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| **Keynote Speakers** |
| Prof. Mike Elliott | Institute of Estuarine and Coastal Studies, University of Hull | **Understanding, quantifying, interpreting and communicating the socio-ecological system for fit-for-purpose lagoon management**The socio-ecological system is taken here as the essence of the Ecosystem Approach – our ability to protect and maintain the natural structure and functioning of aquatic systems while at the same time allowing it to produce ecosystem services from which we can take societal goods and benefits. This relies on our understanding of the ecological structure and functioning and the measurement of the health (or lack of it) of systems such as lagoons and other transitional waters. This understanding has to be sufficient to achieve ecosystem management which focusses on the fundamental processes, the intermediate and final ecosystem services, and the way we can obtain societal goods and benefits from these after inputting human capital. These aspects need to communicated by making our natural and social science applicable and relevant to appropriate audiences. In some cases this may mean using ecological and economic valuation techniques and often it requires the use of indicators linked to monitoring systems to determine whether the drivers, activities and pressures in lagoons and their catchments have affected their state changes and impacts on human welfare. Once such changes and impacts are detected then we need to implement responses which are often defined as measures in a complex system of EU Directives; some of those measures have to achieve the recovery of lagoons from historical degradation. All of these aspects will be illustrated in this contribution to show lagoonal science and management which needs to be fit for purpose. However, this science and management have to accommodate the unbounded boundaries (due to the connectivity which is central to lagoon functioning) and moving baselines (due to wider pressures such as climate change). The contribution will thus include an indication of the mismatch between scientific and management/policy understanding. |
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| **Track 1 - Multidisciplinary science in coastal zone management** |
| Adriaan Slob1 Ingmar van Meerkerk 2 | 1TNO2Erasmus University Rotterdam | **Interdisciplinary science for Integrated Coastal Zone Management**The integration of scientific knowledge for Integrated Coastal Zone Management, requires an in-depth cooperation between many disciplines from social and natural sciences, like biologists, eco-toxicologists, hydrologists, geologists, economists, spatial/urban planners, sociologists, policy analysts, etc. However, interdisciplinary work is not self-executive due to epistemological differences between scientific disciplines and their different approaches. Every discipline has its own specific framing, language, routines, and ways of generating relevant and reliable knowledge. A fundamental challenge is therefore to overcome problems created by differences in disciplinary cultures: to cross the conceptual and methodological boundaries between the prevailing fields of research.In the ARCH-project a specific process and evaluation work package shaped and monitored the progress of the interdisciplinary work. In the presentation we will show the process through which interdisciplinarity in ARCH was enhanced. The following factors appeared to have influenced the interdisciplinary work in ARCH: open mindedness of the project partners, trust building between the partners, the role of facilitative leadership, the importance of developing a common vocabulary and the role of boundary objects (like joint models, maps or reports). In the ARCH project these different factors are facilitated by the project managers and are structured in the process design of the ARCH project. The presentation will end with recommendations how to enhance interdisciplinarity in research projects aimed at supporting Coastal Zone Management. |
| Elizabeth Brooks1 and Simin Davoudi2  | 1Glasgow University2Newcastle University | **Towards Evolutionary Resilience in the Rotterdam Climate Change Adaptation Strategy**This paper applies a four-part resilience framework to critically examine the approaches to climate change adaptation. The framework has been developed by Davoudi et al [1] by drawing on three broad perspectives on resilience − engineering, ecological, and evolutionary [2]. The framework has been expanded in light of recent literature to incorporate greater detail in the various resilience subcategories. Rotterdam in the Netherlands has been selected as an illuminating example from the ten case studies undertaken for a four-year European FP7 research project, ARCH [3]. The evolutionary resilience framework will be applied through a content analysis of the city’s most recent successive climate change adaptation strategies, placed in the context of other relevant Rotterdam and regional policies, and supported by the relevant research literature. A framework applying a holistic model of resilience that envisages interactions between climate events at multiple scales and time points and based on the interwoven nature of social and ecological systems aims to expand understanding of the consequences of different adaptation approaches and actions. This can be useful for coastal regions globally planning for the rising sea levels, greater incidence of rainfall and drought and the generally more volatile climatic conditions of the 21st century. |
