LAND-OCEAN INTERACTIONS IN THE COASTAL ZONE

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A global database for coastal vulnerability analysis (DINAS COAST)

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1. Introduction

The global extent of the effects of rising sea-levels on coastal regions and the increased vulnerability of the coastal zone due to the high concentration of natural and socio-economic resources highlight the need for regional to global assessment. Consistent long-term and broad-scale assessments of potential impacts and responses can significantly assist the formulation of effective climate and coastal policies. Global vulnerability assessment (GVA) studies have been the main sources of quantitative information on potential impacts of sea-level rise. One of the principal limitations however of GVAs, which has compromised their reliability and consistency, has been the lack of appropriate data sources.

Access to reliable and timely data, which are available in a suitable form, can substantially enhance and facilitate analysis. However, available data do not usually comply with this principle as they are usually in a fragmented and non-coherent form that compromises the consistency and reliability of evaluations. Merging different data types, datasets and databases makes this information available to non-specialized users and policy makers and facilitates integrated assessment. This enhances the potential of existing data and tools in assisting the coastal science community. The importance of reliable data-provision mechanisms and of organized, planned and coherent coastal databases as prerequisites for coastal analysis and management has been emphasized by many researchers.

The LOICZ Newsletter is produced quarterly to provide news and information regarding LOICZ activities

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To fill a significant gap in coastal research, a new global coastal database has been developed within the framework of the DINAS-COAST project. (also see NL No. 27 June 2003). The database forms an integral part of the DINAS-COAST system and provides the input data for the Dynamic Interactive Vulnerability Analysis (DIVA) tool, which is the main product of the project. Initially developed within a Geographic Information System (GIS), the DIVA database has been designed to include data on physical, ecological and socio-economic characteristics of the coast at various resolutions and covers all the world's coastline, excluding Antarctica. Given the linear nature of the coast, all the data in the DIVA database are referenced to linear coastal segments and are expressed as attributes of five main geographic features:

(a) coastline segments,
(b) administrative units,
(c) countries,
(d) rivers,
(e) tidal basins.

This gives a fundamentally different data structure compared to the more common raster datasets used in global studies.

2. Representation of coastal information and database design

Information representation is a fundamental factor for the organisation and reliability of a database. The data model and structure have been identified as the major concerns of developers of coastal information systems, with the selection of an appropriate model of coastal space being most important. Due to the dynamic nature of the coast and to the multi-dimensionality of information associated with it, representation of coastal space has always been a complex issue. This presents a challenge in determining appropriate data structures to construct coastal databases.

As it is one of the most distinct features on earth's surface, the coastline has been one of the most widely-used data elements when representing coastal space. Some form of shoreline delineation is used in most examples of coastal or ocean resource mapping. While there are disadvantages, the common perception of the coast as a fundamentally linear entity makes it attractive to model the coast in one dimension. Linear models of the coast have been employed on several occasions for representing coastal information. Recent advances in GIS and data collection techniques have facilitated the development of such models, although

their use is restricted to those with access to specialised hardware and software. However, the DIVA database is available in an easily-accessible form and its use does not require specialized software and hardware, thus rendering it accessible to a wider range of coastal scientists. This is largely due to the effective data model that has been employed in the developed database.

2.1. The DINAS-COAST data model

Based on the concept of linear representation of the coastline, the DINAS-COAST project has created a model of coastal space where geographic information is represented as a collection of geographic features and is referenced to coastal segments of variable length. As DINAS-COAST is focused on coastal vulnerability, coastal space in the DIVA database has been structured to represent longshore variability in vulnerability. Thus, the coastal segments represent reasonably homogenous units in terms of potential impacts and vulnerability to sea level rise. The boundaries of the coastal segments were decided according to a series of physical, administrative and socio-economic parameters. As DINAS-COAST is focused on sea-level rise, the range of critical values that define vulnerability within the coastal zone should reflect the impacts and responses of the coastal system to this factor. Based on the assumption that variations in vulnerability within the coastal zone are controlled by primary variations in the human and physical coastal interchange several meaningful and available parameters were identified to use for segmentation purposes. These parameters were (i) the geomorphic structure of the coastal environment, (ii) the potential for wetland migration, (iii) the locations of major rivers and deltas, (iv) population density classes and (v) administrative boundaries. Based on these parameters, the world's coast was divided into 12,148 segments. These provide spatial reference units for the DIVA database, integrated modules and graphical user interface (figure 1).

