

Appendix I

LOICZ/UNEP Regional Synthesis Thematic Workshop For The Asian-Australian Region

CRC for Coastal Zone Estuary & Waterways Management

Brisbane, Australia

14-17 January 2001

Appendix IA: Participants and Contributors

LOICZ/UNEP Regional Synthesis Thematic Workshop For The Asian-Australian Region

CRC for Coastal Zone Estuary & Waterways Management

Brisbane, Australia

14-17 January 2001

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Appendix IB: Agenda

LOICZ/UNEP Regional Synthesis Thematic Workshop For The Asian-Australian Region CRC for Coastal Zone Estuary & Waterways Management Brisbane, Australia 14-17 January 2001

Sunday, 14 January

- 0900h Opening or workshop and welcome
- 0930h General introduction to workshop schedule, plans and goals.
Plenary review of pre-workshop tests and outcomes.
Tutorial presentations on databases and LOICZView clustering tool.
- 1400h Breakout work using the system to gain familiarity with LOICZView --
- 1600h Plenary discussion of problems and issues
- 1630h Refinement of workshop strategy; development of teams and assignments.

Monday, 15 January

- 0900h Teams of participants and resource people address specific subsets of issues and techniques. Emphasis on classification and calibration.
Breakout work on tasks.
- 1400h Plenary presentation.
- 1445h Continue breakout task work after plenary to evaluate progress.
- 1630h Plenary review of progress and discussion of amendments and additions to the database and clustering tool.

Tuesday, 16 January

- 0900h Plenary discussion of daily schedule and workshop issues/critique.
- 0930h Breakout work on tasks.
- 1400h Plenary presentation.
- 1445h Continue breakout task work.
- 1630h Plenary review of task status. Collection of initial materials for CD-ROM preparation.

Wednesday, 17 January

- 0900h Breakouts continue on task work and systems documentation.
Collection of final materials for workshop CD-ROM.
- 1400h Plenary synthesis overview, presentations and discussion of outcomes.
Plan for follow-up and completion.
Discussion of LOICZView application.
Distribution of workshop CD-ROM
- 1630h Close of workshop.

Appendix IC: Workshop Report

LOICZ/UNEP Regional Synthesis Thematic Workshop For The Asian-Australian Region CRC for Coastal Zone Estuary & Waterways Management Brisbane, Australia 14-17 January 2001

Welcome

Participants were welcomed to the CRC for Coastal Zone Estuary & Waterway Management (Coastal CRC) Brisbane Australia by Dr Paul Lawrence Acting-CEO, Coastal CRC and coordination details were provided by the local organiser, Dr Lynne Turner.

Computer facilities were set up, both local and laptop. A Local Area Network was established with the LOICZ typology database and the LOICZView software supported through a local server arrangement. Electronic services for the typology were provided via either the local LAN or the internet access to the University of Kansas database linked to the Swarthmore College LOICZView site.

Introduction

An introduction to the LOICZ/UNEP project and the LOICZ typology approach for interpolation of data was provided by Dr Buddemeier. While the typology tool has a number of applications, its relevance to the LOICZ initiatives involving global up-scaling of local assessment and evaluation of nutrient biogeochemical budget models data were identified as a primary objective for LOICZ. The application to the Asia-Australasia region was central to the theme and work of the workshop, recognising that activities would be addressing a range of scales, regions and sub-regions, and global-scale trials of data cluster analysis. The workshop was placed in the context of the three global region thematic workshops planned for the LOICZ/UNEP project and the final global synthesis workshop which will aim to build a global picture of C-N-P fluxes in coastal systems. Additional and wider applications were considered both within LOICZ and more widely to meet participant research and interests with application to LOICZ. The LOICZ typology software and tools provide a unique method for scaling and to achieve the global assessment goals of LOICZ.

Workshop Approach

The individual and team approach for application, assessment and further development of the typology methodologies (Appendix VI) was discussed, and a schedule for workshop activities was adopted (Appendix IV).

