

REPORT OF FISHERY SCIENCE COMMITTEE

The meeting of the Fishery Science Committee (FIS) was held from 1330-1730 hours on October 10, 2001. The Chairman, Dr. Douglas E. Hay, called the meeting to order and welcomed the participants. The meeting was attended by 9 FIS members (from 5 countries) and 13 observers (from 5 countries). All countries were represented except China (*FIS Endnote 1*). The Chairman reviewed the original agenda and noted several modifications. These included a request to FIS to discuss co-sponsorship of a Joint Meeting on *The Causes of marine mortality of salmon in the North Pacific and North Atlantic Oceans and in the Baltic Sea*, scheduled for March 14-15, 2002, in Vancouver, Canada. The agenda was approved as modified (*FIS Endnote 2*). Only agenda items with substantive comments are included in this report.

Inter-sessional meetings in 2001 (Agenda Item 3)

There were no inter-sessional meetings of FIS or its Working Groups between PICES IX and PICES X.

Travel support and cost implications (Agenda Item 4)

At PICES IX, FIS requested travel support for a member of WG 16 to attend the American Fisheries Society (AFS) meeting in Phoenix, U.S.A., but these funds were not required in 2001. In view of this, FIS suggested that an equivalent level of support be made available to WG 16 members to attend a proposed inter-sessional meeting of WG 16 in Qingdao, People's Republic of China, in June 2002.

Implementation of PICES IX decisions (Agenda Item 6)

The main decisions were to convene a Topic Session on *Migrations of key ecological species in the North Pacific Ocean* and to participate in

organizing a joint POC/BIO/FIS Topic Session on *The physics and biology of eddies, meanders and rings in the PICES region*, both of which occurred at PICES X.

Changes in the Chairmen's Handbook were scheduled to be reviewed by FIS members before PICES X, but this was not done. FIS decided that the proposed changes did not warrant extensive review at this time, and did not affect the way that the Committee operates.

Report of FIS WG 12 on Crabs and shrimps (Agenda Item 7)

A draft of the final WG 12 report was circulated to the Committee and to observers. The draft had been formatted to the style used in the PICES Scientific Report Series. The final report is 77 pages including tables, figures and appendices, as well as a description of crab and shrimp resources throughout the North Pacific. FIS was advised that the draft has several sections that require some editing prior to the completion. Mainly these are small items, but may need some communication among members before the report is sent to the Secretariat. These minor revisions will be completed under the direction of Dr. Glen Jamieson before November 15, 2001.

FIS accepted the final report, subject to the completion of the minor editorial items identified in the draft, and removal of the "recommendation section". The Committee noted the recommendations commented on changes in membership of PICES nations and suggestions about the organization of PICES Working Groups. While some of the recommendations may have merit, FIS felt they exceeded the mandate of WG 12, and therefore should not be included in the report. On the completion of the report, the FIS Chairman will forward it to the Science Board and, in an accompanying letter, make note of these

recommendations, so that they are part of the record but not part of the report. This suggestion was endorsed by Dr. Jamieson, who represented the Working Group at the FIS meeting.

FIS noted that the report is long, thorough and well done. The report represents a substantial effort by some individuals, and FIS thanks them for their contributions. In this regard, FIS recommends that at the front of the report, the authors be identified and that sources of contributed material be acknowledged.

Progress report of WG 16 on *Climate change and fisheries management* (Agenda Item 8)

The Working Group 16 met in Victoria on October 6, and substantial progress was made (*FIS Endnote 3*). WG 16 expects to produce a draft report in August 2002, following a proposed inter-sessional meeting in Qingdao, approximately in June 2002. Dr. Tokio Wada was replaced as the WG 16 Co-Chairman by Dr. Akihiko Yatsu of the National Research Institute of Fisheries Science. Dr. Yatsu is an active member of BASS and a member of a Working Group of GLOBEC-SPACC.

