

## REPORT OF FISHERY SCIENCE COMMITTEE

The meeting of the Fishery Science Committee (FIS) was held during 14:00–18:00 h on October 27, 2010. Chairman Mikhail Stepanenko and Vice-Chairman Gordon Kruse called the meeting to order and welcomed the participants. The meeting was attended by 13 FIS members plus 20 observers (*FIS Endnote 1*). All PICES member countries were represented. Dr. Kruse served as rapporteur. The agenda was adopted without modification (*FIS Endnote 2*).

### AGENDA ITEM 3

#### **2010 FIS Best Oral Presentation and Poster awards**

Volunteers were sought for FIS awards to be given during PICES-2010. Drs. Stepanenko and Kruse agreed to serve as the awards committee for FIS Best Oral Presentation by an early career scientist. The PICES Best Oral Presentation award was given to Hye-Min Park (Pukyung National University, Korea) for her presentation, titled “*Vertical distribution and reproductive aspects of caridean shrimps in the deep-water of the East Sea, Korea*” (FIS Paper Session). Drs. John Field and Laura Brown agreed to serve as the awards committee for FIS Best Poster. The PICES Best Poster Presentation award was given to Yuichiro Kogura (Hokkaido University, Japan) for his presentation, titled “*Genetic population structure of lacustrine sockeye salmon, *Oncorhynchus nerka*, in Japan*” (FIS Paper Session). This year’s selections were chosen from FIS Topic Session S5, FIS/MEQ Topic Session S7, and the FIS Contributed Paper Session.

### AGENDA ITEM 4

#### **FIS Chairman’s report: Implementation of PICES-2009 decisions**

##### *PICES-2010 sessions*

At PICES-2010, FIS sponsored the following sessions:

- ¾-day Science Board Symposium (October 25) on “*North Pacific ecosystems today, and challenges in understanding and forecasting change*” (S1),
- ½-day FIS Topic Session (October 27) on “*Oceanographic and demographic processes affecting the reproductive biology of exploited marine stocks*” (S5),
- 1-day FIS/BIO Topic Session (October 28) on “*Observations of ecosystem mixing under climate change*” (S6),
- 1-day FIS/MEQ Topic Session (October 26) on “*Economic relation between marine aquaculture and wild capture fisheries*” (S7),
- 1-day FIS Contributed Paper Session (October 29),
- 1-day FIS/POC/BIO Topic Session (October 26) on “*Impact of climate variability on marine ecosystems: Understanding functional responses to facilitate forecasting*” (S8),
- ½-day MEQ/FIS Topic Session (October 29) on “*New and emerging technologies: Applications of genomics for marine ecosystem studies*” (S10),
- ½-day MEQ/FIS Topic Session (October 29) on “*Identifying vulnerable marine ecosystems in the North Pacific*” (S11),
- ½-day FIS Workshop (October 23) on “*Beyond Lagrangian: Modeling migratory fish behavior in Global Circulation models*” (W2).

Summaries of these sessions and workshop can be found in the *Session Summaries* chapter of the PICES Annual Report.

*International symposia*

PICES is co-sponsoring the upcoming Lowell Wakefield Fisheries Symposium, titled “*Ecosystem 2010: Global progress on ecosystem based fisheries management*” to be held in Anchorage, Alaska (U.S.A.) from November 8–11, 2010. Dr. Kruse is chairing the Steering Committee and Dr. Chang-Ik Zhang is the PICES representative on the Steering Committee (FIS). FAO, ICES, PICES, NMFS, Alaska Department of Fish and Game, NPFMC and University of Alaska Sea Grant are co-sponsors. Drs. Zhang (FIS) and Mitsutaka Makino (MEQ) are invited speakers. The peer-reviewed proceedings will be published by Alaska Sea Grant.

The Joint PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (WG-FCCIFS) convened a PICES/ICES/FAO Symposium, titled “*Climate change effects on fish and fisheries: Forecasting impacts, evaluating ecosystem responses, and evaluating management strategies*” in Sendai, Japan, from April 26–29, 2010. The response to this symposium exceeded the expectations of the Convenors, with 208 oral and 105 poster presentations from scientists from 40 countries.

