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Shore Temple, Mamallapuram, India

Foto: Ellen-Barbe Goldberg

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Scientific Highlights

Mechanisms of sediment retention in estuaries‡

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‡Excerpt of the present article have been extracted from Perillo and Syvitski (2010) with permission by Elsevier

Estuaries are the primary receiver and retainer ofsediment delivered to the coast by rivers. Their geomorphologic and dynamic characteristics as well as their prevailing biological conditions are essential to define the capability of each estuary to retain sediments within the system. Whether the accommodation space available and the amount of sediment received are enough to permit the evolution of the estuary in phase with long-term sea level trends or anthropogenic modifications requires an in-depth analysis of the unique conditions present.

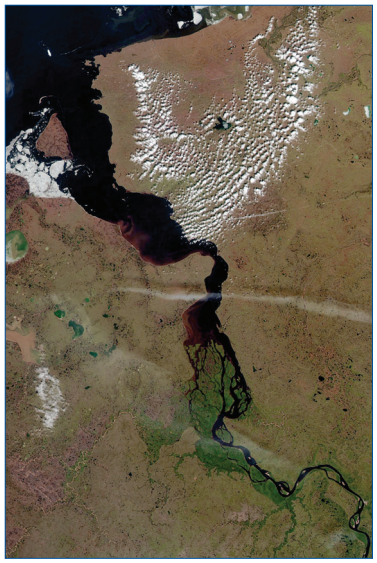

Photo: Yenisey

Estuary in Russia as a MODIS-Aqua image taken July 19 2004, provided by James Syvitski.

Many estuaries are out of equilibrium given 20th century boundary conditions. The sediment load delivered to est uaries has often changed through land use (Syvitski and Milliman, 2007) and from restrictions to offshore sediment sources. Estuaries and wetlands often respond quickly to reductions in sedimentary flux, decreasing their potential to withstand the expected eustatic sea level rise (Nicholls, 2004). Subtidal regions similarly respond to changes in the estuarine sediment budget; a point seldom considered when coastal wetlands are investigated.

Estuaries, including their wetlands, are controlled by hydrodynamic, atmospheric and biogeochemical factors that act upon the original geomorphology by transporting sediment from one place to another (Perillo et al., 2007; Reed et al., 2009, Fig. 1). Over time, cumulative changes grow from the microscale (seldom perceived) to the macroscale (normally perceived by humanity), sometimes passing across some irrecoverable threshold (van de Koppel et al., 2009), inducing a major change in

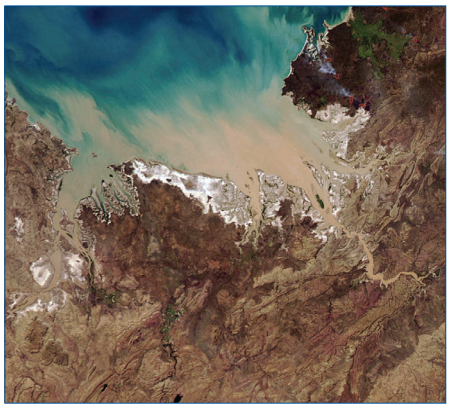

Photo: Australia

MODIS-Aqua image taken June 17 2004, provided by James Syvitski.

The image is the southern portion of the Joseph Bonaparte Gulf showing the Cambridge Gulf to the left and the Queen's Channel to the right.

''state'' of the environment. When this situation becomes noticeable, measures to recuperate the system are very difficult or impossible to implement.

Global climatic changes will affect most coastal environments as they are buffers between the continent and sea. How fast estuaries will respond to changes in 21st century boundary conditions remains a matter of debate. Estuaries exist from the interplay between continental delivery and marine dissipation forces. Ocean energy may carry offshore or littoral sediment into an estuary, as well as disperse material from within the estuary into the coastal ocean. If sediment delivery

Photo: Argentina

Rio de la Plata" estuary in Argentina, a MODIS-Aqua image taken April 3 2002, provided by James Syvitski.

Photo: St. Lawrence
Estuary in Canada a MODIS-Aqua image taken July 21 2002, provided by James Syvitski.

overwhelms dispersal energy, the estuary will accumulate sediment and eventually convert to a delta. Sediment deposits are therefore viewed as a proxy to the health and long-term viability of an estuary.

Pollutants tend to attach to sediment particles and thus follow their fate. Thus to track or predict the behavior of pollutants, one also needs to be able to monitor and model the various sediment retention mechanisms within an estuary.

Estuaries are presently adjusting to changes in mean sea level and to modifications in the water and sediment discharge by rivers and groundwater. The Intergovernmental Panel on Climate Change (IPCC) projects that mean sea level will rise 21–71 cm by 2070, with a best estimate of 44 cm averaged globally (Bindoff et al., 2007) in response to ocean volume expansion. Importantly, many coastal wetlands are subsiding much faster than

Photo: North Sea
MODIS-Aqua image taken March 25 2007, provided by James Syvitski.
The estuaries to the left are the Thames and Essex, UK, and the ones to the right are the Schelde estuaries of The Netherlands.

mean sea level is rising under the influence of human activities (Syvitski et al., 2009), resulting in the inland migration and deepening of the basin which may provide greater accommodation space for sediment trapping.

This is exacerbated by the marked decrease in sediment delivery to the coast due to the construction of dams (Syvistki et al., 2005) and river diversion.

As final output of Working Group 122 under the auspices of the Scientific Committee on Ocean Research (SCOR), the Land-Ocean Interactions in the Coastal Zone (LOICZ), and the International Association for the Physical Sciences of the Oceans (IAPSO), a Special Issue dedicated to the Mechanisms of Sediment Retention in Estuaries has been published by the Estuarine, Coastal and Shelf Science journal (vol. 87, number 2, 2010, Fig. 2). Most of the papers in the issue review the varied sediment trapping mechanism due to the action of currents and waves over tidal flats and marshes, and their interaction with the associated estuary as well. Biological-physical interaction

processes play a major role affecting water circulation. However, biology can be either a mechanism to trap and preserve sediment in the estuaries but on the other hand bioturbation put sediment in a position to be readily available for transport. Tidal wetlands are considered one of the primary systems that retain sediments in estuaries; their survival depends entirely on their efficiency in storing the material being supplied but also to develop systems that prevent erosion.

As Co-Chairs of the SCOR-LOICZ working group, we offer this compilation as examples of the diversity of scenarios and to the challenge in our understanding of these endangered coastal environments. The short-term evolution of estuaries deserves our immediate attention. On behalf of all the members of the WG, we thank SCOR, LOICZ and IAPSO for their guidance and support.

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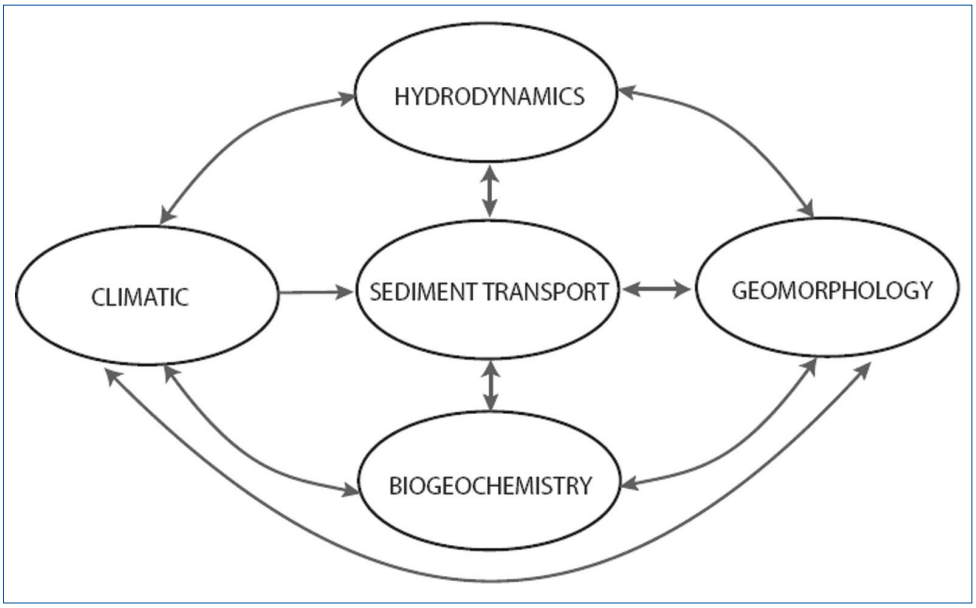

Figure 1: Integrated relations among the different major processes that act upon an estuary (modified from Perillo et al., 2007 and Reed et al., 2009).

Figure 2: Cover of the special issue of Estuarine, Coastal and Shelf Science

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The Wadden Academy: Connecting Science and Policy in the Wadden Sea Region

The Wadden Sea Region encompasses a coastal strip from the Netherlands through Denmark of about 400 km (Fig. 1). It consists of an extensive system of barrier islands, sea, tidal flats and salt marshes, where almost undisturbed natural processes continue to shape the landscape and habitat. The Wadden Sea accounts for

Figure 1: Satellite photo of the Wadden Sea Region (CWSS).

sixty percent of all the tidal areas in Europe and North Africa and provides a habitat for a very rich and varied flora and fauna. In June 2009, the Dutch and German parts of the Wadden Sea have been added to the UNESCO World Heritage list because of the unique natural values. The region also contains age-old man-made landscapes reflecting a unique adaptation by human beings to the dynamics of a very special coastal area.

It has become generally realised that the Wadden Sea Region requires special care following the guiding principle that the natural values of the region are preserved while allowing sustainable shared human use. As part of this approach there is a need to integrate and further reinforce our knowledge of the natural, socio-economic and cultural development of the Wadden Sea and the Wadden Sea Region in a way which is substantively stimulating for science and relevant to policy. In 2008 the Wadden Academy was founded in order to facilitate this process.

The Wadden Academy is a compact organisation with a solid scientific basis that is an entity of the Royal Netherlands Academy of Arts and Sciences (KNAW). It has three major tasks:

- identifying gaps in cross-domain knowledge in order to assist in the sustainable development of the Wadden Sea Region and formulating research questions relevant to the region;
- promoting a coherent research programme at regional, national and international level; and
- promoting information supply and knowledge exchange within and between research institutes, government, industry and social organisations

In 2009 the Wadden Academy published the integrated research agenda, entitled: 'Knowledge for a sustainable future of the Wadden' (Kabat et al., 2009). This agenda has been drawn up in close corporation with numerous researchers and representatives of social and governmental bodies. It identifies knowledge gaps for five different themes: Geoscience; Ecology; Society and cultural history; Social and spatial economics; and Climate and water. Based on these knowledge gaps, a few large, integrated research and knowledge programmes were formulated. The research agenda has been adopted by the Dutch government (Fig. 2) and will be used by policymakers, administrators and scientists as an integrated and thematic framework and as a benchmark on the basis of which they can make

Figure 2: On 30 May 2009, the integrated research agenda was presented by Pavel Kabat (Chair Wadden Academy) to three members of the Dutch government: Minister Gerda Verburg (Ministry of Agriculture, Nature and Food Quality), Minister Jacqueline Cramer (Ministry of Housing, Spatial Planning and the Environment) and State Secretary Tineke Huizinga (Ministry of Transport, Public Works and Water Management) at the 'Waddentoogdag' in Delfzijl, the Netherlands.

choices in the area of Wadden Sea research in the years to come. The Wadden Academy will ensure that the research agenda will be updated regularly to reflect the progress of science and the developments in the Wadden Sea Region. In order to illustrate the type of questions that will be addressed three examples of knowledge gaps from the theme "Climate and water" are described below.

A source of greenhouse gases

The Wadden Sea has been reported to be an actor in climate change. More detailed studies into regional greenhouse gas emissions resulting from the decomposition of organic matter are required. A simple extrapolation of methane emissions measured recently in the German Wadden Sea Region to the Dutch Wadden Sea Region suggests that these could be in the same order of magnitude as the total Dutch anthropogenic methane emissions (Grunwald et al., 2009).

The impact of sea-level rise

As a consequence of future sea-level rise (Fig. 3) the Wadden Sea might not continue to exist in its present intertidal form. It is essential to establish the geomorphologic threshold value in sea-level rise above which this intertidal mudflat area could become swamped. Therefore a thorough exploration of high-end values in region-specific scenarios for sea-level rise is needed with a focus on the possible impacts on morphology, water management and ecology of the Wadden Sea.

Governance of climate change adaptation

Climate change requires multiple actions on multiple levels, while the scientific and societal uncertainties are as yet large. The societal response to climate change has to be recognized as a transition process. The Dutch Wadden Sea area has a complicated political setting and gamma-type of research will be done on how to effectuate this transition process in the area.

Please read more in the upcoming volume of LOICZ Inprint on the integrated coastal zone approach initiated in the research agenda of the Wadden Academy and its global implications.

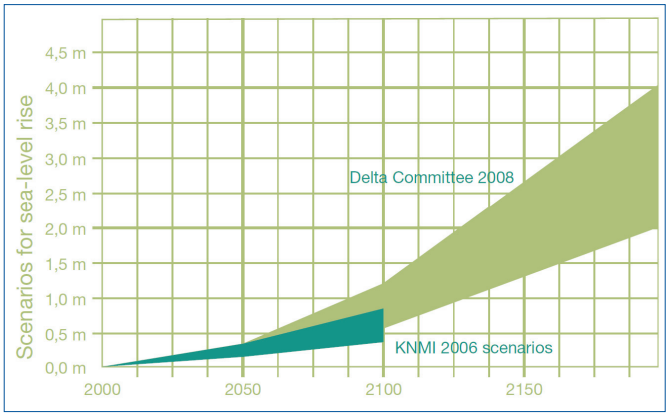

Figure 3: The projected sea-level rise for the Dutch coast relative to reference year 1990. The effects of land subsidence are not taken into account in the graph (Veerman et. al., 2008).

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For more information and PDFs of publications of the Wadden Academy, please visit the website **www.waddenacademie.knaw.nl** or contact Tim van Oijen **tim.van.oijen@waddenacademie.knaw.nl, tel. 0031 (0)582339033).**

LOICZ-Affiliated Activities

KnowSeas - Knowledge-based Sustainable Management for Europe's Seas

By T. O'Higgins

Europe's regional seas have suffered severe environmental degradation. This damage not only affects the marine organisms living in the seas but also has impacts on the welfare of the human communities which are reliant on them. The Ecosystem Approach to management, now being adopted by the EU, offers a means of sustainably managing our seas to optimize both ecological and social well being.

