

# Diagnosis of environmental impacts on the Mexican Coastal Zone with a comprehensive ad-hoc database

V. Solis-Weiss (1), A. Granados Barba (2), and L. Ortiz Lozano (1)

(1) Instituto de Ciencias del Mar y Limnología, UNAM, Apdo Postal 70-305, Mexico, D.F. 04510, Mexico

(2) Centro de Ecología y Pesquerías, Universidad Veracruzana. Apdo. Postal. 663 CP 91000, Xalapa, Veracruz, Mexico

E-mail: [solisw@mar.icmyl.unam.mx](mailto:solisw@mar.icmyl.unam.mx)

Mexico is a country with 11,500km of littorals and almost  $3.10^6\text{km}^2$  of marine Economic Exclusive Zone, in contact with the Pacific, Atlantic and Caribbean and mostly under tropical and subtropical, but also temperate latitudes, thus ideally located for a large array of coastal habitats to thrive, from rich fishing areas, to coastal lagoons, mangroves and coral reefs. The main sources of revenue in the country: petroleum, tourism and shrimp catch, are all mainly found in the coastal zone, together with the highest population growth. This privileged situation contrasts with the current lack of knowledge and poorly developed legislation for the coastal zone, where a booming development of the varied activities has proceeded without adequate frames, protection measures for the environment or coordinated in any way by a central guiding plan.

The Mexican government, through the Ministry of the Environment, recognizing these problems, and in accordance with international treaties, modern views in sustainability and environmental protection, financed this project, the first of its kind, whose aim was to have an integrated state of the art knowledge of what had been done in the country to assess water quality of the coastal waters, in a custom-built database, which would help to define the necessary policies to ensure an adequate development of that area and could also be used to recognize what needs to be done in research to complement this effort.

To this end, a comprehensive bibliographic search was conducted in all the scientific libraries of the country (universities and public or government agencies and ministries) for the entire coastal zone. To construct the database, a total of 113 parameters were chosen as indicators of water quality and divided in six main categories: Biological (9), Physico-chemical (33), Geological (5), Metals (18), Persistent Organic Compounds (28) and Hydrocarbons (20). Of those, 106 were recorded from water, 88 from sediments and 68 from organisms, and can be divided by States (17).

The main activities performed in the coastal areas were divided in five categories: Fishing and Aquaculture, Petroleum extraction, Tourism, Portuary activities, and Urban and Industrial development. Conservation measures were also taken into account. The most common denominator of anthropic impact and practically ubiquitous, was contamination by fecal coliforms, sometimes found in very high concentrations and/or already incorporated to sediments.

The data gathering was complemented with field visits to the 48 most important centers of coastal development in order to corroborate the published data and interview key officials, public or private agencies and involved individuals.

The RAISON system was chosen to manage the information, in order to integrate the database, with the Excel Spread Sheet and a graphic editor to visualize the results in maps and figures. Hierarchization of the validated information was then performed to evaluate water quality at all sites where studies existed, comparing the values measured and the official permissible concentrations of all parameters. Since these norms only exist for water parameters in Mexico, for values recorded in sediments and organisms we resorted to international legislation and literature reports.

As a result, a diagnosis of the coastal localities emerged, which combined with our evaluation at the State level, allowed us to make a General Diagnosis of the Coastal Zone in Mexico.