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## Editorial

## Estuarine ecosystems: Structure, function and management (ECSA-42 Symposium in Russia)



Dr. Krystyna Maciejewska (1946–2009)

The International Symposium ECSA-42 “Estuarine Ecosystems: Structure, Function and Management” was held during September 16–22, 2007 in the resort town Svetlogorsk (Kaliningrad Region, Russia) located at the base of the Curonian spit (southern Baltic Sea, ca. 40 km distance from Kaliningrad). Although ECSA (The International Estuarine & Coastal Sciences Association) has organized symposia worldwide this was the Association’s first symposium in Russia. As such, and as shown by the papers in this issue, this gave the opportunity to showcase science from the former Soviet-bloc and expose to a wider audience the vast amount of information and data previously gathered and which has not hitherto been presented in western literature.

The symposium was organized by:

- Estuarine and Coastal Sciences Association (ECSA, <http://www.ecsa-news.org/>),
- Russian Hydrobiological Academic Society (RHAS, <http://www.zin.ru/societies/gbo/index.html>),
- Atlantic Scientific Research Institute for Marine Fisheries and Oceanography (AtlantNIRO, Kaliningrad),
- Kaliningrad State Technical University (KSTU, Kaliningrad),
- Atlantic Branch of P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences (ABIO RAS),
- Russian State University of Immanuel Kant.

The scientific program of the ECSA42 included invited plenary lectures, oral presentations and posters on the following topics:

(1) Biodiversity and functioning of estuarine and other coastal ecosystems; (2) Biological resources in estuaries: current status and use; (3) Biochemical and biological indication of the coastal ecosystems health; (4) Water pollution and ecosystem changes; (5) Management of estuarine ecosystems: linking science and policy.

The symposium was aimed at encouraging scientific discussions on estuarine ecosystem structure and functions functioning, biodiversity, management, water pollution and eutrophication, ecosystem “health”, the status and use of biological resources in estuaries, and other related topics. The term “estuary” was used in its broadest sense, as a synonym for a variety of marine/coastal transitional environments.

The links between science and policy in estuarine and coastal environments were emphasized at the symposium which was aimed at increasing cooperation within the scientific community, participation in societal dialogue, efficient communication of science to decision-makers and to the public, as well as identifying better governance and management practices in estuarine ecosystems. It is of particular note that the long history of collaboration, the high quality and amount of scientific information and the presence of economically stable societies has lead to the high potential of the Baltic Sea region as a pilot area for carrying out research, delivering efficient protection and restoring marine and estuarine environments in a holistic manner, while simultaneously safeguarding the continuation of economic activities (Statement of the conference ‘Baltic Sea and European Marine Strategy – Linking Science and Policy’, November 13–15, 2006, Helsinki, Finland). Therefore, not surprisingly, the major part of presentations at the ECSA-42 Symposium dealt with estuaries, lagoons and other coastal waters of the Baltic Sea Region as well as other geographical areas.

The research results presented and discussed at the ECSA-42 Symposium in Svetlogorsk allowed an overview of the present-day key scientific problems in estuarine and coastal science and management, as well as in aquatic ecology in general. Together with descriptions of specific features of the hydro-chemical regime, plankton, benthos and fish communities in different estuarine ecosystems worldwide, the symposium participants made certain generalizations on the impact of natural and anthropogenic factors on the trophic status of estuarine ecosystems. The *Estuarine Quality Paradox*, *Environmental Homeostasis* and the difficulty of detecting anthropogenic stress in naturally stressed areas was clearly demonstrated and discussed in detail. The relative role of monitoring versus *The Ecosystem Approach* in present-day estuarine studies was assessed and critically analyzed. Some principal processes within the salinity gradient in estuaries and other natural water bodies were summarized, and the possible application of

the theory of ecosystem functioning to estuarine ecology was discussed.

The symposium participants emphasized the importance of (1) good basic science, e.g. taxonomy and physiology, for the evaluation and prognosis of ecosystem functioning and its evolution, (2) bottom-up processes for understanding causes and effects in estuarine ecosystems, (3) the linkage between survey and experimental approaches, (4) analytical quality control in producing internationally usable data and information, and (5) the availability of inter-calibrated methods, techniques, indices etc. for producing highly relevant and valid conclusions and recommendations for environmental policy making and management.

The ECSA-42 Symposium participants concluded the event with a number of recommendations and indicated the research priorities aimed at intensifying the application of holistic approach to the evaluation and forecasting of ecosystem health and the effective management of estuaries and other transitional and coastal waters.

#### Recommendations of ECSA-42 Symposium:

1. At the **structure** level, a high taxonomical expertise on estuarine biota is essential for the adequate evaluation of e.g. 'ecosystem health' and 'water quality' based on biological parameters. Therefore, taxonomic training, the publication of regional keys and guide-books and species checklists should be considered a priority.
2. At the **process** level, a high methodological (technical) expertise in hydrobiology and general ecology as well as their links to hydromorphology and physico-chemical processes must be intensified.
3. For effective **management** the research on 'integral' (ecosystem – economy) approaches to the evaluation of estuarine ecosystem quality based on biological parameters and functioning should now get the highest possible priority.
4. Development of high quality **'integral' models** including economical aspects and modern ecological concepts is essential for increasing our predictive power and thus for improving ecosystem management.
5. Based on tenets 1 and 2, special attention should be given to education, training and **international exchange programmes** (including joint grants) in the coastal and estuarine sciences for university students and young scientists; this should especially be the case for countries with a developing science base and the need to increase international exposure.
6. The scientific community must **'think out of the box'** by increasing multidisciplinary cooperation, participating in societal dialogue, ensuring the effective communication of scientific results to decision-makers and to the public (provoking the 'so

what', 'what then' and 'what if' questions) and by identifying better governance and management practices in estuarine ecosystems.

7. To improve the role of science in management, the scientific community has to strengthen the need for publishing **management papers in international peer-reviewed journals** instead of reporting in grey literature and it has to ensure ways of making excessive amounts of previously unpublished data available for wider use.

These recommendations were supported by the participants of the ECSA-42 Symposium which counted 58 scientists; among them were researchers from the United Kingdom (2), Germany (1), Portugal (4), Italy (2), Spain (2), Poland (2), Lithuania (3), The Netherlands (1) and Russia (41). The total number of presentations made and discussed at the Symposium was 63, among which 39 lectures and 24 posters. The Symposium participants expressed their gratitude to the Administration of the National Park "Curonian Spit" and Biological Station of the Zoological Institute of the Russian Academy of Sciences for the opportunity to visit the park and the station and get acquainted with the research carried out there. Additional financial support of the Symposium was provided by the Russian Foundation for Basic Research (RFBR grant 07-04-06068) and "Fishing Service Ltd".

Finally, this set of papers is dedicated to Dr. Krystyna Maciejewska, of the Sea Fisheries Institute in Gdynia, Poland, who sadly passed away on October 27, 2009, at the age of 63; she is fondly remembered for her work on the feeding energetics and trophic interactions of juvenile marine fishes and she will be missed by her colleagues and friends throughout the marine biological community.

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