The one major obstacle is that nobody is quite sure how the Ecosystem Approach can be put into practice, and this is where the KnowSeas (Knowledge-based Sustainable Management for Europe's Seas) project comes in. The four-year project (website: **www.knowseas.com**) which began in April 2009, is funded by the European Community's Seventh Framework Programme (FP7) and is affiliated to LOICZ.

It brings together 30 partner institutions in 15 countries[1] and is coordinated by the Scottish Association for Marine Science (SAMS). A successful project launch event was held at SAMS in Oban in May 2009 and the project's first annual Scientific Workshop will take place in Palma de Mallorca in April 2010.

Background

Over the course of European history human activities have had profound effects on Europe's seas. Unsustainable and damaging practices such as overfishing, over-use of fertiliser, inadequate wastewater treatment, habitat destruction and the introduction of invasive species have all taken their toll on the health of our marine ecosystems. In turn the damaged marine ecosystems affect human welfare. For example, overfishing leads to depletion of fish stocks with resulting losses in human welfare and eutrophication leads to reduced water quality, which damages marine organisms through hypoxia and reduces the value of ecosystems as recreational resources.

Today, new uses for the marine environment are emerging. The scramble for increased renewable energy capacity is resulting in the construction of wind farms in marine spaces, with unknown ecological consequences. At the same time new ecological discoveries such as our developing understanding of the extent and importance of structures such as deep sea coral reefs are emerging. These developments all occur within seas already subjected to the changes being brought about by the effects of climate change. The resulting novel policy dilemmas require robust and well informed decision making which must include both ecological and social considerations.

Since human activities have profound effects on our oceans, and the seas affect human welfare, effective management of these coupled systems needs to include both ecological and social components. The Ecosystem Approach, now an element of policy in the EU Marine Blue Book and mandated in legislation by the European Marine Strategy Framework Directive, is a resource planning and management approach that recognizes the connections between land, air and water and all living things, including people, their activities and institutions.

Despite the legislative mandate to implement the ecosystem approach and the sound theoretical basis for implementation, there is little hard information on how the approach should be put into practice. In particular, criteria for assessing costs and benefits of management actions are poorly developed in the complex marine environment where multiple uses and management conflicts are common. There is a strong need for a "joined up" systems approach between natural and social science that delivers the knowledge base to support management for sustainable seas, and that is what the KnowSeas project hopes to achieve.

KnowSeas Inception Meeting delegates at SAMS, May 2009. *(Photo: Joana Mira Veiga)*

Project structure

Implementing the Ecosystem Approach in Europe's seas requires expertise not only in ecology of marine ecosystems but also in human and social systems and the ways in which they interact with the seas. The project comprises an international team of researchers, which includes ecological modellers, economists, geographers and anthropologists, with the aim of understanding how ecological, economic and social data can be brought together and effectively communicated to, and put into practice by, policy makers.

Understanding the Ecosystem Approach requires a great deal of multidisciplinary thinking. Given the variety of backgrounds, knowledge bases and skill sets of project participants, the project has been carefully structured to allow an efficient and effective flow of information between different expert groups.

The systems analysis subgroup is comprised of a think-tank of ecological modellers and economists. A diverse array of ecological modelling methods from statistical syntheses such as Integrated Ecosystem Assessment to ecosystem models like Ecosim and the stochastic Bayesian Belief Network modelling, are being used to understand and predict how ecological processes and the ecosystem services they provide will flow to the people dependent on Europe's regional seas between now and the year 2050. The outputs of these ecological models will be flows of benefits obtained from Europe's regional seas. These will be passed on to the economists in the subgroup. The economists will then translate the physical flows of benefits modelled by the ecologists into flows of economic benefits using the common currency of monetary values.

Translating ecological process into economic benefits is not in itself the goal of the Ecosystem Approach to management. Social and cultural differences between European peoples result in very different preferences, expectations and political cultures and these must all be accounted for if the Ecosystem Approach is to be practiced effectively. Politicians and ecologists often speak a different language. While the ecologist counts in numbers of individual animals, species or populations, the politician counts in numbers of jobs and numbers of votes. To this end the second subgroup of the project will focus on integration. Conversion of the systems analysis information into practical guidance for real world situations will be achieved by means of stakeholder analysis examining the differences in attitudes and expectations that different cultures have of the seas. The project is also developing a suite of communication tools to allow the transfer of knowledge from the specialist systems analysis group to decision makers in ways that are meaningful to them.

Supporting the work of the systems analysis and integration subgroups are groups of regional experts and stakeholders from each of the regional seas and the broad geographic scope of the expertise will provide inputs to regional case studies. These case studies include a geographically explicit examination of the interaction between trawl fisheries, climate change and the cold water coral *Lophelia pertusa* in the North East Atlantic; a study of the costs and benefits associated with the fishing of the endangered Bluefin tuna *Thunnus thynnus* in the Mediterranean; a modelling study of the complex management dilemma caused by the destructive but lucrative fishery for the invasive whelk *Rapana venosa* in the Black Sea; and an examination of the social aspects of eutrophication in the Gulf of Finland. By carefully scrutinizing biological and social aspects of these and other issues the project will develop a template for the implementation of the Ecosystem Approach throughout Europe and this template will inform the way in which EU nations implement the Marine Strategy Framework Directive.

There has been intense interest in the project from within the Directorates General of the European Commission as well as other governmental groups: the International Council for the Exploration of the Seas (ICES), the European Environment Agency, regional seas commissions and non-governmental organisations such as WWF and the International Union for the Conservation of Nature (IUCN). The project is much more than an academic exercise; it has the potential to change the way in which people throughout Europe interact with the marine environment and will achieve this through direct communication with the people who make the decisions.

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[1]A complete list of KnowSeas partners is available at www.knowseas.com

The "Coastal Risks and Sea-Level Rise" Research Group of the "Future Ocean Excellence Cluster" in Kiel

Continuing its long tradition in coastal research, the Institute of Geography at the Christian-Albrechts University Kiel and the "Future Ocean Excellence Cluster" **(www.ozean-der-zukunft.de)** established, in 2008, a new research group focusing on coastal issues. The "Coastal Risks and Sea-Level Rise" brings together young scientists from 6 different countries, with various scientific backgrounds and with expertise in different aspects of coastal research.

The primary research focus of the CRSLR group is to explore the mechanisms in which sea-level rise, one of the more certain consequences of global warming, will exacerbate the impacts of coastal hazards and increase coastal vulnerability in a continuously evolving coast. In this context, the work of the group aims to improve our understanding of how coastal systems respond to combined pressures from natural and anthropogenic forcings and to use and develop novel quantitative methods and tools for coastal vulnerability and impact assessment, at various spatial and temporal scales. This work has links to several of the primary scientific themes of LOICZ and is directly relevant to priority topics 1 and 2, while aiming to provide input for the third one. The activities of CRSLR seek to be endorsed by the LOICZ project of affiliated activities while individual externally-funded projects of the group could also be included in the LOICZ project database.

Ongoing work includes several projects, such as:

- The development of global coastal databases and typologies for impact and vulnerability analysis. In particular, the CRSLR group is working on the updating and maintenance of the DIVA database, which underpins the DIVA integrated assessment model (**www.diva-model.net**)
- Analysis of global population and area potentially exposed to SLR at global scale
- Analysing and modelling the response of coastal wetlands to accelerated sea-level rise, at different scales
- Analysis of sediment resuspension due to ship-induced waves in Venice Lagoon, with the aim of improving the management of the Port of Venice
- The quantitative assessment of submarine groundwater discharge and saltwater intrusion in coastal areas. A global model is currently being developed for assessing the impacts of SLR on saltwater intrusion in coastal regions.
- Modelling the evolution of coastal land use under accelerated sea-level rise and changing climatic and s-e conditions.
- he assessment of ecological and economic impacts of climatic change in coastal fisheries, in the Baltic sea

This work is based on research methods which include the development and application of numerical models for studying the response of coastal regions to various forcings; scenario analysis; the use of Geographic Information Systems for exploring the spatial dimensions of the processes involved; the utilisation of remotely sensed data for the parameterisation of spatial models and for monitoring coastal processes at various spatial scales, from global to local. Analysis is supported by extensive fieldwork for studying coastal processes, underpinning model development and for the verification of model results. Study areas currently include, among others, the Wadden Sea, Venice lagoon, the Baltic Sea coast, the Mediterranean and Black Sea coasts and the S. American coastal region. Two example applications, one for Venice Lagoon and a global scale analysis are described in more detail below.

Human impacts in the coastal zone – Shipping-induced sediment resuspension in Venice Lagoon

The rapid development of the shipping industry is a typical example of the challenges posed from the utilization of the coastal zone by humans. Ships are known to increase air and water pollution through gas emissions, waste effluent, and the dumping of ballast water. Another important impact of shipping in coastal areas is sediment resuspension in channels and in bays and lagoons. Resuspension increases turbidity, thereby blocking sunlight and decreasing biological productivity and dissolved oxygen levels. The sediment can represent navigational hazards and resuspension of sediments can serve to remobilize previously isolated contaminants. Large ships often resuspend sediments in shipping channels through the motion of their propellers. Meanwhile, where deep shipping channels are found adjacent to extensive shoals a powerful shallow water wave can be produced with high orbital velocities leading to massive resuspension events of long duration. The CRSLR group is investigating sediment resuspension in Venice Lagoon. Over the course of two sampling campaigns a suite of geophysical instruments has been

utilized to capture and record the resuspension events. We have found that the majority of sediment resuspension is caused by the development and propagation of shallow water waves (figure 1). Suspended sediment concentration from the shallow water waves was directly correlated with a parameter, which multiplies the Froude number (based on ship velocity) with the size of the ship divided by water level (r^2=0.89, p<0.001). Below a quantified threshold of this parameter, these shallow water waves do not form, therefore sediment resuspension can be prevented from forming by reducing the speed of ships as well as limiting navigation to the period from medium to high tide. Though Venice serves as a case study for similar ports around the world, the situation there is particularly dire as most of the sediment in the vicinity of the port is highly contaminated and a large extension of the port is planned. These shallow water waves can remobilize large concentrations of pollutants from the sediments and allow them to spread to more pristine areas of the lagoon. This serves as a potentially ruinous problem for the health of the lagoon's ecosystem, which is critically important, both physically and economically, to the denizens of Venice. As the shipping industry increases and more channels and harbours are created throughout the world, the understanding of shipping induced sediment mobilization is necessary to protect vital ecosystems.

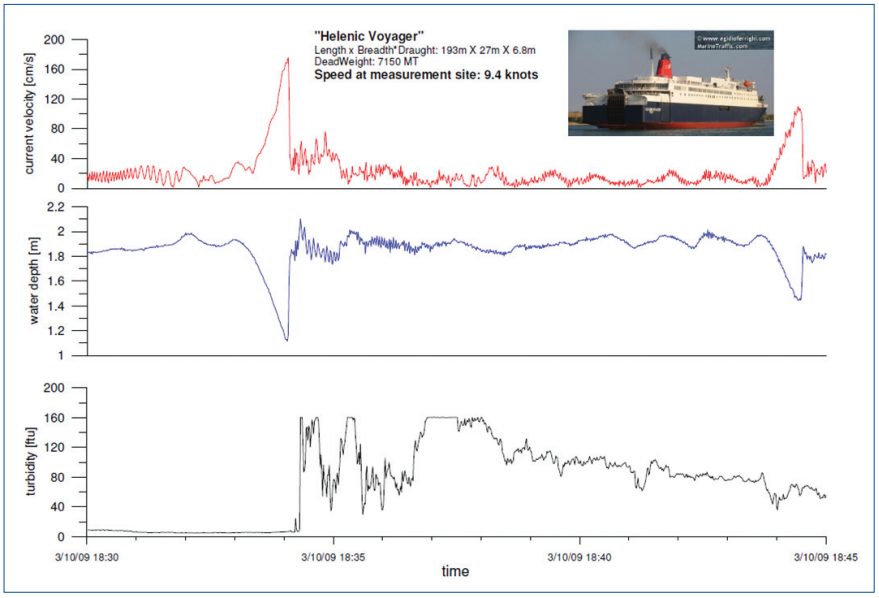

Figure 1:
a. current velocity b. water depth and c. turbidity as recorded by an S4 electromagnetic current meter with built-in optical backscatter sensor (OBS) after the passage of the large cargo ship 'Hellenic Voyager' on March 10th, 2009.

Exploring data-related uncertainties in analysis of land area and population in the 'Low Elevation Coastal Zone' (LECZ)

Analyses of land area and population distribution in the Low Elevation Coastal Zone (LECZ) have been extensively employed in recent years for providing first-order assessments of the magnitude of area and population at risk from future sea-level rise (SLR), at global, regional and local scales. These assessments are performed using data of different scales and resolutions. Variations between the datasets can be significant due to inconsistencies in data coverage, merging of different data sources and acquisition methods, and variable input data quality for different geographic regions. This project has explored differences in land and population distribution estimates in the LECZ resulting from the use of different digital elevation models and population datasets at global, continent, and country levels. For this purpose we have employed digital elevation models and two population datasets, which have been commonly used in previous studies. Initial results show that at global scale, differences of up to 150 % in area can arise depending on the elevation model used. The differences are most extreme under 1 m elevation, and decrease at higher elevation increments. At continent level, the different elevation models produced area estimates differences ranging from more than 1200 % at an elevation of 1 m to 160 % at 10 m (Oceania). Differences at the country level can be even higher. Similarly, substantial differences in population counts can arise with the use of different population datasets. The population distribution under 1m of elevation ranges from 1 % of the total global population to 2.3 %. Under 10 m, the distribution varies from 9.2 % to 10.9 % of the total global population. Continent and country level differences are significant as well depending on the elevation and population distribution models. These differences do not only stem from the differences in the area estimates but can also be due to errors and uncertainties inherent in the population base data and differences in the data processing methods employed for the compilation of the datasets.

