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**a 20th anniversary roundtable**

**march 24, 1994**



# **FISHERIES OF NEW JERSEY: A Twentieth Anniversary Roundtable**

March 4, 1994

Quality Inn  
Route 37 West  
Toms River, NJ

**Sponsored By:**

**NJ Sea Grant Marine Advisory Service  
NJ Sea Grant College Program  
Rutgers Cooperative Extension  
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Rutgers Institute of Marine and Coastal Sciences  
Ocean County Board of Chosen Freeholders**

**Edited By:**

**Gef Flimlin  
Marine Extension Agent  
NJ Sea Grant Marine Advisory Service**



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## PREFACE

On March 4, 1974, the Food Science Department and the Cooperative Extension Service of Cook College, hosted a program titled, "New Jersey Fish Industry, A Roundtable." The program was designed for free discussion and interaction among experts and the interested public to examine the status of the fishing industry.

The basic questions of the Fisheries Roundtable were:

- \* What are the problems?
- \* Where do the problems exist?
- \* What information and resources are available to solve these problems?
- \* What further steps are necessary to solve these problems, on a short term basis?
- \* What are the long term implications associated with these problems?

The program was attended by 26 people who discussed all the aforementioned topics, and produced a proceedings document which made a number of recommendations, many of which were acted upon within the ensuing years.

Since that time there have been many challenges for the commercial and recreational fishing industries in New Jersey and many have been successfully resolved.

Perhaps now, in the last decade of this century, on the twentieth anniversary of the original roundtable, it would be good to re-visit these industries, and these questions, to determine where the fisheries should go in the next millennium.

**Editor's note and acknowledgements:**

The reader of this document may find inconstancy between the style of presentation of the various participants in this proceedings. It should be noted that there was a court reporter present at the event who tried to take a verbatim transcript. Unfortunately the result was less than satisfactory when one read her final document. All authors were supplied with their verbatim text and urged to correct or edit what it was thought they had said. Some returned completely rewritten text about their subject, some made minor corrections and a few made no effort. The editor and other MAS staff assisted wherever possible to make sense of what was unedited. The results speak for themselves.

The editor would like to thank the participants for their time and effort to make the meeting a success, as well as these proceedings. Thanks also go to Chet Teller for the original idea over ten years ago; Colleen Vaughn, the court reporter who valiantly attempted to make sense of MSY, NMFS, Amendment Whatever and all the other fisheries related mis-speak which was spoken; Traci Bacek for a first stab at correcting the original transcript; Stew Tweed and Eleanor Bochenek who badgered some of their constituents into editing their own remarks; Barbara Wingender and Mary Ann Dreikorn of Rutgers Cooperative Extension of Ocean County for their assistance in the production of document; the Ocean County Printing Department for the printing the proceedings; and to the Steering Committee and all the organizations who made the Fisheries Roundtable a success.

## FISHERIES OF NEW JERSEY ROUNDTABLE 1994

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**MR. FLIMLIN:** Good morning. My name is Gef Flimlin. I'd like to welcome you to "Fisheries of New Jersey, A 20th Anniversary Roundtable." The impetus for this conference actually started ten years ago when one of our staff, working as the Advisory Service communicator, suggested that it would be interesting to re-examine the roundtable discussion that was done ten years previously at Cook College. In 1974, the Food Science Department and the Rutgers Cooperative Extension Service held an open discussion with approximately thirty people in attendance. After looking over the notes and schedule for that day, I saw that they had six speakers and the session ran from nine until five. Today we have 31 speakers, and we're going to keep in the same time frame.

We had a Steering Committee who assisted in organizing this program and I'd like to thank them members of the Steering Committee for all their assistance in this program. They are Roger Locandro, Rutgers Cooperative Extension, Robert McDowell, NJDEPE Division of Fish, Game and Wildlife, Linda O'Dierno, NJ Department of Agriculture, Mike DeLuca, Rutgers Institute of Marine and Coastal Sciences, Captain Jim Lovgren, Fisherman's Dock Cooperative, Saul Philips, Philips Seafood, Bgt. Lt. and Pt. Pleasant, Neil Berger, Cape May Seafood Association, Cold Spring Dock, Capt. Tom McVey, Mid-Atlantic and Atlantic Coast Shellfish Council, Raymond Bogan, United Boatmen of New York and New Jersey, Henry Oberfeld, First Southern Bank, Avalon, Ken Bailey, Delaware Bay Watermen's Association, Paul Smith, Jersey Coast Anglers' Association, and Stew Tweed and Eleanor Bochenek of the New Jersey Sea Grant Marine Advisory Service.

I'd also like to acknowledge the Sea Grant Marine Advisory Service Rapid Response Grants, the New Jersey Department of Environmental Protection for their expertise, the New Jersey Department of Agriculture, and the New Jersey Agriculture Experiment Station for financial support. I'd also like to thank The Rutgers Institute of Marine Coastal Sciences and the Ocean County Board of Chosen Freeholders for their contributions.

Some in the audience might remember some of the names of the people involved from twenty years ago. They may be familiar to those of you who were in on the discussion that day. Ray Richardson from Port Monmouth, Russell Cookingham who was the Division Chief of Fish, Game, and Shellfisheries, Axel Carlson who passed away last year, and Roy Morse who was a Professor of Food Science at Rutgers. When I look over the people who are on today's program I see the same caliber of excellence. We have excellent scientists in this state. We have dedicated managers and we have some of the most informed fishermen on the Atlantic Coast.

Today's program starts off with a retrospective. Dick Roe is the Regional Director of National Marine Fisheries Service's Northeast Fishery Center. He'll be giving the Keynote Address on Fisheries Management, Past and Future.

## **RICHARD B. ROE: FISHERIES MANAGEMENT - PAST AND FUTURE**

### **INTRODUCTION**

It certainly is a distinctive pleasure to be here at the Roundtable, and I am flattered to have the honor of offering the keynote remarks. The occasion is especially rewarding since I was born and raised in New Jersey, had the privilege of graduating from Rutgers, and was weaned

in fisheries working for the NJ Fish and Game - albeit back in the mid to late fifties. Much of my experience during those formative years was spent on lake survey, and although I take great

pleasure in extolling the virtues of our efforts, there are those today who say the State still hasn't recovered from the era!

What changes have occurred in marine fisheries management since 1956, when I worked here in the State and particularly in the last decade? I could easily spend the day reminiscing but Gef was quite explicit in his instructions, and I note you've got a full agenda for the day.

I was asked to talk about where we are and where we're going in marine fisheries, touch on the similarities between here and in Canada, and speculate on the upcoming Magnuson Act reauthorization. No mention was made of questions and answers but if permitted, I would be happy to do so at the end.

#### **WHERE WE ARE IN MARINE FISHERIES MANAGEMENT:**

The passage of the Magnuson Fisheries Conservation and Management Act in 1976 ushered in an entirely new and wide sweeping approach to the management of our marine resources. Its most significant innovations were the establishment of a 200 mile sovereignty zone and regional management councils. The zone, commonly called today the EEZ - Exclusive Economic Zone - stimulated a world rush by coastal States to similarly declare their EEZ's, and substantially altered the manner in which nations fished abroad, and in each other's backyard. This sounded the death knell for foreign fishing within our boundaries though some time would pass before all disappeared. Here in the northeast nearly all foreign fishing was immediately terminated, though a fishery for mackerel persisted through the early 1990's.

The second major thrust of the Act, the establishment of eight, regional fisheries management councils, substituted a public participatory process for natural resource management for the standard "Federal" management oversight. The concept was innovative - the governed industries would have a strong voice in the development of the regulatory processes through which they would be governed. The Councils were charged to prepare the management plans; the Secretary of Commerce's role would be to approve or disapprove and implement. In theory, there would be no substitutions of judgement unless the Councils were totally derelict.

Now, some seventeen years later, we ask "has the process worked?" The answer, "not very well". Most of the Nation's marine fisheries are overexploited or on the brink of over exploitation. Here in the Mid-Atlantic/Northeast, the situation is bleak. In New England, the traditional ground fishery for cod, haddock and flounders is just about gone due to depletion of those stocks. We all know what has happened to fluke, though the current plan seems to be turning the tide, and if we can resist the pressure to open the gate, that fishery can be restored.

Why hasn't the act worked; why are our resources so over fished? The answer is largely economics. Under pressure from the industries they must regulate, the councils have more often than not, bowed to the short term economic gain and forsaken sustained, long term biological yield.

A second cause underlying over fishing is a failure to curb the growth of the domestic fleet. Limited entry is not popular with most fishermen and efforts to limit the number of vessels or participants in fisheries has met stiff opposition - particularly in New England. The Mid-Atlantic Council has introduced limited entry in a couple of fisheries; sea clams and fluke. The New England Council has now moved to implement limited entry in groundfish. Now the 64 thousand dollar question on most of our minds, "Is it too late?" If it is we need only turn our attention northward for a perspective of the consequences.

Canada, despite a comprehensive, governmental controlled management program also has come to grief in groundfish. I suspect most of you have followed the recent Canadian actions which have led to the closure of their cod fisheries, and left thousands unemployed. The demise of cod and haddock seems the result of several factors working in concert: over fishing, overestimation of stock abundance, and environmental influence. Which is the principal culprit, I can't judge, but in my personal opinion, the first two factors contributed most to the slide. Whatever, the reason, the fishery is gone and probably won't return before the end of the decade. The economic and social losses to Atlantic Canada are staggering, as is the cost to the people of Canada through financial assistance and training.

Will we need to take similar action? No one, including me knows. The new amendment to the groundfish plan imposed a moratorium on entrances, effort controls (as manifested through limitations on fishing days), mandatory reporting, mesh size regulations, minimum fish sizes, and closed areas. This is a very comprehensive approach that will be difficult to administer and enforce, but in theory can turn the tide. The depressing point is that this is a five year program, whose goal is not to rebuild those stocks, but to overcome the overfishing thresholds. Rebuilding is another day! And how to measure progress? Well in the 1950's the annual landings of haddock averaged around 40,000 metric tons. In 1993, the fleet landed less than 800 mt. We've a long way to go.

Given the current state of our haddock and cod stocks, the prudent thing would be to close the fishery. That's not about to happen I can assure you, because politics won't allow it.

As we limit new permits, and gradually reduce the amount of fishing pressure, we also hope mother nature cooperates with some strong year classes. That would be refreshing; we haven't had a good haddock year class since about 1978, and the last cod year class worth mentioning was in 1987. However, if these measures don't work, and we should have an indication within two years, we may have to follow the Canadians. Our problem with such a draconian approach is our inability to "buy-out or subsidize" the industry like Canada has been doing. There does seem to be a political will on the part of the Congress, and the Administration, to provide some financial support to the troubled industry though I won't speculate on how that might materialize.

There are dangerous economic undertones to closing fisheries though not necessarily on the consumer. After all, we already import over 70% of the seafood we consume, and I'm sure there are import products that can readily substitute for the native product. No, what I refer to is the loss of dockside logistical support. It's not inconceivable that property upon which sits many a fishing wharf is worth much more as a marina or condominium. Once the fisheries usage is lost, and replaced, I seriously doubt it can be reclaimed. Without careful forethought, we could position ourselves so that even with stock recovery, the traditional fishery could not be re-



established. Given a potential \$300 million industry, that's a sobering proposition.

### WHERE LIES THE FUTURE?

Least I cast too much doom and gloom let me speak to the future with a more positive note. I don't think our marine commercial fisheries are necessarily going the way of the dodo. I am optimistic that things will eventually improve both biologically, as well as economically. I don't think, however, the fisheries of the future are going to resemble those of today.

Over capitalization must be held in check; the fleet must match the sustainable yield capabilities of the resources. That means tomorrow's fishing vessels will be fewer in number, more efficient, and less costly to operate. New mandatory seafood inspection programs will require improved refrigeration, better handling, and the production of a quality product. Trips will be shorter but with satellite navigation and improved sonar, less time will be needed to locate and harvest.

Bycatch will be reduced or eliminated through better gear technology. This issue must be addressed throughout our commercial fisheries. The public is becoming aroused at the wanton destruction of non-targeted species whether it be finfish or sea mammals, or anything in between. The conservation community has become very active in this arena, and unless industry comes to grips with the problem, public intolerance of bycatch will become a dominant influence on the survivability of many commercial fisheries.

Management will be different. Although I don't espouse ITQ's as a panacea, I'm beginning to think they're here to stay, and in a smaller, more efficient fishery they make sense. Quota management makes good sense if you can avoid the "gold rush" mentality that immediately sets in with fisheries under the concept. It seems that almost every quota management scheme implemented without limited entry and individual allocations, ends up with increasingly constrained trip limits - that is unless the manager is willing or able to close the fishery when the quota is reached. Even then the gold rush is rarely avoided. A good example is in Alaska where the halibut quota is taken in about three days. Enterprise allocations or ITQ's can be used to avoid that situation, but there are downsides. Monopolies are a risk if not contemplated. There are no provisions with the Act to collect rents for the "sale" of the resource to the stakeholder and thus you and I, the public, give away our public resource to the honored few who reap a windfall profit from the experience. I don't like that one bit and it needs to be addressed before I embrace the concept without reservation.

We're also looking at new and better tools to monitor and enforce the fleet. Beginning this year we'll be requiring many of the vessels in the sea scallop and groundfishery to have onboard vessel tracking systems or VTS's as they're called. These are electronic devices that transmit hourly positions through satellite communication to our shoreside facilities. We'll know where every vessel with a VTS is, whether it be dockside or on Georges Bank. Kind of Orwellian, but given our resource limitations to monitor and enforce, they're a valuable tool for the Service. The technology is not star wars; its available now and is being used nationwide to track such things as rental trucks. We're simply adapting it to the marine environment.

I also believe that aquaculture will play a greater role in the future as we come to recognize there truly is a maximum sustained yield from wild stocks that can't satisfy consumer demand. There are numerous examples of success stories in this arena; shrimp from South America and the Far East; salmon from Norway, Canada and Chile. Up in Maine there is a

blooming mussel aquaculture industry, and Atlantic salmon farming is taking off. In Canada, cod ranching is underway, and researchers have successfully spawned and raised Atlantic halibut. The technology is already available to rear many other valuable marine species, though much research remains.

As to the Magnuson Act, this is a reauthorization year and the question can be asked "will it be extensively amended this time around as a result of the increased focus on stock status?" I doubt it. It's difficult to fault the Act of the problems, rather the process. Fisheries management has become bigtime political; everyone whose ox gets gored, or is being perceived to be gored, calls their congressional representative who in turn rings the Secretary's chime. I should have mentioned earlier that there is a fourth factor at work in stalling management progress, and that's politics. But then, that's the good old American way, either call your congressman or your lawyer, and frankly, the industry (recreational as well as commercial, the trait is universal) has become a master at the technique.

Time limits me but I hope this gives you a flavor of things to come. By now you've probably noticed I've avoided the recreational side of marine fisheries management. I suppose this has been somewhat deliberate on my part. I confess to a distaste for the commercial vs recreational issue though it seems almost unavoidable. I'll not rise to the bait except to indicate that I suspect the debates will continue, and in the case of some species, I hold little doubt they will become solely "recreational" - it's already been done in other fisheries in other regions. Remember, the Act talks of optimum yield, optimum being viewed as the benefit greatest to the nation. Some critters like striped bass, bluefish, some of the large pelagic, are already headed down that path. If declines continue unabated in many species, particularly those of keen interest to the recreational community, the unavoidable intercession of the conservation community will provide leverage to tip the scales.

Let me windup on that note. As I've stated, I have seen, over the past two or three years, greater interest in marine fisheries management by the conservation community, particularly with regard to bycatch and waste. Where once the interest was in large whales and redwoods, focus is now turning to fish, and or the lack thereof. The commercial industry must sit up and take notice that the ways of the past - non-selective and reckless use of gear - will no longer be tolerated. Persisting in techniques that result in non-justified bycatch will only drive the wedge deeper, and I can guarantee that in a war between the conservationist and the commercial fisherman, the outcome will be inevitable.

I think we stand at a crossroads in fisheries management at which we will leave behind the traditional, independence of the American fishermen. The day of the buffalo hunter is gone and so are the buffalo. Tomorrow's fishermen face a tightly controlled and regulated industry. Conservation rather than economics is expected to rule the day.

**MR. FLIMLIN:** Thank you Dick. I'd like to remind the professionals here that we may have the next generation of fisheries mangers sitting with us today. Dr. Bonnie McCay and Dr. Roger Locandro have brought their classes from Cook College here to get hands-on information on what fisheries management is all about.

I know Bonnie has assigned each of her class to buttonhole some of those present for five minutes today and talk to you about your views on fisheries. So you should consider yourselves lucky if you get buttonholed once. If you get buttonholed twice, keep eating your sandwich, and talk with a full mouth.

Dr. Roger Locandro was at the fishery roundtable in 1974. Roger is on the Mid-Atlantic Fisheries Management Council (MAFMC), has been on the Fish and Game Council in the State of New Jersey, teaches at Cook College where he also served as the Dean of Students, and does some extension work for the State of New Jersey. Roger is going to be giving a retrospective on **Twenty Years of Change in New Jersey Fisheries**.

**DR ROGER R. LOCANDRO:** Today we have the good opportunity to reflect on the historic context of fisheries and focus on the happenings of the past 20 years.

We were without federal or state management of marine fisheries. We now have extensive management, fewer prime fish and a greater understanding of the marine ecosystem.

We all work together in the world of fish. We share the same problems and independently we quite often will come up with similar solutions; and, historically, we live in cycles. Many years ago a group of fishermen put to sea, put their nets down, hauled back, discarded what they didn't need and kept what they wanted. Interestingly, that happened two thousand years ago. If you read the writings of St. John, he dealt with discards of marine fish, and we still wrestle with them two thousand years later. In the 1300s, salmon were essentially becoming extinct throughout Europe and Scandinavian countries. By the 1600s they began to link the disappearance of salmon with people and with industrialization. Historically we have captured fish with passive, immobile gear. Harvesting gear was staked out and held in place and fish came to the gear. More recently we chase fish to find them, we invade their spawning grounds and invade fish nurseries. We use scopes, scanners, longlines, lures and global position systems; the fishing has really changed from an art to a science to the extent that we could now locate the last bluefin tuna and swordfish in the ocean and proceed to kill it. Dick Roe, North East Regional Director of the National Marine Fisheries Service, was very accurate in his discussion about the dimensions of the fisheries which we operate in New Jersey and throughout the world.

Another interesting modern fish harvest that I always like to reflect upon is the 20 minute herring fishery in the Gulf of Alaska. Their whole spring fishery is wound up in a 20 minute seine net set. You can imagine what bedlam that is. I might say that for the most part the duration of the herring is the result of advanced gear technology.

Another "derby race" was the race to harvest ocean clams in the early days of the Magnuson Act. We used to race out in an eight hour period and try to harvest a large quantity of clams during this limited window of opportunity during each calendar quarter. Axel Carlson, the former Chair of the Mid-Atlantic Fishery Management Council, used to speak continually about a historic fishery in which he was involved; a passive fishery harvest where they set submarine pounds – nets or submerged fish traps along the coast or in coastal bays. To this day that still is one of the most successful types of capture because you can harvest fish, separate them, take what you want and you can re-release in some large part the discard.

The New Jersey Fish and Game Council came about in 1882, because brook trout stream

stock was almost to the point of becoming non-existent along with white tail deer and turkeys.

What we are dealing with reference to diminishing fish stocks is not a new concept. History has repeated itself many times over with the same theme, and that brings us to where we are in the present. World population is growing by 25 million people each year and is rapidly approaching six billion, if it hasn't exceeded that by now. We're producing something in the neighborhood of 9.6 billion pounds of fish on a yearly, world wide basis, and with human population increases and the constant expansion of development and alternate land/sea use practices, we are losing, at an astronomical rate, those prime, valuable areas where primary productivity is most important -- our wetlands. In some areas of the United States ninety percent of the wetlands in the last 300 years have simply been destroyed, and we wonder where the fish have gone. We quite often trade our needs for energy and developable landbased sites for these historic wetland systems and then we dream up ways to pay for that trade-off and to compensate for the loss of the land but not the ecosystem or the loss of the biota.

More dramatic changes have taken place in the world of marine fisheries management since we sat at that historic fishery roundtable twenty years ago, than since the time St. John put his nets down in the sea at Galilee and addressed the same discard problem with which we still wrestle.

The Magnuson Act of 1977 provided a vehicle to begin a concerted effort for the first time in the history of the management of all natural resources to put lay groups in place to begin to formulate a meaningful approach to manage these public resources, to move foreign fishermen out of the exclusive economic zone (200 mile zone) and Americanize both the harvesting and the processing industry. That was the rhetoric in the meetings. This came about in recent years. Finally with the mackerel fishery, the foreigners were no longer able to direct fish for mackerel where they had been accustomed to receive a direct fishing allocation along with the opportunity to joint fish with U.S. fishermen, purchase over the side and purchase a product, a complicated formula which ultimately gave them the opportunity to direct fish for mackerel. And when the door was shut, the fishing then was Americanized.

The concept of underutilized species is one of my favorite. When I first came to the Mid-Atlantic Fishery Management Council in 1979, and after having done some small scale commercial fishing, we, as a regional fishery, used to thrive on underutilized species. Being a good Sicilian, we never waste anything. I recall having a dinner for the Fishery Council at Rutgers University. We served 25 underutilized species. There were actually 25 underutilized species out in the mid Atlantic ocean to be found and to be served. Squid, of course, always comes out as number one in taste tests; it is no longer underutilized. Monkfish was a popular conversational item and a well defined underutilized species, but not underutilized in Europe because they knew what was good. We also had dog fish, sea urchins, bluefish, mussels and other items which no longer have underutilized status.

Today I have a load of monkfish cheeks from Cape May that I'm taking up to the college to study their use and acceptance. We've gone to the extent of fully exploiting monkfish and we're trying to extend the value of the monkfish by using the value-added concept to receive extra dollars for an over utilized product. Bluefin tuna in the twenty years time went from something called a horse mackerel (not very exciting), selling for pennies if you could sell them (large blue fish would go into cat food), to now selling for the incredible for the price of \$125 a pound in Tokyo. That is the amount of fish that you can place in the palm of your hand. That's the incredible evolution of fish value in these few, short years. Tuna and salmon, believe it or not,

are still going for cat food and commanding a good price. Attention to quality has simply not kept pace with the actual value of these fish, and harvesters are at the short end of the stick when it comes to price received for their product. In Prince William Sound, if you're really lucky and get your boat in the water early and return your catch quickly, you can actually receive a premium price from the catfish market, a higher price than from processors for human consumption.

Bluefish has gone through tremendous ups and downs, especially in the last 20 years. I fished for bluefish all my life on the New Jersey coast. I've seen stocks go from the '40s and '50s when there were no bluefish and very few striped bass to a point where the bluefish became the premium fish both recreationally and commercially. Is it a natural cycle or one influenced by fishermen? The bluefish dilemma is one of the interesting involvements that I had on the federal council. It was one of the few times that I was outright threatened – "if you are going to vote on bluefish conservation (management), we will get you." The emotionalism that surrounded the proposed bluefish conservation plan at the time would approach the early emotionalism of shooting antlerless deer, a practice which at one time was absolutely unheard of. It's still inconceivable that a group of "conservationists" were unable to see a problem looming on the horizon or recognize the cyclic phenomena of fish. When I did vote for the conservation plan I stated that I will always favor conservation when given the choice.

Striped bass have gone through cycles and are now in a cycle where they're becoming an exclusive recreation species. This provides entry into a very interesting discussion of managing salmon in Iceland. You cannot catch a salmon commercially in Iceland. The value of that fish is so great to the overall economy as a recreation species, that it far surpasses any commercial value of the fish. As a country, Iceland has set up a management plan to realize the maximum economic value or return from the resource.

Marine mammals is another issue. I also work up in Newfoundland, Canada, and I'm very close to problematic marine mammals; humpback whales and especially harp seals. Two years ago there was a herd of seals that were 35 miles long and five miles wide off the north east of Newfoundland. Seals eat various quantities of fish, somewhere from 35 pounds down to something greater than zero. If they ate five pounds of fish apiece, millions of seals eating 365 days a year creates some kind of an astronomical number of fish consumed and projects a serious impact on the marine ecosystem. I put marine mammals in the same category as I put antlerless deer. They're an integral part of the ecosystem. We should really think more seriously about managing total ecosystems, a holistic approach, and marine mammal consumption must be considered. And I'll be the first person to vote for a limited or curtailed management system if they are endangered or in jeopardy of serious population reduction.

Another fish management system that's happened in a very significant way in the past 20 years has been the dawn of aquaculture. Over 150 species of fish are now being produced in west coast Central American countries. Domestic aquaculture techniques have lagged considerably behind foreign techniques probably because of the environmental issues. We're now in the clam business, the oyster business, salmon, mussels and striped bass. Reflecting on Iceland again as a model, it is interesting to note that they have already gone out of the aquaculture system of salmon production simply because they can't compete in a world market. Their standard of living is far beyond what the standards are in Chile and other Central American countries that can produce fish at a much cheaper price. Five years ago when I came back from the Fish Management Council, I gave a little synopsis similar to what we're doing today and I

discussed the concept of stocking the ocean; and as I was making eyeball contact with people I could see smiles, you know, "stock the ocean". Well, as Dick Roe indicated they have in fact begun to stock the ocean. There is a whole world of science out there that says be careful. Be careful of putting things in the ocean that have not evolved genetically or spatially. There are flags of caution flying. When we were kids in Seaside Park, NJ, summer flounder and winter flounder were not only names of fish, but that told us when we would catch those fish. In the last twenty years we've found out that the name really doesn't mean anything, because if you have the right technology you can locate and catch those fish almost any time. We've gone from a natural season, as a function of feeding and reproduction to a management season. We've gone to a size and a bag limit to save the fish. We understand the condition of the stocks are bad, and it will be interesting to see whether or not the recent upswing of summer flounder stocks will be able to maintain itself over the next two to five years or into the future. Yellowtail flounder was another premium fish of the north east ground fish industry. The spawning stock biomass of yellowtail flounder in the twenty years, which we are now experiencing, is 1/23rd of what it was twenty years ago according to the latest NMFS fishery statistics. Haddock is 1/15th of what it was twenty years ago. Could you imagine standing here twenty years ago and actually saying to a group of fishermen that twenty years from now there's only going to be 1/23rd the amount of yellowtail flounder to be able to reproduce and maintain some sort of a "stable" population? Silver hake, it is unbelievable that we could lose silver hake. Twenty years ago we had silver hake coming out our ears. We didn't know what to do with it. It was an ethnic food. I always envisioned we could harvest silver hake in quantity, fillet them and sell them as an excellent replacement for flounder. Now we even have a juvenile hake fishery looming on the horizon where they're going to be able to utilize the small fish! Think of this scheme in terms of utilizing trawl discards rather than just dumping them back in the sea. Gourmet markets arise when stocks dwindle and smaller and smaller products are utilized. The tiny little tiny silver hake are twisted around, putting their tails in their teeth, and served as a deep fried fish donut! Maybe we have been targeting the wrong age group of fish and as a result disrupting the fishery. Ever wonder where all those little fish go to or what happens to them if they are killed in a trawl net and dumped overboard?

Ocean quahogs and surf clams are my favorites. I chair the MAFMC committee on ocean quahogs and surf clams. The management plan that's now in place is probably one of the successful ways that we will be going in terms of future fishery management. It's extremely unique. We have a system that we've set up to manage ocean quahogs and surf clams that operates on a finite quantity of fish. NMFS scientists have calculated that we have ten years of surf clams and thirty years of ocean quahogs left and at the end of those periods of time, technically, there will be no resource left at all! Now that's a great way to run a business. So, at the end of ten years close up shop, declare the species extinct and go about your business and wait for something else to fill in the ecological niche. Amendment 8 of the Surf Clam Management Plan instituting the Individual Transferable Quota (ITQ) system was a monumental change for fishermen on the East Coast and throughout the world of commercial fishing.

Amendment 8 specified that a publicly owned resource could be given private ownership status and assigned to people who could then buy, sell, and lease fish quotas and even develop a retirement system around the tangibility of the transferable quotas. First there was a long fight to try to get something in place that was agreeable to all, an opportunity to try to reach common ground. Then there was court "testing", and then there was a settling in period and getting on about business. Now we're into another phase where we're looking at another type of clam called

the mahogany clam, which is in fact, biologically, the ocean quahog; but this clam is not under the Plan regulations. The bottom line is that it must be addressed according to the Act. We have strong pressure on the Council, and rightfully so, to be sure that we do not destroy the integrity of Amendment 8, and allow this clam to be harvested outside of the Management Plan.

Fishermen in the last twenty years have come out of the woodwork, and that's good. They've learned how to speak, and speak well. They've learned how to organize. They've learned how to stand up and successfully speak for their own rights. The team approach has been successful to begin to address solving problems and looking at the serious impacts on social and economic considerations. Scientific data is still in question. Habitat issues have risen from zero concern and near zero involvement to the point where they are now a major issue regionally and nationally. Toxic, non-point pollution sources, alteration of freshwater and the input into marine systems and wetland losses are now major issues in a world of marine fishery management. Ocean dumping was finally halted during the past 20 years. Now all of the stuff that was dumped in the ocean is somebody else's problem. And – you know – that's us. The solid waste problem comes right around to meeting us as a closed circle of large scale environmental problem solving.

The Mid-Atlantic Fishery Management Council has been in the forefront to essentially maintain an attitude with reference to environmental habitat issues. We need to be much more accurate, more knowledgeable, and more active. 50% of the problems related to diminished fish stocks over the past 20 years are traceable to habitat mismanagement.

A couple of thoughts I'd like to leave with you. One has to do with the continuous decline of all fish stocks and the fact that the biomass, the total mass of living organisms in the ocean, tends, surprisingly, to remain the same. When haddock and yellowtails and tunas and swordfish stocks are reduced to a point where they're way below where they normally should be, what happens to the space they vacate and what happens to their gene pool and genetic diversity? What happens to the gene pools that allow populations to naturally become stronger, to be successful in reproducing and maintaining vigor to ward off disease problems and be competitively successful? That's a scientific concern, a concern that should be shared by everyone. Plus, what occupies the niche vacated by the premium species?

In summary, it is critically important to be concerned with a total ecosystem concept in managing the oceans. The weakest link in the chain is critical to the entire system. We need to maintain a strong concern for habitat issues. We have to have people on every management council with specific, focused interest in habitats so that this issue simply is not swept away or ranked as a lower order of priority behind harvesting. We need to work more specifically with value-added issues so that we can get more economic return for fishery products by catching either the same amount or even less product, and doing a better job with the quality or the retail condition of the product. That's the monkfish cheek concept. We need to look more carefully at quality and to prepare fish for market. Maximum Sustainable Yield (MSY) and Optimum Yield (OY) Systems are probably not the best ways to manage marine fisheries. There must be other ways, but it's the best show in town right now. We must improve the ITQ systems for resource protection. We must also look at ways to finance research and further studies in the ocean, to be able to harvest the resource more efficiently with greatly reduced secondary mortality. When you own the business and have a responsibility and share the resources, you look with greater

care after that business with reference to its long-term sustainability.

Thank you.

**MR. STEWART TWEED:** Good morning. I'm Gef's counterpart in the southern part of the state, Cape May, Cumberland and Salem Counties. It's interesting that Gef and Roger keep comparing today to the original conference twenty years ago. It fosters a lot of comparisons and one of the things that was mentioned, is that we're a lot larger than we were twenty years ago. We have also involved the students that will be in twenty years the future of this type of participation. And the most significant part for Gef and me, is the participation and involvement of the fishing industry.

The industry realizes its critical role in these kinds of programs and many of these individuals dedicate part of their business time to attend fisheries meetings.

The other factor is the growth in the topics, and those who will address them. This is a problem we're dealing with this morning.

I will moderate the first session of the roundtable and it deals with a broad range of topics, that really summarizes Roger's input. It's a look at the resources that we have. We're now including the habitat affects that may not have been as significant years ago, plus the growth in management activities and the economic impacts to the industry.

To begin our discussion, I'd like to introduce Stewart Wilk from the National Marine Fisheries Service laboratory at Sandy Hook.

#### Fisheries Resources and Their Management

**MR. STEWART WILK:** Gef Flintin contacted me a month ago and asked me if I would attend this conference and talk about Middle Atlantic finfish resources. I said, that seems like an appropriate topic, something that I have been involved with during the last 30 years or so . . . . . then he gave me the bad news, I had eight to 10 minutes to do it! Therefore, due to that time constraint, I have selected six of, what I feel are, the most important Middle Atlantic fisheries resources. These are summer flounder, Paralichthys dentatus; scup, Stenotomus chrysops; black sea bass, Centropristis striata; silver hake, Merluccius bilinearis; bluefish, Pomatomus saltatrix; and Atlantic mackerel, Scomber scombrus. I have chosen these species because they are particularly important to both New Jersey commercial and recreational interests. Before I begin my presentation there is one thing we have to recognize . . . . . that is, for the most part, all of our Middle Atlantic commercial and recreational fisheries are predicated on transitory species. Therefore, one has to examine the entire region, since with few exceptions, the finfish resources as well as the fisheries for them, tend to move seasonally into and through the Middle Atlantic.



