

# **New Jersey Fishing and Aquaculture: Harvesting the Garden State's Waters**



## Introduction

For over 300 years, New Jersey's commercial fishermen have been bringing home some of the finest fish and shellfish caught anywhere in the world. The burgeoning seafood industry that grew up along the state's coastline shaped how a large part of the landscape would come to look, as fishing villages later evolved into the familiar towns of the Jersey Shore, often with the seafaring life at their core.

Look around those towns, known more today for the tourists they reel in than the fish brought ashore, and you can still find the hard-working fishermen and aquaculturalists making their living from the bounty of the waters. Far from the "salty seadogs" portrayed on celluloid, today's fishermen are apt to know as much about conservation and the life cycles of various fish as they do about hooks, lines and nets. They are keenly aware that over-fishing will bring problems for their business, so they do their best to ensure there will be an ample supply of a variety of species in the future.

Last year alone, over 100 different species of finfish and shellfish were harvested in the Garden State. Local product is shipped to some of the most discerning seafood markets in the world. New Jersey monkfish are on display at wholesale markets in Seoul, South Korea. New Jersey tuna is sliced in sushi bars in Tokyo. New Jersey squid is served in tapas restaurants in Madrid.

*In 2003, New Jersey boats brought in over  
170 million pounds of fish, valued at over  
\$120 million paid to fishermen at the dock.*

Clearly, the harvesting of seafood has played an important role in New Jersey's history. But fishing and aquaculture are more than just a part of the state's heritage. Six major fishing ports are located in this state – Atlantic City, Barnegat Light, Belford, Cape May, Point Pleasant and Port Norris – with a commercial fleet of more than 1,500 vessels employing nearly 3,000 fishermen. New Jersey also boasts 15 seafood processing plants and 81 wholesalers employing more than 2,200 workers.

### *Working the waters -- then and now*

A visit to the Viking Village seaport in Barnegat Light shows just how much the work of those who bring in the bounty of the sea remains a part of everyday life.

The Village, a bustling operation on the northern tip of Long Beach Island, is currently home to 38 fishing boats, the most the business has ever seen. On any given day, vessels like the Virginia Lynn are preparing to head out to sea. The crews of these large fishing boats employ a number of techniques. Some are long-liners, who drag lines with hooks spaced far apart. Others are "dredges," with nets on frames used for gathering shellfish.

Whatever their method, the captains and crews of these vessels know the pressure is on to remain viable. Increasing global competition has turned making the most of each voyage into a necessity.

As Ernie Panacek, general manager of Viking Village put it: “Because you have to compete with more people in the business, you need a better, higher-quality product.” The net result is an emphasis on more boats making shorter trips and bringing their catch home faster. This cuts the time between catch and consumption, giving consumers a better-tasting, safer and higher-quality product than ever before.



Like many ports, fishing communities in New Jersey are defined not only by shared commitment to and dependence on fishing, but also by a high degree of kinship. Fourth- and fifth-generation fishermen can be found at our ports as well as newcomers from other fishing nations.

The value of the seafood harvest extends well beyond the industry itself. The effects of a prosperous seafood industry are felt in other waterfront activities such as shipbuilding, maintenance and repair, support services (equipment, fuel, materials and supplies) and ecotourism. Most importantly, the dollars earned in fishing communities tend to remain in those communities, adding incrementally to the local economy and in turn strengthening the relationship between the industry and its home port.

Growing urbanization, suburban sprawl and rapid growth of vacation communities are increasingly pressuring not only the fishing and aquaculture industries but also environmental and water quality in the state. This growth leads to competition for open space and skyrocketing real estate costs and taxes. As in the past, the industry must adapt to its changing surroundings.

Clearly, the men and women working in New Jersey's seafood industry represent the result of evolutionary changes in how the catch makes its way from the oceans and bays to the dinner table.

### *The importance of seafood in diet*

The diets of American consumers have undergone something of an evolution themselves, and seafood is playing a more prominent role today than in the past.

To be sure, Americans spend more time thinking about their food today. No day passes without some new or rehashed information about health-conscious diets and the dangers of obesity. This has led to consumers who are more demanding than ever about the health benefits of what's on their plates.

A USDA report in the summer of 2004 urged adding more fish to the diet to assist in reducing Americans' waistlines as well as cutting the risk of coronary artery disease. The USDA report recommended that fish containing heart-protecting omega-3 fatty acids should be doubled to two servings a week, at 6 to 8 ounces per serving.

Seafood also has the advantage of being convenient, quick and easy to prepare, fitting perfectly with Americans' demand for healthy foods that fit into our busy schedules.

As these dietary recommendations make their way into consumer demands, it will be even more advantageous to have a thriving seafood industry in New Jersey. As with produce and other agricultural products, consumers prefer fish that is as fresh as it can be, making the existence of an abundant local supply crucial.

### *Planning for the future*

The information in the following report illustrates that it is not only nostalgia that dictates New Jersey do all it can to preserve and enhance its seafood industry, but also sound economic logic.

Clearly, embracing aquaculture and fishing as integral parts of the state's agricultural output is good for all of New Jersey. That is why the New Jersey Department of Agriculture has embarked upon a marketing program to support this important sector of our agricultural community.

