

North Pacific Anadromous Fish Commission

Vladivostok, Russia
2002 May 27-28

REPORT OF THE **BERING-ALEUTIAN SALMON INTERNATIONAL SURVEY (BASIS)** **WORKING GROUP MEETING**

1. **OPENING REMARKS AND INTRODUCTIONS**

The Bering-Aleutian Salmon International Survey (BASIS) Working Group Meeting was held on 27-28 May 2002 at the TINRO Centre in Vladivostok, Russia. V. Fedorenko, Executive Director of NPAFC, opened the meeting. Lev Bocharov, Director of TINRO Centre, welcomed all participants to the TINRO Centre.

List of participants is as follows (Appendix 1):

NPAFC BASIS Working Group (BWG)

<i>Canada:</i>	Richard Beamish Gerry Kristianson Marc Trudel	<i>Russia:</i>	Victor Bugaev Nikolai Chebanov Alexander Efimkin Igor Glebov
<i>Japan:</i>	Tomonori Azumaya Ichiro Kanto Shigehiko Urawa		Oleg Gritsenko Vladimir Karpenko Gennady Khen Maxim Koval
<i>United States:</i>	Douglas Eggers Jack Helle Loh-Lee Low Kate Myers		Alexander Kurmazov Victor Lapko Alexander Rogatnykh Sergey Sinyakov Vyacheslav Smorodin
Secretariat	Vladimir Fedorenko Yoshikiyo Kondo Svetlana Anikeeva		Vladimir Sviridov Olga Temnykh Natalia Varnavskaya Sergei Zolotukhin

2. **APPOINTMENT OF CHAIRMAN**

J. Helle of the United States, Chairman of BASIS Working Group, presided at the meeting.

3. AGENDA

The following agenda was adopted:

- (1) Opening Remarks and Introductions
- (2) Appointment of Chairman
- (3) Adoption of Agenda
- (4) Meeting Procedures
- (5) Financial Support and Proposals
 - (a) Internal support (proposals for use of NPAFC BASIS funds for meetings, equipment, trips of scientists, etc.)
 - (b) External support (funding sources, proposals, data for proposals)
 - (c) Discussion of interesting research issues and hypotheses for proposals
- (6) Research Coordination
 - (a) Coordination of 2002 national plans (e.g., cruise dates, ports of call, maps showing location of sampling stations and cruise tracks, list of participants, points of contact, etc.)
 - (b) Calibration of methods (salmon fishing gear, plankton, stock identification, oceanography, salmon tagging, age and maturity, food habits and bioenergetics, migration and growth models, ecologically related species, parasites and diseases)
 - (c) Coordination and cooperation with other Bering Sea research programs
- (7) Sample and Data Exchange
 - (a) Data structure and management
 - (b) International data managers – (collect data and report to NPAFC)
 - (c) Requests for samples and data
- (8) Reports, Publications, Workshops, and Symposia
 - (a) Annual implementation plan for joint BASIS Research
 - (b) Annual reports and publications of BASIS results
 - (c) Workshops (e.g., review of historical Bering Sea research and data)
 - (d) BASIS Symposium
- (9) Other Business
- (10) Summary Report

4. MEETING PROCEDURES

K. Myers of the United States and M. Trudel of Canada served as Rapporteurs for preparation of a summary report. R. Beamish of Canada, S. Urawa of Japan, V. Karpenko of Russia, and K. Myers were appointed to the drafting group.

5. FINANCIAL SUPPORT AND PROPOSALS

- (a) Internal support (proposals for use of NPAFC BASIS funds for meetings, equipment, trips of scientists, etc.)**

V. Fedorenko summarized the status of the NPAFC Special Fund for Scientific Research, created in 2001 by the NPAFC Commissioners. The Special Fund was established with a voluntary contribution of \$175,000 USD by the United States, and was used to pay the travel expenses of two participants per country for this meeting (BASIS Working Group, Vladivostok, Russia, 27-28 May 2002). The Special Fund now contains approximately \$155,000-\$160,000 USD. G. Kristianson of Canada noted that the NPAFC Committee of Finance and Administration would develop a procedure for disbursement of monies from the Special Fund.

