



MINISTRY OF RESEARCH AND INNOVATION  
„DANUBE DELTA” NATIONAL INSTITUTE  
FOR RESEARCH AND DEVELOPMENT – TULCEA

165 Babadag Street RO 820112 Tulcea, Romania phone +4 0240 531520 fax +4 0240 533547 E-mail [office@ddni.ro](mailto:office@ddni.ro) web <http://www.ddni.ro>

# **DELTAS AND WETLANDS**

(Book of Abstracts)

Vol. 5

**2018**  
Tulcea

Copyright©2018, “Danube Delta” National Institute for Research and Development – Tulcea  
All rights are reserved

Address: 165, Babadag street, Tulcea 820112, Tulcea County, Romania  
Tel:(+04) 0240 531520 / 524548 / 524550; e-mail: [office@ddni.ro](mailto:office@ddni.ro) / [www.ddni.ro](http://www.ddni.ro)

**Recommended citation of the present volume:**

Author / authors, 2018 – title of abstract, p. ... *IN: Deltas and Wetlands (Book of Abstract)*, vol. 5, \_\_\_\_pp, Tulcea, Romania.  
ISSN 2344-3766.

---

***Scientific Editorial Board***

---

**Dr. Marian TUDOR**

*“Danube Delta” National Institute for Research and Development, Tulcea*

**Dr. Iulian NICHERSU**

*“Danube Delta” National Institute for Research and Development, Tulcea*

**Prof. Univ. Dr. Lucian Puiu GEORGESCU**

*“Dunărea de Jos” University of Galați*

**Prof. Univ. Dr. Doc. Petre GÂȘTESCU**

*“Hyperion” University București*

**Dr. Liviu Daniel GALATCHI**

*“Ovidius” University Constanța*

**Conf. Univ. Dr. Marius SKOLKA**

*“Ovidius” University Constanța*

**Dr. Ion NĂVODARU**

*“Danube Delta” National Institute for Research and Development, Tulcea*

**Dr. Tania ZAHARIA**

*“Grigore Antipa” National Institute for Research and Development, Constanța*

---

***Technical Editorial Board***

---

**Moș-Man Veronica** - *“Danube Delta” National Institute for Research and Development, Tulcea*

**Nanu Cristina** - *“Danube Delta” National Institute for Research and Development, Tulcea*

**Lupu Gabriel G.** - *“Danube Delta” National Institute for Research and Development, Tulcea*

---

Bun de tipar: 05.2018

Tiraj: 150 / Printed version: ISSN: 2344-3766; ISSN-L: 2344-3766

## AGENDA

### **16 May 2018, Wednesday**

- Arrival of participants

### **17 May 2018, Thursday – Venue: "Mihail Kogălniceanu" City Hall, Păcii Street, No. 20 - Tulcea**

- 8,30-9,30 Registration
- 9,30-10,00 – Opening / Welcome ceremony
- 10,00-10,30 – Plenary presentation:

#### **Key-note Speaker**

**Prof. Dr. Nicolae Panin** → **Danubius RI** – The International Centre for Advanced Studies on River Estuarine-Sea Systems

- 10,30-10,50 – Coffee Break

#### **Oral Communications**

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

#### **Moderators: Dr. Ion Năvodaru & Dr. Liviu Daniel Galatchi / Dr. Dorel Ureche**

- |    |             |  |   |
|----|-------------|--|---|
| 1. | 11.00-11.20 | <u>Marinov Mihai</u> , Doroşencu Alexandru, Alexe Vasile, Răileanu Ştefan  | The assessment of colonial waterbirds from Danube Delta Biosphere Reserve (Romania) in 2016 and 2017  |
| 2. | 11.20-11.40 | <u>Kohlmann Klaus</u> , Ciorpac Mitică, Kersten Petra, Geßner Jorn, Taflan Elena, Tosic Katarina, Holostenco Daniela, Suciu Radu | Genetic assessment of sterlet ( <i>Acipenser ruthenus</i> ) from a Lower Danube wild population using nuclear and mitochondrial markers                       |
| 3. | 11.40-12.00 | <u>Alexandrou Olga</u> , Catsadorakis Giorgos  | Guidelines for responding to incidences of disease outbreak in pelicans   |
| 4. | 12.00-12.20 | <u>Skorupski Jakub</u>   | Phylogenetic analysis of the complete mitochondrial genome of the European mink <i>Mustela lutreola</i> shed light on the species recent evolutionary history |
| 5. | 12.20-12.40 | <u>Áron Péter</u> , Barti Levente, Csósz István, Alexandra Cordoneanu Földvári Mihály, Sándor D. Attila                          | Study on host specificity of bat flies (Nycteribiidae) from Romanian and Bulgarian bat populations  |
| 6. | 12.40-13.00 | <u>Ciubuc Constantin</u>   | Specified Diversity of the Carabides (Ord. Coleoptera) of the Danube Delta Biosphere reserve trapped with light traps   |

**13.00-14.30 - LUNCH BREAK**

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

**Moderators: Dr. Jenica Hanganu & Denis N. Aibulatov**

- |     |             |  |   |
|-----|-------------|--|---|
| 7.  | 14.30-14.50 | Augustynek Halny P., Babiasz R., Bożek J.,<br>Ciężak K., Engel J., Furdyna A., Gawlik R.,<br>Jaszczuk E., Kotowski W, <u>Leś Ewa</u> , Nawrocki P.,<br>Wawręty R., Wiśniewska M.M. | "May the rivers flow naturally" – Save<br>the Rivers Coalition as an example of<br>Polish social movement caring about<br>the rivers and peoples safety |
| 8.  | 14.50-15.10 | <u>Ciuvăt Alexandru Liviu</u> ,<br>Daia Mihai, Dinu Cristiana, Marcu Cristiana,<br>Apostol Ecaterina, Apostol Bogdan   | Managing natural regenerations that<br>occurred after harvesting hybrid poplar<br>plantations along the Lower Danube<br>floodplain                      |
| 9.  | 15.10-15.30 | <u>Aibulatov D.N.</u> , Shkolniy D.I., Maksakov N.A.   | Features of river mouths on<br>archipelagoes of the Russian Arctic  |
| 10. | 15.30-15.50 | <u>Fasola Regina</u>   | Impact of atmospheric pollution on<br>forest biodiversity in the Republic of<br>Moldova   |
| 11. | 15.50-16.10 | <u>Gliga Olesea</u>  | The anthropic impact on the dynamics<br>of same heavy metals in the<br>environmental components, the bees<br>body and their products                    |

**16.30-18.00 - Coffee Break & POSTERS SESSION** (Venue: **AVRAMIDE House**, Progresului Street No. 32,)

**17.00-18.00 PICO** (Presenting Interactive Content) → **10 min/presentation**

**Apostol Mihaela**: New developments in air and water quality monitoring systems

**Sorin Bogdan** - Equipment and solutions for water and environment

**Constantinescu Adrian C.**, Paula Pindic, Bănescu Alexandru, Anore Ciprian: Flooding hazard and risk maps for localities along Sulina and Sf. Gheorghe Branches

**Răileanu Ștefan**, Cernea Mihai, Marinov Mihai: Epidemiological aspects related to parasitosis and infectious diseases in the equines population of Grindul Letea - Danube delta

Ioja Cristian, Carstea Elfrida, **Talaba Odelin**, Hossu Alina, Cheval Sorin, Sandric Ionut, Vanau Gabriel, Nita Mihai, Popa Ana-Maria: Assessment of ecosystems services generated by Morii Lake in Bucharest city

**Spiridon Cosmin** et all: Preliminary results on phytoplankton in Zaghen Polder

☐ **19.00 - Official Dinner**

**18 May 2018, Friday**

Plenary presentation - **Venue: "Mihail Kogălniceanu" City Hall**, Păcii Street, No. 20 - Tulcea

**9.00-9.30**

**Key-note speaker**

**Prof. Dr. Lucian Puiu Georgescu**→COMMUNITIES BUILDING KNOWLEDGE: Innovation through citizens' science

**Oral Communications**

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

**Moderators: Dr. Jenica Hanganu & Denis N. Aibulatov**

- |    |            |  |  |
|----|------------|--|--|
| 1. | 9.30-9.50  | <u>Hanzu Mihail</u> , Zaharia Alexandru, Ienășoiu Gruiță, Cucu Alexandru | Structure of a woody ecosystem naturally regenerated in Olt river wetland  |
| 2. | 9.50-10.10 | <u>Theochari Dimitra</u>   | What's next for China's Sponge Cities? Innovative riparian delta design of river bed, wetlands, amphibian tunnel, and flood protection system. |

Plenary presentation

**10.15-10.45**

**Key-note speaker**

**Prof. Dr. Erika Schneider** →Lesser known species and habitats in Danube Delta

**10.45 –11.00 Coffee Break**

☐ Section III: Natural Resources and Socio-economic aspects

**Moderators: Dr. Aurel Lup & Dr. Mihai Doroftei**

- |    |             |   |  |
|----|-------------|---|--|
| 3. | 11.10-11.30 | <u>Niculescu Alina Cristina</u><br>Frenț Cristi                           | The identification and evaluation of risks impacting on the locals and on tourist activities in the town of Sulina   |
| 4. | 11.30-11.50 | <u>Iorğa Alexandru</u>  | Political ecology of fisheries and poaching in the Danube Delta  |
| 5. | 11.50-12.10 | <u>Lup Aurel</u> , Indira Deniz Alim, Liliana Miron                       | Agricultural programs in the Danube delta and the Danube flood plain   |
| 6. | 12.10-12.30 | <u>Negrei Costel</u> ,<br>Crăciun Anca, Tudor Marian                      | Methodology for assessing the integration of the environmental decision in the strategy of developing organizations in the economic area of the Danube Delta Biosphere Reserve |
| 7. | 12.30-12.50 | Sbarcea Mădălina, <u>Petrișor Alexandru-Ionuț</u> , Petrișor Liliana Elza | Mapping potential environmental conflicts in the Danube Delta Biosphere Reserve  |

**13.00-14.30 - LUNCH BREAK**

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

**Moderators: Dr. Nina Dobrinkova & Dr. Iulian Nichersu**

- |     |             |  |  |
|-----|-------------|--|--|
| 8.  | 14.30-14.50 | <u>Hanganu Jenică</u> ,<br>Constantinescu Adrian, Covaliov Silviu              | Monitoring the trophic state of lakes based on aquatic vegetation survey by means of Sentinel 2 images |
| 9.  | 14.50-15.10 | <u>Dobrinkova Nina</u>   | Application of GIS tools in wildland fire modeling for south Bulgarian test cases                      |
| 10. | 15.10-15.30 | <u>Magritsky</u> Dmitry V., Mikhailov V.N., Kravtsova V.I.,<br>Mikhailova M.V. | Hydrological and morphological processes in the river deltas of Caspian sea                            |
| 11. | 15.30-15.50 | <u>Ogrezeanu Andrei</u> , Nichersu I., Nichersu I.I.                           | Flood Serv semantic wiki based on ontology evaluation  |

- **16.00-17.30.**  
**ROUND TABLE: Integrating researches, practices and policies for multisector collaboration in sustainable wetlands science**
- 19,00 – Dinner

**19 May 2018, Saturday**

- 9.00-18.00 – Field trip to Danube Delta (*Sulina*)

**20 May 2018, Sunday**

Departure of participants

## POSTERS

## Section I: Biodiversity and nature conservation

No.	Author (s)	Title
1.	Alexe Vasile, Doroşencu Alexandru, Marinov Mihai	Preliminary data on mammal species of community interest in Danube Delta Biosphere Reserve
2.	Andrei Raluca-Cristina (Guriencu), Victor Cristea, Mirela Creţu, Lorena Dediu	Swimming mode of sturgeons. A review
3.	Cerşişencu Irina, Năvodaru Ion, Ibram Orham, Năstase Aurel	Projection of changes in productivity of pike-perch ( <i>Sander lucioperca</i> ) from Razim Lake under climate changes by VPA modeling
4.	Culcea Oana, Boicenco Laura, Lazăr Luminiţa, Pantea Elena	Algal blooms in the Romanian Black Sea waters in the beginning of the 21 <sup>st</sup> Century
5.	Doroftei Mihai, Burada Adrian, Alexe Vasile, Doroşencu Alexandru, Năstase Aurel, Trifanov Cristian, Covaliov Silviu, Lupu Gabriel, Cristina Despina, Ibram Orhan, Mierlă Marian, Tudor Mihaela, Marinov Mihai, Pindic Paula, Sali Iasemin, Spiridon Cosmin	Zaghen Polder – monitoring of ecological aspects after reconstruction works
6.	Holostenco Nicoleta Daniela, Ionescu T., Taflan Elena, Honţ Ştefan, Paraschiv Marian, Iani Marian, Bushuiev S., Chashchyn O., Memis D., Komakhidze G., Mihalache I., Creţu M., Bichescu C., Bîrsan I., Cristea V., Suci Radu, Ciopac Mitică	An overview of Black Sea sturgeons: supportive stocking success, feeding area communities, dispersal, and species gene pool
7.	Kohlmann Klaus., Kersten Petra, Geßner Jorn, Eroglu O., Firdin S., Ciopac Mitică, Taflan Elena, Suci Radu	Validation of 12 species-specific, tetrasomic microsatellite loci from the Russian sturgeon, <i>Acipenser gueldenstaedtii</i> , for genetic broodstock management
8.	Lupu Gabriel, Tudor Iuliana-Mihaela, Ibram Orhan	Assessment of threatening at regional level for community interest insect species from Danube Delta Biosphere Reserve
9.	Năstase Aurel, Năvodaru Ion, Cerşişencu Irina, Ţiganov George	The fish communities of lake-complexes from Danube Delta Biosphere Reserve in spring and autumn of 2016
10.	Przemysław Śmietana, Marek Budniak	Efficiency of interspecific mating in indigenous crayfish <i>Astacus astacus</i> and <i>Astacus leptodactylus</i>
11.	Oţel Vasile, Nagy András Attila	Is <i>Carrasius gibelio</i> (Bloch, 1782) (Pisces, Cyprinidae) a non-native or native species in Europe and Romania?
12.	Ozimec Siniša, Dragan Prlić, Vlatko Rožac	Aquatic and wetland vegetation of the Kopački Rit Nature Park, Croatia
13.	Răileanu Ştefan, Cernea M., Marinov Mihai	Epidemiological aspects related to parasitosis and infectious diseases in the equines population of Grindul Letea - Danube delta
14.	Szenejko Magdalena, Skuza Lidia, Śmietana Przemysław	Molecular characterization of the noble crayfish <i>Astacus astacus</i> populations and its commensal <i>Branchiobdella parasita</i> from Pomeranian lakes in Poland
15.	Török Zsolt, Török Liliana	Occurrence of <i>Perccottus glenii</i> in the Danube Delta Biosphere Reserve (Romania) after a decade of its presence in the area
16.	Dorel Ureche, Roxana-Elena Voicu, Camelia Ureche	Study of fish communities in the middle basin of trotus river (Romania) in 2015-2016
17.	Zawal Andrzej, Szlauer-Lukaszewska Agnieszka, Bańkowska Aleksandra, Michoński Grzegorz, Czernicki Tomasz, Janusz Katarzyna	Water mites (Hydrachnidia) of small lowland river Krapiel (NW Poland)

## Section II: Environmental factors, Ecological Restoration and &amp; Anthropic Impact

18.	Burada Adrian, Teodorof Liliana, Despina Cristina, Seceleanu-Odor Daniela, Tudor Iuliana-Mihaela, Ibram Orhan, Spiridon Cosmin, Georgescu Lucian, Ionescu Tudor	Concentrations of heavy metals in muscle tissue and some organs of juvenile sturgeon
19.	Bondar Constantin	Characteristics of water and alluvial transit through the Danube Delta

20.	Catianis Irina, Pojar Iulian, Grosu Dumitru, Pavel Ana Bianca	Investigation of the surface water quality parameters in the predeltaic area of the Danube Delta in 2017. Study case: Somova-Parcheș aquatic complex lakes.
21.	Certan Corina	Researches concerning forestry recultivation of sterile dumps in the Quarry „Lafarge Cement” (Moldova) S.A. Rezina District, Republic of Moldova
22.	Cioacă Eugenia, Mierlă Marian, Pindic Paula, Anore Ciprian	Researches on the evolution of the Danube Delta Biosphere Reserve ecologically reconstructed ecosystems
23.	Cristian Ioja, Elfrida Carstea, Odelin Talaba, Alina Hossu, Sorin Cheval, Ionut Sandric, Gabriel Vanau, Mihai Nita, Ana-Maria Popa	Assessment of ecosystems services generated by Morii Lake in Bucharest city
24.	Mierlă Marian, Grigoraș Ion, Covaliov Silviu, Doroftei Mihai, Trifanov Cristian	Contributions in knowing the effects of climate change on some ecosystem services within Danube Delta Biosphere Reserve
25.	Pipirigeanu Vasile, Tudor Iuliana–Mihaela, Burada Adrian, Ibram Orhan, Teodorof Liliana, Bota Diana, Despina Cristina, Tudor Marian, Mierla Marian, Trifanov Cristian, Anore Ciprian, Munteanu Doina, Vintila Mihaela, Rafael Robert, Penchev Valeri, Kereš Bibi Ena, Sajgó Nikolett, Zöllner Joachim, Dahlke Friederike, Szuppinger Péter, Kállay Tamás, Budescu Florentina-Natalia Serban-Atanasiu Irina, Camernik Boris	Assessment of air quality status performed in the selected Danube river areas
26.	Pohonțu Corneliu Mihăiță	Biodecolorization of reactive blue 19 dye from effluents by sorption on <i>Aspergillus brasiliensis</i> fungal biomass
27.	Rădan Sorin Corneliu Rădan Silviu, Catianis Irina, Grosu Dumitru, Iulian Pojar, Scriciu Albert	Enviromagnetic Proxies And Lithological Characteristics Of Recent Sediments From Particular Aquatic Waterbodies In The Sfântu Gheorghe Branch Area: Oxbow Lakes And Sacalin Bay
28.	Raicu Filip, Ochinciuc Cristina Victoria, Sbarcea Mădălina	Sustainability upgrades for the built environment in the Danube Delta Biosphere Reserve
29.	Robea Mădălina-Andreea, Ștefan-Adrian Strungaru, Solcan Carmen, Nicoară Mircea, Plavan Gabriel, Petrovici Adriana	Chronic exposure to insecticide deltamethrin affects the aggressive behavior of zebrafish ( <i>Danio rerio</i> )
30.	Popescu Ovidiu, Ciorgac Mitică, Trandafir Văcărean Irina Cezara, Lucian Gorgan, Dumitru Cojocaru	Natural spread vs. invasiveness – <i>Scardinius erythrophthalmus</i> success within its genus
31.	Seceleanu-Odor Daniela, Burada Adrian, Despina Cristina, Teodorof Liliana, Țigănuș Mihaela, Tudor Iuliana-Mihaela, Ibram Orhan, Spiridon Cosmin, Tudor Marian	Gradual changes in water quality parameters in Razim-Sinoe aquatic complex in the period 1991-2017
32.	Simionov Ira-Adeline, Cristea Victor, Plavan Gabriel, Baltag Stefan Emanuel, Strungaru Stefan-Adrian, Nicoară Mircea	The level of pollution with metals and organic carbon on the lower Danube sector through a multilvel analysis
33.	Theochari Dimitra	What's next for China's Sponge Cities? Innovative riparian delta design of river bed, wetlands, amphibian tunnel, and flood protection system.
34.	Tudor Iuliana–Mihaela, Teodorof Liliana, Ibram Orhan, Burada Adrian, Despina Cristina, Sali Iasemin, Tudor Marian, Lupu Gabriel, Doroftei Mihai, Covaliov Silviu, Odor Seceleanu Daniela, Mierlă Marian, Trifanov Cristian, Spiridon Cosmin, Țigănuș Mihaela, Bănescu Angela	Water quality assessment of aquatic ecosystems using Water Framework Directive (WFD) classification (criteria) in Danube Delta Biosphere Reserve.
35.	Török Liliana, Török Zsolt	Techniques on how and when to analyze the presence of algal toxins



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

36.	Bota Diana, Nanu Cristina, Bozagievici Raluca	Opinion Survey – A tool applied for the evaluation of tourist demand and supply in Danube Delta Biosphere Reserve
37.	Butoi Nicoleta Oana, Mateescu Carmen, Lungulescu Marius, Ducu Robert, Luchian Ana-Maria	Experimental research in stimulating algal growth and biomass productivity by electrophysical actions
38.	Kozłowska Aneta, Skorupski Jakub, Brzeziński Radosław	Project CATCH – how to bring coastal angling tourism and nature conservation together
39.	Marin Oana, Török Liliana, Török Zsolt	Mass development episodes of some opportunistic macroalgae during summer season along the Romanian Black Sea Coast in the last decade
40.	Năvodaru Ion, Cernişencu Irina, Năstase Aurel	Fishery from Danube Delta Biosphere Reserve – state and trends
41.	Sela Florentina, Marin Eugenia	Disparities in living conditions and life standards of D.D.B.R.'s human communities - Sulina case study
42.	Spiridon Cosmin, Ibram Orhan, Teodorof Liliana Tudor, Iuliana-Mihaela, Seceleanu-Odor Daniela, Burada Adrian, Despina Cristina, Țiganuş Mihaela, Georgescu Lucian Puiu, Doroftei Mihai	Preliminary results on phytoplankton in Zaghen Polder
43.	Török Liliana, Mateescu Carmen, Ducu Robert, Török Zsolt	Establishing a protocol to analyze harvesting and exploitation of phytoplankton algae for biogas production

**Section IV: Geographical Information System and Application System Modeling**

44.	Alexandrov Laura, Spinu Alina, Madalina Rosca, Nenciu Magda, Angela Szultze, De Grunt Lisa Simone, Waldmann Clare, Zaharia Tania, Vlasceanu Elena, Golumbeanu Mariana, Niculescu Dragos	Focal Point for Black Sea Maritime Spatial Planning, contribution to European MSP Platform
45.	Alexandrov Laura, Spinu Alina, Mateescu Razvan, Nita Victor, Vlasceanu Elena, Nichersu Iulian, Marin Eugenia, Sela Florentina	Maritime Spatial Planning – Coastal erosion, vulnerabilities and public consultation on Case Study Eforie
46.	Alexandrov Laura, Spinu Alina, Niculescu Dragos, Fabio Grati, Francois Bastardie, Bolognini Luca, Celia Vassilou, Vlasceanu Elena, Anton Eugen, Gheorghe Radu, Nicolaev Alexandru, Maximov Valodia	Spatial synergies/conflicts between fisheries, aquaculture and other human activities evaluated in Romania by DISPLACE, GRID and cumulative impacts methodologies
47.	Panait Valentin, Stănică Aurel Daniel, Mierlă Marian	The Danube River evolution within Danube Delta area based on the archaeological discoveries and remote sensing
48.	Iordache Gabriel, Bondar Constantin, Anghel Sorin, Malageanu Marian, Dudu Alexandra	Using of GIS techniques to assess the spatial changes of the islets in the Corabia area – Bechet harbor sector (km 626-679) between 1910-2017
49.	Margritsky Dmitry	Features of spatio-temporal variability of water runoff, sediment yield and heat flux in the delta of the Lena River
50.	Nicolaev Simion, Alexandrov Laura, Nita Victor, Filimon Adrian, Thorleifur Agustsson, Gomiero Alessio, Spinu Alina, Luminita Lazar, Andra Oros, Valentina Coatu	Ecological footprint under marine aqua-farms aiming impact - response assessment and management improvement for mariculture development in the Black Sea basin