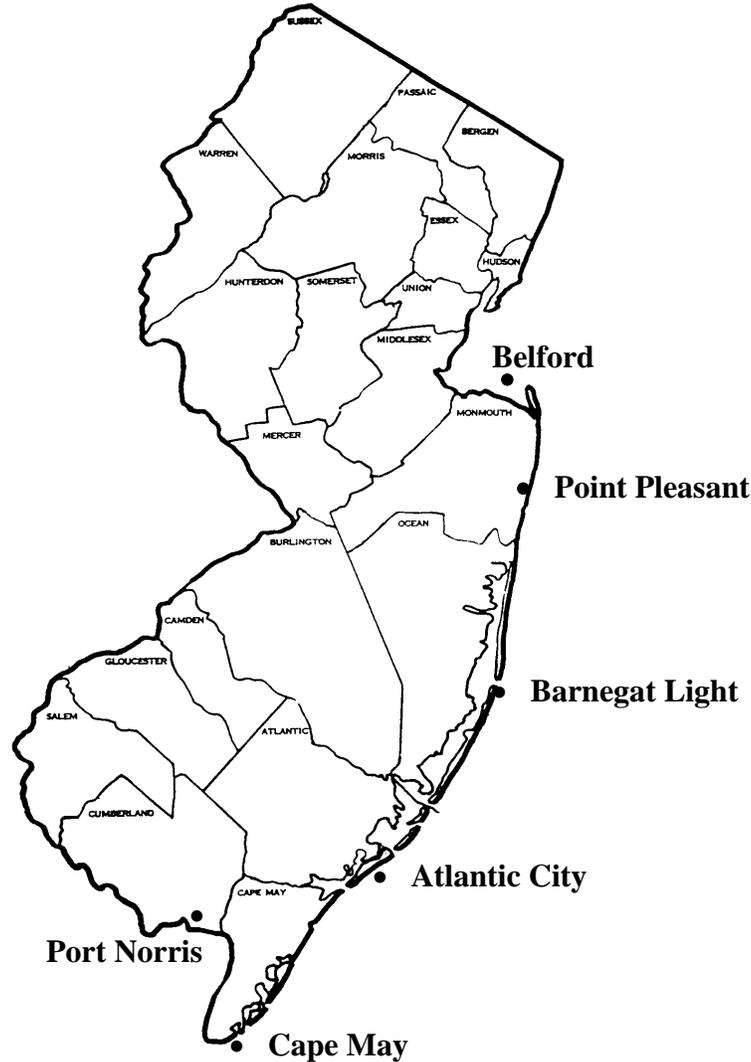
Through branding as “Jersey Seafood” those products caught or cultivated here, producers can assure consumers that this seafood is supremely fresh, as well as meeting new national requirements for labeling seafood’s country of origin and method of production.

With the right assistance, New Jersey’s seafood industry should enjoy a healthy future, just as it has enjoyed a rich heritage.



# New Jersey's Six Major Ports

## Rich Histories, Richer Futures



*New Jersey's six major fishing ports share a common development. Originally, each was home to Native American tribes harvesting finfish and shellfish from nearby waters. Next came the European settlers, harvesting the waters for their own food. They also saw the economic opportunity in catching even more and selling it in nearby cities such as Philadelphia and Wilmington. After decades as fishing centers, during which related businesses like boat-building sprung up, most of the ports also developed a significant tourist trade, creating both a customer base and a nuisance as tourism development put further pressures on natural resources. Eventually, environmental concerns such as over-fishing and natural diseases would force the fishermen to adapt to changing conditions.*

## *Atlantic City: Fish and Chips*

The Atlantic City seaport grew out of what was originally known as Absecon, or alternately, “Absegami,” “Absecom” and “Absegum” by its original inhabitants, the Lenni Lenape Indians.

In 1614, Dutch Captain Cornelius Jackson Mey (for whom Mays Landing and Cape May would later be named, despite the misspelling) explored the Mullica and Great Egg Harbor Rivers. Mey named what is now Atlantic County “Eyren Haven,” or “harbour of eggs,” for the numerous wild fowl eggs he found there.

The area continued developing around its water resources, and by the time of the Revolutionary War, a bustling seaport lined the banks of the Absecon Creek. Besides reaping the harvest of the waters, the area became known for its many skilled boat makers.

So active were the waters around what would later be named Atlantic City that in 1835 Dr. Jonathan Pitney, the “Father of Atlantic City,” began petitioning Congress for a lighthouse on Absecon Island. Pitney was concerned about the safety of seafarers in the area between Great and Little Egg Harbors that had become so dangerous it was known as “Graveyard Inlet.” It would take another 21 years, and untold losses, before Congress finally appropriated \$35,000 for the lighthouse.

Work on the lighthouse was completed in 1856 at a total cost of \$52,187. Clearly, Pitney had hit upon the right idea, as not a single ship was wrecked in the first 10 months of the lighthouse’s operation.

The importance of fishing to the area began to be eclipsed by tourism once the island was connected to the mainland by bridge and rail in 1880. With that connection and the subsequent development of amusement centers on the piers of Atlantic City, the transformation to a resort town had begun. In 1976, it would be furthered by the approval of casino gambling in the city.

Still, there are plenty of fish alongside the casino chips, as Atlantic City serves as a seaport of note in New Jersey. In 2003, the port brought in 20.8 million pounds of finfish and shellfish valued at more than \$38 million. The Atlantic City commercial fishery consists of a sizable sea clam fleet (both for surf clams and ocean quahogs) and a smaller number of in-shore crab, hard clam, net and pot vessels. The size of the sea clam fleet, located at bayside docks near Absecon inlet, has declined in recent years due to changes in federal law allowing the consolidation and transfer of individual quotas.

Sea clams are marketed directly to processors or shuckers, where they are processed into chowders, dips and fried clam strips. The major recent change in this process has been the relocation of processors to areas outside New Jersey due to concerns about rising land costs and environmental regulations.

## *Barnegat Light: Tilefish Capital of the World*

The experience at Barnegat Light shows that commercial food fisheries, charter/party boat fisheries and pricey resort communities can co-exist and mutually benefit. In the 1970s and '80s, multi-use waterfronts were considered trendy and were being actively developed in ports along the East Coast. Barnegat Light has successfully made the transition to a multi-use port as a result of an active fishing community that reached out to both local residents and visitors. Working with the local chamber of commerce, the commercial dock regularly conducts tours that explain the different types of fishing gear, the history of the fisheries, and the many efforts that have been undertaken by the fishermen themselves to help ensure the sustainability of the resource.

During the 1970's Barnegat Light was known as the "tilefish capital of the world". These deepwater fish have a taste and texture reminiscent of scallops. Because there was little market for these fish, it fell to the fishing industry to actively promote and market their catch.

The abundance of tilefish dropped off and concerns about deepwater fish made these harvesters focus on other species. This is a common scenario; species are abundant at one time and then suddenly disappear. Records from the colonial era show that the black sea bass suddenly disappeared and then reappeared. These shifts can be due to water temperature, abundance of predators, and salinity changes, among other factors.

Today, long-line vessels fish in deep water on the edge of the Continental Shelf targeting tilefish, shark, swordfish, and tuna. It is not uncommon for long-liners and scallopers to remain at sea for 12 to 14 days. Scallopers travel to George's Bank to harvest sea scallops. The highest quality shellfish are shucked at sea and dry packed to maintain the best quality. Deep-water fisheries are supplemented by small, inshore gillnetters who harvest high quality fish destined for restaurant menus throughout the area.

The long-liners out of Barnegat Light are similar to the Andrea Gale, the boat featured in the movie "The Perfect Storm". As a matter of fact, one of the vessels from Barnegat Light was used in the movie. The Captain tells stories about the director who felt that the boat should be able to make tight turns and tricky maneuvers. Although this was a fun light-hearted activity, many of the boats also perform more serious recovery efforts like searching for the remains of TWA Flight 800.

