

Juveniles of many different species of oysters, clams and scallops will be produced in the hatchery.

## Giant Shellfish Hatchery Begins Production in Mexico

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The major producers of shellfish have traditionally been the industrialized countries of Europe, Japan and the U.S., but during the past ten years there has been a shift in production to the developing countries in Latin America, Asia and the Pacific.

According to a recent U.S. Department of Commerce report, domestic landings of oysters in the U.S. have been declining for years. Landings in the 1970s are as low as half those of fifty years ago. There are several reasons for this decline, including: 1) overfishing, 2) natural disasters, 3) oyster diseases, 4) closure of waters because of pollution, 5) alternative uses for the growing areas (i.e., leisure activities), and 6) high costs of labor for opening the oysters.

Despite this decrease in U.S. landings, there has been a large increase in demand for shellfish products and a corresponding increase in the value of the landings (from US\$32.2 million in 1967 to US\$45.6 million in 1975).

Latin American countries are beginning to take advantage of the increasing

U.S. demand. Ecuador, for example, now produces nearly 60% of its shrimp on farms, some 14 million kilograms, and is the second biggest supplier of shrimp to the U.S.

In Mexico, the Direccion de Fomento Pesquero of the State Government of Sonora has financed a project for a shellfish hatchery and nursery complex at

Bahia Kino on the Gulf of California which began production in January of this year.

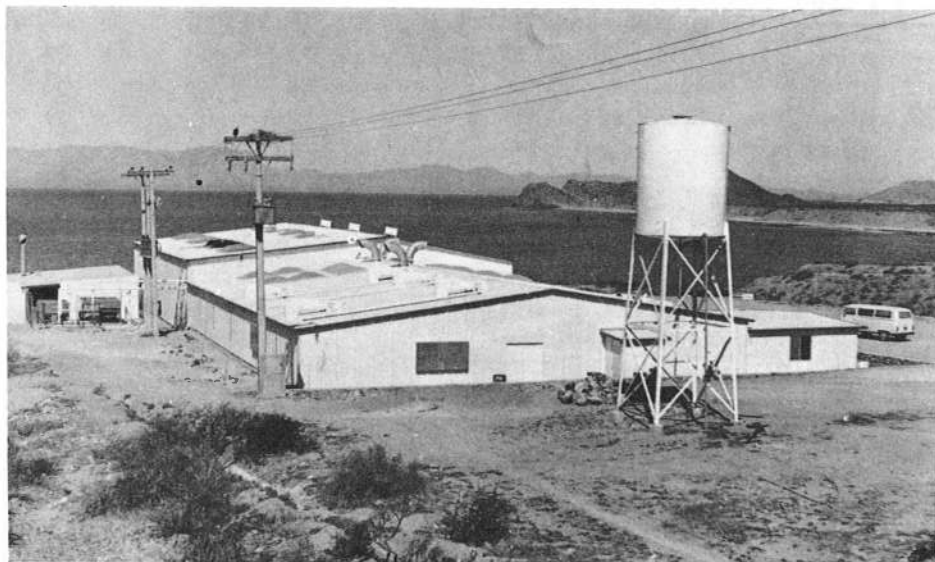
The project is part of a scheme to supplement fished products with aquaculture produce—shrimp, fish and shellfish. There is a large but declining shrimp fishery in Sonora (over 14,000 tonnes worth nearly \$200 million were landed in the 1983-1984 season). Overfishing, which is affecting the shrimp fishery, decimated a previous oyster fishery, while landings of lobsters and finfish have also experienced downturns.

### The Bahia Kino Hatchery

At a cost of less than US\$750,000 (including consultancy fees), the Kino complex is the biggest shellfish hatchery in the world. Designed by Australian registered Maritech International Pty. Ltd., the facilities have the capacity to produce more than 6 billion (6,000 million) juvenile shellfish annually.

Using Mexican contractors and engineers, Maritech also supervised the construction and installation of the buildings and culture systems. This was completed in less than six months. Five biologists from Fomento Pesquero are now being trained by Maritech to run the facilities.

Both the "eyed larvae" and "cultchless seed" methods will be employed at the hatchery. Species to be cultured include the Pacific oyster (*Crassostrea gigas*), the Caribbean oyster (*C. rhizophorae*), the American oyster (*C. virginica*), the native Mexican bank oyster (*C. cortezensis*), the native flat oyster (*Ostrea angelica*), the



The shellfish hatchery at Kino Bay.

can pin clams (*Pinna rugosa*, *Atrina* and *A. tuberculosa*), the hard clam (*Meretrix mercenaria*), the tapes clam (*Argopecten semidescussata*), the giant rock scallop (*Hinnites multirugosus*), the can bay scallop (*Argopecten cirratus*) and the Peruvian scallop (*A. purpurata*).

The hatchery also includes a research component to develop methods for the cultivation of other shellfish species, native and introduced.