## List of Abstracts

## □ Section I: Biodiversity and nature conservation

Authors	Title	Page
1. Alexandrou Olga, Catsadorakis Giorgos	Guidelines for responding to incidences of disease outbreak in pelicans	7
2. Áron Péter, Barti Levente, Csósz István, Alexandra Cordoneanu Földvári Mihály, Sándor D. Attila	Study on host specificity of bat flies (Nycteribiidae) from Romanian and Bulgarian bat populations	7
3. Alexe Vasile, Doroşencu Alexandru, Marinov Mihai	Preliminary data on mammal species of community interest in Danube Delta Biosphere Reserve	8
4. Andrei Raluca-Cristina (Guriencu), Victor Cristea, Mirela Creţu, Lorena Dediu	Swimming mode of sturgeons. A review	8
5. Cernişencu Irina, Năvodaru Ion, Ibram Orham, Năstase Aurel	Projection of changes in productivity of pike-perch ( <i>Sander lucioperca</i> ) from Razim Lake under climate changes by VPA modeling	9
6. Ciubuc Constantin	Specified Diversity of the Carabides (Ord. Coleoptera) of the Danube Delta Biosphere reserve trapped with light traps	9
7. Culcea Oana, Boicenco Laura, Lazăr Luminița, Pantea Elena	Algal blooms in the Romanian Black Sea waters in the begining of the 21 <sup>st</sup> Century	10
8. Doroftei Mihai, Burada Adrian, Alexe Vasile, Doroşencu Alexandru, Năstase Aurel, Trifanov Cristian, Covaliov Silviu, Lupu Gabriel, Cristina Despina, Ibram Orhan, Mierlă Marian, Tudor Mihaela, Marinov Mihai, Pindic Paula, Sali Iasemin, Spiridon Cosmin	Zaghen Polder – monitoring of ecological aspects after reconstruction works	10
9. Holostenco Nicoleta Daniela, Ionescu T., Taflan Elena, Honț Ștefan, Paraschiv Marian, Iani Marian, Bushuiev S., Chashchyn O., Memis D., Komakhidze G., Mihalache I., Creţu M., Bichescu C. Bîrsan I., Cristea V., Suci Radu, Ciorpac Mitică	An overview of Black Sea sturgeons: supportive stocking success, feeding area communities, dispersal, and species gene pool	11
10. Kohlmann Klaus, Ciorpac Mitică, Kersten Petra, Geßner Jorn, Taflan Elena, Tosic Katarina, Holostenco Daniela, Suci Radu	Genetic assessment of sterlet ( <i>Acipenser ruthenus</i> ) from a Lower Danube wild population using nuclear and mitochondrial markers	12
11. Kohlmann Klaus., Kersten Petra, Geßner Jorn, Eroglu O., Firdin S., Ciorpac Mitică, Taflan Elena, Suci Radu	Validation of 12 species-specific, tetrasomic microsatellite loci from the Russian sturgeon, <i>Acipenser gueldenstaedtii</i> , for genetic broodstock management	12
12. Lupu Gabriel, Tudor Iuliana-Mihaela, Ibram Orhan	Assessment of threatening at regional level for community interest insect species from Danube Delta Biosphere Reserve	13
13. Marinov Mihai, Doroşencu Alexandru, Alexe Vasile, Răileanu Ștefan	The assessment of colonial waterbirds from Danube Delta Biosphere Reserve (Romania) in 2016 and 2017	14
14. Năstase Aurel, Năvodaru Ion, Cernişencu Irina, Țiganov George	The fish communities of lake-complexes from Danube Delta Biosphere Reserve in spring and autumn of 2016	14

15. Przemysław Śmietana, Marek Budniak	Efficiency of interspecific mating in indigenous crayfish <i>Astacus astacus</i> and <i>Astacus leptodactylus</i>	15
16. Oțel Vasile, Nagy András Attila	Is <i>Carrasius gibelio</i> (Bloch, 1782) (Pisces, Cyprinidae) a non-native or native species in Europe and Romania?	15
17. Ozimec Siniša, Dragan Prić, Vlatko Rožac	Aquatic and wetland vegetation of the Kopački Rit Nature Park, Croatia	16
18. Skorupski Jakub	Phylogenetic analysis of the complete mitochondrial genome of the European mink <i>Mustela lutreola</i> shed light on the species recent evolutionary history	17
19. Szenejko Magdalena, Skuza Lidia, Śmietana Przemysław	Molecular characterization of the noble crayfish <i>Astacus astacus</i> populations and its commensal <i>Branchiobdella parasita</i> from Pomeranian lakes in Poland	17
20. Török Zsolt, Török Liliana	Occurrence of <i>Perccottus glenii</i> in the Danube Delta Biosphere Reserve (Romania) after a decade of its presence in the area	18
21. Ureche Dorel, Voicu Roxana-Elena, Ureche Camelia	Study of fish communities in the middle basin of trotus river (Romania) in 2015-2016	18
22. Zawal Andrzej, Szlauer-Łukaszevska Agnieszka, Bańkowska Aleksandra, Michoński Grzegorz, Czernicki Tomasz, Janusz Katarzyna	Water mites (Hydrachnidia) of small lowland river Krapiel (NW Poland)	19

□ **Section II: Environmental factors, Ecological Restoration and & Anthropic Impact**

23. Aibulatov D.N., Shkolniy D.I., Maksakov N.A.	Features of river mouths on archipelagoes of the Russian Arctic	19
24. Burada Adrian, Teodorof Liliana, Despina Cristina, Seceleanu-Odor Daniela, Tudor Iuliana-Mihaela, Ibram Orhan, Spiridon Cosmin, Georgescu Lucian, Ionescu Tudor	Concentrations of heavy metals in muscle tissue and some organs of juvenile sturgeon	20
25. Bondar Constantin	Characteristics of water and alluvial transit through the Danube Delta	20
26. Catianis Irina, Pojar Iulian, Grosu Dumitru, Pavel Ana Bianca	Investigation of the surface water quality parameters in the predeltaic area of the Danube Delta in 2017. Study case: Somova-Parcheș aquatic complex lakes.	21
27. Certan Corina	Researches concerning forestry recultivation of sterile dumps in the Quarry „Lafarge Ciment” (Moldova) S.A. Rezina District, Republic of Moldova	22
28. Cioacă Eugenia, Mierlă Marian, Pindic Paula, Anore Ciprian	Researches on the evolution of the Danube Delta Biosphere Reserve ecologically reconstructed ecosystems	22
29. Ciuvăț Alexandru Liviu, Daia Mihai, Dinu Cristiana, Marcu Cristiana, Apostol Ecaterina, Apostol Bogdan	Managing natural regenerations that occurred after harvesting hybrid poplar plantations along the Lower Danube floodplain	23
30. Augustynek Halny P., Babiasz R., Božek J., Ciężak K., Engel J., Furdyna A., Gawlik R., Jaszczuk E., Kotowski W, Leś E., Nawrocki P., Wawręty R., Wiśniewska M.M.	“May the rivers flow naturally” – Save the Rivers Coalition as an example of Polish social movement caring about the rivers and peoples safety	23
31. Fasola Regina	Impact of atmospheric pollution on forest biodiversity in the Republic of Moldova	24

32. Gliga Olesea	The anthropic impact on the dynamics of some heavy metals in the environmental components, the bees body and their products	24
33. Hanzu Mihail, Zaharia Alexandru, Ienăşoiu Gruiţă, Cucu Alexandru	Structure of a woody ecosystem naturally regenerated in Olt river wetland	25
34. Ioja Cristian, Carstea Elfrida, Talaba Odelin, Hossu Alina, Cheval Sorin, Sandric Ionut, Vanau Gabriel, Nita Mihai, Popa Ana-Maria	Assessment of ecosystems services generated by Morii Lake in Bucharest city	25
35. Mierlă Marian, Grigoraş Ion, Covaliov Silviu, Doroftei Mihai, Trifanov Cristian	Contributions in knowing the effects of climate change on some ecosystem services within Danube Delta Biosphere Reserve	26
36. Pipirigeanu Vasile, Tudor Iuliana-Mihaela, Burada Adrian, Ibram Orhan, Teodorof Liliana, Bota Diana, Despina Cristina, Tudor Marian, Mierla Marian, Trifanov Cristian, Anore Ciprian, Munteanu Doina, Vintila Mihaela, Rafael Robert, Penchev Valeri, Kereş BibiĆ Ena, Sajgó Nikolett, Zöllner Joachim, Dahlke Friederike, Szuppinger Péter, Kállay Tamás, Budescu Florentina-Natalia Serban-Atanasiu Irina, Camernik Boris	Assessment of air quality status performed in the selected Danube river areas	26
37. Pohonţu Corneliu Mihăiţă	Biodecolorization of reactive blue 19 dye from effluents by sorption on <i>Aspergillus brasiliensis</i> fungal biomass	27
38. Rădan Sorin Corneliu Rădan Silviu, Catianis Irina, Grosu Dumitru, Iulian Pojar, Scrieciu Albert	Enviromagnetic Proxies And Lithological Characteristics Of Recent Sediments From Particular Aquatic Waterbodies In The Sfântu Gheorghe Branch Area: Oxbow Lakes And Sacalin Bay	27
39. Raicu Filip, Ochinciuc Cristina Victoria, Sbarcea Mădălina	Sustainability upgrades for the built environment in the Danube Delta Biosphere Reserve	28
40. Robea Mădălina-Andreea, Ştefan-Adrian Strungaru, Solcan Carmen, Nicoară Mircea, Plavan Gabriel, Petrovici Adriana	Chronic exposure to insecticide deltamethrin affects the aggressive behavior of zebrafish ( <i>Danio rerio</i> )	29
41. Popescu Ovidiu, Ciorpac Mitică, Trandafir Văcărean Irina Cezara, Lucian Gorgan, Dumitru Cojocaru	Natural spread vs. invasiveness – <i>Scardinius erythrophthalmus</i> success within its genus	29
42. Seceleanu-Odor Daniela, Burada Adrian, Despina Cristina, Teodorof Liliana, Ţigănuş Mihaela, Tudor Iuliana-Mihaela, Ibram Orhan, Spiridon Cosmin, Tudor Marian	Gradual changes in water quality parameters in Razim-Sinoe aquatic complex in the period 1991-2017	30
43. Simionov Ira-Adeline, Cristea Victor, Plavan Gabriel, Baltag Stefan Emanuel, Strungaru Stefan-Adrian, Nicoară Mircea	The level of pollution with metals and organic carbon on the lower Danube sector through a multilivel analysis	30
44. Theochari Dimitra	What's next for China's Sponge Cities? Innovative riparian delta design of river bed, wetlands, amphibian tunnel, and flood protection system.	31

45. Tudor Iuliana-Mihaela, Teodorof Liliana, Ibram Orhan, Burada Adrian, Despina Cristina, Sali Iasemin, Tudor Marian, Lupu Gabriel, Doroftei Mihai, Covaliov Silviu, Odor Seceleanu Daniela, Mierla Marian, Trifanov Cristian, Spiridon Cosmin, Tigănuș Mihaela, Bănescu Angela	Water quality assessment of aquatic ecosystems using Water Framework Directive (WFD) classification (criteria) in Danube Delta Biosphere Reserve.	31
46. Török Liliana, Török Zsolt	Techniques on how and when to analyze the presence of algal toxins	32

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

47. Bota Diana, Nanu Cristina, Bozagievici Raluca	Opinion Survey – A tool applied for the evaluation of tourist demand and supply in Danube Delta Biosphere Reserve	32
48. Butoi Nicoleta Oana, Mateescu Carmen, Lungulescu Marius, Ducu Robert, Luchian Ana-Maria	Experimental research in stimulating algal growth and biomass productivity by electrophysical actions	33
49. Iorga Alexandru	Political ecology of fisheries and poaching in the Danube Delta	33
50. Kozłowska Aneta, Skorupski Jakub, Brzeziński Radosław	Project CATCH – how to bring coastal angling tourism and nature conservation together	34
51. Lup Aurel, Indira Deniz Alim, Liliana Miron	Agricultural programs in the Danube delta and the Danube flood plain	34
52. Marin Oana, Török Liliana, Török Zsolt	Mass development episodes of some opportunistic macroalgae during summer season along the Romanian Black Sea Coast in the last decade	35
53. Năvodaru Ion, Cernișencu Irina, Năstase Aurel	Fishery from Danube Delta Biosphere Reserve – state and trends	35
54. Negrei Costel, Crăciun Anca, Tudor Marian	Methodology for assessing the integration of the environmental decision in the strategy of developing organizations in the economic area of the Danube Delta Biosphere Reserve	36
55. Niculescu Alina Cristina, Frentz Cristi	The identification and evaluation of risks impacting on the locals and on tourist activities in the town of Sulina	36
56. Sbarcea Mădălina, Petrișor Alexandru-Ionuț, Petrișor Liliana Elza	Mapping potential environmental conflicts in the Danube Delta Biosphere Reserve	37
57. Sela Florentina, Marin Eugenia	Disparities in living conditions and life standards of D.D.B.R.'s human communities - Sulina case study	37
58. Török Liliana, Mateescu Carmen, Ducu Robert, Török Zsolt	Establishing a protocol to analyze harvesting and exploitation of phytoplankton algae for biogas production	38

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

59. Alexandrov Laura, Spinu Alina, Madalina Rosca, Nenciu Magda, Angela Szultze, De Grunt Lisa Simone, Waldmann Clare, Zaharia Tania, Vlasceanu Elena, Golumbeanu Mariana, Niculescu Dragos	Focal Point for Black Sea Maritime Spatial Planning, contribution to European MSP Platform	38
60. Alexandrov Laura, Spinu Alina, Mateescu Razvan, Nita Victor,	Maritime Spatial Planning – Coastal erosion, vulnerabilities and public consultation on Case Study Eforie	39

Vlasceanu Elena, Nichersu Iulian, Marin Eugenia, Sela Florentina		
61. Alexandrov Laura, Spinu Alina, Niculescu Dragos, Fabio Grati, Francois Bastardie, Bolognini Luca, Celia Vassilou, Vlasceanu Elena, Anton Eugen, Gheorghe Radu, Nicolaev Alexandru, Maximov Valodia	Spatial synergies/conflicts between fisheries, aquaculture and other human activities evaluated in Romania by DISPLACE, GRID and cumulative impacts methodologies	40
62. Dobrinkova Nina	Application of GIS tools in wildland fire modeling for south Bulgarian test cases	41
63. Hanganu Jenică, Constantinescu Adrian, Covaliov Silviu	Monitoring the trophic state of lakes based on aquatic vegetation survey by means of Sentinel 2 images	41
64. Iordache Gabriel, Bondar Constantin, Anghel Sorin, Malageanu Marian, Dudu Alexandra	Using of GIS techniques to assess the spatial changes of the islets in the Corabia area – Bechet harbor sector (km 626-679) between 1910-2017	42
65. Magritsky Dmitry V., Mikhailov V.N., Kravtsova V.I., Mikhailova M.V.	Hydrological and morphological processes in the river deltas of Caspian sea	42
66. Margritsky Dmitry	Features of spatio-temporal variability of water runoff, sediment yield and heat flux in the delta of the Lena River	
67. Nicolaev Simion, Alexandrov Laura, Nita Victor, Filimon Adrian, Thorleifur Agustsson, Gomiero Alessio, Spinu Alina, Luminita Lazar, Andra Oros, Valentina Coatu	Ecological footprint under marine aqua-farms aiming impact - response assessment and management improvement for mariculture development in the Black Sea basin	43
68. OGREZEANU Andrei, Nichersu I., Nichersu I.I.	Flood Serv semantic wiki based on ontology evaluation	44
69. Panait Valentin, Stănică Aurel Daniel, Mierlă Marian	The Danube River evolution within Danube Delta area based on the archaeological discoveries and remote sensing	45

☐ **PICO (Presenting Interactive Content)**

70. Apostol Mihaela	New developments in air and water quality monitoring systems	45
71. Sorin Bogdan	Equipment and solutions for water and environment	46
72. Constantinescu Adrian C., Paula Pindic, Bănescu Alexandru, Anore Ciprian	Flooding hazard and risk maps for localities along Sulina and Sf. Gheorghe Branches	47
73. Răileanu Ștefan, Cernea Mihai, Marinov Mihai	Epidemiological aspects related to parasitosis and infectious diseases in the equines population of Grindul Letea - Danube delta	47
74. Ioja Cristian, Carstea Elfrida, Talaba Odelin, Hossu Alina, Cheval Sorin, Sandric Ionut, Vanau Gabriel, Nita Mihai, Popa Ana-Maria	Assessment of ecosystems services generated by Morii Lake in Bucharest city	48
75. Spiridon Cosmin, Ibram Orhan, Teodorof Liliana Tudor, Iuliana-Mihaela, Seceleanu-Odor Daniela, Burada Adrian, Despina Cristina, Țiganuș Mihaela, Georgescu Lucian Puiu, Doroftei Mihai	Preliminary results on phytoplankton in Zaghen Polder	48





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

**1. Guidelines for responding to incidences of disease outbreak in pelicans**

**Alexandrou Olga, Catsadorakis Giorgos**

*Society for the Protection of Prespa, Agios Germanos, Prespa, 53077, Greece, e-mail: [o.alexandrou@spp.gr](mailto:o.alexandrou@spp.gr)*

Wildlife diseases are a growing problem in wetlands throughout the world. Recently, infectious diseases, such as avian influenza, have affected the populations of the Dalmatian pelican, an emblematic threatened species. The area of Prespa consists of two lakes surrounded by mountains, lies in a remote part of NW Greece and most of its inhabitants are occupied in the primary sector. The lakes host the largest Dalmatian pelican colony in the world and many other rare waterbirds. Despite the existence of laws and regulations, in the event of an outbreak, how to properly handle locally the various users of wetlands still remains underdeveloped. Things worsen if the veterinary authorities are understaffed and located far from the site. Thus, in “peacetime” i.e. before an outbreak and within the frame of a LIFE Nature project, we prepared a guideline document and a local contingency plan aiming to ensure effective collaboration and coordination of efforts at local level. Emphasis is given to the management of the public disclosure of the event, mainly to local stakeholders, so as to avoid possible secondary threats to pelicans, such as persecution, destruction of colonies or other unpredictable actions caused by panic and confusion. The document lists appropriate steps and measures that need to be taken on a precautionary basis as well as during the event of a disease outbreak in pelicans, taking into account national, regional and local particularities. We consider it is a useful tool for all wetlands hosting waterbird colonies susceptible to infectious diseases.

---

**2. Study on host specificity of bat flies (Nycteribiidae) from Romanian and Bulgarian bat populations**

**Péter Áron<sup>1,2</sup>, Barti Levente<sup>3</sup>, Csősz István<sup>3</sup>, Alexandra Cordoneanu<sup>1</sup> Földvári Mihály<sup>4</sup>, Sándor D. Attila<sup>1</sup>**

*<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Cluj-Napoca, Calea Manastur 3-5, Cluj-Napoca 400372, Romania, e-mail: [aronpeter92@mail.com](mailto:aronpeter92@mail.com)*

*<sup>2</sup>MTA-PE Evolutionary Ecology Research Group, Department of Limnology, University of Pannonia, Hungary*

Bat flies are the most abundant parasites of bats because of their high level of host specificity, extremely interesting biological life traits and ecology moreover with their newly discovered ability, that they can be vectors for several pathogens, the scientific curiosity around them is rising. Few important questions of studies regarding parasites are the species host specificity and seasonality. The bat flies, against the odds and possibilities are showing high levels of specificity, which main driving forces presumably are the higher mating chances on primary hosts and the immune compatibility, which is a result of a long coevolutionary relationship. In this study we investigated the idea that the size and variability of the actual host community can alter the host exploiting behavior of parasites. Bats were captured from 2015 to 2017 in Romania and at the northern parts of Bulgaria. For capturing we used harp trap and fine mist nets. After collecting the ectoparasites, they were stored in alcohol and later in laboratory they were identified on species level after morphological keys. We used a very strict protocol during the collection and identification to avoid errors from mixing the samples. From the almost three thousand collected bats (23 species) 1018 were infected with bat flies, altogether 2277 bat flies were collected belonging to 9 species. By analyzing our data, we found connection between the host specificity of bat flies and the structure of present bat population.

---

### **3. Preliminary data on mammal species of community interest in Danube Delta Biosphere Reserve**

**Alexe Vasile, Doroşencu Alexandru, Marinov Mihai**

*Danube Delta National Institute for Research and Development, Str. Babadag, no. 165, Tulcea, Romania, e-mail: [vasile.alexe@ddni.ro](mailto:vasile.alexe@ddni.ro)*

The Danube Delta Biosphere Reserve (D.D.B.R.) overlaps with two Natura 2000 sites (ROSCI0065 Danube Delta and ROSCI0066 Danube Delta Marine Area). According to the standard data forms these Natura 2000 sites are aiming to conserve the populations of 9 mammal species listed in Annex 2. of the Habitats Directive. A two-year study, 2016-2017, was carried out aiming to assess the status of these 9 mammal species in D.D.B.R. perimeter. In this study we were able to identify in the field 8 out of 9 species of the area. Our results provide preliminary data for identifying the spatial distribution and habitat status of community interest mammals in the D.D.B.R., which are important for the future research and protection management.

---

### **4. Swimming mode of sturgeons. A review**

**Andrei Raluca-Cristina (Guriencu), Cristea Victor, Creţu Mirela, Dediu Lorena**

*"Dunărea de Jos" University of Galaţi, Faculty of Food Science and Engineering, Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Domnească Street no. 47, 800008, Galaţi, Romania, e-mail: [raluca.andrei@ugal.ro](mailto:raluca.andrei@ugal.ro)*

Sturgeons obtained a special attention from biologists not only because of their distinctive morphology and physiology but also because in many ways, they are between sharks (selachians) and the more recently evolved teleosts. Swimming mode has been classified into two categories: Sustained swimming employed by fish to cover relatively large distances at a more or less constant speed and unsteady movements which includes fast moves, escape tricks, and turns; usually used for capturing prey or escaping predators. The majority of freshwater fish utilize an undulatory body and caudal fin swimming manner and a subcarangiform class of locomotion. This swimming type is transitional between the anguilliform type shown by eels, where undulatory propulsive waves involve most of the body length, and the thunniform mode used by tunas, where oscillatory propulsive waves are intensified in the tail region. Sturgeon, like the majority of freshwater fish, have a subcarangiform swimming mode yet, their tails are similar those of sharks. Sturgeons present a heterocercal tail, the upper lobe is greater than the lower lobe. As well, the tail depth is considerably reduced in sturgeon than in teleosts, most likely because of the restricted supportive capability of the cartilaginous skeleton.

This paper aims to summarize the existing information on swimming modes of sturgeons, generated from both lines of research in relation to their unique structural features, and place this knowledge into an evolutionary context with that of teleosts and selachians.

**Acknowledgments.** „This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P2-2.1-PTE-2016-0188, within PNCDI III”.

---

## 5. Projection of changes in productivity of pike-perch (*Sander lucioperca*) from Razim Lake under climate changes by VPA modeling

**Cernișencu Irina, Năvodaru Ion, Ibram Orham, Năstase Aurel**

*Danube Delta National Institute for Research and Development, Str. Babadag, no. 165, Tulcea, Romania, e-mail: [irina.cernisencu@ddni.ro](mailto:irina.cernisencu@ddni.ro)*

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 and supports important commercial fisheries. In this paper we try to predict how climatic change will affect the pike-perch productivity in the Razim Lake. In order to estimate the influence of climate change on pike-perch stocks in Razim Lake, we use von Bertalanffy growth parameters that are influenced by water temperature and are then use it to predict changes in productivity by estimation of stock abundance, biomass and MSY. Thus, within the natural mortality estimation Pauly's formula, as data input is average water temperature. Thus, using the growth parameters estimated in 2016 for pike-perch from Razim Lake ( $L_{inf} = 90.8$  cm,  $K = 0.163$ ,  $t_0 = -0.6$ ), the mortality  $M$  for RCP 4.5 and RCP 8.5 was calculated. These data were the input data for VPA, thus estimating the average number of individual and biomass average. Under several assumption and scenarios, the model predict that the increase of the water temperature will increase the natural mortality, that drive changes in the average biomass and the average number of individuals of stock. However, ecosystem complexities associated with many assumption, make difficult modeling for forecasting how pikeperch populations might respond to future climate change.

