



ENFORCEMENT STANDARDIZATION SYMPOSIUM

KODIAK, ALASKA was the ideal location for the first international symposium on the standardization of high-seas salmon fishing enforcement. Kodiak is the site of: the largest Coast Guard base in the United States; one of the US's largest and busiest fishing ports; one of the USCG fisheries training centers; and the staging area for Canadian and US high-seas driftnet patrols into the North Pacific.

Participants in the March 16–19, 1999 symposium included representatives from China, Japan, Russia, the United States, and Canada. The objectives of the symposium were to share information on organizational structures and to explore areas that could potentially make high-seas salmon fishing enforcement operations more effective.

By spending time aboard the high-endurance USCG Cutter *Rush* and by joining a surveillance patrol aboard a USCG Hercules C-130, participants gained firsthand knowledge of the difficulties associated with high-

seas driftnet patrols. The *Rush* had to break ice both leaving and returning to port, while the initial planned flight aboard the C-130 had to be cancelled due to high winds and a blizzard. Both of these patrols gave participants a much better understanding of how these types of surveillance platforms are used to conduct high-seas driftnet patrols and their limitations.

Participants had the opportunity to socialize, make new contacts, and exchange information on fishing and enforcement matters. Attendees found the symposium productive and worthwhile, and are grateful to the US Coast Guard and the city of Kodiak for hosting this important event.

As a result of the symposium, participants will conduct follow-up work and then exchange the information they gather at the NPAFC annual meeting in Juneau, Alaska in November (see page 8).

—Dennis Brock, *Chairman
Committee on Enforcement (ENFO)*

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MASTHEAD PHOTO:
USCG Cutter *Rush*, Kodiak, AK
Courtesy of Dennis Brock, DFO

Reception hosted by the city of Kodiak and industry.
Left to right: Dennis Brock; Rear Admiral Terry Cross; Alvin Burch; Carolyn Floyd, Mayor of Kodiak; Gary Stevens, Kodiak Island Borough Mayor; Fran Ulmer, Lt. Governor, Alaska and NPAFC Vice -President
Courtesy of NPAFC



Spring 1999

COOPERATIVE HIGH-SEAS ENFORCEMENT



USCGC C-130 Hercules *Courtesy of Dennis Brock, DFO*

Within the NPAFC forum, Canada, Japan, Russia, and the United States have coordinated enforcement activities to stop illegal salmon fishing on the high seas of the North Pacific Ocean, capitalizing on the strong relationships fostered at the Enforcement Standardization Symposium (see page 1). The People's Republic of China also participates in coordinated activity through a Memorandum of Understanding with the US on effective cooperation and implementation of the United Nations (UN) high-seas driftnet fishing moratorium.

CANADA'S AURORA SPOTS HIGH-SEAS DRIFTNET VESSELS FROM THE AIR

SINCE THE LATE 1980S, Fisheries and Oceans Canada (DFO) has been involved in the enforcement of the high-seas driftnet fishery. Aerial surveillance aboard Canadian Department of Defense aircraft and investigations of marketing of salmon caught illegally on the high seas have been the mainstay of Canada's enforcement efforts to detect and deter illegal driftnet fishing in the North Pacific Ocean.

Prior to the 1991 UN moratorium on large-scale driftnet fishing on the high seas, Canadian Fishery Officers working with US National Marine Fisheries Service (NMFS) agents investigated the marketing of illegally caught salmon. Their combined efforts allowed the agencies to compile valuable data on the amount of fish being caught and market practices being used. Investigations resulted in the

prosecution of three individuals through the US judicial system. Since the implementation of the UN moratorium, Canada has directed its efforts towards air surveillance missions—the target is to complete six air surveillance patrols yearly, based out of US facilities in Alaska, Midway, and Hawaii.

Initially, few violations of the UN moratorium were noted in the North Pacific Ocean. Canadian *Aurora* aircraft surveys confirmed the low rate of illegal activity; however, there was little optimism that illegal driftnet fishing would end in the immediate future.

