



Land-Ocean Interactions in the Coastal Zone



INPRINT

- LOICZ SSC needs new enthusiast experts – call is open (deadline is 15 September, 2008)
- 19th SSCM in Cape Town: towards the LOICZ interim synthesis and new avenues in science
- Host institute director F. Colijn, GKSS, is new Associate Member to the LOICZ SSC
- In the biogeochemistry context we feature first steps towards a multiannual budget of the Mediterranean. The LOICZ approach, its implications for scenarios and evaluating institutional response are the background
- Linking Nutrients, Eutrophication, and Harmful Algalblooms is focus of the new SCOR, CAS, LOICZ WG 132
- ENCORA and SPICOSA, two high profile affiliated projects in the context of coastal management and networking, are featured and their approach, achievements and perspectives discussed
- Socio ecological systems assessment sees two important events with LOICZ participation
- Governance baseline assessments in Latin America proceed and EcoCostas and LOICZ are pushing the Train of Trainer and certification approaches
- Coastal Snapshots: a new series today featuring "Coastal Burma".



*Protea: South African national flower.
Foto: H. Kremer*



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Scientific Highlights

Towards a LOICZ Biogeochemical Budget for the Mediterranean Sea – Initial Steps

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Although making up about 1% of the total world ocean surface, the Mediterranean Sea is often used as a representative model of the world's oceans. Due to its practically enclosed character, it is also often used to assess the global change of the environment. Anthropogenic activities have contributed significantly to the existing nutrient enrichment and consequent eutrophication problems in the Mediterranean Sea. At the present, however, mainly due to the favourable circumstances regarding the hydrology, morphology as well as absence of significant upwelling of the Mediterranean basin as a whole, severe eutrophication cases are limited to specific coastal areas (UNEP 2003).

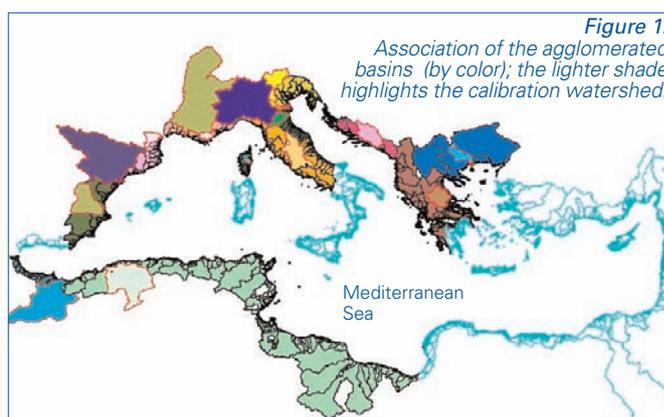
To obtain a detailed knowledge of biogeochemical processes taking place in the Mediterranean Sea, a budget approach was adopted, as proposed by LOICZ. As part of the input to the LOICZ budget, the nutrient loads from contouring land need to be estimated. In fact, an evaluation of the nutrient loads from the adjacent land surfaces lends itself to be used to interpret past, existing and future legislation using scenario analyses, reflecting different expected or known events. The sequence of budgets follows four steps: water budget, salt budgets, nonconservative materials and stoichiometric linkages among non-conservative budgets.

Setting up the Components for the LOICZ budget

Precipitation and evaporation estimates over the Mediterranean Sea were derived from the ERA-40 re-analysis datasets. Such datasets are the result of a collective effort based on the ERA-40 re-analysis project, carried out by the (ECMWF), in collaboration with a number of institutions in Europe, Asia and North America. Precipitation and evaporation data over land were retrieved from the MARS database (<http://agrifish.jrc.it>) for the period 1996–2002 and from pure model data derived from the operational model (IFS) of ECMWF for the remainder of the period (2002 to 2005).

Water and nutrient flows from land were estimated using the AVGWLF model (Evans et al. 2008). Model data requirements (mandatory and optional) are listed in Table 1, along with the data actually used to perform the simulation. For a more detailed description of the model, the reader is referred to Evans et al. (2008). Except for the Nile River, all Mediterranean-discharging watersheds were considered in the present work. The Ebro, Rhone and Po rivers were simulated as single basins. The remaining watersheds were agglomerated into 62 larger

watersheds (see Fig. 1, including the Nile watershed) to reduce the total simulation time. The AVGWLF model was used to simulate the streamflow and nutrients for each of the larger 65 watersheds. Resulting average streamflow and TN and TP loads were aggregated for all 65 watersheds for the period 1996–2005, and compared to estimates for TN and TP as reported in EEA/UNEP (1999) and UNEP/FAO/WHO (1996). The EEA/UNEP (1999) estimates were based on land-based inputs to the Sea, while the UNEP/FAO/WHO (1996) approximations were based on the 50 largest rivers discharging into the Mediterranean Sea.



Results obtained were thus calibrated using the only data found for this purpose (i.e., UNEP/MAP/MED POL 2004). These data are in form of annual averages; however, the reference period for these averages is not reported. Due to the limited amount of actual data available for calibration purposes, the only measure for calibration used was to first match the average annual values for streamflow and then for nutrients (when available). The calibration was undertaken using 15 of the individual basins. At a post-calibration stage, the calibrated values were assigned to the original aggregated basins geographically located close-by around the respective calibrated individual basin and having similar hydroenvironmental conditions and characteristics. There were no reliable data available in an area stretching from basins in the Asian part of the Mediterranean Sea to the northeastern African part. The final calibrated values were then applied to the respectively hydro-environmentally similar and adjacent agglomerated basins. Figure 1 shows the association of the agglomerated basins with each respective individual basin. Outputs of the agglomerated basins for which a calibrated basin was available were re-estimated.



Table 1: Data and data sources available and used by the AVGWLF model.

	Data Type	Description	Mandatory/Used	Source
SHAPEFILES	Weather stations	Weather station locations (points)	Y / Y	MARS STAT ¹ (2007)
	Point Sources	Point source discharge locations (points)	N / N	
	Water Extraction	Water withdrawal locations (points)	N / N	
	Tile Drain	Locations of tile-drained areas (polygons)	N / N	
	Basins	Basin boundary used for modeling (polygons)	Y / Y	CCM2 ² & WWF ³ (2006, 2007)
	Streams	Map of stream network (lines)	Y / Y	CCM2 ² & WWF ³ (2006, 2007)
	Unpaved Roads	Map of unpaved roads (lines)	N / N	
	Roads	Road map (lines)	N / N	
	Septic Systems	Septic system numbers and types (polygons)	N / Y	ELISA ⁴ (2001)
	Animal Density	Animal density (in AEUs per acre) (polygons)	N / Y	FAO GeoNetwork (GLiPHA) ⁵ (2005)
	Soils	Contains various soil-related data (polygons)	Y / Y	ESDB ⁶ & ISRIC-WISE ⁷ (2003, 2006)
	Physiographic Provinces	Contains hydrologic parameter data (polygons)	N / Y	
GRID FILES	Land Use/Cover	Map of land use/cover (16 classes)	Y / Y	Corine 2000 ⁸ & Global Land Cover 2000 ⁹
	Elevation	Elevation grid	Y / Y	SRTM ¹⁰ (2006)
	Groundwater-N	Background estimate of N in mg/l	N / N	
	Soil-P	Estimate of soil P in mg/kg (total or soil test P)		

¹ <http://agrifish.jrc.it/marsstat>

² Vogt et al. (2007)

³ <http://www.worldwildlife.org/science/projects/freshwater/item1991.html>

⁴ <http://elisa.jrc.it/website/imsstartv2.html>

⁵ <http://www.fao.org/ag/aga/glipha/index.jsp>

⁶ <http://eusoils.jrc.it>

⁷ <http://www.isric.org>

⁸ <http://image2000.jrc.it>

⁹ <http://www-gem.jrc.it/glc2000>

¹⁰ <http://www2.jpl.nasa.gov/srtm/>

The subsequent output for streamflow and TN and TP was aggregated and then added to the agglomerated basins for which no calibration could be undertaken. The results are reported in Table 2. Calibrated total streamflow does not include the Nile River, whose discharge to the Mediterranean Sea is estimated at approximately 0.5×10^{10} m³/yr (EEA/UNEP 1999). After adding the Nile river estimate to the calibrated, simulated average, an estimate of 4.14×10^{11} m³/yr is obtained for the Mediterranean Sea, excluding the Black Sea and Strait of Gibraltar inputs. This value compares relatively well with

the streamflow from the EEA/UNEP (1999) estimate of 4.73×10^{11} m³/yr. The TN and TP estimates from the calibrated simulation run, on the other hand, fall within the range or very close to the range given by the UNEP/FAO/WHO (1996) estimations. They are, however, a magnitude higher than the EEA/UNEP (1999) estimates. As previously mentioned, due to lack of calibration data the Middle Eastern part of the AVGWL F model could not be calibrated. In addition, the AVGWL F model did not incorporate any dams.

Table 2: Calibrated AVGWL F simulation results in comparison to EEA/UNEP (1999), UNEP/FAO/WHO (1996) and Vollenweider et al., (1996) estimations.

Parameter	AVGWLF Calibrated Results (average \pm standard deviation for 1996–2005) ¹	EEA/UNEP (1999) ²	UNEP/FAO/WHO (1996) ³	Vollenweider et al. (1996)
Streamflow (m ³ /yr)	$3.64 \times 10^{11} \pm 0.53 \times 10^{11}$	4.73×10^{11}	–	–
Total Nitrogen (ton/yr)	$1.67 \times 10^6 \pm 0.55 \times 10^6$	0.3×10^6	$1.5\text{--}2.5 \times 10^6$	4.05×10^5
Total Phosphorous (ton/yr)	$0.10 \times 10^6 \pm 0.02 \times 10^6$	0.02×10^6	$0.15\text{--}0.25 \times 10^6$	3.38×10^4

¹ Without Nile basin, Black Sea and Strait of Gibraltar inputs.

² 50 largest rivers discharging into the Mediterranean Sea for streamflow and riverine input into the Mediterranean Sea for TN and TP.

³ Land-based range.

Water Exchange estimates at the Straits of Gibraltar and Dardanelles are available in the literature. In particular, estimates for the Gibraltar Strait can be derived from the works of Bryden & Kinder (1991) and Bryden et al., (1994). Estimates for the Dardanelles Strait can be derived, for example, from Stashchuka & Hutter (2001) and Besiktepe (2003).

Multibox Approach for Internal Compartment Exchange. Due to the high variability in nutrient conditions in the Mediterranean Sea, the LOICZ multi-box modeling approach seems the most sensible option to evaluate nutrient budgets. For this reason, a feasibility study has been carried out using the results of a multiannual run (1986 to 2005) of a 3D hydrodynamic model of the Mediterranean (Burchard & Bolding 2002; Stips et al., 2004) to calculate water fluxes between several regions (Figure 2). The average values (Table 3), correspond to the analysis of monthly data simulation files from 1986 to 2005.

Work In-Progress and Future Developments

As stated previously, the final objective of the work is to carry out a multiannual LOICZ balance for the

Mediterranean Sea and use this balance as a baseline for scenario analysis. Results from the exercise will allow studying the influence of the implementation of environmental policies such as the EU-Water Framework Directive and the EU-Marine Strategy Framework Directive, as well as the impacts of global change on the whole Mediterranean Sea.

<http://www.wfdireland.ie/>

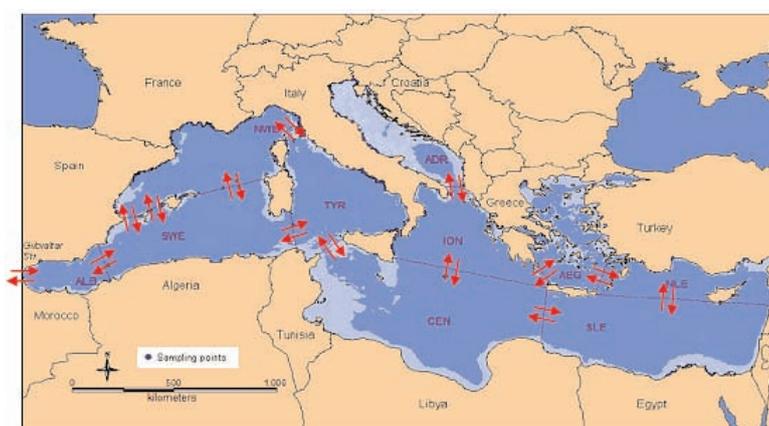


Figure 2: Mediterranean sub-basin definition (modified from Gómez-Gutiérrez et al., 2007).



Table 3: Estimated fluxes between Mediterranean sub-regions.

Region	Flow (106 m ³ s ⁻¹)	Std (106 m ³ s ⁻¹)
Atlantic ALB	0.401	0.089
ALBtoAtlantic	-0.337	0.064
ALBtoSWE	1.768	0.426
SWEtoALB	-4.2545	0.709
Ibiza Channel		
SWEtoNWE	0.482	0.266
NWEtoSWE	-0.266	0.243
Ibiza-Mallorca		
SWEtoNWE	0.178	0.123
NWEtoSWE	-0.145	0.096
Mallorca-Menorca		
SWEtoNWE	0.024	0.019
NWEtoSWE	-0.046	0.032
Menorca-Sardinia		
SWEtoNEW	3.902	1.211
NWEtoSWE	-4.982	1.474
SWEtoTYR	0.418	0.255
TYRtoSWE	-0.696	0.191
NWEtoTYR	-0.001	0.004
TYRtoNWE	0.637	0.147
TYRtoCEN	-0.348	0.126
CENtoTYR	0.208	0.140
IONtoADR	0.465	0.189
ADRtoION	-0.319	0.117
CENtoION	9.361	1.859
IONtoCEN	-11.809	2.426
IONtoAEG	0.390	0.229
AEGtoION	-0.176	0.167
CENtoSLE	2.548	1.483
SLEtoCEN	-3.832	1.245
Creta-Cyprus		
SLEtoNLE	5.427	1.095
NLEtoSLE	-5.589	1.025
Cyprus-Continent		
SLEtoNLE	0.976	0.289
NLEtoSLE	-1.035	0.035
AEGtoNLE	0.648	0.198
NLEtoAEG	-0.282	0.137

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SPECIAL FEATURE – LOICZ Affiliated Activities


**ENCORA:
Sharing Coastal Knowledge
within Europe**

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Abstract

Europe's coastal zones face increasing development, human occupation and resource exploitation; vulnerability to extreme events is aggravated by sea level rise and other impacts of climate change. The development of adequate responses is hindered by the existing institutional fragmentation. New structures and tools for communication, cooperation and research are needed. The European Network for Coastal Research, ENCORA, has taken on this challenge through the development of a number of networking services. In this paper a brief outline is presented.

Fragmentation of Europe

Europe is strongly tied to the sea and European coastal zones represent important economic and environmental assets. The land area within 10 km from the shoreline covers 13 % of the total land area of the European Union and hosts almost 20 % of its population¹. About 15 % of the shoreline is urbanized and another 15 % has a special environmental protection status (NATURA 2000)¹. Other figures illustrating the importance of the coastal zone are given in the table below.

Table 1: Some characteristic figures of the EU coastal zones.

Coastline length ²	185,000 km
Coastline suffering from erosion ²	20,000 km
Land area within 10 km from the shoreline ¹	600,000 km ²
Number of inhabitants in this area ¹	80 million
Number of coastal cities with more than 50,000 inhabitants ¹	280
Number of EU inhabitants living below sea level	8 million
Number of merchant harbors	1200
Number of marina's ³	4000
Annual value coastal tourism ³	75 billion EUR

There is probably no other region of the world where so much effort is spent on coastal management and coastal research and where so many organizations are involved. Throughout the EU there are more than 300 institutes for coastal and marine research, employing some 10,000 scientists. An even larger number of organizations deal

with policy and managerial issues related to the coastal zones and adjacent seas. For instance, in each of the 20 coastal countries of the EU, several state administrations supervise or have responsibility over various aspects of coastal policy and management and they have delegated part of these responsibilities to altogether some 400 regional coastal administrations (EU NUTS3 level)¹ and to many thousands coastal communities.

Coastal zone development in Europe is progressing at a high rate. In Portugal, for instance, coastal urbanization has increased by more than 30 % in the period 1990–2000. The area covered by windfarms in the European coastal seas is doubling every 5 years and this rate of increase will probably continue over the next decades⁴. The upcoming awareness of climate change and its impacts modifies the long-term perspective of existing coastal management policies and is triggering debates on the sustainability of existing practices.

