

REPORT OF ADVISORY PANEL ON IRON FERTILIZATION EXPERIMENT IN THE SUBARCTIC PACIFIC OCEAN

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The meeting of the Advisory Panel on *Iron fertilization experiment in the subarctic Pacific Ocean* (hereafter IFEP-AP) was held from 16:30–18:00 hours on October 13, 2006. The Panel Co-Chairman, Dr. Shigenobu Takeda called the meeting to order and welcomed the participants (*IFEP-AP Endnote 1*). The draft agenda was reviewed and adopted (*IFEP-AP Endnote 2*).

Report of the PICES XV IFEP/MODEL workshop (Agenda Item 2)

To enhance communication between experimentalists and modelers concerning the structure of iron biochemical models, IFEP-AP and the MODEL Task Team co-convened a 1-day workshop (W1) on “*Modeling iron biogeochemistry and ocean ecosystems*” at PICES XV. The workshop was held on October 13, 2006, and participation included 28 scientists from Canada, Japan, the United States of America, France and New Zealand (*IFEP-AP Endnote 2*). This workshop was co-sponsored by SOLAS (Surface Ocean–Low Atmosphere Study) who provided travel support for an invited speaker, Dr. Marie Boye (IUEM, France).

There were 7 oral presentations and 1 poster. Two talks focused on iron biogeochemistry based on observations, and 5 talks used numerical models to address the impact of iron on ecosystem dynamics. Discussion included chemical speciation of iron in seawater as well as iron released from atmospheric dust, biological availability of organically complexed iron, a conceptual model of the iron cycle in the surface ocean, and interaction between phytoplankton and zooplankton functional groups.

The workshop recommended that such communication between experimentalists and modelers who work on iron biogeochemistry

and ecosystem should continue. The summary of the workshop is included in the *Session Summaries* chapter of this Annual Report.

Report of the PICES XV BIO Topic Session (Agenda Item 3)

At PICES XV, IFEP-AP organized a 1-day BIO Topic Session (S4) on “*Synthesis of in situ iron enrichment experiments in the eastern and western subarctic Pacific*” held on October 17, 2006. The session was a compilation of results from the three successful meso-scale iron-enrichment experiments in the subarctic North Pacific, SEEDS-I, SEEDS-II and SERIES, that were initiated by IFEP-AP. The session consisted of 17 oral presentations and 7 posters. There was extensive discussion on the causes of the different responses in the 3 completed experiments. Several lines of hypothesis were set up by the participants to explain the relatively small response of diatoms in the SEEDS-II experiment. The session was very successful because it provided a comprehensive view on the role of iron as a limiting nutrient of phytoplankton production in the subarctic North Pacific, and because it established new hypotheses that should be tested in future studies. A summary of this session can be found in the *Session Summaries* chapter of this Annual Report.

Recent publications (Agenda item 4)

SEEDS-II 2005 Workshop report

A SEEDS-II (Subarctic Pacific Iron Experiment for Ecosystem Dynamics Study, Phase II) Workshop was held on October 17–18, 2005, at the Ocean Research Institute, University of Tokyo, Japan. A brief report of the workshop was published in January 2006 in *PICES Press*, Vol. 14(1).

IFEP-AP-2006

PICES Scientific Report

A *PICES Scientific Report No. 31* of the 2004 IFEP-AP workshop on “In situ iron enrichment experiments in the eastern and western subarctic Pacific” will be distributed to the PICES members after PICES XV. It includes a report and abstracts of the 2000 IFEP-AP planning workshop as appendices.

SERIES special volume

Twenty-four papers based on the results of the SERIES (Subarctic Ecosystem Response to Iron Enrichment Study) iron enrichment experiment will be published in November-December 2006, in *Deep-Sea Research II* Vol. 53 (20–22).

SEEDS-II special volume

Deep-Sea Research II or *Progress in Oceanography* were suggested as candidate journals to publish the results of the SEEDS-II experiment. Drs. Atsushi Tsuda, Mark L. Wells, Mitsuo Uematsu and Hiroaki Saito will serve as the Guest Editors for this special issue. The deadline for submission is March 1, 2007.

Future plans (Agenda Item 5)

Synthesis report of IFEP-AP

IFEP members will prepare a summary paper of SEEDS-I, SEEDS-II, and SERIES when the submission of original papers to the SEEDS-II special volume has been completed (perhaps by

March 2007). The summary paper will be submitted to *Eos* in order to attract a broad interest in the oceanographic community.

Future IFEP-AP activity

A timetable to complete IFEP-AP activities was discussed. There is no iron fertilization experiment planned. Editorial work on the SEEDS-II special volume and publication of the summary paper of SEEDS-I, SEEDS-II and SERIES may need one more year. Thus, it was recommended that the activity of IFEP-AP be closed at PICES XVI in October 2007.

IFEP-AP recognized that a new working group consisting of experimentalists and modelers would be useful to examine the causes for the different responses in the 3 completed iron enrichment experiments in the subarctic North Pacific, to set up new hypotheses on the mechanisms controlling phytoplankton production in the subarctic North Pacific based on small-scale onboard experiments and field observations, and to design and propose a large-scale experiment or field observation program to test these hypotheses.

Terms of Reference for a new working group under BIO will be prepared after PICES XV by selected members from IFEP-AP and MODEL. IFEP-AP will try to include suggestions from all PICES member countries and not only those participated in SEEDS-I, SEEDS-II, and SERIES. The new working group will be proposed to Science Board in April 2007.

IFEP-AP Endnote 1

Participation list*

Members

William P. Cochlan (U.S.A.)
 Paul J. Harrison (Canada/Hong Kong)
 Isao Kudo (Japan)
 Jun Nishioka (Japan)
 Hiroaki Saito (Japan)
 Shigenobu Takeda (Japan)
 Atsushi Tsuda (Japan, Co-Chairman)
 Mark L. Wells (U.S.A.)

James Christian (Canada)
 Hernan Garcia (U.S.A.)
 Albert J. Hermann (U.S.A.)
 Andrew King (U.S.A.)
 Maki Noguchi Aita (Japan)
 Hajime Obata (Japan)
 Atsushi Ooki (Japan)
 Sei-Ichi Saitoh (Japan)
 Taichiro Sakagami (Japan)
 Takashige Sugimoto (Japan)
 Charles Trick (Canada)
 Takaki Tsubono (Japan)
 Daisuke Tsumune (Japan)
 Thomas C. Wainwright (U.S.A.)
 Yasuhiro Yamanaka (Japan)
 Naoki Yoshie (Japan)

Observers

Harold P. Batchelder (U.S.A.)
 Philip Boyd (New Zealand)
 Marie Boye (France)
 Fei Chai (U.S.A.)

* All 28 scientists participated in the PICES XV IFEP/MODEL workshop (W1)

IFEP-AP Endnote 2

IFEP-AP meeting agenda

1. Adoption of agenda
2. Report of the PICES XV IFEP/MODEL workshop (W1) on “*Modeling iron biogeochemistry and ocean ecosystems*”
3. Report of the PICES XV BIO Topic Session (S4) on “*Synthesis of in situ iron enrichment experiments in the eastern and western subarctic Pacific*”
4. Recent publications (PICES Scientific Report, SERIES and SEEDS-II special volumes)
5. Future plans:
 - a. Synthesis report of IFEP-AP
 - b. Future IFEP-AP activity

