

## U.S. Imports, Exports of Fishery Products, 1989

### Imports

U.S. imports of edible fishery products in 1989 were valued at \$5.5 billion, \$56.2 million lower than in 1988, according to data compiled by the National Marine Fisheries Service, NOAA. The quantity of edible imports was 3.2 billion pounds, 275.2 million pounds higher than the quantity imported in 1988.

### Shrimp

The quantity of shrimp imported in 1989 was 502.9 million pounds, 0.9 million pounds less than the previous record quantity imported in 1988. Valued at \$1.7 billion, \$49.5 million less than the 1988 value, shrimp imports accounted for 31 percent of the value of total edible imports. Imports of fresh and frozen tuna

were 649.7 million pounds, 99.6 million pounds more than the 550.1 million pounds imported in 1988. Imports of canned tuna-not in oil were 347.8 million pounds, 103.6 million pounds more than the 244.2 million pounds imported in 1988.

### Fillets and Steaks

Imports of fresh and frozen fillets and steaks amounted to 517.6 million pounds, a decline of 0.1 million pounds from 1988. Regular and minced block imports were 283.3 million pounds, a decline of 19.9 million pounds from 1988. Edible imports consisted of 2.6 billion pounds of fresh and frozen products valued at \$4.7 billion, 532.1 million pounds of canned products valued at \$639.2 million, 65.8 million pounds of cured products valued

at \$97.2 million, 2.1 million pounds of caviar and roe products valued at \$14.4 million, and 15.6 million pounds of other products valued at \$26.1 million.

### Nonedible Products

Imports of nonedible fishery products were valued at a record \$4.1 billion, \$676.1 million more than the \$3.4 billion imported in 1988. Total value of edible and nonedible products resulted in a record import value of \$9.6 billion in 1989, \$732.4 million more than the previous record in 1988, when \$8.9 billion of fishery products were imported.

### Exports

U.S. exports of edible fishery products of domestic origin were a record 1.4 billion pounds valued at a record \$2.3 billion, compared with 1.1 billion pounds at \$2.2 billion exported in 1988. The \$111.8 million received for U.S.-flag vessel catches transferred onto foreign vessels in the U.S. Exclusive Economic Zone joint venture operations are not included in the export statistics.

### Fresh and Frozen

Fresh and frozen items were 1.1 billion

## TED/Tow Time Rules Go Into Effect 1 May

Regulations that require shrimp trawlers to use Turtle Excluder Devices or 90 minute tow times were scheduled to go into effect 1 May 1990, announced Dr. Andrew Kemmerer, Southeast Regional Director of the National Marine Fisheries Service. He also stressed that information and training in use of the TED's is available and urged fishermen who do not understand the rules or how to use TED's to seek help.

The requirements to begin 1 May apply to shrimp trawlers fishing in offshore waters in the South Atlantic from North Carolina through Florida and in inshore waters from North Carolina through Texas. Shrimp trawlers 25 feet or longer fishing in offshore Atlantic waters must have all nets equipped with qualified

TED's. Vessels less than 25 feet can use qualified TED's or restrict tow times to 90 minutes or less. In inshore waters all shrimp trawlers regardless of size must limit tow times to 90 minutes or less or use qualified TED's. Offshore waters are distinguished from inshore waters by the 72 COLREGS line. This line is depicted by a broken purple line, or is otherwise noted on NOAA's 1:80,000 scale coastal charts. Regulations with the same requirements are already in effect in the Canaveral, southwest Florida, and Gulf offshore areas.

There are six certified TED's: The Cameron, Georgia, Matagorda, Morrison, NMFS, and Parrish. Information and technical assistance with TED's are available from several sources. Copies and summaries of the regulations, descriptions of TED's, answers to commonly asked questions and a list of TED

manufacturers are available from Charles A. Oravetz, NMFS, 9450 Koger Boulevard, St. Petersburg, FL 33702; telephone 813/893-3366. General information, rule summaries, information on local manufacturers, and some technical assistance are available from local Sea Grant Marine Advisory agents. Names and numbers of marine advisory coordinators are as follows:

North Carolina	Jim Bahen	919/458-5498
South Carolina	Melvin Goodwin	803/727-2075
Georgia	Duncan Amos	912/264-7268
Florida	Marion Clarke	904/392-1837
Alabama	Bill Hosking	205/661-5004
Mississippi	Dave Burrage	601/388-4710
Louisiana	Ron Becker	504/388-6345
Texas	Mike Hightower	409/845-7526