Many similarities exist among studies and projects carried out in the different EU coastal zones and there is clearly a great potential for optimization by learning from mutual experiences. This may avoid unsustainable practices leading to increased vulnerability, increased coastal erosion, loss of coastal habitats and coastal pollution. Successful strategies, for instance, those based on stakeholder involvement, on coastal planning or soft engineering, could be multiplied. Of course, regional specificity has to be taken into account. Learning from mutual experience does not imply copying solutions, but is most useful for better understanding the reasons for success or failure of coastal practices and strategies.

However, fragmentation over many countries, administrations and institutes is a serious obstacle to taking full advantage of Europe's rich capital of knowledge and experience. To overcome this fragmentation the European Commission launched in 1995 the *Demonstration Programme on Integrated Coastal Zone Management (ICZM)*, designed around a series of 35 demonstration projects and 6 thematic studies to provide technical information about sustainable coastal zone management and to stimulate a debate among the various actors involved in the planning, management or use of European coastal zones⁵.

¹ The Changing Faces of Europe's Coastal Areas 2006. http://reports.eea.europa.eu/eea_report_2006_6/en

² EC 2004. Living with Coastal Erosion in Europe - Sediment and Space for Sustainability. Luxembourg, ISBN 92-894-7496-3. http://www.euroSION.org/project/euroSION_en.pdf

³ An Integrated Maritime Policy for the EU – An Ocean of Opportunity 2007. http://ec.europa.eu/maritimeaffairs/ppt_pres_en.html

⁴ Wind Energy Statistics World Wide. <http://home.planet.nl/~windsh/stats.html>

⁵ EC 1999. EU Demonstration Programme on Integrated Management in Coastal Zones 1997–1999. Towards a European ICZM Strategy.

Based on the results the Commission formulated a *Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe*, adopted in 2002 by the European Parliament and the Council⁶. This Recommendation called the Member States to take a strategic approach to the management of their coastal zones following principles of sound and sustainable practices. However, as the Recommendation did not impose binding commitments it has had less impact on coastal zone management than the more general EU environmental directives, such as the Birds Directive, the Habitats Directive and the NATURA 2000 Initiative. The European Commission has recently developed a *Maritime Policy*⁷ promoting a common approach to coastal and marine management. One of the pillars of this policy is the European Marine Strategy Directive⁸, which has been adopted by the European Parliament in December 2007.

The ENCORA Initiative

The ENCORA initiative, launched in 2006, also addresses the issue of fragmentation in European approaches to coastal and marine management. ENCORA stands for European Network on Coastal Research, a Coordination Action co-funded by the EU 6th Framework Programme. It follows a bottom-up approach and is therefore complementary to the policy initiatives mentioned above. The R for Research does not imply that ENCORA is a mere science-oriented network. In reality, ENCORA develops several services to facilitate sharing of knowledge and experience across Europe within and between the communities of coastal science, policy and practice:

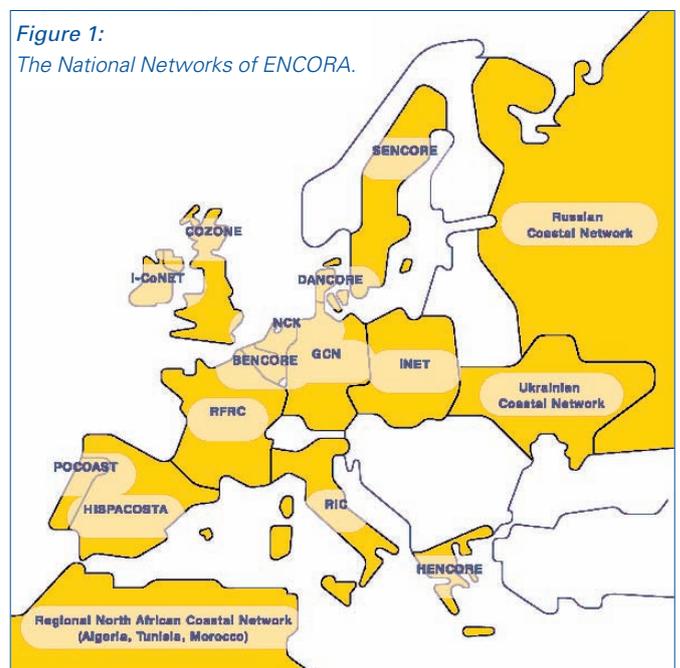
- Sharing knowledge among research institutes, to increase the quality and efficiency of research programs;
- Sharing expertise among coastal management organizations, to spread best coastal practices throughout Europe;
- Sharing experience among policy organizations, to harmonize of coastal policies in Europe for sustainable development.

The ENCORA networking mechanisms also aim at strengthening the interaction between science, policy and practice. This interaction is often weakly developed but it is crucial for developing truly sustainable coastal management strategies, anticipating risks related to climate change and sea level rise.

ENCORA is built on national coastal networks established in 13 EU countries and on 10 thematic networks, see Figure 1. The national networks facilitate sharing knowledge and experience among scientists, policymakers and practitioners in each country; the coordination offices of these networks also work together to facilitate sharing knowledge among countries. The thematic net-

works each address a particular field within coastal management and are led by institutes with outstanding expertise in this field, see Figure 2. Their major task is to produce a European knowledge base for coastal policy, practice and science.

ENCORA is not a network parallel to other coastal networks; it is rather a facility to improve the operational value of existing coastal networks. ENCORA provides networking services that can be used free of charge, thanks to funds provided by the EU Framework Programme. Many existing networks⁹ have agreed to implement the ENCORA networking services and in this way have become interlinked. These Affiliated Networks are represented in the ENCORA Advisory Committee.



In 2007, several countries outside the EU have joined ENCORA and raised a national coastal network. These countries are Russia, Ukraine, Morocco, Tunisia and Algeria. They are related to the EU countries by bordering the same regional seas and enrich ENCORA by offering different types of coastal management experience.

⁶ EC 2002. EU recommendation concerning the Implementation on ICZM in Europe. European Parliament and Council of the European Union.

⁷ An Integrated Maritime Policy for the European Union (COM(2007) 574 final) <http://ec.europa.eu/maritimeaffairs/>

⁸ European Parliament legislative resolution of 11 December 2007 on the Council common position for adopting a directive of the European Parliament and of the Council establishing a Framework for Community Action in the field of Marine Environmental Policy (Marine Strategy Framework Directive) (9388/2/2007 - C6-0261/2007 - 2005/0211(COD)) <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P6-TA-2007-0595>

⁹ ENCORA Affiliated Networks: EEA TC Land Use and Spatial Information, CoPraNet, EUROCOAST, MARBEF, EUROGOOS, SPICOSA, LOICZ (ENCORA is part of the global network portfolio of affiliated LOICZ projects), GISIG/ICOPS, LaguNet

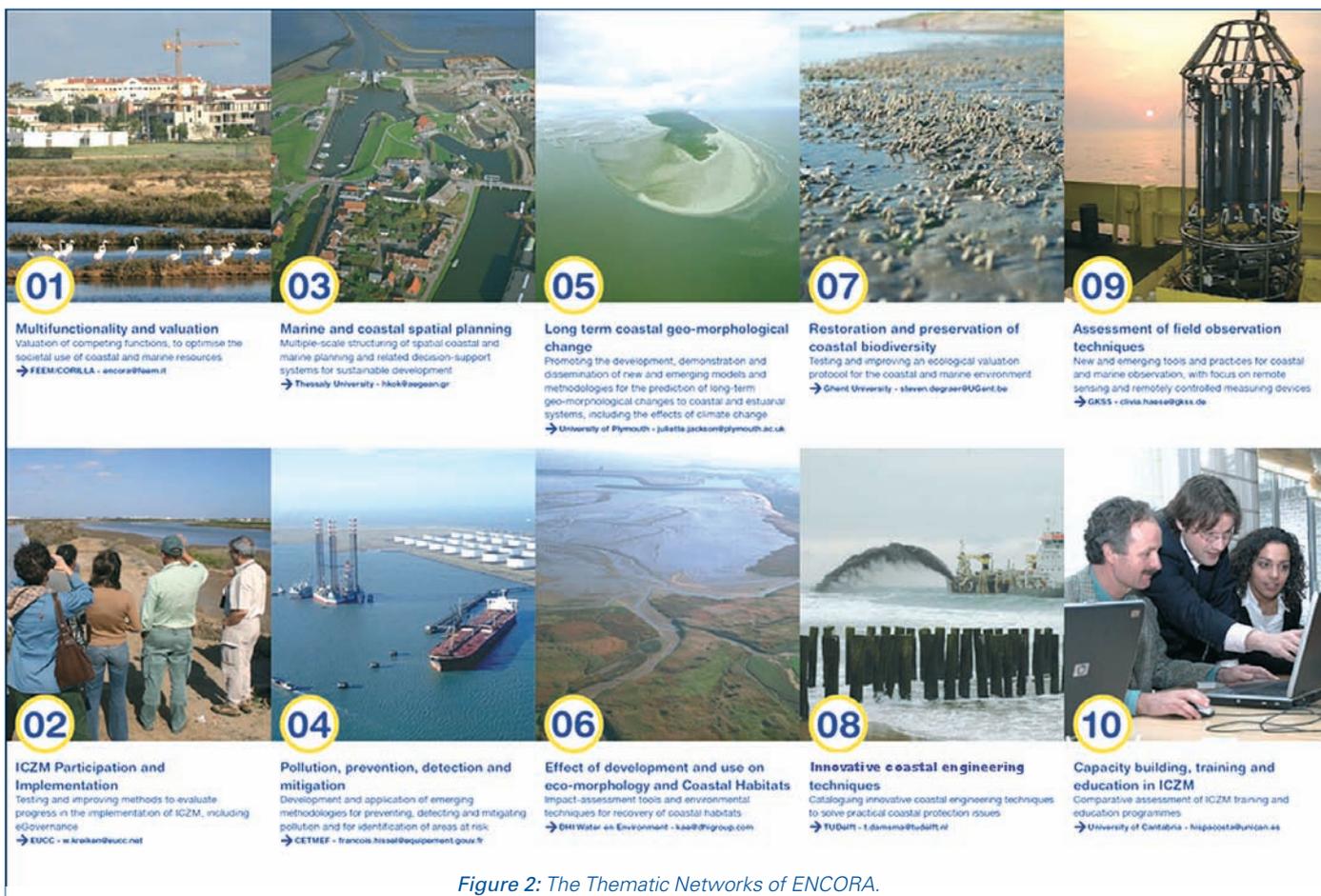


Figure 2: The Thematic Networks of ENCORA.

Services Offered by ENCORA

The ENCORA services are available through the Coastal Portal, www.encora.eu. These services are depicted in Figure 3 and are briefly explained below.

The **Contact Search Service** responds to requests from ENCORA members (individuals or institutes) for identifying and contacting experts and practitioners from different countries to share knowledge and to work together on problems with a common denominator. This is a core task of ENCORA, even if it is not yet used at the expected level.

Contact search is also facilitated by the **Contact Database**, which can be consulted via the ENCORA Coastal Portal. All members of the national networks, more than 2000 coastal experts, are included in this database. Recently it has become possible to enter contact data online. This will stimulate further growth of the Contact Database, which will be more complete and up to date, with only a minor maintenance effort. Through the Contact Database coastal professionals are able to search by themselves for potentially interesting partners to cooperate or to share experience with. The Coastal Portal has also a Forum Facility that members may use for discussions with colleagues.

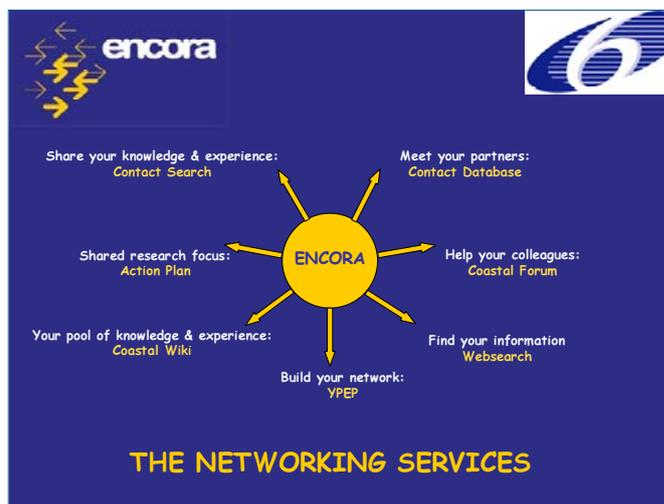


Figure 3: The networking services of ENCORA.

Young coastal professionals are an important target group for ENCORA. They often have not yet an international network and little experience with methods and organization of coastal management in other countries. For this reason the **Young Professionals Exchange Programme, YPEP**, has been set up, meant for coastal scientists and practitioners at the start of their career. YPEP events are workshops, summer schools, site visits,



etc., where young professionals can learn about experience and practices elsewhere and where they can start building a network with colleagues from other countries. The events are listed on the Portal; young participants from Europe may receive some financial support. YPEP organizes also short traineeships and the exchange of young professionals between coastal institutions in different EU countries.

Transfer of knowledge is a major ENCORA goal. Therefore several instruments have been developed.

One instrument is the **Web Search**, enabling a Google-type search through a selected set of highly relevant coastal websites, divided over different categories. It is possible to search in a subset of websites belonging to a certain category or you can make up your own subset. Using Web Search you will not be drowned in an excess of redundant hits, as may happen with a normal Google search. A second instrument is the **Coastweb Archive**, containing a wealth of documents that can be searched using an advanced ontology-based search system. If you want to disseminate important documents you should upload them in the Coastweb library! Users, who upload new documents in the Coastweb Archive, or who propose new websites for inclusion in the Web Search selection, contribute to keeping both instruments up to date.

Coastal Wiki

The most effort has been spent on the development of a third instrument, the **Coastal Wiki**. The underlying idea is that current documentation and publication practices do not enable taking full advantage of present knowledge and experience, because:

- scientific knowledge is communicated mainly among fellow experts; scientific publications focus on specific disciplinary aspects and are often inaccessible to non-expert coastal and marine professionals;
- assessment studies of practical coastal and marine issues are often published in grey literature or brochures and require insight in a specific field situation;
- results published on project internet sites often become inaccessible shortly after the project has ended.

Powerful search systems have been developed to retrieve information from the World Wide Web, but due to the huge proliferation of websites usually not more than a fraction of the relevant information is found. Use of this information is further hampered by lack of coherence among the information pieces and lack of comprehensiveness and context. Some pieces of information may be outdated and others may be unreliable. Information on local practices is often not available in English. Hence, much coastal and marine knowledge existing in research institutes and in practitioners organizations throughout Europe is not fully used, often resulting in a situation that

similar studies are carried out more than once. New knowledge dissemination practices are needed to take better advantage and increase the impact of existing knowledge, especially for use in practice and policy and for increasing public awareness.

The Wikipedia has proven to be a successful and popular means of distributing and sharing information, including scientific information. In a recent issue of the American Geophysical Union publication¹⁰ Mark Moldwin et al. discuss the popularity of the Wikipedia as a source for undergraduate research in science classes. According to their informal survey, for most of the 300 surveyed students, Wikipedia was the first stop for them during their research process. The authors then discuss concerns about the quality of information available on Wikipedia, due to the lack of quality control.

The Coastal Wiki developed within ENCORA is a professional Internet encyclopedia that guarantees high quality information. It is based on the Wikipedia concept and uses the same software (see Figure 4). The strength of this concept is its capability to highlight relationships, to reveal context, to enhance feedback and peer review and to guide users in a simple and natural way through related topics. Therefore the Coastal Wiki includes articles at different levels of specialization, which are mutually interlinked. Non-experts (policy makers, general public) get a comprehensive overview of new insight gained in EU research projects, with links to articles providing information on the general context and other related topics. Experts (scientific stakeholders, practitioners) will find specific up-to-date knowledge and experience, including information on tools and practices. By connecting scattered knowledge sources the Coastal Wiki provides up-to-date, coherent, reliable and comprehensive information.

The Coastal Wiki is primarily meant for disseminating knowledge to a broader audience than the community of specialists working at the frontiers of science. It is not meant for publishing original research; it is a vehicle for disseminating knowledge complementary to the traditional peer-reviewed scientific journals. Original background documents can be uploaded in the Coastweb Archive, which is linked to the Coastal Wiki. Additionally, links are made to other websites where background documents and related information can be found.