| Conides, A.1, Klaoudatos, D.1, Zacharaki, P.2 | 1Hellenic Centre for Marine Research, Institute for Marine Biological Resources and Inland Waters, 2Institute of Geological and Mineral ExploratioN | **How lagoon fishermen perceive their professional and social environment?**Fishermen as a stakeholder group, are significantly complex in behavior and decision making related to the conduct of the fishing profession and therefore it is very important to understand their behavior in order to achieve their better involvement in environmental policy making. Since this group has shown that it prefers to be alienated from the local society due to its beliefs related to the dangers of their profession as well as the fact that they are usually neglected from decision making processes which affect their line of work, creates the need to study this group in detail and namely the way they perceive their social and natural environment and professional risks. Coastal lagoons are known today as sensitive ecosystems which provide valuable ecosystem services to the human community, even in a global scale. Modern sustainable management practices are based on the balance and tradeoffs between the environmental/ecological objectives and the preservation of the welfare of the stakeholders and the fishermen are one of the most important stakeholder group. In order to achieve this objective a detailed survey was conducted in North Amvrakikos gulf lagoon complex (Western Greece) based on questionnaires and targeting the fishermen who belong to the fishermen cooperative that rent the lagoons for fisheries exploitation. The results are presented in tabular format and as mental models. |
| Carlos Vale1,2, Joana Raimundo2 and Miguel Caetano2 | 1 *CIIMAR*2IPMA | **Methodology for assessing anthropogenic pressures in transitional waters: validation with physico-chemical status in the Minho River estuary, Portugal**According to the Water Framework Directive (WFD), the ecological status of the water body in a estuarine ecosystem may be influenced by human activities in the estuary and watershed. This work reports an attempt to score the pressures of anthropogenic activities in the Minho River estuary, a system located in the north of Iberia Peninsula that separates Portugal and Spain. Scores were based on data of demography and main activities in the municipalities adjacent to the estuary, such as agriculture, industry, aquaculture, fishing, recreation use of the estuary, and transports, as well as hydro-morphological changes in the river and estuary. The estimation of the pressures of each activity was done for the four estuarine water bodies defined under the WFD. The low to moderate scores obtained for the pressures on estuarine water bodies were compared to the physico-chemical status assessed through data on water and sediment quality. |

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| **Track 2 - Stakeholder participation towards policy implementation** |
| Andrzej Cieslak,  | Maritime Office in Gdynia and Maritime Institute in Gdansk | **Implementation of ICM, legal system, Poland**In real life management means that decisions are made and implemented by taking resulting/required action. Integrated Coastal Management means that this concerns the coastal zone, and that the decision making and implementation should be holistic (vertical, horizontal, temporal integration) and ensure public participation. Since the decisions are mostly taken by public authorities, and their implementation, but also the process of decision making, largely depends on public money, ICM should be based on law. Legal solutions, supporting ICM, are gradually introduced into the Polish legal system since 1991 and seem to be quite effective. There is no single Coastal Act to regulate management in the coastal zone, but coastal matters are taken into account in various Acts of Parliament and lower order regulations. The presentation provides a short introduction to the Polish way of thinking about ICM and an overview of most important for ICM legal solutions. |
| Manfred Vollmer | Wadden Sea Forum Secretariat | **Experiences from the Wadden Sea Forum**The Wadden Sea Forum (WSF) is an independent platform of stakeholders from Denmark, Germany and The Netherlands contributing to an advanced and sustainable development of the trilateral coastal Region, including the estuaries. In particular, this means integrating specific cross-sectoral and transboundary strategies, actions and techniques which are environmentally sound, economically viable and socially acceptable. The WSF consists of representatives of the sectors Agriculture, Energy, Fisheries, Industry and Harbour, Nature Protection, Tourism, as well as local and regional governments. National governments are represented as observers. The focus of work is on the recently developed ICZM strategy, climate mitigation and adaptation measures, shipping safety in the North Sea and partnership in risk management. The work of the Forum is very much related to the ARCH approach, based on multi stakeholder partnership in managing lagoons and estuaries. The cooperation between WSF and ARCH, particular with the case study Elbe estuary, has fostered knowledge exchange, produced synergies and stimulated networking in the field of coastal management. The challenges of climate change adaptation require a sound framework in management and governance. A collaboration of networks and cases is necessary to learn from each other and to get inspired by experiences across Europe. |
