

March 14

Opening Plenary Session

- 8:30 Introduction / Welcome
- 8:50 **Grégory Beaugrand**
Climate change and planktonic ecosystems: Detection, understanding and projection (Plenary-7339)
- 9:30 **Deborah K. Steinberg**
Zooplankton role in biogeochemical cycles: Progress and prospects for the future (Plenary-7232)
- 10:10 **Coffee/Tea Break**
- 10:30 **Shin-ichi Uye**
The giant jellyfish (*Nemopilema nomurai*) bloom in East Asian seas: Causes, consequences and countermeasures (Plenary-7112)
- 11:10 **Kendra L. Daly**
Modes of climate and food web variability in high latitude oceans (Plenary-7277)
- 11:50 **Torkel Gissel Nielsen**
Composition and succession of zooplankton communities: A global comparison (Plenary-7115)
- 12:30 Session ends

March 14

Session 3 (S3)

Zooplankton life histories: Spatial connectivity, dormancy, and life cycle closure

Co-Convenors:

Hans-Jürgen Hirche (Alfred Wegener Institute, Germany)

Toru Kobari (Kagoshima University, Japan)

Jeffrey A. Runge (School of Marine Sciences and Gulf of Maine Research Institute, University of Maine, USA)

Invited Speaker:

Don Deibel (Memorial University, Canada)

Each zooplankton species has its own set of life history traits, influenced by its taxonomic lineage (e.g., gelatinous zooplankton, copepods, euphausiids), the physical characteristics of the environment in which it resides and the suite of other species with which it interacts. In seasonal environments, life histories may include a dormant phase, which may occur at any life stage and vary in intensity from almost complete shutdown of metabolism to merely arrested reproductive activity. Losses from a population due to advection during dormancy or active phases may prevent life cycle closure, for example in upwelling zones, determining which species are dominant. Immigration from other populations may be required to sustain species abundance within a particular region. In this session we encourage presentations that together will depict the variety of zooplankton life histories across all taxonomic groups and how they interact with the physical environment at local, regional or basin scales to determine species abundance and diversity patterns.

- 14:00 **Introduction by Convenors**
- 14:05 **Don Deibel and Ben Lowen (Invited)**
Life cycles and life history adaptations of pelagic tunicates (S3-7057)
- 14:30 **Ulf Båmstedt**
Explaining the mass occurrence of a deepwater scyphomedusa in Norwegian fjords (S3-6973)
- 14:50 **Cornelia Jaspers, Thomas Kiørboe, Kajsa Tönnesson and Matilda Haraldsson**
The physical characteristics of the Baltic Sea might act as a bottleneck for the *Mnemiopsis leidyi* population expansion in this newly invaded area (S3-7042)
- 15:10 **Alenka Malej, Vlado Malačič, Andreja Ramšak, Tjaša Kogovšek and Katja Stopar**
Spatial connectivity and cycles of *Pelagia noctiluca* (Semaestomeae, Scyphozoa) (S3-7005)
- 15:30 **Natasha Henschke, Jason D. Everett, Mark E. Baird, Matthew D. Taylor and Iain M. Suthers**
Relative abundance of life history stages of the ubiquitous salp *Thalia democratica* in different water types (S3-7002)
- 15:50 **Coffee/Tea Break**
- 16:20 **Shinji Shimode, Mitsuhiro Toratani and Atsushi Tsuda**
Neocalanus ocean vs. *Calanus* ocean: Implication as characteristics of planktonic ecosystem in the North Pacific (S3-6997)
- 16:40 **Frédéric Maps, Andrew J. Pershing and Nicholas R. Record**
Understanding copepod life-history and diversity using a next-generation zooplankton model (S3-7068)

- 17:00 **Andrew G. Hirst, Delphine Bonnet, David V.P. Conway and Thomas Kiørboe**
Does predation control adult sex ratios and longevities in marine pelagic copepods? (S3-6964)
- 17:20 **Leah R. Feinberg, C. Tracy Shaw, William T. Peterson and Hongsheng Bi**
Life history of *Euphausia pacifica* in the northern California current: What can be learned by contrasting field and laboratory studies (S3-7125)
- 17:40 **Espen Strand, Geir Huse and Webjørn Melle**
Behavior and life-history strategies of Northern krill (*Meganyctiphanes norvegica*) and its impact on population dynamics and spatial distribution: Results from a spatial explicit individual-based model with external forcing (S3-7100)
- 18:00 Session ends

Posters

- S3-6434 **Elahe Sanjarani and Malihe Sanjarani**
Zooplankton in Iranian coastal waters (Oman Sea) during the Pre and Post-Monsoon period
- S3-6900 **Benni Winding Hansen**
Physiology and biology of Calanoid copepod eggs
- S3-6908 **Hidefumi Fujioka, Ryuji J. Machida and Atsushi Tsuda (cancelled)**
Preliminary results on the early life cycle of *Neocalanus plumchrus* and *Neocalanus flemingeri* in the Oyashio region, western north Pacific
- S3-6930 **Mary Mar P. Noblezada and Wilfredo L. Campos**
Size distribution, sexual maturity and diet of the chaetognath *Flaccisagitta enflata* along the Pacific Coast and adjacent inland waters of the Philippines
- S3-6941 **Yuichiro Yamada, Shuhei Nishida, Martin Graeve and Gerhard Kattner**
Ontogenetic and seasonal variations in lipid and fatty acid composition of the subarctic copepods *Neocalanus cristatus* and *Eucalanus bungii* in the Oyashio region, western North Pacific
- S3-6958 **Tone Falkenhaug and Svetlana Sudnik**
Reproductive patterns in pelagic decapod shrimps from the northern Mid-Atlantic Ridge
- S3-6962 **Webjørn Melle and Bjørnar Ellertsen**
A high frequency time series of hydrography, nutrients, chlorophyll and *Calanus finmarchicus* life history at Weather Station Mike in the Norwegian Sea during 1997 and 1998
- S3-6963* **Séverine Boyer, Isabelle Arzul, Marc Bouvy and Delphine Bonnet**
(Presenter: Delphine Bonnet on behalf of Séverine Boyer)
Life strategies of *Acartia* spp. populations in the Thau Lagoon
- S3-6970 **Hildur Petursdottir and Astthor Gislason**
Seasonal abundance of zooplankton south of Iceland in relation to environmental variables
- S3-6994 **Anabela A. Berasategui, Mónica S. Hoffmeyer and M. Sofia Dutto**
Eurytemora americana egg production and morphology in the Bahía Blanca estuary, Argentina
- S3-6995 **Anabela A. Berasategui, Mónica S. Hoffmeyer, Florencia Biancalana and M. Sofia Dutto**
Reproductive strategy and egg morphology of the copepod *Acartia tonsa* in a temperate estuary, Argentina
- S3-7001 **Chaolun Li, Guang Yang, Juan Ning and Song Sun**
The response of copepod grazing and reproduction to spring blooms of different species in the Southern Yellow Sea

- S3-7023 **Christina B. Augustin and Sandra Kube**
Lifecycle of the scyphozoan moon jellyfish *Aurelia aurita* in the Western Baltic Sea
- S3-7027 **Wan Aiyong and Zhang Guangtao**
The dead proportion of copepods in Jiaozhou Bay
- S3-7041* **Dellis Montuy Gómez, Jaime Gómez-Gutiérrez, Carmen Rodríguez Jaramillo and Carlos J. Robinson**
(Presenter: Jaime Gómez-Gutiérrez on behalf of Dellis Montuy Gómez)
Nyctiphanes simplex embryogenesis synchronization with female molting and gonadal cycles (Crustacea: Euphausiacea) in the Gulf of California
- S3-7043 **Ann Bucklin and Leocadio Blanco-Bercial**
Comparative phylogeography and connectivity of zooplankton based on DNA barcodes
- S3-7055 **Geneviève J. Parent, Stéphane Plourde, Pierre Joly and Julie Turgeon**
Overlapping size ranges of *Calanus* spp. off the Canadian coast: Impacts on oceanographic surveys
- S3-7056 **Geneviève J. Parent, Julie Turgeon, Stéphane Plourde and Pierre Joly**
Hybridization of *Calanus finmarchicus* and *Calanus glacialis* off the Canadian coast
- S3-7069 **Cheryl A. Morgan, William T. Peterson, Molly V. Sturdevant, Julie E. Keister, Moira Galbraith, Jesse F. Lamb, David L. Mackas, Joseph A. Orsi, Mary E. Thiess, Marc Trudel and Bruce L. Wing**
Latitudinal gradients in copepod community composition in the Northern California Current and S. Gulf of Alaska during years of varying ocean conditions
- S3-7087 **Cesar Vilas, Enrique González-Ortegón, Francisco Baldo, Emilio Pascual and Pilar Drake**
Population dynamic of mysid community and its key role for nursery function in a temperate estuary
- S3-7090 **Maria Pöllupüü, Mart Simm and Henn Ojaveer**
Selective impact of the predatory cladoceran *Cercopagis pengoi* on zooplankton community in the Gulf of Riga (Baltic Sea)
- S3-7121 **Astthor Gislason, Hildur Petursdottir and Teresa Silva**
Life cycle and seasonal vertical distribution of copepods in oceanic subarctic waters north of Iceland
- S3-7165* **Se-Jong Ju, Hye Seon Kim, Donhyug Kang, Woongseo Kim and Kyoungsoon Shin**
(Presenter: Kyoungsoon Shin on behalf of Se-Jong Ju)
Understanding the importance of the bottom cold water mass as an over-summering refuge for *Euphausia pacifica* in the Yellow Sea
- S3-7166 **David W. Pond and Geraint A. Tarling**
Phase transitions of wax esters adjust buoyancy in diapausing *Calanoides acutus*
- S3-7167 **Katie Clarke, David W. Pond and Andrew Brierley**
Seasonal lipid dynamics and diapause of *Calanus finmarchicus* in a fjordic environment
- S3-7168 **David W. Pond, Geraint A. Tarling and Daniel J. Mayor**
Pressure induced homeoviscous adaptation of cellular membranes in diapausing *Calanoides acutus*
- S3-7207 **Elisabeth Halvorsen**
Phenology of reproduction of two calanoid copepods in the Arctic: Life history adaptation and predictability of sea ice break-up