My brief examination of each species will include a history of harvest and management during the past 10 years. [As an aside, I am not quite as old as the two previous speakers who went back in Biblical and 20-year time leaps.] In this overview I will examine the management and status of exploitation as well as try, where applicable, to impart a few **words of wisdom** regarding future harvest and/or management of the aforementioned six species. My source of information for this presentation is the **Status of Fishery Resources of the Northeastern United States**, which is prepared by the Northeast Fisheries Science Center. This document represents the most current compilation of statistics and stock assessment results relative to most, if not all, important northeastern U.S. species. I have chosen the 1983 to 1992 10-year window of data for several reasons: (1) I feel that the statistics (i.e., landings) for the last 10 years, in terms of the recreational and commercial landings, are the best that we have ever had available; and (2) the 1980's through the present time (1992), represent a solid statistical base that is not preliminary to any degree. [N.B. Graphs relating to these species are listed in Appendix 1].

## SPECIES SUMMARIES

### Summer Flounder

My first figure illustrates the catch of summer flounder over the last 10 years (Figure 1). You will notice a decline in both the recreational (16,400 to 3,400 metric tons (mt)) and commercial (13,400 to 7,300 mt) harvest of the species over the last 10 years . . . . . this is a situation that comes as no surprise, and one that was predicted. At the present time summer flounder are being managed under the Summer Flounder Fisheries Management Plan (FMP), a cooperative effort between the Mid-Atlantic Fisheries Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC). According to our best scientific information, the status of exploitation for summer flounder is considered **overexploited**. The **words of wisdom** relative to this species: the 1991 year class, which is about average in size, provides an opportunity for continued rebuilding of the spawning stock. That is, if it and subsequent year classes, continue to be conserved by reducing fishing mortality, I believe the FMP is heading in the right direction.

### Scup

The next figure illustrates the landings for scup (Figure 2). What you should note is that the recreational landings have fluctuate between 1,400 and slightly less than 6,000 mt. Over the last 10 years, the commercial catch has ranged between 3,600 and 7,800 mt, and fluctuated up and down to the present level of 5,600 mt. Scup will be managed under the Scup-Black Sea Bass FMP, which is under development by MAFMC and ASMFC. Present status of the stock, based on our best scientific information, is **overexploited**. **Words of wisdom:** the 1992 recreational catch of 2,200 mt is nearly half of the 1991 level of 3,700 mt, and 35% below the 1981 to 1991 mean of 3,100 mt . . . . . are there problems on the horizon and should prompt actions be taken to circumvent them?

### Black Sea Bass

The next slide pictures the catch for black sea bass (Figure 3). Please note the trend of slight annual ups and downs over the last 10 years (with the exception of the 1986 recreation landings of 6,300 mt). The commercial fishery has basically remained the constant (1,100 to 1,900 mt). I feel this is going to change to change dramatically with the advent of new and/or more sophisticated gear entering the fishery . . . . . this will allow for the capture of black sea bass throughout the year and in areas previously not accessible to commercial fishing.

**A few words of wisdom:** these potential areas of conflict and/or over harvesting should be examined, quantified, and dealt with now before they reaches monumental proportions. The recreational catch has been at relatively low levels over the last ten years, i.e., between 700 and 2,300 mt (with the exception of the previously mentioned 1986 catch). Our assessment information for black sea bass is quite preliminary; however, it appears they are presently **overexploited** and could not withstand additional fishing pressure.

#### **Silver Hake**

The next slide illustrates 10 years of commercial and recreational lands of silver hake (Figure 4). Silver hake is under the Multispecies FMP of New England Fisheries Management Council. You should note the relatively consistent levels of harvest over the last 10 years. The recreational fishery, although historically very important in New Jersey, remains at relatively low levels of less than 1,000 mt over the last 10 years. Commercial landings have ranged between 9,200 and 13,600 mt during the last decade. **Words of wisdom:** it seems unlikely that fishing mortality will decline in the future, and given the rapid removal of young individuals from the stock in recent years, it appears this stock cannot support increased fishing. Therefore, silver hake must be considered **fully exploited** at the present time.

#### **Bluefish**

The next species depicted is the bluefish . . . . . the one near and dear to all New Jersey recreational fishermen (Figure 5). This fishery is being managed under a cooperative effort between the MAFMC and ASMFC. Going back over the last 10 years of Middle Atlantic landings, the commercial fisheries have remained relatively constant (4,700 to 7,700 mt); however, the recreational fishery has dramatically declined from 62,900 mt in 1982 to 17,000 mt in 1992. The 1992 recreational catch of 17,000 mt was a decrease of 19% from the previous year (21,100 mt), and accounted for 78% of the total Middle Atlantic landings of the species. Another strong indication of decline is also evident when one realizes that present catch levels have declined over 300% since 1983. It should also be noted, catch-per-trip has also steadily declined over the last fifteen years along with the total recreational landings. With aforementioned in mind, the status of exploitation is considered **fully exploited**.

#### **Atlantic Mackerel**

The next and last species illustrated is the Atlantic mackerel (Figure 6). The species is being managed under the MAFMC's Squid-Mackerel-Butterfish FMP. Through my affiliation with the MAFMC's Scientific and Statistical Committee since 1978, I can attest to the fact that this species is a real fisheries management success story. The pattern of success illustrated here points out what can happen when fishing mortality is substantially decreased or practically eliminated from what it previously was. As you will note, recreational landings have stayed relatively consistent between 2,000 and 5,600 mt with the exception of 1992 when the catch was only 400 mt. There was a steady increase in commercial landings since 1983 (3,800 mt), with a peak of over 31,000 mt in 1990 followed by a decline to 12,400 mt in 1992. The status of exploitation is considered **underexploited**; one of those rare instances in fisheries . . . . . **a truly underexploited resource!** It is predicted that the catch of Atlantic mackerel in the future can be increased substantially without adversely affecting spawning stock size; thus, a good example of an **underutilized** species.

## CONCLUSIONS

In conclusion, putting aside annual ups and downs during the last decade, both commercial and recreational landings of important Middle Atlantic finfish have either declined or appear to be holding near historical 10-year levels. In addition, one must also recognize that both commercial and recreational effort (e.g., more days fished, increased fishing power, etc.) has increased during the same time span. Therefore, catch-per-unit-of-effort has steadily declined over time; thus, the classic symptoms of overexploitation appear to be upon us. That is, increased effort to catch less, or at best, the same amount of a target species over the same period of time . . . . . a continuing way of life in present day Middle Atlantic fisheries.

**GARY DICKERSON:** Gary Dickerson, Manasquan Fish and Game. You talked about sea bass and you said in your comments that there will be an increase in the commercial catch. Since most managers are based upon this to cap their ratios, you see an increase in the commercial catch. How do you justify allowing this to take place?

**MR. WILK:** I don't make those decisions, Dick Roe does. What I was alluding to basically is there have been some new technologies in the fishery, particularly in the New York, New Jersey area. With the advent of roller gear that allows commercial fishermen to fish very hard bottom primarily where you'll find black sea bass, scup to some degree and black fish. Remember, these are 1992 results. You'll start to see an increased harvest in these areas. How long it will last is another question. How do we make those decisions? Well, we as NMFS scientists bring this information to light, bring them to the managers and hopefully the appropriate management regimen will be put into place.

**AL OGDEN:** Al Ogden. I would like to reverse the question. Why not base management on historic catch. We are now devoting more to recreational fisheries which almost didn't exist twenty or thirty years ago.

**MR. WILK:** Okay. Let me backtrack. We don't from the scientific point of view make these predictions, base decisions entirely on historical catch and effort data. Those would be fishery dependent states of what's going on. We have over the last three decades conducted our own fisheries independent estimates using statistically sound operations to collect information over the entire range of species, so that you can examine it in that framework also. I may have misinterpreted your question. We're getting into specifics. The management side we will be touching on that later on. So let's hold those questions.

**MR. TWEED:** Our next speaker is from the New Jersey DEP, Fish, Game and Wildlife Division and he'll bring us up to date on shellfish resources. Jim Joseph is Chief of the Bureau of Shellfisheries.

**JAMES JOSEPH:** Good morning. The shellfish fishery is part of the Division of Fish, Game and Wildlife and some of our major activities, as Dr. Locandro pointed out, are habitat protection and wise use of the state resources. Habitat protection is a major activity of the bureau of the entire division. We also issue a variety of the clamming licenses. In the fiscal '93, for example, we issued approximately 11,000 clamming licenses. We also facilitate private aquaculture activities through a leasing program that currently includes about 27,000 acres in the state for shellfish.

Today I'm going to talk about four major species that are harvested both commercially and recreationally in New Jersey. These are surf clams, soft clams, oysters and hard clams. In 1992, for example, these four species made up 93 percent of the total landings, excluding squid and in total compared to all species represented 27 percent of the total landings. And the outlook for these species is basically good news and encouraging news, discouraging news and kind of some conflicting news.

First species I'd like to talk about is the surf clam. New Jersey has for many, many years been the leader in surf clam landings due to in part to the extensive resource off the coast, a fishery that harvests these critters both in shore and in federal waters. Here you can see in 1987 New Jersey landings represented 59 percent of the combined total both Mid-Atlantic and the New England region and they have continued their dominance, so that in 1992 New Jersey species piece of the pie amounted to about 71 percent of the total landings in these two regions, valued at about 24.6 million dollars. So you can see it's a pretty important industry in New Jersey. Looking at the twenty year landings picture, you can see that New Jersey is increasing in accordance, indicated by the right side of the graph, with an ever increasing harvest. The management of the resource was actually prompted by industry in the early to mid-seventies when the industry members saw the need to limit annual harvest to preserve the resource. The surf clam advisory committee was formed with members of the industry, the Division and Rutgers University to develop those regulations. And all others were some heated debates and pretty loud public hearings initially when regulations were first thrust upon the surf clam industry in New Jersey, has been kind of a picture of cooperation. The regulations that were developed were basically to limit fishery and establish annual harvest quota, limit industry internationally grandfathered in and those licenses still 57 licenses held by 17 individuals and the annual harvest quota is set between 250,000 and 700,000 bushels per year by regulation, with that harvest quota not to exceed ten percent of the standing stock. So before any regulations could be developed, obviously they needed some data. So the annual stock assessment program was initiated in the mid-'70s, continues to this day, basically under the same procedures.

Each summer we contract a commercial surf clam vessel to sample between Cape May and Shark River. We sample approximately three hundred stations up and down the coast in New Jersey territorial waters and just to run through these real quickly to give you an idea what goes on at each station, we take a Peterson grab looking for juveniles, a five minute dredge tow, quantify that to give us a yield in bushels of the adults per five minute tow and the catch is sorted. Looking at a variety of organisms' mortality, a sub-sample is collected for size, frequency data to give us regular information on the year class strength, and then after all the data is collected, Laurie Mayer who is the biologist in charge of the surf clam project, gets her trusty Compac 486 and crunches numbers like crazy in a variety of ways. One of the ways we look at the standing stock is compared to the nine harvest zones, the fishermen are required to report so we can look at this data and compare stock in each of the nine harvest zones versus the resource itself. You can see that the stock over the last five years has showed a steady increase and, obviously, this

is for inshore and we obviously like to think it's because of the work we do and the work with the Sea Clam Advisory Committee on limiting the resource. It's going to be around for a while.

The next species I'd like to talk about is the soft clam, which is somewhat unique in the commercial quantities, still only occurs in the Northern Monmouth County waters of the Navesink, Shrewsbury, Raritan and Sandy Hook Bays. I don't know how well you can see this, but this is a chart of the distribution of soft clams that we observed during a program in 1983 that you can see throughout the shallow water areas of the Navesink and Shrewsbury. Same holds true for areas of Raritan and Sandy Hook Bay. Since these waters have enclosed to be direct market the shellfish of 1961 or so, and they're classified as special restricted, the only harvest that can occur is through regulation and depuration, the soft clams had to be depurated. So this allows the utilization of that resource. Otherwise it wouldn't occur. The first soft clam depuration plant opened in 1974 and there anywhere from one to three plants operating in New England at the time. Soft clam is subject quite a bit to fluctuations in population, and during the late '80s there was a downturn in that population for a number of reasons. Only one depuration plant existed and in 1991, the resource was still down and the last plant operator died and we haven't had any significant soft clam harvests since that time. The outlook for soft clams is pretty good. Many of you in this part of the state and to the north may have seen a number of articles in the paper about soft clam production. There was tremendous set in 1993. Clyde McKenzie was quoted just about every week in the paper looking at that resource and that, coupled with some improved water quality in the area, bodes well for the soft clam.

I don't want to take any of Dr. Tucker's thunder, but the work of his organization over the last ten years has led to tremendous improvement in water quality and pending some results of this winter looks like that area may go seasonal, which will allow for direct harvest both commercial and recreational fishermen of the soft clam resource in that area.

The next species I'd like to touch on briefly is the oyster resource that at one time occurred throughout the state and now is pretty much limited to Delaware Bay and parts of certain sections along the Atlantic coast. Looking at 20 year landings you can see it's been pretty dramatic.

Oysters, and the oyster fishery in general, is disease dependent. Two diseases that are around are MSX and Dermo and since the late 1950s, MSX has basically been a determining factor for the fishery, and in the late '80s following a drought period we had kind of a collapse of the fishery due to MSX disease. Just when you thought things might turn around a little bit, dermo reared its ugly head and dermo is the principle factor affecting the fishery. The state does have a leasing program. As I say, we currently have about 24,000 acres leased in Delaware Bay and traditionally the fishery was operated in May or June of the year. When the bay season starts the boats go and take seed up river, bring them down, and market them. That program has fallen by the wayside because of the disease. There have been some aquacultural activities to attempt to explore the remote set concept, but disease has hampered that operation as well. Monitoring resources has been a joint venture by the Division and Rutgers University over a number of years where both agencies worked together to monitor bay conditions, disease programs and do some intermediate planning studies. The outlook for oysters again is disease dependent. It doesn't look very good. Rutgers is doing some genetic work trying to look at the genetic factors of the Japanese oyster, how they may be incorporated into the American oyster to bolster that fishery, but those benefits will surely be down the road.

Hard clam landings over twenty years look pretty good at the outset. The Division did a number of surveys, one in 1980 and another one of 1990.

An interesting thing that was born out of this survey was that the piece of pie that commercial harvesters got of the total harvest increased as did the total catch. The total catch record was up, but the recreation people were catching a small component of that resource. As you might expect when you look at the satisfaction, you ask the recreational people, are you satisfied with your catch and the recreations weren't too happy about it, but both categories of commercial men said they were showing increased satisfaction in their catch. But throughout that time period if you went out today and you asked any clammer if he was satisfied, he'd be complaining he can't make a day's pay out in the wild.

Things were pretty bad when you superimposed relay and depuration harvest of the total state landings. You see those two practices are contributing increasing parts of total catch and in 1993, for example, relay and depuration represented almost 47 percent of the total state landings. This coupled with an undetermined amount of aquaculture contribution to the total landings would tend to indicate whatever is harvested from the wild has definitely decreased. So, what do you do? You do more research, which we need to do. In 1983, the state began an inventory program that had up to date sampled from Raritan Bay down to Brigantine. We sampled systematically through estuaries collecting water quality as well as resource information, like the surf clam inventory program using a small hydraulic dredge, like a surf clam dredge, catch sorted, quantified. At any rate, the data has been collected. It's used to keep tabs on the resource and has been used for habitat protection in reviewing coastal development activities. Without this data any attempts to deny large projects won't hold up in court. We've had pretty good success in defending our decisions in court, protecting habitat where necessary and we in other agencies, Dr. Tucker's group in particular, worked hard to protect habitat.

Despite increasing moves to the coastal zone, we've had great improvement in water quality and habitat. Changes in state population only increased eight percent in that twenty year period, but for example, 108 percent during that same time period in the coastal zone. Water quality improved tremendously.

**MR. TWEED:** Why don't we hold the questions since we're running a little late. We'll go with the next part of the roundtable, which is the management concerns, building on the resource in the bays that we have, and as most fishermen know, there's local, state and federal management activities. So we'll begin with Bruce Halgren who is the Marine Fisheries Administrator for the Division of Fish, Game and Wildlife.

**BRUCE HALGREN:** Over the past 20 years, many changes in fisheries management have occurred. From a New Jersey perspective, perhaps the most important was the enactment of the Marine Fisheries Management and Commercial Fisheries Act in 1979.

This Act changed the method of enacting management measures, in large part, from legislative to regulatory. More importantly, however, was how that regulatory process would work. The Act established a Marine Fisheries Council, with a legislatively required balance of sport and commercial representation. This Council was also provided with the authority to veto any

fisheries regulation proposed by the DEPE. This provides commercial and sport fishing interests, through their Council representatives, a true and strong share in the regulatory process. Over the past 5 to 6 years, fishermen have been, and continue to be, very involved.

As most Council members soon find out, managing our living marine resources is a real balancing act - on a slippery log. On the one hand, you have the needs and desires of the commercial fishery, on the other, the needs and desires of the sport fishery (both often broken into dissenting factions), while on the third hand is the need to protect or enhance the resource itself. This usually ends with some sort of compromise which rarely pleases everyone, and sometimes pleases no one. Generally, however, I believe the Council system has been very successful if it encourages public participation, remains the best alternative currently available.

During this time, we have also seen increased coastal populations, increased participation in recreational fishing, a trend to larger commercial fishing vessels and increased harvesting efficiency in both the sport and commercial fishery from improved fish finding and navigational electronics. This increased effort and increased efficiency has led us to a point where virtually all of our traditional species are either fully exploited or over exploited. This, in turn, has led to management plans and fishing restrictions on more and more species.

Management Programs in federal waters (beyond 3 miles) are developed through the regional fishery management councils, implemented by NMFS and are uniform throughout the range of the species.

Management within the three mile limit has been very different. Although the 15 Atlantic coastal states, the District of Columbia, and the Potomac River Fisheries Commission can develop plans jointly through the ASMFC (Atlantic States Marine Fisheries Commission), implementation has been anything but consistent throughout the range of the species.

If one or more states fail to implement, or to fully implement, the recommended measures of a fishery management plan, it can significantly limit the benefits of the plan. This was the case with weakfish. A weakfish management plan was approved in 1985 and amended in 1992, but has never been fully implemented in North Carolina and several other states. Since North Carolina harvested approximately 70% of the coast wide weakfish harvest in 1992, it is obvious that the plan cannot be totally effective without their compliance. Furthermore, when one or more states fail to comply, other states are often discouraged from fully implementing that plan, increasingly or, reduce to their level of compliance. This problem occurred with the summer flounder (fluke) plan when Maryland and Virginia adopted a 10 fish recreational limit.

Recreational fishermen from other states, including New Jersey, complained that it wasn't fair that they be subjected to the full implementation of the six fish limit required by the plan while other states adopted less stringent rule.

On December 21, 1993, in the effort to improve states' compliance with coastwide fisheries management plans President Clinton, signed the "Atlantic Coastal Fisheries Cooperative Management Act of 1993." The act is very similar to the "Atlantic Striped Bass Conservation Act" which helped foster the highly successful recovery of striped bass along the east coast.

Under this Act, coastal states must adopt consistent management measures with approved

ASMFC plans or be subject to a federally imposed moratorium on fishery for that species.

This should definitely help restore coastal fish stocks, and may be one of the most important changes in state fisheries management of the next twenty years. This will however, bring a new series of challenges to fisheries management in New Jersey.

The Division, the New Jersey Marine Fisheries Council and the fishing public will have to play a more active role in the development of ASMFC fishery management plan.

To present the best argument for New Jersey's needs, we need to have the best fishery science we can provide. Such things as trend in locals abundance of adults and juveniles, fishing and natural mortality rates, migration, stock genetics, mesh size equivalents, and habitat requirements are some of these needs. We also need a better understanding of and data from the commercial fishery to deal with more complex management strategies. Better and more timely landings data to deal with quota management, better effort information to help monitor stocks and changes in fishing patterns, size composition data to help monitor stocks and the effectiveness of regulations and individual landings data to establish histories in fisheries, for limited entry program establish ITQ's (Individual Transferable Quotas) or monitor trip limits. In addition this regulations, often of increased complexity, require increased enforcement capabilities. All of this takes money.

Although we are undoubtedly increasing our emphasis on the marine environment, on marine water quality, coastal geology, and capital investment in marine education at the college level, state appropriations of marine fisheries management has been reduced by almost one third over the past three years.

Hopefully, the state legislature will rectify this problem over time. In the short term, however, one possible source of funding exists under the Cooperative Management Act, that could help us meet the requirement of that Act. \$3 million has been authorized for 1994, increasing to \$5 million in 1995, and \$7 million in 1996. This would help ensure that the information gathered and regulations produced will lead to stronger, more diverse sustainable marine fish stocks for everyone. This funding, however, has not yet actually been appropriated. It is very important that all those concerned with marine management contact their federal representatives and assure that this authorized funding is actually appropriated. Just one last word, the best way to make fisheries management work for you... is to be involved. The Council System encourages your involvement, as does the Division. And remember it's your future. Thank you.

**MR. TWEED:** Our next speaker is Dave Keifer who is the Executive Director of the Mid-Atlantic Fishery Management Council.

**DAVE KEIFER:** Thank you. Before I get into the plans that I'm supposed to talk about, for those of you who don't know, the Mid-Atlantic Council was created by the Magnuson Act of 1976. The member states are New York through Virginia. Our fishery management plans cover the range of resource. So most of the plans control from Hatteras to the Canadian line. Bluefish goes all through Dade County, Florida. The Council has 19 voting members, the oldest plan, and in fact the oldest Council fishery management plan is surf clam and ocean quahogs. It was approved



in November of '77 and had quotas, effort limitation, and a moratorium on vessels. The basic systems lasted until Amendment 8, which took effect in October of '90 when the ITQ (Individual Transferable Quota) program came in.

During this year we are obligated to produce Amendment 9, which is intended to deal with the Maine quahog fishery and hopefully manage that in a system consistent with the overall plan. We're also obligated to sharpen our quota setting process, particularly for the quahogs.

The mackerel, squid, and butterfish plan was initially a series of three plan, squid, mackerel, butterfish adopted and implemented in '79 and '80. It was essentially an economic development program to reduce overall catch of mackerel, to rebuild this stock and set up a system of rules to Americanize those fisheries. There are a host of amendments to the individual plans and the merger that finally produced an amendment to that took effect in '84. It's a framework system of setting the annual quotas, which thus far have not been binding on the United States fisheries, and what the foreign allocations would be. In effect there has not been foreign fisheries for the squids for a number of years and essentially negligible foreign fishing for mackerel for a few years.

We are initiating Amendment 5 to deal with a number of things that have been new assessments on squid that raise questions about the maximum sustainable yield figure because of the new information on the lifespan particularly on the squid. And we'll require a reduction in the maximum sustainable yield. More importantly we need to change the management system so that it reflects the Americanized nature of the fisheries. We want to get them managed appropriately before they get into an overfished condition. The new assessment is not that far away. And we just want to turn this thing around, decide how we're going to manage them in an orderly process before we have a crisis on our hands. I don't think we'll finish it this year.

On summer flounder, the first plan was approved in September of '88, with a minimum fish size and vessel permits. That has moved along so that now Amendment 6 is in the approval process in Silver Springs. The current major system is set by Amendment 2 and the following amendments which were essentially modifications to Amendment 2. We've got an annual commercial quota divided among the states with minimum otter trawl mesh size, minimum fish size, and a possession limit. Vessel and dealer permits and reports are required. Among other things it operates with a monitoring committee made up of state and federal biologists by and large that make recommendations to the council and the ASMFC board for quotas.

The quotas were set back in September, with a 30 percent increase over the '93 level. However, they deferred what the recreational measure should be, in other words, how their quota would be translated. They would meet Wednesday of this week and a report will go to the committee next Wednesday or next Tuesday afternoon, but the monitoring committee recommended two fish increase in possession limit and 30 day increase in the season, fifteen days on each end.

On bluefish, the first plan was approved by NMFS in March of 1990, with an allocation of 80 percent for the recreational fishery, 20 percent to the commercial fishery, a fish possession limit that currently is ten, and the possibility of commercial quota if the projected commercial share is anticipated to exceed 20 percent. That, in fact, was reached in '93 when we did the work for the '94 fishing year, such that the council did recommend the commercial quota of a little better

than 11 million pounds and it will be divided among the state. It's up to the states to enforce it.

The council did direct the staff to begin preparation of Amendment 1 to the plan to provide other methods for managing the commercial fishery and to essentially just review where we are. That project really hasn't started yet because there's some questions about the stock assessment. We believe that those issues will be resolved by April and that we can begin Amendment 1.

Scup and Black Sea Bass, they're sort of one phrase. For a long time they were initially thought of as an amendment to the summer flounder plan. They got started in '78, actually, and we got into other things, finally went into production in '90 and then got deferred because of all the unending amendments to the summer flounder plan. We finally got started, split them from summer flounder, and now they split them from each other. So we're working on a scup plan. We're working on a sea bass plan with the staff taking position that we ought to move on whichever one we can get a hold on.

We've been meeting the ASMFC committee for scup and sea bass. We've met with advisors. The most recent meeting was about three weeks ago where we had half a day with scup fishermen and half a day with sea bass fishermen. Frankly, I think that went very well. It was very interesting in this business because usually what happens is when you're coming in with management proposals, the first thing that happens is a fisherman says, "Well, your assessment is wrong. Fish are in good shape. We don't need a plan." This was only an advisory meeting where everybody sat around and nobody questioned the assessments. Everybody discussed how to manage. We are very encouraged by that.

We, the staff, will be making recommendations to the council committee next week for alternative public hearings. Previously the council committee adopted the overfishing definition for both species and the committee adopted the recovery strategy that essentially would have minimal regulations for two years and then kick in with fishing mortality rate reduction in the third year and based on that we're talking about fish size of mesh regulation, escape vents on scup traps, and a maximum size on rollers for the first two years. Then in the third year we could add commercial quotas. Based on the discussions with advisors, we might add our coastwide quotas on a bimonthly basis rather than state by state quotas, with possession limits in seasons on recreational size with operator permits, vessel permits, dealer permits and reporting. This would be essentially the same system except the operator permits will be added, and a moratorium on vessels and panels in the traps.

Scup and sea bass are essentially the same systems, just various things change like mesh size and fish size. If you go to the council and the council accepts what we're proposing, then we would start. We're obligated this year to continue and hopefully complete it.

Tilefish is a difficult problem which started back in '80. It went away. Now we're back on it again. The species is overfished. It's a relatively small fishery in terms of participants. Because it is a small fishery the data sets are weak and it is very difficult to get agreement to the assessment. And we may need to do more research to get agreement with the fishermen on the assessment. I would like to believe that maybe we could push forward with a limited kind of plan for a couple years. While we're doing the research rather than postpone anything, I think that

might be possible, to work with some limited quotas and maybe spawning season restrictions.

We just got approval from National Marine Fisheries Service to initiate a dogfish plan jointly with the New England Council. We don't have a schedule for it yet. The approval came in the last couple of weeks. We are working with the council on the weakfish plan, but I don't have a schedule for that.

The New England Council is working on amendment to the multispecies plan for silver hake. They're pushing very hard to get an amendment out. Some of our people have worked diligently to have some informational meetings down here. So you all can make comments at the prehearing stage as to what issues you want to address in that memo. There's a meeting Monday night, 7 o'clock in Wall. If you know what you want, and want to get some thoughts in before they go to public hearings, show up. It's been real nice 'cause we worked real hard to get them down. Thank you.

**MR. TWEED:** The next commission that we're going to be talking about has recently come to the floor and has gained new recognition at the national level but, I think it's one of the oldest management commissions that's been in existence in the United States and that's the Atlantic States Marine Fisheries Commission. Today we have Tom Fote who's a citizens representative from New Jersey on that commission.

**TOM FOTE:** Back in the late 1930s, the states realized that in order to manage fish species that travel between states they had to get together and formulate plans that everyone would follow. For example, if you put a strict bag limit or you put a strict mesh size in one state and corresponding states didn't follow these regulations then this species would not be managed.

The Atlantic States Marine Fisheries Commission was established in 1942 to represent the interests and needs of East Coast marine fisheries and those of its members from Maine to Florida. The purpose of the Commission, as set forth by Congress in Article One of the Atlantic States Marine Fisheries Commission Compact, is to promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries.

Representing state and industry interests are 45 commissioners. I'm the first speaker up here that is not a paid bureaucrat or paid volunteer. I'm basically a non-paid volunteer and that is what the other 15 commissioners are. We don't get paid for what we do. Basically we do it because we're either interested in the resource or concerned about the future. I don't make any money from the fishing business. As my wife really knows, it always costs me when I go to meetings. Typically one-third of the Commissioners are appointed by the states' legislative bodies. Basically looking at the overhead, you have the governor's appointee. We're appointed by the governor. I'm supposed to represent all the public and the governor in those actions at the Commission.

You also have a legislator on the Commission. Why is the legislator on the Commission? Because back in those days you had to get either funds for the Commission, funds for the state to do the program or get the bill through the legislator. So we figured it was better to put on a

legislator so they could move the bill through their own body. The other one is a state director, why the state director? The state director has the scientists, biologists, the number crunchers and the enforcement bureau to enforce the regulations. So they should know what needs to be done to basically put a good regulation in place. So there's three amendments. When we vote we vote as a caucus. That means if Lou Bassano (legislator on the Commission) and I don't agree or Bruce Freeman (state fisheries representative) and I don't agree, we're only two members, we have to abstain from a vote. It's a consensus vote. So, if two out of three vote yes, then it has to be a yes vote. Usually there are only two of us at a meeting. Sometimes we do not agree on certain issues. Then you wind up seeing a lot of abstentions from New Jersey.

To assist in attaining its goal, the Atlantic States Marine Fisheries Commission uses the senior biologists from each state and an advisory committee which has been changed because of the passage of the Atlantic Coastal Fishery Cooperative Management Act, which I call the Interjurisdictional Fisheries Bill. We are setting up an advisors team because I've been yelling about it for five years because when I first was appointed the commercial industry and commercial and recreational were not involved in the process. So the advisory committee is now made up of the governor's appointees and what we do is decide on the specific species and how many advisors should be in place. Take for example sea bass, since sea bass in the state is harvested by a pot fishery (commercial), recreationally and in other ways. We'll try to get two or three advisors from our state to represent all those groups to be on that advisory committee. Of course, it sounds nice except there are no funds to do any of it. That's the problem when they passed the bill for the Interstate fisheries management program.

When the Commission was formed, they would get together once or twice a year at a fancy resort or hotel, costing \$150 a night. That was my experience for the first two Commission meetings I attended. They sat around and tried to make decisions and come up with a management plan that they could take back to their state and sell. But when they got back to their states, they found out, because of the protest of the recreational or the commercial fishermen or the legislator, that they couldn't get the bills passed. So, when it came to striped bass in the 1980s a new philosophy was developed. Let's get Congress to give us permission that if you can't manage with the Atlantic States Marine Fisheries Commission you wind up with a coastwide moratorium. That was the Striped Bass Conservation Act that was passed in 1984. As a result, that started, as some people stated, the comeback of the striped bass. Some people say it hasn't. What it basically protects are the stocks and you see a growing increase in the stocks.

The real pusher behind the Interjurisdictional bill was weakfish. We saw a dramatic crash in recreational landings during the '70s and into the early part of the '80s. The State of Delaware started talking to their congressional representatives, Senator Carr who is now the Governor, says we need a bill to make sure the states like North Carolina that catches 90 percent of the weakfish both recreationally and commercially comes into the game, abide by the rules of Commission. When they started with that bill which was supposedly for weakfish, after about two years of commercial commission's involvement, it was basically decided let's do it for all species and that was the driving force. The bill as you saw was signed 12/20/93. That means it is now law.

The bill gives a strong role to the states. Basically it allows the states to become more involved in the process. Plus I also think it gives the state a chance to hide behind the

Commission because it is still mostly the state director at the Commission level voting for the management plan and putting the plan together. And then when they come back to the states they say the Atlantic States Marine Fisheries Commission passed this plan so we have to put it into effect.

