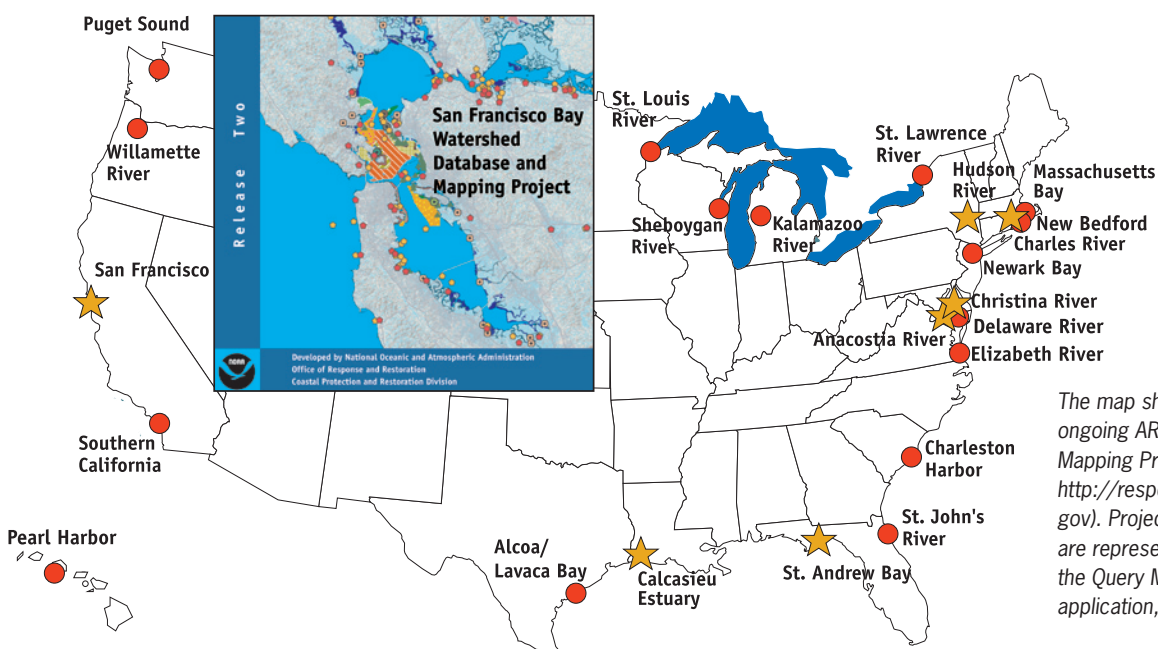# OR&R

Watershed Database and Mapping Projects Decision Support Tools

Protecting and restoring coastal watersheds involves understanding an array of complex environmental issues and the synthesis of various types of information. Evaluating hazardous waste site remediation, dredging and disposal of contaminated sediments, and restoring injured habitats are just a few of the challenges facing coastal managers. The challenge of evaluating multiple environmental issues is made easier by combining scientific data and watershed characteristics into a Geographic Information System (GIS). NOAA's Assessment and Restoration Division (ARD) has developed decision-support tools for specific watersheds that combine the use of a standard database structure, database-mapping application (Query Manager™/ MARPLOT®) and an ArcView® GIS project (i.e., Watershed Database and Mapping

Projects). Sediment and tissue contaminant concentrations, toxicity data, natural resource information, and potential habitat restoration projects can be overlaid on a watershed's features and land uses, and then displayed on maps at flexible spatial scales. This approach simplifies data analysis and presentation, provides valuable tools for complex decision-making, and improves our understanding of dynamic aquatic ecosystems.

NOAA has used this approach in several watersheds throughout coastal regions such as St. Lawrence River, Newark Bay, Anacostia River, Charleston Harbor, Sheboygan River, Calcasieu Estuary, San Francisco Bay, Puget Sound, and others affected by contaminant releases from Superfund sites and additional sources. ARD watershed projects use a standard database structure along with information tailored to the major objectives of each watershed. For example, the Newark Bay and Calcasieu Estuary Watershed Projects support decisions about risk assessment, remediation and disposal of contaminated sediment, while the San Francisco Bay and Puget Sound Watershed Projects focus on Superfund site remediation and habitat restoration. All of the watershed projects provide an integrated assessment tool

The map shows the locations of the 23 ongoing ARD Watershed Database and Mapping Projects (available on our website: http://response.restoration.noaa.gov). Projects available via CD-ROM are represented by ⭐s (these include the Query Manager database, mapping application, and an Arcview GIS project).

to a wide range of coastal resource managers and communities, thereby enabling improved evaluation and problem-solving for a broad spectrum of coastal issues. The common organizational structure for data and spatial information promotes data sharing among Federal, state, local agencies and communities working within a watershed.

NOAA's watershed approach provides a rapid, convenient method to create maps that display analyzed, sorted, and summarized data needed by coastal managers. Base maps display geomorphology, habitat characteristics, and land-use information relevant to the watershed. Query Manager allows sediment and tissue chemistry and sediment toxicity data to be evaluated through a menu of programmed queries. Integrating remedial investigation data with recently acquired site data into a single system helps investigators associate the distribution of contaminants with specific sources and evaluate the possibility of contaminant effects in potential habitat restoration areas. Additionally, combining natural resource information and contaminant distributions across a watershed enhances the potential for successful restoration of wide-ranging populations.

The watershed projects benefit a variety of user groups and have enhanced cooperation and data sharing. The database mapping system allows users to:

· Evaluate multiple data sets within a geographic area;
· Identify chemical concentration and toxicity gradients;
· Prioritize problem areas based on sediment chemistry, sediment toxicity, and/or tissue chemistry;
· Catalog and evaluate potential habitats for restoration;
· Inventory planned, ongoing and completed restoration projects;
· Identify important data gaps; and
· Add and share new information.

The watershed projects run on standard desktop Microsoft Windows®-based personal computers. The database and mapping application, Query Manager, is an easy-to-use, interactive system that allows users to query the database and rapidly display the results on a map in MARPLOT or export the data to any program that supports standard spreadsheet, database, or tab-delimited text files. Custom tools developed by ARD facilitate the seamless import of data from Query Manager into an ArcView GIS project to simplify and enhance further data analysis and presentation. The Query Manager/MARPLOT applications, watershed databases and MARPLOT base maps, and GIS tools are available for download on the ARD website. Many of our watershed projects, which include both standard layers (e.g., wetlands, Superfund sites, and other regulated industrial facilities) and customized basemaps and other relevant spatial data layers, are available for public distribution on CD-ROM (requires ArcView software application) or via our website through an ArcView internet mapping server (ARC IMS). By using various distribution methods our watershed projects provide valuable tools and information to a broad spectrum of users ranging from school children and civic groups to academic and governmental communities.

ARD's watershed projects are proving useful throughout the Superfund remedial decision-making process, from identifying locations for the collection of additional samples to providing the historical context for interpreting data, to identifying areas for restoration. This versatile tool not only improves NOAA's ability to protect and restore the biodiversity of watersheds that contribute to healthy coastal habitats, but has the potential to help address other important environmental issues.

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NOAA's Office of Response & Restoration—Protecting our Coastal Environment

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