Several procedures ensure quality, consistency and comprehensiveness. Anonymous contributions are precluded; authors and co-authors of articles or article revisions are registered in the Contact Database and explicitly acknowledged. The access to the Coastal Wiki is free to any

¹⁰ Mark Moldwin et al., EOS (2007; v.88, n.11, p.134–135)

The screenshot shows the 'Main Page' of the Coastal Wiki. At the top, there is a navigation bar with links for Home, Coastal Wiki, Contact database, Forum, Search, and CoastWeb. Below this is a search box with 'Go' and 'Search' buttons. The main content area is divided into several sections: a 'Main Page' section with a welcome message, a 'This weeks featured article' section titled 'Experiences with beach nourishments in Portugal' which includes a photo of red sand cliffs and a description of the Vale do Lobo beach, and a 'Categories' sidebar with icons for Natural environment, Human activities, Issues and impacts, Areas and Locations, Coastal management, and People and organisations. The page also includes a 'toolbox' with links for What links here, Related changes, Upload file, Special pages, Printable version, and Permanent link.

Figure 4. Screenshot of Main Page prototype Coastal Wiki (www.ENCORA.eu/wiki/).

coastal and marine stakeholder, but only experts registered in the Wiki Contact Database are entitled to enter new information. Editing authorizations are granted only to users with a professional background, checked by the coordination offices of the national networks established by ENCORA. The ENCORA theme networks have contributed an initial body of information to the Coastal Wiki, which currently contains almost 900 articles and definitions. The content of the Coastal Wiki is continuously updated by authorized expert users. This ensures topicality of the Coastal Wiki, with only a limited management effort, which is mainly aimed at quality assurance. Already, several large EU-funded coastal and marine research projects have decided to use the Coastal Wiki as dissemination tool. More than one hundred users currently visit the Coastal Wiki every day.

Publishing in the Coastal Wiki yields many benefits: (1) a broad audience is reached, comprising coastal practitioners, policymakers, other professional stakeholders and the public; (2) duplication of information is prevented; (3) new information is linked with existing information; (4) information will be maintained and remains accessible after the project (1–2 years after a project finishes, most project websites are dead); (5) it is an intelligent innova-

tive database technology which has proven to work (cf. Wikipedia) and completely open-source (no license fees) and (6) it is easily indexed by search boots (cf. Google) enhancing the visibility of the information.

European Action Plan

Taking full benefit of the European potential of knowledge and experience also requires strengthening the cohesion among research and monitoring activities. Sharing the same vision on research priorities is an important precondition. Therefore ENCORA has initiated the European Action Plan, identifying major shortcomings in knowledge and technology that presently hamper the implementation of sustainable coastal and marine management. It provides a reference base for future coastal and marine research investments in Europe and contributes to focusing these research efforts. The foundations of the Action Plan were laid at the Paris Conference of 5–7 December 2007, starting from the research directions set forth in the Aberdeen Declaration¹¹.

¹¹ The ABERDEEN DECLARATION A New Deal for Marine and Maritime Science – 22nd June 2007
http://ec.europa.eu/maritimeaffairs/declaration_en.html



One hundred-eighty experts in different disciplines, invited for their outstanding expertise, submitted their personal ideas on critical knowledge gaps before the conference. These ideas were discussed in ten parallel workshops led by the ENCORA theme coordinators; each workshop was targeted at a specific aspect of coastal and marine management. Quite remarkably, many workshops had an outcome with a common denominator, leading to a few overarching recommendations.

The most prominent recommended action was the "Concerted development of a European network of Coastal Observatories and Capacity Building Centers".

Workshops participants argued that we are not yet capable of modeling (lab, computer) the full complexity of interactions existing in nature and society, in particular the complexity related to interactions between physical, chemical, biological and socio-economic processes. Real world observations are needed to make progress in understanding, but the high natural variability in natural situations, both in space and time, presents a major difficulty – it is impossible to control conditions such as to single out particular trends. We have to cope with this variability, which imposes major investments in observation and assessment tools, to produce systematic, consistent and comprehensive data, at least at the scale of regional seas and catchment basins. Present monitoring programs do not fulfill this requirement. Essential data on social and economic drivers and their spatial impacts are often even not available. Moreover, existing mechanisms to inform policy makers, planners and managers of the coastal and marine environment are often insufficient, leading to inconsistencies between land and sea planning and to inconsistencies among environmental regulations. There is also a lack of adequate implementation tools, including the communication with stakeholders and the public. There is an urgent need for better connections between science and policy and for the development of tools that can be used in practice by policy makers and planners. The development and implementation of truly integrated monitoring, assessment and capacity building programs is beyond the possibilities of single institutions or even beyond the possibilities of single countries. A coordinated effort at the European scale is required. This overarching message of most thematic workshops is addressed by the generic action for the concerted development of a European network of Coastal Observatories and Capacity Building Centres.

The observatories are conceived as development centers for the coherent collection and analysis of coastal zone monitoring data, where innovative methods for observation and data processing are combined with advanced process-based modeling. In these observatories, data collection, analysis and model development are carried out in an interactive way, to increase our under-

standing of the complex interactions in coastal systems. The Capacity Building Centres cooperate in the development of education and training curricula for coastal and marine resource management. They also develop methodologies and tools for marine and coastal spatial planning, for involving public stakeholders and for performing integrated assessments, including the definition of appropriate measurable indicators. The strength of the concept of combined Coastal Observatories and Capacity Building Centres stems from the interaction between science, practice and policy training and the development of management tools.

The Action Plan outlines the long-term perspective for structuring the capacity for knowledge production and application in the coastal and marine fields. The recommendations go further than the usual project-based cooperation. The Action Plan calls for a fundamental change in the way knowledge is produced and applied in the coastal and marine fields and it implies a revision of the relationships between science, policy and practice in the member states and European Institutions. A much closer interaction is required, if we want to strengthen our capacity to deal with the challenges set by climate change, development pressure, trends in environmental quality and extreme events. Science-policy cooperation is essential for informing the public and for creating a sense of urgency. The recommended actions for creating networks of Coastal and Marine Observatories and Capacity Building Resource Centres will only be effective if full advantage is taken of the European scale. The European Union should provide important incentives through the European Maritime Policy.

ENCORA Future: a European Coastal Platform

The ENCORA follow-up was a major discussion topic at the last annual meeting in Copenhagen, February 2008. The members of the Steering Committee and Advisory Board unanimously agreed that the networking structure established by ENCORA during the past two years has created a new dimension in European cooperation on coastal and marine issues. The disappearance of this structure after the end of the EU funded Coordination Action was considered inconceivable and an irresponsible waste. We should strive, on the contrary, for further strengthening European cohesion among the coastal and marine communities of science, policy and practice. EUCC came up with the idea to create a European Coastal Platform that will provide a cooperation structure for existing national and international networks. This idea immediately received broad support. The Platform welcomes not only networks already cooperating within ENCORA, but also other collaborations that aspire to continue in future. The LOICZ International Project Office at GKSS has already expressed its interest to cooperate. A common platform will provide a mechanism for existing

networks to cooperate more effectively. This enhanced cooperation will benefit the networks themselves, through the provision of higher quality and more efficient services to their members. It will also benefit the European Commission, through the ability of the Platform to identify issues of common concern and in this way assist the EC in determining policy priorities in relation to coastal and maritime matters. The Platform will develop and promote networking services that are largely self-sustaining, such as the Coastal Wiki and the ENCORA Contact Database hosted by the Flanders Marine Institute VLIZ as well as those services provided by platformpartners such as the global contacts and affiliated activities in LOICZ. Such networking services that are expanded and kept up to date by the users themselves, can be maintained at low costs.

The following objectives are proposed for the Platform:

1. The Platform voices the shared objectives and concerns of the network organizations at the European level, and seeks to achieve a favorable policy and operational environment for their activities;
2. The Platform facilitates sharing of knowledge and experience between coastal and marine stakeholders and stakeholder organizations across networks and across Europe;
3. Network organizations represented in the Platform coordinate their activities and share experience with networking practices, according to their respective needs and priorities.

A special ceremony will be organized at the LITTORAL conference in Venice (28 November 2008) for the inauguration of the Platform.



**European project SPICOSA,
a closer look by Irene Lucius and
Tom Hopkins**

The Integrated Project SPICOSA, funded by the EU's Sixth Framework Programme (Priority 1.1.6.3, Global Change and Ecosystems) kicked off in February 2007 with the aim to develop and test a self-evolving, holistic research approach for the assessment of policy options for sustainable management of Coastal Zone (CZ) Systems. This approach, together with its support tools, will provide a level of balance between science (ecological, social and economic aspects) and policy (institutional structure, stakeholders and the public) that has no precedent. As an Integrated Project, SPICOSA has the responsibility of contributing to the restructuring of research and its dissemination throughout the European region. 53 institutions from all across Europe are united in the SPICOSA partnership, representing national research institutes, universities, SMEs, the JRC and the NGO EUCC Mediterranean Centre.

SPICOSA aims to assist Europe in its goal of achieving sustainable development by developing and testing a methodological framework, based on the Systems Approach and, to support this transition in coastal zones. The initiative originates from the fact that coastal systems are under increasing human pressure and policy has not been able to respond effectively enough to slow the negative impacts on ecological, social and economic systems. As a consequence, a more innovative, thorough effort is needed to treat the coastal zone as an integral functioning system (the CZ System) and to focus more on how to provide prognostic information to decision makers that help explain how a CZ system might respond to sustainable technical options or management strategies.

SPICOSA has three main working hypothesis:

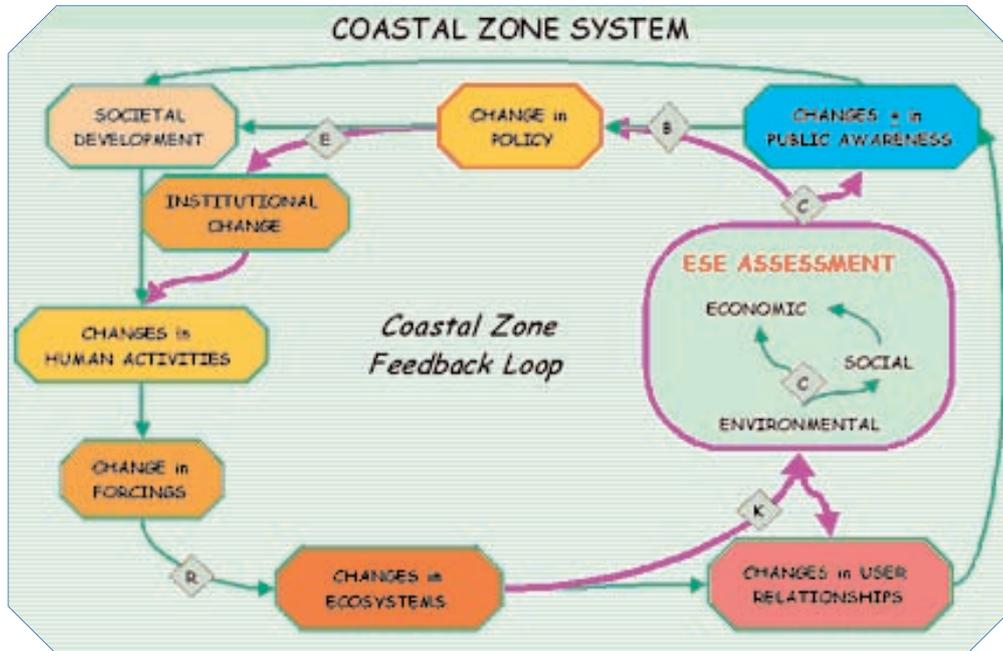
- The first is that Coastal Zones are complex systems such that their responses to anthropogenic disturbances are also complex and that efforts to control them, for example through single-issue approaches or to forecast their behaviour through linear or static models, will fall seriously short of providing the knowledge necessary to manage them.
- The second is that any effort to represent the functionality of CZ system must include all the components that interact to degrade or to stabilise the natural system; and this means that both the social and economic sectors must be included in any dynamical simulation.
- The third hypothesis is that this needed knowledge will not reach Policy decision makers unless the responsible researchers develop more effective communication interfaces specially tailored for that purpose and bridging across traditional barriers.

These aspects are illustrated in figure 1.

Structure and Objectives

The Project is designed such that most of its activities are iterative towards better and more complete products and has the following objectives:

- 1) Create an operational, updatable Systems Approach Framework (SAF).
- 2) Implement the SAF in the 18 Study Site Applications (SSAs) all across coastal Europe (see figure 2).
- 3) Generate a SAF Portfolio for each SSA and synthesize combined results as reference document.
- 4) Improve communication and integration among the main actors and infrastructures of CZ Systems that promote sustainable development in a manner that is self-perpetuating.
- 5) Generate new opportunities for academic and professional training in ICZM.



Switches: E = effectiveness, R = resilience, K = knowledge, C = communication, B = bias.

Figure 1: This figure illustrates two Coastal Zone system Information Feedback Loops. The default loop is shown as a thin green line, and the Spicosa loop as thick purple line. The default loop only slowly forces policy to be reactive to problems by waiting for the general public to become aware that the benefits derived from the CZ ecosystems have changed. Because many of these changes are often irreversible, on any realistic time scale, such that much greater costs are incurred than if precautionary changes had been made earlier. The SPICOSA loop provides scientifically defensible information, on a realistic time-scale, to decision-makers in order that policy can be precautionary regarding serious losses and that these decisions can be based on cost-benefit analyses that optimize social and ecological long-term benefits. The Ecological-Social-Economic (ESE) Assessment box represents the central activity of SPICOSA. The small diamond boxes represent critical threshold constraints on the interactions between components of the system, which need to be properly represented for successful forecasting of policy scenarios.

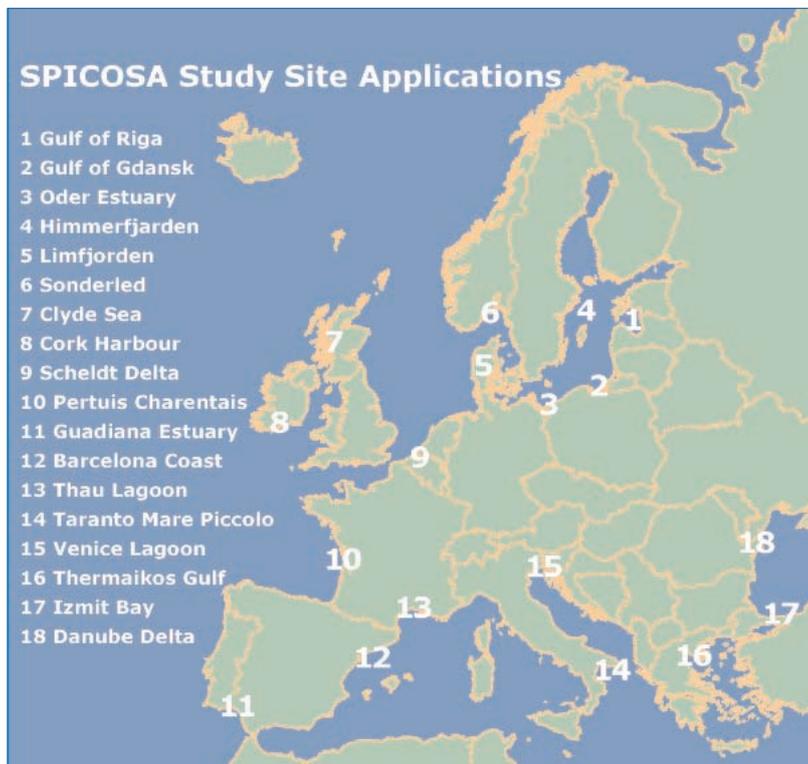


Figure 2: The figure lists the 18 SPICOSA Study Site Applications by number and locates them on the map. SPICOSA is testing and perfecting its methodology (System Approach Framework, SAF) at various sites in a limited, real-time configuration. Eighteen Study Site Applications (SSAs) all over Europe have been chosen for this purpose. In order that the SAF become an operable tool for both science and policy, it must be applicable to the full range of issues confronting coastal zone management, i.e. we are not producing a researcher- or issue-dependent methodology. SPICOSA's objective is to demonstrate the use of the SAF over a wide range of coastal zones that differ in geomorphology, environmental conditions, and human activities. The group of Coastal Zones (CZ) selected for the SSAs (figure below) includes all major impacts, has varying types of watersheds, marine environments, and has a wide range of human activities, cultural patterns, and policy priorities. With the application of the SAF to each of these, SPICOSA will create a significant SSA data set from which those human activities can be credibly distinguished that generate the greatest impacts and those types of CZ systems that are most vulnerable to human activity. These applications will also allow SPICOSA to understand which policy controls can be considered as independent of the natural characteristics of a CZ system, which controls need to be made specific to a particular CZ, and to which policy changes are public perceptions most sensitive.