Proposals for use of the Special Fund will be discussed by the Committee on Scientific Research and Statistics (CSRS) at the Annual Meeting.

(b) External support (funding sources, proposals, data for proposals)

In April 2002, one proposal, "NPAFC Salmon Tagging," was submitted to the North Pacific Research Board (NPRB) by the United States on behalf of the NPAFC. The proposal requested \$190,800 to implement archival and disk tagging work during 2002-2003 BASIS cruises (see NPAFC Doc. 579, sec. 5.2.5.5). In early June, the NPRB will review all requests (forty-one proposals for over \$6 million). The amount of funding available for the first round of proposals (\$1.5 million USD) is relatively small compared to what will be available in the future (\$10-\$12 million USD). Proposals related to North Pacific salmon dynamics are relevant to NPRB. All nations can apply for this funding because it is open to international scientists. The BWG discussed the importance of coordinating the submission of salmon research proposals to the NPRB.

J. Helle noted that the United States is also pursuing other methods of funding for BASIS.

The BWG agreed on the importance of continuing to update and revise the BASIS proposal (Doc. 579) as calibration and refinement of methods and analysis and publication of data proceed.

(c) Discussion of interesting research issues and hypotheses for proposals

J. Helle and L. Low suggested that stock identification research and further development of baseline information for stock identification are important research topics for proposals. The NPAFC may be the best organization to accomplish this work because coordination throughout the Pacific Rim is required. R. Beamish questioned the importance of these topics now that there are no high seas fisheries, wondered how the stock composition of small high seas research vessel samples relates to the population, and suggested that a workshop to examine these questions would be very interesting. With respect to juvenile salmon, J. Helle noted the answers to these questions depend on where the fish are caught and the objectives of the research. He also described the history of the development of genetic baselines.

6. RESEARCH COORDINATION

(a) Coordination of 2002 national plans (e.g., cruise dates, ports of call, maps showing location of sampling stations and cruise tracks, list of participants, points of contact, etc.)

Japan reviewed the updated schedule and list of participants in the *Kaiyo maru* BASIS cruise (Doc. 589, Rev. 1). T. Azumaya requested that the other parties' participants provide detailed information on the purpose of their participation, their airplane flight number, and the name of their hotel in Japan. He also noted that their travel and meal expenses on board (about 1800 yen per day) should be covered by each party.

Russia will soon provide to Japan the requested information, and will cover all expenses. Russia requested from the United States a letter of invitation for a U.S. visa for one participant (V. Davydenko) in the *Kaiyo maru* cruise.

Japan requested information from the United States on (1) whether the *Kaiyo maru* can conduct research in the U.S. EEZ in areas where commercial fishing is prohibited to protect Steller sea lions, and (2) whether they should communicate by radio while conducting research in the U.S. EEZ. The United States will discuss these issues with U.S. law enforcement officials and provide to other parties the information requested as an NPAFC document.

Russia reviewed plans for two surveys that will sample BASIS stations:

- (i) The R/V *TINRO* will conduct a comprehensive epipelagic survey of the Bering Sea within the Russian EEZ from 1 September to 15 October 2002. Scientists will embark and disembark the vessel in the port of Korf, Kamchatka. One scientist from an NPAFC member country is invited to participate.
- (ii) A pelagic trawl survey to collect data on juvenile pink salmon for run forecasting will be conducted at 72 stations in the Bering Sea within the Russian EEZ from 25 August to 25 October 2002. One scientist from an NPAFC member country is invited to participate.

R. Beamish suggested that if trawl calibration is a problem, then participation by a fisherman (trawl fishing gear expert) rather than a scientist may be important. Russia advised that there are many restrictions and regulations on foreign participants in Russian research cruises, and that up to six months may be needed to obtain approval for foreign participants. R. Beamish requested a copy of the regulations.