Co-sponsored meetings and relationships with other organizations (Agenda Item 9)

Study Group Report on *North Pacific Ecosystem Status Report and Regional Analysis Center*

A Study Group report (written by 9 authors including FIS representative Dr. Chang-Ik Zhang) was reviewed by FIS (*SB Endnote 7*). At PICES IX, FIS endorsed the concept of an Ecosystem Status Report but was not prepared to endorse the Regional Analysis Center without further information. In the review of the Study Group report, FIS again endorsed the concept of the Ecosystem Status Report, but noted some uncertainties, and commented that the report may develop in different ways in different areas. The Study Group report does not clarify who would prepare the report: the Regional Analysis Center or some other agency? The cost implications of these proposals and the specific involvement of PICES in the Ecosystem Status Report have not been well defined. It is also not

clear to FIS what the next steps will be in the development of the Ecosystem Status Report, but it was suggested that the proposed schedule appears too ambitious. On the other hand, FIS noticed that this approach is being adopted by many nations and the preparation of such a report represents an important step towards the development of an ecosystem-based management.

Joint Meeting on *Causes of marine mortality of salmon*

FIS supported PICES' co-sponsorship of this meeting (*SB Endnote 5*) with NPAFC, NASCO, IBSFC and ICES, with the understanding that there are likely to be financial commitments related to this co-sponsorship, and also recommended the inclusion of a PICES representative on the Organizing Committee. The representative to the Organizing Committee could be a member of FIS, or some other scientist within PICES with appropriate expertise. FIS noted that the agenda appeared extremely broad for a 2-day meeting, and suggests that the meeting should attempt to develop more focus. The Committee would be prepared to comment on a draft agenda.

Pacific climate/fisheries Workshop

FIS endorsed PICES' co-sponsorship for and the attendance of a Science Board member to the workshop whose major sponsors include the International Research Institute for Climate Prediction, Columbia University, and the International Pacific Research Center, University of Hawaii (*SB Endnote 4*).

Symposium on *North Pacific transitional areas*

FIS endorsed the proposal from the Science Board Chairman to participate in a Symposium on *North Pacific transitional areas*, to be convened in La Paz, Mexico, in April 2002, to encourage exchange between PICES and Mexico on issues of common interest (*SB Endnote 6*). FIS encourages fisheries topics to be included. A co-convenor from FIS could be a useful addition to the agenda.

PICES/FIS-ICES collaboration

PICES and ICES have a Memorandum of Understanding on scientific cooperation. A

suggestion was made to the Chairman of FIS for PICES to consider a joint meeting on small pelagic fishes, noting that PICES/BIO is co-organizing a joint ICES/PICES/GLOBEC Symposium on *Role of zooplankton in global ecosystem dynamics: Comparative studies from the world oceans* in Gijón, Spain, in May 2003. In principle, FIS endorsed collaborative inter-sessional workshops/symposia with ICES but felt that more time would be needed to develop potential topics. The Committee would consider the opportunities for such collaborative workshops in the future.

Other potential joint activities

FIS noted that there may be potential for BASS-NPAFC linkages and collaborations in the future.

Reports from FIS members (Agenda Item 10)

Insufficient time precluded verbal reports from FIS members.

New Working Groups (Agenda Item 11)

The Chairman pointed out that a new Working Group could be established in 2002, and that topics should be developed as proposals in the following year. FIS discussed plans to form a new Working Group in 2003 titled: *Ecosystem considerations in fisheries management*. This Working Group would reconsider the impacts of fishing and other human interventions on ecosystem structure (*FIS Endnote 4*).

Proposed FIS Topic Sessions, joint Topic Sessions and Annual Meeting themes for 2002 and 2003 (Agenda Item 12)

Comments and recommendations for PICES XII Annual Meeting theme

FIS endorsed the overall theme of *Human dimensions of ecosystem variability* for PICES XII in 2003 (*SB Endnote 10*), and suggested that four to five presentations should be focused on the implications of fisheries management decisions in sustaining the structure and function of marine ecosystems. FIS recommended that

fisheries management paradigms be re-examined in light of evidence that marine communities are reorganized after sustained shifts in ocean climate. The PICES XII theme will complement several ongoing activities within FIS, including a joint Topic Session with POC on *The nature, detection and impact of regime shifts in physics and biology* proposed for PICES XI.

