

LOICZ NEWSLETTER

SUCCESSFUL WORKSHOP ON MEXICO LAGOONS

S. Smith, S. Ibarra-Obando, P. Boudreau, V. Camacho.

A central and essential objective of LOICZ is to gain a better understanding of the global cycles of the key nutrient elements carbon, nitrogen, and phosphorus; to understand how the coastal zone effects these fluxes through biogeochemical processes; and the relationship of these fluxes to human intervention. In order to pursue this objective, LOICZ convened a workshop on material fluxes in Mexican coastal lagoons at the Center for Scientific Research and Higher Education of Ensenada (CICESE), Mexico, on June 2-3rd 1997. Eleven scientists familiar with lagoons throughout Mexico and a number of resource persons met to compile biogeo-chemical flux budgets for a number of lagoon systems.

Coastal lagoons along the 12,000 km shoreline of Mexico are numerous, diverse, and well-studied. They are also subject to extremely varied degrees and kinds of human pressure due to direct uses and indirect impacts. Considerable scientific information exists for many of these systems, and the bibliographic information has been well summarised. All of these considerations led to the recognition by several members of the LOICZ Scientific Steering Committee that it would be appropriate to hold a regional workshop in order to develop budgets according to the LOICZ Biogeochemical



This is the third 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 and related activities.

Modelling Guide-lines (LOICZ Reports & Studies No. 5). Such a workshop seemed likely to yield several useful budgets, to generate interest in the region in developing further bud-gets, and perhaps to provide a formula for generating regional bud-gets to be compiled into the world-wide database being developed by the LOICZ Biogeochemical Model-ling Node. These budget results from the workshop will be posted on a World Wide Web Home Page (reachable through <http://www.nioz.nl/loicz/modelnod>). It was further recognised that an understanding of the functioning of these diverse and well-studied Mexican lagoons might be exported to other regions of the world with less wellstudied lagoons.

Following introductory presenta-

tions of the natural history of Mexican coastal zone, an overview of the LOICZ budgeting procedure, and detailed results for Bahia San Quintin as a teaching example, the participants broke into three working groups, loosely structured around hydrological regimes of the Mexican coastal zones:

Group 1 - the arid desert region of Baja California and Sonora.

Group 2 - the high-runoff region between Sinaloa and Chiapas.

Group 3 - the transition region between the high runoff area of the lower part of the Gulf of Mexico coast and the Yucatán Peninsula, which is dominated by low surface runoff but high groundwater flow.

Eight budgets were (essentially) completed during the workshop. Subsequent to the completion of the workshop, two additional budgets were provided and will be included in a forthcoming Reports & Studies document. Table 1 and Figure 1 summarise the lagoon systems which have been budgeted and the authorship on each. It is hoped that budgets will be developed for several additional systems in Mexico as a result of this workshop.

Additionally, there may be sufficient information to budget some systems in Mexico over time, in a manner that will document the interactions between material fluxes and human intervention. As a first step towards this goal, two socio-economic characterisations were provided. It is hoped that these documents, together with the biogeochemical budgets will help provide the framework for realistic integration between understanding

Table 1. Net ecosystem budgets developed during or immediately subsequent to this workshop.

No.	SYSTEM & STATE	AUTHORS	Latitude N	Longitude E
1	Estero de Punta Banda	M. Poumian	31° 44'	116° 38'
2	Bahía San Quintín	V. Camacho, J. Carriquiry, S. Smith	30° 27'	115° 58'
3	Bahía San Luis Gonzaga	F. Delgadillo	29° 49'	114° 23'
4	Bahía Concepción	C. Lechuga	28° 59'	112° 09'
5	Estero La Cruz	M. Botello	26° 43'	111° 48'
6	La Paz	C. Lechuga	24° 14'	110° 29'
7	Tecapan-Agua Brava-Marismas Nacionales,	G. de la Lanza, F. Flores	22° 08'	105° 32'
8	Carretas-Pereyra	F. Contreras	15° 27'	93° 10'
9	Chantuto-Panzacola,	F. Contreras, S. Ibarra-Obando	15° 13'	92° 50'
10	Laguna de Terminos,	E. Gomez, A. Vazquez, J. Carriquiry, R. Buddemeier	18° 40'	91° 35'



Figure 1. Map of Mexico showing names of coastal states and locations of budgeted lagoonal systems