L. Low requested an invitation from Russia for one U.S. scientist (Mr. Dwane Kessler) to participate in the R/V *TINRO* cruise from 1 September to 15 October 2002. Russia requested a copy of his passport to submit to the Ministry of Foreign Affairs.

The United States reviewed plans for three cruises: (1) a juvenile salmon survey in the Gulf of Alaska, (2) a pre-BASIS, Ocean Carrying Capacity (OCC) survey of juvenile salmon on the eastern Bering Sea shelf, and (3) a BASIS survey in the central and eastern Bering Sea.

The United States will charter a commercial fishing vessel for the BASIS survey. Provisional survey dates are from 1 September to 4 October 2002. A midwater rope trawl (model 400/580, made by Cantrawl Pacific Ltd., Richmond, B.C.), towed at the surface, will be used to catch salmon. Temperature and salinity data will be collected with a Seabird SEACAT-19 CTD. Zooplankton will be sampled with a bongo net (mesh sizes: 333 and 505 microns) towed obliquely between the surface and 200 meters. A live box will be tested with the trawl gear to facilitate salmon tagging operations and reduce scale loss. Foreign scientists are invited to participate in the BASIS survey.

Russia requested from the United States a letter of invitation for a U.S. visa for one participant (O. Ivanov) in the U.S. BASIS survey.

V. Karpenko suggested that the United States change the location of Leg 1 of the U.S. BASIS survey to the eastern Bering Sea shelf, because all three U.S. surveys are targeting different stocks, and none of the surveys will be sampling the same populations. He advised that because of the locations of the study areas, the United States may not catch any juvenile salmon in the September surveys. J. Helle explained that if salmon are not caught during the U.S. surveys, then they will move the vessel to a different location. R. Beamish advised that if salmon are not caught, then we cannot be certain that the gear is fishing properly.

(b) Calibration of methods (salmon fishing gear, plankton, stock identification, oceanography, salmon tagging, age and maturity, food habits and bioenergetics, migration and growth models, ecologically related species, parasites and diseases).

The BWG agreed that calibration of methods is a major problem. The BWG agreed that the first step is to develop manuals on the methods to be used by each nation for each major research task. At the 2002 Annual NPAFC Meeting, the BWG will propose that the NPAFC Special Fund for Scientific Research be used to hire a person to coordinate completion and writing of methods manuals for each major research task. The first two manuals would summarize: (1) salmon fishing gear and methods and (2) plankton sampling methods. Manuals on other items would be added as the BWG proceeds through the list of methods. All parties should exchange information on BASIS methods now (via e-mail, through their points of contact; Table 1), but manuals of methods would not be written until after the 2002 NPAFC Annual Meeting. If funding is approved for the writing of manuals, the Secretariat would coordinate hiring, etc.

Table 1. List of contact persons for exchange of information on methods for BASIS research.

Methods	Canada	Japan	Russia	United States
Salmon fishing gear	R. Beamish	T. Azumaya	O. Temnykh	S. Ignell ¹⁾
Plankton sampling	M. Trudel	T. Azumaya	M. Koval, A. Efimkin	S. Ignell ¹⁾
Stock identification	D. Noakes ²⁾	S. Urawa	N. Varnavskaya	R. Wilmot ³⁾ , J. Seeb ⁴⁾
Oceanography	R. Beamish	T. Azumaya	G. Khen	S. Ignell ¹⁾
Salmon tagging	M. Trudel	S. Urawa	A. Rogatnikh	S. Ignell ¹⁾
Age and maturity	D. Noakes**	T. Azumaya	V. Smorodin	S. Ignell ¹⁾
Food habits and bioenergetics	D. Noakes**	T. Azumaya	A. Efimkin, M. Koval	S. Ignell ¹⁾
Migration and growth models	D. Noakes ²⁾	S. Urawa	N. Varnavskaya , V. Smorodin	S. Ignell ¹⁾ , D. Eggers
Ecologically related species	R. Beamish	T. Azumaya	O. Temnykh	S. Ignell ¹⁾
Parasites and diseases	R. Beamish	S. Urawa	I. Kamanova ⁵⁾	S. Ignell ¹⁾

e-mail: 1) steve.ignell@noaa.gov

2) noakesd@dfo-mpo.gc.ca

3) richard.wilmot@noaa.gov

4) jim_seeb@fishgame.state.ak.us

5) n/a

For others, see Appendix 1 of this document (page 9)

The sections that follow summarize additional BWG discussions on calibration of (i) salmon fishing gear, (ii) plankton sampling, and (iii) stock identification.