| Amy M.P. Oen1, Geiske Bouma2, Jiya Benni2, Maria Botelho3, Patrícia Pereira3, Magda Matczak4, Adriaan Slob2 | 1NGI2TNO3IPMA4Instytut Morski W Gdansku | **Stakeholder involvement for management of the coastal zone**Management strategies for lagoons and estuarine coastal areas should be based upon two solid pillars: science and policy. However, the challenge for implementing existing science and policy is the lack of integration and interpretation between the two. Science is multi-disciplinary and covers a broad range of natural and human systems related to lagoon and estuary vulnerabilities. Policy guides actions towards decision making to achieve desired outcomes. As such, both science and policy are anchored in existing legislative frameworks and work towards achieving an integrated approach must occur in this context. In addition to integration, another critical factor for implementing successful management strategies is stakeholder participation. Promoting participatory methods makes existing knowledge available, increases community understanding about the functioning of the system and improves transparency in decision-making.The European Union Commission has taken the lead to promote Integrated Coastal Zone Management (ICZM) to balance the management of coastal systems. Management strategies are implemented by the Marine Strategy Framework Directive (MSFD), the Water Framework Directive (WFB) as well as the Habitat Directive. Although there does not exist a specific EU Directive for ICZM, the EU's ICZM Recommendation functions as an intermediate link between terrestrial and coastal management as well as between freshwater and marine systems as specified in the WFD and the MSDF. Most EU directives have a strong focus on public participation; however, a recent review found that the actual involvement of stakeholders was variable. The ARCH research project has developed and implemented participative methodologies at ten different case study sites throughout Europe. Not only do these cases represent a broad range of coastal systems with various anthropogenic pressures and vulnerabilities, they also highlight different legislative frameworks that are relevant for ICZM. Therefore, the ARCH project aimed to link the ARCH-methodology to the relevant and ongoing policy processes at each case study site.To better assess the degree of stakeholder participation that occurred in the implementation of the ARCH-methodology at each case study site, it is useful to review the extent of public participation that is included in the most relevant coastal zone legislation. Three case study sites will then be further explored to assess the actual implementation of stakeholder participation both prior to and after the connection to the ARCH research project was established. These case study sites and their respective legislative frameworks include: i) Obidos Lagoon, Portugal in the context of the MSFD, ii) Byfjorden in Bergen, Norway in the context of the WFD, and iii) Vistula Lagoon, Poland in the context of EU's ICZM Recommendation and the Habitat Directive. These reflections will result in an increased understanding of how the level of detail of stakeholder involvement included in framework directives can function as a catalyst for interaction and subsequently integration which is essential for implementing successful management strategies in the coastal environment. |
| Geiske Bouma, Adriaan Slob, Alexander Woestenburg | TNO | **What are success factors for stakeholder participation in coastal zone management: Overview evaluation ARCH Case Studies**Within the ARCH project 10 case study sites are studied. The task of ARCH is the elaboration of ‘integrated lagoon management plans’ for selected case studies. This is built up in a sequence of three local workshops (in each case study) in a collaborative process with local actors:Workshop 1: “State-of-the-lagoon” report;Workshop 2: Future challenges to the lagoon considering climate change;Workshop 3: Roadmaps for local lagoon management.Based on the collaborative process with local actors an evaluation framework has been running parallel to the case studies. Based on the evaluation we will present the success factors for stakeholder participation in coastal zone management. An overview will be given of the evaluation framework, the collaborative process, methods used and results that were produced. Elements that will be discussed based on the outcome are for instance similarities and differences between case studies, appreciation of the stakeholders to the collaborative process, knowledge development and knowledge sharing |

