

Report of the Biological Oceanography Committee

The Biological Oceanography Committee (BIO) held its meeting from 18:00–19:30 h on October 16 and 14:00–18:00 h on October 19, 2011 in Khabarovsk, Russia. The Chairman, Dr. Atsushi Tsuda, called the meeting to order and welcomed the participants (*BIO Endnote 1*). The proposed agenda was reviewed and is provided in *BIO Endnote 2*.

AGENDA ITEM 3

Oral and Poster awards

Procedure to select the awards was confirmed as follows: Each Committee member was to list two top candidates for Best Oral Presentation by an early career scientist in Topic Session S2 and BIO Contributed Paper Session and provide the names to the BIO Chairman. For Best Poster, open to anyone, each Committee member was to list two top candidates and provide the names to the BIO Chairman by email. Rankings would then be compiled by the Chairman, and the highest ranked candidate's name provided to the Secretariat for award certificate preparation.

AGENDA ITEM 4

Reports from subsidiary bodies

Brief highlights are given for the following subsidiary bodies reporting to BIO. Their full meeting reports can be found at http://www.pices.int/publications/annual_reports/.

Advisory Panel on *Marine Birds and Mammals* (MBM-AP)

A report summarizing the meeting of AP-MBM, held October 16, 2011, was presented by Dr. Yutaka Watanuki. This detailed presentation included a description of the revised Terms of Reference (*AP-MBM Endnote 4*), the proposed three-year Activity Plan (*AP-MBM Endnote 5*), and a summary of the AP-MBM Topic Session (S2) on “hot spots” (see Session Summaries in the 2011 Annual Report at http://www.pices.int/publications/annual_reports/Ann_Rpt_10/2010-Session-sum.pdf) held on October 18. An additional issue discussed was a proposal by Dr. George Hunt for a study group to evaluate the feasibility of updating PICES Scientific Report No. 14 (2000), *Predation by marine birds and mammals in the subarctic North Pacific Ocean*. BIO actions were: 1) approval of the IWC accepting a PICES observer, 2) approval of a study group for revising PICES Scientific Report No. 14, and 3) approval of the continuation of AP-MBM for 3 more years. These actions will be brought forward to Science Board for approval. (The proposed new study group was later changed to a proposed workshop (*AP-MBM Endnote 7*) at PICES-2012 in Hiroshima, Japan, at the recommendation of Science Board.)

Section on *Carbon and Climate* (CC-S)

An oral presentation summarizing the business meeting of the Section on *Carbon and Climate*, held on October 15, was given by S-CC Co-Chairman, Dr. James Christian.

Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* (WG 22)

WG 22, co-chaired by Drs. Fei Chai (USA) and Shigenobu Takeda (Japan) completed its activities at PICES-2010 and plans to submit its final report in March 2012. Its final business meeting report can be found elsewhere in the PICES 2010 Annual Report.

Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim* (WG 23)

WG 23, co-chaired by Drs. William Peterson (USA) and Song Sun (China), has a 4-year term from 2007–2011.

BIO-2011

A summary of the final meeting of WG 23, held on October 16, 2011, was presented by Dr. Peterson. The target date for completion of the final report of this Working Group was given as April 2012. Some potential new directions were briefly discussed, including establishing a new working group which will be proposed at the next Annual Meeting in Hiroshima.

Working Group on *Jellyfish Blooms around the North Pacific Rim: Causes and Consequences* (WG 26)

WG 26, co-chaired by Drs. Shin-ichi Uye, Young-Shil Kang and Richard Brodeur has a 3-year term from 2010–2012. A summary of the WG 26 meeting, held on October 15, 2011, was presented by Dr. Jennifer Purcell. There were 14 members present at this first meeting, which was primarily an overview of research projects in each PICES member country.

Working Group on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors* (WG 28)

WG 28, co-chaired by Dr. Motomitsu Takahashi, has a 3-year term from 2011–2013. A report summarizing the meeting of WG 28, held on October 15, 2011, was presented by Dr. Takahashi, who discussed the background of this new Working Group. There was some discussion about why BIO was asked to co-sponsor a Topic Session proposed by WG 28 for PICES-2012 when no BIO member was included in the Group. There was also concern that the Group's Terms of Reference were still too broad and ambitious for a 3-year period, and needed to be better focused. It was recommended that these concerns, including those on communication between FUTURE-related activities and BIO, be presented at the Science Board meeting.

