publication of this data in annual tide prediction tables; 3) Investigate fluctuations of sea level and crustal movements of the earth; 4) Supply information concerning tidal conditions for engineering projects; 5) Provide pertinent data for special estuarine studies; and 6) Determine marine boundaries, both state and federal, for coastal zone planning and in some cases, litigation, as well as various other maritime interests.

The Bay Bridge Tunnel station, constructed on the fishing pier, replaces the Virginia Beach station which was destroyed by storms or strong winds five times in 10 years. It joins a long and historical list of tide observation sites for the Chesapeake Bay area, dating back to the earliest at Annapolis, Md., 6 June 1844, and Old Point Comfort, Va., 1 July 1844.

Central Puget Sound Circulation Studied

A search for clues to the uncommon ability of Puget Sound and other deep, cold-water estuaries to digest pollutants—and the limits of that capacity—is being conducted by National Oceanic and Atmospheric Administration (NOAA) scientists in Seattle, Wash.

Using a moored string of seven current-meters suspended beneath a subsurface buoy, NOAA scientists are developing the first detailed three-dimensional view of water circulation in the Sound. From the information collected, researchers expect to learn why the Sound, although bounded by large population centers, remains relatively pristine. They also expect to be able to develop and refine models used in predicitng circulation in Puget Sound, which, with modifications could be applied to other deep, cold-water estuaries.

The year-long current-measuring effort is being conducted by the Commerce Department agency's Pacific Marine Environmental Laboratory (one of NOAA's Environmental Research Laboratories) as part of a new Marine Ecosystems Analysis (MESA) Puget Sound project. The MESA program seeks to determine the impact of human activities on marine life and environment.

The present current-meter mooring was deployed in the central basin of Puget Sound in 650 feet (200 meters) of water north of West Point in September 1975. It will obtain data at two-to-three-month intervals until this September. During one month this summer, five moorings will be deployed in the central Sound to study spatial variations in circulation, and present plans call for additional studies at other Sound locations through next year. Vessel support for this work comes mainly from NOAA's 175-foot (53-meter) ship *McArthur*, based at the Pacific Marine Center in Seattle.

We're mainly concerned with determining behavior of the Sound and the impact of wastes," explained Glenn Cannon, the NOAA oceanographer directing these field studies. "The current-meter mooring is near the largest of four sewer outfalls entering the Sound from the greater Seattle area. This is an area where we've made measurements previously, so that we have some continuity."

The Sound is deep, and its circulation is complicated by rapid tidal currents, relatively high tides, and changing winds, Cannon said. "Based on our earlier studies of circulation near West Point, it looks as though the deep water in the Sound can mix itself in about a month, at least in winter. This rapid mixing means the Sound can handle a large amount of waste, but there's bound to be a limit. We want to determine these mixing mechanisms, and their limitations."

Seasonal changes play a dominant role in the way Puget Sound water moves through the deep estuary and its complex of inter-island channels, he said. As the study progresses, the NOAA investigators will obtain the longest and the first full-year set of circulation measurements at a location in the Sound.

Cannon noted that Puget Sound is unique in the United States south of Alaska. "It's like a fjord in being deep," he said, "but a classic fjord is fed by some fresh water source near its head. The Sound gets a significant part of its fresh water near the seaward end of the estuary north of Seattle."

Understanding how Puget Sound removes pollutants by mixing will do much to help environmental managers preserve this unique, comparatively unpolluted estuary. It will also provide a useful tool for local governments as they make the costly decisions on how to bring their waste-treatment systems up to present federal standards. The Puget Sound study also has special implications for Alaska, where oil exploration and development will bring increasing population—and increasing environmental pressures—on the northern state's deep bays and inlets.

Foreign Fishery Developments

Irish Triple Fish Catch Since 1964

The Irish fishing industry has grown dramatically in the last 10 years, according to the NMFS Office of International Fisheries. From 1963 to 1974, the industry's contribution to Ireland's Gross National Product has increased from US$2 million to US$57.5 million[1]. This total is expected to reach US$205 million by 1984.

Growth began in 1964, after a study by U.S. fishery experts concluded that Ireland offered profitable commercial fishing opportunities, because of its proximity to major fishing grounds and both United Kingdom and European markets. Since then the Irish government has encouraged expansion of shore-based facilities and processing plants by fostering investment and providing grants and loans. Development has been insured through the establishment of national catch quotas to conserve certain species. In the course of the last decade, Irish fisheries have developed into an integrated, export-oriented industry. Despite current marketing difficulties and rising costs of fishing operations, the Irish fishing industry is likely to continue expanding.

The total catch has nearly tripled in the past 10 years (see Fig. 1). Pelagic species, particularly herring, account

[1]A conversion rate of US$1.00 = 0.49 Irish pounds was used in this report. GNP data are from *The Irish Skipper*.

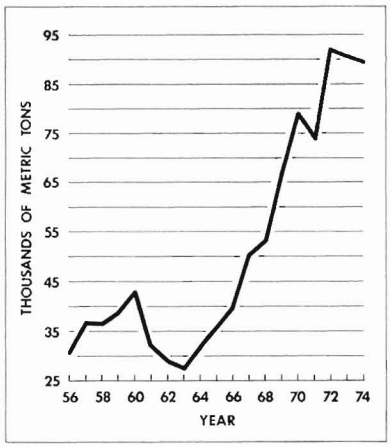

Figure 1.—Ireland's total fish catch, 1956-74.

for 60 percent of the catch by weight. The demersal catch, though less important, includes whiting, haddock, cod, plaice, skate, and other groundfish. Freshwater and Atlantic salmon fisheries are also important: exports of Atlantic salmon alone earn US$6 million per year, or almost 25 percent of the total gross value of the entire Irish fisheries catch. However, only 15 percent of all fish taken off Ireland is landed by Irish vessels, which are not large enough to fish far from the coast. The rest is taken by fleets from other European countries.

