



### Report of LOICZ workshop in Chennai, India

Prof. Ramesh Ramachandran of Anna University, Chennai, India, hosted a LOICZ workshop from 10-13 September 2008, with the primary aim of developing nutrient budgets for South Asian coastal ecosystems, and the secondary aim of evaluating the ASSETS trophic status index software in these estuarine environments.

The workshop was supported locally by the Department of Science and Technology, Government of India and the National Disaster Management Authority, Government of India and Internationally by the LOICZ-IPO. In addition to LOICZ participants from Italy, Portugal, Sri Lanka and the US, the workshop was attended by 32 scientists, students, and dignitaries from different coastal states of India.



Figure 1: Group photograph of the participants at the LOICZ workshop, Anna University, Chennai, India

The biogeochemical budgets sessions were led by Dennis Swaney and Gianmarco Giordani, while Alice Newton led the session on ASSETS methodology. On days 1 and 2 of the meeting, datasets from coastal systems from all over India were presented, and used in the workshop to develop budgets following conventional LOICZ methodology (see figure 2 for the location of the systems). Systems for which at least preliminary budgets were developed included: Ganges, Mahanadi, Adyar, Cooum, Cauvery (Pichavaram and Muthupet), Vembanad and Zuari. The sessions also provided an opportunity to evaluate LOICZ CABARET software in creating budgets from flux and concentration data for each system. Laura David of Philippines University, developer of CABARET, participated on-line, to address software problems and other difficulties. As a result of the meeting, we expect to

---



see some changes in the software, which should be downloadable from the LOICZ biogeochemical budgets website ([www.nest.su.se/mnode](http://www.nest.su.se/mnode)) in the near future. A spreadsheet version of the LOICZ budget procedure, developed by Gianmarco Giordani, was also successfully tested. The budgeting spreadsheet and more information are currently available at [www.dsa.unipr.it/laqunet](http://www.dsa.unipr.it/laqunet), and will likewise soon be available at the LOICZ budget website.

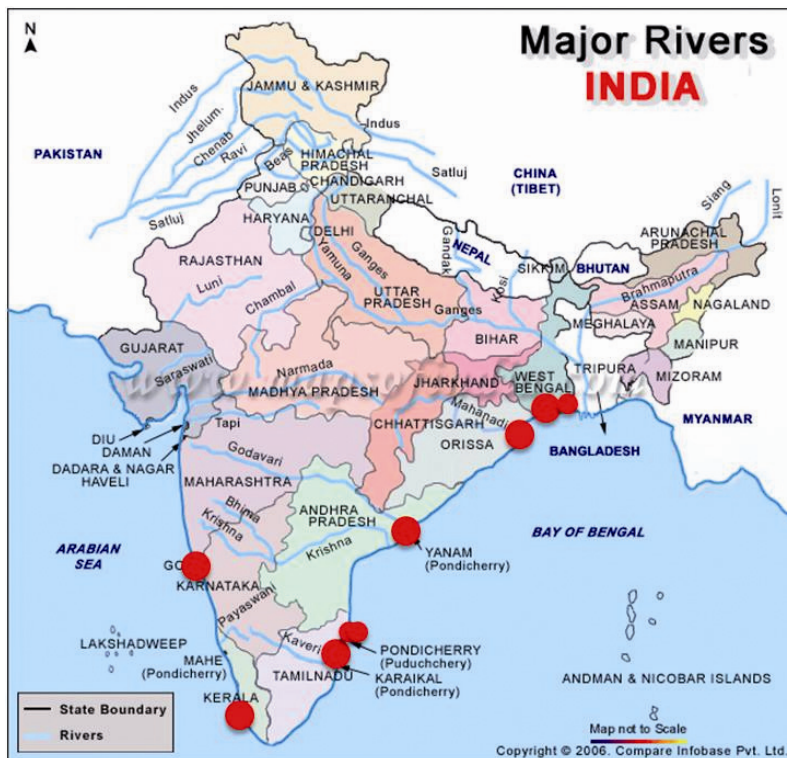


Figure 2: Map of India with River Basins Studied (Source: Maps of India)

The new web-based tool for applying the ASSETS methodology for assessment of estuarine trophic status was tested in a separate session on day three of the meeting. The tool worked well, indicating that the Indian coastal systems spanned a range of conditions from severely threatened to nearly "pristine". The large number of participants allowed us to identify software and methodological issues requiring further clarification, including the appropriate number of compartments required for analysis, and data required to characterize each. Joao Gomes Ferreira was online from Lisbon to help with questions. The ASSETS web-tool is available at <http://www.eutro.org/register/>. More information on ASSETS is available at <http://www.eutro.org>.

In terms of nutrient loading and apparent ecosystem metabolism, the systems presented here mirrored the range observed around the globe: heavily impacted urban drainages subject to little or no sewage treatment (eg Adyar and Cooum) are strongly heterotrophic and generally anoxic. Brackish coastal lagoons (eg Chilika lake), subject to strong monsoonal variation, vary from autotrophic to heterotrophic by season, and support local fisheries. The large, spatially complex, receiving waters of deltas of the major regional rivers (eg Ganges) are best divided into subsystems and analyzed individually. Many of these waters are transboundary in nature, both in their catchments and coastal ecosystem boundaries, resulting in issues of data confidentiality and quality. They represent a continuing challenge for coastal assessment in the region.



The final plenary session of the workshop included a stimulating discussion about the insights gained in the analyses of these Indian coastal systems. Many of India's coastal lagoons and estuaries are subject to organic nutrient loads in both particulate and dissolved forms. The proper application of the biogeochemical budgets framework in highly turbid environments to estimate ecosystem metabolism may require modification to treat the special problems of "muddy waters." Plans are underway to develop this further in a follow-up workshop. Another characteristic of these South Asian ecosystems is their strong seasonal variation due to the effects of the monsoonal climate. Finally, the large rivers of the region (e.g. Ganges, Bramaputra) illustrate the difficulties of analyzing trans-boundary systems with currently available data. Linking LOICZ tools such as the biogeochemical budgets and ASSETS should also yield interesting results.



Figure 3: Photo of field trip to Pulicat Lake, Tamil Nadu, India

On the last day of the workshop a field trip to Pulicat lake, the second largest coastal lagoon in the region after Chilika Lake, was organized by Anna university. Participants enjoyed the natural beauty of this coastal lagoon and learned of the socio-economic resource exploitation of the ecosystem. Pulicat lake and the area adjacent to the lighthouse were badly affected by the tsunami in 2004.

LOICZ thanks Anna University, the sponsors, and all participants for this successful workshop.

September 2008

---