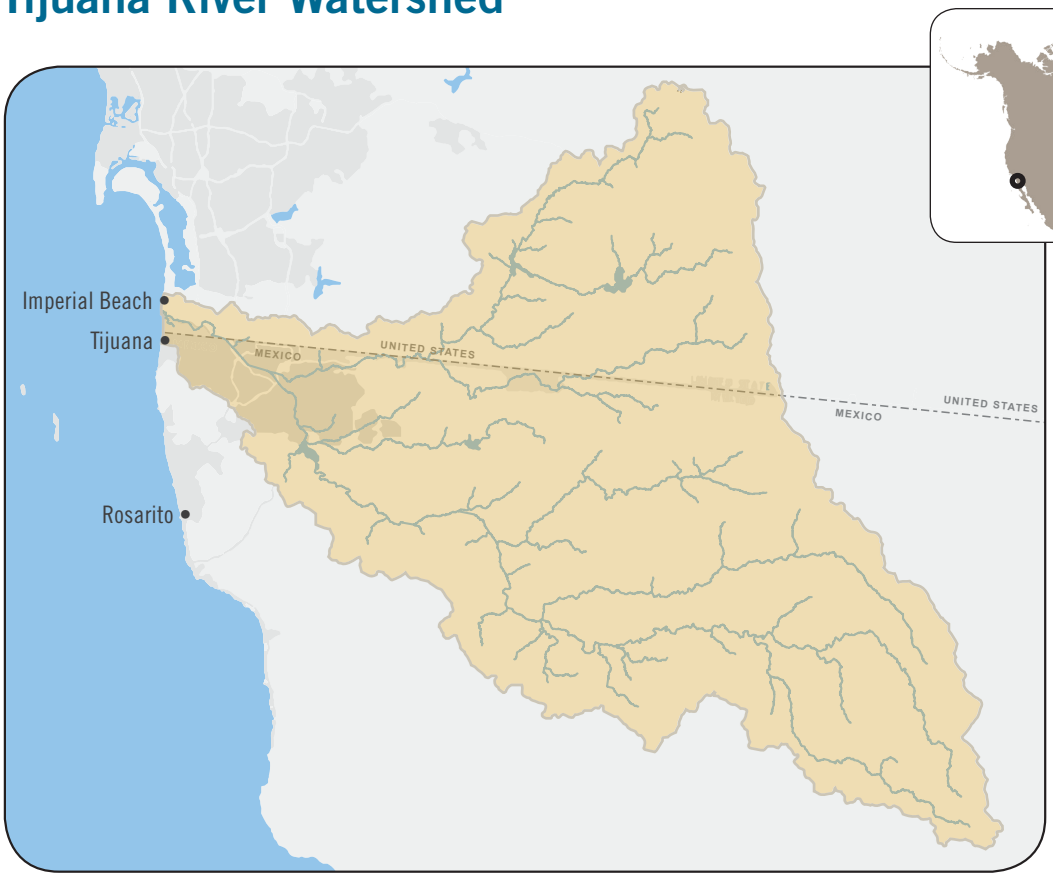
Building Community Solutions to
Marine Litter

Case Study
Tijuana River Watershed



Communities targeted by the project:

- Imperial Beach, California and Tijuana and Rosarito, Baja California
- 2.8 million people residing in the watershed

Marine litter and plastic are now found in every marine environment, from the polar regions to the deep ocean, and in all levels of marine life, from zooplankton to fish, seabirds, whales and even seafood. About 80% of all marine litter, most of which is single-use plastic, originates from land and enters the ocean through inadequate waste management, littering, or illegal dumping in communities located in coastal areas and inland watersheds. Litter can find its way to the ocean through various pathways, either directly from shorelines or indirectly via inland waterways. To put an end to marine litter, we need to engage locally with communities to reduce land-based litter and stop it from reaching waterways and the ocean.

Using a multi-stakeholder engagement process, stakeholders in the Tijuana River watershed designed and implemented local, low-cost and low-technology solutions to local marine litter. Tackling marine litter involves many levels of government and diverse stakeholders, and can be most effectively addressed through collaborative action, especially when doing so in a transboundary watershed like the Tijuana River. This approach recognizes that local action is essential to solving marine litter, and can be replicated in all communities in North America.

North American Cooperation on Marine Litter

In 2017, the Commission for Environmental Cooperation (CEC), through its lead agencies, Environment and Climate Change Canada, the Mexican Ministry of Environment and Natural Resources, and the United States Environmental Protection Agency, launched a project to build community solutions to marine litter in the Tijuana River and Salish Sea watersheds, two ecologically rich, economically important transboundary areas.