EXPORTS AND IMPORTS

More than half of the total catch is exported. The major export commodities are herring, salmon, and shellfish. The United Kingdom is the largest importer of Irish fishery products. In 1973, exports to that country totalled US$7.8 million. Other significant markets for Irish fishery products are France, the Netherlands, and the Federal Republic of Germany. Exports to each of these countries averaged US$3.1 million. Imports by the United States remain comparatively small, about US$422,000 in 1973. In 1974 the value of exports of all types of fish and fishery products reached US$25 million compared to US$22.5 million in 1973 (see Table 1).

The value of fishery imports, mainly fish meal and canned fish, has declined. In 1974, imports were estimated at US$9.8 million compared to US$10.2 million in 1973. Domestic consumption in recent years has risen in response to

Table 1.—Ireland's fishery exports, 1971-74.

Year	Quantity (metric tons)	Value (US$)
1971	37,859	11,945,956
1972	48,758	16,246,452
1973	51,465	22,547,950
1974	47,554	25,950,950

Source: *OECD Review of Fisheries*, 1974.

vigorous sales promotion. Per capita consumption of fish and fishery products in 1974 was 11.8 kilograms (26 pounds) and is expected to increase 10 percent by 1980.

FLEET

The Irish fisheries are coastal and the fleet consists almost entirely of short-range craft. The fleet consists mainly of the Scottish-type trawlers, with capacities of 51-75 gross registered tons, although in recent years there has been a trend toward the acquisition of larger vessels. The remainder of the fleet consists of 1,200 smaller craft of up to 7 meters in length, powered mainly by outboard engines. Ireland had 6,138 fishers (3,890 part-time) in 1974, or about one percent of the total labor force.

GOVERNMENT SUBSIDIES

Industry growth is supported by the Board Iascaigh Mhara (BIM) or the Irish Sea Fisheries Board, a government development corporation. BIM is divided into four major sections: fisheries resources, domestic and export markets, investment, and shipbuilding. The bulk of aid for capital development is in the form of grants for the purchase of new fishing boats. Purchasers receive outright grants on 25 percent of the cost for fishing vessels measuring 20 to 86 feet long, in addition to a loan covering the remaining costs at 4 percent interest over 10 years. The capital development fund allocated for the fishing industry in 1975-76 was US$9.8 million or 40 percent greater than in 1974-75. Development plans for the industry include: 1) strengthening the existing coastal fleet and expanding into midwater fishing; 2) expanding and integrating shore-based facilities to insure maximum employment and more effective marketing; and 3) developing mariculture for fish and shellfish.

FISHERIES LIMITS AND NEGOTIATIONS

Currently, Ireland claims a 12-mile fishing zone, but Irish fishers are demanding its extension to 50 miles. Fishers are also demanding that Ireland renegotiate the EEC Fisheries Agreement, which allows EEC countries to fish up to 6 miles off the Irish coast, in light of the rapidly diminishing stocks and the extended jurisdiction developments.

Taiwan Exports Eels to Japan

A meeting in Taipei, Taiwan, of Japanese eel importers and Taiwanese eel producers resulted in agreement that 14,000 metric tons of eels would be exported from Taiwan for sale in Japan during 1976. Of the total amount, 11,000 metric tons will be live eels and 3,000 metric tons will be processed eels. The export price for live eels was set at $6,000-$7,000 per ton.

Taiwanese eel culturists have agreed to import Japanese eel (*Anguilla japonica*) elvers to raise to maturity. Final details of the trade agreement were worked out at another meeting in May. (Source: *China Post.*)

According to the NMFS Office of International Fisheries, Japan imported 7,689 metric tons of live eels from Taiwan in 1974 and 10,843 metric tons in 1975. Average prices per ton in those years were $5,980 and $5,950, respectively. Japanese eel culturists have been hit hard by increased prices for fuel used to maintain water temperatures during the winter months, but Taiwanese eel culturists, benefiting from their milder winters, appear able to expand production to meet the Japanese market demand.

Japan imported only 13 metric tons of live eels from the United States in 1974 and only 8 metric tons in 1975. Furthermore, average prices per ton for live American eel exports to Japan were $4,430 in 1974 and $2,890 in 1975. U.S. eel exports to Japan have been held back by transportation costs, by a general world economic slump during 1975, and by the Japanese market preference for *Anguilla japonica*, the domestic eel. (Source: *Japan Exports & Imports* and others.)

DENMARK LISTS 1973-1975 FISHERY DATA

Stable cod landings since 1973 and a decline in fish landed for reduction from 1974 to 1975 are reflected in fishery statistics released recently by the Danish Fisheries Ministry. The data include landings and prices of cod and reduction fish and monthly prices of salmon and shrimp.

While cod landings remained relatively constant from 1973 through 1975, cod prices declined from 3.02 Danish krone (US$0.49) per kilogram in December 1973 to 2.66 krone (US$0.43) in December 1975 (Table 1). Landings of fish for reduction to fish meal and fish oil decreased from 1.57 million metric tons in 1974 to 1.47 million metric tons in 1975. The price per kilogram dropped from 8.6 cents in 1973 to 5.9 cents in 1975 (Table 1).

Shrimp prices were well below those prevailing in 1973 and 1974, and fell to 4 cents per kilogram in December 1975, compared to 15 cents in December 1973 (Table 2).

Monthly shrimp landings in 1975 for both Denmark and Greenland (Table 3) totalled 11,500 metric tons—2,139 metric tons for Denmark and 9,361 metric tons for Greenland.

Table 2.—Average monthly prices for landings of shrimp (*Pandalus borealis*) and salmon (Baltic *Salmo salar*) for 1973, 1974, and 1975 in Danish Krone per kilogram (at US$1.00 = DKr6.156). Where landings are nil or inadequate, no average price is given. (Source: Danish Fisheries Ministry, "Oversigt over Fiskeriet.")