For additional information on the above projects and other ongoing work visit **http://www.crslr.uni-kiel.de** or contact:

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The backbone of LOICZ: Affiliated Activities

One aim of LOICZ is to provide a framework to encourage the fullest participation of multi-national, regional, and national research activities in its global research. These activities shall contribute to achieving the goals, aims and objectives outlined in the LOICZ Science Plan and Implementation Strategy (SPIS). A way we accomplish this is to actively engage with the international research community concerned with natural and social sciences on Global Environmental Change in the coastal zone. LOICZ is a forum to assimilate, synthesize and integrate the outputs of the research community. It provides an opportunity to communicate, discuss and disseminate these outputs making them available to the global audience of scientific peers, the general public, and decision-makers in policy and practice. Information on Affiliated Activities is held in a central database that is accessible online through the LOICZ website. It makes basic information and regular updates available to the wider global community as well as to LOICZ for its assessment and synthesis task and its reporting requirements.

We encourage coastal scientists to seek affiliation of their research project/s, PhD thesis or capacity-building activities to LOICZ and become a member of the global science community and network of researchers and practitioners. Since 1993, more than 400 individual activities from all over the world have already been involved in this LOICZ research portfolio.

Early stage research

We particularly encourage early stage researchers from PhD student to Post-Doc level to seek affiliation of their projects. LOICZ acknowledges that much of the work contributing to coastal Earth System science is being carried out by young scientists. Therefore LOICZ wants to support these efforts by enhancing their visibility and introduction to scientific peers in the global research community. Affiliated early stage research will thus contribute to the global research portfolio and its products and information will also feed into the global LOICZ synthesis likewise with the larger affiliated projects.

Affiliation will give early stage scientists comprehensive information about the variety of scientific activities in their field and allow them to foster their network with senior scientists and the global research community. They may also have easier access to participation in workshops, conferences and meetings organized by LOICZ that relate to their own work. By promoting their individual research on a global platform, early stage researchers will be given the opportunity to contribute to LOICZ aims and objectives directly.

Application for affiliation of scientific work at PhD and Post Doc level needs the same set of principle information and delivery of appropriate documents (e.g. thesis outline instead of a project proposal if applicable). In addition and to guarantee a good conduct in quality control LOICZ kindly asks for a co-signature and professional affiliation details of the supervising scientist. The review conducted by the LOICZ scientific peers will apply the same standards as for senior projects. Detailed information on the affiliation procedure is available on the LOICZ website in the 'Projects' section
http://www.loicz.org/projects/index.html.en

Synthesis of Affiliated Activities

LOICZ is preparing for an interim scientific synthesis in 2010, and as part of the synthesis the Affiliated Activities will be evaluated in the context of the LOICZ scientific framework. The synthesis is an opportunity to share your research findings with the global LOICZ community and value your contribution to coastal and global change research. We therefore encourage you to regularly check and update the project information on the LOICZ database
http://kopc01.gkss.de:7777/loiczdb/faces/app/Welcome.jspx,
including relevant publications and reports on your research findings. In order to edit your project information on-line, you need to log in with your user name and password. If you require any assistance, please contact the IPO.

Call for affiliation of research activities

LOICZ seeks to expand its network of scientists by endorsing research activities concerned with any of its priority topics on a global, regional or national level.

Within these topics LOICZ strives to develop:

- methodologies or models that allow data assimilation, processing and synthesis, including up and/or down scaling;
- scenarios of change and/or response to change in socio-ecological systems;
- scientific context for the evaluation of existing policies and structures;
- globally applicable tools for scientific synthesis, decision support and structure development; and
- dissemination interfaces to provide information and assist sustainable coastal development on appropriate scales.

To achieve this, LOICZ is calling for proposals to bring high quality research activities into the LOICZ cluster of Affiliated Activities. As well as fundamental science projects, LOICZ also looks for projects that have a multidisciplinary perspective, especially combining natural and social sciences. Projects can focus on global, regional or local scales and address coastal sciences and/or coastal management questions. Projects that collaborate with other Earth System Science Partnership (ESSP) elements, especially with other Core Projects of IHDP and IGBP, are sought in particular. Also projects that synthesize and analyze research outcomes already available or involve dissemination and outreach that will lead to better public knowledge are most welcome. LOICZ particularly encourages affiliation of early stage research at PhD and Post-doc level. Details about projects already affiliated to LOICZ can be found in the LOICZ Project database accessible through the LOICZ website.

Although LOICZ cannot offer funding to Affiliated Activities, its endorsement provides the following benefits:

1. support in the state of proposal for funding;
2. promotion of the project and associated activities, its contributing team, outputs and outcomes through the LOICZ website and/or newsletter;
3. contribution to workshops, conferences and meetings organized by LOICZ and hence establish linkages to other projects operating in similar fields and/or addressing similar issues;
4. access to a wide circle of information related to funding and the science community that is available through the LOICZ database; and
5. Principle Investigators of Affiliated Activities are offered a Corresponding Membership to the LOICZ Scientific Steering Committee (does not apply to PhD level). This appointment is subject to annual review.
6. Affiliated Activities will generally feed into the global LOICZ synthesis (Interim Synthesis planned for 2010).

Researchers whose work fits into the LOICZ portfolio are encouraged to submit proposals to the LOICZ IPO as soon as possible. The required form is accessible after registration to the LOICZ project database and additional information can be obtained from the LOICZ website or via contacting the LOICZ IPO.

PRIORITY TOPIC 3

Linking Governance and Science in Coastal Regions

The 2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change: "Earth System Governance – People, Places and the Planet", 2-4 December 2009

Andreas Kannen (GKSS Research Center)

The 2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change was the 9th conference in a series of European conferences on human dimensions research. It brought together about 400 scientists providing 250 papers, selected through rigorous double-blind review of each abstract by at least four reviewers. In particular this year's conference marked the launch of a ten-year international research program on global environmental change, the Earth System Governance Project (ESG). This project was formally accepted in October 2008 by the International Human Dimensions Programme on Global Environmental Change (IHDP) as one of its core projects, scheduled to last through 2018.

As a follow-up of the LOICZ workshop at the IHDP Open Science Meeting in Bonn earlier in 2009 (see INPRINT 2/2009), I participated not only with a presentation in the Amsterdam conference, but also served as panelist (representing the Priority Topic on Governance) in a IHDP semi-plenary panel on "Perspectives from the Global Change Programs-Governance: What, Where, Whom & Where Next?" Other panelists represented the Global Environmental Change and Food Systems (GECAFS), the Global Water Systems Project (GWSP), the Stockholm Environment Institute and Industrial Transformation Project (IT). The panel was chaired by Katrina Brown from the Tyndall Centre for Climate Change Research.

What became obvious in the panel, but also throughout the whole conference was one specificity of coastal and marine governance: While most global programs focus on governance from a topical perspective, the coastal (LOICZ-) perspective is different. Its focus is a geographical one, looking into a particular area (large or small scale) in which many different issues come together and need to be handled in a holistic manner. As a result governance in coastal and marine areas has in most cases to deal with many pressures and therefore many actors and agents. This encompasses to deal with many different goals and beliefs and many different social contexts, which result in various issue frames and various institutional architectures from global to local scales. From this perspective originates that many coastal and marine governance initiatives (including analytical scientific approaches) develop from place based problems while many other presentations at this conference came from (a range of) theoretical perspectives and many focused on a particular scale, e.g., the global scale of climate change policies. A future challenge for LOICZ governance research might be to combine both perspectives in order to deepen our understanding of governance processes: Why are certain actions taken by whom and in which way?

LOICZ SSC News

New SSC Members welcome on board!

LOICZ, following IGBP and IHDP approval has appointed three new SSC members, who officially started their membership on 1 January, 2010. In the following we like to introduce our new Scientific Steering Committee members **Tim Carruthers**, Program Manager for the Integration and Application Network (IAN), based at the University of Maryland Center for Environmental Science (UMCES), **Bruce Glavovic** based at Massey University in New Zealand and **Valerie Cummins**. She is the director of the Coastal and Marine Resources Centre, University College Cork.

Tim Carruthers

I started working in the temperate sea grass meadows of south-western Australia, moving from coastal to estuarine habitats and studying eco-physiology of sea grass as related to eutrophication and the resource condition of these habitats. Moving to north-east Australia, I worked on assessing the ecosystem health of tropical and subtropical river estuaries, as part of the Moreton Bay Study. Continuing an easterly migration, I worked in the Yucatan Peninsula and the Caribbean coast of Panama looking at sea grass communities to assess ecosystem scale nutrient processes, and now work for a science synthesis program called IAN (the Integration and Application Network) at UMCES (the University of Maryland Center for Environmental Science). We work on a range of local, regional and global projects related to multiple aspects of science synthesis and ecosystem assessment (marine, aquatic and terrestrial) with multiple; state, federal and private agencies. In all these projects, the underlying philosophy is that the production of a communication product drives the process of effective science synthesis, starting with clarifying key messages and knowledge gaps. To this end, I have worked with our team to produce dozens of graphics rich science newsletters,

developed tools to graphically capture key concepts, edited books and authored book chapters, written synthesis papers, and produced dozens of posters, powerpoints and web pages for multiple audiences. My hope as a member of the LOICZ SCC is to assist in the enhancement of effective science synthesis and communication by the LOICZ community.

Journal articles and chapters available at
http://ian.umces.edu/literature/

Communications products available
http://ian.umces.edu/press/

Bruce Glavovic

Based at Massey University in New Zealand, Bruce is the Earthquake Commission (EQC) Fellow in Natural Hazards Planning and Associate Director of the Massey-GNS Science Joint Centre for Disaster Research. He has 25 years of experience in academia, private consulting and Government. He has worked mainly in South Africa, the United States of America, and New Zealand. Bruce was the Project Manager of the team that designed and facilitated South Africa's coastal policy formulation process that culminated in the Government's *White Paper for Sustainable Coastal Development*. An independent reviewer described it as *"…the world's first consensus based national policy for the sustainable development of a nation's coastal regions and natural resources."* It is the foundation for the Integrated Coastal Management Act that came into force in South Africa in December 2009.

Bruce has a multi-disciplinary education, with a Bachelor's degree in economics and agricultural economics (University of Natal, South Africa), a Master of Science in environmental science (University of Cape Town), a Master of Urban and Environmental Planning and a PhD in Environmental Science (University Virginia, USA). His research focuses on the role of land-use planning in building sustainable, hazard-resilient communities. It is clustered around several themes: natural hazards planning; adapting to climate change; environmental governance; negotiation, collaborative planning and consensus building; and understanding poverty-environment linkages and driving forces. Bruce's particular interest is learning lessons from comparative international experience in coastal sustainability, disaster risk reduction, post-disaster recovery, and adapting to climate change. He has undertaken extensive fieldwork on these issues in South Africa, Brazil, New Zealand, the Gulf Coast of the USA in the aftermath of hurricane Katrina, and in Indonesia and the Maldives after the 2004 Indian Ocean tsunami. Bruce co-edited two recent books: *Integrated Coastal Zone Management: The Global Challenge,* published by Research Publishing Services (2008) and *The Ecological Economics of Oceans and Coasts,* published by Edward Elgar (2008).

Valerie Cummins

Valerie Cummins is the director of the Coastal and Marine Resources Centre, University College Cork. This involves the coordination of 30 research staff working on over 20 EU and nationally funded research projects and commercial contracts.

Valerie is a Marine Geographer with expertise in both the natural and human environmental sciences. Most recently, her research interests cover a range of coastal governance issues including public participation, capacity building for coastal management, the science / policy interface and ecosystems frameworks.

As the co-ordinator of the EU Interreg IVB Imcore project, she is leading an initiative to develop coastal adaptation strategies for nine locations across north-west Europe using a range of scenario building and technical tools. She is a member of the Scientific Steering Committee for the FP6 SPICOSA and Conscience projects dealing with systems approach to coastal assessment and coastal erosion governance respectively.

At the national level, she contributes to the Climate Change Committee of the Royal Irish Academy. She is currently coordinating a STRIVE project on adaptive management for coastal climate change for the Environmental Protection Agency. She also chairs the Irish national coastal network, I-CoNet and has successfully delivered a number of reviews on ICZM for government bodies. Locally, she chairs the Cork Harbour Management Focus Group and engages in the Maritime and Energy Cluster (MERC) initiative. Valerie coordinates the delivery of the module 'ICZM - policy and practice' to UCC's Geography masters students.

She contributes to the editorial panel of the international Marine Policy journal published by Elsevier and is a member of the Marine Geography Commission of the International Geographic Union. She is currently finalising her reading for a PhD on organisational tools for sustainability science in coastal zone management.

Prior to joining the CMRC, Valerie worked in the environmental consultancy industry and for the British Oceanographic Data Centre, UK.

Former SSC members

LOICZ has established a new rubric on the LOICZ website called "Former SSC members". We have now started with those SSC members who rotated off by the end of 2009. In the future you will find all former SSC members on this website.

http://www.loicz.org/about_us/ssc/formermembers/index.html.en

A.G. Huntsman Award for Excellence in Marine Science

2009 Recipient – James P.M. Syvitski, former LOICZ SSC member from 1999 to 2005

James P. Syvitski, Professor of geological sciences at the University of Colorado served on the LOICZ SSC from 1999 to 2005. He was a key initiator of the LOICZ – GWSP (Global Water System Project) – CSDMS (Community Surface Dynamics Modeling System) with focal point on **Dynamics and Vulnerability of Delta Systems** and was the host of the LOICZ Boulder meeting in 2007. One of the outcomes of the Boulder meeting is the LOICZ R&S report No. 35.

http://www.loicz.org/imperia/md/content/loicz/print/rsreports/loicz_report_35.pdf

Syvitski is executive director of CU's CSDMS, which involves hundreds of scientists from dozens of universities and federal labs. It is funded by the National Science Foundation.

The A.G. Huntsman Award was presented by the Royal Society of Canada during a November ceremony at the Bedford Institute of Oceanography in Nova Scotia.

Syvitski's scientific interests include fjords, rivers, deltas, estuaries, particle dynamics, simulation of sediment transport and stratigraphy, continental margin sedimentation, gravity flows and animalsediment interactions. In September, a study led by Syvitski indicated that most of the world's low-lying river deltas are sinking because of human activity. That makes these areas increasingly vulnerable to flooding from rivers and ocean storms and puts millions of people at higher risk. Syvitski's team found several causes of sinking deltas, including the trapping of sediments that would normally be delivered to river deltas, the human construction of levees that move sediment into the oceans and bypassing the floodplains where they would normally settle, and the compaction of floodplain sediment due to groundwater and natural-gas extraction.

