

# REPORT OF REX TASK TEAM

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The REX Task Team met from 8:30 – 9:45 hours on October 17, 2004. This was the last meeting of the REX Task Team because REX and BASS will become transformed into a new CCCC Task Team, CFAME. The Co-Chairmen, Drs. William T. Peterson and Yoshiro Watanabe, welcomed participants (*REX Endnote 1*) and outlined the objectives of the meeting. The agenda was reviewed and accepted (*REX Endnote 2*).

## Accomplishments of REX in 2004 (Agenda Item 1)

Dr. Peterson presented a brief summary of the REX workshop on “The seasonal cycle of plankton production in continental shelf waters around the Pacific Rim”. 45 people attended this year’s workshop. Since a detailed summary of the workshop had been already presented at the CCCC Workshop on “Linking open ocean and coastal ecosystems II” on the previous day, and since most participants of the Task Team meeting had either attended the REX workshop or the CCCC workshop, the detailed summary was not given again. The report of the workshop is included elsewhere in this Annual Report.

## Accomplishments of REX since its inception (Agenda Item 2)

A brief history of REX was prepared by Drs.

### REX Endnote 1

#### Members

Kenji Asano (Japan)  
Brenda L. Norcross (U.S.A.)  
William T. Peterson (U.S.A., Co-Chairman)  
Yoshiro Watanabe (Japan, Co-Chairman)  
Yutaka Watanuki (Japan)

Peterson and Douglas E. Hay and is appended as *REX Endnote 3*.

## Terms of reference for CFAME (Agenda Item 3)

REX members reviewed the terms of reference for CFAME (*CFAME Endnote 3*) to prepare for a better discussion at the CFAME meeting which followed this REX meeting.

## Other business (Agenda Item 4)

Ideas for special sessions that would in turn be presented to the CFAME Task Team for consideration for the next two PICES Annual Meetings were discussed. Dr. Hay’s suggestion to pursue a topic on “An east/west comparison of community structure, productivity and biodiversity under climate change scenarios” was supported (*CFAME Endnote 7*).

Several participants commented on the value of the REX and MODEL collaboration. This was a very productive exercise. The possibility of expanding NEMURO.FISH to include more than size-at-age, and to expand the model to include other fish species such as pink or chum salmon, pollock or sardines, was briefly discussed but no specific recommendations were made.

### Participation List

#### Observers

Christine Abraham (U.S.A.)  
Alexander Buslov (Russia)  
Elena Dulepova (Russia)  
Douglas E. Hay (Canada)  
Oleg Katugin (Russia)  
Sergey Korostelev (Russia)  
Takashi Minami (Japan)  
Oleg Zolotov (Russia)

## REX Endnote 2

### REX Task Team Meeting Agenda

1. Review accomplishments of the REX Task Team in 2004
  - REX workshop on “The seasonal cycle of plankton production in continental shelf waters around the Pacific Rim”
2. Review accomplishments of the REX Task Team since its inception
3. Discuss the terms of reference for CFAME
4. Other business

## REX Endnote 3

### Genesis, life and death of REX: A summary by William T. Peterson and Douglas E. Hay

The name REX is an acronym for “Regional Experiment”. The REX Task Team was born, as a living component of PICES, on October 17, 1997, a few days prior to the beginning of the PICES Sixth Annual Meeting, starting on October 20, in Pusan, Korea. REX was conceived sometime earlier, as a part of the PICES CCCC (Climate Change and Carrying Capacity) Program which had its beginnings at a workshop held in October 1994, prior the PICES Third Annual Meeting in Nemuro, Japan. REX was designed to be one of several task teams concerned with the harmonization of national GLOBEC programs and PICES interests and activities.