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| **Track 3 - Ecosystem services in lagoon management** |
| Gianni Lobosco | University of Ferrara, Italy | **Leaving the Delta: a Selective Desertion Strategy for the Po River Lagoon system in Italy.**The increasing hydro-morphological and environmental degradation of lagoon systems is an issue shared by 4many Mediterranean contexts. A “Selective Desertion Strategy” could be a radical solution for these sites, in order to better manage the investments and maximize the efforts on some specific settings, deliberately omitting others.This approach comes from a research programme developed by Sealine (Architecture Department - Ferrara University) on the delta of the Po River, which covers 18.000 hectares: 8.150 occupied by lagoons, 8.600 by fishing diked valleys, over 1.250 by wetlands. Such lagoon system is highly unstable, vulnerable to intense dynamics (coastal erosion, subsidence, saltwater intrusion, etc.) affecting both its ecological value and the human activities taking place around it (agriculture, fishing, aquaculture, tourism). The infrastructural effort to “freeze” its evolution is no longer maintainable and increasingly less efficient, given the site dimension and complexity. Besides these remarks, such proposal is encouraged by specific boundary conditions like the low productivity of farming areas and the land ownership arrangements based on few big proprieties. Therefore, it is possible to envisage a progressive site reorganization according to its historical character of evolving landscape shaped, over the centuries, by the alternation of natural phenomena and human interventions. |
| Jacek Zaucha | MIG | **Can the ecosystem services concept help arrive at a more adequate development paradigm for land-sea social-ecological systems?**The paper is examines the ability of the concept of ecosystem services to frame the development debate in the lagoon, fiord, and estuary regions in the EU. The research hypothesis assumes that the concept can provide a useful intellectual link for identifying interrelations between social and natural capital in the land-sea interface zone. This paper is the result of the synthesis of knowledge and experience of researchers from a range of social and natural sciences. It is based on the critical analysis of models and concepts published in the literature, and on the use of participatory observation. The hypothesis was verified using case studies from ten European estuaries, fiords, and lagoons investigated within Arch, a 7FP project, that systematically tested the use of the ecosystem services concept for facilitating and managing development in the land-sea interface zone. Arch examined in the years 2012-2014 the following land-sea interface regions: Vistula Lagoon, Baltic Sea; Göta älv, Kattegat; Byfjorden, Norwegian Sea; Elbe estuary, North Sea; Rhine estuary, North Sea; Broads, North Sea; Òbidos lagoon, Atlantic Ocean; Lesina Lagoon, Mediterranean Sea; Amvrakikos Lagoon, Mediterranean Sea; Razelm-Sinoe Estuary, Black Sea. In all of them ecosystem services played crucial role in identifying the socio-ecological and economic consequences of various management and governance patterns. |
| M.G. Palmieri, R.K. Turner, and T. Luisetti | UAE | **Economics of Ecosystem Services and Adaptive Management: A Broads Wetland Case Study.**Adaptation to climate change is about deliberate action to adjust to risk and to recognise opportunities. An adaptive management (AM) approach recognises the uncertainties that shroud issues such as climate change but does not allow this to stultify action based on the best available evidence. The AM approach, together with its practical decision support system (DSS), represents a flexible ‘learning by doing’ course of action. AM also provides a role for individuals and social groups in what are often highly contested environmental change contexts. In this paper we apply a DSS focused on the concept of ecosystem services provided by a coastal wetland complex (the Broads) in the East of England and the threats and opportunities posed to the area by climate change impacts. The analysis explores the process by which an adaptive management plan has been co-produced by a combination of centralised and stakeholder social network arrangements. It values where feasible the ecosystem services under threat and prioritises response actions. Among the issues highlighted are the multiple dimensions of nature’s value; the difficulty of quantifying some ecosystem service changes; and the problem of ‘stakeholder fatigue’ in contexts with a long history of consultation processes |
| Jos Brils | Deltares | **Sediment ecosystem services in the soil-stream-sea nexus**‘Nexus thinking’ gains rapid attention as the way towards truly integrated natural resources management. Many believe that it can break down the silo implementation of European soil (STS, CAP and biodiversity policies), stream (WFD, FD and biodiversity policies) and marine (MSFD and biodiversity policies) policies. These policies ‘meet’ in lagoons, estuaries and coastal zones. It is above all sediment that provides here the physical nexus. However, so far attention for sediment is marginal in the ‘nexus thinking’. This might be altered by raising more awareness for the key role that sediment plays. Mapping and assessment of sediment related ecosystem services may actually be the means to raise that awareness. For nearly 15 years now the European sediment network SedNet ([www.sednet.org](https://owa.ncl.ac.uk/owa/redir.aspx?C=4zcrYivnikCkaZSA7NN3G4yRteiQV9IIm5rtGcrcn8hzQvA-7wAqgVd64LuZJZB0I8rVr5qDhVQ.&URL=http%3a%2f%2fwww.sednet.org)) raises attention for sediment in relation to European environmental policy development and implementation. SedNet now also tries to initiate the mapping and assessment of sediment related ecosystem services. |