## *Belford: A History of Relying on the Catch*

To get an idea of how long the lure of sea fishing has played a major role in northern New Jersey, consider this: The first person believed to have chartered a recreational fishing boat out of Sandy Hook was none other than George Washington.

Centuries later, the ports of northern New Jersey would become synonymous with shellfish. At one point, the land under the Statue of Liberty was known as Oyster Island because of the abundance of oysters in the waters surrounding it. However, water quality issues limited the harvest in the second half of the 20<sup>th</sup> century.

Belford rose to prominence as a fishing port in the 19<sup>th</sup> Century as the center for the menhaden fishery and fish processing. Menhaden is an oily fish used in a variety of industrial processes. The menhaden harvest taken from Belford was processed into oil and meal at a nearby plant from the early 1900s until 1987. Between the port operations and the employment opportunities provided by the processing plant, a great number of the area's residents had their livelihoods tied to the fishing industry.

The following excerpt from a Harper's New Monthly story of October 1878 related the importance of the industry to the area.

*The business of catching these fish and reducing them to oil and manure has only lately been developed into large proportions. From the earliest times the coast farmers have been accustomed to catch them in seines and spread them on their fields -- a very unsavory practice; and to some extent oil was pressed from them long ago. But the fishing was all done in small sailing vessels, and depended on the good fortune of the fish coming to the right spot. A few years ago steamers began to be substituted, and are now almost exclusively employed by those who are able to embark any money in the enterprise. Almost seventy are engaged, all the way from New Jersey to Nova Scotia, catching an aggregate of 50,000,000 (fish) a year.*

Clearly, fishing and aquaculture will continue playing a major role in the area's economic picture. The Bayshore Development Office, working in conjunction with entrepreneurs, local fishermen and government agencies, has proposed a commercial fishing and aquaculture project on the outlet of Compton's Creek in Belford. The plans include an aquaculture development facility, a seafood cooperative site that would expand the existing restaurant and add a fish market building with stalls for individual businesses and a park/educational facility. Initially, the aquaculture facility would focus on hardshell clams and would contain a hatchery, nursery and grow-out facilities.

## *Cape May: New Jersey's largest port*

The Cape May peninsula's 108 miles of coastline preordained that its past, present and future would be tied to the water. Even before it was settled by Europeans, the area was known to be a fishing haven for the Lenape Indians as far back as the early 1600s. By the middle of that century, New England whalers in search of whales and land began settling the area.

In the late 1600s, 35 families settled what is now Cape May proper. Their proximity to the coast led most to make a living by harvesting the waters and marketing their catch to Philadelphia, Wilmington and even Baltimore. The barrier islands on the ocean side of the peninsula served as perfect sites for whaling camps, adding yet another dimension to the fishing industry there.

Although the area developed as a tourist center over the centuries, it never lost its appeal as a seaport. Today, it serves as New Jersey's largest – and the nation's sixth-largest – boasting an active, state-of-the-art fishing fleet.

In 2003, harvesters at the Cape May/Wildwood port brought in more than 42 million pounds of finfish and shellfish, valued at over \$74 million. Its trawler fleet consists of large, steel-hulled vessels that venture to distant waters and make trips of longer duration than the fleets in other New Jersey ports. Others at the port include scallop dredgers, scallop trawlers, sea clam dredgers, pot boats, handliners and purse seiners.

Many of the vessels that call this port home are equipped with on-board flash freezers or refrigerated sea water systems, giving them an advantage in keeping fish aboard, especially during the summer months.

Cape May also boasts some of the most modern fish processing and packing facilities found anywhere in the world. Fish from these facilities are sent all around the globe. This epitomizes Cape May's penchant for quickly reacting to shifting international needs, allowing fishermen and processors here to court buyers in all major markets.

A global view helps the port reach markets for species like mackerel and squid, which are not in high demand in the United States but which are prized overseas. The companies located here also are quick to pick up on other species, such as croaker, which can be harvested in our waters and marketed overseas. So successful was one company in gaining international market share that it saw the need to expand to other ports in the United States to be able to meet the demand for similar species.

Commercial fishermen in Cape May have been proactive in efforts to maintain the sustainability of their resources. They have worked closely with the Fisheries Information and Development Center (FIDC) to improve and refine the data collected on species biomass. The fishermen continue to pursue an agenda of meshing anecdotal information from commercial vessels with statistics developed by scientific trips.

## *Point Pleasant: The meaning of fresh*

The first real settlement in the Point Pleasant area was Lovelandtown, a fishing and clamming village established by Charles Loveland in 1810. It occupied an area east of what is now the Point Pleasant Canal and south of Bridge Avenue.

By the 1830s, the first cluster of about 30 homes served as the base of operations for the village, which consisted largely of Loveland family members. Over the decades, the family would produce a long line of baymen making their livelihoods in fishing, boat-building, decoy carving and guiding fishing boats.

The waters around Point Pleasant gave ample reason for the settlers to base their lives around fishing. In 1898, Captain Edward Loveland reported hauling in 2,600 pounds of perch in one day off Mantoloking. By the late 1800s and early 1900s, the baymen branched out into manning the coastal life-saving stations and taking tourists on fishing trips. In the late 1880s, tourists could take a daylong fishing trip on a catboat for the sum of four dollars.

One important event in the ongoing development of fishing and aquaculture was the construction of the Point Pleasant Canal. Though planned throughout the late-1800s, the canal didn't get started until 1916, when a \$30,000 appropriation from the State Legislature enabled the beginning of construction. However, it was suspended soon after for World War I, then restarted again at the war's end. On December 15, 1925, a scoop dredge lifted the soil that would send the salt waters of the Point Pleasant Bay into the Manasquan River for the first time.

Today, the port of Point Pleasant remains a major venue for fishing and aquaculture in New Jersey. In 2003, the port brought in over 22 million pounds of finfish and shellfish valued at more than \$37 million. The fleet – consisting of sea clam dredgers, day boat trawlers and gill net boats – return to the port daily, meaning the catch is truly fresh. This has helped the dock operators partner with a local upscale food store to run a “catch-of-the-day” promotion emphasizing the local harvest.

The Fishermen's Dock Cooperative at Point Pleasant operates two docks, an ice-making machine, cold storage facility, retail store and a truck-loading station. The cooperative's strength lies in its marketing strategy and service to members.