	Shrimp			Salmon		
Mo.	1973	1974	1975	1973	1974	1975
Jan.	—	—	—	3.218	2.430	2.121
Feb.	.823	.987	.632	3.177	2.495	1.995
Mar.	.699	.911	.559	3.166	2.601	2.018
Apr.	.630	.746	.568	3.376	2.425	2.171
May	.644	.777	.526	3.244	2.347	2.055
June	.700	.780	.465	2.909	2.323	2.030
July	.717	.822	.507	—	—	—
Aug.	.728	.664	.489	—	—	—
Sept.	.821	.748	.512	2.057	1.726	2.229
Oct.	.792	.757	.507	2.138	1.671	2.738
Nov.	.755	.752	.535	2.422	1.982	2.992
Dec.	.950	.851	.255	2.641	2.033	3.720

Table 1.—Landings (in metric tons) and prices (in Danish krone per kilogram at US$1.00 = DKr6.156) of cod and fish for reduction in Danish ports by Danish and foreign vessels for 1973, 1974, and 1975. Source: Danish Fisheries Ministry, "Oversigt over Fiskeriet."

	Cod						Fish for reduction					
	Landings (whole wt.)			Price (DKr/kg)			Landings			Price (DKr/kg)		
Month	1973	1974	1975	1973	1974	1975	1973	1974	1975	1973	1974	1975
Jan.	15,884	17,805	12,949	1.95	2.94	2.61	62,698	63,279	69,168	0.41	0.63	0.42
Feb.	15,576	19,479	23,097	2.01	2.83	1.92	70,966	91,881	136,255	0.41	0.64	0.35
March	22,030	17,444	14,709	1.84	2.81	2.13	106,251	92,926	89,513	0.41	0.63	0.29
April	10,525	13,920	14,552	2.01	2.65	2.03	56,606	109,577	49,236	0.40	0.58	0.22
May	16,876	11,582	16,646	1.99	2.76	2.07	186,429	203,556	195,479	0.40	0.53	0.24
June	10,253[1]	7,727	10,938	2.22	2.79	2.02	142,951	206,349	177,749	0.42	0.49	0.25
July	9,709	6,957	8,691	2.20	2.66	2.09	135,075	98,089	191,420	0.40	0.45	0.25
Aug.	9,569	11,215	8,141	2.69	2.12	2.24	150,014	232,172	193,686	0.48	0.43	0.28
Sept.	6,855	5,591	6,941	3.09	2.97	2.67	113,484	117,798	118,718	0.52	0.45	0.31
Oct.	8,067	9,472	9,753	3.06	2.85	2.78	79,847	168,296	126,790	0.52	0.45	0.33
Nov.	7,053	8,994	5,403	3.14	2.69	2.76	69,807	123,431	69,872	0.43	0.52	0.32
Dec.	6,790	5,990	6,076	3.02	2.86	2.66	25,005	63,603	53,467	0.54	0.43	0.35
Total	139,187	136,176	137,896				1,199,133	1,570,957	1,471,353			

Table 3.—Monthly shrimp landings for Denmark and Greenland in 1975.

	Landings		
Mo.	Denmark	Greenland	Total
Jan.	1	270	271
Feb.	120	418	538
Mar.	192	173	365
April	480	735	1,215
May	336	852	1,188
June	288	1,375	1,663
July	288	1,283	1,571
Aug.	209	934	1,143
Sept.	162	1,059	1,221
Oct.	24	1,178	1,202
Nov.	39	705	744
Dec.	—	379	379
Total	2,139	9,361	11,500

[1]Landings listed in metric tons.
[2]Source not given.

ROK Longliner Seized off Alaska and Fined

A U.S. Coast Guard aerial patrol sighted a Republic of Korea (ROK) longliner, the *Dong Won No. 709*, fishing 11.25 miles offshore in the vicinity of White Sisters Island off the southeastern coast of Alaska on 18 February 1976, reports the NMFS Office of International Fisheries. The Korean vessel was advised that it was in violation of the U.S. Contiguous Fishing Zone (CFZ) and signalled to stop. While aerial surveillance was maintained, the Coast Guard Cutter *Sedge* was dispatched to intercept and board the vessel. The *Dong Won No. 709* was boarded and seized on 19 February.

The ROK vessel was taken to Sitka, Alaska, where the U.S. Marshall took custody of the vessel. The Coast Guard boarding officer and a National Marine Fisheries Service agent traveled to Juneau for debriefing and case preparations. On 24 February, the master of the *Dong Won No. 709*, Young Il Choi, was arraigned in the U.S. District Court in Anchorage. Asserting that he had been 12.5 miles offshore when the Coast Guard aircraft flew over his ships, and that his gear was 13.0 miles offshore, he pleaded not guilty to the charges. On 10 March, he changed his plea to no contest. The *Dong Won No. 709* was then found to be in violation of the CFZ.

Under the provisions of the Bartlett Act (16 USC 1081), the master of the vessel was fined $8,000 and the owner of the vessel was assessed $522,000 in civil penalties. Although payment of the $530,000 total was expected on 17 March, the vessel remained in custody until 25 March, at which time the penalties were paid and the vessel was allowed to depart the Sitka Harbor.

According to the NMFS Office of International Fisheries, the *Dong Won No. 709* is a 55 meter, 629.25 gross-ton longliner. Its homeport is Pusan, ROK, and it is owned by the Dong Won Ice Company. The vessel carries a crew of 35. Its value was estimated at about $1 million. The value of its catch was estimated at $220,000. At the time of boarding, the vessel's catch consisted of approximately 250 metric tons of frozen blackcod, and 3 metric tons of frozen rockfish. The *Dong Won No. 709* is the third Korean vessel seized for violating U.S. fishing laws since 1973. The stern trawler *Kum Kang San* was assessed $415,000 in penalties for a CFZ violation in August 1975.