Discussion and recommendations on FIS Topic Sessions and joint Topic Sessions at PICES XI

Six proposals were presented as potential FIS-sponsored sessions in Qingdao, in 2002. Each was represented by one of the potential co-convenors in a short presentation. FIS approved all of the proposals but indicated that some could be improved with more focus. In the discussion of these proposals, FIS attempted to determine if one or more could be combined, if one or more could be presented as half-day sessions (rather than full-day sessions), and if one or more could be held at PICES XII.

Two of these proposals were for FIS Topic Sessions:

Physical forcing of walleye pollock life history and population structure: New approaches to identifying critical temporal and spatial scales. Co-Convenors: Martin Dorn (U.S.A.), Akira Nishimura (Japan) and Mikhail Stepanenko (Russia).

Comparison of the productivity of marginal seas with emphasis on the western Pacific (Japan/East Sea, Yellow Sea and East China Sea) with a focus on small pelagics. Co-Convenors: Vladimir Belyaev (Russia), Suam Kim (Korea), Hideaki Nakata (Japan) and Qi-Sheng Tang (China).

After discussion with the proponents of the proposals, FIS determined that both proposals could be accommodated with a combination of oral and poster presentations if each is allotted as a half-day session. The Committee emphatically requested that the convenors encourage and select contributions that stress innovative methods.

FIS strongly supported a joint FIS/POC full-day Topic Session at PICES XI:

The nature, detection and impact of regime shifts in physics and biology. Co-Convenors: Jacquelynne R. King (Canada) and James E. Overland (U.S.A.).

It was pointed out that this topic could provide a basis for development of a new Working Group on *Ecosystem considerations in fisheries management*, in 2003 (FIS Endnote 4). It also complements the proposed PICES XII theme of *Human dimensions of ecosystem variability*.

FIS supported the proposal for a joint BIO/POC/FIS Topic Session, and hopes that it can be included in PICES XI:

The importance of biophysical coupling in concentrating marine organisms around shallow topographies. Co-Convenors: Richard D. Brodeur (U.S.A.), John F. Dower (Canada), David L. Musgrave (U.S.A.) and Orio Yamamura (Japan).

The following two proposals were described based on written notes:

A joint BIO/CCCC/FIS Topic Session on *Responses of upper trophic level predators to variation in prey availability: An examination*

of trophic level linkages. Co-Convenors: Hidehiro Kato (Japan), Elizabeth A. Logerwell (U.S.A.) and Gordon A. McFarlane (Canada).

A joint BASS/FIS Topic Session on *Role of predation in the regulation of populations (incorporation of ECOSIM into management strategies)*. Convenors: Gordon A. McFarlane (Canada) and others to be determined.

In general, FIS approved these topics, but noted that they could be combined, perhaps as a joint Topic Session for PICES XII (2003).

Other business

The new Science Board Chairman challenged FIS to develop a Strategic Plan over 2002. Such a plan would consider what FIS would like to achieve during the next few years. Although vague, this challenge was accepted, and FIS will produce the new Strategic Plan before the next PICES meeting in 2002.

Best Presentation Award

Dr. David Hyrenbach (Point Reyes Bird Observatory, U.S.A.) won the FIS Best Presentation Award for his paper entitled "Oceanographic habitats of two sympatric North Pacific albatrosses: Scale-dependent processes".

