

W6: Data management, delivery and visualization of high-volume data products

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Background: Long-term monitoring of multidisciplinary data in boundary currents is a high priority for PICES nations. Boundary currents are locations where many monitoring activities now take place. These regions are very important economically, and also highly variable in both space and time. Dense near real-time data from many disciplines are vital to describe the systems for timely management of coastal resources. Rapid analysis of the data is also essential. However, increased data rates and their diversity provide challenges for both data managers and data users. Cabled arrays and satellite altimeter, color and scatterometer (wind) measurements are examples of these new dense data sets. This workshop discussed the availability of such data and how we can effectively use them, focusing especially on availability, uses, GIS applications and other methods of display and analysis tools. The role of the North Pacific Metadata Base was also emphasized.

Summary of presentations and discussions:

Oral presentations in this workshop included 14 papers, plus summaries of 6 posters and e-posters. 2 additional posters were presented in the Thursday evening poster session.

Presentations covered a wide and overlapping range of topics, including:

- issues and promising new tools for data management and “data serving” (9 talks);
- goals and products of continental margin (9) and offshore (2) monitoring programs; and
- approaches to reaching and serving non-scientist ‘clients’ (7).

Invited speaker Lynn DeWitt noted that ocean science programs have traditionally provided more-or-less adequate funds and intellectual effort for the processes of data collection and in-house analysis, and are beginning to budget for web-based display of the analysis results (a form of advertisement of ‘what was done’). But there is still too little allocation for making source data accessible to future users. Provision for ‘data transport’ to users and into alternative input formats is a key step. Many commercial and open-source software tools are now becoming available to make this step easier.

Other speakers covered a broad range of input and output data products, from conventional (but greatly improved) temperature and salinity maps, to pin-pointing of economic opportunities (e.g. predicted distributions of fish) and hazards (e.g. predicted distributions of algal toxins or hypoxia).

After the presentations, attendees (~40) discussed future directions in terms of both accomplishments/opportunities (good news) and impediments/obstacles (bad news). A brief (and somewhat subjective) summary follows:

Highpoints:

- Lots of progress toward inter-operable formats & software for data access & visualization
- Improving profile and tools for ‘data transport’

- Wide range of new sensors & platforms (especially for biology & chemistry). But many are still prototypes under development
- Strong commitment by PICES nations to “ocean monitoring”, especially of ocean margins. Creates opportunity to integrate these observations across jurisdictional borders. (Can we come up with a basin-scale array for climate/ocean/ecosystem interactions in the N Pacific?)
- Consistent global physical context provided by ARGO and WMO
- More ‘data owners’ are becoming willing to contribute, and more clients want to use data [raw] or data products [processed toward ‘information’].
- Growing list of socioeconomic applications: HAB, hypoxia, fish distribution
- Could produce tools for ‘conservation’ as well as for ‘exploitation’ and ‘adaptation’
- Still need progress toward ways to integrate across data and meta-data types.

Issues & Obstacles:

- Dissimilarity of clients & variables/sampling designs among ‘regional’ Ocean Observing System modules (as yet, no set of standard ingredients). This disparity is in part driven by region-to-region differences in client profiles
- Possibly large changes over time of remote sensing & in situ observation and archival systems (removals, not just additions)?
- Data archives serve multiple functions: complete and safe archival, quality assessment and control, and accessibility/transparency. These are all important but can be in competition when resources are scarce.
- Parallel development of “toolkits” (OBIS, GLOBUS). Are they interoperable?
- Long term preservation of information is a concern. (e.g. media obsolescence). Can we avoid ‘obsolete’ or ‘unsupported orphan’ archives? Also an obsolescence issue for interpreted results (e.g. the disappearance of print journals)
- Some archives have ‘mandatory formats’; others offer ‘translation services’. Too many and too strict mandatory formats may discourage participation?
- As real-time information becomes more available and useful, they also become more valuable and ‘sensitive’. Will economic (individual or collective), political, or security interests begin to block data sharing?
- Increased dependence on high-bandwidth exchanges. Is this risky, given that some clients will continue to use low-bandwidth connections?