- S3-7219 **Gerardo Aceves-Medina, S. Patricia A. Jiménez-Rosenberg, Ricardo Saldierna-Martínez, Reginaldo Durazo-Arvizu and Gilberto Gaxiola-Castro**
Influence of the mesoscale structure off Baja California on the diversity and abundance of the larval fish assemblages
- S3-7245* **Naira J. Silva and Rubens M. Lopes**
(Presenter: Co-Author on behalf of Naira J. Silva)
Occurrence of copepod carcasses on the inner shelf off Ubatuba (Southeastern Brazil)
- S3-7256 **François Carlotti, Zhongfeng Qiu Andrea Doglioli and P. Marsaleix**
The influence of hydrodynamic processes on zooplankton transport and distributions in the North western Mediterranean Sea estimated from a lagrangian model. Application to *Pelagia noctiluca*
- S3-7259 **Lionel Eisenhauer, François Carlotti, Frédéric Diaz and Rose Campbell**
Modelling spatial distributions of zooplankton life stages influenced by mesoscale circulation in the North Western Mediterranean Sea during the year 2001

March 14

Session 6 (S6)

Zooplankton in polar ecosystems and extreme environments

Co-Convenors:

Angus Atkinson (British Antarctic Survey, UK)

Carin Ashjian (Woods Hole Oceanographic Institution, USA)

Invited Speaker:

Øystein Varpe (Norwegian Polar Institute, Norway)

Polar waters and their marginal seas are characterised by low, fairly stable temperatures, intense variation in solar radiation amplified by winter ice cover, and high seasonal variation in pelagic primary production. Further, the fastest warming regions on the planet are at high latitudes. These habitats are undergoing dramatic environmental changes such as summer sea ice retreat in the Western Arctic, and are predicted to show the first signs of carbonate under-saturation. The extreme polar conditions require adaptations by micro-, meso-, and macro-zooplankton (herein “zooplankton”) including stenothermy, shrinkage, use of sea ice, differing phenologies, seasonal migrations and diet shifts plus pulsed reproduction and slow, strongly seasonal growth. Some of these attributes make polar zooplankton potentially sensitive even to small changes in temperature, sea ice extent, seasonality and the timing of food. Polar ecosystems also can provide glimpses into the future of climate change. They provide a natural test-bed to examine both the sensitivity (*e.g.* physiological limits) and the resilience (*e.g.* behavioural flexibility) of zooplankton. In this session we welcome studies from high latitudes of both hemispheres, examining the response of zooplankton to spatial and temporal environmental variability and change. We welcome also broader scale comparative contributions (of species, regions or hemispheres), especially those that explore the mechanisms of sensitivity or resilience.

- 14:00 **Introduction by Convenors**
- 14:05 **Øystein Varpe (Invited)**
Adaptations to seasonality and the annual routine perspective for zooplankton (S6-7484)
- 14:30 **Albert Calbet, Enric Saiz, Karen Riisgaard, Rodrigo Almeda, Ignacio Movilla, Miquel Alcaraz, Sara Zamora and Torkel Gissel Nielsen**
Microzooplankton grazing in Arctic waters (S6-6880)
- 14:50 **Stéphane Plourde, Carin J. Ashjian, Robert G. Campbell and Celia Gelfman**
The energy budget of egg production in *Calanus glacialis* during spring and summer in the Beaufort-Chukchi Seas (S6-7220)
- 15:10 **Sara Zamora, Torkel Gissel Nielsen and Enric Saiz**
Plankton community structure and role of *Oithona similis* on the western coast of Greenland (S6-6883)
- 15:30 **Sanne Kjellerup, Rasmus Swalethorp, Karen Riisgaard and Torkel Gissel Nielsen**
Population dynamics and life strategy of the copepod *Metridia longa* in a Greenlandic fjord, 2010 (S6-6948)
- 15:50 **Coffee/Tea Break**
- 16:20 **Ksenia N. Kosobokova and Hans-Juergen Hirche**
Is Arctic zooplankton sleeping in the winter? (S6-7135)

- 16:40 **Humberto E. González, M.G. Mazzocchi, I. Borrione, Ricardo Giesecke, G. Mahadik, M. Marchant, E. Menschel, P. Martin, M. Ribera d'Alcala and Pieter Vandromme**
A phytoplankton bloom controlled by zooplankton grazing during the LOHAFEX iron-fertilisation experiment in the S-W Antarctic Circumpolar Current (S6-6993)
- 17:00 **Jun Nishikawa, Patricia Kremer, Laurence P. Madin and Erich Horgan**
Diel vertical migration of the pelagic tunicate *Salpa thompsoni* in the Southern Ocean (S6-7193)
- 17:20 **Miquel Alcaraz, Rodrigo Almeda, Enric Saiz, Albert Calbet, Carlos M. Duarte, Susana Agustí, Rocio Santiago, Juancho Movilla, Alejandro Alonso, Jorge Felipe, Elena Arashkevich and Ulrike Grote**
Arctic zooplankton in a warming scenario: Metabolism, tipping points and stoichiometry of regenerated nutrients (S6-6888)
- 17:40 **Rubao Ji, Carin J. Ashjian, Robert G. Campbell, Changsheng Chen, Guoping Gao, Cabell Davis, Geoffery Cowles and Robert Beardsley**
Life history and biogeography of *Calanus* copepods in the Arctic Ocean: An individual-based modeling study (S6-6914)
- 18:00 Session ends

Posters

- S6-6928 **Ulrike Grote, Elena Arashkevich, Elisabeth Halvorsen, Anna Pasternak, Raul Primicerio, Konstantin Solovyev and Anastasia Nikishina**
Effect of rising seawater temperature on the survival of the Arctic calanoid copepod *Calanus glacialis*: A laboratory experiment
- S6-6947 **Guang-Tao Zhang and Song Sun**
Zooplankton species composition and community structure in Western Arctic Ocean in summer 2003
- S6-7013 **Sanne Kjellerup, Rasmus Swalethop, Michael Dunweber, Signe Jung Madsen, Marie Vestergaard Henriksen, Torkel Gissel Nielsen, Benni Winding Hansen and Eva Friis Møller**
Effects of climate changes on the three coexisting *Calanus* species; *C. hyperboreus*, *C. glacialis* and *C. finmarchicus* during the productive season in Disko Bay, West Greenland
- S6-7024 **Camilla Svensen, Lena Seuthe, Yulia Vasilyeva, Anna Pasternak and Edmond Hansen**
Zooplankton community across Fram Strait in autumn: Are small copepods and protozooplankton important?
- S6-7028 **Cecilie Broms, Webjørn Melle, Lars Johan Naustvoll and Tor Knutsen**
Plankton abundance, community structure and production across an Arctic front
- S6-7035 **Enric Saiz, Albert Calbet, Rodrigo Almeda, Juancho Movilla, Eva M. Velasco and Miquel Alcaraz**
Zooplankton feeding in the Arctic during a *Phaeocystis* bloom
- S6-7044 **Gara Franchy, Claire Schmoker and Santiago Hernández-León**
Grazing activity around the South Shetland Islands (Antarctic Peninsula) during summer
- S6-7063 **Konstantin Solovyev and Marit Reigstad**
Three *Calanus* species populations in the Fram Strait in spring period: Role of hydrological and biological factors

- S6-7142 **Amy Maas, Leanne Elder, Heidi Dierssen and Brad A. Seibel**
The metabolic response of Antarctic pteropods (Gastropoda: Mollusca) to food availability
- S6-7145 **J. Berge, F. Cottier, Øystein Varpe, P. Renaud, S. Falk-Petersen, A. Aubert, O. Bjærke, J. Hovinen, S. Juul-Madsen and M. Tveit**
Macrozooplankton rather than *Calanus* are responsible for autumn DVM in Arctic fjords and pack ice: Backscatter contribution by net samples compared with acoustics
- S6-7173 **C. Tracy Shaw, Robin M. Ross and Langdon B. Quetin**
Effect of sea ice conditions on physiological maturity of female Antarctic krill (*Euphausia superba*) west of the Antarctic Peninsula
- S6-7180 **E.L. Orlova, V.A. Ivshin, P. Renaud, Claudia Halsband-Lenk, T.V. Strakhova and I.P. Prokopchuk**
Abundance, structure and biomass of *Calanus hyperboreus* in the Barents Sea
- S6-7189 **Kunio T. Takahashi, Atsushi Tanimura and Kenji Saito**
The occurrence of eugregarinid protozoan within the digestive tract of the Antarctic coastal krill *Euphausia crystallorophias*
- S6-7197 **Lionel Eisenhauer, Dag Slagstad and Paul Wassmann**
Changes in the production and distribution of Arctic *Calanus* spp. congeners at multi-decadal scales in response to climate warming
- S6-7225 **Imme Rutzen, Russell R. Hopcroft and Falk Huettmann**
Assembling pan-arctic patterns of zooplankton abundance
- S6-7250 **Margaux Noyon, Stéphane Gasparini, Fanny Narcy and Patrick Mayzaud**
How did the Arctic amphipod *Themisto libellula* cope with high Atlantic water masses input? A 5 month survey in Kongsfjorden
- S6-7296 **Jennifer Questel, Russell R. Hopcroft and Cheryl Clarke**
Inter-annual variability of the planktonic communities in the Northeastern Chukchi Sea
- S6-7300 **Elizaveta A. Ershova, Russell R. Hopcroft and Ksenia N. Kosobokova**
Broadscale patterns of summer zooplankton communities in the Chukchi Sea during 2004 and 2009
- S6-7308 **Fanny Narcy, Margaux Noyon, Stéphane Gasparini, Patrick Mayzaud and Stig Falk-Petersen**
Feeding habits and life strategy of *Oithona similis* in Kongsfjorden (Spitsbergen): Insights from its lipid content
- S6-7310 **Anaïs Aubert, Tobias Tamelander and Paul Wassmann**
C, N, and P body concentrations and ratios in high latitude calanoid copepods: A reflection of changes in environmental conditions?
- S6-7323 **Cheryl Clarke and Russell R. Hopcroft**
The Arctic Ocean Diversity (ArcOD) data-portal: Zooplankton
- S6-7330 **Angus Atkinson, Katrin Schmidt, Sophie Fielding, So Kawaguchi and Paul Geissler**
Are Antarctic krill fecal pellets exported or recycled?
- S6-7331 **Katrin Schmidt, Angus Atkinson, Hugh Venables and David W. Pond**
Spring blooms in the Southern Antarctic Circumpolar Current Front (SACCF) support early spawning of Antarctic krill

March 15

Session 1 (S1)

Effects of climate variability on secondary production and community structure

Co-Convenors:

Delphine Bonnet (Université Montpellier 2, France)

Catherine Johnson (Bedford Institute of Oceanography, Fisheries and Oceans Canada)

Angel Lopez-Urrutia (Instituto Español de Oceanografía, Spain)

Anthony Richardson (CSIRO Marine and Atmospheric Research and University of Queensland, Australia)

Invited Speaker:

Mark Ohman (Scripps Institution of Oceanography, UCSD, USA)

Climate variability and change influence zooplankton production and community structure through changes in the physical and chemical environment, as well as through changes in primary producers and zooplankton predator dynamics. Understanding and predicting impacts of climate change on secondary production and zooplankton communities will be critical in the near future to managing aquatic resources and mitigating the impact of climate change and other anthropogenic stressors on aquatic ecosystems. In this session, we encourage presentations that contribute to understanding how climate change influences zooplankton production and community dynamics, including climate effects on zooplankton population growth rates, distribution and abundance, seasonal timing, community structure and interactions, interactions with higher and lower trophic levels, and food web structure. This session will embrace studies of both marine and freshwater systems, a diverse range of zooplankton taxa including microzooplankton and gelatinous zooplankton, and a broad range of approaches including modeling, experimental work, and field observations.