Panama Plans New Port Sees Shrimp Catch Fall

The master plan for the fishing port at Punta Vacamonte, the key project in the Government of Panama's plan to modernize the country's fishing industry, was recently delivered to government officials in ceremonies at the project site, according to the NMFS Office of International Fisheries.

The plan was drawn up by a multinational consulting consortium composed of PISTSA (Panamanian), Greiner (American), and Livesey and Henderson (English). The complex is being financed by a $25 million loan from the World Bank. The National Port Authority has received the qualifications of 37 firms indicating an interest in bidding on the construction of the port, and has approved 21 firms for the submission of bids. American firms approved include Morrison-Knudsen Co., Inc., Raymond Corp., and Western Contracting Corp.

The old fisheries port was located in the center of Panama City. Expansion would have been difficult because of the high cost of urban real estate. In addition, tides limited the times when fishing vessels could enter and leave the port, and pollution, due to the port's urban location, made processing difficult.

The new fishing port will be protected by a breakwater and dredged to a depth sufficient to allow 24-hour-a-day operations. The facility will include an administration building, fresh fish market, areas for the construction and repair of boats, three service piers, two piers for the unloading of shrimp and fish, and two piers for tuna. Buildings for use by shrimp packing companies and a 3,000-ton capacity cold storage facility will also be built. Construction on the access road linking Punta Vacamonte with the Inter-American Highway is now 50 percent completed, and the road should be finished by July 1976, thus facilitating access to the construction site. The government expects to have the facility ready for operation by the fall of 1978. Areas have been designated in the master plan for future expansion of the Port.

Figure 1.—Panama's shrimp catch, 1960-75.

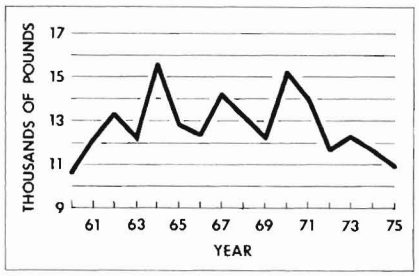

Table 1.—Panama's shrimp landings by species 1974 and 1975, in thousands of pounds.

Species		Landings		Percent change
Spanish	English	1974	1975	
Blanco	White	3,841	3,720	−3.2
Rojo	Pink	3,021	3,333	+10.3
Titi	Sea bob	3,668	2,158	−41.2
Carabalí	—	364	276	−24.2
Solenocera	—	104	75	−27.9
Fidel	—	147	951	+546.9
Cabezón	—	507	397	−21.2
Total[1]		11,652	10,909	−6.4

[1]Totals may not agree due to rounding.
Source: Ministerio de Comercio e Industrias. Departamento de Recursos Marinos.

SHRIMP FISHERY

Preliminary figures for 1975 from the Panamanian Ministry of Commerce and Industry indicated that shrimp landings for 1975 totalled 10.9 million pounds, down 6.4 percent from the 1974 catch and 16 percent below the 1965-74 average catch. This continues the decline from the record 15.2 million pounds landed in 1970 (Fig. 1). According to preliminary data the most significant decline took place in the sea bob (titi) catch which declined over 40 percent (Table 1). On 8 January 1976, a seasonal closure was declared on shrimp fishing during February and March for the white, sea bob, and carabali varieties.

The Minister of Industry and Commerce has drafted a new law designed to limit the number of fishing licenses issued for shrimping. In the past there has been a great deal of speculation on fishing licenses and the fishers have been able to sell their licenses to other individuals for up to $15,000. However, they are presently worth a great deal less because of the problems in the shrimp industry. Under the new law, shrimp licenses will automatically be revoked when the licensed vessel sinks or ceases operation, unless the vessel is replaced within 6 months. In addition, if the new law is enacted, fishers will not be allowed to sell their licenses.

Mexico Purchases 20 Cuban Fishing Vessels

Mexico has purchased 20 Cuban fishing vessels in what President Echeverría described as an example of Latin American economic and technological collaboration. During a christening ceremony for the first 13 vessels, held in Cozumel on the east coast of the Yucatan Peninsula, Echeverría emphasized the close relations existing between Mexico and Cuba. Agreement for the construction of the vessels was presumably reached as a result of President Echeverría's trip to cuba in August 1975. Cuba's First Deputy Director for Fisheries, Alvaro Lavastida, had previously presented a ferro-cement vessel to the Mexicans at the end of his trip to that country in January 1975. The Mexican government plans to use the vessels for training at Mexico's 30 secondary level technical schools. (Source: U.S. Embassy, Mexico City.)

According to the NMFS Office of International Fisheries, the vessels, built by "CubaPesca" in Cardenas and Manzanillo shipyards, are constructed from ferro-cement, a relatively new technique using plasticized wire mesh filled with a sand silicate mortar. Ferro-cement vessels have the advantage of low construction costs and are relatively inexpensive to repair and maintain. Each of the new vessels is 16.2 meters long and displaces 40 tons. They are designed for coastal operations on the continental shelf in tropical and severe weather conditions. Some of the vessels have a refrigeration capacity of 20 cubic meters, others have an 8-cubic meter refrigeration capacity and a 7-cubic meter holding tank[1]. Each vessel is powered by a 150-hp diesel engine and is capable of speeds up to 8 knots. They have a crew of 8 and are capable of trips lasting 5½ days. The vessels are well suited for shrimp and snapper fisheries.

Cuba has approximately 300 ferrocement vessels in operation at the present time.

[1]These vessels were prominently displayed at the Cuban pavillion at the Inrybprom-Exhibition in Leningrad during August 1975. The vessels displayed at Leningrad were designed to keep the catch alive by circulating seawater in the perforated hold.

USSR Reports 1974-75 U.S. West Coast Fish Catch

The Soviet Ministry of Fisheries has transmitted to the National Marine Fisheries Service the final 1974 statistics and preliminary 1975 statistics for the catch made by Soviet vessels fishing off the Pacific coasts of Canada and the United States, according to NMFS's Office of International Fisheries. The latest data, in comparison with former years, were submitted in the detailed format stipulated by the U.S.-USSR Agreement on North Pacific Fisheries.

