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DELTAS AND WETLANDS

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  Tudor Marian, Köhler Berit, Museth Jon, Doroftei Mihai, Marinov Mihai, Mierlă Marian, Năstase Aurel, Dorosencu Alexandru, Lupu Gabriel, Tudor Mihaela, Covaliov Silviu, Ibram Orhan, Gómez-Baggethun Erik, Crăciun Anca

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☐ **Section I** - Biodiversity and nature conservation

1. Genetic diversity of five aquaculture strains of Russian sturgeon from Romania

Burcea Alexandru, Popa Gina-Oana, Florescu Iulia Elena (Gune), Dudu Andreea, Georgescu Sergiu Emil, Costache Marieta

University of Bucharest, Faculty of Biology, Department of Biochemistry and Molecular Biology, 91-95 Spl. Independentei, 050095, Bucharest 5, Corresponding author: Alexandru Burcea, e-mail: alexanburcea@gmail.com

Sturgeons have undergone years of population decline because of anthropic actions such as the constructions of dams and embankments, overexploitation and poaching. Aquaculture strains are an important source of sturgeon products for reducing the anthropic pressure on wild populations and of sturgeon individuals for restocking measures. We investigated five aquaculture strains of Russian sturgeon in order to assess their genetic diversity using mitochondrial and microsatellite markers. The entire *cytochrome b* gene (1141 bp) was amplified and sequenced for 51 individuals from five aquaculture strains raised in four fish farms from Romania. For microsatellite analysis we considered the following 12 loci: AciG93, AciG198, AnacC11, AnacE4, Aox27, AoxD234, As002, LS19, LS34, LS39, LS54 and Spl106. For data analysis we present the results as Maximum Likelihood (ML) and Markov chain Monte Carlo (MCMC) Bayesian inference phylogenetic trees for sequences and Principal Coordinate Analysis (PCoA) on the matrix for microsatellites. The sequencing results showed the presence of three haplotypes among the five aquaculture strains, this being backed up by the PCoA microsatellite analysis. The genetic variation within the aquaculture strains is non-existent while the haplotype diversity between all haplotypes was of 0.67175.The genetic results of this type of study represent a first step in a more complex approach with application in future restocking and *ex situ* conservation programs and in order to advise appropriate breeding schemas in aquaculture.

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2. Evaluation of vegetal diversity of the limestone quarry „Lafarge Ciment" (Moldova S.A.)

Certan Corina, Bulimaga Constantin, Grabco Nadejda

Institute of Ecology and Geography of the Academy of Sciences from Moldova, street Academiei, 1, Chisinau, Republic of Moldova, Phone/Fax 022723544, Corresponding author: Certan Corina, e-mail: certancorina@mail.ru

The „Lafarge Cement" is situated in the northern part of the Republic of Moldova, in 100 km from Chisinau and in 7 km from Rezina town. The cement factory is an industrial platform located in the valley of the Ciorna river, at the altitude of 50 m, bounded from the northeast and southeast with hills of height 100-150 m and down-grades of 40 degrees. The object of the research was the flora from the „Lafarge Cement" stone quarry from Rezina. Floristic research is focused on the study of the flora biodiversity and elaboration of a management plan in order to recover the flora of the „Lafarge Cement" quarry ecosystem. The study was focused on the taxonomic investigation of the floristic diversity on adjacent to the quarry and in the proper quarry. There were identified 117 species of magnoliophyta from 43 families in the study area. The quarry dendroflora is represented by 20 species of arbors and shrubs. The species of accompanying plants which vegetate together with *Elaeagnus argentea Pursh* on the slopes of the dump storages are *Carpinus betulus L., Robinia pseudoacacia L., Acer negundo L.,* the most frequent shrubs are *Rosa canina L.* and *Crataegus monogyna Jacq.* At the same time, species of different age fruit trees were rarely found in sites within storages. Main species were: *Cerasus avium (L.) Moench, Armeniaca vulgaris Lam, Juglans regia L.,* which reached the quarry territory and probably were spread by birds. Those 117 species identified in the quarry represent around a quarter of the petrophyte ecosystem diversity which used to reach total 340 species which were represented by the spontan ones without including in this list ruderal and segetal species.

3. Genetic diversity assessment of Danube Delta Biosphere Reserve colonial waterbirds: a comprehensive study framework

Ciorpac Mitică, Taflan Elena, Onără F. Dalia, Doroșencu Alexandru, Alexe Vasile, Marinov Mihai, Suciu Radu

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The extensive wetland complex of the Danube Delta provides internationally important stopover sites and breeding grounds for millions of migratory birds. Worldwide, natural wetlands are facing an accelerated decline due to the increased urbanization and conversion of open spaces to agriculture. The Danube Delta is no exception, being subject to anthropogenic factors that affect this wildlife hotspot, in spite of considerable conservation efforts. Despite numerous studies focused on Danube Delta waterbird particularities, knowledge of them is limited and highly fragmented. To provide a framework for assessing colonial waterbird populations from the Danube Delta, we developed a comprehensive experimental design to answer existing questions regarding genetic diversity, genetic discontinuities and the degree of genetic differentiation. This paper describes a study which overlaps landscape genetics principles and a small genetic survey in order to provide a feasible framework for studying colonial waterbirds from the Danube Delta.
Keywords: waterbirds, Danube Delta, experimental design, genetic diversity, COX1.

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4. Aquatic habitats with conservative value from the Reserve " Plaiul Fagului "

Covali Victoria, Lilia Tîcu

"Moldsilva" Agency, Natural Reserve Plaiul Fagului, Stefan cel Mare Street, No.124,.Chisinau, e-mail: victoriamoldsilva©gmail.com

This artice presents the results of the research on the identification of conservative value of aquatic habitats from the "Plaiul Fagului" Reserve.
The study of the current status of aquatic habitats and the identification of conservative value of habitats is an important stage in the development and implementation of conservation management plans.
The aquatic vegetation in the protected area is poorly expressed, being present only by the banks of the aquatic basins, in the micro-depressions, in the places where water is stagnant, where the groundwater is close to the surface. The aquatic plant communities in the "Plaiul Fagului" Reserve, is attributed to 2 associations, 2 alliances, 2 orders and 2 classes. The characteristic associations are: *Scirpo-Phragmitetum* W. Koch 1926, *Typhaetum latifoliae* Lang 1973.
The floristic composition has been established, and analyzed from a biological, geographic, ecological, economic point of view, for each association.
The conservative value of phytocoenoses was assessed in accordance with the classification systems used at European level CORINE, EMERALD, EUNIS, NATURA 2000, PALAEARCTIC HABITATS.
As a result, were identified habitats of the two phytocenoses, Scirpo-Phragmitetum W. Koch 1926, and Typhaetum latifoliae Lang 1973, with moderate and low conservative value, being protected at European level:
– EMERALD: 22.31 Euro-Siberian perennial amphibious communities; CORINE: 53.11 Common reed (*Phragmites australis*) bed; PAL. HAB.: 53.113 Gigant Phragmites beds; EUNIS: C3.21 Phragmites australis beds.
– EMERALD: 22.31 Euro-Siberian perennial amphibians communities; CORINE: 53.13 Reedmace (*Typha* beds). PAL. HAB: 53.13, Reedmace beds; EUNIS: C3.231/232 *Typha latifolia/T. angustifolia* beds.

5. Variations of some toxic substances between years 2006 – 2015 in bottom sediments from Matita-Merhei Aquatic Complex

Despina Cristina, Seceleanu-Odor Daniela, Teodorof Liliana, Burada Adrian, Țigănuș Mihaela, Tudor Mihaela, Ibram Orhan, Spiridon Cosmin

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Corresponding author: Despina Cristina, e-mail: cristina.despina@ddni.ro

This study aims to provide an overview on accumulation of some toxic substances in the bottom sediments of some lakes from Danube Delta Biosphere Reserve (Matita-Merhei aquatic complex) in order to assess possible impact of various degradation processes on the environmental status of this protected natural area.
To achieve the proposed objectives in this study, annual average concentrations of 6 high toxicity elements (arsenic, lead, nickel, chromium, zinc and copper) were taken into consideration, determined during a 10 years monitoring period (2006-2015), using mass spectrometry with inductively coupled plasma (ICP-MS) and reported to Water Framework Directive (2000/60/EC), transposed into Romanian legislation through Order M.M.G.A. no. 161/2006 for the aproval of the Normative concerning the classification of surface water quality in order to establish the ecological status of waterbodies.
Study results showed a decreasing trend for lead and zinc concentrations within 2006-2009 period and for arsenic and nickel concentrations during 2006-2011. After the years 2009 and 2011, an improvement of the bottom sediment quality, with respect to toxic substances levels, in the studied area, was observed.
Keywords: *Danube Delta, heavy metals, sediment quality*

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6. Assessing mammal richness in winter 2016-2017 from camera-trap records in the Trofilca area - Danube Delta Biosphere Reserve – Romania

Doroșencu Alexandru, Alexe Vasile, Marinov Mihai, Kiss Janos Botond

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Corresponding author: Doroșencu Alexandru, e-mail: alexandru.dorosencu@ddni.ro

Danube Delta is regarded as a last frontier of biodiversity among European wetlands. Results from camera-trapping set in the fluvial area of Danube Delta Biosphere Reserve have been used to assess overall species richness of mammals, and to identify differences in temporally species detection rates. One camera station have been used during the winter season, December–March, of 2016–2017. From 78 trap-nights we obtained 531 independent photographs of wildlife species and 3 of feral dogs. Wildlife included 10 species of mammals (6 carnivores, 2 ungulates and two rodents) and 5 species of birds. Some species that probably occur in the area (e.g., European Badger *Meles meles* and European Mink *Mustela lutreola*) were not recorded, likely because of camera placement or rarity. The highest frequency and diversity of species per 24 hours was recorded in spring, at the end of February and beginning of March. The lowest activity rate for mammals was recorded in January with only 6 days/month ~ 20%. The most frequent species in January was the Wild Cat *Felis sylvestris* and the activity at the lowest temperature (-14° C) was detected for the Pine Marten *Martes martes*. The largest number of individuals was registered for Wild Boars *Sus scrofa* with a maximum of 7. Beside this the Raccoon Dog *Nyctereutes procyonoides* had the highest activity rate with 30 records for the entire studied period. Camera traps have proved the effectiveness in Danube Delta winter conditions for the surveying of medium and large terrestrial mammals.

7. Population and distribution of beavers in Europe, with an overview of management frameworks and techniques

Halley Duncan J.