## *Port Norris: The Port the Oyster Built*

By 1880, oysters were the leading fishery product in the United States, with 2.4 million bushels harvested. A 1927 typhoid outbreak erroneously attributed to oysters being sold in the shell (the real cause was later determined to be milk from Chicago) gave rise to the practice of shucking oysters. The labor needed to fulfill this role attracted many southern African-Americans to the area.



In 1957, however, the oyster industry collapsed due to a protozoan parasite that decimated the oyster beds. It took nearly 40 years to rebuild. By 1997, oystering began to make a comeback, with more than 102,400 bushels harvested.

The development of the Port Norris area in Cumberland County followed a familiar pattern, with Lenni Lenape Indians first utilizing the oysters from the Delaware Bay, then European settlers expanding their own personal use into commercial operations. The Lenape used the oysters for food and the shells for decoration. Large pile of shells, known as “middens” could be found centuries later as evidence of oyster use.

In the late-1600s and early-1700s, European settlers began settlements based on the oyster trade. As towns and markets grew, the original subsistence use of oysters turned into large, more widespread trade. As early as 1719, New Jersey found it necessary to pass laws aimed at preventing over fishing of oyster beds, although those measures had little effect

In 1876, the oyster trade grew even larger as the railroad came to the Maurice River, allowing shipping of oysters to even further markets. That growth in the trade led to the emergence of towns like Port Norris, Bivalve and Shellpile, names indicative of the trade that spawned them. In addition to fishing, nearby towns like Leesburg and Greenwich became known as ship-building centers. The A.J. Meerwald, now known as “New Jersey’s tall ship,” was among the ships produced there.

The seafood trade in and around Port Norris created a new prosperity to South Jersey. At the peak of the oyster industry in the late-1800s, Port Norris boasted more millionaires per square mile than any other New Jersey town.

# Societal Aspects of Fishing and Aquaculture



As mentioned in the earlier section of this report on New Jersey's six major ports, fishing and aquaculture have long helped shape the society surrounding their operations. Just as the fishing villages and whaling camps of past centuries influenced the evolution of nearby communities, so today does the fishing and aquaculture industry continue to positively impact society.

Most obvious among those effects are the economic ones. All told, the industry brings in \$4.5 billion annually from fisheries, aquaculture and recreational fishing. This is part of a \$50 billion-a-year "Coastal Zone" sector of the state's economy, which employs one out of every six people working in New Jersey.

The seafood industry's jobs aren't limited to the nearly 3,000 fishermen on the boats. Thousands of people work in the state's seafood processing plants and wholesalers. Their wages, in turn, keep afloat a variety of businesses from which they buy goods and services.

In 2003, the New Jersey fish and shellfish harvest totaled \$121 million in "ex-vessel" value, the amount paid to fishermen at the dock when they return with the catch. For that year, 170 million pounds of fish and shellfish were landed. New Jersey's top harvests are sea scallops, surf clams, ocean quahogs and hard clams.

The industry's ups and down have led to many innovations, both in the way fishermen organize themselves for economic benefit and in the adaptations to environmental and quality-control concerns.

The "fisherman's co-op" is perhaps the best example of how industry practitioners can band together for maximum economic benefit. These arrangements date to the 1950s in New Jersey, when a co-op was established at the port of Belford. Historically dependent on finfish that are shipped to New Jersey and New York wholesalers, the co-op has shared facilities that provide dock space, ice and marketing services.

Most recently, the co-op established an on-site retail market and a restaurant, a tip of the fishing cap to the changing nature of how their catch is marketed. Together, the fishermen have been able to create the kind of well-rounded marketing operation that may not have been possible working individually.

## *Fisherman's Dock Cooperative*

Around the same time the Belford co-op was established, another was formed at Point Pleasant. Working together for their common good, fishermen can reap more of the benefits of their hard work than if they were to bring their catch to a private dock owner to pack. The private dock owner can act as a dictator, with a take-it-or-leave-it approach.

The co-op arrangement, however, brings with it the kinds of obstacles that face any democracy. As Jim Lovgren, a member of the co-op, said, "You've got 15 members, so that's 15 different ideas." A chance in 1979 to purchase a nearby dock property that had been a clam processing plant drew mixed reaction from the members, with younger fishermen favoring the purchase and older ones asking, "Why should we stick our necks out?" Lovgren said.

The co-op decided against buying the property, whose asking price at the time was \$600,000. A year later, Lovgren said, the property was worth \$2 million.

One of the challenges faced by the co-op is the diversity of the port. Commercial fishing operations share the area with charter fishing boats and other pleasure boaters. Over the past 20 years, the boats in the party fleet have grown bigger, while the fleet itself has remained about the same size or diminished by a few boats.

Tensions can arise over the interaction between the commercial and party boat operations, mainly over who has more of an interest in catching a limited number of fish.

Party boats may spend as much into the local economy as \$20 per fish for what they catch, while commercial fishermen, who see themselves as the "hunter-gatherers bringing the fish to market," spend considerably less per fish due to economies of scale.

The analogy Lovgren draws is of someone asking whether it is more important to have someone grow a few tomatoes in their back yard or to have a large-scale vegetable farm producing thousands of tomatoes for the public to buy.

The analogies to farming are not lost on the co-op's fishermen. After all, it was the New Jersey Agriculture Department that helped form the group more than five decades ago.

"The one thing you see different about fishing and farming is that when a county agriculture board has a meeting, there's 20 or 30 people in the room," Lovgren said. "You try to get 20 fishermen in a room to work together. The only way to do that it seems is to have the government threaten to shut down the industry."

"Would the industry benefit from a tie-in to agriculture? I think so. I think agriculture and fishing could strengthen each other. What is fishing doing under the U.S. Commerce Department? We (also have oversight) by the National Marine Fisheries Service, the Department of State, U.S. Fish and Wildlife, the Coast Guard. Nobody really has enough of a piece to make a coordinated effort to help the industry."

## *Technological Advances*

Many fishermen will tell you those multiple levels of regulation can be frustrating and counter-productive to the industry. But there have been positive side effects of such demands to abide by environmental and safety regulations.

Just as the ships in which they sail have evolved over the years from schooners to today's powerful vessels, so too have the tools of the trade used by the modern-day fishermen. The growth of the industry in New Jersey has allowed the state to see first-hand the latest in fishing and aquaculture technology.

