

S1 Science Board Symposium

Effects of natural and anthropogenic stressors in the North Pacific ecosystems: Scientific challenges and possible solutions

Co-Convenors: Sinjae Yoo (SB), Atsushi Tsuda (BIO), Elizabeth Logerwell (FIS), Hiroya Sugisaki (MONITOR), Kyung-Il Chang (POC), Toru Suzuki (TCODE), Thomas Therriault (AICE), Hiroaki Saito (COVE), Robin Brown (SOFE), Igor Shevchenko (Russia), Fangli Qiao (China)

Invited Speakers:

Benjamin Halpern (University of California Santa Barbara, USA)

Kitack Lee (Pohang University of Science and Technology, Korea)

William Li (Bedford Institute of Oceanography, DFO, Canada)

Reiji Masuda (Kyoto University, Japan)

Hans Paerl (The University of North Carolina at Chapel Hill, USA)

Ian Perry (Pacific Biological Station, DFO, Canada)

Hiroaki Saito (Tohoku National Fisheries Research Institute, FRA, Japan)

Xuelei Zhang (First Institute of Oceanography, SOA, China)

Human society depends on ocean ecosystems to meet many of its needs. The availability of marine ecosystem services to humans is important to sustain coastal communities and to ensure human health and well-being. Global warming, shoreline development, pollution, eutrophication, overfishing, non-indigenous species, and intensive mariculture are examples of anthropogenic stressors that affect marine ecosystems. These stressors can act alone or in combination to alter the structure, function, and productivity of marine ecosystems. Consequently, the potential for decline in the ability of the ocean to provide essential ecosystem services, as a result of synergies in natural and anthropogenic stressors, is a serious concern for human society. To advance ecosystem-based management and to mitigate the influence of stressors, there is a need to develop improved understanding of the mechanisms of change in marine ecosystems. Improved understanding of ecosystem structure, function, and resilience will aid the development of practical methods to maintain and monitor ecosystem health. These are challenging issues for marine science and PICES will continue to promote research to address these issues through FUTURE.

Monday, October 15 (10:30-18:30)

- | | |
|-------|---|
| 10:30 | Tokio Wada (Keynote)
Resilience and sustainability of the human-ocean coupled system – Beyond the Great East Japan Earthquake |
| 11:15 | Hans W. Paerl, Kedong Yin, James E. Cloern, Paul J. Harrison, Jacob Carstensen and Todd D. O'Brien
Global patterns of phytoplankton dynamics in coastal ecosystems: Utilizing long-term data to distinguish human from climatic drivers of ecological change (S1-8359), Invited |
| 11:40 | Benjamin S. Halpern
The Ocean Health Index: Global assessment and future priorities (S1-8663), Invited |
| 12:05 | William K.W. Li and Nancy Shackell
Ecosystem change in the North Atlantic: Impacts, vulnerabilities, and opportunities (S1-8395), Invited |
| 12:30 | Lunch |

- 14:00 **R. Ian Perry and Diane Masson**
Understanding ecosystem structure, function, and change in the Strait of Georgia, Canada: A human-dominated marine ecosystem (S1-8611), Invited
- 14:25 **Kitack Lee, Tae-Wook Kim, Raymond G. Najjar, Hee-Dong Jeong and Hae Jin Jeong**
The anthropogenic impacts on ocean nutrients and carbon systems in the marginal seas of northwestern Pacific Ocean (S1-8809), Invited
- 14:50 **Anne Hollowed**
Projecting future status and trends of commercial fish and fisheries under shifting management strategies and climate change (S1-8605)
- 15:10 **Yury I. Zuenko**
Ecosystem reconstruction of the Japan/East Sea under recent climate change: Lowered productivity vs enhanced efficiency (S1-8550)
- 15:30 **Jilong Wang, Jilong Li and Wenbo Yang**
Impact of major climatic factors on biomass of the main commercial fishes in east China seas (S1-8456)
- 15:50 ***Coffee/Tea Break***
- 16:10 **Reiji Masuda**
Underwater visual census as a tool to monitor coastal ecosystems: Seasonal and interannual fluctuations, effect of thermal discharge from power stations, and recovery from the tsunami disaster (S1-8629), Invited
- 16:35 **Xuelei Zhang, SL Fan, Y Li, S Fang, MZ Fu, W Zheng, RX Li, ZL Wang and MY Zhu**
The onset and development of green algal tide in the Yellow Sea (S1-8660), Invited
- 17:00 **Hiroaki Saito, Takaomi Kaneko and Mitsutaku Makino**
Marine ecosystem responses to sporadic perturbation: Their processes, social impact and possible solutions (S1-8621), Invited
- 17:25 **Staci Massey Simonich**
Is trans-Pacific atmospheric transport and deposition of persistent organic pollutants (POPs) to the North Pacific Ocean significant? (S1-8511)
- 17:45 **Catharina J.M. Philippart, Martin J. Baptist, Taco de Bruin, Bruno J. Ens, Lucien Hanssen, Folkert de Jong and Frans J. Sijtsma**
Sensing marine life and livelihoods at the seashore – An integrated monitoring network and data portal for the Wadden Sea, a coastal UNESCO World Heritage site (S1-8502)
- 18:05 **Takeo Kurihara, Kengo Suzuki, Gyo Itani, Masatsugu Iseda, Tomoyuki Nakano, Satomi Kamimura Koji Seike, Takenori Sasaki, Hideki Takami and Susumu Chiba**
Comparison of the mollusk assemblage in Japan before vs. after the Great Tohoku Earthquake (S1-8544)
- 18:25 ***Discussion***
- 18:30 ***Session Ends***

S1 Posters

- S1-1 **Victor F. Bugaev**
Effects of pink salmon (*Oncorhynchus gorbuscha*) stock abundance on the growth of sockeye salmon (*Oncorhynchus nerka*) from Kamchatka River in the ocean
- S1-2 **Sangjin Lee**
NOWPAP Medium-term Strategy to address marine and coastal environment issues in the Northwest Pacific Ocean
- S1-3 **Yulia S. Chernyshova and Tatyana Shpakova**
Size-age structure of Japanese scallop (*Mizuhopecten yessoensis*) from Alexandrovsky Bay, Japan Sea in 2009–2011
- S1-4 **Anna S. Vazhova, Denis P. Kiku, Andrey P. Chernyaev and Lidiya T. Kovekovdova**
Assessment of petroleum hydrocarbons and heavy metals in estuarine areas of the rivers of Peter the Great Bay (Japan/East Sea)
- S1-5 **Lidiya T. Kovekovdova and Denis P. Kiku**
Metals in bottom sediments of Peter the Great Bay (Japan/Est Sea)
- S1-6 **Anatoliy L. Drozdov, Galina V. Moiseyenko, Konstantin A. Drozdov and Tatyana S. Vshivkova**
Bioassessment of ecological conditions of rivers, estuaries and marine areas around Vladivostok-city: Amurskiy and Ussuriiskiy Gulfs of the Sea of Japan
- S1-7 **Vladimir M. Shulkin, Tatyana Yu. Orlova, O.G. Shevchenko and Inna V. Stonik**
River runoff as a reason for the seasonal and interannual variability of coastal phytoplankton blooms and hydrochemical characteristics in the northwestern part of the East/Japan Sea
- S1-8 **Kuninao Tada, Miho Kayama, Naoto Hirade, Hitomi Yamaguchi, Supaporn Yamaguchi, Kazuhiro Harada, Minoru Tanda, Munehiro Fujiwara, Kazuhiko Ichimi and Tsuneo Honjo**
Decrease of surface water nutrient concentration and nutrient flux from the sediment in Harima-Nada, Eastern Seto Inland Sea, Japan
- S1-9 **Alla A. Ogorodnikova**
A system of biotic indices and impact – Response indicators of hydraulic activity on marine bioresources
- S1-10 **Dmitry Galanin, Sergey Dubrovsky, Viktor Sergeenko, Tatyana Shpakova and Yulia S. Chernyshova**
Current state of the scallop *Mizuhopecten yessoensis* (Jay, 1856) resources of the Sakhalin-Kuril region (Okhotsk Sea)
- S1-11 **Hyeong Kyu Kwon, Han-Soeb Yang, Seok Jin Oh, Ju Chan Kang and Chang Geun Choi**
Phytoremediation: Novel approach to remediate eutrophic coastal sediment using light-emitting diodes (LEDs) and benthic microalgae (BMA)
- S1-12 **Machiko Yamada, Mayuko Otsubo, Yuki Tsutsumi, Chiaki Mizota, Kuninao Tada and Paul J. Harrison**
Effect of fresh water on species diversity of the genus *Skeletonema* (Bacillariophyceae) in coastal and brackish waters
- S1-13 **Marisol Garcia-Reyes and William J. Sydeman**
Wavelet decomposition of upwelling: Forcing and ecosystem response
- S1-14 **Larissa A. Gayko**
Influence of climate change on the development of mollusks on marine farms (Possyet Bay, Japan/East Sea)

- S1-15
(cancelled) **Shang Chen and Tao Xia**
Technical directives for marine ecological capital assessment: Introduction and application in China seas
- S1-16 **Anna S. Vazhova and Andrey P. Chernyaev**
Content of polycyclic aromatic hydrocarbons (PAHs) in sediments of Amur Bay (Peter the Great Bay, Japan/East Sea)
- S1-17 **Talgat R. Kilmatov**
Changes in natural environment capacities due to climatic trends and possible migration of manpower on the western shore of the North Pacific
- S1-18 **Tamara G. Ponomareva and Polina A. Sokolova**
The Amur River estuary system
- S1-19 **Min-bo Luo and Yun-long Wang**
Community macrobenthos response to engineering in Hangzhou Bay, China

S2 MEQ Topic Session

Range extension, toxicity and phylogeny of epiphytic dinoflagellates

Co-Convenors: William Cochlan (USA) and Satoshi Nagai (Japan)

Invited Speakers:

Masao Adachi (Kochi University, Japan)

Teina Rongo (Florida Institute of Technology, USA)

Patricia Tester (National Ocean Service, NOAA, USA)

Takeshi Yasumoto (National Research Institute of Fisheries Science, Japan)

Ciguatera fish poisoning is a growing food-borne illness that is common in tropical waters, where poisoning numbers are poorly known but estimated to range from 50,000 to 500,000 cases per year. The incidence of ciguatera is on the rise, and appears to correspond to disturbances in the environment such as nutrients released into coastal waters, land-use changes, or warmer coastal waters. Indeed, the flagellates, *Gambierdiscus* and *Ostreopsis*, that can produce ciguatoxin- or palytoxin-like compounds, appear to be spreading to more temperate latitudes, including the waters of PICES member countries. To gain better insight to this new issue, we invite papers addressing benthic dinoflagellate taxonomy, evidence for range extension, descriptions of standardized sampling programs; assays for assessing toxicity, and sentinel products to alert public health officials to ciguatera risk. The goal of the session is to formulate a better understanding of environmental conditions fostering the prevalence of ciguatoxin-producing organisms in new geographical regions.

Thursday, October 18 (9:00-12:50)

- 09:00 **Introduction by Convenors**
- 09:05 **Toshiyuki Suzuki, Ryuichi Watanabe, Hajime Uchida, Ryoji Matsushima, Hiroshi (new) Nagai, Takeshi Yasumoto, Takamichi Yoshimatsu, Shinya Sato and Masao Adachi**
Discovery of novel ovatoxin isomers in several *Ostreopsis* strains in Japan (Invited)
- 09:35 **Masao Adachi, Takamichi Yoshimatsu, Haruka Iwamoto, Tomohiro Nishimura and Haruo Yamaguchi**
Effect of temperature change on the dominant species of *Gambierdiscus* in Japan - From a non-toxic species to a toxic species? (S2-8372), Invited
- 09:55 **Takuo Omura and Yasuwo Fukuyo**
Gambierdiscus in the mainland of Japan (S2-8695)
- 10:15 **Charles G. Trick and Danielle Beausoleil**
HABs and Ciguatera Fish Poisoning: Emerging methodological perspectives (S2-8824)
- 10:35 **Coffee/Tea Break**
- 11:00 **Teina Rongo and Robert van Woesik**
Ciguatera poisoning and climate oscillations in Rarotonga, southern Cook Islands (S2-8330), Invited
- 11:30 **Marina S. Selina, Tatiana V. Morozova, Nellya G. Litvinova and Tatyana Yu. Orlova**
Toxic epiphytic dinoflagellates in Peter the Great Bay, Sea of Japan, Russia (S2-8386)
- 11:50 **Changkyu Lee, Taegyu Park and Youngtae Park**
Geographic distribution of benthic dinoflagellates along Korean coasts (S2-8827)
- 12:10 **Patricia A. Tester and R. Wayne Litaker**
Accidental taxonomists and the resurgence of *Gambierdiscus* research (S2-8826), Invited
- 12:40 **Comments and Discussion**

12:50

Session Ends

S2 Poster

S2-1

Seung Ho Back

Occurrence of epiphytic dinoflagellate *Gambierdiscus* spp. in the uninhabited Baekdo Islands and Seopsom Island in the vicinity of Seogwipo, Jeju Province, Korea

S3 POC Topic Session

Challenges in understanding Northern Hemisphere ocean climate variability and change

Co-Sponsored by CLIVAR and ICES

Co-Convenors: Jürgen Alheit (ICES/Germany), Emanuele Di Lorenzo (PICES/USA), Michael Foreman (PICES/Canada), Shoshiro Minobe (PICES/Japan), Hiroaki Saito (PICES/Japan) and Toshio Suga (CLIVAR/Japan)

Invited Speakers:

Kenneth Drinkwater (Institute of Marine Research, Norway)

Young-Oh Kwon (Woods Hole Oceanographic Institution, USA)

Nathan Mantua (University of Washington, USA)

Yoshi N. Sasaki (Hokkaido University, Japan)

Akinori Takasuka (National Research Institute of Fisheries Science, FRA, Japan)

Physical climate variability and change exert substantial impacts on marine ecosystems, particularly on longer timescales because of the longer ocean memory compared with the atmosphere, and the cumulative effects on marine ecosystems. On a centennial scale, climate changes due to anthropogenic forcings may dominate over natural variability, but variations on decadal or shorter timescales may be mainly due to natural climate variability. Furthermore, natural climate variability can be modified via climate changes. Therefore, a correct understanding of the mechanisms underlying climate variability and change should be the basis for understanding and predicting future conditions of the North Pacific and North Atlantic. For the North Pacific there is no widely accepted consensus on the mechanisms governing decadal-to-multidecadal climate variability, and this mainly reflects the uncertainty of how, or even whether, the mid-latitude ocean influences the atmosphere. Some linkages between processes, such as oceanic memory due to Rossby wave propagation, are generally accepted, and predictability associated with these processes may also be important for understanding marine ecosystem impacts. It is also unclear if teleconnection dynamics between the North Pacific, North Atlantic and the Arctic exert an important control on the ocean's decadal climate state. This session brings together researchers of marine ecosystems, physical oceanography and climate to share ideas about what physical parameters and processes are important in understanding and predicting the response of specific marine ecosystems to climate forcing. Through collaboration among PICES, CLIVAR and ICES, this session invites contributions exploring important developments in the research field of the North Pacific climate variability and change, including physical environmental variations and their predictability, teleconnection dynamics between oceanic basins, such as the Pacific and Atlantic Oceans, and linkages between physical conditions and marine ecosystems.

Thursday, October 18 (9:00-17:30)

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|-------|---|
| 09:00 | Introduction by Convenors |
| 09:05 | Kenneth F. Drinkwater
Challenges in understanding ocean climate variability and change and its impacts: Temporal and spatial scales and multi-forcings (S3-8639), Invited |
| 09:30 | Jürgen Alheit
Impact of multi-decadal climate forcing on northern hemisphere small pelagic fish populations (S3-8595) |
| 09:50 | Andrey S. Krovnin, Boris N. Kotenev and George Moury
Interaction of major teleconnection patterns as a mechanism linking the North Pacific and North Atlantic climate (S3-8493) |
| 10:10 | Nathan Mantua and Megan Stachura
Empirical evidence for North Pacific ecosystem regime shifts revisited (S3-8834), Invited |

- 10:35 *Coffee/Tea Break*
- 10:55 **William T. Peterson, Jay Peterson, Cheryl A. Morgan and Jennifer L. Fisher**
Tracking ecosystem change in the northern California Current (S3-8688)
- 11:15 **Akinori Takasuka, Ichiro Aoki and Yoshioki Oozeki**
Environmental windows for small pelagic fish in the western North Pacific: How do their vital parameters respond to climate variability and change? (S3-8802), Invited
- 11:40 **Albert J. Hermann, Nicholas A. Bond, Georgina A. Gibson, Enrique N. Curchitser, Kate Hedstrom and Phyllis J. Stabeno**
Biophysical frequency response of the Bering Sea to large-scale forcing (S3-8710)
- 12:00 **Hyung Jeek Kim, Kiseong Hyeong, Chan Min Yoo, Dongseon Kim and Boo-Keun Khim**
Impact of strong El Niño events on sinking particle fluxes in the 10°N thermocline ridge area of the northeastern equatorial Pacific (S3-8584)
- 12:20 **Elena I. Ustinova and Yury D. Sorokin**
Regional features of the climate variability and change in the Far-Eastern Seas (S3-8753)
- 12:40 *Lunch*
- 14:00 **Young-Oh Kwon**
Role of the Kuroshio-Oyashio Extensions and Gulf Stream in the decadal climate and ecosystem variability (S3-8636), Invited
- 14:25 **Bunmei Taguchi and Niklas Schneider**
Dynamics of North Pacific oceanic heat content variability on decadal time-scale (S3-8752)
- 14:45 **Yoshi N. Sasaki, Shoshiro Minobe and Niklas Schneider**
Interannual to decadal variability of the Gulf Stream and Kuroshio Extension jets (S3-8397), Invited
- 15:10 **Jennifer L. Fisher, William T. Peterson, Cheryl A. Morgan and Jay Peterson**
Basin-scale *versus* local-scale drivers of copepod community dynamics in the northeast Pacific (Newport, Oregon, USA) (S3-8718)
- 15:30 *Coffee/Tea Break*
- 15:50 **Andrew Davis and Emanuele Di Lorenzo**
Forcing dynamics of mesoscale eddies in the California Current (S3-8332)
- 16:10 **Vadim Navrotsky**
Effects of solar activity on climate-ocean ecosystems interactions (S3-8532)
- 16:30 **Howard J. Freeland**
(cancelled) Temperature, salinity and density trends along Line-P and the implications for mixed layer formation (S3-8380)
- 16:30 **Patrick Cummins and Diane Masson**
Wind-driven variability of dissolved oxygen below the mixed layer at Station P (S3-8643)
- 16:50 **Haruka Nishikawa, Yoichi Ishikawa, Masafumi Kamachi, Hiromichi Igarashi, Shuhei Masuda, Toshimasa Doi, Shiro Nishikawa, Yoshihisa Hiyoshi, Yuji Sasaki, Takashi Mochizuki, Hiroshi Ishizaki, Tsuyoshi Wakamatsu and Toshiyuki Awaji**
Estimation of nutrient supply process in the spring Kuroshio-Oyashio transition region (S3-8523)