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Formerly widespread throughout much of the Palaearctic region, Eurasian beaver *Castor fiber* populations were reduced through overhunting to c. 1200 animals, in eight isolated populations, by around the end of the 19th Century. Effective protection, the resultant natural spread, and widespread reintroductions have led to a powerful recovery in both range and population. The minimum population estimate in 2017 is 1.25 million individuals. There are about 4-6000 introduced N. American beavers *Castor canadensis* in Finland, with several thousand more in adjacent parts of NW Russia. Populations are now established in all natural range countries in Europe except for Portugal, Italy, and the Balkan peninsula south of Serbia. Habitat occupied ranges from wilderness areas to intensively managed landscapes with dense human populations, and from warm temperate to subarctic climates. Considerable further expansion in both range and population, especially in western Europe and the lower Danube basin, is predicted. If current trends continue, *C. fiber* will be a common mammal throughout much of Europe within the next few decades. This has important implications for ecological restoration of wetlands and riparian habitats, and their subsequent management. Beavers both create, and strongly modify, wetland and riparian habitat in the course of their activities in ways that can be difficult to predict or to control in detail. Countries across Europe have developed practices to adapt human management to the presence of beavers with the aim of maximizing the benefits of, and minimizing conflicts with, the species. The most successful techniques are reviewed.
Keywords: beavers, population, management, wetlands

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8. Inter-ministerial consultation for wetlands management

Hossu Constantina Alina, Ioja I.C., Nita M.R., Badiu D.L.

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Wetlands management is considered a key to the effective maintenance of the vital ecosystem services they provide, such as microclimate regulation, habitat and water provision, pollutant removal, flood control, etc. An important institutional arrangement for safeguarding such productive ecosystems is through protected areas. Wetlands protected areas need management plans to ensure a socially and ecologically acceptable management. To develop effective management plans prior inter-ministerial consultations in the development stage are important to ensure appropriate conservation activities and solve potential cross-sectoral conflicts. Therefore, our study explores the consultation reports made by ministries in relevant sectors (e.g. environmental protection, agriculture and fisheries, spatial planning and security) regarding the management plans of 29 wetlands protected areas in Romania. We examined 50 consultation reports of wetlands protected areas' management plans. Self-organizing maps (SOM), an artificial neural network and an unsupervised machine-learning method, were used to gather insights regarding the ways how such sectors conceptualize the management of wetlands protected areas. Our preliminary results reveal the sectoral aspects relevant for an effective wetlands management.

9. The factors affecting the acorns production of pedunculate oak

Jardan Natalia

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The paper presents the evolution of the formation, development and early abscission of the pedunculate oak acorns during vegetation season. The study was conducted in two variants: variant control and variant flower/ acorn isolated. Results showed that only 6,8% of the initial number of flowers have become mature acorns healthy. The non-fecundated flowers represented 21%, but 65,2 % felt down in the different stages of the acorns development. From the carpophagous insects, *Curculio glandum* was that attacked 7% of the initial number of flowers. To the variant flower / acorns isolated, the healthy mature acorns constitute 13,8% of the initial number of flowers. As for the non-fecundated flowers and aborted acorns by the plant, they accounted 26,5% and 59,7%. An important role in acorns production of pedunculate oak it has the air humidity and soil moisture during the transformation of foliaceous buds in flowering buds, the period that takes place in the year preceding blooming.

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10. Ecological preferences and threat categories of Community interest insect species from Danube Delta Biosphere Reserve

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In Danube Delta Biosphere Reserve, according to NATURA 2000 Standard Form (ROSCI0065 Danube Delta), were been reported as present a number of 11 entomofauna species of Community interest whose conservation requires the designation of special areas of conservation (Directive 92/43 / EEC - Annex II) or which require strict protection (Directive 92/43 / EEC - Annex IV). These were targeted by a series of investigations to bring updated information related to the presence, distribution, abundance, reconfirmation of earlier reports, being take into account inclusive clarification of false alerts (as far as possible).
By defining ecology as a science that studies the relationships between organisms and their environment, at individual, population or community level, it was realized an synthesis of the ecological preferences of Community interest entomofauna species from ROSCI0065 Danube Delta, not before making an overview by biological and ecological characteristics point of view for those species.
It was also performed a review of the membership of each species to the legislation about protection of spontaneously genetic heritage at European or national level, to be elaborated a number of categories of endangerment at local level for entomofauna species of community interest from Danube Delta Biosphere Reserve.
Key words: Danube Delta, insect species of Community interest.

11. Monitoring the Great White Pelican (*Pelecanus onocrotalus*) and Dalmation Pelican (*Pelecanus crispus*) breeding populations using drones in 2016 - the Danube Delta (Romania)

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The Danube Delta colony of the Great White Pelican was evaluated in 2016 at 17,000 pairs, with a minimum of 15,000 and a maximum of 19,000 pairs. We used unmanned aerial vehicle (UAV) technology to count the number of nesting birds in the colony. The UAV-derived counts in 2016 show a 4 times higher number of pairs than the most recent estimates for Romania (4,100-4,500 pairs) and 3 times higher than for Europe (4,900 to 5,600 pairs). The possible causes of this increase are discussed. Preliminary analyses suggest that the remoteness and availability of nesting sites played a crucial role. This is supported by significant conversion of the reed bed to nesting units that started in the north-western part of the colony in 2014 and by 2016 there were already 17,076 pairs counted in this site alone. We put forth the hypothesis that Great White Pelicans play an important role in the expansion process of the open water areas from Hrecisca and Buhaiova Lakes to the detriment of floating reed beds. The Dalmatian Pelican status in 2016 shows that 290 pairs have been nested in the Danube Delta Biosphere Reserve (in 4 colonies) and 12 pairs on Taşaul Lake, sums up the total breeding population to 302 pairs in Romania. Considering the significant mortality caused by the avian flu virus in the previous year (at least 118 adult Dalmatian Pelicans were found dead) the discovery of new breeding colonies give new hope for long-term conservation of this species. UAVs proved their ability to survey hard-to-reach locations and increase counting precision for the Great White Pelican and Dalmation Pelican colonies in the Danube Delta. The results of our study suggest that UAV technology is a powerful tool for estimating Great White Pelican and Dalmation Pelican populations for research teams involved in precision monitoring and it provides up-to-date figures for management authorities. We highly recommend its application in further monitoring activities.
Keywords: UAV, colony, Great White Pelican, Danube Delta Biosphere Reserve, population, nesting pairs, Dalmation Pelican

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12. New nesting site for Dalmatian Pelican (*Pelecanus crispus*) in a polyspecific colony of aquatic birds on Taşaul Lake (Romania)

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In the Natura 2000 site, ROSPA 0060 Taşaul - Corbu Lakes, the nesting of Dalmatian Pelican (*Pelecanus crispus* Bruch 1832) have been confirmed in 2016. The presence of the species in the breeding season was regurarly recorded in this location since 2008. The novelty is that it is the first proved nesting of the species in Romania, except the Danube Delta Biosphere Reserve perimeter, in the last 100 years. The colony is located on the La Ostrov island on Taşaul Lake (Constanţa county). The island hosts a polyspecific colony of aquatic birds, 5 species being recorded during our investigations. In the first phase several counts have been performed from the lake shore using adequate optical equipment and on 24th of June 2016 a direct count on the island have been done. The colony comprises 3 orders *Pelecaniformes*, *Ciconiiformes* and *Charadriiformes*: Dalmatian Pelican (*Pelecanus crispus*) - 12 pairs, 800-900 pairs of Great Cormorant (*Phalacrocorax carbo*), 100-200 pairs of Little Egret (*Egretta garzetta*), 30-50 pairs of Night Heron (*Nycticorax nycticorax*) and about 1,000 pairs of Caspian Gull (*Larus cachinnans*). Monitoring of the colony should continue in the following years. Access to the island should be allowed only outside the breeding season of the Dalmatian Pelicans. The colony should be treated as a core area in Natura 2000 site.

13. Evolution of Anseriformes in the Ramsar site "Prutul de Jos" in the last 50 years

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Prut River's basin in one of the main migratory routes of geese and ducks, and lower river lakes are their favorite breeding places. In 60s of XX century, marshes retained their natural appearance, with many floating islands (islets) that outlined existing relative deep lakes, rich in emergent vegetation (reed, mecereed, sedge, fern). Tributaries of Prut River crossing the marshes maintained running water. During spring migration for a short time, for the rest and feeding, appear large flocks of *Anas platyrhynchos, Anas crecca, Anas querquedula* and smaller flocks of *Anas strepera*, *Anas acuta, Anas penolope, Aythya fuligula* etc. Islets and the belt between the river and lake were ducks' favorite nesting places and reed-bed served as nesting places for *Anser anser*. On islets of few dozen square meters were 7-8 nests of 3-4 species of ducks. Most numerous nesting species were *Aythya nyroca* and *Anas platyrhynchos*, followed by *Anas strepera, Anas querquedula, Aythya ferina*. A few pairs of *Netta rufina* were nesting on marshes of Manta Lake. With the destruction of islets caused by big floods, followed by strong winds, siltation of lakes and high temperatures during the breeding period, the number of nesting waterfowl birds was significantly reduced. The disappearance of islets has strongly affected the nesting possibilities of diving ducks species. *Aythya nyroca* has become a critically endangered species; *Anas platyrhyncos* has reduced their number several times similar with other duck species. On some likes disappeared *Anas strepera*, *Anas clypeata*, *Anas quqrquedula* as nesting species, but a few pairs of *Anas crecca* appear. The number of nesting *Anser anser* was reduced tenfold, up to 20 pairs.

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14. Dynamics of the Species *Pelecanus Onocrotalus* in the Natural Reserve "Lower Prut"

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This paper presents the multiannual dynamics of the *Pelecanus onocrotalus* species within the reserve of Lower Prut, an area of international importance, especially as a habitat of aquatic birds. Personal data were collected between 2010-2016.

The great white pelican is a protected species throughout Europe, also endangered species in the Republic of Moldova. He is a summer guest of the studied territory, being present from the second decade of April only to feeding and resting.

Their number starts with 2-3 specimens and sometimes increases up to 2000. Some specimens are kept throughout the spring and summer season until September, others fly to the lakes of Manta, Taraclia or Congaz. The presence of the great white pelican in the perimeter of Lake Beleu is closely related to the hydrological level and abundance of food.

