INSTITUTE OF OCEANOLOGICAL INVESTIGATIONS WORK PROGRAM 1972–1973

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In Mexico investigation of the seas which border the Republic is relatively recent. Great efforts by universities and the Mexican Government led to the creation of elementary or basic groups in teaching and research related to our marine resources. At present the following array of existing centers of teaching and/or research have been established (See Figure 1).

Governmental Agencies

1. National Institute of Fisheries, under the Secretary of Industry and Commerce.
2. Directorate of Aquaculture and General Directorate of Uses of Water and Prevention of Contamination under the Secretary of Hydraulic Resources.

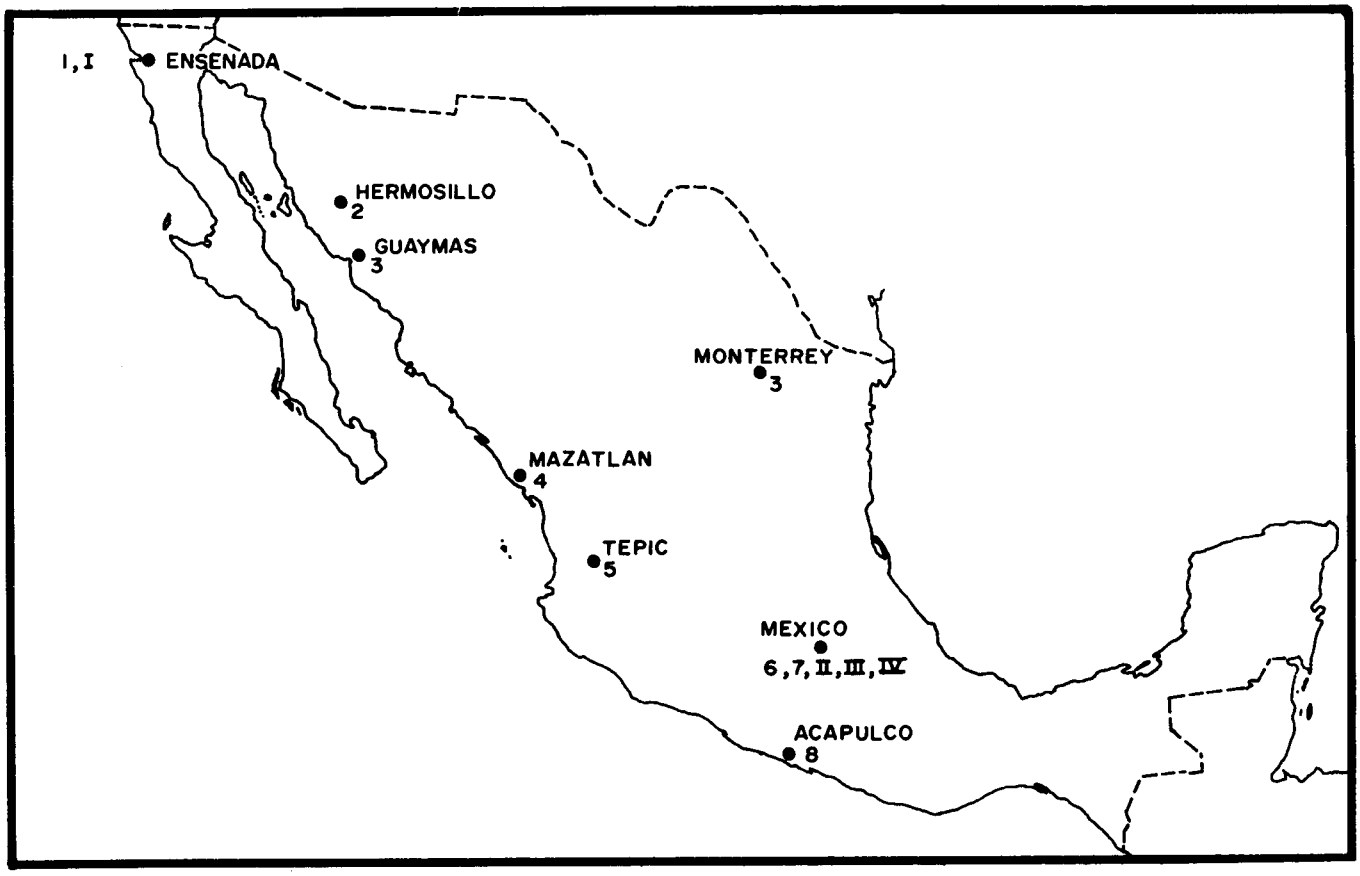

Figure 1. Map of the Mexican Republic, showing location of the principal centers of teaching and research in the Marine Sciences.

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UNIVERSITIES

1. Inst. of Oceanological Inv. (IIO). School of Marine Sciences.
2. Center of Scientific & Technological Inv. Univ. of Sonora.
3. Technological Inst. of Higher Studies of Monterrey (ITESM).
4. School of Marine Biol. Univ. of Sinaloa.
5. School of Oceanography, University of Nayarit.
6. School of Biological ScNal. Polytechnic Inst.
7. Inst. of Geophysics, Inst. of Biol. Inst. of Geol. and Inst. of Geography, Nal. Univ. of Mexico (UNAM).
8. Marine Ecology School (1973). Univ. of Guerrero.

GOVERNMENTAL AGENCIES

I. Center of Scientific Inv. and Higher Education of Baja Cfa. (CONACyT-UABC-UNAM).

II. Nat. Inst. of Fisheries Undersec. of Industry and Commerce.

III. Directorate of Aquaculture and General Directorate of Uses of Water and Prevention of Contamination under the Sec. of Hydraulic Resources.

IV. Gen. Directorate of Maritime Works & Gen. Directorate of Oceanography & Maritime Aids to Navigation under the Sec. of the Navy.

3. General Directorate of Maritime Works and General Directorate of Oceanography and Maritime Aids to Navigation under the Secretary of the Navy.
4. Center of Scientific Investigations and Higher Education of Baja California. National Council of Science and Technology (CONACyT-UABC-UNAM).

Universities

