

Joint LOICZ – Institute for Coastal Research Conference

Linkages between German Coastal Research and LOICZ

Conference Report

14 June 2006
GKSS Research Centre
Geesthacht



Executive Summary

The Land-Ocean Interactions in the Coastal Zone (LOICZ) project is a core project of IGBP, with a task to integrate land, ocean and atmospheric sciences, and a core project of IHDP, with a task of integrating human dimensions science of coastal zones, relating to global environmental change (GEC). After 13 successful years in the Netherlands LOICZ since January 2006 is embarking on a second phase in its new home at the Institute for Coastal Research, at the GKSS Research Centre in Geesthacht (member of the Helmholtz Association).

The next years will be particularly challenging for LOICZ. From an originally rather biogeochemistry oriented global research cluster looking primarily at the role of coastal zones in the carbon cycle it is evolving into an interdisciplinary research project and network aiming to also provide knowledge products for better informed decisions in the realm of integrated management. In the context of the Earth System Science Research, LOICZ is the only global effort with a natural and social science focus on coastal change, its processes and its societal, management and policy implications.

The mission statement of LOICZ therefore reads as follows:

'to provide the knowledge, understanding and prediction needed to allow coastal communities to assess, anticipate and respond to the interaction of global change and local pressures which determine coastal change'

This sets the stage to review and discuss ongoing coastal research on global but also on national and regional scales against political commitments to conventions and directives. It also implies that LOICZ is expected to generate continuous iterative discourse within and beyond the science community as where future science needs to go to address key societal information needs.

The Symposium was meant as a kick-off start of this dialogue here in the new host country, Germany, in awareness of the high and diverse range and capacity in national coastal research. With the selection made for oral and poster presentation the objective was to provide an overview of some of the multiple highlights featuring current research in Germany on coastal change, dynamics and processes. It was also meant to get insight into new high end scientific approaches and to provide a platform for exchange and discussion with the LOICZ international Scientific Steering Committee which held its 17th annual Meeting here at GKSS.

In working groups, which were arranged along the three priority topics of LOICZ, participants took the opportunity to have a vital dialogue and a whole range of personal links and interaction evolved from the meeting. We are grateful for the encouraging response received (77 participants) for this meeting from governmental institutions and the impressive range of participating national institutes (17) representing a variety of ongoing research projects with national and regional focus – some even with global outreach.

The Meeting findings can be summarized as follows:

- Humans are an integral part of the Coastal domain functioning as drivers of change but also under the impact of change
- The River-coast continuum is the scale that needs priority attention
- Scenarios considering both climate change driven impact on the social and ecological coastal systems as well as anthropogenic forcing can be exploited to promote better informed decision making
- Long time series of data can provide invaluable historic information for model development and valuation
- Modeling and prediction of coastal change needs to go across multiple spatial and temporal scales and can benefit considerably from tailored remote sensing techniques.

- Typological approaches to assist up and downscaling and covering data-poor areas and those with no primary information are a critical tool and should be complemented by overlaying information on governance and social choice
- In terms of impact, adaptation, thus social and ecological response, and governance coastal communities need to be involved with appreciation of their complex composition
- The best meaningful way to bring coastal research into management is still work in progress and needs future scientific attention across the disciplines

In conclusion to fulfill the LOICZ mandate mentioned above the project needs to promote, facilitate and engage with two aspects of Global Environmental Change science:

- Fundamental research that addresses key issues of coastal change and use in the context of future scenarios of human activity and environmental state change, and
- Applied research that synthesises and up-scales scientific measurements both for dissemination within the scientific community and outreach of research outcomes into 'science – policy – public' fora.

Finally, with focus on the national research activities the conference was perceived as a valuable platform promoting exchange and collaboration. Therefore LOICZ was encouraged to facilitate the establishment of a national research umbrella that will enable continued exchange of this kind in the future.

For the global implementation of the LOICZ project the Symposium has provided a number of very useful, exciting and encouraging contacts, new impressions and potential for collaboration. LOICZ is very grateful to the local host for the perfect on-ground support and in particular to all the dedicated scientists who contributed actively and also to those many more who had expressed their preparedness and enthusiasm to get involved but hadn't got a slot this time.

Jozef Pacyna (Chair LOICZ SSC) &
Hartwig Kremer (CEO LOICZ IPO)

Franciscus Colijn (Director IfK)

Workshop report Topic 1

Chair: Felino Lansigan, LOICZ SSC vice chair

Rapporteur: Wilhelm Windhorst, University of Kiel

Participants: Eva Roth, Beverly Goh, Liana Talaue-McManus, Hans-Ortwin Nalbach, Martin Le Tissier, Bill Dennison, Bernhard Glaeser, Marion Glaser, Luki Adrianto and Dennis Bray

Topic 1:

What are the implications on ecological and economic change for patterns of land and sea use?

