



Demo 4: Regional Workbench Consortium, Overview



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Project Profile on the RWBC Web Site:

http://regionalworkbench.org/databank/project_all.php?pid=9

Message Board Link on the RWBC Web Site:

<http://regionalworkbench.org/comm/forums.php>

Abstract

The RWBC is a collaborative network of university and community-based partners dedicated to enabling sustainable city-region development. We are building a trusted Internet-based workbench to facilitate research, outreach and education that require region wide data integration and information sharing. Our partnership-driven approach integrates issues of equity, environmental stewardship, and economic efficiency. This demo provides an overview of the RWBC's mission, projects, partners and precepts. We will include a tour of the RWBC's Web site, including the tools, data base structure, and multimedia communications components.

Summary

The purpose of Demo 4 was to give an overarching framework of why the Regional Workbench Consortium was created and how it is forming regional partnerships to address the many issues we face in the San Diego / Tijuana Cross-Border City Region.

Demo 4 began with an overview of scholarly literature the lies at the foundation of the RWBC's conceptual architecture. This includes works in Sustainability Science, New Regionalism, Information/Communication/Visualization Technologies (including integrated planning and decision support systems), and Ethics. Using a model of the RWBC logo, Keith Pezzoli described the 3 E's of sustainability and ICT components of the RWBC and which sets of literature apply.

Jason Wiskerchen and Cindy Santini gave three different user case scenarios for how the RWBC site can be used and what information and services are available. They first described what sections of the site are accessible to a general user who has not registered with the site. These sections include:

- About
 - Mission
 - Partners and Participants
 - Contacts

- Project Summaries and Project Pages
- View Event and Calendar pages
- Tools and Applications Pages
- View the Message Board and Video Comm Center
- All Educational Sections (Narratives, Student Research, etc..)

Jason and Cindy also showed participants how to register and create a "my RWBC account" which gives a user the ability to post events to the Calendar and use Message Board systems.

Lastly, Demo 4 demonstrated how a user with proper permissions can upload new projects and information to the RWBC Database for display in the Projects section of the site. This is a three step process of providing project descriptions, data and file uploads, and linkages to references and other online resources.

A period of time was available at the end of each presentation of the demo for questions and comments on the site, it's capabilities, and the overall organizational structure of the RWBC.

RWBC Information Access through the Geological Data Center



The Geological Data Center (GDC; <http://GDC.ucsd.edu>) holds the discoveries of the expeditions of the Scripps Institution of Oceanography, including 822 cruises over the last 50 years. As a work in progress, data, images and documents are currently being made available online through a fully searchable digital library, <http://SIOExplorer.ucsd.edu>, a collection in the NSF-funded National Science Digital Library (www.nsdlib.org).

The GDC collaborates with the Regional Workbench Consortium (RWBC; <http://regionalworkbench.org>) in three basic areas: data, technology and networking. Many GIS projects stop at the shoreline. The transport of toxic substances does not, and the study of watershed ecology and coastal processes requires a comprehensive integration of terrestrial and marine data.

In terms of data, perhaps the greatest interest for the RWBC is the multibeam seafloor swath mapping data from more than 85 SIO cruise tracks which pass through the San Diego or Tijuana border region. These data are used to create high resolution maps of the sea floor for the research community. Unlike terrestrial mapping where complete spatial coverage is achieved by using optical sensors, ocean seafloor mapping data is mainly collected by sonar systems. Modern multibeam systems map a swath of width up to 3-4 times the water depth, in contrast to the pre-1982 era single-channel echosounders which only yield a single profile under the vessel. An example of a multibeam survey is shown in Figure 1.

Even with the revolution in seafloor mapping brought on by innovations in multibeam sonar systems, coverage is incomplete and modern swath data must be merged with earlier conventional profile data and with prior gridded datasets. Due to navigation and sound velocity correction and other errors, a significant amount of effort must be invested in de-conflicting the various datasets. Figure 2 is an example of a map created from a combination of conventional NOAA ship tracks and surveys, CICESE bathymetric grids, digitized contour maps, and SIO multibeam data. This dataset spans more than two degrees (220 km). The integration of each dataset was screened before it was included in the current model.

As time goes on and new data are acquired, the model needs to evolve. Data from offshore La Jolla are shown in Figure 3, taken during the November 2002 Centennial Expedition Leg 1 with

R/V Roger Revelle. Visually we can compare the new data to the existing grid, identify issues such as sound velocity ray-tracing artifacts, make corrections, and merge the new data with the prior grid.

In terms of technology, a system was devised to introduce new data sources in a controlled fashion. As in many fields, with seafloor mapping too many efforts end up as “make once use once” projects. The system is designed to be scalable and new sources are being considered. As new data are integrated into the system the grid resolution may increase overall. The suite of software tools includes a mix of public domain packages (GMT and MB-System) and commercial packages (ESRI for GIS and Fledermaus (www.ivs.unb.ca) for visualization).