Technical information, problem analysis, and technical assistance are available from John Watson, NMFS, 3209 Frederic Street, Pascagoula, MS 39564; telephone 601/762-4591.

pounds valued at \$1.8 billion, an increase of 197.5 million pounds and \$17.4 million compared with 1988. Fresh and frozen exports consisted principally of 337.4 million pounds of salmon valued at \$747.3 million and 81.7 million pounds of crabs valued at \$246.3 million. Canned items were 136.5 million pounds valued at \$211.2 million. Salmon was the major canned item exported, with 40.4 million pounds valued at \$89.7 million. Cured items were 26.7 million pounds valued at \$31.6 million. Caviar and roe exports were 72.8 million pounds valued at \$194.9 million, an increase of 27.9 million pounds and \$50.3 million as compared to 1988.

### Nonedible Products

Exports of nonedible products were valued at \$2.4 billion. Exports of fishmeal amounted to 103.8 million pounds valued at \$23.8 million. The total value of edible and nonedible exports was \$4.7 billion. The dramatic increase of nonedible fishery products is due to the change in the new schedule B exports codes in 1989.

### Preliminary 1989 Catch, Values of New England Fish and Shellfish Noted

Landings of fish and shellfish in New England in 1989 were down slightly from 1988, from 569.9 to 565.1 million pounds, a decrease of less than 1 percent. Value of the landings was up slightly, from \$493.5 to \$508.8 million in dock-

Table 1.—Preliminary landings and values for fish and shellfish in New England States in 1988 and 1989 (rank in parentheses)<sup>1</sup>.

State	1988		1989	
	Million pounds	Million dollars	Million pounds	Million dollars
Mass.	286.5 (1)	274.0 (1)	268.9 (1)	272.8 (1)
Maine	157.3 (2)	123.9 (2)	151.1 (2)	132.5 (2)
R.I.	106.2 (3)	69.4 (3)	125.1 (3)	75.0 (3)
N.H.	10.8 (4)	8.8 (5)	11.4 (4)	10.2 (5)
Conn.	9.1 (5)	17.4 (4)	8.6 (5)	18.3 (4)
Total	569.9	493.5	565.1	508.8

<sup>1</sup> Landings of lobster and crab in live weight; other shellfish in meat weight.

Table 1.—Summary of U.S. imports and exports of fishery products, 1936-89.

