NOAA Office of Response & Restoration

Watershed Database and Mapping Project for Southern California

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Abstract

For the past several years, NOAA's Office of Response and Restoration (OR&R) has produced integrated Watershed Database and Mapping Projects for coastal watershed areas that have been impacted by the release of toxic chemicals from hazardous waste sites and nonpoint sources. As part of NOAA's Coastal Storms Program, OR&R is developing a Watershed Project focusing on the potential impacts of coastal storms on surface runoff, water quality, and the health of native fish and other at-risk species in the Southern California Bight. The project combines regional contaminant data along with relevant geospatial data to assist in establishing management priorities and help determine the best methods and locations for site cleanups and habitat restoration projects. Sediment chemistry, tissue chemistry, and benthic toxicity data from Point Conception south to the Tijuana Estuary have been incorporated into NOAA's Query Manager application.

Query Manager is a freely downloadable relational database and query engine that allows users to query contaminant and toxicity studies for a site-specific or watershed-wide area. Where appropriate, sediment guidelines have been incorporated into Query Manager to provide comparison of sediment concentrations with potential guidelines and to facilitate assessment of ecological risk to NOAA trust resources present in the region. Users can import these regional data into ArcGIS to view the contaminant data in context of a wide variety of geographic information compiled for the Watershed Project, such as regulated facilities, roadways, terrain, land use, hydrology, habitat, and species distribution. This Watershed Database and Mapping Project also includes an Internet-based interactive mapping website and a comprehensive Watershed Webguide that provides background information on the project's history and objectives, user guides for all applications and tools, available metadata, and related websites.

Footprint covering the contaminant datasets within the Southern California Watershed Project

NOAA's Coastal Storms Ecological Assessment Team

The Coastal Storms Program (CSP) is a nationwide effort, led by the National Oceanic and Atmospheric Administration (NOAA), to reduce the adverse impacts of storms on life, property, the economy, and environmental health in our nation's coastal areas. To accomplish this goal, NOAA is working with coastal communities to provide them with the information they need to plan for storm related damages. CSP is initially focusing on smaller pilot areas, including the Southern California Bight, but also is developing a national strategy.

One way to help improve the health of humans, as well as fish, and other natural resources is to clarify the paths that toxic chemicals travel through coastal ecosystems. One piece of the puzzle is the role that coastal storms play in mobilizing contaminants into rivers, estuaries, and nearshore ecosystems. To help answer this question, scientists from the CSP Ecological Assessment Team are evaluating the mobilization of contaminants by coastal storms, as well as the impacts on Southern California steelhead and other at-risk fish species. The goal of the project is to provide new information and tools that resource managers can use to mitigate the effects of nonpoint source stormwater pollution. One tool being developed for resource managers is the Southern California Watershed Database and Mapping Project; the three major components are described below.

Photo by J. Cubit, NOAA

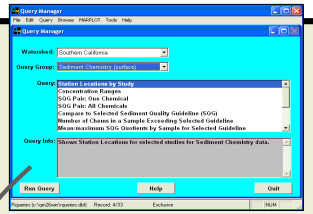
Watershed Project Components

Query Manager

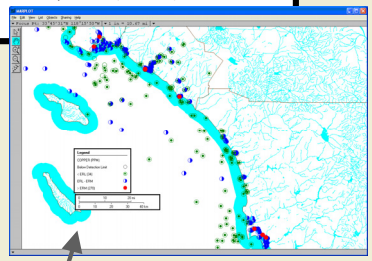
Query Manager is a relational database application and query engine that allows users to examine contaminant datasets. The updated dataset includes sediment chemistry (surface and subsurface), tissue chemistry and surface sediment bioassay test results for the Southern California watershed. The studies compiled in these databases contain information from federal, regional, state, city, and local sources. Both the Query Manager application and Southern California datasets are available for free download from the NOAA Office of Response and Restoration website:

http://response.restoration.noaa.gov/watersheddownloads

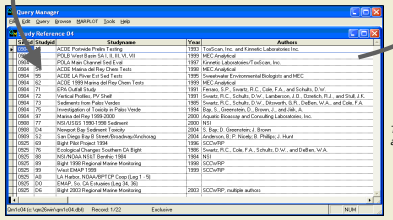
The regional database contains information about the included studies, such as treatment and summary of contaminant data, data sources, and author information. Users are able to query the contaminant and toxicity studies of site specific and watershed-wide areas to produce data tables of interest. This query tool also integrates several common Sediment Quality Guidelines, which can be used as toxicological benchmarks to screen for potential ecological risks due to contaminated sediment exposure. Query Manager also can be used to select and then export data to any program that supports standard spreadsheet, database, or tab-delimited text files or GIS.



Query Manager allows you to select from a variety of queries and studies to produce your results.



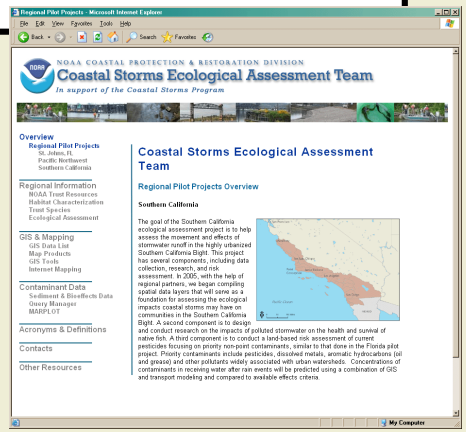
The query results are output in a table format, which can be easily displayed in Query Manager's mapping software, MARPLOT.



This table shows a subset of the 112 datasets available in Query Manager

Webguide

The Watershed Database and Mapping Project webguide takes the user through environmental and technological aspects of the Southern California project. Topics covered by the watershed webguide include background information on NOAA's Coastal Storms Program and contaminant profiles for chemicals often associated with storm water runoff such as pesticides, dissolved metals, aromatic hydrocarbons (oil and grease) and other pollutants generally associated with highly urbanized watersheds. Additional information presented in the webguide includes life history data for key NOAA trust resource species, information on contaminant studies being conducted in the region, and detailed information on how to use the Query Manager database and Internet mapping site.

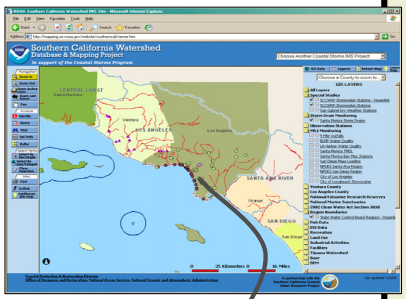


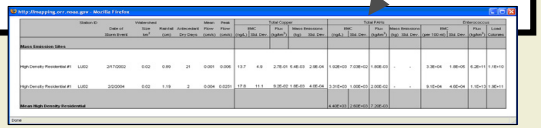
GIS Data & Internet mapping Sites

OR&R is currently developing an Internet mapping site (IMS), which will enable users to map, query, analyze, download regional contaminant data, and view thematic GIS layers within a standard Internet browser that requires no specialized software. The site covers the Southern California Bight and portions of central California and Tijuana where contaminant datasets are readily available.

The Ecological Assessment Team will continue to add new data layers and contaminant data from Query Manager to the Watershed Project as it becomes available. Currently the Watershed Project IMS site contains numerous types of data, including but not limited to:

- Sediment and tissue chemistry data from numerous studies and sources (including Regional Quality Control Boards, Southern California Coastal Water Research Project, Environmental Monitoring and Assessment Program, and the National Sediment Inventory)
- Sediment bioassay study results
- Water Quality Monitoring Stations
- Land use
- NOAA Environmental Sensitivity Index maps
- Hydrography
- Habitat and species data





Southern California Water Resources Research Project (SCCWRP) water quality monitoring station data

For more information please visit:

- OR&R's Coastal Storms Project: http://mapping.orr.noaa.gov/website/coastalstorms/index.html
- NOAA's Coastal Storm Program: http://www.csc.noaa.gov/csp/

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