Participants were introduced and each identified their interest and questions for trial and application of the typology data-clustering tool within the Asia-Australasia region, in addition to the LOICZ training and regional scaling objectives. A number of tasks for application and development of the typology methodology were noted by participants, to provide a framework for their tutorial activities.

The workshop activities were set to encompass four elements of tutorial, trials, application and development of the LOICZ typology method, to address workshop objectives:

- How can we best identify and use budget-relevant data to create coastal classifications for categorizing and extrapolating biogeochemical budgets?
- What effect does the detailed form and nature of the variable portrayal (e.g., max, min, mean values), the scale of consideration, and the clustering approach have on the outcomes? What is 'budget-relevance' in our data, and how do we test or develop it?
- Where can we find or create 'expert typologies' (qualitative or quantitative) developed by other techniques or with other datasets to compare and test the LOICZ typologies against? How do they compare, and how well can we 'tune' them or understand the differences?

- What are the effects of, and how can we best use, discrete (classified) and continuous data? What are the ways to use classification to convert qualitative, highly aggregated, or semi-quantitative data into variables suitable for clustering, or to simplify complex or highly skewed data sets?

Key questions to support these goals included:

1. Cluster-based typologies – What are the appropriate parameters for nutrient budget-related typologies? How can cross-scale and cross-regional comparisons be derived?
2. Expert typologies – Do they exist or can we create them? How do cluster-based typologies compare? Can they be tuned?
3. Form of variables – maximum, minimum, mean values; what are they good for? What do they proxy? What proxies can be developed for process representation in scaling approaches?
4. Variables and typologies – Continuous variables versus discrete classifications – quantifying expertise. For example, how can we deal with discrete location (single pixel data populations) information sets, such as are found with river basin parameters, in the context of continuous datasets across coastal pixels? Are existing datasets robust and what are their characteristics?

Tutorials

LOICZ Typology Database (Jeremy Bartley)

The current database maintained at the University of Kansas is derived from existing global datasets and fitted to 0.5-degree coastal pixels represented in the LOICZ global cell array. This has been derived from an earlier one-degree pixel representation. More than 180,000 megabytes of information are contained as a table in an ORACLE base system which provides for uploading of selected variables (and scale) into the LOICZView clustering tool.

The database and system structure were described, including the process of addressing and using the database interrogation tool, selection of variables and their metadata provenance and information, and linkage to other developmental datasets – for example, the IGBP BAHC coastal basins data and model outputs.

Utility of the database directly and linked to the LOICZView typology clustering tool were outlined, noting the linkage recently developed for “cold fusion” between the two elements (which has helped make the typology method accessible by LAN at the workshop).

Tutorial presentation provided opportunity for participants to step through the variable selection, and familiarise themselves with the database structure. The issue of derivative data sets and new data set developments were discussed.

LOICZView (Dr Bruce Maxwell)

The clustering tool was described in detail and the various sections of operation were discussed, including:

- i) Data and data variables
- ii) Processing (including selection of distance calculation and statistics)
- iii) Visualisation and options
- iv) Downloading, data format and statistical assessment of clusters, and file and image storage.

It was noted that the LOICZView internet site offers a set of trial data as well as the opportunity to upload from the LOICZ dataset site or to import derived geospatially-referenced data.

Tasks and Typologies Development

Participants introduced their questions and task objectives for the workshop.

Initial tasks included:

- Australia and New Zealand estuary types and classification.

- Southeast Asia – how many clusters are needed to represent budgets and seasons?
- Australasia and global distribution of tropical habitats (reefs, seagrasses and mangroves).
- Expert Southeast Asian typologies – comparisons.
- China – coastal provinces and major deltas.
- East Asia and Taiwan - comparison of parameters across grid sizes.
- South Asia – coastal typologies on biophysical parameters.

Break-out groups (2-3 participants) and individuals worked interactively during days 2-4 on the development of different typologies, supplemented with methodological and problem/project tutorials and discussions. Daily summary notes were compiled and distributed addressing, *inter alia*, shortfalls in variable capabilities, methods upgrades incorporated into the tools, product and document handling options

Discussion of problems and methods upgrades

Plenary discussions throughout the workshop addressed a range of issues and problems that came to light with the databases, clustering actions and saving and working with image outputs and statistics of cluster evaluations. Amendments were made to the database and clustering tools as methodological improvements during the workshop.

