South Bay Coastal Ocean Observing System

California Clean Beaches Initiative

Fourth Quarter Report
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to
City of Imperial Beach

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Executive Summary

This quarterly reports reflects efforts conducted under a contract between Scripps Institution of Oceanography and the City of Imperial Beach under California's Clean Beaches Initiative for the period between April 1 2003 – June 30, 2003. Resources provided under this contract are to be used to establish a Coastal Observing System in the San Diego Southbay region to provide real-time time measurements of key oceanographic parameters that are relevant to understanding the complex coastal transport mechanisms present in this region and their relevance to local water quality issues.

Efforts conducted during this time period are as follows:

- Completed the design, fabrication, and installation of the nearshore current monitoring system. This system measures surface and subsurface currents from a tripod mounted to the seafloor approximately 200 feet offshore the Imperial Beach Pier. A power and data cable is routed to the system to allow real-time acquisition of the data.
- Maintenance and improvements of the 3 CODAR systems that were installed earlier for SDCOOS. This effort has included the installation of software upgrades and data archiving.
- The design of the nearshore water quality sampling station which allow real-time measurements of ocean water temperature, water salinity, and turbidity was completed. The sensors have been ordered from the appropriate vendors and an appropriate underwater cable has been identified.
- Design, fabrication, and installation of an ocean buoy located near the South Bay Ocean Outfall. The buoy presently has a vertical array of temperature sensors to allow the measurement of water column stratification in the region. The buoy was designed to have the capacity to support a vertical profiling current meter should subsurface currents be of interest in the outfall region at a later date.
- Integration of County of San Diego Department of Environmental Health monitoring data into the SDCOOS web site. Web pages have been developed which allow the viewing of recent monitoring results in a GIS format.
- Continued development and expansion of the SDCOOS web site (http://www.sdcoos.ucsd.edu) to include project descriptions and access to real-time data.
- Continued development and expansion of the SDCOOS web site (http://www.sdcoos.ucsd.edu) to include a historical data archive which allows end-user to data products generated.
- QA/QC efforts have been conducted on the broad sensor suite which comprise SDCOOS. This includes the meteorological stations, ocean current meters, CODAR array.

Project Timeline – Schedule update

TASK ITEM	Schedule completion date based on a July 1, 2002 start
1.1. *Coastal Ocean Dynamics Application Radar*	
1.1.1 – 1.1.3 site planning, array design, order system	September 15, 2002 (2.5 months)
1.1.4 – 1.1.6 system installation	January 31, 2002 (6.5 months)
1.1.5 – 1.1.8 system calibrations and optimization	September 15, 2003 (14.5 months)
1.1.9 data integration	continuous effort through June 30, 2004 (24 months)
1.2. *Nearshore Currents and Water Type Sampling*	
1.2.1 – 1.2.2 system fabrication, site planning	December 15, 2002 (5.5 months)
1.2.3 – 1.2.4 system installation	January 15, 2003 (6.5 months)
1.2.5 – 1.2.6 data integration	continuous effort through June 30, 2004 (24 months)
1.3. *Surf-zone Currents and Water Quality Sampling System*	
1.3.1 fabricate system	December 15, 2002 (5.5 months)
1.3.2 install system	January 15, 2002 (6.5 months)
1.3.3 install data cable / logging computers	January 15, 2002 (6.5 months)
1.3.4 data integration	continuous effort through June 30, 2004 (24 months)
1.4. *Water Column Stratification Measurement System*	
1.4.1 – 1.4.2 system fabrication and installation	January 1, 2002 (6 months)
1.4.3 data integration	continuous effort through June 30, 2004 (24 months)
1.5. *Central Data Acquisition and Real-Time Data Distribution System*	
1.5.1 – 1.5.3 database development, data merger, online access tool development	continuous effort through June 30, 2004 (24 months)
1.6. *Data Integration and Interpretation*	continuous effort through June 30, 2004 (24 months)
1.7. *Reporting*	
1.7.1-1.7.3 progress reports of activities, milestones, data summaries, and interpretation efforts	continuous effort through June 30, 2004 (24 months)

Activities undertaken for the above timeline during the time period of this report:

Tasks 1.1 – Coastal Ocean Dynamics Application Radar

All CODAR sites have been installed and are currently operating. Real-time data is streamed to the http:www.sdcoos.ucsd.edu web site. Routine maintenance including software upgrades and data archiving is conducted at each site on an as needed basis.

