

LOICZ NEWSLETTER

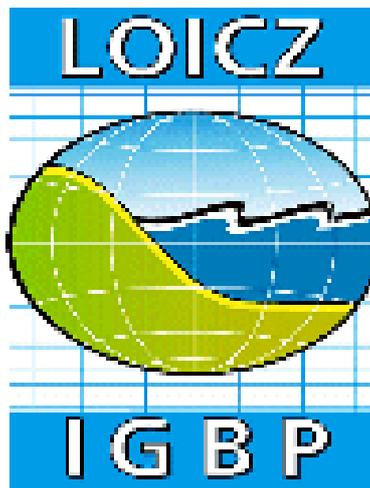
COASTAL SEAS, A CARBON SOURCE OR SINK?

A major goal of the IGBP is to improve our knowledge of the global carbon cycle. Current global carbon models contain a large number of uncertainties and many of these could be due to poorly understood processes occurring in the coastal zone. A central question to LOICZ is whether the world's coastal zone is a net source or sink of carbon dioxide under present day conditions. A general overview of the issues and uncertainties of carbon cycling in coastal seas is given in LOICZ Reports and Studies No. 1.

The LOICZ Implementation Plan outlines steps to develop a series of carbon flow models of the world's coastal zone. An important initial step is to develop biogeochemical models for selected coastal regions around the world for which data are currently available. Guidelines for doing this are reported in LOICZ Reports and Studies No. 5. It recommends that initial modelling efforts should focus on developing relatively simple stoichiometrically-linked budgets of carbon, nitrogen and phosphorus, but in time should consider development of more detailed systems models where data and resources allow.

A substantial start on this task has already been made. For example, many suitable biogeochemical budgets for different geographic regions around the world have already been published in the scientific literature.

Source or Sink continued on Page 2



This is the second newsletter of the Land Ocean Interactions in the Coastal Zone (LOICZ) Core Project of the IGBP. It will be produced quarterly to provide news and information regarding LOICZ activities.

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New Executive Officer for LOICZ

Dr. Roy C. Sidle has accepted the position of Executive Officer at the LOICZ Core Project Office, and joined the CPO staff at the Netherlands Institute for Sea Research (NIOZ) on Dec. 1, 1996. Dr. Sidle comes to the position from his past appointment as Senior Research Hydrologist in the Geological Survey of Denmark and Greenland. Prior to that, he was a research scientist and Project Leader with USDA Forest Service in Alaska and Utah for 15 years. He has also served in positions as Watershed Extension Specialist with Oregon State University and as research scientist with USDA Agricultural Research Service.

With training in hydrology, soil science, and civil engineering, Dr. Sidle has BSc and MSc degrees from the University of Arizona and a PhD from Pennsylvania State University. Recent research interests include cumulative watershed effects, streamflow generation, landslide analysis and contaminant transport.

New EO continued on Page 2

Source or Sink continued from Page 1

Further examples are provided in the LOICZ biogeochemical modelling guidelines. Additional budgets were recently developed at the Continental Margin Task Team (CMTT) workshop held in October 1996 at the Nigerian Institute for Oceanography and Marine Research in Lagos (see report elsewhere in this newsletter). It is anticipated that budgets will be developed for additional important coastal regions around the world as part of national LOICZ programs.

In order to meet the global objectives of LOICZ, it will be necessary to develop first order budgets of carbon, nitrogen and phosphorus for all major coastal regions of the world, including those for which data are either sparse or non-existent, which can be combined to provide a global overview of coastal biogeochemical balances. Critical to this exercise will be the existence of a global typology framework that can help guide the extrapolation of data from one region to another in order to fill important data gaps. Continued development of the coastal typology is being given high priority by LOICZ because of its importance to biogeochemical modelling as well as other activities of LOICZ (see report elsewhere in this newsletter).