1. Institute of Oceanological Investigations (IIO). School of Marine Sciences. Autonomous University of Baja California (UA BC).
2. Institute of Geophysics, Institute of Biology, Institute of Geology and Institute of Geography. Autonomous National University of Mexico (UN AM).
3. School of Biological Sciences. National Polytechnic Institute.
4. Technological Institute of Higher Studies of Monterrey (ITESM).
5. School of Oceanography, Autonomous University of Nayarit. Recently renamed Superior School of Fisheries Engineering (Feb. 1973).
6. School of Marine Biology, University of Sinaloa.
7. Center of Scientific and Technological Investigations, University of Sonora.
8. School of Marine Ecology, University of Guerrero.

Nevertheless, in spite of this proliferation of centers in recent years, economic and material resources are scarce; therefore, research is going through a transition from poorly oriented short term and intermittent studies not leading to significant conclusions, to major projects with specific purposes, which take a long time to bring to completion.

This condition probably is owing to a lack of appreciation by those who direct the destinies of Mexico, including the scientists themselves, of the full magnitude of the relevance and importance of proper understanding and management of our marine resources. Judging by events at the national level in the last five years, the situation just described will be remedied in the next five years.

Meanwhile, the different groups which form the oceanographic structure of Mexico have been effecting a program of preparation and investigation which, although in part simple, is a firm and necessary step toward resolving our most immediate oceanographic problems.

In particular, this is the case in the institution of which I am a part: the Marine Science Unit of the Autonomous University of Baja California, in Ensenada. Within this Unit, the Institute of Oceanology has now established a program of basic preparation in coordination with the School of Marine Sciences. This program has several aspects such as:

a) Training investigators.
b) Acquiring documents.
c) Research on selected problems.
d) Obtaining funds.
e) Obtaining equipment and supplies.