Cautions and issues for data use (Jeremy Bartley)

Database utility and issues were identified:

- Selection of lat.-long; select N to S and W to E;
- Wave height database is not good; a new set from NOAA is being introduced;
- BAHC runoff dataset requires modification;
- Image download to PC (Open CorelDraw and use colour intensity for differentiation);
- Easy to select “inappropriate” data in cells where there are many zero points, and is a function of cell types e.g., terrestrial, coastal, oceanic I cells;
- Marine values in coastal cells are extrapolations of oceanic data that may not accurately reflect extremes and variability of nearshore waters;
- Procedures for saving results were addressed and a protocol developed;
- Need for additional key variables for up-scaling applications, especially 0-40° latitudes; and
- Biogeochemical models data (to date) were included in the current database for use in overlay activities.

Global maps were prepared (J. Bartley and Prof. S.V. Smith) for each variable to assist in visualisation of coverage and gradients, thus supporting choice of databases for typology purposes.

Upgrades to LOICZ View (Casey Smith, Dr Bruce Maxwell)

The LOICZView tools were amended in response to participant comments and use, including the LOICZView clustering tool (Dr Bruce Maxwell) and the Web interface (Casey Smith). Changes included:

- Improved statistical output for clusters
- Cluster information extended re. variables and files in cluster summary
- Image and data can be saved together as “save” or “view” function
- The “source” element was modified
- Overlay facilities amended (cluster then overlay to compare typologies)
- Size of image can be selected for the “visualisation” mode
- Two different clusters can be overlaid, but must be at a comparable scale
- Clustering with parameters that include a high level of missing data (zero values) will be more robust due to statistics modifications.

A format and procedure for saving results and images was developed (Table A-I.1).

Table A-1.1. Proforma for data reports and archiving information

DATA REPORTS

OPERATOR(S) NAME:

DATE:

Database Information

Geographic zones selected (leave blank if done by zones):

Geographic range selected (leave blank if done by zones):

Cell types selected from database (Terrestrial, Coastal, Oceanic I, Oceanic II, Oceanic III):

Variables selected from database:

What do you expect to get out of clustering these variables or what are you trying to achieve?

Additional comments on problems or improvements needed:

LOICZVIEW INFORMATION

Cluster Run Number:___

Variables selected in cluster (include any weights if not set at 1):

Number of clusters:

SAVE IMAGE

Step1: Click on the View image as one layer button

Step2: After the new window pops up Right-Click on Image and select the Save image as option

Step3: Place the image in the LOICZ folder on your desktop

Insert Image into the space below:

COMMENTS OR DESCRIPTION ON CLUSTER OUTPUT:

NOTES ON SAVING YOUR INFORMATION:

Cluster information:

Step1: On the Visualize tab click on “Source” button

Step2: Under the View Column click on the “clu” button

Step3: Select all of the text in the bottom right window and copy it to the clipboard (edit copy or ctrl-C)

Step4: Open Notepad and paste the information in and save it into your LOICZ folder

Step5: Save the file with a unique name like clusterNum_clu.txt and then write the name below:

CLUSTER ASSIGNMENT FOR EACH DATA CELL:

ONLY DO THIS IF YOU PLAN ON USING IT IN ARCVIEW!!!

Step1: On the Visualize tab click on “Source” button

Step2: Under the View Column click on the “tag” button

Step3: Select all of the text in the bottom right window and copy it to the clipboard (edit copy or ctrl-C)

Step4: Open Notepad and paste the information in and save it into your LOICZ

Step5: Save the file with a unique name like clusterdata_tag.txt and then write the name below.

Plenary presentations

Three plenary presentations provided points for discussion and potential application of the typology products.

