



# PICES FIS Committee

## Action Plan 2007

### **Mission**

The FIS Committee's area mission is to promote and coordinate fisheries science and interdisciplinary research in the northern North Pacific. This includes biology and ecology of living resources, particularly those that are subject to harvest or have the potential to be harvested.

Specific topics of interest to the FIS committee include:

- Taxonomy;
- Genetics;
- Behaviour;
- Diet and trophic relationships;
- Habitat;
- Distribution;
- Abundance;
- Ecology;
- Population dynamics;
- Regimes and global warming;
- Ecosystem dynamics;
- Aquaculture and ocean ranching; and
- Methods for stock assessment.

In considering these topics, the FIS committee endeavors to develop new concepts relating to the regulation of fish populations. A common focus is the relationships between human factors, climate, ecosystems, and fishery resources.

Given the connections between humans, climate, and fishery resources, the FIS committee's areas of interest intersect those of the other PICES committees (POC, MEQ, BIO, TCODE, and MONITOR). This Action Plan endeavors to reflect these connections.

### **Strategy of the FIS Committee**

The PICES mission has five central themes: (A) advancing scientific knowledge; (B) applying scientific knowledge; (C) fostering partnerships; (D) ensuring a modern organization in support of PICES activities; and (E) distributing PICES scientific information. Specific goals are identified within each of these themes. The actions of the FIS Committee endeavor to meet these goals.

## **Theme A. Advancing scientific knowledge**

### **Goal 1. Understand the physical, chemical, and biological functioning of marine ecosystems**

**Action 1.1** Improve our understanding of North Pacific ecology.

**Task 1.1.1** Convene a session on “Global (or North Pacific) synchrony in fish population variations” perhaps in cooperation with ICES.

**Task 1.1.2** Convene a series of scientific sessions that examine the roles of bottom-up, top-down, and middle-out controls of marine ecosystems of the North Pacific.

**Task 1.1.3** Convene a series of scientific sessions that examine the roles of various functional groups (e.g., sessile benthic invertebrates, small pelagic fishes, large predators) within marine ecosystems of the North Pacific.

**Task 1.1.4** Convene a series of scientific sessions on the biology of fish and invertebrate species of mutual interest to PICES countries.

**Task 1.1.5** Convene annual FIS Contributed Paper sessions to foster information exchange on a diversity of fisheries topics.

**Action 1.2** Improve our understanding of ecosystem function and resilience.

**Task 1.2.1** Convene a scientific session on comparative analyses of ecosystems using retrospective analyses and other methods.

**Task 1.2.2** Convene workshops or scientific sessions on identifying those systems or species for which fishing is a major factor and those species for which climate is a major factor in the regulation of fish stocks.

### **Goal 2. Understand and quantify the impacts of human activities and climate on marine ecosystems**

**Action 2.1** Evaluate and increase the knowledge and forecasts of climate effects on marine ecosystems of the North Pacific.

**Task 2.1.1** Convene a series of scientific sessions on the effects of interannual and decadal climate and ocean changes on growth, recruitment, mortality, migration and population dynamics of commercially and ecologically important species in the North Pacific Ocean.

**Task 2.1.2** Consider and evaluate the impacts of climate change on marine ecosystems of the North Pacific, including changes in predator-prey relationships, competition, habitat availability, and biodiversity.

**Task 2.1.3** Form a working group to develop indices of fish productivity that help to interpret ocean and climate effects. Include common species to contrast basin-scale responses.

**Task 2.1.4** Convene a series of scientific sessions on relationships between climate indices and fisheries resources to promote development of single-species, multi-species and ecosystem predictive models that

include forecasts of future climate and oceanographic conditions. Include estimates of uncertainty in such forecasts.

**Action 2.2** Evaluate and increase knowledge of the potential impacts of fishing on marine ecosystems of the North Pacific.

**Task 2.2.1** Convene a scientific session on impacts of bottom trawling on benthic communities and ecosystems.

**Task 2.2.2** Form a working group or conduct a workshop to document levels of fishery bycatch and discards in the North Pacific.

**Task 2.2.3** Convene a scientific session on the possible impacts of fishery bycatch and discards at the ecosystem and community level.

**Task 2.2.4** Convene a series of scientific sessions that consider other ecosystem effects of fishing, such as genetic selection and loss of genetic diversity, truncation of size/age distributions, alteration of predator-prey relationships, biological interactions between wild and hatchery fish, and other direct and indirect effects of fishing.

**Action 2.3** Develop and evaluate potential approaches toward mitigating effects of fishing on marine ecosystems.

**Task 2.3.1** Convene a scientific session to investigate the effects of marine reserves on maintenance of fished populations through recruitment, migration, and habitat preservation.

**Task 2.3.2** Convene a session on effects of alternative gear types on bycatch and habitat effects.

**Task 2.3.3** Convene a session on wild fish stock and habitat rehabilitation and enhancement methods, successes and failures.

**Task 2.3.4** Form a working group or conduct a workshop to compare stock rebuilding program in each member countries and develop cooperative work among their programs.

**Action 2.4** In cooperation with the MEQ Committee, document and evaluate the impacts of introductions of non-indigenous species (NIS) on ecosystems of the North Pacific.

**Task 2.4.1** Convene a working group to document cases of NIS introductions in PICES countries and to evaluate studies of their ecosystem effects.

**Action 2.5** In cooperation with the MEQ Committee, evaluate and increase knowledge of the potential impacts of aquaculture on ecosystems of the North Pacific.

**Task 2.5.1** Hold a scientific session on “Aquaculture and the sustainable management of the marine environment.”

**Task 2.5.2** Convene a PICES-ICES symposium on approaches to assessing environmental risk in association with aquaculture activities.