Year	Imports			Exports				
	Edible products	Nonedible products	Total	Edible products	Nonedible products	Total		
	<i>1,000 lb.</i>	<i>----- \$1,000</i>	<i>-----</i>	<i>1,000 lb.</i>	<i>----- \$1,000</i>	<i>-----</i>		
1936	371,206	30,357	11,516	41,873	111,259	12,263		
1937	364,668	33,911	16,725	50,636	119,068	13,729		
1938	302,624	28,349	10,958	39,307	118,029	13,798		
1939	346,240	32,404	13,595	45,999	124,974	13,580		
1940	302,518	29,073	12,757	41,830	144,804	17,115		
1941	305,875	28,040	12,941	40,981	215,990	21,479		
1942	277,199	28,984	10,584	39,568	167,080	27,876		
1943	324,476	43,689	23,494	67,183	239,260	43,244		
1944	339,431	53,431	24,987	78,418	112,230	31,929		
1945	404,768	76,434	24,820	101,254	135,979	30,855		
1946	473,539	89,986	39,727	129,713	200,398	38,353		
1947	407,636	83,275	26,700	109,975	207,486	49,281		
1948	472,742	111,660	44,988	156,648	95,085	21,020		
1949	470,517	113,753	37,861	151,614	146,660	29,212		
1950	639,725	158,414	39,882	198,296	121,623	18,856		
1951	646,668	158,363	54,094	212,457	164,624	27,072		
1952	705,118	183,121	57,308	240,429	62,056	15,511		
1953	726,195	195,869	49,611	245,480	69,308	17,084		
1954	804,054	203,722	48,687	252,409	62,724	16,238		
1955	780,185	208,973	49,896	258,869	109,750	24,923		
1956	801,655	234,699	48,031	282,730	101,918	22,939		
1957	900,227	252,788	46,487	299,275	85,221	20,549		
1958	1,020,326	283,822	46,959	330,781	65,468	19,440		
1959	1,141,114	314,650	55,467	370,117	80,688	26,747		
1960	1,095,014	310,596	52,685	363,281	61,454	25,622		
1961	1,061,662	335,757	61,301	397,058	40,137	19,594		
1962	1,255,532	405,832	83,975	489,807	56,530	22,470		
1963	1,196,977	399,928	100,784	500,712	64,745	30,376		
1964	1,318,099	433,674	130,569	564,243	94,835	42,878		
1965	1,398,778	479,412	121,492	600,904	96,444	49,308		
1966	1,593,614	568,091	151,611	719,702	109,604	62,882		
1967	1,470,437	538,301	169,582	707,883	107,940	67,524		
1968	1,741,365	643,165	179,504	822,669	90,808	56,845		
1969	1,706,571	704,809	139,484	844,293	140,646	86,474		
1970	1,873,300	812,530	224,880	1,037,410	140,375	93,878		
1971	1,785,470	887,070	187,131	1,074,201	171,816	113,637		
1972	2,341,138	1,233,292	261,119	1,494,411	171,642	134,188		
1973	2,416,193	1,398,484	184,649	1,583,133	238,942	241,866		
1974	2,266,880	1,495,380	215,498	1,710,878	178,011	194,966		
1975	1,913,089	1,367,180	269,919	1,637,099	218,152	267,360		
1976	2,228,091	1,913,922	414,264	2,328,186	240,866	37,369		
1977	2,176,189	2,078,171	555,435	2,633,606	331,059	267,810		
1978	2,410,673	2,256,314	829,637	3,085,951	448,312	47,121		
1979	2,358,920	2,671,860	1,136,931	3,808,791	554,294	73,880		
1980	2,144,928	2,686,721	961,731	3,648,452	573,896	81,654		
1981	2,272,474	3,034,206	1,171,805	4,206,011	669,272	101,791		
1982	2,225,474	3,202,408	1,321,170	4,523,578	1,072,765	84,230		
1983	2,386,771	3,626,704	1,502,668	5,129,372	657,246	84,230		
1984	2,454,287	3,742,333	2,141,060	5,883,393	601,913	113,804		
1985	2,754,018	4,064,334	2,614,252	6,678,586	574,124	842,349		
1986	2,978,905	4,813,488	2,812,805	7,626,293	648,146	1,010,268		
1987	3,201,132	5,711,233	3,106,464	8,817,697	735,026	1,289,807		
1988	2,967,786	5,441,628	3,430,369	8,871,997	782,935	1,577,607		
1989	3,243,017	5,497,849	4,106,507	9,604,356	1,060,186	2,155,628		
					<sup>1</sup> 1,374,012	<sup>2</sup> 2,282,994	<sup>3</sup> 2,423,848	<sup>4</sup> 4,706,842

<sup>1</sup> Record.

side or "ex-vessel" prices, an increase of 3 percent. These are preliminary figures developed by the National Marine Fisheries Service's Northeast Fisheries Center in Woods Hole, Mass. The figures

are subject to minor change as late or corrected reports are received from the field.

Massachusetts again led other New England states in landings and value. The

**Table 2.—Preliminary landings and values of fish and shellfish in New England by principal port for 1988 and 1989 (rank in parentheses)<sup>1</sup>.**

Port	1988		1989	
	Million pounds	Million dollars	Million pounds	Million dollars
Gloucester, Mass.	107.4 (1)	30.8 (2)	98.6 (1)	30.0 (3)
New Bedford, Mass.	90.3 (2)	140.9 (1)	90.4 (2)	141.0 (1)
Portland, Maine	43.9 (4)	30.4 (3)	49.0 (3)	34.4 (2)
Pt. Judith, R.I.	49.6 (3)	25.4 (4)	48.3 (4)	23.6 (4)
Rockland, Maine	40.6 (5)	6.7 (8)	24.8 (5)	7.0 (8)
Provincetown/Chatham, Mass.	25.2 (6)	11.6 (6)	23.7 (6)	12.9 (6)
Boston, Mass.	20.8 (7)	14.5 (5)	17.3 (7)	14.4 (5)
Newport, R.I.	12.8 (8)	11.6 (6)	12.3 (8)	11.5 (7)

<sup>1</sup> Landings of fish, lobster, and crab in live weight; other shellfish in meat weight.