In April 1999, DFO successfully conducted air surveillance operations of high-seas driftnet vessels in the mid Pacific, involving two DFO Fishery Officers, 53 Canadian Air Force Maritime Patrol

personnel, and two *Aurora* aircraft. The patrols, a coordinated international effort with the US Coast Guard and the Russian Federal Border Guard Service, were based out of Shemya on the western end of the Aleutian Islands. A total of four vessels illegally fishing with driftnets were sighted; two of them were apprehended by the USCG Cutter *Rush*.

In the last five years, almost every successful prosecution of driftnet violations has involved cooperative effort by two or more of the nations. In many of these cases, offending vessels would have escaped prosecution if there hadn't been cooperation among the NPAFC countries.

*—Robert Martinolich
Conservation and Protection
Pacific Region, DFO*

DRIFTNET CASE DETAILS—USCG CUTTER RUSH BUSTS VESSELS AT SEA

Operation Northern Watch, the US Coast Guard's High-Seas Driftnet (HSDN) enforcement plan, officially commenced on 1 April 1999, and will continue through October 1999 or until high-seas driftnet activity ceases. Enforcement activities in cooperation with other countries have resulted in the successful interdiction of three HSDN vessels—the F/V Lobana-1, F/V Ying-Fa, and F/V Tayfun-4.

F/V LOBANA-1

On 18 April 1999, the Canadian CP-140 *Aurora* detected the F/V *Lobana-1* recovering seven miles of driftnet in position 46°43.9'N, 164°56.9'E. The vessel's master claimed a Philippine flag and stated that the vessel was the F/V *Florida*. Fish were sighted on deck. The CG Cutter *Rush* was diverted to intercept, and its crew boarded *Lobana-1* on 19 April. Approximately six tons of salmon were found on board. *Rush* verified that the home port of *Lobana-1* was Kholmsk, Sakhalin, Russia. *Rush* rendezvoused with the Russian patrol vessel *Brest* on 21 April and transferred custody of the *Lobana-1*. Russian law enforcement officials fined the master US\$4,000; the owner US\$120,000; and seized the catch, 36 miles of net, and 18 radio net transponders.

F/V YING FA

On 20 April, the crew of *Aurora* spotted the F/V *Ying Fa*. In response to the sighting, *Rush* pursued the vessel. On 24 April, a helicopter from *Rush* reported the F/V

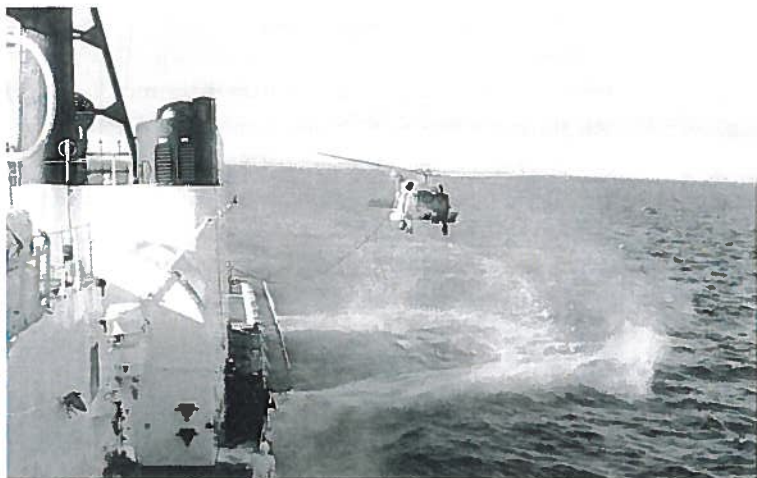
Ying Fa in position 48°55'N, 163°28'E hauling approximately 1.5 miles of net, with fish in the net and on deck. The vessel cut the net, headed in a southerly direction, and increased its speed. *Rush* intercepted *Ying Fa*, and a subsequent boarding revealed 6.2 tons of sockeye and chum salmon.

