RAPORT DE ANALIZA PRIVIND POTENTIALUL TEHNIC SI STIINTIFIC EXISTENT IN REGIUNEA DUNARII, RELEVANT PENTRU MANAGEMENTUL INTEGRAT AL SISTEMELOR FLUVIU – DELTA – MARE

Pachet de Lucru # 2

Analiza potentialului ethnic si stiintific existent in Regiunea Dunarii, relevant pentru managementul integrat al sistemelor fluviu – delta – mare

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CUPRINS

1. INTRODUCERE

Acest raport are ca scop principal realizarea unei analize detaliate a potențialului de cercetare tehnico-ştiinţific existent in Regiunea Dunării, relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare.

Centrul Internaţional pentru Studii Dunare- Delta Dunării - Marea Neagra (*DANUBIUS - RI)* va fi propus pentru a fi inclus pe viitoarea foaie de parcurs ESFRI ca infrastructura de cercetare majoră pan-europeană în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare, cu accent pe macrosistemul Dunăre-Marea Neagră. Propunerea DANUBIUS-RI va trebui depusa în cadrul următoarei competiţii de proiecte pentru următoarea foaie de parcurs a ESFRI (apel asteptat pentru următoarea competitie ESFRI - in prima jumătate a anului 2014).

Se prevede ca DANUBIUS – RI să cuprindă un Nucleu în Delta Dunării – având rolul de centru de comandă şi un rol major ca infrastructura de cercetare (transformând delta intr-un „laborator natural"), precum şi o serie de Noduri în Europa. Noul Centru va contribui la cercetarea mediului si va promova inovarea in regiunea extinsa a Dunării, inclusiv Delta Dunării si Marea Neagra. Aceste noduri vor da DANUBIUS-RI un caracter de infrastructura distribuita si vor avea o contribuţie suplimentară în structura proiectului, dat fiind faptul că vor aduce împreuna facilităţi de cercetare angajate în procese şi metodologii de cercetare din întreaga Europă. Vor fi astfel aduse împreună ca noduri ale unei infrastructuri distribuite, cu nucleul central in Delta Dunării, facilitati de cercetare de excelenta in diferitele problematici ale sistemelor fluviu – delta - mare.

Misiunea centrului DANUBIUS-RI va fi aceea de a furniza soluţii ştiinţifice inovative, ca răspuns la principalele provocări globale din domeniu şi de a stabili cadrul pentru dezvoltarea durabilă a sistemului Dunăre – Delta Dunării – Marea Neagră, ca bună practică pentru sistemele majore de tip fluviu-deltă-mare la nivel mondial.

În cadrul procesului de pregătire, România – în calitate de iniţiator al DANUBIUS - RI – necesită sprijinul celorlalte State Membre ale UE, atât din interiorul, cât şi din exteriorul Regiunii Dunării. Ţările care se vor alătura consorţiului DANUBIUS - RI vor fi selectate pe baza comunităţilor de cercetare puternice de care dispun, capabile să contribuie în mod substanţial la dezvoltarea proiectului. Un element important de reţinut în acest demers constă în nevoia de a dezvolta DANUBIUS-RI ca infrastructură de cercetare distribuită în accepţia ESFRI şi nu ca o reţea de infrastructuri de cercetare– toate acestea abordând aceleaşi teme – deoarece în acest caz ar putea fi asociată cu o „Iniţiativă de Infrastructuri Integrate" (I3). O eventuală confuzie din acest punct de vedere ar putea conduce la respingerea DANUBIUS-RI în cadrul viitoarei Foi de parcurs a ESFRI.

Obiectivul final al DANUBIUS - RI este de a deveni şi funcţiona ca Infrastructura de Cercetare pan-europeană Distribuită cu acces deschis şi de a deveni „ERIC (European Research Infrastructure Consortium - Consorţiu pentru o infrastructură europeană de cercetare)" din punct de vedere juridic.

Pentru a îndeplini aceste obiective, DANUBIUS-RI va numi o echipă de management la nivel internaţional, va avea un *Consiliu Ştiinţific* şi un *Consiliu General* internaţional, cu participarea tuturor asociaţilor.

Prin Strategia Uniunii Europene pentru Regiunea Dunării (SUERD), DANUBIUS-RI a primit statutul de *Proiect Fanion* în cadrul Domeniului Prioritar 7 „Societatea Bazată pe Cunoaştere" a SUERD (2 octombrie 2013). La nivel naţional, Guvernul României a considerat demersul de dezvoltare a DANUBIUS - RI şi a Nucleului său din Delta Dunării drept un Proiect Major de Infrastructură de Cercetare, permiţând finanţarea prin fonduri publice naţionale şi structurale în perioada de programare 2014-2020.

2. METODOLOGICA APLICATĂ

Realizarea raportului de analiză privind potenţialul de cercetare tehnico-stiinţific existent în Regiunea Dunării, relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare, a necesitat o componentă esenţială de cercetare susţinută.

În vederea îndeplinirii obiectivelor raportului, Consorţiul a aplicat mai multe instrumente de cercetare, precum analiza documentară (literatura de specialitate relevantă, documente oficiale şi resurse de pe internet), sondaje în rândul celor mai importanţi actori implicaţi, întâlniri de tip atelier cu experţi din comunitatea ştiinţifică şi cea de afaceri, schimburi de idei între membrii Consorţiului.

Trebuie menţionat, în primul rând, faptul că prezentul document constituie un Raport de faza, iar raportul final privind această temă va fi livrat la încheierea fazei următoare (30 iunie 2014), în conformitate cu Caietul de Sarcini al contractului.

Pe parcursul acestui demers, cercetarea a fost structurată în *5 etape*:

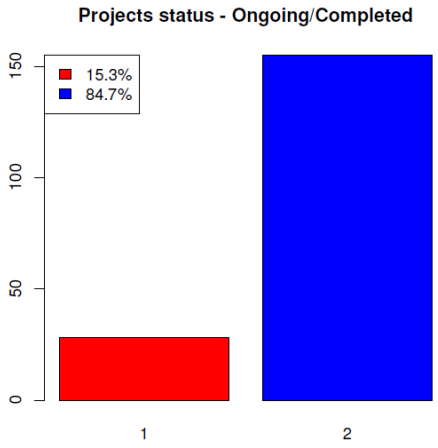
Etapa I: Cercetare documentară a datelor existente

În cadrul acestui proces, Consorţiul a abordat un volum semnificativ de studii descriptive şi de explorare cu privire la infrastructurile şi proiectele de cercetare existente în *Regiunea Dunării*, ce abordează potenţialul existent în materie de infrastructură de cercetare, agendă ştiinţifică şi instruire. Versiunea actuală a raportului se referă la potenţialul tehnico-stiinţific din partea cursului mijlociu si inferior al Regiunii Dunării, inclusiv Delta Dunării, zona costiera si platforma continentala din vestul Mării Negre, aflate sub influenţa fluviului, în timp ce versiunea finală va trata şi porţiunea centrală şi superioară a Regiunii Dunării.

Analiza documentară a implicat realizarea următoarelor activităţi: informare asupra proiectului pentru toţi membrii echipei, identificarea surselor de informaţii, colectarea şi procesarea datelor, completarea fişelor de date privind infrastructura cu referire la aspectele mai sus menţionate, interpretarea şi analiza datelor.

Sursele utilizate în vederea colectării informaţiilor au constat din: versiunea actualizată a Cărţii Albe, Cartea Albastră (dezvoltata in cadrul acestei faze), resursele internet ale infrastructurilor de cercetare şi programelor existente, rapoarte oficiale publicate pe pagina de internet a Comisiei Europene şi domeniul ESFRI, studii şi rapoarte realizate de către membrii Consorţiului în cadrul altor proiecte (FP7 DANCERS), informaţii furnizate în mod direct de către toţii partenerii din consorţiul DANUBIUS-RI.

Esantionul de date folosit pentru analiza in acest raport provine din rezultatele obtinute de proiectul FP7 DANCERS (coordonat de GeoEcoMar şi având INSB în calitate de partener), date care pot fi accesate din baza de date creata in cadrul proiectului si care este gazduita pe serverul Universitatii Wasser Cluster Lunz. Baza de date este active si se poate accesa la adresa http://wcl-geo.boku.ac.at/geonetwork/srv/eng/search.
Esantionul analizat este format din 184 de proiecte coordonate de tari din zona Dunarii de jos. Aceste proiecte sunt coordonate de 5 tari din zona Dunarii: Romania, Bulgaria, Ungaria, Serbia, Ungaria si Ucraina. Din cele 184 de proiecte analizate, 28 de proiecte sunt in desfasurare, 155 sunt proiecte incheiate si un proiect are informatie lipsa.



Din cele 184 de proiecte analizate, 137 sunt proiecte coordonate de Romania, 16 de Bulgaria, 12 de Ungaria, 16 de Serbia si 3 de Ucraina.

Analiza care este prezentata in Sectiunea 5.2 consta dintr-o parte de analiza descriptiva in care variabilele de interes, cum ar fi tipul de finantare, statutul proiectului, aria tematica, tipul de program sunt investigate din punct de vedere cantitativ, iar rezultatele sunt prezentate grafic.

Cea de-a doua parte a analizei prezinta o investigare inferentiala, testeaza ipoteze statistice si efectueaza analiza temporala preliminara a datelor. De exemplu, este testata ipoteza de independenta a variabilelor ariilor tematice ale proiectelor folosind testul Chi-square de independenta. Tabele de contingenta afisand distributia frecventelor variabilelor analizate sunt prezentate si folosite pentru teste statistice care investigheaza relatiile dintre variabile. Analiza presentata in sectiunea 5.2 este obtinuta folosind pachetul statistic R.

Etapa a II-a: Cercetare cantitativă (sondaj)

În vederea completării rezultatelor cercetării cantitative, s-a optat şi pentru realizarea unui sondaj calitativ în rândul celor mai importanţi actori implicaţi (oameni de ştiinţă, factori de decizie şi responsabili de formularea politicilor, comunitatea de afaceri), inclusiv participanţii la atelierele organizate de către

partenerii din Consorţiu, în contextul acţiunilor întreprinse pentru dezvoltarea propunerii DANUBIUS - RI pentru ESFRI.

Echipa Consorţiului a dezvoltat *trei seturi de chestionare*, acoperind o *arie largă de teme* ce vor *furniza informaţii importante nu doar pentru evaluarea potenţialului tehnico-ştiinţific existent în Regiunea Dunării – relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare – ci şi în vederea înfiinţării şi operării viitorului centru DANUBIUS-RI*: potenţialul de cercetare existent în Regiunea Dunării şi domeniile care necesită îmbunătăţiri (infrastructură, agendă ştiinţifică), prioritizarea temelor de cercetare ştiinţifică de abordat în cadrul noii infrastructuri de cercetare în contextul Orizont 2020 (prioritizarea temelor referitoare la Provocările Sociale existente, cu relevanţă pentru DANUBIUS-RI), tipuri de programe de învăţământ comune care vor putea fi oferite de noua infrastructură de cercetare etc.

Chestionarele au utilizat, în mod sistematic, seturi de răspunsuri predefinite şi este de aşteptat ca informaţiile colectate să furnizeze o descriere complexă a convingerilor, opiniilor şi cunoştinţelor actorilor majori implicaţi. Termenul de transmitere a răspunsurilor a fost stabilit pentru luna iunie 2014. Până la data de 31 martie au fost recepţionate 40 de chestionare din partea comunităţii ştiinţifice şi celei de afaceri. Întrebările au fost dezvoltate pe baza provocărilor din domeniul gestionării apelor, în contextul Orizont 2020, şi sunt anexate prezentului raport.

Întrebările formulate acoperă o arie largă de subiecte cu privire la potenţialul existent în Regiunea Dunării, dar şi cu privire la nevoile de dezvoltare ulterioare de tratat în cadrul DANUBIUS - RI:

- necesitatea unei noi infrastructuri de cercetare distribuite la nivel pan-european, având Nucleul în Regiunea Dunării, dedicate managementului integrat al sistemelor de tip fluviu-deltă-mare;
- principalele priorităţi ale activităţilor ce vor fi desfăşurate în cadrul noii infrastructuri de cercetare (şi anume, educaţie, cercetare de bază, cercetare/tehnologie aplicată, inovare, colectare de date şi observaţii, servicii de consultanţă privind reglementarea politicilor);
- lista prioritizată de teme de cercetare privind macrosistemul Dunăre – Delta Dunării – Marea Neagră, necesare în vederea dezvoltării ulterioare a infrastructurii de cercetare din Regiunea Dunării;
- potenţialul de cercetare existent în Regiunea Dunării (laboratoare, programe, proiecte şi iniţiative) şi domeniile care necesită expertiză din alte regiuni;
- agenda de cercetare existentă în Regiunea Dunării şi nevoile de dezvoltare ulterioară în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare (este dezvoltată şi implementată la momentul actual o abordare la nivel de macrosistem?; constituie abordarea la nivel de macrosistem o soluţie pentru succesul managementului integrat al aspectelor

privind regiunea Dunăre-Delta Dunării-Marea Neagră?; studii multidisciplinare versus cercetare sectorială?; este necesară o mai bună integrare şi dezvoltare a cercetării multi- şi pluri-disciplinare din Regiunea Dunării?; care este nivelul actual al calităţii cercetării de mediu din regiune?; este cercetarea actuală privind navigabilitatea în regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă şi rezolvă aceasta problemele de navigaţie?; este cercetarea actuală privind riscurile naturale din regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă şi acoperă aceasta aspectele legate de prevenirea efectelor aferente?; este cercetarea actuală privind calitatea apei pentru diverse utilizări în regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă? Este necesară o mai bună dezvoltare a cercetării privind calitatea apei pentru diverse utilizări?);

- centrele existente de învățământ superior specializat din Regiunea Dunării şi nevoile de dezvoltare ulterioară în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare (existenţa unor programe dedicate de învăţământ superior, diferite de cursurile universitare, care să abordeze soluţiile pentru problemele de gestionare a apelor din Macroregiunea Dunăre-Marea Neagră, şi necesitatea unor astfel de programe în Regiunea Dunării);
- infrastructurile de cercetare din Regiunea Dunării (sunt infrastructurile existente de cercetare şi inovare corespunzător dezvoltate şi coordonate în regiunea Dunăre-Marea Neagră şi este necesară la momentul actual o astfel de infrastructură distribuită la nivelul regiunii?);
- aspectele privind parteneriatele dintre instituţiile de învăţământ şi capacitatea acestora de a îmbina expertiza de cercetare şi cea de predare, îmbunătăţind calitatea studiilor oferite studenţilor şi permiţând, în ultimă instanţă, dezvoltarea cunoştinţelor ştiinţifice (o prioritizare a parteneriatelor dintre instituţiile de învăţământ aflate pe agenda ştiinţifică a DANUBIUS-RI, o prioritizare a instituţiilor implicate în parteneriate în domeniul educaţiei în funcţie de localizarea lor geografică (Regiunea Dunării, alte ţări europene, nivel internaţional); aria geografică a domiciliului studenţilor care participă la cursurile din cadrul DANUBIUS-RI (Regiunea Dunării, alte ţări europene, nivel internaţional); tipuri de diplome/certificate oferite de programele de învăţământ comune ale DANUBIUS-RI (programe universitare comune, programe de masterat comune, programe doctorale comune, programe comune de certificare a cadrelor de conducere – de scurtă durată şi la un

nivel ridicat de specializare, alte tipuri de diplome etc.); tipuri de activităţi de pregătire pentru carieră în cadrul programelor comune de învăţământ ale DANUBIUS-RI).

Sondajul va colecta date care nu pot fi determinate în prealabil şi va fi interpretat în cadrul versiunii următoare a raportului, prevăzută a fi livrată la data de 30 iunie 2014.

Etapa a III-a: reuniune CII şi două întâlniri tip atelier cu experţii din comunitatea ştiinţifică şi cea de afaceri

În vederea completării informaţiilor menţionate anterior, partenerii din cadrul Consorţiului au organizat două întâlniri tip atelier:

- un *atelier cu principalii experţi din comunitatea ştiinţifică (17 – 18 martie)*, având ca scop analizarea cercetării specifice întreprinse până în prezent în Regiunea Dunării. Atelierul a abordat, de asemenea, Delta Dunării şi zona de nord-vest a Mării Negre, precum şi zona de coastă a acesteia, cu accent pe proiectele cu finanţare naţională, internaţională şi europeană din domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare.
- un *atelier cu comunitatea de afaceri (19 – 20 martie)*, intitulat: „*Ştiinţă şi afaceri în domeniul gestionării apelor în Regiunea Dunării: idei noi pentru oportunităţi mai bune de afaceri*". Participanţii la acest atelier au fost invitaţi să descopere împreună modul în care ştiinţa poate răspunde mai bine nevoilor comunităţii de afaceri regionale, care sunt nevoile stringente la nivelul companiilor private, ce pot fi abordate prin idei inovatoare, precum şi acele acţiuni de realizat pentru a dezvolta în continuare Regiunea Dunării.

Minutele celor două ateliere şi prezentările respective sunt incluse în prezentul raport, iar principalele constatări şi concluzii sunt sintetizate în secţiunea şase, "*Concluzii şi recomandări*". Atelierele au fost moderate de către Dr. Adrian Stanica (GeoEcoMar).

Lista participanţilor la ateliere a inclus reprezentanţi ai următoarelor organizaţii:

- ISMAR- CNR şi CORILA – Italia
- University College Cork – Irlanda
- IFREMER şi Universite de Lorraine, Metz – Franţa
- Hellenic Centre for Marine Research – Grecia
- Centrul National de Oceanografie din Southampton (NOC), Universitatea din Stirling şi Universitatea din Birmingham – Marea Britanie
- ZSI Vienna – Austria
- UNESCO – IHE
- Universitatea Ecologică de Stat din Odessa - Ucraina

- Universitatea Szeczeni Istvan din Gyor, Aquaprofit, HydroInform – Ungaria
- Centrul de Cercetare a Mediului Costier, Universitatea Politehnică din Barcelona – Spania
- Univ. Geneva – Elveţia
- DELTARES - Olanda
- Universitatea din Novi Sad – Serbia
- Institutul de Oceanologie – Academia de Ştiinţe din Bulgaria
- FMMC, Gea Consulting, Marine Research Ltd., Institutul Naţional Delta Dunării, Universitatea din Bucureşti, INSB, GeoEcoMar - România

Toate materialele de prezentare, precum şi minutele aferente celor trei evenimente menţionate mai sus au fost utilizate în elaborarea diferitelor secţiuni ale acestui raport.

Etapa a IV-a: Procesarea, analiza şi interpretarea datelor

În cadrul etapei de analiză şi procesare a datelor, informaţiile şi datele colectate din mai multe surse au fost procesate într-o manieră standardizată, folosind un set de criterii predefinite.

Consorţiul a dezvoltat o serie de instrumente de procesare şi interpretare a datelor. A fost dezvoltat un set de fişe de date privind infrastructurile şi programele, (a se consulta anexele), acoperind aspectele relevante referitoare la potenţialul tehnico-stiinţific existent în Regiunea Dunării, din perspectiva managementului integrat al sistemelor fluviu-deltă-mare. Au fost colectate următoarele seturi de date aferente fiecărei organizaţii: nume, categorie, statut, localizare, obiective, descriere, resurse umane şi agendă ştiinţifică.

Etapa a V-a: Redactarea raportului ştiinţific

Instrumentele de cercetare şi sursele de informaţii menţionate mai sus au furnizat date de intrare solide pentru elaborarea diferitelor secţiuni ale raportului şi formularea seturilor de concluzii şi recomandări în legătură cu propunerea de proiect DANUBIUS - RI pentru ESFRI.

Informaţiile incluse în versiunea curentă a raportului se bazează exclusiv pe constatările rezultate din analiza documentară şi concluziile celor două ateliere şi ale reuniunii CII organizate de către partenerii din Consorţiu.

Analiza principalelor puncte forte şi puncte slabe va fi dezvoltată în versiunea finală a raportului, odată ce vor fi disponibile rezultatele sondajului calitativ, permiţând membrilor echipei să formuleze un set relevant de concluzii şi recomandări esenţiale pentru dezvoltarea ulterioară a DANUBIUS-RI, raportul constituind – în consecinţă – un solid studiu de caz.

3. CONSTRÂNGERI ALE RAPORTULUI DE ANALIZĂ

Pe parcursul acestui demers, Consorţiul a formulat următoarele ipoteze şi constrângeri în ceea ce priveşte raportul final:

- Raportul de analiză asupra potenţialului tehnico-stiinţific existent în Regiunea Dunării, cu relevanţă pentru managementul integrat al sistemelor fluviu-deltă-mare, trebuie utilizat în integralitatea sa şi nu parţial.
- Toate materialele elaborate în cadrul acestui proiect vor fi utilizate pentru pregătirea propunerii privind *Centrul Internaţional pentru Studii Avansate Dunăre - Delta Dunării - Marea Neagră* (*DANUBIUS - RI)* în vederea includerii sale pe viitoarea foaie de parcurs ESFRI, ca infrastructură de cercetare majoră pan-europeană în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare, cu accent pe macrosistemul Dunăre-Marea Neagră (apel aşteptat la jumătatea anului 2014).
- Informaţiile cuprinse în acest document se bazează pe eforturile de cercetare şi analiză întreprinse de către consorţiu şi se consideră a fi corecte, constituind informaţii oficiale privind infrastructurile de cercetare, programele şi iniţiativele existente în Regiunea Dunării. Conţinutul raportului de analiză poate suferi modificări şi nu trebuie considerat a fi garantat în nici o circumstanţă.
- Conţinutul acestui raport de analiză a fost elaborat pe baza surselor de informaţii existente, şi anume: informaţii de interes public (paginile de internet ale infrastructurilor de cercetare/ programelor/ iniţiativelor din Regiunea Dunării), minutele întâlnirilor şi prezentările din cadrul evenimentelor organizate de către GEOECOMAR şi INSB (două ateliere şi o şedinţă CII), Cartea Albă, Cartea Albastră, alte informaţii de interes public obţinute pe parcursul acestui proces (a se consulta secţiunea *Bibliografie*). Sondajul organizat va colecta date ce nu pot fi determinate în prealabil şi va fi interpretat în cadrul versiunii finale a raportului, prevăzută pentru livrare pe data de 30 iunie 2014.
- Raportul de analiză se bazează pe informaţiile disponibile referitoare la centrul DANUBIUS - RI, aşa cum este descris în Cartea Albă, versiunea 7 (fără informaţii de tip cantitativ).
- Autorii nu îşi asumă responsabilitatea privind aspectele de natură juridică.

4. CENTRUL PENTRU STUDII AVANSATE "DANUBIUS"

4.1. DESCRIEREA CENTRUL PENTRU STUDII AVANSATE "DANUBIUS"

Centrul International pentru Studii Avansate a Sistemelor Fluviu-Delta-Mare "DANUBIUS-RI" este o initiativa romaneasca de a crea o noua infrastructura care va reprezenta atat un Centru International de cercetare pentru sisteme Fluviu-Delta-Mare cat si un Pol International de Excelenta pentru cercetare si inovare in management si dezvoltare durabila a zonelor umede si a macrosistemelor fluviu-delta-mare.

O abordare integrata a anumitor probleme si aspecte legate de sistemele fluviu-delta-mare este din ce in ce mai necesara, chiar daca numeroasele organizatii de cercetare, avand ca obiect de activitate studierea fluviilor, estuarelor, deltelor si oceanelor, desfasoara proiecte multidisciplinare in acest domeniu, la nivel european. Acest lucru este necesar pentru ca ecosistemele de la interfata apa-uscat reprezinta zone foarte bogate din punctul de vedere a biodiversitatii, care furnizeaza servicii esentiale si sunt (inca) caracterizate de procese dinamice. De asemenea, impactul actiunilor antropice asupra sistemului este important, acestea exercitand o presiune semnificativa si din ce in ce mai intensa, asupra functionarii sisteme naturale (vulnerabile). Toti acesti factori trebuie considerati parti integrante ale ecosistemului, fiind foarte important sa fie identificate si apoi promovate initiative pentru asigurarea durabilitatii (regionale), a protectiei mediului si a dezvoltarii socio-economice in mod optim.

Initiativa va raspunde in principal cerintelor a doua strategii importante din Europa, pentru viitor, cu privire la mediu, schimbari climatice si biodiversitate, folosind sistemul ca model Dunare – Delta Dunarii – Marea Neagra:

- Strategia Europeana Orizont 2020 si
- Strategia Uniunii Europene pentru Regiunea Dunarii.

Strategia cu un rol major in promovarea viitorului centru este Strategia Uniunii Europene pentru Regiunea Dunarii, elaborata de Comisia Europeana in 2010 si adoptata in aprilie 2011, pe baza contributiilor statelor riverane, care a fost creata luandu-se in considerare argumente socio-economice si geopolitice, cu atat mai mult cu cat Regiunea Dunarii reprezinta 1/5 din teritoriul UE. Aceasta strategie reprezinta un instrument comun pentru cooperare macroregionala in Uniunea Europeana, in care sunt invitate sa participe cele 14 state membre si trei state candidate din Bazinul Dunarii. Centrul international raspunde uneia din actiunile majore ale Planului de Actiune al Strategiei – crearea unui centru international pentru studii avansate in Regiunea Dunarii.

In octombrie 2013, DANUBIUS-RI a obtinut statutul de **Proiect Fanion** in Strategia de Dezvoltare a Comisiei Europene pentru Regiunea Dunarii.

De asemenea, proiectul este considerat de catre Guvernul Romaniei/Ministerul Educatiei Nationale ca fiind un Proiect Major care va fi co-finantat din fonduri publice in urmatoarea perioada, 2014-2020, prin Fondurile Structurale si de Investitii ale Romaniei.

4.2. Descrierea Infrastructurii

Infrastructura Centrului International pentru Studii Avansate a Sistemelor Fluviu-Delta-Mare "DANUBIUS-RI" va cuprinde:

- un sediu central in Delta Dunarii, la Murighiol, pe o suprafata de 10 ha, si
- o retea de noduri distribuite in Europa, care reprezinta de fapt facilitati de top si/sau centre de excelenta in cercetare pentru sisteme acvatice.

Locatia sediului central a fost selectata din 11 locatii din Rezervatia Biosferei Delta Dunarii. Sediul central va fi situat pe malul drept al bratului Sfantu Gheorghe, in Rezervatia Biosferei Delta Dunarii, la Murighiol. Aceasta locatie e deschisa accesului direct de pe drumul national si de pe Dunare, ofera acces imediat in Delta Dunarii si faciliteaza accesul in zona de coasta si pe cursul inferior al Fluviului Dunarea. Consiliul local Murighiol a aprobat 10 hectare de teren pentru construirea centrului.

Abordarea nucleu central+noduri ofera sansa de de a grupa cele mai bune facilitati si competente din Europa si de a sustine un efort concentrat (pe plan international) pentru intelegerea, caracterizarea si gestionarea sistemelor fluviu+delta+mare la nivel global.

Prin aceasta initiativa, oportunitatile oferite de cercetarea in laboratorul natural '*sistemul Fluviul Dunarea – Delta Dunarii – Marea Neagra*' vor fi maximizate prin construirea unei noi infrastructuri de cercetare si prin implicarea activa a cercetatorilor si a institutiilor atat din tara cat si din strainatate. Acesta va furniza rezultate cu un beneficiu real pentru populatia din macro-regiunea Dunare-Marea Neagra, care vor fi transferabile si altor sisteme fluviu-delta-mare.

Centrul international va functiona ca o Infrastructura Distribuita de Cercetare pan-europeana, avand unitatea de coordonare in Delta Dunarii, la Murighiol, cu urmatoarele roluri:

- centru administrativ;
- locatie pentru noi laboratoare de cercetare (sediul va reprezenta si o poarta deschisa catre laboratorul natural Delta Dunarii);
- facilitati pentru educatie.

Nucleul central va comunica cu nodurile distribuite din Europa, reprezentate de facilitatile/centrele de excelenta in cercetare pe domenii specifice.

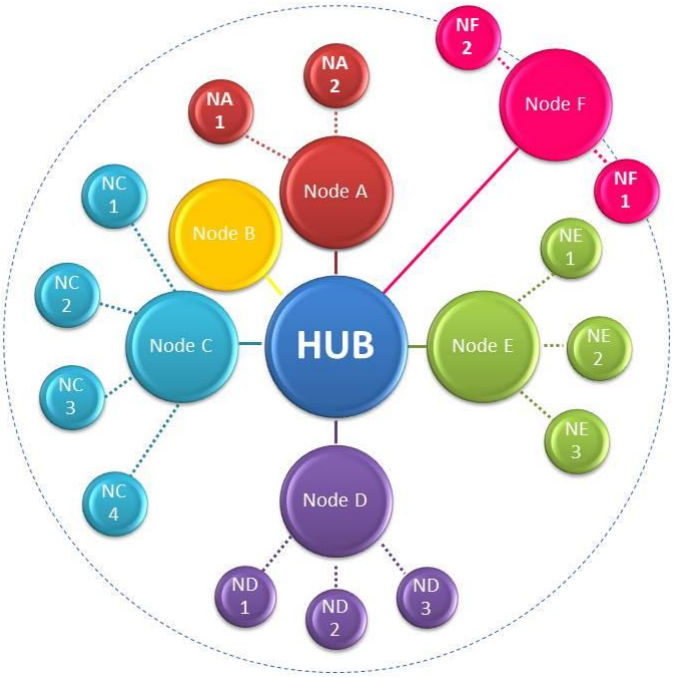


Figura 1. Diagrama care prezinta conceptul centrului ‚DANUBIUS-RI' (nucleu central + noduri)

Centrul va functiona ca o platforma de dialog permanent intre toate partile implicate pentru a identifica si hotari asupra felului optim de folosire a resurselor naturale din zonele sensibile din punct de vedere ecologic, fara a perturba functionarea sau structura ecosistemului.

Nodurile vor fi reprezentate de facilitati de top si centre de excelenta care au ca obiect de activitate cercetarea proceselor naturale si/sau sociale, si/sau ofera acces la alte macrosisteme comparabile (sau parti din acestea). Toate nodurile sunt conectate intre ele in mod direct si de asemenea prin/si cu sediul centrului.

Structura centrului cu un nucleu fizic (sediu) in Delta Dunarii si noduri distribuite in Europa (atat in cadrul cat si in afara Regiunii Dunarii) va oferi astfel sansa de a conecta cele mai bune expertize si capacitati stiintifice din Europa, atat pentru macrosistemul Fluviu Dunarea – Delta Dunarii – Marea Neagra cat si pentru alte macrosisteme similare la nivel global. Expertiza internationala adunata sub umbrela acestui Centru, din stiintele mediului, vietii, Pamantului si cele socio-economice va oferi o baza excelenta pentru dezvoltarea unei structuri care sa lucreze pentru dezvoltarea durabila a sistemelor fluviu-delta-mare.

Crearea DANUBIUS-RI va cuprinde 3 faze, in perioada 2013 – 2020 (pe baza studiului de fezabilitate si a materialelor care vor rezulta din proiectele FP7 DANCERS, si dupa intrarea pe lista ESFRI, a proiectului Horizon 2020 care va fi dedicat DANUBIUS-RI pentru Faza Pregatitoare).

- **Faza 1 – 2014-2016**

Prima faza consta in constructia infrastructurii de baza a nucleului de la Murighiol – „statia de teren”, care va avea:

- Facilitati de cazare si depozitare
- Laboratoare
- Echipament de birou.

In aceasta etapa va fi de asemenea necesara dezvoltarea legaturilor cu alte infrastructuri si facilitati de cercetare, nationale si internationale, implicate in studii ale macrosistemelor fluviu-delta-mare.

La finalul acestei faze, centrul va fi deja o facilitate moderna, pan-europeana, pentru studii complexe in teren a sistemului Dunarea – Delta Dunarii – Marea Neagra.

In aceasta faza se prevede constructia a ~70 % din totalul cladirilor planificate. Acestea sunt:

a. **Cladiri destinate activitatilor de cercetare in sistemul fluviu – delta – mare:**
   - Laboratoare pentru prepararea primara a probelor colectate din teren;
   - Laboratoare pentru analiza probelor care trebuiesc lucrate imediat sau pentru probe care nu pot fi transportate la alte laboratoare fara a fi deteriorate;
   - Facilitati de stocare pentru probe geologice si biologice;
   - Facilitati pentru stocarea pe termen lung a probelor de sedimente – o litoteca;
   - Ateliere pentru construirea si repararea echipamentului de teren
   - Spatii pentru pastrarea in bune conditii a echipamentelor de lucru.

b. Cladirea administrativa a centrului si cladire de birouri pentru cercetatori.

c. Cladiri care sa contina sali de conferinte, sali pentru intalniri/cursuri, biblioteca, centru IT (ex. un centru de „cloud computing”), etc.;

d. Cladiri pentru cazarea
   - cercetatorilor,
   - personalului tehnic
   - personalului adimnistrativ,
   - studentilor si
   - vizitatorilor.

Alti pasi importanti de urmat, prevazuti in Faza 1 a constructiei includ:

- inzestrarea centrului cu echipament pentru probare si observatii in situ, inclusiv echipament automat si echipament pentru monitorizare pe termen lung care va fi amplasat in apa (brate, lacuri, canale, etc.).
- Furnizarea si instalarea de echipament stiintific in laboratoare pentru prepararea primara a probelor si pentru analize imediate.
- Echiparea cladirilor administrative si de birouri si a celor pentru conferinte, centru de calcul si cazare;
- Furnizare de facilitati tehnice si logistice pentru centru, care sa corespunda celor mai noi standarde ale strategiilor de management ecologic pentru:
    - Alimentare cu apa,
    - Alimentare cu energie electrica,
    - Tratarea apei reziduale/uzate;
    - Debarcader pentru vasele si barcile de cercetare ale Centrului.

Faza 2 – 2016-2018

A doua faza a constructiei presupune furnizarea, instalarea si testarea echipamentelor de inalta tehnologie, specializate, care vor forma o infrastructura europeana moderna de prim nivel la scara globala, dedicata studiilor inter si multi-disciplinare a factorilor complecsi care controleaza starea mediului si evolutia sistemulelor fluviu – delta – mare.

Lista detaliata a laboratoarelor specializate, de inalta tehnologie, facilitati/dispozitive/echipamente de modelare fizica, facilitati de tip mezocosm, cat si echipamentul specializat pentru aceste laboratoare, va rezulta din Proiectul de Faza Pregatitoare a DANUBIUS-RI dupa acceptarea pe lista ESFRI.

Faza 3 – 2018-2020

Cea de a treia faza a constructiei va consta in dezvoltarea infrastructurii, in conformitate cu nevoile identificate in viitoarea Faza Pregatitoare (si/sau viitoare alte categorii de proiecte – cu parteneri internationali) si acestea for fi reprezentate de facilitati si capacitati de varf la nivel global, dar si de nave de cercetare pentru studiul fluviului, deltei si marii:

- O nava de cercetare de mari dimensiuni, complet echipata, multifunctionala pentru mare (aprox. 2,000 – 2,500 t) si
- O nava de cercetare de mici dimensiuni pentru fluviu, delta si zona costiera.

Nava maritima va fi parte a flotei de cercetare europene, urmand sa devina nava de serviciu a Uniunii Europene pentru cercetarile din Marea Neagra.

Educatia/programul de strategie si infrastructura lui specifica va fi dezvoltata prin colaborari cu universitati, unitati de cercetare – dezvoltare, alte proiecte ESFRI, infrastructuri europene si regionale, precum si cu alte institutii care vor lua parte la activitatile Centrului International Dunarea pentru Studii Avansate in Sistemele Fluviu – Delta – Mare.

4.3. Descrierea agendei stiintifice

Noua Infrastructura de Cercetare distribuita va fi dedicata studierii sistemelor fluviu - delta - mare, si isi propune sa reuneasca echipe trans si interdisciplinare(din toate domeniile) de cercetatori, cu experienta necesara pentru a rezolva problemele legate de sistemele rau-delta-mare. Aceste sisteme complexe si dinamice trebuie să fie mult mai bine cunoscute, caracterizate si comunicate, dificultatile de monitorizare si managementul acestor sisteme (la scara întregului bazin si in timp real) trebuie rezolvate, trebuie sa fie dezvoltat un management integrat si flexibil in scopul de a evalua si analiza raurile, delta, litoralul si marea aflata sub influenta fluviului ca pe o singură entitate.

Din punct de vedere stiintific, este necesara o abordare profunda a problemelor specifice si a intelegerii unor aspecte legate de sistemele fluviu-delta-mare, cu toate ca la nivel european exista mai multe organizatii sau initiative active in domeniul specific stiintelelor de cercetare multi-disciplinara cu privire la rauri, delte si mari (doar segmente ale sistemelor integrate fluviu-delta-mare). DANUBIUS-RI va oferi o perspectivă integratoare asupra sistemului fluviu- delta-mare, fiind o platformă unică si transdisciplinara în domeniu, care va integra cunostintele existente din diferite discipline, precum cele din stiintele Pământului, ecologie, stiintele vietii si stiintele socio-economice. DANUBIUS-RI va facilita si coordona activitati si proiecte de cercetare si va oferi o infrastructura pentru a implementa si mentine puncte de monitorizare in intregul sistem al bazinului hidrografic pana spre zona de mare adanca. De asemenea, centrul va asigura calitatea datelor colectate, stocarea si diseminarea acestora.

