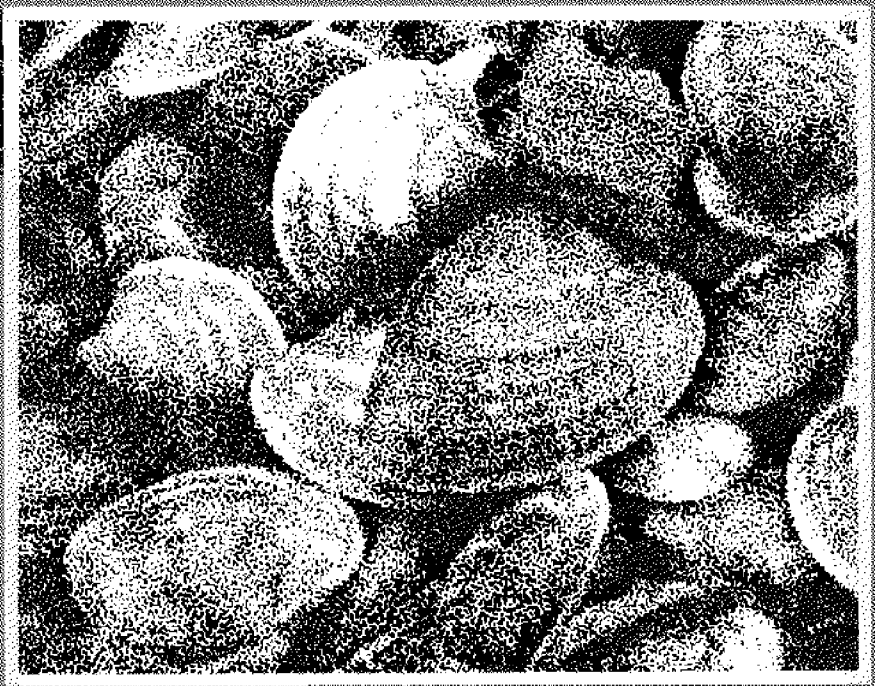
AQUACULTURE in New York State



NEW YORK SEA GRANT INSTITUTE
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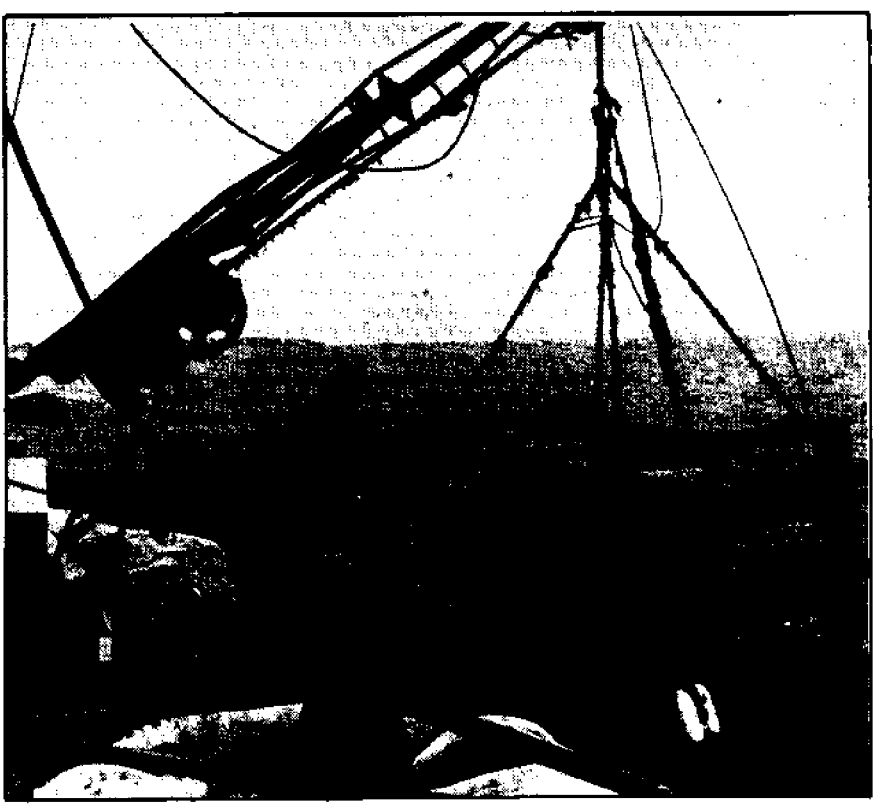
1983

AQUACULTURE is to water--marine or fresh--what agriculture is to land. It is the cultivation of marine plants and animals under controlled conditions. It can produce not only high-quality seafoods, but raw materials for manufacturing and even energy.