(i) Salmon fishing gear

Contact persons for coordination of salmon fishing methods for each party were appointed (Table 1). Each contact person will provide the others with 3-dimensional drawings of the trawl gear that will be used during 2002 BASIS surveys, as well as information on mesh size, depth, speed, etc. The BWG agreed that it would be helpful to have a Russian trawl gear specialist at the 2002 NPAFC annual meeting to provide expert advise on the best trawl design for future BASIS surveys.

S. Sinyakov reported that Russia has tried to compare the catchability of various types of salmon fishing gear without success. K. Myers noted that the calibration of species, size, age, and life-history stage of salmon caught by each type of trawl is also important. J. Helle advised that there are two approaches to calibrating the trawl gear: (1) side-by-side fishing or (2) fishing in an area.

L. Low advised that foreign research vessels do not need permission to operate in the U.S. EEZ, but the United States does request information on the name of the vessel(s) and when the vessel will be operating in the U.S. EEZ. S. Sinyakov advised that foreign research vessels must obtain permission to operate in the Russian EEZ by submitting an application to the State Fisheries Committee 6 months in advance of the survey, and to obtain approval is difficult because several other agencies, including the Ministry of Defense, are involved in the decision.

The BWG agreed that fishing gear calibration during the 2002 BASIS cruises should be conducted in the U.S. EEZ. I. Kanto noted that the time available to coordinate gear calibration experiments is short, because the *Kaiyo maru* cruise begins on 20 June 2002. To save time during this meeting and to develop the most effective calibration experiment for the 2002 surveys, the BWG agreed that this task should be coordinated through contact persons appointed by each party (T. Azumaya of Japan, O. Temnykh of Russia, and S. Ignell of the United States, Table 1).

O. Temnykh suggested conducting a 5-day calibration experiment sometime during the period 1-10 October in an area east of the Commander Islands in the U.S. EEZ (170°E – 172°E, 53-55°N). T. Azumaya noted that the *Kaiyo maru* would be in that location on 17 September, and that their 2002 cruise schedule can be adjusted by only a few days. J. Helle advised that the U.S. survey may occur during September. Japan and Russia agreed to establish a radio frequency and time for communication. The BWG suggested that at least 5 days are needed for the calibration experiment, and that the experiment should include both day and night tows. T. Azumaya advised that the *Kaiyo maru* may have only 3-4 days for gear calibration experiments. V. Lapko advised that the designers of the fishing gear calibration experiments should consider the whole fishing system (trawl and vessel), because factors such as size of the vessel, distance of the net behind the vessel, towing speed, etc., may cause variation in the catch.

(ii) Plankton sampling

M. Koval noted that each country is using different methods to sample plankton during the 2002 BASIS surveys, and that even within Russia different methods are being used. The TINRO Centre scientists provided information on their standard plankton sampling and processing techniques, which they have used since 1984. V. Karpenko advised that the BWG should also determine the most effective gear for studying salmon feeding.

The BWG agreed that the best method of calibration is to use all types of plankton sampling gear simultaneously on the same vessel, and possible exchanges of plankton sampling gear for 2002 cruises will be coordinated through the points of contact (M. Koval, T. Azumaya, S. Ignell; Table 1).

(iii) Stock identification

S. Urawa suggested that each party summarize the stock identification methods that will be applied to each species for analysis of the 2002 BASIS samples. Through their points of contact (Table 1), each party should exchange a table summarizing the name of the lab where samples will be analyzed, target species, sample analysis capacity, and contact persons for each stock identification method.