Pentru a raspunde la diverse probleme legate de managementul integrat si eficient al sistemelor rau-delta/estuar-mare, o serie de **provocari stiintifice majore la nivel global** trebuie sa fie abordate, cum ar fi:

- intelegerea genezei si evolutiei naturale a macrosistemelor Fluviu -Delta-Mare;
- cuantificarea impactului schimbarilor antropice asupra sistemelor Fluviu–Delta-Mare;
- determinarea vulnerabilitatii si/sau a modificarilor suferite de catre sistemele Fluviu–Delta-Mare ca urmare a schimbarilor climatice;
- caracterizarea ciclurilor biogeochimice in intregul macrosistem Fluviu/Rau-Delta-Mare;

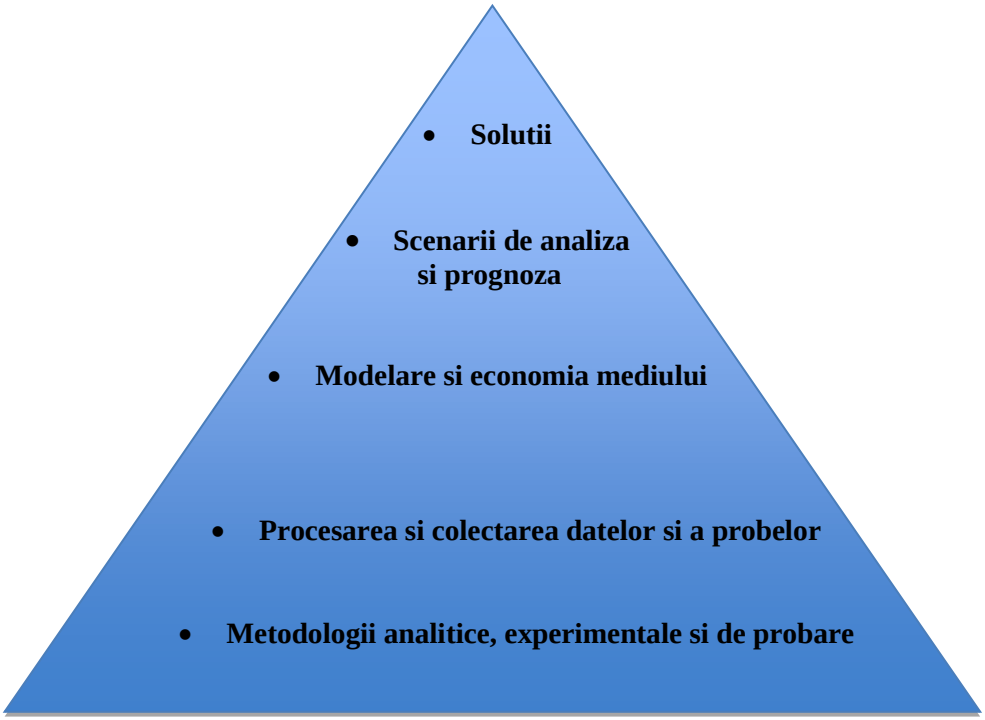
- management integrat avansat cu privire la inundatii/secete catastrofale cu hazard potential asupra intregului macrosistem Fluviu/Rau-Delta-Mare;
- investigarea consecintelor deteriorarii fizice a structurilor morfologice si a habitatului (ex. canalizari, indiguiri, baraje) si determinarea masurilor pentru refacerea hidromorfologiei naturale;
- conservarea si refacerea biodiversitatii din macrosistemele Fluviu/Rau-Delta-Mare;
- imbunatatirea si protejarea bunurilor si serviciilor furnizate de macrosistemele Fluviu-Delta-Mare;
- dezvoltarea solutiilor de management pentru cadrul politic existent si de viitor (de exemplu Directiva Cadru Apa a Comisiei Europene);
- acordarea de expertiza stiintifica pentru dezvoltarea, imbunatatirea si testare de politici si norme de protectia mediului.

DANUBIUS-RI se va implica in programe majore de cercetare a macrosistemelor fluviu-delta-mare care vor raspunde la aceste provocari stiintifice complexe. Capacitatile stiintifice de baza ale DANUBIUS-RI vor cuprinde o piramida a cunoasterii pe care se va baza managementul eficient, integrat, al macrosistemului fluviu-delta-mare.

Potentialul stiintific al Centrului va include (vezi figura 2):

- o infrastructura adecvata de monitorizare, in care se va face colectarea de date si probe complexe si in mod continuu;
- capacitatea de a dezvolta metodologii analitice si experimentale noi si avansate;
- dezvoltarea si aplicarea de modele noi si imbunatatite de mediu din macrosistemele rau-delta-mare, care sa permita elaborarea de predictii;
- dezvoltarea si aplicarea unei abordari noi si performante in ceea ce priveste economia mediului pentru a putea evalua legatura dintre societate si mediu;
- identificarea solutiilor de management pe baza prognozei detaliate si analizei de scenarii cu privire la viitoarele schimbari de mediu.

Figura .2 Diagrama potentialului stiintific al Centrului



In partea superioara a diagramei se poate observa posibilitatea identificarii solutiilor specifice si adecvate pe baza celor mai solide date disponibile si a intelegerii stiintifice ca urmare a activitatii DANUBIUS-RI1 mai sus mentionate.

Pentru stabilirea agendei stiintifice, Centrul isi propune sa se adreseze temelor de cercetare care sunt in prezent de interes (vezi Cartea Alba), precum:

1- **Caracterizarea sistemelor** (inclusiv Geneza si Evolutia macrosistemelor fluviu-delta-mare):

- influenta proceselor geodinamice asupra macrosistemelor fluviu-delta-mare;
- paleoclimatul, paleolimnologia si paleogeografia regionala, hidrologia, transportul de sedimente, ciclurile biogeochimice, hidrogeologia si morfo-dinamica;
- analiza evolutiei ecosistemelor.

2- **Modificarile globale** (inclusiv impactul Schimbarilor Climatice)

- evaluarea schimbarilor din structura si functionalitatea ecosistemelor ca urmare a influentelor naturale si antropice;
- evaluarea in timp real si continuu a calitatii mediului; dezvoltarea unui sistem de avertizare complex care sa vina in ajutorul managementului riscurilor;
- recomandari si norme pentru imbunatatirea nivelului ecologic al ecosistemelor cu probleme de functionare si conservarea speciilor pe cale de disparitie si a habitatului lor.

3- **Managementul flexibil si durabil** al macrosistemelor fluviu-delta-mare.

- metode si modele de dezvoltare durabila pe baza abordarii generale interdisciplinare;
- remedierea sistemului in contextul schimbarilor climatice (ca urmare a influentei climatice si antropice);
- evaluarea schimbarilor sociale ale comunitatilor locale pentru dezvoltare durabila.

Centrul va dezvolta si utiliza alte metode fata de cele folosite pana acum in care, in mod traditional, activitatile de cercetare asupra acestor sisteme erau efectuate separat pe diverse discipline. Aceste noi metode privesc o abordare multi- si transdisciplinara, ca urmare a integrarii mai multor discipline apropiate ca sa poata fi determinate solutii generale cu echipe de cercetatori din diverse ramuri.

Cateva exemple cu teme specifice de cercetare sunt detaliate in Tabelul 1 de mai jos.

Tabel 1. Exemple de topici de cercetare specifice propuse in conformitate cu necesitatile actuale identificate in macrosistemul Dunare – Delta – Marea Neagra.

TOPICI DE CERCETARE SPECIFICE propuse de Centru	
Caracterizarea sistemului	
Originea si evolutia sistemului Dunare – Delta Dunarii – Marea Neagra	- geneza fluviului si a bazinului; - structura geologica; - influenta dinamicii crustei pamantului asupra evolutiei fluviului; - interactiunea dintre fluviu si mare (relatia dintre variatia nivelului marii si conditiile din alte bazine de sedimentare); - formarea deltei; - evolutia depocentrelor, etc.
Procesele geodinamice	- neotectonica; - procesele de ridicare din zona de orogen si formarea si evolutia teraselor fluviului; - subsidenta si compactarea sedimentelor; - corelarea cu evolutia sistemului.
Hidrologie, hidrodinamica, hidrogeologie si sedimentologie	- variatia debitului lichid si solid din sistemul fluviu-delta-mare: - ciclul de sedimentare (sursa – transport – depunere); - bio- si geo-chimia apei si sedimentelor din intregul sistem; - procesele hidrodinamice la interactiunea rau-mare si in zonele lacustre.

Evaluarea si functionarea ecosistemului	- evaluarea stării biotice si abiotice a ecosistemelor fluviu-delta-mare; - poluarea sistemului, eutrofizare, toxicitate, biodiversificare; - evaluarea ciclului hranei, dinamica speciilor si functionarea ecosistemului; - fluxuri de gaze cu efect de sera in zone umede, lacuri si mare.
- **Schimbari de mediu**	
Monitorizarea in-situ a ecosistemului	- evaluarea în timp real si permanentă a calităţii mediului in sistemul fluviu-delta-mare - instalarea de noi tipuri de senzori si echipamente on-line (inclusiv tehnici de micro-si mezocosm); - utilizarea de biomarkeri; - stabilirea seriilor de date pentru analiza pe termen lung a modificarilor din ecosistem.
Monitorizarea terestra si teledetectie	- caracterizarea uscatului si a apei din sistemele fluviu-delta-mare, monitorizarea schimbarilor morfologice si hidrologice, studierea si monitorizarea curenţilor şi a cursului apei, eutrofizarea, dinamica sedimentelor si morfologia albiei raului.
Geo-hazard si evaluarea riscurilor	- evaluarea fenomenelor extreme si a factorilor de declansare, naturali si antropici la diferite scari, cum ar fi: inundatii, secete, alunecări de teren, furtuni; - cutremure; - instabilitati de panta (a sedimentelor) continentala; - geohazardele datorate prezentei gaz-hidratilor in sedimente.
Modelarea, simularea si testarea ipotezelor	- instrumente de predictie pentru evaluarea reactiei mediului inconjurator; - modelarea schimbarilor climatice si de mediu, inclusiv impactul asupra sistemelor fluviu-delta-mare; - efectele evenimentelor extreme asupra sistemului; - impactul cresterii nivelului marii.

Impactul antropic asupra ecosistemului	- degradarea ecosistemului ca urmare a activitatii antropice; - evaluarea dinamicii sociale a comunităţilor locale şi identificarea oportunităţilor economice pentru o dezvoltare durabilă fara degradarea biodiversităţii.
- **Management flexibil si durabil**	
Managementul flexibil al ecosistemului	- Asigurarea bazei stiintifice pentru managementul durabil al sistemelor rau-delta-mare, folosind metode si modele adecvate.
Refacerea si conservarea mediului	- imbunatatirea conditiilor de mediu, refacerea habitatelor, bioremediere, remedierea conexiunilor; - recomandari pentru conservarea speciilor pe cale de disparitie si a habitatelor afectate; - implementarea legislatiei UE; - evaluarea speciilor invazive din afara sistemului.
Inventarierea si evaluarea resurselor naturale	- Studii avansate pentru managementul durabil al resurselor biotice si abiotice prin dezvoltare bazata pe cunoastere si utilizarea unor metode si modele noi (de exemplu, evaluarea beneficiilor ecosistemului).
Evaluarea scenariilor de dezvoltare pentru utilizare durabila	- Abordare interdisciplinara si generala pentru dezvoltarea de noi strategii pentru management durabil. Dezvoltarea de metode pentru crearea si testarea de sisteme de sprijin in luarea deciziilor (DSS) si pentru analiza multicriteriala ca fundamentare in luarea deciziilor.

In plus fata de aceste subiecte stiintifice si manageriale, este preconizat ca DANUBIUS-RI va juca un rol important in:

- **Facilitarea si promovarea educatiei:**
  - Sustinerea programelor de mediu internationale si nationale cu aria de studiu in cadrul macrosistemelor fluviu-delta-mare;
  - Educatie in domeniul mediului pentru cresterea gradului de constientizare in ceea ce priveste problematica din sistemele fluviu-delta-mare.
- **Sustinerea legilor si a regulamentelor in domeniul mediului:**

- Promovarea unei baze stiintifice in vederea imbunatatirii metodelor si a instrumentelor de testare a cadrului legislativ specific, pentru mai buna implementare a politicilor UE;

- **Dezvoltarea de produse si tehnologii ecologice inovatoare:**
  - Concentrarea eforturilor in vederea valorificarii resurselor naturale in sistemele fluviu-delta-mare in conformitate cu directiile dezvoltarii durabile.
- **Dezvoltarea tehnologiilor inovatoare de cercetare-dezvoltare, a echipamentelor si tehnicilor informatice si comunicare de date (IT&C):**
  - Metode inovative de monitorizare, masurare si modelare
  - Noi metode de colectare a datelor, prelucrare, stocare si transfer, unde este necesara dezvoltarea de noi capacitati tehnice si IT&C.
- **Dezvoltarea unei meta-baze de date integrand literatura existenta in domeniu (si date istorice) cat si date** proprii din cadrul programelor ce se vor desfasura in cadrul centrului, in colaborare cu partenerii existenti, in arealul Dunare-Marea Neagra.

4.4. Descrierea Managementului DANUBIUS-RI şi a procesului de Guvernanţă

Din perspectiva resurselor umane, centrul va cuprinde:

- **O echipa de management, constand in**
  - la nivel strategic:
    - Presedinte – Director general;
    - Comitet de coordonare.
  - la nivel operational:
    - sefi de departamente,
    - grupuri de lucru
    - echipe de sprijin.
  - la nivel de sprijin:
    - consiliul consultativ international (incluzand cercetatori de valoare, precum si reprezentanti ai altor posibili beneficiari / utilizatori)

Comitetul Director al centrului este organul executiv, care va lua deciziile DANUBIUS-RI. Aceasta va conduce toate activitatile si va fi responsabil pentru strategia, implementarea si functionarea centrului. Acesta va fi sprijinit de consiliul consultativ international.

Comitetul Director va cuprinde un presedinte, un vicepresedinte si 5 sau 7 membri (inclusiv directorul general al DANUBIUS-RI). Membrii comitetului vor fi numiti pentru a asigura functionarea optima si eficienta a centrului, pastrand in acelasi timp un echilibru rezonabil intre mediile stiintifice diferite, formare si aptitudini.

- **Gupurile si echipele de lucru**

Echipele de lucru vor dezvolta activitatile stiintifice ale centrului, care sunt axate pe directiile principale stabilite de catre Comitetul Director. Structura trebuie sa fie flexibila, cu o participare activa a personalului tehnic, pentru a asigura intretinerea infrastructurii de cercetare. Fiecare grup de lucru va fi condus de un cercetator reputat care ar trebui sa lucreze la un proiect bine definit, pentru o durata limitata.

In plus fata de cercetatori, grupurile de lucru vor fi sprijinite de:

- doctoranzi si post-doctoranzi care abordeaza probleme stiintifice de interes;
- personal stiintific la inceput de cariera, care conduc o activitate de cercetare independenta, sub supravegherea unui cercetator cu renume;
- cercetatori care colaboreaza in zone specifice ale unui proiect pentru o perioada limitata de timp.

La aceasta etapa, sunt avute in vedere doua sectiuni permanente ale centrului, si anume "activitatile IT" si "educatie", pentru a asigura continuitatea.
Pozitia de Director General, precum si toate pozitiile din cadrul departamentelor de servicii vor fi permanente, anuntate si recrutate in plan international. Noul management public va opera pentru a minimiza birocratia si a creste motivatia si eficienta costurilor. Pozitiile de membri ai comitetului director si consiliul consultativ international nu necesita o prezenta personala permanenta la sediul central.

- **Echipele stiintifice si de cooperare**

Ca infrastructura de cercetare de varf (dar si de educatie si inovare) pentru stiintele naturale si socio-economice, DANUBIUS-RI va imbunatati transferul de cunostinte in acest domeniu prin colaborarea stransa cu organizatiile de cercetare si educatie existente.

DANUBIUS-RI va avea printre parteneri o retea stransa de institutii pan-europene si universitati inca de la inceput, astfel incat va beneficia din start de o expertiza deja disponibila. Acesta va coopera cu alte echipe de cercetare pentru a aborda problemele semnificative in macrosistemele fluviu-delta-mare, cum ar fi reducerea biodiversitatii, identificarea de solutii "ecologice" pentru dezvoltarea economica, si buna administrare a resurselor limitate in acelasi timp cu cresterea populatiei.

Cercetatori de varf vor fi invitati sa formeze echipe de baza pentru a lucra in programele de cercetare ale Centrului. Prezenta lor va atrage cercetatori tineri, precum si studenti cu studii universitare finalizate sau/si in curs de finalizare care doresc sa castige experienta in aceste domenii atractive si pe tematici pline de provocari stiintifice. Probele necesare pentru aceste studii vor fi

prelevate, pastrate si analizate in cadrul DANUBIUS-RI sau in laboratoarele altor organizatii de cercetare.

Platforma de educatie oferita de DANUBIUS-RI va oferi o valoare adaugata semnificativa prin crearea unui forum pentru schimbul de cunostinte intre cercetatori si intre cercetatori si studenti. In acest sens, forumul va promova proiecte de cooperare, in special intre echipe din estul si vestul Europei. Cursuri intensive, scoli de vara, conferinte si seminarii vor fi mecanisme importante si valoroase de diseminare a cunostintelor. Mai mult decat atat, Centrul va creste gradul de constientizare a valorii mediului natural si rolul sau in bunastarea oamenilor, prin excursii ecologice si discutii destinate comunitatilor locale, profesori sau turisti.

Alte oportunitati semnificative sunt oferite prin legaturile cu Reteaua Universitatilor de la Marea Neagra. Aceasta retea cuprinde peste 100 de institutii de invatamant superior din regiunea Marii Negre (incluzand Turcia, Georgia, Armenia, Azerbaidjan, Ucraina, Moldova, Romania, Bulgaria, Grecia, Albania, Serbia) si este coordonata de Universitatea "Ovidius" din Constanta, Romania.

DANUBIUS-RI va construi pe baza proiectelor, atat nationale cat si internationale, mai ales europene si in principal Programele Cadru (HORIZON 2020). Acesta va initia in continuare si va participa la proiecte internationale prin cooperarea cu alte organizatii de cercetare majore recunoscute in domeniile lor. Institute romanesti de cercetare relevante si organizatii importante care se ocupa cu studierea si monitorizarea macro-sistemului fluviului Dunare - Delta Dunarii - Marea Neagra vor fi gasi in DANUBIUS-RI o platforma importanta de lucru si educatie.

De asemenea, DANUBIUS-RI va coopera in mod activ cu organizatiile nationale si internationale care sunt desemnate cu gestionarea ecologica si durabila a elementelor specifice fluviului Dunarea - Delta Dunarii - Marea Neagra, prin stabilirea de comun acord a planurilor pentru a rezolvare a unora dintre cele mai importante provocari in macrosistemul Dunare - Marea Neagra.

- **Bazinul Fluviului Dunărea**

Grupul de Lucru Dunăre - Marea Neagră (DABLAS) a fost înfiinţat în anul 2001, cu scopul de a constitui o platformă pentru cooperare în vederea protejării apelor şi ecosistemelor asociate din fluviul Dunărea şi din Marea Neagră. Principalul său obiectiv a constat în dezvoltarea mecanismelor de finanţare pentru implementarea proiectelor de investiţii în vederea reducerii gradului de poluare şi reabilitării ecosistemelor.

- **Marea Neagră**

Ţările cu ieşire la Marea Neagră (Bulgaria, Georgia, România, Federaţia Rusă, Turcia şi Ucraina) au semnat în 1992 şi ratificat în 1994 **Convenţia pentru Protecţia Mării Negre Împotriva Poluării** (Convenţia de la Bucureşti). În vederea implementării Convenţiei, a celor trei Protocoale ale sale (privind poluarea din surse de pe uscat, privind poluarea prin deversare de la bordul navelor şi cel privind acţiunile concertate în caz de accidente, precum scurgerile de petrol) şi a Planului Strategic de Acţiune pentru Reabilitarea şi Protecţia Mării Negre Împotriva Poluării (1996, actualizat în 2002 şi 2009), în anul 2004 a fost înfiinţată Comisia pentru Protecţia Mării Negre Împotriva Poluării (Comisia Mării Negre sau CMN), împreună cu Secretariatul Permanent aferent, în calitate de organism interguvernamental de coordonare.

- **Rezervaţia Biosferei Delta Dunării:**

La momentul înfiinţării Rezervaţiei Biosferei Delta Dunării (RBDD), în anul 1990, Autoritatea pentru Rezervaţia Biosferei Delta Dunării (ARBDD), o instituţie publică aflată sub coordonarea Ministerului Mediului din România.

5. POTENTIALUL TEHNIC SI STIINTIFIC EXISTENT IN REGIUNEA DUNARII, RELEVANT PENTRU MANAGEMENTUL INTEGRAT AL SISTEMELOR FLUVIU – DELTA – MARE

5.1. Analiza infrastructurilor de cercetare existente in Regiunea Dunarii, relevante pentru mangementul integrat al sistemelor fluviu – delta – mare

Infrastructurile majore, programele si initiativele de cercetare din Regiunea Dunarii au fost analizate din punctul de vedere al tematicii si activitatii lor specifice in diferitele parti ale sistemului Dunare – Delta Dunarii – Marea Neagra si au fost stabilite trei categorii (cele dedicate ‚Mediului Marin', ‚Mediului Costier' si ‚Mediului Dulcicol'). Peste 150 de infrastructuri, programe si initiative au fost identificate si in plus, a fost realizata o selectie a universitatilor, laboratoarelor si a altor institutii care isi desfasoara activitatea in regiune. Lista acestora, impreuna cu cateva descrieri detaliate sunt prezentate in Anexa 7.1., cu mentiunea ca lista nu este exhaustiva, activitatea de cautare fiind in desfasurare (in acord cu Planul de Realizare termenul limita pentru materialul final este sfarsitul Fazei 3 – 30 Iunie 2014).

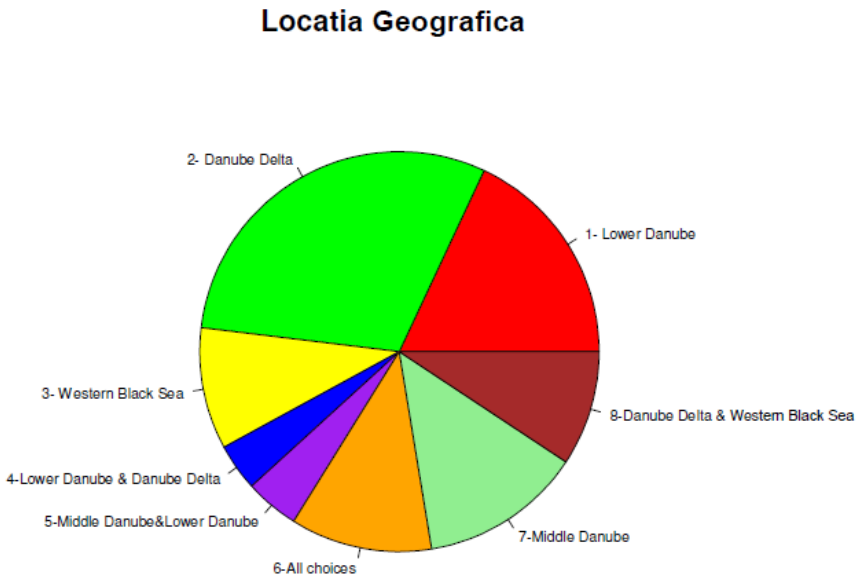
In ceea ce priveste lista proiectelor si initiativelor, analiza nu contine numai infrastructurile propriu-zise (ex. Nave de cercetare) dar si proiecte in derulare si cele deja incheiate, cele mai multe dintre cele prezentate in aceasta etapa fiind localizate in regiunea Dunarii Medii si Dunarii de Jos – Delta Dunarii – Marea Neagra. Din punct de vedere al activitatii specifice in cadrul sistemului Dunare – Delta Dunarii – Marea Neagra, cele mai multe proiecte (65%) sunt dedicate mediului de apa dulce, in timp ce numai 28% mediului marin. Zona de interactiune delta – mare este studiata de 8% dintre proiectele analizate.

Daca sunt luate in considerare numai infrastructurile si proiectele de infrastructura propriu-zise (ex. Proiecte ESFRI, I3 si infrastructurile regionale) cea mai mare parte a lor (64%) este dedicata mediului marin si costier (17% pentru zona costiera, daca este considerata zone de interactiune si nu este asociata marii). Dintre infrastructurile analizate, numai 36% sunt dedicate Dunarii Superioare, Medii, Inferioare si Deltei Dunarii. Laboratoarele si universitatile care gazduiesc laboratoare nu au fost luate in considerare in aceasta analiza.

Aceste informatii dovedesc o mai buna organizare si integrare a comunitatii cercetarii marine decat a celei specializate in apa dulce, atat in Europa in general cat si in Regiunea Dunarii in special. In timp ce comunitatea stiintifica care se ocupa de litoralul si platforma continentala vestica a Marii Negre (inclusiv de regiunea costiera a Deltei Dunarii) este prezenta in cele mai multe proicte ESFRI relevante si retele I3, dat si in alte programe si intiative majore, comunitatea stiintifica dedicata apelor dulci din Regiunea Dunarii este in general absenta din astfel de consortii. In general Regiunea Dunarii este reprezentata in initiative majore de institutii de cercetare din Germania si Austria (Dunarea Superioara) si Romania. Totusi, acest lucru trebuie pus in contextul unui numar redus de infrastructuri si initiative de cercetare care se ocupa de studiul mediilor de apa dulce si de tranzitie. DANUBIUS – RI trebuie sa furnizeze o platforma de cercetare care va acoperi acest domeniu.

5.2. Analiza programelor de cercetare in curs si agendei stiintifice, existente in Regiunea Dunarii, relevante pentru managementul integrat al sistemelor fluviu – delta – mare

Cele 184 de proiecte din esantionul prezentat in aceasta etapa au fost analizate din punct de vedere al locatiei geografice, iar distributia acestora este prezentata mai jos:



Numarul proiectelor finantate in fiecare categorie din cele opt prezentate mai sus este descris in tabelul de mai jos:

Locatie	1	2	3	4	5	6	7	8
Proiecte	33	55	18	7	8	21	24	17

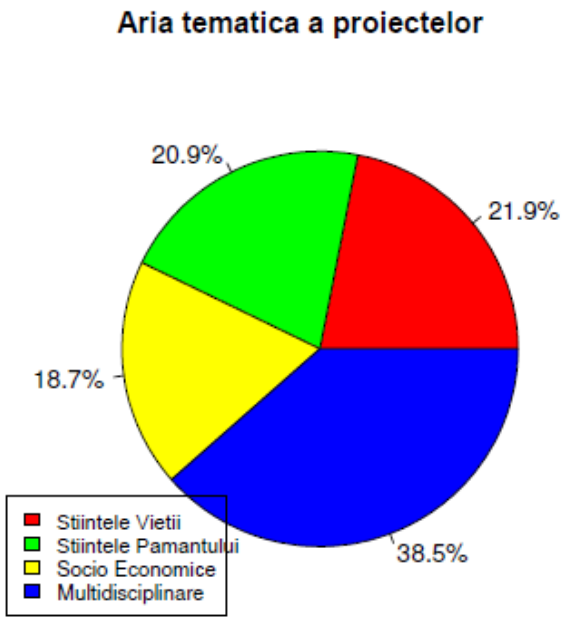
Aria tematica (*Thematic area*) a proiectelor a fost identificata ca o variabila importanta in analiza realizata, sunt 179 de proiecte cu raspunsuri inregistrate si 5 proiecte cu informatie lipsa. Intrebarea referitoare la aria tematica a proiectului permite raspunsuri multiple, raspunsurile posibile fiind:

1. **Stiintele Vietii**
2. **Stiintele Pamantului**
3. **Stiinte Socio Economice**
4. **Multidisciplinare**

Tabelul de mai jos prezinta ariile tematice ale proiectelor analizate, unele dintre aceste proiecte avand selectate mai multe arii tematice:

	Aria tematica Selectata	Neselectata
Stiintele Vietii	61	118

Stiintele Pamantului	58	121
Stiinte Socio Economice	52	127
Multidisciplinare	107	72



Asa cum se poate observa in esantionul analizat proportia proiectelor finantate in aria tematica Stiintele Vietii (21.9%) este comparabila cu proportia proiectelor finantate in aria tematica Stiintele Pamantului (20.9%), subliniind faptul ca cercetarea in zona Dunarii si a Deltei Dunarii a fost sustinuta de ambele arii tematice, fenomen explicat partial de puternica corelatie dintre cele doua domenii, ceea ce sugereaza in mod natural ca si in viitor aceste arii tematice sa fie finantate impreuna. Suntem interesati in a testa daca exista proiecte diferite care sunt finantate in Stiintele Vietii fata de cele finantate in Stiintele Pamantului sau daca aceleasi proiecte sunt finantate sub ambele domenii.

Investigand numarul poiectelor finantate pe combinatiile Stiintele Vietii (SV) si Stiintele Pamantului (SP), obtinem urmatoarele (0 –proiectul nu are finantare sub aria tematica respectiva, 1- proiectul are finantare sub aria tematica respectiva)

SP/SV	0	1
0	83	35
1	44	17

Am testat ipoteza ca variabilele care cuantifica proiectele finatate pe Stiintele Vietii si cele pe Stiintele Pamantului sunt independente fata de ipoteza alternativa ca aceste variabile nu sunt independente, utilizand testul chi-square de independenta. Resultate testului (folosind pachetul R) sunt prezentate mai jos:

chisq.test(mytable)

Pearson's Chi-squared test with Yates' continuity correction

data: mytable

X-squared = 0.0059, df = 1, p-value = 0.9389

Nu am reusit sa respingem ipoteza nula – respectiv ipoteza ca proiectele finantate sub Stiintele Vietii sunt independente de proiectele finantate sub Stiintele Pamantului – contrar cu ceea ce s-a intaplat in cazul analizei efectuata in proiectul DANCERS pentru proiecte coordonate de 26 de tari pentru toata zona Dunarii - si am concluzionat ca in esantionul proiectelor analizat in acest raport, proiectele finantate sub Stiintele Vietii sunt independente/diferite de cele finantate sub Stiintele Pamantului.

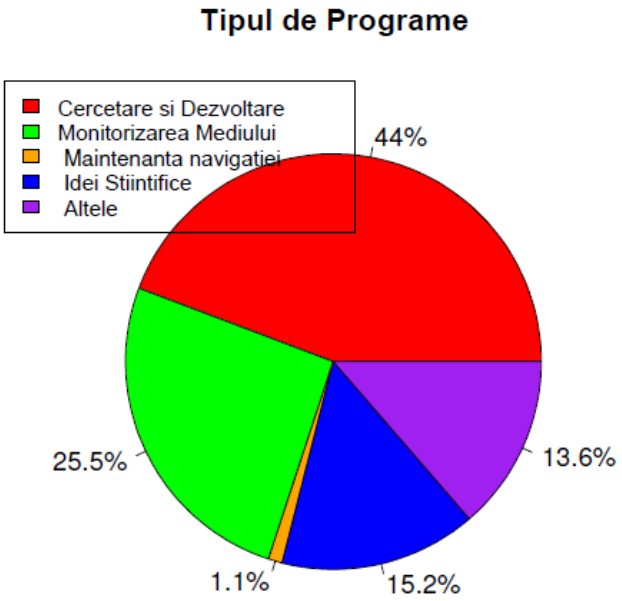
Testand restul ipotezelor statistice am identificat ca proiectele finantate sub Stiintele Pamantului nu sunt independente de cele finantate sub Socio Economie, precum si cele din Stiintele Vietii nu sunt independente de cele Multidisciplinare. Mentionam ca in categoria Multidisciplinare au fost considerate proiecte cu componente de modelare si simulare de bioprocesare, monitorizare in Rezervatia Deltei Dunarii, evaluarea microorganismelor in Biosfera Deltei Dunarii – care au o evidenta componenta in Stiintele Vietii.

Variabila Tipul Programelor este variabila categorica, cu 5 categorii prezentate mai jos:

1- Cercetare si Dezvoltate
2- Monitorizarea mediului si masuratori
3- Maintenanta navigatiei
4- Cercetare si Idei stiintifice
5- Altele

Au fost inregistrate 184 de raspunsuri, iar frecventa raspunsurilor este prezentata mai jos:

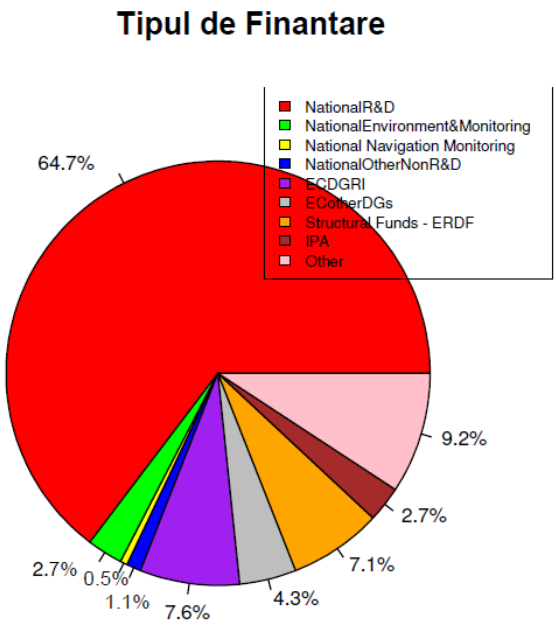
Categorie	1	2	3	4	5
Frecventa	81	47	2	28	25



Se poate observa ca peste 40% dintre proiecte au fost finantate in cadrul programului Cercetare si Dezvoltare (Resurse Umane), urmate de 23% dintre proiecte finantate in cadrul programului Monitorizarea Mediului.

Pentru esantionul analizat, au fost identificate incadrul tipului de finantare, 9 categorii prezentate mai jos:

1. National Research and Development – finantare nationala pentru cercetare
2. National Environmental Monitoring – finantare nationala – monitoring de mediu
3. National Navigation Monitoring – finantare nationala – intretinerea conditiilor de navigatie
4. National non Research and Development – alte proiecte nationale – nu de cercetare-dezvoltare
5. ECDGRI – programe cadru ale directoratului general cercetare inovare – Comisia Europeana
6. EC Other DGs- Comisia Europeana – alte directorate generale (nu DG research)
7. Structural Funds ERDF – fonduri structurale de dezvoltare regionala si coeziune
8. IPA- fonduri europene de preaderare
9. Other- alte



Se poate observa ca aproape 70% dintre proiectele din acest esantion sunt proiecte finantate prin programe nationale.

In cea de-a doua parte a analizei, a fost testata ipoteza ca tipul de finantare este la fel pentru fiecare tara analizata, fata de ipoteza alternativa ca tipul de finantare este diferit.A fost respinsa ipoteza nula ***(p=8.373e^{-16})*** si dupa efectuarea de comparatii multiple s-a observat ca Serbia are acelasi tip de finantare ca Romania sau Ucraina, iar Bulgaria are acelasi tip de finantare ca Ungaria. Analiza a aratat de asemenea ca Romania si Bulgaria – pe baza datelor care au fost inregistrate – au tipuri de finantare diferite.

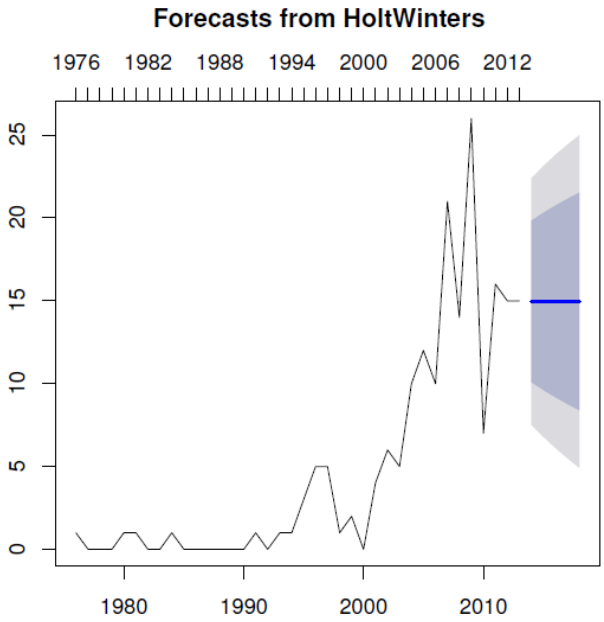
O analiza similara a fost efectuata pentru a testa daca tipul de program al proiectelor finantate este acelasi pentru fiecare tara analizata sau nu si a fost respinsa aceasta ipoteza (p=0.000219) in favoarea ipotezei alternative. Dupa efectuarea de comparatii multiple, au fost identificate urmatoarele tari cu tip de programe diferite: Bulgaria si Romania si de asemenea Serbia si Bulgaria.