Aquaculture can help New York prosper, for it can mean opportunities for economic growth, for employment, and for food production. And aquaculture is compatible with New York's other needs and activities.



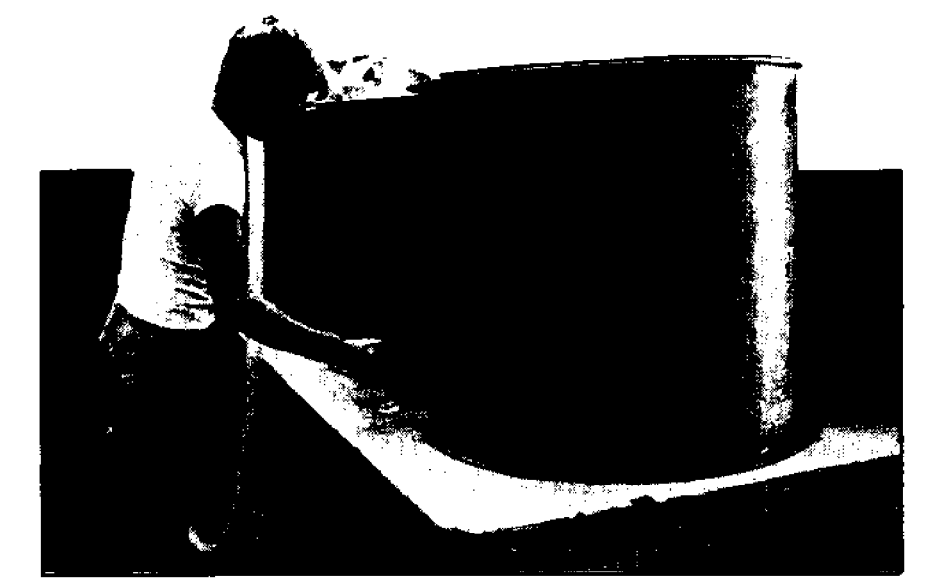
Clam culture in Great Peconic Bay.

MORE FOOD THROUGH AQUACULTURE

Through aquaculture, New York State can:

- Increase yields of fish and shellfish
- Meet demands for fresh, nutritious seafoods of consistent quality
- Extend the season for many commercially important species
- Offer relief from high fuel costs that plague commercial fishermen
- Bring new revenues into the state.

Scientists and processors have already met consumer demands with new processing and storage methods and new food products. These all require raw materials of uniform size, flavor, and composition. These can be better produced through aquaculture.



Raising seed clams at Shellfish, Inc.

New York is well suited for aquaculture. Its metropolitan market has a high per capita seafood consumption. New York's marine waters are close to one of the greatest seafood markets in the United States. Aided by aquaculture, they can produce more kinds of seafood for this market.

This can help the state decrease its dependence on seafood imports and at the same time develop new, nutritious products. While we must further explore the potential of aquaculture--for increasing food production, reclaiming domestic urban markets, and expanding export markets--experience so far is promising.

BESIDES FOOD

Culturing marine organisms opens a wealth of other opportunities. Seaweeds can be digested to produce alcohol or methane--an energy alternative for natural gas. Research and development on marine biomass production is being pursued throughout the world. The New York Sea Grant Institute is collaborating on one such program in New York waters.

Valuable chemicals can also be derived from seaweeds: agar for bacterial cultures, and carrageenin for processing dairy products and medicines.

Research also shows that valuable drugs may be derived from marine plants and animals. In some aquatic species there are substances unlike any found in terrestrial organisms. Some of these substances, for example, exhibit antimicrobial, anticoagulant, or tumor-inhibiting properties and may be the prototype for future drugs.

Aquaculture offers New York major opportunities for producing food, boosting the economy, and promoting industry.