The primary activity unit of SPICOSA is that of a Work Package. Work Packages are clustered into functional Nodes. Each of the Project's five nodes is differentiated by functional distinctions based on differences in objec-

tives, deliverables, and SAF scheduling that facilitate their coordination and management. The purpose of the Nodes is briefly described and their interactions are illustrated in figure 3.

Node 1 produces reference material in the areas of social assessments, deliberation support tools, and methodology for economic evaluation that will serve the objectives of Systems Approach Framework (SAF) development and science-policy interfacing. Each of these activities is placed under the responsibility of a small group of partners that will then serve as a support group to teams in charge of SAF implementation in Study Site Applications (SSAs).

Node 2 is in charge of SAF development. It is implemented by forming working groups to produce methodological frameworks. The work is divided into work packages and work tasks that represent a succession of steps. A small core group is responsible to prepare and deliver. The core group interacts with a larger group of researchers representing the study site teams in charge of SAF application. The SAF develops as an operational decision support system along with these interactions.

Under **Node 3**, 18 Study Sites have been selected to develop an application of the SAF in an interactive manner with local stakeholders. For each SSA a collaborative team involving different core partners in association with affiliated partners is formed. Some involve international collaboration.

Node 4 provides support and services to the whole SPICOSA community, in particular model support, internal and external information management, and an assessment of alternative strategies and technologies for Integrated Coastal Zone Management.

Node 5 concerns knowledge transfer activities, both academic and professional training..

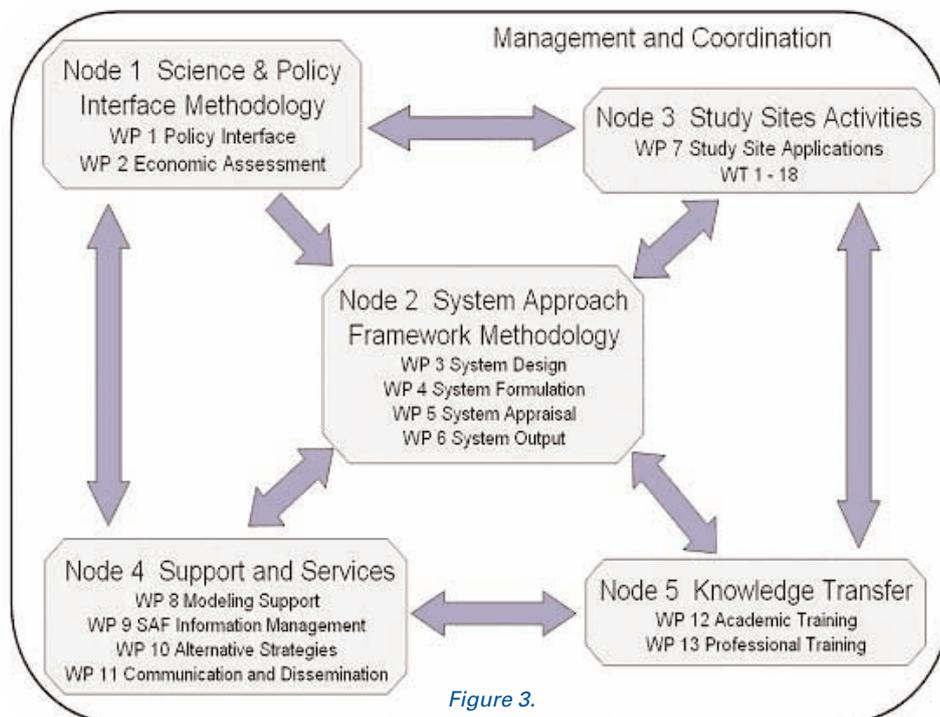


Figure 3.

User's Manual for ICZM Stakeholder-Policy Mapping

This document has been prepared to help SPICOSA-SSAs in identifying the critical policy issues that need to be addressed in a specific coastal zone. It thus pertains to two of the key initial activities that are conducted when implementing Integrated Coastal Zone Management: 1) the identification of the stakeholders in a given coastal zone area and the way these stakeholders relate to one another, 2) the identification of the policy issues that are present (or may potentially arise) in a given coastal zone and the subsequent analysis of the way in which stakeholders relate to the issues. Stakeholder mapping may facilitate answering some of the classic ICZM questions:

- Who should participate in coastal zone governance?
- What are the policy issues that need to be considered?
- How do participants in the coastal zone relate to each other and relate to the policy issues under consideration?
- What type of behaviour can be expected from stakeholders?
- What strategies should the policy/decision adopt to achieve its goals and deal with stakeholders?

Deliberation Methodology

One of the key challenges for the deliberation methodology is the need to jointly hold deliberation on one key priority issue while simultaneously taking into account

the whole breadth of interconnected coastal issues that frame the context of the key issue. A prototype of the Methodology has been developed and will be improved during the coming months. It will provide a major interactive tool for presentation of the results of the SSA simulation assessments.

System Approach Framework, SAF, Design and Implementation for Economic Assessment

The SAF Design for Economic Assessment provides a general framework which shows how the economic dimensions of coastal systems can be integrated into the SPICOSA SAF design – the first of the four steps of the SAF (design, formulation, appraisal, and output). It advocates an approach to economic assessment that incorporates the environment in terms of the ecosystem goods and services that are provided by it and which human society consumes either directly (such as, for example, by harvesting fish from marine and coastal ecosystems) or indirectly (by benefiting, for example, from the carbon sequestration functions of tidal mudflats).

Throughout the document, the underlying principle is to provide concise descriptions of the tools and methodologies that are available and might be useful to Study Site Applications, SSAs, within SPICOSA with further detail being provided in later documents and by reference to useful external sources of information and guidance.



Systems Approach Framework Design and Formulation

The SAF document is developed in an iterative manner. Draft instructions and explanations are passed to the SSA for each of four sequential steps or chapters (Design, Formulation, Appraisal, and Output).

Design Step. For the first application, the Design Step requires the identification of an environmental impact problem (Policy Issue) in the coastal zone that is of interest to Policy decision makers. The researchers then plan a Simulation Analysis to provide information back to Policy concerning the quantification of agreed scenarios surrounding this Policy Issue. A detailed plan for the Simulation Analysis involves extracting from the CZ system a Virtual System that expresses the fundamental functionality, relating the Policy concern to the environmental impact and taking into account of social and economic factors as well as ecosystem theory. In practice, the Design Chapter is subdivided into five tasks each of which describes the concepts, procedures, and information required to implement the Simulation Analysis. These five tasks of System Design:

- Issue Resolution (concerning some malfunction of the natural system)
- System Definition (select the fundamental dynamics needed to simulate this Issue),
- Conceptual Modelling (design and visualize this system)
- Methods and Data (needed for the simulation assessments)
- Problem Scaling (streamline simulation to be within time and resource constraints).

Formulation Step. The purpose of this Step is to systematically organise the Simulation Analyses of the Virtual System as needed to implement the Appraisal Step relative to the Policy Issue. Essentially, it does this by selecting the most relevant inputs, processes, and internal interactions and by assembling these into functional components that can be independently modelled and calibrated. This constitutes five tasks:

- Inputs (identify and acquire the necessary information and data needed)
- Internal Interactions (identify and formulate the fundamental interactions)
- Functional Components (assemble Ecological, Social, Economic (ESE) component models)
- Documentation (test, calibrate, and document component models, and their interpretative analyses).

Appraisal Step. The purpose of this Step is simulation and interpretation the CZ system's response to the selected Policy Issue(s). The main goal then is to construct and run the Simulation Model for delivery of the specified outputs and to conduct the accompanying Interpretive Analyses to provide the scientific and descriptive supplements to these outputs:

- ESE Assessments [conduct analyses and simulations specific to these components]
- Simulation Analyses (link up ESE models into Simulation Model, test and modify)
- Output Preparations (run scenarios and complete interpretive results).

Output Step. The purpose of this Step is to integrate and organise the qualitative and quantitative information resulting from the SAF for written and interactive presentations with policy/stakeholders and end users. This involves translating the information into three primary formats: for end users of each of the SSA, for insertion into the electronic SAF Users Centre, and for non-scientific dissemination.

- Assessments Synthesis (consolidate and format results for various endusers)
- Deliberations (conduct deliberation forum with decision makers and stakeholders)
- Dissemination (satisfy needs for transmission to public and endusers)
- SAF Portfolio Products (complete for final distribution).

Modelling experience and Model Building Blocks

SPICOSA's central objective of developing the Systems Approach Framework (SAF) centres on methodologies for simulating the function of coastal zone systems. The simulation software EXTEND applied at SPICOSA Study Sites has made it possible to show how complex Coastal Zone systems react to a wide range of changes in the use and management of these systems and, in return, how changes in the natural systems influence economic and social sectors.

Many coastal zone related problems such as eutrophication, tourism and aquaculture are being shared by coasts across Europe. The processes and state variables that are needed to simulate these systems are the same or differ only slightly between study sites. Based on the premise that each CZ is unique but most of the fundamental processes describing them are universal, SPICOSA is establishing a Model Library of Model Building Blocks for current and future users. Accompanying the Model Library will be an Information Archive in support of the entire effort for the benefit of future users.

The construction of a simulation model for a specific system will be greatly facilitated by this Library resource. Obviously, the knowledge of how to design, construct, calibrate, and interpret a simulation model remains a learned experience. This learning process in SPICOSA is occurring on many levels from researchers, to stakeholders, to policy makers.

Training

SPICOSA started developing a comprehensive training programme, with a particular focus on the scientific and methodological approach utilised by the Project. It has reviewed the needs and existing efforts in universities throughout Europe. The current activity is to combine the experience and knowledge gained in the SSAs into supplementary curriculum and training programs for professionals.

Outlook

The next milestone to be reached by SPICOSA will be the Forum in Brest, France, from 14 to 17 October, 2008, and our next annual reporting. We are anticipating con-

ducting a second, shorter application of the SAF in selected SSAs during the third year of the project. Such an iteration will allow for many refinements in the method and further development of the SPICOSA resource intended for future users and training activities.

More information

If you want to stay informed on SPICOSA developments, please visit the project website www.spicosa.eu and subscribe to our newsletter by sending a mail to news@spicosa.eu. The SPICOSA Scientific Coordinator Denis Bailly (denis.bailly@univ-brest.fr) and Tom Sawyer Hopkins (tom.hopkins@iamc.cnr.it) will be happy to answer further questions.

Priority Topics

PRIORITY TOPIC 1

Linking social and ecological systems in the coastal zone

**DGH Symposium 2008
Human/Nature Interactions
in the Anthropocene: Potentials of Social-Ecological
Systems Analysis
29–31 May, 2008, Sommerhausen/Main, Germany**

by M. Glaser, I. Radjawali, and B. Glaeser

As one further step towards a synthesis of social-ecological systems analysis (Priority Topic 1) LOICZ supported the 2008 Annual Conference of the German Society for Human Ecology (DGH). This symposium held in the beautiful viticultural town of Sommerhausen was the fourth to address this complex topic. The international conference, organized by researchers from Bremen (M. Glaser, G. Krause), Hamburg (B. Ratter) and Berlin (M. Welp) brought together representatives from different academic fields, including physics, medicine, psychology, ecology, mathematics, geography, various social sciences and philosophy for an exploration of systems thinking and systems analysis in order to address pressing global issues.

The symposium was opened by B. Glaeser (DGH president and LOICZ SSC member) and M. Glaser (organizer and LOICZ SSC member). It was stressed that there are several priority topics under the big theme of understanding the transformation, transition, and change determined by interactions between humans and nature through the consideration of the natural and societal dynamics in conjunction. The LOICZ Symposia on Social-Ecological Systems Analysis aim to assess and compare possible future transformations of coastal social-ecologi-

cal systems and their key drivers. The Sommerhausen conference particularly intended to explore innovative methodological approaches to SES analysis, including participatory modeling and scenario construction in order to provide the basis to better systematize SES analysis in the coastal zone.

It was emphasized that a main method for social-ecological analysis is to compare and develop modeling methods for better understanding the social-ecological dynamics at different scales which have to be accessible to stakeholders and to provide system understanding and decision support. For this, a reality check between the model and SES reality is needed.

Session 1: Social-Ecological System and Complexity



Discussion during Session 1.

Foto: I. Radjawali

F. Tretter, sociologist and psychiatrist, Munich, on "Systems thinking in human-social ecology: System science meets social ecology" first described the scientific knowledge cycle, the transformation from quality to quantity, from



empirics to theory and back again. He proposed the multi-, inter- and transdisciplinary approach to understand the socio-ecological system. He then explained the system modeling process as an iterative approach passing from verbalization via graphical model towards formalization.

E. Becker, founder of the Institute of Social-Ecological Research in Frankfurt/Main, presented "Social-ecological systems: A view from the critical theory of social relations to nature". Becker started off with the Symposium's point of departure, namely with the need for a new worldview in the Anthropocene. Becker's view of the world as a "crisis ridden self-organizing complex system" includes mankind as an integrated part and a powerful driver of system dynamics so that observation is only possible for us from the inside: the observer is part of the system.

B. Ratter, Institute of Geography at Hamburg University, GKSS and co-organizer of this conference, focused on "Complexity and emergence: Key concepts in non-linear dynamic systems". Ratter gave an example of emergence happening in the traffic jam. The model simulates the movement of cars on a highway to exemplify how traffic congestion emerges without any "central cause" such as a car accident or broken bridges but merely by cars following simple rules: slowing down when seeing a car close ahead, speeding up when not. Non-linearity and emergence is what dynamic natural and social systems have in common and have to be taken into consideration in any systems trajectory.

Session 2: Resilience, Adaptability and Transformability

Per Olsson, Stockholm Resilience Centre, on "Social-ecological system's dynamics and change: Key concepts and their application" started with the definition of "relations between humans and nature" as the environmental functions that benefit humans. Water and air purification, flood and erosion control, generation of fertile soils, detoxification of wastes, regulation of climate, and pollination but also the provision of aesthetic and cultural benefits were provided as examples.

K. Eisenack, Potsdam Institute for Climate Impact Research and University of Oldenburg, talked about "Archetypes of adaptation" proposing that complexity and adaptation at the social-ecological interface are more difficult to address. He described the collection of different experiences of adaptation as "seeing trees but missing the forest".

D. Hummel, Institute for Social-Ecological Research (ISOE) at Frankfurt/Main on "Adaptive capacity of supply systems" addressed the interactions of demographic processes and ecological problems, conceptualizing population dynamics in relation to supply systems. Hummel defined supply systems as "structures to pro-

vide the population with basic goods and services which constitute specific societal relations to nature".

Session 3: Multi-agent Modeling and Simulation

P. Mandl, University of Klagenfurt, Austria, presented "Multi-agent simulation for representing human/nature interaction: an appropriate basic approach". After an overview on the principles of multi-agent systems (MAS) and agent-based models (ABM) as a space-time integrated approach, Mandl gave several examples of agent-based models in different settings. It was shown how ABM can be used in ecology and biology (artificial life), genetics medicine, social sciences (artificial societies), and economics, but also in traffic studies, mathematics, physics, chemistry and even art.

The presentation on "Agent-based models of coastal and marine social-ecological dynamics" by M. Glaser, featuring her work with G. Krause and others at the Center for Tropical Marine Ecology (ZMT) Bremen, Germany, started with a working definition of coastal and marine social-ecological systems (CM-SES). Glaser pointed out a number of specific features of CM-SES in comparison with terrestrial social-ecological systems. The observation shows that coastal and marine governance is weaker and less structured than that in terrestrial systems.

M. Wildenberg, PhD candidate at Klagenfurt University and researcher at Institute of Social Ecology, Vienna, talked about "Research on coping with vulnerability to environmental risk". The project aims at generating scientific support for the planning, implementation and evaluation of aid after the 2004 tsunami in Central Nicobar, at better understanding the interplay of natural, cultural, and institutional features in determining the resilience of local social-ecological systems. The potential of different modeling techniques is explored to link functional tools and tools dealing with meaning, human preferences, and choice.