FIS Endnote 1

Participation List

Members:

Richard J. Beamish (Canada)
George Boehlert (U.S.A.)
Douglas E. Hay (Canada, Chairman)
Anne B. Hollowed (U.S.A.)
Jin-Yeong Kim (Korea)
Suam Kim (Korea)
Gordon Kruse (U.S.A.)
Victor Lapko (Russia)
Kei-ichi Mito (Japan)
Takashi Minami (Japan)
Laura Richards (Canada)

Observers:

Kenji Asano (Japan)
Vladimir Belyaev (Russia)
Bill Clark (U.S.A.)
Yukimasa Ishida (Japan)
Jacquelynne R. King (Canada)
Jae-Bong Lee (Korea)
Patricia Livingston (U.S.A.)
Gordon A. McFarlane (Canada)
David Meerburg (Canada)
Tokio Wada (Japan)
Yasunori Sakurai (Japan)
Akihiko Yatsu (Japan)
Inja Yeon (Korea)

FIS Endnote 2

FIS Meeting Agenda

1. Welcome and introduction of members
2. Approval/modification of the agenda
3. Inter-sessional meetings in 2001
4. Travels support and cost implications
5. Publications of reports and cost implications
6. Implementation of PICES IX decisions
7. Report of FIS WG 12 on *Crabs and shrimps*
8. Progress report of WG 16 on *Climate change and fisheries management*
9. Co-sponsored meetings and relations with other organizations
10. Scientific items of interest – reports from FIS members
11. New Working Groups
12. Proposals/topics/issues for the Topic Session at PICES XI (October 2002)
13. Discussion of any other arising issues
14. Draft report and FIS recommendations to Science Board

FIS Endnote 3

Interim Report of Working Group 16 on *Climate change, shifts in fish production, and fisheries management*

The Working Group meeting was convened at 13:30 on October 6, 2001, by Co-Chairman, Dr. Richard J. Beamish.

Members present:

Canada	Richard J. Beamish, James Irvine Jacquelynne R. King,
China	No representatives attending
Japan	Akihiko Yatsu
Korea	Suam Kim
Russia	No representatives attending
U.S.A.	George Boehlert, Bill Clark (for Steven R. Hare)

Observers present:

Gordon (Sandy) A. McFarlane (Canada)
R. Ian Perry (Canada)

Introduction

Dr. Beamish welcomed the participants and provided an agenda for the meeting. Dr. Boehlert agreed to serve as rapporteur. The agenda was agreed upon, and a discussion of progress of the Working Group to date was made. For a variety of reasons, WG 16 has been unable to meet the objectives set forth in its meeting at PICES IX. As a result, the workshop scheduled for PICES X was cancelled, and an important objective of this meeting was to develop a Workplan to complete the Working Group's duties within the next year. Participants

agreed on the importance of the Working Group's work, specifically, to examine potential impacts of climate change on major fisheries of the subarctic North Pacific.

WG 16 Co-Chairman

It was noted that the Co-chairman of WG 16, Dr. Tokio Wada, had changed affiliations and was no longer able to serve as a Co-Chairman or member of this Working Group. It was recommended that Dr. Yatsu replace Dr. Wada as WG 16 Co-Chairman.

Future activities of WG 16

Dr. Beamish outlined a potential approach for the coming year. He recommended a report with three principal sections, specifically:

1. Trends in fishery landings for the subarctic North Pacific.
2. Analysis of the effects of fisheries and natural variability on important stocks in the North Pacific.
3. Potential effects of greenhouse-gases based warming on the fisheries of the North Pacific.

He suggested that an inter-sessional workshop would be required to complete this work, and that the end product would be the report, which

after review by FIS and approval by PICES, could be published, potentially as a book.

The Working Group discussed the kinds of assessments of climate change and its effects that are available, including those from the International Panel on Climate Change (IPCC). National assessments are available from the US, Canada, and Japan, and all participants were urged to review some of this documentation, particularly sections related to the North Pacific and its fisheries. Regional assessments are also available for the US, and it was noted that the document for the Pacific Northwest contains especially good information relative to fisheries. There was also discussion of the recent (August 2001) symposium on *Effects of global climate change on fisheries* at the annual meeting of the American Fisheries Society. Several aspects of that meeting, and papers presented there, were appropriate to the objectives of this Working Group.

Developing a Working Group report

Discussions of the Working Group report were done by section.