17:10 **Toshio Suga, Shigeki Hosoda, Ryuichiro Inoue, Kanako Sato, Koketsu Shinya, Taiyo Kobayashi, Fumiaki Kobashi, Katsuya Toyama, Toshiyuki Kita, Makio C. Honda, Kazuhiko Matsumoto, Kosei Sasaoka, Tetsuichi Fujiki, Hajime Kawakami, Masahide Wakita, Yoshikazu Sasai, Akihiko Murata, Kazuhiko Hayashi, Yoshimi Kawai, Vincent Faure, Akira Nagano, Takeshi Kawano and Toshiro Saino**
Western North Pacific Integrated Physical-Biogeochemical Ocean Observation Experiment (INBOX) (S3-8619)

17:30 *Session Ends*

S3 Posters

- S3-1 **Svetlana Yu. Glebova**
Winter cyclonic activities over the ocean as a factor in the subsequent changes in the atmospheric and thermal regime of the Far Eastern Seas and north-west Pacific (with a shift in one year)
- S3-2 **Qinghua Qi, Rong-shuo Cai and Qilong Zhang**
The variability of sea temperature in South China Sea (SCS) and its relationship with the early or later of SCS summer monsoon outbreaks
- S3-3
(cancelled) **Licheng Feng, Baochao Liu and Jianping Li**
A study of the effect of wind on Changjiang (Yangtze) River diluted water in summer
- S3-4 **Howard J. Freeland**
The current status of the international Argo project
- S3-5 **Hong-jian Tan and Rong-shuo Cai**
Possible impact of El Niño Modoki on marine environment in China offshore and its adjacent seas
- S3-6 **Taewook Park, Chan Joo Jang, Minho Kwon, Hanna Na and Kwang-Yul Kim**
ENSO effect on surface salinity variability in the Yellow and East China Seas in summer
- S3-7 **Dmitry V. Stepanov, Victoriia I. Stepanova and Nikolay A. Diansky**
Interannual to interdecadal variability of circulation in the Japan/East Sea based on numerical simulations
- S3-8
(cancelled) **Jianguo Du, William W.L. Cheung, Bin Chen, Qiulin Zhou and Shengyun Yang**
Progress and prospect of impacts of climate changes on marine biodiversity
- S3-9 **Larissa A. Gayko**
Air-sea interaction along the coast of north-western East/Japan Sea within 75 years
- S3-10 **Yang Liu, Sei-Ichi Saitoh, I. Nyoman Radiarta, Tomonori Isada, Toru Hirawake, Hiroyuki Mizuta and Hajime Yasui**
Impact of climate variability on marine aquaculture: A case study on the Japanese kelp in southern Hokkaido, Japan, using satellite remote sensing and GIS-based models
- S3-11 **Yuri Oh, Chan Joo Jang and Jihyun Lee**
Enhanced stratification in the southwestern East Sea (Japan Sea)
- S3-12 **Yoshikazu Fukuda, Wataru Ito, Toshiya Nakano, Shiro Ishizaki and Tsurane Kuragano**
Decadal variability of subsurface temperature in the North Pacific and recent modulation of the leading EOF modes

- S3-13 **Larisa Chernysheva and Viktoria Platonova**
Seasonal climate variability on the coastal zone of the western part of North Pacific
- S3-14 **Kosei Komatsu**
3D structure and decadal change of the nutrient in the Kuroshio region detected from historical data
- S3-15 **Naoki Furuichi, Toshiyuki Hibiya and Yoshihiro Niwa**
Assessment of turbulence closure models for resonant inertial response in the oceanic mixed layer using a large eddy simulation model
- S3-16 **Olga Skaberda, Lubov' Vasilevskaya and Julia Stochkute**
The relationship between the air temperature of East Kamchatka and the water temperature of western part of the Bering Sea
- S3-17
(cancelled) **Yulong Liu, Qi Wang and Jinkun Yang**
The features of bifurcate line about the North Equatorial Current in the Pacific
- S3-18 **Chan Joo Jang, Jihyeon So, Taewook Park and Sinjae Yoo**
Mixed layer variability and its associated chlorophyll *a* changes in the East Sea (Japan Sea)

S4

FIS/MONITOR/POC Topic Session

Monitoring on a small budget: Cooperative research and the use of commercial and recreational vessels as sampling platforms for biological and oceanographic monitoring

Co-Convenors: Steven Barbeaux (USA), Jennifer Boldt (Canada), Martin Dorn (USA) and Jae Bong Lee (Korea)

Invited Speaker:

Rudy Kloser (CSIRO (Commonwealth Scientific and Industrial Research Organisation), Australia)

Long-term monitoring is a key component of an ecosystem-based approach to fisheries management. Time series data enable the examination of changes in oceanographic and community metrics. Government funding sources for long-term monitoring of biological and oceanographic processes has dwindled in recent years, while the mandate for this type of information has increased. If data driven ecosystem-based management continues to be goal then methods for reducing the costs of data collection must be found while data quality is maintained. An example of this type of innovative approach can be found in Alaska walleye pollock (*Theragra chalcogramma*) fishery where researchers have teamed with commercial fishers to deploy inexpensive temperature and depth data storage tags on trawl nets. At the same time, data on fish density and distribution are being collected using the fishing vessels' own acoustic systems. These data are being used to validate oceanographic models, to assess the effects of oceanographic conditions on bycatch in the walleye pollock fishery, and to evaluate the effects of oceanographic conditions on walleye pollock density and distribution. This session is intended to explore the ways in which cooperative research with other seagoing stakeholders and the use of commercial and recreational vessels as sampling platforms for biological and oceanographic monitoring can be integrated into ocean monitoring systems. With sufficient interest by the contributors, a special issue of *Fisheries Research* will be sought.

Wednesday, October 17 (9:00-12:50)

- 09:00 *Introduction by Convenors*
- 09:05 **Rudy J. Kloser, Tim E. Ryan, Ryan Downie, Mark Lewis and Gordon Keith**
Using commercial vessels to monitor deep-water fisheries and basin scale ecosystems (S4-8546), Invited
- 09:30 **Sonia Batten and Anthony Walne**
Ship of Opportunity sampling of lower trophic levels (S4-8392)
- 09:50 **Elizabeth A. Logerwell, Steven J. Barbeaux and Lowell W. Fritz**
Using walleye pollock acoustic survey data and Steller sea lion foraging information to manage fisheries – sea lion interactions in the Aleutian Islands (S4-8435)
- 10:10 **Viktor N. Filatov, Yury.V. Eremin, Elena I. Ustinova and Aleksey V. Ballo**
Monitoring of oceanographic and biological conditions in the Pacific saury fisheries expedition (S4-8811)
- 10:30 *Coffee/Tea Break*
- 10:50 **Ata Suanda and John A. Barth**
Long-term observations of internal waves with shore-based video cameras (S4-8361)
- 11:10 **Oksana G. Mikhailova**
Coastal monitoring the state of pink shrimp *Pandalus borealis* population on West Kamchatka (S4-8382)
- 11:30 **Christopher Siddon**
Collaborating with the commercial fishing industry: An intensive, cost-effective method to improve red king crab stock assessments in southeastern Alaska, U.S.A. (S4-8689)

- 11:50 **Aimee A. Keller, W. Waldo Wakefield, Victor H. Simon, John A. Barth and Stephen D. Pierce**
(new) Environmental sampling, hypoxia and the Northwest Fisheries Science Center's Cooperative U. S. West Coast Groundfish Bottom Trawl Survey (S4-8804)
- 12:10 **Kazuaki Tadokoro, Yuji Okazaki, Akinori Takasuka, Tadafumi Ichikawa and Hiroya Sugisaki**
Archiving historical meso-zooplankton samples collected around Japan (S4-8552)
- 12:30 **Steven J. Barbeaux**
Cooperative monitoring in the Alaska walleye pollock (*Theragra chalcogramma*) fishery (S4-8510)
- 12:50 *Session Ends*

S4 Posters

- S4-1 **Igor Burago, Georgy Moiseenko, Olga Vasik and Igor Shevchenko**
Sharing marine "small science" data
- S4-2 **Aimee A. Keller, W. Waldo Wakefield, Victor H. Simon, John A. Barth and Stephen D. Pierce**
(moved to oral) Environmental sampling, hypoxia and the Northwest Fisheries Science Center's Cooperative U.S. West Coast Groundfish Bottom Trawl Survey
- S4-3 **Orio Yamamura, Kouji Kooka and Takeomi Isono**
Monitoring demersal fish community containing predators of walleye pollock using a small fishing boat

S5

MEQ/FUTURE Topic Session

Social-ecological systems on walleye pollock and other commercial gadids under changing environment: Inter-disciplinary approach

Co-Convenors: Keith Criddle (USA), Suam Kim (Korea), Mitsutaku Makino (Japan), Ian Perry (Canada), Yasunori Sakurai (Japan) and Anatoliy Velikanov (Russia)

Invited Speakers:

Oleg Bulatov (Russian Federal Research Institute of Fisheries and Oceanography, Russia)

Alan Haynie (Alaska Fisheries Science Center)

In order to build bridges between scientists, decision-makers, stakeholders, and across sectors, there is a need for more in-depth and concrete inter-disciplinary research framework in the context of the PICES integrative science program FUTURE. One of the typical groundfish resources in the North Pacific, pollock is highlighted to facilitate such academic discussions under the PICES framework. Research on walleye pollock from the perspectives of ecology, biology, stock dynamics, harvesting, fisheries management, history, marketing, processing, international trade, consumption, and culture will be presented. Inter-relationships among these varied perspectives, information needs, potential values for other disciplines, *etc.*, will be discussed during this session. An expected outcome of this session will be a holistic framework for the inter-disciplinary research, which could be applied to other species.

Tuesday, October 16 (9:00-17:30)

- 09:00 **Introduction by Convenors**
- 09:05 **Oleg A. Bulatov**
Walleye pollock: Global view (S5-8399), Invited
- 09:35 **Tetsuichiro Funamoto, Osamu Shida, Kazuhiko Itaya, Orio Yamamura, Ken Mori, Yoshiaki Hiyama and Yasunori Sakurai**
Comparisons of recruitment fluctuation mechanisms of walleye pollock in the Sea of Japan and the Pacific Ocean off northern Japan (S5-8526)
- 09:55 **Anatoliy Ya. Velikanov**
Long-term changes in abundance and annual catches of walleye pollock off Sakhalin Island in the Japan/East Sea and the Okhotsk Sea: From collapse to renewal (S5-8357)
- 10:15 **Benjamin C. Williams, Gordon H. Kruse and Martin W. Dorn**
Variations in walleye pollock (*Theragra chalcogramma*) maturation rates in the Gulf of Alaska (S5-8455)
- 10:35 **Coffee/Tea Break**
- 11:00 **Anatoly V. Smirnov**
Ecosystem approaches to pollock fishery management in Russia (S5-8333)
- 11:20 **Hiroshi Kuroda, Daisuke Takahashi, Tomonori Azumaya and Humio Mitsudera**
Development of a high-resolution coastal model around Hokkaido for fisheries science – A study on passive transport of eggs, larvae and juveniles of walleye pollock (S5-8747)
- 11:40 **Igor K. Trofimov**
About distribution of under-yearling saffron cod in Karaginsky and Olutorsky Gulfs, Bering Sea (S5-8383)

- 12:00 **Toru Nakagawa, Masayuki Chimura, Naoto Murakami, Takashi Ichikawa, Norio Shirafuji, Jun Yamamoto, Tetsuichiro Funamoto, Ken Mori, Yoshiaki Hiyama and Toyomitsu Horii**
Establishment of a rearing system of larval and juvenile walleye pollock for elucidating their biological properties and responses to environmental changes (S5-8565)
- 12:20 ***Lunch***
- 14:00 **Alan C. Haynie**
FishSET: A new tool to better incorporate fisher behavior into fisheries management (S5-8707), Invited
- 14:30 **Osamu Shida, Yukio Mihara and Kazushi Miyashita**
Interannual changes in the timing of walleye pollock spawning migration and their impacts on gill-net fisheries in the southwestern Pacific coast of Hokkaido, Japan (S5-8696)
- 14:50 **Yohei Kawauchi, Masayuki Chimura, Takashi Muto, Masamichi Watanobe and Kazushi Miyashita**
The effect of environmental factors on the distributions of walleye pollock (*Theragra chalcogramma*) juveniles in Funka Bay and vicinity, Hokkaido, Japan (S5-8385)
- 15:10 **Mikhail A. Stepanenko**
Bering Sea pollock recruitment, abundance, distribution and approach to fishery management under changing environment (S5-8327)
- 15:30 ***Coffee/Tea Break***
- 15:50 **Keith R. Criddle and James Strong**
Straddling the line: Cooperative and non-cooperative strategies for management of Bering Sea pollock (S5-8379)
- 16:10 **Masamichi Kawano and Masahito Hirota**
Market and distribution of walleye pollock (S5-8780)
- 16:30 **Suam Kim, Sukyung Kang and Dohoon Kim**
The ecology of walleye pollock and its market importance in Korea (S5-8830)
- 16:50 ***Discussion***
- 17:30 ***Session Ends***

S5 Posters

- S5-1 **Andrei N. Stroganov and Alexei M. Orlov**
On the population structure of Pacific cod
- S5-2 **Sergey S. Ponomarev**
Inter-annual variability of Pollock 0-year-class abundance in the northern sea of Okhotsk
- S5-3 **Andrey Smirnov**
Correlation of pollock and herring yield broods inhabiting the northern part of the Sea of Okhotsk
- S5-4 **Nadezhda L. Aseeva, Marina B. Shedko, Andrey Smirnov and Alexander S. Sergeev**
New data on ectoparasites of walleye pollock in the Okhotsk Sea
- S5-5 **Tadayasu Uchiyama, Gordon H. Kruse and Franz J. Mueter**
Effects of water temperature increases on eastern Bering Sea juvenile pollock predation

S6 BIO/MEQ Topic Session

Environmental contaminants in marine ecosystems: Seabirds and marine mammals as sentinels of ecosystem health

Co-Sponsored by JSPS

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

Invited Speakers:

John Elliott (Science & Technology Branch Environment Canada)

Atsuhiko Isobe (Ehime University, Japan)

Andy Sweetman (Centre for Chemical Management, Lancaster University, UK)

Hideshige Takada (Tokyo University of Agriculture and Technology, Japan)

Rei Yamashita (Tokyo University of Agriculture and Technology, 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 as 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 PICES-2011 MEQ Workshop. This 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 are invited, as well as 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 are encouraged.

Wednesday, October 17 (9:00-13:00)

- 09:00 **Introduction by Convenors**
- 09:05 **Andy Sweetman, John Crosse, Richard Shore, Gloria Pereira and Kevin Jones**
Long term trends in PBDE concentrations in gannet (*Morus bassanus*) eggs from two UK colonies (S6-8461), Invited
- 09:30 **Rei Yamashita, Hideshige Takada, Mai Miyazaki, Takashi Yamamoto, Akinori Takahashi, Maki Yamamoto, Philip N. Trathan and Yutaka Watanuki**
Persistent organic pollutants (POPs) in preen gland oils from streaked shearwaters reflect exposure in overwintering areas (S6-8745), Invited
- 09:50 **Sang Hee Hong, Gi Myung Han, Won Joon Shim, Sung Yong Ha and Nak Won Heo**
Concentrations and profiles of persistent organic pollutants (POPs) in birds collected from an urbanized coastal region of South Korea (S6-8763)
- 10:10 **Annamalai Subramanian and Shinsuke Tanabe**
Developing Asian countries as sources of pollutants to the Asia-Pacific region (S6-8540)
- 10:30 **Coffee/Tea Break**
- 10:50 **John E. Elliott, Kyle H. Elliott, Melanie F. Guigueno, Laurie K. Wilson, Sandi Lee and Abde Idrissi**
Seabirds are indicators of persistent contaminants in the marine environment: Examples from the Pacific Coast of Canada (S6-8626), Invited

- 11:15 **Peter S. Ross**
Persistent Organic Pollutants (POPs) in marine mammals: Harmless chemicals or lingering poisons? (S6-8641)
- 11:35 **Vasily Yu. Tsygankov, Margarita D. Boyarova, Anna A. Lukashkina, Peter A. Tyupelev, Ilya A. Shcherbakov, Yuri V. Prikhodko and Olga N. Lukyanova**
Marine mammals as bioindicators of persistent toxic substance (PTS) contamination in Russian Subarctic marine ecosystems (S6-8554)
- 11:55 **Atsuo Ito, Rei Yamashita, Hideshige Takada, Takashi Yamamoto, Kozue Shiomi, Carlos Zavalaga, Takuya Abe, Shinichi Watanabe, Maki Yamamoto, Katsufumi Sato, Hiromi Kohno, Ken Yoda, Tomohiko Iida and Yutaka Watanuki**
POPs in the preen gland oil of Streaked Shearwaters breeding on the islands in Japan reflect marine pollution in western North Pacific (S6-8465)
- 12:15 **Atsuhiko Isobe, Shin'ichiro Kako and Etsuko Nakashima**
Marine/beach plastic litter as a transport vector of pollutants (S6-8533), Invited
- 12:35 **Kosuke Tanaka, Hideshige Takada, Rei Yamashita and Yutaka Watanuki**
Marine plastics: Monitoring matrix for persistent organic pollutants (POPs) and carrier of POPs to seabirds (S6-8731), Invited
- 12:55 *Discussion*
- 13:00 *Session Ends*

S6 Posters

- S6-1 **Andrey S. Neroda, Vasily F. Mishukov, Vladimir A. Goryachev, Denis V. Simonenkov and Anna A. Goncharova**
Radioactive isotopes in atmospheric aerosols over Russia and the Sea of Japan following the nuclear accident at Fukushima nr. 1 Daiichi nuclear power station in March 2011
- S6-2 **Tatiana Chizhova, Pavel Tishchenko, Liubov Kondratieva and Takuya Kawanishi**
Polycyclic aromatic hydrocarbon (PAH) distribution in the Amur River estuary
- S6-3 **Yulia Koudryashova, Natalia Prokuda, Natalia Khodorenko, Tatiana Chizhova and Pavel Tishchenko**
PAHs in sediments of rivers of the Primorsky Region, Far East of Russia
- S6-4 **Mikhail V. Simokon**
Ecological risk evaluation of metals in the coastal areas of Peter the Great Bay, Japan/East Sea

S7 BIO/FIS Topic Session **Jellyfish in marine ecosystems and their interactions with fish and fisheries**

Co-Sponsored by ICES

Co-Convenors: Richard Brodeur (PICES/USA), Cornelia Jaspers (ICES/Denmark), Christopher Lynam (ICES/UK), Song Sun (PICES/China), Shin-Ichi Uye (PICES/Japan) and Won-Duk Yoon (PICES/Korea)

Invited Speakers:

Thomas K. Doyle (University College Cork, Ireland)

William M. Graham (University of Southern Mississippi, USA)

Reiji Masuda (Kyoto University, Japan)

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.