Those findings, published in the Sept. 20 issue of Nature Geoscience (see LOICZ INPRINT 2009/2, page 20), include the prediction that global delta flooding could increase by as much as 50 percent by the end of the century, assuming sea-level rise of about 18 inches by then.

Source: Colorado Arts & Sciences Magazine » Carpentry prospect wins prestigious marine science award

Read more
http://artsandsciences.colorado.edu/magazine/2009/12/carpentry-prospect-wins-prestigious-marine-science-award/

http://www.geohab.org/huntsman/syvitski.html

LOICZ Regional Nodes

New LOICZ Regional Node for South Asia opened in Chennai, India

Chennai, 7 December 2009.

In parallel with an International Workshop on Deltas: *"Coastal Vulnerability and Management"* organised by the Institute for Ocean Management, Anna University Chennai, Chennai, India, the new LOICZ Regional Node South Asia was officially opened.

The purpose of the workshop was to understand the current environmental status of Asian deltas from various viewpoints, e.g., changes in runoff, nutrient and sediment loads, coastal ecosystem health, and human activities, and to synthesize these data for future assessments and management. Biogeochemical assessment of turbid water systems was a second focus.

The aim of LOICZ Regional Nodes in general is to coordinate and promote global coastal change research at the regional and local level as well as to facilitate links and exchanges between international, national and local science and policy communities.

LOICZ is currently supported by three Regional Nodes: East Asia, Southeast Asia and South Asia. A fourth Regional Node will open in 2010 in Portugal: LOICZ Regional Node Europe-MENA (Middle East and North Africa) and PALOP (Países Africanos de Língua Oficial Portuguesa) countries.

Following a typical Tamil Nadu tradition to give a warm welcome and to express each other's honour the Vice Chancellor of Anna University, Prof. P. Mannar Jawahar and LOICZ CEO Dr. Hartwig H. Kremer exchanged colourful silk scarves and handed over flowers to each other.

LOICZ is now also a part of Anna University, Chennai.

From left: P. Mannar Jawahar (Vice-Chancellor Anna University), Hartwig H. Kremer (LOICZ IPO), Ramachandran Ramesh (Director of the Institute for Ocean Management at Anna University, Chennai, host of the LOICZ Regional Node and LOICZ Scientific Steering Committee member)

(Photo. Staff of the Institute for Ocean Management at Anna University, Chennai)

Purvaja Ramachandran, leading through the inauguration ceremony.

(Photo. Hartwig H. Kremer)

From left: P. Mannar Jawahar (Vice-Chancellor Anna University) and Hartwig H. Kremer (LOICZ IPO) exchanging the signed MoU. Ramachandran Ramesh (Director of the Institute for Ocean Management at Anna University, Chennai, host of the LOICZ Regional Node and LOICZ Scientific Steering Committee member)

(Photo. Staff of the Institute for Ocean Management at Anna University, Chennai)

From left: Yoshiki Saito (ex. LOICZ SSC Member, Institute of Geology and Geoinformation (IGG), Geological Survey of Japan (GSJ), AIST.), R. Sellamuthu (Additional Chief Secretary, Development Commissioner, Government of Tamil Nadu), P. Mannar Jawahar (Vice-Chancellor Anna University), Hartwig H Kremer (LOICZ IPO), Ramachandran Ramesh (Director of the Institute for Ocean Management at Anna University, Chennai, host of the LOICZ Regional Node and LOICZ Scientific Steering Committee member) presenting the signed Memorandum of understanding (MoU) for scientific collaboration in this new LOICZ Regional Node.

(Photo. Staff of the Institute for Ocean Management at Anna University, Chennai)

Contact: LOICZ South Asia Node

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rramesh_au@yahoo.com

More information about LOICZ South Asia Node:

http://www.loiczsouthasia.org/

www.annauniv.edu

LOICZ/UNEP Workshop on Deltas: Coastal Vulnerability and Management

R. Ramesh, Ahana Lakshmi and R. Purvaja
Institute for Ocean Management, Anna University
Chennai, Chennai, India

Photo: Hartwig H. Kremer

Deltas may be described as the dynamic interplay between land and sea forcings at the coastal zones that can be studied at a range of scales. Global coastal zones provide a host of goods and services and are the major location of the biogeochemical cycling of nutrients and are vulnerable because of the extensive anthropogenic activities that occur in this zone. As the number of new activities increase- such as energy generation from tides and waves, drilling of offshore oil and mariculture systems, the stress on the coastal areas is on the rise. Primary questions that arise include:

- How do deltas form?
- What are the stresses that have built up over the years?
- What are the areas where management focus should be directed?

Recent studies of deltas all over the world have clearly indicated increasing vulnerability to flooding due to sinking of deltas due to a variety of reasons such as sediment compaction due to removal of gas, oil and water from the delta's underlying sediments, upstream trapping of sediments in dams and reservoirs as well as floodplain engineering. Deltas being areas of intensive agriculture and settlements also see large amounts of nutrient inputs which reach coastal waters resulting in eutrophication and pollution related problems.

To obtain an overview of the vulnerabilities and management of deltas in the coastal zone, especially in Asia, an international workshop was held at the Institute for Ocean Management, Anna University Chennai, Chennai, India, in December 2009. The focus of the workshop was multi-disciplinary including geology, biochemistry of deltas in the coastal zone and the social sciences aspects. The workshop included five sessions as follows:

1. Types, formation and characteristics of Deltas
2. Biogeochemistry and Nutrient Budgeting of Deltas
3. Nutrient Budgeting for Muddy Coastal Waters
4. Global Climate Hazards and Vulnerability
5. Human Perspectives

There were keynote addresses and technical presentations in each session and also a separate poster session. The sessions covered a range of approaches to delta studies. This report uses the papers presented at the workshop to provide an overview of various aspects of deltas in Asia. At the end of each session, there were discussions on the way forward. It was observed that apart from focusing on scientific (including geological, chemical and biological) studies, deltas need to be seen as social-ecological systems with social aspects and hazard mitigation needing more research and action. The changes in sediment fluxes in some cases were changing the dominating force in the delta. Shoreline changes need to be better mapped and ability to forecast future changes based on past records has to be developed. The role of the biology of fine sediments in the nutrient budget in estuaries needed more study as models developed based on laboratory studies were not successful in the field as the micro-organisms inhabiting the mud changed its characteristics in many ways.

People living in deltas are vulnerable to a variety of hazards. They have, for the most part, natural-resources dependent livelihoods such as agriculture and fisheries. Floods and droughts take a toll on agriculture and the increased groundwater usage for irrigation is leading to reduced water availability as well as deteriorating groundwater quality. Post tsunami interventions have benefitted fishermen in some areas but the resources are stressed because of various reasons. While villages behind mangroves can be shielded from effects of cyclones, it is the bottom-up approach in disaster preparedness that actually enables people to overcome disasters. The move is also towards an adaptation framework which may require higher capital influx but is more effective in the long term especially with climate change effects impacting deltas.

In summary, deltas are seen vulnerable to a series of stresses and impacts. Many of the activities and issues are cross-cutting in nature and hence, better communication amongst researchers and workers in these areas is necessary. Deltas need to be seen in the future as socio-ecological systems with particular focus on the changes in dynamics of the deltas due to its interplay with human interactions.

This work continues the LOICZ focus on Deltas initiated in collaboration with CSDM (Community Surface Dynamics Modeling System) and the GWSP (Global Water System Project) in 2007.

Participants International workshop on Deltas. (Photo: Hartwig H. Kremer)

IPO Notes

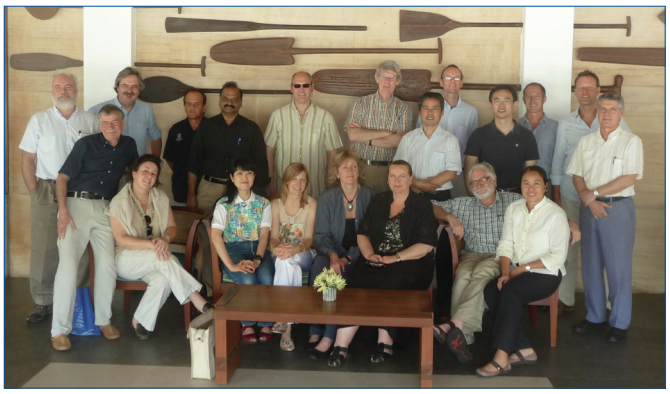
21. LOICZ SSC Meeting in Chennai, India

The new LOICZ Regional Node South Asia in Chennai, India, hosted the LOICZ Science Steering Committee (SSC) Meeting from 2–4 of March, 2010. The venue of the meeting was adjacent to the magnificent Hindu temples on the coast at Mamallapuram, a UNESCO World Heritage site. The coast of Tamil Nadu was ravaged by the tsunami on 26 December, 2004, and although many people and properties were lost, the temples were not destroyed.

On 2 March, 2010, SSC chairperson A. Newton opened the 21st LOICZ SSC Meeting by underlining the important activities of the core project: the scientific interim synthesis and the mid-term evaluation of LOICZ. She thanked R. Ramesh and his team for hosting the meeting and organizing everything so well in *"Incredible India"*. LOICZ thanked also to B. Goldberg, J. Weichselgartner and H. Kremer, as well as the other members of the IPO for organizing all the travel and documentation so well. Thanks were expressed to S. Olsen and B. Glaeser who prepared two new Heritage lectures to add to the growing collection on the website. Sadly, some past members had rotated off and we missed great friends and colleagues: N. Rabalais, W. Dennison, E. Roth, J. Restrepo and F. Lansigan. However, we met the new SSC members V. Cummins, B. Glavovic and T. Carruthers who made a wonderful contribution. LOICZ welcomed the guests F. Colijn (GKSS) and J. Morais (IGBP) and conveyed apologies on behalf of SSC member A. Diegues.

On day 1, the SSC meeting focused on the upcoming assessment of LOICZ by GKSS, the host institution of the IPO, and the procedure was explained by F. Colijn. The Priority Topic Leaders outlined the outcomes of the topics that will be concluded this year. On day 2, the LOICZ science strategy for the next five years was discussed within the context of the ICSU visioning process and the upcoming IGBP synthesis and the new topic, concentrating on coastal "hotspots". On the third day of the SSC meeting, the plans for the Storm Surges Congress in September 2010 and the LOICZ Open Science Meeting in 2011 were discussed. The 2011 OSM will be hosted by the LOICZ Regional Node East Asia in Yantai, China. The wonderful setting and cultural events, such as the Tamil Nadu traditional dances and dances in honor of Shiva-Nataraja-Koothtan in magnificent and colorful costumes, stimulated the discussions.

On 4 March, the SSC Meeting closed with chairperson and IPO expressing their gratitude to all the SSC members for their active participation in the SSC Meeting. A. Newton thanked the LOICZ IPO, who ensured a well prepared and organized meeting, and the Regional Node coordinators for their continued efforts to spread LOICZ science in their regions, as well as the GKSS Research Center for the excellent support. On 5 March, most participants attended the organized field trip to various cultural sites along the coast, including visits of quartz sand and salt extraction sites in Ellamman Kovil and a geological park in Thiruvakkarai (see article in coastal



LOICZ SSC and IPO members, Regional Node coordinators and guests of the 21st SSC Meeting, hosted by the LOICZ Regional Node South Asia, Anna University, Chennai

(Photo: J. Weichselgartner)

read also Coastal snapshot on page 26

East Asian Seas Congress 2009, Manila

The East Asian Seas (EAS) Congress 2009 *"Partnerships at Work: Local Implementation and Good Practices"* opened on 23 November in Manila, Philippines. Organized by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and Department of Environment and Natural Resources (DENR) and supported by the GEF/UNDP/UNOPS, the five-day event provided a region-wide platform for dialogue, knowledge exchange, capacity building, strategic action and cooperation for the sustainable development of the seas of East Asia.

An International Conference on Sustainable Coastal and Ocean Development, a Ministerial Forum, a special EAS Partnership Council Meeting, a Senior Government Officials Meeting and a Youth Forum all convened as part of the Congress that had more than 1,400 registered participants from 43 countries. As a partner organization, LOICZ supported the event in various ways. On the first day, Senior Science Coordinator J. Weichselgartner gave a talk on *"Capacity building activities: Experiences of a global project"*. In the workshop on *"Meeting Human Resources Requirements in Coastal and Ocean Governance: Formal and Informal Training"*, chaired by

C. Thia-Eng and G. Jacinto, he shared the LOICZ capacity building experiences and discussed the various initiatives in promoting capacity development together with representatives from IOI, ASEAN Foundation, APN, UNIDO, PAMSEA, among others.

On the same day at the Youth Forum, LOICZ SSC member and vice-chair F. Lansigan gave a presentation on *"Warmer or cooler earth? The facts and myths of climate change"*. Together with B. Goh, coordinator of the LOICZ Southeast Asia Regional Node, he later on joined the panel and discussed with the Youth Forum participants various climate change issues. On 24 November, panelist J. Weichselgartner presented his thoughts on *"How to become an influential scientist? Bridging the science-policy-practice interface"*. Moreover, he visited the mangrove planting site at Las Piñas-Parañaque. Together with the ca. 70 international students around 150 new mangroves were planted. At this point, a special "Thanks" to SSC member Z. Chen who supported the Youth Forum participation of his student X. Zhong.

During the closing of the Conference, participants heard reports on the outcomes of the: meeting's six themes; Youth Forum; and overall conference outcomes. They also participated in an open discussion on the key recommendations, lessons learned and issues for future attention on coastal management and policy. During the Ministerial Forum, participants: attended a signing of the agreement on PEMSEA's legal personality and the Manila Declaration; heard a keynote speech by President G. Macapagal Arroyo, Philippines; and listened to Minister's statements, before the Forum closed on 27 November. The next EAS Congress in 2012 will be hosted by the Republic of Korea.

LOICZ contribution to the EAS Congress in Manila: Senior Science Coordinator Juergen Weichselgartner, Southeast Asia Node Coordinator Beverly Goh, Youth Forum Organizer Daisy Padayao, participant Xiaojing Zhong, and SSC Member Felino Lansigan, after a LOICZ session at the Youth Forum (Photo: J. Weichselgartner)

Interns at the LOICZ IPO

Internship at the LOICZ IPO, GKSS Research Center

(Photo: J. Weichselgartner)

Eric Kiener

The training period from 16–20 November, 2009, at the International Project Office of the Land-Ocean Interactions in the Coastal Zone project (LOICZ IPO) was very interesting and productive. After a nice welcome, I was shown my office space and was introduced to the working environment of LOICZ. Dr. J. Weichselgartner, Senior Science Coordinator of LOICZ, showed me the tasks that I had to do during my internship.