In terms of “networking,” the extensive contacts of the GDC with academic, government and industry researchers over the years has proven to be a valuable resource, in terms of access to data, introduction of new sensor systems, and opportunities for collaborative efforts.

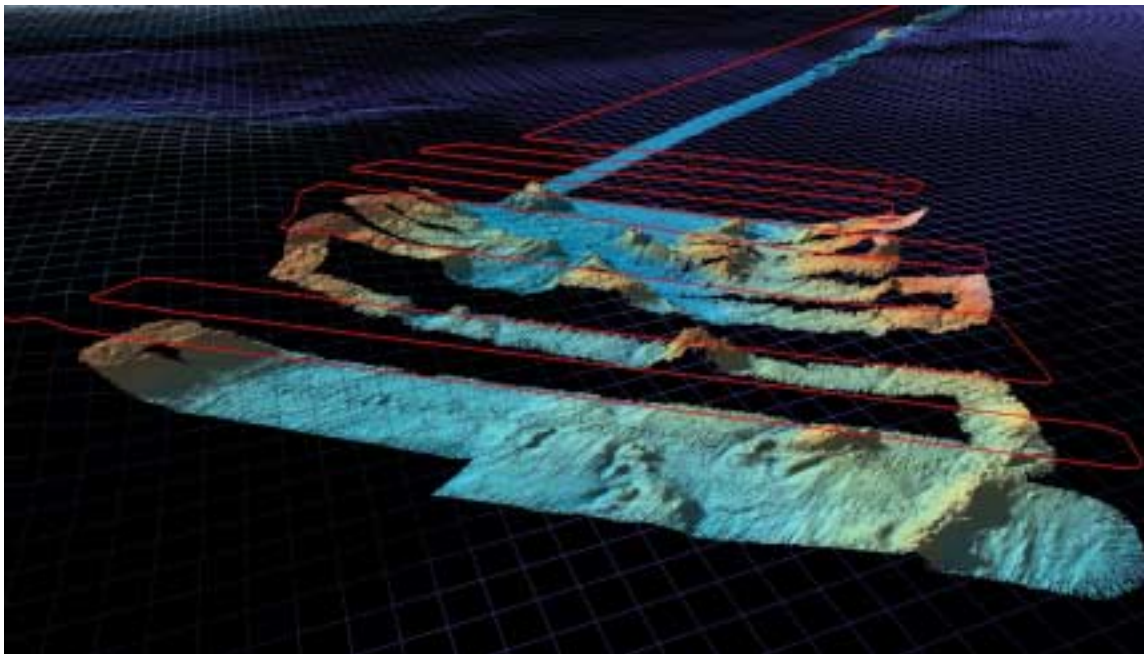


Figure 1. 3D view of a typical multibeam seafloor mapping survey. The ship track on the sea surface is shown in red.

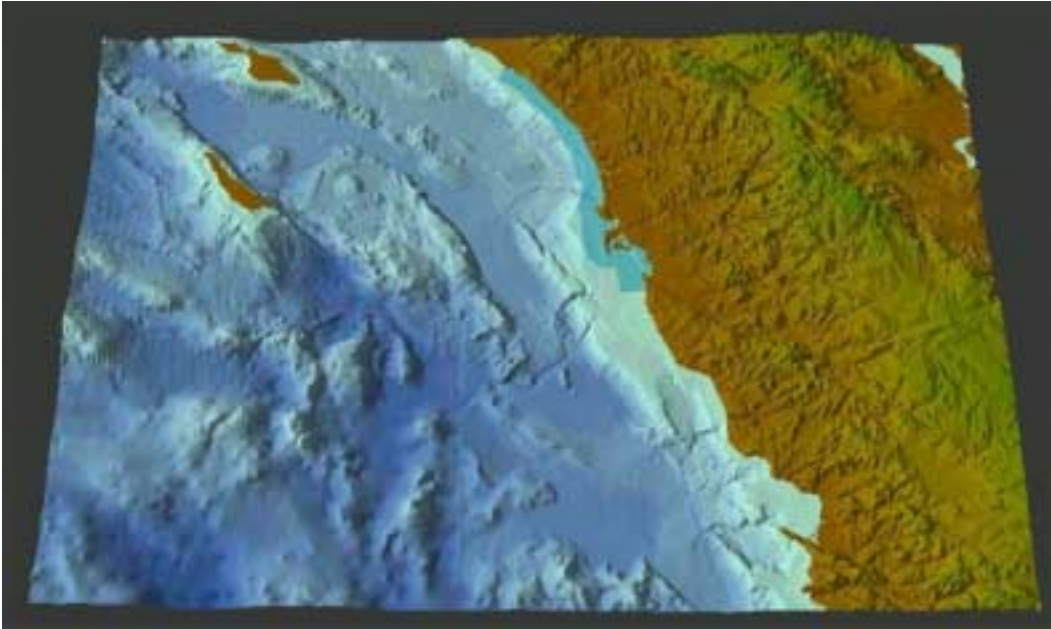


Figure 2. An example of a GDC combined data product, including contributions from multibeam sonar, conventional echosounders, prior grids, and hand-digitized contours, plus terrestrial DEM's. The technology to combine and de-conflict data sets is a work-in-progress.