Thursday, October 18 (9:00-18:00)

- 09:00 **Introduction by Convenors**
- 09:05 **William M. Graham, Stefan Gelcich, Carlos M. Duarte, Shin-ichi Uye, Richard Brodeur, Robert H. Condon and NCEAS Jellyfish Working Group**
Jellyfish and fisheries: Risks, trade-offs and adaptations (S7-8601), Invited
- 09:35 **Thomas K. Doyle, Emily J. Baxter, Graeme C. Hays, Hamish D. Rodger and Neil M. Ruane**
Detrimental impacts of jellyfish on finfish aquaculture: insights from the North East Atlantic (S7-8603), Invited
- 10:05 **Reiji Masuda, Yuko Miyajima, Ryosuke Ohata and Yoh Yamashita**
Jellyfish as a predator and prey of fishes: Underwater observations and rearing experiments (S7-8630), Invited
- 10:30 **Coffee/Tea Break**
- 10:50 **Jennifer E. Purcell, Ana Sabatés, Verónica Fuentes, Francesc Pagès, Uxue Tilves, Alejandro Olariaga and Josep-María Gili**
Predation potential of blooming jellyfish, *Pelagia noctiluca*, on fish larvae in the NW Mediterranean Sea (S7-8367)

- 11:10 **Cornelia Jaspers**
The invasive ctenophore *Mnemiopsis leidyi* in northern European waters and its potential impact on fisheries (S7-8597)
- 11:30 **Shin-ichi Uye, Alenka Malej and Tjasa Kogovsek**
Comparative analysis of the Inland Sea of Japan and the northern Adriatic: Can changes in anthropogenic pressures disclose jellyfish outbreaks? (S7-8623)
- 11:50 **Martin K.S. Lilley, Steven E. Beggs, Thomas K. Doyle, V.J. Hobson, K.H.P. Stromberg and Graeme C. Hays**
Direct and indirect evidence for massive differences in jellyfish biomass between the Pacific and Atlantic: Implications for fisheries bycatch? (S7-8590)
- 12:10 **Lucas Brotz, William W.L. Cheung, Reg Watson, Kristin Kleisner, Evgeny Pakhomov, Philippe Cury, Roxane Maranger, Brooke Campbell and Daniel Pauly**
Anthropogenic impacts related to observed increases of jellyfish populations (S7-8509)
- 12:30 **Lunch**
- 14:00 **Christopher P. Lynam, Martin K.S. Lilley, Thomas Bastian, Thomas K. Doyle, Steven E. Beggs and Graeme C. Hay**
Have jellyfish in the Irish Sea benefited from climate change and overfishing? (S7-8676)
- 14:20 **Alexander V. Zavolokin**
Jellyfish of the Far Eastern Seas of Russia: Composition, spatio-temporal variations and significance for ecosystems (S7-8331)
- 14:40 **Song Sun, Chaolun Li, Guangtao Zhang, Shiwei Wang and Xiao Xia Sun**
Giant jellyfish blooms in the Yellow Sea and East China Sea (S7-8450)
- 15:00 **Akira Okuno, Tatsuro Watanabe, Satoshi Kitajima, Naoto Honda and Katsumi Takayama**
Numerically simulated migration/distribution of *Nemopilema nomurai* in the Japan Sea using temperature-based controls (S7-8633)
- 15:20 **Masaya Toyokawa, Akira Yasuda, Yusuke Murata, Kazuhiro Aoki, Manabu Shimizu and Minoru Hamada**
Aurelia swarms originate from polyps near the mouth of a bay: evidence from Mikawa Bay and Ise Bay (S7-8464)
- 15:40 **Coffee/Tea Break**
- 16:00 **Mary Needler Arai**
Predation on gelatinous cnidaria and ctenophores (S7-8402)
- 16:20 **Brian E. Smith and Jason S. Link**
The presence of gelatinous zooplankton in the diets of fishes of the Northeast U.S. continental shelf: Trends in shelf-wide feeding and consumptive removals (S7-8667)
- 16:50 **James J. Ruzicka, Elizabeth A. Daly and Richard D. Brodeur**
Salmon and jellyfish: Bumping elbows in the Northern California Current (S7-8360)
- 17:10 **John C. Field Jarrod A. Santora Keith Sakuma Amber Payne and Baldo Marinovic**
Spatial and temporal patterns of variability in Scyphomedusae in the central California coastal marine ecosystem (S7-8798)
- 17:30 **Richard D. Brodeur, Mary Beth Decker, Elizabeth A. Daly, Caren Barcelo, James J. Ruzicka and Kristin Cieciel**
A tale of two *Chrysaora*: Pivotal roles in contrasting marine ecosystems (S7-8430)
- 17:50 **Discussion**
- 18:00 **Session Ends**

S7 Posters

- S7-1 **Sim Yee Kwang, Chuah Chern Chung, Anita Talib and Khairun Yahya**
Exogenous impacts on the massive occurrence of jellyfish in the northern part of Malacca Straits, Malaysia
- S7-2 **Wen-Tseng Lo, Hung-Yen Hsieh and Shwu-Feng Yu**
Comparison of siphonophore assemblages during northeasterly and southwesterly monsoon seasons in the Taiwan Strait, western North Pacific Ocean
- S7-3 **Ryosuke Makabe, Ryuji Furukawa, Mariko Takao and Shin-ichi Uye**
Marine construction as a factor boosting *Aurelia aurita* s.l blooms: A case study of a new floating pier deployment in Hiroshima Bay, Japan
- S7-4 **Takashi Kamiyama**
Planktonic ciliates as a prey source for moon Jellyfish *Aurelia aurita*: Feeding activities and growth effects of ephyra and metephyra stages
- S7-5 **Satoshi Kitajima, Akira Okuno, Naoki Iguchi, Naoto Honda, Tatsuro Watanabe and Osamu Katoh**
Low temperature excludes medusae of *Nemopilema nomurai* in the Japan Sea in winter
- S7-6 **Thomas Bastian, Damien Haberlin, Mary Catherine Gallagher, Sean Rooney, Graeme C. Hays and Thomas K. Doyle**
Tracking the lion's mane jellyfish: Horizontal and vertical movements of *C. capillata* (Scyphozoa) in a shallow coastal environment
- S7-7 **Steven E. Beggs, Thomas Bastian, Martin K.S. Lilley and Thomas K. Doyle**
Annual and regional variations in associations between Scyphomedusae and juvenile gadoids in the Irish Sea
- S7-8 **Martin K.S. Lilley and F. Lombard**
Developing a technique for *in-situ* monitoring of fragile planktonic organisms
- S7-9 **Kristin Cieciel, Jeanette Gann and Bruce Wing**
Methods for conducting individual measurements on trawled jellyfish
(cancelled)
- S7-10 **Naoki Fujii, Shinya Magome, Atsushi Kaneda and Hidetaka Takeoka**
Relationship between jellyfish abundance and environmental fluctuations in Uwa Sea
- S7-11 **Jun Nishikawa, Fatimah Md. Yusoff, Nguyen Thi Thu, Khwanruan Srinui, Mulyadi and Shuhei Nishida**
Jellyfish fisheries in Southeast Asia

S8 POC/FIS Topic Session

Linking migratory fish behavior to End-to-End models II

Co-Convenors: Enrique Curchitser (USA), Shin-ichi Ito (Japan) and Michio Kishi (Japan)

Invited Speaker:

Robert Humston (Washington and Lee University, USA)

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 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. To model fish behavior, integrated studies are needed including laboratory experiments, tagging and acoustic observations, and modeling. The purpose of this session is to review the current state of development in laboratory experiments, field observations and modeling to understand fish behavior and to discuss future potential collaborations to improve fish migration models. Presentations related to laboratory experiments, field observations and modeling works related to fish behavior are welcome.

Wednesday, October 17 (9:00-12:40)

- 09:00 **Introduction by Convenors**
- 09:05 **Robert Humston**
Selecting appropriate models of fish movement for End-to-End models of marine ecosystems (S8-8831), Invited
- 09:30 **Ivonne Ortiz, Kerim Aydin and Albert J. Hermann**
20 species, 15 lengths: How fish move driven by happiness as defined by growth and predation (S8-8706)
- 09:50 **Seokjin Yoon, Terui Takeshi, Michio J. Kishi and Shin-ichi Ito**
An individual-based modeling approach for Pacific saury migrations (S8-8570)
- 10:10 **Yoshioki Oozeki, Takeshi Okunishi, Akinori Takasuka and Daisuke Ambe**
Annual change in migration pattern of Pacific saury larvae from spawning to nursery grounds (S8-8681)
- 10:30 **Coffee/Tea Break**
- 11:00 **Masanori Takahashi, Atsushi Kawabata, Chikako Watanabe, Michio Yoneda, Daisuke Ambe and Takeshi Okunishi**
Migratory behavior and recruitment process of the Pacific stock of chub mackerel *Scomber japonicus* (S8-8766)
- 11:20 **Tohya Yasuda, Ryuji Yukami and Seiji Ohshimo**
Changes in spatial distribution of chub mackerel under climate change: The case study using Japanese purse seine fisheries data in the East China Sea (S8-8560)
- 11:40 **Jung Jin Kim, William T. Stockhausen, Yang-Ki Cho, Gwang Ho Seo and Suam Kim**
Transport processes of eggs and paralarvae of Japanese common squid, *Todarodes pacificus* in the Northwest Pacific (S8-8765)
- 12:00 **Akira Okuno, Tatsuro Watanabe, Naoto Honda, Katsumi Takayama, Naoki Iguchi and Satoshi Kitajima**
Importance of swimming-depth model of jellyfishes *Nemopilema nomurai* in simulation of their migration in the Japan Sea (S8-8634)

12:20 **Satoshi Nakada, Takashi Uenaka, Ken-ichi Kitao, Kenta Matsui, Yoichi Ishikawa, Naohisa Sakamoto, Koji Koyamada, Toshiyuki Awaji and Sei-Ichi Saitoh**
Estimated migration of scallop larvae in Funka Bay by using streamline visualization (S8-8677)

12:40 *Session Ends*

S8 Poster

S8-1 **Michio J. Kishi**
Discussions on random walk and behavioral movement models coupled with NEMURO.
FISH: Case study on chum salmon and saury

S9 FIS/MEQ Topic Session

Ecological functions and services associated with marine macrophyte communities as indicators of natural and anthropogenic stressors in nearshore zones of the North Pacific

Co-Convenors: Ik-Kyo Chung (Korea) and Jun Shoji (Japan)

Invited Speakers:

Masakazu Hori (National Research Institute of Fisheries and Environment of Inland Sea, Japan)

Katsumasa Yamada (National Institute for Environmental Studies, Japan)

Diverse communities of marine and estuarine macrophyte vegetation including kelp beds, seaweeds, macrobenthic algae, seagrasses, and salt marshes occur along the coastlines of the PICES member countries. In addition to the direct primary production of organic material into marine ecosystems, these macrophytic communities are also considered as ecological engineers that can have important indirect supporting roles in the lives of heterotrophic organisms such as fishes, shellfish, seabirds, and other marine organisms. Seasonal growth and breakdown of macrophytic vegetation has important implications for the biochemistry of essential nutrients in the nearshore zones, and for the interactions among vertebrate and invertebrate members of marine and estuarine communities. Fluctuations in physical and chemical parameters such as sea water temperature, salinity, nutrient availability, incident light levels, water flow, and sediment conditions contribute as complex regulating factors toward the establishment and persistence of macrophyte communities. In contrast, the physical structure of the macrophytes themselves can modify the local environment, affect the composition and abundance of their associated organisms, and provide essential ecological roles as recruitment sites, nursery areas, foraging habitats, and sinks for marine carbon. These interactions among ambient environmental parameters, macrophytes, and their associated organisms are collectively known as ecosystem functions and services, which are influenced not only by natural forces but also by anthropogenic stressors. The topic session will focus on the ecological functions and services provided by diverse communities of macrophytes throughout the North Pacific coastal zone. In particular, presentations are encouraged that explore the diversity and dynamics of ecosystem functions and services provided by macrophytes that may be regarded as biotic indicators of natural shifts and human-induced stressors in nearshore ecosystems.

Friday, October 19 (9:00-12:15)

- 09:00 ***Introduction by Convenors***
- 09:05 **Masakazu Hori**
Effect of coastal seascape diversity on associated fish production (S9-8495), Invited
- 09:30 **Nam-Il Won, Hideki Takami, Yutaka Kurita, Daisuke Muraoka and Tomohiko Kawamura**
Trophic structure of the rocky shore ecosystem in Otsuchi Bay, Japan: Implications for benthic–pelagic coupling (S9-8529)
- 09:50 **Tsutomu Noda, Yoshitomo Nagakura, Daisuke Shimizu, Hideaki Aono, Hiroyuki Okouchi, Masami Hamaguchi, Atsushi Fukuta, Yasuhiro Kamimura and Jun Shoji**
Impact of the tsunami from the Great East Japan Earthquake on seagrass beds and fish assemblages in Miyako Bay (S9-8632)
- 10:10 **Shiori Sonoki, Yuka Morita, Jun Syoji and Kazushi Miyashita**
Monitoring seasonal variations in a seagrass bed by an acoustics method (S9-8416)
- 10:30 ***Coffee/Tea Break***
- 10:50 **Katsumasa Yamada**
Functional diversity and functional redundancy of a faunal community in a seagrass ecosystem of northern Japan (S9-8587), Invited

- 11:15 **Sang Rul Park, Joseph Stachelek and Kenneth H. Dunton**
The role of salt marsh plants as a net sink or source for carbon dioxide in the southwestern Gulf of Mexico (S9-8506)
- 11:35 **Ekaterina V. Golovashchenko**
The economic value of ecosystem services in Kievka Bay (Japan Sea) (S9-8675)
- 11:55 **Seokjin Yoon, Michio J. Kishi, Satoshi Nakada, Yoichi Ishikawa, Tomonori Isada and Sei-Ichi Saitoh**
Ecological functions of a kelp community as an indicator of anthropogenic nutrient stressors (S9-8772)
- 12:15 *Session Ends*

S9 Posters

- S9-1 **Chunjiang Guan, Jie Na, Meng Xu and Xiutang Yuan**
Studies on carbon, nitrogen, and phosphorus uptake fluxes by *Suaeda salsa* around the Bohai Sea District
- S9-2 **Ivan I. Cherbady and Ludmila I. Sabitova**
Influence of environmental factors on ammonium and phosphate uptake rates by a red alga (*Ahnfeltia tobuchiensis*) population in Izmena Bay (Kunashir Island)
- S9-3 **Yun Hee Kang, Chang Jae Choi and Sang Rul Park**
Effects of intensity and season of disturbance on the marine benthic community of a rocky intertidal shore with a periodic green tide occurrence in Korea
- S9-4 **Chang Geun Choi and Seok Jin Oh**
(move to poster) Development of artificial seaweed bed for ecological restoration (S9-8558)

S10 BIO/MEQ/FUTURE Topic Session **Ecosystem responses to multiple stressors in the North Pacific**

Co-Sponsored by SOLAS

Co-Convenors: Vladimir Kulik (Russia), Ian Perry (Canada) and Motomitsu Takahashi (Japan)

Invited Speaker:

Natalie Ban (James Cook University, Australia)

Marine ecosystems of the North Pacific, both coastal and offshore, are influenced by multiple stressors, such as increased temperature, change in iron supply, harmful algal blooms, invasive species, hypoxia/eutrophication, ocean acidification, and intensive fishing. These multiple stressors can (but do not always) act synergistically to change ecosystem structure, function, and dynamics in unexpected ways that can differ from responses to single stressors. Further, these stressors can be expected to vary by region and over time. This session seeks to understand the responses of various marine ecosystems to multiple stressors and to identify appropriate indicators of these effects. Contributions are invited which review and define categories of indicators to document the status and trends of ecosystem change at a variety of spatial scales (*e.g.*, coastal, regional, basin) in response to multiple stressors. Emphasis will be placed on empirical and theoretical approaches that forge links between ecosystem change and the intensities of multiple stressors. This session will form a contribution to the work of PICES WG 28 on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors* (http://www.pices.int/members/working_groups/wg28.aspx).