After water-quality issues arose in the mid-20<sup>th</sup> Century, restrictions were placed on the harvesting of shellfish off northern New Jersey. Instead of abandoning that market, the industry set out to create the technology necessary to keep it thriving. Clams harvested in designated waters off Monmouth County cannot be marketed directly. They must first undergo a self-cleansing process to purge themselves of bacterial impurities or contaminants they may have ingested through the water.

Two depuration plants currently operate in Monmouth County. One is privately financed while the other uses several sources of grant funding. After the first plant opened in Monmouth County, the number of clambers increased and the harvest grew by about 50 percent. An additional depuration plant is part of the Bayshore Development Office's project, as is a shellfish processing facility using high hydrostatic pressure (HHP), a technique that increases the safety and shelf life of the product, but which can be costly to implement.

Updated technology also helps the fisherman at sea. Beyond the modern equipment that helps captains find fish easier, many of the vessels at New Jersey's ports are equipped with on-board flash freezers or refrigerated sea water systems, giving them an advantage in keeping fish aboard, especially during hotter summer months.

A good glimpse into how technology and modern understanding can help revive the shellfish industry can be found in the New York/New Jersey Baykeeper program, a volunteer group working to re-establish oyster beds in three key locations – Liberty Flats to the south of the Statue of Liberty, the Raritan Bay in Keyport and the Navesink River near Oyster Point in Red Bank.

On a recent humid afternoon, volunteers from the NY/NJ Baykeepers loaded bags of young oysters onto boats docked behind Bahr's Landing in Atlantic Highlands for a trip up to Oyster Point. The oysters were the product of "remote setting" – the attachment and metamorphosis of hatchery-raised oyster larvae to clam shell substrate – in tanks operated by the Baykeeper group, Brookdale Community College and Bahr's Landing.

As Baykeeper's oyster program technician Katie McCrone explained, the oysters were to be taken to a restored reef at Oyster Point. The program began in 1999 at the Liberty Flats site, and has been underway in the Navesink River since 2002.

“We grow them here in the tanks until they are about the size of a quarter,” McCrone said, showing off the young oysters. “Then they’re transferred down to the reef. Historically, there had been a large population of oysters there. That’s how Oyster Point and the Oyster Point Hotel got their names.”

Oysters, once an integral part of the Hudson-Raritan Estuary system, play a key role in their environment. They are referred to as “bioengineers,” since their growth and accumulation provide a habitat for a broad community of aquatic life. They also play an important part in keeping bay water clean, as one adult oyster can filter up to 50 gallons of water per day.

Decades ago, vast numbers of oysters with names like Amboys, Shrewsburies and Navesink Goldens were harvested across 350 miles of oyster beds stretching from New Jersey to New York. Disease, pollution and, to some degree, overharvesting created a severe decline in that population, impacting not only the oyster industry, but also the health of the estuary system.

It is hoped the Baykeeper project and other similar restoration efforts can reverse that trend.

“This year, for the first time since we’ve been doing this in the Navesink, we are seeing natural oysters occurring there beyond what we’re putting there,” McCrone said. “Once they’re on the reef, we monitor them once a month to see how they’re doing.”



LEFT: Young oysters on clam shell substrate. RIGHT: A bayman loads bags of young oysters for a trip to the Navesink River oyster reef, where they will continue growing.

## Environmental adaptations

Like nearly every business over the past 30 years, fishing and aquaculture have had to adapt to increasing demands to protect the environment. It's been a double-edged sword, decreasing efficiency in the short-term while ensuring an environment that can sustain fisheries in the long-term.

In some cases, it has meant shifting to techniques that aren't the fishermen's favorite. For instance, the most efficient technique for wild harvest is the otter trawl, but it also draws the most fire from environmentalists for the way it stirs up the ocean. The least efficient method is the hook and line, with numerous individual hooks spread across a long line. However, it is favored environmentally because it does the least to disturb the surrounding habitat.

Another example of environmental adaptation is the scallop fishery. At one point, the scallop fishery was closed across the entire George's Bank – the area starting just southwest of New England that suffered from over-fishing in the mid-20<sup>th</sup> Century. The scallop fishery was closed to allow the yellowtail flounder and scallop resources to rebuild. To avoid a repeat of the circumstances leading up to that closure, the fishermen modified their gear so that the dredges did not drag along the bottom and pick up yellowtail as a by-catch.

As a result of that change, along with better data collection and effective management plans, the stocks of both yellowtail flounder and scallops made a comeback.

Sometimes, the changes forced upon the industry by environmental interests don't achieve the goal the environmentalists had hoped for.

One such issue occurred in a movement to encourage American chefs to boycott swordfish. The high-quality swordfish harvested by the local long-line fleet rapidly lost market share to cheap imports from countries that allowed the harvest of fish that would have been considered below the legal size limit domestically. Ultimately, this led to the depletion of migratory breeding groups and a correlating decrease in swordfish stock. Finally, the federal government stepped in to prohibit the importation of the smaller fish.

Today's successful fisherman knows the value of sound management plans and environmental regulations in safeguarding the future of the catch. Logic would dictate that fishermen want to keep the waters clean and avoid over-fishing to ensure the continuation of their catch. But logic often takes a back seat in the environmental debates about the industry, said Gregory DiDomenico of the Garden State Seafood Association.

“They believe this industry should be held to a standard where you have zero impact,” DiDomenico said of the members of large environmental groups, known as “enviros” to fishermen. “How can you do that? In your daily life, you can't drive a car, use energy, create waste, consume things in your personal life without creating an impact. Then you

look at the industry and say, 'You guys can't have any impact at all.' It's completely unfair."

At times, it can seem to fishermen that the myriad environmental regulations make it tougher and tougher to stay in business. Some don't foresee the next generations of their families following them into the industry, and in some cases actively dissuade their children from pursuing it.

## *One fisherman's story*

Jim Lovgren's grandfather came with six brothers to America from Sweden after World War I. They brought with them the fishing life they had led in their homeland.

Two generations later, Lovgren, who is 48 years old, wonders if there'll be another generation to follow.

"When I grew up in the '60s and '70s, and my father was a fisherman, generally your father wanted you to be a fisherman, too," said Lovgren, now a member of the Fisherman's Dock Cooperative at Point Pleasant. "Now, if your father's a fisherman, generally he wants you to be anything other than a fisherman."

Harvesting the ocean's bounty has never been an easy life, what with long hours, sometimes treacherous ocean conditions and uncertain pay. But foreign competition, strict environmental regulations and numerous opportunities in other fields make it more difficult now to pass on the business to a new generation, Lovgren said.