Ipoteza ca Aria Tematica a proiectelor este la fel pentru fiecare tara a fost respinsa (p=9.93e-07) si dupa efectuarea de comparatii multiple pentru fiecare dintre perechile de tari analizate s-a concluzionat ca Serbia si Bulgaria au proiecte cu Arii Tematice diferite, precum si Serbia si Romania.

Urmatoarea ipoteza testata a fost aceea ca Core Category este la fel pentru cele 5 tari analizate si nu am respins aceatsa analiza (p=0.0748), concluzionand ca, categriile de rezultate sunt la fel pentru cele cinci tari participante la analiza.

Ultimele ipoteze au analizat daca numarul mediu de publicatii in reviste ISI, BDI, NRJ este egal pentru fiecare dintre tarile analizate si nu a fost respinsa aceasta ipoteza. De asemena nu a fost respinsa ipoteza ca numarul mediu de studenti doctoranzi sau masteranzi este acelasi pentru fiecare dintre tarile analizate, fata de alternativa ca cel putin una din tari are un numar mediu de studenti diferit.

In ultima parte a analizei prezentam o diagrama aratand cum a evoluat numarul de proiecte finanatate in fiecare an sub forma unei serii temporale. Observam ca numarul de proiecte finantate anual a crescut din 1976 pana la un prim varf in 2007 si catre maximul din toata perioada analizata in 2009, urmand ca in 2010 sa scada la nivelul anului 2002 dupa care sa creasca si sa ramana la nivelul anului 2008. In ceea ce priveste asteptarile pentru urmatorii 4 ani sub forma de predictie, se poate observa in partea dreapta a diagramei: prognoza pentru perioada 2014-2018 este punctata cu o linie albastra, un interval de predictie cu 80% nivel de incredere se poate observa in zona albastru inchis umbrit, iar un interval de predictie cu 95% interval de incredere se poate observa in zona albastru deshis umbrit. De remarcat ca intervalul de predictie cu 95% nivel de incredere are limita superioara situata intre varfurile dintre 2007 si 2009.



5.3. Analiza programelor destinate dezvoltarii resurselor umane, specializate in managemetul integrat al sistemelor fluviu-delta-mare, existente in Regiunea Dunarii

Un context din ce in ce mai potrivnic pentru exploatarea durabila a mediului inconjurator, datorat schimbarilor climatice, pierderea biodiversitatii si alte tendinte negative reprezinta probleme majore pentru toti actorii-cheie din Regiunea Dunarii. Resursele umane reprezinta un capital cheie pentru dezvoltare si in mod special, pentru o economie bazata pe cunoastere.

Programele destinate dezvoltarii resurselor umane, specializate in management de mediu, sunt reprezentate mai ales de programe universitare de master si doctorat (dar sunt putine per ansamblu);

idea de specialist in managementul integrat al sistemelor fluviu-delta-mare este aproape absenta, specializarile universitare fiind concentrate pe probleme particulare.

Acest raport nu prezinta informatia de ultima ora si concluzii cu privire la nivelul de dezvoltare al programelor destinate resurselor umane specializate in managementul integrat al sistemelor fluviu-delta-mare din Regiunea Dunarii, pentru ca sunt inca analizati alti potentiali experti.

Intr-o prima instanta, atunci cand se face un inventar al programelor in desfasurare legate de resurse umane, implicate in dezvolatre stiintifica si cercetare, agendei stiintifice si programelor educationale din Regiunea Dunarii, rezulta o imagine cu multe legaturi lipsa, dintre care cea mai importanta este o cooperare eficienta pentru dezvoltarea programelor comune care sa sustina dezvoltarea de resurse umane.

In regiunea Dunarii realitatea este reprezentata de existenta unei mari mase de resurse umane, capabila de a contribui la implementarea managemntului integrat al sistemelor fluviu-delta-mare, dar capacitatile sunt impartite, polarizate. Regiunea Dunarii Superioare are politici bine definite pentru resursele umane, intr-un mediu social si economic cu strategii clare, programe eficiente si functionale, interconectand educatia cu cercetarea, in timp ce regiunile Dunarii Medii si Inferioare sunt caracterizate de o experienta valoroasa, centre bune de cercetare in continua dezvoltare, dar fara o viziune de ansamblu si fara o exploatare coerenta a capacitatilor existente. In acest sens trebuie subliniat ca cea mai mare provocare in prezent este data de eficientizarea unei structuri care sa poata conecta capacitatile deja existente, pentru a creste beneficiul masei critice de cunoastere din prezent. In timp ce regiunea Dunarii de Jos este concentrata si interesata de interactiunile fluviu-mare si impactul Regiunii Dunarii asupra Deltei Dunarii (inclusiv zona sa de coasta emersa si submersa - marina) si zonei de NV a Marii Negre, un astfel de interes si participare in proiecte conexe este foarte slab reprezentat de cei din zona Dunarii Medii si Superioare.

O polarizare similara este observata pentru numarul de persoane care activeaza in managementul sistemelor fluviu-delta-mare. In zona Dunarii Superioare si o parte din Dunarea Medie exista o experienta avansata (decenii) in ceea ce priveste programele de educatie dedicate mediului inconjurator, biodiversitatii, schimbarilor climatice and diverselor domenii transdisciplinare.

Germania, de exemplu, are o abordare clara a agendei stiintifice si cercetarii, ceea ce a dus la elaborarea unor scheme de finantare care au contribuit la rezolvarea problemelor legate de Regiunea Dunarii, toate bazate pe o retea eficienta care a conectat cercetarea stiintifica dedicata mediului, stiintelor vietii si tehnologiilor noi/avansate cu industria, centrele de inovare si structurile care au facilitat cunoasterea si transferul de inovatii intre mediul academic si celelalte parti interesate.

Germania gazduieste peste 390 de institutii de educatie, mai mult de 70% dintre ele avand cel putin o specializare legata de managementul de mediu si domenii interdisciplinare. Sistenul german de educatie superioara este caracterizat de o legatura stransa intre predare, invatare si cercetare, cu o componenta importanta a cercetarii aplicate destinata companiilor publice si private, pentru beneficiul general al publicului, asigurat de Fraunhofer-Gesellschaft Institutes, cea mai mare organizatie de cercetare aplicata din Europa.
Un alt exemplu remarcabil este constituit de Max Planck Society, care are ca scop cercetarea fundamentala in stiinte naturale, stiintele vietii si stiinte sociale, si care este complementara centrelor universitare. Activitatea de cercetare in centrele universitare este bine organizata si dezvoltata, Asociatia Helmholtz a centrelor germane de cercetare (Association of German Research Centres) contribuie la rezolvarea multor probleme cu care se confrunta sosietatea, stiinta si industria prin cercetare de top in programe de aeronautica, spatiu si transport, pamant si mediu, energie, sanatate, tehnologii-cheie si structura materiei. Nivelul inalt de conectivitate intre mediul academic, cercetarea aplicata si industrie din Germania fac din acesta tara un principal potential contributor in oferirea de expertiza pentru dezvoltarea resursei umane specializate in managementul integrat al sistemelor fluviu-delta-mare. Un alt furnizor de programe de inalta calificare, care sa contribuie la dezvoltarea resursei umane, este Austria.

La celalalt pol sunt tarile din regiunea Dunarii Medii si de Jos, care pana acum nu pot nici macar furniza un inventar complet al proiectelor si actiunilor de pregatire profesionala si formare, legate de probleme de mediu, socio-economice si ce cercetare din Regiune Dunarii, in ciuda existentei unei resurse umane foarte bine calificata, dar fragmentata.
Potrivit Ministerului Mediului al Republicii Cehe, functionarea educatiei de mediu este un rezultat al eforturilor comune de multi ani a institutiilor de stat, profesionale, organizatiilor si ONG –urilor, totusi efectul politicilor conjugate este vizibil mai mult la nivel national.

Experti importanti in management de mediu au fost identificati in Ungaria (Centrul Szeged si Universitatea din Budapesta), Serbia (universitati) si Romania (universitati si institute). Cu toate acestea, cu exceptia Germaniei, cele mai multe pot furniza expertiza intr-un domeniu specific al managementului de mediu, fiind din ce in ce mai evident ca pana acum nu exista o abordare a dezvoltarii resursei umane specializate in managementul integrat al ciclului apei.

Asa cum este mentionat in raportul EUSDR al PA9 WG din Octombrie 2013, trebuie avut in vedere ca pe baza resursei umane disponibile, valoarea adaugata specifica consta in includerea tuturor

tarilor din regiune si asigurarea unei mai bune utilitati a programelor deja existente (ca Erasmus, Copernicus, etc) si a structurilor de cooperare.

Programele de educatie si formare eficiente, inovative si bine guvernate ar trebui sa poata furniza resursa umana capabila sa faca fata provocarilor produse de globalizare, schimbari demografice, dezvoltarii rapide de tehnologii si presiunii in crestere asupra bugetelor locale. Acest lucru ar trebui facut mai ales prin schimburi de experienta si de bune practici intre diferite sisteme de educatie, prin cooperare transnationala, dezvoltare comuna de programe si materiale, promovarea cercetarii in economia educatiei. Este necesara si construirea de capacitati pentru dezvoltarea unor politici decizionale bazate pe argumente clare si cuantificabile, pentru facilitarea procesului de intelegere si asimilare a diverselor politici de dezvoltare durabila, a procesului de formulare a strategiilor si actiunilor care trebuie sa decurga din acestea.

Utilizarea resurselor si ‚know-how'-ului, de multe ori deja disponibile in Regiune, ar trebui sa fie mult mai bine coordonate. Exemplele includ: proiecte de infrastructura care ar trebuie sa includa si module de educatie/formare profesionala; programe trans-frontaliere, ca cele intre Romania si Serbia, Romania si Bulgaria, Ungaria si Serbia, etc si programe transnationale de cooperare, precum programele coordonate de DG Regio *South East Europe* si *Central Europe*, ambele avand o componenta de formare, dar care nu este inca destul de exploatata.

O idee buna este dezvoltarea unei directii de specializare a profesorilor in managementul integrat al sistemelor fluviu-delta-mare, cu atat mai mult cu cat implementarea si dezvoltarea unor astfel de programe in invatamantul primar, gimnazial, liceal si profesional ar putea fi un element cheie in asigurarea dezvoltarii durabile din regiune.

Luand in considerare toate informatiile existente despre dezvoltarea resursei umane apare concluzia fireasca despre rolul pe care DANUBIUS – RI l-ar putea avea in acoperirea eficienta a acestui gol de comunicare intre ‚parti' (mediul academic, cei interesati din industrie, comunitate), asigurand expertiza specializata si fiind principalul furnizor de strategii armonizate, bazate pe o cunoastere de nivel inalt.

5.4. Analiza potentialului ethnic si stiintific al infrastructurilor de cercetare din Regiunea Dunarii si relevant pentru managementul integrat al sistemelor fluviu – delta – mare

In acord cu contractul si Planul de Lucru existente, aceasta parte va fi dezvoltata si prezentata in raportul Fazei 3, cu termen de predare pe 30 iunie, 2014.

5.5. Analiza principalelor puncte tari si puncte slabe ale infrastrcuturii de cercetare din Regiunea Dunarii, relevante pentru managementul integrat al sistemelor fluviu – delta – mare (*infrastucturi de cercetare, agenda stiintifica si dezvoltarea resursei umane*)

In acord cu contractul si Planul de Lucru existente, aceasta parte va fi dezvoltata si prezentata in raportul Fazei 3, cu termen de predare pe 30 iunie, 2014.

6. CONCLUZII SI RECOMANDARI

Regiunea Dunarii nu este bine conectata cu initiativele europene majore de infrastructuri de cercetare (ESFRI, LTER, I3), dedicate domeniilor legate de apa dulce. In afara de Germania, Austria si Romania, exista foarte putini parteneri (Bulgaria) sau nu exista deloc reprezentanti din Regiunea Dunarii in aceste infrastructuri. Situatia generala este caracterizata de fragmentare si slaba comunicarea intre diferitele infrastructuri care au legatura cu sistemul Dunare-Delta Dunarii-Marea Neagra, si care necesita imbunatatiri mari. O alta discrepanta majora exista intre infrastructurile dedicate apelor dulci si cele costiere si marine. Infrastrcucturile marine pan-europene majore sunt bine conectate cu NV Marii Negre, atat Romania cat si Bulgaria fiind membri in aceste structuri ESFRI (Romania in EMSO si Bulgaria in EURO-ARGO) si proiecte I3 (ambele in EUROFLEETS, Bulgaria in JERICO, Romania in HYDRALAB IV). Aceasta dovedeste si o mai buna organizare a comunitatii de cercetare marina decat a celei care se ocupa de apa dulce, nu numai in zona dar si in Europa in general. Nu exista in acest moment infrastructuri majore care doresc sa lege fluviul de mediul de tranzitie apa dulce-sarata si costier ale sistemului. In acest fel, DANUBIUS – RI ar acoperi un gol major in peisajul infrastructurilor din Regiunea Dunarii dar si din Europa (vezi raportul fazei I).

Cu toate acestea, in toate tarile danubiene exista capacitate cu potential major de imbunatatire (asa cum a fost aratat pana acum). Aceste capacitati trebuie insa intarite, integrate si facute sa colaboreze eficient in acord cu o strategie coerenta. Chiar mai mult, aceste capacitati trebuie sa coopereze mai bine cu alte facilitati din Europa, dupa o filozofie coerenta pentru intregul bazin al Dunarii. Din nou, DANUBIUS – RI ar trebui sa raspunda acestor probleme, furnizand solutii si strategii.

Educatia reprezinta o alta problema critica. Necesitatea cresterii numarului de initiative care doresc imbunatatirea calitatii educatiei in linie cu cererile pietei de munca, necesitatea crearii de oportunitati pentru o mai buna calificare si generarea conditiilor de dezvoltare a cercetarii aplicate, avand in veder transferul de cunoastere reprezinta factori-cheie de dezvoltare in Regiunea Dunarii.

Rolul DANUBIUS – RI este acela de a acoperi in mod eficient golul de comunicare intre ‘parti’ (mediul academic, industrie, comunitate), acordand expertiza specializata si fiind furnizorul unor strategii armonizate bazate pe cunoastere de nivel inalt.

Rezultate ale conferintelor si seminariilor

In Regiunea Dunarii, fragmentarea institutiilor de cercetare este si mai acuta. Cauzele sunt legate de aspecte heterogene din institutii si proiecte. Colaborarea nu este nici ea optima, datorita abordarilor divergente in tematica de cercetare si zona de interes.

Avand de a face cu diferite tari/institutii in diferite elemente ale sistemului (fluviu, delta, mare), fiecare isi stabileste diferit directiile prioritare de dezvoltare si colaborare, fara sa analizeze in general, imaginea de ansamblu.

La nivelul de institutii coordonatoare, acestea sunt dedicate marii (Comisia Marii Negre) sau fluviului (ICPDR – Comisia Internationala pentru Protectia Fluviului Dunarea). Fiecare dintre ele are prioritati si obiective divergente si diferite. O incercare anterioara (2000-2009) de a corela mai bine cercetarea de mediu in zona Dunarii si a Marii Negre – DABLAS – a inceput cu success dar s-a incheiat datorita evolutiei anilor 2000. Strategia Europeana pentru Regiunea Dunarii (EUSDR) reprezinta o initiativa care integreaza prioritatile din zona. De aceea, EUSDR a acordat statutul de Proiect Fanion in regiune pentru DANUBIUS – RI, pentru modul in care acest proiect integreaza si armonizeaza prioritati si idei.

Un punct important este totusi intelegerea prioritatilor si intereselor fiecarei tari in relatie cu pozitia ei in Regiunea Dunare – Marea Neagra, pentru ca aceasta explica partial diferentele, atat din punctul de vedere al dezvoltarii economice cat si din punct de vedere al agendei stiintifice si prioritatilor (a se vedea preocuparile Ungariei pentru apa pluviala).

Peste 450 de proiecte majore derulate sau in curs de derulare in ultimii 15 ani au fost identificate prin Proiectul FP7 DANCERS. Aceasta demonstreaza ca zona are capacitatea de a trage fonduri, chiar daca in mod fragmentar. De aceea consideram ca un proiect pan-european ESFRI, cu statutul legal de ERIC, va facilita si va da valoare aspectelor financiare din zona si va contribui la sporirea interconectivitatii cu restul Europei. DANUBIUS – RI va fi un punct de validare unic, din punct de vedere stiintific, mai ales in programul Orizont 2020.

DANUBIUS – RI va integra institutii si tari din regiunea Dunarii si Marii Negre atat intre ele cat si cu restul Europei, cu atat mai mult cu cat nodurile sale vor aduce excelenta in expertiza si cercetare din toata Europa.

Din punctul de vedere al comunitatii de afaceri, DANUBIUS – RI trebuie sa abordeze prioritati si obiective traduse in teme simple si cuprinzatoare care pot atrage mediul privat in forme multiple de colaborare. Comunitatea stiintifica implicata trebuie de asemenea sa inteleaga, sa clasifice si sa sintetizeze interesele comunitatii de afaceri, constrangerile si prioritatile, pentru a putea furniza rezultatele asteptate.

O atentie speciala ar tebuie acordata aspectelor colaborative cu JPI (Joint Programming Initiatives), dintre care JPI Water si JPI Oceans sunt de interes special pentru DANUBIUS – RI.

Aspecte colaborative

Oragnizatiile de cercetare analizate in panel folosesc infrastructuri cu acces deschis la date in proiectele colaborative in care participa si pun la dispozitie propria infrastructura in cadrul proiectelor pan-europene. Facilitatile de cercetare sunt disponibile direct in cadrul organizatiei (laboratoare cu echipament stiintific performant, statii de masura in situ si la distanta) sau pot fi accesate in colaborare cu alte institutii partenere (vapoare de cercetare, vehicule subacvatice teleghidate si submarine, drone, instalatii de teste hidraulice si hidrodinamice, baze de date).

Concluzii:

- Exista numeroase facilitati de cercetare si institutii in Regiunea Dunarii, care pot fi incluse in DANUBIUS – RI.
- O organizatie de cercetare poate fi parte (ca nod, satelit, partener cu sau fara drept de vot) la una sau mai multe initiative si proiecte de cercetare, deschizand astfel o perspectiva lui DANUBIUS – RI, de a include astfel de infrastructuri ca sateliti sau viitoare noduri.
- In Regiunea Dunarii exista multe organizatii de cercetare care nu sunt incluse in infrastructure distribuiti, si reprezinta potentiali participanti in proiecte viitoare de infrastructuri distribuite. DANUBIUS – RI ar putea include unele dintre aceste institutii ca noduri, sub coordonarea centrului, atata timp cat vor fi identificate beneficiul comun in domeniul de cercetare si sustenabilitatea nodului.

Rezultatele agendei stiintifice:

Concluzii:

- Agendele institutiilor de cercetare si proiectelor din Regiunea Dunarii acopera aspecte legate de managementul ciclului apei, geostiinte, stiintele mediului si ale vietii.
- Nu toate agendele acopera ciclul apei, asa cum sunt definite in Cartea Alba a DANUBIUS – RI, dar aceasta poate fi cobnsiderata o complementaritate.

- Exista maniere diferite de a prezenta agenda unei institutii:
    - Dupa obiectiv
    - Dupa rezultate
    - Dupa metode
    - Dupa sistemul sau obiectul de studiu
    - Dupa colaborari
- In ceea ce priveste aspectele colaborative si de conectivitate pentru fiecare organizatie, agenda stiintifica este dezvoltata in relatie directa cu numarul proiectelor de colaborare trecute si actuale.

Resurse umane

Resursa umana intr-un proiect la scara larga, pan-europeana, reprezinta totatlitatea resurselor alocate, care se ocupa de cercetare, colaborare, educatie si managemntul unui astfel de proiect.

Concluzii

- Numarul total de persoane da o idee despre dimensiunile organizatiei;
- Personalul fiecarei organizatii este in relatie directa cu agenda stiintifica si proiectele in care aceasta este implicata;
- Personalul DANUBIUS-RI va fi planificat in acord cu propriile nevoi de cercetare si perspectiva de dezvoltare.
- Managementul DANUBIUS-RI va cauta complementaritate in termeni de educatie si abilitati in comunitatea de cercetare din Europa;
- Criteriile folosite pentru selectia nodurilor vor include de asemenea si resursa umana si abilitatile si inzestrarile fiecarei organizatii care candideaza;
- Relatia de colaborare a DANUBIUS-RI va fi definita pe baza unei analize detaliate a potentialului resurselor umane a organizatiei corespunzatoare.

Provocari si probleme nerezolvate

Principalele provocari identificate sunt legate mai ales de aspecte financiare si instutitutionale si de dezvoltarea unor domenii de cercetare specifice printr-o abordare colaborativa.

Concluzii

- Exista o lipsa in programele de educare si formare in domeniul ciclului apei pe care DANUBIUS – RI o poate suplini cu programe de instruire si mobilitate.
- Lipsa mobilitatii si dispersia geopolitica, dar si un numar redus de resurse umane in cercetarea ciclului apei reprezinta o lipsa care va fi acoperita de DANUBIUS – RI.
- Cum centrul DANUBIUS-RI va fi in Delta Dunarii, nevoia de facilitati si experienta va fi satisfacuta chiar in locul in care este localizat obiectul cercetarii, impreuna cu toate facilitatile necesare unei activitati de cercetare de top.
- Sustenabilitatea financiara a DANUBIUS-RI este una dintre cele mai importante probleme, care trebuie bine administrata, pentru succesul infrastructurii.

Exista nevoia unei comunicari mai bune. DANUBIUS-RI poate dezvolta si promova un set multimedia destinat educatiei de mediu. Acesta va acorda sustinere planificarii tematice a programelor de formare pentru o dezvoltare durabila.

Comunicarea, parteneriate imbunatatite si transfer de cunostinte sunt elemente-cheie care vor ajuta la dezvoltarea resursei umane in macro-regiunea Dunarii. Toate acestea trebuie furnizate de DANUBIUS-RI.

7. ANEXE

7.1. Analiza potentialului tehnic si stiintific relevant, existent in Regiunea Dunarii

7.1.1. Anexa 1 – Lista principalelor infrastructuri, programe si initiative din Regiunea Dunarii

MARINE ENVIRONMENT			
ESFRI Projects			
Project/Node	**Website**	**Member countries from the Danube Region**	**Description**
Lifewatch – E Science European Infrastructure for Biodiversity and Ecosystem research	http://www.lifewatch.eu/web/guest/home	Hungary Romania	**LifeWatch** is a European research infrastructure in development. The first services to users are planned for 2013. Users may benefit from integrated access to a variety of data, analytical and modeling tools as served by a variety of collaborating initiatives. Another service is offered with data and tools in selected workflows for specific scientific communities. In addition, LifeWatch will provide opportunities to construct personalized 'virtual labs', also allowing to enter new data and analytical tools.
I3 (Networks of RI`S) – FP7 Projects			
EnviroGRIDS Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development	http://envirogrids.net/	Bulgaria Hungary Romania Ukraine	With 30 partners distributed in 15 countries, the EnviroGRIDS project is contributing to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information in the Black Sea catchment (2.2 mio. km^2, 24 countries, 160 million inhabitants). The main aim of the project is to assess water resource in the past, the present and the future, according to different development scenarios. The objective is also to develop datasets that are compatible with the European INSPIRE Directive on spatial data sharing across Europe. The data and metadata gathered and produced on the Black Sea catchment will be distributed through the EnviroGRIDS geoportal. The challenge is to convince and help regional data holders to make available their data and metadata to a larger audience in order to improve our capacity to assess the sustainability and vulnerability of the environment.

MESOAQUA	http://mesoaqua.eu/	?	A network of leading MESOcosm facilities to advance the studies of future AQUAtic ecosystems from the Arctic to the Mediterranean.
Eurofleets (and Eurofleets 2)	http://www.eurofleets.eu/np4/home.html	Bulgaria Romania	Aim: bringing together the EU research fleets to enhance their coordination and promote the cost effective use of their facilities. It is a research infrastructure project under the FP7.
SeaDataNet 2 Pan-European Infrastructure for Ocean & Marine Data Management	http://www.seadatanet.org/	Bulgaria Romania	SeaDataNet has developed an efficient distributed Marine Data Management Infrastructure for the management of large and diverse sets of data deriving from in situ and remote observation of the seas and oceans. Professional data centres, active in data collection, constitute a Pan-European network providing on-line integrated databases of standardized quality. The on-line access to in-situ data, meta-data and products is provided through a unique portal interconnecting the interoperable node platforms constituted by the SeaDataNet data Centres. Data, value added products and dictionaries serve wide uses: e.g. research, model initialisation, industrial projects, teaching, marine environmental assessment.
Upgrade BlackSeaScene (and previous FP6 BlackSea Scene)	http://www.blackseascene.net/	Bulgaria Romania Ukraine	The UP-GRADE BS-SCENE project is an FP7 EU funded project running from 2009-2011 that is building and extending the existing research infrastructure (developed under FP6 project BlackSeaScene 1) with an additional 19 marine environmental institutes/organizations from the 6 Black Sea countries. Implementing FP6 RI SeaDataNet project standards regarding common communication standards and adapted technologies will ensure the dataCentres interoperability. Main output will be on-line access to in-situ and remote sensing data, meta-data and products.
EAST-NMR	http://www.east-nmr.eu	Hungary Slovakia	Enhancing Access and Services to East European users towards an efficient and coordinated Pan-European pool of NMR (nuclear magnetic resonance) capacities to enable global collaborative research & boost technological advancement. Nuclear magnetic resonance (NMR) spectroscopy is a key technology for research in the modern Life Sciences, with an increasing impact on human health. This technology is unique in new areas of molecular systems biology providing detailed insight into protein-protein and protein-ligand interactions.
GROOM	http://www.groom-fp7.eu/doku.php	Germany	The objective of the GROOM project is to design a new European Research Infrastructure that uses underwater gliders for collecting oceanographic data. This new infrastructure shall be beneficial for a large number of marine activities and

			societal applications, which can be related to climate change, marine ecosystems, resources, or security and which rely on academic oceanographic research and/or operational oceanography systems. GROOM will define the scientific, technological, and legal framework of this European glider capacity. GROOM is a key project for building the required observatory network that would allow the Marine Strategy Framework Directive to be implemented. GROOM will develop in line with other European and international initiatives supporting marine in-situ observations, like in particular Euro-Argo, JERICO, and GOOS.
Joint Programming Initiative			
JPI OCEANS	http://www.jpi-oceans.eu/prognett-jpi-oceans/About_us/1253960389448	Germany Romania	The Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) is a **coordinating and integrating platform**, open to all EU Member States and Associated Countries. In its role as a coordination platform, JPI Oceans will focus on making better and more efficient use of national research budgets, which represent 85% of the marine-maritime funding within Europe. One of the JPI's goals is to **develop joint research programs** in which countries can be involved on a voluntary basis (variable geometry). Participating countries will also decide what contribution to make: this may include institutional, project-related or new funding.
JPI Climate	http://www.jpi-climate.eu	Austria Germany	JPI Climate is a collaboration between 13 European countries to coordinate jointly their climate research and fund new transnational research initiatives. Transnational coordination of the research base aims to overcome research fragmentation, to make better use of precious public R&D resources and to facilitate cross border collaboration between top scientists. JPI Climate connects scientific disciplines, enables cross-border research and increases science-practice interaction. By doing this, it is expected that JPI climate significantly contribute to underpinning the European efforts to respond to climate change. JPI Climate: • aims to respond to the knowledge needs of policy and the European society at large to address climate change • provides a platform to align national research priorities according to a jointly agreed Strategic Research Agenda (SRA) with the aim of complementing and

			supporting initiatives at the European level (ERANET's, FP8, Climate KIC, ESFRI Projects) • facilitates the coordination, collaboration and exploitation of synergies in climate change research, learning and innovation while working against fragmentation and duplication of efforts • connecting different disciplinary approaches in natural and social sciences leading to interdisciplinary research efforts of higher quality and relevance • connecting top researchers and research groups from different European countries, leading to high quality and efficient research efforts, long term collaborations and a stronger global position • connecting scientific insights with the demands of policy makers, decision makers and other stakeholders from local to international levels, leading to more effective policies
Networks of Infrastructures and Users			
SedNet	http://www.sednet.org/	Germany Serbia	SedNet is a European network aimed at incorporating sediment issues and knowledge into European strategies to support the achievement of a good environmental status and to develop new tools for sediment management. Our focus is on all sediment quality and quantity issues on a river basin scale, ranging from freshwater to estuarine and marine sediments.
ERVO, EU research Vessels Operators - Marine research Infrastructure Infobase	http://www.eurocean.org/np4/60 http://www.rvinfobase.eurocean.org/	Bulgaria Germany Romania	Contains information about every research vessel operated in EU (operator, area of operation, technical characteristics, contact details)
EMODNet	http://www.emodnet-physics.eu/	Bulgaria Germany, Romania	The EMODnet Physical Parameters portals is aimed at providing layers of physical data and metadata available for use by public authorities, scientists and industry, and contribute towards the definition of an operational **European Marine Observation and Data Network** (EMODnet) and contribute to developing of the definition of the Global Monitoring for Environment and Security (GMES) marine core service. The portal is being developed by a European consortium and operated in a cooperation between EuroGOOS, its Regional components (ROOSs), and exploiting SeaDataNet

			and MyOcean infrastructures and services bringing together many marine data users and providers. The EMODnet Physical Parameters portal provides access to near real time and archived data series from fixed stations and ferry box lines in the European Sea and provides OGC services (WMS, WFS, and WCS) for data discovery, view and download.
Regional Infrastructures			
MARINEGEOHAZARD **1.EUXINUS network** **2.GeoPontica network**	www.geohazard-blacksea.eu	Bulgaria Romania	1. **EUXINUS** - the Black Sea regional early warning system to marine-geohazards – marine observatories **2. GeoPontica** network - the first on-line geodynamic surveillance network in the entire Black Sea region
Major Initiatives and Projects in the Danube Area and the Black Sea			
The Commission on the Protection of the Black Sea Against Pollution	http://www.blacksea-commission.org/	Bulgaria Romania Ukraine	The Commission on the Protection of the Black Sea Against Pollution (the Black Sea Commission or BSC) via its Permanent Secretariat is the intergovernmental body established in implementation of the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), its Protocols and the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea (latest version adopted in 2009).
HERMES - Hotspot ecosystem research on the margins of European seas	http://www.eu-hermes.net/intro.html	Germany Romania Ukraine	HERMES is designed to gain new insights into the biodiversity, structure, function and dynamics of ecosystems along Europe's deep-ocean margin. It represents the first major attempt to understand European deep-water ecosystems and their environment in an integrated way by bringing together expertise in biodiversity, geology, sedimentology, physical oceanography, microbiology and biogeochemistry, so that the generic relationship between biodiversity and ecosystem functioning can be understood. Study sites will extend from the Arctic to the Black Sea and include open slopes, where landslides and deep-ocean circulation affect ecosystem development, and biodiversity hotspots, such as cold seeps, cold-water coral mounds, canyons and anoxic environments, where the geosphere and hydrosphere influence the biosphere through escape of fluids, presence of gas hydrates and deep-water currents. These important systems require urgent study because of their possible biological fragility, unique genetic resources, global relevance to carbon cycling and possible

			susceptibility to global change and man-made disturbances. Past changes, including catastrophic events, will be assessed using sediment archives. We will make estimates of the flow rates of methane from the geosphere and calculate how much is utilised by benthic communities, leaving the residual contribution to reach the atmosphere as a greenhouse gas. HERMES will enable forecasting of biodiversity change in relation to natural and man-made environmental changes by developing the first comprehensive pan-European margin Geographic Information System. This will provide a framework for integrating science, environmental modelling and socio-economic indicators in ecosystem management. The results will underpin the development of a comprehensive European Ocean and Seas Integrated Governance Policy enabling risk assessment, management, conservation and rehabilitation options for margin ecosystems.
Sea Basin Strategy: Black Sea	http://ec.europa.eu/maritimeaffairs/policy/sea_basins/black_sea/index_en.htm		The Black Sea is bordered by 6 countries - including EU members Bulgaria and Romania. Extensive dialogue and stakeholder involvement is vital for a coherent and coordinated approach to maritime issues in the area. A first dialogue was held in 2011 with Bulgarian and Romanian stakeholders, and since then the Commission has extended the dialogue to all Black Sea countries. ***Regional cooperation*** The Black Sea Synergy launched by the EU is an initiative for regional cooperation with and between the countries surrounding the Black Sea. It was designed as a flexible framework to ensure greater coherence and policy guidance while also inviting a more integrated approach. The EU also enjoys observer status in two regional organisations: • The Black Sea Economic Cooperation (BSEC) • The Commission for the Protection of the Black Sea Against Pollution (BSC, Bucharest Convention).
International Initiatives and UN Programmes			
GEO	http://www.earthobservations.org/geoss_wa_tar.shtml		GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. These high-level meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world.