Two days, I spent at the printing department of LOICZ, where Mrs. Meiners showed me how to use graphic design programs. There, I have not only learned editing LOICZ R&S Reports, but also designing cover pages by using the photo editing program *"Quark"*. On Thursday afternoon, I was invited to attend a seminar on *"Risk Management and Project Conception"* at the Institute of Geography, Hamburg University. It was very interesting to see how the students gave presentations and discussed about them. At my last day, I was at the GKSS pupil laboratory *"Quantensprung"*. The main topic was *"Introduction in Water Analytics"*. Together with other pupils, I was experimenting with water.

During my week at the LOICZ IPO, I spent my lunch breaks with my colleagues from LOICZ in the cafeteria of the GKSS Research Center. The food was very good and not too unhealthy. All in all, I think my internship at the LOICZ IPO was very informative and exciting. Thanks to Hartwig, Juergen, Barbe, Christiane, Ines and Ivan.

Eric Kiener, 15 years old, Intern at the LOICZ IPO (E-Mail: eric.kiener@gmail.com)

My name is **Stephanie Gschrei**. I studied Geography at Ruhr-Universität Bochum and have a Master degree in Physical Geography. During my studies I did internships at GFZ German Research Centre for Geosciences (GeoForschungs-Zentrum Potsdam) and University of Hamburg (Universität Hamburg, Institut fuer Meereskunde). I am interested in Oceanography and Coastal Research. Currently I am preparing my Doctoral thesis. For this I have chosen to attend to theme 2 (Implications of Global Change for Coastal Ecosystems and Sustainable Development) of the scientific themes proposed by LOICZ. I did an internship at LOICZ in March 2010 to get a review about the working fields and research methods in Coastal Research. My task was to prepare a synthesis of each of the different projects affiliate to LOICZ for the evaluation in summer 2010.

Storm Surges Congress 2010

Risk and Management of current and future Storm Surges

2nd Announcement and Call for Abstracts

Deadline extended to 30th of April 2010! Because of numerous requests to extend our deadline for abstract submissions until after the Easter holidays, we have decided to extend our deadline until the end of April 2010. Therefore, if you still wish to present at the Storm Surges Congress, please feel encouraged to continue preparations and submit your abstract by the end of April.

Conference program will be soon available on the conference website: http://meetings.copernicus.org/ssc2010/

The Congress is organised by the LOICZ IPO and the Director Hans von Storch of the Institute for Coastal Research of the GKSS Research Centre in Geesthacht and supported by:

UNESCO (United Nations Educational, Scientific and Cultural Organization)

IOC (Intergovernmental Oceanographic Commission)

BSH (Bundesamtes für Seeschifffahrt und Hydrographie, Federal Maritime and Hydrographic Agency of Germany)

HPA (Hamburg Port Authority)

Klima Campus Hamburg

IASC (International Arctic Science Committee)

BAW (Federal Waterways Engineering and Research Institute)

LSBG (Landesbetrieb Straßen, Brücken und Gewässer, Agency for Roads, Bridges and Waters)

DWD (Deutscher Wetter Dienst, German weather Service)

ESA (European Space Agency)

COPRI (Coasts, Oceans, Ports, And Rivers Institute - An Institute of ASCE, USA)

DKKV (Deutsches Komitee Katastrophenvorsorge/German Committee for Disaster Reduction)

MLUR (Ministerium für Landwirtschaft, Umwelt und ländliche Räume)

UHH (Universität Hamburg)

LOICZ Website

New Heritage Lectures online!

LOICZ feels that it is important to reach out and include previous members of the SSC in LOICZ activities. One of these is the series of so-called "LOICZ Heritage Lectures" where we usually ask former or rotating-of LOICZ SSC members to reflect on LOICZ science building on both their past involvement and future perspectives.

In March 2010 we took the opportunity of having Stephen Olsen and Bernhard Glaeser (both rotating off by the end of 2010) with us in Chennai for the LOICZ 21. SSC Meeting, who gave their vast experience to LOICZ, on record:

1. Stephen Olsen
   Coastal Ecosystem Governance:
   What? Why? How?
   http://www.d-lecture.de/LOICZ2010/Olsen/index-first.htm

2. Bernhard Glaeser
   Beyond Natural Hazards
   http://www.d-lecture.de/LOICZ2010/Glaeser/index-first.htm

In 2009 we took the opportunity of having several past SSC members with us in Oslo for the Dahlem-Type workshop, who gave their vast experience to LOICZ, on record:

- William Dennison:
  Catalyzing a Paradigm Shift: Sustainability of the Coastal Zone
- Kerry Turner:
  Ecosystem Services and Coastal Zone Management
- Peter Burbridge:
  The "So What" and LOICZ
- Liana Talaue-McManus:
  Plankton, Fluxes and Futures
- Nancy Rabalais:
  Scientist Citizen: Can a Scientist Influence Policy?

Available are: video, PPT presentation, thumbnails, contact details, and a table of content.

Please have a look at the LOICZ website:

http://www.loicz.org/mediacentre/heritage_lectures/index.html.en

To join the videos and the "d-Lectures", the Microsoft Internet Explorer V 6.4 or higher and the Microsoft Media Player are necessary.
If your computer is behind a firewall, ports for video must be enabled!
"Active X" and "JavaScript" must be activated!

Programme News

New IHDP Project

Earth System Governance Project

Frank Biermann (SSC Chair) and Ruben Zondervan (Executive Officer)

Humans now influence all biological and physical systems of the planet. Almost no species, no land area, no part of the oceans has remained unaffected by the expansion of the human species. Human activity is generating change that extends well beyond natural variability and at rates that continue to accelerate. It is apparent that the institutions, organizations, and mechanisms by which humans currently govern their relationship with the natural environment and global biochemical systems are not only insufficient - they are also poorly understood. More effective governance systems are needed.

This is the rationale and challenge for the Earth System Governance Project, a new long-term core project of the International Human Dimensions Programme on Global Environmental Change. The Project defines earth system governance as the interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative context of sustainable development.

The Earth System Governance Project strives for fundamental and applied research on the institutions and governance systems that regulate human interactions with natural systems. For this, it advances a science plan that is organized around five analytical problems:

First, the Project seeks to advance understanding of the emergence, design and effectiveness of governance systems as well as the overall integration of global, regional, national and local governance, in short: the overarching architectures of earth system governance.

Second, the Project suggests that understanding effective earth system governance requires understanding the agents that drive earth system governance and that need to be involved. The research gap is here especially the influence, roles and responsibilities of actors apart from national governments, such as business and non-profit organizations, the ways in which authority is granted to these agents, and how it is exercised.

Third, earth system governance must respond to the inherent uncertainties in human and natural systems. It must combine stability to ensure long-term governance solutions with flexibility to react quickly to new findings and developments. In other words, we must understand and further develop the adaptiveness of earth system governance.

Fourth, the Project submits that the more regulatory competence and authority is conferred upon larger institutions and systems of governance – especially at the global level - the more we will be confronted with questions of how to ensure the accountability and legitimacy of governance, which require further scrutiny.

Fifth, earth system governance is, as is any political activity, about the distribution of material and immaterial values. It is, in essence, a conflict about the access to goods and about their allocation - it is about justice, fairness, and equity. The novel character of earth system transformation and of the new governance solutions that are being developed puts questions of allocation and access, debated for millennia, in a new light, warranting further research.

In addition, the Earth System Governance Project emphasizes four crosscutting research themes that are crucial for the study of each analytical problem but also for the integrated understanding of earth system governance: these four themes are the role of power; the role of knowledge; the role of norms; and the role of scale.

While the Earth System Governance Project is essentially a scientific effort, it is also designed to assist policy responses to the pressing problems of earth system transformation. Moreover, the Project will serve as a nodal point within the global change research programs to guide, organize and evaluate research on governance in the various projects, thus strengthening and incorporating governance as a crosscutting theme within the international human dimensions of global environmental change research community. As such it actively seeks collaboration with other global change projects, including LOICZ. A panel on coastal governance at the IHDP Open Meeting 2009, with panelists from both the Earth System Governance Project and LOICZ, is an example, illustrating the potential and relevance of cooperation between both projects.

More information on the Earth System Governance Project is available at the project's website: **www.earthsystemgovernance.org.**

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Email: ipo[at]earthsystemgovernance.org.

Final Symposium of the LOICZ-affiliated Project "Coastal Futures"

Andreas Kannen (GKSS Research Center)

4 March, 2010, Hamburg

Marcus Lange, Kira Gee, Andreas Kannen, Benjamin Burkhard, Stefan Garthe, Hermann Lenhart, Wilhelm Windhorst with contributions of other team members of the Coastal Futures project

Photo: Nico Stelljes
Brochure: Coastal Futures

From 2004 to April 2010 the co-operative research project Zukunft Küste – Coastal Futures (www.coastal-futures.org), funded by the German Federal Ministry of Education and Research (BMBF) developed methodological approaches for analysing change on the coast and in the sea. Using offshore wind farming in the German North Sea as a case study, a holistic approach was conceived and tested that allows for the assessment of opportunities as well as risks associated with this new form of use. On 4 March 2010 members of the research consortium presented selected results at the project's final symposium in Hamburg including a panel discussion on future challenges for coastal and marine planning and management. Around 100 representatives from science and research, administration, different economic sectors, politics and the media attended the event at the Hamburg Chamber of Skilled Crafts and Small Businesses in Hamburg.

Offshore wind farms: Opportunities and risks

Coastal Futures did not focus on individual wind farms, but looked at the cumulative effects of all currently planned offshore wind farms in the German North Sea. If current government plans are realized, enough offshore wind farms will be installed in the EEZ by 2030 to deliver a total of 25,000 MW. This expansion of a new technology will need to be integrated into the existing range of sea uses. The project thus identified risks and opportunities associated with offshore wind farming in the ecological, economic and social spheres (Kannen & Burkhard 2009). Bird collision and the potential barrier effect of offshore wind farms were established as potentially significant ecological risks, affecting sea birds and migrating bird species. On the other hand, if artificial reefs develop as a new habitat type, this could create new fish habitats. In the social sphere, perceived risks associated with offshore wind farming relate to changes in the visual manifestation of the seascape. Clashes with traditional views of the sea can influence the degree of acceptance of offshore wind farming. On the other hand, renewable energies are considered worthy of support by many people and a preferable alternative to conventional means of power generation. Opportunities were also established in the economic sphere, where input-output analysis has shown that offshore wind farming can enhance employment opportunities as long as decision-makers create the necessary framework conditions for attracting relevant companies (Hohmeyer 2006). Last not least offshore wind farming can make a contribution to mitigating climate change.

Research approach and results

In order to assess the overall impacts of offshore wind farming the project drew on a range of methods and approaches from ecology, the social sciences and economics. The DPSIR framework and the ecosystem service approach served as structural aids for linking the various research results (Kannen & Burkhard 2009). A range of ecological sub-projects assessed the impacts of offshore wind farms in the marine environment, bringing together effects under water and above water in an overall ecological impact assessment (Burkhard et al. 2009). Modelling of wind field alterations caused by offshore wind farms highlighted changes to the stratification of the sea, which could lead to changes in biological processes and potentially also species composition. Social analyses focused on acceptance of offshore wind farming within society. Research showed that acceptance is influenced by individual value constellations and beliefs, in particular on landscape aesthetics and ideas of the coast and the sea. Local residents consciously weigh up between the opportunities and risks presented by this new technology (Gee 2010).

Coastal Futures research was carried out by scientists at the GKSS Forschungszentrum Geesthacht GmbH, the Ecology Centre Kiel, the Research and Technology Centre Westküste (FTZ) and the Centre for Marine and Atmospheric Sciences at Hamburg University, as well as other cooperation partners (Figure 1: The Coastal Futures research team at the final symposium in Hamburg).

Photo: Cillie Sobiech

Residents' perspectives and new forms of governance

The project concluded that given the diversity of human uses in the sea, cumulative impacts need to be taken into account by planners and managers as early as possible. Analysis in Coastal Futures has shown that intense shipping in combination with offshore wind farming leads to a significant loss of habitat for certain sea bird species such as divers. The increasing number and intensity of sea uses also leads to a shift in perception of the sea towards a largely industrial space – a shift that collides with the traditional perception of the sea as a natural space, a shift that is not welcomed by all (Gee 2010). Social values associated with the sea should therefore be made visible and included in transparent decision-making processes. Although offshore wind farming was the specific case study example, and although some results are clearly area and case study specific, the methods and tools employed by the project can be transferred to other settings and areas.

Panel discussion: Challenges posed by future sea use, problems arising for future marine strategies and what is expected from science

Moderated by Franciscus Colijn, the panel discussion brought together Wulf Hülsmann (Federal Environment Agency), Dr Nico Nolte (Federal Maritime and Hydrographic Agency), Heinz Glindemann (Hamburg Port Authority) and Prof Alexander Proelss (Walther-Schücking-Institute for International Law of Kiel

Photo: Nico Stelljes

University). The debate centered on challenges for future management of coasts and seas and challenges for coastal and marine science.

Panelists emphasized the role of science as a provider of information. The diverse range of existing uses, as well as newly emerging problems such as climate change, demand balanced political decisions and forward-looking planning. Here, scientific expertise provides an essential foundation. To enable cross-sectoral decision-making, methods are required that allow for the assessment of cumulative impacts on ecosystems and impacts across different spatial and temporal scales. Integrated Coastal Zone Management as an informal instrument can help to take such decisions and be a useful complement to formal decision-making processes.

Cross-border cooperation with respect to sea uses and the implementation of EU Directives were also discussed. It emerged that cross-border cooperation is part of the formal licensing process for German offshore wind farms. Panelists agreed that greater flexibility would be useful in terms of EU Directives, allowing them to be adapted to the specific demands posed by different sea areas. Agreed criteria for assessing impacts could be a useful means in this context. Panelists also agreed that research should be applied, in the sense of addressing the specific problems facing authorities and decision-making bodies. Continuous dialogue between science and politics is essential here. Science, however, should not just participate in the political debate but also make research results available in a format that is widely understood in order to engender wider debate of key issues.