The 1974 final catch statistics (Table 1) show the Soviet Alaska pollock fishery in the eastern Bering Sea and the Gulf of Alaska as the most significant, amounting to almost 362,000 metric tons, or 52 percent of the total. The Pacific hake fishery off northern California, Washington, and Oregon was also large, amounting to about 159,000 metric tons, or 22 percent of the total Soviet catch off the U.S. Pacific coast.

The 1975 preliminary catch statistics (Table 2) show that the Soviet catches, for the most part, remained within the quotas set by the U.S.-USSR Agreement on North Pacific Fisheries for 1975 and 1976. (The quotas, and 1975 catch totals as a percentage of the quotas, are shown in Table 3.) Overruns were recorded only for the rockfish fishery in the Gulf of Alaska and for composite fisheries for other species in the Gulf of Alaska and off the Aleutian Islands.

Table 1.—Russia's 1974 fisheries catch (final statistics by fishing grounds) off the Pacific coasts of the United States and Canada in metric tons.

Species	Eastern Bering Sea	Aleutian Islands	Western Alaska	Eastern Alaska	Wash., Oreg., Calif.	Total (U.S.)	Percent of U.S. Total	Total Canada	Grand total
Pac. halibut	123	4	48	12	—	187	negl.	—	187
Arrowtooth halibut	18,650	—	1,412	—	5	20,067	3.0	—	20,067
Pac. black halibut	10,820	39	92	—	—	10,951	2.0	—	10,951
Flounders	9,200	—	830	—	—	10,030	1.0	—	10,030
Cod	16,547	45	2,136	—	—	18,728	2.0	—	18,728
Alaska pollock	309,613	21,346	29,820	1,180	—	361,959	52.0	—	361,959
Rockfish	31,877	824	15,106	2,088	2,536	52,431	8.0	176	52,607
Black cod	77	14	27	11	148	277	negl.	16	293
Herring	19,800	—	—	—	—	19,800	3.0	—	19,800
Atka mackerel	—	1,377	17,531	—	—	18,908	3.0	—	18,908
Pac. hake	—	—	—	—	156,708	156,708	22.0	1,799	158,507
Shrimp	—	—	1,706	—	—	1,706	negl.	—	1,706
Others	12,770	1,726	7,469	180	4,835	26,980	4.0	660	27,640
Total	429,477	25,375	76,177	3,471	164,232	698,732	100.0	2,651	701,383

Source: All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, 1976.

Table 2.—Russia's 1975 fisheries catch (preliminary statistics by fishing grounds) off the Pacific coasts of the United States and Canada in metric tons.

Species	Eastern Bering Sea	Islands Aleutian	Alaska Western	Eastern Alaska	Wash., Oreg., Calif.	Total (U.S.)	Percent of U.S. total	Total Canada	Grand total
Alaska pollock	209,957	9,874	36,353	1,488	—	257,672	42.0	—	257,672
Pac. halibut	137	3	50	—	—	190	negl.	—	190
Other flounders	49,800	37	2,392	24	136	52,389	9.0	—	52,389
All rockfishes	26,915	11,877	10,014	201	2,292	51,299	8.0	239	51,538
Cod	24,043	184	1,392	92	—	25,711	4.0	—	25,711
Atka mackerel	462	6,377	17,249	2,750	—	26,838	4.0	—	26,838
Pac. hake	—	—	—	—	150,829	150,829	25.0	3,493	154,322
Herring	18,504	—	—	—	—	18,504	3.0	—	18,504
Shrimp	—	—	—	—	—	—	—	—	—
Others	17,500	257	6,775	201	2,598	27,331	5.0	82	27,413
Total	347,318	28,609	74,225	4,756	155,855	610,763	100.0	3,814	614,577

Source: All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, 1976.

Table 3.—Total catches (in metric tons) allowed Soviet fishers during 1975-76 from the fishing grounds adjacent to U.S. Pacific coast, by area and species.

Area	Total catch allowed	1975 totals as % of catch quotas
Eastern Bering Sea		
Pollock	210,000	99.9
Herring	30,000	61.7
Other species	120,000	99.0
Gulf of Alaska		
Pollock	40,000	94.6
Rockfishes	10,000	102.2
Other species	30,000	103.1
Off the Aleutian Islands		
Rockfishes	12,000	98.9
Other species	16,000	104.6
Off Wash., Oreg., Calif. (south of lat. 47°45'N)		
Rockfishes (incidental catch only)	2,500	91.7
Other species (incidental catch only)	3,000	91.1
Pacific hake	150,000	100.6

Source: U.S.-USSR Agreement on North Pacific Fisheries, July 1975.

Venezuela Tells Foreign Fishing Vessel Rules

Fishing by foreign nationals aboard vessels of foreign registry within Venezuela's 12-mile Territorial Sea[1] is permitted in certain exceptional cases and under certain conditions. If the Oficina Nacional de Pesca (National Fisheries Office) of the Ministerio de Agricultura y Cria (Ministry of Agriculture and Livestock) deems it in the scientific or commercial interest of the nation, it may authorize foreign vessels to operate in Venezuelan-claimed waters.

Any request for such authorization must be solicited by the Venezuelan associates of the foreign vessel's owners. A monthly fee of at least 2,000 bolivares (US$467),[2] based on the vessel's size, must be paid to the National Fisheries Office. The entire catch must be landed and sold in Venezuela. In addition, depending on the vessel's size, 25 to 30 percent of the crew must be Venezuelan nationals.

The only restriction related to the fishing method used prohibits trawling for shrimp. Regulations concerning the licensing of foreign vessels are not codified and each application is weighed on its particular merit by the Venezuelan authorities. (Source: U.S. Embassy, Caracas.)