Federal support for the Atlantic States Marine Fisheries Commission comes in the form of money. The way the Commission gets its funds is by state contributions. We pay a set fee of \$15,000. Pay is based on how high the commercial landings are in your state. We pay the third highest. We're supposed to pay the third highest fee except Florida has not paid their dues in three years. So, basically we're paying the second highest dues. That is where it gets the majority of funds. The rest of the money the Atlantic States Marine Fisheries Commission (45 percent) comes out of recreational funding from taxes recreational fishermen pay. The rest of it comes from general tax revenue, which we all pay. When they passed this bill they said that four million dollars should be appropriated. They didn't fund it. Hopefully in this session of Congress they'll appropriate the four million dollars. Because of some of the taxes, they were able to set up an advisory committee. Everything else can't be done without the money. Can't get the public participation that needs to be in this process for public hearings.

I first found out about the Atlantic States Marine Fisheries Commission in 1988, when they had their meeting in Atlantic City. There were some who wanted to go down to Atlantic City and talk about the species. And in order to get on the agenda to be able to open our mouths Senator Gagliano, senator to Monmouth County, had to ask permission from the Commission to allow us to speak. We couldn't ask questions. We couldn't deviate from the subject and we had to read from a prepared statement. Also, they allowed us to speak after they voted on the issues. So it really did not make a lot of sense. I got very annoyed about the process and started making a congressional stink. Charles Bird can tell you. Lars was down at the last Atlantic States Marine Fisheries Commission. All you have to do is raise your hand and somebody will recognize the audience. You can voice your opinions at Commission meetings now even if you're not a commissioner and before even some of the commissioners were not allowed to talk at board meetings. So that's been a big change.

I'm going to briefly give you an overview of what the interjurisdictional fisheries bill does. The bill passed by Congress says that the Commission, once it approves a plan that the states have up to 12 months or when the commissioner decides when that plan should be implemented to come into compliance. At the end of that period of time if the state is not in compliance and Atlantic States Marine Fisheries Commission, which will vote that state out of compliance and sends it to the Secretary of Commerce. The Secretary of Commerce will make a ruling within six months to say if that state is in compliance or not. If they decide the state is out of compliance, then they can put a moratorium on both the commercial and recreational fishing in that state. That's basically what the bill does. So it's basically a brave new world out there. A lot of you know that I had some real problems with this bill going through. I still do because the money is not there. There's no money for public participation and it needs to be.

I had to put the last slide on here. There are two last slides. And really in the last couple of years the battle goes in the direction like Roger Locandro and Axel Carlson over the years when I first got involved with this. That shows the real issue is habitat destruction. We lose a lot. We fight over small allocations of fluke. Yet we let nursery spawning areas be totally destroyed. I mean Barnegat Bay is a prime example. All those areas used that used to be

wetlands, now have houses on them. We fight over allocations of bluefish and yet when it comes down to it we don't fight the battles. We fight PCB contamination or dioxin, called turn into hook and release species, and I mean right now there's another area besides the Hudson River that hasn't become public knowledge yet and it's contaminated with PCBs. So another whole section is going to be basically told to limit fish consumption. That is not what we all want.

They still dump dioxin in the ocean off the coast and so we still have dioxin pollution of the fish. That's why the Commission basically set up a habitat committee, which is new. I think some people just try to keep me quiet. Chairman, give Tom a job. He can't cause much trouble over there. Well, they found out that wasn't true. I mean so far the Army Corp. of Engineers has been yelling at us ever since. As a matter of fact, one or two states wrote when I complained about certain projects they had that contained a lot of dioxin. I mean that's really what we need to concentrate our efforts on. If we don't protect the wetlands, if we don't protect the environment, if we don't protect the resource from contamination, then we don't have fisheries in ten years because no one can eat the fish. Thank you.

**MR. TWEED:** I'll raise one issue and we're going to be exploring two issues that grow out of management conservation for our resources. One is the habitat changes and the other is the economics of fishery for habitat. We have Dr. Ken Able from the Rutgers Institute of Marine and Coastal Sciences who will discuss the Importance of Habitat to New Jersey Finfish Fisheries:

**DR. KEN ABLE:** For purposes of this discussion, we can define habitat as simply where a fish lives, including any of its life history stages, i.e. eggs, larvae, juveniles and adults. Much of the current discussion concerning the status of finfish fisheries of the region is focused on the issue of overfishing, but it is becoming increasingly apparent that our fisheries will not recover if the habitats, especially those for the early life history stages, are destroyed or compromised by pollution, habitat destruction or degradation. Of course, the issue of habitat protection or enhancement should be of concern to every fisherman regardless of whether they are commercial or sport fisherman.

The following are some examples from New Jersey waters that demonstrate the value of habitats for species that are the basis for important fisheries. These stretch from the deep continental shelves to shallow estuaries and demonstrate how a variety of species use a variety of habitats.

The tilefish (Lopholatilus chamaeleonticeps) live at the edge of the continental shelf in a fairly restricted depth zone where some of our studies have demonstrated that they are restricted to areas where the bottom sediments, which are composed primarily of clay, enable them to construct large burrows that they use for their entire lives. Studies by scientists and the fishermen's experience show clearly that they are restricted to areas with this particular sediment type.

In estuaries, tethering of small blue crabs (Callinectes sapidus) in vegetated (eelgrass and sea lettuce) and unvegetated habitats demonstrate clearly that survival, even over very short periods, is much higher in areas of vegetation. Thus, at least to some degree, if

eelgrass was eliminated there would probably be fewer blue crabs around to harvest.

Other types of vegetation such as salt marshes also provide important habitats for a variety of species. We have used large weirs to block off small marsh creeks to determine the number and type of fishes that depend on these habitats. These studies have shown that an extremely large number of fishes, that eventually become food for a variety of predators such as weakfish and fluke, are produced in these creeks. These prey species include such things as mummichogs, (*Fundulus heteroclitus*) and silversides or spearing (*Menidia menidia*).

Another clear example is the way in which fluke or summer flounder (*Paralichthys dentatus*) of a variety of life history stages use these same marsh creeks. Fluke spawn in the ocean but the larvae, at about one half inch in length, move into estuaries where they spend the first summer of life. During this time they grow very quickly and reach approximately 8 - 10 inches by the end of the first summer. This is one of the fastest growth rates for any estuarine fish in North America, and attests to the rich food resources in these creeks. In order to learn more about how these fast growing fish used these creeks, we attached ultrasonic tags to fish of this size and released them into the creeks where they were captured. With an underwater microphone we were able to locate individual fish for periods up to 34 days after they were released. During this time we tried to locate these fish at least four times a day, i.e. at daytime high and low tide and nighttime high and low tide. During the day the fish stayed at the mouth of the creek and apparently were not feeding. On night high tides they moved into the creek to feed on the abundant fishes and shrimps there, and they moved out of the creek on the night ebb tide and stopped again at the mouth of the creek. This pattern was consistent for many of the fish observed. Thus it seems clear if these marsh creek habitats are destroyed or degraded it will affect fluke nursery areas and, as a result, reduce the number of fluke available for harvest and for sustaining these important populations.

Sometimes other changes in habitat receive a lot more attention. A good example is the 1976 anoxia event that was responsible for significant mortality in surf clams off the coast of New Jersey but these populations have recovered. This kind of recovery would not be possible for species such as fluke if all marsh creeks were eliminated or permanently degraded. This is still happening although not on the scale it did in earlier decades. It is also important to recognize that habitat improvements have resulted in improved fish stocks. One of the best examples in New Jersey is the recovery of shad (*Alosa sapidissima*) in the Delaware River. This has occurred in response to the improved water quality in the river in the vicinity of Philadelphia and Camden. These same changes may be responsible for the increase in the striped bass (*Morone saxatilis*) stocks as well.

We are continuing to conduct research on the significance of estuarine habitats as nurseries for juvenile fishes at the Rutgers University Marine Field Station on Great Bay near Tuckerton. We are focusing particularly on the very small individuals, those that are transforming from the larval stage and leaving the water column to settle on the bottom. We suspect that events occurring at that time (predation, starvation, etc) might determine how many fish will be around to reach harvestable size. Unfortunately this period in the life history of fish is probably the most poorly known. This is why we are concentrating our efforts on this portion of the early life history stage. In particular we are trying to answer the following question: Is transformation or metamorphosis a critical period in the life history of fishes?

What habitats do fish at these early life history stages require to ensure good growth and survival during this period? Are these estuarine habitats declining in quantity and quality?

We have the advantage of working in a relatively pristine estuary, the Great Bay - Little Egg Harbor system. This clean system provides an important baseline study site so that we can accurately determine how natural, unaltered habitats function. Once we sort that out we can begin to understand if heavily altered estuaries, such as Raritan Bay, can provide nurseries for juvenile fishes. As part of these comparisons we are focusing on such species such as winter flounder (*Pleuronectes americanus*), tautog (*Tautoga onitis*), black sea bass (*Centropristis striata*), and fluke (*Paralichthys dentatus*).

The publications which address some of the questions posed above for several species of economic importance in New Jersey waters are contained in Appendix 2.

**MR. TWEED:** We'll go on to our next speaker. That will be Bernard Brown from the Department of Environmental Protection and Energy, to talk about the economics in the fishing industry.

**BERNARD BROWN:** I'm Bernard Brown from the Division of Fish, Game and Wildlife. And I took very literally the fact that we were going to have a roundtable. So my talk will be somewhat different than everyone else's.

My first handout is a picture. [See Appendix 3] This is a picture of commercial landings from 1950 to 1992. This is one part, one small part, of the commercial fishing industry. The value of the commercial fishing industry, as with all industries, is determined by the consumer. The person who buys the fish, who eats the fish in restaurants and buys it in retail stores. There are a lot of producers involved in getting this to the final consumer. The first, the initial producer is the harvester and many of them, of course, are here today. If you look at this chart, you notice interesting things happened. First place I don't go back quite that far, certainly not to St. Paul, but what's very interesting is when I first started doing this, I guess back in the late '70s, that was just after the two hundred mile law came into being, there was great euphoria in the industry and it shows it was warranted. If you look at the dollar value of landings in New Jersey it shot up in '76 and stayed up until the '80s. It was a euphoria that didn't last very long. Since then it's been moving up and down, but nevertheless at the present time, in terms of constant dollars, we haven't reached the peak that we reached back in 1979. In terms of pounds of landings, back in the '1950s, they were very high. But something happened in '82, namely a menhaden plant went out of business. So if you just look at the pounds landed it messes it up a bit because menhaden was landed in great quantities, but very low value. But nevertheless, starting at that point in '82 both dollars and pounds have increased. And so that by 1992 the landings in pounds I notice were higher than they'd been at any point since 1976. We brought for the recreational side a report on the New Jersey saltwater angler. This was a survey of the 1992 fisheries. So we're pretty much up to date. And there are many things in here other than economics and so I'll just pass by those items. The report speaks of species caught, species that are released, released rates, targeted species, harvested species, and why people don't fish more. Most of them seem not to have enough time. Another interesting thing that would distinguish the recreational fishery from the commercial fishery is that the number one item for what is essential to the success of



the trip is good company. Now, I'm sure the commercial harvester loves good company as well as anybody else, but I don't think he would list that as number one.

But when we get down to the economics of it, we find that in terms of spending, as most of you might suspect there's a tremendous difference between spending by the type of person who owns his boat and the type of person who doesn't own his boat. And so here I have the average expenditure on a short fishing trip is \$31. Now, this is trip expenditures. It doesn't include all those capital costs like rods and reels, but this is just what's associated with the trip and this is mainly food and beverages. But when you get to the fellow who owns his boat why then the costs go up. We triple the cost of the trip; the fuel and oil for the boat, that's the important thing. Interestingly enough, people who go out on charter boats buy a lot more for their trip than people who own their own boat. And people who go on party boats spend more than the shore trip. But once we get beyond that, seasonal expenditures or capital expenditures, of course, the boat ownership is the major cost, but then rods, reels and other things are added on.

What I had indicated when we talk about commercial or recreational fishing economics, chances are we're talking to fishermen in both cases. But from the economic point of view, they're totally different. When you're talking about commercial fishery you're talking about the supply side. You're talking about the producer. Now, what is the producer supposed to do? He's supposed to supply goods and services. He's supposed to supply many goods and services, quality goods and services at a low cost. So in terms of the producer what we want him to do is to lower his expenditures, lower his costs so we can get more value at the consuming end.

However, when we talk about the recreational fisherman that's another story all together. He is a consumer. The producer in the recreational fishery are the people who own the tackle shops et cetera. What we want from the recreational fisherman is for him to spend as much money as he can and to really enjoy it and live it up. He should be the last of the big time spenders, so that the producers in the industry make a lot of money. And they will make their income from the spending of the recreational fisherman. Of course, he wants the people who provide him with the goods and services to hold down those costs so that he can enjoy himself much more at a lower cost.

So that's the difference. I think that's a critical difference and that's what makes it so difficult from an economic point of view to compare the contributions of the commercial fisherman and the recreational fisherman. We have harvesting and then we have shore activities of production. There's processing at the docks and processing at other levels. And then there's wholesaling to get it out to retail stores. That should at least double the value. Here's an interesting thing. Three-fifths of the value, of the fishery or the value of fish in the commercial industry is at the retail level. So that again when we're talking about the commercial industry and we're talking about the harvester we're talking about a small part of the commercial industry. I said the consumer is the driving force and harvesters provide a service to the consumer. If the harvester stays in business and earns a living, then he's providing that service to the consumer. When we get to the recreational fisherman then the value of the industry is his expenses and expenditures because he is the driving force. He is the consumer.

I tried to get some numbers together. For the recreational side, we have over half a billion dollars of spending. Now, put that together with the commercial side. I know everyone likes this concept of a multiplier, because what you do when you earn income and spend income is to provide income for somebody else. So put them all together and the total economic contribution of the commercial and recreational fishery resource is somewhere between one and a half billion to a little over two billion. Now, I'll end up with one point. The gross state product of the State of New Jersey is \$208.4 billion. This will put it all in perspective.

**MR. TWEED:** I did appreciate Bernard's explanation on the economics. He can legitimize terms to what I always called apples and oranges. It's good to hear that from Bernard. To finish up this morning we have input from our industry participants in terms of the industry infrastructure. We've invited Dan Cohen from Atlantic Capes Fisheries in Cape May.

**DAN COHEN:** Hello. My name is Daniel Cohen. I'm from the Atlantic Capes Fisheries in Cape May, New Jersey, but I'm also with Point Pleasant Packing in Point Pleasant Beach, New Jersey, and I'm here also on behalf of the Cape May Seafood Producers Association, which is Lund's Fisheries, Atlantic Capes Fisheries, Axelsson and Johnson Fisheries, Cold Spring Fish and Supply, and The Lobster House.

We're here reviewing the last twenty years at the roundtable. What we're really looking at is the public resource off the coast of New Jersey and the east coast of the United States, and how to protect that resource for future generations so it is a resource available for all consumers.

At the same time, we're looking at the next twenty years and how to manage that resource, as a sustainable resource and to have access for consumers to eat and for commercial fishermen to make a living from. The issues that we're looking at as a common goal is the co-management of the resource, our access to it as commercial fishermen for consumers, and as recreational fishermen. It's only a benefit when we can actually gain access to the resource. You must be able to harvest the resource.

When we're looking at harvest we're talking about boats and ports. That's really what I'm here to talk to you about today. On the East Coast of New Jersey there are four major ports, Belford, Point Pleasant, Atlantic City and Cape May. In reality the last 20 years the infrastructure of these ports hasn't changed. In fact, the infrastructure has deteriorated. If we want to look at continuing access for fishermen to catch the fish, and make it available to the consumers to eat, we must maintain the infrastructure of the fisheries.

Let's look at a couple of our problems. Number one, in terms of regulations we all must look at the common goal of protecting the resource in terms of habitat defilement. At the same time once we have a structure on the waterfront, such as a dock, it must be maintained. There are regulations on the books now which make it very difficult for people to maintain their structures. The Zane letters permit an individual recreational boater or home owner to replace a dock like for like after a storm. Like for like allows for reconstruction without major problems. In terms of permitting, one of the biggest problems you'll see on the side of the

commercial industry is that when you replace like for like the ability to use the Zane letter is not available. If in the next twenty years, DEP management should allow us to extend to all existing structures, the ability to replace like for like after storms. Reconstruction and maintenance of facilities without additional costs to the bureaucracy and additional costs to the end user would be a benefit to all.

The second major problem that I would like to address that confronts the commercial fishing industry is access to waterways dredging. Unfortunately, the State of New Jersey due to underfunding of the DEP program for waterway maintenance has fallen down completely in providing safe and adequate waterways for commercial fishing. This is really not the fault of the DEP, because I clearly know there are members of their staff that are very concerned about the safety of these waterways, the hazards in them, the navigation problems, and the extreme costs to the commercial fishing industry. The problem has been lack of funding, resulting from the lack of support from the constituents and the public.

In 1990, there was a new study done by the Army Corps of Engineers to reauthorize dredging in Point Pleasant. Simultaneously there was a new reauthorization by the Congress of waterways in Cape May, Atlantic City and Wildwood. Those projects were passed by Congress, still have not been built even though the project called for the work to be done in 1991. These are all just maintenance dredging projects for existing waterways. All the dredge spoils exist, but the funds have not been allocated from the State of New Jersey. As recently as November of this last year, the Governor of the State of New Jersey made it known that emergency dredging would be done in Point Pleasant because of the extreme critical nature. Despite those promises the funds are not yet available, and work has not begun.

What is the cost to the commercial fishing industry? What is the cost to the state? The truth is that a number of vessels in this state have left the state because of the inadequate water depth. In Point Pleasant we've seen big boats moving out of the state. The ability for a boat to stay and use the waterway is critical to gaining access. I don't know how to underline this, but I think we must have a long-term and short-term solution. I'm here to offer both.

In the short-term, I think it's critical that the new administration, and the DEP, find a mechanism to fund the projects which were already approved by Congress and New Jersey. These would include dredging at Wills Thoroughfare in Point Pleasant Beach, and Middle Thoroughfare in Cape May County, Wildwood, and lastly Atlantic City. That is the priority of the projects that was determined by the State DEP, and approved by the Army Corps of Engineers, over three years ago.

I would hope that somehow emergency funds are made available this year. I don't know how to express this except to ask each person to go back to their own constituent, whether it be Fish, Game and Wildlife, whether it be the Angler's Association, and say this is a common problem, not an individual problem.

What is the long-term solution? I'm going to suggest that the Governor begin a program that will ask our neighboring states to make a change in our port pacts. I'm going to talk about two different port programs. The State of New Jersey and the State of New York are involved in the New York, New Jersey Port Authority which has radius authority to spend

monies within twenty-five miles of the Statue of Liberty. The Port Authority owns all of the bridges and tunnels and airports in New York. As we all know the Port Authority has significant funds because they actually operate at a profit though they're nonprofit organizations. They do not have authority to operate out of that area. Actually State of New York ports have the same problems. There are radical dredging needs in Montauk. I know the work was done already in Shinnecock. There will never be long-term dredging for any of these harbors if we have to continually depend upon the voters of the state to give us their sympathies because we all know there's not enough money. There must be some dedicated funds. We should consider requesting the port authorities of each state to extend their jurisdiction which I would suggest New York, New Jersey, to two ports in each state which would be within their jurisdiction where they could use funds to improve the harbors with maintenance dredging, et cetera. I would say in New Jersey, it would be Belford and Point Pleasant, in New York, Shinnecock and Montauk.

We are probably the number one exporters of seafood out of the East Coast of the United States. Why don't I add Cape May for the New York and New Jersey Port Authority? Cape May should be under the jurisdiction of the Delaware Bay Port Authority which runs all the bridges, and also operates at a profit. I would suggest that the port authority there be extended to cover this Port of Cape May, Port of Atlantic City and Lewes, Delaware, and ports up the river. The purpose would be to maintain dredging infrastructure with those funds which could be made available from continuing political motivation. Without that there may be a five year program before dredging is implemented unless people in this room help us now in Point Pleasant, boats are going to be standing at the dock.

In the last few weeks boats in Point Pleasant were aground for over four hours waiting for the tide. One of the plants in Cape May, New Jersey was shut down because it was not able to get product for the two hundred fifty employees sitting idle in the clam processing facility.

I'd like to leave you with two ideas, one is the Zane letter for rebuilding bulkheads, second, is the dredging. I'd also like to just return to the original goal that I really hope the people in this room realize. Recreational and commercial fishermen must realize that we have a resource out in the ocean. It's a public resource that we have to manage for the benefit of all people, so that commercial and recreational fishermen in Cape May all have some access to that resource. We must be able to access it in an economically viable manner, and protect it for future generations. If people don't leave this room with that spirit, to give equal access, we're doing a major disservice to the public at large who we all represent. Thank you.

**MR. TWEED:** The last speaker will be Ray Bogan with United Boatman of New York and New Jersey.

**RAY BOGAN:** Thank you Stu, I would like to acknowledge the late Axel Carlson, who was a very dear friend of mine. He had an extraordinary amount of experience and involvement in many facets of fisheries. He and I fished together and attended many New Jersey Marine Fishery Council meetings, which we served on together. He was extra

ordinarily dedicated to the health and well-being of the entire marine fisheries community and worked tirelessly for marine conservation.

Gef Flimlin asked me to give a presentation centering around, as he phrased it, "physical limitations of the recreational fisheries and infrastructures, especially as it applies to party boat and charter boats." Infrastructure issues as they relate to the party and charter boat industry cover a very broad area. Some of the infrastructure issues which I believe are part of, and affect, this unique industry are habitat, docking, and on-land facilities capable of allowing this industry to adapt to changing regulations and requirements. It would be impossible, in a short time, to discuss solutions, so I will try instead to raise what I think are some of the pertinent issues which face us. I will begin by addressing the issue of adequate dock capacity and the changing need of the industry with regard to capacity and characteristics. A recent development in fluke management will help explain changes that are occurring.

There was recently a six fish bag limit imposed on the recreational fishing community by the federal government. The party boat and charter boat industry expressed the opinion that the bag limit was too restrictive to maintain a healthy and viable industry. One of the things that persons inside of Fisheries Management recommended was that certain boats should adapt by changing from all day fishing vessels to half day or three-quarter day fishing vessels. Besides pointing out that only a certain amount of vessels could sustain a business with half or three-quarter day fishing, docking restrictions became a significant part of the industry's consideration. For example, party boats from Cape May pointed out that there were restrictions on their leases in the ways in which they could function at their docks. Certain captains pointed out that they could not change from an all day boat into a half day boat, or vice versa, because of parking restrictions and use restrictions at their particular marinas. As you can imagine, these types of issues were never considered in earlier discussions regarding fisheries management and conservation. With bag limits being changed on blue fish, that same issue will now arise in that fishery.

Another development, which is most evident in Belmar, is municipal restrictions and changes on docking spaces. Belmar has proposed shifting the location of the party and charter boat fleet to another area of the marina. The Belmar marina facility is extremely big, but from a marketing standpoint, the present location of the party and charter boat fleet is ideal. It provides excellent parking capacity and convenience as well as open visual advertisement. This has long been a hallmark of Belmar from the party boat and charter boat industry's standpoint. The Borough of Belmar, however, would like to make the aforementioned boats less visible and in less desirable docks. This could have a major impact on one of the most significant party and charter boat fleets in this State.

Moreover, the Borough has also expressed a desire to enter into shorter term leases with these vessels. This can create problems when trying to obtain a mortgage for a vessel. Most banks require a stable lease situation. Banks would be reluctant to loan money to a small fishing business, which is uncertain of where it will be located after 3 to 5 years. The implications of these discussions with Belmar are huge. Docking and parking are obviously major infrastructure issues in the party boat and charter boat industry.

Another issue, which as applied more to smaller vessels, is the availability of docks. During the boating and building boom of the 1980's there was a serious concern as to whether there would be enough docking capacity in public marinas. The concern was that developers would purchase many of the small public marinas and boat basins, and convert them into private marinas, or into docks which might be purchased in the same way as a condominium. This issue was addressed specifically by the State Maine Fisheries Council and the now defunct Fisheries Development Commission. Interestingly, this problem did not become as bad as we had feared. One of the reasons that it did not is because of certain environmental land development restrictions and statutes which controlled overdevelopment to some extent. There was also the economic downturn in the boating and building industry which, also "helped" prevent this problem from growing. As to the party boat and charter boat industry, however, a more troubling situation has contributed to solving this problem, and that is the great diminution in the size of the party boat and charter boat industry. A recent trip that I took to Cape May drove this point home.

While dining at the Lobster House, I looked at a series of pictures of the Cape May party boat fleet from the 1920's and 30's. The size of the fleet was extraordinary. The size of that fleet has shrunk at an alarming rate. Likewise, the Atlantic Highlands has seen that same shocking decrease in the amount of vessels. Other inlets have experienced decreases. The United Boatmen of New Jersey and New York, a group of party boat and charter boat fishermen that I represent performed an informal survey to determine the degree to which the number of party and charter boats have decreased in the New York Bight. After examining the number of vessels out of the Atlantic Highlands, Sheepshead Bay in New York, Shark River, Manasquan River and Barnegat Light, we learned that the size of the fleet had decreased by almost 50%. There are those who have said that while the amount of boats may have decreased, the carrying capacity of the existing boats equals the carrying capacity of the much larger fleets of smaller boats from by gone years. That is not accurate. For example, we looked at five boats out of Sheepshead Bay in New York and the Atlantic Highlands from the early 1920's to the 1930's which had carrying capacities of up to 225 and 250 people. The vessels "Glory" and the "Satium" come to mind immediately. Old timers remember these double-decker boats very well. Moreover, there were a great number of the 45 to 55 foot vessels. The industry has definitely shrunk. Thus, while we always want to assure adequate docking capacity for this industry, the problem has not been as significant as we had originally feared.

A relatively recent problem which has developed, and which Gef has asked me to comment on, is the sewage disposal issue. When regulations were implemented by the Coast Guard for sewage containment tanks on vessels, it was anticipated that there would be an adequate disposal system for those vessels once they reached port. It was anticipated that when a vessel came in after a number of fishing trips, there would be a facility in which it could empty its sewage tanks, however, while the regulation regarding these sewage tanks was passed, a sewage collection facility program was never developed. The industry itself could never afford to provide this disposal system. Some day, perhaps, the persons who developed the plan for the storage tanks will develop a system by which the waste can be handled.

There is another infrastructure issue which is not seen by most persons, but which could have devastating effects on the fishing industry and fishing habitat. As the size and

horsepower of certain commercial vessels has increased, the destruction to underwater marine habitat by those vessels has increased. Large clam and scallop vessels are ripping apart significant areas of bottom which include rock piles and sunken wrecks. For example, approximately one and a half miles off the coast of Mantoloking is a large rock pile named "Inrock". There are a number of other rock piles that immediate area. This rock pile was formed during the time that the great wall of ice from the ice age was receding. This winter, a number of those vessels went through the "Inrock" area and tore up and removed significant amounts of this underwater habitat. Remember, these rocks have been home for fish for thousands of years. In the course of several hours, these large and powerful vessels have torn through that habitat and literally removed sections of it. My father began fishing these areas sixty some odd years ago. We have brought literally tens of thousands of people there ever since, where they have enjoyed fishing on this rough bottom. Now parts of it are being wiped out. Likewise, sunken ships, some of which sunk in the late 1700's and early 1800's are being flattened and torn apart. It is shocking.

Another example of this is an area where I fish for blackfish. One wreck, which my father discovered over forty years ago, is several miles offshore of "Inrock". You can't imagine how shocking it is to go out to fish one of these wrecks only to find out that half of it has been torn apart by a scalloper or a clam boat that has just passed through the area. This significant problem is rarely discussed by persons other than full time bottom fishermen. However, when one considers how the bottom is now being scoured, we all have to be concerned about this destruction, not only to the structured habitat, but the plant and vegetation life on the open bottom. It's an issue that will have to be addressed.

It is essential that persons involved in Fisheries Management consider the implications of regulations in their broadest sense. Fisheries Management must consider not only the marine and human resources, but the other more practical effects of their regulations.

**Mr. Tweed:** The next speaker is Dery Bennett, Executive Director of the American Littoral Society based on Sandy Hook. He will speak on NJ Environmental Groups and Fish.

**Mr. Bennett:** I can and will say some things specifically about how the American Littoral Society views and works on fisheries issues in New Jersey, but first some comments about environmental groups in general in this state.

Few NJ environmental groups directly target marine issues. Most are interested in land use (including open space), surface and groundwater quality and quantity, air quality, toxins, public right to know about environmental threats, and wildlife habitat. Their efforts include active support of the State Development and Redevelopment Plan, citizens' right to sue, the federal clean air and water acts, mass transit, Green Acres funding, workplace safety, and pollution prevention.

While not directly aimed at living marine resources, most of their work does impact on almost everything that lives in or on salt water. Sensible land use upstream means better water quality in estuaries. Watershed protection means lower bacteria levels and better shellfish harvests. Decreased use of toxins means healthier fish. Mass transit begets less non-point source runoff. Open space is better for marine life than developed space.

While some groups emphasize human health and focus on such issues as safe drinking water and clean air to breath, all deal with wildlife habitat in some way and are, thus, an important influence on New Jersey's living marine resources.

By in large, New Jersey environmental groups do not get involved in fisheries allocation/management issues, taking, instead, the view that healthy habitat is their basic cause, and they will leave it to others to figure out who gets the proceeds from good environment and good habitat. This is not to downplay the impact environmental groups have on fish. Any time the water entering an estuary is cleaner or a piece of wetland is saved from the bulldozer, fish benefit.

The Littoral Society's special interest is the well being of coastal ecosystems. We operate from the basic premise that most marine productivity is concentrated in shallow coastal waters; our major role is to make sure that there is public understanding of the importance of a good nearshore environment and that the officials charged with protecting coastal natural resources do their jobs.

NJ's saltwater habitat has been damaged from many directions -- wetland dredge-and-fill, oil spills, channel maintenance, bulkheading, upland overdevelopment, and stormwater discharge. No one of these actions by itself will necessarily sound a deathknell for marine critters, but when the cumulative impacts of a century or more of such environmental insults are added up, the effect is devastating. It can be measured by fish advisories, bag limits, shellfish bed closures, and decreases in submerged aquatic vegetation and waterfowl populations, and the virtual disappearance of some fish species -- puffers and whiting, to name two. All you have to do is look at landing statistics for fish or maps of beds closed to direct harvest of clams and it is obvious that something is wrong.

The basic problem is too many people and their devices -- homes, boats, cars, trash -- too close to tidewater. In New Jersey, coastal areas are heavily developed or developing. "A place at the shore" is many person's dream. This means more land covered with homes, streets, and driveways. It means more shopping centers and four-lane highways -- more cars, oil on the street, dogs and cats adding wastes to streams, more septic tanks, more freshwater use, bigger sewer plants, more of almost everything except living space for marine wildlife. Natural wild populations suffer.

Here are a few examples of actions the Littoral Society has taken, working often in concert with other NJ environmental groups:

The State's coastal zone land use law -- CAFRA -- is supposed to protect coastal resources. It often fails, because of political pressure from developers or because of weak exercise of regulatory authority. In several instances, the Littoral Society has intervened at public hearings and in court to compel NJDEP to enforce its own regulations. One such case was at Smithville on Route 9 in Galloway Township, where State approval of a 7000-unit development threatened water quality and habitat in the Mullica/Great Bay estuary. In this case, we worked closely with National Audubon Society, the NJ Conservation Foundation, the South Jersey Shellfishermen's Association, and two Atlantic County shellfishermen.

Currently, we are appealing a decision by NJDEP to permit development of a shopping



center and hotels on an island between the mainland and Atlantic City, and just a year ago, we won a decision before the NJ Supreme Court to stop a similar development on an island between Longport and Somers Point (a development which, by the way, had been denied by NJDEP, but appealed by the developer).

The Littoral Society has joined with other environmental groups on several such disagreements – open ocean dumping of contaminated dredge spoils off Sea Bright, rights of access for surf fishermen along the coast, planned development on Stone Harbor Point, in Cape May Harbor, dredging and filling of wetlands in the Hackensack Meadowlands, and dredging of offshore sand for beach replenishment.

In all these situations, environmental groups ask themselves basic questions: Does the development need to go at the water's edge? Are there less environmentally damaging alternatives? Can a project be realigned or redesigned to minimize environmental impact? What secondary or cumulative impacts will the project cause?

In its most simple terms, we ask if the proposed development will hurt fish? Surely this state, the country's most densely populated, should not be gambling its living marine resources for a few more condominiums, shopping centers, and seaside beer gardens.

What to do? Most important, the human being must come to understand his or her impact on the marine ecosystem, the direct and indirect cost of illogical "progress" in New Jersey's coastal zone. So the first need is lots of education about how natural systems work and how we need to live with these systems rather than at odds with them. This is a long-term proposition, but it needs to happen. The message should be that coastal marine habitat needs protection (indeed, in New Jersey it needs restoration if that is possible), that some of the things people come down to the shore for – to fish or crab, to look at birds, to swim in the ocean – are endangered through overuse.