			GEO is a voluntary partnership of governments and international organizations. It provides a framework within which these partners can develop new projects and coordinate their strategies and investments. As of 2013, GEO's Members include 89 Governments and the European Commission. In addition, 67 intergovernmental, international, and regional organizations with a mandate in Earth observation or related issues have been recognized as Participating Organizations. GEO is constructing GEOSS on the basis of a 10-Year Implementation Plan for the period 2005 to 2015. The Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine "Societal Benefit Areas" of disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity.
GEOSS	http://www.earthobservations.org/geoss.shtml		The Group on Earth Observations is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS. The Global Earth Observation System of Systems will provide decision-support tools to a wide variety of users. As with the Internet, GEOSS will be a global and flexible network of content providers allowing decision makers to access an extraordinary range of information at their desk. This 'system of systems' will proactively link together existing and planned observing systems around the world and support the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different instruments can be combined into coherent data sets. The 'GEOPortal' offers a single Internet access point for users seeking data, imagery and analytical software packages relevant to all parts of the globe. It connects users to existing data bases and portals and provides reliable, up-to-date and user friendly information – vital for the work of decision makers, planners and emergency managers. For users with limited or no access to the Internet, similar information is available via the 'GEONETCast' network of telecommunication satellites. The Global Earth Observation System of Systems is simultaneously addressing nine areas of critical importance to people and society. It aims to empower the international community to protect itself against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard water resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture and conserve biodiversity. GEOSS coordinates a multitude of complex and interrelated issues

			simultaneously. This cross-cutting approach avoids unnecessary duplication, encourages synergies between systems and ensures substantial economic, societal and environmental benefits.
GOOS	http://www.ioc-goos.org/	Romania Bulgaria	**The Global Ocean Observing System** GOOS is a permanent global system for observations, modelling and analysis of marine and ocean variables to support operational ocean services worldwide. GOOS provides accurate descriptions of the present state of the oceans, including living resources; continuous forecasts of the future conditions of the sea for as far ahead as possible, and the basis for forecasts of climate change.
Copernicus The European Earth Observation Programme	http://www.copernicus.eu/	It represents the European contribution to GOOS.	**Copernicus, previously known as GMES (Global Monitoring for Environment and Security), is the European Programme for the establishment of a European capacity for Earth Observation.** Copernicus is a European system for monitoring the Earth. Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and *in situ* sensors such as ground stations, airborne and sea-borne sensors. It processes these data and provides users with reliable and up-to-date information through a set of services related to environmental and security issues... The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security. They support a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable development, civil protection and tourism. The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian crisis. Based on the Copernicus services, many other value-added services can be tailored to more specific public or commercial needs. This will create new business opportunities. In fact, several economic studies so far have demonstrated a huge potential for job creation, innovation and growth. The Copernicus programme is coordinated and managed by the European

			Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency for the space component and of the European Environment Agency and the Member States for the in situ component. The provision of Copernicus services is based on the processing of environmental data collected from two main sources: • A space component, which consists of several Earth observation satellites; • An *in situ* component, which consist of a multitude of sensors on the ground, at sea or in the air. The European Space Agency (ESA) is responsible for the space component and coordinates the delivery of data from upwards of 30 satellites. The European Environment Agency (EEA) is responsible for the development of the *in situ* component and coordinates the gathering of data coming from both European and non-European organisations.
IOC – UNESCO	http://ioc-unesco.org/		**Intergovernmental Oceanographic Commission (IOC) of UNESCO** is the United Nations body for ocean science, ocean observatories, ocean data and information exchange, and ocean services such as Tsunami warning systems. Its mission is to promote international cooperation and to coordinate programmes in research, services and capacity building to learn more about the nature and resources of the oceans and coastal areas, and to apply this knowledge to improved management, sustainable development and protection of the marine environment and the decision making processes of States.
IODE in IOC UNESCO	http://www.iode.org/		The programme "International Oceanographic Data and Information Exchange" (IODE) of the "Intergovernmental Oceanographic Commission" (IOC) of UNESCO was established in 1961. Its purpose is to enhance marine research, exploitation and development, by facilitating the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products.
GEF	http://www.thegef.org/gef/whatisgef		**The Global Environment Facility** (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international

			waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition, providing $11.5 billion in grants and leveraging $57 billion in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP), the GEF has also made more than 16,030 small grants directly to civil society and community based organizations, totaling $653.2 million.
UNEP	http://www.unep.org/		United Nations Environment Programme UNEP, established in 1972, is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP work encompasses: • Assessing global, regional and national environmental conditions and trends • Developing international and national environmental instruments • Strengthening institutions for the wise management of the environment **Mission** "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations." **Mandate** "to be the leading global environmental authority that sets the global environmental agenda, that promotes the coherent implementation of the environmental dimensions of sustainable development within the United Nations system and that serves as an authoritative advocate for the global environment" Priorities: Climate Change, Disaster and conflicts, Ecosystem management, Environmental Governance, Harmful Substances, Resource Efficiency.
IUCN	http://www.iucn.org/about/		International Commission for Conservation of Nature The International Union for Conservation of Nature is the world's oldest and largest global environmental organization. **IUCN at a glance** • Founded in 1948 as the world's first global environmental organization • Today the largest professional global conservation network

			• A leading authority on the environment and sustainable development • More than 1,200 member organizations including 200+ government and 900+ non-government organizations • Almost 11,000 voluntary scientists and experts, grouped in six Commissions in some 160 countries • IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world. The Union's headquarters are located in Gland, near Geneva, in Switzerland. • A neutral forum for governments, NGOs, scientists, business and local communities to find practical solutions to conservation and development challenges • Thousands of field projects and activities around the world • Governance by a Council elected by member organizations every four years at the IUCN World Conservation Congress • Funded by governments, bilateral and multilateral agencies, foundations, member organizations and corporations • Official Observer Status at the United Nations General Assembly
Vessels and Boats			
Mare Nigrum multidisciplinary research Vessel	http://www.geoecomar.ro/website/nave-cercetare-mare-nigrum.html	Romania (Black Sea)	Mare Nigrum is the multidisciplinary marine research vessel belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Length-82 m. Breadth -13.6 m Max draft -5 m Gross tonnage -2495 t Engine: 2 engines of 1160 HP Electrical power : 2x320 kVA, 1x350 kVA, 1x50 kVA; Laboratories on board: Biology Geochemistry Geophysics (Magnetometry and Gravimetry)

			Seismo-acoustic Hydrology Gas measurements Tomography Computer room Accommodation facility: 25 places (permanent crew) 25 places (scientists on board) **Marine equipments:** • Multibeam bathymetric system SEABEAM 1050 Elak Nautik; • Seism - acoustics CHIRP Star Full Spectrum; • Magnetometer Geometrics G-87; • On-board (GMNKM) and bottom (GDK) gravimeters; • ROV (1000 m water deep); • Sub-bottom profiler; • Side Scan sonar. **Geochemical, Geoecological and Sedimentological equipments:** • CTD SBE 25 Sealogger ; • Gravity and piston corers; • Multi-corer Mark II-400; • Grab samplers; • Nets for biology; **Deck equipments:** • Hydraulically Winch 10 tf; • Electrical Winch 8 tf; • CTD Winch; • ROV winch; • Grab sampler winch; • Crane 3 tf/15 m; • A – Frame on aft ship.
Akademik		Bulgaria (Black Sea)	Akademik is the Oceanographic Multipurpose Research Vessel belonging to IO-BAS - Institute of Oceanology - Bulgarian Academy of Science. General characteristics: Length: 55.5 m

			Beam: 9.80 m Draft: 4.80 m Gross tons: 905 Power: 1000 HP Range 7500 n.mi Endurance: 35 days Cruise speed: 9.5 kt Max. speed: 10.5 kt Crew: 22 Scientists: 20 Equipment on board: Fixed equipment Navigation and communication Nav. equip: Radar Loran Decca SatNav Gyro DopLog Acoustic Echosounders for scientific research: 12kHz 27kHz Oceanographic Oceanographic winches: number: 3 Gantry Crane Electronic data processing equipment permanently available on board
COASTAL ENVIRONMENT			
I3 (Networks of RI`S) – FP7 Projects			
FP7 HYDRALAB IV Infrastructure Network	http://www.hydralab.eu	Hungary Romania	The co-ordinated and integrated approach of HYDRALAB aims at structuring the access to unique and costly hydraulic and ice engineering research infrastructures in the European Research Area. The network of HYDRALAB is unique in the hydraulic research community and has large experience in co-operating since its start in 1997. It began by informing and co-ordinating the activities of the partners in HYDRALAB I and II, and via strong collaboration in HYDRALAB III we will now realize further integration of our research services in Europe in HYDRALAB IV. Research in this infrastructures deals with complex questions regarding the interaction of water with environmental elements, sediment, structures and ice and goes beyond just hydraulic

			research: hence we have adopted the theme More than water, with the following elements: water and environmental elements (focusing on ecology and biology); water and sediment; water and structures; water and ice.
JERICO – Towards a joint EU research infrastructure network for coastal observatories	http://www.jerico-fp7.eu/	Bulgaria Germany	Around European coastal seas, the number of marine observing systems is quickly increasing under the pressure of both monitoring requirements and oceanographic research. Present demands for such systems include reliable, high-quality and comprehensive observations, automated platforms and sensors systems, as well as autonomy over long time periods. In-situ data collected, combined with remote sensing and models output, contribute to detect, understand and forecast the most crucial coastal processes over extensive areas within the various national and regional marine environments. Coastal observations are an important part of the marine research puzzle of activities and applications. However significant heterogeneity exists in Europe concerning technological design of observing systems, measured parameters, practices for maintenance and quality control, as well as quality standards for sensors and data exchange.
Pegaso	http://www.pegasoproject.eu	Romania (Danube Delta is a Pegaso pilot site) Ukraine	Many efforts have been deployed for developing Integrated Coastal Zone Management in the Mediterranean and the Black Sea. Both basins have, and continue to suffer severe environmental degradation. In many areas this has led to unsustainable trends, which have impacted, on economic activities and human well-being. An important progress has been made with the launch of the ICZM Protocol for the Mediterranean Sea in January 2008. The main goal of the PEGASO project is to construct a shared Integrated Coastal Zone Management (ICZM) Governance Platform (figure 1) with scientists, users and decision-makers linked with new models of governance. Spatial Data Infrastructure for the Mediterranean and Black Seas The PEGASO project is an example initiative for the Mediterranean and Black Seas that aims to build a shared ICZM Governance Platform with scientists and end-users, linked with new models of governance. The PEGASO ICZM Platform will be supported by the development of a Spatial Data Infrastructure (SDI) and the suite of sustainability assessment tools required for making multi-scale integrated assessments in the coastal zone.

Vessels and Boats			
Istros research ship	http://www.geoecomar.ro/website/nave-cercetare-istros.html	Romania (Lower Danube Danube Delta The coastal zone of Romania)	"ISTROS" is the coastal and river research ship belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Displacement – 147,8 t Length – 32 m Width – 6,80 m Engine: – 2 engines type Doosan 350 CP each 3 electricity generators; no need for electricity at docking sites Fuel consumption: 90 l/h Cruising speed: 18 km/h downstream and 10 km/h upstream Draft theoretical: 1,08 m (practically 1,40 m) Common navigation area so far: Danube (from Regensburg to Sulina), Danube Delta, the coastal area of Romania. Accommodation facility: 10 places (2 single cabins and 4 double cabins). There is one laboratory on-board: (chemistry lab); possibility to use dining room for laboratory work. Storage facilities – 1 storage room ca. 3 x 2 x 2.5 m; opening ca. 1.2 x 0.65 m; 1 storage room ca. 2 x 2 x 2 m; opening ca. 0.65 x 0. 65 m. Cooling capacities: freezer 200 l, fridge 180 l with freezer 20 l, fridge 180 l; availability of 15 kW additional cooling capacity; space for at least 6 fridges and 2 freezers for storage of samples. Sitting capacity in the dining room: minimum 18 persons. Possibility to provide power and fuel for other ships in case of emergency. Equipments for launching measuring devices: - A frame aft - 2 winches on the sides - 1 oceanographical winch to the aft Other available equipment: - Equipment for river and marine navigation: radar (Simrad CX44), GPS (Simrad CX33), transponder AIS, radiostation;

			- Rescue equipment; - The ship has a large bow bridge, useful as a working place; - Two motor boats with engine, capacity 4 researchers and driver; two drivers from the crew of Istros available at each sampling site; - Short range radio transmission devices (walkie talkie) for the two motorboats; Crew: - Permanent: 7 pers. - Scientific: 10 pers. - Maximum capacity of passengers: 12 pers.
Carina research boat		Romania (Danube Danube Delta Romanian coastal area of the BS)	"Carina" is the coastal and river research boat belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. Carina is used for areas where the access of Istros or Mare Nigrun (marine research vessel of Romania) is restricted or impossible (e.g. water depth). Technical characteristics: 6m long Diesel Engine of 150 HP It can accommodate up to 6 people.
Others Types of Projects/Possible Nodes			
PLANCOAST - Spatial Planning in ICZM	http://www.plancoast.eu/	Bulgaria Croatia Germany Romania Ukraine	PLANCOAST was an INTERREG IIIB NP CADSES Project with the aim to develop the tools and capacities for an effective integrated planning in coastal zones and maritime areas in the Baltic, Adriatic and Black Sea regions. Introduced the completely new spatial planning instrument Maritime Planning Linked Integrated Coastal Zone Management (ICZM) and Maritime Planning with the processes of statutory spatial planning in selected number of pilot projects Spread the use of modern geographical information systems (GIS) for an effective transnational planning. Contributed to the creation and implementation of EU policy on coastal zones and maritime areas, such as the Green Book and Blue Book, and led to creation of numerous national laws and strategies. PlanCoast had 16 partners representing the spatial planning departments or responsible regional authorities from Albania, Bosnia–Herzegovina, Bulgaria, Croatia, Germany, Italy, Montenegro, Poland,

			Romania, Slovenia and Ukraine." Start developing and implementing the tools and procedures for the brand new discipline of Maritime Spatial Planning in each participating country. These tools should comply to international standards and at the same time reflect the local and regional needs.
Globolakes	http://www.globolakes.ac.uk/	Romania (Razelm was included in the network)	GloboLakes is a five year research programme investigating the state of lakes and their response to climatic and other environmental drivers of change at a global scale through the realisation of a near-real time satellite based observatory with archive data processing to produce a 20-year time series, of observed ecological parameters and lake temperature supported by linked auxiliary data on catchment land-use and meteorological forcing. LIMNADES (Lake Bio-optical Measurements and Matchup Data for Remote Sensing) is an initiative to centralize data of ground bio-optical measurements of worldwide lakes through voluntary cooperation across the international scientific community.
Integrated water resources and coastal zone management in European lagoons in the context of climate change	http://lagoons.web.ua.pt/	Ukraine	**The environmental issue of concern of the LAGOONS project is the anthropogenic deterioration and climate change impacts (especially the effects of extreme weather event) on surface water and lagoons ecosystems.** **The main objective of the LAGOONS project is to contribute to a science-based seamless strategy – in an integrated and coordinated fashion – of the management of lagoons seen under the land-sea and science-policy-stakeholder interface; i.e., the project seeks to underpin the integration of the EU Water Framework Directive, Habitat Directive, the EU's ICZM Recommendation, and the EU Marine Strategy Directive.**
FRESH WATER ENVIRONMENT			
ESFRI Projects			
Project/Node	**Website**	**Member countries from the Danube Region**	**Description**
Lifewatch – E	http://www.life	Hungary	**LifeWatch** is a European research infrastructure in development. The first services to

Science European Infrastructure for Biodiversity and Ecosystem research	watch.eu/web/guest/home	Romania	users are planned for 2013. Users may benefit from integrated access to a variety of data, analytical and modeling tools as served by a variety of collaborating initiatives. Another service is offered with data and tools in selected workflows for specific scientific communities. In addition, LifeWatch will provide opportunities to construct personalized 'virtual labs', also allowing to enter new data and analytical tools.
I3 (Networks of RI`S) – FP7 Projects			
EnviroGRIDS Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development	http://envirogrids.net/	Bulgaria Hungary Romania Ukraine	With 30 partners distributed in 15 countries, the EnviroGRIDS project is contributing to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information in the Black Sea catchment (2.2 mio. km^2, 24 countries, 160 million inhabitants). The main aim of the project is to assess water resource in the past, the present and the future, according to different development scenarios. The objective is also to develop datasets that are compatible with the European INSPIRE Directive on spatial data sharing across Europe. The data and metadata gathered and produced on the Black Sea catchment will be distributed through the EnviroGRIDS geoportal. The challenge is to convince and help regional data holders to make available their data and metadata to a larger audience in order to improve our capacity to assess the sustainability and vulnerability of the environment.
MESOAQUA	http://mesoaqua.eu/	?	A network of leading MESOcosm facilities to advance the studies of future AQUAtic ecosystems from the Arctic to the Mediterranean.
ExpeER Ecosystem Research	http://www.expeeronline.eu/	Austria Hungary Romania Serbia	ExpeER is a major European Infrastructure project (2010-2014) in the field of Ecosystem Research. ExpeER will, for the first time, federate existing national infrastructures, improve their research capacity whilst at the same time facilitating access to those key experimental and observational platforms as well as analytical and modelling facilities for the benefit of the international research community.
EAST-NMR	http://www.east-nmr.eu	Hungary Slovakia	Enhancing Access and Services to East European users towards an efficient and coordinated Pan-European pool of NMR (nuclear magnetic resonance) capacities to enable global collaborative research & boost technological advancement. Nuclear magnetic resonance (NMR) spectroscopy is a key technology for research in the modern Life Sciences, with an increasing impact on human health. This technology is unique in new areas of molecular systems biology providing detailed insight into protein-protein and protein-ligand interactions.

ClimateWater - Bridging the gap between adaptation strategies of climate change impacts and European water policies	http://www.climatewater.org/project.php	Austria Germany Hungary Romania	The overall objective of the ClimateWater project is to study European and international adaptation measures and strategies related to climate change impacts and how these are taken into account in water policies. The project will formulate a coherent framework on adaptation strategies of climate change impacts on water resources, water cycling and water uses of the society and nature with special regard to those that water policy has to take into account when considering climate change impacts. The project will bring together scientific and policy experiences on the existing and/or missing links between climate change and water management and will help to: • identify research needs on climate change impacts on water cycle and resources, •develop and apply methodologies for adaptation measures to climate change, •develop scenarios of water demand and to potential implementation on water policies.
PSI-Connect* (FP7, GA 226915): Policy Science Interactions:- Connecting science and policy through innovative knowledge brokering	http://public.cranfield.ac.uk/e101732/psi%20connect/documents/d3.2_national_level.pdf http://www.psiconnect.eu/	Germany Hungary	**Bridging the policy-science gap** The inherent ecological and societal complexity of water management challenges means that management decisions are always challenged by a lack of factual knowledge. This situation is exacerbated by rapidly changing physical and socio-economic boundary conditions such as climate change. Although much new knowledge on the issue of climate change impacts on water resources has been generated, these understandings remain poorly exploited by policy makers and water managers. In recent years, considerable effort has been devoted to designing approaches that support dialogue between science and policy communities in an attempt to relate science, experience and insight to policy. Knowledge brokering instruments such as role playing, simulation games, group model building, soft systems analysis and futures visioning, offer opportunities to increase the effectiveness of these interactions, thus facilitating a discourse on the framing of policy issues, collaborative learning as well as the exchange and co-creation of relevant knowledge. PSI-connect is a three-year collaborative project funded under EC FP7. Through experimentation with and development of innovative knowledge brokering instruments, PSI-connect aims to improve the quality and value of interactions

			between the science base and river basin managers and policy makers in the field of climate change impacts on river systems. PSI-connect will: • generate insight into how the science policy gap can be bridged in the context of water management and climate change. • develop and test different types of knowledge brokering instruments in concrete policy situations at the European, national and regional level. • provide descriptions of different types of knowledge brokering instruments and conditions for their successful application. • introduce different science and policy actors to knowledge brokering instruments through case studies, thus encouraging a further dissemination of the tools to a wider audience. • The long term impact of the project will be ensured through initiation of problem or sector specific forums for information exchange and deliberation, the Knowledge Brokerage Collectives.
River Information Services for Transport & Logistics (RISING)	http://www.rising.eu/web/guest;jsessionid=54C646109495289362536A502C99A548	Austria Croatia Germany Hungary Romania Serbia Slovakia	RISING, a project co-financed by the European Commission within the 7th Framework Programme for Research and Technological Development, will investigate how the efficiency of co-modal transport logistics processes using Inland Waterway Transport (IWT) can be increased. This will be achieved by providing seamless traffic and transport-related information as well as standardized IT interfaces to transport logistics actors and players.
Joint Programming Initiative			
JPI Waters	http://www.waterjpi.eu	Austria Germany Hungary Moldova Romania	The JPI "***Water challenges for a changing world***" deals with research in the field of water and hydrological sciences. The availability of water in sufficient quantities and adequate quality is indeed a public issue of high priority and addresses a pan-European and global environmental challenge.
JPI Climate	http://www.jpi-climate.eu	Austria Germany	JPI Climate is a collaboration between 13 European countries to coordinate jointly their climate research and fund new transnational research initiatives. Transnational

			coordination of the research base aims to overcome research fragmentation, to make better use of precious public R&D resources and to facilitate cross border collaboration between top scientists. JPI Climate connects scientific disciplines, enables cross-border research and increases science-practice interaction. By doing this, it is expected that JPI climate significantly contribute to underpinning the European efforts to respond to climate change. JPI Climate: • aims to respond to the knowledge needs of policy and the European society at large to address climate change • provides a platform to align national research priorities according to a jointly agreed Strategic Research Agenda (SRA) with the aim of complementing and supporting initiatives at the European level (ERANET's, FP8, Climate KIC, ESFRI Projects) • facilitates the coordination, collaboration and exploitation of synergies in climate change research, learning and innovation while working against fragmentation and duplication of efforts • connecting different disciplinary approaches in natural and social sciences leading to interdisciplinary research efforts of higher quality and relevance • connecting top researchers and research groups from different European countries, leading to high quality and efficient research efforts, long term collaborations and a stronger global position • connecting scientific insights with the demands of policy makers, decision makers and other stakeholders from local to international levels, leading to more effective policies
Networks of Infrastructures and Users			
Delta Alliance – A Global Network for the Resilience of Deltas	http://www.delta-alliance.org/	Romania (Danube Delta Wing)	Delta Alliance is an international knowledge-driven network organization with the mission of improving the resilience of the world's deltas. With increasing pressure from population growth, industrialization and a changing climate, it is more important than ever that these valuable and vulnerable locations increase their resilience to changing conditions. Delta Alliance brings people together who live and work in deltas. They can benefit from each other's experience and expertise and as such contribute to an increased resilience of their delta region.

EurAqua	http://www.euraqua.org/	Austria Germany Hungary	EurAqua is the European Network of Freshwater Research Organizations. The aim of EurAqua is to contribute substantially to the development of European freshwater science and technology and its dissemination on a European scale, thus having a significant input on the development of the scientific and economic basis of European water management. The EurAqua Partner institutions are leading, generally public, freshwater research institutions in the Member States of the European Union plus Norway and Switzerland. They extensively support national policies as well as water business. Within the country, the EurAqua members are closely connected to other relevant institutions.
SedNet	http://www.sednet.org/	Germany Serbia	SedNet is a European network aimed at incorporating sediment issues and knowledge into European strategies to support the achievement of a good environmental status and to develop new tools for sediment management. Our focus is on all sediment quality and quantity issues on a river basin scale, ranging from freshwater to estuarine and marine sediments.
BioWetMan: A science based approach to understand biodiversity driven functions and	http://www.ibiol.ro/man/wkp2009a/Sandu_BIOWETMAN_Feb2009.pdf	Austria Bulgaria Croatia Romania	The aim of the proposal is to initiate a network of scientists and wetland managers for improving wetland management by using an integrated scientific approach based on the role of biodiversity for ecosystem services. The preparation of a proposal for a research project can be one of the results of the established network. The core aim of the network is to investigate and elucidate the role of biodiversity for water quality and other ecosystem services, thus, leading to potential answers how ecosystem functions can improve water quality and nature conservation issues related to WFD and human uses. Aim and objectives: • To investigate the role of biodiversity in water quality improvement and other ecosystem services, thus, leading to potential answers how wetlands functions can support the implementation of WFD and human needs • To select case studies and their pressures –evaluate impact situation and the urgent needs related to ecosystem services, especially in the context of climate change • To initiate a network of scientists and wetland managers for improving wetland management on a larger scale by using an integrated scientific

			approach • To increase knowledge and know-how exchange within this network in order to provide useful scientific tools to the decision makers for a sustainable management of Danubian wetlands
Major Initiatives and Projects in the Danube Area			
ICPDR – International Commission for the Protection of the Danube River	http://www.icpdr.org/main/	Austria Bosnia and Herzegovina Bulgaria Croatia Czech Republic Germany Hungary Moldova Montenegro Romania Serbia Slovakia Slovenia Ukraine	The International Commission for the Protection of the Danube River (ICPDR) is a transnational body, which has been established to implement the Danube River Protection Convention. The International Commission for the Protection of the Danube River (ICPDR) works to ensure the sustainable and equitable use of waters and freshwater resources in the Danube River Basin. The work of the ICPDR is based on the Danube River Protection Convention, the major legal instrument for cooperation and trans-boundary water management in the Danube River Basin.
DABLAS	http://www.icpdr.org/main/activities-projects/dablas	Austria Bosnia and Herzegovina Bulgaria Croatia Czech Republic Germany Hungary Moldova Montenegro	The DABLAS (Danube - Black Sea) Task Force is an example of providing a platform between International Funding Institutions, donors and beneficiaries to support cooperation and to leverage investment projects for the protection of water and water-related ecosystems of the Danube and Black Sea. The **Danube Black Sea Task Force (DABLAS)** was set up in 2001 with the aim to provide a platform for cooperation to ensure the protection of water and water-related ecosystems in the Danube and the Black Sea. This was in response to a Communication adopted by the European Commission in 2001, which highlighted priority actions required to improve the environmental situation in the region.

		Romania Serbia Slovakia Slovenia Ukraine	
IAD	http://www.iad.gs/	Austria Bulgaria Czech republic Croatia Germany Hungary Moldavia Romania Serbia Slovakia Ukraine	The International Association for Danube Research (IAD) was founded in 1956 and is the longest existing international scientific network in the Danube Region. IAD is an Association according to Austrian law with the goal of promoting and coordinating activities in the fields of limnology, water management, water protection and sustainable development in the Danube River basin (current structure and contact).
Danubia	http://www.glowa-danube.de/eng/projekt/projekt.php	Germany (GLOWA project)	Integrated simulation model for the climate change impact on activities related to the Upper Danube.
ALSO DANUBE 2000-2003	http://www.alsodanube.at/	Austria Germany Romania Slovakia	ALSO DANUBE (Advanced Logistic Solutions for Danube Waterway) was a Research and Demonstration project within the 5th Framework Programme of the European Union. The overall objective of ALSO DANUBE was to increase significantly the use of inland waterway as a key transport mode within intermodal door-to-door logistic chains, focusing on the Danube axis. Therefore, ALSO DANUBE aimed to: • develop and implement an advanced European concept to manage intermodal transport chains with inland navigation as core transport mode • set up and run highly integrated logistic networks and operational platforms to enlarge the current range of logistic services • integrate advanced traffic and transport management systems

			• introduce new systems and technologies in the area of data exchange and communication • create independent logistic information and communication services • stimulate the extension of waterway transport relations to port hinterland and combined cargo • improve the efficiency of Danube transport which shall contribute to the development of the Danube waterway as a backbone for European transports, promoting the sustainable integration of the accession countries into the European Union
Danubeparks - The Danube River Network of Protected Areas	http://www.danubeparks.org/	Bulgaria Germany Hungary Moldavia Romania Serbia Slovakia (17 protected areas along the Danube, from its source to the Danube Delta)	The Protected Areas along the Danube preserve and restore the most valuable habitats of this international river, thus safeguarding an important part of Europe's natural heritage for future generations. Cross-border and transnational cooperation is an indispensable part of this work; nature doesn't recognise state borders, so nature protection needs cooperation across borders as well if results are to be achieved. Therefore, DANUBEPARKS – the Danube River Network of Protected Areas – was founded in April 2007 through the signing of the Declaration of Tulcea. Eight protected areas were among the founders of this network, and many more joined their work during the early years. The goal is to integrate all Protected Area administrations along the Danube as well as the bigger tributaries (e.g. Prut, Sava, Tisza, Morava, etc.),which share the same problems and are therefore able to solve these issues more efficiently by close cooperation. *Aims of the Network* Based on the principles of the Ramsar Convention and the Convention and Co-operation for the Protection and Sustainable Use of the Danube River (Sofia, 1994), the Declaration of Tulcea solidifies the aims of the Network**:** • enhance nature conservation of Danube River Protected Areas • manage Danube Protected Areas wisely • exchange and promote expertise in management • improve knowledge of the ecological status of the river, as well as the the economic, social and environmental impacts and the management of the Danube Protected Areas

			• take actions for the prevention, control and reduction of pollution in the floodplains and wetlands in the Danube Basin • promote awareness of the international importance of the Danube River • promote sustainable development • influence the implementation and future development of public policies The Declaration of Vienna, signed by twelve partners on the occasion of the Kick-Off Event of the first joint transnational project, further details these aims as well as the means of cooperation.
Danube Reference Data and Service Infrastructure DRDSI Pilot Project	http://7fp.mon.bg/upload/docs/Danube_RDSI_Pilot_Project_Final.pdf	NA	RATIONALE AND OBJECTIVES The EU Strategy for the Danube Region (EUSDR) relies on an integrated approach to encourage better policy development and the alignment of funding and resources through concrete actions and projects. Since the Danube countries share a common territory and face interrelated crossborder issues, the Strategy aims to propose common solutions to the challenges faced by these countries. However, to propose such solutions, policy makers need first to be able to access clear and comparable information and understand better the issues involved. Many stakeholders have been collecting data for several years at the regional, national and local levels but at the moment there is still no common access point for harmonised data covering a wide range of scientific issues and encompassing the whole Danube Region. Now is the time to fill this gap taking advantage of the investment made by Member States to implement INSPIRE and recent progresses on ICT standardisation. For this reason, the JRC with the support of scientific partners of the Danube countries launched this project to develop a Danube Data and Services Infrastructure (DRDSI) that will facilitate access to comparable and harmonised datasets on various issues related to the Danube Region. Thanks to its cross cutting nature, this Infrastructure will contribute to the holistic scientific approach needed to tackle the interrelated and interdependent challenges which the Danube Region is facing. The DRDSI project was proposed as one of the flagship actions of Priority Area 07 "To develop the Knowledge Society (research, education and ICT)" of the EUSDR and is mentioned in the Roadmap for the implementation of this Priority Area. In particular the Priority Area 7 Progress Report was referring to the following recommendation:“Need to obtain a better overview of all research, initiatives and

			resources which are available and to gather the existing research results on the Danube Region in a structured and harmonised data set which could [be] used by policy makers across the Danube Region and will serve as a starting ground for the launch of large scale projects in the future". The recent report (COM(2013) 181 8/4/2013) from the Commission on the progresses made in the implementation of the EUSDR pinpoints the DRDSI initiative as one of the new projects contributing to the strengthening of the Danube Region.
Danube Floodrisk	http://www.danube-floodrisk.eu/2009/11/about/	Austria Bulgaria Croatia Hungary Moldavia Romania Slovakia Ukraine	The DANUBE FLOODRISK project focuses on the most cost-effective measures for flood risk reduction: risk assessment, risk mapping, involvement of stakeholders, risk reduction by adequate spatial planning. Risk reduction in large international river basins can only be achieved through transnational, interdisciplinary and stakeholder oriented approaches within the framework of a joint transnational project. Practice has shown that starting this kind of cooperation is extremely difficult, due to practical, political and financial reasons. If incentives exist, like the transnational cooperation programme, the start up can be successful. The long term process will be self-running after the starting phase. The project will bring together scientists, public servants, NGOs and stakeholders who develop jointly a scalable system of flood risk maps for the Danube River floodplains. Transnational methodology and models will be defined and implemented for flood risk assessment and mapping. This results in proposals for flood mitigation measures, adjustments of spatial development plans, assessment tools for economic development in flood plains and raised awareness of flood risk of stakeholders, politicians, planners and the public. Infrastructures at risk like industry, power stations and supply infrastructure will be considered in the project. Partners: 19 institutions all along the Danube countries, central public bodies, universities, research institutes and operational agencies, NGOs are implicated in the project. Lead partner is the Ministry of Environment, Romania.
Others Types of Projects/Possible Nodes			
LTER Europe	http://www.lter-europe.net/	Austria Bulgaria Germany Hungary	Long-Term Ecosystem Research (LTER) is an essential component of world wide efforts to better understand ecosystems. This comprises their structure, functions, and response to environmental, societal and economic drivers as well as the development of management options. For the first two decades of its existence

		Romania (Danube Delta and Braila Island) Serbia Slovakia	LTER built on natural sciences. The ongoing re-**d**esign of LTER aims at expan**d**ing its scope to the human **d**imension. Strongly couple**d** an**d** integrate**d** socio-ecological systems are **d**riven by economic, cultural an**d** environmental forces likewise. Their investigation requires a new generation of socio-economic an**d** ecological research (LTSER) with a**d**equate infrastructure. LTER-Europe is a network of: ▪ National networks and the European contribution to the global International Long Term Ecological Research (ILTER) with over half of the ILTER members belonging to LTER-Europe ▪ Research infrastructures (LTER sites and LTSER platforms forming national networks) ▪ Institutions involved in ecological research across the continent and aiming at a virtual European ecological research institute ▪ Researchers in natural sciences, sociology and economy ▪ Scientific site co-ordinators and research platform managers ▪ Long-term data ▪ Research projects ▪ Support for communication and lobbying.
WISER – Water bodies in Europe: integrative systems to assess ecological status and recovery Integrated Project to Evaluate the Impacts of Global Change on European Freshwater	http://www.wiser.eu/programme/	Austria Bulgaria Germany	WISER will support the implementation of the Water Framework Directive (WFD) by developing tools for the integrated assessment of the ecological status of European surface waters (with a focus on lakes and coastal/transitional waters), and by evaluating recovery processes in rivers, lakes and coastal/transitional waters under global change constraints. The project will (1) analyse existing data from more than 90 databases compiled in previous and ongoing projects, covering all water categories, Biological Quality Elements (BQEs) and stressor types and (2) perform targeted field-sampling exercises including all relevant BQEs in lakes and in coastal/ transitional waters. New assessment systems will be developed and existing systems will be evaluated for lakes and coastal/transitional waters, with special focus on how uncertainty affects classification strength, to complete a set of assessment methodologies for these water categories. Biological recovery processes, in all water categories and in different climatic conditions, will be analysed, with focus on mitigation of hydromorphological and eutrophication pressures. Large-scale data will

Ecosystems Integrated Project to Evaluate the Impacts of Global Change on European Freshwater Ecosystems			be used to identify linkages between pressure variables and BQE responses. Specific case studies, using a variety of modelling techniques, will address selected pressure response relationships and the efficacy of mitigation measures. The responses of different BQEs and different water categories to human-induced degradation and mitigation will be compared, with special focus on response signatures of BQEs within and among water categories. Guidance for the next steps of the intercalibration exercise will be given by comparing different intercalibration approaches. Stakeholders will be included from the outset, by building small teams of stakeholders and project partners responsible for a group of deliverables, to ensure the applicability and swift implementation of results.
International Initiatives and UN Programmes			
GEO	http://www.earthobservations.org/geoss_wa_tar.shtml		GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. These high-level meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world. GEO is a voluntary partnership of governments and international organizations. It provides a framework within which these partners can develop new projects and coordinate their strategies and investments. As of 2013, GEO's Members include 89 Governments and the European Commission. In addition, 67 intergovernmental, international, and regional organizations with a mandate in Earth observation or related issues have been recognized as Participating Organizations. GEO is constructing GEOSS on the basis of a 10-Year Implementation Plan for the period 2005 to 2015. The Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine "Societal Benefit Areas" of disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity.
GEOSS	http://www.earthobservations.org/geoss.shtml		The Group on Earth Observations is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS. The Global Earth Observation System of Systems will provide decision-support tools to a wide variety of users. As with the Internet, GEOSS will be a global and flexible network of content providers allowing decision makers to access an extraordinary range of information at their desk. This 'system of systems' will proactively link together existing and planned

			observing systems around the world and support the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different instruments can be combined into coherent data sets. The 'GEOPortal' offers a single Internet access point for users seeking data, imagery and analytical software packages relevant to all parts of the globe. It connects users to existing data bases and portals and provides reliable, up-to-date and user friendly information – vital for the work of decision makers, planners and emergency managers. For users with limited or no access to the Internet, similar information is available via the 'GEONETCast' network of telecommunication satellites. The Global Earth Observation System of Systems is simultaneously addressing nine areas of critical importance to people and society. It aims to empower the international community to protect itself against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard water resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture and conserve biodiversity. GEOSS coordinates a multitude of complex and interrelated issues simultaneously. This cross-cutting approach avoids unnecessary duplication, encourages synergies between systems and ensures substantial economic, societal and environmental benefits.
Copernicus The European Earth Observation Programme	http://www.copernicus.eu/	It represents the European contribution to GOOS.	**Copernicus, previously known as GMES (Global Monitoring for Environment and Security), is the European Programme for the establishment of a European capacity for Earth Observation.** Copernicus is a European system for monitoring the Earth. Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and *in situ* sensors such as ground stations, airborne and sea-borne sensors. It processes these data and provides users with reliable and up-to-date information through a set of services related to environmental and security issues... The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security. They support a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable

			development, civil protection and tourism. The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian crisis. Based on the Copernicus services, many other value-added services can be tailored to more specific public or commercial needs. This will create new business opportunities. In fact, several economic studies so far have demonstrated a huge potential for job creation, innovation and growth. The Copernicus programme is coordinated and managed by the European Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency for the space component and of the European Environment Agency and the Member States for the in situ component. The provision of Copernicus services is based on the processing of environmental data collected from two main sources: • A space component, which consists of several Earth observation satellites; • An *in situ* component, which consist of a multitude of sensors on the ground, at sea or in the air. The European Space Agency (ESA) is responsible for the space component and coordinates the delivery of data from upwards of 30 satellites. The European Environment Agency (EEA) is responsible for the development of the *in situ* component and coordinates the gathering of data coming from both European and non-European organisations.
IHE – UNESCO	http://www.unesco-ihe.org/		**Institute for Water Education** The mission of UNESCO-IHE is to contribute to the education and training of professionals, the knowledge base through research and to build the capacity of sector organizations, knowledge Centres and other institutions active in the fields of water, the environment and infrastructure in developing countries and countries in transition. In support of its mission, the Institute has three main goals: • Develop innovation, provide new knowledge, and promote the uptake of technologies and policies that will address the issues of the global water agenda, in particular those related to the Millennium Development Goals

			(MDGs) and the post 2015 Sustainable Development Goals (SDGs); • Seek, evaluate and facilitate responses for the sustainable management of water, to meet the needs of all sectors of society, particularly the poor; • Strengthen and promote principles of good governance that drive institutional and management change to support the sustainable management of water.
GEF	http://www.thegef.org/gef/whatisgef		**The Global Environment Facility** (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition, providing $11.5 billion in grants and leveraging $57 billion in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP), the GEF has also made more than 16,030 small grants directly to civil society and community based organizations, totaling $653.2 million.
UNEP	http://www.unep.org/		United Nations Environment Programme UNEP, established in 1972, is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP work encompasses: • Assessing global, regional and national environmental conditions and trends • Developing international and national environmental instruments • Strengthening institutions for the wise management of the environment **Mission** "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations." **Mandate** "to be the leading global environmental authority that sets the global environmental agenda, that promotes the coherent implementation of the environmental dimensions

			of sustainable development within the United Nations system and that serves as an authoritative advocate for the global environment" Priorities: Climate Change, Disaster and conflicts, Ecosystem management, Environmental Governance, Harmful Substances, Resource Efficiency.
IUCN	http://www.iucn.org/about/		International Commission for Conservation of Nature The International Union for Conservation of Nature is the world's oldest and largest global environmental organization. **IUCN at a glance** • Founded in 1948 as the world's first global environmental organization • Today the largest professional global conservation network • A leading authority on the environment and sustainable development • More than 1,200 member organizations including 200+ government and 900+ non-government organizations • Almost 11,000 voluntary scientists and experts, grouped in six Commissions in some 160 countries • IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world. The Union's headquarters are located in Gland, near Geneva, in Switzerland. • A neutral forum for governments, NGOs, scientists, business and local communities to find practical solutions to conservation and development challenges • Thousands of field projects and activities around the world • Governance by a Council elected by member organizations every four years at the IUCN World Conservation Congress • Funded by governments, bilateral and multilateral agencies, foundations, member organizations and corporations • Official Observer Status at the United Nations General Assembly
Vessels and Boats			
Argus – Danube research ship	http://www.icpdr.org/main/publications/million-euro-boat-expedition-	Serbia	The Argus was the main laboratory ship during 2 ICPDR surveys. It has a cruising speed of 25 km/h (some 13 km/h upstream). Dimensions: 33.0 x 4.5 m, drought: 1.35 m, height: 5 m. Serbia reported in December 2012 that the Argus is in good condition and that it had

	test-danube-pollution http://www.ngo.ro/site_item_full.shtml?x=1896		recently been completely refurbished. The ship has new radar and the system of communication enabling automatic communication with port authorities. A sieving machine is also in good condition and the following sieves are available: 3 x 0.063 mm, 1 x 0.250 mm, 1 x 1 mm and 1 x 2 mm. Only one bottom part (bellow all the sieves) is available. The following additional equipment is available on-board: • Bacterial incubator HASH small, • Binocular Magnifier, • Microscope, • Automatic dozers 40 ml 2 pcs, and 25 ml 2 pcs. • Microbiological incubators (the status still to be checked). Available cooling capacities: 2 x 60 L refrigerators and one combined (20 L freezer and 60 L fridge). Possibility of additional cooling capacities is limited by the available electric power. The maximum number of persons who can be formally reported on the Argus is 12 plus the crew.
Wien		Austria	A privet Austrian ship that can support the research programs. Total length: 20,4 m Width: 3,8 m Draught: 1,2 m Engine: 2x 200 hp Max. speed (rel. to water surface): 22 km/h downstream.
Meßschiff IV		Austria	A privat Austrian fishing ship that can be used in research projects.
Istros research ship	http://www.geoecomar.ro/website/nave-cercetare-istros.html	Romania (Lower Danube Danube Delta The coastal zone of Romania)	"ISTROS" is the coastal and river research ship belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Displacement – 147,8 t Length – 32 m Width – 6,80 m Engine: – 2 engines type Doosan 350 CP each

			3 electricity generators; no need for electricity at docking sites Fuel consumption: 90 l/h Cruising speed: 18 km/h downstream and 10 km/h upstream Draft theoretical: 1,08 m (practically 1,40 m) Common navigation area so far: Danube (from Regensburg to Sulina), Danube Delta, the coastal area of Romania. Accommodation facility: 10 places (2 single cabins and 4 double cabins). There is one laboratory on-board: (chemistry lab); possibility to use dining room for laboratory work. Storage facilities – 1 storage room ca. 3 x 2 x 2.5 m; opening ca. 1.2 x 0.65 m; 1 storage room ca. 2 x 2 x 2 m; opening ca. 0.65 x 0. 65 m. Cooling capacities: freezer 200 l, fridge 180 l with freezer 20 l, fridge 180 l; availability of 15 kW additional cooling capacity; space for at least 6 fridges and 2 freezers for storage of samples. Sitting capacity in the dining room: minimum 18 persons. Possibility to provide power and fuel for other ships in case of emergency. Equipments for launching measuring devices: - A frame aft - 2 winches on the sides - 1 oceanographical winch to the aft Other available equipment: - Equipment for river and marine navigation: radar (Simrad CX44), GPS (Simrad CX33), transponder AIS, radiostation; - Rescue equipment; - The ship has a large bow bridge, useful as a working place; - Two motor boats with engine, capacity 4 researchers and driver; two drivers from the crew of Istros available at each sampling site; - Short range radio transmission devices (walkie talkie) for the two motorboats; Crew: - Permanent: 7 pers. - Scientific: 10 pers. - Maximum capacity of passengers: 12 pers.