“Coastal system processes and science- links with policy” (Dr Bill Dennison) provided a description of multi-disciplinary scientific studies of processes and changes in Moreton Bay, Queensland. There, the involvement of management and policy agencies in the research design, implementation and analyses has yielded an effective partnership for science transfer.

“Regional material flux” (Prof. Ming Wong) is a vital issue in East Asia, with increasing scientific effort and efforts for effective environmental management and resource protection. Biogeochemical process assessments and scaling issues are of key interest.

“A fine-scale approach to estuarine classification in New Zealand” (Dr Terry Hume) is currently a high-priority research-management project, to describe and characterise status and changes in more than 300 estuaries along 11,000 km of coast. Limited knowledge about many estuaries makes a typological approach attractive and here, the selection and development of derivative proxies is a leading issue.

Presentation of Developed Typologies

The task outcomes were summarised and constructive comments made on shortfalls in databases and techniques (Table A-I.2). The typologies developed during the workshop and authors notes are more completely described in the accompanying CD-ROM.

TABLE A-I.2. Participant Contributions.

#	Name(s)	Region(s)	Subjects	Notes
1	Yanagi	Japan/E Asia	Eutrophication	
2	Hung	NE Asia (China/Taiwan/Japan)	Classification	5 clusters
3	Cao	China (Japan, Korea)	Cluster comparison	2-7 variables
4	Wong	East Asia	Human activities	
5	Dupra	SE/E Asia	Process proxies	5 clusters
6	McManus/Swaney	SE/E Asia	Coastal typology	Cluster no. effect
7	Wattayakorn	Thailand/SE Asia	Humans/nutrients	
8	McGlone	Philippines	Production/eutrophy	
9	David	Asia-Australia	Extreme events	Latitude-independent variables
10	Zeldis/Hume	NZ-S Australia	CZ classification	6 variables
11	Eyre	Australia	Estuarine classification.	3 variables.
12	Pullar	Queensland coast	Coastal productivity	4 variables.
13	Dennison	World	<i>Trichodesmium</i> distribution	
14	Turner	Australia	Process classification	
15	Robb	Australia/S Africa	Coast/estuary classification.	
16	Broadman	Australian latitude band	Scale comparisons	
17	Camacho-Ibar	Australia/S America	Hydrology comparisons.	
18	Naqvi	S Asia (Indian subcont.)	Typology	
19	Wulff/Swaney	Europe	Nutrient loads	5 var.
20	Opdyke/Dennison	World	Benthic habitats	
21	Smith	World	Land-ocean influence	2 derived variables

1. Australian estuaries classification (Dr Bradley Eyre)

Constructed a LOICZView typology and compared with an existing fine-scale classification using the same variables. Rainfall variables and tidal range yielded a good relationship at regional levels, though there was a mis-match of some classes and the overlay tool was not effective for inter-comparison. The variables were applied to a global view with acceptable outcomes; a lesser number of classes but similar patterns.

2. Tropical habitat mapping (Dr Bradley Opdyke)

Coral distribution in Australia was classified using parameters for depositional environments and the typology was extended (with Dr Bill Dennison) to seagrass and mangrove environments. The classification was extended to a global scale where 27 clusters gave a successful representation (>70% agreement with expert typology). Salinity, temperature, wind speed and tide were key variables; runoff data was not very useful; sediment database would be a valuable addition along with coastal temperature data determined in coastal areas. Weightings: salinity was a major driver; tidal range and wind speed weighted to influence clusters.

3. *Trichodesmium* distribution (Dr Bill Dennison)

SST, runoff and tidal range provided useful proxies for the Australasian-Indonesian region. Global scale elicited the “hot spots”. LOICZ typology method may be a valuable search tool for susceptible areas; data will be compared with satellite techniques being developed elsewhere.

4. Defining functional zones in Australian coasts (Dr David Pullen)

A staged approach was made with the Queensland coast. Salinity, SST, tidal range, chlorophyll and bathymetry variables were evaluated to yield discrete area locations but not a spatial pattern. Comparison made with “impacts” (population and runoff variables); results suggest a N-S gradient driven by SST and impact of land flow on the coastal environment. A terrestrial cell classification will be applied to make further pattern evaluations.