15. A molecular and ecological approach to offspring communities of two sturgeon species from a Lower Danube feeding area

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The sturgeons represent an extremely valuable natural heritage of the Danube River Basin from biodiversity, scientific perspective and socio-economical points of view. Beside the tremendous efforts made to protect and conserve these species and the fact that were and remain a research topic often approached, the present knowledges about their behavior are incomplete or even completely absent. To ensure a step forward in understanding sturgeons behavior in general and offspring ethology in particular, we developed a pilot study regarding the 2016 sturgeons offspring diversity in the Lower Danube River, Km 123, feeding area community. This approach will allow us to draw a hypothesis of the offspring behavior applicable in other feeding areas on the Danube River. This paper describes aspects of annual recruitment, fitness distribution and genetic diversity of two sturgeon species offspring. In conclusion, present paper presents a pilot study in sturgeon behavior that reveal several traits of offspring ethology, but even so, further analysis are needed to decode the sturgeons cryptic behavior.
Keywords: sturgeon, D-loop, diversity, feeding area

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16. Ectoparasites of bats in Romania – results of a new survey

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The ectoparasites deprive resources and energy, they can alter the host's behaviour and they can act as vectors for pathogens. The Romanian bats are mostly infested with bat flies (Nycteribidae), ticks (Ixodidae), mites (Spinturnicidae) but we can find fleas (Siphonaptera) and also bedbugs (Cimicidae). It is well known fact that ticks are able to transmit many pathogens and recently the same was proved about bat flies, moreover there was no comprehensive study aiming the bat flies after the early 1960's in Romania. We started our study in 2015, visiting 22 locations in Romania, mostly in Dobrogea and the Banat region; we collected data and ectoparasites from more than two thousand bats (26 species). Almost half of them being Schreibers' bat (*Miniopterus schreibersii*), but from the Genus *Myotis* we captured almost the same numbers. Among these, we captured rare species like the Mehely's horseshoe bat (*Rhinolophus mehelyi*), the Blasius' horseshoe bat (*Rhinolophus blasii*), the steppe whiskered bat (*Myotis aurascens*) or the Natterer's bat (*Myotis nattereri*). From ectoparasites we collected more than 700 tick specimens from 551 bats, belonging to 6 species. From 671 bats we have more than a thousand bat fly, belonging to 9 species. We also collected fleas from 31 bats (4 species). Beside the two ordinary bat specialist tick species (*Ixodes simplex* and *I. vespertilionis*), we also recorded for the first time in Romania, *Ixodes ariadnae*, which is a freshly described species from Hungary. Our results contribute to the knowledge regarding the geographical distribution of some bat species and the quality of their roosts. Another object of our research is to broaden the knowledge about the bat ectoparasites from epidemiological and ecological point of views.

17. Phylogeny of *Scardinius* Genus Inferred from Nuclear (*Rag1*) And Mitochondrial (*Co1*) Sequences

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The systematics of the cyprinids has always been disputed, mainly because the family holds a great morphological and genetic diversity, and the systematics based on morphological traits sometimes comes in contradiction with molecular data, this leading to the idea that the recognized monophyletic groups are surely misinterpreted. *Scardinius* is a genus of ray-finned fish within the Cyprindae family. It is comprised from 10 species and more than half of them have a status from near threatened (NT) to critically endangered (CR) on IUCN Red List. The aim of this study is to identify the phylogenetic relationship within *Scardinius* genera using both mitochondrial and nuclear markers. The total DNA was isolated for the species from Romania (*S. erythrophthalmus* and *S. racovitzai*) using different protocols according to the sample type. The PCR was carried out to amplify the mitochondrial cytochrome c oxidase I gene (COI) and the nuclear recombination activating gene I (RAG1) with specific primers. The GenBank sequences for *Scardinius* genera species for both genes were used as reference for phylogeny inference. Our findings show a complex relationship between the species belonging to the *Scardinius* genus. In the present study, *S. dergle* and *S. elmaliensis* seem to be the most distant species from the *Scardinius* genera, describing two basal clades. The common rudd (*S. erythrophthalmus*) appears to be polyphyletic, while the thermal rudd (*S. racovitzai*) doesn't form its own separate clade.

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18. Data regarding the ichthyofauna, benthofauna and riparian vegetation from the Siret River, downstream of Galbeni Reservoir

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The study below is done based on data obtained by researching the fish populations and benthic biocoenosis from the Siret River, nearby Bacau city. Our study was done in a zone which corresponds to middle sector, where the river forms a plateau with an average slope of 0.5 m / km. The data wants to highlight the structure of fish populations of the river, downstream of Galbeni Reservoir and the benthic invertebrate populations, in order to see the possible relationships between these and the importance of the riparian vegetation as refugee and reproduction places, correlate with local biodiversity. The fish catchments were done through several years, from the main course of the Siret and from some aquatic accessories meadow area. Benthos quantitative samples were taken in autumn of 2016 from different sites which correspond with some fishing points along the river, downstream of Galbeni Reservoir. The paper will be present a list of taxonomic composition of recorded ichthyofauna, the ecological status of fish species and some indices regarding the distribution of these in the different fishing sites. Regarding the benthos, a list with main identified taxa will be presented in the paper. Percent qualitative composition in studied sites will be analyzed and some synecological indices (as abundance, frequency, dominance and Dzuba indices) will reveal characteristic groups of the ecosystem. Potential local threats of anthropogenic or natural origin will be taken into consideration.
Keywords: Middle Siret, fish populations, benthic invertebrates, aquatic vegetation

19. Distribution, ecology and vectorial role of *Rhipicephalus rossicus* in the Danube Delta region

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Among medically relevant arthropods, ticks are probably involved in the transmission of most pathogens, being competent vectors for a large variety of parasites, bacteria or viruses. While their medical importance is acknowledged and most disease have a long epidemiological history, most tick-borne diseases show an emerging pattern throughout Europe (and some even globally). This study covers the distribution, ecology, vectorial role and epidemiologic importance of a range-expanding tick species, *Rhipicephalus rossicus*. This species is a proven vector for Crimean-Congo Haemorrhagic Fever, Q-fever, tularaemia and West Nile virus, while it's vectorial competences for *Rickettsia* spp., *Anaplasma* spp., and *Cercopithifilaria* spp. are hypothesised. By collecting ticks from hosts and the environment, we assessed the distribution (18 new locations) and potential hosts of the species (66 vertebrate species tested, only 6 hosting this tick species). Using molecular techniques we screened ticks for DNA of bacterial pathogens: *Rickettsia*, *Anaplasma*, *Borrelia, Bartonella, Coxiella, Francisella* and *Ehrlichia* genera; as well as for the presence of the three piroplasmid genera: *Babesia*, *Theileria* and *Hepatozoon*. Even though 6 species of Spotted Fever Group *Rickettsia* (*R. monacensis*, *R. massiliae*, *R. slovaca*, *R. raoultii*, *R. helvetica, R. mongolitimonae*), 3 genospecies of *Borrelia* (*B. burgdorferii* ss, *B. afzelii* and *B. myamotoi*), *A. phagocytophilum* and three piroplasmid genera were found in ticks collected in the region, *Rh. rossicus* were infected only with *R. monacensis* and *B. canis*. The low prevalences of pathogens found in the tested *Rh. rossicus* are probably caused by a recent expansion of this species (founder effect), which is currently just expanding its geographical range and the localised samples are currently generally pathogen-free.

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20. Aspects regarding macrophytic vegetation from Danube Delta lagoons

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Danube Delta Biosphere Reserve, the largest wetland under the Ramsar Convention (from the total of 600 that are in attention of the Convention), represents for Europe the northern boundary of Mediterranean flora and fauna. This Reserve includes specific ecosystems, where we can find strictly protected and preserved areas, with species of particular importance at European and global level. Reserve territory is characterized by a particularly high biodiversity, both because of its geographical position and specific genesis of Delta, this resulting in a variety of aquatic, marsh and terrestrial habitats. According to research conducted over the years, of the 1,000 species of cormophyte flora, approximate 120 aquatic species are part of aquatic and palustrine associations. The purpose of this paper is to contribute to the study of aquatic macrophytes, both submerged and floating flora, with observations from Danube Delta lagoons, Musura, Zătonul Mare and Sinoe. Present study was conducted over a period of two years when expeditions that took place several times a year were made in different seasons, because, due to seasonal variation in water quality, there might be a significantly seasonality of the vegetation also. Study of the Danube Delta flora is important, taking in consideration that plants of this area are of social, economical and ecological importance, and not lest they are subject to human pressure.
Keywords*:* Danube Delta lagoons, aquatic vegetation

21. Alien species in Danube Delta Biosphere Reserve – current status

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Danube Delta is a unique area in terms of European biodiversity. Included in a biosphere reserve, Danube Delta is practically the last delta of Europe where habitats were preserved in a near-natural state. In such a territory where biodiversity conservation represent a major challenge, the presence of alien species, some with the status of invasive species, is an issue that requires special consideration. The number of established alien species in the Danube Delta is known today. From Danube Delta area are mentioned both species of invertebrates and vertebrates with status of alien species. Chinese pond mussel *Sinanodonta woodiana*, asian clam *Corbicula fluminea*, zebra mussel *Dreissena polymorpha,* the little New Zealand mudsnail *Potamopyrgus antipodarum*, the Chinese mitten crab *Eriocheir sinensis*, are just some of the species that have this status. There are also a number of other species about whose spreading in Danube Delta habitats is know very little. These include the entoproct *Urnatella gracilis*, the magnificent bryozoan *Pectinatella magnifica*, the north american tubificid *Branchiura sowerbyi*. Then there is a whole category of invasive species whose appearance in the Lower Danube and including Delta is sadly predictable, and we know almost nothing about their possible impact in danube Delta habitats. Here we can speak of species as the north american spiny-cheek crayfish *Orconectes limosus* (unfortunately associated with the lethal crayfish plague fungus - *Aphanomyces astaci*) already advancing downriver Danube, the *Procambarus* crayfish species, or even of the atypical freshwater jellyfish *Craspedacusta sowerbyi*. What is especially needed now is an inventory of all these alien and/or invasive invertebrates, vertebrates or plants species, as the investigating how their presence deltaic ecosystem change. Even if some of these species do not seem to have a significant effect, in terms of biodiversity conservation the invasive species phenomenon it is a problem that can not be neglected.