- 8:30 **Introduction by Convenors**
- 8:35 **Mark D. Ohman (Invited)**
Zooplankton as sentinels of climate change (S1-7271)
- 9:00 **Karen Wishner, Kendra L. Daly and Brad A. Seibel**
Potential effects of climate variability on oxygen minimum zone zooplankton communities (S1-7064)
- 9:20 **Saskia A. Otto, Rabea Diekman, George Kornilovs, Lutz Postel and Christian Möllmann**
Climate-related decadal dynamics in Baltic Sea zooplankton: Interactive and additive effects of bottom-up and top-down controls (S1-6884)
- 9:40 **Marcos Llope, Priscilla Licandro, King-Sik Chan and Nils Chr. Stenseth**
Spatio-temporal variation of the plankton trophic interaction in the North Sea (S1-7050)
- 10:00 **Coffee/Tea Break**
- 10:30 **Vivian Montecino, Juan Pablo Oyanedel, Irma Vila and Luis Zúñiga**
Limnetic zooplankton structure and distribution in Chilean lakes and reservoirs (S1-7170)
- 10:50 **William T. Peterson, Cheryl A. Morgan, Hongsheng Bi, Jennifer L. Fisher and Jay O. Peterson**
Climate change in the northern California Current ecosystem: Impacts on the community composition and production of zooplankton (S1-7128)
- 11:10 **Lingbo Li, David L. Mackas, Brian P.V. Hunt, Jake Schweigert, Evgeny A. Pakhomov, Moira Galbraith, John F. Dower, Stephen Romaine, Deborah Faust and Tony J. Pitcher**
Large changes in zooplankton communities in the Strait of Georgia, British Columbia, during 1990 – 2007 (S1-7312)

- 11:30 **Erica Head**
Responses of *Calanus finmarchicus* to climate-related changes in phytoplankton bloom dynamics in Northwest Atlantic shelf and sub-polar gyre regions (S1-7136)
- 11:50 **Jeffrey A. Runge, Frédéric Maps, Andrew Leising, Andrew J. Pershing, James J. Pierson and David G. Kimmel**
Scenarios of climate change impacts on local production of the subarctic copepod, *Calanus finmarchicus*, in the Gulf of Maine (S1-7293)
- 12:10 **Viviana Farstey and Amatzia Genin**
Global relationships between water temperature and vertical distribution of zooplankton (S1-7071)
- 12:30 **Lunch**
- 14:00 **Ioanna Siokou-Frangou, Maria-Antonietta Pancucci-Papadopoulou, Dionysios Raitsos, Alex Theocharis, Vassilis Zervakis and Sultana Zervoudaki**
Mesozooplankton in the Aegean Sea (E.Mediterranean Sea): Differences among decades (S1-7153)
- 14:20 **Sanae Chiba, Hiroya Sugisaki, Tsuneo Ono, Tomoko Yoshiki and Sonia Batten**
Changes in community structure, trophic links, and phenology in a lower trophic level ecosystem in the western subarctic North Pacific during 2001-2009 (S1-7252)
- 14:40 **Anthony J. Richardson, Felipe Gusmão, Mark Baird, Frank Coman, Claire Davies, Jocelyn Dela-Cruz, Tim Pritchard, Anita Slotwinski and Iain Suthers**
Long-term hydroclimate drivers of zooplankton composition and phenology off eastern Australia (S1-7190)
- 15:00 **Alessandra Conversi**
Late 1980s regime shifts: Intriguing parallelisms in European (and other) seas (S1-7076)
- 15:20 **David G. Kimmel, Stéphane Plourde, Andrew Leising, James J. Pierson, Jeffrey A. Runge and Frédéric Maps**
Regional scale climatological forcing of *Calanus finmarchicus* dynamics in the Gulf of Maine and the Gulf of St. Lawrence (S1-7229)
- 15:40 **Jack Forster, Andrew G. Hirst, David Atkinson and Guy Woodward**
How do organisms change size with changing temperature? Exploring the mechanism of the Temperature-Size Rule (S1-7091)
- 16:00 **Coffee/Tea Break**
- 16:30 **Sophie G. Pitois, Christopher P. Lynam, Nicholas C. Halliday and Martin Edwards**
Long-term changes in the distribution and abundance of selected fish larvae from the CPR (1950-2005) over the UK shelf, in relation to biological and environmental factors (S1-7032)
- 16:50 **Juan Carlos Molinero, Manuel Hidalgo, Marta Coll, Mirna Batistić, Delphine Bonnet, Michele Casini, Ons Daly Yahia, M^aLuz Fernández de Puelles, Lyudmila Kamburska, Mario Lebrato, Priscilla Licandro, Lucía López-López, Davor Lučić, Alenka Malej, Frédéric Mélin, Laura Prieto, Ioanna Siokou-Frangou, Sultana Zervoudaki and Nejib Daly Yahia**
Jellyfish outbreaks in the Mediterranean Sea unveil synergies of climate and fisheries (S1-7320)
- 17:10 **Pieter Vandromme, Lars Stemmann, Carmen García-Comas, Laure Mousseau, Franck Prejger, Ornella Passafiume, Marc Picheral and Gabriel Gorsky**
Zooplankton response to NW Mediterranean hydroclimatic changes from 1966 to 2010 (S1-7007)

- 17:30 **Aino Høsia, Tone Falkenhaus and Lars Johan Naustvoll**
Scyphozoan jellyfish trends during 1992-2010 at Flødevigen, Southern Norway (S1-6904)
- 17:50 Session ends

Posters

- S1-6897 **Alexandra V. Temnykh, Viktor V. Melnikov and Mikhail Silakov**
Effects of long-term climate variability on the mesoplankton community structure in the Black Sea coastal areas
- S1-6898 **Alexandra V. Temnykh, Viktor V. Melnikov and Mikhail Silakov**
Regional differences in water temperature impact on coastal mesoplankton communities
- S1-6910 **Jaime Gómez-Gutiérrez, Samuel Martínez-Gómez and Carlos J. Robinson**
Seasonal growth, molting and egg production rates of *Nyctiphanes simplex* (Crustacea: Euphausiacea) in the Gulf of California
- S1-6918 **Jessica Garzke and Ulrich Sommer**
The response of zooplankton body size to warming
- S1-6923 **Elena P. Dulepova**
Differences on zooplankton productivity in the western and eastern Bering Sea in the “warm” and “cold” periods
- S1-6924 **Alexander V. Zavolokin**
Composition, distribution and dynamics of large-size jellyfish in the Bering, Okhotsk, and Japan Seas and northwestern Pacific Ocean
- S1-6940 **Hongsheng Bi, William T. Peterson and Paul T. Strub**
Alongshore transport and zooplankton communities in the northern California Current system
- S1-6975 **Lutz Postel**
Specific long-term variability of Baltic Sea zooplankton stocks due to environmental and anthropogenic influences
- S1-6979* **Christopher P. Lynam, Martin Lilley, Thomas Bastian, Tom Doyle, Steven Beggs and Graeme Hays**
(Presenter: *Sophie Pitois on behalf of Christopher P. Lynam*)
Have jellyfish in the Irish Sea benefited from climate change and overfishing?
- S1-6987 **Désirée Tommasi, Evgeny A. Pakhomov and Brian P.V. Hunt**
Assessing the environmental drivers of interannual variation in mesozooplankton community structure: Insights from field observations in a Canadian fjord
- S1-7003 **Min-Chul Jang, Kyoungsoon Shin, Hyun-Ho Shin and Young-Ok Kim**
Egg hatching of copepod in hypoxic zone
- S1-7008 **Sünnje L. Basedow, Meng Zhou and Kurt S. Tande**
Growth and mortality within a mesozooplankton community at the polar front
- S1-7015 **Germán A. Kopprio, M. Celeste López-Abbate, Gerhard Kattner, R. Hugo Freije, Mónica S. Hoffmeyer and Rubén J. Lara**
Effects of climate change on the zooplankton lipid dynamics in coastal water bodies: A case-study in a brackish lake of Argentina