5. Extreme events and vulnerability (Dr Laura David)

The Asia-Australasia regions were evaluated for assessment of storm event changes. Coastal regions were clustered for a latitudinal typology total precipitation, bathymetry, population, salinity, basin runoff. Storm events were then developed by proxies (standard deviation of precipitation and annual average wind) to give a before and after (extreme event) picture. 60% of the pixels (1850 of 3221 cells) were not affected by extreme events. Recalculation of total runoff provided higher or added flow vs uncharacteristic flow or flooding (usually in drier areas) to elucidate vulnerable areas.

6. New Zealand estuary classification – scaling evaluations (Dr John Zeldis, Dr Terry Hume)

Aimed to develop an estuarine classification using appropriate LOICZ parameters and further derivative parameters and proxies that can represent the finer scales required. Catchment parameters were evaluated and a typology was reassembled using oceanographic data; the latter were preferable and provided a reasonable clustering of NZ coast with windspeed, salinity, SST, tidal range, soil texture and a derived “flow volume”. Highlighted use of derivative parameters and awareness of metadata supporting the variables. Looking to cluster about 300 NZ estuaries in 2001 with LOICZView (at fine scale) and link to Australian assessments and classifications.

7. Comparative classification of Australian estuaries (Dr Lynne Turner)

Earlier AGSO classification was classified into six classes based on energy and relative wave-tide dominance discriminants (variables: runoff, tidal range, wave height). Using 3- and 6-cluster selection (MDL indicated 27 clusters), this was applied to a global scale. The 6-cluster approach resulted in the Australian estuaries apparent within the global picture – however, the cluster statistics need to be reviewed. A follow up analysis of data sets (variations and gaps) is to be made to check whether the Australian classification can be fully applied as a surrogate (ground truth) for the global scale.

8. Proxies for biogeochemical budgets in South East Asia (Vilma Dupra)

A key question was: how do the budgets fit to characteristics of the coastal region? This was addressed by analysing for similarity between budgets and similarity of coastal characteristics (by assessment of gradients in each parameter). Key variables included: bathymetry (minimum depth), precipitation, runoff (and salinity gradient), water exchange and bathymetry. Loadings that fall into areas of high precipitation need to be refined, but can compare budgets across precipitation classes for different locations. Population, represented as DIP load estimates (ranked as high, medium or low) have yet to be overlaid and evaluated.

9. Freshwater discharge comparison of Australia and eastern South America (Dr. Victor Camacho)

Discharge typology to provide a basis for assessment of biogeochemical budget sites. Evaluated various variables to cluster (initially four variables but temperature and precipitation provided best similarity). It was noted that datasets for coastal runoff variables in Australia have many missing data; runoff datasets are more complete for South America. The database was upgraded during the workshop and the cluster analyses will be repeated. The datasets were useful at global and continental scales; clustering rigour degrades at finer scales.

10. Classification of coastal eutrophication in Japan and application to South East Asia (Prof. Tetsuo Yanagi)

A 4-parameter and 10-cluster analysis, including [p-r] valuations yielded a “sensible” outcome for further applications.

11. Classification of the East China Sea region (Dr Jia-Jang Hung)

A range of variables was trialled (temperature, precipitation, salinity, runoff, population). Temperature, salinity and precipitation provided an acceptable typology vs expert judgement for Taiwan; the runoff variable was not consistent. A 5-cluster approach delivered output little different from a 10-cluster approach for Taiwan, but a 10-cluster approach was more representative of the region, including Japan.

12. Classification of eutrophication in Philippine waters (Dr Malou San Diego-McGlone)

A number of variables were tested as proxies for eutrophic conditions: water exchange (salinity gradient as a proxy, but this was small), light, mean SST, nutrients (population density and precipitation as an indicator of runoff and quality). Hot spots were visualised for a good agreement with expert knowledge. Terrestrial inputs will be applied to the classification and the Philippines output will be trialled as a surrogate location for South East Asia.