The master indicated he had planned to fish for seven to ten days to catch 40–50 tons of fish. The boarding team observed a haulback of one mile of net, and counted 59 birds in the net. The master stated that the net had soaked throughout the day. On 30 April, after the Chinese government refuted registry of the F/V *Ying Fa*, the vessel was assimilated as stateless and seized by the United States. *Ying Fa* was escorted to Adak, Alaska, and arrived there on 3 May. Twenty Chinese crew members were repatriated to Shanghai by the US Immigration and Naturalization Service on 20–21 May, and five Taiwanese crew members were repatriated to Taipei on 7 May. Custody of *Ying Fa* was transferred to NMFS, and samples of

salmon were taken for analysis. The sockeye salmon are undergoing genetic identification to determine their origin. Chinese enforcement officials reported that the company that owned the *Ying Fa* (Nanao Deep Sea Fishing Limited Company—a joint venture between the Guangdong Bureau of Aquatic Products and Taiwanese businessmen) is suspected of engaging in HSDN activities with other vessels. As a result, the government has revoked the registration and licenses for these vessels.

F/V TAYFUN-4

F/V *Tayfun-4* (Russian-flagged) was intercepted by *Rush* in position 47°33'N, 164°21'E on 3 May. The vessel was hauling in net, and was observed with approximately 1.4 miles of net in the water. Salmon were observed during the haulback. The master stated that the net was a total of three miles in length. *Rush* crew boarded the vessel, and found salmon in the net and 90 cases of frozen salmon. The master claimed that *Tayfun-4* was a research vessel, and that one crew member on board was a licensed fish inspector. Sources in Moscow stated that *Tayfun-4* was not recognized as either a research or enforcement vessel. The master was directed by Russian authorities to get underway and retrieve five nets, each about three miles long. *Rush* and *Tayfun-4* rendezvoused with the Russian enforcement vessel *Barrs*, and *Rush* transferred custody of *Tayfun-4* to *Barrs*. The case is pending in Russian courts.



Helicopter from
USCG Cutter
Rush
Courtesy of
Dennis Brock, DFO

—LTJG Tammie Martin
Maritime Operations Planning and Policy
USCG

RESEARCH PLANNING & COORDINATING MEETING



HAL GEIGER
HIROKO OMORI



SKIP MCKINNELL
YUKIMASA ISHIDA



SHIGEHICO URAWA
KATE MYERS



IGOR MIKHNO
VLADIMIR KARPENKO

IN MARCH, the NPAFC Research Planning & Coordinating Group (RPCG) met in Vancouver, BC. Oleg Gritsenko of the Russian Federation and Chair of the Committee of Scientific Research and Statistics (CSRS) chaired the meeting. The group reviewed the 1998 CSRS work plan; cruise activities; and exchange of biological samples, data, and personnel.

SCIENCE SUBCOMMITTEE

Members Dick Beamish (Canada), Yukimasa Ishida (Japan, Chair), Vladimir Karpenko (Russia), and Kate Myers (USA) reported that drafting of the 1999–2000 NPAFC Science Plan is complete. Since 1995, the Plan has focused on two critical issues: (1) factors affecting current trends in ocean productivity in the North Pacific Ocean and their impacts on salmonid carrying capacity, and (2) factors affecting changes in biological characteristics (growth, size and age at maturity, oceanic distribution, survival, and abundance) of Pacific salmon. A substantial revision to the Plan will be made after reviewing NPAFC's total activities from 1992 to 1999 and the upcoming 1999 Symposium results (see page 8).

Subcommittee members joined with Pacific Marine Science Organization (PICES) representatives to form an ad hoc organizing group for a workshop on factors affecting juvenile salmon production. The group proposed that the workshop be held in Japan in 2000.

WORKING GROUPS

The Methodology Standardization Working Group—David Meerburg (on behalf of David Mackas, Canada); Masa-aki Fukuwaka (Japan); Vladimir Karpenko (Russia); and Nancy Davis (USA)—exchanged information on methods of zooplankton analysis and measurement of salmon biological charac-

teristics. The Group discussed the development of a standardized format for a common NPAFC salmon food habits database, and is summarizing information on methods of collecting data on salmon food habits and bioenergetics.

The Working Group on Stock Assessment—Don Noakes (Canada); Shigehiko Urawa (Japan); Vlad Radchenko (Russia, on behalf of Sergei Sinyakov); and Hal Geiger (USA)—is compiling preliminary 1999 salmon catch statistics, which will be reported at the 1999 annual meeting.