**Table 3.—Preliminary landings and values of fish and shellfish in New England by species for 1988 and 1989<sup>1</sup>.**

Species	1988		1989	
	Million pounds	Million dollars	Million pounds	Million dollars
Atl. herring	89.1	5.1	89.6	5.0
Atl. cod	75.4	42.3	77.6	47.2
Am. lobster	45.2	133.6	48.7	135.2
Pollock (Boston bluefish)	32.9	11.1	23.2	9.8
Silver hake (whiting)	24.9	5.3	22.6	4.3
Sea scallop	18.4	80.0	20.6	84.0
Winter flounder (blackback, lemon sole)	16.7	20.7	13.6	18.5
Yellowtail flounder	10.9	13.0	11.5	12.6
White hake (ling)	10.5	3.2	11.3	4.4
N. shrimp	6.8	7.5	8.0	7.9
Summer flounder (fluke)	7.7	11.6	5.0	9.0
Scup (porgy)	7.9	5.4	4.0	3.0
Swordfish	4.1	12.0	4.0	11.3
Haddock	6.4	7.0	3.8	4.6

<sup>1</sup> Landings of fish, lobster, and shrimp in live weight; scallops in meat weight.

**Table 4.—Preliminary landings and values of lobster in New England by state for 1988 and 1989 (rank in parentheses)<sup>1</sup>.**

State	1988		1989	
	Million pounds	Million dollars	Million pounds	Million dollars
Maine	21.7 (1)	60.7 (1)	23.3 (1)	59.2 (1)
Mass.	15.5 (2)	47.3 (2)	16.2 (2)	48.5 (2)
R.I.	4.9 (3)	15.6 (3)	5.7 (3)	17.5 (3)
Conn.	2.0 (4)	6.8 (4)	2.1 (4)	6.4 (4)
N.H.	1.1 (5)	3.2 (5)	1.4 (5)	3.6 (5)
Total	45.2	133.6	48.7	135.2

<sup>1</sup> Landings in live weight.

biggest gain in landings among states was by Rhode Island, up 18.9 million pounds; biggest gain in value was by Maine, up \$8.6 million. Gloucester, Mass., again led other New England ports in landings; New Bedford, Mass., again led in value. The biggest gains in landings and value among ports were by Portland, Maine, up 5.1 million pounds and \$4.0 million.

For food fish and shellfish, respectively, Atlantic herring and American lobster again led other species in landings; Atlantic cod and lobster again led in value. The biggest gains in landings among food fish and shellfish, respectively, were by cod, up 2.2 million pounds, and lobster, up 3.5 million pounds. The biggest gains in values, respectively, were by cod, up \$4.9 million, and sea scallop, up \$4.0 million.

Maine again led the New England states in lobster landings and value. The biggest gain in landings was by Maine, up 1.6 million pounds; biggest gain in value was by Rhode Island, up \$1.9 million. Tables 1-3 list complete landings and values by state, port, and species; Table 4 lists lobster landings and values by state.

## Preliminary 1989 Catch, Value of Middle Atlantic, Chesapeake Fishes Told

Landings of fish and shellfish in the Middle Atlantic and Chesapeake states during 1989 were up moderately from 1988, from 890.7 to 949.2 million pounds, an increase of 7 percent. Value of the landings was up slightly, from \$281.8 to \$285.3 million in dockside or "ex-vessel" prices, an increase of 1 percent. These are preliminary figures developed by the National Marine Fisheries Service's Northeast Fisheries Center in Woods Hole, Mass. The figures are subject to minor change as late or corrected reports are received from the field.

Virginia again led other Middle Atlantic and Chesapeake states in landings and value. Virginia also had the biggest gain in landings among states, up 41.2 million pounds; New Jersey had the biggest gain in value, up \$6.7 million. Cape May/

**Table 1.—Preliminary landings and values of fish and shellfish from Middle Atlantic and Chesapeake States during 1988 and 1989 (rank in parentheses).**

State	1988		1989	
	Million pounds <sup>1</sup>	Million dollars	Million pounds <sup>1</sup>	Million dollars
Va.	650.8 <sup>2</sup> (1)	104.3 (1)	692.0 <sup>2</sup> (1)	100.0 (1)
N.J.	112.7 (2)	72.1 (2)	128.5 (2)	78.8 (2)
Md.	84.3 (3)	49.5 (4)	84.9 (3)	52.1 (3)
N.Y.	37.2 (4)	52.8 (3)	36.9 (4)	50.9 (4)
Del.	5.7 (5)	3.1 (5)	6.9 (5)	3.5 (5)
Total	890.7	281.8	949.2	285.3

<sup>1</sup> Landings of bivalve mollusks (clams, scallops, oysters, etc.) in meat weight; Landings of fishes, crustaceans, and squids in live weight.

<sup>2</sup> Includes landings of menhaden, a nonfood (industrial) species.