---

## 6. Specified Diversity of the Carabides (Ord. Coleoptera) of the Danube Delta Biosphere reserve trapped with light traps

**Ciubuc Constantin**

*Universitatea Din Bucuresti Stațiunea Zoologică Sinaia, Sinaia, Sr. Cumpătu Nr. 5 Jud. Prahova Cod. 106100, e-mail: [ciubuc1206@gmail.com](mailto:ciubuc1206@gmail.com)*

The distinct diversity of the Danube Delta habitats provides, to a certain extent, a high specific diversity of carabine communities in these ecosystems. Although the catches were made using the light trap method, however, a number of 104 taxa were captured compared to only 61 and 69 registered by M.A. Ieniștea (1986 and 1974 respectively) and Șt. Black only 29 taxons (1968). The use of light trap methods appears to have a selective character in attracting only the macroproducts and micropters species of the Harpalinae, Stenolophinae, Trechinae, Scaritinae, etc. subfamilies. In the 545 samples with carabidae were captured 1875 ♂♂, 2916 ♀♀. In our researches we mostly surprised the exceptional diversity of the Danube Delta habitats, so samples from salty areas, such as Chituc Grind and Mila 26 (Maliuc), Enisala (Fishery Farm of INCPDD Tulcea) as well as habitats with lush vegetation from Mila 23 (Dunarea Veche) and the Litcov - Caraorman Canal. In all the sites where they were sampled, the taxa of the subfamily mentioned above prevailed. It is worth noting that the Shannon - Wiener High Growth Index ( $H' = 4.318$  on 31.07.2002) recorded at the samples captured at Mila 23, Dunarea Veche, where 51 species were captured single night in traps with white neon light and at Maliuc, there were registered indexes of 4.008 (30.07.2002). The same category includes the communities on the Litcov Canal - the confluence with Caraorman (values between 3.5 - 3.8) as well as at Enisala and Grindul Chituc.

Conclusions: The very large number of captured species, as well as the large number of specimens, indicate a diversity unprecedented in the literature of the Carabidae family;

-carabids are considered to be indicative species of "habitat health" in wetlands, ecotone areas, specific to the Danube Biosphere Reserve;  
- although the capture methods were specific, for the macroptera species of the family, the target species being exclusively those with membrane wings, we would have expected the number of taxa to be low, in fact if one considers that there are species non-enclosed apertures in light traps, specific diversity must be much higher in these ecosystems;  
- If we relate to the whole fauna of Carabidae in Romania, about 1/5 of this fauna is present in the Danube Delta Biosphere Reserve (568 taxa belonging to the Carabidae family, Nițu, 2012).

---

## 7. Algal blooms in the Romanian Black Sea waters in the beginning of the 21<sup>st</sup> Century

**Culcea Oana, Boicenco Laura, Lazăr Luminița, Pantea Elena**

National Institute of Marine Research and Development Grigore Antipa, Mamaia Boulevard, no. 300, Constanța, România, e-mail: [oculcea@alpha.rmri.ro](mailto:oculcea@alpha.rmri.ro)

The paper represents an overview of the algal blooms in the Romanian Black Sea waters between 2001 and 2017 using historical data from NIMRD phytoplankton and chemistry database. The magnitude and frequency of the algal blooms decreased compared to the events reported during the period when the phytoplankton reached its maximum development (in the 1980's). The most common species producing blooms events were diatoms and dinoflagellates, such as: *Skeletonema costatum*, *Cyclotella caspia*, *Pseudonitzschia delicatissima*, *Nitzschia tenuirostris*, *Chaetoceros socialis*, *Chaetoceros curvisetus*, *Cerataulina pelagica*, *Prorocentrum minimum*, *Scrippsiella trochoidea*, *Heterocapsa triquetra*. However, between 2001 and 2017, there were particular phenomena to develop nondiatoms species found in low salinity values and high nutrients of shallow water conditions favorable to the emergence of high-intensity phytoplankton blooms. An example would be the algal blooms produced in 2003 by the cyanobacteria *Microcystis pulvereae*, which reached its maximum density of  $57.6 \cdot 10^6$  cells/L in the samples from the station East Constanta 2. Another nondiatom species important for the phytoplankton community is the coccolithophorid *Emiliana huxleyi*. During 2013-2017 *Emiliana huxleyi* has begun to record densities of over  $10^6$  cells/L in the Romanian Black Sea waters during summer. In the last decade, it can be seen the general trend of reducing the quantities of phytoplankton and lower frequency of large algal blooms.

---

## 8. Zaghen Polder – monitoring of ecological aspects after reconstruction works

**Doroftei Mihai, Burada Adrian, Alexe Vasile, Doroșencu Alexandru, Năstase Aurel, Trifanov Cristian, Covaliov Silviu, Lupu Gabriel, Despina Cristina, Orhan Ibram, Mierlă Marian, Tudor Iuliana-Mihaela, Marinov Mihai, Pindic Paula, Sali Iasemin, Spiridon Cosmin**

Danube Delta National Institute for Research and Development, Str. Babadag, no. 165, Tulcea, Romania, e-mail: [mihai.doroftei@ddni.ro](mailto:mihai.doroftei@ddni.ro)

Since the beginning of the century, the Zaghen area has been mentioned as a marsh unconnected to the Danube, but it was flooded only at the high-water levels, and locals in the vicinity of the ponds occasionally fished, not being rich in fish. The vegetation was largely composed of reedbeds and aquatic vegetation in forests, lakes and canals. In 1962, a flood defense dike was constructed and a network of indoor drainage channels grouped into two subsystems consisting of open secondary channels intercepted by a magistrate channel connected downstream to a pumping station. In the floodplain area, recovered by desiccation and

hardening works, designated polder, the activities were grazing, agriculture and fishing. This monitoring study was carried out after the hydro-technical works finished within project "Ecological Reconstruction in the Zaghen Polder of the Danube Delta Cross-Border Biosphere Reserve Romania / Ukraine SMIS-CNSR 36276". This study is financed by the Administration of the Danube Delta Biosphere Reserve Administration. The subject of the contract are the actions carried out in the field of biodiversity between April 2017 and April 2018. Observations were made on the vegetation, invertebrates, amphibians, reptiles, fish, birds and mammals in the Zaghen Polder area. As a general area, the study area is located in the South East Development Region 2, west of the Danube Delta, respectively in the eastern part of Tulcea. The general aspect is a dilapidated enclosure that falls within the Danube river basin, on the lower course upstream of St. George's hill being identified as part of the floodplain of the Danube. Since 1993, the Zaghen Polder is under the administration of the Danube Delta Biosphere Reserve Authority, and, as part of the Natura 2000 sites: ROSCI0065 Danube Delta and ROSPA0031 Danube Delta and Razim Sinoe Complex, from 2011. During the monitoring of flora and vegetation in Zaghen Polder, over 300 species of plants were inventoried in both pre-construction and post-construction, most of the species identified are ruderal, without conservative value. The anthropogenic nature of vegetation is better emphasized on and near dikes.

---

#### 9. An overview of Black Sea sturgeons: supportive stocking success, feeding area communities, dispersal, and species gene pool

**Holostenco Nicoleta Daniela<sup>1</sup>, Ionescu T.<sup>2</sup>, Taflan Elena, Hont Ștefan<sup>1</sup>, Paraschiv Maria<sup>1n</sup>, Iani Marian<sup>1</sup>, Bushuiev S.<sup>3</sup>, Chashchyn O.<sup>3</sup>, Memis D.<sup>4</sup>, Komakhidze G.<sup>5</sup>, Mihalache I., Crețu M., Bichescu C.<sup>2</sup>, Bîrsan I.<sup>2</sup>, Cristea V.<sup>2</sup>, Suci Radu<sup>1</sup>, Ciorpac Mitică<sup>1\*</sup>**

<sup>1</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, <sup>2</sup>"Dunarea de Jos" University of Galati, Domnească Street, No. 47, 800008, Galați, Romania

<sup>3</sup>SE Odessa Center YUGNIRO, 132 Mechnikova Street, 65007 Odessa, Ukraine

<sup>4</sup>Istanbul University, Faculty of Fisheries, Department of Aquaculture, Ordu Cad. No. 200 34130 Fatih / Istanbul, Turkey, <sup>5</sup> - Fisheries and Black Sea Monitoring Center of National Environmental Agency, 11 Sherif Khimshiashvili Ave., 6010 Batumi, Georgia

\*corresponding author address: e-mail: [mitica.ciorpac@ddni.ro](mailto:mitica.ciorpac@ddni.ro)

Current knowledge about meta-population structure and genetic distribution of sturgeon species inhabiting Black Sea coastal areas is incomplete or totally absent in some respects. For a better understanding of the sturgeon communities from Black Sea coastal areas, we conducted a study on metapopulation structure using data collected in 2014 and 2015. Over these two years 1627 juveniles belonging to three sturgeon species (*Huso huso*, *Acipenser stellatus* and *A. gueldenstaedtii*) were captured with nets (scientific fishing) or accidentally by commercial fishers in Black Sea coastal areas. The individual were subjected to biometric measurements and CWT reading to determine their origin, wild or stocked in a Romanian pilot project aiming to evaluate stocking procedures. The genetic diversity of the sturgeon juveniles was assessed using a data set comprising 425 D-loop sequences (184 *Huso huso*, 125 *Acipenser stellatus* and 116 *A. gueldenstaedtii*). For all three-sturgeon species, D-loop sequences were analyzed for haplotypes, genetic diversity and selective neutrality. This approach allows us to draw a hypothesis about the genetic status, pattern of movements and sharing degree. This paper describes aspects of genetic diversity, meta-population structure and gene flow within and between populations utilizing Black Sea feeding areas. Our analysis revealed that out of 1627 captured individuals ~47% were originating from experimental stocking in Romania. Out of five fishing areas (within Romanian, Ukrainian, Turkish and Georgian territorial waters) in four of them, we recorded *H. huso* individuals, while *A. gueldenstaedtii* and *A. stellatus* only in two of them. Additionally, our survey revealed the presence of *A. baeri*-like in Ukrainian and Georgian territorial waters. The genetic

analysis showed complex genetic structure and a significant sharing degree between Romanian and Ukrainian territorial waters. Overall, the present paper represents a step forward in understanding the Black Sea sturgeons' distribution and sharing degree within four countries territorial waters, therefore a starting point for a better conservation management.

---

#### **10. Genetic assessment of sterlet (*Acipenser ruthenus*) from a Lower Danube wild population using nuclear and mitochondrial markers**

**Kohlmann Klaus<sup>\*1</sup>, Ciorpac Mitică<sup>2</sup>, Kersten Petra, Geßner Jorn, Taflan Elena, Tosic Katarina, Holostenco Daniela, Suci Radu**

<sup>1</sup>Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm 310, 12587 Berlin, Germany,

<sup>2</sup>Danube Delta National Institute for Research and Development, 165 Babadag, 820112 Tulcea, Romania, \* corresponding author: phone 0049-30-64181634; e-mail: [kohlmann@igb-berlin.de](mailto:kohlmann@igb-berlin.de)

Most wild populations of Eurasian sturgeon species have, in recent decades, suffered an accelerated demographic decrease due to overfishing and habitat fragmentation. Sterlet sturgeon (*Acipenser ruthenus*) is no exception. However, its wild populations still inhabit most parts of its historical range. The sterlet is a full freshwater species, migrating only within its home river drainage basin, thus being more susceptible to river damming and habitat fragmentation. In the Lower Danube River (LDR) survives one of the last wild sterlet populations from the EU. Knowledge regarding the genetic diversity and management units of this population are lacking, but are urgently needed to enable long-term conservation actions. Therefore, a genetic screening of the LDR wild population was conducted on 151 individuals, and on another 20 farmed individuals from Germany as an outgroup. In order to identify the number of management units and population structure, 15 polymorphic microsatellite markers were developed and genotyped. Additionally, full-length cytochrome b CDS, and partial D-loop sequences were used to determine the maternal lines population history. Microsatellite analysis revealed a well-defined cluster, pure and distinct, for German farmed sterlets, while the wild LDR sterlets comprised three other distinct clusters. Two of them dominated, but showed a high proportion of admixed individuals. The third one was composed of just two individuals, which later proved by molecular methods to be *A. stellatus* x *A. ruthenus* interspecific hybrids. Our results show a significant number of maternal lines on mitochondrial data, and the presence of at least two ancestral populations in the LDR with a high tendency to homogenize the gene pool at the nuclear level. This data suggest an active genetic uniformity tendency induced by spatial contraction due to habitat fragmentation by dams. Moreover, the presence of two interspecific hybrids, in two consecutive years, highlights that naturally occurring interspecific hybrids are more common than previously believed, most probably due to the same causes - habitat contraction.

---

#### **11. Validation of 12 species-specific, tetrasomic microsatellite loci from the Russian sturgeon, *Acipenser gueldenstaedtii*, for genetic broodstock management**

**Kohlmann Klaus<sup>☒</sup>, Kersten Petra<sup>1</sup>, Geßner Jorn<sup>1</sup>, Eroglu O.<sup>2</sup>, Firidin S.<sup>2</sup>, Ciorpac Mitică<sup>3</sup>, Taflan Elena<sup>3</sup>, Suci Radu<sup>3</sup>**

<sup>1</sup>Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm 310, 12587 Berlin, Germany,

<sup>2</sup>Central Fisheries Research Institute, Vali Adil Yazar Cd. No: 14, 61250 Trabzon, Turkey

<sup>3</sup>Danube Delta National Institute for Research and Development, 165 Babadag, 820112 Tulcea, Romania, ☒ corresponding author: phone 0049-30-64181634; email [kohlmann@igb-berlin.de](mailto:kohlmann@igb-berlin.de)

The Russian sturgeon, *Acipenser gueldenstaedtii*, is a critically endangered fish species. Hatcheries are operated in several countries within its natural range to produce stocking material for release into the wild but also for aquaculture purposes (caviar and meat production). An appropriate genetic broodstock management is required to avoid negative effects, e.g. admixture/hybridization of genetically differing stocks or loss of genetic variability due to inbreeding and genetic drift. Therefore, 11 tetrasomic microsatellite loci were newly isolated from the Russian sturgeon genome and arranged together with an already known locus into four multiplex PCR sets. These microsatellites were used to characterize three groups of hatchery juveniles from Germany (aquaculture production), Turkey and Romania (production of stocking material) as well as a group of wild-caught adults from the Danube River, Romania. Based on the variability within groups, measured by the mean number of alleles per locus and expected heterozygosity, and the differentiation between them, measured by Nei's GST and genetic distance D, their suitability to detect unwanted reductions in genetic variability within hatchery broodstocks and to differentiate between them could be demonstrated. This set of loci can also be used to identify those pairs of spawners that transmit the highest possible genetic variability to the next generation.

---

## **12. Assessment of threatening at regional level for Community Interest Insect Species from Danube Delta Biosphere Reserve**

**Lupu Gabriel, Tudor Iuliana-Mihaela, Ibram Orhan**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [gabriel.lupu@ddni.ro](mailto:gabriel.lupu@ddni.ro)*

The process of designating NATURA 2000 sites (SCI and SPA) in Romania was assumed at European level, the classification being made taking into account EU policies on environmental protection. Therefore, inevitably, some errors of designation have occurred, most of which being related to the erroneous indication of the presence of species or habitats.

The solving to some of these problems was attempted with the organization of biogeographical seminars in 2008, 2010 and 2012. Therefore the three actions were meant to bring some clarifications:

2008:

- have been established the reference lists for habitats and species from Romania;
- preliminary conclusions were drawn regarding the conservation status of habitats and species in Romania.
- 2010:
- the Black Sea Seminar set out the reference lists of Member States for habitats and species in the Black Sea area;
- have been drawn up the conclusions on the conservation status of habitats and species for Member States in the Black Sea area.
- 2012:
- have been drafted and available the Detailed Conclusions on Representativity of Habitats and Species of Community Interest (SCI) in Romania.

The debates in these meetings also wanted to eliminate the inconsistencies between the data included in the NATURA 2000 Standard Forms and the realities on the ground regarding the presence of habitats and species of community interest in Romania. As a result of these discussions and the elaboration of the conclusions of the biogeographical seminars, a number of changes have been made regarding the lists of species and habitats of some sites of Community importance.

This intro was made to highlight the way in which changes were made to the Standard Form of NATURA 2000 - ROSCI0065 Danube Delta, where, from the species listed in Article 4 of Directive 2009/147/EC, species listed in Annex II Directive 92/43/EEC, two invertebrate species - a snail (*Theodoxus transversalis*, Pfeiffer, 1828) and an arthropod (insect, butterfly) (*Colias myrmidone*, Esper, 1781) have been removed. In the list of entomofauna species, there is a change that was made and on which we also caught attention on various occasions, *Colias myrmidone* being a taxon erroneously reported in Dobrogea (in Dobrogea Gorges) and never within the Danube Delta Biosphere Reserve territory, these being present (in Romania) only in Transylvania. In this work we will synthesize the analysis of the presence and the endangerment degree for the entomofauna species of community interest from Danube Delta Biosphere Reserve. This analysis took into account the membership of the IUCN Red List for each of the target species, indicating the threatened categories. At the same time were also indicated the threatened categories for the species present in The Red List of Plant and Animal Species from the Danube Delta Biosphere Reserve (Oțel, 2000).

---

### **13. The assessment of colonial species from Danube Delta Biosphere Reserve (Romania) in 2016 and 2017**

**Marinov Mihai, Doroșencu Alexandru, Alexe Vasile, Răileanu Ștefan**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [mihai.marinov@ddni.ro](mailto:mihai.marinov@ddni.ro)*

In the Danube Delta Biosphere Reserve the authors have carried out colonial waterbird survey in 2016 and 2017. The main goals were to count the number of the colonial waterbirds (*Pelecaniformes*, *Ciconiiformes* and *Charadriiformes*) and to assess the current state of their colonies. The most abundant colonial species in 2016 were Whiskered Tern (*Chlidonias hybridus* - 17,560 pairs) and Great White Pelican (*Pelecanus onocrotalus* - 17,000 pairs) and in 2017 were Great White Pelican (14,400 pairs) and Great Cormorant (*Phalacrocorax carbo* - 8,485 pairs). The least abundant colonial species in 2016 and 2017 was the Little Tern (*Sterna albifrons* / *Sternula albifrons* - 4 and 6 pairs respectively). As a result of the action of several natural and anthropic factors there were significant differences (-48%) in the number of nesting birds in 2017 (46,596 pairs belonging to 26 species) compared to 2016 (68,747 pairs belonging to 26 species). The exact identification of colony site and their status of these colonial waterbirds will enable Romanian authorities to actively preserve, protect and stimulate the factors that prove to be crucial to birds' survival. Comparing data from 2016 - 2017 with those from the last decade allows us to have an overview on the state of colonial species.

---

### **14. The fish communities of lake-complexes from Danube Delta Biosphere Reserve in spring and autumn of 2016**

**Năstase Aurel, Năvodaru Ion, Cernișencu Irina, Țiganov George**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [aurel.nastase@ddni.ro](mailto:aurel.nastase@ddni.ro)*

Fish in Danube delta generally spawn in spring, grows over the summer and in autumn season juveniles recruit to the population. To study fish fauna in this area we chose May-June after spawning and October after the juveniles recruitments. A number of 136 fish species was identified in Danube Delta Biosphere Reserve (DDBR) (included marine species) belonging to 3 Classes with 20 Order, 45 Families (representing more than 70% of Romania's ichthyofauna). Using 3 methods of sampling in accordance with UE fish



sampling methods, were sampled 11 representative lakes in 249 stations: electric fishing in 55 sites (fishing effort over 9 hours), 164 sites with Nordic multimesh size gillnets (4,920 m/night fishing effort) plus 23 sites with commercial gillnets (1950 m/night fishing efforts) and 7 sites with seine fishing (in the Razim lake). In 2016 in 6 lake-complexes were identified 46 species of fish (majority are limnophilous). Totally were captured over 60,000 fish individuals with almost 1 t weighting. The main catches being in Rosu-Puiu and Razim-Sinoie lake-complexes and the smallest catches in Somova-Parches lake-complexes, in both season (spring and autumn) of 2016. Using Catch per Unit Effort (CPUE) standardization, it was analyzed species richness and ecological parameters, like relative abundance, relative biomass, constancy/frequency, ecological significance, biodiversity index and others. Present work will characterize the ichthyocoenoses and estimate conservation status of fish fauna from lake-complexes of DDBR.

---

### **15. Efficiency of interspecific mating in indigenous crayfish *Astacus astacus* and *Astacus leptodactylus***

**Przemysław Śmietana, Marek Budniak**

Green Federation "GAIA", Institute for Research on Biodiversity / University of Szczecin,  
Wąska 13 St., Szczecin, 71-415, Poland, e-mail: [leptos@univ.szczecin.pl](mailto:leptos@univ.szczecin.pl)

Noble crayfish *Astacus astacus* and Narrow-clawed crayfish *Astacus leptodactylus* are indigenous species to Poland. Despite the fact that there is little known about coexistence of aforementioned species, according to some authors *A. astacus* and *A. leptodactylus* could constantly coexist in the same water bodied because they preferred different bottom habitats. However, some reports suggest that introduced *A. leptodactylus* (e.g. in Switzerland) can competitively displace of native *A. astacus*. The mechanism of that interspecific competition remains unclear and multiple factors are probably involved. One of the factors can be interspecific mating. To test the efficiency of interspecific mating, the cage experiment under semi-natural conditions was performed. In two special cages submerged into a lake, mixed-species crayfish pairs were kept throughout mating season. In one variant of the experiment eight males of *A. astacus* coexisted in the cage with eight females of *A. leptodactylus*, while in the second cage an opposite sex-species combination was applied. The mating efficiency was evaluated by the results of transfer of spermatophores to female bodies and the place of spermatophores localisation. Moreover, the females' survival and condition (eg presence of broken antennules and legs) were observed. The results of the experiment showed that mating in pairs *A. leptodactylus* male – *A. astacus* female is much more effective than in the opposite sex-species pairs. After the conspecific mating, only females of *A. astacus* laid fertilized eggs. The experiment suggests the competitive advantage of *A. leptodactylus* over *A. astacus* in terms of effectiveness of conspecific mating.

---

### **16. Is *Carassius gibelio* (Bloch, 1782) (Pisces, Cyprinidae) a non-native or native species in Europe and Romania?**

**Vasile Oțel, Nagy András Attila**

Corresponding e-mail: [vasile\\_otel@yahoo.com](mailto:vasile_otel@yahoo.com)

*Carassius gibelio* (Bloch, 1782) (caras argintiu, caras, crap-caras / gibel carp, Prussian carp) is considered by some authors alohtone for Europe and Romania respectively, originated from East Asia, Japan, and more recently, by others, a native species for this area, with the Euro-Asian geographical area (from Central Europe to Siberia). Those who claim non-native species take into account the history of the introduction of the goldfish (*Carassius auratus*) in Europe since the 17th century (initially from Java in Portugal, and later in several

European countries, from the Far East). The introduction, propagation and linking of goldfish with the Prussian carp are quite unclear in the literature. Those who claim the native status mention that the presence of the species in Europe occurred prior to introduction of the goldfish here (without clear evidence) and although there are no significant morphological differences between these two species, there are obvious genetic ones at the molecular and chromosomal levels (the existence of triploid specimens with parthenogenetic reproduction - gynogenesis is characteristic only at *Carassius gibelio*). The most recent monographs on the ichthyofauna of Romania considered the Prussian carp (Bănărescu, 1964; Oțel, 2007) as an autochthonous species. In this article we intend to carefully study some older and more recent publications that refer to the mention of the species in the territory of Romania and of Europe respectively. Following this analysis, we have concluded that *Carassius gibelio* is a native species.