**Action 2.6** In cooperation with the MEQ Committee, develop the scientific basis for an ecosystem approach to fisheries management, including assessments and the

provision of scientific advice. Specifically, the following activities are needed:

- Task 2.6.1** Identify and evaluate the use of indicators for assessing the achievement of ecosystem-based fisheries management.
- Task 2.6.2** Convene a series of scientific sessions that consider ecosystem features, such as ecosystem carrying capacity and mechanisms for stability and disturbance.
- Task 2.6.3** Continue and expand the development of ecosystem models that facilitate the assessment of monitoring and scientific knowledge of ecosystem functions in a holistic manner.
- Task 2.6.4** Hold a series of symposia on the science of ecosystem-based fisheries management.
- Task 2.6.5** Convene a topic session on the utility of multispecies and ecosystem models to conduct management strategy evaluations.

### **Goal 3. Provide advice on methods and tools to guide scientific activities**

**Action 3.1** Develop new tools to expand historical records of variability in North Pacific climate and biota.

**Task 3.1.1** Hold a scientific session or workshop to explore alternative methods to derive historical records of North Pacific climate conditions, including chemical analysis of calcified structures such as fish otoliths and corals.

**Task 3.1.2** Convene scientific sessions that evaluate the utility of archaeological sites and paleo-proxies to reconstruct historical ecosystems.

**Action 3.2** Improve the understanding of alternative stock assessment techniques and harvest strategies and their utility for fishery management approaches.

**Task 3.2.1** Conduct a workshop to review the fisheries management approaches employed by each PICES country.

**Task 3.2.2** Conduct a workshop or topic session to review scientific knowledge of fisheries management techniques including stock assessment methods, survey design and sampling methods, and ABC and TAC management.

**Task 3.2.3** Convene a workshop or topic session on procedures for conducting management strategy evaluations.

**Task 3.2.4** Conduct a workshop or topic session to review standardization of quantitative stock assessment methods for pelagic fishes.

**Action 3.3** Improve the technologies available to study the biology and ecology of fishes and invertebrates in the North Pacific.

**Task 3.3.1** Conduct workshops and scientific sessions on new methods and technologies to study fish population genetics, age, growth, feeding, mortality, reproduction and movement in the North Pacific.

**Task 3.3.2** Convene topic sessions on new acoustic, optical, and other

- techniques to estimate fish abundance and species composition.
- Task 3.3.3** Conduct workshops and scientific sessions on new methods and technologies to study ecosystems, including food web structure and processes.

## **Theme B. Applying scientific knowledge**

### **Goal 4. Provide scientific advice towards wise use of the North Pacific Ocean**

**Action 4.1** Improve the understanding and application of alternative stock assessment techniques and harvest strategies and their utility for fishery management approaches.

**Task 4.1.1** Conduct a workshop or topic session to review quantitative stock assessment methods for application in PICES countries.

**Task 4.1.2** Conduct a workshop to review the fisheries management approaches employed by each PICES country.

**Task 4.1.3** Conduct a workshop on application of fisheries management techniques, including ABC and TAC management.

**Task 4.1.4** Begin discussions on fishery target reference points or conservation benchmarks that explicitly consider ecosystem concerns, perhaps by convening a scientific session or working group.

**Action 4.2** Assess the degree to which marine resources are robust to human uses.

**Task 4.2.1** Convene a topic session to compare how societies have adapted to ecosystem changes and changes in management procedures.

**Task 4.2.2** Convene a series of sessions or a workshop/ working group to develop risk-based ecological assessments for major fisheries that project future states, their implications, and uncertainties.

**Task 4.2.3** Convene a theme session/ workshop to discuss how the results of ecological assessments can be communicated to policy makers, managers and society.

## **Theme C. Fostering partnerships**

### **Goal 5. Promote collaboration with organizations, scientific programs, and stakeholders that are relevant to the PICES goals**

**Action 5.1** Develop formal linkages with ICES, NPAFC, IPHC and other organizations on fishery areas of common interest.

**Task 5.1.1** Periodically sponsor PICES scientists to join organizing committees and to give presentations in international symposia of

mutual interest to PICES.

**Task 5.1.2** Invite scientists from other international organizations to participate in PICES FIS-sponsored scientific sessions on topics of mutual interest for the North Pacific and North Atlantic.

**Task 5.1.3** Formalize PICES participation on symposia held by other organizations, such as ICES, NPAFC, IPHC, and others.

**Task 5.1.4** Post announcements about upcoming international fisheries symposia on the FIS website.

## **Goal 6. Promote collaboration among scientists within PICES**

**Action 6.1** Improve opportunities for young scientists.

**Task 6.1.1** Add links to the FIS website announcing graduate student opportunities in PICES-member countries.

**Task 6.1.2** Maintain FIS Contributed Paper sessions at all PICES Annual Meetings to foster young scientist participation in PICES.

**Action 6.2** Improve participation of all member countries in FIS activities.

**Task 6.2.1** Select topics for scientific sessions and working groups of broad interest among all PICES-member countries and maintain broad representation among co-convenors.

## **Theme D. Ensuring a modern organization in support of PICES activities**

### **Goal 7. Provide an effective infrastructure to support PICES programs**

**Action 7.1** None

## **Theme E. Distributing PICES scientific information**

### **Goal 8. Make the scientific products of PICES accessible**

**Action 8.1** Publish Working Group reports

**Task 8.1.1** Publish a WG 16 report (and brochure) on climate change and fisheries management in the PICES Scientific Report series.

**Task 8.1.2** Together with MEQ Committee, publish a brochure on ecosystem-based management.

**Action 8.2** Link published products to the PICES website.

**Task 8.2.1** Provide web links with information on recent publications, such as journal articles published after presentation in PICES sessions.