A second need is action to prevent the impacts of short term economic gain at the expense of the long-term renewable resources of New Jersey's coast. Our elected and appointed officials must be convinced that the largest public good is served by calming the desire for "progress" at any cost, especially when that cost is borne disproportionately by the very values that make the New Jersey coast so biologically productive in the first place.

**MR. TWEED:** I'd like to thank all the speakers that we had this morning. I think they've identified some very serious concerns in fisheries and I think they've shared with us a lot of their valuable information. I would entertain maybe one or two questions if something has peaked someone's interest generally. (Whereupon, a luncheon recess was taken.)

### **Marketing**

**MS. O'DIERNO:** Good afternoon, I am Linda O'Dierno from the New Jersey Department of Agriculture. I serve as the Seafood Marketing Specialist for the Department and the state Aquaculture Coordinator. I will be serving as the moderator for this afternoon's session on Marketing, and will begin with my own presentation on Marketing New Jersey Fish & Seafood in the 21st Century.

The fish and seafood industry is changing rapidly. Traditional species that were once

abundant are now in short supply. We no longer deal with a local market but must be ready to response to changes in the global market. Seafood supplies and currencies in other parts of the world can effect business right here at home.

Since seafood is still largely a hunted commodity, you can no longer think locally, you must be concerned about supplies, imports, exports and shifting worldwide demand. This means that successful seafood marketers have to take a much broader view.

Many marketing strategies are just common sense. To develop a successful marketing strategy, you have to consider both the macro and micro environment. The macro-environment consists of the factors that we cannot change. These are legal issues, economic issues regulatory issues, and political issues. These things are usually beyond your ability to change. What you have to do is to develop a strategy that can be defended in the face of those changes. We're all affected by these things. A drop in the economy means that the consumer has less money available to spend on fish and seafood products. What can we do when consumer price resistance depresses sales and reduces demand? Management policies regulate which fish you can catch and how you catch those fish. What can we do when we suddenly closed out of a traditional fishery?

The micro-environment consists of the things that you can change within your own organization and how you react to changes around you. These are the factors that you can control directly.

Let's consider fish and seafood consumption. Essentially fish and seafood consumption hasn't changed over the past fifty years. Demand is still very low. Consumption stands at approximately 14.8 pounds per capita (fig 1). That's not very much. Especially when you consider that three and a half pounds of that total is tuna in the can. Another three and a half pounds is shrimp. Now you have 7 pounds taken away from your original 14.8 pounds. That's only 7.8 pounds for all the other fish in the sea. On the positive side, because consumption is so low, there is still a great deal of area for market penetration.

We have to consider ourselves to be "chicken busters". When red meat consumption declined, poultry quickly fill the void. The average American consumes about 43 pounds of poultry every year. Because of an aggressive advertising and marketing campaign, pork has gained considerable market share as "the other white meat." Fish and seafood are rapidly losing ground to these other protein sources. We have to develop some better ways to position ourselves in the marketplace.

One of the major areas of consumer purchase resistance is price. People get sticker shock when they go into a store to purchase seafood. Part of this can be attributed to the demand on the top ten seafood species. Demand for these species is quickly outstripping supply while many other equally good seafood choices enjoy very little market demand although the price is reasonable. People want to purchase the same products over and over again.

If you look at figure 2, you can see how the ex-vessel prices changed from 1987 to

1992. The ex-vessel price has lagged way behind the consumer and producer price indices. That means that the harvesters are not the people who are actually reaping the rewards of higher retail prices and any projected demand increase. We have to look at mechanisms for developing a more equitable distribution of the profits from seafood sales. That means to look at ways of packing and processing your products, value adding and getting them out to consumers. This can put more dollars into the pockets of harvesters.

We have to look at competition from foreign nations. Sixty percent of the seafood consumed in this country is imported product. The trade deficit in fishery products through the Port of New York/New Jersey alone is over 523 million dollars. How can we get more of that market? How can we recapture our domestic market?

There are also user group conflicts with which to contend. These are causing problems for many of our local fishing ports and harvesters. There are recreational, residential and land use conflicts with which to deal. The cost of doing business is escalating. It's costing you more per unit effort to harvest and market your products although ex-vessel prices have not increased substantially. There is some evidence that ex-vessel prices in New Jersey are actually lower than those in surrounding states.

If you traveled across the United States and counted all the different species of fish that are in commerce, you would find between 800 and 1,000 different species. One of the most important things that we can consider is diversifying the fishery and that diversification can extend to both the commercial and recreational industries. With diversified fisheries, you can gain economic and environmental stability. I, personally believe that increasing consumer demand for a broader variety of species is the key to the continued survival of the industry.

We need to look at market price penetration strategies. How can we gain a greater market share? There are three basic strategies for gaining market share: 1) stimulate present purchasers to purchase more product, 2) attract your competitor's customers, and 3) attract non-users. That non-user group is extremely important. We need to look at the market and do some homework. When I first got involved with fisheries, fifteen years ago, people were talking about underutilized species and this is still a major issue. We have to look at products that are underutilized and develop a demand for them. However, this has to be done carefully. You can't just target one species and increase the demand. This just moves that species from the underutilized column to the overexploited column. You have to focus on developing demand for a variety of species. Because of the loss of federal dollars for fish and seafood promotion, this has become a do-it-yourself job.

Let's look at a classic market study, orange roughy. Suddenly, this fish has become one of the most important products at the retail counter in the United States. It's imported from New Zealand. It's usually frozen twice – once at sea and then again after land-based processing. The New Zealanders didn't know what to do with it. It's a very ugly, deepwater fish, but it's perfect for the American market – a white, mild-tasting, boneless fillet. The product was first introduced in the Mid-west where there is very little established seafood tradition. The price was low. There were lots of point of purchase materials and advertising and the product gained acceptance quickly. Once that market was saturated, demand started to move toward both coasts. Retailers find the produce easy to handle. It is usually in

frozen fillet form. Materials were available to teach their customers who to prepare it.

The French are running into many of the same problems with their fisheries as we have in this country. You've all seen French fishermen demonstrating on television. They're concerned about foreign competition. They're looking for additional products to sell and additional markets. One of the things that they've done in France is to investigate deepwater resources below two hundred meters along the Continental Slope. They identified three species. One was very similar to the orange roughy. Because it was red, they called it an emperor fish after Napoleon and his red coat. They also found grenadiers or rattails and began to market those. The third was the cutlassfish.

Once they identified these resources, they began a government-financed marketing campaign in order to develop a domestic market. The basic introduction was through the Club Med restaurants around the world. Many consumers first try lesser known species in restaurants. This was the situation with monkfish ten years ago. When people are on vacation, they tend to be more adventurous in their food choices and are willing to sample new products. Last fall, whole emperor fish were retailing for \$23 per kilo.

Export is another important marketing channel. Many of the species that we harvest locally don't enjoy a strong market demand in the United States but can be sold overseas. You have to have some commitment to actually develop foreign markets but the rewards can be high.

There are some other issues to complicate the whole issue of marketing local products. There is always the possibility that new media scare can erupt. People have concerns about the quality of the seafood available locally. Because seafood is such a fragile commodity, it is difficult to maintain quality through the distribution chain until it reaches the hands of the final consumer. Are there ways that the industry can better monitor quality?

In summary, it is critical to develop alternative markets and products both here and abroad if the commercial fish and seafood industry is to survive in the 21st Century.

Now, the other speakers who are going to deal with marketing are going to look at some of those quality initiatives. Does anybody have any questions? I have about a minute. No. Okay. Our next speaker is Gary Wolf from the Department of Health Division of Consumer Health.

**GARY WOLF:** I'm responsible for the shellfish and seafood regulatory programs in the state health department. None of my talk will be in any newspapers tomorrow or on any television shows, because I have some good information to report.

First of all, I'm unlike the commissioner of the Food and Drug Administration, I do eat raw shellfish. It also has nothing to do with my hair loss. So that's good news that happened way before I started eating shellfish. Let me just go over some facts and try to dispel some of the misconceptions. In my job over the last few years I get all kinds of questions from consumers ranging from several years ago when we had beach wash-ups, you know, whether needles sticking out of fish, can I eat the fish? I was feeding some leftover fish to my cat who was glowing in the dark. Does that mean it's radioactive? Will the worms that I found in my

fish kill me? These are some of the typical questions you get. Many of these questions have nothing to do with public health, and I try to convey that to people. Maybe aesthetics. It may be quality control. However, it's not a public health issue.

We have not had from shellfish harvested in the State of New Jersey any outbreaks of illness since 1985. That's just about nine years we have not had one case of illness related to shellfish harvested in New Jersey waters.

Some of the misconceptions again are regarding our programs and the inspection programs in place. Again, some facts. When you see some of the sensational stories on TV and/or read some of the articles in the newspapers the media just keys in on either a very small incident and doesn't look at the overall situation. There is some factual information from the Center For Disease Control in Atlanta, Georgia, which keeps records on communicable disease illnesses for the entire country, and the U.S. Public Health Service and according to their statistics only 4.8 percent of the reported cases of food illness from the period 1973 to 1987 were from seafood products. That's a pretty small amount considering there's about 12 billion pounds of seafood products consumed in this country annually.

Also according to the National Academy of Sciences Institute of Medicine, their 1991 report said most seafood available in the U.S. are wholesome and unlikely to cause illness in the consumer. And in reviewing the CVS data, there was a 23 percent increase in seafood consumption in the United States in the ten-year period ending '89, and it was accompanied with no increase in seafood borne illness. So, in other words, it was not a proportionate increase in seafood illnesses. That's all good news and again, you know, hopefully we can convey that to people. I try to. And I also would like to commend our industry in New Jersey who I work with all the time and even though I'm in a regulatory position. We have had very few problems with dealing with the industry. We work together as a team because a lot of our requirements are also what they would like to see as well, and we have very few problems with that. We try to keep the line of communication open, and communicate the information to the public and to the consumers as best as possible.

There are seafood inspection programs both in the state and at the federal level and our next speaker will cover some of the federal inspection programs. Much of the discussion here was about what's changed over the last 20 years. The last time you met there was no National Shellfish Sanitation Program. What's happened there is positive. Illnesses from consumption of raw shellfish, which was a problem, had to be addressed because states were pretty much doing things on their own. Every state was doing things a little bit differently as far as classifying their waters, determining bacteriological criteria, chemical criteria and other contaminants for certification.

The National Shellfish Sanitation Program was created to have input from all the shellfish producing states, from some of the receiving states and from the industry, as well. This program has advanced to the point now where there is a standardized program for doing inspections which requires standardization of the state inspectors, a uniform type of inspection for processing plants and distribution facilities for shellfish, and uniform criteria for classifying shellfish growing waters. So that has been a big change in that aspect for the last twenty years.

If we look at the shellfish related illnesses that you hear about, most are due to products which has been harvested in the Gulf of Mexico from bacteria which are endemic to their waters. They would impact a very small segment of the population whose immune systems are compromised, have had liver problems, some stomach problems, or some underlying medical problems. That's how one gets the severe type of illnesses related to those gulf state oysters.

Many of the seafood illnesses are related to scombroid, which is a natural bacterial breakdown causing changing histamine levels. Again, most of the scombroid illness outbreaks in New Jersey, once they're investigated we find that either the harvesting vessel in Ecuador, or during the transportation of product to the United States it was not properly refrigerated, and by the time it gets to the final retailer, the consumer, there's a problem with histamines. So, again, it's an education process that I think has to be made.

In our shellfish program in New Jersey, we certify and classify waters in the state. We provide certification for anyone distributing and processing shellfish products. We do have a program where we look at seafood products other than shellfish also caught in the State of New Jersey, harvested in the state and look at toxins that may have an impact on recreational population and other consumers and we issue a certification based on those.

The DEP also looks at seafood products. In FY '91 and '92 they took six thousand domestic seafood samples and fifteen thousand imported seafood samples. This was for microbiological criteria, decomposition, filth, et cetera. Also during that same period for chemical contaminants and pesticides, they took 2100 domestic samples and 1800 imported samples at ports of entry. And there should be a lot of emphasis placed on imported seafood products.

As Linda mentioned earlier, about sixty percent of our seafood products are imported. When I talk to the consumer who calls up and they have a fear about eating seafood because of what they've read or misunderstood, once you explain it to them and put it all in perspective that most seafood products are safe and indicate some of the positive aspects to eating seafood products and indicating what's a public health problem versus what's a quality problem or aesthetic problem, they might have a much clearer understanding of it and they could put it perspective.

Also high risk consumers should be educated. There are certain fish that pregnant women should stay away from. If you're talking about the immune compromised individual that has liver damage, maybe they should stay away from raw seafood products altogether and this should be conveyed through the proper channels.

So, I think we can all do a job as a team approaching this, because I think if we don't there's something to lose for everyone and if we do it right you have everything to gain. I guess you've read about some of the proposed regulations that the Food and Drug Administration is proposing for mandatory HACCP, which is a control point inspection. If nothing else, I think that this may give consumers a little bit of assurance that someone is looking at these products and it also places a burden on the industry to do the actual monitoring or testing at these different levels.

Also, the retailers need to be educated. How many times have you gone into a supermarket and find they don't even understand that shellfish are living animals. They will

put them in a plastic bag, tie the bag up and wonder why these mussels are just laying there open and gaping and don't look very appetizing. Well, you know, if anybody was put in a plastic bag I guess that's what we'd look like. So, you try to educate.

It's not just the consumers we have to educate. I think we also have to educate the retailer segment of the industry and it has to be a coordinated effort to give consumers confidence to provide the inspections and the controls that we need, and basically I think we can all work together to do that. In the past we've had some success with some publications we put out with other departments in the state to try to talk about seafood safety and we need to do more through working with the industry.

One weakness as far as trying to get word out is that there hasn't been a coordinated industry effort like the meat industry or the milk industry to explain things to the public so that they have it in the right perspective. I'm glad to see, for example, with the hard clam industry in New Jersey that they formed an association and I think as a matter of fact Mr. Maxwell, their president will be speaking later. That's the kind of thing you need. Thank you very much.

**MS O'DIERNO:** Following up on what Gary had mentioned about raising consumer confidence in local products, our next speaker is Mike Bavota who is with the National Training Branch of the National Marine Fisheries Service. Mike has been extremely helpful in responding to industry requests for training programs here in New York and New Jersey in both the HACCP Program and also in a program to train retailers how to better market and handle seafood products. Mike.

**MIKE BAVOTA:** I am a seafood training specialist for the United States Department of Commerce/National Marine Fisheries Service. The primary function of the branch is to provide seafood training to the industry and our own inspection services. I am here today to talk about HACCP.

Contrary to what you have read in the newspapers or heard on the T.V., concerning the negative experiences or perceptions of seafood, this food protein source, according to reliable scientific sources, is relatively safe for consumption. In addition, there are some very good things happening with seafood in the U.S., that seldom find their way into the news. We do have regulations pertaining to seafood. Although not the same type of inspection as allied to beef or poultry, the type of inspection which does exist for seafood is a voluntary system offered through the U.S. Department of Commerce. And now we have a proposal by the FDA to create a mandatory seafood inspection using HACCP principles.

HACCP - stands for Hazard Analysis Critical Control Point. My job today is to give you an overview of this inspection system.

Currently there are about 200 seafood processing plants in the U.S. which are under

the US Department of Commerce (USDC) voluntary program, there are mandatory regulations through the Food and Drug Administration (FDA). You will find these regulations published in the Code of Federal Regulations Title 21. It is a thick book and if you go to the library you are most likely to find a copy there.

The USDC seafood inspection program offers three types of inspections. Type one is continuous on-site inspection. Those involved in the Grade A program are under continuous inspection. If you have a HACCP plan with the USDC or an Integrated Quality Assurance program, you are a Type one facility too. Type two inspection involves lot inspection, and Type three is consultative.

Let's look at HACCP. The premise of HACCP-Hazard Analysis Critical Control Point, is a concept which has been in use for a few decades. It was designed by Pillsbury and the Natick Laboratory to solve a problem unique to the space program. When NASA reached a point whereby man would be traveling in space there was a real need to provide nourishment to these astronauts. In doing so, it became obvious that the food supplied for this program needed to be as close to 100% safe for consumption as possible. It had to be free of foodborne illness causing bacteria and other hazards which could jeopardize the space mission. The Pillsbury Company was given the challenge of producing just such a product. Now Pillsbury knew that traditional inspection techniques were not suitable to achieve this goal. Since traditional inspection relied mostly on end product testing, any hazards which might occur during the processing of product for the space food would appear in the end sampling of the product. And once at the end, in order to produce 100% safe product, it meant that a large amount of product destruction could occur to meet the needed end result of 100% assurance. So Pillsbury had to find a better way. They came up with an idea which took a logical approach to the problem. What if the company determined all of the hazards which could exist in the operation, assessed the risk of those hazards to the astronaut and developed a way to control those hazards throughout the process of the product? This way, once at the end of the production, the food intended for the space program should be as close to 100% safe as possible. They called this inspection system HACCP. Analyze the Hazards (which reversed is Hazard Analysis) to determine the best points in the operation to control said hazards (Critical Control Points).

In 1986 Congress authorized NOAA (National Oceanic Atmospheric and administration), which is also an agency in the U.S. Department of Commerce, to design the Model Seafood Surveillance Project. Then in 1992, the National Marine Fisheries Service was given the task of developing HACCP for seafood.

There are seven principles of HACCP. The facility will determine the hazards which could exist in its operation and assess the risk to the consumer. Then they will identify the Critical Control Points needed to control the hazards. After that, they will establish Critical Limits for the hazards, monitor those limits to see that they are not exceeded, and if exceeded, enact Corrective Actions to bring the hazard back into control. The firm will also establish a Record Keeping Procedure, and a means to verify that the system works effectively (Verification Procedure).  
Any Questions?

**ED CAMP:** We can't even get down to controlling how they handle the fish product in our



Acme and supermarkets. They're intermixing the fish. We can't even educate our home grown health departments.

**MR. BAVOTA:** Well, there's more and more education coming out. Cross-contamination, fortunately, is one of those issues that people are starting to understand. It has taken some time. I travel extensively throughout the country and I am quite happy to say that a lot of retailers are starting to get the message of cross-contamination. They're learning. But it's the consumer who needs to get the message. For instance, it is not a good idea to take a piece of chicken and put it on your grill and then take that cooked chicken right on that same platter with the raw juices.

**KIMBERLY SHEEHAN:** Kimberly Sheehan, Rutgers. With shellfish being filter feeders and the potential for heavy metals to bioaccumulate, is there any kind of mandatory tests or inspection for that?

**MR. BAVOTA:** There is ongoing inspection of shellfish. As a matter of fact, the shellfish inspection used in the state is a very good system. There's water testing. There's product testing. There are actual closures where you can harvest or not harvest shellfish. Most of what Gary Wolf related to about shellfish being a higher risk than other seafood you eat it raw, is because it's a living animal, a filter feeder, and most of the bacteria and viruses again are successfully deactivated through proper cooking.

I'm not sure how much heavy metals is a real part in shellfish. Gary could probably answer that better.

**MS. O'DIERNO:** Our next speaker is Captain Lou Puskas who is Co-owner of Viking Village in Barnegat Light and one of the first to begin the tilefish fishery in NJ. He will talk about Industry Marketing Initiatives.

**CAPT. LOU PUSKAS:** I am here to talk about fresh fish, mainly tilefish, which we started marketing back in the 1970's. I define the term "marketing" as getting the fish from the fishermen to the end-user who is going to consume the product.

If you have a limited number of customers, and a small amount of fish, you usually get more money. But when you have the same number of customers and a lot of fish, you have to sell cheaper, and thereby open the market to some people who could not buy at the higher price. If they like it, you have a new customer. Supply and demand set the price.

In December 1970, Hammer (Nelson Biedeman) and I made the first longline set for tilefish in the Hudson Canyon, returning the same day with 3500 pounds, that I shipped to Fulton Fish Market in New York. Before I sailed on that first trip, I called the market, and because there were no cod being supplied, they were anxious to try the tilefish with their customers. They paid a big 35 cents a pound, and we all thought it was terrific. In a short time other Barnegat Light fishermen joined us on the grounds, and we were on our way.

In 1975, Capt. John Larson and I bought Independent Dock and started our own enterprise with our own boats. We landed thousands of pounds of tile, and Fran, my wife, handled the dockside activity. In the early days tile was plentiful, but not well known, and the large share of the fish ended up in Fulton Fish Market. Gradually dealers in Philadelphia, Baltimore, Florida and Canada bought the fish, and the market demand expanded. The fish were popular for restaurants because they had white meat, were somewhat bland, and were easily steaked or sliced for serving. The flavor has a distinct resemblance to lobster, which led to the slogan "If you like Lobster, you'll Love Tile."

Tilefish filled a need in the winter months, when most other fish are hard to come by, so they became the fish of choice, as long as the price was in line with the buyer's needs. Stories about the new fish on the market appeared in magazines and newspapers, and they appeared in restaurants under many different names.

When the West Coast marketed fish were flown in, they were known as Eastern Sea Bass, Golden Tile, Mexican Sea Bass and other seductive names.

When the market seemed saturated and Fulton cut prices, I took it on the road. You cannot fish and sell your catch. Someone has to devote a lot of time to do the job, and you need a constant dependable supply, with a price everyone can live with, not a roller coaster price.

We always tried to get a better price for the fish to the fishermen because we dealt with a fresh fish, and not a frozen fish. Supply and demand set the price, and when the fish went to market it was hard to know what the price might be. Our goal was to get the fish to the end user as fast as possible, with as few middlemen as possible.

It became apparent that not just supply, but quality made a difference in the prices. Some boats stayed on the grounds longer and brought in older fish, the prices dropped accordingly. Also, the size affected the price; fish too large had more waste and some we cut off heads for shipping, only to find that some users wanted the heads for ethnic markets.

When I started marketing these fish, I took advantage of all the stories and made personal visits to buyers all across the country. Sue Bonsell from Rutgers Extension Service and I presented a cooking seminar for food chains and provided them with samples and recipes in Buffalo, NY.

We joined the National Fisheries Institute and even experimented with filleting fish for the Japanese market. To cut shipping costs, especially for air freight, we took orders for head-off and fillets of tile, then sent the heads to another market. We met restaurateurs and chefs, grocery chains and neighborhood markets. I distributed brochures, recipes and sometimes the fish themselves. Eventually the market developed.

Today's marketing is faster, more sophisticated, with world-wide competition and potential. Tilefish can be marketed side by side with Salmon from Norway, Orange Roughy from New Zealand and squid from the Mediterranean. We have to keep abreast of regulations in the US and all over the world, and know how the South American Imports and our exports to European markets affect us all. More complex, yes, but fascinating!

**MS. O'DIerno:** That gives you some idea of the kind of initiative you need to develop some of these new fisheries to get the price up to the level that you need to be able to finance your ventures. Now, we're going to look at another side of the same issue. The sports fishing industry has had difficulties with marketing their wares here in New Jersey. So to look at that aspect we have Dick Weber from Cape May to fill you in on some of their marketing initiatives and some of the difficulties the industry is facing.

**CAPT. DICK WEBER:** This will be different, my first free-hugger speech. But nonetheless I'm going to enjoy it and share a few things. I saw a lot of young people in the room. It made me even happier that I decided to go the way that I did. So please bear with me.

I grew up at the Jersey Shore during the 1950s and 1960s like a lot of other people in this room did. As a kid I was always interested in boats and fishing and gathering whatever nature had to offer and I remember those days as vividly as though it was last week.

I worked on the fish docks and on the party boats and always kept in touch with what kind of fish were being caught and who was catching them.

Most of the draggers back then were dayboats. They left each morning to see what the day had to offer. They returned to port each night to pack out and we worked on the docks packing out those fish. In the summertime they fluke fished and they would catch anywhere from maybe 800 to 1500 pounds of fluke a day, fish that ranged in size anywhere from 12 inches to 12 pounds. And normally in the daily catch there would be an assortment of other things. There would be a sprinkling of squid or maybe a box or two of weakfish, maybe some butterfish or even sea bass or porgies depending on what time of year it was and where the guy was towing, whether it was rough bottom or whether it wasn't.

In the spring and fall, fisheries changed. Draggers caught mostly trout and whiting and ling. They were a little bit less desirable, brought a little less money at the marketplace, but they usually caught more of them. It wasn't an unusual day for the boats to pack 30, 40 boxes a day for whiting or ling in the spring, some the fall. During those days boats went eight to ten miles off the beach. It was a pretty long run and if you got all the way out in our neck of the woods to the five fathom light ship, which was 16 miles offshore, you were really out there. Mostly the only boats who went off that far were either looking for bluefish, tuna, marlin or something exotic. The clam fleet also worked that area as the surf clam were abundant and thrived on the edges of all the shoals that stretched about 15 miles offshore.

As us kids waiting on docks for the boats to come in and pack their catch, we would go on ice carts where we ground three hundred chunks of ice. We'd pick up the chunks of ice out of the ice carts and we'd throw them at the diamond back terrapins that were sticking their heads up. There was never a time you couldn't see 15, 20 heads. We didn't hit them very often. It was a hell of a lot of fun trying. If the tide was low instead of chucking the ice at the terrapins we'd get a net. We'd scap the crabs off the pilings, there wasn't one on every piling,

but there was one on every third or fourth piling and most of them were what we call doublers. You know it as the big jimmy crabs that had shedders underneath because they were always under protection. They were soft and vulnerable until the shed was over.

In Cape May there when the wind was just right, coming out of the east you could smell the stench from the bunker factory in Wildwood. On the road to Wildwood you'd have to put the windows up. Big seine boats would literally pump the schools of menhaden aboard from their seine nets, and then in the evening they'd pack those fish over at the factory to be rendered for fish oil and fish meal. I always liked the way the schools of bunker looked as a boy when I went out on the boats. There was a kind of a red glow to those schools. The water always danced right on top of the school, kind of like the water itself was alive. But those buggers sure did stink when you cooked them in the evening, I'll say that.

In the winter time most of these day draggers tied up to the dock and the fishing was left primarily to those few hardy souls who gillnetted for mackerel and longlined for codfish. That was something I did a lot of that myself. I had friends that did that. They'd take me along and in the 35 or 40 foot boat you might catch anywhere from two to three thousand pounds of codfish, eight or ten miles off the beach. Lots of work, but a heck of a lot of fun too.

The sport fishing industry was different then too. Most folks went out on what we call party boats. They were the forerunner to today's head boats. Party boats ran from almost every port on the Jersey Shore, but Cape May was a prime location. In the "hey days," I guess there may have been 30 or more sailing from Cape May alone and each one of them carried about 50 people a day. You know, I thought about that. That comes to about 1500 people a day. That's not really bad for a little town like Cape May and they all bought gas and lunch and ice and fish hooks, all kinds of stuff. Marketing sport fishing then was pretty simple. It was as easy as waiting for today's customer to get back to Philadelphia and share their catch with their neighbors. The next morning there would be a new batch and the next morning when those fishermen arrived they all had burlap sacks with them and boats had steel rails. They'd tie up burlap sacks around the rail. The burlap sacks were just the right size to cover the space needed for one fisherman, and it made a handy place to deposit your fish. Those of us in the party boat business all knew what kind of a day they were going to have as soon as we got there in the morning by counting how many bags were hung. Heck, if it was a normal day fishing, by the time it was over the bags were half full too, 'cause each fisherman would end up catching about half a bag of fish. I guess the average catch may have been about 30 fish in the pound or pound and a half range. Mostly porgies and sea bass that we caught off local wrecks, but sometimes whiting or ling in the spring or in the fall and weakfish depending on the season. Not too many party boats fished for flounder or fluke then. Private boats did, but the party boats didn't even though the flounder were bigger. People preferred the faster action of the wreck fishing.

Party boats ran from early April when the mackerel season started until sometime in January when the codfish would quit biting on rod and reel, but they still kept biting on those long lines. Anyway most of the boats had heated shelters for the customers. Some had heated rails to warm your hands in between fish or between baiting your hook.

Charter boats fished for bigger game and catered a little bit more to the affluent personnel. Cape May in the late '60s or early '70s probably had 30 charter boats that sailed

on a daily basis. The main quarry was bluefish, which were generally abundant. There was also a tuna season during the month of July, and you could catch marlin from about mid-July to mid-September. In bluefin tuna season, schools were cited every day anywhere from 15 to 25 miles offshore. The marlin were usually on the 20 Fathom Curve, which is about five miles further out.

The tuna fishing stayed good, supporting the charter industry until about the mid-'60s. That's when the purse seines discovered the apparent abundance of bluefin tuna and flooded the Jersey shore. Boats arrived that were capable of carrying a thousand tons and pounded those fish year after year. Now, only three or four much smaller boats remain, to mop up of the remaining scraps. I guess it's been fifteen years since we saw three or four schools in one day on the way out or back. Rumor has it that this year recreational fishermen are likely to be able to catch one fish per boat if you have a special permit. Things have certainly changed a lot in twenty-five years.

Anyway, my topic today is marketing sport fishing. As you can tell by my opening remarks, marketing sport fishing today is largely a matter of marketing one thing, reduced expectations.

We can seize brief seasons when we might actually make a reasonable catch of fish and we make sure to take advantage of those times when they happen. First boats to the wrecks in the spring can count on a few hours of action just like the old days. But anglers who want to try to spring wreck fishing would be well advised to get it done before the end of May, because after that most of the wrecks have been fished off to the point that they'll only sustain a few moments of action. Wreck fishing then does again pick up in the fall as the fish migrate back offshore.

No more porgies. It seems that somewhere along the line the draggers got bigger, and developed enough horsepower, that they were able to travel to those fish's winter schooling grounds on the edge of the continental shelf. I used to hear the captains in the coffee shop talking about schools that were so vast that they would literally stop the boat when the nets hit the fish. The nets were so full they couldn't be taken aboard in one time and had to be done in splits. The net was hauled in sections so that it wouldn't tear apart. A good tow might be 4 or 5 splits. It seemed as though there must be an endless supply of porgies, but they kept getting smaller and smaller and there for a while you had to catch thousands of two and three inch porgies, hold them in a shovel to pick out a few four and five inch porgies in order to pay your bills. The shorts as they were called were shoveled overboard by the millions and millions. Fluke and bass also congregate in the winter on the edge of the continental shelf. Most of the commercial fishing today takes place in the wintertime, and dayboats are pretty much a thing of the past.

Our party boat business has also changed dramatically. Most of the time now our head boats do more volume in half-day business. Half-day business means that you mostly carry tourists who are looking for half a day diversion from the beach. Sometimes you catch a few fish. Most times you don't. The best way to market this type of sport fishing as we call it is to have a nice clean boat, a neatly attired crew, preferably in white, possibly some music in the background, the captain has a microphone connected to the speaker system on the boat so that he can highlight points of interest as the boat leaves the slip and passes out the inlet towards the fishing grounds. When someone does catch a fish, whether it's a sea robin or a

skate or a small flounder, the crew should carry that fish around the boat and show the other anglers that a fish has been caught. You know, you make a fuss about it. It's part of the fun and it's also a necessary part of the show.

Other "party" boats that used to take people fishing in Cape May now carry folks exclusively for dolphin watching or to look at rare offshore birds. Some go for the more exotic whale watching. But I must admit we have to be pretty lucky in Cape May to have bona fide whales during the tourist season. It does happen and we had them a couple of years ago, but mostly we look at dolphins.

It should be pointed out that the best of the headboat captains still have stuck to their craft, and manage to get a respectable catch of fish for their customers most days. They know all the sneaky spots. They guard their wreck boats with their lives. They know the seasonal migrations and they find a way to pace those fish during the course of the summer, saving special spots for those days when they know they can't catch fish that are migrating through. Artificial reefs also help us there, but now they're pretty heavily potted.

The new striper emphasis is also an example of a growing seasonal fishery. Under the protection of the law, the stripers in the Jersey Shore have rebounded remarkably well and they now offer a real opportunity for New Jersey anglers. Though it's a late season, up to November and December in Cape May, the anglers still seem willing to endure the cold wind and spray to get a chance at the action. Most of the fish are undersized and released, but still they come, these striper fishermen. These folks seem to be happy even if three people come down to go fishing and one of them takes a fish home. That's what I call creating proper expectations.

Those of us who still cling to the recreational fishing business, have become masters at arranging for folks to have a good time on the water even if they don't catch much. Each fish caught on a half-day fishing trip gets converted into everyone's fish. We have sort of a group experience. It goes like "Look at what he caught." You know, "maybe next time you'll get one." Offshore fishing now relies on dockside parties, layday activities, and special events other than fish carry the vast majority of the good time load. If you happen to catch a fish that's a bonus. This is sad, but increasingly today is reality.