*Publications*

The following FIS-related PICES publications are either under preparation or have been published:

- Jamieson, G., P. Livingston, and C.I. Zhang. 2010. *Report of Working Group 19 on Ecosystem-based Management Science and its Application to the North Pacific*. PICES Scientific Report 37. 166 p.
- Papers from a FIS Topic Session at PICES-2009, titled “*Ecosystem-based approaches for the assessment of fisheries under data-limited situations*”, are being reviewed for publication in a special issue of the journal, *Fisheries Research*. The editors are Pat Livingston, Gordon Kruse, and Laura Richards.
- Papers are currently under review from the Symposium on “*Climate Change Effects on Fish and Fisheries: Forecasting Impacts, Evaluating Ecosystem Responses, and Evaluating Management Strategies*” held in Sendai, Japan, from April 26–29, 2010. Selected papers will be published in a special issue of the *ICES Journal of Marine Science* in July 2011.
- *Marine Ecosystems of the North Pacific Ocean, 2003–2008*. 2010. S.M. McKinnell and M.J. Dagg, editors. PICES Special Publication 4, 393 p. FIS Committee members contributed to the Bering Sea and other chapters.

AGENDA ITEM 5

**Status reports of FIS-sanctioned groups**

Joint PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (WG-FCCIFS)

Co-Chairman of ICES/PICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (WG-FCCIFS), Dr. Suam Kim, provided a summary of the Working Group’s activities. This Working Group was extremely active in 2010. Highlights included the International Symposium on “*Climate Change Effects on Fish and Fisheries: Forecasting Impacts, Evaluating Ecosystem Responses, and Evaluating Management Strategies*” (Sendai, Japan, April 29–30, 2010). The symposium and a subsequent publication will advance understanding within the scientific community of the potential effects of climate change on fish and fisheries. Key findings from the meeting were summarized in PICES Press: ([http://pices.int/publications/pices\\_press/volume18/v18\\_n2/PICES\\_Press18\\_FULL.pdf](http://pices.int/publications/pices_press/volume18/v18_n2/PICES_Press18_FULL.pdf)). Another major highlight included the 1-day FIS/POC/BIO Topic Session at PICES-2010 on “*Impact of climate variability on marine ecosystems: Understanding functional responses to facilitate forecasting*” (S8).

WG-FCCIFS requested several actions of the FIS Committee:

1. Funding for two PICES scientists from Asian countries to attend a workshop on “*Biological consequences of decrease in sea ice in Arctic and Sub-Arctic Seas*” at the 2<sup>nd</sup> ESSAS Open Science Meeting in Seattle (May 22–26, 2011). Convenors: Harald Loeng (Norway) and Anne Hollowed (U.S.A.).
2. Two scientists to be funded to attend the an ICES 2011 ASC Theme Session on “*Atmospheric forcing of the Northern Hemisphere ocean gyres, and the subsequent impact on the adjacent marine climate and*

- ecosystems*” to be convened by Drs. Emanuele Di Lorenzo (U.S.A., PICES) Ichiro Yasuda (Japan, PICES) Hjálmar Hátún (Faroe Islands, ICES) and Jürgen Alheit (Germany, ICES).
3. PICES’ support and endorsement for a 1-day theme session during the International Symposium on “*Effects of climate change on the world’s oceans*” in Yeosu, Korea (May 15–19, 2012).
  4. PICES’ support for an ICES Symposium on “*Forage Fish Interactions and Ecosystem Approach to Fisheries Management*” to be held in Nantes, France, from September 10–14, 2012 to be convened by Dr. Myron Peck (ICES).
  5. WG-FCCIFS may consider an endorsement by ICES and PICES of the addition of 1–2 new working group members who would represent an emerging new South Pacific marine science organization.
  6. It was proposed to merge ICES SSICC (ends December 2010) and ICES-PICES WG-FCCIFS (ends December 2011) to address a joint ICES/PICES strategic initiative on climate effects.

#### Strategic Initiative on Stock Assessment Methods (SISAM)

During the summer of 2010, PICES was invited to join ICES in a Strategic Initiative on Stock Assessment Methods (SISAM). Two PICES members were nominated: Dr. William (Buck) Stockhausen (Alaska Fisheries Science Center, NMFS, U.S.A.) and Dr. Norio Yamashita (Hokkaido National Fisheries Research Institute, FRA, Japan). On behalf of Dr. Yamashita, Dr. Akihiko Yatsu provided a summary of the activities of SISAM. A Workshop on “*Reviews of recent advances in stock assessment models worldwide*”, chaired by Drs. Coby Needle (UK) and Chris Legault (U.S.A.), met at IFREMER, Nantes, France, from September 27 to 1 October 2010 to collate, review and comment on stock assessment methods currently in use around the world. The workshop included 32 participants, including 18 participants from the PICES member countries of Canada, Japan, Russia, and U.S.A. Following this initial workshop, planning will start for a world workshop in 2012 on stock assessment methods with invited and contributing scientists. The objective of the conference would be to determine the state-of-the art for stock assessment methods around the world. The final product will be a series of published papers in the *ICES Journal of Marine Science* and an ICES Cooperative Research Report review of state-of-the-art stock assessment methods and repository of stock assessment methods in 2013. The Initiative is a 3-year plan of wide-ranging work in which PICES can contribute.