Session 4: World Systems Café

The world systems café "Application of systems thinking in social learning for sustainability" brought symposium participants together in a relaxed atmosphere. Discussion groups each had a "host" or "hostess" who remained permanently at certain tables while other participants regularly changed their location. Four questions were discussed:

1. Who needs systems thinking?
2. Which are the arenas where people can learn systems thinking and put knowledge into action?
3. What tools, methods, and approaches can scientist use to transfer systems thinking into society?
4. What do you not perceive of the world when you apply systems thinking?

A discussion on SES and complexity followed. It was argued that we cannot predict but we can explore and assume in order to develop plausible scenarios. Questions were debated such as how to understand the embeddedness of humans in nature? What is the role of emergence and self-organization? The importance of clearly defining the notion of "relation" in SES analysis was re-iterated. The critical question was raised: Do scientists really need to bring systems thinking to society, or is it mutual and also the other way around?

Some of the major areas of consensus in Sommerhausen 2008 were:

- Systems are abstract objects in an ideal, symbolic world, models of knowledge to advance our understanding, rather than images of reality. Systems-thinking is a sub-category of relational thinking. Social-ecological systems represent one specific type of system, defined by its open, dynamic and non-linear character.
- Methods for social-ecological systems analysis need to be developed further. In particular, inter- and trans-disciplinary agent/individual-based modeling (simulation-supported science) offers good potentials to explain emergent phenomena.
- Our understanding of social-ecological transformations is fragmented at best.
- We need to develop a knowledge-action system, to enhance the incorporation of knowledge into practice.

"Coping with global change in marine social-ecological systems", 8–11 July, 2008, FAO, Rome, Italy

a conference report by M. Glaser

The theme addressed in this conference, organized by GLOBEC, a sister program of LOICZ in the Erath System Science family, is at the core of LOICZ PT1. Thus the Rome conference was a good opportunity to explore complementarities and synergies.

Conference goals introduced by the main organizer, I. Perry were

- 1) Explore conceptual issues
- 2) Analyze case studies
- 3) Synthesize natural and social science co-operations
- 4) Develop innovative methodological approaches
- 5) Address governance.

Over four days, these were addressed by four keynote papers and eight sessions with short papers.

The first keynote speaker, F. Berkes advocated a redefinition of the terms resource and management to better address the management of the resilience of "fish and

fishers as an integrated system". In particular, Berkes stressed the need to widen our knowledge base by including local knowledge. He also emphasized the distinctions and interactions between global environmental change and globalization and suggested that climate change be seen in the context of other global changes.

In three research regions (NE Canada, Baja California, Mexico and the US East coast), the second keynote speaker, B. McCay explored the question of what prompts an SES to switch from undesirable to desirable strategies.

K. Brown, the third keynote speaker, explored the concept of vulnerability at national, regional, community and household level. The lists of components of adaptive capacity, she and her colleagues compiled differed between spatial scales and provided rich discussions on measurement issues as well as on the relative merits of the concepts of vulnerability, resilience, adaptive and transformative capacity in the study of change in marine social-ecological systems.

Moving on to the topic of governance, the fourth and last keynote speaker J. Kildow addressed the difficulties of translating knowledge into actual practice. Postulating the existence of "social tipping points" beyond which governments heed scientific knowledge, Kildow underlined the greater reactivity of local and regional citizens and governing bodies to the threats of environmental change, stressed the need for concerted action at higher levels and pointed out how fast rates of social change might slow down rates of environmental change.

Session 1 (the largest one) presented case studies and integrated approaches to the study of change in marine social-ecological systems. For the GLOBEC Focus 4 group "Feedback from Ecosystem Changes", I. Perry and cooperators consider marine social-ecological systems as composed of human and non-human subsystems" and explored human and non-human responses and coping strategies in the face of crises. The GLOBEC group has an exclusive focus on fisheries.

Most **Session 2** speakers, under the heading "Are the high seas social-ecological systems?", provided evidence on a diverse set of human-nature interactions surrounding open-ocean resources.

Session 3 explored the integrated modeling of marine social-ecological systems with 10 presentations ranging from agent-based modeling on the Australian Great Barrier Reef (as in the oral presentations by Rich), via innovative stochastic modeling techniques (incl. Bayesian Belief networks) which link lifestyles to ecosystem changes (as in the oral presentations by Mee & Longmead), to models with larger spatial scales such the 20 LMEs with 60 % of world fish catches covered by the Questfish program (as in the oral presentations by M. Barange et al.) or the 66 LMEs which make up the worlds oceans and 39 trophic groups "from detritus to toothed



whales” included in J. Alder's global fisheries model EcoOcean.

Session 4 underlined an emerging consensus that “humans are not just disturbances in ecosystems (humans as predators), that the value of marine ecosystems is not reducible to “the value of dead fish” (economics predominance) but that it comprises a range of spiritual and cultural values and that we need to understand fishers in order to manage fisheries (agent-oriented analysis).

Session 5 addressed human security in the face of climate change with diverse examples of exposure and vulnerability of coastal communities and fisheries. The relation between poverty and coastal resource management in developing countries was analyzed. C. Andreassen presenting a small-scale fisheries in Guatemala emphasized the lack of impact fisheries resources management is likely to have in this country unless other issues like drugs traffic and violence are confronted at the national level.

Session 6 entered the “minefield” of discussions on how marine and social scientists can work together on social-ecological systems analysis. In her presentation on the impact of social and environmental restructuring on human and coastal health, R. Ommer stressed the need for a common vision among researchers of different disciplines who aim to cooperate. T. Starfield proposed that system modeling start with prototyping social-ecological systems from an integrative point of view, irrespective of individual disciplinary knowledge rather than starting off with the attempt to bring together different disciplinary foci.

Session 7 explored the connection between marine science and society. B. Neis stated that knowledge is a social-ecological product and science needs to pay attention to its own social ecology”.

In **Session 8** A. Charles picked up her call for “trans-boundary knowledge” in his account of transdisciplinary efforts to connect academic and community partners in the Coastal Community-University Research Alliance. S. Jentoft presented the “governability assessment framework” of the Fisheries Governance Network, and discussed who should govern the fisheries and in particular, whether governance should be market- or community-led.

All the highlights of this rich and diverse set of papers cannot be presented here (see: www.peopleandfish.org). However, many speakers provided detailed accounts of local and regional implications of climate change. Lives lost as fishermen defy increasingly frequent and intensive storms were a particularly striking demonstration that human well-being is affected by global change as fishermen go to sea despite increased storm warnings, exacerbated by inflexible regulations (by J. McGoodwin, ITQs in Iceland and Alaska) or, as in Bangladesh because

they cannot afford days off fishing despite the increased incidence of storms (by A. Uddin Ahmed). The conference also highlighted the very different pathways coastal social-ecological systems are taking at present: on the one hand, coastal communities of the North where young people of fishing origin out-migrate to more promising regions and economic sectors and remaining communities are stretched to the breaking-point to maintain even basic social and cultural features; and on the other hand, coastal communities in generally hotter and poorer regions which support large numbers of subsistence and artisanal fishers and, in addition, are the recipients of many poor immigrants in search of the mostly de-facto open-access resources of the sea. A common trend in most coastal communities is perhaps towards stratification in fishing communities accompanied by a loss of local control and increasing corporate influence. This increases the vulnerability of coastal residents. Examples to the contrary (by B. McCay, Baja California) raised the questions to what extent the conditions for successful co-management can be generated by governance and management interventions and to what extent they are determined by ecological, social and historical facts over which humankind has little influence. However, the final session on governance indicates that most researchers, this writer included, tend to assume some scope for human-induced change.

PRIORITY TOPIC 2

Assessing and predicting impacts of environmental change on coastal ecosystems



International Council for Science
Scientific Committee on Oceanic Research

International SCOR/LOICZ/CAS Working Group “Harmful Algal Blooms” inaugurated by the LOICZ IPO at GKSS



Foto: T. Fischer

A new collaborative and international working group co-sponsored by SCOR, the Scientific Committee on Oceanic Research, LOICZ and the Chinese Academy of Sciences, CAS, assembled for the first time at the GKSS in Geesthacht, Germany, in late July. The task is to tackle the important question if and how nutrient loads from land-based sources may relate to the increasing proliferation of harmful algae and their blooms worldwide. Harmful algae are those proliferations of microscopic algae that can cause oxygen depletion and fish kills, seafood poisoning, and undesirable changes in the aquatic ecosystem. Harmful algal blooms are increasingly affecting coastal ecosystems worldwide. While such phenomena have long been recognized, it is thought that they are increasing in frequency and geographic distribution due to nutrient pollution. However an anticipated underlying cause-effect relationship needs yet to be identified and quantified. Nutrient pollution in general comes from the runoff of nitrogen and phosphorus from agriculture where fertilizer is heavily used, and from highly populated areas, where nutrients come from sewage. As mentioned above, to date there has not been a global assessment of how nutrient pollution relates to these algal outbreaks.

This working group, led by Patricia Gilbert of the University of Maryland, USA, and Lex Bouwman, Netherlands Environmental Assessment Agency, includes academic experts from the United Kingdom, Sweden, Mexico, Chile, Oman, and mainland and Hong Kong China. During this inauguration workshop of the so called Workinggroup 132 German experts from AWI, Bremerhaven, and GKSS joined the discussions.

Read an extended report in LOICZ INPRINT 2008/3

PRIORITY TOPIC 3

Linking
governance and
science in coastal
regions

Major Report on Increasing Capacity for Ocean and Coastal Stewardship

by S. Olsen

The U.S. National Research Council has released a major report entitled "Increasing Capacity for the Stewardship of Oceans and Coasts". Stephen B. Olsen, LOICZ SSC Member and Priority Topic 3 Leader, was a major contributor to this report. It assesses past and current capacity building efforts to identify barriers to the effective management of coastal and marine resources, particularly in the developing world. The report recommends ways that governments and organizations can help strengthen marine and coastal protection and management capacity, including periodic program assessments, sustained funding, and the development of leadership and political will.

The report finds that most capacity building activities have been initiated to address particular issues such as overfishing or coral reef degradation, or they target a particular region or country facing threats to their marine resources. Unfortunately, there is little coordination among efforts with similar goals or overlapping geographic coverage—resulting in programs that are isolated in time and space. This fragmentation inhibits the sharing of information and experience and makes it more difficult to design and implement management approaches at appropriate scales.

The report makes a number of sweeping recommendations. It begins by recommending that capacity building programs should instill the tools, knowledge and skills and attitudes that address:

- How ecosystems function and change;
- How the processes of governance can influence societal and ecosystem change;
- How strategies can be tailored to the history and culture of the place; and
- How to assemble and manage interdisciplinary teams.

One of the central recommendations of the report is that regular, regional assessments should be undertaken to help programs adapt to changing needs in long-term capacity building efforts. These assessments should examine environmental, social, and economic conditions, as well as the existing governance structure, to document changes in societal and environmental benefits resulting from ecosystem-based management practices. Some common criteria for assessments will be needed to facilitate comparisons through time and across programs, but each assessment will also need to be tailored to fit the circumstances and characteristics of specific programs. The findings of program assessments should form the basis for regional capacity building needs and associated action plans that guide further investments in capacity and set realistic milestones and performance measures. Such regional action plans should include concrete agreements on roles and responsibilities of donors and doers to strengthening capacity. LOICZ is responding to this recommendation by piloting methods for assembling such regional assessments of governance baselines through an ongoing effort in Latin America (www.ecocostas.org).

A Network of Leaders Promoting the Stewardship of Latin America's Coasts

by S. Olsen

EcoCostas is a network of professionals working to achieve more sustainable forms of coastal and marine development and conservation in Latin America.





Its members are leading long-term programs addressing societal and environmental governance issues at sites extending from Patagonia to Mexico.

Those who came together to form the EcoCostas Foundation in 1997 saw a region with an abundance of short-term projects and a scarcity of sustained programs. Initiatives with similar aspirations operated in isolation, unaware of others working on similar issues and challenges. They saw much re-inventing of the wheel and too little dissemination of hard-won lessons learned. At their first regional assembly in 2004 the members of EcoCostas drafted the Guayaquil Declaration that recognized that:

- Transforming societal values and behavior requires strong leadership rooted in the place.
- A lack of capacity is the primary factor limiting progress in ecosystem governance.
- Success requires a sustained commitment to a place and its people; it cannot be achieved during the life of the typical 4–8 year “project”.
- It is most effective to take action before an ecosystem is severely degraded.
- Coastal stewardship must be practiced at the community, province and national levels; but local successes can produce tangible results quickly and inspire others.
- Much has been learned and must be disseminated through peer-to-peer relations and by inserting coastal governance concepts and tools into current educational programs.

Since then EcoCostas has worked to create the basis for collaborative learning and action through the preparation of detailed governance baselines. They are aimed to document the long term trajectory of change and the responses – or lack of responses – of past and existing governance system to such changes in the coastal ecosystems in which each member is working. This work has been supported by the Costa Rica based AVINA foundation, USAID and LOICZ. In collaboration with the Coastal Resources Center at the University of Rhode Island a certification program is being designed for practitioners that is based on a Code of Conduct and a set of competencies for the practice of special area coastal governance. The certification program and associated training will be operational by the end of 2008.

The EcoCostas web page (www.ecocostas.org) features a knowledge management system (KMS) that will make accessible the wealth of materials assembled through the process of assessing governance baselines for the sites where each of its members are operating. The KMS is designed as a layered system that provides summary information at the top layer and permits users to drill down to increasing levels of detail. It enables various technical and non-technical staff to create, edit, manage

and finally publish a variety of content (such as text, graphics, video, documents etc), governed by a centralized set of rules, process and workflows that ensure coherent, validated electronic content.

Examples of what EcoCostas members are doing

In The Gulf of California

Gaston Luken and Alejandro Robles, as President and Executive Director of Nor Oeste Sustentable, are working to negotiate long-term goals for selected areas of the Gulf and its watersheds. Their approach features negotiating agreements that draw together leaders from government, business and civil society. In 2006, Luken and Robles facilitated a historic commitment by the shrimp trawler fleets to adopt practices that will reverse decades of chronic over-fishing and conflicts with the conservation community.

In Nicaragua

In the Estero Real, a largely intact estuary system with rich mangrove forests on Nicaragua's Pacific coast, Agnes Saborio has led a dedicated group of community leaders and scientists in a twenty-year effort to achieve and sustain shrimp farming that is socially and environmentally responsible. This is an ecosystem of remarkable contrasts. Communities live in abject poverty and barely eke out a living, while beside them lie expanses of industrialized agriculture and prosperous shrimp farms. Agnes and her team are helping chart a course to a more just and sustainable future for the coastal peoples who live and work in this richly endowed but conflict-torn corner of Nicaragua.

In Ecuador

Emilio Ochoa and Rafael Elao have been working to organize coastal communities around livelihoods that sustain and restore the goods and services that flow from healthy estuaries and watersheds. Coastal Ecuador's sequence of boom-bust cycles has degraded unusually diverse and productive coastal ecosystem. Progress towards sound governance requires linking community-based initiatives with governmental policies and emerging markets for responsibly produced seafood.

In Chile

Max Bello, Caduzzi Salas and a small dedicated team are working to create a blue whale sanctuary in the Chiloe fjord region where salmon aquaculture and a diversity of fisheries are producing major stresses on a beautiful and highly productive ecosystem. Here the complex tangle of issues includes resolution of conflicts between artisanal and industrial fisheries, the siting of salmon farms, the rights of indigenous people and a growing tourism industry.

In Argentinean Patagonia

Guille Caille and Jose Maria Musmeci have been working for more than a decade to organize a management scheme that links across four provinces to create a network of protected areas and associated artisanal fisheries management and coastal development plans. They face a wide diversity of problems and opportunities ranging from responses to oil spills, encroachment of commercial fisheries into nearshore grounds, the growth of urban areas and solid waste management.

In Cuba

Pedro Alcolado is one of the leaders of a multi-disciplinary team of scientists, resource managers and investors in tourism that has succeeded in launching a management program for the Sabana-Camaguey Archipelago and its watershed. This effort is supported by the Global Environmental Facility. It has restored lagoons damaged by the construction of causeways, re-oriented where and how tourism facilities are sited and operate and reduced the flow of wastes from sugar cane plantations in the watershed. This largely pristine coast of northwest Cuba is an important source of coral, fish and lobster larvae that sustain coral reefs in nearby southern Florida.