2.2. The role of the database in DINAS-COAST

The DINAS-COAST database has been initially developed within a GIS due to the explicit spatial nature of the data. Coastal GIS is often described as a "tough issue" due to numerous fundamental problems such as the lack of effective conceptual and data models of coastal objects and phenomena, and the handling of the temporal and dynamic properties of coastal properties. However, GIS still offers significant advantages such as the ability to handle large databases and to integrate and synthesize data from a wide range of sources (e.g. remote sensing, cartography, etc.) and also the potential to convert and model data. They have been extensively used as a medium for storing, displaying and analyzing coastal data.

In order to provide a lean and well-structured database which would not compromise the execution time of the tool, all the operations necessary for converting the primary and secondary input data into the form for the DIVA database were performed within the DINAS-COAST Geodatabase externally to DIVA. Therefore, the GIS Geodatabase occupies a central role within the project (figure 1). This reflects its role as the medium for storing, processing and exporting the acquired data in a format suitable for the DIVA database.

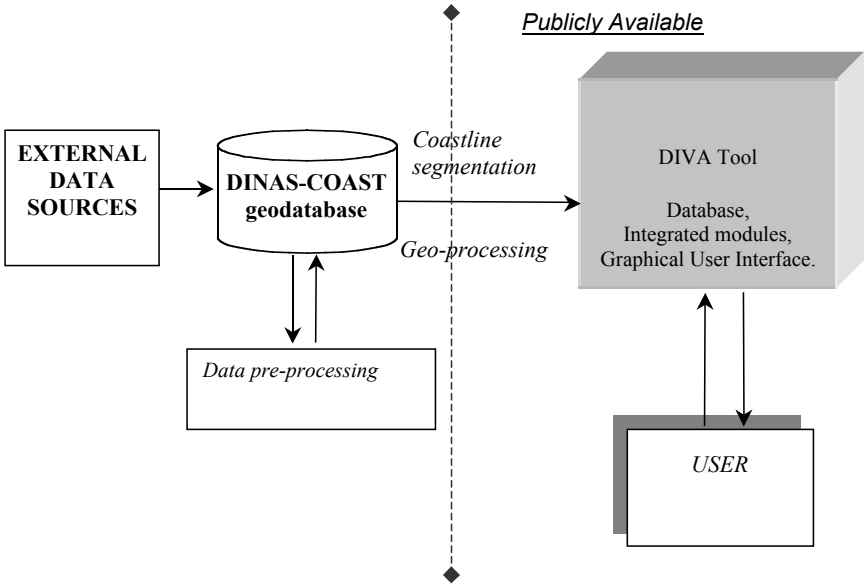

Figure 1 *The central role of the geodatabase within DINAS-COAST, including feeding data to the DIVA database (adopted from Vafeidis et al., 2003).*

3. The database

Compilation of the database has been based on a series of primary and secondary data sources included in the contents of the vast archives of existing datasets. Secondary data sources have been extensively used for the generation of digital datasets in those cases where data were not available or where existing data were not deemed adequate for the requirements of DINAS-COAST. According to Rhind and Clark the integration of primary and secondary data offers the most promising approach to develop globally coherent, up-to-date and scientifically valid databases. Nevertheless, the integration of datasets from such a large variety of data sources constituted a major challenge as the spatial-data "inheritance" of DINAS-COAST unavoidably presented massive variations in quality, timeliness and coverage. All the digital datasets that were acquired and all the analogue ones that were converted to digital form were processed and customized to a standard format in order to overcome the inherent variations.

Dataset	Format	Source
Gridded Population of the World	Raster	CIESIN
World Elevation and Bathymetry	Raster	NGDC
Geomorphic type	Analogue map	McGill, 1958
Landform type	Analogue map	Valentin, 1952
Tidal Range	Raster	IGBP-LOICZ
Second Level Admin. Boundaries	Polygon	DCW, ESRI
Uplift/Subsidence	Raster	Peltier, 2000
GDP per capita	Tabular	CIA (2002), WRI (2003)
Dominant Religion	Tabular	CIA (2002)
Wetlands	Tabular/polygon	CCRU
Sea Level Change	Raster	CLIMBER

Table 1 *Characteristic datasets, originating from different sources and in different formats, that were included in the database.*