I would hope that the stark comparisons and contrasts that I might have reminded a few of you today or introduced to a few who are younger, might be as shocking to you as they were to me as I wrote them.

In preparing today's comments I had a kind of surrealistic feeling that I was rewriting one of Michener's chronicles, you know, like Hawaii or Chesapeake where he was writing tales of virgin wildlife that had not yet been disturbed by modern civilization, of man arriving at one of nature's shores that abounded with diamond back terrapins, and had crabs clinging to the pilings and schools of fish that you ran through in your boat, they showed red in the morning.

But hell this wasn't eons ago, back when the Earth was unpopulated. I'm 51 years old. This is less than 40 years ago. Much of the sealife that had flourished since time began has been decimated in the lifetimes of the people sitting in this room. The technology, the

demand, and the horsepower finally has become too much. We're just too damn good at what we do. Nature can't compete.

Fortunately, nearly everyone now seems to be becoming more sensitive to our current problems. Even the hardest core of us who are gatherers realize there are limits to what we can continue to take on an unlimited basis. We need to let our stocks rebuild. We need the guidance and leadership of our scientists and our regulating agencies. And we need it now! We need the full cooperation of sport fishermen and commercial fishermen alike. Farmers don't eat their seed corn. We simply can't harvest the last of our fishery's breeding stock and every one of us in this room knows it.

I for one can understand the excesses of the past. I blame no particular segment of the industry. How could we know? The ocean was so big. There were so many fish. It was so much fun. We made so much money. But now we know.

When this roundtable convenes again 25 years from now on this month, I hope that we'll be talking more about the revival of our bread and butter stock, and less about converting algae to stuff that "tastes like flounder." If our emphasis the next time around is how to harvest and market deeper and rarer species, we will all know that we have failed. Let's hope we all seize the moment together and do something about it during the next 25 years. Thank you.

### Fisheries Research and Extension

**ALEX WYPYSZINSKI:** My name is Alex Wypyszinski. I'm the Director of Sea Grant Marine Advisory Service in New Jersey. I was going to use my moderator prerogative and lead off as speaker for this session, but I don't hardly want to follow that act. As a result I'm going to get our first speaker of this section, Dr. Bonnie McCay of Rutgers Cook College who needs no introduction to talk about the glory days of research over the last 20 years.

### **DR. BONNIE MCCAY: "New Jersey Fisheries Research over the Past Twenty Years"**

Fisheries-related research in New Jersey is done by federal, state, university, and other groups – the "actors" – and is supported by sources of money – the "angels"? The major actors are the National Marine Fisheries Service, the State of New Jersey (DEP's Division of Science and Research and its Division of Fish, Game, and Wildlife), the New Jersey Marine Sciences Consortium and the associated New Jersey Sea Grant College Program, and Rutgers University. Other universities and colleges have also been involved, as has the Philadelphia Academy of Sciences. Other actors include the short-lived State Fisheries Development Commission, the EPA and the Army Corps of Engineers, and various NGOs (non-governmental organizations) such as the American Littoral Society and the Wetlands Institute, the Hudson River Foundation; industries such as Oyster Creek Nuclear Generating Station; and at least one "co-management" organization, the Maurice River Oyster Culture Foundation.

"Angels" for fisheries research are: the state of New Jersey (principally Department of

Environmental Protection and Energy and Department of Agriculture); the federal government, particularly NOAA (National Oceanic and Atmospheric Administration) of the Department of Commerce and its several programs, including Sea Grant, Saltonstall/Kennedy and the Wallop-Breaux recreational fisheries program; the National Science Foundation; the Port Authority of New York and New Jersey; the Hudson River Foundation, the Electric Power Research Institute and other bodies created out of pollution fines; and the US Department of Agriculture, through its agricultural experiment station at Rutgers and its Cooperative Extension programs, which, with state and county moneys added, join with Sea Grant in supporting the Marine Advisory Service.

Please forgive omissions, misrepresentations, and the fact that I will not refer to each and every one of the actors and angels mentioned above. I also do not examine relative degrees of tarnish or shine on the halos of angels and actors.

I start with state and federal agencies and use history as a justification. In 1870 the US Congress created the office of Commissioner of Fisheries, appointing Spencer Baird. This action was prompted by concern about disappearing fishes and conflicts between different groups of fishers, such as pound-net fishermen and sports anglers, and hook-and-line fishers and menhaden/bunker purse-seiners. In the 1880s Baird's lieutenant, George B. Goode, carried out an extensive study of US fisheries and fishing communities. Emboldened by the federal initiatives, states quickly created their own commissioners, bureaus, and departments involved in fisheries, and soon the federal government created its own formal agency for marine fisheries, which eventually became the National Marine Fisheries Service, under NOAA, within the Department of Commerce.

Goode's study, published in many volumes in 1887, emphasized the "shore," or "inshore" nature of the fisheries of New Jersey and neighboring states of the Mid-Atlantic region, as did subsequent annual reports of state and federal agencies. The orientation of New Jersey fisheries research remains toward the bays and inshore waters even though major commercial fisheries – i.e. out of Cape May and Wildwood, together one of the leading fishing ports of the US – are highly mobile and offshore, as are some of the sportfisheries. The state has jurisdiction from 0-3 nautical miles; as of 1977 the federal government has exclusive jurisdiction over fisheries from 3 to 200 miles. The Northeast Region of the NMFS, which represents federal jurisdiction over the fisheries of both the Mid-Atlantic and New England, is situated in New England and, for a variety of reasons, has focused more on New England than Mid-Atlantic fisheries.

Let me now put aside editorializing and history and turn to specifics of the recent past.

### **State of New Jersey, DEP/DEPE, Division of Fish, Game, and Wildlife**

#### **Shellfish**

Dating back to the late 19th century Bureau of Shellfisheries, the state has long exercised responsibility for the clam and oyster fisheries of the bays in conjunction with advisory shellfish councils from the industry. Some of this has involved programs to replenish shell stock and monitor the status of oysters, particularly on oyster seed beds in the Mullica River and Delaware Bay. There have also been research and action programs to control



shellfish predators, primarily the oyster drill. The state and Rutgers University have done research on the oyster seed beds and cooperate in many other ways, often through the work of Hal Haskin and his associates. Rutgers began annual monitoring of surf clam populations, for the offshore fishery, in the 1970s; the state picked up responsibility for this in the early 1980s and continues to do it. The state was also involved in the hard clam spawner sanctuary program of the mid 1980s.

The state began a shellfish inventory in the 1980s, which focuses on hard clams and other species in the bays, and has served purposes of both environmental review and determining the permissibility of shellfish leaseholds (which may not be on grounds naturally productive of shellfish). This continues but at a very reduced level. The state has been involved in shellfish "relay" and "depuration" programs sporadically over the century but particularly since the early 1970s. Beyond monitoring and enforcing regulations, the state has engaged in some research; now, Jim Joseph is looking at ways to establish relay or holdover lots in the bays that will not impact natural clam populations. Water quality work, for shellfish-bearing waters, is also critical.

### **Habitat and Finfish**

Shad was the initial concern of New Jersey's Fish Commissioners, in the 1870s, and there were even attempts to stock, or restock (depending on one's interpretation of history) Atlantic salmon in the Delaware Bay. The state also maintained a statistics program for many years, until taken over by the federal government. However, serious finfish research for other species was recent.

According to Bruce Halgren (personal communication, February 24, 1994), the state's involvement in fisheries changed in emphasis about a decade ago, from habitat-oriented to species-oriented research. Prior to the late 1970s, early 1980s, the emphasis was on ecosystem and inventorying research: what was where, overall trends, and habitat problems. For example, from the early 1970s to the early 1980s the state had a program inventorying coastal bays, including seasonal distributions of species and their abundance, water quality, and human activities. In cooperation with Rutgers, they attempted to estimate the value of New Jersey's wetlands and their contributions to fisheries productivity, comparing relatively undeveloped and developed areas.

In this spirit, in later years the state did a complete inventory of the Manasquan river, for about four years: finfish, invertebrates, epibenthos, water quality; potential impacts of water withdrawal (reservoir). It was hoped that this study could provide generic answers for other water withdrawal situations, but the unique features of the Manasquan River probably preclude that without comparable studies in other systems.

As habitat protection laws appeared (for example the state Wetlands Act), the state began to focus more on individual species research. This was also due to the national emphasis on species management after 1977, when the Magnuson Act set in place the regional system of fisheries management for species beyond state waters, 3-200 miles, but in coordination with the states.

The state does species-specific research, including tagging, age-length classifications;

migratory patterns, and estimates of mortality and/or recruitment. Major species studied include winter flounder, summer flounder, striped bass, sturgeon, and bluefish; tautog is now being studied. The state's winter flounder studies, looking also at estuarine areas, salinity and temperature patterns for spawning, and habitat protection, predated Ken Able's work on the topic.

There is an extensive program on striped bass: juvenile recruitment in the Delaware River; tagging, a cooperative interstate study on coastwide mortality; and an investigation of the feasibility of stocking stripers to establish self-sustaining populations.

The state's marine division handles striped bass, but its freshwater division handles American shad, another anadromous fish of some historic commercial as well as historic and contemporary sports value. Annual population estimates are done, recently including sonar estimates to modernize and simplifying the process.

The state works closely with NMFS in the design of its ocean trawl survey, looking at trends of abundance of all sizes of fish within the near-shore waters, 0-90' in depth. The segments of strata selected for the survey are designed to match those used by NMFS, and the state provided data to the SAW (Stock Assessment Workshops) which are extremely important in fisheries management. [Don Byrne is in charge].

### **Recreational Fisheries and Fisheries Economics**

The state did research on some recreational fishes until the late 1970s/early 1980s, when NMFS/NOAA began the National Recreational Survey, making state studies redundant. This included the sport and commercial harvest of weakfish in Delaware Bay. However, the state continues its commitment to recreational fisheries through several programs and some small research efforts, including Bernard Brown's work on recreational anglers.

Fisheries economics has seen little action in New Jersey. In the early 1980s attempts were made to describe the New Jersey commercial fishing industry in general, and the tilefish industry in particular, by Dan Rossi and others at Rutgers University, through the New Jersey Agricultural Experiment Station. However, in the 1980s Bernard Brown of DEPE and Douglas Ofiara, then at Rutgers, focused on the economics of recreational fishing in a series of studies supported in part by the New Jersey Marine Sciences Consortium and the Sport Fishing Institute. The studies are based on a 1986 survey of New Jersey recreational big-game anglers carried out by Bernard Brown. One depicts the economic importance of New Jersey's marine recreational fishery; another looks at the economics of New Jersey's offshore sport canyon fishery, another the sport shark fishery, and the fourth the sport bluefin tuna fishery.

### **New Jersey DEPE, Division of Science and Research**

NJ DEPE has a long history of research on contaminants in fish and a shorter history of research on Barnegat Bay. Details of this research can be obtained from Dr. Robert Tucker at the Division of Science and Research.

### **New Jersey Fisheries Development Commission (8/84 - 6/91)**

With funding from the Port Authority of New York-New Jersey, the State of New Jersey

established a Fisheries Development Commission in 1983 which began its work in 1984, headed by George Grant. This commission, true to its name, supported applied, not basic, research. It provided support, in conjunction with the state's Fisheries Technology and Aquaculture Center (Fish Tech Center) and other sources, for the hard clam spawner sanctuary project; it was the major source of support for the Maurice River Oyster Culture Foundation, which brought industry and scientists together to find ways to save oystering in New Jersey; it did original work in trying to develop a mackerel project with Nona Henderson at Rutgers and a cannery in Cape May; it worked with the marine advisory service on aquaculture conferences; it provided funds to expand a NJ Department of Agriculture-sponsored study of food processors to seafood processors; it sponsored a study of marinas and fishing docks, in an effort to provide tax breaks for fishing docks, and provided matching funds for a Saltonstall/Kennedy (NOAA) study of the feasibility of a fishing vessel insurance cooperative. Finally, the Commission provided the leadership and some of the technical expertise required to help secure the Sandy Hook Lab as a New Jersey-based research lab of NMFS at a critical time.

### **National Marine Fisheries Service**

As the state shifted from habitat and ecosystem based research to species-specific research, the local NMFS lab moved in the opposite direction.

Following 1977, the 200-mile limit, and regional fisheries management in federal waters (3-200 miles), the Northeast Region offices of NMFS at Gloucester and Woods Hole are responsible for fisheries-management related research and offshore fisheries stock assessment, including fishes important to New Jersey commercial and recreational fisheries. Annual reports, "Status of fishery Resources off the Northeastern United States," are put together by the Conservation and Utilization Division of the Northeast Fisheries Science Center at Woods Hole, and provide readable interpretations of the results of stock assessment, much of which relies on annual SAW workshops (Stock Assessment Workshops). Results are presented with regional breakdowns. The Middle Atlantic region, incorporating waters used by New Jersey fisheries, is virtually always reported together with another region, such as Southern Georges Bank or Southern New England, limiting the usefulness of the reports for analyzes of New Jersey fisheries. It is arguable that the Mid-Atlantic is underserved by NMFS, and that this is partly because the local lab has had to find a niche other than classic stock assessment work.

The "Sandy Hook Lab," now James D. Howard Marine Sciences Laboratory, of the Northeast Region of NMFS is a major actor in regional marine research. A small amount of bay shellfish work has taken place, largely through Clyde Mackenzie who works closely with people at the Milford Lab of NMFS in Connecticut, who has contributed a great deal to understanding the importance of cooperation and mutual understanding between industry people and scientists and who has also written an important history and description of the fisheries of Raritan Bay.

The Sandy Hook lab has done more finfish work. An example is Stu Wilk's continuing project collecting data from cooperating pound-net fishermen on the abundance and distribution of fish in Sandy Hook and Raritan Bays. Although the data came from commercial fisheries, Wilk's work was part of the lab's long-standing commitment to recreational fisheries,

on one hand, and ocean pollution studies on the other. Over time the latter became predominant.

In the 1960s the lab was heavily involved in recreational fish research, through the then-Bureau of Sportfisheries and Wildlife. The Sandy Hook lab became a species-oriented sport fish lab. Stu Wilk, Bruce Freeman, John Clark, Dave Duell, and Jack Casey were among those doing tagging and behavior studies with bluefish, mackerel, fluke, and sharks (Casey took the shark work with him to the Narragansett Lab).

In the early 1970s the lab's focus shifted to pollution-related activities and to habitat assessment, and was driven by policy concern over thermal and sewage pollution. Benthic research began in the region, supported by NOAA and as part of the MESA (Marine EcoSystem Analysis) New York Bight program, which was co-managed by NOAA and SUNY-Stony Brook. Jack Pearce did a survey of benthic species in Raritan Bay and initiated environmental assessments. This work and others, like Wally Smith's research on ichthyoplankton, came out of research on effects of thermal problems (the AES), and ocean dumping.

In the mid-1970s there was a shift from thermal pollution to heavy metals, organics, and their body burdens in fishes. This included Jay O'Riley's work on nutrients; studies of effluents from the Long Branch (sewerage?) transection, and work on chlorophyll and phytoplankton. Ocean dumping work became even more important. The Northeast Monitoring Program (Ann Cali, Angela Cristini, etc.) was reorganized in 1985; it started the 12-mile dump site program and more recently the 106-site research program.

In more recent years, the capability of the Sandy Hook Lab to investigate habitat questions has been strengthened by a remote sensing group (since moved to Washington, Bill Phoell and Jim Thomas). Current fisheries-related programs include Stu Wilk's study for the Army Corps of Engineers (COE) on the Passaic River floodplain, involving surveys up in Newark Bay of fish, benthos, and plankton; a study for EPA and COE, related to dumping at the 6 mile site, of the background level of contaminants in recreational fish in the New York Bight (fluke, bluefish, black sea bass, and tautog); and a project under the NOAA Coastal Oceans Program on estuarine habitats. Poorly funded but intellectually exciting, this involves collaboration with Ken Able and Sam Wainwright at Rutgers, Tony Calabrese at the Milford Lab. of NMFS/NE and Anne Studholme, director of the Howard Lab (and source of this information). As noted elsewhere in this roundtable, Rutgers has a Cooperative Marine Education and Research agreement with the Northeast Fisheries Center of NOAA that promises further collaboration.

#### **MESA & EPA**

In the 1970s and into the 1980s much scientific research was done under the Marine EcoSystems Analysis (MESA) program of NOAA; the MESA New York Bight Project was a cooperative effort between NOAA and New York Sea Grant Institute. I do not know how much original fisheries research was supported through the MESA project but recall, from reviewing materials many years ago, that there was very little. However, important reviews of what was already known appeared. The MESA atlas series, to provide environmental information to policy-makers and the public, included several monographs on the fisheries per

se (15, Fish Distribution; 16, Fisheries; 17, Aquaculture, 18, Artificial Fishing Reefs, 19, Recreation) and many others about related matters, ranging from climatology (7) and waste disposal (26) to jurisdictional zones and governmental responsibilities (22). A MESA-supported conference in 1979 resulted in a large volume edited by Garry Mayer that reviewed what was then known about pollutants, including their effects on fishes.

In 1989 a collaboration between SUNY-Stony Brook's Waste Management Institute and the NJMSC, under the auspices of U.S. EPA - Region II, led to another assessment of the pollution problems of the area and their impacts on things important to humans, including fisheries. Unlike the MESA project, this one also tried to incorporate economic valuation of impacts.

### **Barnegat Bay and Oyster Creek Nuclear Generating Station Research**

Just as the pollution problems caused by the operations of a GE plant and ballast-offloading practices of Exxon helped finance the Hudson River Foundation and important research on the river and in the estuary, so concerns about the ecological effects of nuclear-power generating stations have led to important research efforts in New Jersey's marine ecosystems, some of which concerns fisheries. The siting and operation of Oyster Creek Nuclear Generating Station generated over two decades of intensive ecological research on Barnegat Bay, much of which is summarized in a volume edited by Michael Kennish and Rich Lutz. There is some work related to the Salem nuclear operations on the Delaware, and there also may be fisheries-related research on water quality stemming from Ciba-Geigy problems in the 1980s.

### **New Jersey Marine Sciences Consortium and Sea Grant**

The National Sea Grant program began in the 1960s; in most states single universities became the official Sea Grant "Colleges," but in New Jersey a consortium of colleges and universities was formed to serve the functions of such an institution. The Sea Grant program is an attempt to do for uses of the sea what the Land Grant program of the mid-19th century tried to do for land-based rural systems: bring science to bear on real-life problems of people and industries.

The NJMSC (New Jersey Marine Sciences Consortium) runs the state's Sea Grant program, which I discuss below, but also handles contract research from other sources of funds. According to Bob Abel, former executive director of NJMSC, there have been two of these projects concerned with fisheries. In 1980-81, Bob Ellis, the former executive director, ran a survey of freshwater and estuarine fish for metals, that presaged much of what the state DEPE has done since. Second, and most notable, was the Consortium's late 1980s contract to do striped bass research for the Army Corps of Engineers to analyze the potential environmental effects of New York City's planned "Westway" development along the Hudson River. The project involved over 100 people, 12 institutions, and the deployment of 6 ships, and played a major role in decisions about Westway.

## Sea Grant

Sea Grant is an "angel" and, through the Marine Advisory Service, an "actor." This federal program of NOAA, administered through coastal states, is a key source of funds for the fisheries work done by universities and colleges in New Jersey. The Marine Advisory Service plays a key role in translating the needs of industry and other user groups to researchers, as well as carrying out applied research, such as Flimlin's work in aquaculture and Tweed's work on clam waste processing.

In the late 1970s New Jersey's Sea Grant research responded to concern about "fish kills" and pollution through the work of S. C. Esser on dinoflagellates associated with noxious "blooms" off the New Jersey coast and through the work of S.J. Koepp and J.M. McCormick; J.S. and P. Weis; and C.H. Murphy on the distribution and toxicology of mercury, zinc, and other pollutants primarily in the Newark Bay area. Money also went for oceanographic work on the New York Bight, Newark Bay, and Great Egg Harbor (G.L. Mellor, R.I. Hires, A.L. Meyerson and G.W. Luther). Although shrimp aquaculture never developed in this state, Sea Grant supported work on feed pellets for shrimp (A. Farmanfarmaian); it also supported work on non-fisheries uses of marine animals, such as anticoagulant drugs (S.S. Stivala) and chitosan (D.E. Eveleigh).

More direct fisheries work in the late 1970s was found in Ida Thompson's research on the growth rates, age composition and natural mortality of ocean quahogs and surf clams, and the research of Churchill Grimes and Kenneth Able on the life history and population dynamics of tilefish. I also began my own work in 1978-79 with a baseline study of a New Jersey fishing community, Point Pleasant.

Since the early 1980s the pattern is one of heavier emphasis on bivalve research than for research on finfish or lobsters, reflecting the Goode study's analysis of priorities in New Jersey fisheries back in the 1880s. The pattern also includes some socio-economic research, more proportionately than many other Sea Grant programs in the US.

The bivalve research included oysters, hard clams, surf clams and ocean quahogs; it included disease resistance studies in oysters (always a major effort), work on the effectiveness of hard clam depuration in lowering viral content in the calms, attempts to estimate ocean quahog growth and to identify larval forms of bivalves, a joint industry/academia/government attempt to use spawner sanctuaries to improve hard clam recruitment in lower Barnegat Bay, and a study of the socio-economic aspects of federal management of surf clams and ocean quahogs in the form of privatized rights to percentages of the annual quota. The following shows the projects as they appeared in the 1985 and 1989 technical reports to Sea Grant:

### 1985-1989 New Jersey Sea Grant Final Reports: Bivalves

Identification of bivalve larvae (Rich Lutz); 1985-6

Ocean quahog growth (Rich Lutz): 1987-88

Spawner sanctuary (hard clam) (Bonnie McCay) 1986-87.

Hard clam growth rates in coastal lagoon (Peter Morin, Richard Lutz, and Raymond Grizzle)

- Viral content and filtration rates in hard clam in commercial depuration facility (Tim Carter, Frank Cantelmo): 1987-88
- Genetic factors associated with disease resistance and growth rates in oysters (Robt. Vrijenhoek and S.E. Ford); 1988-89
- Development of an enzyme-linked immunosorbent assay for detection of the oyster parasite Haplosporidium nelsoni (MSX) (Susan E. Ford and Sheila Kanaley); 1988-89
- The physiological basis of MSX mortality-resistance in hatchery produced oysters (Bruce Barber and Susan E. Ford): 1988-89
- Use of numerical circulation modeling to define oyster larval and spat distributions (Timothy Jacobsen): 1991
- Social and cultural aspects of regulation in surf clam and ocean quahog fisheries (Bonnie McCay & Carolyn Creed); 1991

The "other" research included Able's work on habitat utilization and other factors affecting the survival of juvenile lobsters and blue crabs, the work of Ann Cali and Peter Takvorian on disease in winter flounders, and my work, with John Gatewood, measuring variation in job satisfaction in the commercial fisheries of New Jersey, both bay and ocean.

1985-1989 New Jersey Sea Grant Final Reports: Other

- Effect of habitat quality and predation on survival of juvenile lobsters (Diana Barshaw and Ken Able); 1988-89
- Juvenile blue crab habitat utilization and survival: an evaluation of nursery areas (Ken Able, K. Heck, K. Wilson); 1991.
- Impact of Glugea stephani disease on winter flounder populations (Ann Cali and P. Takvorian); 1991.
- Job satisfaction and fishing (Bonnie McCay & John Gatewood): 1986-87

Given the difficulty getting a full accounting of Sea Grant projects, I will take the liberty of reporting only my own over the longer haul. I began in 1978 and continued through 1982, with a study of the commercial fisheries of Point Pleasant Beach, the workings of the local cooperative and its role in fisheries management, the constraints faced by inshore commercial fishing communities, such as Belford, and their responses to them, and changes occurring in the fisheries in the wake of the 200-mile limit (such as an end to the offshore lobster trawl fishery when foreign fishing ended, removing an obstacle to placement of lobster pots). With a student I then investigated the adoption of technology in the Cape May/Wildwood fisheries, and in 1984 began a 3-year study of job satisfaction in the commercial fisheries of New Jersey, which documented the various and important non-monetary values involved in this occupational choice and the implications of job satisfaction for management.

One of my students then did a study of fishermen's wives, and another, for the NJ Fisheries Development Commission, surveyed the fisheries docks of the state, in relation to development pressures. Sea Grant was one of the many contributors to the hard clam spawner sanctuary experiment in cooperative, multi-party resource enhancement that I helped initiate. Sea Grant also supported collaboration with Nils Stolpe of the New Jersey Commercial Fisherman's Association on creating a handbook for people who find themselves

involved in fisheries management, a project yet to be completed.

Finally, Sea Grant supported the work I have been doing on privatization in fisheries, focusing on the surf clam and ocean quahog fisheries. These fisheries are centered in New Jersey and comprise a very high percentage of the landed value of New Jersey's fisheries overall. They are also the first in the US to be managed with individual transferable quotas, which make it possible for people to buy and sell and trade and lease shares of a quota, and remove the element of competition for a limited quota. Analyses of the process leading to the system have been completed as have analyses of the first two years. Current Sea Grant research, supplemented by support from the MacArthur Foundation and the National Science Foundation, involves a comparative analysis of privatization in these fisheries and those of Nova Scotia, Newfoundland, and Norway. A major concern in these studies is the question of equity, or who pays the costs and who reaps the benefits of radical transformation in property rights, as well as the question of stewardship, or the extent to which and the mechanisms by which changes in property rights do and do not result in changes in incentives to conserve natural resources.

#### **Saltonstall-Kennedy projects:**

Another federal, NOAA/NMFS, "angel" is the Saltonstall-Kennedy program for applied fisheries research and development. I do not have a full accounting of this program's appearance on the New Jersey scene. All I know about is what I have participated in, and that includes (a) a large survey of the commercial and charter/party boat fisheries concerning the feasibility of a mutual insurance company in New Jersey, 1985-86, and resulting descriptive analyses of New Jersey's fisheries and the problem of marine safety; (b) an equally large-scale study of attitudes and behaviors of New Jersey fishermen in relation to marine safety and training, in 1989-90. Subsequently, the New Jersey Marine Sciences Consortium developed a marine safety training program, with support from the U.S. Coast Guard.

#### **Mid-Atlantic Fishery Management Council**

The Magnuson Act of 1976 (implemented 1977) set up regional fishery management councils for the 3-200 mile zone of extended economic jurisdiction. The Mid-Atlantic Fishery Management Council (MAFMC) has jurisdiction over many of the species of importance to New Jersey commercial and recreational fishers and prepared management plans for them, subject to approval and implementation by the US Secretary of Commerce. States, federal agencies, and individual citizens representing a variety of perspectives and interests sit on the council. In the course of its work, some research is commissioned. I do not have a full record of this, once again, so will only mention one of my own projects, a very recent one. In the fall of 1993 three of my students (R. Blinkoff, B. Blinkoff and D. Bart) worked with me on Phase I of a study to develop the basis for socio-economic impact analyses of fishery management plans for a large set of species; our mission was to find a way to accurately depict the groups of fishers involved in fishing for those species with an understanding that although the species might differ, in many places and case the fishers were the same: the "multi-species trawl fisheries," etc. The report is available through the MAFMC.

I now turn to some of the Rutgers University initiatives in fisheries research, some of



which are supported by sources already mentioned.

### **Rutgers University, Institute of Marine and Coastal Sciences.**

IMCS was formed in 1989, headed by Frederick Grassle. It was largely funded through the Port Authority of New York and New Jersey and has a mission for fishery-applied research. It subsumes much of the work that had been done in the past by the Center for Coastal and Environmental Studies, the Haskin Shellfish Research Lab, and the Tuckerton Lab, each of which is reported below, but it has added a deep-sea twist through the expertise of Grassle and the people brought on. Thus, in 1991-92 it began functioning as an undersea research center for the NY Bight, through the NOAA-NURP program, and research was carried out on the potential impact of sewage sludge disposal at the EPA approved 106 mile dump site. In 1992-93 institute work began on Barnegat Bay studies, as part of the state's program, as well as on the Mullica River/Great Bay estuary system. Judith Grassle also began work on surf clam recruitment.

Although many members of the IMCS are experts in deep sea or blue ocean research, the institute contributes importantly to estuarine and inshore fisheries research. This is evident not only in the research taking place at the Tuckerton and Bivalve research laboratories and field stations but also in the introduction of a Long Term Ecosystem Observation station in New Jersey waters, in the establishment of a National Estuarine Research Reserve for the Great Bay/Mullica River system; and in projects concerning fish and bird habitat in Barnegat Bay.

### **Rutgers University Center for Coastal and Environmental Studies (Norbert Psuty; now subsumed into the Institute of Marine and Coastal Sciences)**

Throughout the 1970s and 1980s the Center carried out research oriented toward coastal zone /barrier beach management and coastal geomorphology. CCES also did socio-economic and environmental impact studies of a variety of interventions and accidents, ranging from Three Mile Island to dredge spoil disposal, offshore oil and gas development, and submarine pipelines. More direct work on fisheries included a survey done by Lorraine Caruso in 1982 of the state's fishing ports; one by Susan Bonsall in 1977 on the fishing industry, another study done by Langdon Warner and P. Brown in 1982 on the commercial fishing ports, and Warner's 1983 assessment of the conservation aspects of the 1977 Magnuson Fishery Management Act.

### **Marketing and Processing Industry Research**

In connection with extension activities, both the state Dept. of Agriculture, under Nils Stolpe, in the past, and then Linda O'Diemo; and at Rutgers University/ Sea Grant /Dept. of Agricultural Economics and Marketing, Nona Henderson, Rigoberto Lopez and others, there have been several studies of the seafood industry, accompanied by extension efforts to develop appropriate applied research plus programs to increase public appreciation of seafood.

A major effort was to analyze the constraints and factors affecting the location decisions of seafood processors in New Jersey, particularly compliance with environmental

regulations.

This research is closely related to work done to find alternative uses of sea clam viscera (as feed and as protein and calcium supplements for livestock and game birds), led by James Wohlt and others at the Departments of Animal Science and Nutrition at Cook College/NJAES and extension agents Dan Strombom and Stew Tweed. Some of this work has been part of the University/Industry Partnership Educational Program, through the Fish Tech Center of the Institute of Marine and Coastal Sciences at Rutgers (IMCS). NJAES's Solid Waste Management Initiative also included analyses of the potential for use of fish waste as liquid fertilizer.

**The Fisheries and Aquaculture Technology Center (FATEC), Institute of Marine and Coastal Sciences, Rutgers University; The Haskin Research Lab., Bivalve.**

FATEC receives some funding from NJ's Science and Technology Commission, the impetus for its formation some years ago. Today it primarily supports oyster research and a smaller amount of work on the use of sea clam waste and striped bass aquaculture, at the Haskin Shellfish Research Lab in Bivalve. State, federal, and industry funds combine to support these projects. Of particular interest is the "University/Industry Partnership Educational Program" that brings groups such as the Delaware Bay Watermen's Association, or a clam aquaculture company, or a subsidiary of a multinational food corporation, such as Borden, Inc. into a collaborative arrangement with researchers. Included is the Maurice River Oyster Culture Foundation, the forum through which the oyster industry and university researchers collaborate in the difficult task of finding ways to save and revive oystering.

**Rutgers University /Institute of Marine and Coastal Sciences/ Marine Field Station, Tuckerton**

The longest, most continuous trajectory of finfish-related research in New Jersey has been carried out under a variety of auspices by Ken Able of Rutgers University and his colleagues and students, now situated at the Marine Field Station in Tuckerton. A list of their primary activities, reflected in an extensive bibliography of refereed journal articles and research reports available through Able, follows:

1. Tilefish population dynamics, life history, and the status of the long-line fishery;
2. Lobster outer continental shelf habitats and juvenile nurseries;
3. Underutilized species (e.g., Conger eel);
4. Life history and ecology of summer flounder, winter flounder, tautog, black sea bass, and windowpane;
5. Habitat quality for juvenile fishes in impacted and unimpacted estuaries;
6. Fish recruitment processes on the inner continental shelf.

Among the current projects of Able and his group is one for NJDEPE/ Division of Science and Research that proposes to accumulate existing information on finfish resources for each estuarine system in the state, using both published and "gray" literature and examining sources of data and data coverage. It will also include a list of ongoing studies.

### Conclusion

The research found in New Jersey reflects the state's dependence on estuarine and coastal fisheries, a dependency well documented even in the 1880s, and the vulnerability of those fisheries to pollution and to disease, a situation that has developed with the industrialization of America. On the other hand, there has been remarkably little basic or applied research on the economics, sociology and technology of the state's fisheries and fish-related industries and on the population dynamics and life histories of some of the key commercial species such as whiting and scup. As scientists are expected to say, "much more work needs to be done."