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| **Track 4 - Case studies to illustrate balancing multiple pressures in lagoon and estuary management** |
| Ivonne Stresius &Susanne Heise | Hamburg University of Applied Sciences (HAW Hamburg) | **Creating an overall concept for an Integrated Management – Future Visions for the Elbe Estuary**The Elbe Estuary is characterized by a manifold and in parts contradictory utilization and by high pressures to use resources. Shipping and the harbor, agricultural land use, industry, recreation and tourism, flora-fauna-habitats and bird sanctuaries are the most important kinds of use. Complex societal interactions, conflicts of interests, deeply rooted in existing structures and institutions and highly uncertain physical and ecological processes demand an integrated management strategy, which needs to be pluralistic involving multiple stakeholders. A joint understanding of future challenges and a long-term vision are of vital importance for the development of such a strategy. In this paper we will describe the development of a common future vision for life in the Elbe Estuary in 2050. This perspective has been developed during a stakeholder workshop within the project ARCH following a method from the Austrian conflict researcher Friedrich Glasl. The task was to create a future vision independent from what is possible, necessary or allowed, with the focus only on what is desired. With this approach we were able to create a powerful, clearly articulated, common view of the future with a strong motivational value. But what do we do with it now? Where does this vision take us? What possibilities do we have to realize such a perspective in future and should we do that at all? Those aspects will be raised in this paper and hopefully the discussion will be continued with the conference’s participants. |
| Ballarini E.1, D´Adamo R.2, Pazienza G.2, Zaggia L.3, Vafeidis A1 | 1 Christian Albrechts University of Kiel,2 National Research Council, Institute of Marine Science, UOS of Lesina 3 National Research Council, Institute of Marine Science, Venezia | **Coastal management of Lesina lagoon: a case study of the ARCH project**The lagoon of Lesina is a microtidal shallow lagoon situated on the Italian southern Adriatic coast. The surrounding area is mostly rural and the main issues affecting it are the loss of human capital and the load of sediments and nutrients discharged from land reclamation canals. Climate change and socio.-economic development are expected to exacerbate these problems and possibly lead to further issues. The aim of ARCH has been to develop future management plans for European lagoons through participatory processes. In the case study of Lesina lagoon this was achieved through a series of workshops, where the methodology of each workshop was adapted according to the purpose of the meeting and participants´ suggestions. Contacts with stakeholders were maintained both through a local contact point and social networks. The major outcomes of this process are a) development of a “state-of-lagoon” report and of a geographic database made available through a WebGis; b) enabling stakeholders to better understand the cause- effects of the main issues in a structured manner; c) develop visions about the future, through the development of scenarios and discussions on how to address existing problems and exploit the potential of the region; d) synthesising the above into a roadmap for the future of the lagoon. |
| Maria João Botelho1, Carlos Vale1,2 and João Gomes Ferreira3 | 1CIIMAR2IPMA3 CMA | **Connectivity of bivalve toxicity episodes between estuarine systems and adjacent coastal areas with toxic algal blooms**Paralytic shellfish toxins (PSTs) produced by marine dinoflagellates occur recurrently worldwide associated with cyst germination or relaxation of coastal upwelling systems. During blooms PSTs are accumulated by bivalves, which may result in the closure of bivalve harvesting having impact on local economies. A interesting question is to what extent coastal lagoons and estuaries import toxic cells from adjacent coastal areas being vulnerable to PST contamination.Connectivity of bivalve toxicity episodes among four estuarine systems (Aveiro, Mondego, Óbidos, and Formosa) and between them and adjacent coastal areas (Aguda and Culatra) was examined in the Portuguese coast. The interdiction periods from 1994 to 2012 were examined. Toxicity episodes by PSTs points to an irregular multi-annual variation, associated with the inter-annual variability of Gymnodinium catenatum blooms. High connectivity was obtained among Aveiro, Mondego and Óbidos, suggesting the import of G. catenatum cells from blooms of the adjacent coastal area common to these systems. Connectivity was also registered between an estuarine system (Formosa) and the corresponding adjacent coastal area (Culatra). Mussels, cockles and clams were used in this exercise. |