#### MEQ/FIS Working Group on *Environmental Interactions of Marine Aquaculture* (WG 24)

WG 24 Co-Chairman, Dr. Brett Dumbauld, provided an oral report and written report (see WG 24 report elsewhere in the PICES 2010 Annual Report) on the activities of Working Group 24. During 2010, Dr. Dumbauld was appointed as Co-Chairman to replace retiring Dr. Kevin Amos. This Working Group began in 2008 and its first face-to-face meeting during PICES-2009 in Jeju, Korea resulted in all PICES member countries sharing information on the key production methods and species, upon which subsequent work is planned. This Working Group was not too active in 2010. A plan was discussed to achieve the objectives described in the Terms of Reference (TOR) by the end of WG 24’s term at PICES-2011. The first TOR addresses modeling and assessing interactions on marine aquaculture. This involves a review of long- and short-term, near- and far-field effects of aquaculture on benthic communities, including chemical and physical changes, and rate of ecosystem recovery. Co-Chairman, Dr. Katsuyuki Abo, is leading this effort. Each PICES member country is to review approaches related to their primary forms of culture. First drafts are due by April 1, 2011. The second TOR will address risk assessment methods. Work to be done includes updating and finalizing an overview of risk assessment approaches and relative legislative frameworks for sustainable marine aquaculture. The deadline for reports is November 30, 2010 (This date was extended to December 15, 2010; see WG 24 report.). Beyond this, there are no additional plans for work under this TOR. The third TOR addresses aquatic animal disease of aquaculture concern. This will involve listing the diseases of concern, description of diagnostic programs, identification and detection methods, former and ongoing research efforts, and ongoing issues and risks. Dr. Laurie Gustafson (U.S.A.) is leading this effort. Overviews will be developed for each member country, and drafts are due April 1, 2011. The need for ongoing participation from China was discussed, and FIS member, Dr. Xin (China), offered his assistance to securing appropriate participation from China. The FIS Committee looks forward to the successful completion of the TOR of WG 24, as well as their advice on approaches to incorporate aquaculture science into the PICES FUTURE program.

WG 24 proposed a 1-day MEQ/FIS Topic Session on “*Environmental interactions of marine aquaculture in the North Pacific: Alterations and indicators of benthic effects and health of both cultured and wild stocks*” (later renamed “*Identification and characterization of environmental interactions of marine aquaculture in the North Pacific*” and set for a ½ day) for PICES-2011 (WG 24 Endnote 5). The Working Group seeks PICES funding for two invited speakers.

AGENDA ITEM 6

**Relations with other programs and organizations**

*International Council for the Exploration of the Sea (ICES)*

Dr. Harald Loeng presented a report from the International Council for the Exploration of the Sea (ICES). He discussed the new ICES Science Plan, which has three teams: understanding ecosystem function, understanding human activities with ecosystem function, and development of options for sustainable use of ecosystems. New strategic initiatives include climate change, biodiversity, area-based science and management, and stock assessment methods.

Two ICES/PICES workshops were proposed:

- “*Reaction of Northern Hemisphere ecosystems to climate events: A comparison*” (Hamburg, Germany, May 2–6, 2011).
- “*Biological consequences of decrease in sea ice in Arctic and Sub-Arctic Seas*” (Seattle, U.S.A., May 22, 2011).

Three joint ICES/PICES theme sessions were proposed for the ICES Annual Science Conference in Gdansk, Poland, in 2011:

- a. “*Atmospheric forcing of the Northern Hemisphere ocean gyres, and the subsequent impact on the adjacent marine climate and ecosystems*” with Convenors: Jürgen Alheit (Germany), Hjálmar Hátún (Faroe Islands), Emanuele Di Lorenzo (U.S.A.), and Ichiro Yasuda (Japan).
- b. “*Recruitment processes: Early life history dynamics – from eggs to juveniles*” with Convenors: Richard Nash (Norway) and Edward Houde (U.S.A.).
- c. “*Atlantic redfish and Pacific rockfish: Comparing biology, ecology, assessment and management strategies for *Sebastes spp.**” with Convenors: Benjamin Planque (Norway), Paul Spencer (U.S.A.), Christoph Stransky (Germany) and Steve Cardin (U.S.A.).