References

Burkhard, B., K. Ahrendt, S. Garthe, H.-J. Lenhart, B. Mendel, S. Opitz & W. Windhorst (2009): Ecosystem based modeling and indication of ecological integrity in the German North Sea – Case study offshore wind farms. Ecological Indicators.

Gee, K. (2010): Offshore wind power development as affected by seascape values on the German North Sea coast. Land Use Policy 27: 185-194.

Hohmeyer, O. (2006): Endbericht zum Teilvorhaben 'Regionalökonomische Auswirkungen des Offshore Ausbaus der Windenergie in der deutschen Nordsee auf die Region Westküste im Rahmen des Forschungsvorhabens Zukunft Küste - Coastal Futures. Universität Flensburg. Flensburg, 32 S.

Kannen, A. & B. Burkhard (2009): Integrated Assessment of Coastal and Marine Changes Using the Examples of Offshore Wind Farms: the Coastal Futures Approach. GAIA 3: 228-238.

More information

The research approach and results of Zukunft Küste – Coastal Futures will be documented in a forthcoming Synthesis Report to be published as LOICZ R & S Report.

Media

Conference webpage
http://iczm.ecology.uni-kiel.de/servlet/is/17347/

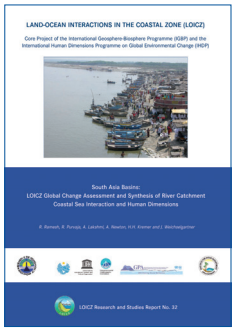
on LOICZ website: **http://www.loicz.org/projects/documents/008804/index_0008804.html.en**

Direct link:

TV Report (only in german)
http://www.rtlregional.de/player.php?id=9860

Radio Report (only in german)
http://www.dradio.de/dlf/sendungen/forschak/1138185/

Publications



New LOICZ R&S Report No. 32

South Asia Basins:
LOICZ Global Change Assessment and Synthesis of River Catchment - Coastal Sea Interaction and Human Dimensions

Edited by

R. Ramesh, R. Purvaja, A. Lakshmi, A. Newton,
H.H. Kremer and J. Weichselgartner

www.loicz.org/products/publication/reports/index.html.en

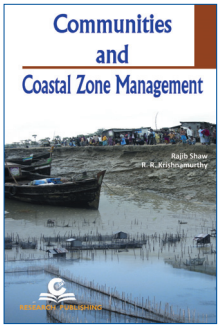
Next volume: No. 36 - Coastal Futures Synthesis report

Communities and Coastal Zone Management book

Editors: **R. Shaw**, Graduate School of Global Environmental Studies, Kyoto University, Japan
R. R. Krishnamurthy, Dept of Applied Geology, School of Earth & Atmospheric Sciences, University of Madras, India

Foreword: **M. S. Swaminathan**

Publisher: **Research Publishing**, Singapore ISBN 978-981-08-2141-8 Pages: 356 Year: 2010



Five years have passed since the devastating Indian Ocean Tsunami of 2004. In some of the affected countries, this event has triggered tremendous changes in the area of disaster risk reduction, whereas in others, it is business as usual. Though coastal zone management has been popular for the last several decades, the emphasis has always been more on policy level interventions. There is still a lot more to be done on the role of communities in coastal zone management, and hence a book entitled **"Communities and Coastal Zone Management"** based on the compilation of case study experiences totaling 23 chapters from about ten countries in the Asia. The book was initiated through a bilateral collaboration project of Kyoto University and the University of Madras, funded by the Japan Society of Promotion of Science (JSPS) and the Department of Science and Technology (DST) of Government of India. To understand the role of communities in coastal zone management, this book presents an integrated framework with the physical, ecological and social dimensions. It is hoped that this book is able to throw some light on the issues related to community based coastal zone management and proves to be useful in generating innovative research and implementation ideas. This book brings several important findings of the collaborative research by Kyoto University and University of Madras addressing some of the urgent research issues in the coastal zone management, with emphasis to community participation and risk communication.

Topics Covered

- coastal zone management issues and community practices
- community based coastal management
- coastal conservation
- resource management
- disaster risk reduction experiences

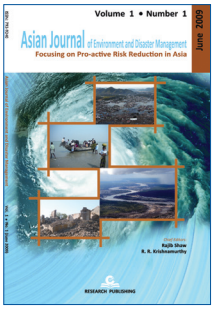
Readership

Practitioners, policy makers, researchers and students in coastal zone management and in the field of disaster risk reduction. The book will assist to generate a better idea on the current trend of research in the field, and will provide basic knowledge on this important topic.

More details:

http://www.rpsonline.com.sg/books/cczm.html

Asian Journal of Environment and Disaster Management (AJEDM) – New journal focuses on environment and disaster related issues in Asia



Focusing on Pro-active Risk Reduction in Asia, the Asian Journal of Environment and Disaster Management (AJEDM) was recently launched by a Singapore based publisher, Research Publishing Services. The journal claims to be the first journal to focus on environment and disaster related issues in the Asian region. According to the journal, the region has created severe environmental problems due to rapid urban growth and is prone to different types of 'natural' disasters.

Focusing on Pro-active Risk Reduction in Asia, Asian Journal of Environmental and Disaster Management publishes significant studies in the fields of environmental and disaster management. The goal of this journal is to establish academic linkages of field practices with specific emphasis on environment and disaster management in the Asian context.

The journal encourages the field practitioners and managers to share their thoughts and experiences and to interact with the academic community so as to fill the gap of research, education and implementation.

The topics include: Disaster risk reduction, Environmental practices; Community based environment and disaster management; Climate change adaptation; Urban risk; Policy framework of environment and disaster management; Disaster-development-environment inter linkage; Human security; Environment disaster education, risk communication; Project management in environment and disaster risk reduction; Post disaster recovery issues and Coastal zone management.

Published twice yearly, this journal provides a forum to communicate research findings, not only through academic research, but also incorporating field based action research. It will have wider authors and readers, which will include the research and academic community, non-government organizations, policy makers and international organizations. The print version of this journal was released during AUEDM workshop held at

Bangkok during 22–24 February 2010. The first issue of this journal is now available electronically.

Prof. Rajib Shaw from Kyoto University, Japan and Prof. R. R. Krishnamurthy from University of Madras, India serve as the chief editors of the journal. The editorial board of the journal includes leading experts in environmental and disaster management.

Additional information

http://rpsonline.com.sg/journals/101ajedm/ajedm.html

VCD entitled "A View on the Indian Coast"

Project SELAMAT Building Resilience to Tsunami in the Indian Ocean

Project Selamat, funded by the European Union (EU), was an initiative of the United Nations – International Strategy for Disaster Reduction (UN-ISDR) and Asian Disaster Risk Reduction Network (ADRRN) http://www.adrrn.net. The project was implemented in India and Maldives by the University of Madras, during 2008-2009. As a direct implementation of the Hyogo framework of action (HFA), the project aimed at building community level coping capacities to achieve long term resilience. A teaching / training module on *"School Safety in Coastal Areas"* prepared by the University of Madras under this project has helped to motivate teachers to promote the culture of disaster preparedness in schools. About 200 school teachers from Tamil Nadu and Orissa states of India were trained through in-house workshops and demonstrations that were jointly conducted with experts from Kyoto University, Japan. A Video CD has been prepared to highlight the vulnerability of India's coastal zone with respect to hazards and disasters which is being freely distributed to schools.

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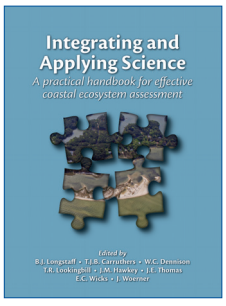


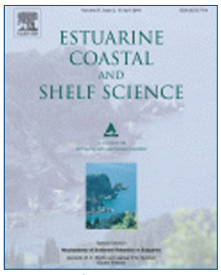
Vast areas of the globe's coastal zone have experienced significant declines in ecosystem health.

Deteriorating water quality, loss and alteration of vital habitats, and reduced populations of fish and shellfish are some of the major changes recorded. Regardless of the differences between cultures, climate regions, and population pressures, integrated management and assessment is required to solve coastal environmental problems.

Establishing and running an effective assessment program is a complex process that necessitates strategic collaboration and partnerships between many individuals and agencies. This book was written to make the process of running a coastal assessment program easier and the outcomes more effective. It provides a step-by-step approach from data collection and information management to synthesis and application and draws on the knowledge of a variety of coastal scientists and managers. The book which understands itself as a contribution to LOICZ is divided into four sections that represent the four major steps needed to apply data within an coastal assessment program: community engagement, community knowledge, environmental information, and data collection.

http://ian.umces.edu/press/books/

Estuarine, Coastal and Shelf Science



is an international multidisciplinary journal devoted to the analysis of saline water phenomena ranging from the outer edge of the continental shelf to the upper limits of the tidal zone. The journal provides a unique forum, unifying the multidisciplinary approaches to the study of the oceanography of estuaries, coastal zones, and continental shelf seas. It features original research papers, review papers and short communications treating such disciplines as zoology, botany, geology, sedimentology, physical oceanography.

Data reports of mainly local interest are discouraged.

Research areas include:

- Numerical modelling of estuarine and coastal marine ecosystems
- Species distribution in relation to varying environments
- Effects of waste disposal
- Groundwater runoff and Chemical processes
- Estuarine and fjord circulation patterns
- Meteorological and oceanic forcing of semi-enclosed and continental shelf water masses
- Sea-surface and sea-bed processes
- Estuarine and coastal sedimentary processes and geochemistry
- Brackish water and lagoon phenomena
- Transitional waters

ISSN: 0272-7714
Imprint: ELSEVIER

Editors
M. Elliott
D.S. McLusky
I. Valiela
E. Wolanski

A recent special issue of this journal accommodates the outcomes of the SCOR LOICZ IAPSO Working Group on 'Mechanisms of sediment retention in estuaries'. (see: Scientific Highlight on page 3)

http://www.sciencedirect.com/science/journal/02727714

For further LOICZ recommended literature please have also a look at the LOICZ website: http://www.loicz.org/news/literature/index.html.en

Coastal Snapshot

South Indian glimpses and cultural historical footprints

Impressions and experiences around the LOICZ SSC Meeting in Chennai, India, March 2010

Report by Bernhard Glaeser and Marion Glaser

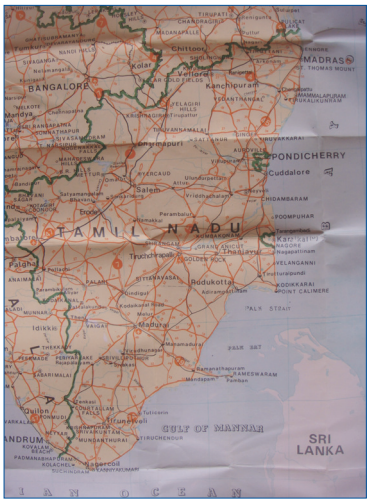


Photo: Bernhard Glaeser

South India is different. One of our colleagues who came to Chennai for the first time summarized her impressions like this: Colors are bright, people are friendly, and the legume based vegetarian diet is both tasty and healthy. Unknowingly, our colleague referred to Tamil Nadu's cultural heritage, with Arian Hinduism as the dominant creed which merged with village gods and ancient proto-Tamil deities. The landscape and the cultural and political history formed what is now the modern society in the south Indian state of Tamil Nadu.

Historical aspects

The cultural and political history of Tamil Nadu (literally, land of the Tamilians) covers 20 to 30 centuries and is thus one of the oldest still existing in the world, comparable almost to that of China, with which there must have been contacts as early as the 2nd century BC. The Tamils are Dravidians, their origin being unclear. It is assumed that the Dravidians were the original Indian inhabitants, Proto-Indians, who were later pushed "down" to South India by the intruding Aryans from Central Asia. They developed a scientific grammar for their language about 1,500 years ago.

The Brahmin culture of the North and the Dravidian culture of the South were entirely different. They spoke different languages, adopted different religious practices, and were accustomed to different social values and structures. However, neither culture believed in intermarriage or dining together. These customs played a role in the emergence of the Indian caste system. At the same time, they practiced social coexistence.

A fusion of the two cultures came about through three waves of Aryan migration to the South between the 4th century BC and the 6th century AD. While northern philosophy, mythology and the Sanskrit language influenced Dravidian patterns, the immigrants adopted southern patterns of living, accepted local deities in the Aryan mythology, and assimilated Dravidian words. The Sangam period (about 100 BC to 300 AD) marks the beginning of recorded Tamil history, it is considered to be the "golden age" of Tamil Nadu cultural history. Tamil poets praised the achievements of their kings. The Pandya dynasty ruled the southern part of the Tamil country, the Cholas ruled the North, and the Cheras ruled the western regions (now Kerala).

According to Sangam literature, society was geographically divided into mountainous, desert, pastoral, agricultural and coastal regions. No mention is made of the four traditional castes, namely, priest, warriors, merchants and farmers. Their food consisted of grains (rice, millet) served with meat, fish, roots and fruits. Vegetarian nutrition was not prevalent; it was popularized later by Jainas, Buddhists and "Brahmanas". Consumption of liquor was looked upon as an innocent pleasure. Premarital love was viewed as something prompted by nature or god. There was faith in astrology. The status of women was one of subordination to men. Slavery was common.

Traditional culture and the social system remained fairly intact throughout centuries, conquests and the maze of dynasties up to the 17th century. This includes the caste system although the number of subcastes and communities was constantly growing. Social change came about through British colonial administration and legislation: After 1801, British authorities unified and centralized the Tamil country. Universities were established, the education of women was introduced, marriages before the age of 14 and *sati* (women dying on their husbands' funeral pyres) were abolished.

The reforms to establish equality between communities and castes struck at Hindu social and religious traditions. Originally, Hindu rational philosophic truths were applicable to all of humanity. The pursuit of *dharma*, doing one's duty, being of selfless service to others, was independent of caste affiliation. Later, physical rites became more important than their underlying concepts. According to P. Kalyanasundaram, many Hindus may not understand what they are performing and why in the rituals and lost Hindu philosophy which emphasized equality and love among all beings (professor and caste Hindu, Brahmin: various personal communications with B. Glaeser in different years).

Religious tolerance: Devotional picture uniting Islam, Hinduism, Christianity. *(Photo: Bernhard Glaeser)*

After independence in 1950, the states within the Indian Union were reorganized on a linguistic basis. The new Madras state, with Tamil as the main language, was born in 1956 and renamed Tamil Nadu in 1969.