S. Urawa advised that at present there is no international genetic baseline for pink salmon. J. Helle noted that S. Hawkins, NMFS, Auke Bay Laboratory, has almost completed odd- and even-year baselines for pink salmon (allozyme data).

(c) **Coordination and cooperation with other Bering Sea research programs**

R. Beamish of Canada, T. Azumaya of Japan, O. Temnykh of Russia, and L. Low of the United States were appointed as contact persons for coordination of BASIS research with other Bering Sea research programs. Each party will compile for the 2002 NPAFC Annual Meeting a list of other national and international Bering Sea research programs, vessel cruises (e.g., U.S. pollock research cruises), descriptions of oceanographic and other Bering Sea databases, and drifters and oceanographic moorings in the Bering Sea (e.g., ARGOS).

G. Khen suggested that all oceanographic data from other Bering Sea research programs (drifters, ARGOS, etc.) be submitted to a BASIS oceanography database for all years of the BASIS program.

7. SAMPLE AND DATA EXCHANGE

(a) **Data structure and management**

This item will be discussed at the 2002 NPAFC Annual Meeting in Vladivostok, Russia.

(b) **International data managers – (collect data and report to NPAFC)**

This item will be discussed at the 2002 NPAFC Annual Meeting in Vladivostok, Russia.

(c) **Requests for samples and data**

The BWG agreed that fulfillment of requests by other parties for collection of samples and data during BASIS cruises is voluntary. A prioritized request, including the species, number and type of samples to be collected, and detailed collection, preservation, and shipping methods should be submitted to the points of contact for the 2002 BASIS cruises (T. Azumaya, O. Temnykh, and S. Ignell), as soon as possible.

The United States requested that Japan collect the following samples during the *Kaiyo maru* BASIS cruise, listed in order of priority:

- ?? Sockeye salmon; 60 fish per station; fin clips for DNA analysis.
- ?? Sockeye salmon; 60 fish per station; liver, heart, muscle, eye for electrophoresis.
- ?? Chinook salmon; 60 fish per station; fin clips for DNA analysis.
- ?? Chinook salmon; 60 fish per station; liver, heart, muscle, eye for electrophoresis.

These samples should be collected from the same fish that are measured for the principal biological characters (fork length, body weight, sex, and gonad weight).

The United States requested that Russia collect the following samples during their BASIS cruise(s), BASIS stations only, listed in order of priority:

- ?? Sockeye salmon; 60 fish per station; fin clips for DNA analysis.
- ?? Chinook salmon; 60 fish per station; fin clips for DNA analysis.

The United States will provide sampling instructions and vials for storage of fin clips.

Japan asked Russia to describe their stock identification plan. N. Varnavskaya explained that Russia will use both DNA and protein electrophoresis techniques for genetic stock identification. In order of priority, species analyzed will include: (1) sockeye and chinook salmon, (2) chum salmon, and (3) pink salmon. S. Sinyakov explained that in 2002 Russia is not going to collect data for genetic studies during the BASIS program cruise. However, work on creation of the genetic database is being conducted, and Russia will be ready to present information on the results of this work.

Japan had no special requests to the other parties for samples and data, but requested that all data collected for BASIS be open to all parties with consideration of the data priorities.

Russia had no special requests to the other parties for samples and data, but requested that all data collected for BASIS be open to all parties.

8. REPORTS, PUBLICATIONS, WORKSHOPS, AND SYMPOSIA

(a) Annual implementation plan for joint BASIS Research

The BWG agreed that a 2002 implementation plan is not necessary, because each party has developed their own BASIS plan for 2002.

(b) Annual reports and publications of BASIS results

This item will be discussed at the 2002 NPAFC Annual Meeting in Vladivostok, Russia.

(c) Workshops (e.g., review of historical Bering Sea research and data)

This item will be discussed at the 2002 NPAFC Annual Meeting in Vladivostok, Russia.