Keywords: Danube Delta, alien species, biodiversity conservation'

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22. Towards an Ecosystem-Based Management in the Lower Danube Region (Romania)

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Human activities affected in different ways the natural patrimony of the Danube Delta Biosphere Reserve (DDBR) and of the areas located in the Danube river valley upstream of the DDBR. The main civil works performed in the DDBR were: building of dams (activity that drastically reduced or practically eliminated several types of natural habitats – e.g. the ones suitable for amphibians and other species adapted to wetlands -, modified the reproductive biology of various fish species - mostly the ones belonging to Family Cyprinidae –, respectively, interrupted the lateral connectivity), meanwhile the periodical and frequent dredging (de-clogging) of channels affected several species depending on the undisturbed waterways (e.g. *Palingenia longicauda*, amphibians etc.) and also interrupted the lateral connectivity on several sectors of the channels. In case of the former Danube floodplain, upstream of the DDBR: building of Iron Gates I and II modified the dynamics of river sediments, interrupted the migration route of sturgeons and shads etc. meanwhile building of dams along the river interrupted the lateral connectivity, respectively had as result loss of natural habitats on a surface of about 500,000 ha (currently, agricultural polders). The ecosystem-based management is a proper approach in order to reduce the negative impact of human activities in the Lower Danube Region. The present work was prepared in the frame of the project *Knowledge, Assessment and Management for **AQUA**tic Biodiversity and Ecosystem Services a**CROSS** EU policies (**AQUACROSS**)*, financially supported by the European Commission, under grant agreement No 642317 (contract No 527/INCDDD/2015) (Horizon2020 Program – call H2020-SC5-2014-2015).

23. Up-dating the knowledge on the current distribution of *Perccottus glenii* in the Lower Danube Region (Romania)

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During 2016 there were performed several field-investigations in a total number of 34 sites from the Danube Delta Biosphere Reserve (DDBR), in order to assess the current status of the invasive *Perccottus glenii*, which entered this region at about 10 years ago. Several types of devices were tested to capture the specimens, as follows: in case of sites close to the river/lake shoreline, the specimens were caught with a mesh (net) with handle (the metal frame was reinforced with iron blades, in order to avoid its damaging when pulling the device through dense submerged vegetation); along the river/lake shoreline (waters were deeper than 1 m), the specimens were caught with a folded fishing dip-net trap; in large, open waters (lakes), sampling was performed with series of gills (having different mesh-sizes, combined as Nordic gill-net sets); in channels there were used folding portable crayfish cages, respectively, electrofisher device. The invasive species was recorded in 10 sites from the DDBR area. The works were performed in the frame of the project PN 16 28 01 03 ("Studiul modificărilor induse de speciile invazive în comportamentul şi dinamica populatională a vertebratelor native de interes conservativ din Rezervaţia Biosferei Delta Dunării" [Study of the changes induced by invasive species into the behaviour and populational dynamics of native vertebrates of conservative interest from the Danube Delta Biosphere Reserve]), financially supported by the Romanian National Authority for Scientific Research and Innovation, under contract number 47N/28.03.2016 ("Danube Delta" Core Program).

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24. Pontic shad (*Alosa immaculata*) and the Danube: towards decoding its life history

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The Pontic shad (*Alosa immaculata* Bennett 1835) is an anadromous species belonging to the Clupeidae family that spends the majority of its life in the Black Sea, but migrates into rivers - including the Danube via all three branches of the Danube Delta - to spawn. Populations of the Pontic shad are reported to have a declining trend and according to the IUCN Red List of Threatened Species the species is classified as vulnerable (VU). Although its migratory route up the Danube was shortened to 863 rkm by the construction of the Iron Gates II dam in 1984, it still represents a commercially important species in the downstream reaches of the Danube. Despite its high commercial and cultural value, knowledge of the life history of the Pontic shad remains surprisingly obscure and there have been almost no investigations into the details of its migratory behavior in the Danube. Features such as spawning migration triggering factors, confirmation of homing behavior and meta-population structure are guidelines for sustainable fish stock management and allow the design of effective medium- and long-term fisheries management strategies. To shed some much-needed light on the Pontic shad's life history we combine several morphological traits with the patterns of geo-climatic factors and individuals' records. The present study represents a framework for deciphering the life history of this anadromous fish by testing certain empirical hypotheses (environmental constraints to migratory behavior) and questioning if the current fisheries management approach is suitable in the long run.

25. Assessment of the aquatic ecosystems in Danube Delta Biosphere Reserve

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The paper classifies aquatic ecosystems in the Danube Delta Biosphere Reserve area and assesses their current ecological status and importance. Water pollution and water scarcity poses threats to human health and quality of life. The free flow of water, unaffected by pollution, is important for sustaining water-dependent ecosystems. A shortage of good-quality water damages aquatic and wetland environments, putting further pressure on flora and fauna that are already suffering the impact of anthropogenic activities (tourism) and climate change.
Keywords: Water Framework Directive, water quality assessment, Danube Delta aquatic ecosystems

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26. An inventory of species from the Danube Delta Biosphere Reserve

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Proliferation of human activities, resulting in habitat loss, habitat fragmentation, pollution, and the introduction of exotic species, has contributed to changes in biological diversity and integrity. The aim of this paper is to explore how far Danube Delta Biosphere Reserve (DDBR) biodiversity may be accounted for by taxonomic description, emphasizing diversity at the species level. This was done with reference to the total number of species currently recognized and the degree to which we can estimate the completeness of taxonomic knowledge. The Species Inventory Working Group consisted of regional and national inventory biologists from universities and research institutes. One of the objectives of the working group was to develop a species inventory checklist that will lead to comparable and useful monitoring data for the species component of biodiversity in the DDBR. Species inventories include all surveys undertaken to determine the presence of any native, exotic or invasive species. Historically, there has been too little data to allow resource managers to evaluate the state of the DDBR's biodiversity. Only in occasional cases have inventory and monitoring projects been designed to give statistically complete valid checklists over time. Most of these reports have focused on game species and species of economic interest. However, expansion of anthropogenic activities and increasingly more efficient methods of resource extraction have made it imperative for scientists and land managers to develop a clear picture of the status and trends of a wide array of species.

27. Research regarding the fish communities in the Basin of River Tazlău (Romania)

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Our research study has been performed in the basin of the River Tazlau (the main tributary of the River Trotus) during September 2015. The aim of the study is to assess the structure of the fish communities in the study area and to compare the data obtained with the prior data. In order to estimate the state of the fish communities an electrofishing was used. The sampling methods used in our research study were in according with the European requirements. Obviously, after identification we have released the fish specimens.
The fish individuals were collected from 29 sampling side placed along the main course of the River Tazlau and also on its main tributaries. An amount of 16 fish species has been identified, one of them being a non-native species (*Pseudorasbora parva*). The fish fauna has lacked in three of the sampling sites, at the spring of Tazlaul Sarat rivulet. Some of the physico-geographical parameters have been determined. An ecological analyze has been performed based on some of the ecological and biodiversity indices, and also the biological integrity index. The number of species in sampling sites ranged between 0 and 14. The species frequency in sampling sites ranged between 6.89 and 86.20%.

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☐ **Section II** - Environmental factors, Ecological Restoration and & Anthropic Impact

28. The investigation of the water quality and bed-sediment conditions in Cutetchi Lake, Danube Delta, Romania

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Danube Delta includes many ecosystems functioning in a dynamic environment that could be considered, each of them, as"natural laboratories". In this sense, Cutetchi Lake was chosen for conducting practical investigations (August 2016) and the obtained data will be used to evaluate the impacts associated with natural factors or human-related activities. Water samples were investigated for physical parameters and water-quality constituents. Bed-sediments samples were analyzed for the main lithological components and trace elements to identify the levels, distribution and the potential sources of heavy metals in surficial accumulations. Related environmental standards were used to evaluate the water and sediment quality. Results indicate that, in the surface water the mean concentration of the environmental indicators ranged mainly in line with sampling points and generally agreed with reference standard: transparency (0.94 m), dissolved oxygen (8.98 mg/l), temperature (22.39 ^{o}C), conductivity (392.2 µS/cm), total dissolved solids (196.1 mg/l), pH (7.91), Eh (22 mV), turbidity (5.06 NTU), total suspended solids (9.25 mg/l), nitrite-nitrogen (0.04 mg/l), nitrate-nitrogen (0,12 mg/l), soluble orthophosphates (0.15 mg/l), sulphates (39 mg/l), silica (4.22 mg/l). The mean sediment parameter values were: moisture (23.13 %), dry sediment content (76.87 %), total organic matter (75.53 %), total carbonates (3.29 %) and minerogenic fraction (23.18 %). In the bed-sediment, the average metal content was: Zn (102.17 mg/kg), Ni (44.77 mg/kg), Cr (73.23 mg/kg), V (75.30 mg/kg), Co (9.38 mg/kg), Pb (24.83 mg/kg), Cu (58.70 mg/kg), Cd (0.82 mg/kg), etc., and individual values only incidentally exceed the maximum recommended level. This work could be a basis for the ongoing evaluation processes of water and sediment quality.
Acknowledgements: The research leading to these results was financed from the Romanian National Authority for Scientific Research and Innovation – ANCSI –"Program Nucleu 37N/2016 – Proiect PN 16 45 01 04".
Keywords: assessment, bed-sediment, Cutetchi Lake, human impact, water samples

29. Restoration of wetland ecosystems from the Danube Delta Biosphere Reserve

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Within the Danube Delta Biosphere Reserve aquatic ecosystems, habitat restoration works are implemented in order to re-shape degraded connectivity of aquatic habitats to the main channels, as well as to restore the migratory routes of aquatic species. These are hydro-technical works of dredging side channels whose connection to the main channels is silted in the Danube River low water level condition and they do not longer asure the tertiary channels and lakes connectivity. This hydrological condition can last 2-3 months a year and some flora and fauna species feeding and reproduction are hardly disturbed. The paper presents the Sontea-Fortuna wetland ecosystems habitat restoration case study, as a general objective of the RESTORATION-DD project, implemented within 2015-2017. The three channels subject to dredging works are Trofilca, Peritesca and Draghilea. Their trough morphology is re-shaped as the bottom elevation from about +1.00 m asl, post-restoration gets -1.5 ÷ -2.00 m asl. The project area, about 7000 ha, 29% of the of Şontea-Fortuna hydrographic unit, is covered by main and secondary channels, fishery streams, low hollows, lakes, swamps and boasts. Its ecological restoration assures an improvement of hydrological regime, even in the Danube River low water level condition, as a prerequisite measure for biodiversity protection and conservation.

