

# LOICZ NEWSLETTER

⚡ Final Call ⚡

## NEWSLETTER READER SURVEY

If YOU want to continue receiving the LOICZ Newsletter as a hard copy let us know NOW!!

Please go to the IPO Notes (page 7) of this volume for full details on how to remain on the LOICZ hard copy mailing list.

### Arctic Coastal Dynamics (ACD) – A new LOICZ Regional Project

*Volker Rachold<sup>1</sup>, Steven Solomon<sup>2</sup>, Jerry Brown<sup>3</sup> and the ACD Group*

#### Background and rationale

The coastal zone is the interface through which land-ocean exchanges in the Arctic are mediated and it is the site of most of the human activity that occurs at high latitudes. The Arctic coastlines are highly variable and their dynamics are a function of environmental forcing (wind, waves, sea-level changes, sea-ice etc.), geology, permafrost and its ground-ice content and morphodynamic behavior of the coast. Environmental forcing initiates coastal processes, such as the sediment transport by waves, currents and sea-ice and the degradation of coastal permafrost. The coastal response (erosion or accretion) results in land and habitat loss or gain and thus affects biological and human systems. Figure 1 schematically illustrates the major processes involved in Arctic coastal dynamics. Coastal processes in the Arctic are strongly controlled by Arctic-specific phenomena, i.e. the sea-ice cover and the transition between onshore and offshore permafrost. During the winter season comprising 7-8 months a thick and extensive sea-ice cover protects the coastline from hydrodynamic



This is the twenty ninth newsletter of the Land Ocean Interactions in the Coastal Zone (LOICZ) International Project of the IGBP. It is produced quarterly to provide news and information regarding LOICZ activities

forcing. During the open water season, mainly after break-up in spring, the sea-ice is an important transport agent for coastal sediments.

The degradation of permafrost, which can be connected with the release of permafrost-bound greenhouse gases (GHG), is

concentrated in the coastal zone. During the short ice-free period, the un lithified ice-rich, permafrost-dominated coastlines are rapidly eroded (at rates of several meters per year) and it is assumed that the resulting coastal sediment, organic carbon, and nutrient fluxes play an important role in the material budget of the Arctic Ocean.

Global and regional climate changes will significantly affect physical processes, biodiversity and socio-economic development in the Arctic coastal areas. In reverse, Arctic coastal changes likely feedback into the global systems via the material flux generated by eroding coasts and the GHG emission from degrading coastal permafrost (Figure 2).

Thus, the overall scientific goals of Arctic coastal research are (1) to identify and understand the key processes controlling Arctic coastal dynamics and their impact on human systems, biology and ecosystems, (2) to quantitatively assess the recent role of the Arctic coasts in the global system concerning estimates of coastal retreat, material flux, GHG emission from permafrost degradation and (3) to establish models to predict the future behavior of the Arctic coastal region in response to climate and sea-level changes.

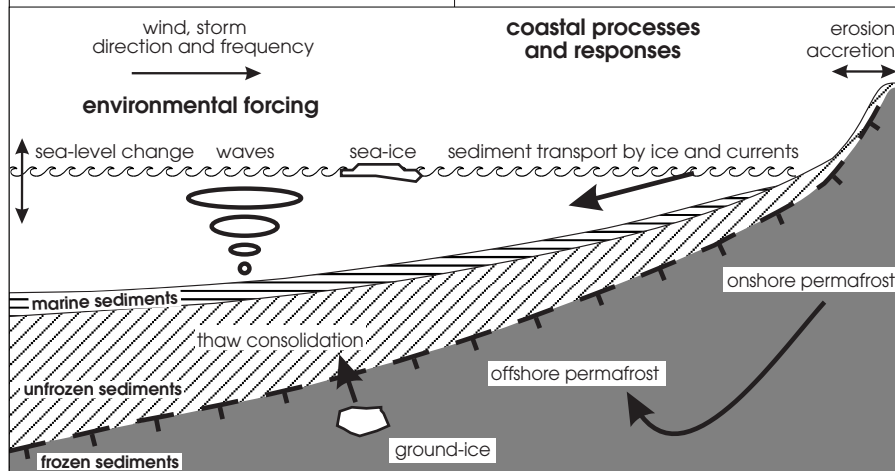


Figure 1 - Arctic coastal processes and responses to environmental forcing.

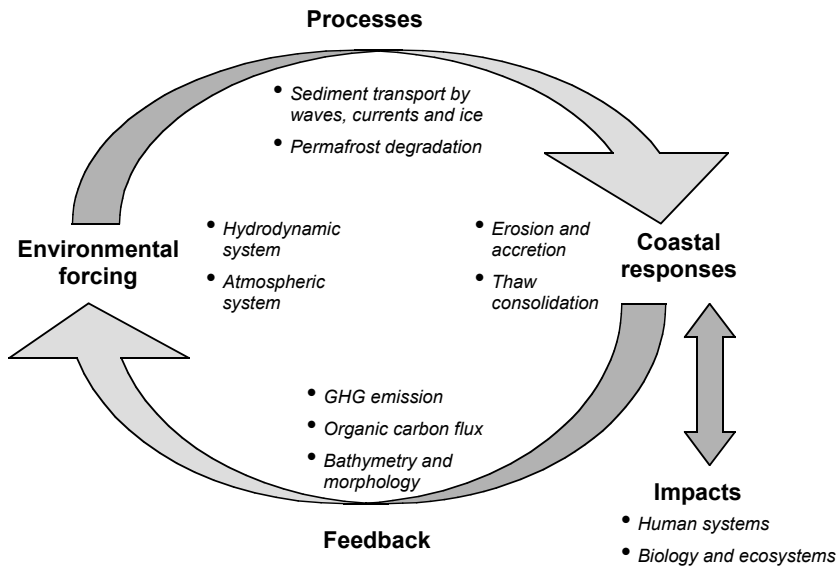


Figure 2 - Environmental forcing, coastal processes and responses, impacts and feedback.