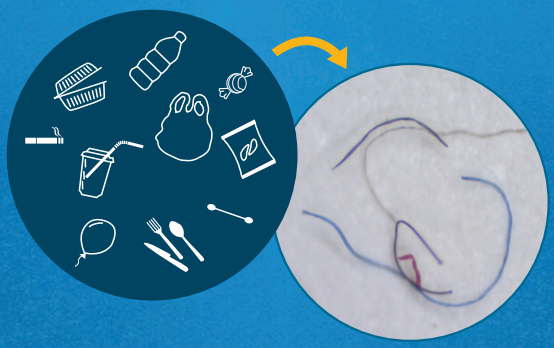
The Tijuana River Watershed

The binational Tijuana River watershed spans an area of 453,300 hectares,[1] of which 75 percent is in Mexico (Baja California) and 25 percent is in the United States (California). A total of 2.8 million residents live within its boundaries, with the majority of them residing in Mexico.[2] The Tijuana River flows from Mexico and through the United States before reaching the ocean in Imperial Beach, California. Along its path, the river picks up litter that ends up in the estuary or in the ocean.

Getting Stakeholders Involved

In May 2018, stakeholders from southwestern San Diego, Tijuana and Rosarito, including representatives from local, state and national governments, industry, nonprofit organizations, and youth groups and academics, were brought together to discuss sources of, and solutions to, marine litter in the Tijuana River watershed. After sharing information on litter of concern, such as plastic bottles, plastic bags, polystyrene and cigarette butts, the stakeholders proposed over 15 actions, including seven that are low-cost and low-technology.

1. San Diego State University. 2005. *Tijuana River Watershed Atlas.* San Diego State University Press and Institute for Regional Studies of the Californias. San Diego, California. Available at: ‹https://irsc.sdsu.edu/docs/pubs/TRWAtlas.pdf›
2. Project Clean Water. 2014. *Tijuana River watershed management area analysis*. Available at: ‹http://www.projectcleanwater.org/download/tijuana-river-tjr-watershed-management-area-analysis-wmaa-draft-report-october-3-2014/›



The Marine Litter Problem

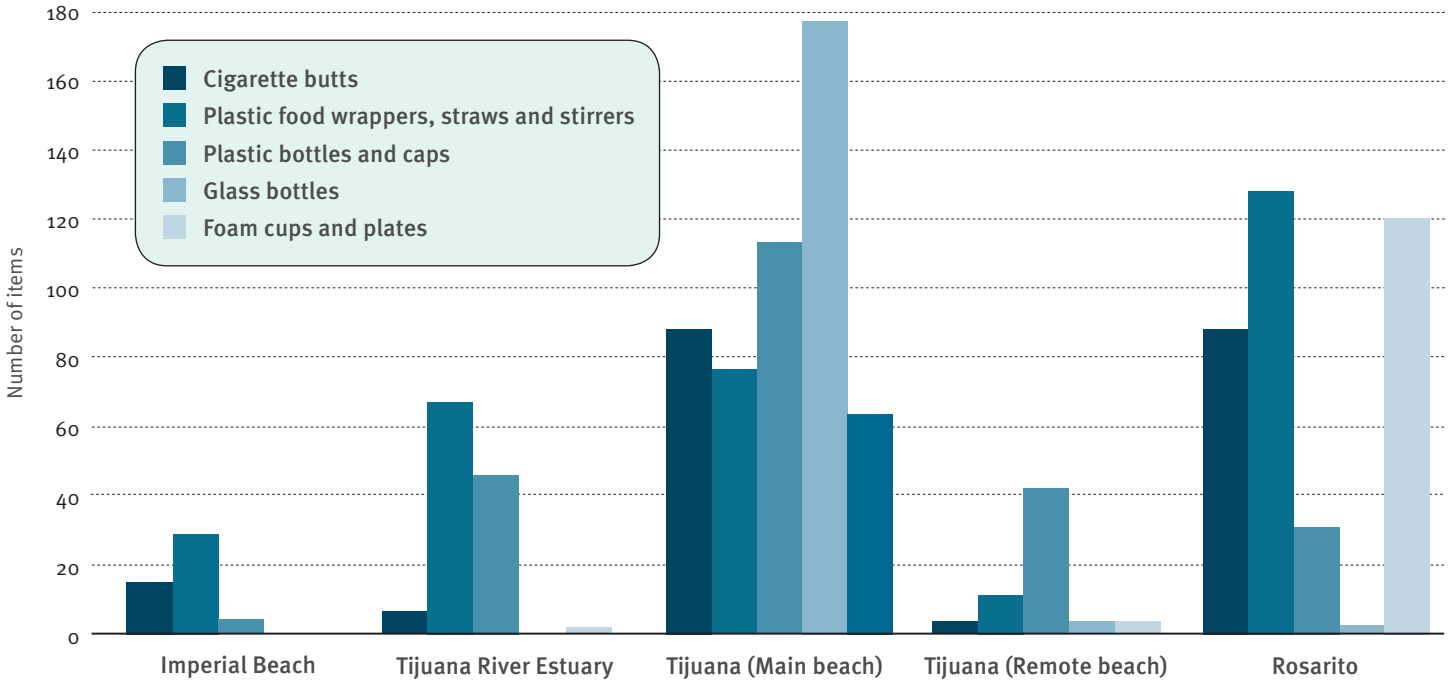
Every year about **8 million metric tons of plastic waste enters the ocean from land[3]**. Marine litter has significant impacts on ecosystems and economic activity. Plastic or other littered items can entangle or be ingested by wildlife, and affect the tourism and fishing industries, among others. Plastics are persistent and can break down into small pieces that accumulate in the environment and enter the food chain. Most marine litter comes from consumer products, often single-use items, reaching the ocean from the watershed.