The first Co-Chairmen of REX were Drs. Anne Hollowed (U.S.A.), Vladimir Radchenko (Russia) and Tokio Wada (Japan). This group directed the activities of participants in a 2-day workshop on “Development of cooperative research in coastal regions of the North Pacific” held October 17-18, 1997. The workshop involved over 50 scientists, representing over 40 research institutions from all PICES countries, plus some other nations. The participants were asked to review four key scientific questions presented in the CCCC Implementation Plan:

1. What are the characteristics of climate variability, can inter-decadal patterns be identified, and how and when do they arise?
2. How do primary and secondary producers respond in productivity, and in species and size composition, to climate variability in different ecosystems of the sub-arctic Pacific?
3. How do life history patterns distributions,

vital rates and population dynamics of higher trophic levels respond directly and indirectly to climate variability?

4. How are sub-arctic ecosystems structured? Do higher trophic levels respond to climate variability solely as a consequence of bottom up forcing? Are there significant intra-trophic level and top-down effects on lower level production and on energy transfer efficiencies?

Over the two days, breakout groups explored different aspects of these questions. The meeting concluded with recommendations that the key CCCC questions should be examined for small pelagic species in the North Pacific. This recommendation led to four REX workshops, in Fairbanks (1998), Vladivostok (1999), Hakodate (2000) and Victoria (2001). Also at the PICES Seventh Annual Meeting (October 1998, Fairbanks, U.S.A.), REX convened a scientific session that highlighted research of GLOBEC and GLOBEC-like programs. The results from the 1997 workshop, that initiated REX activities, are summarized in the 1997 PICES Annual Report and reported fully in the PICES Scientific Report No. 9 (1998).

The venues, topics and reports that developed from REX activities are described, sequentially, as follows:

- Fairbanks, U.S.A. (October 16-17, 1998, PICES VII). This REX workshop dealt with “Small pelagic species and climate change”. Though the workshop discussions were quite interesting, the Task Team felt that the topic

was too broad and that REX would be better served by taking a more focused “target species” approach in discussions of climate variability. Thus, the recommendation at was to focus on “...comparative analysis of larval and juvenile vital rates of Pacific herring from different regions of the North Pacific and its adjacent seas, and to facilitate comparative studies of the life history patterns of dominant zooplankton species (especially euphausiids and calanoids (*Neocalanus* and *Calanus*)).” Scientific contributions are reported in the PICES Scientific Report No. 11 (1999).

- Vladivostok, Russia (October 8-9, 1999, PICES VIII). This REX workshop focused on “Herring and euphausiid population dynamics” and considered diets of larval and juvenile herring, and long-term changes in abundance of herring and zooplankton in several populations. Sixteen contributions from this workshop were published in the PICES Scientific Report No. 15 (2000).
- Hakodate, Japan (October 20-21, 2000, PICES IX). This REX workshop on “Trends in herring populations and trophodynamics” focused on long-term trends in abundance of herring in relation to environmental signals, and featured reviews of the status of all major herring populations around the Pacific Rim. Ten contributions from this workshop were published in PICES Scientific Report No. 17 (2001).
- An interesting spin-off developed at this meeting, with a joint meeting of the REX and MODEL Task Teams. Each Task Team considered their respective mandates and suggested that some activities might be examined jointly. The specific goal was to have a workshop to explore the application of the developing NEMURO trophodynamic model to explain observed changes in size-at-age in small pelagic species in the North Pacific. Work started on herring and saury populations. This collaboration between the REX and MODEL Task Teams led to a successful MODEL/REX workshop (co-sponsored by the Nakajima Foundation) to “Develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes” held January 24-27, 2002, in Nemuro and Yokohama, Japan, with workshop results published in the PICES Scientific Report No. 20 (2002). (Subsequently, this has led to other successful workshops in Yokohama in March and December 2003, with similar objectives, but expanded to include other species. The results from the second MODEL/REX workshop (also co-sponsored by the Nakajima Foundation) to “Develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes” (March 3-6, 2003) are published in the PICES Scientific Report No. 27 (2004). Further recent support for this work also has come from other institutions, including the Asian Pacific Network (APN) that sponsored a PICES workshop on “Climate interaction and marine ecosystems” held October 10-13, 2004, in Honolulu, immediately prior to PICES XIII.
- Victoria, Canada (October 5, 2001, PICES X). This REX workshop was on “Temporal variations in size-at-age for fish species in coastal areas around the Pacific Rim”. We focused on long-term trends in size-at-age thinking that this parameter could be more sensitive to physical signals (warming, cooling) or biological signals (zooplankton biomass, species composition or productivity). Although many of the presentations focused on herring populations around the North Pacific, other species (*e.g.*, salmon, sablefish, saury) were discussed as well. It was at the Victoria meeting that a formal collaboration with MODEL was established, and REX scientists began attending inter-sessional MODEL workshops. Thirteen contributions from this workshop were published in the PICES Scientific Report No. 20 (2002).
- Qingdao, China (October 2002, PICES XI). No workshop was held this year because the CCCC Task Teams were participating in the NEXT workshop. Instead, as a contribution