**Table 2.—Preliminary landings and values of fish and shellfish in the Middle Atlantic and Chesapeake's principal ports during 1988 and 1989 (rank in parentheses).**

Port	1988		1989	
	Million pounds <sup>1</sup>	Million dollars	Million pounds <sup>1</sup>	Million dollars
Cape May/Wildwood, N.J.	47.9 (1)	28.4 (2)	54.0 (1)	30.8 (1)
Atl. City, N.J.	27.7 (2)	12.6 (4)	33.9 (2)	15.5 (3)
Ocean City, Md.	21.1 (3)	8.5 (5)	24.6 (3)	9.1 (4)
Pt. Pleasant, N.J.	17.3 (5)	6.2 (6)	19.2 (4)	8.4 (6)
Hampton Roads, Va.	20.0 (4)	34.4 (1)	15.3 (5)	17.8 (2)
Montauk, N.Y.	13.2 (6)	14.7 (3)	9.6 (6)	8.5 (5)

<sup>1</sup> Landings of bivalve mollusks (clams, scallops, oysters, etc.) in meat weight; landings of fishes, crustaceans, and squids in live weight.

**Table 3.—Preliminary landings and values of Middle Atlantic and Chesapeake food fish and shellfish during 1988 and 1989.**

Species	1988		1989	
	Million pounds <sup>1</sup>	Million dollars	Million pounds <sup>1</sup>	Million dollars
Blue crab, hard	90.2	25.7	100.5	42.0
Atl. surfclam	57.6	26.2	62.1	28.1
Ocean quahog	43.1	12.4	47.5	13.8
Squids	17.6	5.3	18.1	5.6
Silver hake (whiting)	10.3	3.1	16.7	5.0
Sea scallop	10.1	40.7	11.7	43.5
Summer flounder (fluke)	17.7	21.7	8.1	11.9
Atl. mackerel	9.6	1.0	7.3	0.8
East. oyster	5.7	16.6	4.4	15.8
Am. lobster	3.1	10.2	4.3	13.6
Scup (porgy)	4.7	3.1	3.8	3.1
Weakfish (gray sea trout)	5.3	2.5	3.8	2.7
Softshell clam	4.5	9.2	3.2	6.0
Bluefish	7.5	1.4	3.2	0.4

<sup>1</sup> Landings of bivalve mollusks (clams, scallops, oysters, etc.) in meat weight; landings of fishes, crustaceans, and squids in live weight.

**Table 4.—Preliminary landings and values of Atlantic surfclams from Middle Atlantic and Chesapeake states during 1988 and 1989 (rank in parentheses)<sup>1</sup>.**

State	1988		1989	
	Million pounds	Million dollars	Million pounds	Million dollars
New Jersey	37.2 (1)	17.0 (1)	42.9 (1)	20.0 (1)
Virginia	10.6 (2)	4.8 (2)	7.3 (2)	3.1 (2)
New York	2.9 (4)	1.1 (4)	6.3 (3)	2.4 (3)
Maryland	6.9 (3)	3.3 (3)	5.6 (4)	2.6 (4)
Total	57.6	26.2	62.1	28.1

<sup>1</sup> Landings in meat weight.

Wildwood, N.J., again led other Middle Atlantic and Chesapeake ports in landings, and replaced Hampton Roads, Va., as the leader in value. The biggest gains in landings and value among ports were by Atlantic City, N.J., up 6.2 million pounds and \$2.9 million.

Hard blue crabs again led other Middle Atlantic and Chesapeake seafood species in landings; sea scallops again led in value. The biggest gains in landings and values were by hard blue crabs, up 10.3 million pounds and \$16.3 million. Two other major shellfish species of the Middle Atlantic-Chesapeake area, Atlantic surfclams and ocean quahogs, had gains in both landings and values. The area's leading finfish species in landings and value, respectively, were silver hake (whiting) and summer flounder (fluke). New Jersey again led the Middle Atlantic and Chesapeake states in Atlantic surfclam landings and value. It also had the biggest gains in surfclam landings and value, up 5.7 million pounds and \$3.0 million. Tables 1-3 list complete landings and values by state, port, and species; Table 4 lists surfclam landings and values by state.

### **NOAA Enforcement Investigation Results in Fine for Company**

An investigation by enforcement agents of the National Oceanic and Atmospheric Administration's (NOAA) Northeast Region, in cooperation with other Federal and state agencies, resulted in a fine of \$7,500 for the Rock Hall Clam

and Oyster Company, Inc. of Rock Hall, Maryland. Company president, Gilbert E. Hinefelt, entered a guilty plea in the U.S. District Court for New Hampshire. The felony information charged Rock Hall with a violation of the Lacey Act. The Lacey Act is designed to prohibit the illegal trade of fish or wildlife under false labeling.