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30. Veesels Type Used In Fishing Activities In The Romanian Black Sea Coast During 1982 - 2016

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Fishing is a traditional activity that over time has had an essential role in the economy of marine regions. Fishing operations are both industrial and artisanal.
This paper describes the types of dimension used by operators in fishing activities along the Romanian Black Sea coast, covering the period 1982-2016.
The establishment of an coastal fishing fleet in early 1982 helped the Romanian fishery sector reach a higher stage in the realization of national programs and priorities for the enhancement of living marine expenditure in the Black Sea.
This is an overview of the existing equipment and facilities on board of fishing vessels and boats, of the fishing techniques and gears used on ships and boats for various target fish species.
Keywords: fish, fishing vessel boats, Black Sea, fishing techniques, target fish species

31. Habitat status within the DDBR ecological restoration areas

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Under the auspices of the Ramsar Convention, since 1994, within the Danube Delta Biosphere Reserve various restoration projects have been implementing on those wetland zones anthropologically modified through drainage and embankment works executed within 1980-1990. Thus, these zones become polders, disconnected from the Danube River natural flooding regime. After 1990, they were abandoned and got inefficient for the use they were set-up (agriculture: Babina 2100 ha and Cernovca 1580 ha, forestry: Furtuna East - West 2115 ha, and aquaculture: Popina II 3600 ha and Holbina-Dunavăţ 5630 ha). Within 1994-2007, these zones were subject to ecological restoration works to reconnect them to the Danube River flooding regime. This way, their wetland habitats and species have been recovered and the results are presented in this paper in terms of Natura 2000 habitats, for each area. To keep habitats in favorable conservation state, there is mandatory to maintain the DDBR hydrographical network good status as the water circulation take place in conditions good conditions too, even at low water level. For each habitat, a conservation status is showed, as stated by Article 17 (Habitats Directive). The habitat coverage, the species composition, the services provided and conservation perspective in concern with DDBR's management plan are the main challenges under the alluvial clogging process.
Keywords: Danube Delta, hydrotechnical works, habitats restoration, conservation state

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32. Nutrient Balance of two protected areas in the Prut River Basin

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In the period 2014-2015, field study on nutrient balance in the protected areas "Prutul de Jos" and "Padurea Domneasca" in the Prut River Basin was carried out calculate actual nutrient analysis of statistical material. The main aims of this study was to estimate fluxes of N and P from main sectors of local economy, to identify reference conditions in regard to nutrients for certain eco-regions according to the EU Water Framework Directive, to harmonize monitoring activities, and to provide recommendations for integrated river basin management in a transboundary perspective. For estimation of the nutrient fluxes next component of environment were studied: lake sediments with an organic nitrogen and phosphorus content of 0.2-0.4% and 0.06-0.09%, respectively, while soils in contrast were enriched with organic N (91-96%) and P (62-84%) from total ones. Aquatic vegetation (reeds) accumulated nutrients more efficiently (by 25%) than agricultural crops (probably to high mineral content of nutrients in sediments). Nutrient load to lakes by superficial runoff (mainly from agricultural lands) amounts to 80% of the total nutrient input and significantly enhances eutrophication. However, wetland restoration in the catchment can decrease nutrient load on water ecosystems by 70%.

33. Evolution of islets from Balta Ialomiței hydrographic system (km 345-241) between 1908-2016

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Study area is part of the Balta Ialomitei hydrographic system and belongs of Lower Danube sector, being characterized by the multitude of ramifications, secondary branches with islets between them, which indicates a state of hydromorphological instability of the riverbed. The analyzed sector in this paper it's between Bala bifurcation (Turcescu islet) from km 345 and up near the Borcea branch bifurcation (Vadu Oii – km 241).
Hydrographic changes produced over time in the hydrographic nodes Danube-Bala and Danube-Borcea, have considerably affected the morphohydrographic features of secondary branches. Thus, in the Bala-Danube bifurcation area, the consequences of riverbed changes, were reverberated by the increasing the takeover capacity of water by Bala branch to the detriment of Danube branch. This leads to a decrease in depths on the Danube branch at low waters, endangering the optimal depths for navigation, the occurence of critical points for navigation downstream, changes of islets and the main elements of riverbed. Thus, across the analyzed period, the number of islets present in the riverbed of the Danube branch, decreased between 1908-1960, remaining constant with small changes until 1990, after that is remark a consistent increase of the islets number until the end of interval studied. Also, it find an increase in the total length of the islets and also changes in their geometry and position, especially at the smallest of them.
Key words: islet, Danube branch, critical points, hydrographic changes

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34. Solid Waste Management the case study story for Danube Delta Biosphere Reserve for the improvement of the Ecosystem Based Management of the Danube River Basin

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The analysis of the current status of Solid Waste Management collection, reception facilities and services for garbage collection, transportation and recycle rate is the primary goal of the present case study.
Due to the lack of integrated waste management facilities corroborated with the lack of collection of floating wastes, the solid waste management is an important issue in Danube Delta coastal area that could damage both habitats of the coastal areas and public health.
One of the most impacted area affected by an inadequate management have been identified in Sulina, a city with 3.663 inhabitants in 2011 where land waste disposal site is located on the coast outside the residential area, in the Eastern part of the city, at a distance of 7 km.The unconformable landfill located entirely within Natura 2000, including both Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Its capacity has of 15,000 m^3 and area of 10.000 ha will be operational until May 2017 when is going to be closed.
Keywords: waste management, ecosystem based management, Danube delta

35. Some climate parameters evolution within Danube Delta Biosphere Reserve territory for 1961-2013 period

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This study aims to study the climate change knowing the climate parameters as an important step to determine the changes and their meaning. Knowing that the meaning of the changes is valuable information for future actions to adapt to climate change. For a consistent study, ROCADA dataset was used for the evolution of climatic parameters in the Danube Delta Biosphere Reserve territory. This is a set of daily gridded data for the entire Romanian territory, covering data from 1961 to 2013 with values for weather variables. From the mentioned dataset, there were extracted information for the Danube Delta Biosphere Reserve and a 20 km buffer zone. From the extracted data, it was taken into account a set of 16 points widely distributed in a manner to cover all the area in order to provide weather information as much as possible close to the reality from the field. Inside the expanded study area there were materialized the selected points (centred cell) in order to be relatively evenly distributed across it's the entire surface. In the point selection process, there were taken into account the S-N and V-E directions. From the data, the assessment of rainfall evolution for most points shows very little decrease which can be interpreted as a very slight increase of the dryness for the studied period. This very slight decrease in rainfall is supported by the low or very low negative correlation coefficients along the passing of the years. The area under research shows, in terms of climate, a trend toward aridity.
Keywords: Danube Delta Biosphere Reserve, climate change, precipitations, temperatures

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36. Integrating the environmental decision in the strategy of development of the organization

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Environmental decision has emerged as a new area of responsibility and accountability of the organization, along with economic and social fields. The level of harmonization of these areas from the perspective of sustainable development can be evaluated on the basis of analytical approaches, allowing normal curves and real reflection of environmental policy in the development strategy of the organization. For this purpose, considering the main areas of strategy development, we will prioritize their components so we can determine the percentage deviations between the two curves. The importance of the results lies not only in overall assessment (by adding the percentage deviations) but it also refers to the finding of over - and under - valuation of the efforts to integrate the environmental policy in the areas of the development strategy of the organization.
Keywords: sustainability, development, integration, hierarchy, misconduct

37. Reducing the pollutant emissions from inland waterway transport using innovative technologies (Green Danube) approached in partnership with CERONAV and INCDDD

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The Green Danube project consortium consists of 10 partners from the Danube riparian countries and brings together national & regional, public and private organizations, covering almost all sectors of the Danube waterway (DE, AT, HR, HU, RS, BG and RO) whose specific thematic background guarantees a solid knowledge of the challenges raised by the negative impact of IWT on the environment & the necessary expertise to tackle these problems by coming forward with appropriate innovative solutions.
Medium and Long Term Perspective of Inland Waterway Transport in the EU highlights that the market of Inland Waterway Transport is growing with about 80% until 2040 compared to 2010. Without policy intervention in the year 2020 the average emission level of air pollutants of inland navigation vessels will in many cases be higher than that of trucks. The transport sector is recognized as a major contributor to emissions, therefore it is important to support environmentally sound transport modes like Inland Waterway Transport.

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38. Deciphering natural environmental changes and human impacts from magneto-lithological archives in lake sediments: evidences from Lumina - Roşu Depression (Danube Delta, Romania)

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Over 15 lakes and swamps (*e.g.*, *Lumina*, *Roşu*, *Roşuleţ*, *Puiu*, *Puiuleţ*, *Iacub*, *Macuhova*, *Vătafu*), belonging to the *Lumina – Roşu Depression*, have been investigated by applying a methodological version of environmental magnetism. The paper analyses a large magnetic susceptibility (**MS**; **k**) database resulting from *ca.* 20 expeditions carried out in the Danube Delta during 1981 – 2015 time period. The lithological (**LITHO**) support of the **MS** records is discussed, based on three main components: minerogenic fraction, organic matter, and carbonates. The **LITHO** classification of the lake sediments is illustrated by using ternary diagrams, while for the **MS** characterization a **k** scale for recent sediments is used. The variability of the magneto-susceptibility régimes is exemplified by a series of **MS** maps. The **k** anomalies generated by the deposits from the channel entry mouths into the lakes are relieved inside of the **MS** maps. The effects of silting up or of polution are decreasing as much as the transport distance is increasing. The presented data prove the magnetic susceptibility as a sensitive marker for monitoring the natural environmental changes or the anthropic impacts taking place in the lakes. Moreover, the capability to detect and to define magneto-lithologically some marine deposits located very close of the water/sediment interface is exemplified. The *magneto-litho archive* constituted for surficial sediments and cores sampled from this lacustrine area is very important in the context of deciphering the spatial and temporal evolution of the deltaic geosystem.

39. Design of the experimental-set for studies on changes in behavior of native vertebrates in the presence of invasive fish species

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For shelfs (representing part of the research-infrastructure achieved in 2001, in the frame of the LIFE-NATURA/RO/06404 project) having four levels there were designed sets that include four types of experimental enclosures. One type of enclosure is resembling to only one of the following cases: a. both compartments are without aquatic vegetation (or other types of shelters); b. aquatic vegetation only in the compartment with the invasive species; c. aquatic vegetation only in the compartment where there is no invasive species; d. both compartments are without aquatic vegetation (or other types of shelters). The main target species is the invasive *Perccottus glenii*, in 2007 recorded for the first time in the Danube Delta Biosphere Reserve. The native vertebrates included into the tests are various amphibians (*Triturus dobrogicus*, *Bufo bufo*, *Pelophylax ridibundus* etc.) and fishes (*Rhodeus amarus*, *Cobitis* sp., *Leuciscus borystenicus* etc.) The experimental sets were built in the frame of the project PN 16 28 01 03 ("Studiul modificărilor induse de speciile invazive în comportamentul şi dinamica populațională a vertebratelor native de interes conservativ din Rezervaţia Biosferei Delta Dunării" [Study of the changes induced by invasive species into the behaviour and populational dynamics of native vertebrates of conservative interest from the Danube Delta Biosphere Reserve]), financially supported by the Romanian National Authority for Scientific Research and Innovation, under contract number 47N/28.03.2016 ("Danube Delta" Core Program).