Source: Bernhard Glaeser (first published in 1995). *Housing, sustainable development and the rural poor. A study of Tamil Nadu*. Sage Publications (New Delhi/Thousand Oaks/London), 432 pages.

Historic sites

Mahabalipuram, located 60 km south of Chennai (Madras), is one of the classical sites of Indian archaeology and included in the UNESCO's "World Heritage List". Mahabalipuram is a shining example of the Dravidian culture and of the ancient civilization of the Tamils. It was a flourishing seaport and trading center as early as in the 1st and 2nd century AD, visited among others by the ancient Greeks. The monuments and temples were designed during the 7th and 8th century by the Pallava dynasty who ruled over northern Tamil Nadu for about 400 years from the 6th century AD. Mahabalipuram was renamed Mamallapuram after king Mamallan Narasimha Pallavan who defeated the Chaluka king Pulakesin II in 642 AD.

The town of Mahabalipuram *(Photo: Marion Glaser)*

There are four types of sculptures available in India: Bas reliefs (sculptured scenes), cave temples, carved monoliths and masonry temples. Mahabalipuram's unique feature is that it hosts all four types. The 2004 tsunami did not touch the sites. The Shore Temple had been protected by stone walls even before that date. The LOICZ group visited most of the sites; we select a few in this report.

Arjuna's Penance is a massive piece of art, a monument which is 25 m long and 12 m high, which has been carved on the edge of a huge whale shaped rock. It might be the world's largest bas relief, a universe in stone, featuring Arjuna – the hero of the famous Indian epic Mahabharata – doing penance for obtaining a powerful weapon from Lord Shiva, and including more than 150 life like figures, such as gods and goddesses, sages, hunters, wild animals (serpent, lion, elephant, deer) and domestic a nimals (cat, mouse). (see also photo 'Arjuna's Penance' in snapshot article of J. Sethuraman Managing Director of *Hi-Tours* Mamallapuram on page 32)

In the middle of the monument, dividing it vertically into two halves, there is a narrow cleft supposedly representing the descent of the holy river Ganga from heaven to the earth: the Ganges, which originates from the Himalayans and runs through the north Indian plains. This feature seems to be telling us – as did the Greek philosopher Thales of Miletos (624-545 BC) – that water is the lifeline of any existence. It is eye-opening for interdisciplinary LOICZ coastal research and management to note that most civilizations in the world have originated on river banks or coasts.

Drinking water is a scarce commodity worldwide, including the city of Chennai which has experienced water shortage for a long time. So, perhaps, it is Bagiratha's penance depicted here, rather than Arjuna's, as some scholars claim? Bagiratha, the prince of the Solar dynasty, did penance for bringing the holy river Ganges to the earth, only to make the earth fertile. The Ganges rushed to the earth but its might was too strong for the earth to withstand, and Lord Shiva held out his thickly matted hair to hold the descending river and soften its journey. In Judaeo-Christian mythology, a comparable theme is the deluge. More recently, we have become afraid of sea level rise, tsunamis and hurricanes.

Adjacent to Arjuna's Penance lies the Pancha Paandava Cave, a cave temple which was scooped out of the rocks. Just south of it, the Krishna Mandapam (pillared hall) contains a scene, carved in stone, that shows a boy named Krishna (regarded as an incarnation of Lord Vishnu) who holds the mountain in his left hand and lifts it up like an umbrella to protect cow herds and village inhabitants against a storm which was sent by God Indra to punish the villagers for some reason. They use the mountain as shelter, and the village was saved from destruction.

Pancha Paandava Cave, Krishna Mandapam (Photo: Bernhard Glaeser)

A short bus ride away, we find the Five Rathas which are monoliths, free standing temples cut out of solid rock. They are known as *rathas*, which means chariots, because they resemble Indian temple carts. In temple architecture, the monolithic temples followed the cave temples, historically. There are four types of roofs for the five Rathas: the curvilinear roof (resembling a thatched hut), the hood shaped roof (resembling a country wagon), the pyramidal structure, and the arched roof (resembling the back of an elephant). These superstructures can be seen as the first specimen of temple towers *(vimanas)* which form a significant characteristic of South Indian temple architecture. (see also photo 'Five Rathas' in snapshot article of J. Sethuraman, Managing Director of Hi-Tours Mamallapuram on page 32)

The Shore Temple nearby is a masonry temple (8th century), featuring the uniqueness of south Indian temples. This temple used to stand majestically in the sand right on the sea shore (BG still remembers this sight) for more than a thousand years, with the waves gently knocking against it until a wall of rocks was built around it, some years ago, to protect the temple. There had been seven temples on the beach. Only two temple towers remain. Archaeologists believe that the other temples were submerged by the sea. (see also photo 'Shore Temple' in snapshot article of J. Sethuraman, Managing Director of *Hi-Tours* Mamallapuram on page 31)

Source: Srinivaas and J. Prabhakar (no date). *Mahabalipuram. A journey through a magic land.* Thanga thaamarai Publications (Chennai), 119 pages.

Fishery observations

Mahabalipuram has about 15,000 inhabitants, according to the 2001 census. The population consists of basically four communities (castes), according to informant R. Rajesh (citizen of Mahabalipuram, BSc in social work, water management volunteer) who provided the following information. The fishermen all belong to the same community. Apart from the fisher community, there are scheduled communities (masons), Christians and Muslims. Christians and Muslims perform different professions, they are not fishermen.

Beach observation on March 6, from 8 to 9:30 AM): A fishing crew returned home. Three boats had been 8 km offshore with a long Inshore drag net or Peruvalai to be operated by about 20 helpers onshore, dragging the net closer to the beach, including the fish catch in a poche (bag). The larger fish are for the market, the smaller for home consumption.

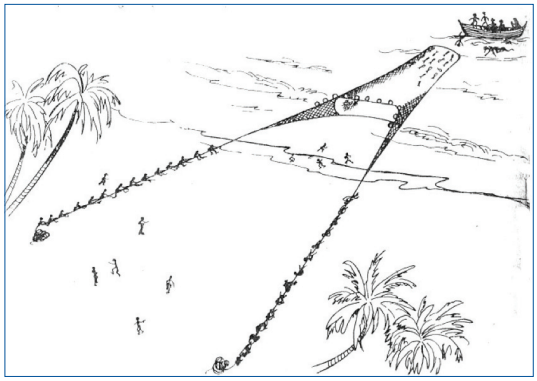
Rapporteur Marion Glaeser, SSC, talking to people digging for crabs on the beach of Mamallapuram. (Photo: Ellen-Barbe Goldberg)

Cooperative fishing (1). Finally on shore (Photo: Marion Glaser)

Cooperative fishing (2) . Checking the catch. (Photo: Marion Glaser)

Women take their share to the Market. (Photo: Marion Glaser)

Women fill baskets with fish to be sold and negotiate a price. If they achieve a surplus they may keep it. The fisher families form a cooperative society and received the net from the government that subsidizes the fishers during monsoon (rainy season) when there is no catch. The fish caught look like sardines (sardinella spp), Indian mackerel (Ratrelliger kanagurta) and probably seer fish *(Scomberomorus guttatus)*. (Sketch and information provided by S. Satheesh, senior research fellow, Institute for Ocean Management, Anna University, Chennai: March 8, 2010).



Inshore drag net (Kara Valai): sketch. S. Satheesh (IOM)

Narambi fishing village (near Pondicherry: LOCZ field trip on March 5, 2010) has a population of about 6,000 who settle along three main streets. Three people died during the 2004 tsunami. An amazing feature: There is internet in the village; they have an internet café. All children go to school, for 10 years. There is no school fee; books, a bicycle and two sets of school uniforms are free. The village is composed of 4–5 castes; it was 2-3 before the tsunami. 300–400 houses were built after the tsunami for the new people to settle here. The members of different castes do not intermarry but share resources and fish together. Fish stocks appear to have been less abundant after the tsunami for no obvious scientific reason; there has been no change in the biodiversity of fish, according to our village informant (B. Baskar, fisherman, Narambi). Generally, fishing income decreased in spite of price increases. The reason is a (fishing) population increase which may also explain the alleged fish stock reduction: The total catch may have been stable but the individual share is less. Collaborative fishing (interviewer: S. Olsen) is performed as follows: One 70 foot boat and around 10 accompanying small boats go 30–40 km offshore to fish. The fishing methods used seem to be the same or resemble the bag net fishing observed in Mahabalipuram.

Narambi fishing village (Photo: Bernhard Glaeser)

Narambi: House interior. (Photo: Bernhard Glaeser)

A concluding remark (following Prof. Srinivasalu) is that there have been fewer conflicts between communities after the tsunami. Fisher families are more prone to send their children to school to keep them away from the sea. Before, they had sent them out to fish instead.

Field trip to Pondicherry: Social and economic observations

Additional observations during the LOICZ field trip to Pondicherry and adjacent sites on March 5, 2010, included a silica (quartz sand) site and a salt extraction site in Ellamman Kovil, as well as a geological site in Thiruvakkarai featuring petrified wood. Pondicherry, about a two hour bus ride south of Chennai, is not part of the south Indian state of Tamil Nadu but a "union territory" governed directly by the union government in Delhi. Pondicherry used to be a French colony which is

still reflected in the architectural style of colonial heritage office buildings or the colorful uniforms of the policemen. The field trip participants were accompanied by Dr. Srinivasalu (professor of geology), Mr. Bani, (tour guide), Mr. P. Aravind Mukesh and Ms. M. Sowmya (both junior research fellows).

Silica (silicon dioxide) appears as quartz, sand flint and agate. In Ellamman Kovil, it is sieved by women to be used for glass production by Glass Containers Ltd., a private company nearby. The women working at the site visited are employed by the public sector, a government project. They earn 150 Rupees/day (3 US $ or 2 €/day).

Women sieving quartz (1) *(Photo: Bernhard Glaeser)*

Women sieving quartz (2) *(Photo: Ellen-Barbe Goldberg)*

The close by salt production site where 60 people work is owned privately. Some, not all of them, are harijans (untouchables below the caste system, called children of God or *harijans* by M. Gandhi). The women who work here earn 70 Rs/day. They do not own land, such as a vegetable garden, nor animals and hardly survive on a day to day basis. They need to buy all their food, including rice which is subsidized by the government and costs 2 Rs/kg. They claim that this rice is hardly edible and buy instead market rice which costs 25 Rs/kg. There is no social security safety net. Their concern is how to survive illnesses or to live when they get old. Government schools (12 years) are free, including books and one set of school uniforms (they need three). Drinking water supply is good and free. They need to pay, however, for electricity which amounts to 150 Rs/month (3 US $ or 2 € /month). Couples come here to work together. Women earn 1,500 Rs/month (30 US $ or 20 €/month). Men who do harder work (digging) earn 3,500 Rs/month (70 US $ or 47 €/month). India's history of liberation from colonial rule still lives on in the fact that salt producers pay no tax to remember Mahatma Gandhi`s famous salt march (making salt without paying tax) in defiance of British rule in India.

Salt extraction *(Photo: Ellen-Barbe Goldberg)*

Rapporteur Bernhard Glaeser, SSC, taking notes.
(Photo: Ellen-Barbe Goldberg)

The fossil wood seen at the Thiruvakkarai National Park (Geological Survey of India) is 30–50 million years old and stems from the Miocene, a division of the Tertiary. The wood was covered by sediments with no access to oxygen when buried. Later, the soil eroded and exposed the petrified wood, hard as stone. The site is part of a shady grove of tamarind *(Tamarindus indica)* and banyan trees

(Ficus benghalensis) that send out adventitious or aerial roots. The grove is protected by sculptures of small temple horses whereby new ones seem to replace "retired" ones regularly.

Conclusions

South India is culturally and ethnically different from the better known North. On the coast this is as manifest in the 2000 year plus stone masonry culture as in the elaborate and apparently successful cooperative structures in artisanal fisheries. An eight-day stay for the LOICZ SSC members showed clearly the rich research potentials in this part of the region.

Mamallapuram: the town which hosted the 21. LOICZ Scientific Steering Committee Meeting

An article from J. Sethuraman Managing Director of *Hi-Tours* Mamallapuram Pvt. Ltd

It is great privilege to write about the town which hosted the 21. LOICZ Scientific Steering Committee Meeting organized by the LOICZ Node South Asia.

Coastal town Mamallapuram (Photo: Ellen-Barbe Goldberg)

Mamallapuram a coastal town in South India is one of the lesser known destinations in India. This town has been around since the 7th century and it is tucked away so well that one can reach this town within 10–12 hours from all continents. I reckon this could be one of the reasons that this port town was a popular tourist cum port destination as early as 7th century. Now it is no more a port but in many ways it acts as one, for the thousands of tourists who touch South India .A great place to get accustomed/acclimatised to India with friendly faces welcoming the foreign guests and miles and miles of empty beaches.

Located very close to the city of Madras now known as Chennai, this town has a unique combination of being a very Indian village which has built itself in a very Indian way to cater to the needs of every type of tourist. Mamallapuram came to be known as the city of Mamalla, after the title of great Pallava ruler Narasimhavarman-I (AD 630-68). It was a sea-port during the time of Periplus (1st century AD) and Ptolemy (AD 140) and many Indian colonists sailed to South-East Asia through this port town. While there is some evidence of architectural activity going back to the period of Mahendravarman-I (AD 600-30), the father of Mamalla, most of the monuments like rock-cut rathas, sculptured scenes on open rocks like Arjuna's penance, the caves of Govardhanadhari and Mahishasuramardini, the Jala-Sayana Perumal temple (the sleeping Mahavishnu or Chakrin at the rear part of the Shore temple complex) are attributed to the period of Narasimhavarman-I Mamalla.

Shore Temple at Mamallapuram (Photo: Ellen-Barbe Goldberg)

Recently after the Tsunami hit Mamallapuram ,it exposed certain excavations to the north and south of the Shore Temple which have revealed rock-cut figures representing religious themes of period prior to the construction to the temple. Besides, a monolithic Bhuvaraha, a reclining image of Vishnu, the base of Durga shrine with deer and a square socket possibly to accommodate mahastambha have also been exposed. To the south of the Shore Temple was exposed a stepped ghat facing the sea. Looking at these structures it once again reminds us of the fact the sea level was much lower than what it is at the present.