*International Pacific Halibut Commission (IPHC)*

Dr. Juan Valero presented a report from the International Pacific Halibut Commission (IPHC). IPHC was established in 1923, and has been conducting an annual longline survey since 1925. The survey is used to develop an annual stock assessment for Pacific halibut. During the survey, IPHC collects bycatch and other data. It also conducts other research studies, such as pop-up tag studies, rockfish monitoring along U.S. west coast, bycatch studies, electronic monitoring, contaminants, and other special projects.

*International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC)*

Dr. Jae Bong Lee presented a report of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC). ISC was established in 1995 to provide advice on highly migratory species. The seven ISC member countries include five PICES countries: Canada, China, Japan, Korea, and U.S.A. ISC strives to enhance scientific research, international cooperation, and a scientific basis for management, and has established five working groups on sharks, billfish, albacore tuna, Pacific bluefin tuna, and statistics. Their activities tend to focus on calculation of BRPs and stock assessments. ISC intends to hold its next Plenary in the U.S. in July 2011. Collaborative work includes information for both PICES North Pacific Ecosystem Status Reports (PICES Special Publications 1 and 4) on tunas, provided by the ISC. PICES activities of interest to ISC include characterizing changes in oceanographic conditions and causal mechanisms, development of environmental time series, and development of bioeconomic reference points. An invitation was also extended to PICES scientists to become involved in stock assessments and workshops.

*Northwest Atlantic Fisheries Organization (NAFO)*

Dr. Vladimir Shibanov presented a report of the Northwest Atlantic Fisheries Organization (NAFO) and its history. Established in 1949, the International Commission for the Northwest Atlantic Fisheries (ICNAF) was replaced by NAFO 1979. The new organization stemmed from the establishment of the 200 mile limit. Fourteen member countries make up the Organization, and the area covered includes the NW Atlantic. The EEZ coastal states are comprised of Canada, U.S., Greenland, and France (St. Pierre/Miquelon). The NAFO Scientific Council is comprised of four standing committees.

*North Pacific Anadromous Fish Commission (NPAFC)*

Dr. Jin Yeong Kim presented a report from the North Pacific Anadromous Fish Commission (NPAFC). The NPAFC annual meeting was held in November 2009 in Niigata, Japan. NPAFC developed a new Science Plan for 2011–2015 which entails international cooperative research involving five research components: (1) migration and survival mechanisms of juvenile salmon in ocean ecosystems, (2) climate impacts on Pacific salmon production in the Bering Sea (BASIS) and adjacent waters, (3) winter survival of Pacific salmon in North Pacific Ocean ecosystems, (4) biological monitoring of key salmon populations, and (5) development and applications of stock identification methods and models for management of Pacific salmon. NPAFC is planning an International Workshop on “*Production Trends of Pink and Chum Salmon: Why They Can Retain High Abundance?*” [later renamed to “*Explanations for the high abundance of pink and chum salmon and future trends*”] for October 30–31, 2011 or April 22–23, 2012 in Nanaimo, Canada, and seeks PICES to be a co-sponsor.

*North Pacific Research Board (NPRB)*

Dr. Clarence Pautzke reported on the North Pacific Research Board (NPRB). He reported that the FIS Action Plan overlaps considerably with activities of NPRB. NPRB, funded by U.S. federal funds, focuses on pressing fishery management issues and marine ecosystem information needs. In general, funds are allocated as: 30% GOA, 60% BSAI, and 10% Arctic aligned with Large Marine Ecosystems. In addition, NPRB has developed integrated ecosystem research programs for the Bering Sea and Gulf of Alaska. A Request for Proposals is released each October and proposals are reviewed in spring. NPRB has funded studies on most topics in the FIS Action Plan. NPRB funds an average of \$3.5–4.0 million annually. In addition, NPRB has funded scientists to attend the Symposium on “*Climate Change Effects on Fish and Fisheries: Forecasting Impacts, Evaluating Ecosystem Responses, and Evaluating Management Strategies*” held in Sendai, Japan (April 26–29, 2010) as well as ESSAS Open Science Meetings. Annual RFP is \$3.5 million going up to \$4.0 million. Every summer NPRB looks for ideas for research priorities. Ideas for collaboration include opportunities for international collaboration with U.S. scientists on NPRB research, identification of research priorities, coordination of the annual Ecosystem Considerations Chapter prepared annually for the NE Pacific, with periodic updates of the PICES Ecosystem Status Report.