An important component of the overall LOICZ project is to better understand the interactions between global change and human activity in the coastal zone. For example, important biogeochemical pathways in the coastal zone have been measurably influenced by human activities in many parts of the world during the past, and these changes are likely to increase in the near future as the human population continues to grow. In turn, global environmental change is having an impact on human populations living in the coastal zone. This difficult task requires the development of conceptual frameworks for integrating biogeochemical and socio-economic models which has been initiated as part of the SARCS/WOTRO/LOICZ project

in Southeast Asia. (see report on the Vietnam workshop on page 4).

Altogether, these various coordinated LOICZ efforts are expected to result, in five years time, in a much clearer understanding of carbon cycling in the world's coastal zone and how it is influenced by human activities.

LOICZ PROJECT INFO REQUESTED

In July, 1996, LOICZ, through the national contacts, sent out a request for information on research proposals for formal acceptance by LOICZ. Project submissions were received and reviewed by SSC-Execomm for relevance to the global aims of LOICZ.

Approved projects will be listed on the LOICZ WWW Home Page following finalisation of agreements between LOICZ and the investigators.

Additional submissions are solicited and can be made by completing the attached forms and sending them to the LOICZ CPO.

LOICZ OSM3

Noordwijkerhout, The Netherlands, will be the site of the third LOICZ Open Science Meeting, October 10-13th, 1997 (yes, this is a week-end). Planning has begun with recent meetings between CPO staff, SSC and the National Committee, after an offer by the National Netherlands LOICZ Committee to assist in organising the meeting was gratefully accepted by the LOICZ SSC. The programme will be finalised soon and will include topics such as the integration of natural science and socio-economics, biogeochemical modelling and material flux across the continental shelf, coastal typologies, biogeomorphology, and European, as well as, Southeast Asian regional studies.

New EO continued from Page 1

Dr. Roy Sidle has worked extensively in coastal watershed systems from both a scientific and a management standpoint, dealing with the interaction between forestry and fisheries in both terrestrial and marine environments. His background includes the development, co-ordination, and management of multi-disciplinary research focused on water quality and integrated ecosystem studies. He has authored two books, over fifty refereed journal papers, and numerous other professional publications, and he holds appointments as Adjunct Professor in the Departments of Forest Resources, and Civil and Environmental Engineering at Utah State University. For the past six years he has been Assoc Editor of Journal of Environmental Quality and is now on the editorial staff of the Journal of Forest Research published by the Japanese Forestry Society.

In addition to his past appointment involving work within Denmark and the European Commission, Dr. Sidle's international experience includes receipt of a fellowship from the Science and Technology Agency of Japan to develop co-operative studies in watershed hydrology and erosion, and numerous follow-on collaborations in Japan. He has also carried out research or consulting activities in Canada, Iceland, Indonesia, Malaysia, New Zealand, Norway, Oman, PR China, Taiwan and Thailand.

Roy was raised on a small farm in eastern Pennsylvania, USA and has two children, Shelley working in Salt Lake City, USA and Brad, a student at University of Kentucky. Roy is interested in various outdoor activities, an avid baseball fan and is committed to establishing a smoke-free LOICZ CPO environment.

He replaces **Dr. John C. Pernetta**, who left the LOICZ CPO in May to accept a position with the GEF Co-ordination unit of UNEP in Nairobi, Kenya.