SETTING THE RECORD STRAIGHT

• **Will aquaculture threaten commercial fishing and shellfishing interests?**

Aquaculture is not a serious competitor with commercial fishing. While commercial fishermen and baymen harvest most seafoods produced in New York, some of these species are in short supply or unavailable during parts of the year. In addition, many shellfishermen are leaving the business because of declining natural stocks. Aquaculture offers fishermen another income and offers consumers larger supplies over a longer season.

• **Don't natural stocks already supply us with enough fish and shellfish?**

Most fish and shellfish consumed in the United States are harvested from wild stocks. But as consumer demands for seafood have grown, wild stocks have diminished. New York's hard clam landings have decreased nearly 50% since 1976. Just as wild herds of game no longer provide enough food for our nation, so wild stocks of fish and shellfish might no longer meet consumer demands. Aquaculture can help provide a steady supply.

• **Is New York's water clean enough for culturing fish?**

New York's waters vary in quality. But the state has plenty of high-quality waters for aquaculture. Because animals grown through aquaculture are closely monitored, their quality and healthfulness can be better controlled than that of wild animals.

• **If New York is such a great place for aquaculture, why don't we already have a booming business?**

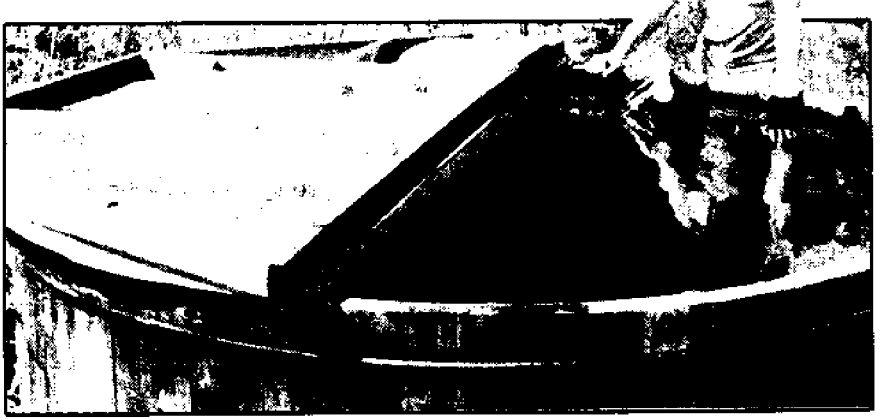
Historically, New York has been a leader in

aquaculture. In fact, many of the pioneer US culturists practiced in New York. More recently, the industry has run into a variety of obstacles: New York's governments have not recognized the value of aquaculture for New York; state and local governments control much of the underwater lands needed for aquaculture; and the culturist must deal with cumbersome procedures for access and permits. While attitudes and procedures are changing, New York still lags behind other states in developing supportive policies toward aquaculture. In addition, more research is needed to upgrade existing technologies, and access to venture capital must be assured. Yet the markets and the environment are promising, especially for saltwater aquaculture.

• **Won't aquaculture involve fencing off large tracts of water so that nobody else can use them?**

Many users already compete for New York's waters--for recreation, transportation, and commerce. Aquaculture, as currently practiced in New York, excludes few other users.

Marine aquaculture, or mariculture, is usually practiced in waters too deep and inaccessible for



Inspecting trout tank culture in Delaware County.

swimming. Boaters can navigate easily over submerged structures or around surface structures. The mariculture structures also act as artificial reefs, attracting schools of wild fish--a benefit for commercial and recreational fishermen. Culturists do not object to others using the same area, as long as the aquaculture facilities and crops are not damaged--much as land farmers allow hunters, hikers, or horseback riders to use their property as long as there is no damage to crops.

- **Won't aquaculture flood existing seafood markets and drive fishermen out of business?**

Recent studies show that demand for seafood is rising, while wild stocks of some fish and shellfish are being harvested at or above maximum sustainable yields. Aquaculture can provide a steady supply of high-quality products for currently unmet market needs. Since aquaculturists do not depend solely on nature for supply, they can often meet market demands when natural supplies are low. In fact, they can hold their products until such times, in hopes of higher market prices.