[1] The *Territorial Sea Law* of 27 July 1956, authorized territorial limits and an exclusive fishing zone of 12 nautical miles.

[2] Based on an exchange rate of US$1.00 = Bs4.28.

USSR Purchases Polish Sealing/Fishing Vessels

The Soviet foreign trading company *Sudoimport* concluded a contract at the 1971 Poznan International Fair with the ship-building industry of the Polish People's Republic for the delivery of 23 dual-purpose marine mammal trapping and fishing vessels. They were to be delivered to the Soviet Ministry of Fisheries between 1972 and 1975, reports the NMFS Office of International Fisheries.

The economic advantage of these unique dual-purpose vessels is that, upon completion of the short, 3-4 month seal trapping season, they can be shifted into commercial fishing operations for the rest of the year. The vessels initially will be used to hunt marine mammals, primarily seals, from small boats or on foot (on ice and ice floes). Skins will be processed aboard the vessels and commercial oil, frozen meat, and force-meat will also be produced. When the sealing season ends the vessels will fish using bottom and deep-sea stern trawling gear.

The *Zveroboi*, ordered in 1971, is the prototype of this class of 23 dual-purpose vessels built at the Lenin Shipyard in Gdansk, Poland. The *Zveroboi*-class vessels (see table) are designed for operations in the White Sea, in the North Pacific, northeast and northwest Atlantic Ocean, the Gulf of Alaska, and Bering Sea. Their hulls have been reinforced against ice and adapted to winter seas. The vessels are fitted with fish and fish meal processing equipment, modern navigational and fish-finding instruments, and an automated, remote-controlled, diesel-electric engine.

Up to 24 tons of fish or 600 seals a day can be processed aboard the *Zveroboi*-class vessels. Working at full maximum capacity, each of this class of vessels can produce 240 seal skins, 15 tons of frozen meat, and 1.2 tons of seal liver oil each day. In addition to the 24 tons of frozen fish, the vessels can also produce 12 tons of fish meal and small quantities of fish liver oil daily.

The entire order of 23 *Zveroboi*-class vessels was delivered by the end of 1975. Of these 23 vessels, 13 went into a new flotilla being formed in the Soviet Far East on Sakhalin Island. The *Zveroboi* is the flagship of this new fleet. The remaining 10 vessels joined the Archangel's Trawler Fleet. The *Serebrianka* and *Laplandiia* were the first two vessels constructed for this fleet in 1973.

Basic specifications of *Zveroboi*-class vessels.

Gross register tons	1,971 GRT.
Deadweight	800 DWT
Length (overall)	72.8 m
Length (between perpendiculars)	65.0 m
Breadth	13.0 m
Draft (fully loaded)	4.85 m
Horsepower	2,300 h.p.
Endurance	105 days
Speed (maximum)	13 knots
Speed (trawling)	4 knots

The *Zagorianii*, a standard vessel of the *Zveroboi*-class, was launched in late 1975 in Poland and sent to Nevel'sk on Sakhalin Island where it will be based. Three U.S. scientists, Francis Fay of the University of Alaska, James Estes of the U.S. Fish and Wildlife Service, and Howard Ferrin, a graduate student at the University of Alaska, participated in a U.S.-USSR cooperative walrus-ice seal research cruise aboard the *Zagorianii* from 12 March to 1 May 1976 in the Eastern Bering Sea.

Japan, Australia Discuss New Fisheries Agreement

The Fisheries Agency of Japan plans to begin talks with the Government of Australia about a new fisheries agreement or a further extension of the 1968 bilateral agreement. The 1968 agreement was to expire 27 November 1975, but was extended by mutual agreement to 27 November 1976.

A preliminary meeting in Canberra will discuss long-term arrangements concerning port privileges for Japanese fishing vessels, mutual cooperation in fishing technology, and joint ventures in marine product processing.

Japanese fishing vessels are presently allowed to call at the ports of Brisbane, Fremantle, Hobart, and Sydney. The 1968 bilateral agreement made it possible for Japan to resupply in these four ports a fleet of tuna longliners whose trips last as long as 6-12 months. Japanese tuna longliners fish off Australia, in the eastern Indian Ocean, and also off East Africa. Japan's tuna catch in waters near Australia is estimated at 25,000 tons annually.

Opposition to Japanese fishing off Australia has increased among Australian citizens. The Government appears cautious about granting unconditional or long-term permission for Japanese fishing vessels to enter Australian ports due to the effect such permission might have on Korea or other nations with longline fleets.

The Japanese delegation will include representatives of the Federation of Japan Tuna Fisheries Cooperatives (Nikkatsuren) and representatives of Japanese processors. Japan may discuss builting a plant designed for tuna *sashimi* export trade in Australia, as well as other cooperative ventures. (Source: *Nihon Keizai Shimbun.*)

According to the NMFS Office of International Fisheries, Australia's tuna catches, albeit still small when compared with those of other Asian tuna-fishing countries, are increasing rapidly (Tables 1 and 2). At the same time, international conflicts with Indonesia off Australia's northwest coast and Taiwan in the Gulf of Carpentaria have caused concern in Australian fishing circles about foreign fishing in waters near Australia.

Table 1.—Nominal catches of highly migratory species by certain nations of the western Pacific in FAO statistical areas 57, 71, and 81, (eastern Indian Ocean and southwestern Pacific Ocean), in metric tons.

Nation	1970	1971	1972	1973
Australia	9,200	9,900	11,000	14,600
Japan	164,800	176,800	167,600	186,600
Korea	56,100	50,800	52,900	16,600
Philippines	23,100	31,400	28,400	50,000
New Zealand	100	300	500	600
Other	48,400	53,800	28,300	25,000
Total	301,700	323,000	288,700	293,400

Table 2.—Nominal catches of highly migratory species by nation as percentage of total catch in FAO statistical areas 57, 71, and 81, (eastern Indian Ocean and southeastern Pacific Ocean) for years 1970-73.