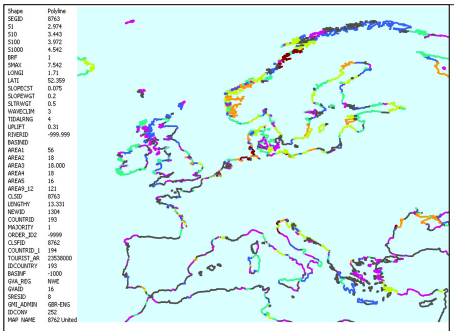

Figure 2 *An example of the coastline segmentation. Coastline segments for Europe and associated information.*

One of the most important aspects of this work has been the geographical integration of the datasets that were collected or generated as georeferencing constitutes a major problem even in large scale (i.e. small area) studies. For this purpose a series of global projections were employed, for projection-dependent calculations, depending on the processing needs of the individual datasets and after pre-processing was completed all data were referenced to a geographic (latitude/longitude) reference system.

Using the storage and analytical powers of GIS, the spatial data were referenced to the coastline segments (figure 2) and were exported in the form required by the data model of DIVA, where all data are presented as properties of the five geographic features defined earlier. The database in its final form includes information on more than 50 physical and socio-economic parameters of the coast (table 1). The database is associated to extensive descriptive metadata information which contain detailed information on the data properties including information on the underlying data sources, processing methods and data coverage.

4. Conclusions

A new global coastal database has been developed within the context of the DINAS-COAST project – the DIVA database (figure 1). It merges data of different types and from various sources to create a consistent and coherent source of information on coastal physical and socio-economic parameters that covers the entire globe. It has to be noted that since DINAS-COAST is focused on climate policy analysis, the resolution of the DIVA database is too coarse for more detailed coastal management purposes. Therefore its contents should be evaluated considering all the limitations that are associated with global datasets. The DIVA database has a fundamentally different structure to most commonly used global datasets as it has been designed for the needs of coastal vulnerability assessment and in that sense aims to better serve the current information needs and priorities of coastal scientists working in this field. At the same time, it has been designed for application specific needs and in that sense reflects the priorities and perspectives of the DINAS-COAST project. Nevertheless, the methodological and structural advances achieved and the interdisciplinary character of the database are expected to impact a wider range of applications. In this context, commitment to the adopted data structure in future versions and updates of the database is deemed essential for the use of the database in a consistent and coherent manner through time and space.

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Groundwater and Nutrient Inputs into the Upper Gulf of Thailand

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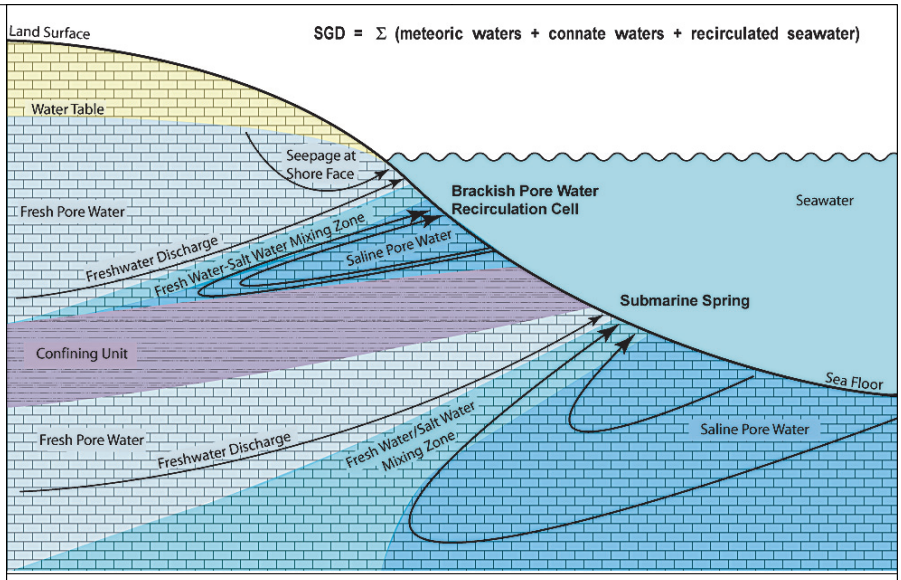

Figure 1 *Diagrammatic cross-sectional view of a coastal zone, illustrating the types and pathways of fluid movements that may result in interactions between groundwater and surface waters (diagram courtesy of Peter Swarzenski, USGS Open File Report 2004-1369).*

Introduction

We hypothesize that many water quality and associated problems influencing coastal environments around the world today are related to past and on-going contamination of terrestrial groundwaters because those groundwaters are now seeping out along the world's shorelines. Such inputs contribute to the increased occurrences of coastal hypoxia, nuisance algal blooms, and associated ecosystem consequences. A complete understanding of the marine budgets of carbon, nutrients, and other key biogeochemical species should thus include consideration of groundwater inputs.