Section 1: *Trends in fishery landings for the subarctic North Pacific.* Needed for this section will be a decision on the species to consider, and also a compilation of all available catch data by nation. The goal is to compile a database of reliable information. Each country should consider the most important species to be included. Dr. Beamish provided an example with Canadian data, selecting as important, those species that represented 77% of the total value of landings in 2000. The Working Group discussed criteria for national species selection as including proportion of landings value, proportion of landings biomass, and “special interest species” that are of particular concern for reasons that might be unrelated to value or biomass (for example species formerly supporting a large fishery).

A discussion of the index years for important species ensued. It was suggested that a four-year average of value and catch, from 1996 to 1999, be used. Dr. Beamish noted that three was

a nicer number than four, and the three-year period from 1997 to 1999 was accepted. Dr. Beamish also volunteered to take the lead on this section and to send the results out to national members for their comments.

Questions and discussions included the use of FAO data and discussions with FAO, whether to use biomass data if they were available from stock assessments. There was also some question as to the information required. For example, should there be a spatial component to these data? It was suggested that this would not be needed for section 1 but might be important for section 2. It was noted, however, that documentation of all data would be highly important.

Section 2: *Analysis of the effects of fisheries and natural variability on important stocks in the North Pacific.* This section of the report will document how fishing and natural variation affect the fluctuation of fish populations. This will require analyses of the data collected in section 1 for selected species, as well as any other data that might be available. The species considered will be far less comprehensive than in section 1. It was suggested that the species synopses submitted to WG 16 by the national members should be distributed as a first approach to begin the process of identifying a smaller number of species. The following were suggested as being of interest nationally:

- Canada: Sablefish, herring, hake, sockeye salmon, prawns
- China: To be determined later
- Korea: Small yellow croaker, hairtail, saury, macroalgae
- Japan: Chum salmon, jack mackerel, anchovy, chub mackerel, squid (*Todarodes*)
- Russia (tentatively recommended by Chairman): Pink salmon, pollock, Pacific cod, Kamchatka crab
- United States: Halibut, sardine, coho salmon, Pacific ocean perch, crab

Dr. Yatsu recommended that a template be developed to serve as guidance for writing up the species accounts, and the Working Group

accepted. Dr. Yatsu agreed to take on the task of circulating a draft template for comment.

Section 3: Potential effects of greenhouse-gases based warming on the fisheries of the North Pacific. The objective of this section is to develop an analysis of how North Pacific fisheries will respond to greenhouse gas-induced scenarios of climate change. The multiplicity of climate change models and scenarios were discussed, and it was agreed to focus on perhaps 2 scenarios, most likely from the IPCC, since there are no currently agreed forward looking scenarios developed in other components of PICES. The possible species lists for this work would probably be a subset of that developed in section 2, dependent upon the types of data available for those species. In addition, this section should consider guilds or assemblages of species, particularly ideas about species groups replacements that may occur under scenarios of climate change.

FIS Endnote 4

Proposed topic of a new Working Group to be established in 2003

Proposed Title: *Ecosystem considerations in fisheries management*

This Working Group will incorporate new information on decadal scale shifts in ocean condition and re-examine interpretations of fishing effects in light of this information. Working Group members will consider papers that identify how climate variability impacts the structure and function within marine ecosystems

Timetable for developing WG work product:

November 30, 2001: WG members to send list of species for Section 2 to Dr. Beamish, who will distribute it to WG. Background information on these species could also be provided.

February 28, 2002: Complete draft of Section 1 (Beamish) and distribute for comment and revision to WG members.

June 2002: Convene a 3-day inter-session workshop to present and finalize the write-ups for Section 2, and to discuss outline for Section 3 and make writing assignments. Location: suggested to be in Asia to maximize WG member participation.

August 30, 2002: Complete draft report and distribute among WG members for discussion.

October 2002: Distribute report at PICES XI; approval for publication.

and how changes in climate variability trigger community re-organization. The Working Group will examine whether fisheries management decisions alter the intensity of, and temporal/spatial pattern of, community re-organization. The proposed joint FIS/POC Topic Session at PICES XI and the Working Group formation in 2003, will have strong linkages to the proposed PICES XII theme of *Human dimensions of ecosystem variability*.