LOICZ SSC News

Nancy Rabalais, LOICZ SSC Vice-Chair and Executive Board Member



Foto: E.-B. Goldberg

Nancy Rabalais to receive NWRI's 2008 Clarke Prize

5/4/2008

This year's recipient of the National Water Research Institute's Athalie Richardson Irvine Clarke Prize is Dr. Nancy Rabalais, Executive Director and Professor of Louisiana Universities Marine Consortium. She will be the fifteenth recipient of the National Water Research Institute for excellence in water research. She was nominated for the award because of her seminal research on human-induced changes in water quality, particularly the long-term environmental impacts of excess nutrients on marine ecosystems. The award ceremony was held Thursday, July 10, 2008, in Huntington Beach, CA.

In honor of Athalie Richardson Irvine Clark and her vision to recognize water science and technology, National Water Research Institute established the Clarke Prize in 1993 to honor outstanding individuals in the fields of water science and technology.

Nancy Rabalais elected to Board of Trustees of Consortium for Ocean Leadership, COL

Nancy Rabalais, Executive Director of Louisiana Universities Marine Consortium, LUMCON, was elected as one of four new Inside Trustees of the Consortium for Ocean Leadership in a recent election. She assumed her three-year term at the Annual Meeting of COL on March 8, 2008. COL is the newly constituted combined CORE (Consortium for Ocean Research and Education) and JOI (Joint Oceanographic Institutions). Dr. Rabalais encouraged the formation of four Gulf coast institutions into a Gulf of Mexico Consortium membership for CORE in 2006, which was then accepted for membership in the new COL. COL is a Washington, DC-based nonprofit organization that represents 95 of the leading public and private ocean research education institutions, aquaria and industry with the mission to advance research, education and sound ocean policy. The organization also manages ocean research and education programs in areas of scientific ocean drilling, ocean observing, ocean exploration, and ocean partnerships. Dr. Rabalais is also the Chair of the Membership Committee of COL.

Nancy Rabalais received Ruth Patrick Award

Nancy Rabalais, Executive Director of LUMCON, received the American Society of Limnology and Oceanography's Ruth Patrick Award. The award was presented at ASLO's meeting in St. John's, Newfoundland, 8-13 June, 2008. The award notes her courageous struggle for implementation of policies to reduce the size and effects of hypoxia. The Ruth Patrick Award honors outstanding research by a scientist in the application of basic aquatic science principles to the identification, analysis and/or solution of important environmental problems. Dr. Rabalais was commended for her unwavering commitment to creating a broad understanding of the dramatic expansion of coastal hypoxia in the Gulf of Mexico.

LOICZ News

LOICZ SSC Membership Call for Nominations

Land-Ocean Interactions in the Coastal Zone (LOICZ) is core project of the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP), and thus under the umbrella of the Earth System Science Partnership (ESSP). Since 1993, LOICZ



scientists from across the globe have been investigating changes in the biology, chemistry and physics of the coastal zone. Since 2003, LOICZ has expanded its areas of research to include social sciences in order to address the human dimensions of the coastal zone.

LOICZ activities – aiming to implement the objectives of the LOICZ Science Plan and Implementation Strategy (SPIS) – are overseen by an international Scientific Steering Committee (SSC). The SSC represents a broad spectrum of scientific disciplines and nationalities. It provides guidance to the LOICZ SSC Chair and IPO on project planning, development and implementation. Obviously, the continuing success of LOICZ relies considerably on the continued commitment and input of its SSC members.

Members of the LOICZ SSC are mainstreaming challenging interdisciplinary research on coastal change and human dimensions. They form and inform existing and new networks of scientists and user communities on local up to global scale. Ideally, their individual research and networks including young researchers are being exposed to global scientific review and synthesis.

SSC Functions

Primary functions of the LOICZ SSC are to

- Oversee and guide the continued project development, planning and implementation as well as the delivery of project outputs
- Encourage collaboration between LOICZ, the ESSP, and international programs and agencies concerned with global change in the coastal zone
- Provide scientific advice and assistance to national Global Change and ESSP Committees
- Encourage national governments and regional and international funding agencies to support research that contributes to the LOICZ SPIS.

SSC Tasks

Members of the SSC serve in their individual capacities and are expected to

- Provide scientific knowledge and advice from their field of expertise as it relates to LOICZ goals
- Attend the annual SSC Meeting
- Provide scientific advice to the Chair on LOICZ development and implementation
- Develop and promote activities contributing to the LOICZ SPIS
- Encourage new and maintain existing multidisciplinary science networks including young researchers
- Host LOICZ workshops and coordinate own LOICZ activities
- Represent LOICZ at relevant scientific and user community meetings and act as a liaison to LOICZ workshop organizers, ESSP partners and external researchers and institutions

- Edit special newsletter or journal issues and provide a written report to the IPO within one month of representational attendance at any meeting
- Encourage and foster the affiliation of LOICZ-relevant projects and activities with which they are associated or of which they become aware
- Provide a two-way channel of communication between the SSC and national, and where possible, regional and international research and science user communities
- Inform the IPO, Regional Nodes, National Committees/Contacts, and the SSC Chair of all actions directly or indirectly related to LOICZ
- Assist in securing financial and other support for research activities adopted and approved by the SSC.

Note: Applicants should be aware that an active role in the LOICZ SSC requires a certain and flexible time commitment, but will be mutually beneficial for both the candidate and the project.

Selection criteria

In seeking nominations, we are not only looking for scientific excellence and a high level of commitment to the LOICZ goals, but are also aiming to achieve a disciplinary, nationality, gender and age balance. Criteria for candidates are:

(1) Disciplinary expertise. Areas of expertise that are required include:

- environmental, ecological and resource economics
- social anthropology (ethnology)
- political science, international relations
- science communication
- vulnerability, resilience, and gender research
- remote sensing and GIS, typology approaches for coastal classification
- sedimentology
- modeling
- atmosphere/coast exchange
- hydrology and coastal oceanography
- coastal fisheries and aquaculture, and
- biogeochemistry.

(2) Geographical balance, important for a global project.

(3) Available time, commitment and vision.

To view the status of the current LOICZ SSC, including scientific expertise and nationalities, please check our website www.loicz.org.

Application Procedure

Scientists who serve on the SSC normally do so for a period of 3 years, with the potential for renewal for one additional term. Nominations to the SSC can be made by individuals or the SSC itself, and are considered by the Executive Committee (ExCom) of the SSC. Selected candidates are then recommended to IGBP and IHDP for

final approval (following regulations of the International Council for Science, ICSU). To be nominated, the candidate should send the following items (as Word files) by email to Hartwig Kremer (Chief Executive Officer, LOICZ IPO):

- A cover letter addressed to the LOICZ SSC Chair. This should include the following points: area of expertise, possible contribution to the LOICZ SPIS, involvement in LOICZ-related international projects, coordination of LOICZ-related projects, involvement in other IGBP/IHDP activities, capacity building, international experience and LOICZ-relevant international contacts (max. 2 pages)

- The nominee's CV (max. 5 pages incl. recent and relevant publications)
- 2 letters of support from scientists within LOICZ research areas (each max. 1 page)
- A statement from the nominee on their aspired role and concrete plans as a LOICZ SSC Member stating their available time, commitment and vision. (max. 1 page).

Application Deadline

The next deadline is 15 September, 2008.

The backbone of LOICZ: Affiliated Projects

LOICZ has a mandate to address key issues of coastal change and use in the context of scenarios of future human activity and environmental change. LOICZ endorses and seeks to support both fundamental coastal zone research and research that synthesizes and up-scales results for dissemination within the scientific community, and outreach to policy makers and the public. An important part of this research is carried out by scientists who affiliate their projects to LOICZ thereby becoming part of the global network of LOICZ. These projects build the backbone for up- and down-scaling of LOICZ results and the LOICZ synthesis.

LOICZ provides a forum to assimilate, integrate and synthesize the outputs of its affiliated projects. Additionally, it provides an opportunity to communicate and disseminate these outputs making them available not only to other scientists, but also the public, decision-makers and managers. Information on affiliated projects 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 community as well as to LOICZ for its reporting requirements.

Once a project has been entered to the database by its Principle Investigator (PI), it will be reviewed by the IPO and the coordinator of the theme/topic it is contributing to most. As soon as the project is accepted it will appear in the public part of the database. This lean procedure allows LOICZ to maintain an up-to-date record of global research activity that relates to the LOICZ Science Plan as well as ensure that affiliated projects are given opportunity to fully participate in LOICZ activities such as workshops and joint projects.

Moreover, the database accomplishes an essential element that applies for all LOICZ interdisciplinary studies within and beyond the project namely data sharing and exchange. To facilitate this exchange LOICZ has developed a Data Policy to help affiliated projects and LOICZ to fully benefit from each other. Both documents, the Terms of Reference for affiliated activities and the Data Policy, can be found on the LOICZ website.

LOICZ protects its community members by restricting access to contact details in the public part of the database. But every community member and person interested in the activities affiliated to LOICZ is invited to register and then view full contact details and be able to submit and edit own projects. As the database is linked to the LOICZ contact database, all newsletter recipients are already recorded. If you wish to receive your login name and password for the database, please send us an email to maike.paul@soton.ac.uk

Do we hold your current contact details?

To receive LOICZ INPRINT it is sufficient that we know your email address, or if you receive the newsletter in hardcopy your postal address. But there is much more information available at the LOICZ IPO that does not make it into the newsletter, for various reasons. If you are interested in receiving information targeted to your field of expertise, please request your login details from us and update your profile online.

Call for research proposals concerned with Land-Ocean Interactions in the Coastal Zone

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 Projects. As well as fundamental science projects, LOICZ also seeks projects that have a multidisciplinary perspective, especially combining natural and social sciences. Projects can have global, regional or local scales and be focused on coastal sciences and/or coastal management. Projects that collaborate with other Earth Science System Partnership (ESSP) projects, especially with other Core Projects of IHDP and IGBP, are sought in particular, as well as projects that synthesize and analyze research outcomes already available or involve dissemination and outreach that will lead to better public knowledge. 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 Projects, its endorsement provides the following benefits:

- support in proposing for funding;
- promotion of the project and associated activities, its contributing team, outputs and outcomes through the LOICZ website and/or newsletter;
- 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; and
- access to a wide circle of information related to funding and the science community that is available through the LOICZ database.
- support in proposing for funding;
- promotion of the project and associated activities, its contributing team, outputs and outcomes through the LOICZ website and/or newsletter;
- 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; and
- access to a wide circle of information related to funding and the science community that is available through the LOICZ database.

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.



IPO Notes

19th LOICZ SSC Meeting in Cape Town



From 4–6 May, 2008, LOICZ held its 19th Scientific Steering Committee (SSC) Meeting at Kirstenbosch National Botanical Garden in Cape Town, South Africa. Key objectives of the 2008 SSC Meeting were to update the SSC Members and the Regional Node Coordinators both on the various activities proceeded in 2007/08 and the planned activities for 2008/09. Guests from the parent programs IHDP and IGBP, the ESSP, and IGBP National Committees joined the meeting temporarily.

On the first day (Reporting Day), the LOICZ Priority Topic and Cross-Cutting Activity Leaders, Regional Node Coordinators, and the IPO informed the SSC Members about their activities since the 2007 SSC Meeting in Vancouver, including steps taken on decisions and action points. The second day (Science Day) was dedicated to scientific synthesis and future activities. As in the last year, the SSC reviewed achievements and shortcomings along the LOICZ Activity Plan in working groups.

A focal point of the SSC Meeting was to discuss initial plans and conclude on a design for the LOICZ interim synthesis and the review process for the Priority Topics. Following a vital debate, the SSC agreed that a two-pronged approach would be the most suitable to pave way towards innovative science as well as to enter into a synthesis and review mode for the Priority Topics. These steps will be carried out in sequence in the following years 2009 and 2010.

Consequently, SSC and IPO prepared a concept for a LOICZ Dahlem-Type Workshop in Kjeller, Norway, to be hosted by the Norwegian Institute for Air Research in June 2009. This non-consensus-based approach invites a variety of background papers to discuss and provocatively question existing science. It is purely focused on discussion and debate across and beyond traditional disciplinary boundaries. LOICZ considers this concept a

milestone on the way to a new scientific focus and integrative concepts towards adaptive and resilient coastal and human systems. In 2010, a LOICZ Open Science Meeting will collectively review the findings of the analysis and synthesis of the Priority Topics and Cross-Cutting Activities and discuss them with the broader global research community. As an ultimate outcome, LOICZ aims to present a new set of Priority Topics that will guide the activities in the next five years. The second day closed with the traditional LOICZ dinner. The SSC enjoyed the South African cuisine at De Leuwen Jagt restaurant, located within the Seidelberg wine estate.

On the third day (Administration Day), the SSC Meeting focused on administrative planning, including SSC membership and chairmanship. The new LOICZ website was introduced. Featuring a new visual profile as well as improved navigation and contents, it is a fundamental step towards a new strategy and platform for comprehensive outreach, education and capacity building efforts in LOICZ. Major decisions included the refurbishment of the Corresponding Membership towards a more formal frame in which also Principal Investigators of Affiliated Activities will be invited to join. Furthermore, the director of the IPO host institute will receive an Associated Membership status (see below for more detail) and a special effort will be set up in LOICZ to open the project and its science to young people. The idea is to provide a platform that attracts the often very substantial research of early stage scientists and to establish communication with educational bodies e.g. schools. Launching of these activities is foreseen for later in 2008. LOICZ will provide a frame for this new group to join the portfolio and establish mechanisms to guarantee scientific quality and credibility. The SSC also revised the LOICZ Activity Plan 2008/09 – a document outlining the spectrum of LOICZ activities internally and to the outside world. Finally, with A. Newton a well-respected and skillful scientist with long-standing experience in and a broad spectrum of LOICZ-related science will be nominated to IGBP and IHDP for taking responsibility as the new LOICZ Chair, following J. Pacyna, taking effect in January 2009.

Very delightful highlights during the SSC Meeting were two international scientific awards given to Co-Chair N. Rabalais for her outstanding research. In addition, three more awards were given to LOICZ by T. Essop (South African Ministry of Environment, Planning and Economic Development) and G. Midgley (Local Organizing Committee). Those were in recognition of the IGBP Congress posters prepared by N. Rabalais and LOICZ Senior Science Coordinator J. Weichselgartner who won first prizes for the best expert and best public poster, respectively. Moreover, runner-up was the public poster of SSC Member W. Dennison.

The SSC Meeting closed with SSC Members and IPO expressing their gratitude to J. Pacyna as an outgoing

Chair for his excellent nine year commitment and great leadership. A painting of South Africa's Bird of Paradise Flower *Strelitzia Regina* handed to him made this a warm farewell. According to the evaluation carried out by the SSC Members, the 2008 SSC Meeting was considered successful in terms of science and organization.



On the second day of the 19th SSC Meeting in Cape Town, SSC Members reviewed achievements and shortcomings along the LOICZ Activity Plan in working groups. (Foto: H. Kremer)

Director of IPO host Institution, Prof. Franciscus Colijn, is assigned the status of "Associate Member to the LOICZ SSC"

The SSC decided to establish an official status for the director of the IPO host institution. This will be in the form of an "Associate Membership to the LOICZ SSC". This decision was long suggested and has been made in recognition and wide appreciation of the broad scientific, logistical and financial support of the hosting arrangement for the IPO. The SSC sees the leading role the director/head of the host institute plays at the interface between the SSC, the IPO and the Board of Directors of in this case the GKSS Research Centre Geesthacht, GmbH, and its Institute of Coastal Research.

In this role the SSC welcomes Prof. Franciscus Colijn as the leading representative of the GKSS, Institute of Coastal Research to join the Committee as an official associate. Prof Colijn is invited to regular SSC meetings and his active participation in the discussion on the LOICZ implementation is particularly welcome. It is anticipated that

he can generate and maintain closer links with the researcher community in the hosting institute as well as on national or if appropriate regional scale. He will be consulted in advisory context and works closely with the IPO in any administrative matter and financial set up at the host location. He can also be consulted and work closely with the SSC Executive Board in matters of financial, administrative or in general strategic issues that refer to the collaboration with the IPO hosting institution.