| Adriana-Maria Constantinesc, Albert ScrieciuAdrian Stanica | GeoEcoMar | **Reed beds as green coastal protection structures – Testing site in the Razelm-Sinoe lagoon**Estuaries and lagoon systems are under increased pressure worldwide due to human interventions but also from climate change impacts, such as sea level rise and accelerated erosion. These complex ecosystems provide resources and services which have a significant role as natural coastal protection structures. The protection role of lagoon ecosystems is considered to be increasingly important, as traditional solutions as dykes and levees in these areas are very expensive and hard to maintain. Danube Delta is the biggest coastal wetland in the European Union and the largest reed (*Phragmites asutralis*) area in the world. Reed beds are developed from inside the delta plain to the backward part of the lowlying sandy coast. Recent results (Moller et al., 2011) from the Baltic Sea show the capacity of reed beds to attenuate wind waves. This role of reed beds as green coastal protection is currently being tested in the Razelm-Sinoe Lagoon System, southern part of the delta, as activity in the FP7 FAST project (Foreshore Assessment using Space Technology). A network of 5 wave sensors was installed on the western shores of the lagoon, where extensive reed beds are developed, on a transect of 50 m, from the foreshore (20 m from the reed edge) to 30 m inside the vegetated lake margin. Data recorded by the wave sensors is continuously delivered in real time via GPRS, and existing time series give already a set covering 9 months. These data are from the stormiest period and are thus vital for the better understanding of the protection services provided by the reeds. Preliminary results show a massive decrease in wave energy and height from the reed margin (sensor 2) to the inside of the reed beds (sensor 5). This proves the effectiveness of reed beds as natural methods with critical role in wave dissipation |
| Yvonne Andersson-Sköld1,2 and Marie Haeger-Eugensson1,2 | 1COWI AB2Department of Earth Sciences, University of Gothenburg | **Norde älv estuary - Challenges and potentials identified in ARCH and EMOVE**The Nordre Älv estuary has been a pilot area of the projects ARCH (FP7) and EMOVE (Estuaries on the move, NS Interreg). It is a non-dredged estuary neither impacted by urban settings, shipping or industry (apart from pollutants transported from upstream the river) linked to the Göta älv estuary (with great anthropogenic impacts from shipping, industrial activities and urban settings in central Gothenburg). The aim of both the projects has been to assess drivers, pressures, impacts and potential solutions to achieve sustainable estuaries. An important part has been to involve, and contribute to increased cooperation between, stakeholders. Accordingly stakeholders were involved through interviews and workshops in all parts of the projects (in general represented by the same organisations, e.g. administration, planners, nature conservation, water management, in both projects).  The main issues identified were increased exploitation and climate change (increased water flows and sea level). Integrated assessment illustrates that solutions to reduce risks in central Gothenburg may cause unwanted impacts in Nordre älv. Increased cooperation is crucial to find sustainable (environmental, social and economic feasible) solutions. However, barriers for such cooperation was identified as well as potential activities to overcome the barriers |
| Carlos Vale1,2, Maria João Botelho2, Elisabetta Ballarini3, Bruno Henriques2, Patricia Pereira2, Marie Haeger-Eugensson4 Nassos Vafeidis 3, Magda Matczak5 | 1 *CIIMAR*2IPMA*3* Christian-Albrechts-Universitaet4 IVL*5The Maritime Institute in Gdansk* | **Physical and Ecological Vulnerability of Coastal Lagoons: a comparative study of Lesina, Obidos and Vistula**Coastal lagoons are highly productive ecosystems and thus have historically been managed to provide resources to human communities living in the adjacent region. One of the major concerns is controlling the extent of water exchange with the sea in order to result salinities and good water quality that favour food species and food production. In more recent times, lagoon landscape has attracted tourism, nautical sports and leisure. Lagoons are evolving ecosystems particularly vulnerable to human pressures and climate changes. Increase of nutrient loads and the progressive use nutrient-rich fertilizers may result in eutrophication with dramatic changes on the lagoon ecology. Alterations on storms and sea level may destroy the sand barriers. Under extreme impacts, coastal lagoons may change in relatively short time to a bay, or close the connection to the sea resulting in a land-lock lagoon and eventually lack of existence. This communication examines the challenges of three evolving coastal lagoons located at different latitudes in Europe: Lesina (Italy), Óbidos (Portugal) and Vistula (Poland, Russia). We analyzed excess, depletion and composition of nutrients in order to assess present ecological conditions and possible changes under climate changes. Although the three lagoons are characterized by diverse dimensions, human pressures and uses, this nutrient based methodology allowed to suggest adaptive management action. |