AD HOC WORKING GROUPS

The Ad Hoc Working Group on Salmon Marking and external experts considered four items: a national thermal otolith mark; a proposal for a central data repository at a US location; future coordination and cooperation; and database formats and standards for data exchange. Experts advised that the number of unique patterns for otolith marking is very limited and that as use of technology grows, there will be increasing occurrences of conflicting marks. Generally, this is not a problem for local domestic management of terminal fisheries (the current major use of the marks), but can present problems for offshore mixed stocks. The proposed US location for a central data repository is the Pacific States Marine Fisheries Commission (PSMFC), which is also the repository for US and Canadian coded-wire tag release and recovery data. Discussions on database formats and standards for data exchange are being coordinated by the Alaska Department of Fish and Game. PSMFC has put together a prototype web page that is available for viewing and discussion: <http://www.psmfc.org/rmpc/iatmo/>.

The Ad Hoc Working Group on Archival Tags summarized plans for archival tag research in 1999.

MARCH, 1999

Photos: Courtesy of Nancy Davis, University of Washington



WAKAKO MORRIS
DAVID MEERBURG



IOURI & IRINA SHESTAKOVA
VLADIMIR FEDORENKO

Canada is continuing research on algorithms for estimating daily position of the tag based on the archived light record, growth and survival of salmon tagged externally (using pins) or internally (using surgery), and effects of depth on changing the estimates of geoposition. Japan intends to place 25 archival tags internally in maturing chum salmon in the Bering Sea; these tags will record water temperature, body temperature, depth, and geoposition determined by light levels. The United States intends to place 35 tags that record temperature data, and up to 100 tags that record temperature and depth data externally on salmonids of several species in the Gulf of Alaska, central North Pacific, and the Bering Sea. The objective of all programs is to obtain environmental data for inferences of salmon behavior and oceanographic features during migration and for bioenergetics applications.

INTERNATIONAL ORGANIZATION REPS

Representatives of other relevant international organizations were invited to attend the RPCG meeting. Patricia Livingston, representing PICES, stated that many of the PICES activities could assist NPAFC scientists in understanding ecosystem relations among salmon and their prey and predators, in both the regional and open-ocean environments. PICES welcomes ideas for using data in collaborative efforts with NPAFC. Livingston encouraged submission of abstracts to PICES by 1 November 1999 for the *Beyond El Niño Conference* in March 2000.

Meeting participants socialized, visited the new NPAFC offices, and bid farewell to outgoing Director Irina Shestakova at an evening open house party hosted by the Secretariat (see accompanying photos). ■

I N M E M O R Y O F

DICK CARLSON

H. RICHARD "DICK" CARLSON died July 22, 1999 from injuries, after being struck by a motorist. He was 59. He received his BS degree in Fisheries from Humboldt State University, his MS in Fisheries from the University of Connecticut, and his PhD in Fisheries from Oregon State University. A graduate of the US Coast Guard Officer Candidate School, he was commissioned ensign and lieutenant. He served as operations officer and executive officer of a search and rescue unit on the Gulf Coast, and was honorably discharged in 1975.

Since 1968, Dick worked as a fishery research biologist for the US Department of Commerce, NOAA, National Marine Fisheries Service, Alaska Fisheries Science Center at the Auke Bay Laboratory (ABL), Juneau, where he led several major fisheries studies. He was the first US scientific observer on the Hokkaido University research vessel *Oshoro maru*, and became an active participant in international cooperative high-seas salmon field research in the 1990s. He worked with Canadian scientists aboard the *W. E. Ricker* and *F/V Anita J*, and was party chief of US high-seas salmon field research aboard the fishing vessel *Great Pacific*. He represented the United States in the NPAFC Research Planning and Coordination Group and the Committee on Scientific Research and Statistics. Dick's life was celebrated by over 300 family members and friends, who attended a memorial service at Chapel by the Lake on August 4.