### Development and implementation of a circum-Arctic coastal project

ACD is a multi-disciplinary, multi-national project of the International Arctic Science Committee (IASC) and the International Permafrost Association (IPA). The overall objective is to improve our understanding of circum-Arctic coastal dynamics as a function of environmental forcing, coastal geology and permafrost and morphodynamic behavior. In particular, ACD aims to:

- establish the rates and magnitudes of erosion and accumulation of Arctic coasts and to estimate the amount of sediments and organic carbon derived from coastal erosion;
- develop a long-term monitoring including local community-based observational sites;
- compile, analyze and apply existing information on relevant environmental forcing (e.g., wind speed, sea-level, fetch, sea ice);
- identify and undertake focused research on critical processes;
- develop empirical models to assess the sensitivity of Arctic coasts to environmental variability and human impacts;
- refine and apply an Arctic coastal classification (incl. ground-ice, permafrost, geology, etc.) in digital form (GIS format) and produce a series of thematic and derived maps (e.g., sensitivity).

The project elements for ACD were formulated at a workshop in Woods Hole, Massachusetts (Nov. 1999), funded by the U.S. National Science Foundation (NSF) and organized under the auspices of the IPA working group on Coastal and Offshore Permafrost and its Coastal Erosion subgroup. As a result of the

workshop a metadata form for the selection and establishment of key monitoring sites was developed. A consistent and generalized coastal classification scheme was established based on morphology and materials. Consensus was reached on direct and indirect methodologies for estimating ground-ice volumes and mapping of data. Finally, a suite of standard tools and techniques for development of long-term coastal monitoring sites was recommended (Brown and Solomon, 2000). During the Arctic Science Summit in April 2000 in Cambridge, UK, at request of IPA, the IASC Council approved funding for development of a Science and Implementation Plan for ACD. The resulting international workshop, held in Potsdam (Germany) in October 2000, produced a phased, five-year Science and Implementation Plan (2001-2005). The ACD project office was established at the Research Department Potsdam of the Alfred Wegener Institute, AWI, to maintain international communications, the web site and an electronic newsletter. It is assisted by the International Steering Committee (ISC) consisting of

- Felix Are, St. Petersburg State University of Means and Communication
- Jerry Brown, International Permafrost Association, Woods Hole
- George Cherkashov, VNIIOkeangeologia, St. Petersburg
- Mikhail Grigoriev, Permafrost Institute, Yakutsk
- Hans Hubberten, AWI, Potsdam
- Volker Rachold, AWI, Potsdam (Project Leader)
- Johan Ludvig Sollid, Oslo University
- Steven Solomon, Geological Survey of Canada, Dartmouth

At their Council Meeting during the Arctic Science Summit in Iqaluit, Canada (April 2001), IASC officially accepted the ACD Science and Implementation Plan (IASC ACD 2001). In the following years, annual IASC-sponsored ACD workshops were held in Potsdam (Germany), 26-30 November 2001, Oslo (Norway), 2-5 December 2002 and in St. Petersburg (Russia), 10-14 November 2003. Proceedings and extended abstracts were published in Rachold et al., 2002, 2003 [a], Rachold and Cherkashov, in prep. Currently, ca. 25 institutions from Austria, Canada, Germany, Norway, The Netherlands, Russia, Switzerland, UK and USA are contributing to the ACD project. The secretariat maintains communication with the following international programs/projects:

- IASC and its projects
- Arctic Climate Impact Assessment (ACIA)
- Land Ocean Interactions in the Russian Arctic (LOIRA)
- Circum-Arctic Terrestrial Biodiversity (CAT-B)
- Arctic Ocean Science Board (AOSB) and its program
- Arctic Paleo River Discharge (APARD)
- IPA and its program
- Global Terrestrial Network Permafrost (GTNP)
- Circum-Arctic Environmental Observatories Network (CEON)
- Conservation of Arctic Flora and Fauna (CAFF)
- Study of Environmental Arctic Change (SEARCH)
- US Land-Shelf Interactions (LSI)
- World Climate Research Program - Arctic Climate System Study / Climate and Cryosphere (WCRP - ACSYS/Clic)

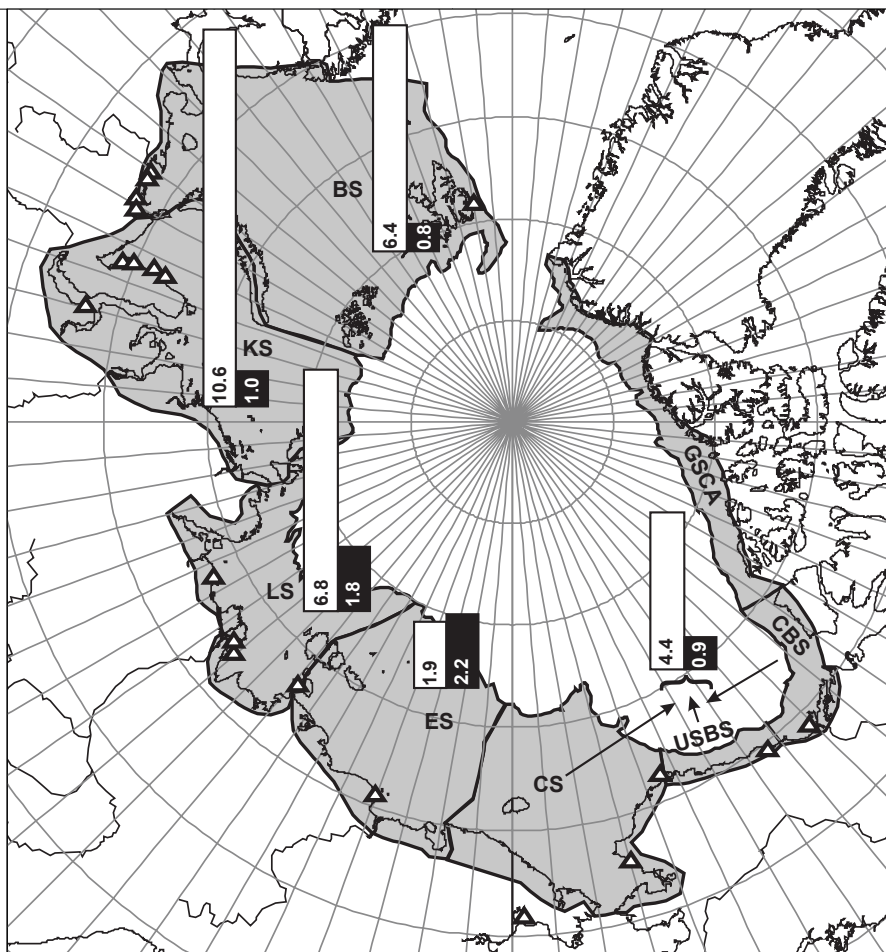
### Results, products and current focus of the Arctic Coastal Dynamics project

