

TIJUANA RIVER WATERSHED NATIONAL SPATIAL DATA INFRASTRUCTURE COMMUNITY DEMONSTRATION PROJECT

WHERE IS THE TIJUANA RIVER WATERSHED AND WHY IS IT AN NSDI SITE?



The Tijuana River Watershed (TRW) spans 1,750 square miles astride the California-Baja California border between the United States and Mexico, with one third of the watershed in the United States and two thirds in Mexico. The northern section in the United States drains into Mexico and merges with a network of tributaries, which form the Tijuana River just outside the City of Tijuana. Flowing through the Tijuana River Valley, the river drains northward again into the United States where it flows through the Tijuana estuary on its way to the Pacific Ocean. The Tijuana Estuary is one of the largest functioning wetlands remaining in Southern California and is protected as a U.S. National Wildlife Refuge, a National Estuarine Research Reserve (NERR), and a California State Park.

The TRW is diverse geographically with a wide range of physical and cultural environments. It supports a population of about two million people and lies in the most populous section of the 2,000 miles U.S.-Mexico border region. The lower TRW is characterized by unconsolidated sediments, steep canyon slopes, a Mediterranean climate regime with intermittent stream systems. The international border's economic and social dynamics foster intense migration patterns into the TRW from the interior of Mexico. The intense population growth results in developmental stresses on the ecosystems in the TRW, water supplies, and urban infrastructure. These developmental stresses also increase hazards from floods and earthquakes as populations develop on unstable slopes.

The social and ecological risk from developmental pressures, and the lack of data to support proactive decision-making targeted at more sustainable development strategies provided the basis of initiating what is known as the TRW Project.

HOW WE APPROACHED THE PROJECT

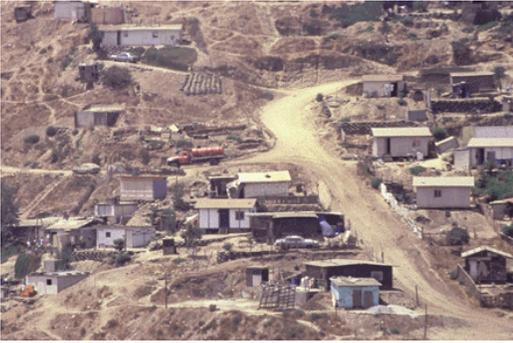
The TRW team solicited the support and ideas for the NSDI project goals from the members of the bi-national stakeholder community, many of whom were involved in the original TRW Project. The NSDI team facilitated a project identification workshop to assess regional priorities and the availability and quality of existing data. Using guidelines, specifying that the project must be geographically bi-national, address social and ecological concerns, and be doable by the identified NSDI project deadline, the 70 participants present at the workshop identified the NSDI project as **a risk assessment to identify vulnerable human and ecological communities in the TRW associated with 25, 50, 100, and 500 year flood events. The risk assessment focused on the watershed, sub-basin, and canyon levels of detail.**



A team of graduate students from both San Diego State University (SDSU) and El Colegio De La Frontera Norte (COLEF, a think tank in Tijuana) conducted an extensive literature review and met with hydrologists and flood forecasters from both the public and private sectors to develop a methodology appropriate for the TRW and available data. NOAA supported the project by producing aerial photographs of the study area at a low altitude to develop a high resolution digital elevation model (DEM) capable of conducting a risk assessment at the canyon scale. The Environmental Systems Research Institute (ESRI) and L.H. Systems donated hardware and software that enabled the team to develop the DEM. SUN Microsystems, Inc. donated hardware to COLEF. The study indicated which communities, economic sectors, facilities, infrastructure were at risk for floods of varying intensities.

WHAT ARE THE RESULTS/OUTCOMES OF THE PROJECT?

There were a number of outcomes relating to improved human and technological capacity as well as the risk assessment. The outcomes include:



- An updated GIS database for Goat Canyon/Canyon de Los Laureles and the Tijuana River Valley;
- Enhanced GIS capability at SDSU and COLEF through training and donations of hardware and GIS software;
- Identification of flood hazards and assessment of flood risk in the lower TRW;
- Improved binational coordination among government agencies, universities, and the private sector;
- Support of other projects in the study area; and,
- Signed Declaration of Intent to continue working binationally to develop a flood forecasting and warning system for the TRW.

WHO ARE THE PARTNERS IN THE TIJUANA RIVER WATERSHED?

Following are the partners who supported this project: National Oceanic and Atmospheric Administration (National Ocean Service and National Weather Service); San Diego State University; Tijuana River National Estuarine Research Reserve; El Colegio De La Frontera Norte; Environmental Systems Research Institute (ESRI); L.H. Systems; and, SUN Microsystems, Inc.

WHAT ARE THE FUTURE PLANS FOR THE TIJUANA RIVER WATERSHED PROJECT?

The TRW project has formed a technical committee pursuant to the Declaration of Intent to work towards developing a flood forecasting system for the region. The National Weather Service has purchased stream gages and rain gages for a pilot project to test the flood forecasting system. The technical committee is working on designing the system and its operational protocols, both of which do not exist for this binational region.