COASTAL OCEANOGRAPHY

T. Yanagi

One of objectives of coastal oceanography is to produce an accurate numerical ecosystem model and to clarify quantitatively the material flux in the coastal sea. We have established a lower trophic ecological model in the East China Sea (ECS) from such a viewpoint. An ecological model which includes DIN (dissolved inorganic nitrogen), DIP (dissolved inorganic phosphate), phytoplankton, zooplankton and detritus can reproduce observed distributions of DIN, DIP, chlorophylla, and detritus observed in the East China Sea in April 1994. These findings were obtained as part of

the Chinese project MAFLECS (Guo et al., 1997). Based on these calculated results, the role of the nutrients from different origins (Chinese rivers, Taiwan Strait, and the shelf edge), the budgets, the average residence times of the nitrogen and phosphate, and the ecosystem structure are discussed for the ECS. The fluxes of various forms of nitrogen, including DIN (DINC - from Chinese rivers; DINT - from Taiwan Strait; DINK - from the shelf edge), phytoplankton (PHY), zooplankton (ZOO) and detritus (DET), through the boundaries of Region 1 are shown in Figure 2. Plus values for nitrogen flux (in tons of N per day) indicate an influx of nitrogen whereas negative values indicate an outflux. In the Taiwan Strait (see lower left portion of Fig. 2), all forms of nitrogen are transported north into the ECS. In the

Tsushima/Korea Strait (see middle right portion of Fig. 2), all forms of nitrogen are transported out of the ECS at slightly lower rates. Along the 200 m contour line (see lower left hand corner of Fig. 2), DIN is transported into the ECS, while PHY, ZOO and DET represent net outputs of nitrogen from the ECS. Along the boundary between the ECS (Region 1) and the Yellow Sea (Region 2), DIN and DET are transported into the Yellow Sea, while PHY and ZOO are transported from the Yellow Sea to the ECS. The transport of DIN across 200m contour line (1194 ton N/day) is less than the input of DIN from Chinese rivers in the region (1840 ton N/day). The fluxes of organic materials through the Taiwan Strait and the Tsushima/Korea Strait are not balanced, although the volume of water transported through these two straits is similar. In other words, a portion of the organic material coming in from the Taiwan Strait is directly transported out of the ECS across 200m contour line. Using this ecological model, we can predict future changes in material fluxes across the shelf edge related to global change.

References:

Guo, X., T. Yanagi, and D.Hu (1997) Ecological modeling in the East China Sea (to be submitted).

COASTAL VULNERABILITY ASSESSMENT

N. Harvey

One of the long-term objectives contained within the LOICZ Implementation Plan (Task 4.2.3) is to "improve methodologies for vulnerability assessment at regional and global scales". This resulted from criticisms of the original "Common Methodology" (developed by the Coastal Zone Management Subgroup (CZMS) of the Intergovernmental Panel on Climate Change (IPCC) in 1991. In particular a number of international studies were conducted to test the applicability of this methodology but questions