The first phase of the ACD project has been directed towards the assessment and synthesis of existing information on Arctic coastal properties and dynamics. About 800 Russian literature entries on Arctic coastal processes and a circum-Arctic collection of some 120 coastal photographs have been compiled and made available through the ACD web page and the second version of the IPA CAPS-CD (Circumpolar Active-Layer Permafrost System) prepared by the National Snow and Ice Data Center, Boulder, Colorado. A network of long-term monitoring sites has been

established. Some of these sites have been studied for about 20 years and most of them are re-visited each year (see Figure 3). The metadata information for these ACD key sites is available on the ACD web site.

Workshop reports and several ACD relevant papers and extended abstracts have been published in the Proceedings Volume of the 8<sup>th</sup> International Conference on Permafrost held in Zurich (Switzerland), July 2003. 16 papers on Arctic coastal processes and dynamics will be featured in a special issue of *Geo-Marine Letters* by mid 2004.

Emphasis is currently on developing a circum-Arctic estimate of sediment and organic input from coastal erosion to the inner shelves. In the past, the contribution of coastal erosion to the material budget of the Arctic seas has been underestimated, but recent investigations have underlined its importance. Reimnitz et al. (1988) presented calculations for 344 km of Alaskan coast in the Colville River area and found that coastal erosion here supplied seven times more sediments to the Alaskan Beaufort Sea than rivers. Are (1999) suggested that the amount of sediment supplied to the Laptev Sea by rivers and shores is at least of the same order and that the coastal erosion input is probably even larger. This finding was supported by Rachold et al. (2000), who concluded that the sediment input to the Laptev Sea through coastal erosion is twice as large as the river input. In the Canadian Beaufort Sea on the other hand, the Mackenzie River input is the dominant source of sediments and coastal erosion is much less important (MacDonald et al. 1998). These pronounced regional differences in the riverine and coastal erosion sediment input have to be considered when establishing budgets of the Arctic seas. Recent papers published under the ACD framework indicate that coastal erosion forms a major source not only of the sediment input but also of the total organic carbon (TOC) input to the Arctic seas (Brown et al., 2003; Grigoriev and Rachold, 2003; Jorgenson et al., 2003; Rachold et al., 2003 [b]). The comparison between riverine and coastal TOC input, based upon literature review and detailed field studies carried out in the Laptev and East Siberian Seas during the last several years is shown in Figure 3 (Rachold et al., 2003 [c]). It has to be noted that the data given in the figure are the best currently available estimates, but may include errors ranging from ca. 30% for the Laptev and East Siberian Sea



**Figure 3** - ACD subdivision of the Arctic coastline by major seas (BS = Barents Sea, KS = Kara Sea, LS = Laptev Sea, ES = East Siberian Sea, CS = Chukchi Sea, USBS = US Beaufort Sea, CBS = Canadian Beaufort Sea, GSCA = Greenland Sea / Canadian Archipelago) and ACD key sites marked by triangles. Bars represent the riverine and coastal TOC input ( $10^6 \text{ t C yr}^{-1}$ ) to the Arctic Ocean (data taken from Rachold et al. 2003 [c]). White bars refer to river input and black bars to coastal input. Note that the sum is shown for Beaufort and Chukchi Sea and that Barents Sea input data include White Sea.

(Grigoriev and Rachold, 2003) to one order of magnitude for the other seas.

The development of a reliable assessment of the sediment and organic input through coastal erosion involves segmenting the entire circum-Arctic coastline into homogenous elements based primarily on morphology, composition and erosion rates. Each segment is to be classified according to a coastal classification template (Rachold et al., 2003 [a]). Geographical information of the segments and physical and geomorphologic attribute tables are stored and managed in GIS format for visualization and analyses. The final data set (incl. metadata) will be stored in the PANGAEA system (<http://www.pangaea.de>). Regional expert teams have almost completed the segmentation procedure during the recent ACD workshop in St. Petersburg (10-14 Nov.) and the first version of the circum-Arctic GIS product, available via internet and on CD-ROM, is anticipated by mid 2004.

Available data for various parameters, summarized under the term “environmental forcing”, such as winds, waves, currents, sea-level, water and air temperatures, sea ice, have been analyzed. The subsets relevant to the ACD project are currently being extracted from weather observatories and global reanalysis products and formatted for inclusion in the circum-Arctic GIS (Atkinson, in review). Methodologies for correction of wind data from the reanalysis products and analyses of storms and storminess are by-products of this ACD effort and form an important contribution in their own right to the study of the Arctic coastal environment. The information will be available as GIS layers (shapefiles), which can be overlaid and compared with the coastal characteristics.

#### Outlook and perspectives

During the second phase of ACD research, until 2005, emphasis will be on critical processes. This includes

concentrating on the transport and fate of eroded organic material and the most critical and poorly understood transition between onshore and offshore permafrost.