The direct discharge of groundwater into the coastal zone, called "submarine groundwater discharge" (SGD) is now recognized as a significant, but poorly quantified, pathway between land and sea (figure 1). As such, SGD acts as a source of inorganic and organic carbon, nutrients, and other dissolved species to coastal waters and ecosystems. Unfortunately, the process is very difficult to quantify because of its diffusive nature – this is one of the reasons the process has been ignored by coastal scientists for so long. A few years ago, SCOR and LOICZ brought together an expert team, which has now made significant progress in advancing our understanding of the forces and components of SGD as well as advances in measurement techniques and protocols that can be applied elsewhere. A recent review of all SGD research performed to date showed that there is a significant lack of data for regions in Africa, South America, and Southeast Asia. One conclusion of this review was that groundwater transport could be particularly important in Southeast Asia because of the wet humid climate and excessive limestone terrains that are conducive to rapid underground flow. We have just completed an initial study of groundwater inputs into the Upper Gulf of Thailand – a few highlights of that study are presented here.

Study area and methods

We focused this investigation on the Chao Phraya Estuary and near-shore areas of the Upper Gulf of Thailand just to the east (Sri Racha) and west (Hua Hin) of the estuary. The Chao Phraya is the largest river located in the northern and central part of Thailand. It accounts for about half of the riverine flow to the Gulf of Thailand. Continued deterioration of the water quality of the Chao Phraya and groundwater in the region could have important implications for the biogeochemistry of the Gulf of Thailand.

We had two sampling campaigns in 2004, one in January (dry season) and the other during July (wet monsoon). Transects in the river, estuary, and out to about 50 km in the Gulf were made using the R/V Chula Vijai from Chulalongkorn University. Inorganic and organic nutrient species, carbon, radioisotopes (radon and radium isotopes), CTD profiles were made at over 60 stations during these field studies. In addition, groundwater seepage was measured in the coastal areas of Sri Racha and Hua Hin using both manual and automated seepage meters (vented benthic chambers). Resistivity measurements were also made to investigate the fresh water – seawater interface.

Nutrient inputs via SGD

We assessed the potential importance of SGD for nutrient inputs into the Upper Gulf by combining results from our data sets from the Chao Phraya River-Estuary with the seepage measurements made in Sri Racha and Hua Hin. Complete sets of nutrient measurements were made in all cases, together with our estimates for SGD based on seepage meter and isotopic measurements. We calculated fluxes from the Chao Phraya River by multiplying the average nutrient concentration by the river discharge as recorded at the Chao Phraya Dam during the same period. The nutrient concentrations were measured repetitively at one downstream location (~18 km from river mouth) monitored over several days during both the January and July surveys. This provides a river flux estimate for each nutrient in moles per day. We next assessed an estimate of the seepage inputs by multiplying integrated seepage fluxes by the average concentrations of each nutrient measured in waters collected directly from the seepage chambers. This provides estimates of nutrient fluxes via seepage per unit width of shoreline (moles m^{-1} d^{-1}). Since the seepage estimates are per unit width of shoreline while the river estimates are in absolute terms, we may compare the two by dividing the river flux (moles d^{-1}) by the seepage flux per shoreline width (moles m^{-1} d^{-1}) to derive an "equivalent shoreline length" (figure 2).

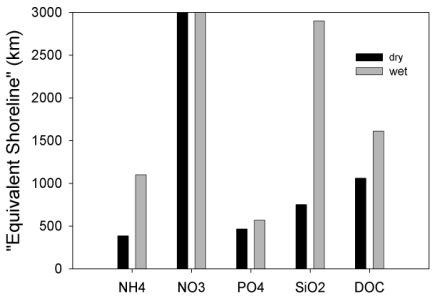

Figure 2 *Estimates of the approximate amount of shoreline that would provide nutrient fluxes to the Upper Gulf of Thailand equivalent to that from the Chao Phraya River in the dry (black) and wet (grey) seasons, respectively. Nitrate levels are off scale at about 16,000 km (dry) and 38,000 km (wet).*

In other words, this is length of shoreline along the upper Gulf of Thailand that would have groundwater seepage inputs equivalent to the nutrient delivery of the Chao Phraya River.