*Pacific Fishery Management Council (PFMC)*

Mr. Michael Burner presented a report on the Pacific Fishery Management Council (PFMC). The PFMC is a fishery management organization for federal fisheries off the U.S. west coast. In addition to single-species FMPs, PFMC is developing an ecosystem-based fishery management plan. This plan is loosely patterned after the Aleutian Islands Fishery Ecosystem Plan of the North Pacific Fishery Management Council, except that it may have some regulatory actions associated with it to protect rockfish. The PFMC routinely puts out a document on its research and data needs, which is available from the PFMC website ([www.pcouncil.org/resources/research-and-data-needs](http://www.pcouncil.org/resources/research-and-data-needs)). Other items of interest include the desire to develop an approach to evaluate benefits of management tools to achieve ecosystem-based fishery management objectives, an annual ecosystem status report, identification of key indicators to predict salmon early ocean survival and groundfish recruitment, development of indices of ecosystem state, and the need for models of environmental variability and human effects to establish harvest strategies and assess risk.

AGENDA ITEM 7

**Proposals for FIS Topic Sessions and workshops at PICES-2011, theme sessions at ICES ASC 2011, and inter-sessional workshops**

*PICES-2011 Topic Sessions*

The following Topic Sessions were proposed for PICES-2011:

- *Identification and characterization of environmental interactions of marine aquaculture in the North Pacific* (MEQ/FIS, ½ day). Papers submitted to this session may be considered for a special publication. (WG 24 Endnote 5)
- *Population dynamics, trophic interactions and management of cephalopods in the North Pacific ecosystems* (FIS, ½ day). (FIS Endnote 3)
- *Recent changes of North Pacific climate and marine ecosystems: Implications for dynamics of the dominant species* (FIS/POC, 1 day). (FIS Endnote 4)
- *Linking migratory fish behavior to End-to-End models* (POC/FIS, ½ day). (FIS Endnote 5)
- *Impacts of hypoxia on the mesopelagic micronekton and its implications for marine food webs* (FIS/BIO, ½ day). Convenors: Tony Koslow (U.S.A.) and Chiyuki Sassa (Japan). Invited speakers TBD.
- FIS Contributed Paper Session (1 day)

The FIS Committee decided that the top priority was the FIS Paper Session, followed by the proposal of the FIS-sanctioned group, WG 24, on “*Identification and characterization of environmental interactions of marine aquaculture in the North Pacific*”. FIS also gave high priority to the proposal for a Topic Session on “*Population dynamics, trophic interactions and management of cephalopods in the North Pacific ecosystems*”. There was strong support for this Topic Session by FIS members from the western North Pacific.

For the next lower level of priority, the FIS Committee supported the idea of a fishery-climate session as a joint FIS/POC Topic session. Among the choices proposed, “*Recent changes of North Pacific climate and marine ecosystems: Implications for dynamics of the dominant species*” received the most support.

Regarding the proposal on micronekton, FIS members noted that the proposal was not so well structured and that hypoxia was not a common phenomenon in the western Pacific. The proposed topic session on migratory fish behavior did not attract much discussion among the FIS Committee.

*ICES 2011 ASC theme sessions*

The FIS Committee discussed three proposals for ICES/PICES joint theme sessions at the 2011 ICES ASC in Gdansk, Poland:

- *Surplus production models: Quantitative tools to manage exploited fisheries and compare the productivity of marine ecosystems*. Convenors: Bernard Megrey (U.S.A.), Ken Drinkwater (Norway), Jason Link (U.S.A.). Either Ian Perry (Canada) or Jennifer Boldt (U.S.A.) are willing to serve in lieu of Bern Megrey, or an alternative PICES Convenor is welcome.
- *Atmospheric forcing of the Northern Hemisphere ocean gyres, and the subsequent impact on the adjacent marine climate and ecosystems*. Convenors: Jürgen Alheit (Germany), Hjalmar Hátún (Faroe Islands), Emanuele Di Lorenzo (U.S.A.), and Ichiro Yasuda (Japan).
- *Atlantic redfish and Pacific rockfish: Comparing biology, ecology, assessment and management strategies for *Sebastes* spp.* Convenors: Benjamin Planque (Norway), Paul Spencer (U.S.A.), Christoph Stransky (Germany and Steve Cardin (U.S.A.)).