Task 1.2 Nearshore Currents and Water Type Sampling System

This system was deployed offshore approximately 200' offshore the Imperial Beach Pier. Delays in deploying the instrument resulted from significant marine growth that was present on the pier pilings. A cable conduit was installed on an offshore piling using stainless steel clamps to allow a power and data cable to be run to the current measurement system. The system has been running unattended except for periodic human resets to the system as a result of intermittent power failures at the City's pier. Software is currently being developed to allow the real-time display of the wave and current information on the SDCOOS web site.

Task 1.3 Surf-zone Currents and Water Quality Sampling System

Data from the current meter continues to be evaluated for QA/QC purposes. Additional sensors for surf-zone water quality have been received and are currently being fabricated into system which will be deployed in the near-future once an underwater cable becomes available. Software is currently being developed to allow the real-time display of the wave and current information on the SDCOOS web site. All data since installation has been archived.

Task 1.4 Water Column Stratification Measurement System

This system was deployed near the wye of the South Bay Ocean Outfall. Data has been offloaded and is currently being QA/QC. Software development is underway to display this data in realtime on the SDCOOS web site.

Task 1.5 Central Data Acquisition and Real-Time Data Distribution System

Developments and advances in the SDCOOS real-time data distribution system continue. A data archival system is now in place which allows users to access historical data from the system including hourly and daily averaged ocean current maps, satellite imagery, weather data, and water quality data.

Figure 1. Pictures of the underwater tripod which supports the Acoustic Doppler Current Profiler (ADCP). The ADCP (the instrument in the center of the tripod) allows vertical profiles of the subsurface currents to be measured continuously from the end of the Imperial Beach Pier. The white pressure case on the side of the tripod is for connecting the underwater cable to the system.

Figure 2. A bosuns chair was used to lower personnel to the waterline at low tide to clean growth off an offshore piling. A conduit for the underwater cable was attached to the clean piling using stainless steel clamps.

Figure 3. The meteorological station which measures wind speed/direction, solar radiation, air temperature, relative humidity, and rainfall. Data from the system is available at www.sdcoos.ucsd.edu. We anticipate that having local rainfall data will be critical to understanding the influence of local runoff on beach water quality during this upcoming winter. The system was deployed using resources from the National Science Foundation.

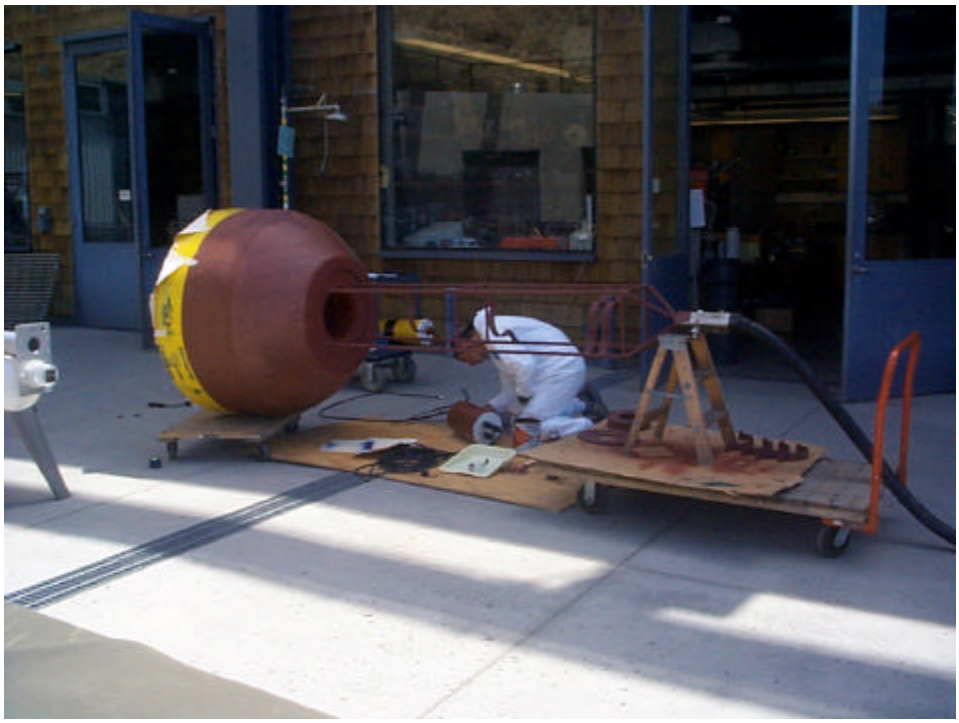

Figure 4. The water column stratification buoy being prepared at the SDCOOS operational facilities. This system is designed to measure temperature at a number of different depths spanning the entire water column at the site of the South Bay Ocean Outfall. An interim system (non-realtime) has been deployed at the wye of the outfall.