Introduction:

The definition in the provided basic paper was interpreted in a way that research in this field has to be problem focussed, where the ecological integrity is endangered and /or where social hot spots are identified.

This definition is relevant as it is the basis for identification and selection of suitable indicators for both, ecological and social aspects. In order to be useful in science, indicators should be measurable, usable in models and mappable.

Which leads to the spatio-temporal scaling issue in social aspects covering individuals and global organisations as well as local habitats and large marine water bodies including big catchments.

Also different time horizons have to be accounted. While local participatory processes e.g. fishers are expected to be short term planners, science to bring in the long term perspective as well.

In order to support a useful selection of indicators, it was recommended to focus dependency indicators, bridging the gap between ecosystem processes and human well being.

It was agreed, that ecosystem services are at stake, which are generated by ecological processes and used as assets (or production factors) in the economic sense, thus becoming topics of societal valuation.

Questions & Findings:

German R&D -> LOICZ:

The group identified that the presented contributions on data collection and especially the development of integrated measuring schemes are very helpful as they facilitate the modelling activities which on the other hand provide harmonised data on different spatio-temporal scales needed to devise and underpin scenarios of possible futures. Furthermore the high value of the R&D projects in the Oder estuary and in the North Sea (Coastal Futures) to foster the development of integrative skills was pronounced.

LOICZ -> German R&D:

A mutual benefit was identified, where project proposals benefit from the LOICZ Science Plan, as it helps to identify and justify the need for further research, as it happened for example in Coastal Futures. On the other hand also the impact of research on policies

was identified. The German ICZM strategy was strongly influenced by scientific research.

Bottlenecks:

As major bottleneck a lack of efficiency in communicating scientific results to users of scientific information was identified. The catastrophe driven PR should be replaced by a supply driven PR.

But also a need for coaching scientists to do better communication, to provide better lectures and to support life long learning were identified as pressing issues.

Workshop report Topic 2

Chair: Dennis Swaney, LOICZ SSC member and topic 2 co-ordinator

Rapporteur: Kay-Christian Emeis, University of Hamburg

Participants: Justus van Beusekom, Falk Pollehne, Markus Diesing, Alexander Schimanski, Thorsten Albers, Juan Restrepo, Yoshiki Saito, Klaus-Werner Gurgel, Robert W. Buddemeier, Götz Flöser, Kirstin Dähnke, Christian Winter, Gerd Liebezeit, Rolf Riethmüller, Hans Brumsack, Alexander Bartholomä, Burghard Flemming, John Parslow, Nancy Rabalais, Alice Newton, Franciscus Colijn, Nalin Wikramanayake, Isao Koike, Andreas Moll and Kai Wirtz

Topic 2:

What are the effects of changes to the flow of freshwater and materials to estuaries and shelf seas?

Introduction:

The workshop was run in conversational mode, with the facilitator initially asking the participants, mostly members of the German research community, for general comments and questions regarding what they were looking for from LOICZ, and what they thought they could offer LOICZ. The conversation ranged over several topics, and was occasionally quite lively. While the individual terms of reference were not addressed explicitly, the conversation frequently touched on them. Highlights of the discussion are outlined below.

Questions & Findings:

To what extent does GEC research in Germany align with the structure and goals of LOICZ science?

To what extent are the themes and topics of LOICZ relevant to science-public-policy dialogue in Germany?

What are the bottlenecks and barriers to furthering research interests that are of mutual benefit to both German science community and LOICZ and how could we work together to address these?

One interesting theme, which was touched on is the nature of German coastal research. Perhaps uniquely, its research institutions seem to be relatively well-funded by the Federal government. Research standards are on par or exceed those of any other developed country, and while much of it focuses on the North and Baltic Seas and their coasts, German coastal research extends from the tropics to the polar regions. One role LOICZ can fill is to provide some guidance about globally-relevant coastal research, i.e., to propose scientific and management problems beyond those that occur in developed countries of Northern Europe. A second point is how sophisticated modelling and field research relevant especially to problems of the German coast be extended to similar problems in other places. Here, LOICZ can conceivably provide bridges between the German research community and the coastal science and management communities of other regions.