---

## **17. Aquatic and wetland vegetation of the Kopački Rit Nature Park, Croatia**

**Siniša Ozimec<sup>1</sup>, Dragan Prlić<sup>2</sup>, Vlatko Rožac<sup>3</sup>**

<sup>1</sup>Josip Juraj Strossmayer University of Osijek, Faculty of Agriculture in Osijek, Vladimira Preloga 1, HR-31000 Osijek, Croatia (e-mail: [sozimec@pfos.hr](mailto:sozimec@pfos.hr)), University of Osijek, Department of Biology, Croatia, e-mail: [prlicdragan@gmail.com](mailto:prlicdragan@gmail.com)

<sup>3</sup>Public Institution Kopački Rit Nature Park, Mali Sakadaš 1, Kopačevo, HR-31327 Bilje, Croatia

The Kopački Rit Nature Park is located in northeastern Croatia, in the floodplain formed by the confluence of the Danube and Drava Rivers. It was proclaimed as Nature Park in 1999 and comprises a total surface of 231 km<sup>2</sup>. In July 2012, it was included in the UNESCO Transboundary Biosphere Reserve Mura-Drava-Danube. The diversity of flora, vegetation, and distribution of land, aquatic and wetland habitats are depending on frequency, intensity and duration of floods. Recent vascular flora comprises 512 taxa, of which 156 (31%) are macrophytes. Based on records collected during the multiannual field surveys, the presence and distribution of aquatic and wetland plant communities in the Kopački Rit Nature Park had been analysed. Prolonged dry season and low Danube water level stimulate growth of the amphibious communities from the alliance *Nanocyperion* on muddy or sandy bottoms. Such situation was during the extremely dry summer in 2003, when channels and most of the standing water bodies dried out, and during autumn in 2012 and 2015. During spring and summer 2010, ecological conditions were optimal for the shallow marsh vegetation from the order *Oenenthalia aquatica*. Flooding and prolonged duration of high Danube water levels in the warm summer period makes the optimal conditions for growth of freely floating, rooted, and floating-leaved aquatic vegetation from the orders *Lemnetalia* and *Potamogetonalia*. It was highly pronounced in summer 2011, 2013 and 2016. Since the water outflow was rather slow, high air and water temperature stimulated abundant growth of the aquatic vegetation on water surface.

**Keywords:** Kopački Rit, vegetation, Danube, Croatia

---

**18. Phylogenetic analysis of the complete mitochondrial genome of the European mink *Mustela lutreola* shed light on the species recent evolutionary history**

**Jakub Skorupski**

Green Federation "GAIA", Polish Society for Conservation Genetics LUTREOLA, Poland,  
e-mail: [jakub@gajonet.pl](mailto:jakub@gajonet.pl)

In the past, the European mink was classified by various authors within genus *Viverra*, *Putorius*, *Lutra*, *Martes*, *Hydromustela*, *Lutreola*, and finally *Mustela*. As early as the first half of the XX c., the inconvenience of taxonomic relationships within the traditionally defined *Mustela* genus was pointed out, particularly with respect to the taxonomic position of *M. lutreola* in reference to the position of *Neovison vison* (then *Mustela vison*), *Mustela putorius* and *Mustela sibirica*.

The controversies surrounding the systematic position of the European mink have not ceased and there is still a lack of consensus, primarily on the issue of reflection of the actual phylogenetic relationships between *M. lutreola* and *M. putorius* and *M. eversmani*. The contribution to the discussion of the systematic position of the European mink is also a comparative analysis of the species' mitochondrial genome, conducted in the present research. The complete mitochondrial genome of the species was sequenced *de novo* – the length of a gained nucleotide sequence is 16,5 kbp. The comparison of the recognized sequence of with the complete mitogenome sequences of 24 species of the Mustelidae family, conducted with the neighbor joining method showed a similarity at the level of 86-99%. The phylogenetic tree made on the basis of the recognized sequence of mtDNA was characterized by the high affinity of the European mink with the European polecat and the ferret, and its explicit presence in the clade including also *M. eversmanni*, *M. nigripes*, *M. sibirica* and *M. itatsi*.

---

**19. Molecular characterization of the noble crayfish *Astacus astacus* populations and its commensal *Branchiobdella parasita* from Pomeranian lakes in Poland**

**Szenejko Magdalena, Skuza Lidia, Śmietana Przemysław**

Green Federation "GAIA", Institute for Research on Biodiversity / University of Szczecin, Poland,  
e-mail: [magdalena.szenejko@usz.edu.pl](mailto:magdalena.szenejko@usz.edu.pl)

Branchiobdellidans of genus *Branchiobdella* (Odier 1823) are obligate ectosymbionts living primarily on astacoidean (Astacidae) crayfish. The seven species of the genus *Branchiobdella* are endemic to Europe – *B. astaci*, *B. balcanica*, *B. hexodonta*, *B. italica*, *B. kozarovi*, *B. parasita* and *B. pentodonta*. The molecular examinations of *Branchiobdella parasita*, most common (despite its scientific name) commensal of noble crayfish *Astacus astacus* were undertaken. The research were conducted in parallel with molecular studies of host populations. The use of cytochrome c-oxidase (*cox1*) gene of mitochondrial DNA and the 16S rDNA sequencing allowed to intra- and interpopulation genetic diversity assesment. The results were used as a reference for determination of genetic quality of *A. astacus* populations and applied in restocking programme: "Active protection of noble crayfish in lakes of Pomeranian Landscape Parks Complex", financed by the Financial Mechanism of the European Economic Area 2014-2016. The pattern of the research and the results interpretation are illustrated with molecular analyses of 80 branchiobdellidans specimens from four *A. astacus* populations. Apart from using in the above mentioned restocking programme, the results can shed some light on description of the coevolutive host-commensal interaction.

---

## 20. Occurrence of *Perccottus glenii* in the Danube Delta Biosphere Reserve (Romania) after a decade of its presence in the area

**Török Zsolt, Török Liliana**

*Danube Delta National Institute for Research and Development, 165 Babadag street, Tulcea, 820112, Romania, e-mail: [zsolt.torok@ddni.ro](mailto:zsolt.torok@ddni.ro)*

In 15 V. 2017 - 17 X. 2017 period there were performed 145 samplings in the Danube Delta Biosphere Reserve (DDBR) area, out of which: 125 samplings in the DDBR, 6 samplings in the close neighbourhood of DDBR, 9 samplings in the Lower Danube valley, but outside of the DDBR and 5 samplings in the catchment area of the Razim-Sinoe lagoony region, but outside of the DDBR. *Perccottus glenii* was captured 26 times, in a total number of 25 sites, all the sites being located inside the DDBR, meaning that the species was recorded in 20.8% of the cases. Taking into account the results of the investigations performed with a simple and unselective tool (a mesh with handle), we consider that *P. glenii* has passed the stage of accommodation to the conditions of the proper Delta and is in a process of aggressive occupation of various freshwater habitats. In 2017 the species was recorded for the first time in Dranov region. Consequently, in the next few years *P. glenii* will probably occur in the lagoonary region, too. The investigations were performed in the frame of the project entitled "Study on the changes induced by invasive species into the behaviour and the populational dynamics of native vertebrates of conservative interest from the Danube Delta Biosphere Reserve" ("Studiul modificărilor induse de speciile invazive în comportamentul și dinamica populatională a vertebratelor native de interes conservativ din Rezervația Biosferei Delta Dunării" - project code: PN 16 28 01 03 - Danube Delta Core Program).

---

## 21. Study of fish communities in the middle basin of Trotuș River (Romania) in 2015-2016

**Ureche Dorel, Voicu Roxana-Elena, Ureche Camelia**

*"Vasile Alecsandri" University of Bacau, 157 Mărășești Street, 600115 Bacau, Romania, e-mail: [dureche@ub.ro](mailto:dureche@ub.ro)*

In the context of the water quality alteration along with decreases in habitat heterogeneity as a result of human activities over the last decades, the fish is one of the most important taxonomic groups used for the assessment and monitoring the inland waters. Trotuș River is one of the main right tributaries of the River Siret. It springs from the Ciucului Mountains and joins the Siret downstream Adjud town (Vrancea County). The total length of Trotuș River from its source to its confluence with Siret River is 162 km with a catchment area of 4,456 km<sup>2</sup>.

The present study was carried out in 2015-2016 in the middle basin of Trotuș River, on the main course of the river, and on some of its tributaries. Our research aimed to update the scientific data regarding the structure of fish communities and to highlight the significant changes in fish communities as a result of the human activities impact.

The biological material was sampled by electrofishing from 48 sampling sites (39 in 2015, and 9 in 2016), it was determined and immediately released. The taxonomic analysis revealed the presence of 19 fish species in the study area, one of them being non-native.

Some of the ecological indices were calculated, as well as biodiversity indices (Margalef, Menhinik, Shannon-Wiener), evenness (equitability), and fish stocks in order to assess the actual state of fish communities in the study area.

We also have targeted to complete scientific data for an integrative future study of the Siret River basin.

---

## **22. Water mites (Hydrachnidia) of small lowland river Krapiel (NW Poland)**

**Zawal Andrzej, Szlauer-Lukaszewska Agnieszka, Bańkowska Aleksandra, Michoński Grzegorz, Czernicki Tomasz, Janusz Katarzyna**

*Department of Invertebrate Zoology & Limnology, Faculty of Biology, University of Szczecin,  
e-mail: [andrzej.zawal@usz.edu.pl](mailto:andrzej.zawal@usz.edu.pl)*

During the research on water mites in the Krapiel river valley, 161 water mites species with a total number of 12179 individuals were found. In the upper section of the river there were 67 species with 723 specimens, in the middle section 142 species with 7602 specimens and in the lower section 84 species with 3827 specimens. Differences in species diversity and abundance resulted from differences in the length of these sections, and from different habitat diversification, where the longest and most diverse was the central section, then the lower and upper. The highest species diversity was obtained in the order of: small water bodies species (29%), rheophilous and reobionts (27%), characteristic for lakes (16%), characteristic for astatic waters (14%), crenophilous and crenobionts (9%) and acidophilous species (5%). The highest numbers were obtained in the order of: reophilous and reobionts (56%), characteristic for lakes (22%), small water bodies species (12%), characteristic for astatic waters (7%), crenophilous and crenobionts (2%) and acidophilous species (1%). The upper section was dominated by small water bodies (38% species, 21% specimens, 21% species, 54% specimens respectively) over reophilous and reobionts (14% species, 17% specimens). The middle section was dominated by reophilous and reobionts (28% species, 54% specimens) over small water bodies and lake species (28% species, 16% specimens, 18% species, 23% specimens respectively). The lower section was dominated by reophilous and reobionts (37% species, 68% specimens) over small water bodies and lake species (19% species, 2% specimens, 13% species, 24% specimens respectively).

---

### **□ Section II: Environmental factors, Ecological Restoration and & Anthropic Impact**

## **23. Features of river mouths on archipelagoes of the Russian Arctic**

**Aibulatov D.N., Shkolniy D.I., Maksakov N.A.**

*Lomonosov Moscow State University, Moscow, GSP-1, Vorobievy Gory, e-mail: [gidroden@mail.ru](mailto:gidroden@mail.ru)*

In connection with significant increase in interest in development of the Arctic and also in connection with warming of climate and thawing of sea ices and mantled glaciers in this region, there is a need of hydro-morphological processes studying of the Arctic islands water objects. At the same time the greatest interest is attracted by the river mouths which are carrying out a role of the marginal filter on sites of river and sea waters interaction. Exactly here the result of hydrological processes (formation of water runoff and sediments yield) occurring on basins of rivers flowing into reception reservoirs which final manifestation are processes of delta forming, various on intensity and orientation, in estuarial areas of the rivers is visible. Owing to estuarial processes, multidirectional and various on the volumes, the unique hydrological, landscape and biological image of each estuarial area, regardless of their size is created.

Main goal of this work is introduction of the principles of hydro-morphological approach to studying and monitoring of the Russian Arctic island rivers estuarial areas, definition of their current state and development of projections of their development in the conditions of the surrounding environment global change. So far

water objects of the Arctic islands are almost not studied. On them, with rare exception, it wasn't carried out full hydrological works. Also there are no literary generalizations devoted to regional hydrological regularities. As a result of the developed integrated approach to classification of specific types and forms of estuarial areas, characteristic of polar territories, typification of 400 estuarial areas considered in base on 6 types – simple, estuarial, estuarial-deltoid, lagoon-deltoid, deltoid and lake-deltoid is carried out. Hydrological and geomorphological features of estuarial areas of these types, characteristics of processes of formation of estuarial areas on each of archipelagoes are described. Assessment of modern rates of promotion of deltas on the basis of data comparison of remote sensing from 1967 till present is made. On the basis of the regression analysis assessment of influence of various river morphometric parameters of the rivers basins on geometrical features of deltas has been carried out.

---

#### **24. Concentrations of heavy metals in muscle tissue and some organs of juvenile sturgeon**

**Burada Adrian, Teodorof Liliana, Despina Cristina, Seceleanu-Odor Daniela, Tudor Iuliana-Mihaela, Ibram Orhan, Spiridon Cosmin, Georgescu Lucian, Ionescu Tudor**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [adrian.burada@ddni.ro](mailto:adrian.burada@ddni.ro)*

In general, interactions between pollutants and aquatic organisms involve two major ways of accumulation: the respiratory system (gills) and digestive system. For better understanding of the accumulation and eliminating mechanisms for these contaminants with high levels of toxicity, this study is assessing the level of accumulation of 7 heavy metals (Cd, Cr, Cu, Ni, Pb, Zn and Mn) in muscle tissue, gills, digestive tract, liver, spleen, heart and gonads, collected from 10 specimens of sturgeon fish (*Huso huso*, *Acipenser guldenstaedtii*, *Acipenser stellatus*), who accidentally died in a scientific fishing campaign that took place in the feeding area in the Black Sea, located near the spill area of St. Gheorghe arm.

Fish studied had weights in the range between 1640 g and 7490 g and came from the popular campaigns with sturgeon juveniles in the Lower Danube between 2013 and 2015.

Measurements taken during study, showed that the 7 chemical elements present a different level of accumulation / concentration in the anatomical parts of specimens of sturgeon species studied. Liver and spleen have the highest accumulation capacity of heavy metals, while muscle tissue has shown the lowest degree of accumulation.

---

#### **25. Characteristics of water and alluvial transit through the Danube Delta**

**Bondar Constantin**

*Geoecomar, Bucuresti. e-mail: [constantinbondar@yahoo.com](mailto:constantinbondar@yahoo.com)*

A part of the Danube's water that runs through the Black Sea to the Danube Delta's main rivers, enters a variety of ways (canals, gorges, and river spills) inside the Danube Delta and the Razelm-Sinoe Lagoon Complex, Black. The measurements showed that the Danube water access to the Delta takes place on the upstream half of the arms, and the evacuation takes place halfway downstream. Knowing the transit of water and alluviums through the hydrographic units within the Danube Delta is of particular importance to the Delta habitat. The complex scientific researches carried out in the last two centuries in the Danube Delta responded to the deep knowledge of the biological and physical processes in the Delta (Petrescu 1957, Diaconu C 1963, Banu and Rudescu 1965). Danube water transits the Danube Delta's interior through the hydrographic units Sontea-Furtuna, Matita-Merhei, Gorgova-Uzlina, Puiu-Rosu and Dranov-Razelm. Based on a hydrological

model elaborated by the author, the water flows and the volumes of water entering and leaving the Danube Delta hydrographic units were determined. The results of the calculations showed that the largest water transit through the Danube Delta is through the hydrographic units Sontea-Furtuna and Matita-Merhei, followed by Gorgova-Uzlina, Puiu-Rosu and Dranov-Razelm. The dates of the measurements of the Danube alluvial flows, carried out in the past and to this day, allowed to know the evolution of the concentration of the suspended alluviums at the entrance to the Danube Delta. Data processing results in a decrease in average annual concentrations of Danube sludge concentrations from average values of about 300 mg / m<sup>3</sup> in 1840 to about 80 mg / m<sup>3</sup> in 2014. The overall trend of the decrease in time of concentrations of Danube alluvial sediments was mainly due to the hydrotechnical arrangements made in time in the Danube river basin and was accentuated after the barrage of the Danube bed at Iron Gates 1 and 2 in the years 1971 and 1984. The fluctuations in the Danube Delta concentrations in the Danube Delta in the Danube Delta caused time to diminish the access of the river valleys within the Danube Delta and to diminish the Danube delta between the arms. Thus it results that the process of clogging of hydrographic units subject to alluvia is very slow, equal to about 1.26 mm / year in the hydrographic unit Sontea - Storm and 0.51 mm / year in the hydrographic unit Gorgova - Uzlina.

**Keywords:** water and alluvial transit, clogging.

---

## **26. Investigation of the surface water quality parameters in the predeltaic area of the Danube Delta in 2017. Study case: Somova-Parcheș aquatic complex lakes.**

**Catianis Irina\*<sup>1</sup>, Pojar Iulian<sup>1</sup>, Grosu Dumitru<sup>1</sup>, Pavel Ana Bianca<sup>2</sup>**

<sup>1</sup>National Institute of Marine Geology and Geoecology – GeoEcomar, Bucharest, 23 – 25 Dimitrie Onciul Street, 024053 Bucharest, Romania, <sup>2</sup>National Institute of Marine Geology and Geoecology, GeoEcoMar, 304 Mamaia Blv., 90058, Constanta, Romania, e-mail: [irina.catianis@geoecomar.ro](mailto:irina.catianis@geoecomar.ro)

A research study was conducted to characterize the status of the surface water quality of the Parcheș, Babele, Petica and Somova lakes, situated in the Somova-Parches aquatic complex, located West of Tulcea (Romania), nearby of the industrial area. Water samples were gathered from several sampling points of each lake and investigated for various physico-chemical parameters including water depth (m), temperature (°C), pH (units), DO (mg/l), N-NO<sub>2</sub><sup>-</sup> (mg/l), N-NO<sub>3</sub><sup>-</sup> (mg/l), P-PO<sub>4</sub><sup>3-</sup> (mg/l), EC (μS/cm), TDS (mg/l), SO<sub>4</sub><sup>2-</sup> (mg/l), Turbidity (NTU), TSS (mg/l), transparency (m), chlorophyll "a", SiO<sub>2</sub> (mg/l), H<sub>2</sub>S (mg/l), S<sup>2</sup> (mg/l) etc., during the period of October 2017. Average lake concentrations and measurements for most parameters covered a considerable range in all investigated lakes. In addition, some restricted sampling points were chosen from every lake to assess the levels of some heavy metals in surface water. Generally, no significant exceedances of the investigated heavy metals were recorded excepting elements as Ba, Mn, Ni and Se which showed slight variations for each parameter associated with the Class I, and, respectively, Class II category, in comparison to the maximum allowable limits established by the water quality standards. The results from this study indicated that the physico-chemical characteristics and surface water quality from the Somova-Parcheș aquatic complex may be different due to the natural context (e.g., regional differences in land use, hydrology, underlying geology, climate, flowing regime etc.) and anthropogenic effects of industrial activities that *take place* in the Tulcea town area.

**Keywords:** assessment, environmental indicators, predeltaic area, surface water, water quality

---

**27. Researches concerning forestry recultivation of sterile dumps in the Quarry „Lafarge Cement” (Moldova) S.A. Rezina District, Republic of Moldova**

**Certan Corina**

*Institute of Ecology and Geography of the Academy of Sciences from Moldova, e-mail: [certancorina@mail.ru](mailto:certancorina@mail.ru)*

The factory „Lafarge Cement” (Moldova) S.A. is situated in the northern part of the Republic of Moldova, to 100 km from Chisinau and to 7 km from Rezina district, and is an industrial platform located in the valley of the Ciorna river, at the altitude of 50 m. The sterile dumps modify the environment, affect the landscape, morphology and hydrology. The dump represents the place where is deposited sterile and unusable waste from mining works. Ecological restoration is one of the most frequently applied methods for anthropically degraded land and allows the ecosystem to auto-regulate and easily reintegrate into the natural environment. Ecological reconstruction involves to return of these areas at the initial stage by recultivation with herbaceous or woody species. The afforestation of these areas depends largely on the ecopedological zone and the material resulting from limestone exploitation. In the present paper is proposed the method of ecological reconstruction of the recently deposited sterile dumps by the forest recultivation method. The inventory of samplings, in the autumn of 2017 year showed, that the percentage of adapted plants is 85%.

---

**28. Researches on the evolution of the Danube Delta Biosphere Reserve ecologically reconstructed ecosystems**

**Cioacă Eugenia, Mierlă Marian, Pindic Paula, Anore Ciprian**

*Danube Delta National Institute for Research and Development, Babadag Street, No. 165, 820112, Tulcea, Romania, e-mail: [eugenia.cioaca@ddni.ro](mailto:eugenia.cioaca@ddni.ro)*

Within the Danube Delta Biosphere Reserve some zones of wetland ecosystems get fragmented due to their inner hydrographical network disconnection from the main channels, from the Danube River natural flooding regime. It occurs in some secondary channels /sectors of channels, where the fluvial process of alluvial sedimentation /siltation has a medium-high intensity. In the river low water level conditions, which can last 2-3 months /year, those disconnected areas get dry /degraded, with negative impact on biodiversity. The depositional zones are true "obstacles" in the migration routes of aquatic species. Ecological restoration of degraded areas, which consists of their re-connection to the Danube River natural flooding regime, has been implementing since 1994. There are three types of zones subject to ecological restoration, as follows: a) zones anthropologically modified to be used as agriculture, forestry, and fish polders; b) secondary channels and fishery brooks; c) old zones (small islands) inside the Sf. Gheorghe arm meanders. The evolution of the first two types of these zones, from their morpho-hydrographical changes point of view, has been studied within 2016-2017, in the framework of the "Researches on the evolution of the Danube Delta Biosphere Reserve ecologically reconstructed ecosystems" project. This project was supported by the Ministry of Education and Innovation in the "Danube Delta" NUCLEUS Program, coordonated by the Danube Delta National Institute for Research and Development, Tulcea. Its results are presented in this paper. Data resulted from the field morpho-hydrographical measurements, carried out in areas ecologically reconstructed, show significant morphology changes ranging in between 0.5 – 1.5 m rise of the channels' bottom elevation, from the ecological restoration works execution (1994-2007) to present.

---



## 29. Managing natural regenerations that occurred after harvesting hybrid poplar plantations along the lower Danube floodplain

Ciuvăț Alexandru Liviu<sup>1</sup>, Daia Mihai<sup>2</sup>, Dinu Cristiana<sup>1</sup>, Marcu Cristiana<sup>1</sup>, Apostol Ecaterina<sup>1</sup>, Apostol Bogdan<sup>1</sup>

<sup>1</sup>National Institute for Research and Development in Forestry „Marin Drăcea”,

e-mail: [alexandru.ciuvat@gmail.com](mailto:alexandru.ciuvat@gmail.com), <sup>2</sup>National Forest Administration „Romsilva”

The lower course of the Danube is one of the wet ecoregions representative of the temperate zone of the northern hemisphere.

Due to their rapid growth, poplars and willows, as some of the most widespread forest species in the world, are largely in line with current and prospective needs for renewable energy of human society. However, if bio- and eco-diversity are preserved in the natural forests of the floodplains, it is gradually replaced by a lower, coincidental biodiversity by promoting hybrid poplar and willow crops, which cannot ensure the biological stability of these ecosystems.

The negative effects of climate change, especially felt in southern Romania, was amplified by the consequences of previous anthropogenic interventions, namely river flow regulation by embankment on large stretches of the Danube course, resulting in a decrease in the level of phreatic waters that in turn contributed to a decrease in productivity of *Populus x canadensis* plantations.