Figure 5. Regular, routine maintenance is performed at each of the CODAR land sites. Shown here is staff member Axel Pierson at the Point Loma CODAR site located on U.S. Navy property.

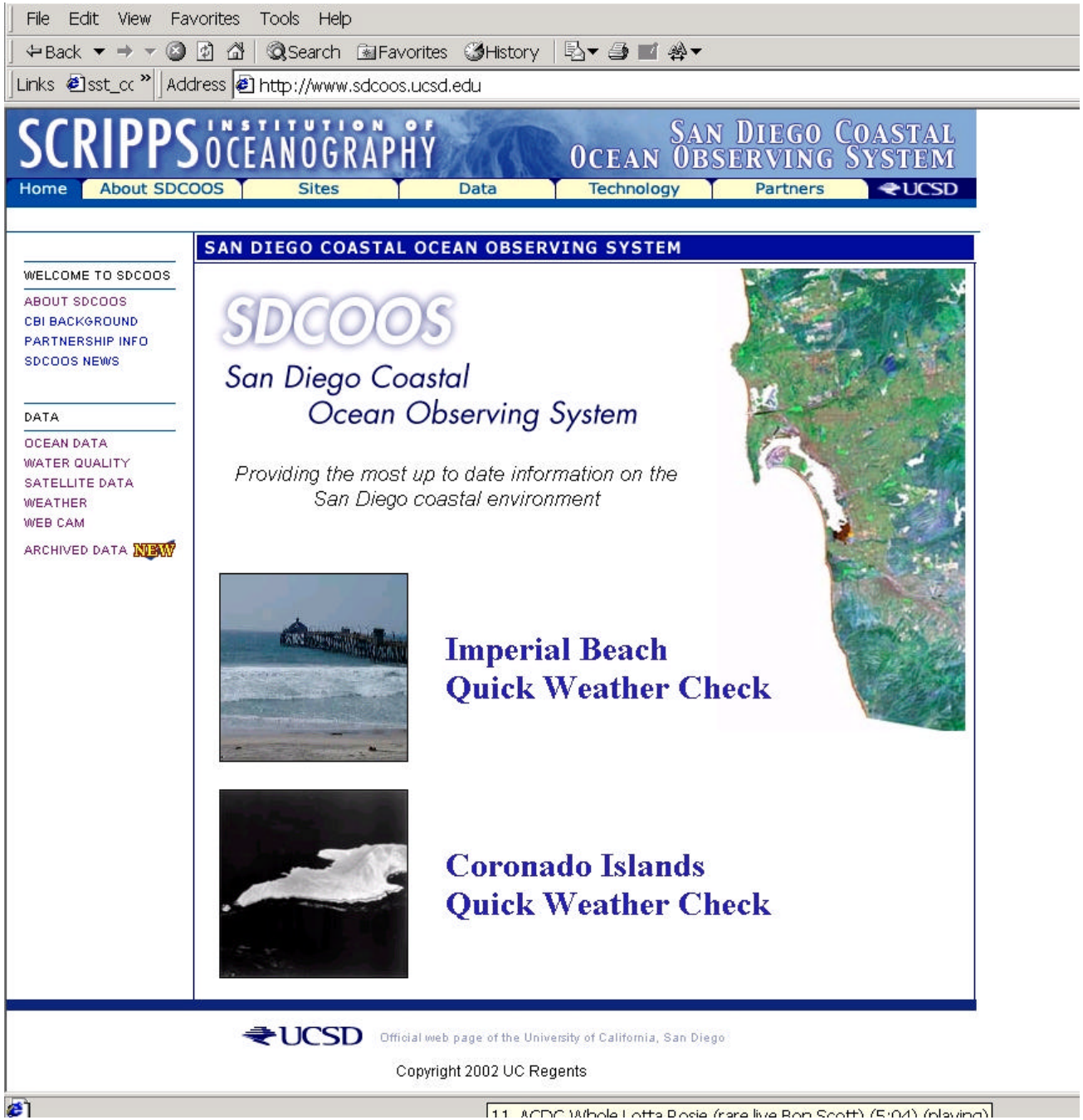

Figure 6. The home page for SDCOOS. The user is allowed to navigate through various realtime and historical data products including transport measurements, water quality, weather data, and satellite imagery.