Halmyris floating laboratory and pontoon	http://www.geoecomar.ro/website/en/nave-cercetare-halmyris.html	Romania (Danube Delta)	**Technical characteristics:** • Length: 32 m; • Breadth: 6,60 m; • Draught: 0,60 m; • Displacement: 90 t; **Laboratory:** • Geochemistry; • Biology; **Facilitys:** • Electrical power generator; • Air condition intalations; **Other facilitys:** • 14 cabins (single and doubles – for 20 people); • Conference room (30 – 40 persons) • Boats.
Carina research boat		Romania (Danube Danube Delta Romanian coastal area of the BS)	"Carina" is the coastal and river research boat belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. Carina is used for areas where the access of Istros or Mare Nigrun (marine research vessel of Romania) is restricted or impossible (e.g. water depth). Technical characteristics: 6m long Diesel Engine of 150 HP It can accommodate up to 6 people.
Local/Regional Projects And Initiatives			
Evaluation of the anthropogenic activities impact on natural areas bordering agricultural polder Sireasa		Romania	This project was a multidisciplinary approach, which aimed to evaluate the impact of human activities in Sireasa polder on surrounding natural areas of the Danube Delta Biosphere Reserve. The second part of the project was devoted to the influence of dam construction Sulina - Sf. Gheorghe road on adjacent habitats.

(Danube Delta Biosphere Reserve)			
UAS inovative survey and monitoring model for colonially breeding waterbird species from Danube Delta Biosphere Reserve	http://delta.aerocontrol.ro/Project_Proposal-UAS-BIRDD%20-%20Short%20Version.pdf	Romania	UAS-BIRDD project envisage a strong interdisciplinary approach in order to identify, evaluate, design, experimentally test and determine all necessary aspects, to define, establish and demonstrate a full cycle functional model and dynamic information support system/toolset for wildlife management and environment research. Unmanned aircraft systems (UAS) are enabled by transformative high technology that can perform feature rich and cost-effective applications for environment, such wildlife management, wildfire command and control, farming and land use management.
Auswirkungen des Klimawandels auf Vegetation und Fauna der Donauaue		Germany	The objective of this project is to assess the impact on plant- and animal habitats along the last free-flowing stretch of the German Danube caused by climate-induced changes of water levels. Scenarios are derived from ensemble projections of runoff data. An extensive database, developed during the Environmental Impact Assessment for the planned river regulation in this stretch, is used. It contains information on flora, fauna and local environmental variables (hydrology, soil). Based on these data, statistic and rule-based models of plant species and plant communities as well as selected animal species (fishes and macro-invertebrates) are developed. Future water levels serve as input variables for these models aiming at the spatially explicit assessment of changes in the habitat. The project results will be used to support the Federal Waterways and Shipping Authority (WSV) in its strategic planning to counteract the effects of climatechange.
Improvement Of The Navigational Systems And Topohydrographic Measurements Along The Danube River		Bulgaria Romania	The project aims at improvement of the navigational systems being an important element for ensuring of safety inland waterway navigation. Specific objectives: modernization of the monitoring networks and methods for collection, processing and analyzing of data for quantitative assessment of the Danube waters in accordance with the requirements set by WMO, WFD and ICPDR; achieving the international standards for implementation of topographic measurements, including hydrographical and hydrological activities necessary for studying the changes along the inland waterways; improvement and unification of the

			marking quality of the fairway along the common Bulgarian-Romanian section of the Danube River; decreasing of the time for delivery of information to the users as one of the services related to the fairway conditions and the waters of the river; rehabilitation and improvement of the basic infrastructure being control geodetic network along the Bulgarian section of the Danube River. The project includes 3 components: 1) Establishment of a control GPS geodetic network on the Bulgarian bank of Danube River and its connection with EUREF 2) Modernization of the navigational systems in the Bulgarian section of the Danube River through delivery of floating and coastal signs 3) Delivery of equipment (surveying vessel, automatic hydrometric stations)
LIFE Szigetköz Project (LIFE04ENV/H/000382): Implementation of an innovative Decision Support Tool for the Sustainable water and land-use management planning and Flow Supplementation of the Hungarian-Slovakian Transboundary Danube Wetland Area	http://www.szigetkoz.info/beadott_riportok/07LaymanReport_LIFE04ENVH000382.pdf	Hungary Slovakia	The overall aim of the LIFE-III Szigetköz Project was to develop an innovative Decision Support Tool (DST) for the sustainable Water and Land-use Management Planning and Flow Supplementation of the Hungarian-Slovakian Transboundary Danube Wetland Area. The brand new DST is based on an integrated approach of studies and analyses evaluated by an innovative, on-line GIS-tool. The Decision Support Tool complemented by the other main result of the project, the flow-supplementation, helped the whole region to create the necessary planning for sustainable development according to the requirements of the Water Framework Directive and the subsidiarity. The objectives of the project were the following: » Creation of a GIS-based integrated Decision Support Tool (DST), which is able to handle social, environmental and also economic issues at the same time. The DST is a strategic development plan and decision-making protocol, based on the findings of the tasks of the "monitoring level". The long-term sustainability and efficiency is guaranteed by the newly-funded Szigetköz Development Council. » Implementation of an innovative, modern flow-supplementation in the Lower-Szigetköz area, and to demonstrate and test the applied technologies according to the requirements of the project and of the Water Framework Directive » Contribution to implementation the following EC Directives and principles in the region: Water Framework Directive, Transboundary Water Convention, RAMSAR Convention Subsidiarity, Sustainable Development and many more.

Capacity Building for implementation Directive on pollution caused by certain dangerous substances discharged into the aquatic environment and the Water Framework	http://www.azo.hr/IPA2009CapacityBuildingFor	Croatia	• Duration: 12 month (06/2012 - 06/2013) 1. Assessment of the current situation regarding the implementation of the requirements and provisions of the Water Framework Directive (2000/60/EC) and the Directive on pollution caused by certain dangerous substances discharged into the aquatic environment (2006/11/EC) and made recommendations for future implementation process. Recommendations must include proposals for an institutional setting, capacity building activities in the laboratory of Hrvatske vode and participation of all stakeholders. 2. Prepared guidelines on quality control methods for the determination of priority substances. The guidelines must include procedures for testing validation and calibration method (unreliability of measurement). 3. Established methodology for assuring quality and quantity data control 4. Improved skills, knowledge and abilities of the Hrvatske vode laboratory staff on new analytical methods. 5. Enhanced capacity of all relevant stakeholders for the implementation of the Water Framework Directive and Directive on Pollution Caused by Certain Dangerous Substances Discharged into the Aquatic Environment 6. Prepare a report on the implementation of the monitoring of surface and groundwater in Croatia.
National Park Donau-Auen, Austria	http://www.donauauen.at/?language=english	Austria	The Donau-Auen National Park protects the largest contiguous wetlands environment in Central Europe. In this region – situated between Vienna and Bratislava – the freeflowing stretches of the Danube have been preserved. The wetlands along the river are the most pristine and ecologically significant of the Central European Danube. The diverse habitats of these wetlands – despite the Donau-Auen National Park's relatively modest total area of 9,300 hectares at present – make the biodiversity found here absolutely unique in all of Central Europe. Over 800 vascular plant species and more than 30 mammalian, 100 breeding bird, eight reptilian and 13 amphibian species – not to mention around 60 fish species – live on the National Park grounds. If one takes the abundance of terrestrial and aquatic insects as well as invertebrates into account, the number of individual species rises to over 5,000 Riverine Wetlands National Park, Category II, recognized by the

			IUCN. Total area currently over 9,300 hectares; of these, approx. 65% is riparian forest, 15% meadow, and approx. 20% is covered by water. Expansion of area is planned. The administration of the Donau-Auen National Parks is incumbent on the "Nationalpark Donau-Auen GmbH", a non-profit organisation formed by the Austrian federation and the provinces of Vienna and Lower Austria. Its managing director is the National Park Director, who sits in the regular general assemblies with the organisation's representatives from the federation and the provinces. Staff employed by the organisation is responsible for a variety of tasks in three main areas: organisation; visitors and region; and science and nature.
HESTIA – Harmonisation and Evaluation of Sampling Techniques in the Aquatic Environment	http://www.umweltbundesamt.at/en/services/services_resources/services_water/?id=15552	Austria Slovakia	To secure our water resources for future generations, the EU adopted the water framework directive (WFD) in December 2000. In the implementation process of the WFD, all member states are required to perform trend monitoring on several pollutants in surface water, starting in 2010. Such a trend monitoring can be carried out in water, suspended particles and sediments as well as in biota. The decision which matrix to survey is even more difficult for less water-soluble pollutants like polycyclic aromatic hydrocarbons (PAH) and heavy metals. For those there is no generally accepted method established within the EU. The objective of our project HESTIA was therefore to compare different monitoring methods for those pollutants (PAH, selected heavy metals) to give a technical recommendation on how to perform a trend monitoring in the aquatic environment.
MoRe - The Morava River Restoration	http://www.etc-more.eu/ms/etc_more/more_en/en_theproject/	Austria Slovakia	The project area extends from the confluence of the Morava and Thaya river km 69.00 to the village Sierndorf at river km 53.0. The revitalization of this section is based on a joint Austrian-Slovak Action Plan, which was for the entire cross-border route of the Morava River within the project bgmII created. The main objectives are to restore the original character of the meandering lowland river, to achieve a dynamic equilibrium according to the ecosystem approach and to improve the diversity of natural habitats in the floodplains. These aims are achieved through the gradual restoration of the natural interaction between the river bed and flood plain

			that are currently isolated from each other. The project objectives are in line with the requirements of the EU Water Framework Directive (achievement of good ecological status) to promote as well the favorable conservation status under the EU-Fauna-Flora-Habitat Directive and support the objectives of the trilateral Ramsar-site "March-Thaya-Auen".
OrientGATE - a structured network for integration of climate knowledge into policy and planning	http://www.orientgateproject.org/index.php?page=partnership	Austria Bulgaria Croatia Hungary Romania Serbia Ukraine	The OrientGate project aims to coordinate climate change adaptation efforts in SEE countries by building a lasting partnership between communities that produce knowledge and experimental studies, and communities that apply that knowledge. The project will: • develop a comprehensive and consistent methodology for assessing the risks arising as a result of climate variability and change; • harmonise risk assessment and communication on the part of hydrometeorological services; • encourage the use of acquired climate adaptation knowledge and experience in territorial planning and development; and • enhance capacity to reconcile the risks and opportunities inherent in environmental changes, including rising temperatures. The core output to be developed by OrientGate is a set of web tools, designed to provide access to data and metadata from climate observations and simulations that will be available through a data platform connected to the European Climate Adaptation Platform (CLIMATE-ADAPT). Other project outputs will include six pilot studies of specific climate adaptation exercises developed by the project's three thematic centres; capacity-building seminars and workshops; and a working partnership among the hydrometeorological services of SEE countries. The web-based network will make all project data, documentation, discussions and guidelines accessible not only to the project partners but also to all interested SEE territories not directly involved in the project.
Development of flood hazard maps and flood risk maps		Croatia	The purpose of this project is to implement requirements of the EU Floods Directive and to that end to prepare flood hazard maps and flood risk maps in the Republic of Croatia. This twinning project will focus on the second phase of the Floods Directive and will help in the preparation of flood hazard maps and flood risk maps for selected pilot

			areas as well as on preparation of guidance documents and capacity building of relevant institutions. The results of this twinning project will be of great help to Croatian experts for the upcoming third phase of the Floods Directive – the preparation of flood risk management plans. This Twinning is between Croatia and three EU Member States, the Netherlands, Austria and France.
Water shortage hazard and adaptive water management strategies in the Hungarian-Serbian cross-border region	http://wahastrat.vizugy.hu/	Hungary Serbia	Hungary, as a member of the EU is engaged to fulfil the requirements of the EU Water Framework Directive. Serbia, being a state heading towards the EU has also a great interest to meet the requirements of the document. To achieve the goals of the directive, catchment management plans need to be implemented, which provide a framework for major water related issues. However, the management of future extremities and hydro-climatic hazards, along with their more and more severe consequences, require an even more integrated approach. Conflicts related to water shortage must be treated in a complex way by resolving the opposing interests of different stakeholders (environmental protection, irrigation, industrial use). The project therefore aims to find integrated water management solutions for the increasing problem of water shortage. Catchments and water related problems are not related to administrative boundaries, thus any measures in this field require a strong cross-border co-operation.
Sustainable Transport and Tourism along the Danube	http://www.danubecc.org/upl/TRANSDANUBE_leaflet_EN.pdf	Austria Bulgaria Germany Hungary Romania Serbia Slovakia	The Danube is passing 10 countries on its way to the Black Sea. Therefore it is one of the most transnational rivers in the world. It is a river full of history and an important interlink between the regions of South East Europe. Several initiatives clearly identified the need for cooperation to boost the development of the Danube Region. With the endorsement of the EU Strategy for the Danube Region in April 2011, the member states declared their will for common action. In line with the objectives of the South East Europe (SEE) Program, Transdanube is aiming at tackeling the weak accessibility levels and poor quality of transport services in SEE as a major constraint for further economic development and growth in the region. It is the objective of the project to develop Sustainable Mobility along the Danube including environmentally friendly modes of transport in order to improve the accessibility and facilitate the concept of sustainable tourism in the whole Danube Region. The regions will benefit from increased added value from tourists being able to reach touristic destinations

			even in the hinterland of the river. The development of sustainable transport offers will stimulate the shift to environmentally friendly mobility systems resulting in reduced green house gas emissions/pollutants/noise and better transport services for the inhabitants as well. This will finally influence the quality of the whole region for economic development and the quality of life for the inhabitants themselves. In order to reach the set objectives, Transdanube is following an intersectoral approach combining the transport and the tourism sector, where the level of cooperation is still weak at the moment. Based on an analysis of the state of the art of sustainable transport offers and tourism the partners will develop actions plans resulting in a priorisation of possible solutions necessary to overcome the identified gaps. A commonly defined vision for Soft Mobility developed and agreed by the project partners will be the guideline for the development of sustainable transport offers. Depending on the project partners? current stage in the planning process, activities will include the elaboration of feasibility studies, pre-investment studies and demonstrations for the implementation of new/ improved multimodal transport offers, new shipping services and new/improved bicycle routes/services. As information about different available mobility options is crucial for the usage of existing and/or newly developed transport offers, access to this information has to be provided on different levels. The involvement of regional/ national and transnational stakeholders is of major importance for the success of the project. Workshops on the regional/national level as well as the participation in transnational conferences and project meetings will provide adequate forums to inform relevant stakeholders about the project and to get access to their know-how during the development and implementation of specific sustainable mobility solutions. The main outputs and results will be: Transnational State of the Art Report on sustainable mobility in the Danube Region; Commonly developed vision of Soft Mobility; regional action plans; precise sustainable transport offers; digital maps presenting information about existing mobility- and tourism offers; Soft Mobility packages and marketing plans. With 14 financing partners allocated equally along the Danube and a large board on strategic partner observers from all levels, the project outputs will reflect the situation of sustainalbe mobility and tourism in this whole area. Summing up the expriences gained during action implementation in reports and manuals will proof and facilitate

			the reproducible character of the developed solutions. Therefore, Transdanube will support the promotion of sustainalbe mobility as an environmentally friendly possibility to improve the accessibility in the SEE region. During the two years of the project's implementation the following activities will be carried out: • Transnational state-of-the-art report on sustainable mobility in the Danube Region (including good practice collection) • Common soft mobility vision • Regional action plans • Sustainable transport offers => Soft mobility tourism packages • Digital map, presenting information about existing mobility and tourist offers • Regional marketing plans and specific marketing activities
Sustainable spatial development of Danube area in Serbia		Serbia	The subject of the Project is the formation of a conceptual basis for an integral and balanced spatial development of Danube area in Serbia. The key determinants of the development in the EU Danubian countries are aimed at an integrated development of regions and local communities in the coastal zone. The impact of the international development documents on the Danube Area will be especially analyzed, as Serbia's priority within the transport, economic, cultural and other forms of integration into the EU. The potential, limitations and manners of solving conflicts in the spatial development of the Danube Area will be examined and analyzed, from the aspect of the impact of transport corridor VII, water supply, tourism, mining, energy supply, industry etc, on the sustainable exploitation of natural and cultural areas. Realizing the methods and determining the instruments for overcoming high concentration of population and economy and development conflicts is one of the greatest priorities of this Project, especially from the aspect of directing rural development and rational use of space in settlements, the protection of natural areas and cultural heritage. Activating the potentials of Danube Area in Serbia is conditioned by the affirmation of strategic planning and the development of a system of indicators (GIS) for efficient management of sustainable development and integral environmental protection.
SEERISK - Joint Disaster	http://www.seeriskproject.eu/seer	Austria Bulgaria	As a general trend in the SEE region, the frequency and seriousness of extreme climatic events is increasing due to climate change. Even though climate change

Management risk assessment and preparedness in the Danube macroregion	isk/#main	Hungary Romania Serbia Slovakia	affects countries, territories and localities differently, there are common and typical challenges. SEERISK takes into account specific risks and horizontal challenges as well. The countries involved are territorially coherent: the project concentrates on the Middle and Lower Danube Basin, where a wide range of risk types occur. There are localities where flashflood is the predominant risk factor (e.g. in Srbac), whereas in other project territories, unforeseeable thunderstorms cause serious damages (e.g. to tourism in Siófok) or frequent draughts cause damage to agriculture. Low level of awareness (addressed via risk assessment), week preparedness (to be addressed through better information flow, awareness raising, cooperation) and institutional gaps (to be addressed by institutional analysis) and weak territorial planning are common, horizontal challenges in those regions. Objectives of the project • to formulate common methodology for the assessment of natural hazards, • reveal the similarities and distinctions between the institutional framework of risk assessment and disaster management • put in local practice the European Commission risk assessment guidelines • reveal the gap between risk experts and communities' understanding of climate change • close gap between risk exposure and preparedness.
SEE RIVER - Sustainable Integrated Management of International River Corridors in SEE Countries	http://www.see-river.net/results.html	Austria Croatia Hungary Romania Serbia Slovakia	Rivers in SEE region are often threatened by unsustainable use, increasing human pressure, and problems of increased floods and droughts driven by climate change. Inhabitation of floodplain areas, hydropower utilization, navigation, gravel and sand extraction, unsustainable tourism etc. lead to changes in morphology, increased pollution, degradation of aquatic habitats, as well as land use conflicts. The most pressures in a river basin occur along river corridors, challenging the sustainable water and riparian land use. The common EU legislation, in particular the Water Framework Directive, the Flood Directive, the Habitat Directive, the Birds Directive and the Renewable Resources Directive, gives a framework to develop processes and practices for sustainable river management. However, such sectoral objectives are often antagonistic and provide a challenge for river managing authorities when it comes to the implementation phase. The main objective of the SEE RIVER project is to empower the multi-sectoral stakeholders sharing the territory of an international

			river corridor to gain knowledge on planning and implementing processes for integration of existing sectoral policies, plans and programmes in order to reach consensus on integrative management of international river corridors, taking into account both the development and the conservation interests. This will be achieved by developing the SEE RIVER Toolkit - a joint approach for establishing common frameworks for integrative management of international river corridors in SEE. Such framework will be established for the Drava River and initiated on 5 other SEE rivers: Bodrog, Prut, Soca, Neretva and Vjosa rivers. The River Frameworks will use a cross-sectoral participatory approach to reach consensus among international stakeholders on the joint vision, goals and measures for sustainable management of river corridors. The project added value is that it does not aim at preparing new sectoral management plans, nor invent new costly managing structures to improve the management of river corridors. It rather provides a framework for utilising the existing management structures and sectoral policies, plans and programmes. The project aim is to simplify and rationalise the procedures for reaching synergetic solutions between development and conservation interests of stakeholders along international river corridors. Through application of the Toolkit and the Frameworks on 6 SEE Rivers the project will improve the transboundary and multi-sectoral cooperation of existing bodies responsible for the management of river corridors in 14 SEE countries. This will increase the capacities and skills for consensus building among policy making and implementing bodies from different sectors in SEE. This way the project will improve policy making processes which we believe is the only way to long term improvement of the quality of life along the river corridors and in the wider SEE region.
SEEMAriner - South Eastern Europe Marine and River Integrated System for Monitoring the Transportation of	www.seemariner.eu/ http://www.delmne.ec.europa.eu/code/navigate.php?Id=2221&project_id=180	Austria Bulgaria Croatia Rep. of Moldavia Romania Serbia Slovakia	The SEE area is a sea and river transit space of vessels carrying hazardous freight which constitutes many potential environmental risks for coasts and inland waterways. Economic development and a strong growth of transport and increased traffic in the SEE area aggravate the already increased threats of pollution and thus there is a great need for efficient management and for high performance observation, communication and monitoring response systems. Results:

Dangerous Goods		Ukraine	• Improved coordination, harmonisation and availability of data on the transportation of dangerous cargoes; • Enhanced managerial skills and equipment for handling dangerous cargoes; • Developed and tested common management structures and tools for the monitoring of dangerous goods transportation; • Streamlined procedures and protocols for emergency situations or disasters caused by the transportation of dangerous goods.
SEE HYDROPOWER - targeted to improve water resource management for a growing renewable energy production	http://www.seehydropower.eu/	Austria Rep. of Moldova Romania	Hydropower is the most important renewable resource for energy production in the SEE countries but creates ecological impacts on a local scale. If on one hand, hydroelectric production has to be maintained and likely increased following the demand trend and RES-e Directive, on the other hand, hydropower utilisation often involves severe hydrological changes, damages the connectivity of water bodies and injures river ecosystems. The project gives a strong contribution to the integration between the Water Frame and the RES-e Directives in the involved countries.
Sava river basin: sustainable use, management and protection of resources	http://wbc-inco.net/object/project/8016	Croatia Serbia	The Sava River (945 km) is the biggest tributary to the Danube River and has 95551 km2 large catchment. It extends over four countries, Slovenia, Croatia, Bosnia and Herzegovina and Serbia and Montenegro. In the development of the river basin management plan all countries are already collaborating under the International Commission for the Protection of the Danube River (ICPDR) guidance. Until 1991, the methodological bases for data collection have been reasonably unified over the catchment, but lucking a l ot of today's important aspects such are ecological character of the river and its tributaries, inventory of pollution sources, dangerous substances, socio-economic parameters, cost and benefit implications and similar. For the later period a lot of data a re missing due to insufficient monitoring (financing, recent warfare) and weak institutional and legal control over use of water and land resources of the Sava River catchment. Many aspects of the river quality need scientific investigations. Furthermore, there is a need to link the knowledge of river quality state and environmental and health risk with pressures and their driving forces to propose efficient and beneficiary actions and measures for protection. In the project specific tools based on combinat ion of chemical analysis and biological

			effect methods will be developed and validated for the pollution of sediments and impact on water biota. Geographical distribution of pollution will be identified and historical trends defined. Integrated prediction model about the behaviour of hazardous chemical substances will be integrated with the socio-economic prediction model to serve as a base for the elaboration of scenario, remediation measures and best practice techniques. For that purpose an expert data an d information management system will be developed. It ended in 2007.
Protecting Rivers from Accidental Industrial Pollution	http://territorialcooperation.eu/frontpage/show/360	Bulgaria Hungary	Although the general condition of most European rivers has improved over recent years, accidental spills of chemicals in rivers remain a severe threat to the environment. This risk is characteristic of all regions involved in the RIVER SHIELD project, as the areas are crossed by rivers which fl ow through more than one country, such as the Danube, Oder, Strimon and Nestos. To overcome the problem of accidental industrial pollution a close co-operation of all involved authorities, services and organisations from all countries concerned is necessary. River Shield targets the protection of rivers from pollution caused by industrial accidents through development and implementation of risk management, prevention and response good practices. The project partners are public authorities and environmental protection organisations from Greece, Hungary, Poland, the Czech Republic, Slovenia and Bulgaria. River Shield increases the capacity of the involved environmental protection and emergency response services to minimise the impact of potential industrial accidents. Regional Networks will be formed to strengthen know-how exchange and transnational co-operation. Emergency response guides will be compiled and disseminated. Spatial planning and land-use measures and policies will be developed and proposed. As a supportive mechanism, the River Shield Unit for the future utilisation of the project outcomes will be institutionalised. Dissemination actions will be carried out at regional, national and European level.
Risk mapping studies and planning. Providing a		Romania	The project's partnership is the core of a research network whose activity aims to develop monitoring and analysis of risk factors in the Lower Danube, at a level of excellence according to international norms. The project covers three types of natural hazards (earthquakes, landslides and floods), only seismic hazard is unpredictable

digital terrain model for risk management in the Lower Danube (RISKGAL)			and unforeseeable. Hazard / natural risk maps should be defined in the county territory, by a multidisciplinary team specialized and properly equipped. The project aims to develop further risk maps based on the elaborated hazard maps, taking into account the vulnerability of the sites objectives. The natural hazard maps will give high precision results in four dimensions, with an indefinite possibility of use in time and space. The expert system developed from these maps will be on the hand of local authorities for optimal, efficient and scientifically based decisions.
Past Projects			
EUWater - Transnational integrated management of water resources in agriculture for the EUropean WATER emergency control	http://www.eu-water.eu/	Croatia Hungary Romania Serbia Ukraine	EU.WATER, carried out in 8 rural study areas belonging to 8 SEE Countries, tackles the emergency related to water consumption and contamination in Europe, and aims at spreading, at transnational level, integrated water resource management in agriculture based on the optimization of water consumption and cutback of groundwater pollution. Through a joint strategy and its downscaling within each Project Partner's governance framework, EU.WATER (which starts from the capitalization of the extreme & fragmented load of results of previous projects) moves towards (1) application of the EU Water and Nitrate Directives across SEE Countries (2) development of adaptive-learning practices and innovative solution to contribute at the transition of local agriculture towards innovative and environmental-friendly measures (3) incentives to farmers to adopt eco-prescriptive practices. EU.WATER, fostering the ongoing rural reforms and agricultural transformation process of most of the SEE Countries (some of them approaching the EU entry), has the capacity to positively influence the process for choosing agricultural management practices at the field scale, where the application of environmental protection measures bring to A) the stewardship of the natural resources B) the generation of incoming benefits in terms of crop's productivity. Ownership & capacity to achieve the expected results is ensured by the profile of PPs and by the role assigned to stakeholders: combination of governance actors (at national, regional and provincial scale) + high-professional technical institutions (as agro-environmental research centres & universities) + permanent network of technicians, association and farmers (called upon to contribute to the general strategy and to apply land-based practices) assure the reach of objectives and the effective impact of the project in the local rural

			policies. EU.WATER is scheduled to run from March 2009 to February 2012**.**
Water scenarios for Europe and for Neighbouring States (SCENES)	http://www.wise-rtd.info/en/info/water-scenarios-europe-and-neighbouring-states	Hungary Romania Ukraine	The SCENES project will develop and analyse a set of comprehensive scenarios of Europe's freshwater futures up to 2025, covering all of Greater Europe reaching to the Caucasus and Ural Mountains, and including the Mediterranean rim countries of north Africa and the near East. These scenarios will provide a reference point for long term strategic planning of European water resource development, alert policymakers and stakeholders about emerging problems, and allow river basin managers to test regional and loc al water plans against uncertainties and surprises which are inherently imbedded in a longer term strategic planning process. Funding Programme: FP6
UNDP/GEF DRP - Danube Regional Project	http://aws.undp-drp.org/drp/project	Bulgaria Croatia Hungary Moldavia Romania Serbia Slovakia Ukraine	The main goal of the project is to strengthen existing structures and activities in order to facilitate a regional approach, thus strengthening the capacity of the ICPDR and the Danube countries to fulfill their legally binding commitment to implement the Danube Convention. This task now also includes the development of a River Basin Management Plan in line with the EU's Water Framework Directive. The following project components are designed to respond to the overall development objective: • Creation of sustainable ecological conditions for land use and water management; • Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin; • Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems; • Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances. Duration: 2001-2007
Defensive strategies and cross border	http://www.strateg.org.ro/index-en.html	Romania	The project aims at developing an integrated IT system for the collection, analysis, valorization and elevation of the results of archeological research in the Roman provinces covered by the Romanian territory.

policies. Integration of the Lower Danube area in the Roman civilization			C OORDINATOR: National History Museum of Romania (MNIR) PARTNERS: • Bucharest University (UB) • "Vasile Pârvan" Archaeology Institute (IAB) • Archaeology and Art History Institute (IAIAC) • SC Digital Domain SRL (DD) The research supposes: • a) the field research phase - obtaining modern measurements (topographic, radar and GPS) of the objectives targeted by the project, as well as their photographs. • b) data processing, that means: 1) assembling a maps, epigraphic, photographic, bibliographic and topographic archive; 2) recording this archive on a digital format, accessible on line • c) the analysis of the data obtained and the presentation of the results in specialized works on a classic format and on line, in seminaries or optional courses at the Faculty of History (Bucharest). Obtaining a series of ample analyses that will be published in the Centre'smonographical series.
Potential threats to environmental and economic sustainability in the Danube and Black Sea region: Danube River as invasive alien species corridor	http://www.eseni as.org/index.php ?option=com_co ntent&view=arti cle&id=302:new s-10-danube- field-trip- &catid=52:eseni as- news&Itemid=1 25	Bulgaria	The main goal of the project is to analyze the role of the invasive alien species (qualitative and quantitative parameters, impact, measures) for the sustainable development in the Danube and the Black Sea region. To implement this goal, regular monitoring will be carried out, lists of alien and invasive species, as well as pathways of their introduction, will be developed, data about biology, ecology and impact will be collected. The results will be used for risk assessment and development of risk management plan.
Tisza River Project (EVK1-CT-2001-00099); Real life scale catchment models	http://www.wise-rtd.info/en/info/tisza-river-project-real-life-scale-integrated-	Hungary Romania Ukraine	End date of the project: 31/12/2004 Funding program: FP5 Contract Code:

for supporting water and environmental management decisions	catchment-models-supporting-water-and		EVK1-CT-2001-00099 The Tisza river basin is of major concern from both water- and environmental management points of view. This is also the international catchment where the catastrophic cyanide and heavy metal pollution accidents happened. The work in the Tisza-River project focussed on the development of a 'real-life-scale' catchments model for this river basin. In addition, eco-hydrological management strategies were developed for the unique wetlands of the riparian zone of the river. Objective oriented sets of hydrological, hydraulic, water quality and ecological models were developed to form an integrated model system that meets the users' requirements.
UNIVERSITIES, INSTITUTES AND LABORATORIES			
Centre for Global Change and Sustainability-University of Natural Resources and Life Sciences, BOKU	http://www.boku.ac.at/	Austria	The Centre for Global Change and Sustainability supports the University of Natural Resources and Life Sciences in realizing its societal responsibility; provides impetus for ideas regarding topics of global change and sustainable development. The Centre is a place of interdisciplinary, scientific debate and offers a learning environment for complex relationships and innovative ideas.
University of Zagreb - Faculty of Chemical Engineering and Technology	http://www.fkit.unizg.hr/en	Croatia	Faculty of Chemical Engineering and Technology is organized in several Departments and Chairs that perform teaching (undergraduate & graduate courses, postgraduate scientific &postgraduate specialization), scientific work, professional and consulting activities in Chemical Engineering, Chemistry and other fields.
Faculty of Biology and Geology, Babes-Bolyai University	http://bioge.ubbcluj.ro/	Romania	Laboratories: Laboratory of Cytology; Laboratory of Aquatic Ecology; Laboratory of Histology and Plant Anatomy ; Invertebrate Zoology Laboratory Research Centres: Centre for Electron Microscopy; the centre provides high performance Electronic Microscopy facilities. Its activities cover a large number of scientific domains: physics, chemistry, geology, mineralogy, geography, animal and plant biology (with special emphasis on cellular and molecular biology, biochemistry and physiology) pharmacology, human and animal medicine, ecology and environment protection, as well as industry areas, such as: food technology, mining,

			oil industry, metallurgy and chemical industry.
Faculty of Biology, University of Bucharest	http://www.bio.unibuc.ro/	Romania	Laboratories for teaching and training Affiliated research centres: • Multi-User Research Database - Molecular Biology • Neurobiology and Molecular Physiology Research Centre • Genetics Institute • Centre for Research, Training and Consulting in Microbiology, Genetics and Biotechnology • Systems Ecology and Sustainability Research Centre • Biochemistry and Molecular Biology Research Centre Chemistry lipids and glycolipids-Research Centre
Faculty of Biology, "Alexandru Ioan Cuza" University of Iasi	http://www.bio.uaic.ro/#home/home.html	Romania	Teaching and research in the following main domains: • Biology • Biochemistry Biodiversity, Modern biotechnologies, Ecology and environmental protection, Pest genetics, Plant physiology
Faculty of Chemistry, University of Bucharest	http://www.chem.unibuc.ro/	Romania	Graduation and post-graduation courses on Environmental Sciences-Environmental Chemistry (BSc, MSc, PhD)
University of Belgrade- Faculty of Chemistry; Faculty of Biology	http://www.chem.bg.ac.rs; http://www.bio.bg.ac.rs	Serbia	The existing facilites comprise of: Superconducting Fourier-Transform NMR Spectrometer AVANCE 500 MHz, Parr Hydrogenization system up to 200 barr, System for synthesis and purification of small physiologycally active molecules consisting of glove box, microwave reactor and Biotage chromatography system, GC-MS, Elemental analysis system, UV/VIS spectrophotometer, Waters Breeze HPLC system with electrochemical detection as well as many other synthetic and analytical equipment. Faculty of Biology infrastructure comprises advanced light microscopy facilities: Laser scanning confocal microscope LSM 510 Carl Zeiss GmbH bsed on Axioskop FS2mot upright microscope with three lasers Ar (457,478,488, 514 nm) He/Ne 543 nm and 633 nm and three recording channels + transmittance channel with time-

			series physiology software. Integrated Electrophysiology "patch-clamp" setup HEKA EPC8 Cell culturing facility. A.S. Vent Light with regulation of volume flow, temperature, air humidity, and pressure and air-change rate. The research infrastructures are open towards external users, which is enabled through bilateral third party contracts and time lease agreements.
University of Szeged	http://www.u-szeged.hu/	Hungary	The University of Szeged offers a wide range of educational programs, such as Bachelor's, Master's, PhD (doctoral), as well as postgraduate specialist training programs. The University of Szeged is actively involved in drawing up middle and long-term programmes (e.g. Biopolisz Pólus) shaping the development of Szeged and the Dél-Alföld region. A variety of R & D activities are conducted by the researchers of the University of Szeged, significant for DANUBIUS being: information technology and software engineering, nanotechnology and materials science, environmental technology and genetics.
Cleaner Production Germany	http://www.cleaner-production.de/	Germany	Cleaner Production Germany is a website published by the Federal Environment Agency (UBA), and includes 2,500 state-sponsored project descriptions and publications. Cleaner Production means improving processes in such a way that the resources used are transformed into products as efficiently as possible, eliminating where possible waste and emissions at source. This reduces the cost of raw materials, energy and waste disposal, at the same time lowering the risk of environmental pollution and improving safety at work.
The Institute of Biodiversity and Ecosystem Research (IBER)	http://www.iber.bas.bg/	Bulgaria	IBER is focused on theoretical and applied aspects of ecology, biodiversity, environmental conservation and sustainable use of biological resources studies and providing training in the competencies fields.
National Institute of Meteorology and Hydrology of Bulgarian Academy of Sciences	http://www.meteo.bg/	Bulgaria	The main objectives if the institute are: • Monitoring, analysis, and forecast of atmospheric and hydrospheric processes; • Study of spatial-temporal characteristics of climate and water resources; • Study and forecasting of atmospheric and hydrospheric composition and its variations of natural and anthropogenic origin;