While we recognize that these calculations have many uncertainties (e.g., only two stations assessed for groundwater inputs) and are thus crude estimates, the results are still compelling in terms of illustrating the significance of groundwater inputs. During the dry season, it would only require seepage inputs over shoreline lengths on the order of 400-500 km to equal the inputs of the Chao Phraya River for ammonia and phosphate. Inputs of silica from seepage would require less than 800 km of shoreline. The results for the wet season showed greater seepage fluxes although less impact relative to the Chao Phraya because the river discharge (and thus the nutrient fluxes) is so much higher at that time. Still, the shoreline length required for an equivalent flux of phosphate is still less than 600 km and just over 1000 km of shoreline is required for ammonia.

These results suggest that nutrient inputs via seepage are comparable to one of the most important rivers draining into the Gulf of Thailand. These results are even more impressive when one considers that the Chao Phraya is a very contaminated river with extremely high nutrient concentrations from industrial and domestic activities in Bangkok. Thus, had we made a comparison of nutrient inputs via groundwater seepage to a less contaminated or pristine river, the equivalent shoreline lengths would have been considerably shorter, i.e., the relative importance of groundwater seepage would be much greater.

Looking ahead

Based on the measurements and insights made during this project, we suggest that future research be directed to making additional groundwater seepage measurements in the coastal Gulf of Thailand. Our estimates of nutrient delivery via seepage are based solely on measurements in one river and two coastal sites. A few additional sites, together with a typological approach towards extrapolation, would result in much more reliable estimates.

The Gulf of Thailand borders on Cambodia, Vietnam, and Malaysia as well as Thailand. In order to provide better Gulf-wide estimates of the importance of groundwater inputs to the carbon and nutrient budgets, it would be preferable to work together with scientists from these neighboring countries. The investigators of this project have recently received a grant from the Asia-Pacific Network (APN) to hold an international workshop on SGD in Thailand in February 2005. Experts in hydrology and coastal oceanography from several Southeast Asian countries will participate in this workshop. This should provide an excellent opportunity to plan for future coordinated efforts.

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SCOR Meeting on Coordination of International Marine Research Projects, Venice/Mestre, Italy, 23-24, September 2004

Discussing common opportunities, issues, and problems is critical to generate collaboration and cooperation among the multiple international ocean research and observation projects and programs including the ESSP, UN frameworks amongst others. Supported by the Alfred P. Sloan Foundation, the Scientific Committee on Oceanic Research (SCOR) convened a meeting "Coordination of International Marine Research Projects" bringing together representatives from virtually all international marine research projects and programmes (CLIVAR, CoML, GEOHAB, GLOBEC, iAnZone, IMAGES, InterRidge, IMBER, LOICZ, and SOLAS). Profs. John Field and Laurent Labeyrie convened the meeting on behalf of the SCOR Executive Committee. The agenda included several specific topics determined by questionnaires prior to the meeting to be important inter-project issues, including data management, interactions of projects with the Global Ocean Observing System (GOOS), project coordination in the area of Southern Ocean research and participation in the International Polar Year, project needs for time-series stations, and future project contributions to global environmental assessments. The agenda also provided an opportunity for projects to raise and discuss other issues of inter-project collaboration and promoted a range of bilateral discussions. Information about the meeting is available on the activity Web page (see www.jhu.edu/scor/ProjCoord.htm).

Recommendations that resulted from the meeting and which aim to develop and enhance *Mechanisms for Interactions Among Projects* include:

- more attention should be given to project coordination based on participation by establishing multi-project SSC membership, or at least liaison structures across the various SSCs including mechanisms for regular reporting,
- regional communication structures should be established in which regional project Nodes could take a leading role,
- SCOR will explore options to establish a regular platform for this type of international coordination Meetings,

- Project Data Management should be standardised, and long-term maintenance and updating platforms be established to guarantee continued use and development of the various databases in the projects. A small subgroup met to develop specific recommendations on project data management, to follow up on the results of the Liverpool meeting sponsored by SCOR and IGBP in December 2003 (see http://www.jhu.edu/scor/DataMgmt.htm). Long-term actions should include easy access to data through the Web, training in accessing and using the data and utilities for intercomparison, and quality control,
- projects should determine their terms of *interaction with GOOS* including for example participatory structures within the SSCs. In the case of LOICZ, and building on the long track record of close collaboration and involvement in the design and development of the Coastal GOOS, immediate action will include the drafting of a white paper between their Coastal Observation Panel (COOP) and LOICZ.
- projects should ensure continued *contributions to Global Environmental Assessments* (e.g., IPCC and MA) to build awareness of their data needs so to enable the development of standardized indicators that can result in future improvement of the coming assessments.