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Complying a wish LOICZ has ordered an ISSN for LOICZ INPRINT: Print: ISSN 2070-2000 / Online: ISSN 2070-2442

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Report

A three-week Internship at the LOICZ IPO, GKSS Research Centre Geesthacht

Nadine Graupmann, 14 years, Intern at LOICZ IPO from a junior high school in Hamburg



The training period from 23 June to 11 July, 2008, 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. A list with working duties was already prepared for me.

During the three weeks of my internship I have not only learned how to write e-mails in English, but also how to handle a two-screen desktop PC that I had to work with. Using new programs (Lotus Notes) and data base software (Cobra), I was shown how to send e-mails and the newsletter INPRINT to international recipients. After familiarizing with the software, I corrected wrong data base entries and included new ones that had to be recorded in Cobra. A significant amount of time I spent on Internet searches to identify potential partners for LOICZ as well as to complete and update contact details of existing ones, respectively. Furthermore, I made different Excel tables, worked on an online calendar for the LOICZ website, and learned how to use photocopy machines and the various printers.

In addition to my daily work, I occasionally participated in appointments. For instance, I attended one day the pupil's lab Quantum Leap where I worked with a fuel cell and could pose questions to an ocean biologist – a profession I am very interested in. Another day I took part in an internal seminar aiming to improve the project management processes of LOICZ. Such activities were very exciting and added value to my internship. The same can be said regarding social activities. During my time at the LOICZ IPO, I mostly spent my breaks with the staff. At any time, I could approach all employees and ask questions – also on a more private level – and I always received appropriate answers.

On 4 July, my teacher Mr. Tiedemann visited me at the LOICZ IPO and met and discussed my internship with the staff. He was satisfied with both my work and the opportunities I was given. In summary: I had a very useful training period and satisfying time.

“From the viewpoint of a supervising teacher, my visit at the LOICZ IPO was a real pleasure. It quickly became clear that the LOICZ staff does not treat school trainees secondary, but rather seriously look after them and integrate them into their team. An extensive and structured selection of activities meets with a pleasant sense of the possibilities and boundaries of pupils. As a teacher, one leaves the LOICZ IPO in the pleasant certainty that your student is embedded in a comfortable atmosphere and provided with intellectually stimulating activities.”

*Dr. Markus Tiedemann,
Teacher of N. Graupmann and Lecturer, National Institute
for Teacher Education and School Development.*

Formation of new department “Human Dimensions of Coastal Areas” at the Institute of Coastal Research of the GKSS Research Centre Geesthacht, Germany



At the Institute of Coastal Research of the GKSS Research Centre in Geesthacht, Germany, host of the LOICZ IPO, a new department for “Human Dimensions of Coastal Areas” has been established. The department dedicates its work to the socio-economic conditions of future developments in the coastal zone, land-use conflicts due to ecological and economic interests, Integrated Coastal Management (ICM) and socio-economic aspects of climate change. The research objective is to explore the various connections of human/nature-interactions and the participating actors in the coastal zone. In order to describe and explain these interactions and to pose questions with regard to resilience, vulnerability and adaptive capacities of coastal systems, the department applies innovative theoretical approaches and research methodologies. Concerning the close topical connection of the new department and LOICZ, collaboration is intended to strengthen innovative scientific approaches in the context of socio-ecological systems.

Dr. Beate M.W. Ratter, Professor of Geography at the University of Hamburg, holds a joint position as head of the new department. Main focus of her research is the analysis of resource and environmental management strategies in different regional cultures of developing and developed countries, such as Canada, Colombia, many Caribbean Island States, Cuba, Guyana and the European Wadden Sea Area. Special emphasis lies on the awareness of nature-culture interaction and intercultural differences as well as the importance of public participatory approaches in the development and adaptation of environmental

management strategies and sustainable development. Current research addresses problems of integrated coastal zone management and climate change as well as adaptation strategies and risk perception in coastal areas and on small islands.

The project cluster “*Zukunft Kueste – Coastal Futures*”, also part of the new department, works towards integrated assessment for coastal changes. Based on the notion of socio-ecological systems, a system characterisation based on the Driver-Pressure-State-Impact-Response (DPSIR) approach and the concept of ecosystem services, the cluster focuses on risks and opportunities associated with offshore wind farms in the German North Sea as an agent of change. Analysis of social values, problem perceptions, institutional networks, and related governance structures are key activities of the project cluster as well as the application of a scenario approach to model future sea use patterns and impact assessments at local and regional scale.

Ph.D. students of the University of Hamburg are also involved in the department. Cilli Sobiech holds a degree in physical geography and has worked in projects dealing with disaster risk management (DRM) on the German North Sea Coast and in El Salvador. Her Ph.D. topic focuses on an integrative systems approach and the application of agent-based models in DRM of the coastal zones. Martin Lange completed his degree in geography with his thesis on poverty alleviation in the coastal zone of Sri Lanka. Before starting his Ph.D. he interned at the Mediterranean Office of EUCC – The Coastal Union in Barcelona and worked at the University of Hanover. His Ph.D. focuses on the analysis of regional identity and cultural landscapes in the context of risk perception and future development of the people at the coast.

Thus, the new department “Human Dimensions on Coastal Areas” contributes to various aspects of the LOICZ Priority Topics 1 and 3 with specific involvement in the activities of the Priority Topic 3 working group. Synergies are expected to derive from the close collaboration especially regarding questions of societal decision-making and the non-linear co-development of society and environment. Taking into consideration that LOICZ also aims at extending its focus on socio-political topics and relevant integrative methods and modelling approaches the collaboration surely will be fruitful for both partners.

Contact:

GKSS Research Centre Geesthacht
Department: Human Dimensions of Coastal Areas
Prof. Dr. Beate M. W. Ratter
E-mail: beate.ratter@gkss.de

Coastal Futures

Dr. Andreas Kannen
E-mail: andreas.kannen@gkss.de

Link:

http://www.gkss.de/institute/coastal_research/structure/system_analysis/KSO/index.html.en

Publications

LOICZ Reports and Studies No. 33

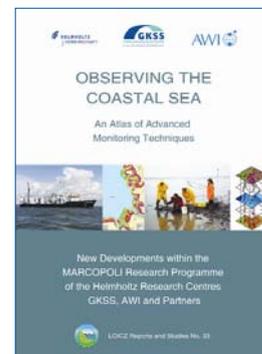
Doerffer, R., Colijn, F.,
van Beusekom, J. (Eds.) (2008)

Observing the Coastal Sea – an Atlas of Advanced Monitoring Techniques

The research program “MARCOPOLI” (Marine, Coastal and Polar Systems and Infrastructure) of the German Helmholtz Association of Research Centres aims at developing the scientific base for the assessment of observed environmental change as well as sustainable ecosystem utilization.

MARCOPOLI is a joint program of the Institute of Coastal Research of the GKSS Research Centre Geesthacht and the Alfred Wegener Institute for Polar and Marine Research. For the past five years interdisciplinary research activities have taken place in the field of marine, coastal and polar sciences to investigate the multiple physical, chemical, biological and geological interactions within the marine and associated terrestrial systems.

One of the themes is the development of new observational techniques and information processing and assessment procedures for coastal waters. Results of the development and the implementation of these techniques and procedures are presented in the new MARCOPOLI Monitoring Atlas which has been published in cooperation with LOICZ in its Reports and Studies series. In the form of short descriptions, figures and maps the Atlas presents methods on all levels of monitoring research, which have been developed by the two research centers and partners, ranging from advanced analysis of biochemical health indicators of marine mammals to remote sensing techniques and finally the highly integrated product of an oil sensitivity map for intertidal flats. The Atlas can be obtained from the LOICZ International Project Office or very soon from the LOICZ website.



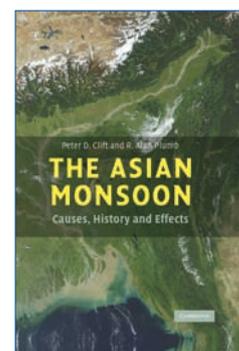
The Asian Monsoon: Causes, History and Effects

**Published by
Cambridge University Press**

Peter D. Clift
University of Aberdeen

R. Alan Plumb
Massachusetts Institute of Technology

The Asian monsoon is one of the most dramatic climatic phenomena on Earth, with far reaching environmental and societal effects. Almost two thirds of humanity lives within





regions influenced by the monsoon. With the emerging Asian economies, the importance of the region to the global economy has never been more marked. The Asian Monsoon describes the evolution of the monsoon, and proposes a connection between the tectonic evolution of the solid Earth and monsoon intensity. The authors explain how the monsoon has been linked to orbital processes and thus to other parts of the global climate system, especially glaciation. Finally, they summarize how monsoon evolution since the last Ice Age has impacted human societies, as well as commenting on the potential impact of future climate change. This book presents a multi-disciplinary overview of the monsoon for advanced students and researchers in atmospheric science, climatology, oceanography, geophysics, and geomorphology.

<http://cambridge.org/catalogue/catalogue.asp?isbn=9780521847995&ss=cop>

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<http://www.abdn.ac.uk/~wpg008/PChomepage.html>

Have you seen

ASLO Aquatic Sciences Meeting 2009

25–30 January 2009, Center de Congres Acropolis
Nice, France

You are cordially invited to participate in the LOICZ Topical Session (number 066) at ASLO Nice, France, January 25–30, 2009.

Details of this session can be found below as well as basic links for abstracts.

Please note the deadline (23:59 GMT/ 18:59 US, CDT) on 3 October 2008.

We look forward to exciting presentations and discussions focused on 5 key questions listed below.

Description of Topical Session:

Land-Ocean Interactions in the Coastal Zone are increasingly important in the current era of global change.

The session will focus on the human dimension and scenarios of change in the coastal zone, the area of the earth's surface where land, ocean and atmosphere meet and interact.

The session aims to address the primary issues of sustainable human use of coastal systems with vulnerability of coasts and risks for human uses playing a key role.

The 5 key questions will be:

1. **Fractal Coastal Futures: Emerging Global Trends:** How can we better forecast coastal futures in the face of global change?
2. **Social-ecological systems analysis in the coastal zone:** What have we done?
3. **Scales of Critical Change in the Coastal Zone:** How are the natural and human processes interrelated at multiple scales?
4. **Coastal Innovation: New methods and Solutions that Integrate Positive Adaptation:** What approaches can assist in developing better science and management in the coastal zone?
5. **The Role of Governance in the Coastal Zone:** How can we overcome existing barriers in the science-policy-practice interface that limit the use of knowledge?

Conference website: <http://www.aslo.org/nice2009/>

Abstract Submission:

<http://www.aslo.org/nice2009/submittal.html>
deadline (23:59 GMT/ 18:59 US, CDT) on 3 October 2008

Title of Session: 066-LOICZ: Land-Ocean Interactions in the Coastal Zone

Organizers:

Alice Newton, CIMA-Universidade do Algarve,
E-mail: anewton@ualg.pt;

Bernhard Glaeser, Deutsche Gesellschaft für Humanökologie, E-mail: bernhardglaeser@googlemail.com

20th biennial conference: CERF 2009 Coasts and Estuaries in a Changing World

The Coastal and Estuarine Research Federation proudly announces the call for scientific session and workshop proposals for its 20th biennial conference: CERF 2009 Coasts and Estuaries in a Changing World, 1–5 November 2009, Oregon Convention Center, Portland, Oregon USA.

Please submit online at www.erf.org Session and workshop proposal deadline is September 4, 2008.

FRANCE-JAPAN OCEANOGRAPHY SYMPOSIUM "GLOBAL CHANGE: INTERACTIONS MANKIND-MARINE ENVIRONMENTS"

Marseille, 8–10 September 2008
Paris, 12 September 2008

This symposium, the thirteenth of a serie, is organized, by three partners:

the Sociétés franco-japonaise d'Océanographie of Japan, the Société franco-japonaise d'Océanographie of France (S.F.J.O.) and the Centre d'Océanologie of Marseille.

The target of this symposium "Global change (eg. climate change, pollution...): interactions mankind-marine environments" focused on the knowledge and the management of marine environments, is to facilitate and strengthen relationships or establish links, between scientists and between laboratories. The goal is to carry out jointly fruitful scientific research in common, with reciprocal benefits, in the short and long term. To date more than 40 Japanese researchers from 15 universities or research center are registered.

<http://cfjo.com.univ-mrs.fr/>

🌐 "Climate Change: Global Risks, Challenges and Decisions"

University of Copenhagen organizes a major Climate Change conference (Risk, challenges and decisions) in March 2009 in collaboration with 9 world leading universities (the IARU alliance).

Please see: www.climatecongress.ku.dk

The Congress is the scientific forerunner for the COP, which takes place in Copenhagen later that year. The outcome of the congress will feed into this political event.

🌐 PEMSEA and HP Philippines present the East Asia Congress 2009 Regional Photo Contest. The Contest theme is "The Coast, The Ocean, My Community," which invites photographs that demonstrate local actions/implementation and good practices in sustainable coastal and ocean protection, development and management. The Contest aims to generate awareness on local and national ocean-, coastal-, environment-related initiatives of each country and increase participation of the communities with these activities.

The contest is open to nationals of the East Asian region. Photos must be high-quality prints or digital files and can be in color or black & white. There is no limit on the number of entries an entrant can send in. Entries must include the entrant's name, contact details, and the date and location of the photograph.

Entries may either be submitted online through <http://www.pemsea.org/eascongress>, or sent to:

The EAS Congress 2009 Secretariat
P.O. Box 2502 Quezon City 1165 Philippines
Telephone: +63 (2) 9292992, Fax: +63 (2) 9269712
E-mail: congress@pemsea.org

Deadline: All entries must be received by 31 December 2008.

For more information on East Asian Seas (EAS) Congress

2009 Regional Photo Contest, please see www.pemsea.org/eascongress

🌐 Opportunity for research funding for African scientists, from START..

Announcement for START's 2009 Call for Pre-Proposals for the Africa Small Grants Program.

This Call is issued to scientists in Africa who intend to conduct research on global environmental change.

The Application Form is available at the START web site: http://www.start.org/Program/African_sm_grants.html. Applicants are requested to follow instructions carefully.

🌐 IHDP 7th International Science Conference – NEW DATES and VENUE!

IHDP announces that the 7th International Science Conference on the Human Dimensions of Global Environmental Change (Open Meeting) "Social Challenges of Global Change", originally scheduled for 15–19 October 2008, will take place from April 26–30 2009 in Bonn, Germany. The new venue will be the former German Parliament premises (World Conference Center Bonn) at the United Nations Campus.

More details:

<http://www.openmeeting2009.org/>



Coastal Snapshot

Christoph Zöckler,
ArcCona Consulting,
Cambridge



Coastal Burma

Myanmar, or better known as Burma, has been very little studied. Independent since 1948, the former British colony has been largely closed for foreigners ever since and widely cut off from the rest of the world.

Only gradually the country opened some areas for tourism in the 1980s when visitors were allowed to enjoy the country's rich cultural treasures for seven days. These restrictions were even loosened in the 1990s and for 15 years tourism gradually began to flourish in certain areas, rich in the cultural heritage of the Buddhist majority of the people.



However coastal areas were mostly inaccessible to foreigners. Apart from some selected beach resorts, the vast coastline of more than 2,000 miles is virtually unknown and not studied.

During an international ornithological expedition in January 2008 I was able to visit some of the coastal areas in the Gulf of Martaban (Mottama) not far from the capital Yangon and in the Arakan (Rakhine) region in the Bay of Bengal near Bangladesh. Both areas are very remote and difficult to access. Organized by our friends from BANCA (Biodiversity and Nature Conservation Association), the half governmental nature conservation NGO we were able to access some of the most remote coastal areas in SE Asia. Our friend Tony Thin Hla has also never visited these areas but confidently and skillfully arranged the expedition of the international team of Burmese, German, Russian, Japanese and Thai experts. Provided with permits from the government of tourism we were able to approach these coasts by two teams and by different means of transport. The Gulf of Mataban is very rich with huge and extensive mudflats. As only small sandy tracks reach the coasts mopeds were the only way to approach some of the coastal stretches.