Marine Ecosystem Inter-comparison Project (MEMIP)

An oral report summarizing the MEMIP-IV workshop, W1 on “*Quantitative comparison of ecosystem models applied to North Pacific shelf ecosystems – humble pie or glee?*” held on October 14–15, was given by Dr. Harold (Hal) Batchelder. The presentation was followed by discussion about 1) a MEMIP presentation to the broader PICES community at the 2012 Annual Meeting, 2) the final goals of MEMIP, and 3) the importance and challenge of including jellyfish in ecosystem models. BIO commented positively about the progress of MEMIP and fully endorsed its plan for the next year (*BIO Endnote 3*).

AGENDA ITEM 5

Topic Sessions and workshops completed at PICES-2011, and inter-sessional meeting

- S2: *Mechanisms of physical-biological coupling forcing biological “hotspots.”*
- BIO Paper session,
- W1: Marine ecosystem model inter-comparison (MEMIP) workshop on “*Quantitative comparison of ecosystem models applied to North Pacific shelf ecosystems – humble pie or glee?*”.

Written reports will be submitted by the convenors of each session and workshop to BIO for inclusion in Session Summaries of the 2011 Annual Report.

- A short report on the ESSAS Open Science Meeting, held in April 2011 and co-sponsored by PICES, was presented by Dr. Hunt.

AGENDA ITEM 6

Proposed new working groups

A Working Group on *Regional Climate Modeling* was proposed by Dr. Enrique Curchitser (POC) (*POC Endnote 3*). As BIO was not proposed to be a parent Committee for this new Working Group, and due to the shortage of time, BIO did not discuss supporting this Group. [BIO was later requested to be a parent Committee with POC at the Science Board Meeting.] BIO will discuss this issue and a decision will be made by the inter-sessional Science Board meeting.

AGENDA ITEM 7
Proposed Topic Sessions and Workshops at PICES-2012

Topic Session

Contact	Title	Mother body	Sponsorship	Duration	Conveners	Invited speakers	Rank	Financial request
Atsushi Tsuda	BIO Paper Session	BIO	BIO	1 day	Atsushi Tsuda (Japan), Michael Dagg (USA), Hiroaki Saito (Japan)	None	1	
Michael Seki	North Pacific Subtropical Frontal System ecosystem		BIO/POC/FIS/MEQ	1 day	Michael Seki (USA), Taro Ichii (Japan), Skip McKinnell (PICES)	TDB	3	
Shin-ichi Uye	Jellyfish in marine ecosystems and their interactions with fish and fisheries	WG 26	BIO/FIS/ICES	1 day	Shin-ichi Uye (Japan), Richard Brodeur (USA), Song Sun (China), Won-Duk (Korea), Chris Lynam (UK)	Reiji Masuda (Japan), Monty Graham (USA), Hermes Mianzan (Argentina), Chris Lynam (UK)	2	
Yutaka Watanuki	Spatial patterns of anthropogenic stressors: predators as sentinels of marine ecosystem health	MBM	BIO/MEQ/JSPS	1 day	Peter Ross (Canada), Yutaka Watanuki (Japan)	Hideshige Takeda (Japan), A. Watanab (Japan), J.A. Franeker (Netherlands)	5	
Elizabeth Logerwell	Science needs for offshore oil and gas development in the North Pacific		FIS/BIO/MEQ/POC	1 day	Elizabeth Logerwell (USA), Ken Lee (Canada), TBD (Russia)	TBD	6	
Kenneth Drinkwater	Subarctic-Arctic interactions	ESSAS	ESSAS/POC/BIO/FIS/FUTURE/MONITOR	1 day	Kenneth Drinkwater (Norway), Jackie Grebmeier (USA), James Overland (USA), Sei-Ichi Saitoh (Japan)	TBD	7	
Motomitsu Takahashi	Ecosystem responses to multiple stressors in the North Pacific	WG28	BIO/MEQ	0.5 day	Motomitsu Takahashi (Japan), Ian Perry (Canada), Vladimir Kulik (Russia)	Natalie Ban (Australia), Benjamin Halpern (USA)	4	
James Christian	Anthropogenic CO ₂ trends and their impacts on marine ecosystems in the North Pacific and its marginal seas	S-CC	POC/BIO	1 day	Masao Ishii (Japan), Lisa Miller (Canada)	TBD	8	
Tony Koslow	Trends in hypoxia and ecosystem impacts in the North Pacific	TCODE	POC/BIO/TCODE	0.5 day	Tony Koslow (USA), Tsuneo Ono (Japan)	Brad Seibel (USA), Frank Whitney (Canada), Tsuneo Ono (Japan) or Y.W. Watanabe (Japan)	Not ranked	