The FIS Committee supports all three ICES/PICES sessions at ASC 2011. Among these, the Committee ranked the redfish/rockfish session as top priority, followed by the surplus production session, and last, the session on gyres, noting that the gyre session may be of higher priority to the POC Committee owing to the emphasis on physical oceanography.

*Inter-sessional workshops*

- “*Production trends of pink and chum salmon: Why they can retain high abundance?*” [later renamed to “*Explanations for the high abundance of pink and chum salmon and future trends*”] planned by NPAFC for October 30–31, 2011 or April 22–23, 2012 in Nanaimo, British Columbia, Canada. NPAFC seeks PICES to be a co-sponsor.

The FIS Committee noted that this workshop would not attract much PICES participation if it is held in October 2011 because of the overlap with PICES-2011. The FIS Committee recommends that PICES should agree to be a co-sponsor, only if the meeting is held in April 2012.

- “*Biological consequences of a decrease in sea ice in Arctic and sub-Arctic seas*”. Convenors: Harald Loeng (Norway) and Anne Hollowed (U.S.A.). This 1-day workshop is proposed to be held on May 22, 2011 in conjunction with the 2<sup>nd</sup> ESSAS Open Science Meeting on “*Comparative studies of climate effects on polar and sub-polar ocean ecosystems: Progress in observation and prediction*” held from May 22–26, 2011, in Seattle, U.S.A. WG-FCCIFS requests PICES funding for two Asian scientists to participate in the workshop. Coincidentally, Dr. Kenneth Drinkwater (ESSAS) also requested funding for two senior scientists plus two early career scientists for the ESSAS OSM.

A question was asked whether the two Asian scientists for the proposed workshop could also fill the needs for two senior scientists of the ESSAS OSM. The response was that this may not necessarily be the case, as it depends on the skills and expertise of the scientists chosen. It was also noted that PICES is providing logistical support for the ESSAS OSM.

The FIS Committee endorsed the request by WG-FCCIFS to support two Asian scientists to attend the workshop proposed by WG-FCCIFS. Regarding the separate ESSAS request for support for two additional scientists from Asia plus two students or early career scientists from those countries, FIS thinks that this is reasonable. However, the Committee noted that it is already recommending support for two Asian scientists to the proposed workshop. Given funding limitations, FIS supports the funding request for travel by two early career Asian scientists to the ESSAS OSM if adequate funds are available.

- “*Reaction of Northern Hemisphere ecosystems to climate events: A comparison*”. Convenors: Jürgen Alheit (Germany), Christian Möllmann (Germany), Sukgeun Jung (Korea), and Yoshiro Watanabe (Japan). This ICES/PICES workshop is proposed for Hamburg, Germany from May 2–6, 2011. The request is for travel by two PICES scientists.

The FIS Committee is supportive of this request.

- “*Climate and oceanic fisheries, and development of climate tools for fisheries*”. This workshop is being organized by the World Meteorological Society and is planned for the Cook Islands from October 3–5, 2011.

The FIS Committee noted that this workshop has an emphasis on the Pacific region extending south of the PICES region. For this reason, this workshop proposal was rated as a lower priority than the other workshop proposals.

## AGENDA ITEM 8

**Proposals for new FIS working groups and study groups**

The FIS Committee received no new proposals for working groups. However, in the report from ICES, it was noted that the ICES SSICC will conclude in December 2010, whereas the PICES/ICES WG-FCCIFS will end in October 2011. Also, ICES is implementing a strategic science initiative for a standing body to function on activities akin to WG-FCCIFS. It was brought to the FIS Committee’s attention that there is a mismatch

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between the standing committees in ICES *versus* the PICES working groups that have a 3-year term. The FIS Committee supports the efforts of WG-FCCIFS and requests that Science Board should explore ways to extend the life of this Working Group in some form to pursue such climate-related activities jointly with ICES into the future.

WG-FCCIFS sought ICES and PICES endorsement for the addition of 1–2 new Working Group members who would represent an emerging new South Pacific marine science organization. The FIS Committee did not take action on this item, but it is raised to the attention of Science Board.

### AGENDA ITEM 9

#### **Proposals for new meetings with PICES as co-sponsor**

None.

### AGENDA ITEM 10

#### **High priority projects**

None.

### AGENDA ITEM 11

#### **Other priority items with funding implications**

It was noted that there may be extra page charges associated with the special issue of the *ICES Journal of Marine Science* associated with the PICES/ICES/FAO Symposium on “*Climate change effects on fish and fisheries: Forecasting impacts, evaluating ecosystem responses, and evaluating management strategies*” held in Sendai, Japan in April 2010. ICES and PICES should explore ways to cover these additional funding needs.