(NIMH_BAS)			• Hydrometeorological Service for the territory of the country and the Black Sea of the state authorities, population and a wide range of users with specialized information; • Protecting lives and property through timely prediction of hazardous and weather and flooding; • Representation in the World Meteorological Organization; • Provision of national and international data exchange in South Eastern Europe and the Middle East for the World Weather Watch (WWW).
Rudjer Boskovic Institute	http://www.irb.hr	Croatia	Rudjer Boskovic Institute (RBI) is the largest Croatian research centre for basic sciences, participating also in science applications and higher education. The Institute has multidisciplinary character activating in various research fields: physics, chemistry, oceanography (including marine and environmental research and geosciences), biology, biomedicine, computer science and electronics/engineering. RBI infrastructure includes twelve divisions, three centres, the largest library in natural sciences in Croatia, computing centre, animal facilities and large number of valuable experimental devices (Xcalibur Nova R – Diffractometer System, RIGAKU D/MAX Ultima IV Theta-Theta X-ray Diffractometer System, Typhoon 9200 Phosphoimager, Atomic Force Microscope (AFM), Scanning Electron Microscope (SEM), Tandem Van de Graaff Accelerator, Fourier Transform Electron Paramagnetic Resonance (FT-EPR), Nuclear Magnetic Resonance (NMR), HPLC/MS/MS, IR, Raman spectrometers).
Max Planck Institute for Biogeochemistry	http://www.mpg.de/institutes	Germany	Research Institute; Max Planck Society The institute studies of the complex interaction between the organisms in the soil and the greenhouse gases in the atmosphere, as well as the influence of humans on these natural processes. Study of the ecosystems inter-action to various climate conditions, land-use practice and species diversity by comparing historical data with current observations from field experiments and measurement campaigns in order to draw conclusions on the future adaptability of organisms.
Max Planck Institute for Chemical Ecology	http://www.mpg.de/institutes	Germany	Investigation of the role, diversity and characteristics of chemical signals which control the interactions between organisms and their environment in order to understand the complex system of chemical communication.
Max Planck Institute for	http://www.mpg.de/institutes	Germany	There are currently 82 Max Planck Institutes and research facilities in the Max Plank network, this RI being state of the art on the field of microbiology focused on bacteria

Marine Microbiology			studies.
Max Planck Institute for Terrestrial Microbiology	http://www.mpg.de/institutes	Germany	Main objectives: • Study of the metabolic diversity of microorganisms. • Analysis of the mechanisms that enable microorganisms to adapt to changing environmental influences and to modify themselves accordingly. • Investigation of the organisms cellular regulation and reproduction regulation. • Study the biogeochemical processes responsible for the exchange of climatically-relevant trace gases. These analyses encompass all functional levels, from the atomic and structural level to the molecular and cellular level, through to biochemistry and physiology, microbial communities and the association of microorganisms with plants.
German Climate Computing Centre (DKRZ)	https://www.dkrz.de/dkrz-en	Germany	German Climate Computing Centre (DKRZ) provides services for climate researchers. Its mission is to install and operate a high-performance computer system for basic and applied research in climatology as well as related disciplines.
Institute of Molecular Genetics and Genetic Engineering	http://www.imgge.bg.ac.rs	Serbia	The major activities of the Institute are oriented towards fundamental research in molecular biology, molecular genetics, recombinant DNA technology and biotechnology. In the field of fundamental research, Institute's projects are mostly focused on research related to analysis of genome organization and regulation of gene expression in different organisms.
The A.O. Kovalevsky Institute of Biology of the Southern Seas (IBSS), National Academy of Sciences of Ukraine	http://ibss.nas.gov.ua/	Ukraine	IBSS includes 13 scientific departments, the Aquarium-Museum, scientific library, the editorial and publishing department, and the R/V *Professor Vodyanitsky*; the Branch in Odessa has 4 research departments.
Ukrainian scientific Centre of Ecology of Sea (UkrSCES)	http://www.sea.gov.ua/	Ukraine	The Ukrainian Scientific Centre of Ecology of the Sea (UkrSCES), Ministry of Environmental Protection of Ukraine (UkrSCES) was founded in January in 1992 on the basis of the Odessa Branch State Oceanographic Institute. It is the main institution of the Ministry of Environmental Protection of Ukraine in the field of marine ecological researches. UkrSCES – is a unique institution of all state ecological systems of monitoring within the Black and Azov Seas, which provides a

			whole complex of tasks of the ecological monitoring. The main task of UkrSCES is scientific and practical providing of realization of public policy of Ukraine in relation to the protection, rational use and rehabilitation of natural resources of the Black and Azov Seas basin, and also providing implementation of international obligations of Ukraine, in relation to marine aspects.
Ukrainian Scientific Research Institute of Ecological Problems (USRIEP)	http://www.niiep.kharkov.ua/	Ukraine	In accordance with the Charter of the Ukrainian Research Institute of Ecological Problems "UkrNDIEP" (new edition), registered by the executive committee of Kharkiv city council Kharkiv Oblast February 4, 2005, the Institute is a state enterprise in the system Minpryrody Ukraine, established to provide scientific public policy in Ukraine environmental protection, natural resources, environmental safety, as well as Ukraine's international obligations arising from the signed conventions, agreements, contracts, etc..
Christian Doppler Laboratory - Advanced methods in river monitoring, modelling and engineering, Vienna, Austria	https://forschung.boku.ac.at/fis/suchen.projekt_uebersicht?sprache_in=en&menue_id_in=300&id_in=8191	Austria	Water forms the basis for life, on the other hand destroys life during extreme floods. Rivers are the lifelines of the landscape, most human settlements are situated along these since thousands of years, related to all possibilities of usage - including navigation, hydropower and recreation - but also danger. These anthropogenic uses of rivers impact the ecological status, so that conflicts increase between economic use and ecological functionality. The interrelation between transport of water, sediments, morphodynamics of rivers, ecology and the consequences of river engineering measures are not fully understood and described. The Christian Doppler Laboratory for Advanced methods in river monitoring, modelling and engineering aims to improve the understanding of processes in rivers, to design mathematical models for simulating river processes and to predict the consequences of engineering measures as well as to develop river engineering methods for improving navigation, ecology and flood protection. Laboratory Module I - River Monitoring New monitoring methods such as Acoustic Doppler Velocimetry, Radiotracer, Multibeam Echosounder and shear stress plates will be combined, further developed and applied, in order to improve the understanding of river processes, the calibration and validation of mathematical models and monitoring programs and the optimisation for practical usage by UWITEC and via donau.

			Module II - River Modelling Multidimensional mathematical models will be planned and designed for simulating hydrodynamics, sediment transport, river morphodynamics as well as ecological processes through habitat modelling for later use in river engineering projects by via donau. Thereby data from Module 1 form the basis for model calibration and validation and the results enter Module III. Module III - River Engineering and Management The development and implementation of advanced river engineering measures are based on monitoring (Module I) and modelling (Module II) results and rely on an improved process understanding. By the realization of the optimized measures via donau will be contributing significantly to the economic development along the Danube river as international waterway as well as to the improvement of the ecological status.
Research Centre of Hydraulic Engineering - Laboratory, TU Vienna, Austria	http://www.kw.tuwien.ac.at/en/research-Centre-of-hydraulic-engineering/laboratory/service-offer.html	Austria	The present Institute of Hydraulic Engineering and Water Resources Management was established as part of the then Vienna Polytechnic in the year 1818. Professor Schaffernak setup a first Laboratory in the main building in 1926. Since 1995 the Institute has had a new Hydraulic Laboratory at the Aspanggründe, Adolf-Blamauer Gasse 3, A-1030 Vienna. The Laboratory consists of a main testing hall, an attached testing hall with 2 tilting flumes, an office block and an open-air testing area with a canvas-protected zone. Both testing halls are connected with the workshop and storage rooms for materials for model production. Each location of the testing area can be independend supplied with water by means of stationary or flexible pipes (present installed pump capacity is 2500 l/s). Additionally to these laboratory facilities are a seminar room, several offices and auxiliary rooms in the attached block. The Laboratory has presently the following test facilities with the necessary infrastructure to fulfill the requirements in teaching, experimental research and commercial testing. •Testing halls with crane 1400 m² •Open-air testing area 2000 m² •2 tilting flumes each of length 17 m •Flexible flumes

			•Reservoir 1000 m³ •Capacity of pumps 2500 l/s •Mechanical workshop with crane 300 m² •Electronic laboratory 80 m² •Offices and seminar room 300 m² The performance of hydraulic model tests within internal but primarily external financed (from private and public clients) research projects (fundamental and applied research as well) are counted adjacent to teaching to the main activities of the Institute. These projects concern mainly the following research fields: • River engineering (flood protection, sediment transport, navigation) • Ecological hydraulic engineering (restoration, bed stabilization, fish migration facilities) • Hydraulic Structures (weirs, power stations, dams, spillways, intakes, outlets, power conduits, gates, diversions, specific structures) • Duct systems (valves, manifolds, culverts etc.) • Cooling water systems (pumping stations) etc. • Embankment dams (slope protection - overtopping sections, dam-break flood analysis - breach formation, design - constructive solutions

7.1.2. Anexa 2 – Descrierea potentialului tehnic si stiintific al infrastructurilor existente, programelor si initiativelor din Regiunea Dunarii (selectii)

Project/Programme Data file

Name	
ALSO DANUBE - Advanced Logistic Solutions for Danube Waterway It is an open virtual network, based on a broad European approach, linked actors in logistic chains by interconnecting existing information and communication systems via a Common Source Logistic Database (CSL.DB), interactively related to traffic management systems. Web based client applications, advanced EDI solutions and innovative telematic technologies were integrated, demonstrated and evaluated within different supply chains	
Category	
FP5 Project	
Status of the project	***Category***
Started in 2000, ended in 2013	
Location	
EU – coordination office in Vienna	
Proposed objectives	
• develop and implement an advanced European concept to manage intermodal transport chains with inland navigation as core transport mode; • set up and run highly integrated logistic networks and operational platforms to enlarge the current range of logistic services; • integrate advanced traffic and transport management systems; • introduce new systems and technologies in the area of data exchange and communication; • create independent logistic information and communication services; • stimulate the extension of waterway transport relations to port hinterland and combined cargo; • improve the efficiency of Danube transport which shall contribute to the development of the Danube waterway as a backbone for European transports; • promotion and lobbying for inland waterway transport. More info on: http://www.alsodanube.at/	
Description	
The developed IT-solutions are enabling the interlinking of traffic and transport management on inland waterways and are supporting thus the realisation of the ALSO DANUBE concepts. IT-solutions summarised are: • CSL.DB (Common Source Logistic Database), the comprehensive logistic database for the interlinking of traffic and transport information and for establishing an information network between the actors in the transport chain. • ETNA (European Transport Network Application), the web-information portal for multimodal liner-services schedules in Europe. • LOMAX, the lock management system for the planning of locking procedures and for supporting traffic management. • AIM (Application Interconnectivity Manager), the communication interface between the CSL.DB and company specific applications, with special focus on the conversion of EDIFACT messages. • ILLONET, the extension of a company specific planning application with traffic information out of DoRIS. • Billing and monitoring application for the management of container liner services. • Resource planning application for the management of Door-to-Seaport transports	

• Online logbook and fleet management system for container liner services on the Danube.
Human resources
N/A
Scientific agenda
The aim of ALSO DANUBE to promote inland navigation focused not only on the development of appropriate IT solutions, but also on ideas to create a "friendly" business environment for waterborne transport in managed intermodal logistics chains. Thus a multitude of results is available after the finalisation of the project. For a better understanding the results are grouped into four main groups: • Concepts • IT-solutions • Demonstrations • Socio-economic assessment The developed concepts and IT-solutions were tested in the demonstration scenarios, whilst the promotion activities were accompanying the project throughout its whole runtime. The socio-economic assessment forms the description of the contribution of the developed concepts and IT-solutions for the European society and economy.

Project/programme Data file

Name	
DANUBE FLOODRISK This project has a far reaching strategic focus beyond risk management and could become a flagship project for the SEE programme. It will improve safer sustainable conditions for living environment and economy in the Danube floodplains. It integrates stakeholders and different acting groups and disciplines.	
Category	
Project in South East Europe Transnational Cooperation Programme	
Status of the project	***Category***
Started in 2009, ended in 2012	
Location	
South-East-Europe	
Proposed objectives	
The DANUBE FLOODRISK project focuses on the most cost-effective measures for flood risk reduction: • risk assessment; • risk mapping; • involvement of stakeholders; • risk reduction by adequate spatial planning. More info on: http://www.danube-floodrisk.eu/2009/11/about/	
Description	
The project will bring together scientists, public servants, NGOs and stakeholders who develop jointly a scalable system of flood *risk maps* for the Danube River floodplains. Transnational *methodology and models* will be defined and implemented for flood risk assessment and mapping. This results in proposals for flood mitigation *measures, adjustments of spatial development plans*, *assessment tools* for economic development in flood plains and raised *awareness* of flood risk of stakeholders, politicians, planners and the public. Infrastructures at risk like industry, power stations and supply infrastructure will be considered in the project.	
Human resources	

N/A
Scientific agenda
Flood risk increases with ongoing climate change. Despite the fact that flood events are natural processes, which occurred in the past and will also occur in the future the situation gets worse, especially in terms of financial losses. The increase of industrial and urban settlements in floodplains during recent years and decades, which causes an accumulation of values in areas at risk, leads to immense damages in case of flooding. The catastrophic flood events 2006 in the Danube Basin in particular reveal the vulnerability of our society against extreme natural events. However, the question of occurrence of an event is closely related with the question of the risk, i.e. the consequences (damages) resulting from this event. With the increase of population and industrialization, the settling areas and land use activities spread in floodplain areas seeming protected or hardly affected. Economic values behind dykes and flood protection structures accumulate more and more, hence they increase significantly the potential damage of extreme flood events. It is a matter of all Danubian countries involved to counter this development of flood risks. Partners from the Danube countries proposed a three years EC Interreg Project for the Danube Flood Risk delineation, which may contribute with knowledge to understand the processes and which provide the tools to improve risk management in practice.

Project / Programme data file

Name	
DANUBEPARKS - The Danube River Network of Protected Areas DANUBEPARKS is a network of Protected Areas along the Danube, currently comprising 15 areas represented by different partner institutions (public authorities, public enterprises, NGOs). The Network cooperates in different fields of work that are important to all partners and where solutions depend on a transnationally coherent strategy.	
Category	
Status of the project	***Category***
Started in 2009, ended in 2012 Step 2 started in 2012 will end in 2014	
Location	
EU – Danube basin	
Proposed objectives	
• enhance nature conservation of Danube River Protected Areas; • manage Danube Protected Areas wisely; • exchange and promote expertise in management; • improve knowledge of the ecological status of the river, as well as the the economic, social and environmental impacts and the management of the Danube Protected Areas; • take actions for the prevention, control and reduction of pollution in the floodplains and wetlands in the Danube Basin; • promote awareness of the international importance of the Danube River; • promote sustainable development; • influence the implementation and future development of public policies. More info on: http://www.danubeparks.org/	
Description	
Human resources	
N/A	
Scientific agenda	

- **River Morphology and Revitalisation;** The *DANUBEPARKS Strategy on Conservation and Navigation*, including ways to deal with river engineering projects and their impacts on nature in the Protected Areas, and the *Danube River's Morphology and Revitalisation*, assembling experiences from the past.Additionally, several demonstrative and innovative revitalisation projects were implemented (e.g. opening of river branches, adaptation of groyns), and study visits as well as an international workshop were organised.
- **Floodplain Management and Habitat Network**: During this project cross-border management plans for the AT-SK, HU-HR and HU-RS areas were developed as a basis for more coherent nature management. The "Perspectives for Danube Floodplain Forests" laid down the general goals of the Protected Areas regarding future implementation measures in forestry. Last but not least, pilot projects (e.g. planting of native trees, mowing and grazing) and study visits, also with external stakeholders, were implemented.
- **Protection of Danube Flagship Species**: White-tailed Eagle and Danube Sturgeon both demonstrate the necessity of an interlinked and uninterrupted habitat network along the Danube. For Sturgeons, cooperation was started with research institutions and communication tools were established. The *Action Plan for White-tailed Eagle at the Danube River* – developed together with experts – was adopted and published by the Council of Europe / Bern Convention. A *White-tailed Eagle Database* was established online to collect international monitoring data coherently.
- **Monitoring and Natura2000**: Handbooks and studies were published to enhance management and monitoring of important species, such as Beaver or European Mink, or general Natura2000 areas. An online database for fish monitoring data has been established. The results of the Danube-wide monitoring of Little-ringed Plover and Sandmartin (indicator species for dynamic river sections) demonstrate the need for further revitalisation and protection.
- **Danube Nature Tourism**: The Joint Ranger Training in 2010 provided the basis for many Protected Areas to guide foreign visitors and communicate to visitors the necessity of transnational cooperation. A Position and Action Plan for tourism and environmental education now serves as the basis for future actions. Several Protected Areas also developed pilot offers (boat and bike tours, nature trails). Communication tools such as the joint tourism brochure and online tourism platform help in marketing the newly established offers.

Project / Programme data file

Name	
EnviroGRIDS **Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development**	
Category	
FP7 Project	
Status of the project	***Category***
Finished	Relations can be developed between DANUBIUS and the community that administer and uses the data portal.
Location	
Black Sea Catchment Area	
Proposed objectives	
General objectives: The scientific aim of the EnviroGRIDS project is to assemble an observation system of the Black Sea catchment that will address several GEO Societal Benefit Areas within a changing climate framework. This system will incorporate a shared information system that operates on the boundary of scientific/technical partners, stakeholders and the public. It will contain an early warning system able to inform in advance decision-makers and the public about risks to human health, biodiversity and ecosystems integrity, agriculture production or energy supply caused by climatic, demographic and land cover changes on a 50-year time horizon.	

Technical objectives: The generic technical objectives of the EnviroGRIDS project are to:

- run a gap analysis of existing regional observation systems to prepare recommendations for improvement of networks of data acquisition in each region/country,
- build capacity on observation systems in the Black Sea catchment,
- improve regional network to coordinate the efforts of partners active in observation systems
- link, gather, store, manage and distribute key environmental data,
- develop the access to real time data from sensors and satellites,
- create spatially explicit scenarios of key changes in land cover, climate and demography,
- distribute large calculations and datasets on large computer clusters,
- streamline the production of indicators on sustainability and vulnerability of societal benefits,
- provide a standard for integrating data, models and information and communication tools,
- provide policy-makers and citizens with early warning and decision support tools at regional, national and local levels.
- produce innovative tools to visualize and interpret data and results of integrated models,
- alert citizens concerning exposure to environmental risks,
- build capacities in the implementation of many new standards and frameworks (INSPIRE, GEOSS, OGC,..).

Beyond state-of-the-art: EnviroGRIDS is clearly going beyond the state of the art in the Black Sea region by adopting a catchment approach and by tackling several societal benefits areas together. By using the most powerful computer network of the world it is clearly showing the direction on how to analyse the increasing amount of global data made available throughout the planet. It is bringing crucial information in a relatively data-poor region on future scenarios of expected climate, demographic and land cover changes. Based on the outputs of these scenarios it is building geoprocessing services in key societal benefits areas that will be connected back to the GEOSS.

Main innovations:

- Contribute to free publicly-funded data through interoperable databases and services
- Streamline data process from data warehouses, to scenarios, hydrological models, impacts assessments and finally to disseminations tools.
- Use grid enabled computer technology to store and analyse environment data
- Gridify the code of hydrological model calibration and validation
- Create regional scenarios of development in function of expected climate, land cover and demographic changes
- Build efficient virtual and life trainings on EnviroGRIDS main topics
- Make available useful open source software and data on DVD and on Internet
- Raise public and decision-makers awareness through innovative collaborative systems
- Provide an early warning system to inform the citizens and decision-makers on environmental vulnerability and risks associated to selected Societal Benefit Area

Description

BSC-OS Portal

Grid - enabled Spatial Data Infrastructure (GSDI) becoming one of the integral systems in the Global Earth Observation System of Systems (GEOSS), and compatible with the new EU directive on Infrastructure for Spatial Information in the European Union (INSPIRE), as well as UNSDI developments.

Human resources
>100
Scientific agenda
Environmental data

Project / Programme data file

Name	
PEGASO - People for Ecosystem-based Governance in Assessing Sustainable Development of Ocean and Coast	
Category	
FP 7 project	
Status of the project	***Category***
Ongoing	
Location	
Black Sea and Mediterranean basins	
Proposed objectives	
• To construct an ICZM (Integrated Coastal Zone management) governance platform, consistent with the aims of article 14 of the ICZM protocol for the Mediterranean, to support the development of integrated policies for the coastal, marine and maritime realms of the Mediterranean and Black sea basins. • To build in collaboration a spatial data infrastructure (SDI) for the Mediterranean and the Black Sea. Supporting and creating local geonodes, in order to deliver a Mediterranean and Black Sea harmonised sets of data, accessible through an Internet viewer. • To refine and further develop efficient and easy to use tools for making sustainability assessments in the coastal zone • To test and validate the assessment tools at regional and local scales to understand both global and cumulative local trends and how they interact in specific coastal and marine regions. • To establish and strengthen mechanisms for networking and capacity development so as to promote knowledge transfer and the long-term use of the project outputs. • To establish and strengthen mechanisms for networking and diffusion of PEGASO outputs so as to enlarge network of interested stakeholders and the large public. More info on: www.pegasoproject.eu	
Description	
Spatial Data Infrastructure (SDI), following the INSPIRE Directive, to organize and standardize spatial data to support information sharing on an interactive visor, to make it available to the ICZM Platform, and to disseminate all results of the project to the end users and interested parties.	
Human resources	
>1000	
Scientific agenda	
The main goal of the PEGASO project is to construct a shared Integrated Coastal Zone Management (ICZM) Governance Platform (figure 1) with scientists, users and decision-makers linked with new models of governance.	

Project / Programme data file

Name

Akademik - Oceanographic Multipurpose Research Vessel belonging to IO-BAS - Institute of Oceanology - Bulgarian Academy of Science.	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Possible node in Bulgaria
Location	
Bulgarian coast and the Black Sea	
Proposed objectives	
Description	
General characteristics: Length: 55.5 m Beam: 9.80 m Draft: 4.80 m Gross tons: 905 Power: 1000 HP Range 7500 n.mi Endurance: 35 days Cruise speed: 9.5 kt Max. speed: 10.5 kt Equipment on board: Fixed equipment Navigation and communication Nav. equip: Radar Loran Decca SatNav Gyro DopLog Acoustic Echosounders for scientific research: 12kHz 27kHz Oceanographic Oceanographic winches: number: 3 Gantry Crane Electronic data processing equipment permanently available on board	
Human resources	
Crew: 22 Scientists: 20	
Scientific agenda	
Multidisciplinary research of the Bulgarian coast and the Black Sea	

Project / Programme data file

Name	
Argus – Serbian River Research Vessel	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Possible node in Serbia
Location	
The entire sector of the River Danube (Joint Danube Survey 3) and tributaries	
Proposed objectives	

Description
- cruising speed: 25 km/h (13 km/h upstream), - Dimensions: 33.0 x 4.5 m, drought: 1.35 m, height: 5 m, - Additional equipment: - Bacterial incubator HASH small, - Binocular Magnifier, - Microscope, - Automatic dozers 40 ml 2 pcs, and 25 ml 2 pcs, - Microbiological incubators, - Available cooling capacities: 2 x 60 L refrigerators.
Human resources
Crew - 5 and scientists on - board - 12.
Scientific agenda
- The R/V Argus can perform hydrologic measurements, biological sampling and observations.

Project / Programme data file

Name	
Carina - coastal and river research boat	
Category	
Coastal and river research boat	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
Romanian sector of the River Danube, the Danube Delta, including the Razelm - Sinoie lagoon complex and on the coastal area of the Black Sea.	
Proposed objectives	
Description	
- 6m long - Diesel Engine of 150 HP - Scientific equipment can be used on board (ADCP, echosounder, sediment sampling, CTD, etc.)	
Human resources	
Crew -15 and places for on-board technical staff - 3.	
Scientific agenda	
- The coastal and river research boat can perform geological - sedimentological and geophysical studies, hydrologic measurements, biological sampling and observations.	

Project / Programme data file

Name	
Halmyris – Floating Laboratory	
Category	
Floating Laboratory	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	

Danube Delta
Proposed objectives
Description
- Main technical characteristics: length -30,00 m, width - 5,00 m, maximum draft - 0,51 m, gross tonnage - 90 t. - With two laboratories and a conference room, Halmyris is an important component of the GeoEcoMar infrastructure.
Human resources
Crew - 2 and scientists on - board - 20.
Scientific agenda
- The floating laboratory facilitates the accomplishment of field works in geology and sedimentology, geoecology, geo- and hydrochemistry, hydrology and biology for the Danube Delta and the littoral area situated in front of the Delta. The floating laboratory also hosts scientific conferences, workshops, summer schools with national and international participation, as well as thematic field trips to promote geology and geoecology.

Project / Programme data file

Name	
Istros – Romanian River and Coastal Research Vessel	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
The entire sector of the Danube River (mother ship for Joint Danube Survey 3), the Danube Delta, including the Razelm - Sinoie lagoon complex and the coastal area of the Black Sea.	
Proposed objectives	
Description	
- Main technical characteristics: length – 32 m, width – 6.80 m, maximum draught: 1.10 m, tonnage – 110 t, 2 engines x 420 HP. - Laboratories on board – 3. - Scientific equipment: SEABEAM 1050 Elac-Nautik - multibeam bathymetric system, moonbeam bathymetric system Ceeducer Bruttour Int. Pty., gravity corers (3 m and 6 m long), VanVeen boden-greifers, A frame, 2 small winches.	
Human resources	
Crew - 5 and scientists on - board - 10.	
Scientific agenda	
- The R/V Istros can perform geological - sedimentological and geophysical studies, hydrologic measurements, biological sampling and observations.	

Project / Programme data file

Name
Mare Nigrum – Romanian Multidisciplinary Marine Research Vessel
Category

RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
Romanian coast and the Black Sea	
Proposed objectives	
Description	
- Main technical characteristics: length - 82 m, breadth - 16,30 m, maximum draft - 5 m, gross tonnage - 3200 t. - Equipment on-board: multibeam bathymetric system, SeaBird CTD/Rosette sampler, multicorer - Mark II-400, side scan sonar, acoustic Doppler profiler, sub-bottom profiler, ROV, winches and cranes. - R/V Mare Nigrum is a main component of GeoEcoMar infrastructure which enables the understanding of the marine environment.	
Human resources	
Crew - 25 and scientists on - board - 25.	
Scientific agenda	
Multidisciplinary Marine research vessel in the Black Sea: - Studies on geology and evolution of the Black Sea and other marine zones in the World Ocean; - Geological and sedimentological mapping of the Black Sea continental shelf; - Single beam and multibeam echosounding:acquisition, processing and interpretation; - Sub-bottom profiling and side scan sonar acquisition, processing and interpretation; - Geochemical studies; - Seismo-Acustic acquisition; - Biological studies; - Hydro-Topography and Geophysical studies; - Gravimetry and Magnetometry; - Ecotoxicology; - Paleobiology and Paleontology;	

Project / Programme data file

Name	
Wien – Austrian private ship for the fish survey	
Category	
Private ship for fish survey	
Status of the project	***Category***
In use/ongoing	
Location	
The entire sector of the River Danube (Joint Danube Survey 3) and tributaries	
Proposed objectives	
Description	
- Total length: 20,4 m - Width: 3,8 m - Draught: 1,2 m	

- Engine: 2x 200 hp - Max. speed (rel. to water surface): 22 km/h downstream
Human resources
Crew - 3 and scientists on - board - 3.
Scientific agenda
- The ship can perform biological, fish sampling and observations.

7.2. Conferinta Internationala "Potentialul tehnico-stiintific privind managementul integrat al sistemului Dunare – Delta Dunarii – Marea Neagra. Realitati si planuri pentru viitor" 17-18.03.2014

7.2.1. Anexa 3 - Minuta intalnirii

International Conference „Technic and scientific potential of the integrated management of Danube – Danube Delta – Black Sea system. Realities and future plans"

1. Welcome and introductions

The meeting started on 17.03.2014 with the welcoming address of Dr. Gheorghe Oaie, General Director of the Romanian National Institute of Marine Geology and Geoecology.
He showed the importance of DANUBIUS – RI as a future pan-European infrastructure and multi-disciplinary project, pointing out that relations must be created between FP7 project DANCERS (Building Excellence in the Danube Region) project and DANUBIUS – RI.

Formal around the table introductions followed, then discussions started.

2. New Research and Innovation opportunities provided by the Horizon 2020 Programme in the Danube Region

Dr. Viorel Vulturescu, Director for European Integration and International Cooperation in the Romanian Ministry of National Education presented the main opportunities provided by the Horizon 2020 programme in the Danube Region.
Horizon 2020 programme combines the former funding programmes for R&I - 7th EU Framework Programme for Research, European Institute of Innovation and Technology (EIT), innovation parts of Competitiveness and Innovation Programme (CIP):

* Focuses more on innovation: closing the gap between knowledge and market, stronger participation of SMEs.
* Promotes solutions for societal challenges with visible socio-economic impact
* It is simplified (single set of simplified rules, reducing time-to-grant, single IT Participant Portal).

The three main pillars of the programme are:
I. Excellent Science
II. Industrial Leadership
III. Societal Challenges

- Spreading Excellence and Widening Participation
- Science with and for Society

Other actions are:

- European Institute of Innovation and Technology (EIT)
- Joint Research Centres (JRC)
- EURATOM

The main elements in Pillar I – Excellent science are:

• **European Research Council (ERC):** support the most talented and creative individuals and their teams to carry out frontier research

• **Future and Emerging Technologies (FET):** fund collaborative research to open up new and promising fields of research and innovation

• **Marie Skłodowska-Curie Actions:** provide mobility of researchers; focus on training and career development:

- **Initial Training Networks (ITN)**
  - Doctoral and initial training of researchers proposed by international networks of organisations from public and private sectors
  - European TN, Industrial Doctorates, Joint Doctorates
- **Individual Fellowships (IF)**
  - Individual fellowships for most promising experienced researchers to develop their skills through international or inter-sector mobility
  - European Fellowship, Re-Integration, Global Fellowships (Return Phase)
- **Research and Innovation Staff Exchange (RISE)**
  - International and inter-sector cooperation through the exchange of research and innovation staff (include administrative, managerial and technical staff)
- **COFUND**
  - Co-funding of regional, national and international programmes covering the above described actions

• **Research infrastructures (**EU definition „Facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields. RI can be single-sited or distributed"):

- Ensure Europe has world-class research infrastructures (including e-infrastructures) accessible to all researchers in Europe and beyond:
- First call for existing but also new RIs, focus on integration (networking, transnational access or service activities, joint research)
- Focus on human capital (training) as a mandate for RIs; innovation potential of RIs (cooperation with SMEs, PPP)

The main elements of Pillar III – Societal Challenges are:

1. Health, Demographic Change and Wellbeing
2. Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy
3. Secure, Clean and Efficient Energy
4. Smart, Green and Integrated Transport
5. *Climate action, Environment, Resource Efficiency and Raw Materials*

- Call – Water Innovation: Boosting its value for Europe
- WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication
- WATER-2-2014/2015: Integrated approaches to water and climate change
- WATER-3-2014/2015: Stepping up EU research and innovation cooperation in the water area (ERA NET COFUND - Water JPI)
- WATER-4-2014/2015: Harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens
- WATER-5-2014/2015: Strengthening international R&I cooperation in the field of water

6. Europe In A Changing World – Inclusive, Innovative And Reflective Societies
7. Secure Societies – Protecting Freedom and Security Of Europe And Its Citizens

A very important issue is **Spreading Excellence and Widening Participation** which refers to:

• A new set of measures introduced in Horizon 2020 under this separate specific objective (WIDESPREAD), aiming to close the R&I divide between Member States and regions

- A number of countries are experiencing low participation in the EU Framework Programmes (compared to FP7)
- H2020 legal text >>" low RDI performing" Member States for Widening actions (Latvia, Croatia, Lithuania, Malta, Slovakia, Romania, Luxembourg, Poland, Bulgaria, Estonia, Portugal, Slovenia, Cyprus, Czech Republic and Hungary).

IMPLEMENTATION:

• Foster synergies with the European Structural and Investment Funds (ESIF). Measures to be implemented by the Member States most in need of the new Cohesion policy for the 2014-2020 programming period

Widening participation can be achieved by:

TEAMING - CSA (100%): 1 year (1st phase) + 5-7 years (2nd phase)

- Creation of new (or significant upgrade of existing) Centres of Excellence in low performing Member States and regions
- Proposals: Need to demonstrate the long-term science and innovation strategy of the future Centre based on a SWOT analysis
  - Stage 1: Funding for the development of a Business Plan for the new Centre of Excellence facilitated by a teaming process with a leading counterpart in Europe
  - Stage 2: Subject to the quality of the Business Plan, and a commitment of the Member State (e.g. support via Cohesion Policy Funds), the Commission may provide further substantial financial support for the first steps of implementation of the Centre.

In each Teaming project there is:

- (1) the participant organisation (COORDINATOR) from a low performing Member State (for example a research agency at national or regional level, or a regional authority);
- (2) an institution of research and innovation excellence (public or private) or a consortium of such institutions;

TWINNING:

- Strengthening a defined field of research of a knowledge institution in a low performing Member State or region through linking with at least two internationally-leading counterparts in Europe.
- Proposals: Will have to outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved in the twinning exercise
- Funding for:
  - expert visits and short-term on-site or virtual training;
  - workshops & conference attendance;
  - organisation of joint summer school type activities;
  - dissemination and outreach activities.
  - Equipment & researchers' salaries will NOT be funded.

In each Twinning project there is:

- ONE institution located in a Low Performing MS/region (COORDINATOR)
- A minimum of TWO additional partners from two different Member States or Associated Countries.

Another important issue in Pillar III is ***Science with and for society*** which has as main objective to:

– to build effective cooperation between science and society,

– to recruit new talent for science,

– to pair scientific excellence with social awareness and responsibility.

The rationale is to:

– Increase of quality, relevance and acceptance of European research through interaction with society
– Deals with needs and concerns of society, gender equality, attraction of young people and the general public to science.
Topics include education, citizen participation in R&I, research outreach, framework conditions for responsible R&I, incl. ethics.
The main instruments are represented by coordination and support actions, collaborative projects.

3. Introduction to FP7 DANCERS project

Dr. Adrian Stanica made a brief introduction to the FP7 Project DANCERS – DANube macroregion: Capacity building and Excellence in River Systems (basin, delta and sea).
The main aim of the project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. Importantly, the new instruments and tools do not start *ab initio* but will build on existing projects and expertise.
The specific objectives are to:

* critically analyse the achievements in integrated river- delta –sea management in the Danube Region.
* understand links between the achievements, deliverables and results of the work performed.
* define a set of instruments to enhance environmental research and innovation in Danube Region.