The fluctuation of the Danube's waters over the past decades, and in particular the periodic prolonged flooding, caused difficulties in the normal operation of the silvicultural works (exploitation - regeneration – tending operations) in hybrid poplar stands, resulting in the vegetative natural regeneration (from shoots and root suckers) on significant areas along the Danube floodplain.

Through this article, the authors bring forward plausible management solutions for the natural regeneration of hybrid poplar crops that exceeded the legal period for the reforestation of harvested stands, taking into account the economic and ecological aspects involved.

**Keywords:** flood plain, hybrid poplars, regeneration, management

---

## 30. May the rivers flow naturally. Save the Rivers Coalition as an example of Polish social movement caring about the rivers and peoples safety

Augustynek Halny P., Babiasz R., Bożek J., Ciężak K., Engel J., Furdyna A., Gawlik R., Jaszcuk E., Kotowski W., Leś Ewa\*, Nawrocki P., Wawręty R., Wiśniewska M.M.

Address of corresponding author: Słowacka 13d/5 71-771 Szczecin, Poland, e-mail: [evvales@gmail.com](mailto:evvales@gmail.com)

Poland's rivers and natural water resources have been the objects of increasingly intensive exploitation and transformation. Reports have been coming in for years from Poland's individual regions and the entire country about harmful activities and investments causing a deterioration of the status of Poland's waters. All this has been happening despite the pledges by successive national and local governments to improve the situation, and despite Poland's commitments under the EU Water Framework Directive. Little has changed in the domain of water policy and sometimes things changed for the worse while the water policy makers continued to turn a deaf ear to the appeals by environmental non-governmental organisations which have been calling for an end to harmful practices such as river-training, river-bed development, dam construction and drainage works drying out the river valleys. Often even proposals of alternative solutions or different technologies, which could mitigate damage to the environment, have been ignored. Facing such hostile attitudes towards the protection of waters, noting the systematic devastation of successive sections of Poland's rivers, and concerned about the plans for further investments with negative impacts, we decided to join ranks and

establish the Save the Rivers Coalition. The Coalition brings together organisations which protect Poland's rivers, streams and wetlands, as well as academic experts, organisations, individuals, local governments and institutions who care about the fate of rivers and water-dependent ecosystems in Poland. We hope that our voice will be better heard and that we can manage to persuade those in charge to stop degrading Poland's water resources. We also hope that by acting jointly we can reach a wider audience with our analysis of the local and national problems and draw adequate attention to our suggestions of legal, design or technological change. Rivers not only matter to environmentalists, they matter in our everyday life and common people.  
[<http://www.ratujmyrzeki.pl/english>]

---

### **31. Impact of atmospheric pollution on forest biodiversity in the Republic of Moldova**

**Regina Fasola**

*The Institute of Ecology and Geography, Republic of Moldova, str. Academiei 1, Chisinau, Republic of Moldova, e-mail: [reginaf21@mail.ru](mailto:reginaf21@mail.ru)*

In this study are provided the emissions, deposition and effects of pollutants  $\text{SO}_2$  and  $\text{NO}_x$ , which manifests risks by acidification and eutrophication effects on forest biodiversity.

Sources of pollution, in the researched area, are studied and characterized according to the Yearbooks of the State Ecological Inspectorate (2012, 2015) and the Reports of the European Monitoring Evaluation Program, where it was identified that the main source of pollution, as well as for all forest ecosystems in the Republic of Moldova, is the cross-border pollution, which accounts for over 80-90% of the anthropogenic impact on the environmental components.

Estimated atmospheric deposition under the forest canopy „Racovății de Sud” are considered as a *large deposits* of  $\text{S-SO}_4^{2-}$  and  $\text{N-NH}_4^+$ , and *reduced deposits* of  $\text{N-NO}_3^-$ , results which are confirmed by the studies carried out previously in European forest monitoring network of the Republic of Moldova. *Lower deposits* of  $(\text{NO}_3^- + \text{NH}_4^+)$ , assume a less significant impact on the studied forest biodiversity, compared with  $\text{S-SO}_4^{2-}$  deposits, an effect that is also determined by higher toxitolerance of plant species to nitrogen.

Characteristic of the pollutants analyzed ( $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$  and  $\text{NH}_4^+$ ) is the reduction in their deposition compared to the 1990s, which implies a reduction of the anthropogenic impact on the environmental components.

---

### **32. The anthropic impact on the dynamics of same heavy metals in the environmental components, the bees body and their products**

**Gluga Olesea**

*Institute of Zoology, 1 Academiei street, Chisinau, Republic of Moldova, e-mail: [camiprim@inbox.ru](mailto:camiprim@inbox.ru)*

The aim of this paper was to establish the anthropic impact on the dynamics of same heavy metals in the environmental components, the bees body and their products. The researches have been conducted in the central part of the Republic of Moldova. The samples have been taken from experimental apiaries located in 4 research areas - with different degrees of pollution and human impact. The research has shown that there is a significant correlation between the concentration of heavy metals in the environmental components (soil, water, flora) and their concentration in the bees body and their products. With the increase of Pb, Cd and Cu content in the environment, also significantly increased their concentration in bees body, pollen, honey and propolis. Thus, with the increase of the concentrations of Pb, Cd and Cu along the system in the "forest area", also increases their concentration in "agricultural area", "transport area" and "industrial area".

---

### 33. Structure of a woody ecosystem naturally regenerated in Olt river wetland

**Hanzu Mihail, Zaharia Alexandru, Ienăsoiu Gruică, Cucu Alexandru**

Romanian National Institute for Research and Development in Silviculture „Marin Drăcea“, Str. Cloșca, nr. 13, Brașov, 500040, Romania, e-mail: [mihail.hanzu@gmail.ro](mailto:mihail.hanzu@gmail.ro)

A wetland reserve was established in the 2000s in the middle Olt river basin at Mândra in Brașov county. The initial vegetation, dominated by *Phragmites australis* (Cav.) Steud. was burned every spring, therefore all woody species were eliminated yearly. As result of different land management imposed by the new protection status of the area, which did not allow further burning, woody species naturally regenerated in the last decades without any direct human interference.

The aim of this research is to quantify the structure of the incipient woody ecosystem both quantitative and qualitative.

In terms of qualitative data, we determined the present tree species and the proportion of species considered pioneer species and climax ones, even if this classification is a disputable one. In terms of quantitative data, we determined the density of the trees, the heights, diameters, repartition patterns of the trees and biodiversity indexes.

The results show that species which are considered pioneer species are dominant. *Betula pendula* Roth, *Populus tremula* L., *Alnus glutinosa* (L.) Gaertn. and *Salix* sp. are the most common ones. Concerning the heights, diameters, spatial structure and biodiversity indexes, patterns similar to other forest ecosystems were found.

The results are significant for this part of Olt river and have the potential for being used in ecological reconstruction of other riparian forest ecosystems.

---

### 34. Assessment of ecosystems services generated by Morii Lake in Bucharest city

**Ioja Cristian<sup>1</sup>, Carstea Elfrida<sup>2</sup>, Talaba Odelin<sup>1</sup>, Hossu Alina<sup>1</sup>, Cheval Sorin<sup>1</sup>, Sandric Ionut<sup>1</sup>, Vanau Gabriel<sup>1</sup>, Nita Mihai<sup>1</sup>, Popa Ana-Maria<sup>1</sup>**

<sup>1</sup>University of Bucharest, Center for Environmental Research and Impact Studies

<sup>2</sup>National Institute for Optoelectronics – INOE 2000, 11 Bd. Nicolae Balcescu, sector 1, Bucharest

<sup>2</sup>Șoseaua București-Măgurele, Măgurele, Ilfov county, e-mail: [odelin94@yahoo.com](mailto:odelin94@yahoo.com)

Urban Ecosystem Services assessment is an important challenge for practitioners, due to the high complexity of relations between urban systems components, high vulnerability to climate change, and consequences in social-economical systems. Adequate urban management supports diverse benefits of urban lakes: clean water availability, mediation of waste, toxics and other nuisance, air quality and climate regulation, support for physical, intellectual or spiritual interactions. Due to underestimation of climate change and misfit urban planning decision, these benefits may be lost or changed into disservices. The aim of the presentations is to present the results of the assessment of urban ecosystems service supplied by urban lakes, using innovative and traditional methods (e.g. spatial modeling, scenarios, fluorescence, sensors, remote sensing, social survey). Considering Morii Lake as case study, we assess the actual level of main urban lakes' ecosystems services supplying: climate and air quality regulation, water self-treatment and cultural services. The paper presents the results obtained into the project PN-III-P2-2.1-PED-2016-1300- Experimental Methods for Ecosystems Services Assessment of Urban Lakes under Climate Changes (EMERSA).

---

### **35. Contributions in knowing the effects of climate change on some ecosystem services within Danube Delta Biosphere Reserve**

**Mierlă Marian, Grigoraș Ion, Covaliov Silviu, Doroftei Mihai, Trifanov Cristian**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [marian.mierla@ddni.ro](mailto:marian.mierla@ddni.ro)*

Climate change is becoming increasingly obvious nowadays. This is evidenced by many studies at international and national level. These studies can be grouped into several categories, namely studies that highlight climate change, the second category of studies are those studying only global warming, and a third category is the one that makes scenarios about the future global climate or even specific for a particular region. The first group could help more in studying the impact of climate changes on ecosystem services.

To evaluate the impact of climate change on ecosystem services in the Danube Delta Biosphere Reserve (D.D.R.B.), analyses on each ecosystem on the studied territory were performed. Data supporting the climate change analyses in the studied area was from dataset called ROCADA. Another dataset used in this assessment is map of the ecosystems of D.D.R.B., which contains ecosystems types and was elaborated in 1998 by the Danube Delta National Institute specialists. There are 30 types of ecosystems in the studied territory. The approach in this paper is the applied methodology of using the logical chain DPSIR (Driving forces, Pressures, States, Impacts, Responses). In the present paper, from the entire DPSIR system for each ecosystem service, the driving forces are those that are linked with anthropic component (in the case of climate change: greenhouse gas emissions, changes in land use etc.). The pressure taken into account in this study is the same for all ecosystem services, namely climate change. But the state is different from service to service. Following the assessment from the paper resulted that climate change is also evident in the Danube Delta Biosphere Reserve and follows the same pattern as the global ones, certainly respecting the scale differences between the two comparisons elements (global and local). The climate change has a negative impact for almost all the ecosystem services. There are few ecosystem services that have positive impact from the climate change.

---

### **36. Assessment of air quality status performed in the selected Danube river areas**

**Pipirigeanu Vasile, Tudor Iuliana-Mihaela\*, Burada Adrian, Ibram Orhan, Teodorof Liliana, Bota Diana, Despina Cristina, Tudor Marian, Mierla Marian, Trifanov Cristian, Anore Ciprian, Munteanu Doina, Vintila Mihaela, Rafael Robert, Penchev Valeri, Kereš BibiĆ Ena, Sajgó Nikolett, Zöllner Joachim, Dahlke Friederike, Szuppinger Péter, Kállay Tamás, Budescu Florentina-Natalia Serban-Atanasiu Irina, Camernik Boris**

*\*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [mihaela.tudor@ddni.ro](mailto:mihaela.tudor@ddni.ro)*

This paper presents ambient air quality status in four areas located along the Danube river.

The ambient air quality survey was carried out from 11<sup>th</sup> of October to 02<sup>th</sup> of November 2017. Sampling time was 24 hrs continuously in seven different locations with respect to sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and fine particulate matter (PM<sub>2.5</sub>; PM<sub>10</sub>).

The measurements were performed in each selected Danube area during low and high traffic of inland vessels, based on the working methodology established in GREEN DANUBE project.

PM10 and PM2.5 were always found below the permissible limit at all the sampling site.

**Keywords:** pollutant emissions, Danube navigation, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM), sulphur dioxide (SO<sub>2</sub>)

---

### **37. Biodecolorization of reactive blue 19 dye from effluents by sorption on *Aspergillus brasiliensis* fungal biomass**

**Pohonțu Corneliu Mihăiță**

Ștefan cel Mare University of Suceava, University Street no. 13, Suceava 720229, Romania,  
e-mail: [corneliu.pohontu@yahoo.com](mailto:corneliu.pohontu@yahoo.com)

Water quality resources in the current context of excessive pollution, are in constant decline. This involves a much better control over the water pollution phenomenon. Thus, strategies are needed to maintain effluent control. This is equally important for the biocenoses of the aquatic environment, so that optimal conditions can be created for organisms living in water and, last but not least, those who benefit from water resources. Dyes represent the main sources of water contamination responsible for the continuous pollution of the environment. The potential of the hyphal network characteristic of fungal morphology represent an alternate to the conventional treatment methods. The main advantages of biosorption are environmental friendly, cost effective, pollutants high selectivity and good removal efficiency. The research was conducted at laboratory scale using biosorbents derived from starter culture *Aspergillus brasiliensis* (ATCC 16404) of fungal biomass and their capacity to removed Reactive Blue 19 Dye (CAS no. 2580-78-1) was evaluated. The influence of process variables such as pH, temperature, exposure time and initial dye concentration had its purpose to highlight their effects in sorption process. The initial biosorbent system parameters were had values of pH = 4.0 and temperature value beginning from 20°C. The equilibrium data fitted well with Langmuir and Freundlich adsorption isotherms and their corresponding adsorption parameters such as KF and KL. Furthermore, the temperature and pH of these effluents is important, because have the ability to control the biosorption process and ultimately affect their efficiency. The high biosorption performance has been reached for *Aspergillus brasiliensis* ATCC 16404 biomass at low pH values in range of 4-5 and high temperature T=40°C. For *Aspergillus brasiliensis* ATCC 16404 biosorbent, maximum removal efficiency of 78.5% was obtained, already proven to be very effective in dye biosorption. Finally, the results revealed that this biomass can be considered an exceptionally versatile material and excellent biosorbent.

---

### **38. Enviromagnetic Proxies And Lithological Characteristics Of Recent Sediments From Particular Aquatic Waterbodies In The Sfântu Gheorghe Branch Area: Oxbow Lakes And Sacalin Bay**

**Rădan Sorin Corneliu, Rădan Silviu, Catianis Irina, Grosu Dumitru, Iulian Pojar, Scrieciu Albert  
Sorin-Corneliu Rădan<sup>1</sup>, Silviu Rădan<sup>2</sup>, Irina Catianis<sup>2</sup>, Dumitru Grosu<sup>2</sup>, Iulian Pojar<sup>2</sup>, Albert Scrieciu<sup>2</sup>**

<sup>1</sup> Geological Institute of Romania, 1 Caransebeș St., RO-012271 Bucharest, Romania;

<sup>2</sup> National Institute of Marine Geology and Geoecology - GeoEcoMar, 23-25 D. Onciul St., RO- 024053 Bucharest, Romania, e-mail: [sc.radan@yahoo.com](mailto:sc.radan@yahoo.com)

In the extension of the reference standard perimeters in the *Danube Delta* which have been under a current magneto-lithological monitoring since ca. 40 years ago, the multidisciplinary expedition carried out in the *Sfântu Gheorghe Branch* area, in October 2015, focused, for the first time, on the lakes of "oxbow"-type (i.e., *Belciug*, *Erenciuc* and *Gorgoștel*), and on the *deltaic front platform area* (i.e., *Sacalin Bay*, formed between *Sacalin Island* and the proper *Delta*). Surficial sediments were sampled in 46 stations, and three cores

(lengths of 33, 47, 70 cm, respectively; 75 slices) were extracted. *Detrital/Siliciclastic (SIL)*, *Total Organic Matter (TOM)*, *Carbonatic (CAR)*, and *Magnetic Susceptibility (MS; k)* maps and vertical profiles were carried out and compared. Direct, highly positive correlations for **SIL** vs. **MS**, and reversed, highly negative correlations for **TOM** vs. **MS** and **CAR** vs. **MS** have usually been determined. An interesting correlation between the *Carbonates* and *Magnetic Susceptibility*, defined by a rather strong positive degree ( $r = 0.83$ ), was identified for the sediments of the core taken out from the *Belciug Lake*; this exception shows the *detrital* origin – and not *biochemical* – of the *carbonates*, the source being the shell detritus.

The study represents a starting point towards the complex investigation of silting up processes of meanders, which are cut by artificial canals, and of changing of these abandoned fragments in future "oxbow"-type lakes. Moreover, by the first complex research undertaken in the *Sacalin Bay*, an up-to-date contribution to explaining the construction mechanisms of the *Sf. Gheorghe Delta* is brought.

---

### 39. Sustainability upgrades for the built environment in the Danube Delta Biosphere Reserve

**Raicu Filip<sup>1</sup>, Ochinciuc Cristina Victoria, Sbarcea Mădălina<sup>2</sup>**

<sup>1</sup>*The Doctoral School of Architecture, Ion Mincu University of Architecture and Urban Planning, Bucharest, Romania / Tulcea Municipality, Str. Academiei nr. 18-20, sect. 1, 010014, Bucharest, Romania / Str. Păcii, nr.20, 820033, Tulcea, Romania*

*e-mail: [filip.raicu@yahoo.com](mailto:filip.raicu@yahoo.com), <sup>2</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [madalina.sbarcea@ddni.ro](mailto:madalina.sbarcea@ddni.ro)*

On the subject of sustainable design, two contrasting approaches can be identified: the high tech direction, that promotes mostly active systems, integrating into new projects modern materials and new technology, aiming to improve energy efficiency and to lower consumption of non-regenerable resources and the low tech direction, aiming to obtain the same efficiency by rediscovering traditional concepts, materials and ways of building, with a focus mainly on passive systems. Many of the professionals affiliated with the return-to-nature trend have drawn inspiration from vernacular architecture (also known as "architecture without architects"), because its value - acknowledged worldwide through the Charter on the built vernacular heritage ratified in Mexico - comes not from having any architect involved in the erection of the buildings, but from the knowledge synthesized from the experiences of many past generations. In the context of a questionable recent development of the built environment in a natural landscape listed as a world heritage site, driven mostly by the development of tourism, the present paper reviews examples of traditional architecture in the settlements of Danube Delta, Romania, with the aim of identifying those features that are a result of many years of optimization of building techniques, using available materials and taking into consideration site-specific constraints and cultural specificity. From the orientation of the household or the use of building materials to the architectural shapes, colors and decorative symbols, these elements may serve as inspiration for future development of the built environment through the reinforcement of a closer connection with the natural environment and with the social and cultural context.

---

#### 40. Chronic exposure to insecticide deltamethrin affects the aggressive behavior of zebrafish (*Danio rerio*)

Robea Madalina-Andreea <sup>1</sup>, Strungaru Stefan-Adrian <sup>2\*</sup>, Solcan Carmen <sup>3</sup>, Nicoara Mircea <sup>1</sup>, Plavan Gabriel <sup>1</sup>, Petrovici Adriana<sup>3</sup>

<sup>1</sup>"Alexandru Ioan Cuza" University of Iasi, Department of Biology, Faculty of Biology, Bd. Carol I, 20A, 700505, Iasi, Romania, <sup>2</sup> "Alexandru Ioan Cuza" University of Iasi, Department of Research, Faculty of Biology, Bd. Carol I, 20A, 700505, Iasi, Romania, e-mail: [\\*stefan.strungaru@uaic.ro](mailto:*stefan.strungaru@uaic.ro), <sup>3</sup> University of Agricultural Science and Veterinary Medicine "Ion Ionescu de la Brad", Department of Molecular Biology, Histology and Embriology, Faculty of Veterinary Medicine, 8, Mihail Sadoveanu Alley, 700489 Iasi, Romania

Deltamethrin [(S) $\alpha$ -cyano-3-phenoxybenzyl-(1R)-cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropane-carboxylate] is a type II pyrethroid extensively used in agriculture and forestry because of its high activity against insect pests. It is the active compound from most of the insecticides found on the market. Recent studies proved that this compound is persistent in aquatic environment. In this study was conducted an experiment using the zebrafish a reference model for fish community to understand and prove the damages of this insecticide on aggressive behavior and brain. It was simulated a chronic exposure for 15 days using relevant concentrations of delthametrin (0.25  $\mu\text{g L}^{-1}$ , 0.5  $\mu\text{g L}^{-1}$ , 1  $\mu\text{g L}^{-1}$ , 2  $\mu\text{g L}^{-1}$ ). A control group simulated the exposure. Each group had 20 specimens (10 males and 10 females) of adults (4-5 months) zebrafish. Each fish was tested every day for aggressive behavior in a multipurpose cross maze that was turned into a T maze. This maze was made from transparent Plexiglas. The images were recorded by an infrared camera connected to a computer and analysed by the software EthoVision XT 11.5 (NOLDUS, Holland) that was previously calibrated for the aggressivity test. In the left arm it was placed a mirror (the aggressivity stimulus) that attracted the fish and force it to stay in that area of interest. Each trial had 4 minutes length. The software measured the follow variable: swimming speed, acceleration, distance swim, clockwise rotations, counterclockwise rotation, activity level, arm preferences, stimulus response). The experiment was done in triplicates.

**Acknowledgments:** This study was supported from project PN-III-P1-1.2-PCCDI-2017-0245 SUSTENVPRO.

#### 41. Natural spread vs. invasiveness – *Scardinius Erythrophthalmus* success within its genus

Popescul Ovidiu, Ciorpac Mitićă, Trandafir Văcărean Irina Cezara, Lucian Gorgan, Dumitru Cojocar

"Alexandru Ioan Cuza" University of Iasi, Bd. Carol I, No. 20A, 700505, Iași, Romania,

e-mail: [popescul.ovidiu.alex@gmail.com](mailto:popescul.ovidiu.alex@gmail.com)

In the last decades, was observed an accelerated tendency of Earth's biota homogenization through the establishment and spread of non-indigenous species, due to globalization process and habitats connections. Accidental or deliberate introduction of alien species represents a major problem to biodiversity at global level and to ecological sustainability. The introduction of fish species into new freshwater ecosystems shows that at least some of these species can interact with native fish populations and could reduce their number, deteriorate the aquatic habitats, alter gene pools by hybridizing with the native populations and also augment the risk of infection and transmission of different exotic diseases and/or parasites. *Scardinius* is a genus of ray-finned fish within the Cyprinidae family and is comprised from ten species, six of them having a status from near threatened (NT) to critically endangered (CR) on IUCN Red List. *Scardinius erythrophthalmus* is native from Western Europe to the Caspian and Aral Sea basins and it was artificially introduced in many countries, like Spain, Ireland, Norway, USA, Canada, Morocco, Madagascar and New Zealand. The aim of

this paper is to highlight the invasiveness and adaptability potential of *Scardinius erythrophthalmus* to different environments by piecing together the current information available regarding this species in comparison with its spread in the native area. We can conclude that *Scardinius erythrophthalmus* species clearly has a huge potential to become a problem in any non-native area, because it is a versatile species capable to change entire habitats to fit its own needs, although an accurate assessment cannot be performed.

---

#### **42. Gradual changes in water quality parameters in Razim-Sinoe aquatic complex in the period 1991-2017**

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

*<sup>1</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112, Tulcea, e-mail: [daniela.seceleanu@ddni.ro](mailto:daniela.seceleanu@ddni.ro)*

Mineral substances in water are the main elements for life sustaining; their existence influences the variety, abundance and nutritional value of aquatic plants and animals. Also, their lack limits the ability of aquatic vegetation to develop but the excess leads to explosive development of phytoplankton, causing algal blooms and, implicitly, eutrophication of aquatic ecosystems.

This paper discusses the time evolution of water quality parameters in Razim-Sinoe aquatic complex, the largest surface water, in natural system, from Romania, situated in the southern part of the Danube Delta Biosphere Reserve. For this purpose, data regarding mean values of nutrients concentrations (nitrogen from ammonium, nitrogen from nitrite, nitrogen from nitrate, phosphorus from orthophosphates) and salinity (chloride, sulphates, calcium, magnesium and sodium) were collected between 1991 and 2017 from Razim and Golovita lakes.