Rock Hall had previously been placed on the state embargo list by the New Hampshire Department of Health and Human Services for shipping contaminated shellfish to New Hampshire. Any company on a state embargo list is prohibited from conducting specified commercial trade in that state. The charges stated that the Rock Hall Company had falsified labels, accounts, and records in order to continue doing business in New Hampshire despite being on that state's embargo list.

The company was placed on the New Hampshire embargo list from 9 August 1988 to 4 January 1990 for shipping shellfish contaminated with fecal coliform, a bacteria harmful to humans. From 15 November 1988 to 17 December 1988 the Rock Hall Company used the names of companies not on the state embargo list to avoid seizure and condemnation of its shellfish by New Hampshire.

### **Drift-gillnet Harvest of Coastal Pelagic Fishes Banned in S.E. Waters**

As of 13 April 1990 drift gillnets cannot be used in the exclusive economic zone (EEZ) to fish for coastal migratory pelagic fish, according to Andrew J. Kemmerer, Director, Southeast Region, National Marine Fisheries Service (NMFS). Coastal migratory pelagic fish include king mackerel, Spanish mackerel, cero, little tunny, cobia, dolphin, and, in the Gulf of Mexico only, bluefish. These fishes may not be possessed on vessels in the EEZ, or having fished in the EEZ, with a driftnet aboard. The prohibition applies to Federal waters from the U.S./Mexico border to the Virginia/North Carolina boundary and is contained in a final rule implementing

Amendment 3 to the Fishery Management Plan for Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Amendment 3 was prepared by the South Atlantic and Gulf of Mexico Fishery Management Councils. The prohibition is based on a more conservative management approach, a new management objective to minimize waste and by-catch in the fishery, and the intent to reduce negative impacts on the traditional hook-and-line fishery.

Also included in the final rule is a prohibition on the use of purse seines and run-around gillnets for the Atlantic migratory group of king mackerel, when that resource is declared overfished, and when other authorized gear can harvest the commercial allocation. Barring an emergency, this purse seine and run-around gillnet net prohibition will not be implemented for the 1990-91 fishing year because, according to the "1990 Report of the Mackerel Stock Assessment Panel," the Atlantic group of king mackerel is not "overfished."

### **Hurricane Forces Move by Subsea Station *Aquarius***

*Aquarius*, the world's most sophisticated subsea research station, is to be moved from the sea floor off St. Croix, U.S. Virgin Islands, to a new site during summer 1990 by the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). NOAA's Office of Oceanic and Atmospheric Research and the National Undersea Research Center at Fairleigh Dickinson University, which operate *Aquarius*, have sought recommendations from the oceanic scientific community for a new site in the Caribbean, the Florida Keys, or the Bahamas.

The decision was forced by the damage to St. Croix from Hurricane Hugo and the loss of critical support services on the island, particularly access to emergency medical care. Although *Aquarius* was not damaged by Hugo, its surface support buoy was destroyed and research station facilities ashore were badly damaged. The 81-ton, 43- by 20- by 16.5-foot *Aquarius*, which has a laboratory and

living quarters that allow teams of up to six aquanaut-scientists to live and work on the sea floor for days at a time, can be floated to the surface and towed to its new location.

Since being deployed off St. Croix in November 1987, *Aquarius* has supported nearly two dozen teams of scientists conducting a variety of marine investigations, including research into how coral reefs cleanse themselves of sediment, important for planning ecologically sound coastal development, and research into the causes of a massive die-off of coral in the Caribbean in 1987 and 1988, which may provide clues to understanding the causes and effects of global climate change.

Missions conducted from the *Aquarius* research station have included a Cornell

University study of chemical and structural defenses of gorgonian soft corals, the first study of chemical variations in a single species from different habitats; a Northeastern University-led study of the effects of water movement on zooplankton feeding by corals; and a University of Georgia-led study that found new evidence of how corals react to light, directly measured the amount of carbon taken up by corals feeding on zooplankton, and discovered trends in the ways corals cleanse themselves of sediments.

David Duane, director of NOAA's National Undersea Research Program, said "the new site should be able to support marine research that increases our understanding of coastal marine ecosystem processes and contributes to NOAA's mission goals to predict global climate

change and its impacts, better understand the effects of pollutants on tropical marine ecosystems, and improve our understanding of the biological productivity of the oceans."

Criteria used to select the new site included: 1) A location in the Caribbean, the Bahamas, or the Florida Keys; 2) access to a diversity of ecosystems; 3) diversity and abundance of plant and animal species; 4) ready access to supplies and laboratory facilities to support *Aquarius* and the surface science team; 5) the degree to which missions can contribute to other existing science programs at the site or in the region; 6) habitat site near shore with a nearby site for shore support facilities; and 7) access to power, telephone service, potable water, and emergency medical care.