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☐ **Section III** - Natural Resources and Socio-economic aspects

40. Study of pikeperch fisheries from Razim Lake, Danube delta, Romania.

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The Razim Lake is a great part of the Danube Delta Biosphere Reserve (DDBR), with a surface of 54,000 ha. Fish fauna from Razim lake include pike-perch (*Sander lucioperca)* as one of the main top predators of fish community, however ecological significance indicates accessory species, recedent as dominance, sometimes been subrecedent species like in 2011 and 2012 sampling, but constant species regarding frequency in sampling. Otherwise, pike-perch is an important value DDBR fishery species with an average of 5% in total catch, range 2-10%, from what Razim lake contributes with average 71%, range 41-95% in the 1960-2015 period. Pike-perch fisheries of Razim lake has been in average 13%, range 1-40% from total Razim lake catch, in the same period of time. Since in RBDD has been fishing up to 2000 fisherman, in Razim lake activated up to 500 fishermen, however nowadays number of fishermen was regulated at lower range. Catch data series shows a continuous stock decline trend, considered to be a consequences of habitat degradation and over-exploitation. Fish stock estimation in last 15 years (2001-2016) support the hypothesis of over-exploitation. Based on length frequency structure of landings the growth, and exploitation parameters have been estimated as well as the average biomass and the maximum sustainable yields for the Razim lake pike-perch stock. Recommendation concerning fisheries management towards sustainable pike-perch stock as increasing of cod-end seine mesh size and decreasing fishing effort regulation are outlined.

41. Contributions to improvement of Danube Delta Biosphere Reserve natural vegetal resources estimation methods

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Danube Delta Biosphere Reserve territory has an important quantity of natural vegetal resources such reed, pastures, herbs, melliferous plants, mushrooms. These resources must be annually assessed to lease/grant their harvesting right within Danube Delta Biosphere Reserve. Methods used for the vegetal resources estimation must be rapid, precise and as much as possible less expensive. The common parameter that is present in all potential estimation is surface covered by certain resource. This parameter is always critically influencing the estimation process therefore its precision is always important. We propose an original approach by using drones in mapping areas of D.D.B.R. territory natural vegetal resources where precision is critical for their potential estimation. Comparing results obtained by using methods using satellite images and drone mapping, superior results have been obtained in favor of the last ones. The main beneficiary of the results of this improvement would be the Danube Delta Biosphere Reserve Authority and the vegetal resources stakeholders.

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42. Assessment of the urban development degree based on integrated system of indicators for Sulina case study

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Any human settlement bears the imprint of society's defining characteristics, which is why urban planning requires scientific knowledge of the territorial distribution of demographic phenomena, of social-economic and urban spatial elements, which is the framework for the urban social life. Given the fact that Sulina is the only town in the Danube Delta, it was chosen as a case study for identifying the specificity of its urban area and for measuring its degree of development by approaching an integrated system of indicators covering a wide range of areas: sociodemographic, socioeconomic, urban space and the integrative index of urban development, which can be further used to support public policies and on which is based the strategy for sustainable development of human settlements. The study aims to capture how Sulina has evolved over the last decades when deltaic space has undergone numerous changes in its structure, functionality and status, geo-demographic and economic phenomena with their territorial manifestations, presenting spatial discontinuities and their effects.
Keywords: urban planning, integrative index of urban development, Danube Delta

43. Running of Pontic shad (*Alosa immaculata*) upstream Danube River and larva drifting downstream to the Black Sea in condition of 2016 migration

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The genus *Alosa* is present only in the northern hemisphere of the earth with four species living in North America and others five in Europe, from what Pontic shad (*Alosa immaculata*) is subject of present study. Migration environmental drivers as increasing of spring water temperature and river flooding in year 2016 favoured start of shad migration earlier than ussualy in February, with peak of spawning runn in April and the beginning of May the catches are no longer motivated fishermen fishing.
Reproduction success was estimated by Larval Abundance Index (LAI) that is Catch per Unit Effort (CPUE) expressed as number of larva per 100 m^3 water volume. Abundance of drifting larva in year 2016 comparing with other 6 previously years showed that average LAI varies in wide limits (2-1,252 larvae per 100 m^3) and reproduction in 2016 are also included in that limits, with an average of 84 lavae/100 m^3 which was ranked in regular reproductive success, except with maximum from year 1997.

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44. Systemic analysis of Danube Delta drinking water in the context of potable water management

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In the present study, an analysis of the flow of information has been carried out and a drinking water warning system has been proposed taking into account the parameters that may create problems for human health. The analysis was focused on parameters that are not currently included in national legislation being from this point of view a new approach for Danube Delta Biosphere Reserve. It represents a new and innovative approach that enhances the results on the distribution of new emerging natural pollutant in the water sources and the opportunities for the stakeholders involved, by understanding the components of the potable water management system. In order to upgrade the water quality, it is needed an improvement on the management of the water supply systems, with direct connection the presence of algae in the water source. As an extension of this approach, it is important for all the stakeholders (local communities, local authorities, regional and national authorities etc.) to be informed about the quality of the drinking water, by creating a virtual space where they have access to the researches in this area. Data regarding the analysis of the drinking water is accessible for viewing on a web-map which shows the sampling points in a specific colour taking into account the level of risk. This map is useful for all kind of stakeholders in order to be informed and take act at each level of involvement for a better drinking water quality.
Keywords: drinking water, operational system, management, web-mapping

45. Natural production of the calorific value from poplar clones and socio-economic aspects of its wider use in Slovakia

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Calorific value production from the above-ground biomass of stands was derived from its volume production. The mathematical models of growth tables of I-214 and Robusta poplar clones, biomass density values and calorific values of biomass dry matter were used for its calculation. At the stands age of 35 years and site indices of 20, 30 and 40, the calorific value has approximately 2,700, 6,000 and 9,300 GJ.ha^{-1} respectively the I-214 clone has higher production than Robusta in the first half of growth, albeit with minimum differences. Lowland forest locations with high level of ground water in Slovakia with the total area of 25,600 ha are most suitable for poplars production. On this area, we can calculate with mean annual production of 3,566 TJ of gross calorific value obtained from above-ground biomass, in the future. From that, about 64% is in wood, 14% in bark and 22% in small-wood. Up to 85% of this production potential is situated in the area of The Danube Lowland and the rest is mainly in southern areas of the middle and east Slovakia. Natural production of poplar clones increases the possibilities of economy activities diversification along with supporting regional policy of the Slovak republic which is also aimed at elimination of socio-economic disparities among regions. Those are mainly caused by high long-term unemployment of people with low qualification. Governmental support of the SR is starting to aim at the green economy development as regions least developed are characteristic by a high proportion of agricultural and forest land.
Keywords: calorific value production, poplar clones, green economy

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46. Bulgarian and Romanian Marine Fisheries and Aquaculture

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The transboundary character of the living resources from the Black Sea imposes the necessity for (1) coordinated efforts for fish exploiting and protection, at regional level and (2) fisheries sustainable development. For an effective management of fisheries, to be taken best decisions and suitable actions, it is necessary to provide (promptly, in time) scientific fundamental information reclaimed. The paper presents the state of marine fisheries supported by an overview of bibliographic research. It emphasise similarities and differences between Bulgarian and Romanian marine fisheries, evidencing needs for spatial analyses under the Maritime Spatial Planning. Under the frame of MARSPLAN-BS it was developed a study case of marine aquaculture and fisheries because of still persisting
- fragmented and irregular of fish stock assessment and monitoring at national level,
- lack of annual assessment of fish stocks at Black Sea basin,
- needs of fish stocks assessment for all fish species, missing in present, excepting the shared and migratory specie,
- incompatible and incomparable data and methodologies for assessment purpose.
These large differences in the economic and technical structure among the countries exploiting their common fishery resources of the Black Sea make the regional cooperation necessary exercise for their in sustainable way and use.
Keywords: marine fisheries, catches, fishing fleet, fishing gear, national legislation, management measures
Acknowledgement: The study has been carried out under technical and financial support of DG MARE Project *Cross border maritime spatial planning in the Black Sea – Romania and Bulgaria*, EASME/EMFF/2014/1.2.1.5/2/SI2.707672 MSP LOT 1/BLACK SEA/MARSPLAN-BS

47. Testing some extracts of plants from the Danube Delta with potential antiparasitic effect on equines

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The study was done during november 2016 on strongyls eggs from feces from a total of 28 horses in Tulcea county, C.A. Rosetti locality in the Danube Delta. To determine the degree of infestation was used the method McMaster and Stoll (adapted for quantitative larvohelmintology). The tests of hatching eggs (egg hatching assay - EHA) and larval development (larvae development assay - LDA) were made, using as active substances herbal decoctions and hydro-alcoholic solutions made from well known anthelmintic plants. One decoction and two hydro-alcoholic extracts were tested, *Hippophae rhamnoides* (sea buckthorn) respectively *Thymus serpyllum* (creeping thyme) and *Arthemisia absinthium* (wormwood). In order to achieve the two tests for therapeutic efficacy of the tested products were obtained six serial dilutions with concentrations of 50%, 25%, 12.5%, 6.25%, 3.12%, and 1, 56%. For decoctions were made control samples with distilled water, and with alcohol for hydroalcoholic solutions. The data obtained in both tests were analyzed using Anthelmintic Rezistance Program (ARP), determining the parameters "a" and "b" to trace the line prediction and lethal concentrations (CL). We can be concluded that for the decoction was observed an emphatic decrease of the percentage of larval development. For the two hydro-alcoholic extracts the hatching percentage of Strongyls eggs was different depending on the concentration used, the maximum value being registered at 25% dilution, in which the percentage of hatching was 82.35%, and the minimum concentration of 12.50%. LDA test showed a significant reduction in the percentage of larval Strongyls development, stage 3, at all dilutions, which is less than 50%.
Keywords: strongylidosis, plant extract, parasitology, extracts testing, antiparasitic effect, Danube Delta

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48. Fish Eustrongylidosis (Ph: Nematoda), A Disease with Potential Socio-Economic Impact