- S1-7049 **Claire Schmoker and Santiago Hernández-León**
Trophic links and variability of the Canary Current system planktonic community in cold and warm years: An end-to-end approach
- S1-7054 **Marijana Miloslavić, Davor Lučić, Juan Carlos Molinero, Barbara Gangai, Ivona Onofri and Adam Benović**
Compensatory dynamics of zooplankton long term changes. Example from a marine protected area in the South Adriatic Sea
- S1-7074* **Patrick H. Ressler, Alex De Robertis, Phyllis J. Stabeno, Joseph D. Warren, Joy N. Smith and Stan Kotwicki**
(Presenter: *Joseph D. Warren on behalf of Patrick H. Ressler*)
Using an acoustic index of euphausiid abundance to understand the impact of fish predation and climate conditions on the euphausiid standing stock of the Bering Sea shelf
- S1-7089 **Maria Pöllupüü, Mart Simm and Henn Ojaveer**
Abrupt abundance changes in copepod abundance in the coastal Baltic Sea at a time-scale of fifty years
- S1-7122 **Astthor Gislason, Hildur Petursdottir and Teresa Silva**
Inter-annual variability in abundance of *Calanus* spp. in oceanic subarctic waters north of Iceland in relation to environmental conditions
- S1-7138 **Nadine Schulz, Jasmin Renz, Janna Peters and Pedro Martínez Arbizu**
Adaptation potential of the calanoid copepod *Acartia tonsa* to multiple environmental stressors
- S1-7176 **Claudia Castellani and Priscilla Licandro**
Do species-specific differences of copepod life cycle and ecology contribute to multi-decadal variability in abundance across the north Atlantic basin?
- S1-7183 **Melisa D. Fernández Severini, Anabela A. Berasategui, Valeria A. Guinder, M. Clara Menéndez, Florencia Biancalana, M. Sofía Dutto, M. Celeste López Abbate and Mónica S. Hoffmeyer**
Long-term trend in the mesozooplankton abundance in a southwestern temperate estuary (Bahía Blanca Estuary, Argentina)
- S1-7201 **Anu Vehmaa, Andreas Brutemark, Jonna Engström-Öst, Elena Gorokhova, Hedvig Hogfors and Towe Holmborn**
Copepod reproduction and oxidative stress in a future climate scenario: Effects of lowered pH, elevated temperature and a toxic cyanobacterium
- S1-7236 **Anita Slotwinski, Frank Coman, Claire Davies, Graham Hosie, James McLaughlin, David McLeod, Mark Tonks, Joanna Strzelecki and Anthony J. Richardson**
Plankton observing in Australia: The Australian Continuous Plankton Recorder (AusCPR) survey
- S1-7237 **Claire Davies, Pru Bonham, Frank Coman, Tim Lynch, Anita Slotwinski, Peter A. Thompson, Mark Tonks and Anthony J. Richardson**
Plankton observing in Australia: Plankton from the Australian National Reference Stations
- S1-7238 **B.H.R. Othman, J.G. Greenwood, A. David McKinnon, Peter C. Rothlisberg and Anthony J. Richardson**
Spatial and temporal distribution of copepod diversity and abundance in the Gulf of Carpentaria, Australia
- S1-7244 **Aiko Tachibana, Takashi Ishimaru and Hiroshi Itoh**
Seasonal variation in copepod community structure in Tokyo Bay, Japan

- S1-7253 **Danilo L. Calliari, Guillermo Cervetto, Rafael Castiglioni and Laura Rodríguez-Graña**
Abundance-diversity-environment relationship: The case of copepod assemblages in the Rio de la Plata estuary
- S1-7266 **Tulia Martínez, Alan Giraldo and Efrain Rodríguez-Rubio**
Fish larvae assemblage during El Niño and La Niña 2007 in the Pacific Ocean of Colombia
- S1-7278 **Ramiro Riquelme-Bugueño, Samuel E. Hormazábal, Marco Correa-Ramírez, Rubén Escribano and Sergio Núñez**
Mesoscale variability and its impact on the euphausiid community off Central Chile during the spring 2007
- S1-7285 **Catherine L. Johnson, Jeffrey A. Runge and K. Alexandra Curtis**
Interannual variability in the Scotian Shelf (Northwest Atlantic) zooplankton community and influence on the Gulf of Maine
- S1-7287 **Elda Pinedo, Yasmín Escudero and Patricia Ayón**
Abundance and composition variability of copepods in the northern Humboldt Current system
- S1-7290 **Russell R. Hopcroft, Cheryl Clarke, Christine T. Baier and Jeffery M. Napp**
Egg production rates of *Pseudocalanus mimus* and *Pseudocalanus newmani* in the coastal Gulf of Alaska
- S1-7299* **Lucía López-López and Juan Carlos Molinero**
(Presenter: Juan Carlos Molinero on behalf of Lucía López-López)
Estimating the effect of environmental conditions on the seasonality and outbreak periodicity of *Pelagia noctiluca* in the Mediterranean Sea

March 15

Session 2 (S2)

Ecological interactions: Links to upper and lower trophic levels

Co-Convenors:

Sanae Chiba (Research Institute for Global Change, JAMSTEC, Japan)

Enric Saiz (Institut de Ciències del Mar, Spain)

Invited Speaker:

Diana Stoecker (University of Maryland Center for Environmental Science, USA)

Zooplankton play a key role in the pelagic realm as a major link between primary producers and higher trophic levels, either directly or indirectly via protozooplankton, therefore being subject to either bottom-up and top-down control. Regionally-specific differences in food web structure and ecological interactions between trophic levels largely influence not only the biological productivity but also the biogeochemical processes acting in the region, such as the efficiency of the biological carbon pump. Recent studies have reported sound changes in zooplankton communities responding to various climatic and anthropogenic forcing, such as species diversity and size composition, seasonality, geographical distribution, *etc.*, yet the mechanisms and consequences of those changes in terms of the functioning of the system and biogeochemical processes in the water column have not been fully investigated. In this session we aim for a better understanding of the complexity of the trophic interactions mediated by micro- and mesozooplankton, either as prey or as predator, in marine food webs, and in particular highlight studies that help explain how the above-mentioned spatio-temporal changes in zooplankton communities would affect biological production as well as biogeochemical processes. We expect papers on this scope, ranging from the smallest scales dealing with individual behavior to the largest scales dealing with long-term community change analysis, based on either laboratory experiments, field observation, and model simulation.

- 8:30 **Introduction by Convenors**
- 8:35 **Diane Stoecker, Kristen Blattner, Alison Weigel and Dean Stockwell (Invited)**
Acquired phototrophy in ciliates: Does it boost trophic transfer to mesozooplankton? (S2-6988)
- 9:00 **Michael Landry and Michael R. Stukel**
Plankton trophic structure and food-web fluxes in the eastern equatorial Pacific (S2-7072)
- 9:20 **Sylvain Lenoir, Grégory Beaugrand and Jean-Claude Dauvin**
Projections of changes in the spatial distribution of zooplankton for the end of this century: Consequences for higher trophic levels (S2-6989)
- 9:40 **Lindsay J. Sullivan, Wim Kimmerer and Joan Lindberg**
Impacts of introduced copepods on the growth and survival of planktivorous fish in the San Francisco Estuary (S2-7103)
- 10:00 **Coffee/Tea Break**
- 10:30 **Daniel Bevan, John F. Dower, Marc Trudel and Asit Mazumder**
Spatial variability in lipid content and fatty acid profiles of macrozooplankton from coastal British Columbia, Canada (S2-7067)
- 10:50 **Hiroya Sugisaki, Kiyotaka Hidaka, Tadafumi Ichikawa, Yuuichi Hirota, Yutaka Hiroe, Mikiko Kuriyama, Toru Udagawa and Kaoru Nakata**
Long-term variation of the plankton community in the Kuroshio warm current area; the spawning ground of Japanese sardine (S2-7191)

- 11:10 **Corinne Pomerleau, Steven H. Ferguson, Véronique Lesage, Gesche Winkler and Wojciech Walkutz**
Zooplankton prey species and foraging ecology of bowhead whales (*Balaena mysticetus*) in the Canadian High Arctic: Insights from stable isotope and stomach content analyses (S2-7137)
- 11:30 **Ainhoa Lezama-Ochoa, Michael Ballón, Daniel Grados, Mathieu Woillez, Udane Martinez, Guillermo Boyra, Xabier Irigoien and Arnaud Bertrand**
Acoustic study of the macrozooplankton community in the Bay of Biscay: Diel vertical migration, spatial patterns and interaction with pelagic fish (S2-7218)
- 11:50 **Gareth L. Lawson, Andone C. Lavery, Peter H. Wiebe, Timothy P. White and Reny B. Tyson**
Aggregation of euphausiids and interaction with higher predators in regions of abrupt topography of the northwest Atlantic (S2-7319)
- 12:10 **Mette Dalgaard Agersted and Torkel Gissel Nielsen**
The functional biology of krill (*Thysanoessa raschii*) with focus on its ecological role in a Greenlandic fjord (S2-7022)
- 12:30 **Lunch**
- 14:00 **Michael J. Dagg, Bruce W. Frost and Jan A. Newton**
Phytoplankton ingestion by populations of dielly migrating copepods and euphausiids in Dabob Bay, a coastal fiord in Washington, USA (S2-7327)
- 14:20 **Julieta Antacli, Marina Sabatini, Rut Akselman and Daniel Hernández**
Seasonal variability of feeding and reproductive activity of the copepods *Drepanopus forcipatus* and *Calanus australis* in the Southern Patagonian Shelf: Post-bloom vs. early-bloom conditions (S2-6932)
- 14:40 **Jonna Engström-Öst, Elena Gorokhova, Hedvig Hogfors, Andreas Brutemark and Anu Vehmaa**
Zooplankton and algal blooms – Case studies from the Baltic (S2-7148)
- 15:00 **Tone Falkenhaug and Padmini Dalpadado**
Diet composition and food selectivity of Sprat (*Sprattus sprattus*) in Hardangerfjord, a fjord off western Norway (S2-6957)
- 15:20 **Leonardo Castro, Gabriel Claramunt, Humberto E. González, María C. Krautz, Alejandra Llanos-Rivera, Joyce Méndez, Wolfgang Schneider and Samuel Soto**
The effect of contrasting feeding environments on anchoveta egg quality during the spawning season off central Chile (S2-7182)
- 15:40 **Wim Kimmerer**
Biotic vs. physical control of zooplankton in estuaries (S2-7004)
- 16:00 **Coffee/Tea Break**
- 16:30 **Joseph D. Warren, Susan E. Parks, David Wiley, Douglas P. Nowacek and Ari S. Friedlaender**
Measurements of zooplankton preyfield densities over small spatial and temporal scales and their effect on the behavior of individual baleen whale predators (S2-7048)
- 16:50 **Klas O. Möller, Christian Möllmann, Axel Temming and Michael St. John**
Resolving the small scale distribution of plankton and marine snow: Unravelling the role of thin layers as assessed with optical techniques (S2-7025)

- 17:10 **Anastasia Nikishina, Alexander Drits and Yulia Vasilyeva**
The role of *Noctiluca scintillans* in the trophic dynamics of the Black Sea plankton community (S2-7070)
- 17:30 **Lene Friis Møller and Peter Tiselius**
Population dynamics and predation impact of the introduced ctenophore *Mnemiopsis leidyi* in the Gullmars fjord, west coast of Sweden (S2-7246)
- 17:50 Session ends