Charitable donations in Dick's memory may be made to the H. Richard Carlson Scholarship Fund, Oregon State University Foundation, PO Box 1438, Corvallis, OR 97339; or c/o Mrs. Shirley Carlson, PO Box 210391, Auke Bay, AK 99821; or the AWARE Shelter, PO Box 20809, Juneau, AK 99802; or Bartlett House, 2225 Jordan Avenue, Juneau, AK 99801. ■

Dick Carlson
recording catch
data aboard the
F/V *Great Pacific*,
Gulf of Alaska,
May 1999

Courtesy of Chris
Kondzela



MASS RECOVERIES OF HIGH-SEAS TAGGED CHUM SALMON

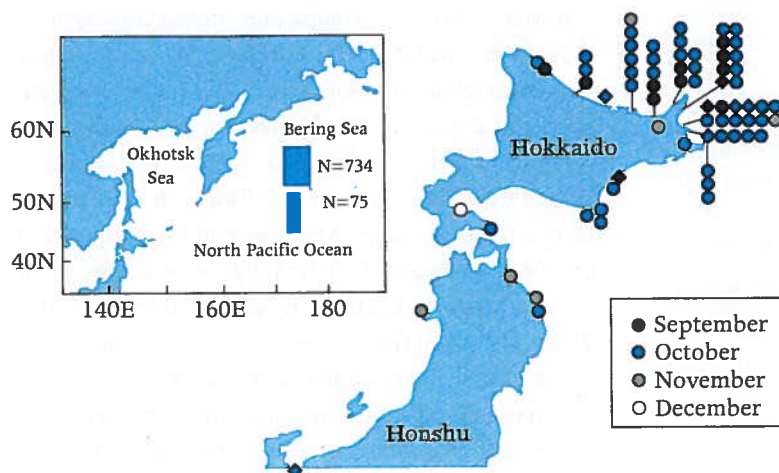
FROM JUNE TO JULY 1998, 75 chum salmon in the central North Pacific Ocean and 734 in the central Bering Sea were tagged and released during the cruise of the research vessel *Wakatake maru*. After measuring body lengths and sampling scales for age determination, scientists placed two kinds of disk tags anterior to the dorsal fin of each fish, and then the fish were released. Among those released, 69 in the central Bering Sea were recovered on the coasts in northern Japan, while no fish were recovered from the North Pacific Ocean. The recovery rate

of chum salmon tagged and released in the central Bering Sea was 9.4%, which is higher than usual. Twenty-eight were recovered on the Nemuro Strait coast and 25 on the Okhotsk Sea coast of Hokkaido (see figure). Recoveries in these two areas composed 77% of total recoveries. Five fish were recovered on the coast of Honshu Island. Tagged fish were caught mainly in September–October, 63–148 days (average 96 days) after release.

Eight of the fish recovered in 1998 were tagged with archival tags, which recorded ambient temperature and depth

data every few dozen minutes. According to the data recorded, chum salmon swam in surface waters during the night and made vertical movements frequently between the surface and 50 m during the day. Some fish dove to 200 m to avoid high water temperatures (18–20 °C) when they were near the coasts of Japan.

Tagging of salmonids during the *Wakatake maru* cruises has continued in the central North Pacific and the central Bering Sea every summer since 1995. The recovery rates of those fish tend to be higher in Japan. The research is made possible by the cooperation of the Hokkaido National Fisheries Research Institute, which does the tagging on the high seas, and the National Salmon Resources Center (NSRC), which collects the tag-recovery information in the coastal areas. Distribution of posters requesting cooperation in collecting tag recovery information effectively advertised the program to coastal fishermen. The NSRC looks forward to the establishment of frameworks for collecting tag-recovery information in other countries. Tagging research will help to clarify geographical origins and migration habits of salmonids distributed on the high seas.