WG-FCCIFS also is exploring the possibility of publishing their 83-page workshop report as a PICES Scientific Report. The FIS Committee is supportive of this effort.

### AGENDA ITEM 12

#### **Proposed publications**

No new publications beyond those already planned.

### AGENDA ITEM 13

#### **Inter-sessional activities, meetings and requests for travel support**

ICES seeks PICES support for an International Symposium on “*Forage fish interactions and ecosystem approach to fisheries management*” to be held in Nantes, France, November 8–12, 2012 to be convened by Dr. Myron Peck (ICES). The FIS Committee understands that this request is premature and should be considered for action at PICES-2011.

Likewise, PICES was asked for support and endorsement of a 1-day theme session during the Symposium on “*Effects of climate change on the world’s oceans*” in Yeosu, Korea in 2012. The FIS Committee understands that this request is premature and should be considered at the PICES-2011 meeting.

## AGENDA ITEM 14

**Review of FIS Action Plan**

The FIS Action Plan has not been reviewed since 2007 and needs to be reviewed and updated consistent with the new FUTURE program. The FIS Committee agreed to review and revise the Action Plan once the PICES Strategic Plan has been revised.

## AGENDA ITEM 15

**Other business**

None.

**FIS Endnote 1****FIS participation List**Members

Laura Brown (Canada)  
 John Field (U.S.A.)  
 Yosuzumi Fujimori (Japan)  
 Toyomitsu Horii (Japan)  
 Xianshi Jin (China)  
 Sukgeun Jung (Korea)  
 Jin Yeong Kim (Korea)  
 Jacquelynne King (Canada)  
 Gordon Kruse (U.S.A., Vice-Chairman)  
 Libby Logerwell (U.S.A.)  
 Laura Richards (Canada)  
 Mikhail Stepanenko (Russia, Chairman)  
 Akihiko Yatsu (Japan)  
 Chang-Ik Zhang (Korea)

Observers

Heui Chun An (Korea)  
 Michael Burner (PFMC)  
 Miriam Doyle (U.S.A.)  
 Ken Drinkwater (ESSAS)  
 Brett Dumbauld (U.S.A.)  
 Doug Hay (Canada)  
 Jim Irvine (Canada)  
 Yukimasa Ishida (Japan)  
 Masahide Kaeriyama (Japan)  
 Suam Kim (Korea)  
 Jae Bong Lee (ISC)  
 Harald Loeng (ICES)  
 Erlend Moksness (Norway)  
 Jay Parsons (Canada)  
 Clarence Pautzke (NPRB)  
 Ian Perry (Canada)  
 Vladimir Shibanov (NAFO)  
 Paul Spencer (U.S.A.)  
 Ed Trippel (Canada)  
 Juan Valero (IPHC)

**FIS Endnote 2****FIS meeting agenda**

1. Welcome, attendance, rapporteur
2. Adoption of agenda
3. 2010 FIS Best Oral Presentation and Poster awards
4. FIS Chairman's report: Implementation of PICES-2009 decisions
  - PICES-2010 sessions
  - International symposia
  - Publications
5. Status reports of FIS-sanctioned groups

- 1.) WG-FCCIFS Joint PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish*
- 2.) Strategic Initiative on Stock Assessment Methods (SISAM)
- 3.) (MEQ/FIS) Working Group on *Environmental Interactions Marine Aquaculture* (WG-24)
6. Relations with other programs and organizations
  - International Council for the Exploration of the Sea (ICES)
  - International Pacific Halibut Commission (IPHC)
  - International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC)
  - Northwest Atlantic Fisheries Organization (NAFO)
  - North Pacific Anadromous Fish Commission (NPAFC)
  - North Pacific Research Board (NPRB)
  - Pacific Fishery Management Council (PFMC)
7. Proposals for FIS Topic Sessions and workshops at PICES-2011, theme sessions at ICES ASC 2011, and inter-sessional workshops
8. Proposals for new FIS working groups and study groups
9. Proposals for new meetings with PICES as co-sponsor
10. High priority projects
11. Other priority items with funding implications
12. Proposed publications
13. Inter-sessional activities, meetings and requests for travel support
14. Review of FIS Action Plan
15. Other business

### **FIS Endnote 3**

**Proposal for a ½-day FIS Topic Session at PICES-2011 on  
 “Population dynamics, trophic interactions and management of cephalopods in the  
 North Pacific ecosystems”**