Nation	1970	1971	1972	1973
Australia	3%	3%	4%	5%
Japan	55%	55%	58%	64%
Korea	19%	16%	18%	6%
New Zealand	0%	0%	0%	0%
Philippines	8%	10%	10%	17%
Other	15%	16%	10%	8%
Total catch in metric tons	301,700	323,000	288,700	293,400

(Sources: FAO *1973 Yearbook of Fishery Statistics*, and others.)

Iceland and Norway Okay Fishery Pact

The Icelandic Foreign Ministry announced the conclusion of a fisheries agreement with Norway on 10 March 1976. The agreement does not regulate the catch by a predetermined quota, but rather stipulates the total number of Norwegian vessels allowed in the 12-200 mile fisheries zone. While 45 vessels are authorized, no more than 30 may fish at one time. The agreement is valid from 15 February to 1 December 1976, and Iceland can reexamine the licenses at its discretion. The agreement may be terminated by either party after 6-months' notice. (Source: U.S. Embassy, Reykjavik.)

Peru and Poland Sign Fisheries Agreement

Peru and Poland signed a pact on 2 February 1976 to renew the 1971 Peru-Poland scientific and technical agreement that provided for increased cooperation in the fisheries sector. The new agreement, the second renewal of the 1971 basic accord, was signed by Polish Deputy Minister of Foreign Commerce and Marine Economy Edwin Wisniewski and Peruvian Fisheries Director Juan José Cardenas Ronco.

Wisniewski indicated at a press conference that Poland would, among other things, construct four factory trawlers for Peru instead of the three specified in the October 1971 agreement. He also stated that the first of these vessels would be delivered in January 1977. According to press reports, the new vessels would be used to catch bonito and "cojinova" (pompano) to supply Peru's domestic market. Wisniewski and Cardenas Ronco also signed a memorandum of understanding in which, according to press releases, Poland agreed to study Peruvian requests to:

1) Grant 10 scholarships to Peruvians for the study of fishery sciences in Poland beginning in 1976;

2) Provide a research vessel to carry out exploratory fisheries studies in Peruvian waters for 4 months each year; and

3) Send Polish fishing vessels to waters off Paita to help provide PEPESCA (Empresa Peruana de Pesca) with fish for human consumption. (Source: U.S. Embassy, Lima.)

According to the NMFS Office of International fisheries, Iceland's Foreign Minister Agustsson stressed that Iceland has the sole authority over the catch, and can limit it by restricting the number of vessels fishing. The agreement is important to the Icelanders as a demonstration of their ability to negotiate fishery agreements with foreign countries fishing off its coasts, in contrast to the alleged intransigence of the British. Iceland also recently announced a fisheries agreement with Belgium which allows 6,500 metric tons of fish (1,500 metric tons of cod) to be taken from Icelandic-claimed waters.

EC Sets Withdrawal and Reference Prices

The Commission of the European Communities (EC) has fixed the 1976 withdrawal prices on fishery products by Regulation (EEC) No. 3372/75 and reference prices by Regulation (EEC) No. 3373/75. These prices are published in European Units of Account (u.a.) per metric ton, and are based on various percentages of the guide prices according to coefficients for various commercial characteristics (size, quality, presentation, etc.) and distant landing areas. The coefficients are published in Regulation (EEC) No. 3371/75. The following withdrawal prices and reference prices have been converted to U.S. dollars per metric ton based on one u.a. equalling 1.16686 U.S. dollars. See tables 1-5.

According to the NMFS Office of In-

Table 1.—EC withdrawal prices (US$ per metric ton), by commercial characteristics and by region for 1976.

Species	Landing areas	Commercial characteristics [1]			Withdrawal price
		Freshness category	Size	Presentation	
Herring	1. All coastal areas of and islands of Great Britain north of a line from Fleetwood to Hartlepool; except the Isle of Man.	All	1	Whole	$153
		All	2	Whole	144
		All	3	Whole	90
	2. Coastal areas and islands north of a line from Loophead to Wicklow Head in Ireland.	All	1	Whole	179
		All	2	Whole	167
		All	3	Whole	104
Mackerel	3. Coastal areas of and islands off Ireland, Northern Ireland, Devon and Cornwall counties in Great Britain.	Extra	1, 2, 3	Whole	
		A	1, 2, 3	Whole in original boxes	131
		A	1, 2	Whole	
		B	1	Whole	
		B	2	Whole	116
		A	3	Whole	
		B	3	Whole	
		A	4	Whole in original boxes	107
		All	4	Whole	62
	4. Western, northern, northeastern coastal areas of Scotland to Aberdeen; islands to the west and north of these areas.	Extra	1, 2, 3	Whole	
		A	1, 2, 3	Whole in original boxes	84
		A	1, 2	Whole	
		B	1	Whole	
		B	2	Whole	
		A	3	Whole	74
		B	3	Whole	
		A	4	Whole in original boxes	69
		All	4	Whole	40
Whiting	5. Coastal areas of Ireland and Northern Ireland, the coastal area of Great Britain from Whitehaven in England to Wick in northeastern Scotland and the islands to the west and north of these areas; except the Isle of Man.	All	1, 2	Gutted w/head	243
		Extra, A	3	Gutted w/head	
		Extra, A	1, 2	Whole	
		B	3	Gutted w/head	219
		Extra, A	3	Whole	
		Extra, A	4	Gutted w/head	186
		B	1, 2, 3	Whole	
		Extra, A	4	Whole	
		B	4	Gutted w/head	135
		B	4	Whole	102
Sardines (Atlantic)	6. Coastal areas of and islands off the counties of Cornwall and Devon in England.	Extra, A	2	Whole	163
		Extra	3	Whole	125
		Extra	1, 4	Whole	106
		A	3	Whole	
		A	1, 4	Whole	68
		B	All	Whole	
Hake	7. All coastal areas of Scotland.	All	1, 2	Gutted w/head	459
		All	3	Gutted w/head	410
		All	4	Gutted w/head	323

[1] The freshness categories, sizes, and presentation are those defined pursuant to Article 2 of Regulation (EEC) No. 2142/70.