Our results revealed a gradual increasing in nutrients concentrations by the year 2010, followed by a significant decreasing trend after this year. In the same time, a decreasing tendency in salts content was noticed throughout the study period. Still, over the monitored period 1991-2017, for chlorides, sulphates, calcium, magnesium and sodium, exceeding of the maximum allowed concentrations for good ecological status (second quality class), according 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, are reported.

---

#### **43. The level of pollution with metals and organic carbon on the lower Danube sector through a multilivel analysis**

**Simionov Ira-Adeline, Cristea Victor, Plavan Gabriel, Baltag Stefan Emanuel, Strungaru Stefan-Adrian, Nicoară Mircea\***

*"Dunarea de Jos" University of Galati, Romania, 47 Domnească Street, 800008, Galați, Romania, e-mail: [ira.simionov@gmail.com](mailto:ira.simionov@gmail.com)*

This paper is a complex study on the aquatic ecosystems health between Danube River (Galati city) and the Black Sea (Sf. Gheorghe), including parts of the Danube Delta (Barcaz and Soschi Lakes). Samples of water, sediment and fish were analyzed from 7 different stations (Galati city, Tulcea city, Sf. Gheorghe, Perisor beach, Barcaz Lake, Soschi Lake, Ghiolul Petrei). For the elements (Zn, Fe, Cu, Ca, Mg, Na, K, As, Ni, Sr, Pb, Cd) quantification analysis two methods were used: flame atomic absorption spectrometer (equipment GBC Avanta, Australia) and high-resolution continuum source atomic absorption spectrometer with graphite



furnace (equipment ContrAA 600-Analytic Jena, Germany). For the water and sediment samples the total nitrogen (TN) and non-purgeable organic carbon (NPOC) were also performed using the Analytic Jena multi N/C 2100S apparatus. Muscle and liver tissue were analyzed from the following fish species: *Platichthys flesus*, *Mugil cephalus*, *Alosa immaculata*, *Trachurus mediterraneus ponticus*, *Silurus glanis*, *Cyprinus carpio*, *Abramis brama*, *Aspius aspius*, *Esox Lucius*, *Carassius gibelio*.

**Acknowledgments:** This study was supported from project PN-III-P1-1.2-PCCDI-2017-0245 SUSTENVPRO.

---

#### **44. What's next for China's Sponge Cities? Innovative riparian delta design of river bed, wetlands, amphibian tunnel, and flood protection system.**

**Theochari Dimitra**

*National Technical University of Athens, El. Venizelou (Patision), Athina 106 82, Greece*

*e-mail: [dimitra.theochari@gmail.com](mailto:dimitra.theochari@gmail.com).*

From raingardens, green roofs and bioswale systems, Chinese cities demonstrate unique opportunity for implemented river restoration projects that can influence the ecological footprint of Chinese citizens and change the image of Chinese cities. Following the 18th National congress of the Communist Party in China that took place in Beijing on 8th of November 2012, issues of Ecological Security for the future development of Chinese cities were first brought forward and various actions were taken since, actions that have put China at the forefront of climate change discussion and leading the discourse of Sponge City development. Recently I have been developing a river restoration project in Changchun the capital of Jilin Province in North China, a project that brought us in RSD once again in front of our responsibility as designers to propose solutions that bring the greatest value of ecosystem services we can provide to the Yitong river plateau and push the boundaries of river design regulations in China. Our long experience in implementing bioengineered river profiles that allow rivers to be the living systems that they naturally are provides us with an opportunity to project a more holistic and inclusive way to implement Sponge City design and propose new design methods and trends for the next step towards the future of China's sponge cities.

---

#### **45. Water quality assessment of aquatic ecosystems using Water Framework Directive (WFD) classification (criteria) in Danube Delta Biosphere Reserve**

**Tudor Iuliana-Mihaela, Teodorof Liliana, Ibram Orhan, Burada Adrian, Despina Cristina, Sali Iasemin, Tudor Marian, Lupu Gabriel, Doroftei Mihai, Covaliov Silviu, Odor Seceseanu Daniela, Mierla Marian, Trifanov Cristian, Spiridon Cosmin, Tiganus Mihaela, Banescu Angela**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [mihaela.tudor@ddni.ro](mailto:mihaela.tudor@ddni.ro)*

This study provides an overview of the quality of surface water from the last two years (2016-2017) based on the measurements made by 42 representative stations (eighteen lakes, eight channels and all branches) from the Danube Delta Biosphere Reserve using Water Framework Directive (WFD) classification. The Directive requires the establishment of classification schemes to reflect the ecological status or potential of surface water bodies by measuring the condition of specific biological, hydromorphological and chemical and physico-chemical quality elements. The relevant elements, are physico-chemical (pH, temperature, conductivity, nitrogen and its forms, phosphorus and its forms, heavy metals: lead, chromium, nickel and manganese)

supporting the biological elements (aquatic macrophytes, phytoplankton, zooplankton and benthic invertebrates) evaluated for the quality of aquatic ecosystems.

The specific conditions required for these elements in each of the classes of the classification schemes, depends partly on the surface water category and type to which the water body belongs, and on whether the body is artificial or heavily modified. The regular analysis of aquatic ecosystems in D.D.B.R. is important for determining the ecological status and deciding whether steps should be taken to improve their quality, for example by reducing the external load of nutrients. The total nitrogen concentrations show higher level in Danube and the Danube arms stations compared with the delta lakes, which is explained by the strong take-up of the nitrogen formations in the surface waters by the primary producers, the nitrate being most available for aquatic vegetation. 60% of the Danube Delta lakes analysed are in the very good quality class, the rest of the lakes being roughly equally distributed in grades of good quality (12%), moderate (17%) and poor (12%).

**Keywords:** aquatic ecosystem; heavy metals; risk assessment, physico-chemical elements, biological elements

---

#### **46. Techniques on how and when to analyze the presence of algal toxins**

**Török Liliana, Török Zsolt**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [liliana.torok@yahoo.com](mailto:liliana.torok@yahoo.com)*

Cyanobacteria are capable of toxin production. Some species of cyanobacteria have reached in the recent years the critical point defined as "limits of blooming" in the aquatic ecosystems of the delta and lagoony area becoming after their cellular lysis a contaminance sources for environment. These toxins can persist in aquatic ecosystems for weeks to months; can be easily detected during bloom events; can produce in living organisms sever symptoms within minutes or hours of exposure. For the first time, the occurrences of algal toxin (microcystin) in Danube Delta have been recorded in 2012.

Taking into account such aspects, it is necessary water quality protocols to include analyses of these toxins. In this respect, an overview of "Field Based Analysis", "Laboratory Based Analysis" and "Response to Animal Illness/Death" will be presented in the present paper. The aims of the present work is to identify what fraction of the water sample should be tested in order to underline the potential of an inexpensive or a fast analysis of the water quality; to have an inter-annual and seasonal variability of toxic effects of cyanobacteria in protected area, and to give fast responses to water managers in order to be able to maintain and mitigate the effects of cyanobacteria on environment.

---

#### ☐ **Section III: Natural Resources and Socio-economics aspects**

#### **47. Opinion Survey – A tool applied for the evaluation of tourists demand and supply in Danube Delta Biosphere Reserve**

**Diana Bota, Cristina Nanu, Raluca Bozagievici**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [diana.bota@ddni.ro](mailto:diana.bota@ddni.ro)*

The opinion survey among the tourists is a very used method for the evaluation of tourists demands and supply, tourist attractions and the tourists opinion on tourism services. The tourism research group of DDNI made the beginning in this field in 1991. Under the monitoring system proposed by DDNI, the surveys

conducted for tourists and visitors must be held on a regular basis, every three years, for the correct assessment of demand and supply in DDBR. The proposed frequency has not always been respected (for objective reasons), but the Institute conducted these surveys in 1991, 1994, 1997, 2002, 2005, 2009 and 2017.

The present paper shows the results of the opinion survey carried out in 2017 and the comparative analysis of the results of the previous surveys carried out for tourists and visitors of Danube Delta Biosphere Reserve.

---

#### **48. Experimental research in stimulating algal growth and biomass productivity by electrophysical actions**

**Butoi Nicoleta Oana, Mateescu Carmen\*, Lungulescu Marius, Ducu Robert, Ana-Maria Luchian**

*National Institute for Research and Development in Electrical Engineering ICPE-CA*

*Splaiul Unirii nr. 313, Bucharest-030138, Romania [carmen.mateescu@icpe-ca.ro](mailto:carmen.mateescu@icpe-ca.ro) (corresponding author),*

*e-mail: [nicoleta.butoi@icpe-ca.ro](mailto:nicoleta.butoi@icpe-ca.ro)*

Microalgae has got great attention for producing biofuels but high production costs and energy consumption in cultivation are main limitations to a feasible application. Finding methods to increase the algal biomass productivity has become a challenging research topic for the scientific community in the context of producing economically viable biofuels. The aim of this work was to evaluate the behavior of *Chlorella sp.* in terms of biomass growth after exposure to electric and magnetic fields. The field effect was evaluated by cell viability analysis, as well as by assessing the chlorophyll *a* level in the algal suspension. Cell viability was tested by using dye exclusion staining method and a hemocytometer. The viable and nonviable algal cells before and after the sample exposure to electrophysical stress were counted and investigated by optical microscopy. The qualitative assessment of chlorophyll *a* was carried out by spectrofluorescence, using a spectrophotometer. Fluorescence intensity measurements were made on samples of algal suspensions exposed in DC, AC electric field and magnetic field of different intensities. All samples of algal suspension showed higher increases in fluorescence intensities for the samples exposed in DC, AC and magnetic field, compared to unexposed samples. The experimental results show that the selected electrophysical actions have a beneficial effect on algal cell proliferation, therefore on biomass productivity. Before being applied on industrial scale, additional laboratory tests should be performed for a wider range of field parameters to confirm the stimulating effect of the electric and magnetic field on algal growth.

---

#### **49. Political ecology of fisheries and poaching in the Danube Delta**

**Iorga Alexandru**

*Constantin Brăiloiu Institute for Ethnography and Folklore & University of Bucharest*

*Str. Dobrescu I. Demetru Nr. 9, Sector 1, Bucharest, e-mail: [al.iorga@gmail.com](mailto:al.iorga@gmail.com)*

In my presentation I discuss the fuzzy responsibilities between the main organisations dealing with governing the natural reserve of the Danube Delta. I describe the fluid situation created by the overlapping legislative layers involved in governing and managing the Danube Delta area and the consequences of exploiting fisheries under such circumstances. In my presentation, I will ask questions regarding the exploitation of and access to natural resources, the social struggles and the transformations of the local state and their relationship with environmental ethic from a political ecology point of view.

My presentation, based on the results of ethnographic fieldwork research, sheds light on the interplay of protected areas, local state authorities, access to land and water/fisheries, social security, political ecology and local development in post-socialist Romania.

---

#### **50. Project CATCH – how to bring coastal angling tourism and nature conservation together**

**Kozłowska Aneta, Skorupski Jakub, Brzeziński Radosław**

*Green Federation "GAIA", 5 Lipca 45 St., 70-374 Szczecin, Poland, e-mail: [anetak@gajanet.pl](mailto:anetak@gajanet.pl)*

The project entitled "Coastal Angling Tourism – a development chance for the South Baltic Region" (CATCH), financed under the EU INTERREG South Baltic Programme, is being implemented in order to increase the capability of coastal communities to establish sustainable coastal angling tourism, deliver improved measures for touristic providers and to combine all new knowledge in an innovative information and knowledge platform on coastal angling tourism. The CATCH project promotes, develop and improve methods of sustainable coastal angling tourism, to make it environmentally friendly and nature-oriented. Coastal angling tourism offers a unique development chance for the Baltic Sea Region, especially for less developed coastal regions, but its development must go hand in hand with respecting the natural heritage, especially in deltas and estuarine areas, which are particularly ecologically fragile (eg Odra Delta and Szczecin Lagoon in Poland). The CATCH project emphasizes the importance of recreational angling within the resource-efficient blue growth in the South Baltic Region, increase the capability of coastal communities to establish sustainable angling tourism, deliver improved measures for touristic providers and combines all new knowledge in an innovative information and knowledge platform on coastal angling tourism. The CATCH project is implemented by the international consortium, composed of the following institutions: University of Rostock (Germany), EUCC - Coastal Union Germany (Germany), Green Federation „GAJA” (Poland), Nida Culture and Tourism Information Centre "Agila,, (Lithuania), Klaipėda University (Lithuania), Municipality of Vordingborg (Denmark).

---

#### **51. Agricultural programs in the Danube delta and the Danube flood plain**

**Lup Aurel, Deniz Alim Indira, Miron Liliana**

*Academy of Romanian Scientists, Str.Pescarilor nr.32, BM 12, ap.16 Constanța e-mail: [lupaurel@yahoo.com](mailto:lupaurel@yahoo.com)*

The two geographical units, i.e. the Danube Delta and the Danube Floodplain, are the largest wetlands in Romania, being flooded permanently or periodically, partially or totally. Over time, they have also been used by agriculture, as pastures or even as arable lands, but on small areas. A change in the use of the two wetlands occurred in 1945 when the new political power aimed at increasing the arable area at any cost to 10 million hectares. For this purpose, programs for the drainage and agricultural development of the two wetlands were drawn up periodically. As far as the Danube Delta is concerned, these programs remained, with only a few exceptions, on paper alone; however, in the Danube Floodplain, an area of over 400,000 hectares was drained at high costs, with disastrous consequences for the environment and inefficient results in terms of agriculture. This paper tackles these issues and presents the results obtained.

---

## **52. Mass development episodes of some opportunistic macroalgae during summer season along the Romanian black sea coast in the last decade**

**Marin Oana, Török Liliana, Török Zsolt**

*National Institute for Marine Research and Development "Grigore Antipa" Constanta  
Blvd. Mamaia no. 300, Constanta 3, RO-900581, e-mail: [omarin@alpha.rmri.ro](mailto:omarin@alpha.rmri.ro)*

The submerged vegetation is an important part of the food chain, a feeding and breeding area for zoobenthic communities that carry-out their vital processes within the thickets formed by macrophytes. The macroalgae are an unique domain able to maintain the ecological balance in the marine coastal environment. The mass developing of the opportunistic macroalgae species along the Romanian Black Sea coast is a common phenomenon during the summer season as a consequence of environmental conditions (high water temperature, high amount of nutrients due to increased influx of tourists). The phenomenon is temporary and decreases in intensity with the passage of the warm season. This paper presents the information and observations from 2009-2017 regarding the presence of algal deposits on the shore along the Romanian Black Sea coast. Green algae respond very quickly to these stimulative factors and develop more intensely, hence their dominant presence in deposits. The formation of algal deposits is strictly correlated with the degree of shore exposure, so it can be stated that in the past years algal deposits are present in very sheltered areas. Over the past two years, macroalgae deposits have been present only punctually, in sheltered areas (bays). It has been observed that the frequency of occurrence and the size of the deposits has decreased over the last years compared to the period 2009-2011.

---

## **53. Fishery from Danube Delta Biosphere Reserve – state and trends**

**Năvodaru Ion, Cernișencu Irina, Năstase Aurel**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [ion.navodaru@ddni.ro](mailto:ion.navodaru@ddni.ro)*

Conservation and sustainable use of fish stocks has become a major objective of the fisheries worldwide and DDBR. The paper presents: i) analysis of catches from the "last fishing year" (October 2016 - September 2017); ii) the long-term evolution of catches; iii) estimation and optimization of fish exploitation. The catch structure included 25 species, dominated by freshwater fish (82% from what gibel carp-50.37%, bream-8.75%, roach-7.97%, pike-7.05%, carp-5.83, wels catfish- 4.62, pike-perch-4.53%, other 10.88), Pontic shad (16%), marine species (1%) and other 1%. In the long term (1960-2016), the catch of 2016 (3,468t) is 2.7 times lower than the multiannual average (9.281t). The Pontic shad catch size shows 10-11 years cycles, with large amplitudes between maximum of 2,507 t in 1975 and the minimum of 23t in 1999. The migration and capture of the Pontic shad in 2016 was approx. 400t below the multi-annual average (500t). Catches decline is due to the loss and degradation of habitats, pollution, invasive species and overexploitation. The exploitation state of fish stocks is under-exploited for gibel carp, bream, balanced for Pontic shad and overexploited for pike-perch stocks. In order to optimize to Maximum Sustainable Yield (MSY), it is advisable to increase fishing effort for under-exploited and reduce it to over-exploited species, and / or mesh size changing to optimize fish length at first catch. Accordingly, have estimated a 4,738 t MSY of commercial fishing for 2018. To improve the accuracy of estimation, it is recommended to increase the quality monitoring data (catch and fishing effort) and develop new methods to study fish stocks and fisheries in DDBR.

---

#### **54. Methodology for assessing the integration of the environmental decision in the strategy of developing organizations in the economic area of the Danube Delta Biosphere Reserve**

**Negrei Costel, Crăciun Anca\*, Tudor Marian**

*\*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [anca.craciun@ddni.ro](mailto:anca.craciun@ddni.ro)*

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 organizations in the economic area of the Danube Delta Biosphere Reserve.

---

#### **55. The identification and evaluation of risks impacting on the locals and on tourist activities in the town of Sulina**

**Niculescu Alina Cristina, Frenț Cristi**

*National Institute for Research and Development in Tourism , Apolodor Street no 17, 050741, District 5, Bucharest, e-mail: [niculescu@incdt.ro](mailto:niculescu@incdt.ro)*

Tourism is a vulnerable sector, as it is increasingly exposed to several risks, which can sometimes feature adverse effects. Each tourist destination is unique, being exposed to different risks. Choosing a destination depends - to a large extent - on the degree of safety it offers to tourists and on the existence of a clean environment. In the mind of the tourist services' consumer, the feeling of safety associated with the destination and risk factors are strongly linked, generating the overall picture he or she is making about the destination. Safety and security represent a key factor in the stability of an area that accommodates tourists, as is the case of the town of Sulina. This is a geographically isolated locality, but it has an attractive and favourable location for practicing various forms of tourism (cultural tourism, ecotourism, sport tourism, adventure tourism, helio-marine tourism, cruising, air gliding, and so on) against the background of the unique landscape scenery (combining the landscapes offered by the Danube, the Sea and the Danube Delta). Awareness of the risks associated with the town of Sulina offers the tourist the possibility of carefully considering them, in order to increase the level of protection of the tourists as consumers.

**Keywords:** evaluation, risks, impact, tourist activities.

---

## **56. Mapping potential environmental conflicts in the Danube Delta Biosphere Reserve**

**Sbarcea Mădălina<sup>1</sup>, Petrișor Alexandru-Ionuț<sup>2</sup>, Petrișor Liliana Elza**

*<sup>1</sup>Danube Delta National Institute for Research and Development: 165 Babadag street, Tulcea - 820112, Romania; e-mail: [madalina.sbarcea@ddni.ro](mailto:madalina.sbarcea@ddni.ro)*

*<sup>2</sup>The Doctoral School of Urban Planning, Ion Mincu University of Architecture and Urban Planning, Bucharest, Romania, Str. Academiei nr. 18-20, sect. 1, 010014, Bucharest, Romania  
e-mail: [alexandru\\_petrisor@yahoo.com](mailto:alexandru_petrisor@yahoo.com)*

A broad literature deals with the environmental conflicts. One of the frameworks for analyzing them is provided by the concept of "opportunity cost"; when the same resource can be used in multiple ways, the potential uses can generate conflicts among the users. Among the resources, land has one of the highest potential for generating conflicts worldwide. Environmental conflicts determined by land use are amplified in protected areas, where the protection status is potentially conflicting with all economic uses. Previous analyses in the Danube Delta Biosphere Reserve underlined the fact that the protection status determined over the time social problems through the restrictions imposed to local activities, but also through the pressure of tourism. The present study was aimed at pinpointing the areas with a high potential for conflict using spatial data. Data was freely provided by the Romanian Ministry of the Environment for the reserve limits and for the spatial distribution of birds, other species and habitats representing a priority in conservation, and from the European Union Copernicus Program for the land cover and use. The analyses consisted of spatially overlaying the areas where human activities occur naturally (artificial and agricultural areas) and the spatial distributions of species and habitats important for conservation. The results indicate that the areas where conflicts may appear are situated mostly in the northern part of the reserve and cover almost 450 ha (8% of the total area of the reserve). Proper planning can provide solutions for harmonizing societal needs and environmental issues.

---

## **57. Disparities in living conditions and life standards of D.D.B.R.'s human communities - Sulina case study**

**Sela Florentina, Marin Eugenia**

*Danube Delta National Institute for Research and Development: 165 Babadag street, Tulcea - 820112, Romania; e-mail: [florentina.sela@ddni.ro](mailto:florentina.sela@ddni.ro)*

Considering the socio-economic situation and the existing disparities of Danube Delta Biosphere Reserve's human communities, it is necessary to rise awareness among local population, hence bringing greater benefits for the sustainable socio-economic development of the localities.

The changes occurred in Danube Delta during time, were triggered by the interaction of several decisive factors, such as: economic, political, social, environmental. As the deltaic landscape underwent major transformations, the relationship of local communities with the environment and natural resources changed as well. Sulina, the only city in Danube Delta, was chosen as a case study to surprise both the positive aspects of life that can constitute support points for individuals as well as those components that remain in critical negative areas, permanent sources of dissatisfaction in people's lives.

The methods used in the research activity were the questionnaire and direct survey organized on five dimensions: living conditions, social environment, political environment, professional life, personal life. The main purpose was to capture as much as possible the elements describing the conditions and quality of life in Sulina city.

The results regarding the quality, complexity, and rhythm of Sulina's socio-economic life are directly influenced by demographic evolution, in general and by the natural growth and migration rate as well as demographic aging, in particular. Based on statistical data interpretation it is emphasized that the quality of life in Sulina is ranked with medium level, with few support elements and many critical areas, especially regarding economical and social facilities.

**Keywords:** Danube Delta, living conditions, human communities, socio-economic development

---

#### **58. Establishing a protocol to analyze harvesting and exploitation of phytoplankton algae for biogas production**

**Török Liliana, Mateescu Carmen, Ducu Robert, Török Zsolt**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [liliana.torok@ddni.ro](mailto:liliana.torok@ddni.ro)*

Biogas can be produced from a wide range of solid or liquid residues, as well as from biomass crops. Microalgae for instance are a well-suited biomass due to their relatively high lipid, starch and protein contents and the lack of lignin. Microalgae are microscopic algae (5–50 µm) and oxygenic photosynthetic bacteria such as cyanobacteria which can double their biomass very fast and has several advantages over conventional crops used for biogas, such as: no requirement for herbicides or pesticides; no need for freshwater because can grow in brackish, salt water and wastewater;

Due to problems caused by eutrophication, the algae bloom events is proposed as an alternative approach for using microalgae as feedstock and for harvesting and testing their fermentative capacity. In order to decrease the cost and energy requirement of harvesting, microalgae from a hypereutrophic lake was concentrated through four types of limnological plankton nets.

For the protocol established in this paper two stage process will be discussed: the screening of the microalgae population, and the harvesting of algae biomass.

The screening of the microalgae population was made using light and confocal microscopy technique.

Harvesting was preceded by biomass stimulation in lab conditions with inputs of nutrients once a week, artificial light, low level of aeration and recirculation of water after harvesting. The harvesting of the algae biomass comprises a concentration stage carried out in four steps process.

In the next stages of the BIOALG project, microalgae biomass will be used to test its fermentative capacity in order to produce biogas.