The group seemed to acknowledge that coastal research in Germany is largely (though not entirely) disconnected from catchment research. This is explained on the basis of institutional separation (the institutions charged with catchment research are not those charged with coastal and marine research) and the perceived independence of the scientific and management problems of the catchment and the coast. The suggestion that a lesson from LOICZ I was that the two realms should merge was met with some principled resistance, i.e., the notion that it is not necessary to understand the catchment in order to, for example, estimate a LOICZ budget for a coastal ecosystem; it is only necessary to assess the terrestrial fluxes (which could be construed as a simple monitoring problem, not a modelling problem). This discussion engendered some lively debate.

Another discussion point concerned the utility of LOICZ budgets and other models to address coastal problems. It seems that the German research community uses a relatively sophisticated range of models to address research and management questions; engaging this community to inform other researchers and to improve other models represents a potential flow of information to LOICZ and its audience. Some individuals expressed the view that the best approach to apply the best science to the coast is to apply the current generation of sophisticated models to various coastal regions. Others suggested that this may be impractical, that a continuum of models exist, and a valid approach is to use the most highly resolved, sophisticated models to inform less complex, less highly resolved approaches. One way to do this is to compare alternate modelling approaches in some key classes of coastal systems. An extension of simple comparisons might combine a typology (coastal classification) approach with a variety of models, each appropriate to a particular class of coastline.

Specific topics were also raised, including modelling sediment fluxes, ensuring the use of appropriate units when comparing flux estimates, model uncertainty (especially when dealing with NET fluxes, which may have very large uncertainty ranges) and the relative merits of various modelling approaches for dealing with it.

Workshop report Topic 3

Chair: Stephen B. Olsen, LOICZ SSC member and topic 3 co-ordinator

Rapporteur: Andreas Kannen, FTZ West Büsum, University of Kiel

Participants: Eberhard Krain, Gesche Krause, Aida Ambo Ala Husain, Paul Overduin, Ulrich Callies, Harald Asmus, Ragnhild Asmus, Beatriz Balino, Hartwig Kremer, Adreas Irmisch, Andi Oetomo, Clivia Häse, Jozef M. Pacyna and Falk Schmidt

Topic 3:

How can comparative analysis inform the improvement of the governance of human activities in changing coastal ecosystems?

Introduction:

As governance and the strong human dimension associated to governance is new in LOICZ, the workshop session started with a discussion on the general understanding of the topic and background text in order to achieve a joint understanding within the group.

Important points in the discussion:

- Topic 3 acts at the interface between science and policy. A discussion on the weighting between science and practice within a scientific program like LOICZ and within scientific projects evolved. Joint understanding in the group was that within LOICZ we should understand this as science to assist governance and management, which includes making governance and its related human dimensions an issue for scientific work.
- As the topic is new to LOICZ, the starting point needs to be:
 - Defining the questions we want to answer within this topic and
 - defining which methods to use.
- The proposal is to work along trajectories of change (past - present – future) and link this with human responses and their achieved results. This can be done in form of a comparative analysis where the same issues are investigated within different contexts (natural, economic, socio-cultural).
- Levels of comparison could be:
 - by geography (e.g. countries, areas with similar topography, ...)
 - by topics (e.g. shipping, environmental degradation, aquaculture, ...)

Scales of space (local, regional, global, ...) and scales of time (what can be achieved with short-term vs. long-term management activities) are very important for this assessment.

LOICZ should try to develop a common methodology, eventually starting with examples from local scales and trying to upscale findings from governance on local scales to governance on global scale. The IHDP offered in this context to look at the tools and the methodology available from IHDP and especially their Institutional Dimension Project. A first step could be trying to apply this for coastal areas and issues and then adjust it to specific coastal needs.

Questions & Findings:

To what extent does GEC research in Germany align with the structure and goals of LOICZ science?

From the presentations in the morning the group could see some examples where German coastal research aligns very well with this LOICZ topic and the related LOICZ themes even though a domination of natural science presentations was obvious. Out of this a discussion on the weighting of natural and social sciences within projects evolved as well as a discussion on the general relationship between LOICZ and Germany. It needs to be noted that for German coastal research science related to the human dimension is as new as it is to LOICZ and for coastal research in other countries. In Germany this type of research is currently evolving from a range of projects like the two pilot projects on ICZM funded by the German research ministry (Coastal Futures for the North Sea and ICZM Odra for the Baltic Sea, both being LOICZ affiliated projects) and research of German scientists in countries like Brazil and Indonesia. Therefore experience, expertise and capacity building is evolving and can be used for joint activities and further development of this type of research under the LOICZ umbrella.

To what extent are the themes and topics of LOICZ relevant to science-public-policy dialogue in Germany?

Topic 3 is of high relevance for current debates in Germany concerning coastal governance, especially within the context of the ICZM strategy, the European Marine Strategy and the EU Maritime policy. In addition changes in marine area use, especially the issue of offshore wind farms have increased sensibility in Germany on how to deal with changes, the role of statutory and non-statutory instruments and scales of decision making.