1998 tag recovery locations of chum salmon released in the Bering Sea, summer 1998. No recoveries were reported for chum salmon released in the central North Pacific Ocean in 1998. Circles = normal disk tag; diamonds = archival tags

—Shigehiko Urawa

National Salmon Resources Center, FAJ

SOCKEYE SALMON TEMPERATURE TAGS

US SCIENTISTS REPORT the first coastal recoveries of sockeye salmon tagged on the high seas with data storage tags. Twenty-four sockeye salmon were tagged and released with temperature-logging tags in the central Gulf of Alaska during research trawl operations aboard the *Great Pacific* in May 1999. To date, four recoveries in coastal or freshwater Alaska fisheries (Port Moller, Chignik Lagoon, Copper River Basin, and Taku Inlet) have been reported. The data provide a detailed look at sockeye salmon behavior, with respect to temperature, on their return migrations from offshore waters. Preliminary results will be reported to the CSRS at the 1999 annual meeting.

—Dick Carlson, National Marine Fisheries Service, Auke Bay Laboratory

—Kate Myers, University of Washington, Fisheries Research Institute



High-seas disc tags recovered from maturing chum salmon captured along Japanese coasts in 1998

Courtesy of Shigehiko Urawa

Trends . . . OF JAPANESE MARKETS

FOR CENTURIES, salmon has been one of the most popular cooking materials in Japan. The word "sake" (meaning salmon and having the same pronunciation as Japanese rice wine) first appeared in eighth-century literature. Steamed rice and shioyaki (grilled, lightly salted salmon) are a familiar traditional breakfast.

In 1998, the annual per capita consumption of salmon in Japan was 1.5 kg (Figure 1), and the salmon supply in the Japanese market remains high (Figure 2). Worldwide, the structure of supply and demand for salmon is changing dramatically. Farmed production exceeded worldwide catch for the first time in 1997. Since farmed products have the advantages of stable meat quality and year-round supply, catch products are struggling to gain market share.

DOMESTIC CATCH & CONSUMPTION OF CHUM SALMON

Chum salmon compose about 80% of the total salmon catch in Japan. The success of hatcheries increased chum catches, which peaked in 1996 at 266,000 tonnes. Fresh fillet products are gaining a market share over traditional salted products as a seasonal favorite in fall. Lightly salted salmon roe "ikura" (mainly chum roe) is a famous Japanese specialty, and is used as a topping on sushi.

DOMESTIC FARMED COHO SALMON PRODUCTION

Japanese producers of farmed coho are well behind foreign producers in terms of business scale, production costs, and natural conditions. Production peaked in 1992. By 1997, only 112 producers remained and production was 9,900 tonnes. The price of farmed coho at local markets was about 1,000 yen/kg until the early

'80s, but decreased to just above 300 yen/kg by 1995. Recent improvements by producers, including change of feed and establishment of brand-name familiarity, kept the price just above 500 yen/kg in 1998.

SALMON IMPORTS (Figure 3)

Imports increased from about 50,000 tonnes in the late '70s to over 100,000 tonnes in 1982. In 1990, large imports of farmed salmon from Norway and Chile began; the total salmon import reached its peak—240,000 tonnes—in 1994. Recently, salmon imports have been fairly stable. In 1997, Chile replaced the US as the top exporter of salmon products to Japan. US imports decreased to 40,000 tonnes in 1998, a huge decline from the maximum of 129,000 tonnes in 1993.

The color and fat content of salmon meat are the factors most affecting consumer purchase. Sockeye, chinook, coho, and steelhead are "bright color products," and are preferred to chum and pink salmon. In 1998, the replacement of captured sockeye by farmed coho, steelhead, and Atlantic salmon was accelerated in the Japanese market. Even during Japan's economic depression, the maximum wholesale prices of sockeye were very high (1,300 yen/kg), due to the shortage of supply compared to farmed coho (800 yen/kg). Such high prices kept sockeye away from retailers and consumers, as retailers focused on selling other salmon species. Farmed steelhead is gaining popularity among Japanese consumers because the price is lower than farmed coho and the color is similar to sockeye.