to this NEXT workshop, REX prepared a “white paper” which discussed the ways in which REX activities related to the eight key questions posed by the PICES CCCC Program.

- Seoul, Korea (October 14, 2003, PICES XII). The final REX Topic Session was on “Influence of fishing and invasive species on ecosystem structure around the Pacific Rim.” We had six talks and five posters. The session was an extension of the Science Board Symposium which might explain the fact that the attendance was overwhelming – speakers were treated to standing room only in a room with 60 chairs. The Task Team meeting was attended by 10 people. We had a full agenda and long discussions of topics for the following year’s meetings, collaborations with MODEL Task Team, the PICES North Pacific Ecosystem Status Report, Capacity Building.
- Honolulu, U.S.A. (October 14, 2004, PICES XIII). This meeting marked the official end of REX. We convened our last workshop, “The seasonal cycle of plankton production in continental shelf waters around the Pacific Rim” which included 10 talks and 4 posters. Attendance was very good with at least 80 scientists in attendance. The REX business meeting had the usual attendance of 10-15 people.

To recap the many workshops which REX convened, each was well attended and discussions were always lively. Apart from learning about zooplankton, and small pelagic and general fish ecology from some of the world’s experts in our earlier workshops, perhaps the most significant accomplishment was the recognition of the large number of long-term data sets on landings, stock size, and size-at-age of herring and other pelagic fish species including salmon, saury, mackerel, sardine and anchovy that have been collected by scientists from PICES nations. There are exciting opportunities to write joint review papers with fellow scientists and this avenue should be pursued. Participants at REX workshops strongly supported the idea that PICES collate and create a CD ROM of all available Pacific herring data. Using a CD to share this data among all scientists associated with PICES would facilitate interactions and future collaborative research and papers.

Also during the course of these “herring” workshops, it became clear that PICES scientists have conducted a surprisingly large number of zooplankton sampling studies that provide multi-year records of zooplankton seasonal cycles in relation to environmental variables. Thus was born the germ of the idea for the final workshop on “Seasonal cycles of plankton”. The idea for a focus on seasonal cycles also evolved from the Victoria meeting in which it was recognized that modeling of seasonal cycles would be timely.

### **Historical List of REX Task Team members**

#### Canada

Richard F Addison (1996-2000)  
Brent N. Hargreaves (1996-2000)  
Michael A Henderson (1996-1999)

#### China

Qi-Sheng Tang (1996-2004)  
Rong Wang (1996-2004)

#### Japan

Kenji Asano (2001-2004)  
Tokimasa Kobayashi (1999-2001;  
Co-Chairman 2000-2001)

Yutaka Nagata (1996-2000)

Yasunori Sakurai (1996-2000)

Tokio Wada (1996-1999;

Co-Chairman 1996-1999)

Yoshiro Watanabe (2001-2004;

Co-Chairman 2001-2004)

Yutaka Watanuki (2001-2004)

#### Korea

Jin-Yeong Kim (1999-2004)

Chang-Ik Zhang (1996-2004)

Russia

Elena P. Dulepova (2002-2004)  
Natalia V. Klovach (2002-2004)  
Vladimir I. Radchenko (1996-2004;  
Co-Chairman 1996-2002)

U.S.A.