Source: *Official Journal of the European Communities*, No. L333/36.

ternational Fisheries, withdrawal prices and reference prices are part of the EC price support program. The withdrawal prices are those prices at which producer organizations start moving products from the human consumption market to the animal feed market. The reference price is the lowest price at which imports can enter the EC market.

Table 2.—EC withdrawal prices (US$ per metric ton) by commercial characteristics, for selected species for 1976.

Species	Commercial characteristics[1]			Withdrawal price
	Freshness category	Size	Presentation	
Herring	All	1	Whole	191
	All	2	Whole	180
	All	3	Whole	112
Sardines	Extra, A	2	Whole	371
Atlantic	Extra	3	Whole	284
	Extra	1, 4	Whole	240
	A	3	Whole	
	A	1, 4	Whole	153
	B	All	Whole	
Mediterranean	Extra, A	2	Whole	231
	Extra	3	Whole	190
	Extra	1, 4	Whole	163
	A	3	Whole	
	A	1, 4	Whole	123
	B	All	Whole	
Redfish (*Sebastes marinus*)	All	All	Whole	452
Cod	All	1, 2, 3	Gutted w/head	414
	Extra, A	1, 2, 3	Whole	
	Extra, A	4	Gutted w/head	300
	B	1, 2, 3	Whole	
	Extra, A	5	Gutted w/head	274
	B	4	Gutted w/head	
	Extra, A	4	Whole	
	B	5	Gutted w/head	200
	B	4	Whole	
	All	5	Whole	149
Saithe	All	1, 2, 3	Gutted w/head	257
	Extra, A	1, 2, 3	Whole	
	Extra, A	4	Gutted w/head	215
	B	1, 2, 3	Whole	
	B	4	Gutted w/head	158
	All	4	Whole	114
Haddock	Extra, A	1, 2	Whole	
	All	1, 2, 3	Gutted w/head	298
	Extra, A	4	Gutted w/head	260
	B	4	Gutted w/head	
	Extra, A	3, 4	Whole	187
	B	1, 2, 3	Whole	
	B	4	Whole	149
Whiting	All	1, 2	Gutted w/head	286
	Extra, A	3	Gutted w/head	
	Extra, A	1, 2	Whole	
	B	3	Gutted w/head	259
	Extra, A	3	Whole	
	Extra, A	4	Gutted w/head	218
	B	1, 2, 3	Whole	
	Extra, A	4	Whole	
	B	4	Gutted w/head	159
	B	4	Whole	119
Mackerel	Extra	1, 2, 3	Whole	
	A	1, 2, 3	Whole in original boxes	187
	A	1, 2	Whole	
	B	1	Whole	
	B	2	Whole	165
	A	3	Whole	
	B	3	Whole	153
	A	4	Whole in original boxes	
	All	4	Whole	88
Anchovies	Extra, A	2	Whole	364
	Extra	1, 3	Whole	300
	A	1	Whole	
	B	1	Whole	257
	A	3	Whole	
	B	2, 3	Whole	193
Plaice	All	1, 2, 3	Gutted w/head	399
	Extra, A	4	Gutted w/head	344
	B	4	Gutted w/head	295
	All	All	Whole	
Hake	All	1, 2	Gutted w/head	833
	All	3	Gutted w/head	744
	All	4	Gutted w/head	588
Shrimp	A, B	1	Boiled	791
(*Crangon* spp.)	A, B	2	Boiled	226

[1] The freshness categories, sizes, and presentations are those defined pursuant to Article 2 of Regulation (EEC) No. 2142/70.
Source: *Official Journal of the European Communities*, No. L333/34.

Table 3.—EC reference prices (US$ per metric ton) for selected fresh or chilled fishery products listed in Table 2 for 1976.

Products	Reference prices	Products	Reference prices
Herring	191	Whiting	299
Sardines		Mackerel	187
Atlantic	371	Anchovies	364
Mediterranean	231	Plaice	399
Redfish	452	Hake (*Merluccius*	
Cod	414	spp.)	833
Saithe	257	Shrimp (*Crangon*	
Haddock	298	spp.)	791

Source: *Official Journal of the European Communities*, No. L333/39.

Table 4.—EC reference prices (US$ per metric ton) for selected frozen fishery products for 1976.

Products	Reference prices
Sardines	313
Sea bream (*Dentex dentex, Pagellus*)	686
Squid (*Loligo* spp., *Ommastrephes sagittatus, Todarodes sagittatus, Illex coindetti*)	1,364
Cuttlefish (*Sepia officinalis, Rossia macrosoma, Sepiola rondeleti*)	863
Octopus	674

Source: *Official Journal of the European Communities*, No. L333/39.

Table 5.—EC reference prices (US$ per metric ton) for selected frozen products for 1976.

Products	Presentation	Reference prices
Cod	Whole	449
	Fillets	1,162
Saithe	Whole	292
	Fillets	639
Haddock	Whole	333
	Fillets	895
Redfish	Whole	487
(*Sebastes marinus*)	Fillets	1,186
Mackerel	Whole	222
	Fillets	453
Hake	Whole	408
(*Merluccius* spp.)	Fillets	729

Source: *Official Journal of the European Communities*, No. 333/40.

Norway: Fewer Fishers But More Full-Timers

Norway's fishers are becoming steadily fewer but those left are more likely to be full-timers, a Central Bureau of Statistics survey shows. This confirms that structural changes evident since the war are still continuing, according to the Norwegian Information Service.

The survey found 31,800 fishers last year, a drop of 3,200 since the last count in 1971. On the other hand, the number working full-time in the trade rose from 14,700 in 1971 to 16,600 or 52 percent of the total by 1975.