Soundings

Web 2.0 technologies have helped globalize the economy and change social interactions, but their full impact on environmental science has yet to be realized. In our essay in this issue, my colleagues and I provide a glimpse of the future. With any luck, the future is right around the corner, but it will still be an uphill climb to get there.

In 2002, I gave testimony advocating for creation of an Integrated Ocean Observing System (IOOS) to the US Commission on Ocean Policy. In the subsequent six years, I've been called into numerous Congressional offices and the President's Office of Management and Budget to help justify IOOS. Recently, despite over 1.5 million page views/year on GoMOOS.org, I watched myself on television news talking about how budget cutbacks will eliminate half the Gulf of Maine Ocean Observing System (GoMOOS) buoy array this year. We are rethinking our federal funding strategy and diversifying our business plan in response to recent budget decisions. Our cutbacks reflect trickle down from bigger problems facing many other national science programs. These problems cannot be solved by any one entity.

While the response to Ocean Commission has been meager, national leadership understands the real problem:

> *"…observing and information systems reside in dozens of federal and state agencies, universities and private industries and are tailored to the individual missions of those who fund them. By continuing on this course of developing isolated, individual systems instead of an integrated system, the nation over the next 20 years could spend billions of additional dollars on ocean observations because of the multiplied costs of development, operations and maintenance."* [Interagency Working Group on Ocean Observations, 2007]

The solution seems simple: integrate first, augment second. We see this wisdom in the five-year strategic plan, which goes on to advocate for a Web 2.0 solution:

> *"Existing data provided by observing systems operated by federal and state agencies, academic institutions, and other local or regional entities will expand the geographic distribution and scope of data types offered through IOOS. The observations will be most useful and timely, and serve the broadest number of users when they are combined and conveyed in an integrated and standardized manner to ensure maximum interoperability."*

Clearly, the solution is a distributed "system of systems" – the Web 2.0 version of an observing system, where the entire community participates in evolving the network. Six years later the concept is no longer new, but it is still timely. Our revised strategy includes the Web 2.0 technical capabilities enabled by standards organizations such as the Open Geospatial Consortium (OGC). I'm thrilled that Mark Reichardt, President and CEO of OGC, has agreed to serve on the Board at GoMOOS. But the biggest challenges are not technical, or we'd be there by now. The metaphor of an eight-person racing shell – the kind I had the privilege to row in college – seems apt. The fastest boat rows in sync, and there's unspoken magic when everyone works together. But when one person tries to go it on their own, even if they're twice as strong as everyone else in the boat, the effect on the boat is like someone throwing out the anchor. The environmental Web 2.0 will arrive when we all agree to work together to make it happen.

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