Workshop

Toru Kobari	Secondary production: measurement methodology and its application on natural zooplankton community		BIO	1 day	William Peterson (USA), Toru Kobari (Japan)	Lidia Yebra (Spain)		Invited speaker
Hal Batchelder	Skill assessment and comparison of multiple region results	MEMIP	BIO	2 days	Hal Batchelder (USA)			0.5 from US
Motomitsu Takahashi	Identifying critical multiple stressors of North Pacific marine ecosystems and indicators to asses their impacts	WG28	BIO/MEQ	1 day	Yutaka Watanuki (Japan), Rolf Ream (USA)			
George Hunt	Workshop on the feasibility of updating PICES Publication 14 on Prey Consumption by marine birds, marine mammals, with the addition of prey consumption by large predatory fish in the PICES regions	MBM	BIO	1 day	George Hunt (USA), Hidehiro Kato (Japan)			1 fish expert

Inter-sessional Workshop (Spring, 2012)

Harold Batchelder	MEMIP meeting in Corvallis	MEMIP	BIO	5 days	Harold Batchelder			
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BIO-2011

Proposals for Topic Sessions and workshops for the 2012 PICES Annual Meeting were summarized and can be found in *WG 28 Endnotes 3 and 4* and *BIO Endnote 3*. There was some proposed modification to the workshop list. BIO endorsed the final summary.

This year, a new system for proposals of Topic Sessions was employed, but BIO felt there were some difficulties remaining. The Committee recommends that the call for Topic Session and Workshop proposals to the Annual Meeting be widely advertised to the PICES community perhaps by announcing it on the PICES website or/and by e-mail to previous PICES meeting participants.

AGENDA ITEM 8

Additional financial requests

None

AGENDA ITEM 9

Revision of BIO Action Plan

The BIO Action Plan has not been revised since 2007 and a new PICES Strategic Plan was presented after the establishment of the FUTURE program. The BIO Committee discussed an outline of the Action Plan. A new BIO Action Plan will be prepared according to the new PICES Strategic Plan by the next inter-sessional Science Board meeting, using e-mail discussion.

AGENDA ITEM 10

Report from FUTURE Advisory Panels

A summary of each FUTURE Advisory Panel meeting and joint FUTURE Advisory Panel meeting was provided by AP-SOFE Chairman, Mr. Robin Brown. BIO recommended that mechanisms for communication from the FUTURE APs to the parent Committees be improved. The Committee felt that a single BIO member appointed to the FUTURE Advisory Panels was not enough to keep BIO members informed and engaged in FUTURE activities. There was brief discussion about the idea of a FUTURE Open Science meeting to be held separately from the PICES Annual Meeting, but BIO did not have a resolution on this issue. There was a request from the SOFE Chairman for comments on the mechanisms for continuation of the North Pacific Ecosystem Status Reports. BIO strongly supports this activity in some form. Considerations included: the need for more rapid reporting than can be achieved with a 5-year report; printed versus web-based reporting; the need for an annual meeting to ensure good synthesis of the annual data; and the need for uniformity across all PICES member countries.

AGENDA ITEM 11

Report from joint PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish*

A report summarizing the actions and requests related to PICES/ICES WG-FCCIFS was presented by Juergen Alheit. PICES (BIO) approval is being requested for continuation/renewal. BIO was concerned about being asked to endorse and approve this Working Group when the Committee had not previously reviewed the Implementation Plan or received other information such as the Terms of Reference, although detailed information had been presented to the FUTURE APs. BIO recommended that mechanisms for communication from the FUTURE APs to the parent Committees be improved. BIO recognized the importance of WG-FCCIFS for FUTURE and for PICES/ICES collaboration, but BIO had only a limited interest about participation on working group that focuses on fish and shellfish issues.