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Larval infestations with Eustrongylides spp have been reported in marine, brackish and freshwater fish species, worldwide. Three Eustrongylides species are commonly being referred to into literature: *E. tubifex*, *E. ignotus* and *E. excisus*. Amphibians, reptiles and humans are occasional hosts of the nematode. Infestations with Eustrongylides in fish are alleged to generate economic loss through impairment of reproduction, alteration of flesh coupled with sensorial devaluation of the meat, commercially displeasing appearance and faster deterioration of the fish, which lead to consumer rejections. To our knowledge, in Europe, with only one exception (*i.e.* a recent report by the CEFAS of eustrongylidosis in brown trout) the case reports communicated in Romania, Serbia, Bulgaria, and Moldavia showed Eustrongylides as sourcing from the Danube River and the Danube Delta. During the past 20 years, the number of case reportings about fish eustrongylidosis has increased. Recent data are confirming the tendency of geographic extension of the parasite towards the Danubian shores of Oltenia and Călăraşi. There is a progressive risk of the parasite to escape from natural environment to fishery farms, by introducing subclinically infested fish from natural waters into farms, using contaminated water/feed with eggs/larvae, or by the infested birds that have access to the farming systems.Given the zoonotic potential and the economic loss which Eustrongylides spp larve may cause in natural and farming aquatic systems in absence of prevention measures, coupled with current scarcity of evidence-based data about fish eustrongyidosis' epizootology, wide communication on these risks to relevant stakeholders is required.
Keywords*:* Eustrongylides spp, fish-borne disease

☐ **Section IV** - Geographical Information System and Application System Modeling

49. Assistance Mechanism for the Implementation of Maritime Spatial Planning at the Black Sea basin under – MSP Platform

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The DIRECTIVE 2014/89/EU of the European Parliament launched in 23 July 2014 has aimed the establishing of Maritime Spatial Planning framework. Based on a European partnership from the EU-PSP Platform aims to conduct studies on subjects defined by the Commission in cooperation with Member States representatives and MSP experts; it identifies Maritime Spatial Planning information, on EU seas, countries, projects, advising on the use of EU financial instruments for MSP projects development and implemention. 25 countries coasts around almost all European seas are included. The progresses in the assistance mechanism is registered by collecting useful information on the MSP implementation at European level, preparing operational summaries of best practices for each requirement of the MSP Directive, editing relevant publications, identifying calls for new proposals or calls for tender. For the first time have been established *focal point services*, for each EU basin (North Sea, Atlantic Ocean, Baltic Sea, Western and Eastern Mediterranean seas and the Black Sea), to provide guidance and information on Maritime Spatial Planning. MSP Focal Point for the Black Sea is NIMRD GA. The paper presents the most important EU-MSP information, the utility of www.msp-platform.eu and the main MSP applications in the Black Sea area, as answer for the stakeholders, interested in MSP Directive implementation.
Keywords: Maritime Spatial Planning, MSP, MSP practices, sea fishes, country fishes, GIS
Acknowledgement: The study has been carried out under technical and financial support of DG MARE Project *Assisstence in Maritime Spatial Planning*, EASME/EMFF/2014/1.3.1.7/SI2.721508, SERVICE CONTRACT #320-4

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50. An integrated analysis of marine environment aiming Maritime Spatial Planning data base

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MARSPLAN-BS / DG-MARE/2014/22 Project is developed under the Ministry of Regional Development and Public Administration and proposes to Member States from the Black Sea coast very important and ambitious objectives: 1) implementation of the EU Directive for Maritime Spatial Planning in Romania and Bulgaria support; 2) creation a Maritime Spatial Planning institutional framework in transboundary approach and information exchange; 3) cooperation developing between Black Sea countries in the field of MSP; 4) setting out vision and strategic goals for Black Sea; 6) contribution to a wider dissemination of gathered MSP information, best practices and stakeholders involvement on the larger area of the Black Sea region.
Contributing to all of these objectives, NIMRD Constanta also elaborated a complex and integrated study regarding the analysis of Romanian marine areas, covering all ecological, economic, social and political aspects by the MSP point of view, important study cases regarding land-sea interaction, coastal erosion, aquaculture and marine fisheries have beendetalied resulting an important data base and GIS mapping.
Acknowledgement: This study has been carried out with financial support from the MARSPLAN-BS Project - Cross border maritime spatial planning in the Black Sea - Romania and Bulgaria (EASME/EMFF/2014/1.2.1.5/2/SI2.707672 MSP LOT 1)
Keywords: Maritime Spatial Planning, Black Sea, monitoring

51. On a mathematical model simulating the formation of hydraulics bars at the mouths of the Danube

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It shows the description of hydraulic process from contact with marine waters of river waters. It makes mathematical analysis of hydraulic process that results in two differential equations of motion of water, one for river jet with variable water flow and another on the river flow water. With constant water discharge. Two differential equations entire measurement was performed finite difference intervals dx = 100 m along the river jets. To integrate the two differential equations were developed two computer programs in Quick Basic 45 programming environment.. The model was tested with hydrological data of the years 1978-2012 term average monthly flows of water and of course silt flows, spilled into the Black Sea to the mouth of the Salina channel. Also forming simulation results Salina bar at the mouth of the channel, they were compared with
Measurements of depths between 1991-2009 the central alignment of the bar. The model showed that the thickness of alluvium deposited layers varies along the jets, extending. Into the high seas to a distance of about 1200 m. The model enables the creation of scenarios that lead to improved dredging technology to ensure great depths maritime navigation bar Salina mouth.
Keywords: hidraulic process, hydraulic simulation, bars Danube.

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52. Use of remote sensing technics on aquatic vegetation survey and mapping

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Since human and financial resources are limited, the development of new mapping tools such as remote sensing ones may be a practical alternative for water bodies' assessment and monitoring, especially within Danube Delta, which has over 300 lakes, many of whom are difficult to access. The paper present the first results on remote sensing methodology to monitor Danube Delta lakes' trophic state by means of satellite image processing and field data on aquatic vegetation survey. Both species composition and abundance change throughout the vegetation season in relation to the lifespan of the species and the changes of the water level. Rapid spread of the macrophyte species is described after it appeared in the reservoir. A multiple point of macrophyte spreading is observed in relation to water flow and wind direction. The existence of strong spatial gradients of the physical and chemical parameters along the main axis of the reservoir is reflected by changes in the macrophyte composition and abundance. Events, like the lowering of the water table, influence the gradients of the physicochemical parameters and the abundance and vertical distribution of the macrophytes can alter the overall assessment of the trophic state. It starts with the completion of the field database necessary to elaborate the methodology and then we have test a series of specific thematic algorithms for discrimination of aquatic vegetation types based on Sentinel 2 images. The next step will be integration of hydro morphological, chemical and biological data to run supervised classification of the satellite images in order to discriminate trophic status of different lakes.
Keywords: Remote sensing, aquatic vegetation relevee, lakes, ecological monitoring

53. Constanta Space Technologies Competence Centre Dedicated to the Romanian Marine and Coastal Regions Sustainable Development

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The overall goal of the Star project with the same name, it is the development of a Competence Center in spatial technologies for the South-East Region of Romania, having the use of space technologies and remote sensing data as main application area, towards monitoring and rapid assessment of the marine and coastal environment state, development of environmental friendly bio-technologies and materials with applicability in spatial programs, as well for support of local and regional small, medium and big enterprises development in accessing opportunities of the EU spatial programs. The main component of the proposed project herewith (COSMOMAR) is to develop a multidisciplinary remote sensing center for the coastal surveillance as a main tool of ICZM implementation (governance, environmental conservation and protection) on the Romanian coastal zone. The work will present certain results encompassing the development of a dedicated facility for assuring center's activities as well the conditions for the development of devices and experimental set ups for three pilot projects applications. The project component of the RS center, related to the selection, training and certification of experts and consultants to assist the companies from the region specialized in manufacturing or services for integration in the programs coordinated by ROSA or ESA, it is presented as a complementary one.
Keywords: Remote sensing of coastal zone, RS competence center, data flux, center activities, UAVs

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54. Expert Judgement Assessment & SCENT Ontological Analysis

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This study aims to provide insights in the starting point of the Horizon 2020 project SCENT Citizen Observatory (CO) in terms of existing infrastructure, existing monitoring systems and some discussion on the existing legal and administrative framework that relate to flood monitoring and management in the area of Danube Delta. The methodology used in this approach is based on expert judgement and ontological analysis, using the information collected from the identified end-users of the SCENT toolbox. In this type of analysis are detailed the stages of flood monitoring and management that the experts are involved in. This is done through an Expert Judgement Assessment analysis. The latter is complemented by a set of Key Performance Indicators that the stakeholders have assessed and/or proposed for the evaluation of the SCENT demonstrations, for the impact of the project and finally for SCENT toolbox performance and usefulness. The second part of the study presents an analysis that attempts to map the interactions between different organisations and components of the existing monitoring systems in the Danube Delta case study. Expert Judgement (EJ) allows to gain information from specialists in a specific field through a consultation process with one or more experts that have experience in similar and complementary topics. Expert judgment, expert estimates, or expert opinion are all terms that refer to the contents of the problem; estimates, outcomes, predictions, uncertainties, and their corresponding assumptions and conditions are all examples of expert judgment. Expert Judgement is affected by the process used to gather it. On the other hand, the ontological analysis comes to complete this study, by organizing and presenting the connections behind the flood management and land use systems in the three phases of the flood event.

55. Flood Services needs in the context of Danube Delta area flood risk management– Flood Serv Project

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Flooding cannot be wholly prevented. Flood risk increases with ongoing climate change. Risk reduction in large international basins can only be achieved through transnational, interdisciplinary and stakeholder oriented approaches within the framework of a joint transnational research project. This study presents the research on the initial needs in the domain of flood risk management and flood related services in the area of Danube Delta and adjacent area. For the past years, Danube Delta National Institute for Research and Development Tulcea (DDNI) has been involved in several flood risk related projects, but the team comes way back with more experience in hydraulic modeling. The previous projects offer the basis and the general framework for the activities within the H2020 project, FloodServ, Public FLOOD Emergency and Awareness SERVice. Starting from the research activities in hydraulic modeling of flood risk, the team delivered successful results in flood risk mapping, followed by high involvement in flood risk management tools development (WEB GIS civil protection pilot tool) that created a solid starting point for this new step, development of a pro-active and personalized citizen-centric public service application. The needs in flood risk management at local decision making level are high and the demand for supporting tools in civil protection is increasing with every dangerous event of floods. This issue, in combination of the increasingly acute problems of the flood risk variations in the context of climate change, will be addressed in Flood Serv Project. The platform developed within this project will enhance the involvement of the citizen and will harness the collaborative power of ICT networks (networks of people, of knowledge, of sensors) to raise awareness on flood risks and to enable collective risk mitigation solutions and response actions.