Posters

- S2-6899 **Alexandra V. Temnykh, Viktor V. Melnikov and Mikhail Silakov**
One more guilty player in the dramatic changes in the plankton of the Black Sea – *Acartia clausi*
- S2-6912 **Joanna Strzelecki and Shaofang Wang**
Influence of physical oceanography on the diet of size fractionated zooplankton of Western Australian coast: Insight from fatty acids
- S2-6922 **Maxim Koval and Anastasia Morozova**
Zooplankton as food supply to the marine pelagic fishes in the Kamchatka waters
- S2-6925 **Natalia T. Dolganova**
Zooplankton of the Sea of Japan as potential prey for livestock growing of salmon
- S2-6933 **Marina Sabatini, Rut Akselman, Rubén Negri, Ricardo Silva, Norma Santinelli, Viviana Sastre, Cristina Daponte, Julieta Antacli, Vivian Lutz, Valeria Segura, Raúl Reta and Mónica Gil**
Mesozooplankton community structure and trophic interactions in the Southern Patagonian Shelf (SW Atlantic, Argentina, 47°-55°S)
- S2-6937 **Karyn D. Suchy and John F. Dower**
Bridging the gap between food quality and secondary production in a highly productive fjord in British Columbia, Canada
- S2-6938 **Gisela Figueiredo, Betina Kozlowsky-Suzuki, Francisco Matos and Jean Valentin**
Grazing and egg production of the copepod *Acartia tonsa* in a highly eutrophic bay, Rio de Janeiro, Brazil
- S2-6951 **Fabien Lombard, Selander Erik and Kiørboe Thomas**
Active food selection in appendicularians
- S2-6966 **Espen Bagoien, Webjørn Melle and Stein Kaartvedt**
Seasonal dynamics of *Calanus finmarchicus* in relation to environmental factors in the Norwegian Sea: A multiyear basin-scale analysis
- S2-6978* **Christopher P. Lynam, Sophie G. Pitois, Nicholas C. Halliday and Martin Edwards**
(Presenter: *Sophie Pitois on behalf of Christopher P. Lynam*)
Spatio-temporal patterns in abundance of larval fish from Continuous Plankton Recorder (CPR) surveys in the North, Celtic and Irish Seas (1950-2005)
- S2-6983 **Tania FitzGeorge-Balfour, Andrew G. Hirst, Cathy H. Lucas and Jamie Craggs**
The influence of prey size, sex and behaviour on predation by the scyphomedusa *Aurelia aurita*

- S2-6999* **Natalya Buslova, Anna Dubinina and Oleg Tepnin**
(Presenter: colleague on behalf of Anna Dubinina)
Spring diurnal dynamics of ichthyo- and zooplankton in a deep canyon in Avachinsky Gulf (South-East Kamchatka) in 2006-2007
- S2-7012 **Sari L.C. Giering, Richard Sanders, Richard S. Lampitt, Alex J. Poulton and Daniel J. Mayor**
Do mesozooplankton cause HNLC conditions in the high-latitude North Atlantic?
- S2-7014 **Joseph S. Paimpillil**
The pelagic food web in Cochin backwaters: The proliferation of micro-zooplankton
- S2-7026 **Gisela Figueiredo, Fabiana Mendes, Adriana Valente and Jean Valentin**
Diet and prey selection of the chaetognath *Parasagitta friderici* in a eutrophic bay in Rio de Janeiro, Brazil
- S2-7046 **David Opazo and Cristian A. Vargas**
Effects of river discharge in the individual and community grazing rates of planktonic copepods in a seasonal upwelling system
- S2-7047 **Paulina Y. Contreras, Cristian A. Vargas and José Luis Iriarte**
The relative importance of phototrophic, heterotrophic, and mixotrophic nanoflagellates in the microbial food web dynamic of a river-influenced coastal area
- S2-7053 **Marijana Miloslavić, Juan Carlos Molinero, Davor Lučić, Barbara Gangai, Ivona Onofri and Adam Benović**
Seasonal habitat utilization of *Calanus helgolandicus* in semi-enclosed marine lakes (“Veliko jezero”, MPA „Mljet“, South Adriatic Sea)
- S2-7082 **Anne Slaughter, Toni Ignoffo and Wim Kimmerer**
Predatory impact and reproductive rate of *Acartiella sinensis*, an introduced predatory copepod in San Francisco Estuary
- S2-7093 **Lin Qun, Jin Xian-Shi and Zhang Bo**
Trophic interactions of jellyfish blooms with fisheries in the Yellow Sea
- S2-7119 **Toni Ignoffo, Alison Gould, Anne Slaughter and Wim Kimmerer**
How they survive: The growth and development of copepods in the food limited San Francisco Estuary
- S2-7130 **Riguel F. Contente, Marina F. Stefanoni and Leonardo Kenji Miyashita**
The role of planktonic copepods in the diet of fishes from the subtropical Estuarine Complex of Paranaguá Bay, southern Brazil
- S2-7150* **Outi Setälä**
(Presenter: colleague on behalf of Outi Setälä)
Mnemiopsis vs. Aurelia: The role of gelatinous top predators in the northern Baltic Sea food web
- S2-7177 **Rodrigo A. Martínez and Albert Calbet**
Use of vital fluorochromes in microzooplankton grazing experiments
- S2-7194 **Elvire Antajan, Stéphane Gasparini, Marie-Hermance Daro and Michèle Tackx**
Contribution of herbivory to the diet of the copepod *Temora longicornis* (Müller) in Belgian coastal waters
- S2-7233 **Joseph Dominic H. Palermo, Aletta T. Yñiguez, Marianne Camoying, Christine Barrera, Aldwin Almo, Christopher Mendoza, Lourdes J. Cruz and Rhodora V. Azanza**
Mesozooplankton grazing activity during a bloom dominated by *Pyrodinium bahamense* var. *compressum* in Sorsogon Bay, Philippines

- S2-7251 **Martin Ogonowski, Jon Duberg and Sture Hansson**
Intraspecific differences in diel vertical migration in a Baltic Sea Mysis species (*Mysis salemaai*, Mysidacea, Crustacea), revealed by stable isotopes, C:N ratios and genetic markers
- S2-7270 **Hedvig Hogfors, Anu Vehmaa, Towe Holmborn, Susanna Hajdu, Jonna Engström-Öst, Andreas Brutemark and Elena Gorokhova**
Stimulating effects of bloom forming cyanobacteria on copepod reproduction and development
- S2-7321 **Juan Carlos Molinero, Katarina Kanevceva and Cristian A. Vargas**
Plankton dynamics in a changing world. Compensatory dynamics and risks for ecological shifts
- S2-7337 **Anu Vehmaa, Anke Kremp, Timo Tamminen, Hedvig Hogfors, Kristian Spilling and Jonna Engström-Öst**
Copepod reproductive success in experimentally modified spring phytoplankton communities

March 16

Workshop 1 (W1)

Zooplankton Individual Based Models

Co-Convenors:

Harold P. Batchelder (Oregon State University, USA)

Douglas C. Speirs (University of Strathclyde, UK)

Invited Speaker:

Wendy C. Gentleman (Dalhousie University, Canada)

This workshop will review the use of individual-based models (IBMs) in zooplankton ecology, and the ongoing debate between those favouring density-based population models and those favouring more flexible, but more complex, simulation approaches.

Individual-based models are population models in which individual organisms, or quasi-individuals representing homogeneous groups of individuals, are explicitly represented as discrete elements of a computer simulation. Individuals have their own state variables (or i-state configuration), such as age, size, developmental stage, and physiological condition; population-level dynamics arise as emergent properties of the interactions among individuals and between individuals and their environment. This approach contrasts with population-level models (PLM), or aggregated mathematical models, in which population processes are described by relationships between densities of individuals. Although PLMs can represent individual properties, they do so through an i-state distribution over a population rather than explicitly representing individuals.

One of the main appeals of IBMs is that they provide an easy way of capturing population heterogeneity, or inter-population variability, because stochastic processes impacting individuals can readily be incorporated into simulations. When non-linear rate processes, the functional feeding response for example, determine population growth, the mean behaviour need not necessarily correspond to that predicted by using the underlying mean rates in a deterministic PLM. Because corresponding IBMs represent population heterogeneity explicitly and the population level outcomes emerge from this, such difficulties are side-stepped. A second advantage is that it is much easier to introduce behavioural rules, especially those relating to movement, which can be extremely hard to represent in PLMs in a mathematically compact way. The inclusion of diel vertical migration in IBMs of marine zooplankton, for example, has helped to demonstrate the importance of such behaviour in the retention of populations in productive coastal upwelling zones.

The most fundamental difference between IBMs and PLMs is the continuum assumption underlying PLMs. At high trophic levels, when individual organisms are sparse, the concept of density becomes problematic, and IBMs are a natural tool. By contrast, for abundant and relatively homogeneously-distributed organisms the computational cost of representing individuals over large areas can be prohibitive. Many zooplankton populations, with complex life-histories and behaviours, and widespread but often patchy distributions, fall somewhere in the centre of this spectrum, thereby making the choice of modelling approach particularly problematic. Computational costs, and the large number of often un-measurable parameters, also mean that IBMs are not practical tools when moving away from single species zooplankton models to include coupling to higher and lower trophic levels. The workshop will focus on new methods and current challenges in the unification of individual level and population level approaches.