Lovgren's two older sons, Eric, 25, and Keith, 21, have already staked out other career paths, although they have helped him with the business in recent years. His youngest, 18-year-old Jimmy, may yet seek the seafaring life, "and if he wanted to, I wouldn't oppose him."

For one thing, it's a business that a high school graduate can enter and make a good living almost from day one.

"I came out of high school in 1974, and I was making \$30,000 to \$35,000 right out of high school," Lovgren said. "My friends went on to four years of college and when they came out, they were still making \$20,000 a year as teachers. But now they're retiring with full benefits and big pensions."

For fishermen just starting out now, the seas are much rougher than in the free-wheeling '70s. While Lovgren sees a restrictive regulatory climate as the biggest obstacle to fishing success now, he also has been keen on capitalizing on market innovations like the Fisherman's Dock Cooperative.

The group helps build cooperation not only between the commercial fishermen, but also among the various other businesses – pleasure fishing charter boats and other pleasure-boating operations – that must co-exist at Point Pleasant.

"The Point Pleasant Beach people understand the value of the fishing industry to the town," Lovgren said. "We're the town's biggest employer."

While that draws a certain amount of cooperation locally, Lovgren worries about the national attitude toward his industry. He sees it as the result of a concerted campaign by other industries to deflect criticism leveled at them for damage done to the oceans.

After the Exxon Valdez oil spill in Alaska, he said, oil and chemical companies took major hits for the impacts their products had on the oceans. Lovgren believes they have proactively tried to paint fishermen as the ones doing the most damage to the seas.

“One hundred million dollars (in public relations) later, we’re the bad guys,” he said. “Meanwhile, Exxon still hasn’t paid the commercial fishermen in Alaska for what they lost due to the oil spill.”

Lovgren blames some of his own brethren for allowing the fisherman-as-bad-guy image to be developed without much fighting back.

“Our biggest strength as fishermen, that we’re fiercely independent, is also our biggest weakness,” he said. “It’s kept us from becoming unified, so we can’t get enough support on a national level to get anything done. Some of our people are just like the rest of the country. As long as they’re making money, they just sit in front of their TV, drink their beer and say, ‘I’m happy.’”

Lovgren is optimistic that within five or six years fishing limits in the Mid-Atlantic region will loosen up and the industry will be more robust.

“In the ’60s and ’70s, the foreign countries wiped out our fishing grounds,” he said. “Then in 1976, the Magnuson-Stevens Fishery Conservation and Management Act kicked the foreigners out. Then the American fleet expanded and we started wiping the fish out. By the time we realized what we were doing, it was really late in the game.”

However, management practices since then have brought the fish back.

“Fish in the Mid-Atlantic are coming back gangbusters,” Lovgren said. “We’re seeing the benefits of proper management.”

The fisherman hopes such a turnaround can spark interest among a younger generation to at least explore the career. Besides his own sons, Lovgren’s fishermen brothers Dennis and Billy, have two and three sons respectively, but none seems interested yet.

“It’s a long way away, so you don’t know what will happen,” Lovgren said. “It is hard work, and it can be dangerous work. But at the end of the day, it’s an honest living and you’ve fed people.”

### *Community ties*

In centuries past, fishermen like Lovgren weren’t likely to wonder if their offspring would enter the industry. The life was so ingrained in the nature of the towns that sprung up around fishing villages that just about everyone who lived in those towns made their living in some way, either directly or indirectly, from the fisheries.

Lawrence Schmidt, Executive Director of the Tuckerton Seaport Village and Museum, recalled how New Jersey's coastal towns revolved around the industry.

"Tuckerton's heyday was really in the mid-19<sup>th</sup> Century or just a little earlier; it was a pretty bustling little place," Schmidt said. "A lot of these little towns thrived and even owed their existence to commercial fishing, and to some degree the sport fishing industry.

"But with the collapse of the shellfish industry, a lot of these towns lost the major thrust of their economies. As those things died out, the people living in those towns pursued other opportunities."

Most of the shore towns these days see themselves as "maritime resorts" more so than fishing and aquaculture towns, Schmidt said. New developments have brought in residents with little or no ties to the industry, and a large number of the towns have populations that dramatically dip after Labor Day.

Yet it is that very shift toward tourism that may offer one of the best opportunities for the seafood industry, Schmidt said.

"One of the things people are looking for these days from tourism is a destination that is something unique, experiential and authentic," he said.

Towns where commercial fishing still thrives would do well to look to Gloucester, Massachusetts, on Boston's north shore.

"There's still a very active commercial fishing industry there," Schmidt said, "But tourists love to come and watch the fleets come in. They're able to have fresh seafood. They go to the docks and converse with the watermen and the baymen. They talk to them about what it takes to continue that kind of operation in 21<sup>st</sup> Century realities.

"The small towns that dot the Jersey shore have an opportunity to capitalize like that. There's something very homey and approachable about it, something very picturesque about a maritime community like Tuckerton or Port Norris or Cape May with its Victorian architecture. Yet on the northern end of Cape May, you've still got a number of commercial and charter operations."

Some of the elements already exist for such a co-mingling of the seafood and tourism industries, said Gregory DiDomenico, Executive Director of the Garden State Seafood Association.

"You've got places like the Lobster House in Cape May, which is, I think, one of the top-ten grossing restaurants in the country," DiDomenico said. "And you've got boats coming in there all the time. It's an area where people could see the industry at work. Viking Village also does a good job with their restaurant. Their community knows they're there."

Port Norris also could see opportunities in the agri-tourism or eco-tourism arenas. A 1996 eco-tourism plan designed by Cumberland County leaders identified six areas that could be targeted for eco-tourism growth. Of the six, four had to do with the county's maritime characteristics.

According to a section of the web site of the Cumberland Development Corporation (CDC), tourism possibilities along that line include, "marine-based industries and recreation amenities; tracing Cumberland County's Maritime Heritage; boating adventures in Cumberland County; (and) hunting, fishing and crabbing opportunities..."

A \$300,000 marketing initiative in 2002 targeted local residents, visitors and investors, but "there is a need to go further to attract the tourism dollars," according to the CDC web site. One big obstacle to attracting tourists to the area is a lack of hotel rooms. In the two-county Southern Shore Region that includes Cumberland and Cape May counties, more than 96 percent of the tourism-related expenditures went to Cape May. The CDC recommended:

"Lengthening the stay of tourists – at a minimum, accommodating a greater number of overnight stays – is a key element to gain tourism dollars. Since Cumberland County does not have major attractions, it will be critical to package destinations together for potential tourists to entice them to extend their stay."