(d) BASIS Symposium

This item will be discussed at the 2002 NPAFC Annual Meeting in Vladivostok, Russia.

9. OTHER BUSINESS

The BWG agreed that BASIS needs a logo. A logo contest will be held at the 2002 CSRS meeting in Vladivostok, Russia, and the winner will receive a prize. Designs should be submitted to the BWG (Jack Helle, Chairman), and the BWG will select the winner.

10. SUMMARY REPORT

A summary report was adopted upon approval by R. Beamish of Canada, T. Azumaya of Japan, S. Sinyakov of Russia, and J. Helle of the United States.

11. ADJOURNMENT

The meeting adjourned at 4:45 p.m., May 28, 2002.

Appendix 1 to follow.

Addresses of the Participants

Canada

Richard Beamish
Fisheries and Oceans Canada
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, B.C. V9T 6N7
Canada
Tel: 1-250-756-7029
Fax: 1-250-756-7141
E-mail: beamishr@pac.dfo-mpo.gc.ca

Gerry Kristianson
Director of Public Affairs
Sport Fishing Institute
67 McKenzie Cr.
Sidney, B.C. V8L 5Y7
Canada
Tel: 1-250-656-5829
Fax: 1-250-656-5829
E-mail: kristian@islandnet.com

Marc Trudel
Fisheries and Oceans Canada
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, B.C. V9T 6N7
Canada
Tel: 1-250-756-7049
Fax: 1-250-756-7053
E-mail: trudelm@pac.dfo-mpo.gc.ca

Japan

Tomonori Azumaya
Hokkaido National Fisheries Research Institute
Fisheries Research Agency
116 Katsurakoi
Kushiro 085-0802
Japan
Tel: 81-154-92-1715
Fax: 81-154-91-9355
E-mail: azumaya@fra.affrc.go.jp

Ichiro Kanto
Fisheries Agency of Japan
1-2-1 Kasumigaseki, Chiyoda-ku
Tokyo 100-8907
Japan
Tel: 81-3-3502-8111 ext. 7171
Fax: 81-3-3592-0759
E-mail: ichiro_kanto@nm.maff.go.jp

Shigehiko Urawa
National Salmon Resources Center
2-2 Nakanoshima, Toyohira-ku
Sapporo 062-0922
Japan
Tel: 81-11-822-2341
Fax: 81-11-814-7797
E-mail: urawa@salmon.affrc.go.jp

Russia

Victor Bugaev
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683600
Russia
Tel: 7-415-212-5954
Fax: 7-415-211-2701
E-mail: Kamniro@mail.kamchatka.ru

Nikolai Chebanov
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683600
Russia
Tel: 7-415-212-4992
Fax: 7-415-211-2701
E-mail: chebanov@kamniro.kamchatka.ru

Alexander Efimkin
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690960
Russia
Tel: 7-4232-25-79-68
Fax: 7-4232-300-752
E-mail: efimkin@tinro.ru

Alexander Kurmazov
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690600
Russia
Tel: 7-4232-25-73-11
Fax: 7-4232-300-752
E-mail: KURMAZOV@mail.ru

Igor Glebov
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690960
Russia
Tel: 7-4232-25-95-04
Fax: 7-4232-300-752
E-mail: tinro@tinro.ru

Victor Lapko
State Committee for Fisheries of Russian
Federation
12, Rozhdestvensky Glv.
Moscow
Russia
Tel: 7-095-9255337
Fax: 7-095-928-4798
E-mail: lapvic@yandex.ru

Oleg Gritsenko
Russian Federal Research Institute of
Fisheries & Oceanography (VNIRO)
17, V. Krasnoselskaya
Moscow 107140
Russia
Tel: 7-095-264-8683
Fax: 7-095-264-9187
E-mail: gritsenko@vniro.ru

Alexander Rogatnykh
Magadan Res. Inst. Of Fish & Oceanography
MagadanNIRO
36/10 Portovaya St.
Magadan 685000
Russia
Tel: 7-413-222-6413
Fax: 7-413-229-7419
E-mail: tinro@online.magadan.su