The knowledge of the type of organic carbon (dissolved or particulate), and its fate and availability for bio-productivity is essential in order to understand the role of coastal erosion in the carbon budget of the Arctic. As a first step three key transects located in the Kara, Laptev and East Siberian Seas have been sampled in 2003 with regard to detailed organic carbon and geochemical properties.

The future degradation of the permafrost both on shore and on the Arctic shelf is of worldwide importance because GHG bound within and beneath the permafrost may be released (Romanovskii et al., in review). In this context the coastal areas are of specific interest because they are the site of the transition between onshore and offshore permafrost. Along the Arctic coastlines permafrost is exposed to the influence of relatively warm and saline sea-water, which potentially accelerates permafrost degradation. Changes occurring within the coastal zone control the characteristics of offshore permafrost and the associated geotechnical properties of the offshore materials. A better understanding of this zone is also required for safe and efficient development of offshore Arctic hydrocarbon resources. To decipher the processes acting during the transformation of onshore to offshore permafrost and to improve mathematical models of the permafrost distribution and coastal morphodynamics, coastal permafrost drilling transects are required. The first program will be performed in the Laptev Sea in spring 2004.

An additional objective of the last ACD workshop held in St. Petersburg was to initiate planning of an Arctic Coastal Biodiversity research agenda (ACB). The primary goal was to provide an international forum for discussion of research that will be relevant to biodiversity assessment in the coastal zone. Biodiversity assessment is considered critical for improving coastal zone management and designing of terrestrial and marine protected areas. Incorporating information on species composition, habitat structure, and ecological function, biodiversity assessment is an emerging interdisciplinary research topic, of critical importance for coastal management. The Arctic coastal zone is especially suitable for biodiversity assessment due to its relative lack of human disturbance and its

high sensitivity to ecosystem change through global warming.

Financial support through the IASC, IPA, the Canadian Department of Foreign Affairs and International Trade (DFAIT), the International Arctic Research Center (IARC), INTAS (International Association for the promotion of co-operation with scientists from the New Independent States of the former Soviet Union) and the National Science Foundation (NSF) is greatly appreciated. The ACD project looks forward to future cooperation with the "New" LOICZ program. Several ACD products and results are anticipated for the near future and a result-oriented article will follow in one of the next LOICZ Newsletters.

### References

Are, F.E. (1999) The role of coastal retreat for sedimentation in the Laptev Sea. In: Kassens, H., Bauch, H., Dmitrenko, I., Eicken, H., Hubberten, H.-W., Melles, M., Thiede, J. and Timokhov, L. (eds.) Land-Ocean systems in the Siberian Arctic: dynamics and history. Springer, Berlin, 287-299.

Atkinson, D.E. (in review) Environmental forcing of the circum-Polar coastal regime. *GeoMarine Letters*.

Brown, J. and Solomon, S. (2000) Arctic Coastal Dynamics – Report of an International Workshop, Woods Hole, MA, November 2-4, 1999. Geological Survey of Canada Open File 3929.

Brown, J., Jorgenson, M.T., Smith, O.P. and Lee, W. (2003) Long-term rates of erosion and carbon input, Elson Lagoon, Barrow, Alaska. Proceedings of the 8<sup>th</sup> International Conference on Permafrost. Zürich (Switzerland), 21-25 July 2003, 101-106.

Grigoriev, M.N. and Rachold, V. (2003) The degradation of coastal permafrost and the organic carbon balance of the Laptev and East Siberian Seas. Proceedings of the 8<sup>th</sup> International Conference on Permafrost. Zürich (Switzerland), 21-25 July 2003, 319-324

IASC Arctic Coastal Dynamics (ACD) (2001) Science and Implementation Plan, International Arctic Science Committee, Oslo, April 2001.

Jorgenson, M.T., Macander, M., Jorgenson, J.C., Ping, C.P. and Harden, J. (2003) Ground-ice and carbon characteristics of eroding coastal permafrost at Beaufort Lagoon, northern Alaska. Proceedings of the 8<sup>th</sup> International Conference on Permafrost. Zürich (Switzerland), 21-25 July 2003, 495-500.

MacDonald, R.W., Solomon, S., Cranston, R.E., Welch, H.E., Yunker, M.B. and Gobiell, C. (1998) A sediment and organic carbon budget for the Canadian Beaufort Shelf. *Mar. Geol.* 144, 255-273.

Rachold, V., Grigoriev, M.N., Are, F.E., Solomon, S., Reimnitz, E., Kassens, H. and Antonow, M. (2000) Coastal erosion vs. riverine sediment discharge in the Arctic shelf seas. *International Journal of Earth Sciences (Geol. Rundsch.)* 89, 450-460.

Rachold, V., Brown, J. and Solomon, S. (2002) Arctic Coastal Dynamics -Report of an International Workshop, Potsdam (Germany) 26-30 November 2001. Reports on Polar and Marine Research 413, 103 pp.

Rachold, V., Brown, J., Solomon, S. and Sollid, J.L. (2003 [a]) Arctic Coastal Dynamics -Report of the 3<sup>rd</sup> International Workshop, University of Oslo (Norway) 2-5 December 2002. Reports on Polar and Marine Research 443, 127 pp.

Rachold, V., Lack, M. and Grigoriev, M.N. (2003 [b]) A Geo Information System (GIS) for Circum-Arctic Coastal Dynamics. Proceedings of the 8<sup>th</sup> International Conference on Permafrost. Zürich (Switzerland), 21-25 July 2003, 923-927.

Rachold, V., Eicken, H., Gordeev, V.V., Grigoriev, M.N., Hubberten, H.-W., Lisitzin, A.P., Shevchenko, V.P., Schirmermeister, L. (2003 [c]) Modern terrigenous organic carbon input to the Arctic Ocean, In: Stein, R. and MacDonald, R.W. (Eds.) Organic Carbon Cycle in the Arctic Ocean: Present and Past. Springer Verlag, Berlin, 33-55.