The Consortium comprises partners from:

* Danube Region – Germany (1), Austria (3), Hungary (1), Serbia (1), Romania (2)
* EU15 – France (1), Greece (1), Ireland (1), Italy (1), Spain (1), UK (1 sub-consortium of 4 universities)
* UNESCO – IHE

The project is structured in the three pillars of knowledge:

* science,
* research infrastructures
* human potential

There are three categories of stakeholders present in the Danube Region:

* scientists and academia,
* decision and policy makers
* business community.

The project will receive input from the stakeholders and aims to develop instruments that contain:

1. Strategic research agenda,
2. Concept and detailed plan of the distributed research infrastructures for the Danube – Black Sea Macrosystem
3. Proposals for an integrated educational program with the full cooperation of partners from Danube - Black Sea Macrosystem.

Two comments followed:

* Address the EC to obtain continuity in funding research initiatives, as lack of continuity is a major issue here. This requires the need to develop a dedicated programme to the Danube Region specific needs.
* The partners in the Consortium should participate more in JPI Oceans and to link with DANUBIUS – RI project explain that it is not dedicated to the Danube Delta and Romania but to river – delta – sea systems in general.

4. Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region

Dr. Mihaela Paun, from the Romanian National Institute for Biological Sciences presented the data base of the project, hosted by the University of Natural Resources and Life Sciences, BOKU, Vienna.
The data base gathers all existing information about projects and their results in the Danube Region with focus on water and environmental management issues:

- of the last two decades,
- at all geographic levels (national, regional, European, International),
- closely linked to the three main domains: life sciences (including environmental aspects), earth sciences and socio-economics,
- structured into the three main pillars: Scientific Agenda, R&D Infrastructure and Human Capital and
- based on the Danube River Basin Management Plan (ICPDR 2009),

The metadatabase stays open for further entries and remains active even after the project ends, in 2015**.**
DANCERS metadatabase serves as basis for further studies, for identifing of strengths and weaknesses, links and gaps in water management issues in the Danube Region. Its main purposes are to:

- provide structured information for the assessment of the collected projects,
- improve access to the gathered data and
- promote the sharing of obtained knowledge.

Metadata:

- is "data about data" or "information about data"
- provide a short summary about the content, purpose, quality, location of the data as well as information related to its creation

The hardware – features:

- standard server configuration with state of the art components
- have sufficient storage space and high security of the data is guaranteed
- all necessary security updates and software updates are provided during the project lifetime
- accessibility of the server is guaranteed at least for one year after project end.

For each project, the metadatabase contains:

* Title
* Date
* Abstract
* Key words

For data collection two methods were used:

a. Questionnaire

b. Internet Search

The situation of record in the data base is as follows:

Records in DANCERS metadatabase	No of projects
Status: 12.3.2014	**476**
Composition:	
returned questionnaires (deadline 6.2.2014):	256
direct entries into metadatabase	251
Deleted:	
duplicates/multiples/not of interest	31
Geographic location	
Upper Danube	203
Middle Danube	143
Lower Danube	165
Danube delta	136
Danube coastal zone	48
Western Black Sea	116

Core category	
Scientific Agenda	279
Research Infrastructure	48
Human Capital	51
Thematic Area	
Life Sciences	145
Earth Sciences	126
Socio-Economics	95
Multidisciplinary	189
Funding Type	
EC - DG R&I	96
EC-Other	48
Structural Funds (ERDF, IPA, Cohesion)	37
National R&D	138
National Other (environmental monitoring, maintenance of navigation)	46
International (UN and other)	39
Other	67
Programme Type	
Environmental monitoring and measurements	170
Maintenance of navigation	37
Other	77
Research - Human Resources&Education	14
Research - scientific ideas and scientific cooperation	52
Research - development and upgrading of research infrastructure	162
Status of the project	
Completed	372
Ongoing	100

Dr. Paun continued with the presentation of data analysis, made by her team.
Data analysis consisted in:

1. Checking the consistency of all data gathered, deleting duplicates – INSB and GeoEcoMar
2. Implementing the changes in the database - WCL
3. Data Analysis – INSB

The analysis was performed on the data file sent by WCL on February 26th 2014 and the dataset consists of 472 projects from which:

- 468 recorded answers regarding the status of the project
- 4 projects having missing values.
- Out of the 468 recorded answers
    - 370 have been completed
    - 98 ongoing
- 463 projects have recorded answers
- 9 missing values.

There are 26 coordinating countries for the 472 projects entered. The analysis of the projects took into consideration the following criteria: status (completed/ongoing), coordinating country, thematic areas (life, earth, socio, multi), programme type, funding type, year (no per year).
Some of the results are presented in the following figures:

Country	No. of coordinated projects	Percentage of coordinated projects among recorded projects
Austria	140	30.23%
Belgium	7	1.50%
Bulgaria	16	2.60%
Croatia	2	0.40%
Denmark	1	0.20%
Finland	2	0.40%
France	9	1.90%
Germany	23	5%
Greece	9	1.9%
Hungary	12	2.6%
International	1	2%
Italy	11	2.4%
Netherlands	16	3.5%
Norway	2	0.4%
Portugal	1	0.2%
Romania	137	29.60%
Serbia	16	3.50%
Slovakia	4	0.90%
Slovenia	5	1.10%
Spain	5	1.10%
Sweden	1	0.20%
Switzerland	17	3.70%
Turkey	1	0.20%
UK	9	2.60%
Ukraine	3	0.60%
USA	10	2.20%
Total	**463**	**100%**

Country	Ongoing (1)	Completed (2)
Austria	34	104
Belgium	0	7
Bulgaria	4	12
Croatia	0	2
Denmark	0	1
Finland	0	2
France	2	7
Germany	3	20
Greece	2	7
Hungary	4	7
International	0	1
Italy	5	6
Netherlands	5	11
Norway	1	1
Portugal	1	0
Romania	13	124
Serbia	4	12
Slovakia	1	3
Slovenia	1	4
Spain	4	1
Sweden	0	1
Switzerland	4	13
Turkey	0	1
UK	2	10
Ukraine	3	0
USA	3	7
Total	**96**	**364**

At the end, some conclusions were formulated:

1. Database represents a major contribution to the scientific community and is active, new information is still added – 4 observations in the last two weeks;
2. There is a significant larger number of projects entered from Austria, Romania, Germany and Switzerland;

Are there no other projects than the ones entered for the other countries? Or should efforts be made to have the remaining projects entered for these countries?

3. After the National funding type, the second major funding type is EC DG R&I;

4. Largest number of projects funded in Life Sciences, followed by Earth Sciences; Life Sciences and Earth Sciences are depended choices for funded projects;

5. From 1976 to 1994 there is no identifiable trend – either due to lack of funding or lack of information now about the projects funded during that time.

6. An increasing trend in funding from 1994 to an all time high in 2009, with a drop in the number of funded projects in the next 4 years.

7. Only 21% of the total number of projects that have been identified are still active, hence the new strategies should help improve these numbers;

8. Not enough information about the output of the projects – work in progress.

Following the presentation some comments were made:

C1: The merit of the project is that its database represents a step forward in terms of information in the Danube Region.

C2: The terminology of the questionnaire is not the best, to encourage people to participate, use: ex. 'Upload your project'.

C3: Make clean pies for the projects that interconnect for the projects that don't.

5. Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)

Dr. Adrian Stanica delivered the presentation on behalf of Christos Fragakis, DG Research and Innovation, who could not be present.

In the Pillar III (Societal challenges) of Horizon 2020, "Climate action, environment, resource efficiency and raw materials" is an important chapter. Related to this, the main objective is to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems.

The broad lines of activities are:

- Fighting and adapting to climate change
- Sustainably managing natural resources and ecosystems
- Sustainable supply of non-energy and non-agricultural raw materials
- Transition towards a green economy through eco-innovation
- Global environmental observation and information systems
- Cultural heritage

In the Work Programme 2014/2015 twelve focus areas were identified, of which five linked to 'Climate action, environment, resource efficiency and raw materials:

- Waste: A resource to recycle, reuse and recover raw materials
- Water innovation: Boosting its value for Europe
- Energy-efficiency
- Disaster-resilience: Safeguarding society and adapting to climate change
- Blue growth: Unlocking the potential of the oceans

Regarding Water innovation, boosting its value for Europe - areas covered 2014/2015, the main objectives are:

- Bridging the gap: from innovative water solutions to market replication
- Integrated approaches to water and climate change
- Stepping up EU research and innovation cooperation in the water area
- Harnessing EU water research and innovation results for industry, policy makers and citizens
- Strengthening international R&I cooperation in the field of water

For bridging the gap, from innovative water solutions to market replication, the main activities are:

- Accelerate commercialisation of eco-innovative water solutions (technologies, process, products, services, etc.)
- Stimulate sustainable economic growth, business and job creation in the water sector

Proposals should:

- Support first application and market replication of near-market water solutions
- Address the 5 thematic priorities identified in the SIP (strategic implementation plan) of the EIP (European Innovation Partnership) on Water
- Address issues affecting rapid uptake and market deployment of innovative solutions
- Include participation of SMEs

Appropriate EU contribution: EUR 2-4 million. Type of action: Innovation actions

The topic is relevant also for process industries (SPIRE PPP) and advanced ICT solutions (data interoperability and harmonization with INSPIRE).

For Integrated approaches to water and climate change, the specific challenge is:

- Improved understanding of the impacts of climate change on the hydrological cycle for better informed decision making and sustainable management of water systems in EU, ensuring both adequate quantity and quality (Blueprint)

Proposals should:

- Maximise reliability of projections of precipitation at various spatial and time scales;
- Improve the short-to-medium term forecasting of related extreme events;
- Assess the impacts of weather extremes and climate change on water cycle in terms of quantity and quality;
- Develop risk management strategies and adaptation options at the appropriate scales, involving all relevant stakeholders;

Appropriate EU contribution: EUR 6-8 million. Type of action: Research and innovation actions.

For stepping up EU research and innovation cooperation in the water area, the specific challenge is:

- Support to JPI on water to implement its common vision and Strategic Research Agenda (SRA) to reduce fragmentation of nationally funded water-related R & I activities and enhance synergy, co-ordination and coherence between national and EU funding

Proposals should:

- Pool resources from national/regional research programmes to implement a joint call with EU co-funding
- Support the priorities identified in the SRA of the Water JPI related to the development of technological solutions and services for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts, etc.

Type of action: ERA-NET Cofund

In harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens, the specific challenge is:

- Ensure more effective use and exploitation of research results and good water management practices to enhance decision making in the field of water

Proposals should address one of:

- Promote dissemination and exploitation of EU funder activities, including relevant ICT-based tools and platforms and foster knowledge sharing and continuous benchmarking and awareness across EU and Associated Countries, including the WFD network of River Basin Districts, and/or
- Identify research gaps taking stock of existing knowledge, research activities and the implementation needs of WFD, and/or
- Promote water-related innovation and business development, cluster eco-innovative companies, develop innovative financial instruments; and/or
- Develop a coordinated approach to the integration of the water and waste sectors in the EIP "Smart Cities and Communities", identifying research and innovation needs which could lead to future actions

Appropriate EU contribution: EUR 1 million. Type of action: Coordination and support action

For strengthening international R&I cooperation in the field of water, the specific challenge is:

- Strengthen international cooperation in the field of water with emerging economies, especially China and India
- Promote market opportunities for innovative water solutions outside Europe and share experiences in water policy and river management
- Promote EU leadership in international water-related negotiations

Proposals should:

- Help creating strategic cooperation partnerships for water research and innovation and shared R & I agendas and roadmaps
- Priority will be given to proposals contributing to implementation of on-going international activities and partnerships where EU Member States are jointly committed to providing a more coherent approach (SFIC) to R&I e.g.
    - EU/Member States –India research and innovation partnership in water

- China-Europe Water Platform

Type of action: Coordination and Support Action. Appropriate EU contribution: EUR 1 million.

Smart Specialisation Strategies should :

- ✓ Concentrate resources on a limited and selected number of R&I priorities
- ✓ Priorities are to reinforce the regions' strengths, in line with the national reform programme (NRP)
- ✓ The agreement on the Strategy is an ex-ante condition for the allocation of support from the Structural funds
- ✓ Commission assists regions to develop their strategies: Smart Specialisation Platform

6. Introduction to the workshop. Methods and programme

Dr. Panagiotis Michalopoulos, from the Hellenic Centre of Marine Research presented briefly the purpose of the workshop. The analysis performed on the projects from the data base were presented critically to the representatives of the science community and discussed critically. The main objectives are:

- To present results to scientists/experts and discuss them critically.
- To help the identification of strengths, weaknesses, opportunities and threats in research and integrated management in the Danube river-Black sea macrosystem .
- To provide input toward:
  - Developing a regional science and innovation agenda in the Danube – Danube Delta – Black Sea.
  - Drafting detailed plans for the development of regional distributed research infrastructures, covering all aspects of environmental sciences.
  - Designing an education program aiming at strengthening the human capital in the field of an innovative integrated management for the Danube – Danube Delta – Black Sea macrosystem.

In order to achieve the objectives, the approach is to use group discussions with the aid of Questionnaires to help identify:

- Thematic priorities for a research agenda
- Best future approaches to education in the fields of ecosystem research and management for the Danube – Danube Delta – Black Sea macrosystem.
- Areas of activity, and potential contribution of a distributed research infrastructure to the advancement of research, education, planning in the Danube – Danube Delta – Black Sea macrosystem.

The participants were asked to fill in a 'Thematic Priorities Questionnaire'.

The questionnaire has three main sections:

a) Thematic Priorities related to Horizon 2020 Societal Challenges

b) Thematic Priorities related to the Danube Ecosystem as a whole and its services.

c) Thematic Priorities Related to Water Issues in the Danube Region.

Participants were asked to fill in an 'Educational Priorities Questionnaire'.

Participants were asked to fill in a 'Research Infrastructure Priorities Questionnaire'.

The group discussions for each of the questionnaire continued the next day – 18.03.2014.

Several comments were made related to the Thematic Priorities Questionnaire' (final results to be presented in Phase 3):

C1: Identify and assess the degree of connectivity between present and past and see how it can affect the future

C2: In the energy (hydro power) field, there is a lack in communication between the administration of transport and administration of hydro power and it is important for dams and flood issues
C3: The regulation of hydrological regime in the Danube Region is a political issue, as each country has its own sets of rules and regulations

Several comments were made related to the 'Education Agenda Questionnaire' (the final form of the questionnaire will be circulated separately, at the end of Phase 3):
C1: How to identify a market for students? Make Danube Region a place of excellence in some specific fields, so students will come to study those specific aspects (create solutions)
C2: Danube Region - make it a EU brand
C3: Talking to employers (industry, government, management, administration) to identify the needs in relation to graduate students (ask Deltares and Ifremer and others, learn from their experience)

Several comments were made related to the 'Research Infrastructures' (the final form of the questionnaire will be circulated separately at the end of Phase 3):
C1: Existing infrastructure needs to be upgraded and the collaboration must be enhanced
C2: Unique point in the Danube Region – it raises major social and political and we need to know how to respond in terms of science
C3: Related to data:

- The existing databases should connect to Copernicus and GEOSS
- Create metadata for the existing data
- Prepare the existing 'historical' data and make it digital

Close agreements between Danube countries to collect, collate and share data in the region
C4: Empower society in science – framework for citizen science
C5: Safe navigation is not possible from the navigation point of view (ex. Hungary), find allowed solutions (see scenarios).

The meeting ended on Tuesday, 18.03.2014.

Annex 1. List of participants:

Name	***Country***	***Organization***
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Alexandra Vancea	Romania	MEN
Viorel Vulturescu	Romania	MEN

Annex2. Agenda of the meeting

17 / 18 March 2014

Venue: ***HOTEL HOWARD JOHNSON –*** *Calea Dorobantilor nr. 5-7, Sector 1****, Bucharest***

Monday 17 March 2014

14.00 -14.20 **Welcome addresses**
Gheorghe Oaie, General Director of GeoEcoMar
Viorel Vulturescu, Director, Programs for European and International RDI Priorities Directorate, Ministry of National Education

Introduction of participants. Tour de table

14.20 -14.45 **New Research and Innovation oportunities provided by the Horizon 2020 Programme in the Danube Region**

Viorel Vulturescu, Director for European Integration and International Cooperation – Ministry of National Education – Activity of Research and Innovation

14.45 -15.00 **Introduction to FP 7 DANCERS Project**

Adrian Stănică – project coordinator (RO)

15.00 – 15.30 **Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region (D2.1.)**

Mihaela Paun, NISB

15.30 -16.00 **Coffee break**

16.00 – 16.30 **Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)**

Adrian Stanica, project coordinator on behalf of Christos Fragakis, EC Officer, DG Research and Innovation (tbc)

16.30 – 16.45 Introduction **to the workshop. Methods and programme**

Panagiotis Michalopoulos, HCMR

16.45 – 18.00 **Group discussion of state of research in the Danube Region**

Participants will be asked to analyze:

What is strong

What appears to be missing

What should be strenghtened

By taking into account: domain / geographic distribution / field of interest

19.00 – 21.30 **Working dinner.**

Tuesday 18 March 2014

09.30 – 09.40 **Welcome and agenda of the day**

*Adrian Stanica,*GeoEcoMar

09.40 – 10.30 **Group discussion of state of research in the Danube Region (continuation from Day 1)**

10.30 – 11.00 Coffee break

11.00 - 12.00 **New ideas for the development of a successful research and innovation agenda in the Danube – Black Sea Region**

Group discussions

12.00 – 13.00 **New ideas for the development of new and successful education plans in the field of water management and research in the Danube – Black Sea Region**

Group discussions

13.00 – 14.30 **Working lunch**

14.30 - 15.30 **New ideas for the development of new distributed Research Infrastructure in the field of water management and research in the Danube – Black Sea Region**

Group discussions

15.30 - 17.00 **Outcomes and wrap-up of the Workshop**

All partners

Annex3. Questionnaires with inputs from the participants (in bold and italic)

1. Thematic priorities

1. Questions 1-4. THEMATIC PRIORITIES Related to Horizon 2020 Societal Challenges in the Danube Region

9. Please indicate the importance of the following human modifications in ecosystem processes in the Danube Region where scientific effort should be directed.

9.1 Disease emergence (e.g. flooding due to climate change can cause the spread of edidemics).
9.2 Fisheries collapse
9.3 Species introductions and losses
9.4 Regional climate change
9.5 Eutrophication and hypoxia
9.6 Avoid excessive modification of coastal zone
9.7 Flooding
9.8 Connectivity
9.9 Legacy and Emerging contaminants
9.10 Cropping Modifications
9.11 Cost of Ecological Restoration
9.12 Genetic Pollution
9.13 Sediment dynamics related to Hydropower & Navigation & Ecological re-naturation & conservation
9.14 Artificial Dam
9.15 Armoring (Protection)
9.16 Water course management (dams etc.)
9.17 Water course management (dams etc.)
9.18 Global Climate change Sea level rise

10. The Millenium Assesment report has identified the following risks to ecosystem services that are most likely to lead to irreversible downgrading in the future. Please rank them with respect to their importance in the Danube Region. Add any other risk you consider appropriate and rate its importance.

	High Importance	Medium Importance	Low Importance	No Importance

10.1 Water Cycle. *Water withdrawals from rivers and lakes for irrigation or for urban or industrial use, large reservoir construction.*	☐	☐	☐	☐
10.2 Carbon Cycle. *Changes on ecosystem function as a net source/sink of CO2 due to afforestation, reforestation and forest management, degradation of agricultural, pasture,and forestlands, land use change, changed agriculture practices, the fertilizing effects of nitrogen deposition and increasing atmospheric CO2 .*	☐	☐	☐	☐
10.3 Nitrogen Cycle. *Increase in reactive or biologically available nitrogen due to use of fertilizers and its effects in terrestrial and marine ecosystems*	☐	☐	☐	☐
10.4 Phosphorous Cycle. *Increased use of phosphorous fertilizers and other substances, accumulation in agricultural soils and its effects in terrestrial and marine ecosystems.*	☐	☐	☐	☐
10.5 Sediment dynamics	☐	☐	☐	☐
10.6 Heavy metals	☐	☐	☐	☐
10.7 Impact of sediment- particulate transport changes due to anthropic and climate change	☐	☐	☐	☐

11. *In the past 50-100 years, the following direct drivers have caused significant changes in terrestrial ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in terrestrial ecosystems of the Danube Region likely to cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other direct drivers you may consider relevant.*

	High Importance	Medium Importance	Low Importance	No Importance
11.1 Land cover change	☐	☐	☐	☐
11.2 New technologies for the provision of food, timber, fiber.	☐	☐	☐	☐
11.3 Pollution/nutrient loading	☐	☐	☐	☐
11.4 Climate change	☐	☐	☐	☐
11.5 Other (Please add)	☐	☐	☐	☐

11.5 changes in fishing practices

11.6 Disruption of the sedimentary regime

11.7. development of extensive "hard" flood protection systems & destruction of wetlands

11.8 development of "soft" and "smart" flood protection systems (natural infrastructure flood protection)

12. In the past 50-100 years, the following direct drivers have caused significant changes in freshwater ecosystems and their services. Based on your expert opinion, rank the most important direct drivers in freshwater ecosystems of the Danube Region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
12.1 Modification of water regimes (from water abstraction / consumption and uses, hydrotechnical interventions, etc)	☐	☐	☐	☐
12.2 Alien species and biodiversity changes / species alteration	☐	☐	☐	☐
12.3 Pollution/nutrient loading	☐	☐	☐	☐
12.4 Climate change	☐	☐	☐	☐
12.5 Other (Please add) *Environmental accidents*	☐	☐	☐	☐

12.5 Energy (Hydro Power) *Dam lakes = storage capacity during extreme floods*
12.6 Fishing and aquaculture

13. In the past 50-100 years, the following direct drivers have caused significant changes in coastal ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in coastal ecosystems of the Danube Region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
13.1 Fishing pressures	☐	☐	☐	☐
13.2 Alien species	☐	☐	☐	☐

13.3 Land, River,Ocean-based Pollution/Nutrient loading	☐	☐	☐	☐
13.4 Climate change	☐	☐	☐	☐
13.5 Habitat Loss/Conversion	☐	☐	☐	☐
13.6 Sediment Starvation	☐	☐	☐	☐
13.7 Other (please add) *sea level variation (long term and short – term – result of storms)*	☐	☐	☐	☐

13.7 Navigation
13.8 Embanking Flood plain
13.9. Dams and jetties construction
13.10. Biodiversity initiatives – regulations (conventions to which Danube Delta Biosphere Reserve adhered)
13.11. Risk of environmental accidents
13.12. Tourism

14. *In the past 50-100 years, the following direct drivers have caused significant changes in coastal ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in freshwater ecosystems of the marine ecosystems of the Danube-Western Black Sea that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.*

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
14.1 Fishing pressures	☐	☐	☐	☐
14.2 Alien species	☐	☐	☐	☐
14.3 Land, River,Ocean-based Pollution/Nutrient loading	☐	☐	☐	☐
14.4 Climate change- / temperature changes / changes in circulation / forecasted changes in wind circulation regime	☐	☐	☐	☐
14.5 Other (please add)	☐	☐	☐	☐

14.5 Tourism

14.6. Sediment supply

27. Please indicate the themes you consider research priorities. You can add other research priorities in the blank fields.

		High priority	*Medium priority*	*Low priority*	*No Interest*
27.1	*Maintaining ecosystem sustainability*	☐	☐	☐	☐
27.2	*Developing safe water systems for citizens*	☐	☐	☐	☐
27.3	*Promoting competitiveness in the water industry*	☐	☐	☐	☐
27.4	*Implementing a water-wise bio-based economy*	☐	☐	☐	☐
27.5	*Closing the water cycle gap*	☐	☐	☐	☐
Add Theme		☐	☐	☐	☐

27.6 Upstream & downstream effects of human activities on water ecology

27.7 Flood risks along climate change and exceptional events

27.8 Changed food webs emerging from expected climate change effects and fluvial dynamics

27.9 Interrelation with suppliers river upstream

27.10 River continuity and lateral connectivity

27.11 Climate Change adaptation

27.11 Synergies (win-win) management scenarios for hydropower, navigation & ecological (WFD) requirements

27.12 Sediment transport continuity

27.13 Flood plain restoration

27.14 Water Treatment optimization of technologies

27.14 Risk assessment in drinking water quality

27.15 Health

2. Education Agenda

1. Which other education/training activities do you consider important, other than formal educational programs leading to undergraduate/graduate degrees.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*

Exchange Programmes Students teachers	☐	☐	☐	☐
Training workshops Commercial courses	☐	☐	☐	☐
Short courses (summer/winter schools) = student education + Continuous professional development	☐	☐	☐	☐
Other (Please add)	☐	☐	☐	☐

Media Communication - Vulgarization (popularization)
Fellowships = activity based on fellowships and sponsorships of individually selected persons to work on specific projects (not project based but person – based)
Competence assessment = continuous professional development
Science-Policy-Industry Collective workshops
(Exchange of teaching staff- In Both directions(developed - less developed countries)
(Exchange of students –In both directions
PhD funded by the industry to solve their issues (transport, navigation, water quality)
Emphasis on multidisciplinary + interdisciplinary high-level courses Internships

Partnerships between educational institutions provide a way to combine research and teaching expertise, improve the quality of studies offered to students and ultimately lead to scientific knowledge advancement. The following Questions explore aspects of such partnerships.

2. *Do you believe that educational institution partnerships should be a priority in the development of an educational agenda in the Danube Region?*

Top Priority	☐
Medium Priority	☐
Low Priority	☐
Not important	☐

3. *Please indicate priorities in the origin of institutions participating in educational partnerships. .*

	Top	*Medium*	*Low*	*No Priority*
Danube Region institution	☐	☐	☐	☐
Other European institutions	☐	☐	☐	☐
Other international (non-European) institutions.	☐	☐	☐	☐

4. *Which students should educators/researchers have in mind when developing educational curricula.*

Students originating from the Danube Region	☐

Students from other European countries	☐
Other international (non-European) students	☐

All and reach for the best

5. *In developing joint educational programs for the Danube-Black Sea Macrosystem which in your opinion should be the priorities in terms of degrees/certificates offered.*

Joint Undergraduate Programs	☐
Joint Masters Programs	☐
Joint Ph.D. programs	☐
Short and highly specialized Joint executive Certificate programs	☐
Other (Please Add)	☐

6. *Joint educational programs should give priority to preparing students for a career in:*

Education	☐
Pure/Applied Research	☐
Environmental / Ecosystem/ Natural Resource Management	☐
Policy /Government/ International Organizations	☐
Industry	☐
Environmental planning	☐
Law/ Regulation	☐

3. *Research agenda*

1. *Do you believe there is scope/need for a new research infrastructure in the Danube Region dedicated to Danube-Black Sea Macrosystem Processes.*

1.1 Yes	☐
1.2 No	☐
1.3 Do not know	☐

But not only to Danube –more to rivers-sea-macrosystem
Existing infrastructure needs to be upgraded and working together

2. *Which should be the main priorities for the activities carried out in a new research infrastructure.*

	High Priority	Medium Priority	Low Priority	No Priority
2.1 Education	☐	☐	☐	☐
2.2 Basic Research	☐	☐	☐	☐
2.3 Applied Research/Innovation/ Technology	☐	☐	☐	☐
2.4 Monitoring/ Data gathering and archiving	☐	☐	☐	☐
2.5 Basic Research	☐	☐	☐	☐
2.6 Expert Analysis/Consultation	☐	☐	☐	☐
2.7 Advising on Policy/Regulation	☐	☐	☐	☐
Other (please add)	☐	☐	☐	☐

Coordination with other –global-riverine/delta infrastructures

3. To the best of your knowledge, which of the following topics are adequately covered by the existing research infrastructure in the Danube Region;

	High relevance	Medium relevance	Low relevance	No relevance
3.1 Heavy metals impacts on water quality/ecosystem	☐	☐	☐	☐
3.2 Emerging pollutant impacts on water quality	☐	☐	☐	☐
3.3 Research and development on biomarkers and other indices related to water quality	☐	☐	☐	☐
3.4 Hydrological monitoring	☐	☐	☐	☐
3.5 Biodiversity/ Ecological status	☐	☐	☐	☐
3.6 Genetic biodiversity	☐	☐	☐	☐

3.7 Biogeochemical Cycles/ Ecosystem Metabolism	☐	☐	☐	☐
3.8 Monitoring Technology for Suspended Sediment Mobilization/Transport/ Accumulation	☐	☐	☐	☐
3.9 Monitoring Technology for Bedload Sediment Mobilization/ Transport/Accumulation	☐	☐	☐	☐
3.10 Remote Sensing Technology with applications to ecosystem monitoring	☐	☐	☐	☐
3.11 Development of Field Sensor Technologies/ Independent in-situ multiparameter observatories	☐	☐	☐	☐
3.12 Laboratory facilities for small-scale physical simulations of rivers, lakes and the coastal zone.	☐	☐	☐	☐

Upstream simulation fascilities for sedimentation
Climate change impacts on regional level(simulation, adaptation)

4. Please indicate priorities in topics that are crucial for the Danube-Black Sea Macrosystem and are in need for further development in a future research infrastructure in the Danube Region

	High Priority	*Medium Priority*	*Low Priority*	*No Priority*
4.1 Heavy metals impacts on water quality/ecosystem	☐	☐	☐	☐
4.2 Emerging pollutant impacts on water quality	☐	☐	☐	☐
4.3 Research and development on biomarkers and other indices related to water quality	☐	☐	☐	☐
4.4 Hydrological monitoring	☐	☐	☐	☐
4.5 Biodiversity/ Ecological status	☐	☐	☐	☐
4.6 Genetic biodiversity	☐	☐	☐	☐
4.7 Biogeochemical Cycles/ Ecosystem Metabolism	☐	☐	☐	☐
4.8 Monitoring Technology for Suspended Sediment	☐	☐	☐	☐

Mobilization/Transport/ Accumulation				
4.9 Monitoring Technology for Bedload Sediment Mobilization/ Transport/Accumulation	☐	☐	☐	☐
4.10 Remote Sensing Technology with applications to ecosystem monitoring	☐	☐	☐	☐
4.11 Development of Field Sensor Technologies/ Independent in-situ multiparameter observatories	☐	☐	☐	☐
4.12 Laboratory facilities for small-scale physical simulations of rivers, lakes and the coastal zone.	☐	☐	☐	☐
Database host/facilities for simulation software e.g. for sediments, macroregional simulation of climate impact. *Navigation* *Socioeconomic +land practice*	☐	☐	☐	☐

5. Please indicate the scientific topics with adequate experts/scientists/laboratories in the Danube Region/countries Versus the topics where expertise should be brought in from other regions/countries.

	Adequate *Expertise in Danube countries*	*Inadequate* *Expertise/ Need for external experts*
5.1 Heavy metals impacts on water quality/ecosystem	☐	☐
5.2 Emerging pollutant impacts on water quality	☐	☐
5.3 Research and development on biomarkers and other indices related to water quality	☐	☐
5.4 Hydrological monitoring	☐	☐
5.5 Biodiversity/ Ecological status	☐	☐
5.6 Genetic biodiversity	☐	☐
5.7 Biogeochemical Cycles/ Ecosystem Metabolism	☐	☐

5.8 Monitoring Technology for Suspended Sediment Mobilization/Transport/ Accumulation	☐	☐
5.9 Monitoring Technology for Bedload Sediment Mobilization/ Transport/Accumulation	☐	☐
5.10 Remote Sensing Technology with applications to ecosystem monitoring	☐	☐
5.11 Development of Field Sensor Technologies/ Independent in-situ multiparameter observatories	☐	☐
5.12 Laboratory facilities for small-scale physical simulations of rivers, lakes and the coastal zone.	☐	☐
Urban + Governance Intergrated catchment Socioeconomic input	☐	☐

6. *Which of the following ecosystems should be the priority for the activities of the new research infrastructure.*

	High Priority	*Medium Priority*	*Low Priority*	*No Priority*
6.1 Terrestrial	☐	☐	☐	☐
6.2 Freshwater	☐	☐	☐	☐
6.3 Coastal	☐	☐	☐	☐
6.4 Marine	☐	☐	☐	☐
6.5 Atmosphere	☐	☐	☐	☐

7. *Which of the following do you consider the biggest challenges/risks in the planning and operation of a new research infrastructure in the Danube Region.*

	High Risk	*Medium Risk*	*Low Risk*	*No Risk*
7.1 Financial	☐	☐	☐	☐

Security/Funding				
7.2 Organization Structure	☐	☐	☐	☐
7.3 Clarity of Scope/ Direction	☐	☐	☐	☐
7.4 Quality of Staff-Facilities/ Appeal to targeted end-users	☐	☐	☐	☐
7.5 Appropriate Thematic Area selection (too narrow, too broad,too ambitious)	☐	☐	☐	☐
7.6 Clarity of Scope/ Direction	☐	☐	☐	☐
7.7 Obtaining continuous support/endorsement from regional/national/internationa l stakeholders	☐	☐	☐	☐
7.8 Other (Please add)	☐	☐	☐	☐

Sufficient link with European global research communities
Superposition with existing structures
Applications and links to practical outcomes

7.3. Seminar International „Cresterea colaborarii dintre comunitatea stiintifica si mediul de afaceri din Regiunea Dunarii. Noi oportunitati" 19-20.03.2014

7.3.1. Anexa 4 – Minuta intalnirii

International Seminar „Increasing the collaboration between the scientific community and the business environment in the Danube Region. New opportunities"

1. Welcome and introductions

The meeting started with a short welcoming address from Dr. Adrian Stanica, Scientific Director of the Romanian Nation Institute for Marine Geology and Geoecology.

Formal around the table introductions followed, then discussions started.

2. New Research and Innovation opportunities provided by the Horizon 2020 Programme in the Danube Region

Mrs. Alexandra Vancea, NCP for Marie Curie actions in the Romanian Ministry of National Education presented the main opportunities provided by the Horizon 2020 programme in the Danube Region.
Horizon 2020 programme combines the former funding programmes for R&I - 7th EU Framework Programme for Research, European Institute of Innovation and Technology (EIT), innovation parts of Competitiveness and Innovation Programme (CIP):

- Focuses more on innovation: closing the gap between knowledge and market, stronger participation of SMEs.
- Promotes solutions for societal challenges with visible socio-economic impact
- It is simplified (single set of simplified rules, reducing time-to-grant, single IT Participant Portal).

The three main pillars of the programme are:

I. Excellent Science

II. Industrial Leadership

III. Societal Challenges

- Spreading Excellence and Widening Participation
- Science with and for Society

Other actions are:

- European Institute of Innovation and Technology (EIT)
- Joint Research Centres (JRC)
- EURATOM

The main elements in Pillar I – Excellent science are:

• **European Research Council (ERC):** support the most talented and creative individuals and their teams to carry out frontier research

• **Future and Emerging Technologies (FET):** fund collaborative research to open up new and promising fields of research and innovation

• **Marie Skłodowska-Curie Actions:** provide mobility of researchers; focus on training and career development:

- **Initial Training Networks (ITN)**
  - Doctoral and initial training of researchers proposed by international networks of organisations from public and private sectors
  - European TN, Industrial Doctorates, Joint Doctorates
- **Individual Fellowships (IF)**
  - Individual fellowships for most promising experienced researchers to develop their skills through international or inter-sector mobility
  - European Fellowship, Re-Integration, Global Fellowships (Return Phase)
- **Research and Innovation Staff Exchange (RISE)**
  - International and inter-sector cooperation through the exchange of research and innovation staff (include administrative, managerial and technical staff)
- **COFUND**
  - Co-funding of regional, national and international programmes covering the above described actions

• **Research infrastructures (**EU definition „Facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields. RI can be single-sited or distributed“):

- Ensure Europe has world-class research infrastructures (including e-infrastructures) accessible to all researchers in Europe and beyond:
- First call for existing but also new RIs, focus on integration (networking, transnational access or service activities, joint research)
- Focus on human capital (training) as a mandate for RIs; innovation potential of RIs (cooperation with SMEs, PPP)

The main elements of Pillar III – Societal Challenges are:

1. Health, Demographic Change and Wellbeing

2. Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy
3. Secure, Clean and Efficient Energy
4. Smart, Green and Integrated Transport
5. Climate action, Environment, Resource Efficiency and Raw Materials

- Call – Water Innovation: Boosting its value for Europe
- WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication
- WATER-2-2014/2015: Integrated approaches to water and climate change
- WATER-3-2014/2015: Stepping up EU research and innovation cooperation in the water area (ERA NET COFUND - Water JPI)
- WATER-4-2014/2015: Harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens
- WATER-5-2014/2015: Strengthening international R&I cooperation in the field of water

6. Europe In A Changing World – Inclusive, Innovative And Reflective Societies
7. Secure Societies – Protecting Freedom and Security Of Europe And Its Citizens

A very important issue is **Spreading Excellence and Widening Participation** which refers to:

• A new set of measures introduced in Horizon 2020 under this separate specific objective (WIDESPREAD), aiming to close the R&I divide between Member States and regions

- A number of countries are experiencing low participation in the EU Framework Programmes (compared to FP7)
- H2020 legal text >>" low RDI performing" Member States for Widening actions (Latvia, Croatia, Lithuania, Malta, Slovakia, Romania, Luxembourg, Poland, Bulgaria, Estonia, Portugal, Slovenia, Cyprus, Czech Republic and Hungary).