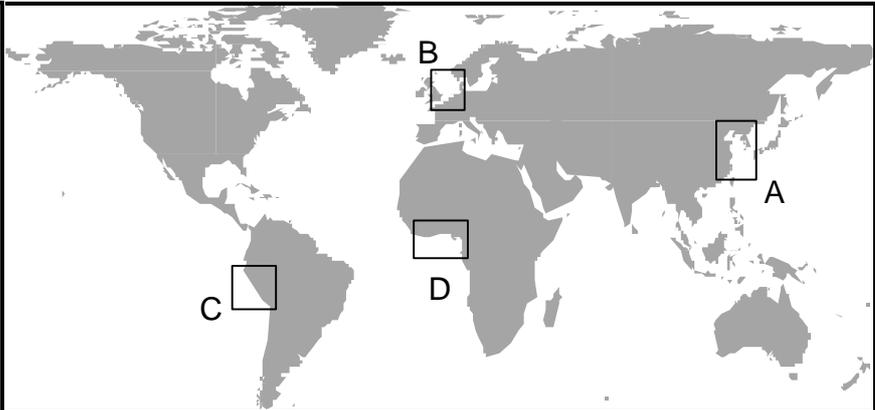
CMTT & LAGOS WORKSHOP RESULTS

The Continental Margins Task Team (CMTT) is an intercore activity formed to address common interests of the Joint Global Ocean Flux Studies (JGOFS) and LOICZ Core Projects of the IGBP. The Projects share a primary interest in material fluxes across the continental margins and the CMTT was established to bring together coastal and oceanic researchers to develop methodologies for studying fluxes across the continental margins. The Task Team, co-chaired by **Dr. Julie Hall** (JGOFS) and **Prof. Stephen Smith** (LOICZ), has prepared a report describing methods for interaction and compiling a list of continental margin research (LOICZ R&S No. 8). The CMTT recognised that, in order to gain a global view of shelf function over the duration of the JGOFS and LOICZ Projects, a great deal of the effort will need to be focused on existing data of variable quality and extent and that it would be necessary to work with a broad variety of shelf-sea types.

In order gain experience with these approaches and to test the utility of the guidelines - which were primarily developed from the perspective of inshore systems such as bays and estuaries - a workshop was convened at the Nigerian Institute for Oceanography and Marine Research in Lagos, Nigeria, October 14-18th, 1996.

The workshop studied methods to develop simple water and salt budgets to estimate water exchange, and the use of stoichiometric simplifications to approximate the biogeochemical pathways and estimate net system uptake or release of C, N and P.

Four areas were chosen as case studies to represent a range of environments and data availability: A) East China Sea; B) North Sea; C) Peru-Chile coast; D) Gulf of Guinea (see figure).



The workshop included participants from each region and "resource people" to facilitate the effort. The meeting consisted of 3 days for each regional group to prepare a consensus budget for their system, and a general review. The budgets and workshop proceedings are published in LOICZ R&S No. 9.

It was the consensus of the participants that:

- the budgeting approach is a diagnostic tool which is useful for comparing systems; and,
- this tool can yield new insights into the performance of even well studies systems.

For additional information on CMTT activities, access the CMTT WWW Home page at: <http://keep.oc.ntu.edu.tw/cmtt>

or contact:

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COASTAL TYPOLOGY: THE GLOBALISATION CHALLENGE

The role of the coastal zone in the Total Earth System will clearly not be determined by direct measurement or experimentation during the lifetime of the IGBP. Understanding must come from globalisation of available data, which means coupling the biogeochemical models and budgetary

data (LOICZ R&S 5 and LOICZ R&S 7) with coastal typologies that provide a manageable method of extrapolation from known to similar but unknown areas (LOICZ Implementation Plan).

Following an initial trial typology exercise (LOICZ R&S 3), LOICZ has collaborated with the FAO in producing a typology of coastal lowlands (LOICZ Meeting Report No. 18). LOICZ interests in river typologies (GLORI: LOICZ R&S 5) and groundwater discharge (LOICZ Meeting Report No. 17, LOICZ R&S 8) have also been driven largely by the need to globalise terrestrial inputs to the coastal zone.

The next major step will be working with the LOICZ Biogeochemical modelling node and other SSC members and advisors to develop hierarchical typologies for the open shelf region, the estuarine zone, and the terrestrial coastal environment. Although the initial efforts will be focused on globalisation of biogeochemical models, close coordination with socioeconomic researchers will be maintained to ensure that the typologies can ultimately be expanded to include human dimensions as well as other factors.

Following a small workshop, LOICZ will feature typology issues in the upcoming Open Science Meeting (see article, this newsletter). Because typologies and the related issue of scaling are concerns throughout the IGBP, LOICZ actively solicits suggestions, references, or contacts with others addressing similar problems; interested parties should contact the CPO.