AGENDA ITEM 12

SCOR Working Groups

A report summarizing the activities of SCOR WG 137 (SCOR/ICES/PICES Working Group on “Global Patterns of Phytoplankton Dynamics in Coastal Ecosystems: Comparative Analysis of the Time Series Analysis”) was given by Dr. Sinjae Yoo who indicated the importance and under-representation of coastal phytoplankton time series in the PICES region. The requests were for BIO/FUTURE endorsement of: 1) continued ICES/PICES/SCOR collaborations on this coastal theme, 2) co-sponsorship (with ICES) after 2012 when SCOR funding ends, and 3) an ICES/PICES workshop next year’s Annual Meeting in Hiroshima. BIO supported the requests.

For Working Groups on “Organic Ligands – A Key Control on Trace Metal Biogeochemistry in the Ocean” and “Biogeochemical Exchange Processes at the Sea-Ice Interfaces (BEPSII) Volkman”, BIO did not recommend sending an affiliated member to these Working Groups.

AGENDA ITEM 13

Other items

None

AGENDA ITEM 14

Adjourn

The meeting was adjourned at 18:00 hr.

BIO Endnote 1

BIO participation list

Members

Yuqu Chen (China)
 Michael Dagg (USA, Vice-Chairman)
 Se-Jong Ju (Korea)
 Alexei Orlov (Russia)
 Angelica Peña (Canada)
 William Peterson (USA)
 Vladimir Radchenko (Russia)
 Atsushi Tsuda (Japan, Chairman)
 Atsushi Yamaguchi (Japan)
 Mingyuan Zhu (China)

Observers

Juergen Alheit (ICES)
 Harold Batchelder (USA)
 James Christian (Canada)
 Elliot Hazen (USA)
 George Hunt (ESSAS)
 Ken-Ichi Ishida (Japan)
 Stewart Johnson (Canada)
 Maurice Levasseur (Canada)
 Jennifer Purcell (USA)
 Robert Suryan (USA)
 William Sydeman (USA)
 Motomitsu Takahashi (Japan)
 Shin-ici Uye (Japan)
 Yutaka Watanuki (Japan)
 Sinjae Yoo (Science Board Chairman)

BIO Endnote 2

BIO meeting agenda

1. Welcome, introductions
2. Meeting agenda
3. Oral and Poster awards
4. Reports from subsidiary bodies
5. Topic sessions and workshops (completed) at PICES-2011, and inter-sessional meeting
6. Proposed new working groups
7. Proposed workshop and Topic Sessions for the 2012 PICES Annual Meeting in Hiroshima, Japan
8. Additional financial requests
9. Revision of BIO Action Plan
10. Report from FUTURE APs
11. Report from WG-FCCIFS (ICES/PICES)
12. SCOR working groups
13. Other items
14. Adjourn

BIO Endnote 3

Proposals for Topic Sessions and Workshops at PICES-2012

2-day BIO Workshop on

“Comparison of multiple ecosystem models in several North Pacific shelf ecosystems (MEMIP-IV)”

Workshop Chairs: Hal Batchelder (USA), Shin-Ichi Ito (Japan), Angelica Peña (Canada), Yvette Spitz (USA)

This workshop will be the first MEMIP workshop where we have completed model comparisons within single shelf systems; *e.g.*, within the Northern California Shelf, Gulf of Alaska shelf and Oyashio shelf and offshore, individually. The workshop tasks will be to undertake quantitative assessment of the successes and shortcomings of individual models within regions and across regions. This formal skill assessment is a key activity to enable MEMIP to identify which, if any, of the various ecosystem models have broad skill spatially and temporally in multiple North Pacific shelf ecosystems. The observations (nutrients, chlorophyll and zooplankton biomass) from the key years of simulation (2000-2003) have been compiled to enable model-data comparisons for each of the three regions. To our knowledge this will be the first multiple model skill assessment that extends to zooplankton, *e.g.*, beyond phytoplankton, and the first that focuses on ecosystem models applied to coastal systems. We anticipate one or several peer-reviewed scientific papers and a MEMIP report to result from this workshop.