Clearly, any one of New Jersey's six major ports could pursue the Gloucester, Massachusetts, model mentioned by Tuckerton Seaport's executive director, but it would take a concerted effort in some cases, as evidenced in Port Norris, to also provide the amenities needed to accommodate tourists. Whether residents in largely rural areas like Cumberland County would be receptive to such development would remain to be seen.

That could depend, Garden State Seafood's DiDomenico said, on how well the industry can make itself a known quantity in its host communities.

"We're so hidden, in many cases, that I'm not sure the local community knows we're there," he said. "You talk to people in the food store, in the restaurant business, and they don't seem to have a clue that New Jersey is a tremendous source of seafood."

A big part of that public education effort is one-to-one relationships between the fishermen and members of groups like local Chambers of Commerce and other business organizations.

"That's where you see the benefit of people like Jim Lovgren at Fisherman's Dock Co-op and Ernie Panacek of Viking Village," DiDomenico said. "They're real local people who do a lot of work in their communities. People know those guys and know what they do."

Another paradox for the industry is that while 78 percent of seafood consumed in the United States is imported, that doesn't mean that there aren't large quantities of fish being caught domestically.

"We import a lot of fish to meet domestic demand," DiDomenico said, "but we also export a whole lot of fish to other countries."

Fish that previously would have been exported are now staying in the United States in greater numbers, though. As New Jersey's ethnic populations rise, fish that would have been exported to places like Asia are finding their markets much closer to the home ports.

Monkfish is one example, Fisherman Dock Co-op's Lovgren said. Asian groups are big consumers of monkfish, Lovgren said, which is especially prized for a soup made from its liver.

As more U.S. residents who traditionally wouldn't have strayed from flounder and tuna are exposed to other tasty varieties, more of the fish caught off New Jersey will stay in domestic markets, DiDomenico said.

"It's about cultural trends," he said. "Some people will only eat flounder. But we've got great sea bass and monkfish and scup and mackerel and squid. The more people try them, the more they go for the different varieties."

### *Branding New Jersey Seafood*

In early-2005, the first effort to brand a seafood product under the "Jersey Seafood" label and standards was kicked off as the New Jersey Department of Agriculture partnered with the USDA to award a \$47,100 grant to a group of seven aquaculture producers to market clams.

The New Jersey Seafood Marketing Group, led by third-generation bayman George Mathis of Egg Harbor Township, began selling fresh, locally raised hard clams in mesh bags at retail stores and farm markets.

"I hope that the quality standards that we are implementing, as well as the new packaging, will go a long way toward furthering consumer interest and purchasing of the best available product," Mathis said at the launch of the new effort.

# **Seafood and Diet**

**A Great-Tasting Way to Good Health**



Hardly a day goes by without some new study showing the health benefits of eating more fish and shellfish. From increased heart health to fending off Alzheimer's disease, recent studies have touted seafood's ability to provide better health.

Some studies have focused on seafood alone, and have shown numerous advantages to be gained by eating a diet rich in fish and shellfish.

The reasons are many. First, all seafood is low in fat, typically less than 5 percent fat, and most is low in cholesterol. At the same time, seafood provides an excellent source of high-quality protein. Oily fish are very high in Vitamin D, and seafood is an excellent source of minerals such as iron, zinc, niacin and iodine. By comparison, oysters and mussels have nearly three times as much iron as most meats.

Garnering much attention in the medical press lately are the "Omega-3" fatty acids that are commonly found in fish oils. Fish such as salmon, tuna and mackerel are the richest sources of Omega-3 fatty acids, which can inhibit blood clotting and help keep arteries from becoming clogged. They also lower the circulating levels of blood fats and blood pressure, thereby reducing the risk of heart attack.

Baking, broiling, poaching, steaming, stir-frying, grilling and sautéing are the best ways to cook seafood to ensure it retains the most of its healthful properties. Deep frying is the least beneficial method as it destroys more of the Omega-3 fatty acids and also adds high levels of bad fats to the meal.

### *It's brain food*

Generations of parents and teachers weren't too far off when they touted fish as "brain food." While it may not have caused you to be as intelligent as you are, recent studies have shown that seafood does help people maintain their mental acuity, perhaps even warding off Alzheimer's disease.

A recent *USA Today* article said that seafood "is becoming to Alzheimer's candidates what the aspirin-a-day regimen is to many heart patients." The article cited studies by Tufts University in Boston, Rush University in Chicago and the University of California-Los Angeles, all showing seafood was important in protecting against the onset of Alzheimer's.

In the Rush University study of 815 men and women, covering a four-year period, researchers found that eating fish at least once a week produced a 60-percent reduced risk of developing Alzheimer's.

Additionally, some research has shown that fish oils and Omega-3 fatty acids can be used to replace prescription anti-inflammatory drugs. Recent scares about inflammatory drugs like Vioxx have heightened awareness of the drugs' down side. In a recent Dutch study,

more than two-thirds of participants were able to substitute fish oils and Omega-3 fatty acids for anti-inflammatory drugs.

Still, most Americans don't get enough of the fatty acids from fish that foster learning and protect memory, the researchers found. Eating two to three fish meals a week would ensure that protection, the studies found.

One reason people don't get enough fish in their diets is the concern over mercury. However, the risk from mercury by eating fish and shellfish is not a health concern for most people. Women who are pregnant or who may become pregnant, nursing mothers and young children are most susceptible to harm from mercury. Therefore, it is recommended those groups follow three rules:

1. Do not eat shark, swordfish, king mackerel or tilefish.
2. Eat up to 12 ounces (two average meals) per week of fish and shellfish that are lower in mercury, including flounder, scallops, clams, sole or freshwater trout.
3. Check local advisories about the safety of recreational fish caught by family and friends in local lakes, rivers and coastal areas.

### *Raw or cooked?*

Eating raw seafood is one of those ideas where people find little middle ground. Either people enthusiastically partake of raw seafood or they turn up their noses at the prospect.

Eating raw seafood such as oysters, sushi, sashimi and ceviche can be done safely, although the consumption of any raw or undercooked protein can pose a risk of food-borne illness.

However, certain individuals whose immune systems are weakened may not be able to effectively fight bacteria in raw foods, and should enjoy seafood only when cooked. Those at-risk groups include people with liver disease, diabetes, cancer, immune disorders including HIV infection, anyone using steroids for conditions such as asthma or arthritis and anyone with hemochromatosis, an iron disorder.