ELOISE on final? - 6th European Conference on Coastal Zone Research: an ELOISE Approach. Portoroz, Slovenia 15 - 18 November, 2004

The 6th meeting of the European Land-Ocean Interaction Studies (ELOISE) marked the sunset of more than two years of intensive synthesis. The meeting, organized by the Norwegian Institute for Air Research and Jozef Stefan Institute in Ljubljana, reported and discussed results, future relevance and outreach of the cluster of 60 projects in this framework. The cluster largely focused on how land-ocean interactions operate and the influence of human activities. It aimed to coordinate and facilitate communication and integration, among related projects and their end-users. The ELOISE program to date has run for some seven years and is one of the largest regional coastal research program in the world. The focus of the current integration and synthesis centres on four major topics:

1. Climate change and coastal management
2. Nutrient dynamics
3. Habitat dynamics at the coast-catchment interface
4. Contaminant budgets in the coastal zone

The 6th meeting showed that ELOISE has undergone considerable evolution. In particular in recent years it has not only contributed to Global Change Sciences in coastal zones as part of IGBP/LOICZ, but evolved from a curiosity driven set of individual projects into a focused effort that has started to generate an information flow that has had an impact on European policy. In doing so the ELOISE community has become more focused on the needs of process oriented ecosystem sciences, the needs to develop integrated modelling approaches and to find ways to communicate the results of its science to stakeholders and policy makers.

Among the key findings is that considerable parts of the European coast are affected at least as much as by catchment based processes than by oceanic and atmospheric influences. This has influenced the scale and scope of ELOISE science helping to identify and visualize the different views of stakeholders (incl. scientists) on their "role" within the catchment–coast water continuum. Taking a holistic perspective of this water continuum requires understanding of how the multitude of individual elements interacts in the delivery of goods and services in support of human life for sustainable development of coastal societies. There is an obvious mismatch in information needs and the way knowledge is provided. This is probably one main reason why, in contrast to assessments such as the IPCC, coastal zone research has not had a comparable impact on policy making. Coastal science and stakeholders are challenged to provide and exchange the information needed in the policy process and decision making.

In conclusion, at the onset of the EC 7th Framework Programme and shortly before launching a final 6th FP call, the meeting affirmed that the EC should continue with a contribution to coastal sustainability science in the context of global change and human dimensions. This should be linked closely to climate change research and recognize the scientific agendas of the Earth System Science Partnership (ESSP) of the IGBP, IHDP, WCRP and DIVERSITAS so that they can support the further development of European coastal change research. A key future aspect will be the applicability of scientific information to both, a) the immediate and upcoming decision support needs (e.g., EU-Marine Strategy, ICZM Strategy, EU WFD), and b) the emerging broad themes of interdisciplinary global change science for which LOICZ II provides an emerging peer reviewed frame. The ELOISE cluster has been able to contribute a considerable scientific basis for the future, e.g., in form of integrated modelling and participatory approaches in the context of the highly variable temporal and spatial scales of the coastal zone, and it has an increasing relevance for the further development of LOICZ II.

Further information on the ELOISE cluster and synthesis can be found at http://www.eloisegroup.org/.

UNEP-DEWA AEO-2 workshop, Nairobi, Kenya, 21-23 October 2004

LOICZ was represented by Russell Arthurton at the UNEP-DEWA AEO-2 preparation workshop held between 21 and 23 October attended by about 40 participants. The brief of the workshop was to report on the Coastal and Marine environment including Wetlands. The workshop and UNEP-DEWA has strong relevance to LOICZ in terms of the natural science and its human dimensions. The workshop highlighted the problems of reconciling the research/knowledge needs of the broader coastal zone with the boundaries imposed by the policy frameworks of Regional and International programmes and geography that often prescribe an inflexible sectorial approach to environmental assessment. This despite attempts to overcome such fragmentation through instruments such as the UNEP Nairobi and Abidjan convention. However, the workshop did successfully turn the assessment emphasis from the sectorial inventory and 'doomsday' approach' to identifying development opportunities in the light of environmental threats and other issues. LOICZ, through Russell, will continue to further this progression and development of the concept of a water cascade or continuum by assisting in the peer review of the sub-regional assessment reports.

IPO NOTES

☆ Contribute to LOICZ ☆

Your scientific article in the LOICZ Newsletter? If you want to submit a scientific article for review and publication in the LOICZ Newsletter please send it to loicz@nioz.nl. The article should be relevant to LOICZ related research and of a maximum of three printed pages including figures, tables and references.