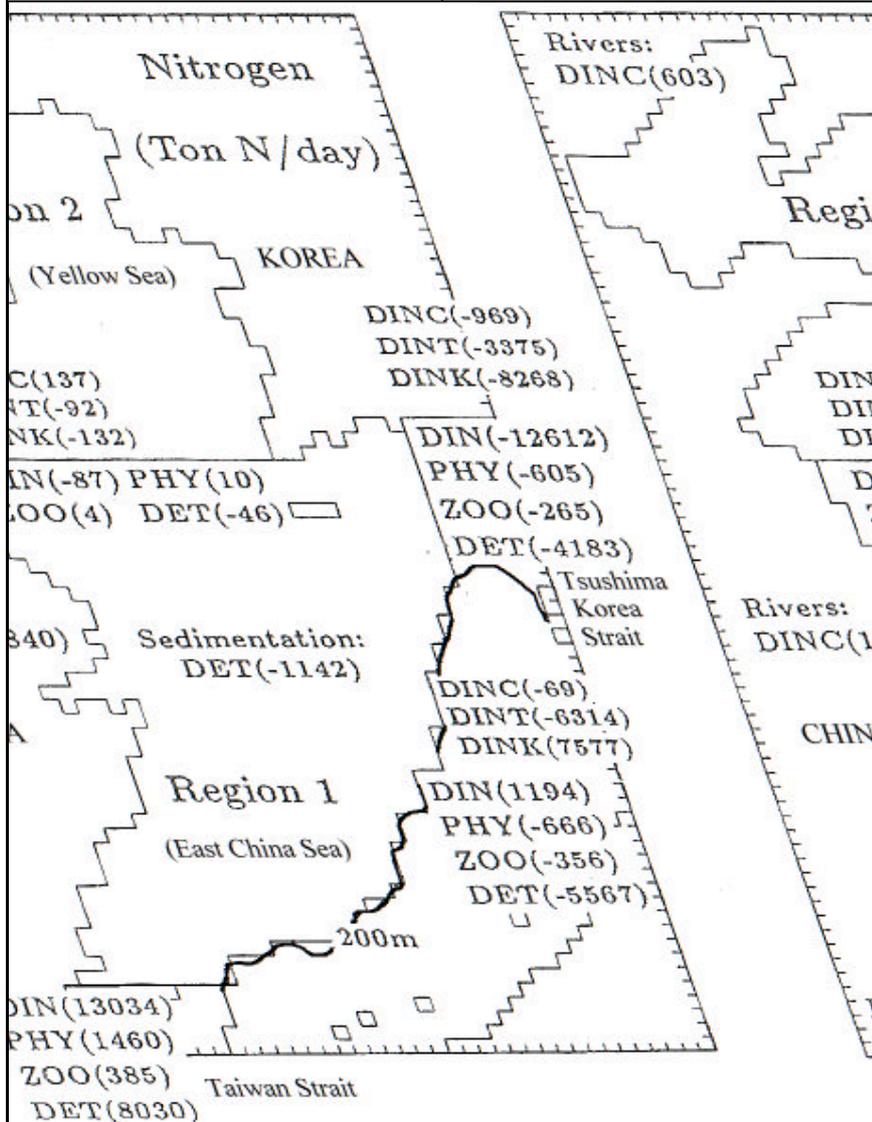


Fig 2. Nitrogen Fluxes in the East China and Yellow Seas.

were raised, particularly from Australian studies, at the World Coast Conference held in The Netherlands in 1993. The Australian Commonwealth Government conducted its own vulnerability assessment studies in an attempt to find an appropriate methodology. Recent research in South Australia has produced a revised methodology, which attempts to address spatial and temporal scales, to reduce the emphasis on sea-level rise relative to other impacts such as human induced hazards, and to incorporate appropriate management and response priorities. Research conducted by the Centre for Environmental Studies at the University of Adelaide in South Australia demonstrates the applicability of this revised methodology using case studies from different biophysical and socio-economic coastal areas. It is concluded that the methodology lends itself to a broader application than previous methodologies for coastal vulnerability assessment and is particularly revealed for developing an integrated approach to coastal management.

LOICZ 3rd Open Science Meeting

Although the official deadline for registration for the LOICZ Open Science Meeting has past, there are still openings for funded scientists who wish to participate. Please send registration forms in to the LOICZ CPO promptly if you wish to participate. Information on the meeting is available on: <http://www.nioz.nl/loicz/osmnot.htm> The meeting will be held from October 10 to 13, 1997 in Noordwijkerhout, The Netherlands.

IOC GLOBAL DIRECTORY

A Global Directory of Marine (and Freshwater) Scientists (GLODIR) containing information on individual scientists is being maintained

by the IOC Secretariat in Paris. The target audience is the marine science community, however freshwater and brackish water scientists are also welcome to submit their entries. Data can be directly submitted through a www input form on:

<http://www.unesco.org/ioc/isisdb/html/glod.htm>. General information on GLODIR can be found on: <http://www.unesco.org/ioc/infoserv/g>

FOR MORE INFORMATION,
PLEASE CONTACT:

LOICZ CORE PROJECT OFFICE
NETHERLANDS INSTITUTE FOR SEA
RESEARCH
PO Box 59
1790 AB DEN BURG - TEXEL
THE NETHERLANDS

PHONE: 31-222 369404

FAX: 31-222 369430

E-MAIL: LOICZ@NIOZ.NL

WWW HOME PAGE:

HTTP://WWW.NIOZ.NL/LOICZ/

NEW LOICZ PUBLICATIONS

(To be published in August):

- Comparison of Carbon, Nitrogen and Phosphorus fluxes in Mexican Coastal Lagoons. Texel, The Netherlands, *LOICZ Reports & Studies No. XX*.

"Science is the great antidote to the poison of enthusiasm and superstition"

CPO STAFF

ROY C. SIDLE,
Executive Officer
PAUL R. BOUDREAU,
Project Scientist
CYNTHIA PATTIRUHU,
Office Administrator
MILDRED JOURDAN,
Secretary
MARTIJN VAN DER ZIJP
Data Analyst
REGINA FOLORUNSHO
GIS Analyst

- LOICZ Second Workshop on Integrated Modelling, July 28-30 Kuala Lumpur, Malaysia.
- Coastal Margins Task Team, (CMTT) Workshop, October 6-9 Texel, The Netherlands.
- LOICZ Open Science Meeting, October 10 -13, Noordwijkerhout, The Netherlands.
- LOICZ SSC7 Meeting, October 13-14, Noordwijkerhout, The Netherlands.
- SARCS/WOTRO/LOICZ P.I. Meeting, November 24-28, The Philippines.

CPO Credits

The LOICZ CPO would like to acknowledge the completion of work and training of Ms. Regina Folorunsho in the CPO. Ms. Folorunsho was in the CPO for the first half of 1997 as a visiting GIS specialist funded through a START fellowship. She has worked with the CPO Geographic Information systems developing skills in data management, manipulation and presentation of results. She returns to her home institute, the Nigerian Institute for Oceanography and Marine Research (NIOMR) in Lagos. We wish her the best and look forward to continued co-operation on the development of the global LOICZ typology initiative.