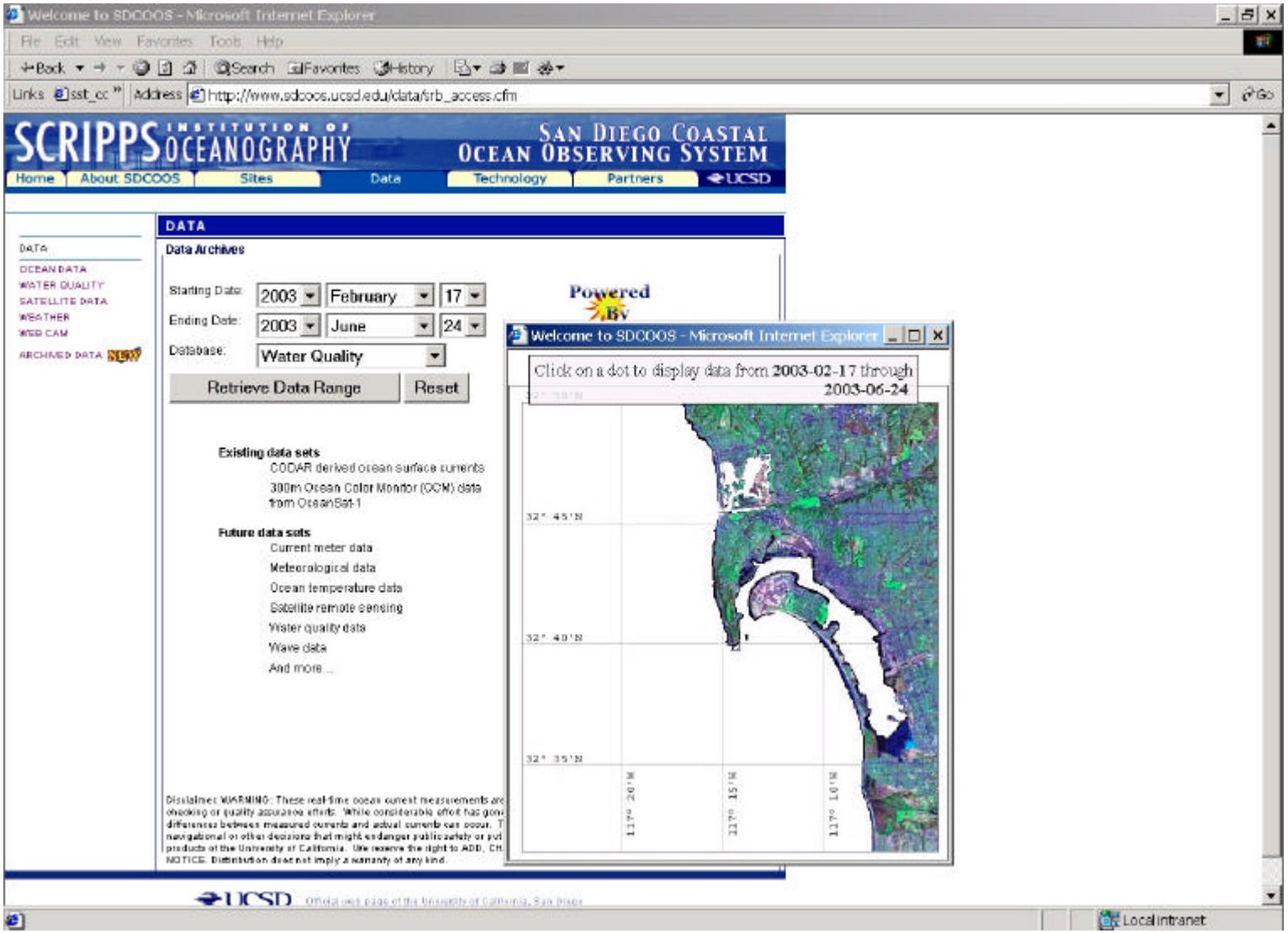

Figure 7. Users can interface to an online database of up-to-date and historical water quality data from the San Diego Department of Environmental Health. Access to the data is provided via a GIS style point and click map of the region. Further efforts will incorporate data sets from the Scripps adaptive sampling efforts sponsored by the County, and water quality data from the City of San Diego,