IMPLEMENTATION:

• Foster synergies with the European Structural and Investment Funds (ESIF). Measures to be implemented by the Member States most in need of the new Cohesion policy for the 2014-2020 programming period

Widening participation can be achieved by:

TEAMING - CSA (100%): 1 year (1st phase) + 5-7 years (2nd phase)

- Creation of new (or significant upgrade of existing) Centres of Excellence in low performing Member States and regions
- Proposals: Need to demonstrate the long-term science and innovation strategy of the future Centre based on a SWOT analysis
  - Stage 1: Funding for the development of a Business Plan for the new Centre of Excellence facilitated by a teaming process with a leading counterpart in Europe
  - Stage 2: Subject to the quality of the Business Plan, and a commitment of the Member State (e.g. support via Cohesion Policy Funds), the Commission may provide further substantial financial support for the first steps of implementation of the Centre.

In each Teaming project there is:

- (1) the participant organisation (COORDINATOR) from a low performing Member State (for example a research agency at national or regional level, or a regional authority);
- (2) an institution of research and innovation excellence (public or private) or a consortium of such institutions;

TWINNING:

- Strengthening a defined field of research of a knowledge institution in a low performing Member State or region through linking with at least two internationally-leading counterparts in Europe.

- Proposals: Will have to outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved in the twinning exercise
- Funding for:
  - expert visits and short-term on-site or virtual training;
  - workshops & conference attendance;
  - organisation of joint summer school type activities;
  - dissemination and outreach activities.
  - Equipment & researchers' salaries will NOT be funded.

In each Twinning project there is:

- ONE institution located in a Low Performing MS/region (COORDINATOR)
- A minimum of TWO additional partners from two different Member States or Associated Countries.

Another important issue in Pillar III is ***Science with and for society*** which has as main objective to:
– to build effective cooperation between science and society,
– to recruit new talent for science,
– to pair scientific excellence with social awareness and responsibility.
The rationale is to:
– Increase of quality, relevance and acceptance of European research through interaction with society
– Deals with needs and concerns of society, gender equality, attraction of young people and the general public to science.
Topics include education, citizen participation in R&I, research outreach, framework conditions for responsible R&I, incl. ethics.
The main instruments are represented by coordination and support actions, collaborative projects.

3. Presentation of FP7 DANCERS project

Dr. Adrian Stanica made a brief introduction to the FP7 Project DANCERS – DANube macroregion: Capacity building and Excellence in River Systems (basin, delta and sea).
The main aim of the project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. Importantly, the new instruments and tools do not start *ab initio* but will build on existing projects and expertise.
The specific objectives are to:

- critically analyse the achievements in integrated river- delta –sea management in the Danube Region.
- understand links between the achievements, deliverables and results of the work performed.
- define a set of instruments to enhance environmental research and innovation in Danube Region.

The Consortium comprises partners from:

- Danube Region – Germany (1), Austria (3), Hungary (1), Serbia (1), Romania (2)
- EU15 – France (1), Greece (1), Ireland (1), Italy (1), Spain (1), UK (1 sub-consortium of 4 universities)
- UNESCO – IHE

The project is structured in the three pillars of knowledge:

- science,
- research infrastructures
- human potential

There are three categories of stakeholders present in the Danube Region:

- scientists and academia,
- decision and policy makers

- business community.

The project will receive input from the stakeholders and aims to develop instruments that contain:

- Strategic research agenda,
- Concept and detailed plan of the distributed research infrastructures for the Danube – Black Sea Macrosystem
- Proposals for an integrated educational program with the full cooperation of partners from Danube - Black Sea Macrosystem.

Dr. Stanica then presented DANUBIUS – RI as a future ESFRI pan – European infrastructure.

4. Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)

Dr. Adrian Stanica delivered the presentation on behalf of Christos Fragakis, DG Research and Innovation, who could not be present.

In the Pillar III (Societal challenges) of Horizon 2020, "Climate action, environment, resource efficiency and raw materials" is an important chapter. Related to this, the main objective is to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems.

The broad lines of activities are:

- Fighting and adapting to climate change
- Sustainably managing natural resources and ecosystems
- Sustainable supply of non-energy and non-agricultural raw materials
- Transition towards a green economy through eco-innovation
- Global environmental observation and information systems
- Cultural heritage

In the Work Programme 2014/2015 twelve focus areas were identified, of which five linked to 'Climate action, environment, resource efficiency and raw materials:

- Waste: A resource to recycle, reuse and recover raw materials
- Water innovation: Boosting its value for Europe
- Energy-efficiency
- Disaster-resilience: Safeguarding society and adapting to climate change
- Blue growth: Unlocking the potential of the oceans

Regarding Water innovation, boosting its value for Europe - areas covered 2014/2015, the main objectives are:

- Bridging the gap: from innovative water solutions to market replication
- Integrated approaches to water and climate change
- Stepping up EU research and innovation cooperation in the water area
- Harnessing EU water research and innovation results for industry, policy makers and citizens
- Strengthening international R&I cooperation in the field of water

For bridging the gap, from innovative water solutions to market replication, the main activities are:

- Accelerate commercialisation of eco-innovative water solutions (technologies, process, products, services, etc.)
- Stimulate sustainable economic growth, business and job creation in the water sector

Proposals should:

- Support first application and market replication of near-market water solutions

- Address the 5 thematic priorities identified in the SIP (strategic implementation plan) of the EIP (European Innovation Partnership) on Water
- Address issues affecting rapid uptake and market deployment of innovative solutions
- Include participation of SMEs

Appropriate EU contribution: EUR 2-4 million. Type of action: Innovation actions

The topic is relevant also for process industries (SPIRE PPP) and advanced ICT solutions (data interoperability and harmonisation with INSPIRE).

For Integrated approaches to water and climate change, the specific challenge is:

- Improved understanding of the impacts of climate change on the hydrological cycle for better informed decision making and sustainable management of water systems in EU, ensuring both adequate quantity and quality (Blueprint)

Proposals should:

- Maximise reliability of projections of precipitation at various spatial and time scales;
- Improve the short-to-medium term forecasting of related extreme events;
- Assess the impacts of weather extremes and climate change on water cycle in terms of quantity and quality;
- Develop risk management strategies and adaptation options at the appropriate scales, involving all relevant stakeholders;

Appropriate EU contribution: EUR 6-8 million. Type of action: Research and innovation actions.

For stepping up EU research and innovation cooperation in the water area, the specific challenge is:

- Support to JPI on water to implement its common vision and Strategic Research Agenda (SRA) to reduce fragmentation of nationally funded water-related R & I activities and enhance synergy, co-ordination and coherence between national and EU funding

Proposals should:

- Pool resources from national/regional research programmes to implement a joint call with EU co-funding
- Support the priorities identified in the SRA of the Water JPI related to the development of technological solutions and services for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts, etc.

Type of action: ERA-NET Cofund

In harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens, the specific challenge is:

- Ensure more effective use and exploitation of research results and good water management practices to enhance decision making in the field of water

Proposals should address one of:

- Promote dissemination and exploitation of EU funder activities, including relevant ICT-based tools and platforms and foster knowledge sharing and continuous benchmarking and awareness across EU and Associated Countries, including the WFD network of River Basin Districts, and/or
- Identify research gaps taking stock of existing knowledge, research activities and the implementation needs of WFD, and/or
- Promote water-related innovation and business development, cluster eco-innovative companies, develop innovative financial instruments; and/or
- Develop a coordinated approach to the integration of the water and waste sectors in the EIP "Smart Cities and Communities", identifying research and innovation needs which could lead to future actions

Appropriate EU contribution: EUR 1 million. Type of action: Coordination and support action

For strengthening international R&I cooperation in the field of water, the specific challenge is:

- Strengthen international cooperation in the field of water with emerging economies, especially China and India
- Promote market opportunities for innovative water solutions outside Europe and share experiences in water policy and river management
- Promote EU leadership in international water-related negotiations

Proposals should:

- Help creating strategic cooperation partnerships for water research and innovation and shared R & I agendas and roadmaps
- Priority will be given to proposals contributing to implementation of on-going international activities and partnerships where EU Member States are jointly committed to providing a more coherent approach (SFIC) to R&I e.g.
    - EU/Member States –India research and innovation partnership in water
    - China-Europe Water Platform

Type of action: Coordination and Support Action. Appropriate EU contribution: EUR 1 million.

Smart Specialisation Strategies should:

- ✓ Concentrate resources on a limited and selected number of R&I priorities
- ✓ Priorities are to reinforce the regions' strengths, in line with the national reform programme (NRP)
- ✓ The agreement on the Strategy is an ex-ante condition for the allocation of support from the Structural funds
- ✓ Commission assists regions to develop their strategies: Smart Specialisation Platform

5. Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region

Dr. Mihaela Paun, from the Romanian National Institute for Biological Sciences presented the data base of the project, hosted by the University of Natural Resources and Life Sciences, BOKU, Vienna.

The data base gathers all existing information about projects and their results in the Danube Region with focus on water and environmental management issues:

- of the last two decades,
- at all geographic levels (national, regional, European, International),
- closely linked to the three main domains: life sciences (including environmental aspects), earth sciences and socio-economics,
- structured into the three main pillars: Scientific Agenda, R&D Infrastructure and Human Capital and
- based on the Danube River Basin Management Plan (ICPDR 2009),

The metadatabase stays open for further entries and remains active even after the project ends, in 2015**.**

DANCERS metadatabase serves as basis for further studies to identify strengths and weaknesses, links and gaps in water management issues in the Danube Region. Its main purposes are to:

- provide structured information for the assessment of the collected projects,
- improve access to the gathered data and
- promote the sharing of obtained knowledge.

Metadata:

- is “data about data” or “information about data”
- provide a short summary about the content, purpose, quality, location of the data as well as information related to its creation

The hardware – features:

- standard server configuration with state of the art components
- have sufficient storage space and high security of the data is guaranteed
- all necessary security updates and software updates are provided during the project lifetime
- accessibility of the server is guaranteed at least for one year after project end.

For each project, the metadatabase contains:

- Title
- Date
- Abstract
- Key words

For data collection two methods were used:

a. Questionnaire

b. Internet Search

The situation of record in the data base is as follows:

Records in DANCERS metadatabase	No of projects
Status: 12.3.2014	**476**
Composition:	
returned questionnaires (deadline 6.2.2014):	256
direct entries into metadatabase	251
Deleted:	
duplicates/multiples/not of interest	31
Geographic location	
Upper Danube	203
Middle Danube	143
Lower Danube	165
Danube delta	136
Danube coastal zone	48
Western Black Sea	116
Core category	
Scientific Agenda	279
Research Infrastructure	48
Human Capital	51
Thematic Area	
Life Sciences	145
Earth Sciences	126
Socio-Economics	95
Multidisciplinary	189
Funding Type	
EC - DG R&I	96
EC-Other	48
Structural Funds (ERDF, IPA, Cohesion)	37
National R&D	138
National Other (environmental monitoring, maintenance of navigation)	46
International (UN and other)	39
Other	67
Programme Type	
Environmental monitoring and measurements	170
Maintenance of navigation	37
Other	77

Research - Human Resources&Education	14
Research - scientific ideas and scientific cooperation	52
Research - development and upgrading of research infrastructure	162
Status of the project	
Completed	372
Ongoing	100

Dr. Paun continued with the presentation of data analysis, made by her team.
Data analysis consisted in:
1. Checking the consistency of all data gathered, deleting duplicates – INSB and GeoEcoMar
2. Implementing the changes in the database - WCL
3. Data Analysis – INSB

The analysis was performed on the data file sent by WCL on February 26th 2014 and the dataset consists of 472 projects from which:

- 468 recorded answers regarding the status of the project
- 4 projects having missing values.
- Out of the 468 recorded answers
    - 370 have been completed
    - 98 ongoing
- 463 projects have recorded answers
- 9 missing values.

There are 26 coordinating countries for the 472 projects entered. The analysis of the projects took into consideration the following criteria: status (completed/ongoing), coordinating country, thematic areas (life, earth, socio, multi), programme type, funding type, year (no per year).
Some of the results are presented in the following figures:

Country	No. of coordinated projects	Percentage of coordinated projects among recorded projects
Austria	140	30.23%
Belgium	7	1.50%
Bulgaria	16	2.60%
Croatia	2	0.40%
Denmark	1	0.20%
Finland	2	0.40%
France	9	1.90%
Germany	23	5%
Greece	9	1.9%
Hungary	12	2.6%
International	1	2%
Italy	11	2.4%
Netherlands	16	3.5%
Norway	2	0.4%
Portugal	1	0.2%
Romania	137	29.60%
Serbia	16	3.50%
Slovakia	4	0.90%
Slovenia	5	1.10%
Spain	5	1.10%
Sweden	1	0.20%
Switzerland	17	3.70%
Turkey	1	0.20%
UK	9	2.60%
Ukraine	3	0.60%
USA	10	2.20%
Total	**463**	**100%**

Country	Ongoing (1)	Completed (2)
Austria	34	104
Belgium	0	7
Bulgaria	4	12
Croatia	0	2
Denmark	0	1
Finland	0	2
France	2	7
Germany	3	20
Greece	2	7
Hungary	4	7
International	0	1
Italy	5	6
Netherlands	5	11
Norway	1	1
Portugal	1	0
Romania	13	124
Serbia	4	12
Slovakia	1	3
Slovenia	1	4
Spain	4	1
Sweden	0	1
Switzerland	4	13
Turkey	0	1
UK	2	10
Ukraine	3	0
USA	3	7
Total	**96**	**364**

At the end, some conclusions were formulated:

3. Database represents a major contribution to the scientific community and is active, new information is still added – 4 observations in the last two weeks;
4. There is a significant larger number of projects entered from Austria, Romania, Germany and Switzerland;

Are there no other projects than the ones entered for the other countries? Or should efforts be made to have the remaining projects entered for these countries?

3. After the National funding type, the second major funding type is EC DG R&I;

4. Largest number of projects funded in Life Sciences, followed by Earth Sciences; Life Sciences and Earth Sciences are depended choices for funded projects;

5. From 1976 to 1994 there is no identifiable trend – either due to lack of funding or lack of information now about the projects funded during that time.

6. An increasing trend in funding from 1994 to an all time high in 2009, with a drop in the number of funded projects in the next 4 years.

7. Only 21% of the total number of projects that have been identified are active, hence the new strategies should help improve these numbers;

8. Not enough information about the output of the projects – work in progress.

Following the presentation some comments were made:

C1: The merit of the project is that its database represents a step forward in terms of information in the Danube Region.

C2: The terminology of the questionnaire is not the best, to encourage people to participate, use: ex. 'Upload your project'.

C3: Make clean pies for the projects that interconnect for the projects that don't.

6. Introduction to the workshop. Methods and programme

Dr. Panagiotis Michalopoulos, from the Hellenic Centre of Marine Research presented briefly the purpose of the workshop. The analysis performed on the projects from the data base were presented critically to the representatives of the business community and discussed critically. The main objectives are:

- To present results to business reprezentatives and discuss them critically.
- To help the identification of strengths, weaknesses, opportunities and threats in research and integrated management in the Danube river-Black sea macrosystem .
- To provide input toward:
    - Developing a regional science and innovation agenda in the Danube – Danube Delta – Black Sea.
    - Drafting detailed plans for the development of regional distributed research infrastructures, covering all aspects of environmental sciences.
    - Designing an education program aiming at strengthening the human capital in the field of an innovative integrated management for the Danube – Danube Delta – Black Sea macrosystem.

In order to achieve the objectives, the approach is to use group discussions with the aid of Questionnaires to help identify:

- Thematic priorities for a research agenda
- Best future approaches to education in the fields of ecosystem research and management for the Danube – Danube Delta – Black Sea macrosystem.
- Areas of activity, and potential contribution of a distributed research infrastracture to the advancement of research, education, planning in the Danube – Danube Delta – Black Sea macrosystem.

The participants were asked to fill in a 'Thematic Priorities Questionnaire'.

The questionnaire has three main sections:

a) Thematic Priorities related to Horizon 2020 Societal Challenges

b) Thematic Priorities related to the Danube Ecosystem as a whole and its services.

c) Thematic Priorities Related to Water Issues in the Danube Region.

Participants were asked to fill in an 'Educational Priorities Questionnaire'.

Participants were asked to fill in a 'Research Infrastructure Priorities Questionnaire'.

Several comments were made related to the Thematic Priorities Questionnaire:

C1 (from a representative of the science community): Is there a disconnection between what EU proposes and business needs in terms of thematic priorities? Do you actually need this from the scientific (agenda) community?

A: Not really, it depends mostly on country and region, some of the points are of interest for the business community.

C2: The questions are too general, maybe would be better to adapt them on country and region (for example, coastal issues are rather regional, local).

C3: Stakeholders manage the Danube Region by region/country, keeping in mind that it should be seen as a system.

C4: A Better management of the system means to come up with solutions – make innovation – ask how we can use the system to solve the problem.

C5: How to do more with less money - combine efforts from the countries of the Danube Region to achieve something for the entire macrosystem.

C6: Find economic and political solution to these problems in addition to technical solutions.

C7: For each of the identify issues on the scientific agenda create databases per region/system (ex. Maps for soil as a resource, state of conservation, etc.)

A general comment: Put in parallel for a specific question, the answers from the scientist and the business community and make comparisons.

The group discussions for each of the questionnaire continued the next day – 20.03.2014.

The discussions continued, on the results of the questionnaires. For the 'thematic priorities' questionnaire the results were observed in parallel, the inputs from the scientists and the business community (file to be sent separately – in the following phase).
Some comments were made:
C1: the terminology in the questionnaires is not very familiar to people from the business community (in general) and should be adapted.
C2: What people in business would like to see in the questionnaires? Why would they reply?
A: they would replay have on overview of the opportunities in the future. Suggestion: Short description of the purpose of the questionnaire at the beginning would be very welcomed and would make clearer the purpose of the questionnaires.
C3: Go online with the questionnaire – simplify, put it on the DANCERS site, for example.

Then, the participants were given time to complete the other questionnaires, on 'Education Agenda' and 'Research Infrastructures'. The results (their answers and the proposed topics to be added to the questionnaires) are to be communicated.

The meeting ended on Thursday, 20.03.2014.

Annex 1. List of participants:

Name	***Country***	***Organization***
Eva Kopataki <eva.kopataki@aquaprofit.com>	Hungary	Aquaprofit
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Alexandru Dan Ionescu office@marine-research.ro	Romania	Marine Research Ltd.
Istvan Gabor	Hungary	MTA CSFK FGI
Balazs Trasy	Hungary	ECTE TTK
Francesco Marabini franco.marabini@bo.ismar.cnr.it	Italy	ISMAR
Jeremy Gault <J.Gault@ucc.ie>	Ireland	University College Cork
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Robert Devoy r.devoiy@icc.ie	Ireland	UCC
Panagiotis Michalopoulos <pmichalo@hcmr.gr>	Grece	Hellenic Centre for Marine Research
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Cristian Cudalbu c.cudalbu@geoecomar.ro	Romania	GeoEcoMar
Madalina Nailia	Romania	GeoEcoMar

madalina@geoecomar.ro		
Adrian Stanica astanica@geoecomar.ro	Romania	GeoEcoMar

Annex 2. Agenda of the meeting

19 / 20 March 2014

Venue: ***HOTEL HOWARD JOHNSON –*** *Calea Dorobantilor nr. 5-7, Sector 1****, Bucharest***

Wednesday 19 March 2014

09.30 –10.00 **Registration of participants**

10.00 -10.10 **Welcome addresses**

Adrian Stanica, Scientific Director of GeoEcoMar

Introduction of participants

Tour de table

10.10 -10.35 **New Research and Innovation oportunities provided by the Horizon 2020 Programme in the Danube Region**

Alexandra Vancea, Marie Curie Coordinator – Ministry of National Education – Activity of Research

10.35 -10.50 **Presentation of FP 7 DANCERS Project**

Adrian Stănică – project coordinator (RO)

10.50 -11.20 **Presentation of the DANCERS Data Base of Projects**

Mihaela Păun, NISB

11.20 – 11.50 **Coffee break**

11.50 – 12.20 **Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)**

Adrian Stanica, project coordinator on behalf of Christos Fragakis, EC Officer, DG Research and Innovation

12.20 – 12.40 **Introduction to the workshop. Methods and programme**

Moderator: Panagiotis Michalopoulos, HCMR

Adrian Stănică – project coordinator (RO)

12.40 – 13.00 **Group discussion of state of research in the Danube Region.**

Participants will be asked to analyse this in terms of businesses (opportunities):

What is strong
What appears to be missing

What should be strengthened
By taking into account: domain / geographic distribution / field of interest

13.00 – 14.00 **Working lunch**

14.00 – 15.30 **Mapping of existing projects in Danube Area.**

15.30 – 16.00 **Coffee break**

16.00 – 17.00 **Development of a successful research & innovation agenda in the Danube – Black Sea Region (as support for innovative businesses in this area)**

Group discussions

17.00 – 18.00 **Medium and long term needs on human resources (education programs) in the field of water management and research in the Danube – Black Sea Region**

Group discussions

19.00 – 21.30 **Working dinner**.

Thursday 20 March 2014

09.00 - 09.10 **Welcome and agenda of the day**

Adrian Stănică, GeoEcoMar

09.10 – 10.10 **Ideas of a new distributed Research Infrastructure in the field of water management and research in the Danube – Black Sea Region, in support of businesses.**

Group discussions

10.10 – 10.40 Coffee break

10.40 - 12.00 **Conclusions of the Workshop**

All partners

12.30 – 14.00 **Joint lunch**

Annex3. The questionnaires with inputs from the participants (end of tables)

1. **Thematic priorities**

Questions 1-4. THEMATIC PRIORITIES Related to Horizon 2020 Societal Challenges in the Danube Region

1. *Horizon 2020 societal challenges will be the guiding principles for the future research direction in Europe. Which are the most relevant scientific areas in terms of societal challenges In the Danube Region?*

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*

11.1 Health, demographic change and wellbeing	☐	☐	☐	☐
1.2 Food Security, sustainable agriculture, marine and maritime research and the bio-economy	☐	☐	☐	☐
1.3 Secure, clean and efficient energy	☐	☐	☐	☐
1.4 Smart, green and integrated transport	☐	☐	☐	☐
1.5 Climate action, resource efficiency and raw materials	☐	☐	☐	☐
1.6 Inclusive, innovative and reflective societies	☐	☐	☐	☐
1.7 Secure societies to protect freedom and security of Europe and its citizens	☐	☐	☐	☐

2. With respect to Societal Challenge 1.2 (Food Security, sustainable agriculture, marine and maritime research and the bio-economy) which themes are more relevant in the Danube Region.

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
2.1 Sustainable agriculture and forestry	☐	☐	☐	☐
2.2 Sustainable and competitive agri-food sector for a safe and healthy diet	☐	☐	☐	☐
2.3 Unlocking the potential of aquatic living resources	☐	☐	☐	☐
2.4 Sustainable and competitive bio-based industries	☐	☐	☐	☐

3. With respect to Societal Challenge 1.3. (Secure, clean and efficient energy) which themes are more relevant in the Danube Region.

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
3.1 Reducing energy consumption and carbon footprint through smart and sustainable usage	☐	☐	☐	☐

3.2 Low-cost, low-carbon electricity supply	☐	☐	☐	☐
3.3 Alternative fuels and mobile energy sources	☐	☐	☐	☐
3.4 A single, smart European electricity grid	☐	☐	☐	☐
3.5 New knowledge and technologies	☐	☐	☐	☐
3.6 Robust decision making and public engagement	☐	☐	☐	☐
3.7 Market uptake of energy innovation, empowering markets and consumers	☐	☐	☐	☐

4. With respect to Societal Challenge 1.5 (Climate action, resource efficiency and raw materials) which themes are more relevant in the Danube Region.

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
4.1 Fighting and adapting to climate change	☐	☐	☐	☐
4.2 Sustainably managing natural resources and eco-systems	☐	☐	☐	☐
4.3 Ensuring the sustainable supply of non-energy and non-agricultural raw materials	☐	☐	☐	☐
4.4 Enabling the transition towards a green economy through eco-innovation	☐	☐	☐	☐
4.5 Developing comprehensive and sustained global environmental observation and information systems.	☐	☐	☐	☐

Questions 5-10. THEMATIC PRIORITIES Related to the Danube Ecosystem and ecosystem services

5 . Please indicate the relevance of Provisioning Ecosystem Services for the Danube Region

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*

5.1 Food and fiber	☐	☐	☐	☐
5.2 Fuel	☐	☐	☐	☐
5.3 Genetic resources	☐	☐	☐	☐
5.4 Biochemicals, natural medicines, and pharmaceuticals	☐	☐	☐	☐
5.5 Ornamental resources	☐	☐	☐	☐
5.6 Fresh water	☐	☐	☐	☐

6 . Please indicate the relevance of Regulating Ecosystem Services for the Danube Region

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
6.1 Air quality maintenance	☐	☐	☐	☐
6.2 Climate regulation.	☐	☐	☐	☐
6.3 Water regulation	☐	☐	☐	☐
6.4 Erosion control	☐	☐	☐	☐
6.5 Water purification and waste treatment	☐	☐	☐	☐
6.6 Regulation of human diseases.	☐	☐	☐	☐
6.9 Pollination.	☐	☐	☐	☐
6.10 Storm protection.	☐	☐	☐	☐

7. Please indicate the relevance of Cultural Ecosystem Services for the Danube Region

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
7.1 Cultural diversity	☐	☐	☐	☐

7.2 Spiritual and religious values	☐	☐	☐	☐
7.3 Knowledge systems (traditional and formal)	☐	☐	☐	☐
7.4 Educational values	☐	☐	☐	☐
7.5 Inspiration	☐	☐	☐	☐
7.6 Aesthetic values	☐	☐	☐	☐
7.7 Social relations	☐	☐	☐	☐
7.8 Sense of place	☐	☐	☐	☐
7.9 Cultural heritage values	☐	☐	☐	☐

8. Please indicate the relevance of Supporting Ecosystem Services for the Danube Region

	High relevance	*Medium relevance*	*Low relevance*	*No relevance*
8.1 Soil formation and retention	☐	☐	☐	☐
8.2 Nutrient Cycling	☐	☐	☐	☐
8.3 Primary Production/ Photosynthesis/Production of Atmospheric Oxygen Gas	☐	☐	☐	☐
8.4 Water cycling	☐	☐	☐	☐
8.5 Provisioning of habitat	☐	☐	☐	☐

9. Please indicate the importance of the following human modifications in ecosystem processes in the Danube Region where scientific effort should be directed.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
9.1 Disease emergence (e.g. flooding due to climate change can cause the spread of edidemics).	☐	☐	☐	☐

9.2 Fisheries collapse	☐	☐	☐	☐
9.3 Species introductions and losses	☐	☐	☐	☐
9.4 Regional climate change	☐	☐	☐	☐
9.4 Eutrophication and hypoxia	☐	☐	☐	☐

9.6 Forestry: changes in ecosystem services due to climate Changes+ Wrong forest management+ (managing with climate change, pest & pathogens, defforestation, soil & water retention, carbon loss, groundwater changes, etc...).

9.7 Land Use change

10. The Millenium Assesment report has identified the following risks to ecosystem services that are most likely to lead to irreversible downgrading in the future. Please rank them with respect to their importance in the Danube Region. Add any other risk you consider appropriate and rate its importance.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
10.1 Water Cycle. Water withdrawals from rivers and lakes for irrigation or for urban or industrial use, large reservoir construction.	☐	☐	☐	☐
10.2 Carbon Cycle. Changes on ecosystem function as a net source/sink of CO2 due to afforestation, reforestation and forest management, degradation of agricultural, pasture,and forestlands, land use change, changed agriculturepractices, the fertilizing effects of nitrogen deposition and increasing atmospheric CO2 .	☐	☐	☐	☐
10.3 Nitrogen Cycle. Increase in reactive or biologically available nitrogen due to use of fertilizers and its effects in terrestrial and marine ecosystems	☐	☐	☐	☐
10.4 Phosphorous Cycle. Increased use of phosphorous fertilizers and other substances, accumulation in agricultural soils and its effects in terrestrial and marine ecosystems.	☐	☐	☐	☐
10.5 Other.	☐	☐	☐	☐

Soil as a resource – conservation & management

11. In the past 50-100 years, the following direct drivers have caused significant changes in terrestrial ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in terrestrial ecosystems of the Danube Region likely to cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other direct drivers you may consider relevant.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
11.1 Land cover change	☐	☐	☐	☐
11.2 New technologies for the provision of food, timber, fiber.	☐	☐	☐	☐
11.3 Pollution/nutrient loading	☐	☐	☐	☐
11.4 Climate change	☐	☐	☐	☐
11.5 Other (Please add)	☐	☐	☐	☐

11.6 Land Use change

11.7 Alien + invasive species, degradation of (mamal ???) systems

Working with nature = eco-engineering
Groundwater flooding / lack of groundwater recharge = extreme variations of the groundwater level (with potential impact on land subsidence)
Alterations of water recharge due to dams
= understanding the dynamics of the entire system!!

12. In the past 50-100 years, the following direct drivers have caused significant changes in freshwater ecosystems and their services. Based on your expert opinion, rank the most important direct drivers in freshwater ecosystems of the Danube Region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
12.1 Modification of water regimes	☐	☐	☐	☐
12.2 Alien species	☐	☐	☐	☐

12.3 Pollution/nutrient loading	☐	☐	☐	☐
12.4 Climate change	☐	☐	☐	☐
12.5 Other (Please add)	☐	☐	☐	☐

12.6 Comment on 12.3 Pollution/Nutrient loadingd. Depends on the country in which it is relevant as WWTP-s are underdeveloped. Tertiary treatment is not yet available.

13. In the past 50-100 years, the following direct drivers have caused significant changes in coastal ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in coastal ecosystems of the Danube Region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

	High Importance	*Medium Importance*	*Low Importance*	*No Importance*
13.1 Fishing pressures	☐	☐	☐	☐
13.2 Alien species	☐	☐	☐	☐
13.3 Land, River,Ocean-based Pollution/nutrient loading	☐	☐	☐	☐
13.4 Climate change	☐	☐	☐	☐
13.5 Habitat Loss/Conversion	☐	☐	☐	☐
13.6 Sediment Starvation	☐	☐	☐	☐
13.7 Other (please add)	☐	☐	☐	☐

14. In the past 50-100 years, the following direct drivers have caused significant changes in coastal ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in the marine ecosystems of the Danube-Western Black Sea that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

	High Importance	Medium Importance	Low Importance	No Importance
14.1 Fishing pressures	☐	☐	☐	☐
14.2 Alien species	☐	☐	☐	☐
14.3 Land, River,Ocean-based Pollution/nutrient loading	☐	☐	☐	☐
14.4 Climate change	☐	☐	☐	☐
14.5 Other (please add)	☐	☐	☐	☐

THEMATIC PRIORITIES Related to Water Issues in the Danube Region
Questions 10-15 define themes of future water strategies. Please identify which fields in each theme described below you consider a priority for a water strategy in the Danube Region.
15. Sustainable Ecosystems (monitoring of threats, risk assessment, climate change scenarios)

	High priority	Medium priority	Low priority	No relevance
15.1 Ecological engineering (restoration of ecosystems, ecosystems resilience characterization)	☐	☐	☐	☐
15.2 Ecohydrology (relationships between hydrological processes and biotic dynamic; ecosystem responses)	☐	☐	☐	☐
15.3 Managing the effects of hydro climatic extremes on ecosystems (monitoring of drought events and water scarcity; early warning system; water management)	☐	☐	☐	☐
15.4 Developing ecosystem services approaches (ecological functionning of ecosystems, economic value assessment of ecosystem services)	☐	☐	☐	☐

16. Developing Safe Water Systems for Citizens

		High priority	*Medium priority*	*Low priority*	*No relevance*
16.1	*Emerging pollutants: assessing their effects on nature and humans, their behaviour and treatment opportunities*	☐	☐	☐	☐
16.2	*Minimizing risks associated with water infrastructures and natural hazards (towards urban flood proof cities; Exploiting ageing urban water systems for dependable and cost-effective service)*	☐	☐	☐	☐

17. Promoting Competitiveness in the Water Industry

		High priority	*Medium priority*	*Low priority*	*No relevance*
17.1	*Developing market-oriented solutions for the water industry (smart technology, water treatment)*	☐	☐	☐	☐
17.2	*Enhancing the regulatory framework (removing barriers to innovation)*	☐	☐	☐	☐

18. Implementing a Water-Wise Bio-based Economy

		High priority	*Medium priority*	*Low priority*	*No relevance*
18.1	*Improving water use efficiency for a sustainable bio-economy sector (efficient irrigation systems, water conserving farming and forestry)*	☐	☐	☐	☐
18.2	*Reducing soil and water pollution (efficiency of protection measures on water quality)*	☐	☐	☐	☐

19. Closing the Water Cycle Gap

		High priority	*Medium priority*	*Low priority*	*No relevance*
19.1	*Sustainable water management (water platform – observatory, management aquifer recharge)*	☐	☐	☐	☐
19.2	*Socio-economic approaches to water management*	☐	☐	☐	☐

Questions 20-30 define themes of water policies or activities. Please identify which fields in each theme described below you consider a priority in water activities in the Danube Region.

20 . WATER USE

		High priority	*Medium priority*	*Low priority*	*No relevance*
20.1	*Environmental*	☐	☐	☐	☐
20.2	*Agricultural*	☐	☐	☐	☐
20.3	*Forestry*	☐	☐	☐	☐
20.4	*Rural Water*	☐	☐	☐	☐
20.5	*Industrial*	☐	☐	☐	☐

21. WATER QUALITY/ECOLOGY

		High priority	*Medium priority*	*Low priority*	*No relevance*
21.1	*Ecological status (WFD)*	☐	☐	☐	☐
21.2	*Chemical status (WFD)*	☐	☐	☐	☐
21.3	*Indicators and monitoring*	☐	☐	☐	☐

21.4 Potability	☐	☐	☐	☐
21.5 Human health	☐	☐	☐	☐
21.6 Endangered species	☐	☐	☐	☐

22. WATER AVAILABILITY

	High priority	*Medium priority*	*Low priority*	*No relevance*
22.1 Water scarcity and drought	☐	☐	☐	☐
22.2 Flood risk management	☐	☐	☐	☐
22.3 Effects of and adaption to climate change	☐	☐	☐	☐

23. WATER TECHNOLOGIES

	High priority	*Medium priority*	*Low priority*	*No relevance*
23.1 Conveying and distribution	☐	☐	☐	☐
23.2 Desalination	☐	☐	☐	☐
23.3 Industrial water treatment	☐	☐	☐	☐
23.4 Urban water treatment	☐	☐	☐	☐
23.5 Irrigation	☐	☐	☐	☐
23.6 Efficiency and energy	☐	☐	☐	☐
23.7 Reutilization	☐	☐	☐	☐
23.8 Waste disposal	☐	☐	☐	☐

23.9	*Smart technologies*	☐	☐	☐	☐

30. WATER MANAGEMENT

		High priority	*Medium priority*	*Low priority*	*No relevance*
30.1	*Planning and management of water resources*	☐	☐	☐	☐
30.2	*River basin management (WFD)*	☐	☐	☐	☐
30.3	*Agricultural water management*	☐	☐	☐	☐
30.4	*Wastewater management/ sanitation*	☐	☐	☐	☐
30.5	*Coastal/transitional zones management*	☐	☐	☐	☐

31. ECONOMIC USE OF WATER RESOURCES

		High priority	*Medium priority*	*Low priority*	*No relevance*
31.1	*Hydro-power*	☐	☐	☐	☐
31.2	*Transports*	☐	☐	☐	☐
31.3	*Fishing*	☐	☐	☐	☐
31.4	*River beaches, recreation, etc.*	☐	☐	☐	☐

32 . Please provide priorities in the evaluation of impacts from any of the following environmental pressusres on Water related issues in the Danube Region

		High priority	Medium priority	Low priority	No relevance
32.1	Pollution from point sources	☐	☐	☐	☐
32.2	Pollution from diffuse sources	☐	☐	☐	☐
32.3	Emerging pollutants	☐	☐	☐	☐
32.4	Reduction of river continuity	☐	☐	☐	☐
32.5	Alien species	☐	☐	☐	☐
32.6	Water flow regulation /morphological alterations	☐	☐	☐	☐
32.7	Water abstraction	☐	☐	☐	☐

33. Please indicate the themes you consider research priorities. You can add other research priorities in the blank fields.

		High priority	Medium priority	Low priority	No Interest
33.1	Maintaining ecosystem sustainability	☐	☐	☐	☐
33.2	Developing safe water systems for citizens	☐	☐	☐	☐
33.3	Promoting competitiveness in the water industry	☐	☐	☐	☐
33.4	Implementing a water-wise bio-based economy	☐	☐	☐	☐
33.5	Closing the water cycle gap	☐	☐	☐	☐
Add Theme		☐	☐	☐	☐

Add Theme	☐	☐	☐	☐

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