**ALEX WYPYSZINSKI:** Our next speaker on the list is Mike DeLuca from the Institute of Marine and Coastal Sciences, who is unable to be here. Our next speakers, Rich Lutz and Ken Able will split eight minutes between them to discuss the Rutgers Perspective on Fisheries Research.

**DR. KEN ABLE:** I'm filling in for Mike DeLuca today and all he really wanted to say was that the University has finally got its act together and will be able to respond to fishery issues more appropriately in the future than they have been able to in the past. One of the main reasons for that is there are a number of new faculty members who are, perhaps, non-traditional fishery biologists. They have expertise that can address some of the issues that have been discussed today. I will mention some names and hopefully some will be retained by some of you. For example, Waldo Wakefield is a new member of the Institute and the University and Waldo's interests are in deep sea fishing. So for those of you who are considering moving into deeper water to harvest some things that haven't been harvested before, you ought to talk to Waldo. Most of his experience has been in the Pacific, but he has real expertise in developing some of these deep water fisheries.

Sam Wainright is an ecosystems ecologist. Some of the work he's trying to do is to study food chains and food webs, particularly estuaries. He started work on striped bass, especially in the Delaware and the Hudson, to examine some of the parameters which might be responsible for supporting those striped bass nurseries in those particular areas.

Uwe Kils is another new faculty member. He's not even here yet, but we anticipate he'll be here in the next couple of months. He comes to us from Germany. He has particular expertise with juvenile fish, using very good optic imaging technology, specifically looking at fish feeding in the larvae and juvenile stages.

We're interviewing now for a new director of the Haskin Shellfish Laboratory. People who are planned to be interviewed all have expertise with shellfish, particularly oysters and hard clams and we hope that person will be on board soon.

The last person that I'm going to mention has only been at the University a couple of days. This is Sybil Seitzinger. Sybil is here with us today. She could tell you very quickly about some of her research interests and the CMER program.

**DR. SEITZINGER:** The Rutgers/NOAA Cooperative Marine Education and Research program was established in early 1993 under the aegis of a cooperative agreement between Rutgers University and the National Oceanic and Atmospheric Administration. The Rutgers/NOAA CMER program is intended to foster enhanced interactions between all elements of NOAA and the University; however, special emphasis is placed upon projects of mutual interest to the University and the Northeast Region of NOAA's National Marine Fisheries Service. The proximity of these institutions offers enhanced opportunities for: (a) joint research involving faculty, students and NOAA personnel; (b) training opportunities for both students and federal employees; and (c) shared use of specialized facilities and equipment. The CMER program combines university and agency expertise to address marine issues affecting the state, region, and nation. Four programs currently receive CMER funding including studies of the: 1) life history of windowpane flounder, 2) recruitment of surf clams, 3) toxicity of dioxins and PCBs in commercial finfish and shellfish species in Newark Bay, and 4) development of chemical methods to determine quality deterioration of mackerel and other fatty fish.

**DR. RICH LUTZ:** I direct the Fisheries and Aquacultural TEX Center. Bonnie summarized very briefly a number of the efforts in which we've been involved over the last five to seven years. We rely extremely heavily on input from the industry to tell us the problems that we should be involved in. Had I had more time I was going to show a series of slides that summarized those projects, but let me tell you very briefly when you look at that list what you've got is focus on bivalves and aquaculture with a spackling of research concentrated on finfisheries.

The reason for my being here today is not to pontificate to you, but to hear the industry so that we can get a sense of those aspects where we should be focusing, so we can address some of the questions that Dick Weber so articulately put forth for those fisheries throughout the state. We do have a university industry partnership program with dwindling resource and yet we're critically committed to working together with the industries to secure necessary funds for the most important programs.

About ninety percent of our funding comes from external sources at the federal level focusing on problems that are integral in nature, and about ten percent of our funding comes from the Commission on Science and Technology. We're committed to working together with various industry members who can define and articulate problems that we need to address, so that we go forth to secure the funds necessary. The research with which we're involved in with oysters is going to be summarized by Sue Ford who's been with us for probably about twenty years at the laboratory. Thanks.

**MR. WYPYSZINSKI:** Our next speaker, Dr. Susan Ford, will summarize

the work on the Haskin Shellfish Lab.

**DR. SUSAN FORD:** The Haskin Shellfish Laboratory that I'm representing is located in the southern part of the state at Bivalve. We have another facility at the Cape Shore. It's a field station which operates mostly in the summertime where we have a small hatchery. Rutgers is actually been in the oyster research business for over 100 years with stations at several locations throughout this state.

As Jim Joseph told you, the history of the oyster fishery in the state has been one at least in recent years of decline. First we were hit by MSX in the late 1950s, made a fairly good recovery from that, and then in 1990 were hit by another oyster parasite called dermo. So, in 1974 at the last one of these meetings, the oyster seed fishery was looking very, very healthy. At that time the oyster lab in Bivalve was housed in a couple of rooms at the top of a shucking house. Four people worked there. The operating budget came mostly from a little bit of state money supplemented by federal money. It was small, but it was consistent from year to year. The research program was focused on getting information from Delaware Bay oyster populations on disease, recruitment, survival, which was provided to the Shellfisheries Council for management of the fishery. At the same time, Dr. Harold Haskin at the Cape Shore Lab was well under way in developing strains of oysters that were resistant to MSX.

In the intervening twenty years the oyster industry has gone to almost nothing. However, the state of oyster research is quite healthy. We moved into this a much larger laboratory and the faculty and staff now number about 25. Our funding comes, as Rich Lutz was indicating, mostly from short-term one and two year grants from the federal government. U.S.D.A. has helped us out a lot. We have gotten money also from Sea Grant and from a new program in NOAA called the Oyster Disease Research Program. There are two different thrusts here. The U.S.D.A. money comes largely because of interest from oyster growers in the northeastern United States who are really doing intensive aquaculture, who are interested in the MSX resistant strains. The NOAA money comes more because of the oyster problems in the Chesapeake. So both aquaculture and fishery problems have given us money to do oyster research.

So let me just now touch on some of the projects that we're working on here at the Haskin Lab. I've divided them into three groups: 1) to develop information to try to manage the existing resource as well as possible; 2) to find alternatives to the dwindling supply of seed, and specifically to get seed that is resistant to these diseases that we're faced with. We also need to develop methods for grow out of this seed which have to be produced in a hatchery; and 3) a variety of basic and applied studies on the host, the parasites, and their interactions.

Best management of existing resources. We're continuing this long-term program that we've been involved in with the state Bureau of Shellfisheries on disease monitoring and recruitment. It involves annual surveys and experimental plantings to develop information that then goes into determining whether seed beds should be opened, how long the season should be, and to tell the planters and where and when they should plant and harvest. And because this program has been going on for so long, we've developed what is probably the best, most consistent long-term data set of a benthic estuarine population. We've recently been doing some work to get all these data onto a computer, and to do some modeling. The management, of the seed resource turns out to have been very effective during the period

when the diseases were a major problem.

This was a combination of the industry, the state and the university getting together and really managing the resource. Our analysis of the data show that fishery was not overfished, that really the only problem was the disease. We hoped that this will be able to help us in predicting and understanding the environmental influences on these diseases and the amount of recruitment. We're comparing disease losses with harvest pressure also.

Alternative seed sources. As I mentioned, Hal Haskin started the program to develop strains of oysters resistant to MSX disease. We have gotten seven to tenfold improvement in survivability to market size through just regular selective breeding. However, these strains are not resistant to dermo disease and we have had to start over again. We have some preliminary evidence that it is possible to selectively breed and improve survival in the face of dermo disease, but that research and development is continuing.

Stan Allen, geneticist and oyster breeder at our lab has been looking at non-native species and the Pacific oyster was tested for the first time late this year. At least in our test, this species did not get any MSX, and only very light dermo, but no mortalities. Similar results were obtained in tests in Virginia. Stan is also interested in eventually trying to hybridize the non-native species which have these characteristics, with our native oyster which has other desired characteristics. That's a long-term thing and still very much preliminary research and development.

As I mentioned, these resistant oysters have to be produced in the hatchery. You can't just throw them out on the oyster beds, because predators will get them. We've worked with the Morris River Oyster Culture Foundation on a remote setting project. Another project looked at bag and rack culture. Both of these showed that intensive aquaculture, at least to start with, is technically feasible. There's a problem because the seed is so expensive and has to compete with much cheaper natural seed. Producers of intensively cultured oysters would have to develop specialty markets to be economically viable. But all of this is now on hold because of dermo disease and the need to develop strains of oysters that are resistant to that before they can be used in an aquaculture situation.

Basic and Applied Studies. I've picked out some examples from a whole variety of other things that we do. For instance, our method of diagnosing MSX is very expensive and time consuming. We've been working with developing some improved diagnostic techniques using molecular probes. We now have a molecular probe against MSX. We are also looking at the MSX and dermo life cycle and transmission questions. Dr. Steve Kleinschuster of the Haskin Labs has managed to culture the dermo parasite and is working on culturing of the MSX parasite. Culture of these organisms outside of the oyster allows us to do a whole variety of experimental things that we can't otherwise do. We are examining pathogenicity of the parasites and resistance of the oyster.

So, in the end I guess the big question is whether the oyster industry in New Jersey going to go back to the traditional fishery, or maybe go on into more intensive aquaculture. Probably both. We know that the seed fishery recovered very nicely from the devastating effect of the MSX epizootic. We think that the recent incursion of dermo is because of the

unusually warm weather we've been having. We'll see whether a return to cooler temperatures, reduces dermo pressure, and allows the fishery to recover.

Meanwhile, the industry needs to push forth with some alternative methods. We know the technology and the biology. What needs to be worked on are economic problems. Developing markets that will pay for a higher priced oyster is crucial.

This picture was taken at the largest oyster aquaculture house on Cape Cod. They have a nice little business, but you'll notice the price that they get for their oysters is \$216 a bushel. In New Jersey, right now, the price is maybe 25 to \$30 a bushel. The Cape Cod aquaculturist can charge high prices because they've developed specialty markets. That's what is going to have to happen in New Jersey if the aquaculture of oysters is to compete with the natural product coming not only from Delaware Bay, but from the Gulf Coast and a lot of other locations. Thank you.

**MR . WYPYSZINSKI:** I serve as the Director of the New Jersey Sea Grant Marine Advisory Service, and its now my turn to discuss our program.

The New Jersey Sea Grant College Program is part of a national network of similar programs in thirty coastal and Great Lakes states, Puerto Rico, the Virgin Islands and Guam. Funded by the Department of Commerce, for the past 25 years, the Sea Grant Marine Advisory Service has played a unique role in the National Sea Grant College Program - identifying problems, finding solutions and providing informal outreach education for a broad spectrum of marine clientele. Whether it's improving fishing gear technology, helping citizens monitor water quality, assisting towns in waterfront development, or helping to train a new generation of aquaculturists, the SGMAS has brought the users of marine resource information together with the sources of information and provided them with problem-solving capabilities.

NJSGMAS provides a practical means of getting useful information off the shelves and out of the laboratories and scientific journals and into the hands of those who can use it. To accomplish this, NJSGMAS uses all the means of informal education - that is, education outside the formal school or university setting - using the techniques and methods of Rutgers Cooperative Extension (RCE) for program development, delivery, and evaluation. NJSGMAS employs the agricultural extension service model that uses agents in the field to form a link between the research community and user groups - such as the commercial fishing industry, aquaculture industry, recreational boating and fishing groups, the marina industry and others. The MAS program is co-administered by the NJ Sea Grant College Program and Rutgers Cooperative Extension, and agents and specialists bring the best of both programs into the field. Since the last Fisheries Roundtable, the staff is also able to draw on the expertise of the Institute of Marine and Coastal Sciences and the Fisheries and Aquaculture Technology Extension Center at Rutgers.

"The Field" in New Jersey covers a lot of ground - and water. With a dense population, massive urbanization, industrialization, valuable fisheries resources, and an enormous investment in tourism, the competition for use of NJ's coastal land and waters is keen. There is constant pressure for increased beach access, shorefront development, waste

disposal alternatives, and other forms of resource utilization; and a corresponding constant need for research and dissemination of accurate information to resource managers, coastal industries, user groups and members of the public.

The backbone of the Program has always been the ability to help clientele use knowledge and research results through a broad multidisciplinary approach to public service, including outreach education, technology transfer and communications. Our principal goal is to identify the areas of research needs that have application to real life situations; to develop useful information, and to get it back to where it can be used.

During the past twenty years, since the need for this type of program was identified at the first Fisheries Roundtable, NJSGMAS agents and specialists have worked at Fishermen's Forums, Aquaculture Symposia, and workshops on such themes as Alternative Building Materials in the Coastal Zone, Marina Environmental Regulation, Zebra Mussel Control, Beach Access, and Vessel Safety. They've helped to put together the fishermen training sessions required by the U.S. Coast Guard, conducted youth education sessions with recreational fishing groups, organized Seafood Festivals, and worked one-on-one with aquaculturists, clambers, and commercial fishermen. These user groups know our agents and specialists by name and know that they are always ready to lend a hand where it's needed.

Everyone knows that work never ends. While some problems related to our fisheries seem to go on year after year, new challenges are presented by improved technology and communications, environmental change, marketing considerations, health questions, and governmental regulation. NJSGMAS will be here to meet new challenges.

**DR. ELEANOR BOCHENEK:** I represent the marine recreational industry for the New Jersey Sea Grant program and will moderate the next section of Industry Perspectives. Our first speaker is John Koegler. He's a recreational fishermen who has fished for several years. He's president of the 1000 Fathoms Club South and he's also Chairman of the Jersey Coast Anglers Association. Mr. Koegler.

**JOHN KOEGLER:** Let me give you a little background. My topic today is offshore fisheries. As someone who's grown up with the introduction of commercial fishing in offshore areas and as a lifetime salt water angler, there's a few things I think need to be addressed. I started this topic about six times and due to the blizzard which hit Pennsylvania a lot harder than it did down here, I had a chance to redo it. I started out by looking at what the government thought was going on in deep water.

On the screen you see a sheet called Atlantic Highly Migratory Pelagic Fisheries. NMFS's database is on the graph and shows you total catches. The ones with a block are bluefin tuna. The ones with a straight line are swordfish and the ones with the pluses on them are yellowfin tuna. So what NMFS says in this series starting in the early 1960s through 1977, U.S. commercial pelagic fisherman averaged about 5,000 metric tons of pelagics per year. Since 1978 U.S. commercial fishermen have averaged 8,000 metric tons per year. This average jumps sharply in the late 1980s to 16,512 metric tons. NMFS estimates current potential yield that is the replacement number for all latinographic pelagics within our EEZ is only 11,519 metric tons a year. And you'll see at the bottom 11,500 catch is 16,512. We're



overfishing the resource by one-third and we're not getting much. The magnitude of this overfishing is destroying a very valuable precious public resource. Legally, economically, scientifically, socially and morally this destruction of the Atlantic Highly Migratory Pelagic Fisheries should not be allowed to continue. NMFS has total authority to manage the offshore tuna fisheries of our Atlantic and Gulf Coasts and the Caribbean Seas and was given this authority by the Fishery Conservation Amendment of 1990, signed into law on November 28, 1990. They took effect January 1st, 1992. Currently on the offshore tuna there's only one tuna species being regulated. This is regulated under NMFS. The result of more than fifteen years of NMFS control must be viewed by any sensible person as a total failure. The optimum yield concept has not worked as NMFS has tried to keep everyone fishing. The basic biological needs of this valuable public fish resource receives much less consideration than the immediate economic desires of the fisherman. As a result, overfishing is permitted for short-term economic gains. Lobbying forces ensure there is no political will. Hence severely overfished species continue to be overfished.

Every astute angler I know believes it is totally wrong for fishery management policies to create fishery management plans that provide the most fish to those commercials who are most responsible for the destruction of their own fishery. Tourism in New Jersey is said to be worth over ten billion dollars per year to the New Jersey economy.

New York State studies, in 1991, valued salt water recreational fisheries at over one billion dollars a year to the State of New York. New Jersey has more boats registered in salt water and more marinas and more inlets. New Jersey's recreational salt water fisheries must be worth more than a billion dollars a year. What choices do our politicians, regulators, councils and managers want to make? To continue the destruction of valuable public ocean resource or accept their legal, moral and social responsibilities and give us rules that work.

There are many things that could possibly be done, but rather than waste my time I'm going to show you some slides. I've changed things around totally in the last couple days. And let me show you the next slide. If you read here at the top it shows total recreational fisheries in New Jersey at 855 billion dollars based on an '89 survey. The offshore fisheries normally considered to be worth about ten percent of that. The bottom line is, probably harder to read from the back, says and this is from NMFS own data sets. About six months ago I called NMFS and asked for some information. After thinking about it for a while I had a question and revised what I was asking. About six weeks ago they sent me a package, heavy package. What it is, is a complete set of data from NMFS computers which show all the tuna caught commercially from Maine to Virginia by state, by year, by species and by gear type. What I will show will be from this data.

Bernie Brown, in 1986, did a survey that tried to put some value on the recreational fisheries. And one of the pages in there lists the following things. He lists starting at the top the cost of an average boat in 1986. Now, this is quite a few years ago, the electronics and outfitting and the total cost. What he didn't show I put in there is if we're financed on the standard twenty percent down which is pretty normal for that kind of stuff. \$25,000 becomes the amount financed and would be \$100,000. And just to make things easy, that would be 11,820 bucks a year. Annual maintenance in his own survey is \$4,322, trip expenses which are things like food and fuel \$985, tackle, gas, new lines and the total annual was \$25,697. At the bottom it says the average big game fisherman took 15 trips a year, eight more or less in

shore, bluefin, bluefish and shark, and using the charter boat survey at that time, which said the average of those three species was 500 bucks, I arbitrarily put 800 bucks down and took off \$6,400. What's left is seven canyon trips. If you take seven and divide it into the balance it says every recreational angler spent 2,756 bucks for every offshore canyon trip that he took.

In getting ready for this presentation I decided to see what was going on in New York State. Up there they have a tremendous fishery in salmon. They have a thing called the Eslo Spring Derby. If you look here on the left it shows that the value to the economy of this fishery which was just developing in '78, was 483,764 bucks. By 1988, I don't think you guys can see, it was \$5,978,638. The point of this is that they correctly managed the fishery giving a recreational angler a fair shot which results in a tremendous economic benefit to the shore community.

MFCMA says you should manage the fishery based on optimum yield. It can't work. Hasn't worked. They have had 15 years to prove it doesn't work. I suggest they change it using current potential yield, which is how much fish come back into the fishery from new babies and this would be a substantial fishery. Fishery managers must calculate who gives the best economic value for each pound harvested.

In conclusion, economic value must be used in allocating fisheries. I'm just going to use three slides real quick. 1992 data from NMFS said the purse seine was 50 percent, the pair trawling 9.2 percent, the trap fisheries which is something from Rhode Island, caught 4.7 percent, the haul seine 2.4 percent, run around gillnetters 0.5 percent, the traditional guys that caught fish in the ocean, the longliners, the hand fishermen and the recreational note this is all commercial, have been reduced from '89 to '92 to one-third of the whole fisheries. There's been some discussion you should have economic rent for the resource. When the government sells and oil leaks they don't sell it to the lowest bidder. They sell it to the highest bidder. When the government sells a bunch of trees they don't sell to the lowest bidder. They sell the trees to the highest bidder. Look what happens in our ocean resource. You just saw on the one before that said the purse seiner took over half of the fish. I took one yellowfin and the price per pound, harpoon on the left \$2.80, drift gillnets \$1.35, longliner \$1.58, dayliners \$1.42, pair trawlers \$1.69, haul seiners \$1.41 and the purse seiners \$.15 a pound. It's valid economic theory to take a couple years and draw a line across the top and gauge when the resource goes to zero. I did that. It says the resource goes to zero in 1997. It is easy to come up with excuses.

However, the bottom line is commercial fishermen today have the capacity to sweep the ocean, you know, clean of all desired species. All the excuses in the world will not reverse the current decline. Stringent regulations, catch restrictions, responsible fishing practices are the only measures that can turn a situation around. I ask the commercial, traditional commercial fishermen and anyone else to join the recreational angler and bring some sense into this deal. The reason is it's not for me. I caught a lot of tuna fish. I've put more tuna fish on the deck before most of you were born. And I want my kids and the commercial's kids to be able to go in the ocean and have the opportunity to catch a fish. If we keep doing what we're doing there won't be anything there. There's the date 1997. Thank you.

**DR. BOCHENEK:** Our next speaker is Gary Caputi. He's been in the recreational fishing

industry since 1972. He's the public relations manager with Garcia Corporation, and advertising director for The Fisherman magazine. He has written many recreational fishing books. He's also Vice President of Jersey Coast Anglers Association.

**GARRY CAPUTI:** Recreational fishing has been recognized as an important part of the socio-economic structure of New Jersey only recently, but, to date, it has been considered secondary to commercial fishing interests when fisheries management plans are being devised and implemented.

This practice is folly. Recreational fishing as an industry generates far greater benefit to the economy of the state, the region and the nation than commercial fishing. The numbers are dramatic and quantifiable and should open the eyes of all fisheries managers to the detriment they can do by not taking this important industry into account when devising and implementing fisheries management plans.

In 1989, recreational fishing expenditures in New Jersey alone amounted to \$855 million with an economic output of \$1.4 billion. It generated 25,900 jobs in the state with income earnings of \$438 million. It generated state sales tax revenues of \$43 million and state income tax revenues of \$8.8 million, a direct revenue source for the state totaling over \$51 million (Source: Joint Economic Extension Program: American Fishing Tackle Mfg Assn./Sport Fishing Institute).

The health of our inshore fisheries has been severely damaged as commercial fishing efforts have increased and the effectiveness of new gear types have plundered one fishery after another. These are public resources, yet most are managed to maximize commercial utilization, often with total disregard for fair and equitable distribution to all user groups. Commercial fishermen have been given free reign to over-exploit key species so critical to a healthy recreational fishing industry.

We can no longer continue to balance management policies on the backs of recreational fishermen. Quotas must be established on an equitable basis, with due consideration given to the economic impact and societal benefits recreational fishing generates for New Jersey and the nation. This has not been done in the past, as recreational fishermen have been saddled with disproportionate restrictions on any number of inshore species while ignoring historic participation ratios of the two user groups. Commercial fishing interests are allowed to commandeer larger and larger percentages of targeted fisheries even before actual management quotas are established.

We've all heard the plight of the commercial fisherman. They have regaled fisheries managers and politicians with stories about the negative impact of regulations on their businesses and families. While these are often heart wrenching images, what right do fisheries managers have to adversely impact the tens of thousands of Americans whose livelihoods depend on recreational fishing. How many bait and tackle stores have gone out of business due to the managed decline in our fisheries? How many party and charter fishing boat operators have lost their boats and businesses? How many marinas, boat builders, tackle manufacturers and tackle wholesalers must loose their jobs before their plight is taken into consideration? How much tourism must New Jersey loose because it's waters no longer hold the fish to attract anglers from other areas?

Fisheries management decisions impact more people whose livelihoods are dependent upon recreational fishing than the managers are willing to consider, yet these people's jobs and incomes often hang in the balance. We can no longer allow the industry that supports their families to be ignored. We can no longer allow the needs of one user group to totally overshadow the needs of another, while doing damage to the economy of New Jersey and the states ability to generate revenues. Yet it happens all the time!

Let's look at three key fisheries that have been mismanaged, to the benefit of the commercial user group at the expense of the recreational user group.

#### **BLACK FISH:**

Black fish are traditionally a recreational caught fish. In more recent years, their importance has been elevated as other fisheries have succumbed to relentless commercial pressure. On the commercial side, black fish have become the latest target species.

Three years ago, it became apparent that the commercial impact on black fish was increasing at an alarming rate with the introduction of roller nets into New Jersey waters, a gear type that targets them in areas where they were inaccessible before. At the same time we have seen a proliferation of fish pots in our bays, especially Raritan, a key spawning area, and even more pressure on our artificial reefs from pots and gillnets. Obviously, measures must be taken to protect the species, which is showing serious signs of population depletion.

Historically, there have been a harvest ratio of 90% recreational and 10% commercial for black fish, according to figures provided by the NJ Division of Fish, Game & Wildlife, yet this traditional ratio is being ignored by the Division in their proposed black fish regulations.

Black fish are a very slow growing and most are not sexually mature until they reach 12 to 13 inches in length. Therefore, any management regime must allow these fish to mature and permit reproduction, while dramatically reducing total mortality. After three years of study by the Division and Council, the only regulations being proposed are size limits, which will disproportionately impact recreational catches, while doing little to reduce commercial catches, since pots and roller nets catch larger average size fish than hook and line.

No regulations are being proposed to reduce or limit the number of pots in use and no closed season is being imposed on pots, which do their greatest damage during the spawning season catching roe laden females before they have the opportunity to reproduce.

No regulations have been proposed to control roller netting, because the Division is supposedly involved in a two year study to determine the impact of this gear type. If the Division listened to party boat skippers in north Jersey whose business depends on black fish, they would already know that roller nets are not only stripping mining mussel beds and hard bottom areas of fish, but that they destroy a large percentage of the bottom structure that attracts black fish. The rollers crush the shellfish that black fish feed upon and flatten less prominent bottom structure. Party boat skippers have been telling the Division this for two years, but have been ignored. No rocket science is required here, but the Division continues to hedge on taking any action with regard to pots or roller nets. This is fisheries management

in the 1990's.

Yet, recreational fishermen, being true conservationists, still support the imposition of size limits, even knowing they are, once again, taking it on the chin.

#### **BLUEFIN TUNA:**

Bluefin tuna provide a worst case scenario with regard to fisheries management and an example of how what once was a totally recreational fishery in New Jersey has been closed to anglers by fisheries managers.

Large bluefin tuna were never considered marketable because their oily flesh was shunned by consumers in this country. Therefore, the traditional fishing that developed around this species was recreational, dating back to the late 1800's. In the 1950's there were over 50 full time charter boats operating from Beach Haven with bluefin generating the majority of their charters. Today, only three full time charter boats remain and none can depend on bluefin for business, because they have been affectivity shut out of the fishery, just as private boat fishermen throughout the state have.

In years past when there was heavy recreational pressure on school bluefin, the stocks remained strong and as one fisheries biologist stated, "a hook and line fishery could never damage the population."

The precipitous decline began when the predecessor of NMFS, the Bureau of Commercial Fisheries, brought West Coast tuna purse seiners to the East Coast, after they had decimated the Pacific tunas. After their arrival, it is no stretch to say that in the first ten years of operating in Atlantic waters, more bluefin were harvested than in the prior 60 years of recreational fishing combined. In 1970, purse seiners landed 318,000 school bluefin. It's obvious that the purse seiners did the damage, but recreational anglers are paying the price under current management regulations. In 1993 and again in '94, anglers will be restricted to catching only 7,000 school fish for the entire East Coast recreational fishery, and New Jersey gets the shortest season and smallest percentage of that quota.

NMFS, after orchestrating the collapse of the school bluefin fishery, redirected the purse seiner's efforts to giant bluefin, which were just beginning to increase in value as an export commodity to Japan. Fish that had been worth less than \$.15 a pound at home were bringing prices of \$15 to \$30 per pound, but the market was export and the economic benefit was limited to a very few purse seine operators who were being allowed to reap fortunes while destroying what was left of a public resource. This is a total disgrace!

In 1970, giants still were not valuable and only 4,700 were harvested. When the market price soared, the catch increased dramatically to 12,000 giants. Commercial fishermen are being allowed to kill the only bluefins left to repopulate the species, the large spawners, but our fisheries managers could care less because decisions on this fish are made in a dirty, back room, political forum and the health of the resource never enters into the picture. Even sadder, even NMFS biologists realize that if a total moratorium was instituted tomorrow, it would take over 20 years to bring this species back to some semblance of health. Unfortunately, bluefins will be fished into extinction under the direction of NMFS and ICCAT.

## **BLUE CLAW CRABS:**

The species generating the highest participation of any inshore recreational fishery in New Jersey isn't a finfish at all, but the blue claw crab. I can remember dozens of boat liveries on Barnegat Bay that serviced tourists that came for the crabbing, but they are gone today. Then, the traditional commercial method for catching blue claw were simple trot-lines. They co-existed with recreational crabbers for hundreds of years without damaging the resource.

In the 1970's, Maryland style crab traps were introduced, which allowed for greater efficiency in the number of crabs that could be harvested recreational and commercially. During the late 70's and early 80's, commercial crabbing was more often a part of a wider commercial fishing business, used to augment incomes from damming or other unrelated work. It still did not create a conflict between user groups, but in the late 80's and early 90's, some commercials began targeting crabs exclusively with little regard for the consequences. These operators place up to 1,500 pots at a time, while in earlier years, 50 pots were the norm.

These new operators feel they have a God given right to plunder this important public resource with no regard for the damage they do or for other traditional user groups. They have also created a new conflict as the huge number of pots and buoys they leave littering our bays create a hazard to navigation, fouling propellers and damaging boat hulls.

This highlights the effects of more efficient gear in the hands of greedy entrepreneurs who care little about the resource or other user groups. They have succeeded in pushing out the traditional baymen that worked these waters for hundreds of years in harmony with nature and recreational users.

If regulations were properly instituted early to prevent these excuses, these problems could have been avoided, but fisheries management is strictly reactive and not proactive in nature. Throughout this commercial build-up, the Division has sat on its hands, doing little or nothing to defuse a rapidly escalating problem.

## **CONCLUSION:**

Fisheries managers like to point to the striped bass as a success story because restrictions on their harvest has seen a rebounding of the population, but lets look at the facts. Today, commercial fishermen are harvesting at 20% of their historic catch rates, with those in Maryland at 40%. Recreational anglers have been reduced to only one fish per angler per day over 34 inches in ocean waters, which probably equates to only 1% of the historic recreational catch. Would somebody please tell me where to find the equity in this plan?

The only FMP we can point to as a viable model and relatively equitable solution is the present fluke plan instead of basing a quota ratio on catch records at the time of the fisheries collapse, managers established the quota ratio based on the historic catch rates of 40% recreational and 60% commercial. This proved to be a fair and equitable method of establishing used quotas and supposedly, any increase or decrease in total catch must be done equally from both sides of the equation. If, and this is a big if, these ratios are maintained, then both user groups benefit or loose equally based on the restoration of the

fluke population.

Regardless of the species to be managed, all future FMP's must take both user groups into account in a fair and equitable manner. The group that does the most damage to the resource can not be allowed to benefit from their plunder by using catch rates that were well over the sustainable yield of any fishery as the basis for unfairly tilting quotas in their favor. The recreational fishing industry has been severely damaged already and all present and future management plans must take the socio-economic impact of this important industry into account in a fair and balanced manner.

**DR. BOCHENEK:** Our next speaker is Walter Palmer. He's a member of the Cape May Charter and Party Boat Association. He'll be talking about Delaware Bay Fisheries.

**CAPT. WALTER PALMER:** Good Afternoon. My name is Walter Palmer. I am representing the Cape May County Party and Charter Boat Association. We are located in Cape May, New Jersey. I own and operate the charter boat Noreaster II. It is a U.S. Coast Guard inspected vessel, licensed to carry up to 18 passengers. I have been fishing out of Cape May, since 1974. I gravitated to the area as a result of the Delaware Bay weakfishing that was rapidly becoming one of New Jersey's major fisheries.

The weakfish were abundant in the bay, during that period. There were numerous party, charter and commercial gillnetting vessels fishing the bay around the dock. The vessels sailed from Wildwood, Cape May, Fortesque and Matts Landing, on the New Jersey side of the bay. On the Delaware side, they sailed from Indian River, Lewes, Bowers Beach and a few ports further north. On any given day you could almost walk from boat to boat when the fleet was catching weakfish or "trout" as they were know locally. There were "tide runner" weakfish that weighed ten to fifteen pounds, and on rare occasions record size weakfish up to 22 pounds. During the spring run of large weaks it was not uncommon to see a fleet of 400 to 500 boats. This included recreational, charter, party and commercial vessels.

There was also a large influx of black drum fish along with the weakfish, during that period. Usually the drum schooled up in the mid to upper bay. On occasion, they frequented the Delaware side of the bay in an area called Slaughter Beach. Most of the day weakfishing boats had an additional night fishery with the drum fish. The trips consisted of leaving the dock in the late afternoon, anchoring up, and catching weakfish of the tide runner variety, along with the drum fish well into the evening hours.

The charter and party boat industry shared in this abundance of fish, usually sailing with full boats. During the period there was a large influx of gillnetting vessels that also engaged in day and night fishing. Some of these boats operated on a 24 hour schedule. There were no regulations on size or amount as far as the catch was concerned for commercial or recreational vessels. This caused overfishing at it's worst. Most individuals caught as many fish as they could and did not leave the grounds until their boxes were completely full. We were all guilty of it. There was no particular group that could say they did not take part in the overkill.