13. Coastal typologies for South Asia using biophysical variables (Dr Wajih Naqvi)

Applied up to 12 variables and clusters initially. Five variables and 5 clusters yielded a typology for South Asia that fits expert judgement. This was further applied to the Arabian-South Asia regions yielding an acceptable typological representation of 10 coastal types (with 8 variables). Extension to South East Asia required 10 variables and 10 clusters. The classification sorted upwelling areas.

14. Human impacts on South East Asian coasts (Dr Gullaya Wattayakorn)

The coasts of Thailand, Malaysia and Vietnam were used as demonstration areas and, with a 5-variable array, a reasonably good classification was developed, though some sites were unresolved. A trial of population and data variables was followed and delivered acceptable visualisation. Application to the wider South East Asian region was in progress, making further assessment of discriminating variables and clusters numbers, and assessing by expert judgement classification “sensibilities”.

15. Typologies for the China coast (Prof. Ming Wong, Dr Wenzhi Cao)

Evaluated a range of variables in both coastal and terrestrial cells for data quality and representation on the coast of China. Applied a number of combinations of variables and clusters to develop a coastal cell typology; this was compared with expert judgement and an independent database. Temperature, precipitation and organic carbon proved to be key variables for classification of the coast. Effects of human activities (noting that 70% of major cities are coastal) were evaluated. Effort was put into formatting and entering a comprehensive dataset for coastal regions of China that had been brought to the workshop. A preliminary run had been made with application of these data, and work will continue post-workshop.

16. Classification of coastal runoff and nutrients in Europe (Prof. Fred Wulff, Dennis Swaney)

Single variables for the region were individually assessed and their characteristics appraised as discriminatory criteria within the region. A 4-variable (annual mean temperature, precipitation, drainage basins, drainage basin population) typology was developed that gave a good fit against expert judgement. However, the major river discharge areas were not resolved in the cluster development.

The typology appeared useful for the region and could be tested for application to other parts of the globe.

17. Proxies for biogeochemical budgets – ocean and river systems (Prof. Steve Smith)

Earlier trials were built on. Derived variables were developed as a proxy for residual flow and (windspeed)² was used to represent energy (both were constructed off-line and input to the database); missing data were stripped from the databases. Pattern evaluation of clustering included cell-by-cell analysis for “sensitivity”. The results confirm that the LOICZView clustering can deal with non-adjacent point pattern analysis at small scales. Global clustering, following application to Australia as a trial area, yielded a 20-cluster output which showed that the derivative variables behaved as expected and that the Australian surrogate fit well for production of a global pattern

Utility and Application of LOICZView

Use and potential application of the LOICZView methodology was discussed in light of the workshop trials and activities. Key points included:

A. As a general access tool for geo-referenced data

- The Oracle data base will continue to be expanded as will the LOICZView access. The immediate priority will be to meeting the demands of LOICZ-based projects.
- Continue development of techniques for fitting and use as a tool within LOICZ, and compilation of derivative data sets, utility for scaling patterns.
- Options for mirror sites are under consideration. Transfer of tool to a central agency for support and maintenance is being considered.
- A network of key users will be provided personal access codes, via University of Kansas in the short term, with facility provided for general or guest users.

Application to science and wider users

- Global scale habitat mapping (actual, expected, changes).
- Inventory comparisons and mapping e.g., marine taxonomic systems, sediment chemistry, groundwater attributes.
- Application to access specialist geo-referenced data.
- Application on different scales of data sets, global to very fine-scale.
- Conceptualisation and visualisation of data.

Outcomes and Wrap-up

Typologies were developed to interim draft stage during the workshop; text additions and checks on data sources were required for completion of most tasks. A schedule for contribution of final documents, report and publication, along with the process for review and editing was agreed, noting that hard-copy reports, web-posting and CD-ROM products are planned.

A CD-ROM of workshop databases, materials and developed typologies was prepared and distributed to all workshop participants as an interim product and for further use by participants.

Members of the Project steering committee met informally during the workshop to plan content and programs for further workshops, and to review and finalise arrangements for preparation and publication of tutorial materials.