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56. The Analysis Methods of the Romanian Bank of Danube Evolutions, in the Cotul Pisicii - Ceatalul Izmail Sector, based on the Archaeological Discoveries and Remote Sensing Techniques

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The aim of this study was to develop a working method for natural environment analysis in function by archaeological data. In order to achieve these, the data obtained by classical archaeological and historical studies were correlated with those obtained by field studies and remote sensing techniques. Within this paper, the studies have focused on the evolution of the Lower Danube, in the Cotul Pisicii - Ceatalul Izmail sector. Data processing was done based on some free and open source applications. Through these were processed data from archaeological studies and satellite imagery so succeeding in achieve a trace of the shape and distribution of the archaeological sites on the vector layers. The other data sets used were the following: Aster DEM (digital elevation model), SRTM, Landsat ETM + and Google Earth satellite images. These were used to determine the actual shape of the Danube fairway.Preliminary data existing at this time revealed an intense alluvial process of the Danube bank in the Cotul Pisicii - Crapina Lake area, upstream of the Noviodunum Fortress (Isaccea) area and in the Revărsarea - Ceatalul Izmail sector. The intense process of erosion was found in the Noviodunum Fortress (Isaccea) area. The correlation of these processes with data about both the spatial distribution of archaeological sites and historical periods belonging to them, can offer valuable indicator of the lower sector of the Danube course evolution trend.
Keyword: Danube terrace, remote sensing techniques, settlement, necropolis, barrow tombs (tumuli), Noviodunum Fortress (Isaccea), Danube fairway.

57. Flood Services legislative approach in the context of Danube Delta area flood risk management– Flood Serv Project

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After acknowledging the speed and costs of the climate change in Europe and world wide, floods have become a major concern in terms of economic, social and human rights. European Union challenged it's approach on flood management, from reacting to risk analysis and prevention. The study is documented by parallel descriptions of how the provisions of the European Directives are transposed into the national legislations and it will provide key country characteristics and differences of the governance structure of the flood risk management, which are crucial elements for the effectiveness of the societal risk reduction. The purpose of the study is to present an analysis of the legal framework, regulation and organization of flood risk management, contingency planning and response functions, as compared to other selected regions. It was documented using parallel descriptions of how the provisions of the European Directives are transposed into the national legislations and provides key country characteristics and differences of the governance structure of the flood risk management, the contingency planning and response functions, which are crucial elements for the effectiveness of the societal risk reduction. The current document provides a comparative study on measures taken by the public administration in several European countries to reduce the hydrological risk reduction, focusing on governance structure, strategic use of ITC tools, the usage of open services and transparency tools to enable the community to have a say in the flood risk management processes.

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58. MI-SAFE services – the role of coastal vegetation in flood risk reduction

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Coastal areas are becoming more vulnerable while facing the increased pressure generated by human interventions and climate changes effects. One of the biggest threat is represented by floods and erosion. As proven many times, this complex ecosystem has the capacity of self-healing by using its own resources. Natural coastal protection provided by local vegetation is becoming increasingly important, while traditional solutions (engineered works like dikes and dams) are not proving themselves to be cost-effective anymore.
The role of foreshore vegetation as green coastal protection was tested in the Razelm-Sinoe Lagoon System, southern part of the Danube Delta, as activity in the FP7 FAST project (Foreshore Assessment using Space Technology).
The major outcome from the FP7 FAST project is represented by MI-SAFE package, a set of products and services accessible and demonstrated through a user-friendly online viewer: the MI-SAFE Viewer. The MI-SAFE application uses a series of layers of information on elevation (topography and bathymetry), vegetation, water and wave statistics correlated with Earth Observation resources and data collected in situ by the FAST consortium in order to calibrate the open software model XBeach, for estimating the effects of foreshore vegetation on wave attenuation and dike overtopping.

59. Maritime Spatial Planning. New methodologies for spatial analyses of marine fisheries

Spinu Alina, Alexandrov Laura, Sarbu George, Nicolaev Alexandru, Danilov Cristian, Niculescu Dragos, Radu Gheorghe, Anton Eugen, Totoiu Aurelia

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Under ERA NET/COFASP Program, the ECOAST Project included the Black Sea as study case, aiming to develop new methodologies for ecosystem approach, fisheries and aquaculture management, spatial analyses, to support fisheries management and stategies. Not many activities are carried out on sea, in Romania, due to geographical and climate instability, strong winds and waves, currents, coastal erosion, continental floods and freshening influence, adding high temperatures, salinity, density variations. Concerning species biodiversity under the Danube freshening impact along the coast the marine waters are inhabited by aquatic organisms with a high plasticity, resistant to environment conditions changes. Valuable and endemic fish species (sturgeons, flatfish, shads, mullets, etc.) have here habitats for feeding and reproduction. The main activities of the marine space have been identified and mapped: tourism, navigation, oil and gas extraction, transport, coastal pressures, specifically locations for fisheries and aquaculture, artificial reefs, marine protected areas, natural resources stocks. These have been spatially analysed, aiming to identify interconnection and conflicts evaluation between them, for a sustainable and harmonised development on the sea space. ECOAST project proposes to use new methods GRID, DISPLACE, RUMM and INVEST as application of specifically MSP tools. The present results are obtained for the first time in the Black Sea region.
Acknowledgement: The study has been carried out under technical and financial support of ERA NET/COFASP Program, the ECOAST Project 45/2016, *New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture at Romanian coastal zone*
Keywords: Maritime Spatial Planning tools and analyses, marine fisheries, programs GRID, DISPLACE, RUMM, INVEST, management measures

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60. The Benefit Impact of Implementation the 100% Electric Boat in the Danube Delta - Presentation of the Ruban Bleu Electric Boats (Best solution - No environmental and noise pollution)

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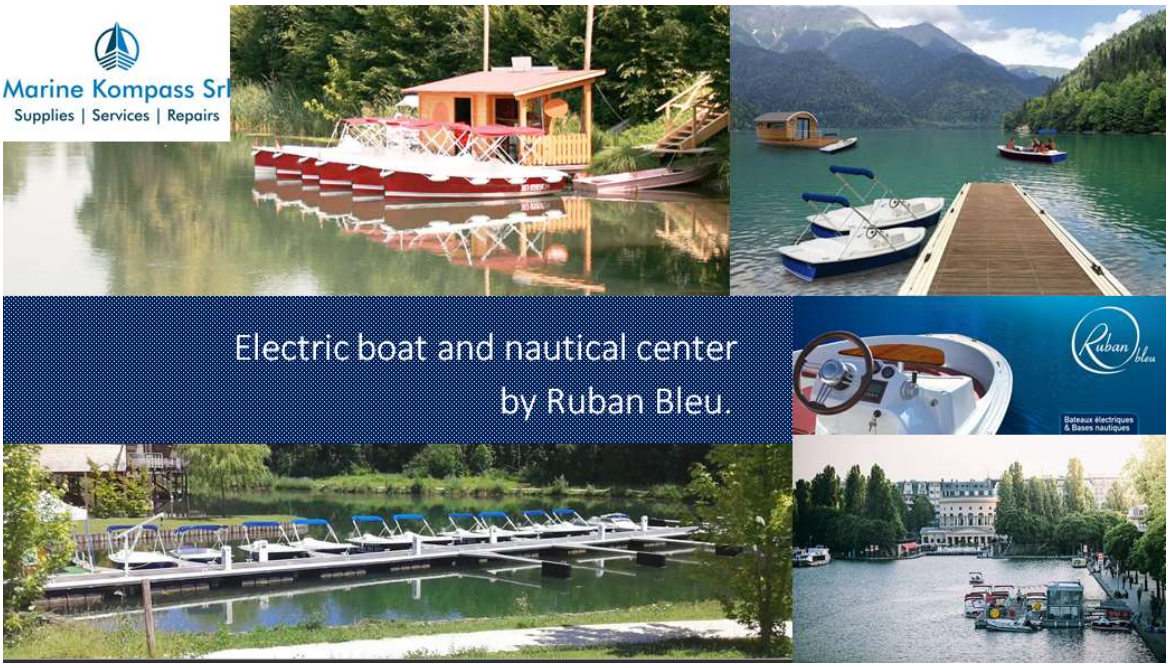
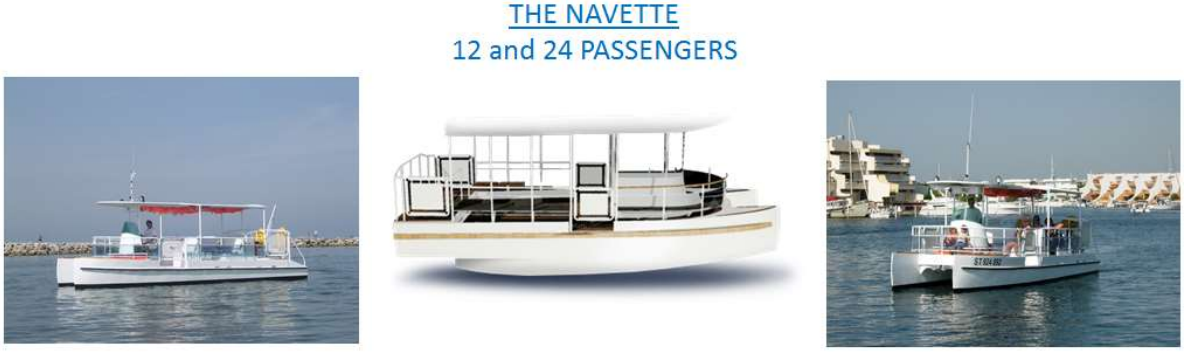
"Ruban Bleu is the European leader in building 100% electrical boats for nautical centers, with 24 years of experience in the field of ecotourism. Marine Kompass is our partner in Romania and our exclusive distributor - they are based in Constanza and are able to assist you with your project from early specifications stage to operating budgets, maintenance costs, profitability. our START & GO service department is at your disposal before and after the project is completed. We can complement your nautical rental centre with other solutions such as canoes, stand-up paddling boards, pedal boats, pontoons, charging stations, ticket office area. Our range of electric boats start from 5-seater ACE to 24-seats NAVETTE, all configurable to your requirements. We have built over 1500 boats and can deliver your orders in 1-3 months time depending on order size. Please get in touch with us to discuss your requirements in detail, Best Regards - Arnaud Wrede - European Sales Director."

http://www.marinekompass.ro/, http://www.rubanbleu.com/en/#





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