When the fish moved from the middle and upper bay to the mouth and eventually into the ocean there was a fishery known as "pair trawling" waiting for them. This consisted of two

commercial fishing vessels running side by side with a net strung between them. They caught the rest of the moving fish that escaped the upper bay pressure.

I would like to note, that the Cape May Party and Charter Boat Association, and several other party and charter boat organizations, pressed for federal regulations when we realized something had to be done to save whatever fish were left. This was to avoid the situation as it presently exists where states have instituted size and bag limits on their own but, very few are consistent or uniform.

We still feel the federal regulations are the only way to save a 13 inch fish thrown back in the summer in Delaware Bay, only to be taken in December or January off the Carolina coast. The laws must be the same whether the fish are off New Jersey, Delaware, Virginia, New York, etc. Although there may be a cynical explanation for the weakfish decline, the recreational and commercial sector certainly took its toll upon the population.

In a few short years after the 1984 peak there was a rapid decline. My recollection is that 1988 was the last good year we had for weakfish of any size. There was also a summer residence of fish in the bay ranging in size of from three to five pounds. They usually were there from mid-spring well into the fall. They too have disappeared.

The main body of fish currently available on a limited basis consists of thirteen inch fish with some bigger fish mixed in occasionally. It is not beneficial to the recreational or commercial fishing community to target them on a regular basis.

One other factor that should be addressed with regards to the decline in fishing was the tremendous impact it had on supportive services such as service stations, hotels, motels, tackle shops, restaurants, etc. It was a depressing economic situation for this area when this fishery took such a downfall.

Bluefish were another fishery in the bay during that period, which continues to the present, although it too is severely curtailed. The spring run of large bluefish and small resident summer fish are just not present these days. There appears to be a short spring season of two or three weeks with fish of mixed size, and then the fish disappear. This is also true on the ocean front.

At one time it was felt a moratorium should be placed on the weakfish, and I still believe this should be done on the federal level. The striped bass comeback should give some indication as to what this type of management can produce.

Fluke fishing has remained decent up to this point and has been a staple from the early days. I cannot say if it has improved or declined to any great degree. I believe the reason for it still being around, and a savior on many occasion, is due in part to the regulations governing the fishery.

As noted previously, striped bass are making a strong comeback and is producing limited new business. The problem with bass fishing is the season conflicts with the hunting season, and it will never replace the weakfishing we once had. The drum fish still come into the bay, but the numbers are no where near what they were. There is minimal charter



business for drum fishing at this point in time. We feel the current regulations and any future regulating, will certainly be beneficial in helping to restore the fisheries to what they once were.

I would like to thank the workshop organizers on behalf of the Cape May Party and Charter Boat Association for allowing us to participate. I feel that programs like this will go a long way to help us in the future. Thank you.

**MR. FLIMLIN:** The last session of the day is going to look at the industry perspectives from the commercial fishing industry. I want to reiterate the statement Rich Lutz made, and those who are about to speak should take him at his word. He asked the industries to identify areas for research, and I wish I had said this before the recreational sector spoke. The Fisheries and Aquaculture Technology Extension Center partly funds the Marine Advisory Service. We are the conduit through which the industries can send information back to the research components of the University to try to get research to address industry needs. However, I will say that, unfortunately, in my 15 year tenure with research in the State of New Jersey that has happened very few times. It's certainly not because the industries have kept their mouths closed. It's certainly not because I haven't tried to yell and scream at people in New Brunswick or Sandy Hook. It's not many times we've had the faculty address some of these concerns. But now I am quite happy to hear of the new people on staff that Ken mentioned, and I think we now have the people to start doing some of these things.

Rich said to define and articulate industry problems. And I think that's part of what we're doing today is. The first part in Commercial Fisheries is focused on the Atlantic Coastal Bays, and will be addressed by John Maxwell, President of the New Jersey Shellfisheries Association. John is also a clam aquaculturist and clam dealer.

**JOHN MAXWELL:** My name is John Maxwell, and I presently serve as the President of the New Jersey Shellfisheries Association.

I am a fifth generational bayman. My family has worked the waters of New Jersey since before the Civil War. I'm also a full time clammer, aquaculturist, and a shellfish dealer.

I don't think anybody decides to be a clammer. It sort of happens to you over the course of time. So you sort of get into it and that's it.

My topic is Atlantic Coastal Bays, and specifically, the shellfish, like clams, crabs, oysters, and conch. I think Ken Bailey who's up after me will probably address the crab issue a little better than I will. So I'd like to concentrate on clams.

We in the Shellfisheries Association developed a wish list for areas of improvement on the coastal bay areas.

The first is the continuation of the analysis of coastal bay water by the Bureau of Marine Water Classification and Analysis, to closely examine marginal areas for upgrading seasonal waters to approved waters. Over the past few years we've seen the upgrading of water quality through regional sewerage hook-ups and reduction of non-point run-off. We now have more clean water in New Jersey than we ever had before.

Second, we'd like to support the opening of a depuration plant in the southern part of New Jersey to help with access to the resource in closed areas. We feel this would reduce the incentive to harvest clams illegally. With a depuration plant, clams can be taken from the polluted water, purified and marketed. Thus helping the economy.

Third, we'd like to aggressively foster the reopening of the relay in Atlantic and Cape May Counties for the spring of 1994 and resurvey the Great Bay relay leases.

Four, we'd would transfer the management of conch and hard crabs from Title 23 to Title 50 of the New Jersey statutes, thus giving responsibility for their management to the Shellfisheries Council.

Five, the association supports the use of the money that was dedicated through the increase of clamming license to rehabilitate once productive shellfish growing grounds, as was promised when the fees were changed.

Six, we support the formation of an all around waterman's license. One of the problems with crabbing regulations is that a license history in one type of the crab fishery is needed for a certain amount of time to reapply to get a license for it the next year. Traditionally a waterman moves back and forth between fisheries during his years on the bay. A waterman's license would enable him to do that, without having to reapply for the various fisheries when the season opens. It would also allow the professional waterman first crack any newly regulated fishery, if a limited entry system were initiated.

Seven, we'd like a permanent Bureau Chief of Shellfisheries. There hasn't been a permanent chief since Gale Critchlow retired, and we'd like to see the position filled.

Eight, we'd need an examination of hard clam stocks in our coastal bays, because they are almost non-existent. More importantly, we must begin active stock rehabilitation projects for hard clams with the input and assistance of the industry. Rutgers University shellfisheries researchers must expand the focus of their research from the oyster and focus more on the hard clam.

Nine, we must begin a program to reintroduce the bay scallop to our bays. The bay scallop has a unique life cycle, in that they only live about eighteen months. They have been wiped out in our coastal bays and have never made a comeback. Nor has anyone ever investigated why they haven't repopulated.

Ten, we must expand the shellfish aquaculture industry to increase production while reducing pressure on natural stocks. We'd like to see the aquaculture development plan become effective. It's supposed to be done this year. We support an effort to speed up the construction of the Rutgers aquaculture research center and hire a shellfish specialist to work on applied shellfish production research.

Eleven, reopen the conch pot fishery in the Atlantic coastal bays. This has been tied up in regulations for two years. We keep hearing about it's completion, but nothing ever seems to happen.

And finally, number twelve, we'd like to examine the impact of CCA (Copper,

Chromium, and Arsenic, editor note) treated wood and electrical generating stations on shellfish larvae in the estuaries. We think they may be a significant cause of decreased shellfish populations.

Also, on a personal note, I guess commercial fishing doesn't seem to be politically correct right now. My family, as I said at the start, has been in this business for a long time. We're very proud of our heritage, and I'm proud of the industry that we have in New Jersey. It's a big industry in South Jersey and I'd like to work together with other groups, especially the DEP, to promote a more harmonious relationship. I see a relationship that's deteriorated over the years and I'd like to see it turned around. I remember when I first got into the business there was a big problem with regional sewage plants. My father was the first president of the South Jersey Baymen's Association and he worked very closely with the state developing a regional sewerage plan and it benefitted everyone.

That's just a personal note for me and I'm sure a lot of our members feel the same way. So thank you for your time.

**MR. FLIMLUN:** Thank you, John. Next to talk about fisheries in Delaware Bay, is Ken Bailey from the Delaware Bay Watermen's Association.

**KEN BAILEY:** Thank you. I'm the President of the Delaware Bay Watermen's Association. We formed several years ago in response to increasing regulations and competition from out-of-staters.

Over the past couple of years, we've worked alot with the DEPE trying to make regulations that will allow us to fish and also protect the resources. We need regulation. I think most people who are familiar with fishing know you have to have some regulations. But alot of times it seems like the regulations have gone too far. They unnecessarily restrict our ability to make a living in Delaware Bay and increase our reporting.

We often sit down in committee meetings with the DEP and work to agree on the wording of regulations. Then when the regulations are published in the State Register they look altogether different. It seems like this is the DEP's way of dealing with the commercial fishing industry.

Being on the water everyday, we fishermen see a lot things that regulators, sitting in their office, will never see. They won't know these things unless they work with us.

I've been a commercial fishermen for most of my life. Like a lot of inshore or bay fishermen, I am a small scale fishermen. I represent the little guys like myself. We build most of our own fishing gear and work out of boats 18 to 45 feet in length. We want to be left alone to make a living for our families and we try not to interfere with the income of other fishermen. But times have changed. Conflicts between commercial and recreational fishermen means we need to work together. I see the need for working with the DEP, working with other fishermen and to do studies to support regulations. We fishermen could be very helpful in this process.

Fish populations and locations are always changing. You don't see them unless you are working on the water. Our fishing knowledge is based on being on the water in all

seasons and over many years. Our observations should be included in the State's management plans.

I've been crabbing since I was eight years old. I've been running a boat since I was 13. We had areas when I was a kid where we caught nothing but female crabs. That's all I ever done. I fished the crabs from spring till fall. It's not that way anymore. You don't catch females in the areas where I used to catch them. Conditions have changed. The bottom has changed. The crabs are in different areas. Fishermen know these changes and the DEP should include their information in designing regulations.

One of the problems we have had recently is the number of out-of-staters, nonresidents, that come when fishing is good in New Jersey, and restricted or unprofitable in their state. Nobody likes resource being shared by people from out of state when stocks are declining and restrictions increasing. A lot of our members feel they shouldn't be here, and they feel the state should take care of our own people first. We feel the economic value of the resource should benefit the residents of New Jersey.

A classic example of over regulation, one that upsets me and probably other people, is the recent crabbing regulation. The DEP wants to have the power to permanently take away our license for filing a late report. I've been in a lot of fisheries. I've been fined for late reports, but I've never had my license taken temporarily, let alone permanently. That's an example of how the DEP treats commercial fishermen. It's really sad. I'd like to know how many other businesses or professionals have their licenses revoked because you fill out your report late. Give us a fine if necessary but don't take our license. I think that's absurd.

I've heard mention of the striper or striped bass. I'd like to touch on that situation very quickly. New Jersey's management restrictions are a sore subject with my members. Most people don't realize that New Jersey received a Federal allocation for a commercial harvest of stripers based on the state's commercial harvest in the 1970's. The state chose to give this allocation to the recreational fishermen. Recreational fishermen are allowed to catch two fish. The first fish is the recreational allocation fish; the second fish, DEP calls its trophy fish. Trophy fish is the commercial allocation that was given to the sports fisherman. The DEP ignored the by-catch problem and the economic value of the commercial fishery when they gave away the allocation. New Jersey is the only state to take away the commercial allocation and prevent the use of the resource by all the fisheries. We have objected to these actions but we have been ignored by the DEP.

The DEP often tries to apply one set of regulations to all the waters of the state. Many times this ignores the differences that exist between the coastal bays, Barnegat Bay, Raritan Bay and Delaware Bay. We have traditionally fished under separate regulations in all these areas. The recent state wide crab pot restrictions are an example of the problem. The number of pots may need to be limited in the smaller bays because of "user conflicts", but they are not necessary in Delaware Bay. We will have to reduce our fishing businesses even though the law addresses a problem that doesn't exist in our fishing area.

Another thing I hear a lot, it's been said here today, is "commercial fishermen are always the first to be blamed for resource problems". It's always over-fishing by the commercial fishermen. There probably is some overfishing by commercial fishermen, but we're not to blame for all the changes in fish populations. One of the biggest factors is water quality and water use. Everybody drinks water. Everybody needs water. I don't know how many new

intakes and discharges have been put into the bay. These pull the fresh water out of the bay and add discharges to it. We need water for these things, but it also impacts the fish and crab resources. Pulling water out of the river changes salinity. Salinity affects everything living and growing in the Bay. Nobody ever looks at these environmental impacts when we talk about management plans.

The Delaware Bay Watermen are committed to maintaining the Bay's resources and our livelihood. A lot of times we feel we're listened to, but we're not heard. Thank you.

**MR. FLIMLIN:** The next area that we're going to examine are the nearshore fisheries, Captain Jim Lovgren from Fisherman's Dock Cooperative in Point Pleasant.

**CAPT. JIM LOVGREN:** Thanks for having us today. First thing I want to do is read a little statement from Brick Wenzel who represents the gillnet fishermen.

The New Jersey gillnet industry has the largest amount of gear conflict of all the producer groups. The greatest majority of fishing time is spent within state waters, thus the largest percentage of the gear conflict is with the recreational fisherman. The public's perception of gillnetters is a negative one and can be changed with proper industry recognition on the Atlantic States Marine Fisheries Council.

New Jersey's gillnet industry has been closed to new participants through legislation. This will have a negative impact on the expansion of production within the industry and thus reduce its economic benefit to the state. Consideration should be given towards creating policy that evaluates an industry on more than economic importance.

New Jersey's gillnet industry is one of the most efficient and environmentally safe forms of commercial fishing. Selectiveness of targeted species and limited by-catch through monitoring and mesh size will enable New Jersey gillnet industry to be one of the most acceptable forms of wild fish harvest in the future.

The environmental and economic importance of New Jersey's gillnet industry must be recognized by the legislators and their constituents through the representatives on the fisheries council. Therefore, having a non-biased representative on the Atlantic States Marine Fisheries Council is one of the most important issues for the gillnet fisheries. That ends that there. Now, I get into my cynical views.

This 20th anniversary of the roundtable is also the 20th year of my employment in the commercial fishing industry. In that span of time I've witnessed many changes in this industry, some good, some bad.

The best thing that has happened to the fishing industry has been the stopping of ocean dumping of most of our waste products. Sewerage sludge, acid wastes, chemical pipelines have all been eliminated as the environmental damage they created was recognized and finally halted. We owe our gratitude to the American Littoral Society, Clean Ocean Action

and other environmental groups and legislators who had the guts to finally stop the destruction that was caused by these careless disposal methods. Unfortunately, the dumping of contaminated dredge spoils is still taking place, and this is one of more serious problems facing our industry today. PCBs and Dioxin do not belong in the food chain, but because the government has been studying alternatives for 20 years, that's exactly where they are. Hopefully a solution will be agreed upon soon. But all in all, ocean water quality is enormously improved over the last 20 years.

I got to put in my little bit of information here. I keep hearing about the overfishing by the commercial industry and yet there's one thing that's never addressed. While environmental degradation has been focused on obvious forces, what is totally ignored is the effect of 150,000 recreational boats heavy use on marine organisms in the water. Outboard motors presently pump 25 percent of fuel they use into the water unburned. This amounts to millions of gallons of gas and oil annually in New Jersey alone. The high speed propellers like egg beaters causing substantial damage to marine organisms. Unfortunately, this damage subject is taboo. Outboard industries and sport fishing groups contribute enormous amounts of monies, thus buying the silence of the environmental groups.

The next most important change in fisheries was passage of the Magnuson Act, which kicked out the huge foreign fleet that was destroying our native fisheries, which was good. But it got government involved full time in fisheries management, which was bad. In 18 years of fisheries management, the federal government has mismanaged every species under its control. Granted, it's not easy to control an industry that cannot even control itself, but the public deserves more for the billions of dollars spent on NMFS budgets than the impending collapse of the whole commercial and party boat industries.

These two changes have affected all of the commercial fishing industry.

Now I'd like to tell of the changes that have occurred in the Point Pleasant fishery. Twenty years ago an observer in Point Pleasant would have found five operating commercial docks. There are now two. In 1974, Point Pleasant was a major port in the lobster industry. Up to 20 boats used to otter trawl for lobster either full or part time. It was the only port on the East Coast with such a large lobster trawling industry. At the Fisherman's Dock Co-op boats typically fished for lobster six months, then switched over for whiting in the winter. The loss of Jack Baker's Lobster Shanty boats was the doom of the lobster trawl industry. Without his big boats to keep the Hudson Canyon clear of lobster pots, lobstermen from New England moved in and took over where they remain firmly entrenched.

This created the need to find alternative fisheries for the late spring to early fall. Some boats went fluke fishing, while others turned their attention to squid. I must give credit to the government on the development of the squid fishery. They did help a great deal in approving the joint ventures with foreign boats, and by helping to develop the domestic and export market. Now if they would require two-inch bag size and ban the use of liners, perhaps this fishery can stay healthy.

A number of our boats fished out of Newport, Rhode Island in the summer for yellowtail flounder, fluke, squid, whiting and butterfish. It's been six years since I was last up in New England waters fishing. Now those boats are coming down here. Some boats went scallop fishing either with dredges or nets. The point is that the inshore fisheries that have developed through the years in Belford and Point Pleasant depended on their ability to adapt

to the changing nature of the fisheries population. If one species was declining we switched to another in order for the less abundant fish to replenish. In commercial fisheries if it is not economically feasible to fish for a species, you stop fishing for them.

Whiting has historically been the backbone of the commercial fishing industry in Belford and Point Pleasant. In the '70s to the mid-'80s, the Mid-Atlantic landed more than half of all the whiting caught on the East Coast. The late '80s and '90s have seen New England take over and destroy this once prosperous industry. Fisherman's Dock Co-op whiting landings have dropped from a high of 8 million pounds annually to under a million pounds last year. The Mud Hole fishery for whiting is a thing of the past, and NMFS landing records will now show that New Jersey's whiting industry is small compared to New England. When quota time comes we will be virtually kicked out of an industry that we successfully controlled by voluntary trip limits, which kept the supply and prices steady while being its own conservation plan.

Trip limits worked for a long time until the big rigs from New England got involved and started wiping out the stocks with no concern of dockside prices. Trip limits, in my opinion, are the only effective means of averting the disaster resulting from the mismanagement and overfishing of the New England groundfish stocks.

Government regulations have now effectively eliminated any versatility we have historically had. I can no longer fish for scallops, codfish, haddock, yellowtail flounder and graysole. My versatility is severely limited by net restrictions which don't allow the possession of different size nets on board the fishing vessels. Operator permits have now been issued for the sole purpose of being able to take them away. The cost of meeting new safety requirements, EPIRBS, new life rafts, black tracking boxes, and God only knows what the FDA has planned, will force most boats out of business. Individual transferable quotas will do to the fishing industry what they did to the surf clam industry, that is, put the independent owner-operated boats out of business and allow the corporate takeover of seafood production in this country. Regulations favor the big high horsepower boats that do the most damage to the stocks, while putting the smaller boats at a distinct disadvantage, because they cannot close the meshes of their nets the way a bigger boat can. NMFS has to recognize this fact in all its fishery plans before a vital segment of the industry is destroyed.

What can be done in New Jersey to help the commercial fishing industry? We need a friendly administration in Trenton and we need the Division of Fish and Game bureaucrats to try to keep us in business, rather than put us out of business. With the passage of the Interjurisdictional Fisheries Act, the role of Atlantic States Marine Fisheries Commissioner of each state becomes more important. In New Jersey, the appointed position is currently held by a man whose only concern in life is the recreational industry and how to put commercial fishermen out of business. Federal legislation is needed so that there are two people for this position, one recreational, one commercial. Until this legislation comes about the next New Jersey Commissioner must come from the commercial industry.

A review is needed of the money that is spent in New Jersey on fisheries and what is actually gained from it. Are the millions of dollars spent on oysters in Delaware Bay worth the little commercial return?

Aquaculture has a place in fisheries, but why is so much money being spent with so little return? I see the best use of aquaculture as being used to replenish the dwindling stocks

of wild species. If we can stock lakes with trout, surely we can help weakfish, haddock, cod and other species. If anything positive is to happen to the fishing industry, and the stocks that support it, I think it can come from increased support of aquaculture as a means of replenishing natural stocks. The benefits to all would be enormous. Thank you.

**MR. FLIMLIN:** Dave Wallace is here to give the commercial industry perspective on ocean clamming. Dave is with South Jersey Surf Clam Company.

**MR. WALLACE:** I am here to talk about the ocean clam industry, which is operated from off-shore Virginia to the Canadian boarder. For once, from a fisheries management prospective, there is good news. This fishery has not been decimated by over fishing since the original management system went into effect. And today, it is reasonably well managed. There are groups within the industry, and without, who do not like our management structure, which entails limited access and individual transferable quotas, but we should look at the results.

Twenty years ago in 1974, the industry caught the most clams in its history...it was a blue ribbon year. About 110 million pounds of surf clam meat was landed. Almost all of which was caught off of the state of Virginia. An insignificant number of clams were also landed from the state of New Jersey's inshore beds. At that time, the clam bed off the Chesapeake Light Tower was 30 miles long and 50 miles wide. In short order, the industry did an efficient job of decimating them. In June of 1975, the stocks collapsed in Virginia, we had caught up all the clams. The following year, the surf clams in northern New Jersey were killed by an anoxic condition from a massive phytoplankton bloom.

During this time the state of New Jersey was scrambling to put regulations in place to protect their inshore fishery, which was the only significant clam stock that remained. There were boats towing for clams right off the pier at Atlantic City. There were big vessels, little vessels, all kinds of vessels, and, often, they would run aground because the clam beds ran right up to the beach. In an effort to control the situation, New Jersey began implementing severe limits on vessel size and the number of vessel participants.

The clam industry had experienced collapse twice before, the last time in 1972. At that time, an industry group, of which I was a member, invited the states and the federal government to meet and come up with a means to protect the resource from the industry. We are a highly competitive industry, and as such, no company is going to restrain itself to preserve the stocks when its competitors are catching full tilt. It is not the nature of the fishing business, therefore, we recognized that we would have to come to a consensus and support a law that would have the federal government impose limitations on the industry. We knew that we had to be protected from ourselves. Unfortunately, we were too late for the Virginia and northern New Jersey surf clam stocks.

The Magnuson Act was passed during this period, and the state of New Jersey implemented its inshore fishery system. In the beginning New Jersey system was very similar to the federal system that was developed. This was understandable because, several state fisheries people from New Jersey were among those who helped develop the federal plan. Both plans emphasized limited access, fishing time restrictions, and quotas as the basis for control. The industry could not maintain an unlimited number of fishing vessels, since the clam stocks could not stand the fishing pressure. The federal system was very controversial.



The Surf Clam and Ocean Quahog Fishery Management Plan was the first management system to be implemented under the Magnuson Act. It was developed and implemented very quickly. Why? Because as I mentioned, industry had already come to grips with the problem and hashed out solutions several years earlier.

Originally, the recommended 1977 federal quota for surf clams was set at zero. We conceded that the stocks had collapsed, but suggested a more moderate approach, consequently a very small quota was set for the early year. Along with limited access fishing time limitations and a quota, a few years after the plan went into effect we also implemented closed areas to protect juvenile clams. After several years of stringent quota management, the surf clam stocks began to recover. Nature lent a helping hand with a big set of clams in the area of the anoxia during the following year. Coincidentally, the anoxia killed off all the clam predators in northern New Jersey's waters, which allowed the juvenile clams to survive. In addition, there was another good set off Virginia the next year.

One should also recall that twenty years ago, there were no restrictions on ocean quahogs at all. Today, we catch 5 million bushels a year, most of which are landed in New Jersey.

So, where is the clam industry today? The clam industry still has very stringent quotas. We catch only what the surf clam fishery will sustain. In 1990, we passed Amendment 8 to the federal plan. This Amendment featured an Individual Transferable Quota (ITQ) system. This system allocated the right to catch the offshore clam stock to the historical participants. They are not tied to a vessel and may be bought, sold, traded or leased. A vessel may catch as many clams as they have allocation.

The state of New Jersey had a similar system whereby they limited the number of permits. There were and still are 57 permits in New Jersey, so the quota can only be fished by those vessels. Each vessel was allowed to catch so many bushels per week. When the quota was taken the fishery is closed. When the federal ITQ system went into effect, the state of New Jersey changed their system to more closely align with of the federal system. This was because the New Jersey fishery was still operating with too many vessels, while under the federal ITQ system, the overcapitalized fleet had been reduced. In the new system, New Jersey allowed one vessel to catch as many as three permits in a season. While today the offshore fishery has reduced the fleet to 65 fully employed vessels, the New Jersey system still artificially inflates the number of vessels that must fish to create unneeded jobs. We have suggested that New Jersey should increase the number of permits allowed for a vessel to catch from 3 to 5 per ship. It is very inefficient for the industry to maintain all of these vessels, most of which are only used to catch inshore clams. For the most part, they are manned by crews who run other vessels during the winter. This is the most serious problem the New Jersey part of the industry has today.

The future of the clam industry will prove to be interesting. We have not had a major set offshore since 1978. Surf clams live approximately 25 years and take about 5 years to grow large enough for harvesting. They are sexually mature at about 2 years. It appears that there have been a number of small sets over the years. However, if we do not get a set in the next few years, we will have a problem with the overall surf clam population.

Ocean quahogs, however, are a much different story. They live for about 200 years and become sexually mature at about 35. The average harvest age for ocean quahogs is about 75 years old. The biggest problem with our quahog management system is one that Dr. Locandro addressed earlier. In quahogs, our management approach is basically a mining operation. There is no indication that we have had a quahog set since 1976, when we started catching quahogs after the surf clam stocks collapsed. Under the federal FMP the quahog fishery is to take no more than one thirtieth of the standing stock in any given year. If we were to have a major set today, those clams would be restricted from harvest until they have been sexually mature for at least one year, or until they are at least 36 years old. Assuming this resource is managed properly, the industry as we know it will get smaller as the population gets smaller, the new quota of one thirtieth of the population will reduce the quota. It is going to be a slow process, because we are only taking about 2 percent per year of the standing stock at this time. At the current catch rate, we have about 50 years worth of stock for the future. The waters off Canada, Iceland, Norway, and down the western coast of Europe have commercial quantities of ocean quahogs. So the species will be a viable resource for some time to come.

In conclusion, there are a number of people who do not think that the ITQ system is a good management tool. However, you cannot have a system that fosters too many fishermen who cannot make a living fishing, and not have them put political pressure on the government to ignore the quota. It is unfortunate that all fishermen cannot do well financially, but if the quota were to be ignored, it would just exacerbate the fishermen's problems as the over production would drive down clam prices, as well as over-fish the resource. The only way to keep from over-fishing the resource is to limit access and have a finite quota. When there is a finite quota and a ITQ system, the industry finds the point where it is efficient both in terms of economy and resource conservation. Yes, there are not as many clam fishermen as their once were. In fact, we are rarely heard from any longer because there are so few of us. But the stocks are not being over fished. Nonetheless, the surf clam and ocean quahog fishery is one of only a few fisheries on the East Coast of the United States that is fully utilized without being in trouble.  
Thank you.

**MR. FLIMLIN:** Nelson Biedeman who is the President of the Blue Water Fishermen's Association was supposed to be with us this afternoon to talk about longline fisheries. Nelson was in Rockland, Maine yesterday for the Maine Fishermen's forum and his flight was canceled or whatever, and so he's not going to be here. He was suppose to leave Portland, Maine 6:30 this morning, but I don't think he's made it. Nelson has already sent me a copy of his presentation, which we will have entered into the proceedings of this roundtable. However we will hear from Charlie Bergman from Axelsson and Johnson's Dock in Cape May today about longline fisheries.

**CAPT. NELSON BIEDEMAN:**

**Evolution of Commercial Longlining out of Barnegat Light and other New Jersey Ports**

Thank you for inviting me to participate at this Twentieth Anniversary Roundtable. I

am Nelson Beideman, Executive Director of Blue Water Fishermen's Association. I have been a fisherman since childhood and began commercial fishing year round following graduation from college in 1975.

There has always been some degree of commercial longline fishing from Barnegat Light and other ports along New Jersey's coastline. However, these fisheries were primarily inshore, centering on codfish baited tubs during winter months when the cod stocks were strong and their southern range included New Jersey waters. In modern times, Charter and Headboat operations initiated these seasonal fisheries to tide them over during the winter lapses in clientele. Today's offshore longline fisheries for tilefish as well as this area's far-ranging pelagic longline fleet for swordfish, tunas and pelagic sharks has evolved from this part-time traditional baited tub fishery.

Twenty years ago, I was a Junior at Maine Maritime Academy, majoring in nautical science due to my interest in the ocean and fishing. After graduation, I briefly worked in the maritime trade; however, before long I returned to fishing out of Barnegat Light. Fishing has always been my first calling. During the four years spent in college, I was able to step back and watch the evolutionary changes that were occurring to fisheries off New Jersey, particularly in Barnegat Light.

Throughout the 60's, catching fish for a living was generally thought of as a very clean, simple, out-of-doors, GOOD thing to do for a living. Fish was basically viewed as exactly what it is "a food item". The oceans were viewed as being endless in bounty and what we didn't know contributed to the enormity of its size. Generally, fish stocks were thought to be endless.

**But in retrospect, there were signs back then that should have led us to conclude more quickly that the Bounty of our Atlantic Ocean is not endless.**

During the summers, I remember always hoping that today's charter would prefer the challenge of tuna fishing over the mundane slaughter of bluefish on the ridge or drifting for fluke along the beach. The first signs of warmer, bluer water would usually arrive in early July. Charter boats who for years had cultured a clientele to take the gamble that Bluefin tuna could be found within range of these day trips would start their mornings extremely early. Bluefin were usually found in vast schools; however, they were not always actively feeding. I often wonder if the enormous catches of Captain Lou Puskas, who was renowned for his ability to come to the dock day after day with substantial catches, (sometimes over 100 head of tuna in a day's fishing) have been properly accounted for in the present bluefin tuna science. Today's bluefin tuna fishermen are only recently beginning to realize that miscounting back then may be contributing in part to the problems in Atlantic bluefin tuna management today.

Back then, charter and many times headboat operators kept full time operations going by commercially fishing on days when no clientele were available. Bluefish, Fluke, Porgies, Seabass and Tunas were harvested in this manner during the summer. Codfish was the primary commercial target species during the winter. Long days were spent hand setting and hauling Baited Tub Gear for Codfish. Then upon return to the dock, a scale would be pulled out to retail much of the catch directly to customers who were drawn by the freshness of the

day's catch. The remainder was shipped by the local commercial market to New York and Philadelphia.

As the range of Atlantic Codfish receded and winter tubfishing became less productive, fishing further offshore with the same basic tub gear slowly took its place. The first commercial longline Tilefish trip in modern times occurred in December 1970 aboard the Gra-Cee II with Captain Lou Puskas sailing out of Barnegat Inlet. The availability of tilefish to catch was already established; for years, draggers periodically caught tilefish, and rod and reel landings by headboats and charter boats from Atlantic City and Barnegat Light took place the summer prior to this first commercial longline trip. The quality of the longline product was quickly recognized in Fulton Fish Market and soon a fishery developed out of Barnegat Light.

When summer arrived, headboats and charterboats went back to sailing their normal charters for the diverse species we enjoy along our shores. Foreign Tuna Clippers moved into this area and within a few short seasons, they tapped the cream off the bluefin tuna fishery. Our own domestic seiners eventually switched to and built a market for giant bluefin. Offshore pelagic longline was in its infancy in some areas but had not yet been initiated in this area. Some charter and headboat operations slowly turned to full time/year round longlining for tilefish. Vessels were converted or built specifically for their new duty.

By the mid 70's, a few longliners from New England, the Gulf of Mexico and the East Coast of Florida began appearing off New Jersey's waters as they followed swordfish and tunas. Again Lou Puskas, now with the Gra-Cee III, was the first to begin harvesting these species out of Barnegat Light. It did not take long before other tilefishermen converted to pelagic longline for the summer months.

In the late 70's, commercial longlining for tilefish was at its peak. The fleet of longline vessels had grown to 35-45 vessels, accompanied by as many (or more) draggers during the winter and a substantial number of rod and reel charter and headboats in the summer. The narrow band of 60-150 fathoms of water between Hudson and Veach Canyons where the majority of the tilefish congregated began showing signs of declining catches. These signs were recognized by those who had experienced declining cod stocks in the 60's. Exploratory trips during all seasons of the year to extend the grounds south produced little success.