The participants joined with LOICZ in expressing thanks to Dr Lynne Turner and Kerry Rosenthal for their preparation and support throughout the workshop, and to the CRC for Coastal Zone Estuary and waterway Management for the arrangements and hosting of the workshop in Brisbane. The financial support of the Global Environmental Facility was gratefully acknowledged.

Appendix ID: Terms of Reference

LOICZ/UNEP REGIONAL SYNTHESIS THEMATIC WORKSHOP FOR THE ASIAN-AUSTRALIAN REGION

CRC for Coastal Zone Estuary & Waterways Management

Brisbane, Australia

14-17 January 2001

Background Information:

A major overall objective of LOICZ (<http://www.nioz.nl/loicz/>) and the facilitating UNEP GEF project is to provide an assessment of uptake and release of nutrients (nitrogen and phosphorus) in the global coastal zone. The tools being used to meet this objective are biogeochemical budgets of nitrogen and phosphorus for specific sites (primarily bays, estuaries, and lagoons) in the coastal zone, and application of an objective classification, or "typology," (<http://water.kgs.ukans.edu:8888/public/Typpages/index.htm>) to extrapolate from individual sites to the global coastal zone. To date, approximately 150 site budgets have been developed (<http://data.ecology.su.se/MNODE>), mostly through a series of workshops sponsored by GEF. The primary classification tool will be the geospatial clustering program "LOICZView," which has been developed for this specific application (<http://www.palantir.swarthmore.edu/~maxwell/loicz/>; refer to LOICZ Newsletter No.15 June 2000, available on the LOICZ web-site).

Over the course of the year 2001, a series of three regional synthesis workshops will be held to develop objective classifications for the global coastal zone, to reconcile the objective classifications with "expert classifications" and to relate the coastal classes to the budgets. The workshops will be targeted at specific regions, but each will also have a classification theme to provide a conceptual as well as a geographic focus. The first of these workshops will be held in Brisbane, Australia, in January 2001. This workshop will be the regional synthesis for the Asia/Australasia region, and the classification theme will be Hydrologic Variability (Effects of episodic water discharge). This region is appropriate for the first synthesis workshop, because three budgeting workshops have been held there (two with UNEP GEF funding) and almost half of the available biogeochemical budgets are from this region.

Primary Goals:

To work with resource persons and researchers dealing with coastal fluxes and biogeochemistry in the general region of East Asia, South East Asia, South Asia and Australasia, in order to relate C-N-P biogeochemical budgetary information to coastal system classifications that will be developed by cluster analysis of suites of environmental and human-dimension variables

The workshop provides the opportunity to test and develop coastal and budget classification techniques for the region and selected sub-regions, and to apply these to a regional synthesis of biogeochemical fluxes and budgets as well as to the initial steps of a global synthesis.

Anticipated Products:

1. The following tests of coastal and budget classification schemes [Note: it is expected that much of this will be accomplished, posted electronically, and disseminated to participants during the 2-month pre-workshop period]:
 - a. Preliminary whole-region classifications based on physical environmental variables (list to be posted).
 - b. Exploratory tests of coastal classification by sub-region (e.g., tropical vs. temperate, rainfall/runoff or other classes).
 - c. Classification of budget types by selected key variables, and initial correlations with environmental variables.
 - d. Classification of coastal regions by human-dimension and related variables.

2. [Note: the following are the primary in-workshop and post-workshop goals] Classifications of the Asian/Australasian region and reconciliation of objective and expert classifications for the region, based on physical variables and the results of #1 above.
3. Trial extrapolations of classifications from this region to the remainder of the global coastal zone.
4. Overprinting of variations in socio-economic conditions onto these physically-based classifications.
5. Estimates of mean and variability of budget variables (water, salt, nutrients) within the coastal classes deemed most suitable for optimisation and extrapolation.
6. Prompt, updated electronic presentations (WWW and stand-alone files) of the typology/synthesis results and progress; further development of databases, procedures and tools on the basis of experience gained.
7. Printed reports and submissions to the scientific literature as appropriate.