Rachold, V. and Cherkashov, G. (in prep.) Arctic Coastal Dynamics -Report of the 4<sup>th</sup> International Workshop, St. Petersburg (Russia) 10-14 November 2003. Reports on Polar and Marine Research

Reimnitz E, Graves S.M., Barnes P.W. (1988) Beaufort Sea coastal erosion, sediment flux, shoreline evolution and the erosional shelf profile. U.S. Geological Survey. Map I-1182-G, and text, 22 pp.

Romanovskii, N.N., Hubberten, H.-W., Gavrilov, A.V., Eliseeva, A.A. and Tipenko, G.S. (in review) Offshore Permafrost and Gas Hydrate Stability Zone on the Shelf of East Siberia Seas. *GeoMarine Letters*.

**Contact Details**

<sup>1</sup> Alfred Wegener Institute for Polar and Marine Research, Research Department Potsdam, Telegrafenberg A43, 14473 Potsdam, Germany (vrachold@awi-potsdam.de) <http://www.awi-potsdam.de/www-pot/geo/acd.html>

<sup>2</sup> Geological Survey of Canada (Atlantic), Bedford Institute of Oceanography, P.O. Box 1006, 1 Challenger Drive, Dartmouth, NS Canada B2Y 4A2, Canada (SSolomon@nrcan.gc.ca)

<sup>3</sup> International Permafrost Association, P.O. Box 7, Woods Hole, MA 02543, USA (jerrybrown@igc.org)

### LaguNet: the Italian Lagoon Observational Network

*P. Viaroli and G. Giordani, Dept. Environmental Sciences, University of Parma, Italy*  
*J.M. Zaldivar and N. Murray, JRC-CCE, Ispra, Italy*  
[www.dsa.unipr.it/lagunet](http://www.dsa.unipr.it/lagunet)

LaguNet is a scientific observational network studying coastal lagoon ecology, especially the fluxes of nutrients and other contaminants from catchments to the near coastal environment. The network has five major objectives.

- i. To provide a forum for discussion and cooperation between researchers who are studying biogeochemical processes in lagoons, wetlands and salt-marshes at sites along the Italian coast.
- ii. To evaluate available information and present understanding of the biogeochemistry of carbon, nitrogen and phosphorous in transitional and coastal waters under the influence of catchment basins.
- iii. To discuss the feasibility of the application of the LOICZ Biogeochemical Model to such areas.
- iv. To promote an agreed common approach to studies of biogeochemical processes, typology, indicators of health and quality that can provide support to management or policy applications in these transitional ecosystems.
- v. Consider the feasibility of developing one or more projects either in Italy or in Europe (with Mediterranean EU partners as well as eventually from Eastern Europe and North Africa).

The idea of a network of Italian researchers who are involved in the study of lagoons and coastal transitional ecosystems was developed by the authors during and after the LOICZ workshop "Coastal and estuarine systems of the Mediterranean and Black Sea regions: carbon, nitrogen and phosphorous fluxes" (Athens, 5-8<sup>th</sup> February 2001 – see LOICZ R&S No. 19, Dupra et al 2001). After a bottom-up process that led to a first agreement, LaguNet was inaugurated during a workshop held in Venice 14-15<sup>th</sup> April 2002.

LaguNet comprises 130 scientists and PhD students. Presently 24 coastal ecosystems are under investigation, where the Biogeochemical Model of LOICZ has been applied for well-defined time periods. In total 81 flux estimations have been undertaken considering a wide range of systems and different time periods (figure 1). Currently a review process is underway with the LOICZ biogeochemical core project aiming to publish the results as part of the R&S series in early 2004.



**Figure 1** - Map and distribution of the LaguNet sites



### “Mechanisms of Sediment Retention in Estuaries” New SCOR-LOICZ-IAPSO Working Group 122 launched

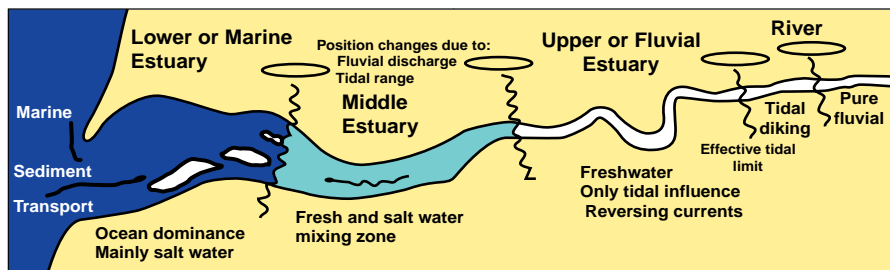
*Gerardo M. E. Perillo  
 and Björn Kjerfve*

Following the announcement in NL 27 we are glad that the Scientific Committee for Ocean Research (SCOR) and

LOICZ, with additional support of the International Association for the Physical Sciences of the Oceans (IAPSO) have joined forces and approved the formation of a new working group WG122. The objective of the group will be to determine the current state and advance on the understanding of the amounts and mechanisms for sediment retention in the different estuarine zones. It will compare river sediment load to the sediment fraction escaping into the coastal ocean, and identify the importance of the different underlying mechanisms. Deficiencies in available data and gaps in our understanding will be addressed to better inform estuarine management.

Under chairmanship of Gerardo M. E. Perillo (Argentina, [perillo@criba.edu.ar](mailto:perillo@criba.edu.ar)) and Björn Kjerfve (USA, [bjorn@msci.sc.edu](mailto:bjorn@msci.sc.edu)), WG 122 includes, as full members, James Syvitski (USA), Eric Wolanski (Australia), Maria Snoussi (Morocco), Yoshiko Saito (Japan), Carl L. Amos (United Kingdom), Susana B. Vinzon (Brazil), Morten Pejrup (Denmark), and Shu Gao (China). A number of corresponding members have also accepted to participate, including Pedro Depetris (Argentina), John Milliman (USA), Pedro Walfir M. Souza Filho (Brazil), Ray Cranston (Canada) and Bob Stallard (USA).