INTEGRATION WORKSHOP SUCCESSFUL

As reported in the first newsletter, a workshop was held recently in Hanoi, Vietnam, cosponsored by SARCS/WOTRO/LOICZ to initiate development of a conceptual framework for the integration of socio-economic and natural sciences. The 30 participants reviewed the work and plans of the five core research sites and began work on a guidelines document.

This initiative builds on the two existing LOICZ Guideline documents for biogeochemical modelling and coastal zone resource assessment. Independent of each other, the Core Project teams prepared initial drafts conceptual frameworks for such integration. These drafts were used as a starting point for developing a single consistent conceptual framework.

Much of the meeting focused on attempts to establish the economic values associated with particular components of coastal ecosystems, that is, the output to the economy.

Plans are underway for a number of smaller workshops for 1997 that will draft guidelines to be presented and discussed at the SARCS/WOTRO/LOICZ workshop to be held in the Philippines in November, 1997.

LOICZ 1997 CALENDAR

- LOICZ SSC6 Meeting May 28-30, Ensenada, Mexico.
- LOICZ Budget Modelling Workshop, June 1-2, Ensenada, Mexico.
- LOICZ SSC7 Meeting, October 10 & 13, The Netherlands.
- LOICZ Open Science Meeting, October 10 -13, The Netherlands.
- SARCS/WOTRO/LOICZ P.I. Meeting, November, The Philippines.

LOICZ WHO'S WHO

The LOICZ Core Project would like to thank to outgoing SSC members **Dr. D. C. (Don) Gordon** and **Dr. V. (Slava) Gordeev** for their hard work and dedication.

Dr. Gordon has been an active member of the SSC from 1993-96. He has served on the LOICZ Executive Committee as member-at-large, and has also played a leading role in the development of the LOICZ Biogeochemical Modelling Guidelines as chair of a number of workshops and as the lead author of the Guidelines.

Dr. Gordeev has been a member of the SSC since 1993. He played an active role in organising the LOICZ-RAS Groundwater Symposium and has maintained contacts with coastal arctic research initiatives.

We welcome **Dr. Nick Harvey** who joins LOICZ as SSC member on Jan. 1, 1997. His PhD is in geomorphology; he was previously employed with the Dept. of Environment and Management in South Australia, and is presently Assoc. Prof. in Environmental Studies at the University of Adelaide. He also has a Master of Planning degree. He has published extensively in the areas of coastal management, environmental impact assessment and coastal physical processes. We look forward to his contributions to LOICZ coastal science syntheses.

At the ExeComm meeting in Nov., **Dr. Robert Buddemeier** was named Task Team Leader for Focus 2 (Coastal Biogeomorphology and Global Change). In this capacity he joins Jeff Richey and Kerry Turner as vice-chairs of the SSC.

"Science is built up of facts, as a house is built of stones; but an accumulation of facts is no more a science than a heap of stones is a house."

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NEW LOICZ PUBLICATIONS

- First Report of the JGOFS/LOICZ Continental Margins Task Team. *LOICZ Reports & Studies No. 7.*
- Proceedings of the International Symposium on Groundwater Flux to the Coastal Zone. *LOICZ Reports & Studies No. 8.*
- Report on the International Workshop on Continental Shelf Fluxes of Carbon, Nitrogen and Phosphorus. *LOICZ Reports & Studies No. 9.*
- Report of the Second LOICZ Executive Committee Meeting. Texel, the Netherlands, November 1996. *LOICZ/EXCOMM.2. Meeting Report No. 19.*
- Report on the SARCS/WOTRO/LOICZ Workshop on Integrated Natural and Socio-economic Modelling, Hanoi, Vietnam. *Meeting Report No. 20.*

CPO Credits

The LOICZ community would like to thank **Dr. Robert Buddemeier** who has recently completed a 6-month sabbatical with the LOICZ CPO. During that period, Dr. Buddemeier played a significant role in furthering the development of LOICZ Scientific research. In addition to providing general help and guidance, he has played a major role in setting up a groundwater initiative to study fluxes into the coastal zone.

Although he returns to the Kansas Geological Survey, he continues to function as an active member of the LOICZ SSC.