Training investigators is without doubt the most difficult and time consuming task, a slow process of preparation and selection of competent people on whom within four years we believe we can rely as the basic group of investigators meeting our requirements. This will ocur thanks to the opportunities which the Government now offers through the National Council of Science and Technology.

Acquiring documents, that is, forming in Ensenada *a specialized center of oceanographic* information on the seas adjoining Baja California, is vitally important because the efficient utilization of the marine resources in the waters off our coasts depends largely on our understanding of the resources and of the application of technology. Even the developent of this technology will depend on the quantity and quality of the existing scientific and technical knowledge, and its availability and accessibility for efficient use.

Therefore, the objectives which this center of information seeks should be:

1. To identify the information required for teaching, research and industry; in marine sciences, atmospheric sciences, earth sciences, and applied sciences.
2. To satisfy and encourage a growing demand for information from the permanent users in the areas mentioned.
3. To provide reference, loan, and copying services.

However, for this to become a reality, it is necessary to obtain the close collaboration of the scientists of the whole world. For this purpose we have considered undertaking several projects, the most important being organizing *an international symposium on the oceanology of the seas adjoining Baja California* which in accord with what has been said already, will have the following objectives:

a) To accomplish the most complete synthesis of what has been learned up to now about the seas adjoining the peninsula of Baja California.
b) To identify the most urgent problems which demand immediate attention, and those problems which can be resolved only by long term programs.
c) To create the necessary bases for carrying out multi-institutional collaborative programs.
d) To lay the foundations necessary for a series of symposia to be held every year or two.

This would give an opportunity for an annual or biennial review of the advances accomplished, and for reorientation of work according to the experience being obtained.

The international symposium we plan to celebrate is expected to take place in late 1974. Meanwhile, obtaining funds and therefore equipment and supplies is being accomplished with direct assistance from the Government, as in the case of the research vessel, BENITO JUÁREZ, given by the President of the Republic and on the way to being built, or in the case of contracts for work on specific problems such as those we already have.

Research Projects

In the upper Gulf of California we now have two studies under way. One of them is *Contamination of the mouth of the Colorado River by insecticides,* in its second stage on the general ecology of the zone. The other is *Hydrography of the upper Gulf of California.* The objectives being pursued in these two studies are:

1. To recognize the mechanisms by which contaminants penetrate the marine ecosystem (trophic chain and transport).
2. To evaluate the hazard presented by the brackish effluent waters from the geothermal electric plant at Cerro Prieto.
3. To obtain data series of the ambient conditions in the northern part of the Gulf of California and the brackish water lagoons of the Colorado delta.
4. Effects of tides and tidal flats on the physical and chemical characteristics of the waters of the upper Gulf.
5. The submarine topography of the upper Gulf.
6. The commercial fishing grounds, betweeen 31° north latitude and the frontier with the United States of America.

On the Pacific slope basically we are carrying out two projects, one of them on *Contamination of the coast between Ensenada and the frontier by heavy oils.* In the first stage, we are limiting the area to the littoral zone and the sea bed. At the same time, observations are made on ecological effects. The other project is a long term program related to mariculture; in this project we are attempting to develop a pilot plan for oyster culture in Bahía de San Quintín in order to later create in that area a center of mariculture, which when operating will be able to finance itself and to extend cultivation to the whole peninsula of Baja California.

In this program, even though the oyster is the base of the project, experimentation will include all those marine species of commercial importance and susceptible to cultivation.

In conjunction with the studies previously pointed out, there is one more on the *Effects of tropical storms on the Pacific coast of Mexico.* In this program we are attempting to evaluate the damage caused on the coast by tropical disturbances, in order to be able to suggest types and characteristics of works to be constructed, and in addition to contribute to the beginning of a maritime system of protection against chubascos.