—Ichiro Kanto & Osamu Ishikawa
Fisheries Agency of Japan

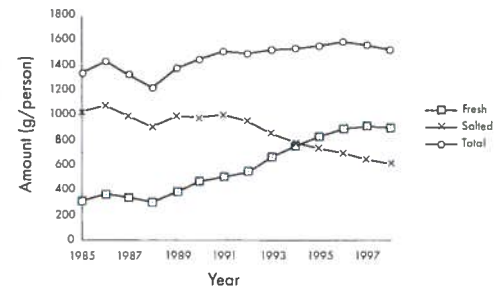


FIGURE 1. ANNUAL PER CAPITA CONSUMPTION OF SALMON

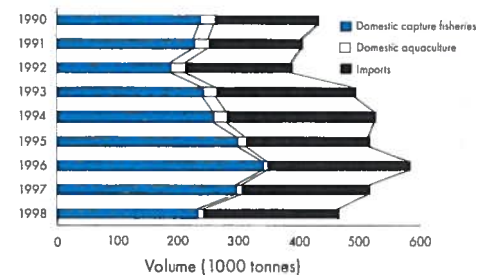


FIGURE 2. JAPANESE SUPPLY OF SALMON PRODUCTS

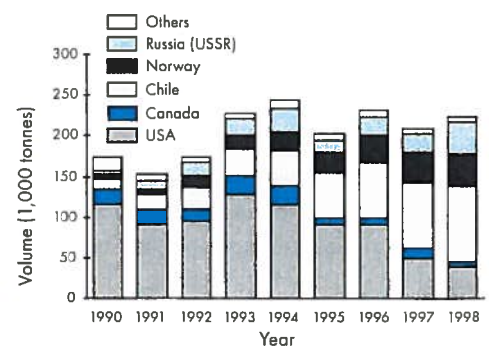


FIGURE 3. JAPANESE IMPORTS OF SALMON PRODUCTS BY COUNTRY

1999 ANNUAL MEETING & SYMPOSIUM

7TH NPAFC ANNUAL MEETING
OCTOBER 24-29, 1999

INTERNATIONAL SYMPOSIUM
NOVEMBER 1-2, 1999
*Recent Changes in Ocean
Production of Pacific Salmon*

WESTMARK BARANOF HOTEL
JUNEAU, ALASKA



Photo: Courtesy of Patricia Hull, Juneau Visitors and Convention Bureau

REPRESENTATIVES from Canada, Japan, Russia, and the United States will meet at the 7th NPAFC Annual Meeting to consider matters on enforcement, scientific research, and finance and administration of the Commission.

At the symposium, 21 oral and 50 poster presentations by leading scientists from Pacific Rim countries are planned. Participants will be welcomed in an opening address by Fran Ulmer, Lieutenant Governor, State of Alaska and NPAFC Vice-President. A keynote lecture by Elbert W. (Joe) Friday, Jr., Director of the Board on Atmospheric Sciences & Climate, National Research Council, Washington, DC, will provide a global perspective on fisheries and climate changes. A keynote lecture by Bruce P. Finney, Associate Professor, Institute of Marine Science, University of Alaska, Fairbanks, will focus on an historical perspective for North Pacific salmon fisheries and climate. The Final Announcement of the symposium, including titles of keynote lectures and oral presentations, information on hotel accommodation and access to the symposium site, and registration and hotel reservation forms, is available at the NPAFC Secretariat and its website (<http://www.npafc.org>). Preregistration is required by 15 September 1999.

Ms. Patricia Hull, Juneau Visitors and Convention Bureau, describes the city as "the most scenic of all US state capitals; its spectacular setting, rich cultural life, and abundant outdoor activities are unequaled. Juneau is at the heart of the world's largest temperate rainforest, at the base of majestic glacier-carved mountains, and nestled along a pristine waterfront. A downtown tramway, which soars to 2,000-foot elevation, permits a 360° bird's eye view. History buffs enjoy the fabulous museums and diverse architecture, which tell the story of Juneau's Tlingit and Haida native heritage, early Russian influences, and turn of the century Gold Rush. Juneau will leave you enchanted."

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The Commission invites you to submit articles and photos or slides on NPAFC-related activities for publication in the newsletter.

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ERRATA

NPAFC Newsletter - Winter 1999 issue vol. 3(1)

Page 1, article "6th Annual Meeting of NPAFC," last line of the fourth paragraph "up from 4.4 billion in 1996" must be replaced by "down from 5.4 billion in 1996."

Visit the NPAFC website:

<http://www.npafc.org> for more information on events, publications, scientific documents, and salmon catch statistics.