Gulf of Martaban



Fisherman checking nets at low tide a along way out. (Foto: C. Zöckler)

This region, very close and just east of the Capital Yangon, is part of the Andaman Sea and fed by three major rivers of the country. Due to its location and shape the bay is prone to huge sedimentation processes and coastal dynamics shaping the coastline with large extensive sandbanks and mudflats, the main targets for our water birds. Even though the region is very close to the capitol, the coasts remain very remote and the people have not met foreigners before. Most coastal sites are only accessible by boat. We managed to approach the coast by 2.5 hour motor bike ride on sandy bumpy tracks along small channels and rice paddies across uncountable small bridges, sometimes only makeshift structures or a board.

People along the coast live in small villages made of small huts of clay and straw, situated close to the mud cliff or shallow dunes. There is no dike protecting the communities. Only small dams protect the rice paddies from the sea, but not enough to protect the flat and vulnerable hinterland, when the sea is rising by storm or freak events. With little or no connection to the rest of the country the people are self-dependent, growing their own crops and live from fish and other marine products.



Some own little boats, but many fishermen walk long distances across salt marshes and mudflats to check their nets at low tide. Nobody owns a motorboat and few villages have generators and some electricity.

Arakan

The Arakan region at the northwest coast was for many years completely closed and not accessible due to local unrests. Very little was known about its biodiversity and the state of the coastal ecosystems. The opportunity with our local partner organization BANCA to visit this area in 2008 was very appealing.

In contrast to the Bay of Martaban the coastline is much more rugged and interspersed with rocky outcasts, in some places spiraling into the extensive mudflats, remnants of some volcanic activity in the geological past. The flatter part of the hinterland is used as paddy fields and mixed with many small ponds, allowing fishing inland as well. Mangrove forest has been cut as in so many places and only small rests have been left along the many coastal channels.

The most striking first impression for the foreign visitor is the almost total lack of engines and electricity. Sittwe (or Akyab) the regional capital of Arakan has hardly any cars, only affordable by a rich minority and Tony has difficulties to organize transport for our team and luggage. The main streets are full with bicycles and bicycle rickshaws, with two seats for passengers, regularly equipped with opened umbrellas as protection for the sun, shining with predictable reliability every day. Just a few mopeds try to

circumvent the myriads of bicycles. Hardly any cars move along the main street.

Two of these rickshaws take our Thai friend Tii, our Burmese colleague Aung Moe and I to the edge of the town, where a sandy track leads us towards the beach. It's Sunday and many people occupy the beach. A loud-speaker, placed on the back of a lorry entertains a group of youngsters playing football, a popular game like almost everywhere in the world, while young ladies stroll along the beach in small groups, dressed in fancy sarongs and hats. But only a few hundred meters further the scene is totally different again. Nobody is on the beach. Only a few brave boys followed us, inquisitive and trying to find out what these huge instruments on top of the tripods might be.

Behind some thinly vegetated dunes we find to our surprise small settlements spread out along the back of the dunes with small crops and haystacks surrounded by small freshwater lakes. The first object I noticed is a huge moving haystack, pulled by an ox cart and two smiling farmers. A woman near by is picking up small pieces of driftwood in a basket, washed from the sea at high tide.



Small-scale agriculture in the near coastal hinterland with traditional means. (Foto: C. Zöckler)

Aung Moe explained it's for cooking food in the evening. She also replies my interest with a smile. Different boys accompany us now, still checking the funny instruments we carry. We scan the lakes with our telescopes and allow the boys to look through without touching. Some manage to focus on a Ruddy Shelduck or wader and immediately show amazement.

These people keep small crops just along the dune edges on very poor soils, have a few water buffalos and ox near by, collect firewood from the beach and go out fishing at times. They live entirely from the resources found in their immediate surroundings.

In the following days our survey took us by boat into the near by coastal mudflats and beaches. Our boat was one of three motorboats we encountered during the next

9 days of the entire period of our survey. The other motorboats were a military vessel situated in the river mouth checking for illegal Bangladeshi immigrants and an overcrowded ferry across the channel. All the other myriads of boats belong to local fishermen, sailing out to their well-known fishing grounds, landing huge amounts of fish ashore. At certain tides one could see several sailing boats, each with different colorful sails, resembling a picture from the Kiel regatta in the Baltic Sea. But all these people are out there for a purpose. They pursue their fishing for their livelihoods and do not just sail for fun. Our Burmese friends stop some of the boats, which skillfully turn to come along the port side of our anchored boat. Tony shouts if we would fancy stingy ray. Of course we agreed and the fishermen pick a few huge rays from under a sheet in the wooden boat. These fishermen were specially targeting rays, a popular item for trading. Others closer to shore were fishing for prawns only. They walk along the near-shore water and use a fine net and 'hover' the sea bottom.

Once ashore the entire community is helping to process the fish, dividing the catch in different species, separating the shellfish and sepias from the fish and preparing the catch for storage and market. Big baskets full of fish are carried ashore by two men carrying the heavy load over a stick between them. Emptied on the shore women spread the fish on a layer of rice straw on the beach for drying in the baking sun. Most astonishing though is the observation of three young girls not older than 11 years who confidently drag a net from the sea on shore. Skillfully they search for valuable marine items, pick up squid, small fish and shellfish, before they throw the net back into the sea. They already become familiar with fishing by practicing fishing with small nets at an early age.

Further on, at low tide we come along a group of solely women who dig in the mudflats. At close range we identify a small shellfish-like animal with a long siphon, most likely ancient brachiopods collected from 10–20 cm depth. Several buckets are already filled.

The people live in small huts often close to the shore with little shelter from the sea. On one island we surveyed for birds, the people only settle here in the winter months, because in the summer the monsoon and other storms frequently flood the near shore areas. All these villages are temporarily constructed by makeshift huts and people move around seasonally dependant from coast further inland or back into the town Sittwe.

The coast is very rich in fish and wildlife. We encountered well over ten Irrawaddy Dolphins and several thousand water birds migrating from as far as Siberia and the Himalayas to winter in the rich coastal areas.

Just as I wrote these lines in May a violent cyclone hit the coast of Myanmar. More than two hundred thousand feared to have lost their lives and 2 million are threatened by disease and starvation. Little and incomplete information is coming out of the secretive country. The northern



region around Sittwe seems to have escaped the storm, but the Bay of Martaban has been hit hard. The coastline has been altered completely and I can't bear the thought that some of the many smiling faces we encountered might be among the casualties.

The same dynamic coastal processes responsible for the diverse coastal ecosystems, the rich marine life and livelihoods for millions of people is now creating utter destruction and disaster as the cyclone too well illustrated.

This is not new and the Bay of Bengal always suffered high losses of life and the people knew of the risk and how to live with it. Climate change and more importantly the gradual degradation of coastal ecosystems will though exacerbate the impacts and consequences for local people, leaving them more and more vulnerable to storm surges.

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

Calendar

2008

September 21–24, 2008: **7th International Conference on Tidal Environments (Tidalite 2008)**

September 16–21, 2008: **Pre-excursion (China coasts)**,
September 25–26, 2008: **Post-excursion, Qingdao, China**
Circular pdf file: <http://unit.aist.go.jp/igg/rg/cug-rg/ADP/files/Tidalites%202008%20First%20Circular.pdf>

ECSA 44 Symposium – Bahía Blanca, Argentina

Open Registration and Abstract Submission

September 29 to October 3, 2008

Deadline for Abstract submission: May 20, 2008

Deadline for early full registration: May 20, 2008

<http://ecsa44.criba.edu.ar>

contact information to ecsa44@criba.edu.ar

The ICES/NAFO symposium on **The Role of Marine Mammals in the Ecosystem in the 21st Century** will be held on 29 September – 1 October, 2008, at Dartmouth, Nova Scotia, Canada with co-convenors Garry Stenson (NAFO) and Tore Haug (ICES).

A **Symposium on the Ocean in a High-CO₂ World** will be held 6–8 October, 2008, at Monaco, with James Orr (Monaco, Chair), Ken Caldeira (USA), Victoria Fabry (USA), André Freiwald (Germany), Jean-Pierre Gattuso (France), Peter Haugan (Norway), Patrick Lehodey (France), Silvio Pantoja (Chile), Hans-O. Pörtner (Germany), Ulf Riebesell (Germany), and Tom Trull (Australia) as the organizing committee. Main sponsors are SCOR, IOC, IAEA, and IGBP.

A Scientific Steering Group will be established with members nominated by relevant Working Groups to assist the organizers in planning the Symposium. In consultation with the ICES representatives, the General Secretary will solicit appropriate co-sponsorship.

IHDP 7th Open Meeting, "Social Challenges of Global Change", 26–30 April, 2009, Bonn, Germany

The 7th International Science conference on the Human Dimensions of Global Environmental Change (Open Meeting) originally scheduled for 15–19 October, 2008 in India, will take place from April 26–30, 2009 in Bonn. The new venue will be the former German Parliament premises (World Conference Center Bonn) at the United Nations Campus, 2008. <http://www.openmeeting2008.org>

EMECS 8 International Conference Shanghai, October 27–30, 2008

Conference web site: <http://www.emecs-8.ecnu.edu.cn>

The EMECS 8 calls for its theme: 'Harmonizing River Catchment and Estuary' which is proposed on the basis of the rapid growing Asian economy that inevitably gives rise to intensifying modification between river catchment and estuary. This example can also apply to any analogue of the world, where the EMECS 8 conference theme should be used for ecosystem safety. Like all other conference, EMECS 8 is to provide a forum to all participants, including natural and social scientists, administrators, government officers, and younger students, to interact each other to work out a better understanding of how to minimize potentiality of the environmental risk. This is pursuing a harmonizing society with global concept of environmental conservation.

Organized by: East China Normal University, Chinese Research Academy of Environmental Sciences (CRAES), SEPA, International EMECS Center.

Zhongyuan Chen

Conference Secretariat

East China Normal University, Shanghai, China

E-mail: Z.Chen@ecnu.edu.cn – emecs8@mail.ecnu.edu.cn

A **World Conference on Marine Biodiversity** will be held 11–15 November, 2008, at Valencia, Spain with Carlo Heip (The Netherlands) and Carlos Duarte (Spain) as conference Chairs; Jake Rice, Canada, and Heye Rumohr, Germany as ICES co-convenors of the theme session.

A Scientific Steering Group has been established including ICES membership.

October 27 – November 3, 2008: **International Conference on Deltas (China venue)**

5th Annual Meeting of IGCP-475 DeltaMAP, Shanghai and Qingdao

In conjunction with EMECS-8 in Shanghai

Excursions to the Yangtze Delta, Old-Yellow River Delta, Modern Yellow River Delta

LITTORAL 2008

A Changing Coast: Challenge for the environmental Policies

November 25–28, 2008, Venice, Italy.

<http://www.littoral2008.corila.it/>

– Coming to an end: the EC funded project ENCORA has provided a very successful networking structure creating a new dimension to European cooperation on coastal issues.

– Opportunity to discuss the possibility of creating a European Coastal Platform that will provide a cooperative structure for existing national and international coastal networks.

**Coastal Cities Summit
Values & Vulnerabilities**

November 17–20, 2008, St. Petersburg, FL, USA
<http://www.coastalcities.org/>

Arctic Change 2008

December 9–12, 2008, Quebec City Convention Centre
<http://www.arctic-change2008.com/>

2009

ASLO Aquatic Sciences Meeting 2009

A Cruise Through Nice Waters, 25–30 January, 2009, Center de
 Congres Acropolis, Nice, France
 Sponsored by the American Society of Limnology
<http://www.aslo.org/nice2009/>

International climate change conference for Perth

Burswood Convention Centre in Perth, 23–26 March, 2009
 Further Information:
 Paul Holper, CSIRO Marine and Atmospheric Research
 For more information about Greenhouse 09 visit:
 03 9239 4661; paul.holper@csiro.au
<http://www.greenhouse2009.com/>

The University of Copenhagen is hosting an international scientific
 congress on climate change under the heading "**Climate
 Change: Global Risks, Challenges and Decisions**", 10–12 March,
 2009, in Copenhagen, Denmark. The congress is organised in co-
 operation with nine other universities in the International Alliance of
 Research Universities (IARU).
<http://climatecongress.ku.dk/>

An **ICES Symposium on issues confronting the deep oceans**
 will be held in the Azores from 27 to 30 April, 2009. The prime
 focus will be on the North Atlantic (ICES + NAFO Areas) but rele-
 vant contributions from elsewhere will be included. Conveners
 will be Robert Brock (USA) and Gui Menezes (Portugal). A scien-
 tific committee will be established to include relevant scientific
 disciplines and regulatory authorities. In consultation with the
 conveners, the General Secretary will solicit appropriate co-spon-
 sorship.

**The proceedings will be published in the ICES Journal of
 Marine Science in 2010.**

<http://www.ices.dk/iceswork/symposia.asp?topic=2009>

An **ICES Symposium on Rebuilding Depleted Fish Stocks –
 Biology, Ecology, Social Science and Management Strategies**
 will be held during the autumn 2009 at Hamburg (Germany)
 with Cornelius Hammer (Germany), Olav Kjesbu (Norway) and
 Peter Shelton (Canada) as Conveners.

A **Scientific Steering Group** will be established comprising
 12–15 leading scientists, approx. 5–8 leading scientists from
 the UNCOVER project and approx. 5–8 scientists from outside
 the project as well as from outside Europe.

**The proceedings will be published in the ICES Journal of
 Marine Science in 2010.**

Call for sessions: **iLEAPS Science Conference 2009**

iLEAPS, the Integrated Land Ecosystem-Atmosphere Processes
 Study (<http://www.ileaps.org/>) is organizing a Science Conference
 24–28 August, 2009 in Melbourne, Australia.

The iLEAPS Scientific Steering Committee is hereby inviting
 session topics and conveners for the iLEAPS conference. The
 sessions will be thematic and encompass several projects and
 initiatives all over the world. To fit the iLEAPS objective, the

sessions will be addressing land-atmosphere
 interactions in an integrative manner.

iLEAPS is also organizing an Early Career Scientists' Conference/
 Workshop prior to the main conference. We welcome sugges-
 tions for topics and hosts, especially from Australia.

The iLEAPS Science Conference is organized parallel to GEWEX
 Scientific Conference. The two parallel conferences will have
 three joint sessions that cover broadly the following themes:

1) Land in the climate system; 2) Aerosol, cloud, precipitation,
 climate interactions; 3) Future generation of integrated obser-
 vation and modeling systems.

Anni Reissell, PhD

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<http://www.ileaps.org>

second DIVERSITAS Open Science Conference:

Biodiversity and society: understanding connections, adapting
 to change, 13–16 October, 2009, in Cape Town, South Africa

Contact:

Mélinda SEENEEVASSEN

DIVERSITAS Secretariat

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57 rue Cuvier – CP 41

75231 Paris Cedex 05, France

Tel: + 33 1 40 79 80 40, Fax: + 33 1 40 79 80 45

E-mail: secretariat@diversitas-international.org

Website: <http://www.diversitas-international.org>

20th biennial conference: CERF 2009 Coasts and Estuaries in a
 Changing World, 1–5 November, 2009, Oregon Convention
 Center, Portland, Oregon, USA .

2010

An **ICES Symposium on the Collection and Interpretation of
 Fishery Dependent Data** will be held during the summer 2010,
 in Galway, Ireland with N. Graham (Ireland), K. Nedreaas
 (Norway), and W. Karp (USA) as Conveners.

A Scientific Steering Group will be established with members
 nominated by relevant Working Groups to assist the Conveners
 in planning the Symposium. The Symposium will be co-spon-
 sored by the Marine Research Institute of Ireland and the United
 States National Oceanic and Atmospheric Administration and
 will be held in association with FAO. In consultation with the
 Conveners, the General Secretary will solicit further co-spon-
 sorship as appropriate.

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 organization to assist the Conveners in planning
 the Symposium.



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.

Published and edited by:

The Land-Ocean Interactions in the Coastal Zone
International Project Office

Design:

Ellen-Barbe Goldberg
Ute-Gerit Stoffregen
Hester Whyte

Printing and layout:

GKSS-Hausdruckerei, Geesthacht, Germany

Photographs and illustration:

The illustration of the coastal zone on the front page is made by the artist Glynn Gorick, UK, 2005 and commissioned by LOICZ/IGBP. The photographs on the front and back page of this newsletter are copyright to Martin Le Tissier. Photo H. Kremer (front page): Part of Penglai Castle, and Penglai Pavilion; a 1000 year old fortress overlooking the junction of the Bohai and Yellow Sea 65 km north west of Yantai.

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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 Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP).

The LOICZ IPO is hosted by the Institute of 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.