| Conides, A.1, Klaoudatos, D.1, Zacharaki, P.2 | 1Hellenic Centre for Marine Research, Institute for Marine Biological Resources and Inland Waters, 2Institute of Geological and Mineral ExploratioN | **Life cycle analysis and carbon footprinting of lagoon fisheries production in rural Greece.**Standard Life Cycle analysis (LCA) and Life Cycle Impact Analysis (LCIA) was applied in the case of North Amvrakikos lagoon fishery in order to study and quantify the process of producing a unit of fish (from 'cradle' to 'grave') and the associated carbon footprint of the process. In order to quantify the LCA pathway and the LCIA impacts in terms of CO2 emissions per process stage, standard indicators were used as provided by international organisations such as the European Environmental Agency (EEA), the US Environmental Agency (USEPA) and EuroStat as well as local such as the Hellenic Statistical Survey Agency. |
| Joanna Przedrzymirska1, Małgorzata Bielecka2 | 1Maritime Institute in Gdańsk2Institute of Hydro-engineering of the Polish Academy of Sciences | **Case Study – Vistula****Role and engagement of local communities in lagoon’s participatory management process - the Vistula Lagoon case**Based on experience gained through collaboration of two FP7 projects (LAGOONS and Arch) a methodology used for stakeholders’ involvement in management of lagoons under climate and anthropogenic pressures is discussed. An approach applied to the Vistula Lagoon stakeholders’ consultations process (collecting opinions from different groups of interests like public administration, researchers and experts as well as local citizens) was extremely well assessed by all participants. The role of local communities and their actual engagement in the management processes is analysed and evaluated. Creating positive and trustful relations is a prerequisite for successful consultations with local communities. An importance of role played by local communities in the management process is still underestimated by both managers and the communities themselves. However, building trustful relations requires time and efforts from both sides and cannot rely on ‘project to project basis. Local communities that once got involved in the participatory management process expect continuity and implementation of their ideas through rational and fair-minded debate. There is an urgent need for a permanent consultation process built in a daily routine of managing organisations constituting, in a sense, their statutory task not resulting from different legislation, laws, obligations, etc. but from the will to build a participatory society. |

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| **Track 5 – Influencing the policy debate** |
| Fred Heuer |  | **Lagoon management: the policy maker’s perspective#**The paper is written from the perspective of the policy maker, using the concept of the so called policy life cycle. It argues that the approach of sustainable lagoon management depends on the stage of the policy life cycle. Four stages are distinguished: recognition of the problem, policy formulation, implementation and control. The measures to manage lagoons differ by stage, both in terms of external instruments as well as in term of internal organizational provisions. Looking at the ARCH cases, it can be stated that most cases are still in the first two stages of the policy life cycle.Combining the lessons of the ARCH case studies with the author’s experience with other complex policy issues regarding challenges to balance economic, safety and environmental interests, four broader applicable recommendations are developed and presented.Finally, a number of maybe controversial conclusions are drawn by comparing the broader policy and organizational recommendations with the experiences during the case studies |
| Nataşa VĂIDIANUa | School of Environmental Sciences, University of Liverpool, Faculty of Geography, University of Bucharest,  | **Legal and Institutional Framework for Integrated Governance in a Biosphere Reserve**Wetlands provide a wide range of benefits to human communities. Better cooperation between governing bodies and human communities is essential for the optimal functioning of these wetlands and for their ongoing management. This paper aims to provide a clear understanding of the multi-level governance process by describing the management structure in the context of sustainable development, considering the main challenges arising from the co-existence of the human communities in Danube Delta Biosphere Reserve (DDBR) and the administration body, namely Danube Delta Biosphere Reserve Authority (DDBRA). We also underline the institutional and legal changes induced by the shift of government schemes over the last century. In particular, the paper outlines the link between the perceptions of different stakeholders regarding the value of this area and the investments made by the Romanian government for the development and implementation of management plans. Decision-making authority concerning DDBR management still resides with the central government. This top-down approach causes conflicts and the flexibility required to respond to local problems is lacking. At the local community level, better legal and institutional support is needed for community-based management, especially of fisheries and tourism. At the highest level, there is a need for a permanent inter-institutional coordination arrangement to deal with the harmonization of laws and operational practices and to clarify the conflicting roles of the various government agencies concerned with DDBR management. |