## **U.S.-U.S.S.R. Fishery Negotiations Concluded**

The U.S.-U.S.S.R. Intergovernmental Consultative Committee on Fisheries, which was established pursuant to the 31 May 1988, U.S.-U.S.S.R. Agreement on Mutual Fisheries Relations, held its third meeting in Washington, D.C., during 16-22 March 1990. The Committee considered a number of issues, including the proposed establishment of a new treaty on Pacific salmon, as well as conservation problems posed by highseas driftnet fishing activities and the intensive unregulated fishery for walleye pollock being conducted beyond the U.S. and Soviet 200-mile zones in the central Bering Sea. The two delegations were headed by their respective representatives on the Committee: V. K. Zilanov, Deputy Minister of the U.S.S.R. Ministry of Fisheries, and Edward E. Wolfe, Deputy Assistant Secretary for Oceans and Fisheries, U.S. Department of State.

The two sides developed a draft text of a new convention for the conservation of anadromous stocks of fish (i.e., the stocks of various Pacific salmon species and steelhead trout). The Convention would promote the conservation and rational management of valuable salmonid re-

sources of mutual concern and prohibits the fishing for and incidental taking of salmonids on the high seas, except as specifically agreed. The Committee recommended that the two sides present the joint draft text of the proposed Convention to the Governments of Canada and Japan and request multilateral discussions at an early date. The proposed Convention reflects the view of the two sides that the harvest of Pacific salmonids on the high seas is irrational and wasteful. The terms of the proposed Convention include significant enforcement provisions designed to prevent unauthorized harvest of North Pacific anadromous species. The proposed Convention would provide for a more comprehensive conservation regime than those regimes currently in place, and would, for the first time, include all four of the major countries of origin of Pacific salmonids.

The two sides reviewed disturbing information regarding the level of unregulated fishing for walleye pollock in the central Bering Sea beyond the U.S. and U.S.S.R. 200-mile zones (the so-called "donut hole area"). U.S. and Soviet fishery scientists explained to the Committee that the Bering Sea pollock resource is declining. A major factor for this decline was attributed to the intensive

level of unregulated fishing conducted primarily by distant-water fishing fleets in the area beyond the U.S. and U.S.S.R. 200-mile zones. The two sides noted that the volume of unregulated fishing has grown dramatically in recent years, approaching 1.5 million metric tons annually. If unmitigated, this fishery could pose serious consequences to the biological health of the Bering Sea pollock stocks and ecologically related species, as well as to the economic and commercial interests of the Bering Sea's only coastal states, namely the U.S. and the U.S.S.R. Based on the information submitted by the scientists, members of the Committee preliminarily explored elements and principles aimed at the possible establishment of a conservation regime for the central Bering Sea. Because of the serious nature of this issue, the two sides agreed to meet bilaterally at an early date to continue these discussions.

The two sides discussed the high-seas driftnet issue. Both sides expressed great concern over the interception of U.S.- and Soviet-origin salmon in certain driftnet fisheries and other adverse impacts on the North Pacific marine environment. The two sides considered the U.N. General Assembly Resolution on driftnet fishing and its implementation, including

agreements that have been reached to assess the impacts of the fishery on target and nontarget resources, including salmonids, marine mammals, and other marine species. They noted their intention to cooperate in gathering information

on the impact of high-seas driftnet fisheries and in gaining multilateral cooperation in addressing this issue.

The two sides also reviewed the close cooperation of U.S. and U.S.S.R. enterprises in the field of fisheries and agreed

that such cooperation should be facilitated to the extent possible in the future. The Committee agreed to hold its next meeting in the U.S.S.R. in 1991 at a location to be announced. Source: U.S. Department of State.

## Foreign Fishery Developments

# Norway's Salmon Farming Industry

## Introduction

Norway dominates the world farmed salmon industry, accounting for over half the world's production of farmed Atlantic salmon. The Government of Norway in 1988 permitted fish farmers to expand the size of individual farms from 8,000 m<sup>3</sup> to 12,000 m<sup>3</sup>. This action is largely responsible for the increase in production of farmed Atlantic salmon from 80,000 metric tons (t) in 1988 to an estimated 110,000 t in 1989. The increase in production placed pressure on world suppliers to reduce prices for this luxury seafood. The long-term effect of this ac-

tion is likely to be severe difficulties for salmon producers and marketers in Norway and elsewhere in the world.