Friday, October 19 (9:00-12:00)

- 09:00 **Introduction by Convenors**
- 09:05 **Natalie C. Ban, Stephen S. Ban and Hussein M. Alidina**
Mapping cumulative impact: Advances, relevance and limitations to marine management and conservation in Pacific Canada, and emerging Bayesian approaches (S10-8514), Invited
- 09:25 **R. Ian Perry and Jennifer Boldt**
Identifying multiple stressors and potential habitat responses in marine ecosystems of Pacific Canada (S10-8612)
- 09:45 **Vladimir V. Kulik**
Mapping cumulative human and natural impacts in the Sea of Okhotsk (S10-8559)
- 10:05 **Motomitsu Takahashi, Sachihiko Itoh, Naoki Yoshie, Kazuhiko Mochida, Masakazu Hori and Shigeru Itakura**
Comparative study on ecosystem responses to anthropogenic activities and natural stressors among inland, shelf and oceanic waters around Japan (S10-8568)
- 10:25 **Coffee/Tea Break**
- 10:45 **Mingyuan Zhu, Ruixiang Li and Zongling Wang**
Ecosystem Changes under multi-stressors in the Yellow Sea (S10-8573)
- 11:05 **Kyung-Su Kim, JeongHee Shim and Suam Kim**
The combined effects of elevated carbon dioxide concentration and temperature on the early development stage of olive flounder *Paralichthys olivaceus* (S10-8429)
- 11:25
(cancelled) **Anna V. Skriptsova, Ludmila I. Sabitova and Ivan I. Cherbady**
Long-term changes in the subtidal macrophyte community in Peter the Great Bay (Sea of Japan): A response to climate change? (S10-8428)
- 11:25 **Discussion**
- 12:00 **Session Ends**

S10 Posters

- S10-1 **Evgeniya Tikhomirova**
Typical distributions of primary production at the surfaces of Peter the Great Bay (Japan Sea)
- S10-2 **Kanako Naito, Setsuko Sakamoto, Mineo Yamaguchi, Ichiro Imai and Ken-ichi Nakamura**
Iron as a triggering factor for harmful dinoflagellate blooms
- S10-3 **Aya Morinaga and Kazumi Matsuoka**
Eutrophication suggested by the heterotrophic signal of dinoflagellate cyst assemblages; Case of Omura Bay, West Japan
- S10-4 **Yuta Inagaki, Tetsuya Takatsu, Masafumi Kimura, Yota Kano, Toyomi Takahashi, Yoshihiko Kamei, Naoto Kobayashi and Tatsuaki Maeda**
Effects of hypoxia on annual changes in growth and somatic condition of flathead flounder *Hippoglossoides dubius* in Funka Bay, Japan
- S10-5 **Tetsuya Takatsu, Koji Shinoda, Shoichi Inoue, Tomofumi Seta and Yuta Inagaki**
Drastic reduction of demersal fish abundance by hypoxia in Mutsu Bay Japan in the fall of 2011
- S10-6 **Stephani Zador and Kirstin Holsman**
Identifying and comparing ecosystem stressors in the eastern Bering Sea and Gulf of Alaska
- S10-7 **Yumiko Yara, Meike Vogt, Masahiko Fujii, Hiroya Yamano, Claudine Hauri, Marco Steinacher, Nicolas Gruber and Yasuhiro Yamanaka**
Ocean acidification limits temperature-induced poleward expansion of coral habitats
- S10-8 **Anastasiia Strobykina**
Spatial and temporal variability of nutrients in the Okhotsk Sea shelf zone

S11 MONITOR/POC Topic Session **Effects of natural and artificial calamities on marine ecosystems and the scheme for their mitigation**

Co-Sponsored by JSFO and FRA

Co-Convenors: Michael Foreman (Canada), Toyomitsu Horii (Japan), Vladimir Kulik (Russia), Phillip Mundy (USA), Sei-ichi Saitoh (Japan), Hiroya Sugisaki (Japan) and Tokio Wada (Japan)

Invited Speakers:

Josef Cherniawsky (Institute of Ocean Sciences, Canada)

Shin-ichi Ito (Tohoku National Fisheries Research Institute, Japan)

Nikolai Maximenko (International Pacific Research Center, USA)

Stanley Rice (University of Tampa, USA)

Masahiro Yamao (Hiroshima University, Japan)

From ancient times, we have been discussing and taking countermeasures on revival of fisheries and social infrastructures of waterside from natural disasters such as tsunamis and floods. The earthquake (Magnitude 9.0) that occurred in northeastern Japan on the 11th of March, 2011, was beyond our imagination. The earthquake and the subsequent gigantic tsunami destroyed the regional fisheries and surrounding society, and impacted marine ecosystems in eastern Japan. The tsunami also damaged the nuclear power plant of Fukushima, posing a serious threat to the North Pacific ecosystems due to the radioactive contamination of the ocean. Other recent examples of disasters which caused serious problems of environmental pollution for the marine ecosystems are hurricane Katrina in 2005, and the oil spill of the Gulf of Mexico in 2010. The magnitude of climatic disasters such as storms and floods may have been enhanced due to global warming. Since oil refineries, factories, power plants and other industrial infrastructures are often built in the coastal areas of the world, coastal ecosystems are vulnerable to natural and artificial disasters. For the wise use of ecosystem services, it is urgent and important to reveal the effects of natural and artificial disasters on marine ecosystems, to document their restoration processes, and to promote effective measures for restoration and mitigation of disaster impacts. The purposes of this session are to discuss: (1) the effect on the marine ecosystem by disasters, (2) the effect on the marine industries and societies by disasters, (3) schemes for the mitigations and recoveries from the disasters, (4) field monitoring on the effect and the process of recoveries, (5) domestic and international cooperation, and (6) policy and its effect.

Tuesday, October 16 (9:30-17:30)

- 09:30 **Introduction by Convenors**
- 09:40 **Stanley D. Rice**
Exxon Valdez: Long Term environmental consequences of oil persistence and toxicity (S11-8835), Invited
- 10:10 **Hiroya Sugisaki**
On behalf of Japanese Society of Fisheries Oceanography
General report on the projects aided by the PICES/ICES/JSFO fund for fisheries and oceanographic research on the recovery from the Great East Japan Earthquake (S11-8539)
- 10:30 **Coffee/Tea Break**
- 10:50 **Shin-ichi Ito, Shigeho Kakehi, Taku Wagawa, Yoji Narimatsu, Yutaka Kurita, Tomoko Sakami, Hideki Takami, Hideki Kaeriyama, Ken Fujimoto, Tsuneo Ono, Hiroyuki Tanaka, Takashi Kamiyama, Shigeru Itakura, Yuji Okazaki, Kazuaki Tadokoro, Akira Kuwata, Hiroaki Saito, Masaki Ito and Tsutomu Hattori**
The application of marine research to the study the marine ecosystem on the Pacific coast of northeastern Japan after the Great East Japan Earthquake disaster (S11-8403), Invited

- 11:20 **Daisuke Muraoka, Tomoko Sakami, Goro Yoshida, Masakazu Hori, Hiromori Shimabukuro, Takehisa Yamakita and Hitoshi Tamaki**
Impact of the Great East Japan Earthquake on *Zostera* meadows in the coastal area close to the epicenter (S11-8441)
- 11:40 **Hideki Takami, Tomohiko Kawamura, Daisuke Muraoka, Nam-II Won and Hiroshi Nakaie**
Effects of the mega-earthquake and tsunami on rocky shore ecosystems on Sanriku Coast, Japan (S11-8345)
- 12:00 **Hiroshi Isami and Atsushi Tsuda**
Effects of the tsunami on zooplankton communities in Otsuchi Bay, northern Japan (S11-8650)
- 12:20 ***Lunch***
- 13:50 **Masahiro Yamao Zulhamsyah Imran, Achmad Zamroni, Kazuko Tatsumi and Michiko Amamo**
Strengthening social resilience in earthquake and tsunami affected coastal Asia through improvement of livelihood and social capital (S11-8820), Invited
- 14:20 **Natsuki Hasegawa and Toshihiro Onitsuka**
Damage from the tsunami on the Asari clam fishery in east Hokkaido, Japan and the problems in its recovery (S11-8352)
- 14:40 **Delvan Neville, Richard D. Brodeur, A. Jason Phillips and Kathryn Higley**
Assessment and characterization of radionuclide concentrations from the Fukushima Reactor release in the plankton and nekton communities of the Northern California Current (S11-8703)
- 15:00 **Toshihiro Wada, Yoshiharu Nemoto, Shinya Shimamura and Satoshi Igarashi**
Tsunami disaster and nuclear power plant accident effects on fishery facilities and marine products in Fukushima Prefecture: Present conditions and prospects (S11-8594)
- 15:20 ***Coffee/Tea Break***
- 15:40 **Nikolai Maximenko and Jan Hafner**
Tracking marine debris generated by the March 11, 2011 tsunami using numerical models and observational reports (S11-8530), Invited
- 16:10 **John A. Barth, Jonathan Allan, Craig Risien, Jan A. Newton and NANOOS Colleagues**
The Northwest Association of Networked Ocean Observing Systems (NANOOS) interactive tsunami evacuation maps (S11-8821)
- 16:30 **Josef Cherniawsky and Roy Walters**
Predicting future tsunami waves and currents on the West Coast of Canada (S11-8800), Invited
- 17:00 **Xiaorong Li, Huaming Yu and Songyang Song**
A new method based on FVCOM to simulate the impacts of a tidal power station on the surrounding marine environment (S11-8810)
- 17:20 ***Discussion***
- 17:30 ***Session Ends***

S11 Posters

- S11-1 **Yuichiro Yamada, Shinnosuke Kaga and Takehiko Ogata**
Influence of a huge tsunami on the coastal plankton community structure, especially on the abundance of the toxic dinoflagellate (*Alexandrium tamarense*) in Ofunato Bay, Sanriku, Japan
- S11-2 **Yuji Okazaki, Yutaka Kurita and Shinji Uehara**
Changes in the demersal fish communities of the sandy beach in Sendai Bay after the disturbance by the tsunami
- S11-3 **Hiroyuki Tanaka, Shigeho Kakehi and Shin-ichi Ito**
Temporal variation of polycyclic aromatic hydrocarbons in surface seawater from Sendai Bay, Japan, between June 2011 and March 2012
- S11-4 **Daisuke Ambe, Hideki Kaeriyama, Yuya Shigenobu, Ken Fujimoto, Hajime Saito, Hideki Sawada, Tsuneo Ono, Takashi Setou and Tomowo Watanabe**
Distribution of radioactive cesium in sea sediment and bottom boundary layer after the Fukushima Daiichi Nuclear Power Plant accident
- S11-5 **Galina S. Borisenko, Yuriy G. Blinov and Igor I. Glebov**
Investigation of radioactive pollution of biological resources in the northwest part of the Pacific Ocean after leakage at the nuclear power station “Fukushima-1” in Japan
- S11-6 **Hideki Kaeriyama, Daisuke Ambe, Masachika Masujima, Kou Nishiuchi, Ken Fujimoto, Tsuneo Ono and Tomowo Watanabe**
Oceanic dispersion of radioactive cesium around Japan and western North Pacific after the Fukushima Dai-ichi Nuclear Power Plant accident
- S11-7 **Hiroya Sugisaki**
On behalf of *Japanese Society of Fisheries Oceanography*
General report on the projects aided by the PICES/ICES/JSFO fund for fisheries and oceanographic research on the recovery from the Great East Japan Earthquake (S11-8539)

S12 BIO/FIS/POC Topic Session

Advances in understanding the North Pacific Subtropical Frontal Zone Ecosystem

Co-Convenors: Taro Ichii (Japan), Skip McKinnell (PICES) and Michael Seki (USA)

Invited Speakers:

Hikomichi Igarashi (Data Research Center for Marine-Earth Science, JAMSTEC, Japan)

The goal of this session is to compile a comprehensive collection of papers for the first time in two decades that can serve to synthesize knowledge of the roles of climate, physics, chemistry, biology, and humans in the Subtropical Frontal Zone (STFZ). The STFZ is a large, seasonally variable, dynamic, and complex oceanic region spanning the breadth of the North Pacific Ocean from Asia to North America. Its large-scale fronts and mesoscale processes give rise to localized “hot spots” of enhanced biological aggregation. The productivity of the region provides the ecological underpinnings for multi-national commercial fisheries. The STFZ provides important habitat for many species of fish and squid, seabirds, and marine mammals that undergo extensive seasonal migrations between the STFZ and summer feeding grounds in the Subarctic. Concern for interactions between protected species, such as loggerhead turtles, and fisheries are focus areas of interest today, as is the health and productivity of the fisheries resources. Finally, interest in the effect of marine debris that is accumulating in oceanic “garbage patches” is increasing, perhaps exacerbated by growing interest in the fate of the debris field in the aftermath of the 2011 tsunami near Japan. This session would provide valuable information on potential impacts of climate and humans on marine ecosystem in the STFZ. The compilation of papers submitted to this session will be published in a special issue of *Progress in Oceanography*.

Friday, October 19 (9:00-12:30)

- 09:00 **Introduction by Convenors**
- 09:05 **Hikomichi Igarashi, Toshiyuki Awaji, Taro Ichii, Mitsuo Sakai, Yoichi Ishikawa, Shuhei Masuda, Haruka Nishikawa, Yoshihisa Hiyoshi, Yuji Sasaki and Sei-Ichi Saitoh**
Diagnosis of the possible link between interannual variation of neon flying squid abundance in the North Pacific and the recent climate regime shift in 1998/99 by using 4DVAR ocean data assimilation product (S12-8662), Invited
- 09:30 **Evan A. Howell, Aimee L. Hoover, Jeffrey J. Polovina and Michael P. Seki**
Spatial and temporal variability in the biophysical properties of the North Pacific Subtropical Frontal Zone during 1997-2011 (S12-8615)
- 09:50 **Carey Morishige and Evan A. Howell**
Marine debris movement and concentration within the North Pacific Ocean (S12-8708)
- 10:10 **Kedarnath Mahapatra and Yoshihiro Okada**
Influence of climate variability on pelagic ocean condition in the Kuroshio-Oyashio Transition Area using time series remote sensing data (S12-8803)
- 10:30 **Coffee/Tea Break**
- 10:50 **Hiroaki Saito, Kazutaka Takahashi, Yuichiro Nishibe, Ken Furuya, Koji Hamasaki, Kiyotaka Hidaka, Tadafumi Ichikawa, Mutsuo Ichinomiya, Shigeo Kakehi, Miwa Nakamachi, Yuta Nishibe, Yuji Okazaki and Yuya Tada**
Food-web structure and dynamics in the frontal zone of Kuroshio Extension (S12-8622)

- 11:10 **Mitsuo Sakai, Toshie Wakabayashi, Haruka Urabe, Makoto Okazaki, Yoshiki Kato, Masachika Masujima, Denzo Inagake and Yasuhiro Senga**
Distribution and growth of young neon flying squid, *Ommastrephes bartramii*, in the central North Pacific Subtropical and Transition Zones during winter (S12-8564)
- 11:30 **Taro Ichii, Haruka Nishikawa, Hiromichi Igarashi, Hiroshi Okamura, Kedarnath Mahapatra, Mitsuo Sakai, Toshie Wakabayashi, Denzo Inagake and Yoshihiro Okada**
Impacts of extensive squid driftnet fishery and climate variability on epipelagic nekton in the Transition Region of the central North Pacific (S12-8563)
- 11:50 **David G. Foley, Elliott L. Hazen, Steven J. Bograd, Scott A. Shaffer, Scott Benson, Barbara A. Block and Daniel P. Costa**
Convergence from bottom to top: An oceanographic perspective on the movements of apex predators near the North Pacific transition zone chlorophyll front (S12-8799)
- 12:10 **Lesley H. Thorne, Scott A. Shaffer, Elliott L. Hazen, Steven J. Bograd, David G. Foley, Melinda G. Connors, Michelle A. Kappes and Daniel P. Costa**
Effects of inter-annual variability of the transition zone chlorophyll front on the habitat use and reproductive success of Laysan and Black-footed albatrosses (S12-8618)
- 12:30 *Session Ends*

S12 Posters

- S12-1 **Atsushi Yamaguchi, Kohei Matsuno, Yoshiyuki Abe and Ichiro Imai**
Interannual/latitudinal variations in abundance, biomass, community structure and estimated production of epipelagic mesozooplankton along 155°E longitude in the western North Pacific during spring
- S12-2 **Dharmamony Vijai, John R. Bower, Yoshihiko Kamei and Yasunori Sakurai**
Distribution and characteristics of neon flying squid (*Ommastrephes bartramii*) near a spawning area off Hawaii

S13 MEQ/FUTURE Topic Session

Risk management in coastal zone ecosystems around the North Pacific

Co-Convenors: Masahide Kaeriyama (Japan) and Thomas Therriault (Canada)

Invited Speaker:

Erlend Moksness (Institute of Marine Research, Norway)

Currently, approximately 60% of the world's population lives within 60 km of the coast, and this number is expected to reach 75% within the next two decades due to increased population growth. The coastal zone is an extremely complex environment that includes both coastal, nearshore marine and estuarine ecosystems, and the adjacent terrestrial area. Human populations around the North Pacific rely heavily on this zone for their livelihood, but growing pressures from increasingly diverse human activities coupled with climate change and natural catastrophes (e.g., earthquake and tsunami) threaten the sustainability and productivity of coastal ecosystems. Risk management based on adaptive management and precautionary principles, is one way to prioritize, identify, and potentially mitigate impacts resulting from diverse human activities in coastal zones. This session will focus on: (1) preparation and countermeasures to respond to natural catastrophes; (2) protection of coastal zone ecosystems from human-mediated impacts (e.g., habitat loss, pollution, harmful algal events, invasive species), and (3) the institution and protection of marine protected areas (MPAs).