- 8:30 **Introduction by Convenors**
- 8:35 **Wendy C. Gentleman (Invited)**
Thinking outside the Z-box: How Individual-Based Models (IBMs) can advance zooplankton ecology (W1-7328)
- 9:00 **Gaël Dur, Sami Souissi and Jiang-Shiou Hwang**
Individual Based Model for the phenology of *Eurytemora affinis* from the Seine Estuary, France (W1-7240)
- 9:20 **Douglas C. Speirs and Michael R. Heath**
Modelling *Calanus finmarchicus* in the Irminger Sea: From individuals to populations (W1-7340)
- 9:40 **Matteo Sinerchia, Wes R. Hinsley, Anthony J. Field and John D. Woods**
Using an Individual Based Model with four trophic levels to model fisheries recruitment (W1-7124)
- 10:00 **Coffee/Tea Break**
- 10:30 **Jeffrey G. Dorman, Thomas M. Powell, William J. Sydeman and Steven J. Bograd**
Modeled krill distribution in the California Current from 1990-2005 (W1-7309)
- 10:50 **Brie Lindsey and Harold P. Batchelder**
North Pacific krill production: A bioenergetic model for *Euphausia pacifica* in the California Current System (W1-7307)
- 11:10 **Harold P. Batchelder and Brie Lindsey**
Comparison of IBM and concentration based approaches to modeling krill growth and population dynamics (W1-7288)
- 11:30 Discussion
- 12:30 Workshop ends

Poster

- W1-7210 **Samuel Soto-Mendoza, Leonardo Castro, Carolina Parada and Joyce Méndez**
Retention of *Engraulis ringens* eggs and larvae, connectivity among spawning and recruitment zones, and their relationship with invertebrate predators and larval food distributions in the southern part of the Humboldt Current

March 16

Workshop 2 (W2)

Advances in genomic and molecular studies of zooplankton

Co-Convenors:

Erica Goetze (University of Hawaii at Manoa, USA)

Ryuji Machida (Smithsonian Institution, National Museum of Natural History, USA)

Katja Peijnenburg (Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, The Netherlands)

Invited Speaker:

Carol Eunmi Lee (Center of Rapid Evolution (CORE), University of Wisconsin, USA)

Molecular techniques have provided important insights into a number of aspects of zooplankton ecology. For example, genetic markers have been used to characterize the population structure of zooplankton species, to assess the phylogenetic relationships among extant taxa, and to test the specificity of their trophic niche. Phylogeographic studies have also added a historical perspective to understanding contemporary species distributions and demography. New zooplankton species are being discovered via molecular studies, and research in DNA Barcoding and community meta-genetics promises to greatly accelerate efforts to assess zooplankton diversity in a range of ocean environments. These diverse ongoing research lines rely on both conventional and emerging molecular techniques, and address long-standing questions in biological oceanography. The purpose of this workshop is to assess the current state-of-the-field of molecular and genomic studies of marine zooplankton, and to discuss key research areas that could be significantly advanced through creative application of existing and emerging molecular techniques. For example, we are interested in how molecular approaches could inform interdisciplinary studies of (1) the effect of changing climate on zooplankton physiology, distribution, or feeding ecology, (2) the role of biodiversity in ecosystem function, and (3) the role of mesozooplankton in structuring pelagic food webs through trophic ecology, among others. We envision a workshop with a number of short presentations from the variety of active research areas in zooplankton molecular ecology, followed by discussion focused on specific research questions.

- 8:30 **Introduction by Convenors**
- 8:35 **Carol Eunmi Lee, Greg Gelembiuk, Joana Silva, Marijan Posavi, Michael Kiergaard, Brian Eads, Davorka Gulisija and Yuseob Kim (Invited)**
Rapid evolution during independent copepod invasions into novel environments (W2-7120)
- 9:00 **Petra H. Lenz, R. Patrick Hassett, Paola Batta Lona, Ebru Unal, Benjamin King, Ann Bucklin and David W. Towle**
Microarray studies in a calanoid copepod, *Calanus finmarchicus* (W2-7105)
- 9:15 **Ebru Unal, Petra H. Lenz, David Towle and Ann Bucklin**
Gene expression analysis of time-series collections of *Calanus finmarchicus* in the Gulf of Maine, NW Atlantic Ocean (W2-7066)
- 9:30 **Mattias L. Johansson, Leah R. Feinberg, Michael A. Banks and William T. Peterson**
A comparison of the mitochondrial genomes of five species of North Pacific krill (W2-6942)
- 9:45 **Silke Laakmann, Inga Mohrbeck, Thomas Kneibelsberger and Michael J. Raupach**
Do we know the known? Zooplankton biodiversity of the North Sea (W2-7160)
- 10:00 **Coffee/Tea Break**
- 10:30 **Pennie Lindeque**
Molecular identification of zooplankton: 10 years on (W2-6960)

- 10:45 **Jaime Gómez-Gutiérrez, Michaela C. Strüder-Kypke, Denis H. Lynn, C. Tracy Shaw, Alejandro López-Cortés, Mario J. Aguilar-Méndez and Carlos J. Robinson**
Genetic evidence of distinct new *Collinia* species, parasitoids of krill from the Bering Sea to the Baja California peninsula region (W2-6909)
- 11:00 **Paolo Simonelli, Christofer Troedsson, Hans H. Jakobsen, Albert Calbet, Marc E. Frischer and Jens C. Nejtgaard**
Calanus spp. feeding rates on a diatom species estimated by quantitative PCR (W2-6965)
- 11:15 **Tatiana Rynearson, Edward Durbin, Alison Cleary and Maria Casas**
DNA analysis of prey in zooplankton: From gut contents to feeding rates (W2-7217)
- 11:30 **Katja T.C.A. Peijnenburg, Mirna Batistić, Lisa E. Becking, and Rade Garić**
Zooplankton populations isolated in marine lakes: Natural laboratories of evolution? (W2-7065)
- 11:45 **Hiroomi Miyamoto, Ryuji J. Machida and Shuhei Nishida**
Genetic diversity of pelagic chaetognaths (W2-6950)
- 12:00 **Erica Goetze and David B. Carlon**
Does habitat specialization drive population genetic structure of oceanic zooplankton? (W2-7213)
- 12:15 Discussion
- 12:40 Workshop ends

Posters

- W2-6968 **Georgina Cepeda, Leocadio Blanco-Bercial, Ann Bucklin, Corina Berón and María Delia Viñas**
Molecular systematics and biogeography of *Oithona* spp. of the Atlantic Ocean
- W2-6974 **Ryuji J. Machida, Laetitia Plaisance, Christopher P. Meyer, Jonathan Geller and Nancy Knowlton**
Environmental genetic analysis of coral reef metazoan communities
- W2-7037 **Lidia Yebra, Delphine Bonnet, Roger P. Harris, Pennie Lindeque and Katja T.C.A. Peijnenburg**
Barriers in the pelagic: Population structuring of *Calanus helgolandicus* and *C. euxinus* in European waters
- W2-7077 **Paola G. Batta-Lona, Rachel O'Neill, Craig Oberfell and Ann Bucklin**
Adaptation in a changing antarctic environment: Transcriptomics of the southern ocean salp, *Salpa thompsoni*
- W2-7161 **Inga Mohrbeck, Silke Laakmann, Thomas Knebelsberger and Michael J. Raupach**
First insights into the molecular diversity of the North Sea zooplankton
- W2-7317 **Elena Gorokhova**
Growth strategies of the invasive cladoceran *Cercopagis pengoi* in the Baltic Sea, and the molecular basis for its invasion success

March 16

Workshop 3 (W3)

Updates and comparisons of zooplankton time series

Co-Convenors:

David Mackas (*Institute of Ocean Sciences, Fisheries and Oceans Canada*)

Martin Edwards (*Sir Alister Hardy Foundation for Ocean Science, UK*)

Invited Speaker:

Jenny Huggett (*Department of Environmental Affairs, South Africa*)

Zooplankton time series data are becoming not only more available, but also more widely used as diagnostics of change in marine ecosystems. Since the last International Zooplankton Symposium (2007), a lot has happened. Several new time series sampling programs (rich but brief in 2007) have become long enough to support broader analyses. SCOR Working Group 125 carried out comparisons among many of the earlier and longer time series. New visualization and statistical tools have been developed and applied. And several ocean regions have undergone very strong fluctuations of climate and zooplankton composition. For the 2011 workshop, part of the schedule will be contributed papers. We continue to be especially interested in between-regional teleconnections of decadal fluctuations, and in zooplankton time series that go beyond biomass to include information on variability of community composition, zoogeographic distributions, phenology, and/or physiological condition, and in papers that examine the role of zooplankton in marine ecosystem change and resilience. However, we will also reserve time for on-site demos, discussions, and synthesis efforts (so please bring your laptops, stocked with data tables and favorite analysis tools in addition to your polished presentations).

- 8:30 **Introduction by Convenors**
- 8:35 **Jenny Huggett, Todd D. O'Brien, Hans Verheye, Ángel López-Urrutia, Patricia Ayón, Rubén Escribano, Larry Hutchings, Anja Kreiner, David L. Mackas, Mark D. Ohman, William T. Peterson and Chris Reason (Invited)**
Zooplankton time series from eastern boundary upwelling ecosystems: Within- and between-system comparisons (W3-7116)
- 9:00 **Patricia Ayón, Gordon Swartzman, Pepe Espinoza and Arnaud Bertrand**
Long term changes in zooplankton size distribution in the Peruvian Humboldt Current System: Conditions favouring sardine or anchovy (W3-7075)
- 9:15 **Todd D. O'Brien**
The COPEPOD Interactive Time-series Explorer (COPEPODITE) (W3-7230)
- 9:30 **M^aLuz Fernández de Puelles and Todd D. O'Brien**
Zooplankton trends in an oligotrophic open area of the Balearic Sea (central western Mediterranean) (W3-7095)
- 9:45 **Pierre Helaouet, Martin Edwards and Grégory Beaugrand**
Understanding populations changes in time due to niche requirements (W3-6886)
- 10:00 **Coffee/Tea Break**
- 10:30 **Claudia Halsband-Lenk and Elvire Antajan**
Comparative time series analyses in the English Channel (W3-7199)
- 10:45 **Catherine L. Johnson, Pierre Pepin and Michel Harvey**
Interannual variability in abundance and seasonal timing of dominant species, immigrant groups, and functional groups at six stations in the northwest Atlantic (W3-7284)

- 11:00 **Kazuaki Tadokoro, Yuji Okazaki, Tsuneo Ono and Hiroya Sugisaki**
Recent changes of meso-zooplankton community in the western North Pacific Ocean (W3-7228)
- 11:15 **William T. Peterson, Cheryl A. Morgan, Jennifer L. Fisher, Jay O. Peterson and Hongsheng Bi**
15 years of biweekly sampling along the Newport Hydrographic Line: An update (W3-7140)
- 11:30 **David L. Mackas**
Flow-field fluctuations vs. warming trend: What is driving meridional shifts in zooplankton distribution ranges and community dominance? (W3-7080)
- 11:45 Group Discussion and Data Exchange
- 12:45 Workshop ends

Posters

- W3-6961 **James Highfield, Damien Eloire, David V.P. Conway, Pennie Lindeque, Martin Attrill and Paul Somerfield**
Seasonal dynamics of meroplankton assemblages at Station L4
- W3-7241 **Gaël Dur, Syuhei Ban, Sami Souissi, Emi Doi, Shinsuke Oomae, Takashi Morita and Yoichiro Sakai**
Multiscale temporal variability of *Eodiaptomus japonicus* in Lake Biwa

March 16

Workshop 4 (W4)

Impacts of ocean acidification

Co-Convenors:

So Kawaguchi (Australian Antarctic Division, Australia)

M. Brady Olson (Western Washington University, USA)

Invited Speaker:

Brad Seibel (University of Rhode Island, USA)

Studies exploring the effects of ocean acidification on zooplankton are scarce, and with few exceptions are limited to assessing direct effects on zooplankton calcification. This focus on calcification, although vitally important, constrains our ability to predict what effects ocean acidification will have on zooplankton in a wider biological and ecological context. For example, what are other direct, but sub-acute zooplankton responses to ocean acidification? How might these responses alter zooplankton interactions with their predators and prey? What may be the effects on zooplankton-mediated nutrient cycling? Will the timing of transition between zooplankton life histories be altered by ocean acidification? How might secondary production change in response to acidification? Will the magnitude of these effects be altered by interactions with climate parameters synergistic with ocean acidification? This workshop solicits participation from plankton biologists and ecologists that wish to contribute to a dialog aimed at meeting these specific workshop goals: (1) report on current research and/or discoveries regarding zooplankton and ocean acidification, and (2) identify the critical research and information needed to provide a framework for better predicting zooplankton responses to ocean acidification.