If you would like to submit notification of an up-coming meeting/workshop for inclusion in the LOICZ newsletter and/or on our website please contact the LOICZ IPO.

Third LOICZ Regional IPO Node established in Sri Lanka

The third Regional IPO Node of LOICZ II covering the South Asian region has been established at the National Science Foundation, Sri Lanka (NSF) in Colombo, Sri Lanka. The Memorandum of Understanding between the LOICZ Central IPO and the NSF was signed in November. As with other Regional IPO Nodes, the Node in Sri Lanka will represent a national and institutional commitment to support the implementation of the LOICZ II programme.

In terms of land-ocean interactions, South Asia presents many research challenges for LOICZ. The Ganges-Brahmaputra river system ranks highly amongst the world's rivers in terms of freshwater flux and sediment flux. The majority of the 1.4 billion population of the region (approx. a fifth of the World's population) live within the coastal zones, contributing significantly to the global nutrient flux to the oceans. They are also highly vulnerable to the present extreme events such as floods, storm surges and cyclones with millions affected annually, as well as to any future impacts of climate change induced sea level rise.

The establishment of the Node is a culmination of coastal related activities organized by the Sri Lankan National Committee of the IGBP, led by Dr Janaka Ratnasiri. These included two Regional Workshops in 1999 and 2000 and a Regional Project on "An Assessment of Nutrient, Sediment and Carbon Fluxes to the Coastal Zone in South Asia and their Relationship to Human Activities" from 2001 to 2004 (www.nsf.ac.lk/slaas/cfweb). These activities were organized in association with LOICZ and SASCOM and funded by APN, START and LOICZ.

NSF as a host of the South Asia Regional IPO Node of LOICZ is hosted in Sri Lanka by the National Science Foundation (NSF) that is part of the Ministry of Science and Technology. Its functions include the initiation, facilitation and support of basic and applied research, fostering the exchange of scientific information among scientists, maintaining a database of scientific and technical personnel and resources and the popularisation of science. The NSF liases with many international scientific organizations, is member of the ICSU from Sri Lanka and coordinates the Sri Lankan activities of the Man and the Biosphere programme of UNESCO.

The South Asian Regional IPO Node will be under the direction of a national committee appointed by the NSF chaired by Dr Nalin Wikramanayake (tomwiks@yahoo.com), who is currently a member of the LOICZ SSC. It is planned to expand this committee into a regional committee with representation from the wider scientific community of other South Asian countries. The Node will play a regional coordinating role and help develop regional funding proposals to implement the science agenda of LOICZ including links with other regional programmes and intergovernmental networks including the South Asia Committee (SASCOM) of START, South Asia Cooperative Environmental Programme (SACEP) , IUCN Regional Coastal Programme and Indian Ocean Global Ocean Observation System (IOGOOS), to develop regional coastal modules for the new Earth System Science Partnership (ESSP) integrated studies.

Dr Nalin Wikramanayake

Dr Janaka Ratnasiri

The official inauguration of the Regional Node is planned to be held in early 2005 in Colombo. The Node's contact is:

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PUBLICATIONS

Keep an eye on the LOICZ website for news on **new LOICZ R&S reports** that will soon be available as hard copy and electronic download.

Dennis Swaney held meetings with Gianmarco Giordani, Pierluigi Viaroli and members of the **Italian Lagoon Observational Network** (LaguNet) to revise preliminary nutrient budgets toward publication in the LOICZ R&S series. Revisions of individual budgets were discussed and recommendations

Obituary

Prof. Nuruddin Mahmood, Director of the Institute of Marine Sciences affiliated to the University of Chittagong in Bangladesh, passed away on the 18th October without recovering from a coma he fell into after meeting with a motor car accident.
Born in November 1948, Prof. Mahmood received his higher education at Universities in Bangladesh, Pakistan and Japan. He specialized in Biological Oceanography/ Limnology and was team leader in Bangladesh for the highly successful APN funded South Asia regional project on Coastal Fluxes which was carried out in association with LOICZ between 2001 and 2004. He prepared two budgets, one for Meghna estuary and the other for Karnaphuli estuary using LOICZ methodologies.
Prof. Mahmood was very supportive towards the recently established South Asia IPO Node of LOICZ and we were very much looking forward to work with him in the coming years. We are sorry indeed for not having that opportunity.