Wednesday, October 17 (9:00-12:30)

- 09:00 **Introduction by Convenors**
- 09:05 **Erlend Moksness**
Coastal marine ecosystems and Integrated Coastal Zone Management (ICZM): A way forward (S13-8376), Invited
- 09:35 **Ichiro Imai, Asami Kuroda, Yuka Onishi, Atsushi Yamaguchi and Mineo Yamaguchi**
History of eutrophication and harmful algal bloom (HAB) events in the Seto Inland Sea of Japan and a proposal for prevention strategies for HABs using seaweed- and seagrass-beds (S13-8649)
- 09:55 **Ellik Adler, Lawrence Hildebrand and Reynaldo Molina**
Coastal Spatial Planning in the East Asian Seas Region – Climate Change and Disaster Risk Reduction (S13-8825)
- 10:15 **Ji-Yeon Shin**
Analysis of urban high school students' and scuba divers' awareness on the ocean environment and plans to enhance public awareness (S13-8628)
- 10:35 **Coffee/Tea Break**
- 10:50 **Tomohiko Kawamura**
Secondary succession in coastal ecosystems after the enormous disturbance by the Great East Japan Earthquake on the Sanriku Coast: Importance of scientific guidelines for future sustainable fisheries and ecosystem management (S13-8389)
- 11:10
(cancelled) **Zheng Wei, Zhan Lian, Fengye Zhang and Honghua Shi**
Assessment of ecological loss of the oil spill based on hydrodynamic numerical model – A case study in Jiaozhou Bay (S13-8714)
- 11:10
(new) **Tomoya Kataoka, Hirofumi Hinata and Shin'ichiro Kako**
Simultaneous monitoring at multiple sites of beached plastic litter quantity using webcam

- 11:30 **Sei-Ichi Saitoh, Katsuyoshi Tanaka and Fumihiko Takahashi**
Development and application of Tohoku Coastal Web-GIS for supporting recoveries of the Tohoku Earthquake (S13-8786)
- 11:50
(cancelled) **Jianguo Du, Qiulin Zhou, Shengyuan Yang, Quan Wen and Bin Chen**
The demonstration of estuarine biodiversity conservation, restoration and PA networking in China (S13-8412)
- 11:50
(new) **Paul J. Harrison, Jie Xu and Kedong Yin**
Do changes in N:P ratios influence the occurrence of HABs?
- 12:10
(cancelled) **Blake E. Feist, Marlene Bellman, Michael J. Ford and Phillip S. Levin**
Potential vulnerability of cetaceans to groundfish fishing fleets in the California Current (S13-8795)
- 12:10
(new) **Masahide Kaeriyama, Yu-xue Qin, Yosuke Koshino, Daisuke Uryu and Hideaki Kudo**
Sustainability and risk management of Pacific salmon under changing climate and catastrophic earthquake and tsunami in coastal ecosystems around Japan
- 12:30 *Session Ends*

S13 Posters

- S13-1 **Masahide Kaeriyama, Yu-xue Qin, Yosuke Koshino, Daisuke Uryu and Hideaki Kudo**
(moved to oral) Sustainability and risk management of Pacific salmon under changing climate and catastrophic earthquake and tsunami in coastal ecosystems around Japan
- S13-2 **Tomoya Kataoka, Hirofumi Hinata and Shin'ichiro Kako**
(moved to oral) Simultaneous monitoring at multiple sites of beached plastic litter quantity using webcam
- S13-3 **Galina S. Gavrilova**
Some risks of on-bottom shellfish aquaculture in Peter the Great Bay (Japan Sea)

S14 POC/TCODE Topic Session

Changing ocean biogeochemistry and its ecosystem impacts

Co-Sponsored by ICES, IMBER and SOLAS

Co-Convenors: Silvana Birchenough (ICES/UK), Steven Bograd (PICES/USA), Arthur Chen (IGBP), Masao Ishii (PICES/Japan) and Tony Koslow (PICES/USA)

Invited Speakers:

Curtis Deutsch (University California Los Angeles, USA)

Akihiko Murata (JAMSTEC, Japan)

Brad Seibel (University of Rhode Island, USA)

Ocean biogeochemistry is undergoing rapid and growing anthropogenic change. A significant fraction of anthropogenic CO₂ is taken up by the ocean, which drives down pH and reduces the saturation state of carbonate minerals like calcite and aragonite, a process known as “ocean acidification”. Global climate models also predict that dissolved oxygen concentrations in the deep ocean will decline by 20-40% over the coming century or so as global warming enhances stratification of the upper mixed layer and reduces ventilation of the deep ocean. Declining oxygen levels have now been reported from mid-ocean depths in the tropical oceans and across the North Pacific. Both processes are of particular concern in the North Pacific, where the water is naturally “old” and has shallow carbonate saturation horizons, relatively low buffering capacity, and extensive oxygen minimum zones. It is anticipated that these anthropogenic influences on the global ocean will increase in coming decades as atmospheric CO₂ levels and global temperatures continue to rise. We invite papers on the changing biogeochemistry of the global ocean, its impacts on organisms and ecosystem function, and emergent impacts on biogeochemical cycles related to the interaction of ocean acidification and declining oxygen with climate change and other anthropogenic impacts.

Tuesday, October 16 (9:00-17:30)

- 09:00 **Introduction by Convenors**
- 09:05 **Akihiko Murata, Shinya Kouketsu, Toshimasa Doi, Kazuhiko Hayashi and Yuichiro Kumamoto**
Decadal changes of dissolved inorganic carbon in the Pacific (S14-8699), Invited
- 09:35 **Liqi Chen, Zhongyong Gao, Wweijun Cai, Heng Sun and Suqing Xu**
Surface Carbon Changes in the western Arctic Ocean under seaice rapid shrinking and its implication of Arctic Ocean Acidification (S14-8394)
- 09:55 **Takamitsu Ito and Curtis Deutsch**
Understanding low-frequency variability of subsurface oxygen using a hierarchy of models (S14-8705)
- 10:15 **Shuchai Gan and Ying Wu**
Quantification of BDOC (bio-available dissolved organic carbon) of different water masses in East China Sea (S14-8651)
- 10:35 **Coffee/Tea Break**
- 10:55 **Kosei Komatsu, Ichiro Yasuda, Sachihiko Itoh, Toru Ikeya, Hitoshi Kaneko, Kiyotaka Hidaka and Satoshi Osafune**
Impacts of epipycnal and diapycnal nutrient-transport by the Kuroshio on the productivity in the adjacent epipelagic waters (S14-8691)
- 11:15 **James Christian, Laurent Bopp, John Dunne, Michael Eby, Paul Halloran, Tatiana Ilyina, Ian Totterdell and Akitomo Yamamoto**
Trends in ocean CaCO₃ undersaturation in the CMIP5 suite of Earth System Models (S14-8721)

- 11:35 **Silvana N.R. Birchenough, Nigel Lyman, David A. Roberts, Juan Moreno-Navas and J. Murray Roberts**
In-situ characterisation of habitats adjoining cold-water coral reefs using a Sediment Profile Imagery (SPI) camera (S14-8789)
- 11:55 **John A. Barth, Francis Chan and Stephen D. Pierce**
Understanding and predicting hypoxia over the Pacific Northwest continental shelf (S14-8814)
- 12:15 **Yvette H. Spitz and Harold P. Batchelder**
Oregon shelf oxygen dynamics and exchange with the deep ocean: A modeling approach (S14-8788)
- 12:35 **Lunch**
- 14:05 **Curtis Deutsch and Aaron Ferrel**
Metabolic constraints on marine habitat and its climatic change (S14-8732), Invited
- 14:35 **Brad A. Seibel**
Climate change impacts on animal function and biogeochemical cycles (S14-8700), Invited
- 15:05 **Angelica Peña and William Crawford**
Trends in oxygen concentrations in the Gulf of Alaska and British Columbia waters (S14-8518)
- 15:25 **Coffee/Tea Break**
- 15:50 **Yukihiro Nojiri, Sayaka Yasunaka, Shinichiro Nakaoka, Tsuneo Ono, Hitoshi Mukai and Norihisa Usui**
Variability of carbon cycle and biological production in the North Pacific estimated from mapping of $p\text{CO}_2$, alkalinity, and dissolved inorganic carbon (S14-8625)
- 16:10 **Keith B. Rodgers, Masao Ishii, Daniele Iudicone, and Olivier Aumont, Matthew C. Long and Joan A. Kleypas**
Re-emergence of anthropogenic carbon and pacific warm pool acidification (S14-8757)
- 16:30 **Finlay Scott, Ruth Parker and Silvana N.R. Birchenough**
Predicting the regional impacts of ocean acidification: Integrating sediment biodiversity and ecosystem function (S14-8782)
- 16:50 **J. Anthony Koslow, Peter Davison and Ana Lara-Lopez**
The influence of declining oxygen concentrations and mesopelagic fish biomass on ecosystem structure in the California Current (S14-8658)
- 17:10 **Julie E. Keister, Anna McLaskey, Lisa Raatikainen, Shallin Busch, Amanda Winans and Paul McElhany**
Oxygen and pH conditions experienced by zooplankton in a North Pacific fjord: Impacts on taxonomic composition, distributions, and growth (S14-8750)
- 17:30 **Session Ends**

S14 Posters

- S14-1
(cancelled) **Baodong Wang**
Shift in salinity regions of maximum phytoplankton biomass in the Changjiang River plume: Impacts of the Three Gorges Dam?
- S14-2 **Toshiya Nakano, Takashi Midorikawa, Tomoyuki Kitamura, Yusuke Takatani, Kazutaka Enyo, Masao Ishii and Hisayuki Y. Inoue**
Recent slowdown of wintertime oceanic $p\text{CO}_2$ increase in the western North Pacific: Relationship to variation in the subtropical gyre
- S14-3 **Yusuke Takatani, Daisuke Sasano, Toshiya Nakano, Takashi Midorikawa and Masao Ishii**
Decrease of dissolved oxygen due to warming and other factors in the western North Pacific subtropical gyre
- S14-4 **Naohiro Kosugi, Daisuke Sasano, Masao Ishii, Kazutaka Enyo, Toshiya Nakano and Takashi Midorikawa**
Acidification in the North Pacific subtropical mode water and its relation with climate variability
- S14-5 **Sébastien Putzeys, Carlos Almeida, Pierrick Bécognée, Lidia Yebra, Ángeles Marrero Diaz and Santiago Hernández-León**
Active carbon flux by diel migrant zooplankton in the eutrophic and oligotrophic waters of the Canary Current
- S14-6 **Toru Suzuki, Masao Ishii, Tsuneo Ono, Takeshi Kawano, Masahide Wakita, Lisa A. Miller, Akihiko Murata, Ken-ichi Sasaki, James Christian and Robert M. Key**
PACIFICA: Pacific Ocean Interior Carbon Data Synthesis

BIO Paper Session

Co-Convenors: Michael Dagg (USA), Hiroaki Saito (Japan) and Atsushi Tsuda (Japan)

The Biological Oceanography Committee (BIO) has a wide range of interests spanning from molecular to global scales. BIO targets all organisms living in the marine environment including bacteria, phytoplankton, zooplankton, micronekton, benthos and marine birds and mammals. In this session, we welcome all papers on biological aspects of marine science in the PICES region. Contributions from the early career scientists are especially encouraged.

Day 1, Thursday, October 18 (14:00-17:30)

- 14:00 **Introduction by Convenors**
- 14:05 **John R. Bower, Katsunori Seki, Tsunemi Kubodera, Jun Yamamoto and Takahiro Nobetsu**
Egg brooding in a gonatid squid off the Shiretoko Peninsula, Hokkaido, Japan (BIO-P-8672)
- 14:25 **Oh Youn Kwon, Jung-Hoon Kang, Kyun-Woo Lee, Woong-Seo Kim and Jin Hwan Lee**
Size-fractionated phytoplankton biomass and species composition in the Yellow Sea: A comparison of different latitudes in spring and summer (BIO-P-8631)
- 14:45 **Hidefumi Fujioka, Atsushi Tsuda and Ryuji J. Machida**
Early life cycle of *Neocalanus plumchrus* and *Neocalanus flemingeri* in the Oyashio region, western north Pacific (BIO-P-8586)
- 15:05 **Yuichiro Nishibe, Kazutaka Takahashi, Tadafumi Ichikawa, Kiyotaka Hidaka, Hiroaki Kurogi, Kyohei Segawa and Hiroaki Saito**
Feeding of oncaeid copepods on discarded appendicularian houses (BIO-P-8553)
- 15:25 **Coffee/Tea Break**
- 15:50 **Minkyung Shin, Wongyu Park and Jungwha Choi**
Population dynamics of *Oithona similis* off Busan, South Korea (BIO-P-8724)
- 16:10 **C. Tracy Shaw, Leah R. Feinberg and William T. Peterson**
Effects of environmental changes on the euphausiids *Euphausia pacifica* and *Thysanoessa spinifera* in the coastal upwelling zone off the Oregon Coast, USA (BIO-P-8507)
- 16:30 **Rui Saito, Atsushi Yamaguchi, Hiromichi Ueno, Hiroji Onishi and Ichiro Imai**
Interannual variations in the zooplankton community in the Alaskan Stream region during the summer of 2004-2010 (BIO-P-8497)
- 16:50 **Akash R. Sastri, John Nelson and Beatrix E. Beisner**
Spatial patterns of zooplankton community productivity and functional trait diversity in the Bering and Chukchi Seas (BIO-P-8665)
- 17:10 **Jarrod A. Santora, John C. Field, Isaac D. Schroeder, Keith Sakuma, Brian K. Wells and William J. Sydeman**
Spatial ecology of krill, micronekton and top predators in the central California Current: implications for defining ecologically important areas (BIO-P-8417)
- 17:30 **Session Ends**

Day 2, Friday, October 19 (9:00-12:30)

- 09:00 **Introduction by Convenors**
- 09:05 **Vjacheslav S. Labay**
Long-term variability of sublittoral macrobenthos of the Sakhalin's shelf of Tatar Strait (Sea of Japan) (BIO-P-8349)
- 09:25 **Harold P. Batchelder**
Spatial-temporal patterns of residence-time, transport and connectivity among near-shore marine reserves on the Oregon shelf from particle-tracking using inputs from multiple physical models (BIO-P-8796)
- 09:45 **Yongjiu Xu, Joji Ishizaka and Hisashi Yamaguchi**
Interannual variation of jellyfish (*Nemopilema nomurai*) abundance and magnitude, and timing of phytoplankton bloom in the Yellow and East China Seas (BIO-P-8580)
- 10:05 **Koji Hamasaki, Akiko Tomaru, Akito Taniguchi, Yuya Tada, Yasuyuki Nogata and Haruto Ishii**
Microbial control of jellyfish larval settlement (BIO-P-8709)
- 10:25 **Coffee/Tea Break**
- 10:50 **Tabitha C.Y. Hui, Yumi Kobayashi, Yoko Mitani, Kei Fujii, Kei Hayashi and Kazushi Miyashita**
Spatial, temporal and dietary overlap between harbour seals and fisheries in Erimo, Japan: Conflict at sea? (BIO-P-8652)
- 11:10 **George L. Hunt, Jr., Martin Renner and Kathy Kuletz**
The composition and distribution of seabird communities across the southeastern Bering Sea shelf (BIO-P-8816)
- 11:30 **Robert M. Suryan and Amanda J. Gladics**
Effects of environmental variation on diets and stable isotope signatures of a piscivorous seabird in a coastal upwelling system (BIO-P-8808)
- 11:50 **Andrew W. Trites, Elizabeth Atwood, Christopher Barger, Brian Battaile, Kelly J. Benoit-Bird, Ine Dorrestijn, Scott Heppell, Brian Hoover, David Irons, Nathan Jones, Alexander Kitaysky, Kathy Kuletz, Chad Nordstrom, Rosana Paredes, Heather Renner, Daniel Roby and Rebecca Young**
Is it food? A comparative analysis of increasing and decreasing populations of thick-billed murres, black-legged kittiwakes and northern fur seals in the eastern Bering Sea (BIO-P-8719)
- 12:10 **Peter A. Thompson, Anya Waite and Lynnath Beckley**
Investigating the recruitment failure of Australia's western rock lobster (*Panulirus cygnus*) (BIO-P-8444)
- 12:30 **Session Ends**

BIO-P Session Posters

- BIO-P-1 **Yuji Tomaru and Yoshitake Takao**
Diversities of diatom viruses isolated from Japanese coastal waters
- BIO-P-2 **Anastasia S. Dolganova**
Far eastern seas benthos and its investigation in TINRO-Centre (2002-2012)

- BIO-P-3 **Toru Kobari, Minoru Kitamura and Makio C. Honda**
Seasonal changes in abundance, stage composition and depth distribution of *Neocalanus* copepods in the Western Subarctic Gyre
- BIO-P-4 **Chiyuki Sassa and Yuichi Hirota**
Seasonal occurrence of mesopelagic fish larvae in the onshore side of the Kuroshio off southern Japan
- BIO-P-5 **Young-Ok Kim, Seung Won Jung and Eun-Sun Lee**
Effects of oil pollution on attached microbial communities in short-term indoor microcosms
- BIO-P-6 **Seung Won Jung, Young-Ok Kim, Jung-Hoon Kang, Moonkoo Kim and Won Joon Shim**
Impact of dispersant plus crude oil on natural plankton assemblages in short-term marine mesocosms
- BIO-P-7 **Kyun-Woo Lee, Chang Kyu Joo, Jung-Hoon Kang, Oh-Yoon Kwon and Won Joon Shim**
Acute and chronic toxicity of the water accommodated fraction (WAF) and chemically enhanced WAF (CEWAF) of crude oil in the rock pool copepod *Tigriopus japonicus*
- BIO-P-8 **Elena Dulepova and Vladimir Dulepov**
Carrying capacity of the Okhotsk Sea pelagic ecosystem
- BIO-P-9 **Ludmila S. Belan, Tatyana Belan, Boris Borisov, Alexander Moshchenko and Tatyana Konovalova**
Distribution of macrozoobenthos along the pipeline route at the Lunskeye field (NE Sakhalin Island Shelf)
- BIO-P-10 **Seung Ho Back, Moon Ho Shon and Won Joon Shim**
Effects of the chemically-enhanced water-accommodated fraction of Iranian Heavy Crude oil on the periphytic microbial communities in microcosm experiments
- BIO-P-11 **Vladimir P. Korchagin, Olga Grunina, Alexander Dubov and Olga N. Vakulenko**
Bioconversion of algae biomass into bioethanol using homogenate from marine invertebrate digestive organs
- BIO-P-12 **Rie Nakamura, Toru Kobari, Kazuyuki Tanabe, Minoru Kitamura and Makio C. Honda**
Comparison of seasonal changes in the mesozooplankton community between the subtropical and subarctic North Pacific Ocean
- BIO-P-13 **Liudmila Dolmatova and Olga Zaika**
Temporal variations in activities of antioxidant enzymes in coelomic fluid of the holothurian *Eupentacta fraudatrix* in Alexeev Bay (Peter the Great Bay), Sea of Japan
- BIO-P-14 **Kiyotaka Hidaka, Takumi Nonomura, Kosei Komatsu, Sachihiko Itoh, Ichiro Yasuda, Toru Ikeya and Shingo Kimura**
Distribution of calanoid copepods of the genus *Paracalanus* around the Izu Ridge, south of Japan, and extent of the 'island mass effect' in the region
- BIO-P-15 **Hirotsada Moki, Akira Okuno and Tatsuro Watanabe**
Development of a new ocean carbon cycle model for the Japan Sea
- BIO-P-16 **Corinne Pomerleau, Francis Juanes, Rodney Rountree and Kate Moran**
A comparative study of sound production in two marine environments monitored by the NEPTUNE Canada undersea observatory network
- BIO-P-17 **Kate Moran, S. Kim Juniper and Corinne Pomerleau**
The Two Ocean Networks Canada (ONC) undersea observatory networks: NEPTUNE Canada and VENUS