- 8:30 **Introduction by Convenors**
- 8:35 **Brad A. Seibel (Invited)**
Zooplankton physiology in a changing ocean: Synergistic effects of climate-related variables on metabolism (W4-7106)
- 9:00 **M. Brady Olson, Brooke A. Love and Suzanne L. Strom**
Microzooplankton feeding and growth in an acidified ocean (W4-6895)
- 9:20 **Barbara Nichoff, Jan Czerny, Signe Klavsén, Sebastian Krug and Kai Schulz**
The response of zooplankton to elevated CO₂ concentrations: Results from a mesocosm experiment in a high Arctic fjord (W4-7280)
- 9:40 **Jörg Dutz, Sara Ceballos, Alejandro Isla and Erik Selander**
Does the allelopathic and toxic activity of *Alexandrium minutum* change with ocean acidification? (W4-7036)
- 10:00 **Coffee/Tea Break**
- 10:30 **Maria Byrne, Steve Doo, Natalie Soars and Symon Sworjanyn**
Effects of ocean warming and acidification on larval development in the diadematoid sea urchin *Centrostephanus rodgersii* (W4-7329)
- 10:50 **So Kawaguchi, Haruko Kurihara, Rob King, Akio Ishida, Masahide Wakita, Lillian Hale, Thomas Berli, James P. Robinson, Stephen Nicol, Patti Virtue and Atsushi Ishimatsu**
Impacts of Ocean Acidification on early development of Antarctic krill (W4-7000)
- 11:10 **James P. Robinson, So Kawaguchi, Atsushi Ishimatsu, Haruko Kurihara, Rob King, Patti Virtue and Stephen Nicol**
The effects of CO₂-induced ocean acidification on the survival and development of early larval stage Antarctic krill (*Euphausia superba*) (W4-7187)

- 11:30 **Leah R. Feinberg, Melissa E. Prechtl and William T. Peterson**
Impacts of ocean acidification on the hatching success and larval development of *Euphausia pacifica* (W4-7079)
- 11:50 **Liza M. Roger, A. David McKinnon, Anthony J. Richardson and Brenton Knott**
Comparison of shell structure of two tropical species of thecosome pteropods (*Creseis acria* and *Diacavolinia longirostris*) over a 40-year period (W4-6926)
- 12:10 Discussion
- 12:30 Workshop ends

Posters

- W4-7111 **Moira Galbraith and David L. Mackas**
Pteropod time series from the NE Pacific
- W4-7131 **Cathryn Wynn-Edwards, Andrew Davidson, Simon Wright, So Kawaguchi, Rob King, Peter Nichols and Patti Virtue**
Effects of elevated CO₂ levels on the biochemical composition of Antarctic phytoplankton species and their quality as food for *Euphausia superba* larvae
- W4-7181 **Kristian McConville, Elaine Fileman and Claudia Halsband-Lenk**
Impact of ocean acidification on the reproduction of coastal calanoid copepods
- W4-7188 **James P. Robinson, So Kawaguchi, Atsushi Ishimatsu, Haruko Kurihara, Rob King, Patti Virtue and Stephen Nicol**
The effects of CO₂-induced ocean acidification on the survival and development of early larval stage Antarctic krill (*Euphausia superba*)

March 16

Workshop 5 (W5)

Automated visual plankton identification

Co-Convenors:

Mark Benfield (LSU, USA)

Phil Culverhouse (Plymouth University, UK)

Invited Speaker:

Cabell Davis (Woods Hole Oceanographic Institution, USA)

Advanced pattern recognition techniques are being applied to plankton identification to automate sample specimen counting to generic level. These tools, for example Zoo/Phyto Image and Zooprocess/Plankton Identify offer fast semi-automatic identification. They are free and can analyse the output from a flatbed scanner (Zoo/phyto Image), Zooscan and FlowCAM instruments as well as from digital cameras and other sources. This workshop will introduce the concepts and methods used, with some practical experience in using the tools. Automation can allow many thousands of specimens to be analysed daily. This workshop is a must for those wishing to embrace this new technology.

The workshop is split into 4 blocks. The first block will present an overview of current practices (manual and machine), together with the shortcomings of manual identification (if you have a laptop, you can take part in an identification experiment). We then introduce the basics of machine identification (i.e., extracting measurements from plankton images and using spreadsheets to show how images may be grouped into clusters), using previously prepared data from a Zooimage or a Zooscan machine. The third block will cover issues of machine calibration and using it in routine sample analysis. We will close with a look what is happening in leading laboratories around the world, and what the future holds.

- 8:30 **Introduction by Convenors**
- 8:35 **Cabell Davis (Invited)**
In situ optical imaging of mesoplankton using the Video Plankton Recorder and digital holographic imaging (W5-7254)
- 9:00 **Lars Stemann, Franck Prejger, Corinne Desnos, Marc Picheral and Gabriel Gorsky**
Long term and spatial plankton monitoring with the ZooScan: Insights from a 6 years project at the Laboratory of Villefranche sur Mer and perspectives for a global network (W5-7009)
- 9:15 **Elvire Antajan, Stéphanie Lelièvre and Sandrine Vaz**
Comparison of winter fish eggs distribution in Eastern Channel and Southern North Sea derived from traditional microscopy and digitalized images analysis identification (W5-7192)
- 9:30 **Harry Nelson, Ben Spaulding and Matthew Duplisea**
New methods for using a continuous imaging particle analyzer (FlowCAM) for the analysis and classification of zooplankton (W5-7223)
- 9:45 **Catarina R. Marcolin and Rubens M. Lopes**
Zooplankton biomass size spectra off Rio de Janeiro (Brazil) estimated by LOPC and Zooscan observations (W5-7334)
- 10:00 **Coffee/Tea Break**
- 10:30 Discussion
- 12:30 Workshop ends

Posters

- W5-7149 **Xiaoxia Sun, Song Sun, and Shiwei Wang**
Application of automated image identification in the Jiaozhou Bay zooplankton ecological study
- W5-7186 **Karen Manríquez, Nicolás Bralic and Rubén Escribano**
Biomass structure of the mesozooplankton in the coastal upwelling system off central-southern Chile during the spring 2004 as assessed by automated image analysis

March 16

Session 4 (S4)

Small-scale biological-chemical-physical interactions in the plankton

Convenor:

David Fields (Bigelow Laboratory for Ocean Sciences, USA)

Invited Speaker:

John Dower (University of Victoria, BC, Canada)

Processes that occur at the level of the individual animal drive large scale distribution patterns of zooplankton populations. At the scale of the individual, motility, feeding rates, detection of signals, and encounter rates with other individuals are the product of the interactions between the individual and physical properties of their environment (e.g. viscosity, fluid motion, diffusion). Research on this topic is inherently interdisciplinary. It includes fluid dynamics across the viscous-inertial ranges, the study of functional morphology and structural analysis, investigations into the sensory perception of both mechanical and chemical cues, and much more. In this session, we invite contributions that explore the intimate interactions of zooplankton with their prey, predators, conspecifics, and their environment, framed within the context of large-scale distribution patterns of zooplankton.

- 14:00 **Introduction by Convenors**
- 14:05 **John F. Dower and Pierre Pepin (Invited)**
Does individual variability matter in small-scale interactions involving zooplankton?
Observations and considerations from ichthyoplankton field studies (S4-7208)
- 14:30 **Margarita Zarubin, Viviana Farstey and Amatzia Genin**
Depth keeping by swimming against the flow in zooplankton: Adaptive benefits and ecological implications (S4-6956)
- 14:50 **David M. Fields, T. Quincy Browne and Steve D. Shema**
Mechanoreceptive hairs: How do they work? (S4-7172)
- 15:10 **Houshuo Jiang, Thomas Kjørboe and Sean P. Colin**
Toward a mechanistic understanding of the jumping behavior of copepods (S4-7114)
- 15:30 **Luis Fabiano Baldasso, J. Rudi Strickler and Rubens M. Lopes**
Behavioral responses of *Temora turbinata* (Copepoda, Calanoida) exposed to phytoplankton thin layers (S4-7333)
- 15:50 **Coffee/Tea Break**
- 16:20 **Susanne Menden-Deuer**
Predator prey interactions in the plankton: Linking microscopic behaviors to population dynamics (S4-7206)
- 16:40 **Fred Marin and Cabell Davis**
Quantification of plankton and marine snow in the Gulf of Mexico during summer 2010 using the Video Plankton Recorder (S4-7298)
- 17:00 Session ends