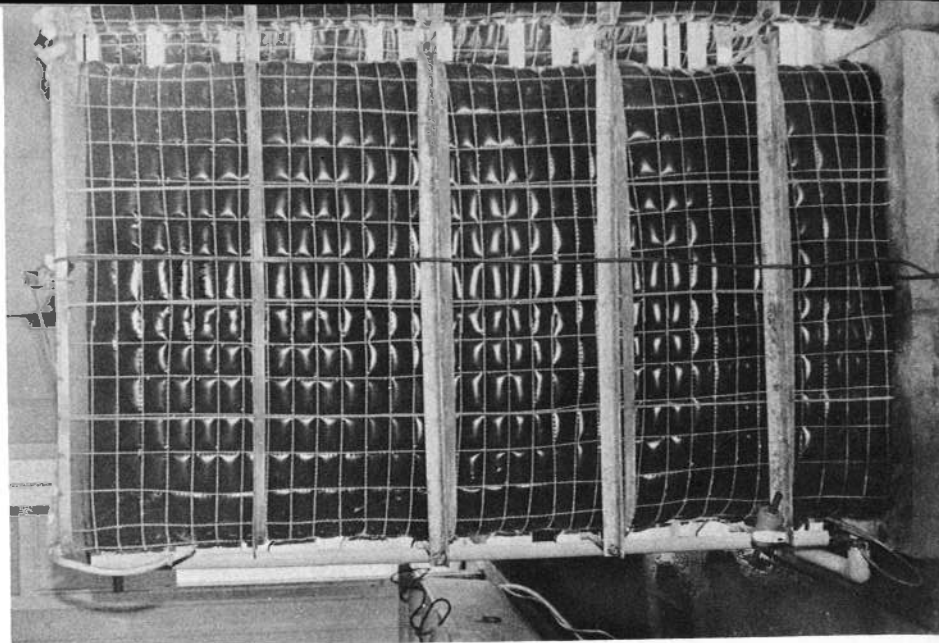
Microplankton (microscopic single-celled algae), grown in 600-liter plastic tanks are used to feed both the adult broodstock and the larvae.

Filtered seawater, mixed with nutrients to enhance the growth of the algae, and air are introduced into the bags through sterilized tubes and syringes. A system of pumps and tubes enables the contents of the bags to be transferred to 4,000- or 600-liter tanks and to be refilled at the push of a switch. Half of the algae is cultured using natural sunlight. Over 70,000 liters of algae can be harvested daily to meet peak demand.

Low-cost turbidimeters are used for the distribution of algae to the larvae. These turbidimeters read the water column in the larvae tanks with light-sensitive photocells. As the larvae feed, the diminishing turbidity indicates increasing food consumption and automatically more seawater is pumped to the tanks.

### Shellfish Production

The first batch of oyster larvae were produced in January using broodstock

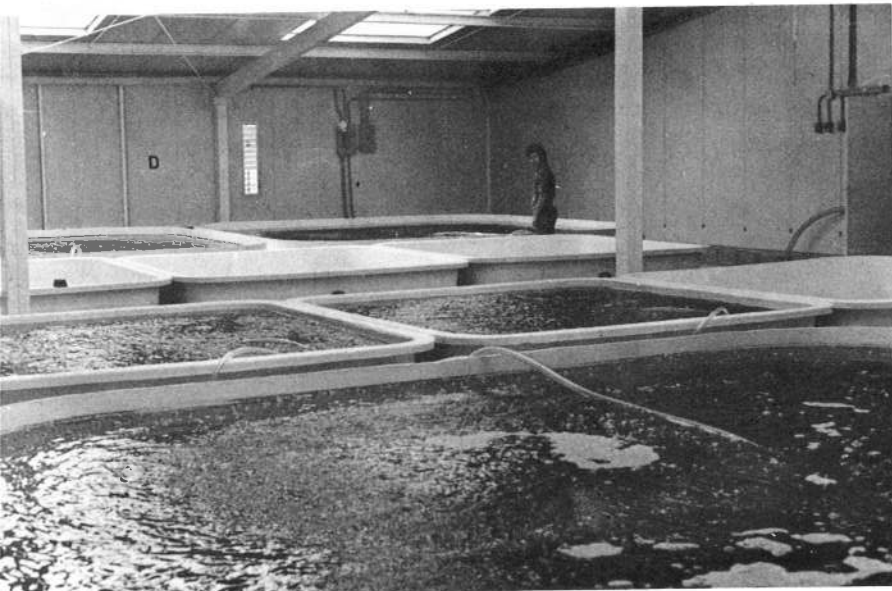


A bag culture with a bank of lights behind it.

from Chile. In February, oysters from Yavaros (Sonora) were spawned. It is also planned to use broodstock from Australia. Clams, scallops and other species of



Above: The nursery is situated on the shores of a large estuarine embayment. Below: Algae is also cultured using natural sunlight.



oysters are now being conditioned for spawning. The hatchery has the capacity to hold over 5,000 adult shellfish in a controlled environment.

Most commercial shellfish species reach marketable size in 8-12 months in this area. Shellfish farming, currently for oysters only, should therefore expand rapidly.

### Aquaculture Institute

Besides the Kino shellfish hatchery and nursery, the State Government of Sonora also operates a *Macrobrachium rosenbergii* and fish (catfish, tilapia, grass carp and big head carp) hatchery near Obregon and a saltwater shrimp (*Penaeus stylirostris*) culture plant at Puerto Peñasco. A shrimp research facility run by the University of Sonora is also located at Kino.

There is a plan to incorporate all these culture establishments into one body known as the "Instituto Acuicola de Sonora"—the Aquaculture Institute of Sonora. The Institute will provide excellent facilities for research and for training aquaculturists in a commercial environment.

A model shellfish farm may also be established to demonstrate various techniques for culturing shellfish and to develop cost effective distinctly Mexican technologies using local materials.

For more information on the project, please write to: Mr. Ron Zebal, Maritech International, Aptdo Postal 1855, Hermosillo, Sonora, Mexico 83000, Telex: 58780 SOEXME. ●

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