The archaeological marvel that one finds in Mamallapuram, makes one wonder as to where did this inspiration come for the creators of these marvels and I believe it is from the town itself. As a person belonging to this town I find this town to be a very inspiring place and I have met quite a few that agree with me on this . A good friend of mine Mr. Rob de Laet founder of a big adventure company in Netherlands always came back to this town for inspiration. He conceived the idea here at Mamallapuram and came back every time to be inspired more. So do other business friends. One can feel this

inspiration the moment you get into Mamallapuram and the inspiration takes over. I have been living here for the past 42 years and my family for a much longer period. I am able to track down my family past here for the past ten generations. It is this inspiration that has kept us here and I would like all of you out there to come and experience this.

This town has played host to quite a few greats and celebrities'. Most heads of states and royalty starting from Prince Charles, Princess Diana have stayed here in Mamallapuram. Back in the sixties and seventies this town was a popular destination with the then USSR citizens. This influence can still be seen with locals who can speak Russian which they had picked up trying to barter things with the tourists from USSR. In the recent years this town has been receiving visitors from as far as South America and the list is growing.

Five Rathas, Mamallapuram (Photo: Ellen-Barbe Goldberg)

Mamallapuram is a small town and it's the perfect place to wind down from your flight and acclimatize to the Indian climate. Mamallapuram is most known for her 7th century World Heritage rock-cut monuments. The most famous of these are the Shore Temple, which looks out over the tranquil beach, and the Five Rathas, a collection of small gems resembling chariots. Very beautiful is Arjuna's Penance, a relief carving displaying scenes from the ancient epic tales of the Mahabharata.

The people of Mamallapuram still cut impressive statues from rocks. All through the easy going village you'll see the sculptors creating amazing images from pieces of stone, coaxing flowing images out of immutable rock.This town offers a unique combination of being a small Indian town with all its buzz with 7th monuments that would enthral you. One can roam around this town with a bicycle or join the fisherman on a catamaran ride into the sea to explore the archaeological sites beneath the ocean.

Arjuna's Penance, Mamallapuram
(Photo: Ellen-Barbe Goldberg)

International guests have been visiting this town for over 20 centuries now and one would expect the influence to be adverse on the town. Luckily the impact has been quite minimal in comparison to other places mainly due to the strong family bondage that comes with the culture. It has rather helped this town to broaden its thoughts and appreciate the culture that we come from. Thought the tsunami in late 2004 did a lot of destruction to this town it also turned around lives of many people.

Fishermans boat and net, Beach Mamallapuram.
(Photo: Ellen-Barbe Goldberg)

Many fisherman got new houses, new boats and nets to sustain their livelihood. The old had the access to better health care .The children suddenly had the support of numerous generous hearts that had provided education and employment oppurtunities. For the town of Mamallapuram we got two new archaeological sites as well.

Life after the tsunami had changed the perspective of the people of this town a lot. The exposure and attention that this part of the country got was enormous. First of all

the word tsunami was more widely understood. The threat and danger it could bring was more widely understood. My father went back to shave after he came to know that a tsunami wave has hit our town. Our house was a mere 300 mts from the shore line. Such was the information available prior the 2004 tsunami. The people in this town have started looking beyond their town and have started to see and read more of the news beyond India. Internet usage became more and use of Email as a communication tool increased. All of this has raised the overall awareness of the people of Mamallapuram.

The post tsunami aid and rehabilitation programmes have gifted this town a new school, and a new hospital. This has followed by a new waste water treatment plant and a solid waste bio gas plant. This when completed would bring down the carbon emission of this town by a considerable margin.

During the summer of last year we had a big surge of the sea and the land was pushed in by more than 75 mts at the coast. This has caused a lot of panic and has lead to awareness about climate change and geohazards and the effect it would have on the town of Mamallapuram. This has prepared the minds of people to look out for other options as well.

The change in the climate has made people realize that it is a universal problem and more and more people want to do their bit to slow down the process. This is a very positive change.

So come and enjoy this wonderful place.

Further articles of 'Coastal Snapshots' can be found here:

http://www.loicz.org/Snapshot/index.html.en

If you also want to become a “LOICZ Snapshot Reporter” please send your “Snapshot article” to: b.goldberg@loicz.org

Have you seen

IOC celebrates its 50th anniversary

The IOC celebrates its 50th anniversary in 2010. Beginning with the International Indian Ocean Expedition in 1960 the IOC has worked tirelessly for fifty years to promote international cooperation in researching and protecting the ocean.

The IOC 50th Anniversary Web Page is now posted. Learn more about Fifty years of IOC history and the many IOC 50th Anniversary events which will be held around the world.

Go the IOC web page **http://ioc-unesco.org**
Click on the 50th Anniversary Logo or the links in the main banner item or the menu link under "The Commission".

Opportunities and Challenges for Sustainability in an Urbanizing World

The International Conference on Urbanization and Global Environmental Change creates the first opportunity for a joint meeting and discussion between international scholars and practitioners who work at the interface of urban areas and global environment change. Our main goal is to promote a stronger collaboration between academics, political decision-makers, and practitioners, acting at local, regional, and global scales in order to capture the benefits of urbanization, as well as mitigate and adapt to global environmental and socioeconomic change and its impacts.

The UGEC Conference will work closely with the Global Land Project (GLP) Open Science Meeting, held October 17–19. GLP is a joint research project for land systems for the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme (IHDP). Both conferences will be held back to back with one overlapping day, in which the two programs will focus on the themes surrounding the urban, land, and climate change interface.

http://www.ugec2010.org/

International summer school on 'Climate Change in the Baltic'

From 5 –18 Sept 2010, the Leibniz Institute for Baltic Sea Research Warnemuende (IOW) will host an international summer school on 'Climate Change in the Baltic: From global problems to local adaptation'. Since summer 2002 IOW, together with the Alfred-Wegener Institute for Polar and Marine Research (AWI) and the Research Centre GKSS Geesthacht, offers annual summer schools in a rotating schedule. A team of prominent lecturers from all 3 institutions together with a group of 20 participants will through lectures and hands-on exercises cover topics such as global scenarios, models and consequences, risks, vulnerability & adaptation, marine ecology, marine chemistry, ecosystem modelling and coastal protection. EUCC – the Coastal & Marine Union, Germany will support the summer school as local organisers.

Application is open to graduates or post-graduates, preferably in natural, life or geosciences, yet other applicants with a strong interest in coastal research and climate change are welcome, too. Deadline for application is 15 May 2010.

More information can be found under:
www.io-warnemuende.de/summer-school-2010-en.html.

Calendar

2010

Fifth Global Conference on Oceans, Coasts and Islands – Global Oceans Conference 2010 Advancing Integrated Ocean Governance At National, Regional, And Global Levels

May 3rd – 7th 2010, UNESCO Paris, France
More information:
http://www.omrn-rrgo.ca/bulletinBoard/GOC2010_Flyer.pdf

4th International Meeting of world Ocean Network

05–12 May 2010
Boulogne sur Mer, France
www.worldoceannetwork.org
E-mail: meeting@worldoceannetwork.org

CENOZOIC TECTONICS, LANDFORM EVOLUTION AND CLIMATE CHANGE IN ASIA

Venue: School of Earth Sciences and Engineering, Nanjing University, Nanjing, China

May 8–21, 2010; May 8–9: Scientific session; May 10–21: Excursion to southern part of Tibetan Plateau "Cenozoic Tectonic and Sedimentary Geology in the Southern Tibetan Plateau"

Earth System Science 2010: Global Change, Climate and People

The AIMES Open Science Conference
Edinburgh, 10–13 May 2010
http://www.earthsystemscience2010.org

IInd International Symposium on Sediment Management"

11th to 13th May 2010 in Casablanca – Morocco
E-mail: akerbec@menara.ma
Web site: http://www.amcemorocco.ma

ASLO-NABS 2010 Meeting

Global Changes from the Center to the Edge
June 6–11, 2010
Santa Fe, New Mexico, USA
http://www.aslo.org/forms/santafe2010.html
Session proposals must be submitted online by 23:59 U.S. Central Daylight Time, 30 September, 2009

IPY Oslo Science Conference

08–12 June 2010
Oslo, Norway
http://www.ipy-osc.no/

Goldschmidt™2010 – Earth, Energy and the Environment

June 13–18 in Knoxville, Tennessee, USA
http://www.goldschmidt2010.org/index

38th Conference of the International Association for Danube Research (IAD)

"Large River Basins – Danube meets Elbe – Challenges – Strategies – Solutions"
June 22–25, 2010, in Dresden, Germany.
www.iad-dresden-2010.de

11th INTERNATIONAL MEETING on STATISTICAL CLIMATOLOGY

JULY 12–16, 2010, UNIVERSITY OF EDINBURGH, SCOTLAND
http://cccma.seos.uvic.ca/imsc/11imsc.shtml

5th International Conference on Environmental Science and Technology

July 12-16, 2010 in Houston, Texas, USA.
conference Website at
http://www.AASci.org/conference/env/2010
email inquiries to env-conference@AASci.org.

ICES Symposium on the Collection and Interpretation of Fishery Dependent Data

Galway, Ireland, 23–26 August 2010
An international conference for managers, scientists and the fishing sector on the collection and interpretation of traditional and non-traditional information in the context of the ecosystem approach
http://www.marine.ie/fisherydependentdata/

Eight International Training Workshop on Integrated Coastal Management in the Mediterranean and the Black Sea

(MEDCOAST Institute 2010). 31st August – 16th September 2010, in Dalyan/Southern Aegean coast, Turkey. The deadline for application is 31st May 2010.
http://www.medcoast.org.tr/

Littoral 2010 – an international conference for researchers and practitioners "Adapting to global change at the coast: Leadership, Innovation, and Investment"

21st to 23rd September 2010
Littoral is organised by CoastNet and Eurocoast, and is to be held at the Royal Geographical Society, London. Call for Papers, deadline 21st December 2009:
http://www.coastnet.org.uk/Littoral-2010-Call-for-papers
Further information: http://www.coastnet.org.uk/Littoral2010

Deltas in Times of Climate Change

September 29th – October 1st, 2010, Rotterdam, The Netherlands
For further information, see www.climatedeltaconference.org/

The International Conference 'Deltas in Times of Climate Change'

September 29 – October 1, 2010, Rotterdam, the Netherlands
February 15: deadline for submission of abstract
www.climatedeltaconference.org

International Conference on Urbanization and Global Environmental Change

organized by the UGEC project (www.ugec.org). October 15th–17th 2010 at Arizona State University, located in Tempe, Arizona, USA.

conference website: www.ugec2010.org

"Urban futures and human and ecosystem wellbeing"

It is co-organised by UNESCO, SCOPE and the Chinese Academy of Sciences in Shanghai, China, on 26–30 October 2010.

http://www.icsu-scope.org/

3rd International Conference on the Management of Coastal Recreational Resources, Beaches, Yachting, Ecotourism & Conservation and Coastal Hazards

Grosseto, Southern Tuscany, Italy 27 – 30 October 2010

http://www.um.edu.mt/iei/mcrr3-2010

Topical Conference Earth Observation for Land-Atmosphere Interaction

ESA, in collaboration with iLEAPS and EGU, will organise the Topical Conference Earth Observation for Land-Atmosphere Interaction Science, next 3–5 November 2010 at the premises of ESA-ESRIN in Frascati (Rome), Italy.

An ICES/NASCO/NPAFC Symposium on Marine Mortality of Salmon

will be held in October 2010 in Europe with Niall Ó Maoiléidigh (ICES), Malcolm Windsor (NASCO), and Jim Irvine(NPAFC) as Conveners. A Scientific Steering Group will be established with members nominated by each organisation to assist the Conveners in planning the Symposium.

The initial IGCP588 "Preparing for Coastal Change" meeting

will be organised in conjunction with the INQUA Coastal Marine Processes Commission conference. The meeting will be held at the University of Hong Kong from 30th November – 4th December 2010.

5th International Nitrogen Conference N2010 – Reactive Nitrogen Management for Sustainable Development - Science, Technology and Policy

New Delhi from 3–7 December 2010.

www.n2010.org and www.initrogen.org

2011

Coastal Sediments 2011

May 2–6 in Miami, Florida, at the Miami Regency Hyatt

More information at: http://coastalsediments.cas.usf.edu/

International Symposium on Integrated Coastal Zone Management

03–07 July 2011

Arendal, NORWAY

http://www.imr.no/iczm/

2012

International Polar Year (IPY) "From Knowledge to Action"

Montreal, Quebec, April 22–27, 2012. For more information please see the News

Release at:

http://www.ainc-inac.gc.ca/ai/mr/nr/s-d2009/23301-eng.asp

All dates are also available on our website:
EVENTS UPDATE – for a complete list of the planned events and conferences please visit:
http://www.loicz.org/calender/index.html.en
If you have news, announcements and events of interest for the LOICZ community do not hesitate to contact us!





Publication details

The LOICZ Newsletter is produced three times per year to provide news and information regarding LOICZ activities. The views and opinions in this newsletter do not necessarily represent the position of LOICZ or its sponsoring organizations.

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LOICZ in brief

LOICZ aims to provide science that contributes towards understanding the Earth system in order to inform, educate and contribute to the sustainability of the world's coastal zone. LOICZ is a Core Project of the International Geopsphere-Biospere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP).

The LOICZ IPO is hosted by the Institute for Coastal Research at GKSS Research Centre which is part of the Helmholtz Foundation.

LOICZ research as outlined in the science plan and implementation strategy is organised around five themes:

- Vulnerability of coastal systems and hazards to society
- Implications of global change for coastal ecosystems and sustainable development
- Human influences on river-basin-coastal zone interaction
- Biogeochemical cycles of coastal and shelf waters
- Towards coastal system sustainability by managing land-ocean interactions

The Science Plan and Implementation Strategy is available electronically on the LOICZ website and in hard copy at the LOICZ IPO.

Get involved

If you wish to contribute to LOICZ INPRINT please send an e-mail to: loicz.ipo@loicz.org or visit the LOICZ website www.loicz.org for article requirements.

If you have a project you would like to affiliate to LOICZ please go to www.loicz.org and click on research for detailed information.

LOICZ

GKSS FORSCHUNGSZENTRUM in der HELMHOLTZ-GEMEINSCHAFT

GLOBAL CHANGE IGBP International Geosphere-Biosphere Programme

IHDP International Human Dimensions Programme on Global Environmental Change