Scientifically the group will focus on the critical role the interaction between fresh and salt water plays in determining the dynamics of estuarine circulation and sediment transport. Sediment budgets will be derived considering riverine delivery into the coastal zone versus local effects of waves, tides, and storm induced coastal erosion and alongshore transport. Equally important is to evaluate how and how much of the remaining sediment will be retained within (i) the tidal portion of the river, (ii) the estuary proper, (iii) adjacent tidal flats and wetlands, and (iv) deltas building tidal flats and wetlands, which otherwise would become totally inundated as a function of relative sea level rise (Vogel et al., 1996). This has hardly ever been established along the total length of an estuary and explicitly for the different portions of the estuarine system from where tides are first measurable until the beginning of a detectable marine salinity gradient (Fig. 1). Perillo (2000) proposed a Retention Index ( $R_i$ ) as the ratio between



**Figure 1** - Schematic diagram of an estuary and its integration with the river. Boundaries between reaches may change in position depending on river discharge and tidal range (modified from Perillo, 1995).

the sediment permanently retained by the coastal zone and the total sediment input from fluvial, marine, atmospheric and coastal zone inputs.

Most studies of river dynamics and sediment delivery to the coastal zone provide information only to the last gaging station usually more than 100 km upstream from the mouth of the estuary (Restrepo and Kjerfve 2000a,b; Kjerfve and Restrepo 2002). This is well upstream of any tidal influence. An estimate of the global sediment load contributed by all rivers on the continents is summarized in Table 1, based on monitoring of rivers upstream. Thus, the actual sediment load that enters the coastal ocean worldwide could be substantially different than the load reaching the estuaries.

**Table 1** - Sediment discharges by major rivers of different continents (after Wang et al., 1998).

Continent	Sediment Load (10 <sup>6</sup> t/a)
Africa	295
Asia	4507
Europe	388
North America	595
Oceanic Islands	380
South America	1731
Total	7897

Many different sediment trapping mechanisms are active and a question to ask is how they act in synergy, and how they affect the sediment retention index along the estuary as a function of space and time. The combined effect of each factor also is a function of space and time. Important factors are (i) both overall and local geomorphology, (ii) sediment load and local sediment storage/ erosion, (iii) local tidal range, water level, and current variability, (iv) tidal pumping, (v) formation of turbidity

maxima, (vi) vertical and longitudinal salinity (density) gradients, (vii) nearshore coastal dynamic processes, (viii) climate dynamics, (ix) relative sea level change, (x) sediment-biological interactions, and (xi) human structures in the estuary and adjacent coastal ocean.

Also anthropogenic influences need to be considered. Sediment load is certainly controlled by the currently more than 2 million dams globally and demographic and climatic change will further increase the demand for irrigation water, cause land clearing and deforestation, water and hydrocarbon extraction, sediment dredging and dredge material disposal, and artificial structures along river channels, within estuaries, and near estuarine mouths.

In conclusion the group will aim to answer a.o. the questions, what fraction of the river sediment load eventually enters the coastal ocean, and why this percentage varies so widely globally. The first meeting of WG 122 will take place in April 2004 in Faro, Portugal.

### References

Kjerfve, B. and Restrepo, J. D., 2002. River discharge and sediment load variability in South America. pp. 87-91. *In South American Basins: LOICZ global change assessment and synthesis of river catchment - coastal sea interaction and human dimensions*. Lacerda, L. D., H. H. Kremer, Kjerfve, B., Salomons, W., Crossland, J. I. M. and Crossland, C. J. (eds.). LOICZ Reports and Studies No. 21, ii + 212 pages, LOICZ, Texel, The Netherlands.

Perillo, G. M. E., 1995. Definition and geomorphologic classifications of estuaries. In Perillo, G. M. E. (ed.) *Geomorphology and Sedimentology of Estuaries*. Developments in Sedimentology 53, 17-47, Elsevier Science BV, Amsterdam, The Netherlands.

Perillo, 2000. Sediment budgets and fluxes in estuarine and coastal areas. IGBP-LOICZ Water Workshop, Boulder, Co. (oral presentation).

Restrepo, J. D. and B. Kjerfve. 2000a. Water and sediment discharges from the western slopes of the Colombian Andes with focus on Rio San Juan. *Journal of Geology* 108(1):17-33.

Restrepo, J. D. and B. Kjerfve. 2000b. Magdalena River: Interannual variability (1975-1995) and revised water discharge and sediment load estimates. *Journal of Hydrology* 235:137-149.

Vogel, R. L., B. Kjerfve and L. R. Gardner. 1996. Inorganic sediment budget for the North Inlet salt marsh, South Carolina, U.S.A. *Mangroves and Salt Marshes* 1(1):23-35.

Wang Y., Ren, M.-e and Syvitski, J.P.M. 1998. Sediment Transport and Terrigenous Fluxes. In: K.H. Brink & A.R. Robinson (editors) *The Sea: Volume 10 - The Global Coastal Ocean: Processes and Methods*. John Wiley & Sons, New York, p. 253-292.

SCOR supports LOICZ participation in the NASA, LUCC, Istanbul Technical University & LOICZ Conference

### “Studying Land Use Effects in Coastal Zones with Remote Sensing and GIS”

Land Use/Cover Change Science and Applications, Kemer, Turkey, 13-16 August 2003

Two scientists, Dr Maria Zoran\*, Romania, and Mr Imassi Saïd\*\*, Morocco, have been supported by SCOR and LOICZ to participate in this colloquium addressing the role of remote sensing in future integrated studies on land processes affecting global coastal zones. By presenting case studies on the “North-Western Black Sea and Danube Delta Coastal Zone Environmental Impact Assessment by Satellite Remote Sensing Data” and “Historical shoreline changes at the Moulouya deltaic coast in connection with land use effects” respectively they contributed to the broader context of the conference: *Natural Processes and Impacts, Linking People and Pixels to Ecosystems and New Tools & Methods*.