Janaka Ratnasiri
Principal Investigator, APN Coastal Flux Project

made toward final presentation. Final editing has now been completed by Jan Crossland and the printing and publication as hard copy and electronically is nearing completion. The budgets are to be posted on the LOICZ budget website by Dennis Swaney.

Russell Arthurton and Martin le Tissier have been editing the outputs from the **AfriCat** studies that with a synthesis paper will be published as hardcopy and electronically early in the New Year.

ANNOUCEMENTS

ICSU and WMO propose an International Polar Year 2007-2008 (IPY).

The fundamental concept of the **International Polar Year (IPY) 2007-2008** is of an intensive burst of internationally coordinated, interdisciplinary, scientific research and observations focused on the Earth's polar regions. The official observing period of the IPY will be from 1 March 2007 until 1 March 2009, the International Council for Science (ICSU) takes the lead in organizing the IPY.
As a coastal component of the IPY, the Arctic Coastal Working Group of the 2nd International Conference on Arctic Research Planning (ICARP II) and Arctic Coastal Dynamics (ACD), which is a project of the International Arctic Science Committee (IASC), the International Permafrost Association (IPA) and LOICZ, will be submitting a proposal for the establishment of a network of circum-Arctic coastal observatories, including long-term ecological research areas (LTER). Coastal issues will be considered from three major systemic perspectives: physical, ecological, and anthropological. Sensitive sites with different levels of human impact will be selected in coordination with local communities.

FINAL CALL

LOICZ II Inaugural Open Science Meeting

27-29 June 2005,

Egmond aan Zee, Netherlands

www.loicz.org/conference

Deadline for abstract submission: 14 February 2005

Further expressions of intent for IPY to the IPY International Programme Office (IPO) are due by **14 January 2005**, via www.ipy.org or by e-mail: jcel@bas.ac.uk or by fax: +44 1 223 221 270.
Full proposals will be due in **June 2005**

MEETINGS

For a complete list of future meetings and regular updates visit our web-site at www.loicz.org

24-29 April 2005, Vienna, Austria: Assembly of the European Geosciences Union. Special session on Coastal biogeochemistry and its response to anthropogenic perturbations: inputs, gasexchange, carbon and nutrient and other elements cycling: **Biogeochemistry section BG3.01.** www.copernicus.org/EGU/ga/egu05/index.nl

16-21 May 2005, Victoria, Canada: GLOBEC Symposium on Climate Variability and Sub-Arctic Marine Ecosystems, Victoria. www.globec.org

6-9 June 2005, Brest, France: 4th EuroGOOS Conference-European Operational Oceanography: Present & Future. www.eurogoos2005.org

19-24 June 2005, Santiago de Compostela, Spain: ASLO summer meeting-A Pilgrimage Through Global Aquatic Sciences. Special sessions:
SS08-Carbon and carbonate fluxes in the coastal ocean: a tribute to Roland Wollast. Organisers:Jean-Pierre Gattuso (gattuso@obs-vlfr.fr) & Fred T. Mackenzie (fredm@iniki.soest.hawaii.edu)
SS42-Hydrology-related Downstream-effects on Lakes. Organisers: Alfred Wüest (wuest@eawag.ch) and S. Geoffrey Schladow (gschladow@ucdavis.edu) and Kenneth I. Ashley (ken.ashley@gems5. gov.bc.ca)
http://aslo.org/meetings/santiago2005/

7-9 July 2005, Amsterdam, the Netherlands: People and the Sea III: New Directions in Coastal and Maritime Studies. www.marecentre.nl or e-mail Iris Monnereau at imonnereau@marecentre.nl

4-9 October 2005, Klaipëda, Lithuania: 2nd European Lagoon Conference: European lagoons and watersheds: function and biodiversity. http://artiom.home.mindspring.com/gumilev/ch4.htm

9-13 October 2005, Bonn, Germany: Open Meeting of the Human Dimensions of Global Environmental Change Research Community, "Global Environmental Change, Globalization and International Security: New Challenges for the 21st Century".
http://openmeeting.homelinux.org

25-29 October 2005, Kusadasi, Turkey: 7th International Conference on the Mediterranean Coastal Environment-Medcoast '05. Deadline for abstract submission: **31 January 2005**.
www.medcoast.org.tr

Wishing you all a Merry Christmas and a fantastic New Year!

Hartwig, Martin and Hester

For address or subscription changes please contact the LOICZ IPO by regular or e-mail (loicz@nioz.nl) indicating you wish to receive the newsletter:

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