The Food and Drug Administration recommends cooking most seafood to an internal temperature of 145 degrees for 15 seconds.

## Preparing seafood

Those more familiar with cooking meat than seafood should simply remember that the rules are turned upside down. Unlike with meat, seafood does not need to be tenderized by cooking. In fact, cooking seafood too long has the opposite effect, making it tougher as its natural juices are lost.

When cooking whole fish, steaks or fillets, cook for 10 minutes per inch, as measured at the thickest part. For less than an inch, shorten the time accordingly; i.e. half-inch, five minutes.

Color is the best sign for determining the cooking time for shrimp, lobster and scallops. Shrimp and lobster turn red and the flesh becomes white. Scallops firm up and turn a milky white color

The shells of other shellfish are the best gauges. Clam, mussel and oyster shells will open when they are done cooking. Those that stay closed should not be used.

When buying shellfish, make sure they are coming only from reputable sources. Shellfish bought live should be kept alive and refrigerated properly until ready to prepare. Live clams, mussels and oysters should be stored in well-ventilated refrigeration, not air-tight bags or containers.

## Differences in nutrition

Remember that *how* seafood is prepared can make all the difference when counting calories and fat.

A recent article in the Dallas-Forth Worth *Star-Telegram* gave the following examples:

- ✓ Two cups of Manhattan clam chowder have 256 calories, 8 grams of fat, 32 grams of carbs and 14 grams of protein. By comparison, New England clam chowder has 542 calories, 40 grams of fat, 29 grams of carbs and 16 grams of protein. Lobster bisque weighed in at 710 calories, 58 grams of fat, 32 grams of carbs and 16 grams of protein.
- ✓ While shrimp is typically low-calorie, not so when served with scampi sauce. A typical shrimp scampi dish (eight shrimp with pasta and sauce) contains 830 calories. An eight-ounce broiled halibut, by comparison, has 317 calories.
- ✓ Finally, what you put on your fish makes a difference, too. One tablespoon of tartar sauce, with its mayonnaise base, has 74 calories and 7.5 grams of fat. The same amount of cocktail sauce, by comparison, has 15 calories and 0.1 gram of fat.

# Conclusions



Clearly, New Jersey's fishing and aquaculture industry faces great challenges while also enjoying certain advantages over its counterparts in other states.

Foremost among those advantages has been a historical willingness to be innovative, to try new approaches and to look at regulatory and natural obstacles as hurdles to be overcome, not roadblocks to elicit surrender.

The cooperatives formed at both Belford and Point Pleasant more than 50 years ago speak to that willingness to innovate. The recent moves at both ports, as well as in Barnegat Light, to embrace direct marketing techniques for the fleets' catches also speaks to a flexibility that can lead to greater success.

The ability to work within fair, beneficial management plans ensures New Jersey's fisheries a more even-handed future than those experienced during the days when entire species were practically wiped out due to over-fishing.

Also, the state's position in a high-technology corridor allows ready access to the kinds of on-board freezing and other apparatus that can make each crew's journey more efficient and profitable.

Finally, a support system of academic institutions and government agencies interested in enhancing the viability of the industry brings a level of security that the captains and their crews are not in this alone.

### *Moving forward*

There is no doubt that New Jersey's wild harvest and farm-raised seafood is among the most delicious. But, as much as the state is known for its seashore resorts, the fishermen lament that this connection does not extend to the same degree to the seafood industry.

Accordingly, a stepped-up public relations/public education effort is a key component for the industry. Fortunately, a good model already exists in the Department of Agriculture's "Jersey Fresh" campaign for produce. That logo has become widely known throughout the nation, as far away as Washington State and into Canada.

"Jersey Fresh" branding was used as a template for the recently launched "Jersey Seafood" web site, which seeks to do for seafood what its predecessor did for Jersey produce. Additional public relations/education campaigns should be explored and, where feasible, pursued to elevate the awareness of the state's great seafood.

Just as agri-tourism has provided expanded opportunities for farmers, a tie-in between the seafood industry and tourism would also be a benefit. The Gloucester, Massachusetts, example should be studied for approaches that could be applied in New Jersey.

Clearly, this could be more easily pursued in the seashore resort towns near the major ports than in a Delaware Bay location like Port Norris. However, the growing popularity of eco-tourism could lend itself to developing a tourism link for Port Norris as well. As mentioned in this report, such a move would take a concerted effort to build the kind of infrastructure needed to support tourism.

This kind of development linked to the shellfish industry in the Delaware Bay could help the industry in its comeback there. Improvements in water quality, as well as the work of such institutions as the Haskins laboratory in researching shellfish diseases, have given that comeback a fighting chance. While more needs to be done, support for the industry garnered through tourism related to it could provide the impetus for future advancement.

Finally, New Jersey's seafood industry would benefit greatly from a greater and clearer perception of it as part of the state's overall agricultural landscape. Fishermen themselves admit they are not adept at organizing their rather independent-minded colleagues into a cohesive unit that can fight for the industry.

Embracing the seafood industry as part of the whole of agriculture would add a voice that has proven successful in standing up for the rights of farmers. That community has been able to mobilize to slow the loss of farmland in New Jersey to where the state now preserves more farmland than it loses each year. It has found a way to work with other, sometimes oppositional, constituencies to build support for farming as a great contributor to New Jersey's quality of life.

It is in that last area that the New Jersey Department of Agriculture can be of greatest assistance to fishing and aquaculture. By introducing the principles and practices that have helped keep land agriculture vital in New Jersey, the Department can bring the same kind of renewed spirit to the state's fisheries and aquaculture.

In this vein, the Department has embarked upon a course to more fully integrate fishing and aquaculture into the definition of agriculture. To date, the Department has undertaken a number of initiatives, which should be enhanced and broadened to aid the industry.

They include the Jersey Seafood web site; the issuance of aquatic farmer licenses allowing producers to demonstrate definitive ownership of organisms being cultured; the creation of an Aquaculture Advisory Council charged with developing a business-friendly and environmentally sound policy framework to foster the growth of aquaculture in the state; and the Department's involvement in Jersey Seafood promotional events involving the state's leading chefs.

This report was prepared to stimulate discussion in the industry and general public about the ways New Jersey can further foster a vital and sustainable seafood industry. Anyone with ideas about improving the viability and vitality of the industry is welcome to send comments via e-mail to [jeffrey.beach@ag.state.nj.us](mailto:jeffrey.beach@ag.state.nj.us).