Under the chairmanship of Dr. Garik Gutman (NASA) and Prof. Derya Maktav (ITU, Turkey) the scientific presentations and panel discussions of this interdisciplinary natural and human dimension colloquium focused on the analysis of the

complex interactive forcing in coastal zones i.e. biological, chemical, geological and physical processes that define coastal system dynamics. Particular attention was paid to the role of human activities on land in affecting and changing these processes. Remote sensing methods and new applications were reviewed and advanced applications highlighted as a crucial means to inform the important integration between natural and social sciences for assessing, modeling and predicting coastal change at local, regional and global scales.

Capacity building activities including tutorials on "Power and Limitations of Remote Sensing and GIS in studying land use effects in coastal zones" addressed participants' needs to build experience with new technologies and data processing incl. GIS, LANDSAT, MODIS, IKONOS data. In addition participants and in particular young scientists from developing economies were enabled to establish scientific links relevant for their future activities.

LOICZ is particularly grateful to the participants for their contribution and to SCOR for supporting the engagement in this activity. The published proceedings of this colloquium can be ordered via <http://www.ins.itu.edu.tr/rslucoat1/>.

\* Research Scientist First Rank, Institute of Atomic Physics, National Institute of R&D for Optoelectronics, Head of Environmental Remote Sensing Department, Bucharest Magurele, Atomistilor Street 1, MG 5, Romania 76900, tel. +40-723024834, e-mail : maria@dent.ro or marianazoran@netscape.net

\*\* University Mohamed V, Faculty of Sciences, Department of Earth Sciences, Rabat, Morocco, contact via Prof. Maria Snoussi, e mail: snoussi@fsr.ac.ma

## IPO NOTES

⚡ Final Call ⚡

### NEWSLETTER READER SURVEY

**If YOU want to continue receiving the LOICZ Newsletter as a hard copy let us know NOW!!**

A final chance to let us know if you wish to keep receiving the LOICZ Newsletter: Please download the reader survey (<http://www.nioz.nl/loicz/firstpages/fp-newsletters.htm>) and return it to us or send an e-mail ([loicz@nioz.nl](mailto:loicz@nioz.nl)), fax us

(+31-222-369430) or write to: LOICZ IPO, c/o Royal NIOZ, P.O. Box 59, 1790 AB, Den Burg, Texel, The Netherlands!

We wish to thank those of you who have responded to our reader survey in volume No. 25 and 26. In our previous newsletter (No. 28) you could read of the decision made by the IPO and SSC Chair that **as of next year's first newsletter (No. 30)** only those readers who have replied to our survey and request in previous Newsletters or to the final call in this volume will be kept on the LOICZ Newsletter hard copy mailing list. The absolute deadline to respond is: **23 February 2004!!!!**

**Action to be taken by LOICZ:** as of next year's first newsletter (No. 30), all individual members who have not approached us (**excluding institutions and sponsoring organisations**) will automatically be removed from the (hard copy) mailing database. The LOICZ Newsletter will however remain available on the LOICZ web-site, as it is now! The first issue of next year's Newsletter will also be sent electronically to those of you that have used the reader survey to inform us about their preference to receive the LOICZ newsletter either as a PDF or by an e-mail alert once it is available on the web-site.

We anticipate that the future mailing database will thus be improved to function as a growing platform of actively involved multi disciplinary scientists, policy-makers, managers and people with a general interest in LOICZ activities.

Wishing you all a Merry Christmas and a peaceful and successful New Year 2004 we look forward to actively working with you in the challenging "New" LOICZ!



## HAVE YOU SEEN

**Postdoctoral Research Positions at Oceans Division CICESE, Ensenada, Mexico:**

Oceans Division (OD) of Centro de

Investigación Científica y de Educación Superior de Ensenada, B.C., (CICESE) announces the search for postdoctoral researchers with exceptional talent and strong motivation. Successful applicants are expected to contribute to a broad variety of topics (see web for detail) in priority areas in the Aquaculture; Ecology; Biological Oceanography, and Physical Oceanography Departments. Candidates should have a recent PhD (awarded in 2001 or later) in marine, atmospheric, basic science or a related field. Closing date for application is **29 February 2004**. Send a letter of intent (free format, indicating research interests and group or project suitable to join, if possible); full CV and the contact details of three referee's to: Dr. Francisco J. OCAMPO TORRES, Director, Division de Oceanologia CICESE, km. 107 Carretera Tijuana-Ensenada B.C., 22860 Mexico. International postal address: CICESE, P.O.Box 434844, San Diego CA, 92143, USA.

E-mail: [ocampo@cicese.mx](mailto:ocampo@cicese.mx), web-sites: [www.cicese.mx](http://www.cicese.mx) and <http://oceanologia.cicese.mc>.

Vacancy:

**Executive Director of the IGBP**

Full advertisement available on the IGBP web-site: <http://www.igbp.kva.se/> Closing date for applications is **15 January 2004**.

## WHAT'S ON THE WWWEB

*Web-sites on Biogeochemical Budgets and Modelling, Typology, Basins, Deltas Management & South-Asia Coastal Fluxes are accessible via the LOICZ home page: <http://www.nioz.nl/loicz>*

Available on the LOICZ Web-site is a link to the IMBER draft Science Plan and Implementation Strategy.

The Hydrology for the Environment, Life and Policy (HELP) Programme has launched a Global Call for HELP Basins Proposals. Available on the HELP web-site: <http://unesco.org/water/ihp/help> under "You and HELP"

EU has opened a web-site at JRC. An overview of all Pilot River Basins is available which gives you a description of each basin and an idea of which guidelines will be tested in each area. Go to [http://viso.ei.jrc.it/wfd\\_prb/index.html](http://viso.ei.jrc.it/wfd_prb/index.html) or <http://projects.dhi.dk/waterdir>

The World Water Council Newsletter is available at: [www.worldwatercouncil.org/newsletter.shtml](http://www.worldwatercouncil.org/newsletter.shtml)

Invitation to Subscribe: Japan for Sustainability. Mission: JFS is a non-profit communication platform to disseminate environmental information from Japan to the world, with the aim of helping both move onto a sustainable path. You can go to <http://www.japanfs.org/mail/index.html> to sign up for the free subscription.