| Ingela Isaksson,  | Regional Coordinator MSP Skagerrak & Kattegatt, | **Linking different directives together – cross-border col-laboration on different scales**The EU-funded project (2010-2013) Sea meets Land vision “It shall always be good to live where Sea meets Land – there are no borders under the water surface”, constituted the framework for collaboration between three countries; Sweden, Norway and Denmark. Many interests are competing for the sea as a resource. Hence the need for a common approach in the long term, when working with maritime spatial planning and coastal sustainable management. As governmental regional authority the County Administrative Board (CAB) work to facilitate the connection between the national level as marine spatial planning forms and the local level, municipal planning.The marine industry along the west coast of Sweden is extensive with great potential for development, but this requires best as possible available knowledge based planning for sensible location. In this way, we avoid the ocean ecosystem and our prosperity for now and future generations at risk. Blue growth constitutes both possibili-ties and challenges. To describe the different stakeholder expectations with impact assessments based on good knowledge of the sea is an important part of the work, where collaboration is the key to achieve sustainable use of the unique values of the seas and coastal areas of Kattegatt and Skagerrak. |
| Sabine E. Apitz | SEA Environmental Decisions Ltd | **Ecosystem Response Assessment (EcoResA): A case study in Venice Lagoon**Ecological risk assessment (ERA) has traditionally been applied to sediment management to evaluate whether specific actions (such as permitting of chemicals or disposal of dredged material) have the potential to pose risk to ecological or human endpoints, or whether in situ contaminated sediments pose risks requiring management actions. With advances in our understanding of ecosystem services, recognition of the interconnectedness between ecology, environment, and human uses has prompted new considerations for evaluating and protecting ecosystems.1,2 Although ERA is a powerful tool for sectoral, single-issue regulation and management, an EsS-based assessment considering a range of desirable and undesirable responses by different ecosystem endpoints may be better described as an Ecosystem Response Assessment (EcoResA).3Using such an approach, potential short-term risks of a management action can be balanced against lagoon resilience and longer-term enhancements of critical ecosystem services. This paper will present an EsS-focused case study which evaluates how beneficial use or habitat restoration considerations might be balanced against contaminant risks when disposing of slightly to moderately contaminated sediments. This case study adapts Weight of Evidence approaches to integrate results of a multi-investigator study on the ecosystem effects of habitat restoration using dredged material in Venice Lagoon. |
| Simin Davoudi andPaul Cowie | Newcastle University | **Bridging the scientific – Policy divide** This paper seeks to examine how the process of engaging local communities in the process of governance is crucial in bringing together scientific, policy and community knowledge to tackle place based issues. The papers draws on two research projects undertaken by the authors: The first took the form of a case study of a neighbourhood plan undertaken by a community at the mouth of the river Tyne. A range of stakeholders organised themselves to undertake a formal planning process. The case study revealed provided an insight into how communities access scientific and technical evidence when seeking to develop a plan for the future. He case study also highlighted how important the process is to ensuring success.The second research project uses theatre as an engagement tool to develop governance capacity in communities seeking to have a greater input into their future. The initial findings from the play highlight the importance of framing the problem clearly at the outset of the process and being open and transparent regarding the evidence to be provided and the degree of control exercised by various stakeholders involved in the process. Together these examples shed further light on the problem of knowledge and legitimacy when developing a management or strategic plan for an area.  |
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| **Orphan Abstracts** |
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