- **Won't aquaculture facilities detract from the region's natural beauty and decrease property values?**

Aquaculture facilities need not be unsightly, noisy, or smelly. Water-based structures are usually underwater. Sometimes buoys or markers--like lobster trap markers--rise above the water line. Other floating structures look like ordinary rafts, and land-based structures generally look like barns or greenhouses and blend in with the surroundings. The noisiest machinery a culturist uses is a boat.

- **Won't aquaculture disrupt the coastal environment?**

Aquaculture poses little threat to the environment.

For too long developers and others have abused the fragile coastal environment. But because culturists depend on high-quality environment to raise their crops, aquaculture is compatible with environmental protection. In fact, the New York Tidal Wetlands Act specifically excludes aquaculture from its regulation.

- **Is Aquaculture compatible with the economy and lifestyle of the state?**

Aquaculture can fit in with existing rural and coastal industries of New York. It is similar, in fact, to farming and fishing industries in terms of skills and technology.

- **Is special training necessary for becoming an aquaculturist?**

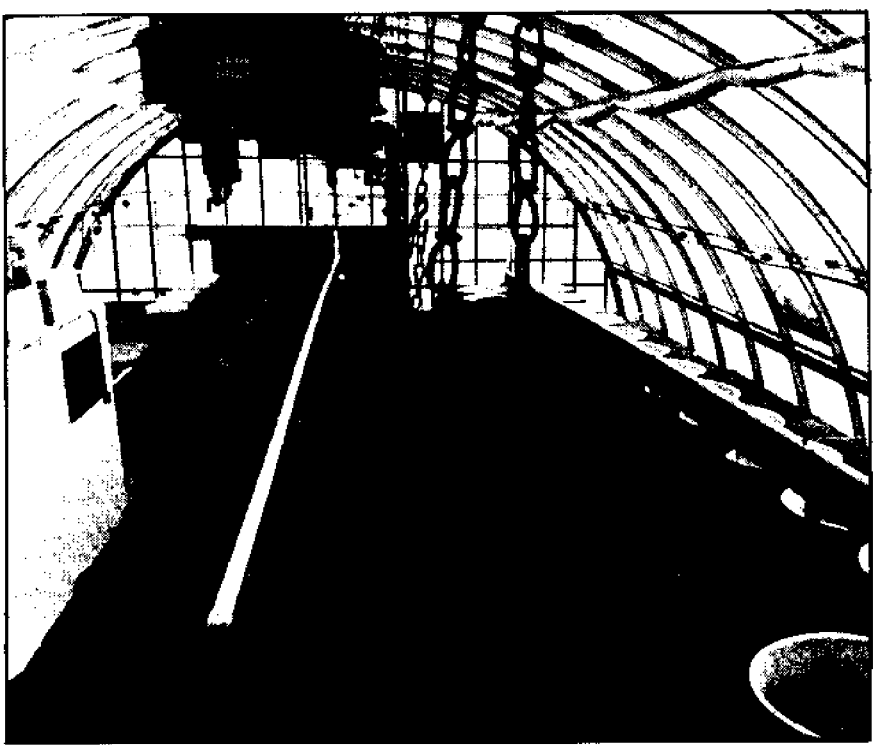
While the aquaculturist must know some basic techniques of culture and principles of biology, these and other skills are not difficult to learn on the job. But culturists must be willing and physically able to maintain and harvest the crop.

Experimental kelp culture at SUNY Stony Brook.

AQUACULTURE IN NEW YORK

Although it is not a large industry, aquaculture is not new to New York. For more than 100 years New Yorkers have cultured fish and shellfish. As early as the 1850s, Long Island towns leased bay bottom to oystermen, and private finfish culturists statewide were experimenting with stock augmentation programs. Today, most of New York's aquaculture is in Suffolk and Nassau counties.

- Established in 1912, Bluepoints Company in West Sayville is the oldest venture. Originally, Bluepoints



A clam hatchery in West Sayville, NY.

harvested oysters from company-owned land in Great South Bay. But as oysters declined in the bay, the company turned to clams. Today they grow seed clams in their hatchery and plant some in the bay. Bluepoints' 60 workers harvest about 100,000 bushels of clams annually.