---

#### **□ Section IV: Geographical Information System and Application System Modeling**

#### **59. Focal Point for Black Sea Maritime Spatial Planning, contribution to European MSP Platform**

**Alexandrov Laura<sup>1</sup>, Spinu Alina<sup>1</sup>, Rosca Madalina<sup>1</sup>, Nenciu Magda<sup>1</sup>, Szultze Angela<sup>2</sup>, de Grunt Lisa Simone<sup>2</sup>, Waldmann Clare<sup>2</sup>, Zaharia Tania<sup>1</sup>, Vlasceanu Elena<sup>1</sup>, Golumbeanu Mariana<sup>1</sup>, Niculescu Dragos<sup>1</sup>**

<sup>1</sup>NIMRD -National Institute for Marine Research and Development "G.Antipa" Costanta, Mamaia Blv.300, Constanta, Romania

<sup>2</sup>s.Pro – sustainable projects GmbH, Körntener Str. 20, DE – 10827 Berlin e-mail: [mrosca@alpha.rmri.ro](mailto:mrosca@alpha.rmri.ro)



Starting with December 2015, NIMRD has been nominated as Maritime Spatial Focal Point for Maritime Spatial Planning (MSP) under the Project DG-MARE/2014/23, *Assistance Mechanism for the Implementation of Maritime Spatial Planning* and under the European MSP Platform. The role of this Focal Point has been:

- to collect MSP information from Black Sea area, to make an inventory of the most important MSP projects, practices, events, trainings, etc.,
- to contribute to the main important MSP studies, guidelines, manuals and reports elaboration, including the field of data base for MSP,
- to participate to the most important MSP events (MSP conferences, workshops, public events, etc.) and exercises regarding the most important MSP processes, land-sea interaction, Blue Growth, transboundary approach, ecosystem approach, stakeholders consultation,
- to create MSP Fishes for Romania, for the Black Sea, for the most important regional events and practices, etc.

A huge quantity of information has been collected, classified, sent and installed on the web-site (<http://www.msp-platform.eu/>). This paper shows the most relevant examples of them, quantifying the Romanian contribution to the European, regional and national implementation of MSP Directive – 2014/89/EU. I have to underline the necessity of continuity for a clear transparency and knowledge of this new field in continue development, about spatial and temporal analyses of marine space, which include also Black Sea region.

**Keywords:** Black Sea, Romanian coast, maritime spatial planning, European MSP Platform, MSP practices, vision, synergies, strategies

**Acknowledgement.** This work has been supported by the European Commission through the European Maritime and Fisheries Fund, 2014/DG MARE/23, Project „*Assistance Mechanism for the Implementation of Maritime Spatial Planning*” (2015-2017), EASME/EMFF/2014/1.3.1.7/SI2.721508, SERVICE CONTRACT #320-4

---

## 60. Maritime Spatial Planning – Coastal erosion, vulnerabilities and public consultation on Case Study Eforie

**Alexandrov Laura<sup>1</sup>, Spinu Alina<sup>1</sup>, Mateescu Razvan<sup>1</sup>, Nita Victor<sup>1</sup>, Vlasceanu Elena<sup>1</sup>, Nichersu Iulian<sup>2</sup>, Marin Eugenia<sup>2</sup>, Sela Florentina<sup>2</sup>**

<sup>1</sup>NIMRD -National Institute for Marine Research and Development “G.Antipa” Costanta, Mamaia Blv.300, Constanta, Romania, e-mail: [Enigel108@yahoo.com](mailto:Enigel108@yahoo.com)

<sup>2</sup>Danube Delta National Institute for Research and Development, Babadag Str., Tulcea

Eforie is located to the south of Constanta, extending for 10km along the Black Sea coast, bounded by headlands. It has a rich natural setting, with diverse coastal and marine habitats, including a small freshwater lake (Belona) and another very salty (Techirghiol), separated from the sea by a coastal strip, now heavily developed. Eforie South is a historic resort, which has extended with mass beach tourism to Eforie North, where there is also a port, linked to the Danube by a systematic channel. A recent jetty development has improved the port conditions.

The geological, meteorological, hydrological, hydrochemical and ecological conditions of the area are studied. Similarly, the socio-economic characteristics are described, including population growth, transport infrastructure, economic activities, urban growth, services and tourism.

The area is particularly vulnerable to coastal erosion because of hydrological pressures and geological and geomorphological conditions, such as soft cliffs. Shoreline retreat has been exacerbated by human activities, such as urban development that has led to loss of sand dunes, dams on the Danube that have reduced

sediment input, and barriers that have impeded sediment flow. A 2011 master plan for coastal protection recommended measures such as dikes to reduce wave energy, groins to accumulate sand and beach nourishment. However, this has had some unforeseen negative effects, such as clogging of Belona Marina by sediment transported from beach nourishment areas. Relocation of this marina is now proposed to a nearby location where water circulation is greater,

One more potential conflicts have been identified, such as between fishing and navigation, and marine protected areas with economic uses. A Sketch Match exercise, involving stakeholder engagement, was carried out to explore options for integrating these and other uses. This allowed participants to draw maps of possible configurations of uses and develop other management proposals. For instance, routes to fishing grounds could be clearly established, mussel farms could be relocated and accredited, and the tourist diving potential of shipwrecks could be developed. An interaction matrix of human activities was drawn up, as a means of defining functional zones, including for *nature protection*.

**Keywords:** Black Sea, Romanian coast, maritime spatial planning, coastal erosion, land – sea interaction, stakeholders consultancy

**Acknowledgement.** This work has been supported by the European Commission through the European Maritime and Fisheries Fund, grand No. EASME/EMFF/2014/1.2.1.5/ 2/SI2.707672MSP LOT 1 /BLACK SEA/MARSPLAN-BS. To Stephen Jay and Emiliano Ramieri, Experts for the European MSP Platform particularly thanks.

---

#### **61. Spatial synergies/conflicts between fisheries, aquaculture and other human activities evaluated in Romania by DISPLACE, GRID and cumulative impacts methodologies**

**Alexandrov Laura<sup>1</sup>, Spinu Alina<sup>1</sup>, Niculescu Dragos<sup>1</sup>, Grati Fabio<sup>2</sup>, Bastardie Francois<sup>3</sup>, Bolognini Luca<sup>2</sup>, Vassilou Celia <sup>4</sup>, Vlasceanu Elena<sup>4</sup>, Anton Eugen<sup>1</sup>, Radu Gheorghe<sup>1</sup>, Nicolaev Alexandru<sup>1</sup>, Maximov Valodia<sup>1</sup>**

<sup>1</sup>NIMRD -National Institute for Marine Research and Development “G.Antipa” Costanta, Mamaia Blv.300, Constanta, Romania

<sup>2</sup>Technical University of Denmark, Kemitorvet, 201, 047, 2800 Kgs. Lyngby, Denmark

<sup>3</sup>National Research Council-CNR, Institute of Marine Science-ISMAR, L.go Fiera della Pesca, 60125, Ancona, ITALY, e-mail: [dniculescu@alpha.rmri.ro](mailto:dniculescu@alpha.rmri.ro)

The specific case of the Black Sea and of the Romanian coast of it has been taken into account with the two main parts, in front of Danube Delta Biosphere Reserve, and the the central and southern part, which is under human pressures and demography development effects. Not many activities are carried out at sea, comparing with other seas and coasts, due to geographical and climate instability, strong winds and waves, coastal erosion, continental floods and freshening influence, high temperatures differences, salinity, density variations. As a consequence, the coastal areas are inhabited by aquatic organisms with a high plasticity, resistant to local conditions changes, but enough healthy, with qualities for aquaculture. Valuable and endemic species, like sturgeons, flatfish, shads, mullets have here places for feeding and reproduction. The traditional ways of migrations are disturbed because of different hydrotechnical works and closures between coastal and marine waters. They have to be recovered concerning the water quality and the main marine valuable species. To avoid transboundary conflicts a good management of the fish stocks is necessary, adding legislation harmonisation and control improvement. As an exercise, the main activities of the marine space have been identified and should be up-dated by their geographical coordinates, for mapping. The Romanian coast (in its whole integrity) answers to the ECOAST Project objectives, and delineate human activities (tourism, navigation, oil and gas extraction and transport, coastal

pressures, etc.) including specifically locations for aquaculture, artificial reefs, marine protected areas, natural resources stocks. All of these are taken into account for interconnection and conflicts evaluation, also in transboundary way by the methods planned to be applied under ECOAST Project. This paper presents the results obtained by applying DISPLACE, GRID and cumulative impact assessment methods. Recommendations elaborated will support a good management of fisheries resources, habitats recovery, maritime spatial plans and scenarios approach. As Member State, Romania has to implement all EU Directives regarding marine space and resources

**Keywords:** spatial and temporal analyses, DISPLACE, GRID, matrices, cumulative impact

**Acknowledgement.** This work has been supported by the COFASP Program, ECOAST Project *New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal area*, Contract 45/2016-UEFISCDI, 2015-2019

---

## **62. Application of GIS tools in wildland fire modeling for south Bulgarian test cases**

**Dobrinkova Nina**

*Institute of Information and Communication Technologies – Bulgarian Academy of Sciences, Acad. Georgi Bonchev str. bl. 2, 1113, Sofia, Bulgaria, e-mail: [ninabox2002@gmail.com](mailto:ninabox2002@gmail.com)*

This article will present a summary of a work that has been done in a period of ten years. The article will illustrate how all available data and ICT tools which were available at that time in Bulgaria can be used in wild land fire propagation modeling. The described test cases are in south central part of Bulgaria where the most fire prone nonurban areas of the republic are. The data availability and the used tools to collect the missing pieces for simulations will be described and visualized with test simulations along with the final results and analysis.

---

## **63. Monitoring lakes trophic state based on aquatic vegetation survey by means of Sentinel 2 images**

**Hanganu Jenică, Constantinescu Adrian, Covaliov Silviu**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [jenica.hanganu@ddni.ro](mailto:jenica.hanganu@ddni.ro)*

This work present the 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. Field survey were conducted to define vegetation types in relation to physical and chemical statuts of the water bodies. We could group our 205 training sites in 16 vegetation types. Each type of vegetation revealed a typology depending on the dominant species and characteristics of the water body. A series of specific thematic algorithms for unsuperived discrimination of aquatic vegetation types were run by means of Sentinel-2 Toolbox programme. The Vegetation Index carried out a good discrimination of both floating vegetation (*Trapa natans*) and areas with active sedimentation. By processing the algorithm 'Pigment Specific Simple Ratio' or The Chlorophyll Index, information regarding plant concentration on the surface unit has been gathered. The algorithm 'Normalized Difference Water Index' (NDWI) has proved to be very useful in getting a gradient of coverage with aquatic vegetation on each lake. By runing the supervised classification only *Ceratophyllum* sp., *Chara* sp., *Myriophyllum spicatum*, *Nuphar/ Nymphaea*, *Stratiotes* sp. and *Trapa natans* types proved to be easy to identify.

**Keywords:** Remote sensing, aquatic vegetation relevee, lakes, ecological monitoring

---

#### **64. Using of GIS techniques to assess the spatial changes of the islets in the Corabia area – Bechet harbor sector (km 626-679) between 1910-2017**

**Iordache Gabriel, Bondar Constantin, Anghel Sorin, Malageanu Marian, Dudu Alexandra**

*National Research and Development Institute for Marine Geology and Geoecology – GeoEcoMar, Bucharest, e-mail: [gabriel.iordache@geoecomar.ro](mailto:gabriel.iordache@geoecomar.ro)*

The study area is a part of the Lower Danube sector and belongs to the Gura Vail-Calarasi sub-sector. This area is characterized by a course without important secondary branches and an asymmetric floodplain, very well developed on the left bank. Climate changes and anthropogenic impact from the last centuries have changed significantly the hydro-morphological characteristics of the Danube River. Using GIS methods and techniques in the field of hydrology/river geomorphology facilitates the morphometric analysis of the fluvial islets present in the Danube riverbed through determining their morphometric parameters. All of the parameters that define a fluvial islet will be computed by detailed analysis of cartographic documents, orthophotoplans, and satellite imagery. Based on the historical and recent cartographic sources, satellite imagery and in-situ measurements, the Danube in this sector undergoing a modeling process under the influence of natural and anthropogenic factors. Thus, during the analyzed period there were changes in the width and shape of the riverbed, especially on the left bank, the right bank being higher and more stable. There have been major changes to the islets in this sector. These consisted in changes in the geometry of the islands, either by increasing their surface or by diminishing them, migrating, sticking to one of the banks and even disappearing some of them over the period under review.

**Keywords:** riverbed, islets, GIS techniques, morphometric parameters

---

#### **65. Hydrological and morphological processes in the river deltas of Caspian sea**

**Magritsky Dmitry V., Mikhailov V.N., Kravtsova V.I., Mikhailova M.V.**

*Lomonosov Moscow State University, 119991, Russian Federation, Moscow, GSP-1, Leninskie gory, Faculty of Geography, e-mail: [magdima@yandex.ru](mailto:magdima@yandex.ru)*

Regularities in the response of the mouths of major rivers, flowing into the Caspian Sea, to large-scale variations in its level and river water runoff and sediment yield are considered. Changes in the morphological structure and hydrological regime of the Volga, Terek, Sulak, Samur, Ural, Kura and Sefidrud mouths have been analyzed in both geological past and separately for three modern periods: a considerable drop in Caspian Sea level before 1978, its abrupt rise in 1978–1995, and a relative stabilization and drop in the subsequent years. Specific features were identified in the hydrological–morphological processes in different mouths, caused by the differences in river water runoff and sediment yields, and the slopes of delta surface and mouth nearshore beds. Some theoretical and methodological approaches were verified in the analysis and evaluation of the processes under consideration. The obtained results of studies of the mouths of rivers flowing into the Caspian Sea can be regarded as examples and analogues in the assessment of processes, which take place at the mouths of other rivers at present and can take place in the future under anticipated natural and anthropogenic variations in sea level and river runoff. The research has been performed at the expense of RFBR Grant 16-05-00288 and RSF Grant 14-37-00038.

---

## **66. Features of spatio-temporal variability of water runoff, sediment yield and heat flux in the delta of the Lena River**

**Magritsky D.V.**

*Lomonosov Moscow State University, 119991, Russian Federation, Moscow, GSP-1, Leninskie gory, Faculty of Geography, e-mail: [magdima@yandex.ru](mailto:magdima@yandex.ru)*

In the last 30–40 years, the flux of the Lena River have undergone significant changes due to, mainly, climatic factors. Features of these changes at the marine margin of the Lena delta are different compared to changes in the basin outlet station. The reason is transformation of runoff in the large and multi-branched delta.

The water runoff in the lower reaches of the Lena River has increased due to all hydrological seasons by 41.7 km<sup>3</sup> per year (in 1980–2014 vs 1935–1979), the suspended sediment load – by 5.85 mln tons per year (since 1988), the heat flux – by  $0.8 \cdot 10^{15}$  kJ/year. An increase in water temperature has been noted as well. The main increase in flux has been observed since the end of the 1980s. The water use had almost no impact on the water resources of the river, but have violated natural conditions of winter low water.

In the main delta branch node the percentage of water runoff of the Bykovskaya branch was about 25%, Trofimovskaya – 61%, Tumatskaya – ~ 7%, Olenekskaya – 7%. Within a year, these ratios change. The suspended sediment load: 17, 70, 7 and 6%.

The runoff to the sea is distributed between ~6 thousand streams and is rather unstable due to the fluviomorphological processes. The water runoff at the basin outlet station, delta head and marine margin equals to 543, 547 and 553 km<sup>3</sup>/year; suspended load is roughly 22.5, 22.5 and 7.9–13.5 million tons.

The research has been performed at the expense of RSF Grant 14-37-00038.

---

## **67. Ecological footprint under marine aqua-farms aiming impact - response assessment and management improvement for mariculture development in the Black Sea basin**

**Nicolaev Simion<sup>1</sup>, Alexandrov Laura<sup>1</sup>, Nita Victor<sup>1</sup>, Filimon Adrian<sup>1</sup>, Thorleifur Agustsson<sup>2</sup>, Gomiero Alessio<sup>2</sup>, Spinu Alina<sup>1</sup>, Luminita Lazar<sup>1</sup>, Andra Oros<sup>1</sup>, Valentina Coatu<sup>1</sup>**

*<sup>1</sup>National Institute for Marine Research and Development "Grigore Antipa", 300 Mamaia Blvd., Constanta, Romania, e-mail: [laalexandrov@alpha.rmri.ro](mailto:laalexandrov@alpha.rmri.ro)*

*<sup>2</sup>Marine Enviroment , International Research Institute of Stavanger, Norway, [www.iris.no](http://www.iris.no)*

According to new directive aiming to develop demonstrative centres for marine aquaculture in the Black Sea region, as first stage in this field development of research and rehabilitation of the industrial level, NIMRD started to inventory and apply new methodologies. Romania was selected to create a demonstrative centre for bivalves' cultivation in the sea and Turkey for fish cultures, decision take at the last meetings of Working Groups for the Black Sea GFCM (General Fisheries Commission for the Mediterranean).

The needs for improvement the monitoring/diagnostic/detection tools to quantify the ecological impact of aquaculture leaded to the development of some important analyses for a better quantification of ecological impacts. Usually they allow a more comprehensive evaluation of the ecological footprint of the aquaculture industry in the area where they are.

Taking into account the existing methods used to describe or quantify specific impacts, a more holistic approach is required to identify the real carrying *capacity* at industrial (Venetoulis and Talberth, 2008; Wiedmann and Barrett, 2010, Roth et al., 2000) because the impact is huge in some martine areas and it must be evaluated and mitigate. At European level a common objective for a sustainable aquaculture

reflected in the maintaining of a dynamic ecosystem, adapted to a more demanding market and environmental protection need. Under the ECOAST Project (COFASP Program) propose the need to improve knowledge in all aspects concerning the ecological impact has been covered and for the first time in the Black Sea area a method was applied based on a review of the state-of-the-art detection methods, necessary to highlight the needs in assessing the ecological, societal and economic impacts of the aquaculture industry (Jones et al., 2014; Ertör and Ortega-Cerdà, 2015). Current diagnostic methods were revised and the possibility of using new tools was tested, knowledge exchanging with different disciplines. Several scenarios with increasing aquaculture growth were evaluated and the impacts on the system carrying capacity studied, including the Romanian case study and experience. This paper presents first results obtained by using the method of ecological footprint in aquaculture.

**Keywords:** Black Sea, mariculture, mussel cultivation, spatial and temporal analyses, ecological footprint, BSWG-GFCM

**Acknowledgement.** This work has been supported by the COFASP Program, ECOAST Project *New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal area*, Contract 45/2016-UEFISCDI, 2015-2019

---

## 68. Flood Serv semantic wiki based on ontology evaluation

Ogrezeanu Andrei\*, Nichersu I. <sup>1</sup>, Nichersu I.I. <sup>1</sup>

\*SIVECO Romania, e-mail: [andrei.ogrezeanu@siveco.ro](mailto:andrei.ogrezeanu@siveco.ro), <sup>1</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [julian.nichersu@ddni.ro](mailto:julian.nichersu@ddni.ro)

Semantic wiki module is a multi-lingual component to accompany the educational and the emergency management facilities of the FLOOD-serv system and will represent a specific ontology for floods, based on an existent ontology for hazard management and early warning

The multi-lingual semantic wiki aimed to accompany the emergency management facilities of the FLOOD-serv system will be built upon the vulnerability ontology, containing knowledge necessary for increasing the awareness of the general public. This component will also introduce references towards simulations of flood situations, built upon practical information available for understanding strategies in the decision making process. The ontology will be represented by a knowledge acquisition system and stored in a standard format, with the possibility to export it into a variety of formats, including OWL, RDF (Resource Description Format) and XML (Extensible Markup Language) Schema. The study of the semantic Wiki content and its navigability capabilities are expected to increase the comprehension level of the general public and to raise awareness and cooperativeness.

The FLOOD-serv SW solution will consist of a front-end and a back-end and other external services. The front-end of the solution consists of the software applications and thin clients that directly interact with the users (human actors): interested citizen involved or affected by the hydrological hazards; public authorities and emergency personnel. The backend of the solution implements software components for: Decision support; Data analysis; Emergency Management Console and Databases. External services integrated into the solution are represented by the Social Media collection and communication system; Open data sources and Semantic wiki. The data sources are: apps in the front-end (from all actors), social media and open data sources.

---

## **69. The Danube River evolution within Danube Delta area based on the archaeological discoveries and remote sensing**

**Panait Valentin, Stănică Aurel Daniel, Mierlă Marian**

*Gavrilă Simion Eco-Museum Research Institute, Tulcea, 32 Progresului street, RO 820009, Tulcea, România, phone/fax (+4) 0240 513231, e-mail: [panvali@gmail.com](mailto:panvali@gmail.com)*

The purpose of this study was to develop a working method for analysing the natural environment according to archaeological data. In order to achieve these results, the data obtained from classical archaeological and historical studies were correlated with those obtained by field studies and remote sensing techniques. In this paper, the studies focused on the evolution of the Lower Danube, in Danube Delta area. Data processing was based on free and open source applications.

In order to use the archaeological information almost at the same level as the sedimentological ones, the data obtained through classical archaeological and historical studies were correlated with those obtained by field studies and remote sensing techniques.

Based on the spatial distribution of archaeological sites over historical periods, the evolution of this sector has been tracked over time. Data processing was based on cluster analysis, as well as free and open source applications. The analysis of the cluster was performed based on data obtained through historical and archaeological studies.

Based on the connectivity-based clustering (hierarchical grouping), observations made within the archaeological sites were grouped into classes (groups or clusters) of similar elements (historical periods). The evolution of Danube Delta was tracked using the data obtained in the cluster analysis in relation to their spatial distribution.

---

### **□ PICO (Presenting Interactive Content)**

## **70. New developments in air and water quality monitoring systems**

**Apostol Mihaela**

*SC Tehnoinstrument Impex SRL , e-mail: [mihaela.apostol@tehnoinstrument.ro](mailto:mihaela.apostol@tehnoinstrument.ro)*

Environmental Quality Monitoring is an important step in detection of pollutants for all the environmental factors: air, water, soil, vegetation. During last years the technology has evolved very fast and permit to obtain more precisely information very useful for people to detect any pollutant and to react with measurement decreasing the concentration and /or eliminate totally the specific pollutant.

Also nowadays we have the option to see in real time some pollutants action and we can prevent events which might have important impacts to the people health.

Since 1997, Tehnoinstrument is an important company in the market offering equipment and solutions for Environmental Quality Monitoring. We want to present some solution for each type of environmental factor, underlining the innovative parts of last technologies developed by part of our main partners such as :

- Integrated systems to monitor air, water and soil quality: mobile units, fix systems and buoys
- New compact fully integrated air monitoring station , opens up monitoring locations that were previously inaccessible to traditional monitoring stations -

- An unique laser absorption technology for greenhouse measurements called Off-Axis Integrated Cavity Output Spectroscopy (OAICOS). This technique offers superior performance, value and reliability .
- i::scan - the new miniature multi-parameter spectrophotometer probe which will revolutionize online water quality monitoring: from very cost sensitive applications down to highly resolved "Smart Water Grids", in small unmanned plants, or even in single building protection
- Laser Remote Sensing and Spectral Fluorescence Analysis in oil detection from water
- Autonomous non contact sensors for water quality – ideal for detection of chlorophyll-A in green algae
- Laser diffraction instruments for particle size determination
- Environmental forecasting solutions for operational management

**Keywords:** quality monitoring, environmental solutions, environmental technology

---

## **71. Equipment and solutions for water and environment**

### **Sorin Bogdan**

*MDS ELECTRIC srl, Str. Ajutorului, nr. 1, sector 6, Bucuresti, [www.mdselectric.ro](http://www.mdselectric.ro),*

*e-mail: [sorin.bogdan@mdselectric.ro](mailto:sorin.bogdan@mdselectric.ro)*

MDS ELECTRIC is one of the few suppliers in Romania of complete solutions for measurement and monitoring of water quality parameters (multiparameter for pH, conductivity, temperature, level, dissolved oxygen, ammonia, nitrates, Redox, turbidity, salinity, chlorine, blue-green algae, chlorophyll, CDOM, fDOM, rhodamine), for field applications.