Workplan:

Participants will be expected to come prepared to contribute actively to the classification and synthesis process. Preparation should include: reading, examination of the data, tools, and tutorials presented on the LOICZ Typology and Web- LOICZView web pages (see URLs, above), and completion (on- or off-line) of pre-workshop tests and exercises (see Item #1 under Anticipated Products). This pre-workshop activity should include electronic submission of preliminary results in agreed format so that these can be posted and made available as the resource base for the workshop

NOTE: This is the first in a series of workshops that will rely heavily on the use of on-line internet tools and data, and on prompt web-site posting and electronic dissemination of products and progress. Alternative distribution and access channels for those lacking ready WWW access will be provided, and it is anticipated that the workshops will be run via local networks on-site. Some of the procedures are necessarily experimental, and will be developed throughout the synthesis process.

Further Details:

LOICZ will arrange travel and make other workshop arrangements in consultation with the CRC Coasts. LOICZ will pay for all travel, accommodation and support costs for the participants.

Further details will be provided to participants during the lead-up to the workshop.

Draft Workshop Schedule:

Preworkshop:

ca. 11 Oct -- participants invited; schedule confirmed

Oct 16-18 -- Preparatory Typology Workshop for key resource people

ca. 1 Nov -- Final adjustments to database, interface, Web-LOICZView, and tutorial material made; participants given Web access.

ca. 15 Nov -- Suggested pre-workshop 'assignments' (based on interests and expertise) given to participants, to complete and bring to workshop. Ongoing discussions and outputs posted to WWW.

ca. 15 Dec -- Pre-conference summary, follow-ups, and final instructions/requests

Workshop:

January 13: Arrival; set up and test hardware and software

January 14: (am) General introduction to workshop schedule, plans and goals. Plenary review of pre-workshop tests and outcomes. Refinement of workshop strategy; development of teams and assignments.

(pm) Breakout work as decided - teams of participants and resource people address specific subsets of issues and techniques. Emphasis on classification and calibration.

January 15: Continue breakouts; midday plenary to evaluate progress, shift activity emphasis to budget extrapolation via typology.

- January 16: Breakouts/plenary as above - transition to developing synthesis.
 January 17: (am) Breakouts continue coordinated synthesis activities.
 (pm) Plenary synthesis overview and assembly; plan for follow-up and completion.
 January 18: Departure.

Postworkshop:

- ca. February 1 -- all electronic products edited, summarized/explained, and posted to website.
 Preparation of workshop report for LOICZ R&S series. Participants in Regional Workshop #2 invited; pre-workshop cycle begins.

Background Documents:

1. Gordon, D.C., P.R. Boudreau, K.H. Mann, J.-E. Ong, W. Silvert, S.V. Smith, G. Wattayakorn, F. Wulff, and T. Yanagi. 1996. LOICZ Biogeochemical Modelling Guidelines. *LOICZ Reports and Studies* 5, 96 pages.
2. All LOICZ R&S budget workshop reports from the region: The earlier workshops on Australasian systems (*LOICZ R&S* 12, 1999) and the South China Sea region (*LOICZ R&S* 14, 2000) are available in hard copy or electronically from the LOICZ web-site. Reports from South Asia and East Asia regions are in preparation and will be made available to participants before the workshop.
3. All LOICZ "typology" reports. These are in preparation and will be made available to all participants in the near future.
4. LOICZ Modelling web page, for everyone with www access: (<http://data.ecology.su.se/MNODE/>).
 - The web pages, including the guidelines, are frequently updated. *Recent additions to the site include several PowerPoint presentations designed to familiarize you further with the budgeting procedures and with an overview of the LOICZ budgeting efforts.*
 - If you do not have access to the World Wide Web but do have access to a computer with a CD-ROM, please let us know; we will send you a CD-ROM with the web page. Please do not request the CD-ROM at this time if you have access; you will be furnished one during the workshop.
 - CABARET (Computer Assisted Budget Analysis, Research, Education, and Training). *A version of this software and a PowerPoint demonstration of its use are now available on the web-site.*