- The Shinnecock Indians have recently opened a modern shellfish hatchery on their Southampton reservation. Along with their primary crop of oysters, they plan to raise scallop and clam seed. Besides the hatchery, the Shinnecocks have developed a raft method to grow shellfish to market size. They hope aquaculture will provide employment for their tribe.

- Coastal Farms, Inc. grows clams in the Peconic Bays on open-sided racks that rest on the bay bottom. The owner holds a patent on this kind of rack culture. Using this system, he notes, one can earn a living on just five acres of underwater land. Open since 1977, Coastal Farms expects its first crop of all rack-cultured clams this year. They employ 11.

- Multi-Aquaculture Systems, operating since 1976, is Long Island's only finfish culturing venture. They raise striped bass in tanks or in stock pens in Gardiners Bay. They employ four.

- Shellfish, Inc., of West Sayville was started in 1936 as a family-run oyster harvesting business. When Great South Bay's oyster crop failed, they turned to clams. They have developed both a hatchery and an aquaculture system. In April 1982, however, the town discontinued their bottom lease. The company now grows and sells seed clams to others.

• Hydro-Botanicals of Shelter Island is a research-oriented business that raises seaweed in greenhouses for overseas customers.

• Ocean Pond Corporation of Fisher's Island raises oysters to field planting size on rafts in a 40-acre saltwater pond. The oysters are planted and grown in Massachusetts.

• F.M. Flower and Sons Oyster Company has operated in Bayville since 1887. They raise oyster seed in their hatchery, place it on racks in Oyster Bay, and then, when the oysters are old enough, plant them on leased bottom. Flower employs about 40 and harvests 50,000 to 100,000 bushels of cultured oysters per year.

• Aquaculturist members of the OURS-Delaco Association, a non- profit association, raise rainbow and brook trout, perch, and bullhead in ponds and tanks. Fish farmers now total 25, and interest is growing. The cooperative is in its first year of full-scale production. Members raise the fish primarily for their own use and then sell the rest. This fish farming project was developed to broaden Delaware county's economic base.

Public aquaculture:

Some Long Island towns also practice aquaculture as part of their bay management programs. Towns with more advanced culture projects include Oyster Bay, Babylon, Islip, and Brookhaven. Each of the towns gets seed clams from private hatcheries, cultures them in racks or on rafts in town waters, and then plants the shellfish on town-owned bottom for public harvest.

A handful of clam seed.

Research and Development:

The academic community has an important role in fostering the aquaculture industry. From developing new culture strains to engineering techniques and equipment, university research and development is crucial. New York has two strong centers for aquaculture research: SUNY at Stony Brook's Marine Sciences Research Center, and Cornell University's New York State College of Agriculture and Life Sciences and New York State College of Veterinary Medicine. Together these institutions provide a base for knowledge in aquaculture, including: aquatic disease, seafood science and technology, and culture of shellfish, finfish, and seaweeds. The Sea Grant Institute of SUNY and Cornell, in addition to sponsoring research and development in aquaculture, carries out education and extension work with fishery and aquaculture industries.

Realizing the future potential of aquaculture requires the efforts of industry, government, and the academic community. Fortunately, a foundation already stands--small but strong--for aquaculture in New York State.

NEW YORK NEEDS AQUACULTURE

Wild stocks of terrestrial animals and plants no longer supply all the food we need from the land, nor can we expect wild stocks of aquatic plants and animals to supply all the food we need from the sea. Even now, US traditional fisheries are being harvested at or near the maximum sustainable yields; and demand is increasing. Since 1960, per capita consumption of fish has increased over 25%, but more than 50% of the seafood Americans eat is imported.

Demands are even greater in New York. People in the metropolitan New York-New Jersey region eat nearly twice as much fish as the national average. In fact, they eat almost twice the amount of all the food fish landed in the major fishing ports from Maine to South Carolina. As a result, consumers in the region pay more for fish and related products, because of the high cost of shipping the products into the area.

Aquaculture can help meet the increasing consumer demands for seafood; it has the potential to produce greater yields per given area than the wild harvest fishery. In an 8-foot diameter tank, as many trout can be cultured as grow naturally in a one-quarter acre pond. The Japanese can culture 32 tons of oysters per acre--about 100 times natural production.

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