- BIO-P-18 **William J. Sydeman, Jarrod A. Santora, Jason Hassrick, Marcel Losekoot, Sean Hayes and William T. Peterson**
Canyonlands: Krill “hotspots” of the northern California Current
- BIO-P-19 **Naoya Kanna, Koji Suzuki, Aiko Murayama and Jun Nishioka**
Bioavailability of sea ice-derived iron for phytoplankton growth
- BIO-P-20 **Natsuko Nakayama, Shinichi Kondo, Reiko Nakao, Yasuhiro Shima, Naotsugu Hata, Yuji Tomaru, Masami Hamaguchi, Keizo Nagasaki and Shigeru Itakura**
Contribution of HcRNAV viruses against *Heterocapsa circularisquama* bloom by inoculating frozen sediment
- BIO-P-21 **Sayaka Sogawa (nee Matsumura), Hiroya Sugisaki and Tomohiko Kikuchi**
Carbon and nitrogen isotope ratios of euphausiids in the northwestern Pacific
- BIO-P-22 **Yoshiyuki Abe, Masafumi Natsuike, Kohei Matsuno, Atsushi Yamaguchi and Ichiro Imai**
Variability in assimilation efficiency of the copepod *Neocalanus cristatus*: Effect of food
- BIO-P-23 **John R. Bower, Yusuke Okude, Tetsuya Nishikawa and Kazutaka Miyahara**
Movement of diamond squid in the Sea of Japan revealed using pop-up satellite tags
- BIO-P-24 **Shinji Shimode Kazutaka Takahashi and Atsushi Tsuda**
Ontogenetic vertical migration of two tropical-subtropical copepods, *Rhincalanus nasutus* and *Rhincalanus rostrifrons*, in the northwestern Pacific Ocean: Implication for a variety of life history strategies of *Rhincalanus*
- BIO-P-25 **Toru Kobari, Keisuke Unno, Haruka Nagafuku, Hajime Kawakami, Minoru Kitamura and Makio C. Honda**
Comparisons of fecal pellet characteristics in the surface layers between the subarctic and subtropical North Pacific Ocean
- BIO-P-26 **Hironori Higashi, Hiroshi Koshikawa, Wang Qinxue, Motoyuki Mizuochi, Toru Hasegawa, Yoko Kiyomoto, Kou Nishiuchi, Kazumaro Okamura, Hiroaki Sasaki, Yasushi Gomi, Hideki Akiyama, Kunio Kohata and Shogo Murakami**
A numerical study on predominance of dinoflagellates on the central continental shelf of the East China Sea
- BIO-P-27 **Jingfeng Fan, Xiaohui Wang and Hongxia Ming**
(cancelled) Bacterial communities of the sea surface microlayer in the Northern Yellow Sea in China
- BIO-P-28 **Yuri V. Prikhodko, Vasiliy Yu. Tsygankov and Margarita D. Boyarova**
Pesticides and seafood safety in the Russian fish market
- BIO-P-29 **Wang Lijun**
Introduced marine species and their impacts in China seas
- BIO-P-30 **Konstantin A. Karyakin, Alexander A. Nikitin and Oleg N. Katugin**
Distribution Patterns of the Common Squid (*Todarodes pacificus*) in the Russian EEZ in 2009-2011
- BIO-P-31 **Shinichi Watanabe, Satoshi Morinobu and Norimichi Souji**
Daily and seasonal activity patterns of horseshoe crabs in the Kasaoka Bay estuary, Seto-Inland Sea, Japan

FIS Paper Session

Co-Convenors: Xianshi Jin (China) and Elizabeth Logerwell (USA)

This session invites papers addressing general topics in fishery science and fisheries oceanography in the North Pacific and its marginal seas, except those covered by FIS-sponsored Topic Sessions.

Thursday, October 18 (9:00-16:45)

- 09:00 **Introduction by Convenors**
- 09:05 **Yongjun Tian, Kazuhisa Uchikawa and Yuji Ueda**
A comparison of fish community and trophic structure from three marine ecosystems around Japan: Synchronies, differences and environmental forcing (FIS-P-8661)
- 09:25 **Osamu Tamaru, Kazushi Miyashita, Nobuo Kimura, Yasuzumi Fujimori, Toshihiro Watanabe, Hideo Takahara and Teisuke Miura**
Fishery income fluctuation due to changing vessel speed from harbor to the fishing ground in the Japanese coastal squid jigging fishery (FIS-P-8334)
- 09:45 **Xun Zhang, Sei-Ichi Saitoh and Toru Hirawake**
Spatial modeling of the potential fishing zone of Japanese common squid in coastal waters of southwestern Hokkaido, Japan (FIS-P-8501)
- 10:05 **Sergey V. Prants, M.V. Budyansky and M.Yu. Uleysky**
Lagrangian coherent structures in the ocean favourable for fishing grounds (FIS-P-8325)
- 10:25 **Coffee/Tea Break**
- 10:50 **Cindy A. Tribuzio and Gordon H. Kruse**
Demographic and risk analyses of spiny dogfish in the Gulf of Alaska (FIS-P-8348)
- 11:10 **Jacquelynne R. King and Romney P. McPhie**
Age, growth and maturity estimates of spotted ratfish (*Hydrolagus collieri*) in British Columbia (FIS-P-8432)
- 11:30 **Alan C. Haynie and Lisa Pfeiffer**
Climate change and fisher behavior in the Bering Sea pollock trawl and Pacific cod longline fisheries (FIS-P-8781)
- 11:50 **Jeffrey Polovina and Phoebe Woodworth-Jefcoats**
Understanding ecosystem dynamics in the central North Pacific pelagic ecosystem from a size-based perspective (FIS-P-8469)
- 12:10 **Steven J. Barbeaux, John Horne and Jim Ianelli**
A novel approach for estimating location and scale-specific fishing exploitation rates of eastern Bering Sea walleye pollock (*Theragra chalcogramma*) (FIS-P-8508)
- 12:30 **Lunch**
- 14:00 **Kai Zhang, Yoshiro Watanabe, Hiroshi Kubota, Atsushi Kawabata and Tomohiko Kawamura**
Growth and survival of juvenile Japanese anchovy *Engraulis japonicus* in the Kuroshio-Oyashio transitional regions in 2010 (FIS-P-8694)

- 14:20 **Pavel Chernyshkov**
Interannual variability of large-scale hydrometeorological processes in the northern parts of the Pacific and Atlantic Oceans and their probable impact on commercial fish migrations (FIS-P-8833)
- 14:40 **Chiuyki Sassa, Motomitsu Takahashi, Kou Nishiuchi and Youichi Tsukamoto**
Distribution, growth, and mortality of larval jack mackerel *Trachurus japonicus* in the southern East China Sea in response to habitat conditions (FIS-P-8426)
- 15:00 **Peng Sun, Zhenlin Liang, Liuyi Huang and Xin He**
Changes in fish phenotypic traits induced by trawl selectivity (FIS-P-8481)
- 15:20 *Coffee/Tea Break*
- 15:50 **Poster Introductions**
- 16:45 *Session Ends*

FIS-P Session Posters

- FIS-P-1 **Pavel Mikheev**
Relationships between Pacific salmon and residential fish in the Amur River basin
- FIS-P-2 **Svetlana Yu. Kordicheva, Alexei M. Orlov, Alexander A. Volkov, Pavel K. Afanasiev and Eugeny G. Shaikhaev**
Preliminary results of the study of sablefish population structure within the Russian waters using DNA-markers
- FIS-P-3 **Wen-Bin Huang, Chih-Shin Chen and Wei-Ting Hsu**
The spatio-temporal pattern of Pacific saury *Cololabis saira* abundance in the Northwestern Pacific
- FIS-P-4 **Yu-xue Qin, Ryo Koyama, Yosuke Koshino, Hideaki Kudo, Shigehiko Urawa and Masahide Kaeriyama**
Spatiotemporal change in carbon and nitrogen stable isotopes of chum salmon during developmental
- FIS-P-5 **Eugene V. Samko and Nafanail V. Bulatov**
The role of a warm anticyclonic eddy at Hokkaido (North-West Pacific) in the formation of saury fishing grounds
- FIS-P-6 **Indah Puspitasari and Chulwoong Oh**
Population structure and reproductive biology of the lake prawn *Palaemon paucidens* (Caridea, Palaemonidae) from Goesan Lake, Korea
- FIS-P-7 **Oleg Ivanov**
Nekton species structure in the Far East Seas and adjacent waters of the Pacific Ocean in 1980-2009
- FIS-P-8 **Ming-Ming Zhang, Chulwoong Oh, Wan-Ok Lee and Kyung-Jun Song**
Reproductive biology of the largemouth bass, *Micropterus salmoides* from Goe-san Lake, Korea
- FIS-P-9 **Ming-Ming Zhang, Chulwoong Oh, Wan-Ok Lee and Kyung-Jun Song**
Age and growth of the catfish *Pelteobagrus fulvidraco* in Goe-san Lake, Korea

- FIS-P-10 **Youjung Kwon and Chang Ik Zhang**
An ecosystem-based assessment and management system in Korean waters
- FIS-P-11 **Hiroshi Kuroda, Takashi Setou, Kazuhiro Aoki, Yoshitsugu Hagiwara and Hiroko Akabane**
A numerical study of “shirasu” fishing ground formation based on the Kuroshio submesoscale model, south of Japan
- FIS-P-12 **Atsushi Tawa, Taku Yoshimura and Noritaka Mochioka**
High dispersal of moray eel larvae to the open ocean: Early life history estimated from ocean-wide distribution patterns
- FIS-P-13 **Michail Kuznetsov**
The influence of underwater vessel noise on fish behaviour and methods of its reduction
- FIS-P-14 **Graham E. Gillespie, Tammy Norgard, Sean MacConnachie, Lily Stanton and Jessica Finney**
Program to assess the conservation status of the Olympia oyster, *Ostrea lurida*, in Canada
- FIS-P-15 **Hideki Nakano**
International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean

POC Paper Session

Co-Convenors: Kyung-Il Chang (Korea) and Michael Foreman (Canada)

Papers are invited on all aspects of physical oceanography and climate in the North Pacific and its marginal seas, except those covered by POC-sponsored Topic Sessions.

Tuesday, October 16 (9:05-17:20)

- 09:05 ***Introduction by Convenors***
- 09:10 **Makoto Kashiwai**
ToV analysis on watermass processes in the Sea of Okhotsk (POC-P-8344)
- 09:30 **Yohei Takano, Taka Ito and Curtis Deutsch**
High-frequency variability of dissolved oxygen in the subpolar North Pacific (POC-P-8562)
- 09:50 **Michael Foreman, Wendy Callendar, Diane Masson, John Morrison and Isaak Fain**
An update on the IOS regional climate model for the British Columbia continental shelf (POC-P-8613)
- 10:10 **Evgeny Vyazilov, Evgeny Uraevsky, Igor Rostov, Natalia Rudykh, Vladimir Rostov, Elena Dmitrieva and Andrey Golik**
Far Eastern segment of the Unified State System of Information on the World Ocean (ESIMO) (POC-P-8443)
- 10:30 ***Coffee/Tea Break***
- 10:50 **Jae-Hun Park, Hanna Na, D. Randolph Watts, Kathleen A. Donohue and Ho Jin Lee**
Near 13-day barotropic ocean response to atmospheric forcing in the North Pacific (POC-P-8778)
- 11:10 **Hiroyuki Tsujino, Shiro Nishikawa, Kei Sakamoto, Norihisa Usui, Hideyuki Nakano and Goro Yamanaka**
Effects of large-scale wind variation on the Kuroshio path south of Japan in a 60-year historical GCM simulation (POC-P-8567)
- 11:30 **Olga Trusenkova**
Intraseasonal SST oscillations in the Japan/East Sea (POC-P-8423)
- 11:50 **Jun-pen Zhang and Rong-shuo Cai**
Modeling the East China Sea Cold Eddy responses to the inter-decadal climatic jump of the East Asian monsoon around 1976/77 (POC-P-8415)
- 12:10 **Viktor Kuzin, Gennady Platov and Elena Golubeva**
Influence of interannual variations of Siberian river discharge on the redistribution of freshwater in the Arctic Ocean (POC-P-8346)
- 12:30 ***Lunch***
- 14:00 **Vadim Navrotsky and Elena Pavlova**
Biological effects of internal waves in coastal waters (POC-P-8531)
- 14:20 **Keiichi Yamazaki, Yujiro Kitade, Yosuke Igeta and Tatsuro Watanabe**
Time variations of large amplitude near-inertial internal waves induced by typhoon observed around the Tango Peninsula, Japan (POC-P-8575)

- 14:40 **Takahiro Tanaka, Ichiro Yasuda, Kenshi Kuma and Jun Nishioka**
Vertical turbulent iron flux sustains the Green Belt along the shelf break in the southeastern Bering Sea (POC-P-8746)
- 15:00 **Fangli Qiao and Chuan Jiang Huang**
Comparison between vertical shear mixing and surface wave-induced mixing in the extra-tropical ocean (POC-P-8736)
- 15:20 **Young-Gyu Park, Jae-Hun Park, Ho Jin Lee, Hong Sik Min and Seon-Dong Kim**
The effects of geothermal heating on the East Sea circulation (POC-P-8735)
- 15:40 **Andrey G. Andreev and Igor A. Zhabin**
Origin of the mesoscale eddies and year-to-year changes of the chlorophyll *a* concentration in the Kuril Basin of the Okhotsk Sea (POC-P-8538)
- 16:00 ***Coffee/Tea Break***
- 16:20 **Aigo Takehige, Tetsuya Takahashi, Hideaki Nakata and Shingo Kimura**
Long-term trends in seawater temperature in Omura Bay, Japan (POC-P-8424)
- 16:40 **Masanori Konda, Tamami Ono, Kazuyuki Uehara, Kunio Kutsuwada, Osamu Tsukamoto, Fumiyoshi Kondo and Naoto Iwasaka**
Ocean mixing layer variation as indicated by the measurement of the dissipation rate in the Kuroshio Extension region (POC-P-8486)
- 17:20
(cancelled) **Talgat R. Kilmатов and Olga I. Trinko**
The influence of cumulative cabbeling on the salinity minimum of North Pacific Intermediate Water and future climatic trends (POC-P-8655)
- 17:00 **Liping Yin and Fangli Qiao**
Observation and simulation of Continental Shelf Waves in the East China Sea (POC-P-8727)
- 17:20 ***Session Ends***

POC-P Session Posters

- POC-P-1 **Igor Rostov, Vladimir Rostov, Natalia Rudykh, Elena Dmitrieva and Andrey Golik**
Components of oceanographic and marine environment management information support in the Far Eastern region of Russia
- POC-P-2 **Valentina V. Moroz**
Thermohaline structure peculiarities formed by tides in the Kuril Straits archipelago and adjacent areas
- POC-P-3 **Valentina V. Moroz**
Thermohaline structure peculiarities formed in the Kuril Islands area and climate change
- POC-P-4 **Yosuke Igeta, Tatsuro Watanabe, Akira Okuno and Naoto Honda**
Strong coastal currents associated with winter monsoon around the Noto Peninsula, Japan
- POC-P-5 **Sachihiko Itoh, Ichiro Yasuda, Masahiro Yagi, Satoshi Osafune, Hitoshi Kaneko, Jun Nishioka, Takeshi Nakatsuka and Yuri N. Volkov**
Strong vertical mixing in the Urup Strait, Kuril Islands
- POC-P-6 **Hiroshi Kuroda, Daisuke Takahashi, Takashi Setou, Tomonori Azumaya and Humio Mitsudera**
Hindcast experiment for the Okhotsk Sea using the sea-ice-coupled Regional Ocean Modeling System
- POC-P-7 **Tatsuro Watanabe and Koji Kakinoki**
Interannual variation in the volume transport through the Sado Strait in the Japan Sea