We supply an extended range of equipment, from hand-held or small sized multiparameter for fast spot checking, that does not have installed many parameters but have lower costs, to complete multiparameter for long term monitoring, which can integrate up to 16 parameters simultaneously.

Measured and stored data can be remotely transmitted using GPRS modules or other types of telemetry (radio, GSM, geostationary satellites), thus reducing the costs or having the option of alarms sending for critical applications.

For measurement and telemetry in applications of monitoring the level, velocity, flow in rivers and open channels or even pressurized closed pipes, we can supply quality, precise and performant equipment which can measure, store and remotely transmit the data in real time.

Equipment can be installed in fixed applications or can be used in moving applications by using the Doppler principle, being able to measure speed and integrate flow on the water column profile, obtaining the total instantaneous flow.

In the range of equipment we can supply, there are included also buoys or pontoons equipped with automated profiling systems, equipment for in-situ algae class differentiation, equipment for sediment measuring, equipment for bathymetry. We can supply solutions for most of the applications for surface waters (rivers, lakes, estuaries, coastal areas), depths to 6000m and applications for underground applications, depths to 250m

We supply also solutions for applications like (aquaculture, monitoring and warning for floods or low levels, discharge measurement, irrigations, bathymetrical surveys, 3D mapping for water quality parameters, 3D bathymetrical maps, monitoring of the bathing areas, pollution monitoring and warning.

For more informations, please visit [www.mdselectric.ro](http://www.mdselectric.ro), section „parteneri” or contact at e-mail [sorin.bogdan@mdselectric.ro](mailto:sorin.bogdan@mdselectric.ro), phone 0745157777 or fax 0214305578.

---



## **72. Flooding hazard and risk maps for localities along Sulina and Sf. Gheorghe Branches**

**Constantinescu Adrian C., Paula Pindic, Bănescu Alexandru, Anore Ciprian**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [adrian.constantinescu@ddni.ro](mailto:adrian.constantinescu@ddni.ro)*

The paper meets the requirements of Directive 2007/60 / EC of the European Parliament and Council from 23 October 2007 on the assessment and management of flood risks, namely making hazard maps and flood risk maps at individual river basin scale detailed for localities along Sulina and Sf.Gheorghe branches. The designed hydraulic scenarios simulate real situations with breaches (width of 20 m for 1 day) in the protective embankment. In total, were made 66 scenarios for both Sulina and Sf.Gheorghe branches, starting from the minimum to the maximum flooding levels with a step of increasing the water level at 25 cm. Based on flood hazard maps there were also made flood risk maps using the vulnerability curves for the analyzed categories: buildings, agriculture, road, forest, grassland.

---

## **73. Epidemiological aspects related to parasitosis and infectious diseases in the equines population of Grindul Letea - Danube delta**

**Răileanu Ștefan<sup>1</sup>, Cernea Mihai<sup>2</sup>, Marinov Mihai<sup>1</sup>**

*<sup>1</sup>Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [stefan.raileanu@ddni.ro](mailto:stefan.raileanu@ddni.ro)*

*<sup>2</sup>University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Veterinary Medicine, 400372, Calea Mănăștur, No. 3-5, Cluj-Napoca, România*

The purpose of this paper is to have an image of the pathology of wild horses from Letea region, Danube Delta. Concerns in this direction of equine pathology from Letea region come with the need to find important data on diseases with epidemiological risk. Following the national legal regulations related to the equine species, this area is characterized by a lack of information because of the exceptional environmental aspects and semi-feral conditions of living. A small number of horses used by humans to farm works end up in groups of semi-wild horses getting infested with parasitic and sometimes infectious diseases. Further, catching and selling the horses to other regions may have serious epidemiological consequences. One important issue is that a dominant percentage of this horse population do not have identification documents and sometimes horse transfers can be made without the intervention of veterinarians, which brings a major risk of disease dissemination. Samples were collected both in terms of parasitic pathology as well as the infectious disease and then a specific impact study was made. The results will be used in assessing treatment methods adapted to delta areas. There will be a set of rules for administering the treatments and respecting a list of measures based on these results.

---

#### **74. Assessment of ecosystems services generated by Morii Lake in Bucharest city**

**Ioja Cristian<sup>1</sup>, Carstea Elfrida<sup>2</sup>, Talaba Odelin<sup>1\*</sup>, Hossu Alina<sup>1</sup>, Cheval Sorin<sup>1</sup>, Sandric Ionut<sup>1</sup>, Vanau Gabriel<sup>1</sup>, Nita Mihai<sup>1</sup>, Popa Ana-Maria<sup>1</sup>**

*<sup>1\*</sup>University of Bucharest, Center for Environmental Research and Impact Studies,  
e-mail: [odelin94@yahoo.com](mailto:odelin94@yahoo.com), <sup>2</sup>National Institute for Optoelectronics – INOE 2000*

Urban Ecosystem Services assessment is an important challenge for practitioners, due to the high complexity of relations between urban systems components, high vulnerability to climate change, and consequences in social-economical systems. Adequate urban management supports diverse benefits of urban lakes: clean water availability, mediation of waste, toxics and other nuisance, air quality and climate regulation, support for physical, intellectual or spiritual interactions. Due to underestimation of climate change and misfit urban planning decision, these benefits may be lost or changed into disservices. The aim of the presentations is to present the results of the assessment of urban ecosystems service supplied by urban lakes, using innovative and traditional methods (e.g. spatial modeling, scenarios, fluorescence, sensors, remote sensing, social survey). Considering Morii Lake as case study, we assess the actual level of main urban lakes' ecosystems services supplying: climate and air quality regulation, water self-treatment and cultural services. The paper presents the results obtained into the project PN-III-P2-2.1-PED-2016-1300- Experimental Methods for Ecosystems Services Assessment of Urban Lakes under Climate Changes (EMERSA).

---

#### **75. Preliminary results on phytoplankton in Zaghen Polder**

**Spiridon Cosmin, Ibram Orhan, Teodorof Liliana Tudor, Iuliana-Mihaela, Seceleanu-Odor Daniela, Burada Adrian, Despina Cristina, Țiganuş Mihaela, Georgescu Lucian Puiu, Doroftei Mihai**

*Danube Delta National Institute for Research and Development, 165 Babadag Street, 820112 Tulcea, Romania, e-mail: [cosmin.spiridon@ddni.ro](mailto:cosmin.spiridon@ddni.ro)*

Zaghen polder is a wetland of faunistic, landscape and recreational area for Tulcea town and the surrounding tourism attraction. The phytoplankton analysis consisted in sample prelevation and measurements in four points in polder area. Measurements on phytoplankton amount were made with Submersible Spectrofluorometer, wich uses light intensity to differentiate the main algal groups and quantifying their biomass. Qualitative analysis of phytoplankton from samples taken from the Zaghen polder was done using the Leitz Laborlux S microscope. The analyses have identified chlorophyll values ranging from 12,41 µg/L in sample point 1 in prelevation from 14.06.2017, and 457,97 µg/L in sample point 3 in prelevation from 27.07.2017. According to Order 161 / 16.02.2006 it shows that the average grade class was the third, having a mesotrophic degree, with values between 50-100 µg / L. The qualitative analisys reveal 39 genus belonging to 4 taxonomic groups as follow: 17 chlorophceae, 3 cyanophyceae, 16 diatoms and 3 euglenophyceae. The lowest number of individuals per liter was identified in 14.06.2017 respectively 154 958 ind/L in sample point 1, and the highest number of individuals per liter in 28.08.2017 in sample point 2 respectively 3.388.430 ind/L. The data presented above represent a preliminary analysis on phytoplankton in first year after the ecological rehabilitation of the area.

---

## List of participants

No.	Name and surname	Organization	E-mail address
1.	Aibulatov Denis	Lomonosow Moscow State University, Ru	gidroden@mail.rus
2.	Ajder Iacob	Cross-Border Cooperation and European Integration Agency Republic of Moldova	iacobajder@yahoo.fr
3.	Alexandrou Olga	Society for the Protection of Prespa, Greece	o.alexandrou@spp.gr
4.	Alexandrov Laura	Grigore Antipa National Institute for Marine Research and Development Constanta	lalexandrov@alpha.rmri.ro
5.	Alexe Vasile	Danube Delta National Institute for Research and Development Tulcea, Ro	alexe.vasile@ddni.ro
6.	Andrei Raluca-Cristina	"Dunarea de Jos" University of Galati, Faculty of Food Science and Engineering, Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Galati, Ro	raluca.andrei@ugal.ro
7.	Anore Ciprian	Danube Delta National Institute for Research and Development Tulcea, Ro	ciprian.anore@ddni.ro
8.	Apostol Mihaela	Tehno Instrument Impex Ploiesti	mihaela.apostol@tehnoinstrument.ro
9.	Aron Péter	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, MTA-PE Evolutionary Ecology Research Group, Department of Limnology, University of Pannonia, Hungary	aronpeter92@mail.com
10.	Bănescu Alexandru	Danube Delta National Institute for Research and Development Tulcea, Ro	alexandru.banescu@ddni.ro
11.	Bîscă Viorica	National Agency for Protected Natural Areas Bucharest	viorica.bisca@anap.gov.ro
12.	Bogdan Sorin	MDS Electric Bucuresti	sorin.bogdan@mdselectric.ro
13.	Bondar Constantin	Geocomar, Bucuresti.	constantinbondar@yahoo.com
14.	Bota Diana	Danube Delta National Institute for Research and Development Tulcea, Ro	diana.bota@ddni.ro
15.	Bozagievici Raluca	Danube Delta National Institute for Research and Development Tulcea, Ro	raluca.bozagievici@ddni.ro
16.	Bratfanof Edward	Danube Delta National Institute for Research and Development Tulcea, Ro	edward.bratfanof@ddni.ro
17.	Burada Adrian	Danube Delta National Institute for Research and Development Tulcea, Ro	adrian.burada@ddni.ro
18.	Butoi Nicoleta Oana	National Institute for research and Development in Electrical Engineering ICPE-CA, Bucharest, Ro	nicoleta.butoi@icpe-ca.ro
19.	Ciubuc Constantin	University of Bucharest, Zoological Station, Sinaia, Ro	ciubuc1206@gmail.com
20.	Cernîșencu Irina	Danube Delta National Institute for Research and Development Tulcea, Ro	irina.cernisencu@ddni.ro
21.	Certan Corina	Institute of Ecology and Geography of the Academy of Sciences from Moldova	certancorina@mail.ru
22.	Cioacă Eugenia	Danube Delta National Institute for Research and Development Tulcea, Ro	eugenia.cioaca@ddni.ro
23.	Ciorpac Miică	Danube Delta National Institute for Research and Development Tulcea, Ro	mitica.ciorpac@ddni.ro
24.	Ciuvăț Alexandru Liviu	National Institute for research and Development in Forestry "Maria Dracea", Ilfov, Ro	alexandru.ciuvat@gmail.com
25.	Condac Marilena	Danube Delta National Institute for Research and Development Tulcea, Ro	marilena.condac@ddni.ro
26.	Constantinescu Adrian	Danube Delta National Institute for Research and Development Tulcea, Ro	adrian.constantinescu@ddni.ro
27.	Covaliov Silviu	Danube Delta National Institute for Research and Development Tulcea, Ro	silviu.covaliov@ddni.ro
28.	Crăciun Anca	Danube Delta National Institute for Research and Development Tulcea, Ro	anca.craciun@ddni.ro
29.	Culcea Oana	Grigore Antipa National Institute of Marine Research and Development, Constanta, Ro	oculcea@alpha.rmri.ro
30.	Despina Cristina	Danube Delta National Institute for Research and Development Tulcea, Ro	cristina.despina@ddni.ro
31.	Dobrinkova Nina	Institute of Information and Communication Technologies Bulgarian Academy of Sciences, Bulgaria	Ninabox2002@gmail.com
32.	Doroftei Mihai	Danube Delta National Institute for Research and Development Tulcea, Ro	mihai.doroftei@ddni.ro

33.	Doroşencu Alexandru	Danube Delta National Institute for Research and Development Tulcea, Ro	alexandru.dorosencu@ddni.ro
34.	Dumbravă Anca	Ovidius University Constanta	office@univ-ovidius.ro
35.	Duralia Gabriel	Danube Delta National Institute for Research and Development Tulcea, Ro	gabriel.duralia@ddni.ro
36.	Ene Liliana	Danube Delta National Institute for Research and Development Tulcea, Ro	ene.liliana@ddni.ro
37.	Fasola Regina	Institute of ecology and Geography, Chişinău, Republic of Moldova	reginaf21@mail.ru
38.	Fazacaş George Ionuţ R.	National Agency for Protected Natural Areas Bucharest	ananp@ananp.gov.ro
39.	Frenţ Cristi	National Institute for Research and Development in Tourism, Bucharest, Ro	niculescu@incdt.ro
40.	Galatchi Liviu Daniel	Ovidius University Constanta	st.naturale@univ-ovidius.ro
41.	Georgescu Lucian Puiu	Dunărea de Jos University of Galaţi	puiu.georgescu@ugal.ro
42.	Grigoraş Ion	Danube Delta National Institute for Research and Development Tulcea, Ro	ion.grigoras@ddni.ro
43.	Hanganu Jenică	Danube Delta National Institute for Research and Development Tulcea, Ro	jenica.hanganu@ddni.ro
44.	Hanzu Mihail	Marin Dracea National Institute for R&D in Silviculture, Brasov, Ro	mihail.hanzu@gmail.ro
45.	Holostenco Daniela	Danube Delta National Institute for Research and Development Tulcea, Ro	daniela.holostenco@ddni.ro
46.	Honţ Ştefan	Danube Delta National Institute for Research and Development Tulcea, Ro	stefan.hont@ddni.ro
47.	Iani Marian	Danube Delta National Institute for Research and Development Tulcea, Ro	marian.iani@ddni.ro
48.	Ibram Orhan	Danube Delta National Institute for Research and Development Tulcea, Ro	orhan.ibram@ddni.ro
49.	Ince Anuţa	Danube Delta National Institute for Research and Development Tulcea, Ro	anuta.ince@ddni.ro
50.	Iordache Gabriel	National Institute For Marine Geology And Geoecology - Geocomar	contact@geoecomar.ro
51.	Iorga Alexandru	Constantin Brăiloiu institute for Eynography and Folklore & University of Bucharest, Ro	al.iorga@gmail.com
52.	Kiss Janos Botond	Danube Delta National Institute for Research and Development Tulcea, Ro	jbkiss03@yahoo.com
53.	Kohlmann Klaus	Leibniz – Institute of Freshwater Ecology and Inland Fisheries Berlin, Germany	kohlmann@igb-berlin.de
54.	Kozłowska Aneta	Green Federation GAIA, Poland	anetak@gajonet.pl
55.	Les Ewa	Green Federation GAIA, Save the Rivers Coalition, Poland	evvales@gmail.com
56.	Luchian Ana-Maria	National Institute for research and Development in Electrical Engineering ICPE-CA, Bucharest, Ro	
57.	Lup Aurel	Academy of Romanian Scientists, Ro	lupaurel@yahoo.com
58.	Lupu Gabriel	Danube Delta National Institute for Research and Development Tulcea, Ro	gabriel.lupu@ddni.ro
59.	Lupu N. Gabriel	Danube Delta National Institute for Research and Development Tulcea, Ro	gabi.lupu@ddni.ro
60.	Magritsky Dmitry	Lomonosov Moscow State University, Ru	magdima@yandex.ru
61.	Marin Oana	"Grigore Antipa" National Institute for R&D, Constanta, Ro	omarin@alpha.rmri.ro
62.	Marin Eugenia	Danube Delta National Institute for Research and Development Tulcea, Ro	eugenia.marin@ddni.ro
63.	Marinov Mihai	Danube Delta National Institute for Research and Development Tulcea, Ro	mihai.marinov@ddni.ro
64.	Mierlă Marian	Danube Delta National Institute for Research and Development Tulcea, Ro	marian.mierla@ddni.ro
65.	Muşetescu Mălin-Matei	Danube Delta Biosphere Reserve Authority	office@ddbra.ro
66.	Nagy András-Attila	University of Babes-Bolyai, Hungarian Department of Biology and ecology, Cluj-Napoca	andrasattila.nagy@milvus.ro
67.	Nanu Cristina	Danube Delta National Institute for Research and Development Tulcea, Ro	cristina.nanu@ddni.ro
68.	Năstase Aurel	Danube Delta National Institute for Research and Development Tulcea, Ro	aurel.nastase@ddni.ro
69.	Năvodaru Ion	Danube Delta National Institute for Research and Development Tulcea, Ro	ion.navodaru@ddni.ro

70.	Nichersu Iuliana	Danube Delta National Institute for Research and Development Tulcea, Ro	iuliana.nichersu@ddni.ro
71.	Nichersu Iulian	Danube Delta National Institute for Research and Development Tulcea, Ro	iulian.nichersu@ddni.ro
72.	Nicolaev Simion	Grigore Antipa National Institute for R&D, Constanta	office@alpha.rmri.ro
73.	Niculescu Alina Cristina	National Institute for Research and Development in Tourism, Bucharest, Ro	niculescu@incdt.ro
74.	Niculescu Dragos	Grigore Antipa National Institute for Marine Research and Development Constanta	dniculescu@alpha.rmri.ro
75.	Ogrezeanu Andrei	SIVECO Romania	andrei.ogrezeanu@siveco.ro
76.	Olesea Gliga	Institute of Zoology, Chisinau, Republic of Moldova	camiprim@inbox.ru
77.	Ozimec Sinisa	Faculty of Agriculture in Osijek, Croatia	sozimec@pfos.hr
78.	Otel Vasile	Tulcea, Ro	vasile_otel@yahoo.com
79.	Panait Valentin	"Gavrilă Simion" Eco-Museum Research Institute	panvali@gmail.com
80.	Panin Nicolae	National Institute for Research and Development of Marine Geology and Geoecology (GeoEcoMar)	panin@geoecomar.ro
81.	Paraschiv Marian	Danube Delta National Institute for Research and Development Tulcea, Ro	marian.parschiv@ddni.ro
82.	Petre Ionel	National Agency for Protected Natural Areas Bucharest	ananp@ananp.gov.ro
83.	Petrișor Alexandru-Ionuț	Ion Mincu University of Agriculture and Urban Planning, Bucharest, Ro	alexandru_petrisor@yahoo.com
84.	Pindic Paula	Danube Delta National Institute for Research and Development Tulcea, Ro	paula.pindic@ddni.ro
85.	Pipirigeanu Vasile	CERONAV Constanta	vasilepipirigeanu@ceronav.ro
86.	Pohontu Corneliu Mihăiță	Stefan cel mare University of Suceava, Ro	corneliu.pohontu@yahoo.com
87.	Popescu Ovidiu-Alexandru	"Alexandru Ioan Cuza" University Of Iasi	popescu.ovidiu.alex@gmail.com
88.	Prlic Dragan	University of Osijek, Department of Biology , Croatia	prlicdragan@gmail.com
89.	Przemyslaw Smietana	Green Federation "GAIA", Institute for Research on Biodiversity / University of Szczecin, Poland	leptosp@univ.szczecin.pl
90.	Raicu Filip	Ion Mincu University of Architecture and Urban Planning, Bucharest, Romania / Tulcea Municipality	filip_raicu@yahoo.com
91.	Rădan Sorin-Corneliu	Geological Institute of Romania Bucharest	sc.radan@yahoo.com
92.	Răileanu Ștefan	Danube Delta National Institute for Research and Development Tulcea, Ro	stefan.raileanu@ddni.ro
93.	Robea Mădălina-Andreea	Alexandru Ioan Cuza University of Iasi, Ro	stefan.strungaru@uaic.ro
94.	Rosca Madalina Gabriela	Grigore Antipa National Institute for Marine Research and Development Constanta	mrosca@alpha.rmri.ro
95.	Sali Iasemin	Danube Delta National Institute for Research and Development Tulcea, Ro	iasemin.aali@ddni.ro
96.	Sbarcea Madalina	Danube Delta National Institute for Research and Development Tulcea, Ro	madalina.sbarcea@ddni.ro
97.	Schneider Erika	Karlsruher Institut für Technologie, Karlsruhe Germany	erika.schb@t-online.de
98.	Seceleanu Odor Daniela	Danube Delta National Institute for Research and Development Tulcea, Ro	daniela.seceleanu@ddni.ro
99.	Sela Florentina	Danube Delta National Institute for Research and Development Tulcea, Ro	florentina.sela@ddni.ro
100.	Simionov Ira-Adeline	Dunarea de Jos University of Galati, Romania	ira.simionov@gmail.com
101.	Skolka Marius	Natural Sciences Department, „Ovidius” University of Constanta	mskolka@gmail.com
102.	Skorupski Jakub	Green Federation "GAIA", Polish Society for Conservation Genetics LUTREOLA, Poland	jakub@gajonet.pl
103.	Spiridon Cosmin	Danube Delta National Institute for Research and Development Tulcea, Ro	cosmin.spiridon@ddni.ro
104.	Suciu Radu	Danube Delta National Institute for Research and Development Tulcea, Ro	radu.suciu@ddni.ro
105.	Szenejko Magdalena	Green Federation "GAIA", Institute for Research on Biodiversity / University of Szczecin, Poland	magdalena.szenejko@usz.edu.pl
106.	Talabă Odelin	University of Bucharest, Center for Environmental Research and Impact Studies	odelin94@yahoo.com
107.	Taflan Elena	Danube Delta National Institute for Research and Development Tulcea, Ro	elena.taflan@ddni.ro
108.	Teochari Dimitra	National Technical University of Athens, Greece	dimitra.theochari@gmail.com

109.	Teodorof Liliana	Danube Delta National Institute for Research and Development Tulcea, Ro	liliana.teodorof@ddni.ro
110.	Török Liliana	Danube Delta National Institute for Research and Development Tulcea, Ro	liliana.torok@ddni.ro
111.	Török Zsolt	Danube Delta National Institute for Research and Development Tulcea, Ro	zsolt.torok@ddni.ro
112.	Tošić Katarina	Danube Delta National Institute for Research and Development Tulcea, Ro	katarina.tosic@ddni.ro
113.	Trandafir Văcărean Irina Cezara	"Alexandru Ioan Cuza" University of Iași, Ro	trandafirina.bi@gmail.com
114.	Trifanov Cristian	Danube Delta National Institute for Research and Development Tulcea, Ro	cristian.trifanov@ddni.ro
115.	Tudor Marian	Danube Delta National Institute for Research and Development Tulcea, Ro	marian.tudor@ddni.ro
116.	Tudor Iuliana-Mihaela	Danube Delta National Institute for Research and Development Tulcea, Ro	mihaela.tudor@ddni.ro
117.	Zaharia Alexandru	Romanian National Institute for Research and Development in Silviculture „Marin Drăcea" Braşov	mihail.hanzu@gmail.ro
118.	Zaharia Tania	Grigore Antipa National Institute for Marine Research and Development Constanta	tzaharia@alpha.rmri.ro
119.	Zawal Andrzej	Department of Invertebrate Zoology & Limnology, Faculty of Biology, University of Szczecin, Poland	andrzej.Zawal@usz.edu.pl
120.	Ureche Camelia	"Vasile Alecsandri" University of Bacau	dureche@ub.ro
121.	Ureche Dorel	"Vasile Alecsandri" University of Bacau	dureche@ub.ro
122.	Vintila Mihaela	CERONAV Constanta	vintilamihaela@ceronav.ro
123.	Vlasceanu Elena	Grigore Antipa National Institute for Marine Research and Development Constanta	enigel108@yahoo.com