Anne B. Hollowed (1996-1998;  
Co-Chairman 1997-1998)  
George L. Hunt, Jr. (1996-2004)  
Brenda L. Norcross (1996-2004)  
William T. Peterson (1999-2004;  
Co-Chairman 1999-2004)

**List of Participants**

**REX Workshop on “Development of cooperative research in coastal regions of the North Pacific”**  
(October 17-18, 1997, Pusan, Republic of Korea)

Canada

Richard J. Beamish  
Kenneth L. Denman  
Brent Hargreaves  
Paul J. Harrison  
Douglas E. Hay  
Paul H. LeBlond  
David L. Mackas  
Gordon A. McFarlane  
R. Ian Perry  
David Welch

Akira Taniguchi  
Makoto Terazaki  
Atsushi Tsuda  
Tokio Wada (convenor)  
Kazutoshi Watanabe  
Orio Yamamura

Korea

Yu-Hwan Ahn  
Young-Shil Kang  
Hak-Gyoon Kim  
Jin-Yeong Kim  
Kuh Kim  
Suam Kim  
Zang-Geun Kim  
Jang-Uk Lee  
Ki-Back Seong  
In-Ja Yoen  
Chang-Ik Zhang

China

Li-Xian Dong  
Shi-Zuo Feng  
Da-Ji Huang  
Tian-Xiang Meng  
Ji-Lan Su  
Song Sun  
Qi-Sheng Tang  
Rong Wang  
Zeng-Mao Wu  
Xou-Xian Yuan  
Zhi-Nan Zhang

Russia

Vadim V. Navrotsky  
Vladimir I. Radchenko (convenor)  
Anatoly F. Volkov

Japan

Kenji Asano  
Yoshinari Endo  
Kimio Hanawa  
Yoshiaki Hiyama  
Koji Iida  
Tsutomu Ikeda (convenor)  
Yutaka Isoda  
Shin-ichi Ito  
Makoto Kashiwai  
Michio J. Kishi  
Kazuya Nagasawa  
Kaoru Nakata  
Kuniaki Okuda  
Naonobu Shiga  
Takashige Sugimoto

U.S.A.

Vera Alexander  
Richard D. Brodeur  
James H. Cowan  
Michael L. Dahlberg  
Bruce W. Frost  
Steven R. Hare  
Anne B. Hollowed (convenor)  
George L. Hunt, Jr.  
Patricia Livingston  
Allen Macklin  
Michael M. Mullin  
Robert S. Otto  
Thomas C. Royer  
Warren Wooster

**List of Presenters**  
**REX Workshop on “Small pelagic species and climate change”**  
(October 16-17, 1998, Fairbanks, U.S.A.)

Canada

Douglas E Hay (convenor)

China

Qi-Sheng Tang (convenor)

Japan

Makoto Kashiwai  
Hiroshi Nishida  
Seiji Ohshimo  
Yasunori Sakurai

Tokio Wada (convenor)

Korea

Jin-Yeong Kim (convenor)

Russia

Vladimir I. Radchenko (convenor)

U.S.A.

Richard D. Brodeur  
Evelyn D. Brown  
Larry Jacobson (convenor)

**List of Presenters**  
**Workshop on “Herring and euphausiid population dynamics”**  
(October 8-9, 1999, Vladivostok, Russia)

Canada

Douglas E Hay (convenor)  
Gordon A. McFarlane  
Jacqueline M. O’Connell

Japan

Michio J. Kishi  
Tokimasa Kobayashi  
Tokio Wada (convenor)

Korea

Young-Shil Kang

Norway

Stein Kaartvbeedt

Russia

N. G. Chupisheva  
Elsa R. Ivshina  
Nikolai I. Naumenko  
Vladimir I. Radchenko (convenor)

U.S.A.

David M. Checkley, Jr  
Scott M. Rumsey  
Augustus J. Paul  
William T. Peterson (convenor)

**List of Presenters**  
**REX Workshop on “Trends in herring populations and trophodynamics”**  
(October 20-21, 2000, Hakodate, Japan)

Canada

Douglas E Hay (convenor)  
Jake Schweigert

Japan

Tokimasa Kobayashi (convenor)

Russia

Elsa R. Ivshina  
Nikolia I. Naumenko

Vladimir I. Radchenko (convenor)

U.S.A.