3. J. R. Jambeck, R. Geyer, C. Wilcox, T. R. Siegler, M. Perryman, A. Andrady, R. Narayan, K. L. Law. 2015. *Plastic waste inputs from land into the ocean*. Science, 347 (6223): 768

Low-cost and Low-technology Actions to Prevent Litter in the Tijuana River Watershed

- Design an awareness campaign to reduce cigarette butts on Rosarito beach
- Create conservation-themed murals in public areas in Rosarito
- Hold art-based community awareness events in Imperial Beach
- Install trash boom in Tijuana
- Provide environmental education to youth, industry and the public
- Visit litter hotspots in the Tijuana River valley and throughout the watershed
- Conduct characterization of litter accumulated in the Tijuana River estuary

Litter items found at five sites in the southwestern San Diego/Tijuana/Rosarito region



The land-based litter surveys performed in the study area showed that single-use plastic items were the most common and were found in areas where they can easily flow into the ocean and become marine litter.

Getting to Know Your Litter

To better understand the type of litter that is found near waterways, citizen science events were organized at four beaches on both sides of the border, using a methodology adapted from NOAA and Ocean Conservancy.[4] The type and amount of litter varied greatly from site to site. On the US side, the most commonly found litter was single-use plastic (e.g., food wrappers, plastic bottle caps and straws) and cigarette butts. Additional litter items, such as glass and plastic bottles and foam cups and plates were found on the Tijuana and Rosarito public beaches, reflecting different litter sources and local regulations.

Education on Marine Litter

To raise awareness on the marine litter issue with youth, industry and the general public, a total of 13 education workshops were presented in schools and universities, and at industry association meetings and public events in Tijuana and Imperial Beach. Presentations were given to over 1,300 students and private sector representatives, with an additional 1,500 from the public. To complement this effort, a group of university students was brought to the trash boom located in Border Field State Park just north of the border to see the large amount of trash that is carried by the river into the estuary.

Litter Characterization in the River Basin

To identify the litter that comes from across the border through the Tijuana River, a characterization was conducted on the US side of the border, in Border Field State Park. Two classifications were used, the first one from CalRecycle[5] to complement annual Border Field State Park data, and the second from NOAA to compare with other shoreline surveys across the region. Using both methods, the results showed a predominance of plastic litter. Although the source of this litter has not been confirmed, improving solid waste management in communities located upstream of the study area could help reduce domestic item litter found in the Tijuana River valley. These data will contribute to long-term monitoring of changes in litter flow across the border over time and under various conditions and inform the development of a binational mitigation program.

Most common items found in Border Field State Park, by method

CalRecycle	NOAA
Plastic bottles	Plastic bottles
Plastic household items	Plastic bags
Plastic toys	Food wrappers
Construction debris	Textiles

Trash Boom Installation in Tijuana

To act as an additional barrier to litter in the Tijuana River, various scenarios for installing a trash boom in Tijuana's Los Laureles sediment basin were discussed and analyzed by the City of Tijuana, considering technical specifications, permitting, ownership, maintenance and storage. Following several meetings, a framework defining the roles and responsibilities of the city and other organizations in regard to boom operation and maintenance was provided to the City of Tijuana for consideration.

4. Ocean Conservancy. Volunteer Ocean Trash Data Form. Online at: ‹https://oceanconservancy.org/wp-content/uploads/2017/04/OC-DataCards_volunteerFINAL_ENG.pdf› and US Department of Commerce National Oceanic and Atmospheric Administration. Marine Debris Shoreline Survey Field Guide, National Ocean Service Office of Response and Restoration, Marine Debris Program. Online at: ‹https://marinedebris.noaa.gov/sites/default/files/ShorelineFieldGuide2012.pdf›
5. ‹https://www.calrecycle.ca.gov/lgcentral/basics/StandLst›

Find out more information at **<www.cec.org/marinelitter>**

Commission for Environmental Cooperation

This brochure was prepared for the Commission for Environmental Cooperation (CEC) as part of the 2017–2018 project "Building Community Solutions for Marine Litter", implemented in partnership with Environment and Climate Change Canada, Mexico's *Secretaría de Medio Ambiente y Recursos Naturales* (Ministry of Environment and Natural Resources), and the U.S. Environmental Protection Agency. The CEC facilitates collaboration and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade, and social links among Canada, Mexico, and the United States. To date, the CEC has published over 400 reports, maps, tools and resources related to the North American environment, all accessible at **www.cec.org**.

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Photos in this brochure courtesy of CEC and Wildcoast.