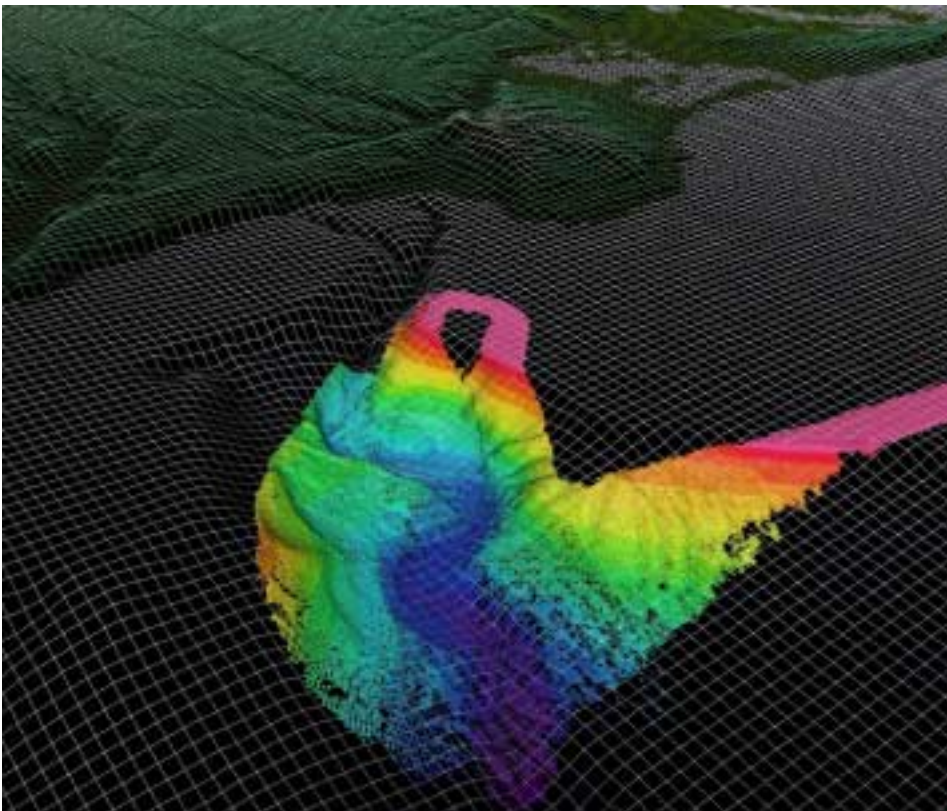


Figure 3. New data from the R/V Roger Revelle, November 2002, are overlain onto the existing grid model. After correction for sound velocity artifacts, the new data will be incorporated into the next version of the RWBC model. This view looks up Scripps Canyon into La Jolla.

The Center for U.S.-Mexican Studies



Since 1998 the Center for U.S.-Mexican Studies has been involved in research and policy analysis related to the border environment in this region. Through its Visiting Research Fellowship program the Center has been able to bring together leading U.S. and Mexican researchers and environmental professionals to advance our understanding of the complex dynamics of population growth, economic development, and environmental management. The Center's unique contribution has been to bring together, on a continual basis, environmental experts representing diverse disciplines in both the natural and social sciences, many of whom have also been actively engaged in environmental policymaking, and focus their energies on sets of issues over time.¹

The Center has been a pioneer in building an interdisciplinary research community representing the partners in NAFTA focused on the border environment. One of the Center's key collaborations within the region is the Regional Workbench Consortium. This year one of our environmental research fellows, Alejandro Hinojosa-Corona, professor at Ensenada's Centro de Investigación Científica de Educación Superior de Ensenada (CICESE) represented the Center's environmental program through his involvement in the RWBC. Professor Hinojosa-Corona brought to the project his extensive experience in the application of geographic information systems and remote sensing techniques to environmental research, spatial analysis and natural resources management, as well as access to his environmental network in Mexico. Interdisciplinary collaborative research is a common denominator in his recent work, which includes themes in hydrology, land cover change, and landslide risk assessment for the Tijuana region. The Center was pleased to collaborate in the Regional Workbench Rollout by providing our state-of-the-art facilities at the Copley International Conference Center and supporting Prof. Hinojosa-Corona's involvement in the RWBC mapping project throughout the year. It is the objective of the Center's environmental program to recruit and provide fellowships for Mexican researchers and environmental professionals who are collaborating with larger projects in the university, thereby enriching the binational nature of these endeavors.

¹ From 1997-2002, the Center's environmental project supported 30 research fellows and 10 non-stipend guest scholars. Fifteen of these individuals were younger scholars (Ph.D. candidates); 13 of them were from Mexican academic institutions