Extending the grounds to the east was profitable but easily recognized as a temporary measure because tilefish to the east were found in extremely narrow bands and pockets. In 1983, my last 7 tilefish trips were among the best catchwise, each trip exceeding 30,000 pounds of tilefish. However, competition was so fierce, one boat out of Montauk hired a plane to locate me while I was fishing to the east in Lydonia Canyon. During the last three trips, I had plenty of company. **Since those days, steady tilefish production has declined greatly.**

That summer, many more vessels than usual converted to pelagic longlining. Some never returned to tilefish, but many still periodically take a tile trip to keep tabs on a once productive fishery. Most of the boats that left the fishery hoped to return in the future when stocks rebuilt themselves. For those vessels, many from New Jersey ports, this was our first tough sacrifice for fisheries conservation. **The fact that fisheries management failed to act for tilefish will always be a black eye, especially for the state of New Jersey, which has**

for now lost an economically valuable fishery simply by not paying attention.

All during the 80's, tilefish longliners changed their gear to economically survive. Steel cable replaced nylon gear. Now, once unfishable lobster pot areas were fished with ease, while gear loss problems due to blue sharks were eliminated. Plotters placed vessels on exact bands with precision. Monofilament leaders replaced nylon, and being keener, received more bites. At times, "suicide runs" of tilefish moved onto the bank before their spawning season and landings would temporarily increase. But the average size of the fish caught has steadily and drastically declined. The first steps toward conservation and management of tilefish has only recently begun. The Mid Atlantic Management Council's staff is working on a proposal for a 30 year recovery plan for the Council to consider. New Jersey should not lose sight of this fishery.

Commercial fishing for pelagic species, such as swordfish and tunas, remains a political issue because of the direct competition for these species by both commercial and recreational users. The five Atlantic Regional Management Councils worked diligently toward management of Atlantic swordfish for fourteen years following passage of the Magnuson Act in 1976. Their culminating accomplishment, Amendment 1 to the Atlantic Swordfish Management Plan, was submitted to the Secretary of Commerce in October of 1990. This proposal called for a unilateral closure of the U.S. directed swordfish fishery despite the Council's acknowledgment that even sacrificing the U.S. industry could not do what they considered necessary for conservation of Atlantic Swordfish.

In the Barnegat Light Firehouse on December 22, 1989, New Jersey pelagic longline fishermen met to form the basis of Blue Water Fishermen's Association. Unlike most fishermen's groups, Blue Water was not formed to simply fight off or to forestall management of the species that we catch. Blue Water's members recognize the need for practical fisheries management for Atlantic Highly Migratory Fish Stocks whose health is directly linked to the security of our own future as well as succeeding generations of fishermen.

In November 1990, two things occurred that moved resource management of these species toward realistic effective conservation and management. First, the U.S. Congress recognized the need for international management measures and the inequity of unilateral restrictions on American highly-migratory species fishermen. Acting with sound resource principles that combined all highly-migratory species within one jurisdiction, Congress transferred the management authority for Atlantic highly-migratory species from the Regional Council structure to direct authority under the Secretary of Commerce.

Secondly, the International Commission for the Conservation of Atlantic Tunas (ICCAT), took significant steps to conserve Atlantic swordfish with management measures affecting all major and minor harvesters in the Atlantic. International management of anything is not easy to achieve; however, it is the only effective and equitable option. It is in the best interest of U.S. fishery managers and fishermen to pursue international conservation and management for these important and valuable fish stocks.

ICCAT has been more progressive in dealing with swordfish than other species. It has the advantage of initiating conservation while the stock is still relatively healthy. The international priority of these fisheries will need to be elevated to a higher level before there

will be a proper handle for rebuilding some of these species back to maximum sustainable levels. Everyone involved must share the sacrifices along the way.

These are vital fisheries to New Jersey's economy. New Jersey needs to stay actively involved in conservation issues and avoid being distracted by allocation issues between user groups. We all need healthy stocks of fish regardless of our method of harvesting the allowable share. Political allocation issues disregard and even undermine progress in these areas. All New Jerseyans will benefit by working together to conserve and manage these renewable resources.

**CAPTAIN BERGMAN:** I'm Charlie Bergman with Axelsson and Johnson's. I could only assume that Gef asked me to come up here for this mainly because I was a longline fisherman for many years. My fishing career started in Florida at the age of six when I went out with cane pole and a piece of bread, and caught blues. I went through college, had a career in sales, automotive parts, decided that really wasn't what I wanted to do. I was still a fisherman at heart. I went back fishing, went back for – one of my customers had a slip boat, went slipping board, then got bored with dragging. Got into longlining.

When I initially starting longlining we were setting gear out of a bucket, putting out one mile of line, catching swordfish. Now this was something that was really, really good. Here I was fighting a fish, had one idiot on one end of the line and another idiot on the other. One of us would win. One of us would lose. I continued.

The first boat I fished longline on was 39 foot long. I progressed from that boat up to running a boat that was 110 foot long. I've chased swordfish, tuna fish, snapper, grouper, tilefish, all with longline gear, from the Azores to south of the Equator through the Gulf of Mexico. I've covered a lot of water.

Some of the problems that arise with longline gear. At one point in time there were so many boats involved in longline fishery that you just really could not set your line. That's changed. The industry is changing. Snapper and grouper longline fisheries in the Gulf of Mexico are now limited during seasons people go out. It's open right now. Opened last month. Price of red snapper, domestic red snapper is probably the lowest it's ever been. There is a lot of red snapper, but everything comes in at once.

Here in New Jersey you originally had a codfish fishery. Lou Puskas was one of the originators of the longline codfish fishery or the renewed longline codfish fishery. There was a fishery prior to Lou. Setting tub gear or many miles of tubs, catching your fish, bring them into port. As things progressed the electronic gear had also progressed making the ability to find the fish so much easier and the gear itself produced so much better.

In New Jersey, New York, the whole Northeast there was a viable tilefish fishery. It was also set up with tub gear. Then from the south came cable gear, snap gear and circle hooks. I see Mr. Kosack shaking his head. Hi, Phil. I was one of the first ones to use cable gear, snaps, circle hooks. I helped to get that industry where it was in the tilefish fishery in the State of Florida. We then brought the knowledge up here. It's gone a lot further than what we

ever thought.

When I was tilefishing we fished 500 hooks twice a day. Today, they could fish thousands of hooks, many miles of line, they catch so many more pounds of fish. Tilefish needs a management plan.

It really is a very small industry. It is a longline industry, predominantly based out of Barnegat Light and Montauk, New York, with a little bit in Maine and Sea Isle City. These people are working out their problems themselves with the government.

The swordfish industry is an international industry as well as the tuna longlining. We in the U.S. seem to suffer quite a bit with regulations. We tend to regulate ourselves because fisheries are in danger. Fisheries need to be managed, whether the U.S. steps forward and we manage the fisheries or its done by international agreement. What happens in Mexico? What happens in Greece, South Africa, the Pacific Ocean? Today there's not anywhere near the amount of longliners, U.S. longliners in this country. The Atlantic Ocean has lost a large portion of that pressure. Management still goes forward, but we still as a country ignore these other countries' impact. We can't.

This state, this country cannot lead the world any longer. We can't sit back and let our industries, which were very viable, suffer when the rest of the world is not going along with fisheries management.

**MR. FLIMLIN:** Charlie, thanks so much for jumping in on short notice. The last speaker in our offshore commercial fisheries is Captain Lars Axelsson from Cape May who runs both the Flicka and the Dursten. Mike Genovese will not be speaking. Lars will be speaking in his stead.

**CAPT. LARS AXELSSON:** My name is Lars Axelsson. I am a commercial fisherman (dragger), out of Cape May, New Jersey. The following is my fishing history:

Prior to 1973, I went summer fishing with my father while I was in high school. We started out in small boats, specifically a 65 foot wood boat dragger named "Dyrsten". We dragged for fluke along the bottom.

In 1973 my father and I formed a partnership, and in 1974 purchased our first steel hulled vessel named "Tina". We also switched to two boat mid-water trawling. With this type of fishing the main catch became mackerel, sea trout and bluefish. We were then known as "round" fishermen. We stayed away from most of the flat fish because these were ground fish, residing strictly on the "bottom" of the sea. We continued this style of fishing throughout the latter 1970's to the early 1980's. In 1979 we formed a corporation.

We went back to single boat trawling during the mid to late 1980's, and got involved in Joint Ventures with other countries, fishing for squid, mackerel and butterfish.

In the late 1980's fishing technology brought us from the "wet boat" era using ice, to

RSW (refrigerated sea water) tanks, and now we are known as "processors", freezing via plate freezers on board at sea.

Today we own two trawlers, the "Flicka" and the new "Dyrsten". The corporation has included other family members, still preserving our "family business", and not expanding to a fleet operation.

The fishing effort done by my family and me is a product of our government's goal for the use of underutilized species, particularly targeting squid and mackerel. Based on what I have been hearing from different user groups I am probably one of the worst perpetrators of the fish resources on the East Coast because of the different gear technology that I have been using, and yet, I do not see it that way.

My father immigrated to this country in 1954. He comes from generations of fishermen. I am a first generation American, raised with the European "old school" way of doing business - you went to sea, did the best that you could with what you had in order to produce fish.

We have seen regulations coming down the pike on all other species, and we diverted from them because of a bad experience with trying to gain access to the so-called "bluefin" fishery, using purse seines. Not only did the industry set against us, but so did the government, and this ordeal almost bankrupted us. Chalk it up to a learning experience, but it taught me to open my eyes to regulations and what our managers are doing to us, the "grass roots" fishermen, as constituents.

Fishing was a lot of fun as a kid, that's why I chose it as a profession. Now, I have redirected my efforts. I personally am in a unique situation because we are a family oriented business. We have three captains for two boats. Between us we have much knowledge to maintain the rigging - both mechanically and technically. We did not go to college to learn this. We did it all out on the Atlantic Ocean, by trial and error, starting with the 65 foot wood boat to today's two steel freezer trawlers, "Flicka" and "Dyrsten".

Flicka is 98 foot capable of 15 tons a day of frozen product at full capacity. Dyrsten is 120 foot, capable of 40 tons a day of frozen product at full capacity. If we fish at full capacity for three days, then we go home. We designed our vessels with the idea of working a five day week. We come home on the weekends - there has to be a family life too. After all, life is not just out on the Atlantic Ocean.

Because the government wanted to increase the area of underutilized species and move into the export market, we have been pushed into "freezing", which has, in effect, limited us.

Our freezers can only do so much product per day. Fifteen tons may sound like a lot of product, but before the "freezer" boat days, was the RSW. When I was a "wet" boat fisherman, I could load my boat with 150 tons of product in one day, go in and unload, and repeat this three times a week, if the product was there and conditions were right. But I did not do that because of the shore-side facility's inability to handle that amount of product. So, there would be one fishing day per week, roughly, because you had to deal out your "allocation" amongst other fishermen, which created a lot of fishing pressure.



There are many misconstrued ideas and fighting between different user groups, recreational versus the commercial. Within the commercial sector there are pot fishermen, dragners, longliners, the list is unending. Yet in the Cape May area, I have been able to work side by side with longline fishermen, pot fishermen, and sport fishermen. Through communication with these different types of fishermen we have been able to maintain a livelihood without destroying each other's gear and/or fishery.

What is most frightening to me is not the user group conflicts and the fighting on how to divide up the pie, but that we have a regime above us. I refer to the managers 20 years ago. I did not even think about fish regulation, nor how those losses were going to effect me.

I watched at the side lines as the surf clam industry was regulated into collapse. I watched fishing industry collapses in Europe. I have family in Scandinavia, and I watched them go through a fish collapse in 1968. I watched vessels disappear because of the fish collapse of herring and mackerel. I was involved with the joint ventures with the East Germans, Russians, Spanish, and Portuguese in the mackerel fishery and would listen to the captains on those vessels tell of lost markets because of the collapses and people's palate had changed from one kind of fish to another. One which they could not produce.

We have a management regime that needs to make regulations. I have been involved with the federal management scheme most of my fishing life, I have to know the system. I also know the "grass roots" level of fishing. I have watched other fisheries, and seen how those affected have become aware and watchful of regulations. And now we have the ASMFC. It has a whole different set of standards. Now, instead of having to go to federal meetings once every six weeks and losing a week of fishing, the ASMFC meets once every month for a week. That's 12 weeks out of the year. That totals to nearly five months of lost fishing time for me - which is where I'd rather be. But I feel my presence is necessary at these meetings in order to keep abreast of what's coming, and possibly have some input to these regulations.

Because of species by species management we have regulations from one fishery that will inadvertently affect another fishery. Many of the managers do not realize that traditionally trawlers were mixed - if I could not find trout, I would target blues. If blues are not there, I would go for squid, or in the worst case, as when I was a kid 20 years ago, I would go fluking. We were "round" fishermen. Wintertime we would go for porgy (scup), sea bass, whiting - anything to make the pay. Any one species would not make our trip successful or profitable, but the combination of all the species made it possible to make a living. Now, management is coming down species by species, limiting one net for one kind of species, and there can not be another kind of net aboard because you will be out of compliance.

Fishermen from my end of the world do not have the knowledge or time to protect themselves in an arena of biologists, experts, and managers armed with statistics and government. By the time we learn what has been decided, we have already been booted out of a fishery. For every fishery that I am booted out of that's an option I lose. For every option I lose, that tracks to dollars and cents out of my pocket to making a successful year.

We need to work together, to communicate. We agree there needs to be management, with an honest effort from all parties and user groups, we can come to a compromise that will be beneficial to all. Thank you.

**MR. FLIMLIN:** Thank you, Lars. That concludes the planned program for the day, but I would give anybody the opportunity who would like to make one or two terse remarks before we leave the opportunity, not to rebuttals, but terse remarks.

**BRICK WENZEL:** Brick Wenzel. And first of all, I'd like congratulate you on a successful forum. Earlier I had seen many students here from Cook College. Unfortunately, many have left before what I conceive is the most informative part of the agenda. These students are the future of industry. Like in other meetings I've been to, the perspective of the industry has been heard by few ears. I would ask that you provide those students a copy of the industry's perspective so that our future can be well informed. Thank you.

**BONNIE McCAY:** Also, I've been painfully typing away so that my students can get a copy even before they might get it from you because many of them had to go to classes this afternoon or to work. So I'm sorry too that they couldn't come.

**MR. FLIMLIN :** You typed almost as fast as you spoke before anybody else. I thank you all for coming and I thank you for your attention and your participation. (Whereupon, the matter was concluded at 4:50 P.M.)0229

Appendix 1

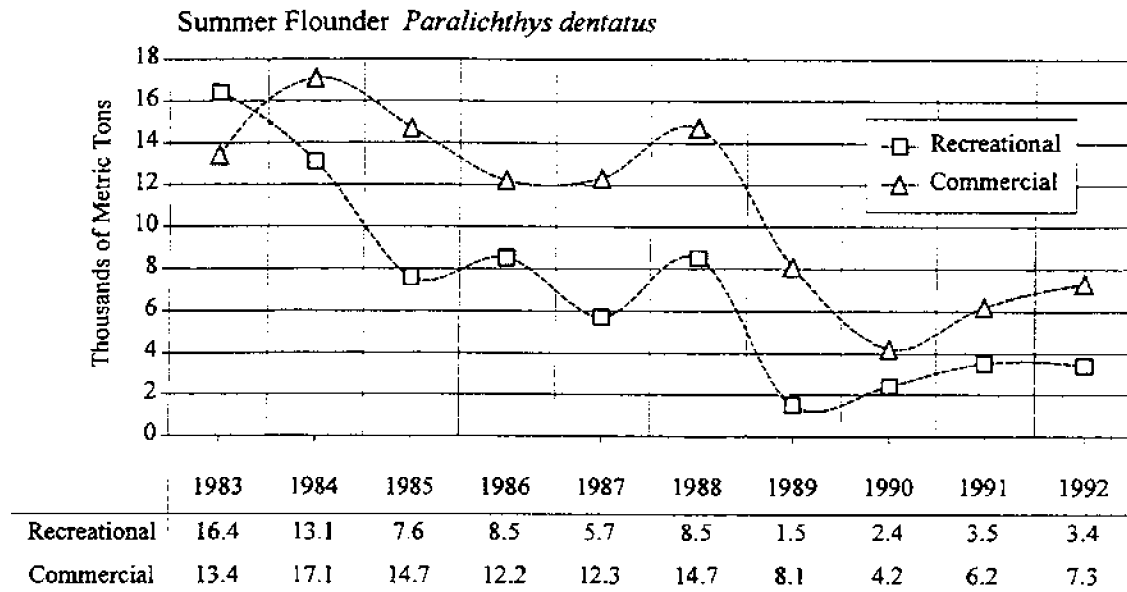


Figure 1. Middle Atlantic commercial and recreational landings of summer flounder, *Paralichthys dentatus*, between 1983 and 1992.

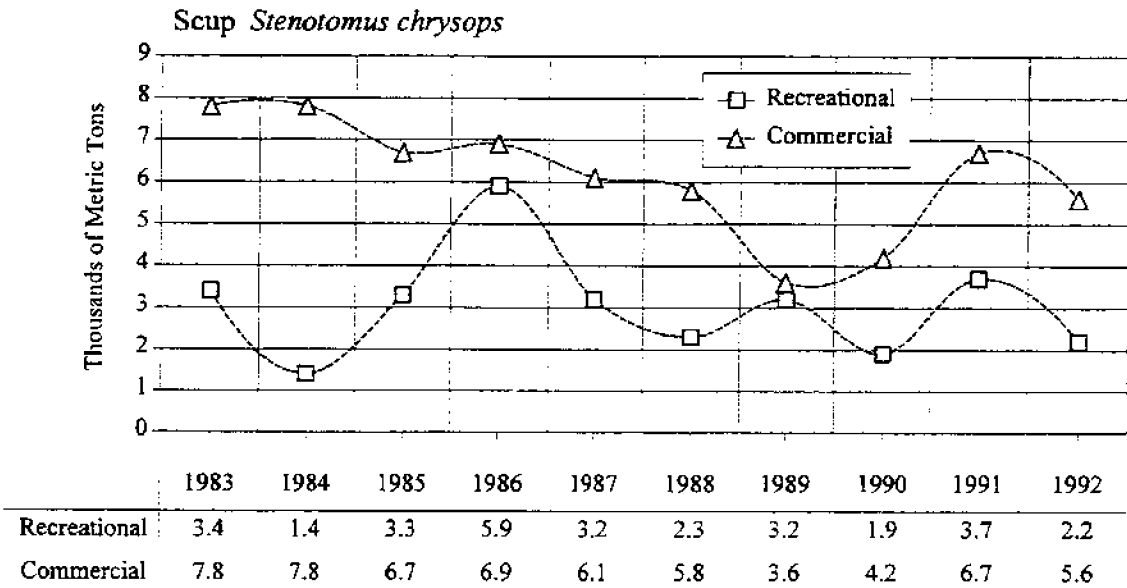
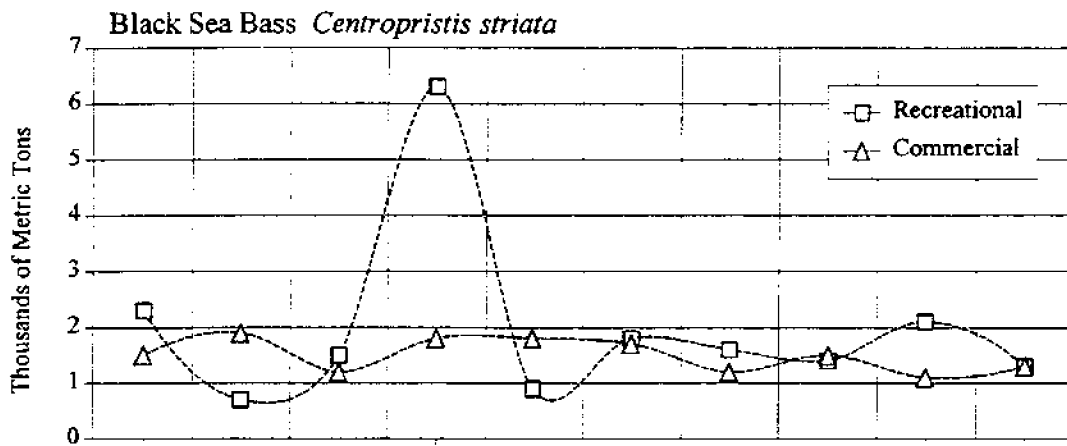
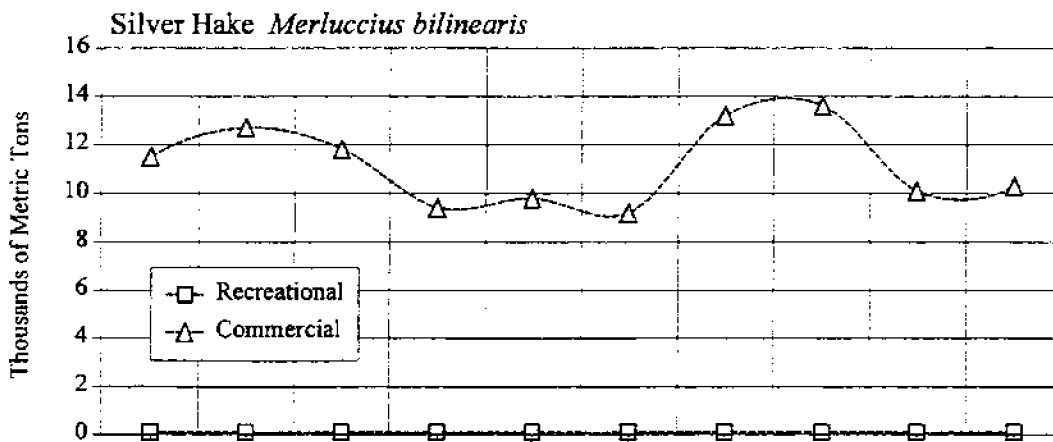


Figure 2. Middle Atlantic commercial and recreational landings of scup, *Stenotomus chrysops*, between 1983 and 1992.



	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Recreational	2.3	0.7	1.5	6.3	0.9	1.8	1.6	1.4	2.1	1.3
Commercial	1.5	1.9	1.2	1.8	1.8	1.7	1.2	1.5	1.1	1.3

Figure 3. Middle Atlantic commercial and recreational landings of black sea bass, *Centropristis striata*, between 1983 and 1992.



	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Recreational	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Commercial	11.5	12.7	11.8	9.4	9.8	9.2	13.2	13.6	10.1	10.3

Figure 4. Middle Atlantic commercial and recreational landings of silver hake, *Merluccius bilinearis*, between 1983 and 1992.

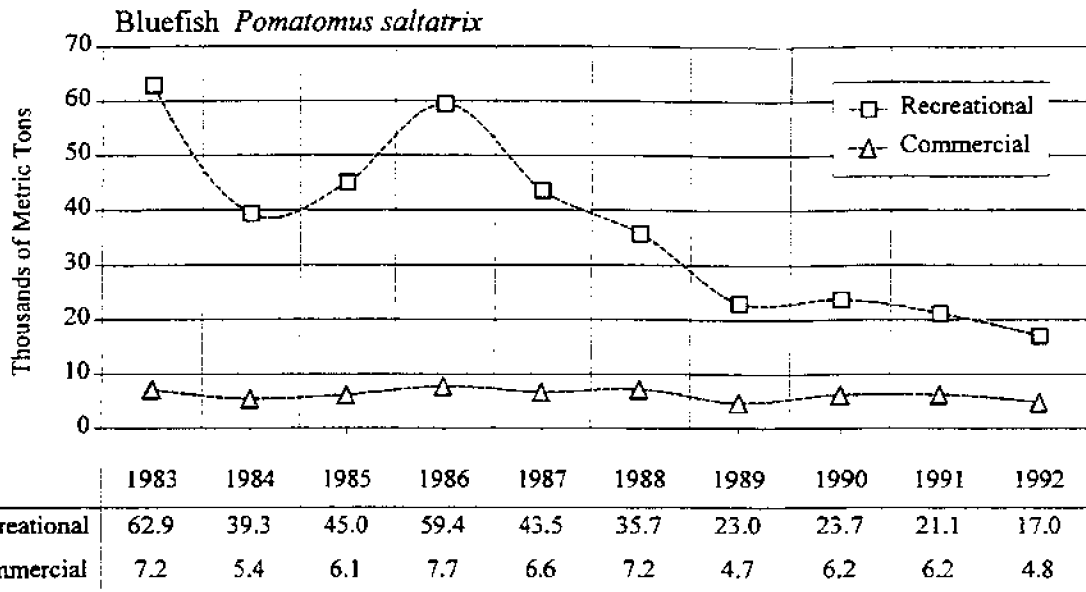


Figure 5. Middle Atlantic commercial and recreational landings of bluefish, *Pomatomus saltatrix*, between 1983 and 1992.

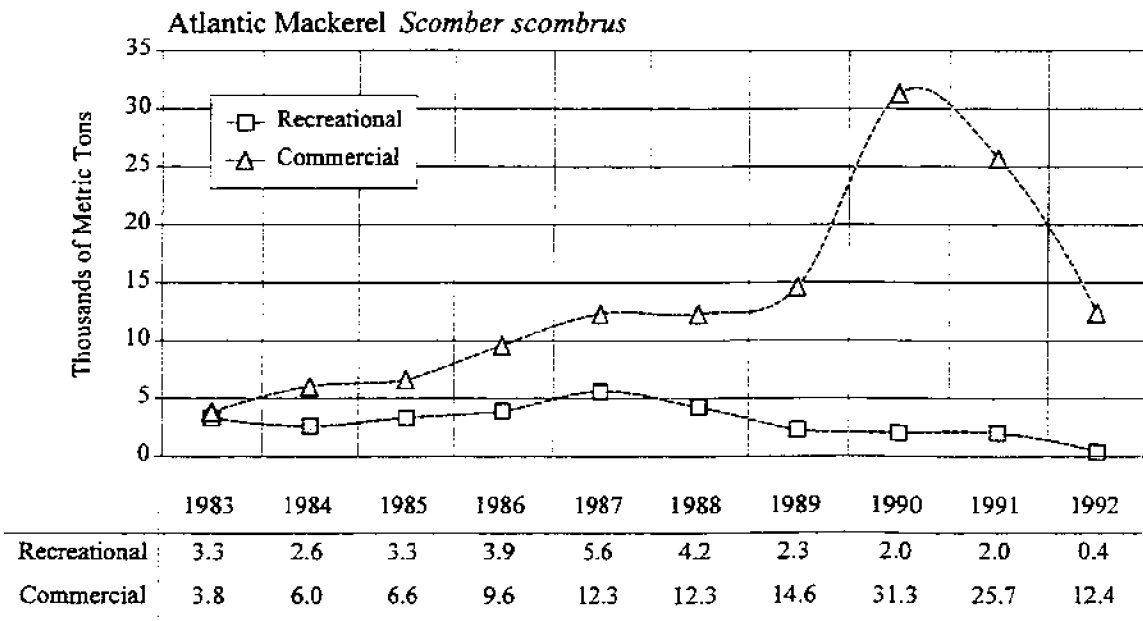


Figure 6. Middle Atlantic commercial and recreational landings of Atlantic mackerel, *Scomber scombrus*, between 1983 and 1992.

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Appendix 2

The following publications address some of the questions posed above for several species of economic importance in New Jersey waters.

Grimes, C.B., K.W. Able and S.C. Turner. 1980. A preliminary analysis of the tilefish, Lopholatilus chamaeleonticeps, fishery in the Mid-Atlantic bight. Mar. Fish. Rev., 42(11):13-18.

Able, K.W., C.B. Grimes, R.A. Cooper and J.R. Uzmann. 1982. Burrow construction and behavior of tilefish, Lopholatilus chamaeleonticeps, in Hudson Submarine Canyon. Env. Biol. Fish. 7(3):199-205.

Grimes, C.B., K.W. Able and S.C. Turner. 1982. Direct observation from a submersible vessel of commercial longlines for tilefish. Trans. Amer. Fish. Soc. 111:94-98.

Katz, S.J., C.B. Grimes and K.W. Able. 1983. Delineation of tilefish, Lopholatilus chamaeleonticeps, stocks along the United States east coast and in the Gulf of Mexico. Fish. Bull. 81(1):41-50.

Turner, S.C., C.B. Grimes and K.W. Able. 1983. Growth, mortality, and age/size structure of the fisheries for tilefish, Lopholatilus chamaeleonticeps, in the Middle Atlantic - southern New England region. Fish. Bull. 81(4):751-763.

Twichell, D.C., C.B. Grimes, R.S. Jones and K.W. Able. 1985. The role of erosion by fish in shaping topography around Hudson Submarine Canyon. J. Sediment. Petrol. 55(5):712-719.

Grimes, C.B., K.W. Able and R.S. Jones. 1986. Tilefish, Lopholatilus chamaeleonticeps, habitat, behavior and community structure in Mid-Atlantic and southern New England waters. Env. Biol. Fishes. 15(4):273-292.

Able, K.W., D.C. Twichell, C.B. Grimes, and R.S. Jones. 1987. Sidescan sonar as a tool for detection of demersal fish habitats. Fish. Bull. 85(4):725-736.

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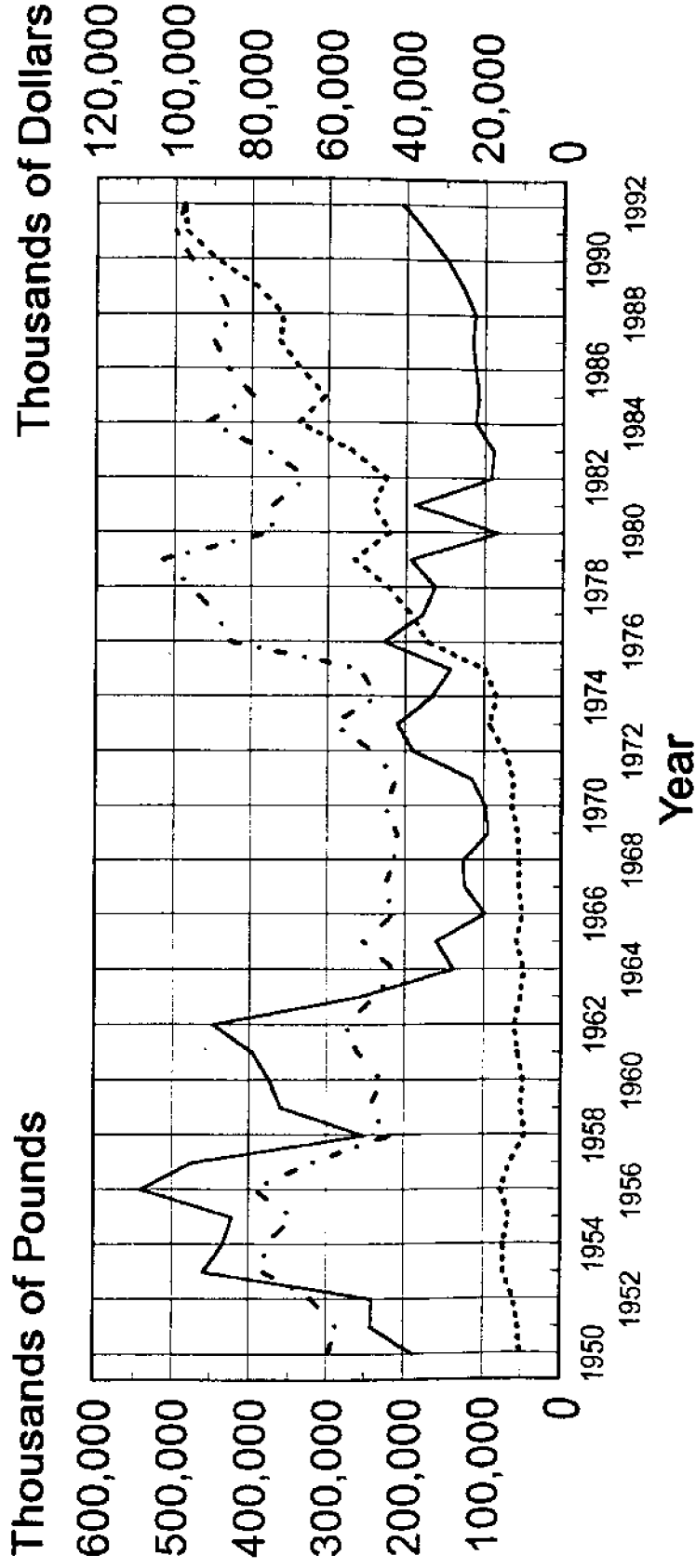
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Appendix 3

# New Jersey Commercial Fishery Landings

## 1950 - 1992



\_\_\_\_\_ Pounds Landed  
 - - - - - Current Dollars 1992 Dollars