Vladimir Karpenko
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683600
Russia
Tel: 7-415-212-5598
Fax: 7-415-211-2701
E-mail: Karpenko@kamniro.kamchatka.ru

Sergey Sinyakov
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683602
Russia
Tel: 7-415-211-2701
Fax: 7-415-211-2701
E-mail: mail@kamniro.kamchatka.ru

Gennady Khen
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690960
Russia
Tel: 7-4232-25-79-34
Fax: 7-4232-25-77-83
E-mail: kheng@tinro.ru

Vyacheslav Smorodin
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683602
Russia
Tel: 7-415-212-1930
Fax: 7-415-211-2701
E-mail: Smorodin@kamniro.kamchatka.ru

Maxim Koval
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683000
Russia
Tel: 7-415-212-1930
Fax: 7-415-211-2701
E-mail: Koval@kamniro.kamchatka.ru

Vladimir Sviridov
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690960
Russia
Tel: 7-4232-25-95-04
Fax: 7-4232-25-77-83
E-mail: vlad@marbio.dvgu.ru

Olga Temnykh
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley
Vladivostok 690950
Russia
Tel: 7-4232-25-95-04
Fax: 7-4232-300-751
E-mail: temnykh@tinro.ru

Natalia Varnavskaya
Kamchatka Research Institute of Fishery and
Oceanography (KamchatNIRO)
18, Nabereznaya Str.,
Petropavlovsk-Kamchatsky 683600
Russia
Tel: 7-415-212-1956
Fax: 7-415-211-2701
E-mail: Varnavskaya@kamniro.kamchatka.ru

Sergei Zolotukhin
Khabarovsk Branch of TINRO-Centre
9, Shevchenko St.,
Khabarovsk, 680000
Russia
Tel: 7-4212-38-70-21
Fax: 7-4212-38-70-21
E-mail: tinro@tinro.khv.ru

United States

Douglas Eggers
Alaska Dept. of Fish and Game,
Division of Commercial Fisheries
P.O. Box 25526
Juneau, AK 99802-5526
U.S.A.
Tel: 1-907-465-6117
Fax: 1-907-465-2604
E-mail: doug_eggerts@fishgame.state.ak.us

Jack Helle
NMFS, Auke Bay Laboratory
11305 Glacier Hwy
Juneau, AK 99801-8626
U.S.A.
Tel: 1-907-789-6038
Fax: 1-907-789-6094
E-mail: jack.helle@noaa.gov

Loh-Lee Low
Alaska Fisheries Science Center (F/AKC2)
National Marine Fisheries Service
7600 Sand Point Way, N.E.
BIN C15700-Bldg. 4
Seattle, WA 98115-0070
U.S.A.
Tel: 1-206-526-4190
Fax: 1-206-526-6723
E-mail: loh-lee.low@noaa.gov

Kate Myers
University of Washington
School of Aquatic & Fishery Sciences
P.O. Box 355020
Seattle, WA 98195-5020
U.S.A.
Tel: 1-206-543-1101
Fax: 1-206-685-7471
E-mail: kwmyers@u.washington.edu

Secretariat

Vladimir Fedorenko
Suite 502, 889 West Pender St.
Vancouver, B.C., V6C 3B2
Canada
Tel: 1-604-775-5550
Fax: 1-604-775-5577
E-mail: vladf@npafc.org

Yoshikiyo Kondo
Suite 502, 889 West Pender St.
Vancouver, B.C., V6C 3B2
Canada
Tel: 1-604-775-5550
Fax: 1-604-775-5577
E-mail: kondo@npafc.org

Svetlana Anikeeva
Pacific Fisheries Research Centre (TINRO-
Centre)
4, Shevchenko Alley, Vladivostok, 690960
Russia
Tel: 7-4232-300-752
Fax: 7-4232-300-752
E-mail: interdept@tinro.ru