R. J. Foy  
Fritz Funk  
William T. Peterson (convenor)  
Scott Rumsey  
Gray L. Thomas

### List of Presenters

#### REX Workshop on “Temporal variations in size-at-age for fish species in coastal areas around the Pacific Rim” (October 5, 2001, Victoria, Canada)

##### Canada

Douglas E Hay (convenor)  
Brain J. Pyper  
Jake Schweigert  
Ron W. Tanasichuk

Alexander A. Bonk  
Ludmila A Chernoiivanova  
Nikolay I. Naumenko  
Sergey N. Tarasyuk  
Olga S. Temnykh

##### Japan

Chikako Watanabe  
Yoshiro Watanabe

##### U.S.A.

Evelyn D Brown  
R. Bruce MacFarlane  
William T. Peterson (convenor)

##### Russia

Pavel A Balykin

### List of Participants

#### First MODEL/REX Workshop on “Develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes” (January 24-27, 2002, Nemuro/Yokohama, Japan)

##### Canada

Douglas E. Hay

Yasuhiro Yamanaka  
Naoki Yoshie

##### Japan

Tomomori Azuaya  
Sanae Chiba  
Masahiko Fujii  
Masakatu Inada  
Shin-ichi Ito  
Toshio Katsukawa  
Makoto Kashiwai  
Michio J. Kishi (convenor)  
Tokimasa Kobayashi  
Daiki Mukai  
Takeshi Okunishi  
Lan Smith  
Kazuaki Tadokoro  
Aiki Tomokazu  
Atsushi Tsuda

##### China

Daji Huang

##### Kroea

Chul-Hoon Hong

##### Russia

Yury I. Zuenko  
Alexander Leonov  
Vadim V. Navrotsky

##### U.S.A.

Robert A. Klumb  
Bernard A. Megrey (convenor)  
Francisco E. Werner

### List of Participants

#### Second MODEL/REX Workshop on “Develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes” (March 3-6, 2003, Yokohama, Japan)

##### Canada

Douglas E. Hay

##### Japan

Maki Aita-Noguchi

Sanae Chiba

Masahiko Fujii

Taketo Hashioka

Shin-ichi Ito

Makoto Kashiwai

Toshio Katsukawa

Michio Kawamiya

Michio J. Kishi (convenor)

Daiki Mukai

Goh Onitsuka

Lan Smith

Maki Suda

Kazuaki Tadokoro

Yongjun Tian

Yasuhiro Yamanaka

Naoki Yoshie

Sachie Yoshimoto

##### Kroea

Sin-Jae Yoo

##### U.S.A.

Bernard A. Megrey (convenor)

Kenneth A. Rose

Fancisco E. Werner

Fei Chai

### List of Presenters

#### REX Topic Session on “Influence of fishing and invasive species on ecosystem structure around the Pacific Rim” (October 14, 2003, Seoul, Korea)

##### Canada

Douglas E Hay

##### Japan

Tadanori Fujino

##### Russia

Larsia S Afechuk (poster)

Pavel A Balykin (poster)

Evgeny Drobjazin (poster)

Larissa A Gayko (poster)

Sergey G. Korostelev (poster)

Anatoliy Ya. Velikanov

##### U.S.A.

Jeffery R. Cordell

Elizabeth A. Logerwell

Steven J. Martell

William T. Peterson (convenor)

### List of Presenters

#### REX Workshop on “The seasonal cycle of plankton production in continental shelf waters around the Pacific Rim” (October 14, 2004, Honolulu, U.S.A.)

##### Japan

Hiromi Kasai

Toru Kobari

Kaoru Nakata (convenor)

Atsushi Yamaguchi

Yasuhiro Yamanaka

##### Korea

Hyen-Gyeong Jeong (poster)

Hyung-Ku Kang (poster)

Young-Shil Kang

Hyun-Cheol Kim

##### U.S.A.

Christine L. Abraham

Russell R Hopcroft (poster)

William T. Peterson (convenor)

Thomas C Wainwright