What are the bottlenecks and barriers to furthering research interests that are of mutual benefit to both German science community and LOICZ and how could we work together to address these?

The discussion on this topic started with discussing opportunities and from this discussing barriers and bottlenecks related to these opportunities. Issues mentioned were:

- The goals of LOICZ are mentioned in German research programs (relating to marine and coastal science), especially in the program “Research on System Earth” and “Research for Sustainability”.
- A lot of experience in dealing with scales and as well dealing with transboundary issues of governance is available in Germany, especially from the two research pilot projects ICZM Odra (e.g. dealing with transboundary issues between Germany and Poland) and Coastal Futures (e.g. dealing with experiences from transnational issues in the Wadden Sea and North Sea). This expertise could and should be used by LOICZ.
- Developing the comparative analysis was discussed as another opportunity, e.g. by working on this in form of a project or a series of workshops. The barrier related to this is the need of funding, e.g. for an EU project.

Funding is generally a critical point for further development of the topic. Another barriers might be the interface between natural and social sciences, which still is in a developing stage.

Conclusions and initial steps following from the Mini Symposium

For the subsequent LOICZ SSC the one day Symposium with our German colleagues provided valuable discussions and exchange which will likely result in multiple links and collaborations. One important general conclusion was the overall participants' perception that such a small scale conference platform is ideal to generate a comprehensive overview of the spectrum of ongoing and planned national activities, how they are interrelated and where for enhanced collaboration can be identified. In particular the dialogue with the scientific steering committee was useful to review the regional and/or global fit of national research efforts.

In conclusion it has been recommended that such a national conference should be a more regular institution and also be a platform to review current scientific direction and future societal information needs. Particularly encouraging was the initial step to cut across the rather fundamental science disciplines and investigations to the more applied and human dimensions oriented science. Finding the right balance here is critical in providing meaningful and societal relevant Earth system science on the multiplicity of scales that need to be addressed.

The LOICZ IPO was encouraged to explore with German partners the establishment of a national support umbrella for coastal research. It was underlined that an "annual coastal day" could be useful to bring together the wider range of expertise and that a national LOICZ forum in form of a committee or node would likely be a helpful mechanism for this purpose.

The SSC in consideration of the multiple research directions and collaborations presented during the Symposium and the subsequent working group discussions concluded further that the overall direction of future LOICZ science – the niche – is well accommodated in the Science Plan and the three "Priority Topics". It became obvious and was underlined also by the LOICZ parent programmes IGBP and IHDP that German experts could play a vital role in further developing these research directions and the cross-cutting activities, which comprise Capacity Building and an extended Coastal Typology approach for up-scaling and data-assimilation. Initial contacts have been made prior to and during the meeting. Some concrete activities likely to be implemented in 2006/07 involving German colleagues include plans for the development of training modules and e-learning including scenario building and considerations of a physical location of the data-bases infrastructure and scientific workshops.

In identifying thematic teams to promote and foster the LOICZ implementation the SSC aims to include external scientists to join more closely in form of priority topic task groups or even as Corresponding Members. This will include a variety of national and international colleagues and reflect in workshop and scientific synthesis participation and for instance in concrete involvement in the LOICZ-IMBER Continental Margins Task Team, CMTT, or the global efforts towards modelling and better management of nutrient fluxes, e.g., nitrogen. The latter will see its initial Congress in the second half of 2007 in Shanghai. Through the links with our social science parent IHDP the involvement of these disciplines is expected to gain further momentum also on national level. This can be of specific interest where LOICZ research is entering the coastal management realm. Operational links with national relevance are in place with the German coastal management research projects and encompasses involvement in international workshops.

Another collaboration that is underway and will enter a state of concrete planning is in the field of remote sensing and implications in advanced coastal change science. A concept note on the role, application and further development of remote sensing in LOICZ future coastal research is under development and coordinated from within the LOICZ SSC and colleagues from GKSS. Initial plans explore the option of a targeted workshop on remote sensing in land ocean interaction studies integral to the CMTT OSM in the second half 2007 in Shanghai plus training courses.

The LOICZ SSC in general reiterated its role in promoting the relevant networking and collaboration with other projects within the Earth system science community and to enable active involvement of all globally affiliated projects which will likely be beneficial also on the regional and national scale. This first national Mini Symposium/SSC combination has proven to be an inspiring effort for the national research community and LOICZ, and consequently the SSC has decided that this concept will be applied to following SSC Meetings. We are grateful to our hosts but in particular, all the participating scientists who made this positive experience a reality.