GP

General Poster Session

- GP-1 **Anna V. Dakus, Denis S. Kurnosov, Helen V. Kashchenko and Sergey D. Ponomarev**
Intraspecific genetic variation among spawning aggregations of the Pacific herring (*Clupea pallasii*) from the Okhotsk Sea
- GP-2 **Mana Ito, Kazuhiko Mochida, Katsutoshi Ito, Toshimitsu Onduka and Kazunori Fujii**
Testicular toxicity of an antifouling biocide 4,5-dichloro-2-n-octyl-3(2H)-isothiazolone (Sea-Nine 211) to the marine teleost mummichog *Fundulus heteroclitus*
- GP-3 **Yoshiharu Nemoto, Shinya Shimamura and Satoshi Igarashi**
Radioactive substance effects on marine products in Fukushima Prefecture
- GP-4 **Naoto Hirakawa, Toshihiro Wada, Ikuo Matsumoto, Tadashi Tokai, Seiji Akiyama, Keiichi Uchida, Yoshinori Miyamoto, Hisayuki Arakawa and Seiichi Takeda**
Great East Japan Earthquake effects on coastal fishing grounds of Iwaki City, Fukushima, Japan
- GP-5 **Min-Chul Jang and Kyoungsoon Shin**
Distribution of calanoid copepod eggs in seabed sediments of Masan Bay, Korea
- GP-6 **Hyoung Sum Han and Chae Woo Ma**
Population dynamics of *Archaeomysis vulgaris* (Crustacea: Mysidacea) after Hebei spirit oil spill accident
- GP-7 **Kyoungsoon Shin, Min-Chul Jang and Keun-Hyung Choi**
Interannual and seasonal changes in zooplankton community in a monsoonal coastal bay
- GP-8 **Hiroki Asami and Takahiro Takashima**
Seasonal and annual fluctuations in the abundance and biomass of *Neocalanus plumchrus* in Japan Sea off northern Hokkaido
- GP-9 **Chul-Min Ko, Il-Ju Moon and Chan Joo Jang**
Effect of preceding and adjacent typhoons on the intensity and track prediction of typhoon in the western North Pacific
- GP-10 **Takashi Iwasaki, Kyoichi Kamiyama, Kazuyoshi Takasaki, Kunihiro Wakui and Satoshi Igarashi**
Tohoku Tsunami effects on Matsukawa-ura Lagoon, Fukushima, Japan
- GP-11 **Youngseok Seo, Hyemin Park, Ahreum Kim, Hojin Bae, Jungyeon Kim, Sangyeop Lee and Chulwoong Oh**
Population dynamics of Kuro Shrimp *Argis lar* from the East Sea of Korea
- GP-12 **Kazunori Shizuka, K. Ito, K. Sasaki, S. Katayama and K. Yusa**
Effects of the great earthquake and tsunami on the running upstream, growth and maturation of ayu *Plecoglossus altivelis altivelis* in the Natori and Hirose Rivers, Northeastern Japan
- GP-13 **Yutaka Okumura, Shigeho Kakehi and Yoh Yamashita**
Mass balance of dioxins from pesticides in Sendai Bay, Japan
- GP-14 **Jung-Hoon Kang, Kyu Hee Cho, Kyun-Woo Lee and Woong-Seo Kim**
Range expansion of calanoid copepod *Acartia hongii* known as endemic species to the coastal waters of the Yellow Sea
- GP-15 **Leslie K. Rosenfeld and Steven J. Bograd**
An update on CeNCOOS, the central and northern California Ocean Observing System

- GP-16 **Yumi Kobayashi, Kei Fujii, Jun Chishima, Tatsuya Kariya, Kazuo Wada, Tetsuro Ito, Toshiyasu Nakaoka, Miki Kawashima, Sachiko Saito, Shinji Yabuta, Noriyuki Aoki, Shin-ichi Hayama, Shinya Baba, Kei Hayashi, Sayaka Tsutsumi, Mari Kobayashi, Yuichi Osa, Hidemi Osada, Akio Niizuma, Kaoru Yoshida, Takashi Saisuu, Nao Matsuda, Masatsugu Suzuki, Yohjiro Uekane, Noriyuki Ohtaishi and Yasunori Sakurai**
Population trends of the Kuril harbor seal *Phoca vitulina stejnegeri* from 1974 to 2011 in southeastern Hokkaido, Japan
- GP-17 **SeHan Lim, Chan Joo Jang, Im Sang Oh, JongJing Park and Ki Young Lee**
Seasonal variability of the mixed layer depth in the East Sea(Japan Sea)
- GP-18 **Yosuke Koshino, Yu-xue Qin, Ryo Koyama, Hideaki Kudo and Masahide Kaeriyama**
Difference with transporting patterns of MDN from salmon to the riparian ecosystems caused by structure and function of river system
- GP-19 **Nak Won Heo, Gi Myung Han, Sang Hee Hong, Sun Wook Hong, Jong Myung Lee and Won Joon Shim**
Spatiotemporal distribution of meso- and micro-plastics on a sand beach in South Korea
- GP-20 **Young Kyung Song, Nak Won Heo, Mi Jang, Sang Hee Hong, Gi Myung Han and Won Joon Shim**
Occurrence and distribution of microplastics in surface bulk water and microlayer in southern coast of South Korea
- GP-21 **Yuko Takigawa and Tetsuo Yoshino**
Significance of the Krusenstern expedition to Japan in the early 19th century: Its contribution to the development of ichthyology from biological and historical perspectives
- GP-22 **Lijian Shi, Qimao Wang and Bin Zou**
(cancelled) Sea ice classification using polarimetric information and texture features of RADARSAT-2 quad-polarization data
- GP-23 **Bernard Avril, Kenneth F. Drinkwater, Alida Bundy and IMBER HDWG members**
Contributions from the IMBER “Human Dimensions Working Group” to the effects of anthropogenic stressors in marine ecosystems
- GP-24 **Bernard Avril, Kenneth F. Drinkwater, Alberto Piola and IMBER DMC members**
Contributions from the IMBER “Data Management Committee” to the scientific challenges of the changing marine ecosystems
- GP-25 **Kei Sakamoto, Hiroyuki Tsujino, Hideyuki Nakano, Mikitoshi Hirabara and Goro Yamanaka**
Development of a high-resolution Japanese coastal ocean model toward operational monitoring and forecasting
- GP-26 **Sang Hee Hong, Gi Myung Han, Nak Won Heo, Young Kyung Song, Mi Jang and Won Joon Shim**
Organic micropollutants in plastic resin pellets from sand beaches of South Korea
- GP-27 **Jacqueline M. Grebmeier and Takashi Kikuchi**
The Pacific Arctic Group (PAG): A Pacific perspective on Arctic science
- GP-28 **Ryoichi Yamanaka, Yasunori Kozuki and Machi Miyoshi**
Effect of mussel ecology on organic-carbon deposition around seawalls in Osaka Bay
- GP-29 **Minwoo Kim, Cheol-Ho Kim and Jang Chan Joo**
Projected sea level change in the North Pacific Ocean based on IPCC AR4 A1B Scenario
- GP-30 **Yutaka Hiroe, Tadafumi Ichikawa, Akihiro Shiimoto, Tomowo Watanabe, Ichiro Yasuda and Kosei Komatsu**
The distribution and the seasonal variability of the nutrient on the O-line (138E-line)
- GP-31 **Denis V. Kotsyuk**
The Effects of Dams on Fish Biology in the Amur River Basin

GP-32 Japan (Student)

GP-33 Japan (Student)

W1

BIO Workshop Identifying critical multiple stressors of North Pacific marine ecosystems and indicators to assess their impacts

Co-Convenors: Jennifer Boldt (Canada), Vladimir Kulik (Russia), Chaolun Li (China), Jameal Samhouri (USA), Motomitsu Takahashi (Japan) and Chang-Ik Zhang (Korea)

Invited Speaker:

Natalie Ban (James Cook University, Australia)

Multiple natural and human stressors on marine ecosystems are common throughout the North Pacific, and may act synergistically to change ecosystem structure, function and dynamics in unexpected ways that can differ from responses to single stressors. Further, these stressors can be expected to vary by region, and over time. This workshop seeks to understand responses of various marine ecosystems to multiple stressors, and to identify and characterize critical stressors in PICES regional ecosystems including appropriate indicators of their impacts. The goal is to help determine how ecosystems might change in the future and to identify ecosystems that may be vulnerable to the combine impacts of natural and anthropogenic forcing. Contributions are invited which identify and characterize the spatial and temporal extent of critical stressors in marine ecosystems (both coastal and offshore regions) of PICES member countries, and in particular the locations at which multiple stressors interact. Contributions will include a review and identification of broad categories of indicators which document the status and trends of ecosystem change at the most appropriate spatial scale (e.g., coastal, regional, basin) in response to these multiple stressors. This workshop is linked with the topic session titled “*Ecosystem responses to multiple stressors in the North Pacific*” but is designed to provide more in-depth examination and discussion of the spatial and temporal extents of critical marine ecosystem stressors and their potential indicators. It will assist with progress towards the goals of PICES WG 28 on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors* (http://www.pices.int/members/working_groups/wg28.aspx).

Friday, October 12 (9:00-18:00)

09:00 **Introduction by Convenors**

09:00 **Papers:**

Natalie C. Ban, Stephen S. Ban and Hussein M. Alidina

Combining stressor information – Experiences from Canada’s Pacific waters and Australia’s Great Barrier Reef (W1-8513), Invited

Olga N. Lukyanova, Elena V. Zhuravel, Sergey A. Cherkashin, Denis N. Chulchekov, Viktor A. Nadtochy and Olga V. Podgurskaya

Bioindicators of multiple stressors interaction in the North-Eastern shelf of Sakhalin Island (Sea of Okhotsk) (W1-8472)

Stephani Zador, Kirstin Holsman, Sarah Gaichas and Kerim Aydin

Developing indicator-based ecosystem assessments for diverse marine ecosystems in Alaska (W1-8638)

10:30 **Coffee/Tea Break**

10:50 **Papers:**

Christopher Mulanda Aura, Sei-Ichi Saitoh, Yang Liu and Toru Hirawake

Spatio-temporal model for mariculture suitability of Japanese scallop (*Mizuhopecten yessoensis*) in Funaka and Mutsu Bays, Japan (W1-8451)

Elliott L. Hazen, Jameal F. Samhouri, Isaac D. Schroeder, Brian K. Wells, Steven J. Bograd, David G. Foley, Nick Tolmieri, Phillip S. Levin, Greg Williams, Kelly Andrews, Sam McClatchie, William T. Peterson, Jay Peterson, Jessica Redfern, John C. Field, Ric Brodeur and Kurt Fresh

Ecosystem indicators for the California Current: A Quantitative Approach Towards Indicator Development (W1-8505)

- 11:40 *Discussion*
- 12:30 **Lunch**
- 14:00 **Papers:**
- Jameal F. Samhour**
Much ado about everything: Comparison of expert-based vulnerability assessments for coastal habitats along the U.S. west coast (W1-8806)
- Jennifer Boldt, Alida Bundy, Caihong Fu, Lynne Shannon and Yunne Shin**
An overview of IndiSeas2: Evaluating the status of marine ecosystems in a changing world (W1-8431)
- 15:30 **Coffee/Tea Break**
- 15:50 *Break out Group Discussions*
- 17:00 *Group Discussion*
- 18:00 *Workshop Ends*

W1 Workshop Poster

- W1-1 **Nadezhda L. Aseeva**
Reconstructions of flounder community on the shelf of West Kamchatka (Okhotsk Sea) under influence of environmental changes and interspecies relationships

W2 **BIO Workshop** **Secondary production: Measurement methodology and its application on natural zooplankton community**

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

Invited Speaker:

Lidia Yebra (Oceanographic Center of Málaga, Instituto Español de Oceanografía (IEO), Spain)

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 intend to 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 will also discuss new techniques (nucleic acids ratio, enzyme activity, chitobiase, or other methods) and challenges in the calibration between the estimates using different methods.

Friday, October 12 (9:00-18:00)

- 09:00 **Introduction by Convenors**
- 09:15 **Lidia Yebra**
Biochemical indices of zooplankton production (W2-8355), Invited
- 10:00 **Akash R. Sastri**
Chitobiase-based measurements of crustacean zooplankton community biomass production rates: Method development and application in the NE subarctic Pacific (W2-8666)
- 10:40 **Coffee/Tea Break**
- 11:00 **William T. Peterson, Jay Peterson and Jennifer L. Fisher**
Use egg production of adult female copepods as a measure of secondary production (W2-8686)
- 11:40 **Hyung-Ku Kang**
Secondary production of *Acartia steueri* and *A. omorii* (Copepoda: Calanoida) in a small bay, southeastern coast of Korea: The growth rate approach (W2-8764)
- 12:20 **Lunch**
- 14:00 **Ruben Escribano and Pamela Hidalgo**
Can temperature-dependent growth be used to measure secondary production of copepods in coastal upwelling systems? (W2-8734)
- 14:40 **Pamela Hidalgo and Ruben Escribano**
The importance of rapid development to produce more biomass on a year cycle: Comparing some copepod species from the Humboldt Current (W2-8733)
- 15:20 **Coffee/Tea Break**

- 15:40 **Yasuhide Nakamura, Atsushi Yamaguchi and Noritoshi Suzuki**
Characteristics of zooplankton community in the Japan Sea: Biomass, stable isotope ratio and dominant taxa (W2-8354)
- 16:20 *Discussion*
- 18:00 *Workshop Ends*

W2 Workshop Posters

- W2-1 **Lidia Yebra, Elisa Berdalet, Rodrigo Almeda, Verónica Pérez, Albert Calbet and Enric Saiz**
AARS activity and RNA/DNA ratio as proxies for growth and fitness of *Oithona davisae* early developmental stages
- W2-2 **Lidia Yebra, Sébastien Putzeys, Dolores Cortés, Ana Luisa Da Cruz, Francisco Gómez, Pablo León, Jesús M. Mercado and Soluna Salles**
Application of biochemical tools to assess zooplankton metabolism in the coastal North Alboran Sea (SW Mediterranean)
- W2-3 **Toru Kobari, Shigeki Kori and Haruko Mori**
Nucleic acids and protein contents as proxies for protein-specific growth of *Artemia salina*
- W2-4 **Sachi Miyake and Toru Kobari**
Nucleic acids and protein contents as proxies for starvation of marine copepods
- W2-5 **Andrew G. Hirst, Julie E. Keister and numerous contributors**
Assessing copepod growth rates using the Modified Moulting Rate Method

W3

BIO Workshop

The feasibility of updating prey consumption by marine birds, marine mammals, and large predatory fish in PICES regions

Co-Convenors: George Hunt, Jr. (USA), Hidehiro Kato (Japan) and Michael Seki (USA)

Invited Speaker:

Robert Olson (Inter-American Tropical Tuna Commission, USA)

It has been 12 years since the publication of PICES Scientific Report No. 14 on “*Predation by marine birds and mammals in the subarctic North Pacific Ocean*” edited by Hunt, G.L. Jr., Kato, H., and McKinnell, S.M. This publication is the sole overview of the trophic requirements and trophic roles of marine birds and mammals for the North Pacific, and has been a much used reference by a wide variety of scientists including those interested in modeling the roles of marine birds and mammals. As of 2012, Google Scholar lists 49 citations of this report. In the 12 years since its publication, it has become rather considerably out of date. Our knowledge of the distribution and abundance of marine birds and mammals has advanced greatly, as has our knowledge of the food habits of a number of species. Additionally, there has been an increase in interest in the roles of large predatory fish in the world’s oceans. Thus it would seem timely to provide an update of PICES Scientific Publication 14, and, if there is interest for it, to include information on prey consumption by large predatory fishes.

Friday, October 12 (9:00-18:00)

- 09:00 *Introduction by Convenors*
- 09:05 **Robert J. Olson**
(cancelled) Data availability for estimating prey consumption by large pelagic fishes, particularly tunas, in the PICES region (W3-8823), Invited
- 09:30 **Tsutomu Tamura and Kenji Konishi**
Prey consumption and feeding habits of three baleen whale species in the western North Pacific (W3-8669)
- 09:50 **Kaoru Hattori, Yoko Goto, Mari Kobayashi and Orio Yamamura**
Food habits of pinnipeds in Japanese waters: A review (W3-8762)
- 10:30 *Coffee/Tea Break*
- 10:50 **Yutaka Watanuki**
Diet study of seabirds breeding in Japan (W3-8466)
- 11:20 **Sayaka Nakatsuka, Daisuke Ochi, Yukiko Inoue, Kotaro Yokawa, Hiroshi Ohizumi, Yasuaki Niizuma and Hiroshi Minami**
The food composition of Laysan and Black-footed Albatrosses in the North Pacific from 2010 to 2011 (W3-8368)
- 11:40 **George L. Hunt, Jr., Martin Renner, Kathy Kuletz, Gary Drew and John Piatt**
Seabird numbers, days of occupancy, and prey habits in the Gulf of Alaska and the eastern Bering Sea (W3-8818)
- 12:00 *Discussion*
- 12:30 *Lunch*
- 14:00 **Mike Seki** Lead
Discussion: Should we Include Fish, and if so, what species?
- 14:30 **Yutaka Watanuke** Lead
Discussion: How much can we add about seabirds in the Western Pacific?

- 15:00 **George L. Hunt, Jr.** Lead
Discussion: How much can we add about seabirds in the Eastern Pacific?
- 15:30 ***Coffee/Tea Break***
- 15:50 **Hidehiro Kato** Lead
Discussion: How much do we know about cetaceans in the Western Pacific?
- 16:20 **Kaoru Hattori** Lead
Discussion: How much do we know about pinnipeds in the Western Pacific?
- 16:50 **Rolf Ream** Lead
Discussion: How much do we know about pinnipeds in the Eastern Pacific?
- 17:20 **Rolf Ream** Lead
Discussion: How much do we know about cetaceans in the Eastern Pacific?
- 17:50 *Wrap up by Convenors*
- 18:00 *Workshop Ends*

W4 ESSAS/PICES Workshop Subarctic–Arctic interactions

Co-Convenors: *Kenneth Drinkwater (ESSAS/Norway), Jackie Grebmeier (ESSAS/USA), James Overland (PICES/USA) and Sei-Ichi Saitoh (PICES/Japan)*

Invited Speakers:

Seth Danielson (University of Alaska Fairbanks, USA)

Ichiro Imai (Hokkaido University, Japan)

Eiji Watanabe (JAMSTEC, Japan)

Exchanges of water masses and their associated flora and fauna strongly link the marine Arctic and the Subarctic. Both regions have undergone significant warming, and there has been reduced sea-ice in recent years in some regions. Climate change scenarios indicate that these regions are likely to experience even greater warming and transformation in the future. To better understand how climate variability and change will affect these marine ecosystems from biogeochemical processes, through the food web to the highest trophic levels, it is essential to improve our knowledge of the role of physical and biological fluxes between the Subarctic and Arctic and the fate of the transported organisms. Therefore, this workshop will examine the influence of the warm Subarctic inflows on the physical conditions and biology in the Arctic basin and shelves, as well as the role of fluxes of water from the Arctic basin onto the surrounding shallow shelves and into the Subarctic. Papers that cover multiple trophic levels or investigate biophysical coupling are especially sought. Also, we encourage presentations on the observed changes that are occurring as well as those on possible scenarios under climate change. Relevant experimental studies, field programs and modeling of Arctic-Subarctic interactions will be considered. Emphasis will be on the Arctic-Pacific Ocean linkages but those considering the exchanges in the Atlantic are also welcome.