In most coastal and oceanic ecosystems, cephalopods are or can be an influential driver of food web dynamics due to their rapid growth, high population turnover rates. They also represent a major, and apparently growing, fraction of total catches, both in the Northern Pacific and throughout the world’s oceans. In contrast to the generally slower population response rates of most finfish, cephalopod populations tend to exhibit boom-bust cycles, challenging traditional management strategies. As events along the West Coast of the United States and Canada have shown, they may also represent highly visible indicators of ecosystem change, and both the causes and the consequences of the jumbo squid range expansion on the California Current ecosystem are questions of growing interest as a result. This theme session will focus on the ecology and management of cephalopods in North Pacific ecosystems, specifically on the known or suspected drivers of population dynamics, and applied or potential management strategies that are (or may be) robust to such dynamics. Papers that focus on the role of cephalopods within marine ecosystems, particularly with respect to trophic interactions and the strategic management of marine ecosystems (*e.g.*, the role of cephalopods as forage versus fisheries targets, or as competitors for species targeted by commercial fisheries), are highly encouraged.

Proposed Convenors: John Field (U.S.A.), Yasunori Sakurai (Japan) and Mikhail Zuev (Russia)

Potential invited speakers: Chingis Nigmatullin (Russia, research area – ecology of ommastrephid cephalopods in pelagic food webs), Mary Hunsicker or Tim Essington (U.S.A. research area – economic and trophic role of cephalopods in global marine fisheries)

**FIS Endnote 4****Proposal for a 1-day FIS/POC Topic Session on “Recent changes of North Pacific climate and marine ecosystems: implications for dynamics of the dominant species”**

The coincidence of multidecadal-scale alternations of dominant marine fish species coupled with multidecadal-scale “Climatic Jumps” created a concept of the Regime Shift. The recently published PICES ecosystem status report noted that the frequency of these events appears to have increased and various indicators suggest that their amplitude has increased as well. The Arctic Oscillation Index, for example, reached an extreme negative anomaly during January–March of 2010, which brought a severe winter to much of the Northern Hemisphere, while other areas were warmed equivalently by the effects of the 2009/10 El Niño. The summer of 2010 saw record-setting high temperatures in some PICES member countries, accompanied by an abrupt shift in the tropics from El Niño to La Niña in July 2010. In the northwestern Pacific, after decades at low levels, sardine abundance has begun to increase while the anchovy abundance is declining; perhaps signalling a new Regime. This topic session will review recent ocean/climate variability, with particular emphasis on what has occurred from 2009 to 2010. It will focus on the major ecological components of North Pacific marine ecosystems, particularly commercially important fish species. Papers on mechanistic linkages between population dynamics of marine species and environmental conditions are especially encouraged.

Proposed Co-Convenors: Sukyung Kang (Korea), James Overland (U.S.A.), Akihiko Yatsu (Japan) and Skip McKinnell (PICES)

Invited speakers: two keynote speakers (climate-1 and fish-1)

**FIS Endnote 5****Proposal for a ½-day POC/FIS Topic Session at PICES-2011 on “Linking migratory fish behavior to End-to-End models”**

In order to understand ecosystem response to climate impacts, End-to-End modeling (E2E) approaches are essential. One of the most difficult parts for E2E is the modeling of fish behavior migration. Fish behavior can be very complex; it is a consequence of genetics, physical, chemical and biological environments and their interaction. Learned behavior may also be a factor. Recently, new technology has been introduced to tagging equipment and as a consequence data availability is vastly improved. Additionally, new technologies are used to investigate fish movements in laboratory settings. This new information is expected to improve our understanding of fish migration mechanism and contribute to the development of fish-migration models. Furthermore, the development of high-resolution ecosystem models coupled to circulation models makes it possible to simulate fish-migration in the context of realistic environmental fields. The purpose of this session is to understand the current state of development in modeling fish behavior and discuss future potential collaborations to improve fish migration models. This session anticipates presentations that discuss successes (and failures) in modeling migratory fish behavior. Presentations related to data availability for model evaluation of fish behavior are also welcome. Based on the results and opinions expressed at the session, the convenors would like to discuss the desirability of establishing a group that will focus its attention on developing and advancing the state of fish behavioral modeling.

Co-Convenors: Enrique Curchitser (U.S.A.), Michio Kishi (Japan), Shin-ichi Ito (Japan), Geir Huse (ICES) and Skip McKinnell (PICES)

Invited speakers: travel support requested for 1 invited speaker: either Wei Hao (China) or Jerome Fiechter (U.S.A.)