Invited speakers: none requested

Travel support request: 0.5 of one travel from US to Japan for Co-chair Yvette Spitz

1/2-day BIO/MEQ Topic Session on “*Spatial patterns of anthropogenic stress: predators as sentinels of marine ecosystem health*”
[renamed as “*Environmental contaminants in marine ecosystems: Seabirds and marine mammals as sentinels of ecosystem health*”]

Co-sponsored by JSPS

Co-Convenors: Peter Ross (Canada), Yutaka Watanuki (Japan)

Urban and industrial developments in the world’s coastal regions have led to the release of a large number of pollutants (heavy metals, POPs, plastics, oils, radioactive substances) into the marine environment. In some cases, these have detrimental effects on variety of marine resources in coastal and offshore areas. It is increasingly important to identify sources, subsequent transport through marine physical systems and resulting spatial patterns of these anthropogenic stressors. Compared to river-lake systems, knowledge of anthropogenic stressors in marine systems is less understood due to difficulties with detection over wide areas and in offshore regions. As top predators such including many marine mammals and seabirds bio-magnify some of these pollutants, these organisms can be used as bio-indicators of coastal, marine and/or food web contamination. The utility of these ‘sentinels’ was discussed at the MEQ Workshop at PICES-2011. Our proposed 2012 session will 1) identify spatial patterns and geographic areas of concern (high concentrations) of pollutants or other stressors in the PICES region using bio-indicator species, 2) examine mechanisms of transport, and ultimate disposition, of contaminants in marine ecosystems, and 3) discuss health risks for certain predators and human consumers. Review papers, case studies, and innovative methods papers on anthropogenic stressors in marine predators will be invited, as will papers that distinguish between the effects of natural and anthropogenic stressors. In particular, studies linking predator habitat use with spatial aspects of stressors in the environment and in predators will be encouraged.

Proposed invited speakers: H. Takada (Japan), A. Watanab (Japan), J.A. Franeker (The Netherlands)

1-day BIO/FIS Topic Session on
“*Jellyfish in marine ecosystems and their interactions with fish and fisheries*”

Co-sponsored by ICES

Co-Convenors: Shin-Ichi Uye (Japan), Richard Brodeur (USA), Song Sun (China), Won-Duk Yoon (Korea), Chris Lynam (UK)

Evidence is accumulating that gelatinous zooplankton populations have increased substantially in many regions of the world, most likely through anthropogenic stresses, but we have insufficient understanding of how these blooms affect fish and, more broadly, marine ecosystems. Some benefits of jellyfish to marine fish include provisioning of food for some species and shelter for juvenile stages of several others. There is also a relatively minor human benefit in that some jellyfish are both commercially fished and cultured for human consumption in several countries. However, the negative effects of jellyfish population outbursts are thought to greatly exceed any positive ones and their effects on ecosystems and the economies that depend on them can be profound. These effects have been examined through field studies, controlled laboratory experiments, and estimated using quantitative ecosystem models. Jellyfish are generally detrimental to fish because they feed on zooplankton and ichthyoplankton, and so are both predators and potential competitors of fish. Relatively little of the energy consumed by gelatinous zooplankton ends up at higher trophic levels of interest to humans compared to krill and forage fishes. Jellyfish blooms also directly impact commercial fisheries through filling or clogging trawls and fouling fixed gear and aquaculture net pens, resulting in enormous economic losses worldwide. This session will focus on empirical field, laboratory, or modeling studies that examine the effects jellyfish have on marine ecosystems, fish species and fisheries, and relevant ecosystem-based management issues important to the needs of society over wide-ranging space and time-scales up to and including climate variations.

Proposed invited speakers: Reiji Masuda (Japan), Monty Graham (USA), Hermes Mianzan (Argentina), Chris Lynam (UK)

1-day BIO Workshop on “*Secondary production: Measurement methodology and its application on natural zooplankton community*”

Co-Convenors: William Peterson (USA) and Toru Kobari (Japan)

Zooplankton communities play important roles on the transfer of primary production to higher trophic levels of marine ecosystems. In the past two decades, the quantitative evaluation of the energy flow has been emphasized for better understanding how marine ecosystems respond to climate change and global warming. To date, primary production can be globally estimated with remote sensing techniques and validated with in situ experiments using radio or stable isotope. Although secondary production has been estimated with various methods (natural cohort, artificial cohort, molting rate, egg production, nucleic acids ratio, enzyme activity and empirical models), there is little information which method is relevant for natural zooplankton population or community. Thereby, we have little knowledge or confidence of secondary production measurements compared with that of primary production. In this workshop, we review current methodologies to measure secondary production. Through published reports of secondary production on natural zooplankton population or community, this workshop will clarify the assumptions, advantages and disadvantages for each method. We also discuss new techniques (nucleic acids ratio, enzyme activity, chitobiase, or other methods) and challenges in the calibration between the estimates using different methods.

Invited speaker: Lidia Yebra (Spain)