Friday, October 12 (9:00-15:30)

- 09:00 **Introduction by Convenors**
- 09:15 **Seth L. Danielson, Tom Weingartner, Kate Hedstrom, Knut Aagaard, Enrique N. Curchitser, Jinlun Zhang and Rebecca A. Woodgate**
The Bering Sea shelf circulation and its role in Pacific-Arctic exchanges (W4-8396), Invited
- 09:40 **Ichiro Imai, Chiko Tsukazaki, Kohei Matsuno, Ken-Ichiro Ishii and Atsushi Yamaguchi**
Abundant distribution of diatom resting stage cells in bottom sediments of Bering Sea and Chuckchi Sea: Possible seed populations for blooms (W4-8646), Invited
- 10:05 **Eiji Watanabe, Michio J. Kishi, Akio Ishida, Maki N. Aita and Takeshi Terui**
Biological hot spots emerging along the pathway of Pacific summer water in the western Beaufort Sea (W4-8525), Invited
- 10:30 **Coffee/Tea Break**
- 11:00 **Atsushi Yamaguchi, Rie Ohashi, Kohei Matsuno and Ichiro Imai**
Interannual changes in the zooplankton community structure on the southeastern Bering Sea shelf and Chukchi Sea during summers of 1991–2009 (W4-8339)
- 11:20 **Yasunori Sakurai, HaeKyun Yoo and Jun Yamamoto**
A comparison of reproductive characteristics and strategies between walleye pollock (*Theragra chalcogramma*) and Arctic cod (*Boreogadus saida*) (W4-8743)
- 11:40 **Franz J. Mueter, Mike A. Litzow, Seth L. Danielson, Paul D. Spencer and Robert R. Lauth**
The roles of temperature, abundance and advection in modifying the spatial dynamics of groundfish at the Subarctic-Arctic boundary in the eastern Bering Sea (W4-8624)

- 12:00 **Jacqueline M. Grebmeier**
The Distributed Biological Observatory (DBO): A change detection array in the Pacific Arctic region (W4-8793)
- 12:20 **Poster Descriptions**
- 12:30 ***Lunch***
- 14:00 **George L. Hunt, Jr., Arny Blanchard, Peter Boveng, Padmini Dalpadado, Kenneth F. Drinkwater, Lisa Eisner, Russ Hopcroft, Kit Kovacs, Brenda Norcross, Paul Renaud, Marit Reigstad, Martin Renner, Hein Rune Skjoldal, Andy Whitehouse and Rebecca A. Woodgate**
The Barents and Chukchi Seas: Comparison of two Arctic shelf ecosystems (W4-8433)
- 14:20 **Kenneth F. Drinkwater**
On the role of advection on the interaction between the Arctic and Subarctic seas: Comparing the Atlantic and Pacific Sectors (W4-8640)
- 14:40 ***Discussion***
- 15:30 ***Workshop Ends***

W4 Workshop Posters

- W4-1 **Zhongyong Gao, Heng Sun and Liqi Chen**
Comparison of decadal changes in the carbon sink and potential responses to climate change in the Taiwan Strait, Bering Sea and bipolar regions
- W4-2 **Jacqueline M. Grebmeier and Takashi Kikuchi**
The Pacific Arctic Group (PAG): A Pacific perspective on Arctic science

W5 **BIO Workshop** **Comparison of multiple ecosystem models in several North Pacific shelf ecosystems (MEMIP-IV)**

Co-Convenors: Harold Batchelder (USA), Shin-Ichi Ito (Japan), Angelica Pena (Canada) and Yvette Spitz (USA)

This will be the first MEMIP (Marine Ecosystem Model Intercomparison Project) 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.

Day 1, Friday, October 12 (9:00-18:00)

- 09:00 **Introduction by Convenors**
- 09:20 **Jarrold A. Santora, William J. Sydeman, Monique Messié, Fei Chai, Sarah Ann Thompson, Brian K. Wells and Francisco P. Chavez**
Triple check: Spatio-temporal observations of krill and seabirds verifies structural realism of an ocean ecosystem model (W5-8418)
- 09:45 **Yvette Spitz (Chair)**
Work Session 1: Overview of MEMIP Model Status. Update on progress since Oct 2011.
- 10:30 **Coffee/Tea Break**
- 10:50 **Hal Batchelder (Chair) / Angelica Peña (Chair)**
Work Session 2: MEMIP Impressions, Recommendations, Stumbling Blocks
- 11:30 **Hal Batchelder (Chair)**
Coupled model results/new simulations/*etc.*
- 12:30 **Lunch**
- 14:00 **Shin-ichi Ito (Chair)**
Work Session 3: Coupled model results/new simulations/*etc.* (*continued*)
- 15:30 **Coffee/Tea Break**
- 15:50 **Angelica Peña (Chair)**
Work Session 4: Coupled model results/new simulations/*etc.* (*continued*)
- 17:30 **Workshop Convenors**
Day 1 Wrap-up: Open Discussion of Progress and Planning Day 2
- 18:00 **Day 1 Workshop Ends**

Day 2, Saturday, October 13 (9:00-18:00)

- 09:00 ***Introduction by Convenors***
- 09:10 **Yvette Spitz (Chair) / Hal Batchelder (Chair)**
Skill Assessment: Example of SA using Newport Spitz model
- 09:45 **Hal Batchelder (Chair) / Angelica Peña (Chair)**
Work Session 5: Continue model simulations and/or skill assessments
- 10:30 ***Coffee/Tea Break***
- 10:50 **Yvette Spitz (Chair) / Hal Batchelder (Chair)**
Work Session 6: Continue model simulations and/or skill assessments
- 12:30 ***Lunch***
- 14:00 **Yvette Spitz (Chair) / Hal Batchelder (Chair)**
Work Session 7: Continue model simulations and/or skill assessments
- 15:30 ***Coffee/Tea Break***
- 15:50 **Yvette Spitz (Chair) / Hal Batchelder (Chair)**
Work Session 8: Continue model simulations and/or skill assessments
- 17:00 ***Workshop Convenors***
Workshop Wrap-up: Accomplishments, Progress Report, Future Steps, Requests to BIO (if any)
- 18:00 ***Workshop Ends***

W6 MEQ Workshop

The contrasting cases of HABs in the eastern and western Pacific in 2007 and 2011

Co-Convenors: Changkyu Lee (Korea) and Mark Wells (USA)

Invited Speakers:

Sanae Chiba (JAMSTEC, Japan)

William Peterson (Hatfield Marine Science Center, NMFS, USA)

Harmful algal blooms reached historic levels along coastlines of the eastern Pacific in 2011, but similar blooms were minimal to non-existent in Japan, Korea and Russia. The situation was largely reversed in 2007, and this disparity between these years offers a unique opportunity to compare and contrast the basic environmental parameters and HAB dynamics during these regimes. Combining these observations with a broader overview of the basin-scale physical dynamics during this time frame would provide new insights to the factors enhancing these blooms. The workshop foundation will be the pre-submission of available data from member countries, including but not limited to: HAB species presence and abundance, time of year, temperature range, salinity range, water clarity, wind, river flow (flooding), and upwelling indices. Workshop participants will review and discuss the trends and patterns in these data over the first day, and integrate them with information on the basin-scale physical dynamics. Participants will develop a detailed outline for manuscript preparation during the second day, with agreed writing assignments and draft submission deadlines. The manuscript will be targeted for the appropriate international journal decided upon by participants.

Day 1, Friday, October 12 (9:00-17:40)

- 09:00 *Introduction by Convenors*
- 09:15 **Takashi Kamiyama, Hiroyuki Yamauchi, Shinnosuke Kaga, Satoshi Nagai and Mineo Yamaguchi**
Effects of the tsunami by the Great East Japan Earthquake on distribution of *Alexandrium* cysts and risk of PSP occurrence in Tohoku coastal areas in Japan (W6-8476)
- 09:45 **Ruixiang Li, Zongling Wang and Mingyuan Zhu**
Harmful Algal Blooms in coastal water of China in 2011 (W6-8697)
- 10:15 *Coffee/Tea Break*
- 11:00 **William T. Peterson**
The potential influence of local physical forcing (factors related to coastal upwelling) and basin-scale forcing (factors related to ENSO and the PDO) on harmful algal bloom in the Oregon upwelling zone (W6-8687), Invited
- 11:40 **Sanae Chiba**
Contrast of the lower trophic level responses to climatic forcing over the eastern and western North Pacific (W6-8406), Invited
- 12:10 *Lunch*
- 13:30 **Tatyana Yu. Orlova, O.G. Shevchenko, Inna V. Stonik and Vladimir M. Shulkin**
Cases of HABs in 2007 and 2011 in Peter the Great Bay (East/Japan Sea), Russia (W6-8537)
- 14:00 **Svetlana Esenkulova and Nicola Haigh**
Bloom dynamics of *Heterosigma akashiwo* in coastal waters of British Columbia (BC), Canada in 2007 and 2011; Data from the Harmful Algae Monitoring Program (W6-8614)
- 14:30 **Chang-Hoon Kim and Ji Hoe Kim**
Monitoring and development of PSP toxins along the south coast of Korea (W6-8754)

- 15:30 *Coffee/Tea Break*
- 16:00 **Changkyu Lee**
HAB DATA 2007 and 2011 - Korea
- 16:20 **Shigeru Itakura**
HAB DATA 2007 and 2011 - Japan
- 16:40 **Charles Trick**
HAB DATA 2007 and 2011 - Canada
- 17:00 **Vera Trainer**
HAB DATA 2007 and 2011 - USA
- 17:20 *Discussion and Day 2 Plan*
- 17:40 *Workshop Ends*

Day 2, Saturday, October 13 (9:00-12:30)

- 09:00 Session Plan
Identification of Central Findings
Discussion of Outcome
- 10:30 *Coffee/Tea Break*
- 10:50 Identification of Lead Author
Detailed Outline of Manuscript
Assignment of Tasks and Timeline
Summary
- 12:30 *Workshop Ends*

W6 Workshop Posters

- W6-1 **Junya Tomita, Tomoki Nishiguchi, Motoaki Yagi, Daekyung Kim and Tatsuya Oda**
Evaluation of toxic potential of newly isolated *Chattonella antiqua*, by laboratory exposure experiments and micro-bioassay using cultured cells
- W6-2 **Hao Guo, Xu Xiao-man and Li Xia**
Red tide survey and information system in Dalian Port
- W6-3 **Feng-ao Lin, Hao Guo, Yongjian Liu, Daoyan Xu and Xingwang Lu**
High-incidence HABs species in China Coastal Waters and the forewarning method based on the HABs Risk Index
- W6-4 **Lijian Shi, Bin Zou, Qimao Wang and Maohua Guo**
(cancelled) The application of multi-sensor to Red Tide monitoring over the Yellow Sea



SCOR/PICES Workshop Global patterns of phytoplankton dynamics in coastal ecosystems

Co-Convenors: Hans Paerl (USA) and Kedong Yin (China)

Invited Speaker:

William Li (Bedford Institute of Oceanography, DFO, Canada)

Phytoplankton biomass and community structure have undergone dramatic changes in coastal ecosystems over the past several decades in response to climate variability and human disturbance. These changes have short- and longer-term impacts on global carbon and nutrient cycling, food web structure and productivity, and coastal ecosystem services. There is a need to identify the underlying processes and measure rates at which they alter coastal ecosystems on a global scale. Hence, the Scientific Committee on Ocean Research (SCOR) formed Working Group 137 (WG 137) on *Global Patterns of Phytoplankton Dynamics in Coastal Ecosystems: Comparative Analysis of Time Series Observations* (<http://wg137.net/>). To address fundamental questions that emerged, WG 137 will use data compiled from 84 sampling stations, representing research and monitoring programs spread across five continents, and is seeking additional time series of coastal/estuarine/near-shore phytoplankton and relevant hydrographic data. Investigators with decadal observational data are encouraged to contribute to this growing compilation and discuss interests in collaboration. The wealth of information in these data sets provides an unprecedented opportunity to develop a global analysis and investigation of the dynamics and status of ecosystems where land and sea meet. The workshop will cover conceptual models of phytoplankton community variability and quantitative approaches for extracting patterns from time series.

Day 1, Friday, October 12 (9:00-18:00)

- 09:00 *Introduction by Convenors*
- 09:05 **William K.W. Li, Todd D. O'Brien and Xosé Anxelu G. Morán**
An ecological status report for phytoplankton and microbial plankton in the North Atlantic and adjacent seas (W7-8704), Invited
- 10:30 *Coffee/Tea Break*
- 10:50 **Jacob Carstensen, Hans W. Paerl and James E. Cloern**
The phytoplankton composition across the world's coastal ecosystems (W7-8602)
- 12:30 *Lunch*
- 14:00 **Todd D. O'Brien**
COPEPODITE: An online toolkit for plankton time series analysis and visualization (W7-8787)
- 15:30 *Coffee/Tea Break*
- 15:50 **N. Ramaiah**
Anthropogenic influences on phytoplankton compositional variability in coastal waters (W7-8715)
- 18:00 *Day 1 Workshop Ends*

Day 2, Saturday, October 13 (9:00-18:00)

- 09:00 *Introduction by Convenors*
- 09:05 **Kedong Yin and Paul J. Harrison**
Anthropogenic influence on phytoplankton community structure: Long time series data analysis in Hong Kong coastal waters (W7-8759)
- 10:30 *Coffee/Tea Break*
- 10:50 **Yury I. Zuenko**
Conditions of phytoplankton blooms at Primorye coast (Japan/East Sea) and year-to-year change of their timing (W7-8551)
- 12:30 *Lunch*
- 14:00 **Poster Presentations**
- 15:30 *Coffee/Tea Break*
- 15:50 **Poster Presentations (continued)**
- 18:00 *Workshop Ends*

W7 Workshop Posters

- W7-1 **Hyeon Ho Shin, Jong Sick Park, Young-Ok Kim, Seung Ho Baek, Dhongil Lim and Yang Ho Yoon**
Dinoflagellate cyst production and flux in Gamak Bay: A sediment trap study
- W7-2 **Dolores Cortés, Ana Luisa Da Cruz, Francisco Gómez, Pablo León, Jesús M. Mercado, Sébastien Putzeys, Iria Sala, Soluna Salles and Lidia Yebra**
Time variability of the taxonomical composition and the physiological performance of diatom-dominated assemblages in an area affected by coastal upwelling
- W7-3 **Inna V. Stonik and Tatyana Yu. Orlova**
Population dynamics and toxicity of the diatom species of the genus *Pseudo-nitzschia* in Peter the Great Bay, the northwestern part of the Sea of Japan
- W7-4 **Ah-Ra Ko, Se-Jong Ju, Ho Young Soh and Kyoungsoon Shin**
Understanding seasonal variation of the source of particulate organic matter in relationship with plankton community in the estuary of Sumjin River, Korea
- W7-5
(cancelled) **Jyun Lee, Mirinae Kim, Jun-mo Lee and Man Chang**
Phytoplankton composition under low temperature period at East Sea in Korea
- W7-6
(cancelled) **Jyun Lee, Mirinae Kim, Jun-mo Lee and Man Chang**
The evaluation for the fast cell division with non-uniform cell cycles
- W7-7
(cancelled) **Jyun Lee, Jun-mo Lee, Mirinae Kim and Man Chang**
Different growth pattern of *Heterosigma akashiwo* with salinity and micronutrients gradient by geology

W8 FIS Workshop **Recruitment of juvenile Japanese eel (*Anguilla japonica*) in eastern Asia**

Co-Sponsored by FRA

Co-Convenors: Ruizhang Guan (China), Tatsu Kishida (FRA, Japan), Akihiro Mae (Japan), Tae Won Lee (Korea), Wann-Nian Tzeng (Chinese Taipei) and Kazuo Uchida (FRA, Japan)

The production of Japanese eel relies mainly on the aquaculture of natural juveniles (glass eel). In recent years, the catch of glass eel has been fluctuating from year to year but remained at the low level. The purpose of this workshop is to discuss the reasons and mechanisms for the inter-annual variation in glass eel recruitment in the coastal area of eastern Asia in order to sustain the stock of Japanese eel. Discussion is also expected on international collaboration and effective measures for sustaining glass eel recruitment.

Saturday, October 20 (10:00-17:10)

- 10:00 ***Introduction by Convenors***
Chair: Wann-Nian Tzeng
- 10:05 **Kazuo Uchida**
Life history of Japanese eel (review) (W8-8839)
- 10:35 **Seinen Chow, Toshihiro Yamamoto, Hiroaki Kurogi, Makoto Okazaki and Tomoo Watanabe**
Discovery of mature freshwater eels in the spawning area and remarks on the oceanic migration (W8-8822)
- 11:05 **Daisuke Ambe, Makoto Okazaki, Tomowo Watanabe, Hiroaki Kurogi and Seinen Chow**
Oceanographic conditions in spawning ground and larvae transportation area of the Japanese eel (W8-8840)
Chair: Tae Won Lee
- 11:35 **Hiroaki Kurogi**
Ecology and annual recruitment levels of Japanese eel in Japan (W8-8842)
- 12:15 ***Lunch***
- 13:35 **Tae Won Lee**
Ecology and recruitment of Japanese eel in Korea (W8-8682)
- 14:15 **Ruizhang Guan**
Ecology and annual recruitment levels of Japanese eel in continent China (W8-8841)
- 14:55 **Wann-Nian Tzeng and Yu-San Han**
Spatial and temporal variations in the recruitment of Japanese eel (*A. japonica*) in Taiwan (W8-8692)
- 15:35 ***Coffee/Tea Break***
Chair: Ruizhang Guan
- 16:00 **Tatsu Kishida and Kazuo Uchida**
Management measures for eel in Europe (W8-8843)
- 16:30 ***General Discussion***
- 17:10 ***Workshop Ends***