## PUBLICATIONS

*LOICZR & S volumes are downloadable from the LOICZ web-site. For hard copies (as long as stocks last) e-mail: [loicz@nioz.nl](mailto:loicz@nioz.nl)*

Springer Regional Environmental Change, Special Issue: **River Catchment – Coastal Sea Interaction and Human Dimensions**; a LOICZ Basins approach to coastal change along the water continuum; – Online Abstracts published December 2003 (hard copy anticipated March 2004) Go to **online first** articles: <http://link.springer.de/link/service/journals/10113/tocs.htm>

Special Issue: **Supply and Flux of Sediment Along Hydrological Pathways: Anthropogenic Influences at the Global Scale**. Guest Editor James P.M. Syvitski, October 2003, *Global and Planetary Change*, Volume 39, NOS 1-2. Visit: [www.elsevier.com/locate/gloplacha](http://www.elsevier.com/locate/gloplacha)

SEPM Special Publication No. 76, **Tropical Deltas of Southeast Asia: Sedimentology, Stratigraphy, and Petroleum Geology** edited by F. Hasan Sidi, Dag Nummedal, Partice Imbert, Herman Darman and Henry W. Posamentier. Visit: <http://sepm.org/>

**Autotrophy, nitrogen accumulation and nitrogen limitation in the Baltic Sea: A paradox or a buffer for eutrophication?** by Thomas, H., J. Pempkowiak, F. Wulff and K. Nagel, 2003, *Geophysical research letters*, Vol.30, No. 21, American Geophysical Union. E-mail: [hthomas@nioz.nl](mailto:hthomas@nioz.nl)

A volume on **Carbon and Nutrient Fluxes in Continental Margins: A Global Synthesis** as part of the IGBP

series has been approved by Springer and will be published in 2004.

## LOICZ/IGBP/IHDP CALENDER

*For a complete list of future meetings and regular updates visit our web-site at <http://www.nioz.nl/loicz> and click on 'Calendar'*

**16-18 February 2004, Mombasa, Kenya:** LOICZ/START/UNESCO-IOC & IHP/NEPAD AfriCat Synthesis & Futures Meeting. (by invitation only)

**1-6 March 2004, Moscow, Russia:** IGBP SC and IPO-Officers Meeting. E-mail: [clemencia@igbp.kva.se](mailto:clemencia@igbp.kva.se)

**18-20 October 2004 Dunedin, New Zealand:** Making Connections: Cross-boundary Coastal Management. The 2004 Annual Conference of the New Zealand Coastal Society. Incorporating a LOICZ workshop in association with the New Zealand IGBP Committee, 'The Impact of Major Dams, Diversions and Water Abstraction on Coastal Sedimentation in New Zealand'. Conference Web-site: [www.coastalsociety.org.nz/conference2004.htm](http://www.coastalsociety.org.nz/conference2004.htm)

## OTHER MEETINGS

**25-30 April 2004, Nice, France:** EGU meeting; special session on Ground-water/surface water interactions: controls and biogeochemical impact. The deadline for abstract submission is January 11, 2004. More information can be found at: <http://www.copernicus.org/EGU/ga/egu04/index.html>

**26-28 April 2004, Alicante, Spain:** 5<sup>th</sup> International Conference on Environmental Problems in Coastal Regions. Visit: [www.wessex.ac.uk/conferences/2004/coastalenvironment2004/3.html](http://www.wessex.ac.uk/conferences/2004/coastalenvironment2004/3.html)

**11-14 May 2004, Cairns, Australia:** Global H2O: Hilltops-2-Oceans Partnership Conference. Conference web-site: [www.hilltops2oceans.org](http://www.hilltops2oceans.org)

**23-26 May 2004, Newport, Rhode Island, USA:** The Coastal Society (TCS) 19<sup>th</sup> International Conference.

Visit: <http://www.thecoastalsociety.org/conference/tcs19/> or e-mail: [coastalsoc@aol.com](mailto:coastalsoc@aol.com).

**5-9 July 2004, Singapore:** The first AOGS (Asia Oceania Geosciences Society) Annual Meeting will be held at Suntec Singapore International Convention & Exhibition Centre. Session: **IWG4 Land-Ocean Interactions in Asia and Oceania**.

Contacts: Makoto Tanaguchi, Japan, [makato@chikyu.ac.jp](mailto:makato@chikyu.ac.jp), Ming H. Wong, Hong Kong, [mhwong@hkbu.edu.hk](mailto:mhwong@hkbu.edu.hk) and Lawrence Koe, LOICZ IPO Node Asia, Singapore, [ccckoe@ntu.edu.sg](mailto:ccckoe@ntu.edu.sg). Visit: <http://www.asiaoceania.org/confer.html>.

**5-9 September 2004, Brisbane, Australia:** Coastal Zone Asia Pacific conference- Improving the quality of life in coastal areas. Abstracts due by 1 March 2004. Visit: [www.coastal.crc.org.au/czap04/index.html](http://www.coastal.crc.org.au/czap04/index.html)

**11-14 October 2004, Beijing, P.R. China:** 7<sup>th</sup> Inter-Regional Conference on Environment and Water "Land and Water Management: Decision Tools and Practice". Visit: [www.2004cigr.org/envirowater2004](http://www.2004cigr.org/envirowater2004) or [www.cau.edu.cn/ciicta](http://www.cau.edu.cn/ciicta)

## IPO STAFF

**Hartwig Kremer**  
*Executive Officer*

**Hester Whyte**  
*Office Manager*

## LOICZ International Project Office

**Royal 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](mailto:loicz@nioz.nl)**

**[www.nioz.nl/loicz/](http://www.nioz.nl/loicz/)**