Norwegian salmon culture is an industry with a spectacular record of success. All sectors within the industry—smolt producers, feed manufacturers, salmon farmers, and salmon exporters—have shared in a remarkable era of growth (Table 1). This growth, however, has not been achieved without problems. The sharp Norwegian production increase in recent years—an estimated 110,000 t in 1989 compared with 80,400 t in 1988 and 47,000 t in 1987—has disrupted salmon markets throughout the world. The quantities of salmon reaching commercial size have been difficult for even the skillful Norwegian exporters to market. Combined with increasing competition from other countries, the result has been a decline in world salmon prices that threatens the profitability of the industry.

Norway's production of farmed salmon could have been even higher in 1989. Early that year, some industry representatives were predicting harvests as high as 150,000 t. However, when the rapid increase in world supplies of farmed salmon made prices decline, Norwegian salmon farmers began to scale back their production estimates. By late 1989, prices received by farmers for large Norwegian salmon had fallen to about \$4.90/kg (NOK 32.50/kg)—less than half of their 1987 levels. To prevent further price erosion, farmers limited supplies of fresh salmon in 1989 by harvesting only about 110,000 t of farmed

salmon—still a record level—instead of the estimated 140,000 t of salmon that were approaching market size. This self-imposed restraint on 1989 production means that Norwegian farmers carried over “inventories” of harvestable salmon, raising the possibility that additional supplies of fresh Norwegian salmon would be brought to market in early 1990.

Recognizing the continuing threat to profits in the fresh salmon market, the Norwegian salmon farming industry is taking strong action to shore up prices in the short term and to limit supplies of fresh salmon in the long term. On 4 January 1990, the the Norwegian Fish Farmers Sales Organization (NFFSO) announced plans to buy and freeze up to 40,000 t of salmon. The Organization plans to borrow US\$200 million from private banks to finance the freezing plan, and will impose a levy of \$0.75/kg on all exports of fresh salmon in 1990, to pay off the loan. Odd Ustad, director of the NFFSO, stated that the combination of the freezing plan and the tax on exports should keep 1990 prices of fresh salmon at about \$6.30/kg (42 NOK /kg). This effort, whose direct purpose is to protect prices in the fresh salmon market, will have an important indirect result: it will significantly increase Norway's involvement in the frozen salmon market, an area in which Norway has played only a limited role in the past.

The uncertain market situation in late 1989 and early 1990—as evidenced by decisions to delay the harvest of some salmon and to freeze others—mean that forecasts of Norway's farmed salmon production in 1990 were extremely tentative. The NFFSO has asked salmon producers to reduce their feeding to an absolute minimum in 1990 to limit production and a reduction in smolt production is being sought. Though a 140,000 t

Table 1.—Norway's production and exports of farmed Atlantic salmon, 1971-88, with projections for 1989-90.

Year	Production			Exports	
	Smolts (mil-lions)	Salmon prod. (t)	No. of farms	Quantity (t)	Value (× 10 <sup>6</sup> ) NOK US\$
1971	N.A. <sup>1</sup>	98	5	995 <sup>2</sup>	N.A. N.A.
1972	N.A.	146	5	1,081 <sup>1</sup>	N.A. N.A.
1973	N.A.	171	4	977 <sup>1</sup>	N.A. N.A.
1974	N.A.	601	13	1,101 <sup>1</sup>	N.A. N.A.
1975	N.A.	862	45	1,335 <sup>1</sup>	N.A. N.A.
1976	N.A.	1,431	61	1,832 <sup>1</sup>	N.A. N.A.
1977	N.A.	2,137	84	2,254 <sup>1</sup>	N.A. N.A.
1978	1.8	3,540	116	3,531	N.A. N.A.
1979	2.1	4,142	147	4,792	217 43
1980	4.8	4,153	173	4,188	263 53
1981	6.2	8,422	215	7,829	357 62
1982	7.7	10,266	300	9,718	367 57
1983	12.8	17,000	479	15,758	644 88
1984	16.0	22,300	500	19,888	965 119
1985	18.4	28,655	600	24,492	1,422 166
1986	25.9	45,675	600	39,648	1,724 233
1987	38.2	47,420	600	41,929	2,115 314
1988	75.0	80,370	600	68,026	3,299 486
1989	82.0	110,000	650	N.A.	N.A. N.A.
1990	72.3	140,000	N.A.	N.A.	N.A. N.A.

<sup>1</sup>N.A. = Not available.

<sup>2</sup>Includes wild salmon.