Posters

- S4-6996 **Zorka Dulić, Miloš Ćirić, Nada Lakić, Marko Stanković, Božidar Rašković and Katarina Bjelanović**
Effects of water source change on zooplankton in aquaculture ponds
- S4-7141 **Adriana V. Araujo, Cristina de O. Dias and Sérgio L.C. Bonecker**
Copepod assemblage dynamics in a tropical estuary
- S4-7178 **Joshua J. Ziarek, Ai Nihongi, Takeyoshi Nagai, Marco Uttieri and J. Rudi Strickler**
Seasonal adaptations of *Daphnia pulex* swimming behaviour: The effect of water temperature
- S4-7209 **M. Clara Menéndez, M. Sofia Dutto, Florencia Biancalana, M. Cintia Piccolo and Mónica S. Hoffmeyer**
Tidal and seasonal changes in the mesozooplankton community in a highly turbid and mixed estuary (Bahía Blanca, Argentina)

March 16-17

Session 5 (S5)

Zooplankton in upwelling and coastal systems

Convenors:

Jenny Huggett (*Ocean and Coastal Management, South Africa*)

Julie Keister (*University of Washington, USA*)

Invited Speaker:

Rubén Escribano (*COPAS, Universidad de Concepción, Chile*)

Upwelling and coastal ecosystems exhibit high temporal and spatial variability in their physical and biological structure, are extremely productive, and are important to global fisheries and biogeochemical cycles. The zooplankton which inhabit these systems are diverse, exhibit a variety of life history strategies and physiological adaptations, and are integral to trophic functioning. In coastal upwelling systems in particular, zooplankton are exposed to strong alongshore and across-shelf circulation and physical gradients which structure their distributions. In addition, coastal regions are under increasing pressure from climate and human impacts that may lead to shifts in species composition, dominance, and distribution. In this session we will examine the behaviors, physiology, community structure, and spatial and temporal patterns of zooplankton in coastal ecosystems. Field, laboratory, and modeling studies will be considered, with an emphasis on studies that elucidate mechanisms of zooplankton variability in these highly dynamic regions.

March 16

- 14:00 **Introduction by Convenors**
- 14:05 **Rubén Escribano (Invited)**
Zooplankton in upwelling and coastal systems (S5-7489)
- 14:30 **Claudia Halsband-Lenk, Stefano Ciavatta and Claire Widdicombe**
Long-term and interannual variability of zooplankton at a coastal station in the Western English Channel (S5-7198)
- 14:50 **Song Sun, Shiwei Wang, Chaolun Li and Xiaoxia Sun**
The life history strategies of *Calanus sinicus* in the continental shelf ecosystem (S5-7154)
- 15:10 **Michael Ballón, Arnaud Bertrand, Anne Lebourges-Dhaussy, Mariano Gutiérrez, Patricia Ayón, Daniel Grados and François Gerlotto**
Is there enough zooplankton to feed forage fish population off Peru? An acoustic (positive) answer (S5-7102)
- 15:30 **Stephen Romaine and Moira Galbraith**
The presence of distinct offshore planktonic communities in coastal British Columbia inlets (S5-6985)
- 15:50 **Coffee/Tea Break**
- 16:20 **Rana W. El-Sabaawi, Marc Trudel, David L. Mackas, John F. Dower and Asit Mazumder**
Interannual variability in nitrogen dynamics and zooplankton structure in the northern range of the California upwelling system (S5-7151)
- 16:40 **Jesse F. Lamb and William T. Peterson**
Comparing the hydrography and copepod community structure of the continental shelf ecosystems of Washington and Oregon, USA from 1998 to 2009: Can a single transect serve as an index of ocean conditions over a broader area? (S5-6892)

- 17:00 **Katia Aronés, Luis Vásquez, Alexis Chaigneau and Patricia Ayón**
Variability of the zooplankton community in the Northern Humboldt Current System (2007-2009) and its relation to physical forcing (S5-7174)
- 17:20 **Antonina dos Santos, Carla Santinho, A. Miguel P. Santos and Margarida Castro**
Abundance and mortality of the larvae of the green crab *Carcinus maenas* in the Bay of Cascais, northeastern Atlantic (S5-7010)
- 17:40 **Anja Kreiner and Dawit Yemane**
Variability in copepod communities in the northern Benguela upwelling region from 2000 to 2010 (S5-7235)
- 18:00 Session ends

March 17

- 8:30 **Introduction by Convenors**
- 8:40 **Hans-Juergen Hirche, Kristina Barz, Patricia Ayón, Jan Schulz and Andree Luedtke**
Zooplankton in the southeast Pacific upwelling: Diversity and vertical distribution derived from an optical imaging system and automated image analysis (S5-6931)
- 9:00 **Arnaud Bertrand, Michael Ballón, Alexis Chaigneau, Daniel Grados, Zaida Quiroz, Patricia Ayón, Florian Monetti and Ronan Fablet**
High resolution of macrozooplankton biomass distribution in relation to the depth of the upper oxygen minimum zone off Peru (S5-7038)
- 9:20 **C. Tracy Shaw, Leah R. Feinberg and William T. Peterson**
Population dynamics of the euphausiids *Euphausia pacifica* and *Thysanoessa spinifera* in the upwelling region off Newport, OR, USA (S5-7129)
- 9:40 **Jason D. Everett, Mark E. Baird, Natasha Henschke, Kylie A. Pitt and Iain M. Suthers**
Swarms of the salp *Thalia democratica* off south-eastern Australia: The interaction of oceanography, fecundity and growth (S5-7222)
- 10:00 **Coffee/Tea Break**
- 10:30 **Ricardo Giesecke, Humberto E. González and Rubén Escribano**
The role of chaetognaths in trophic carbon cycling in the central-southern Humboldt Current System off Chile (S5-7099)
- 10:50 **Mary Mar P. Noblezada and Wilfredo L. Campos**
Comparison of chaetognath assemblages along the Pacific Coast and adjacent inland waters of the Philippines: Biological indicators of water mass movement (S5-6927)
- 11:10 **Jonathan Correa, Alexis Chaigneau, Carmen Grados and Patricia Ayón**
Vertical structure of copepods in the Northern Humboldt Current System (6°-8°S) during February 2008 (S5-7216)
- 11:30 **Odette Vergara, Rubén Escribano and Valentina Valdés**
Is zooplankton grazing an important pathway of C through the pelagic food web in a highly productive coastal unwilling system?
(S5-7109)
- 11:50 **Joana Cruz, M. Alexandra Chícharo, Radhouane Ben-Hamadou, Luís Chícharo, Pedro Ré and A. Miguel P. Santos**
Characterization of plankton communities and *Acartia* reproductive traits related to environmental conditions in the Guadiana river estuary and adjacent coastal zone (S5-7158)

12:10 **Lidia Yebra, Sébastien Putzeys, Dolores Cortés, Francisco Gómez, Pablo I. León, Jesús Mercado and Soluna Salles**
Effect of summer eutrophication on the coastal zooplankton community composition along the Iberian Alborán Sea (SW Mediterranean) (S5-6878)

12:30 Session ends

Posters

- S5-6431 **Malihe Sanjarani and Elahe Sanjarani**
Trends in the distribution and diversity of tintinnids in Iranian waters of the Oman Sea
- S5-6911 **Leonardo Kenji Miyashita**
Production of *Penilia avirostris* (Cladocera, Ctenopoda) off Ubatuba, Brazil
- S5-6920 **Pamela Hidalgo, Rubén Escribano, Odette Vergara, Ramiro Riquelme-Bugueño and Pamela Pino**
Zooplankton biomass and production in the coastal upwelling zone off the Chilean Humboldt Current System
- S5-6969 **Georgina Cepeda, Daniel Hernández and María Delia Viñas**
Oithona nana: population dynamics at the EPEA coastal station (38°28'S 57°41'W) and at the Rio de la Plata estuarine front
- S5-6972 **Cécile Roques, Nicole Lautredou-Audouy, Séverine Boyer and Delphine Bonnet**
Monitoring ciliate populations in Thau lagoon (South of France)
- S5-6977 **Mariela L. Spinelli, Marcelo Pájaro, Patricia Martos, Graciela B. Esnal and Fabiana L. Capitanio**
Size fractions of mesozooplankton (Copepoda and Appendicularia) in relation to first feeding larvae of anchovy (*Engraulis anchoita*) during spring of 2004 at the frontal system of Peninsula Valdes (42-44°S), Argentina
- S5-6998* **Anna Dubinina, Natalya Buslova and Oleg Tepnin**
(Presenter: colleague on behalf of Anna Dubinina)
Spring zoo- and ichthyoplankton of the Pacific Ocean waters adjacent to Kamchatka in 2006-2007
- S5-7031 **María Delia Viñas, Rubén Negri, Ricardo Silva, Fabiana L. Capitanio, Cristina Daponte and Daniel Hernández**
Zooplankton structure and succession at the EPEA coastal station (northern Argentina): Dominance of the smaller size fractions
- S5-7058* **M. Sofía Dutto, M. Celeste López Abbate, Florencia Biancalana, Anabela A. Berasategui and Mónica S. Hoffmeyer**
(Presenter: Anabela A. Berasategui on behalf of M. Sofía Dutto)
Does untreated sewage discharge affect the zooplankton community? A case study in a turbid estuary (Bahía Blanca, Argentina)
- S5-7059 **Arasan Srinivasan and Rajdeep Dutta**
Seasonal distribution and biomass of copepods in the Thoothukudi coastal waters of the Gulf of Mannar, southeast coast of India
- S5-7083 **Sarah Pausina, Emily Saeck, Felipe Gusmão, A. David McKinnon and Anthony J. Richardson**
Zooplankton community response to disturbance following a flood event in a subtropical bay, Australia

- S5-7094 **Tatiana R. Avila, Anderson Abel S. Machado and Adalto Bianchini**
Estimation of secondary production in Patos Lagoon Estuary (Brazil): Methodological aspects
- S5-7098 **M^aLuz Fernández de Puellas, Laura Vicente and Alicia Herrera**
Comparative studies on zooplankton (micro- and mesozooplankton) in two oligotrophic areas of the Central Western Mediterranean
- S5-7108 **Bellineth Valencia, Bertha Lavaniegos and Alan Giraldo**
Temporal and spatial variation of hyperiid amphipod assemblages in the eastern tropical Pacific off Colombia (2007-2008)
- S5-7139 **Arturo Nava-Torales, Sergio Hernández-Trujillo and Gabriela Ma. Esqueda-Escárcega**
Mesozooplankton community structure in Bahía de La Paz, Mexico
- S5-7147 **Jay O. Peterson, William T. Peterson and Cheryl A. Morgan**
Seasonal and inter-annual variability in copepod species composition and egg production related to climate and upwelling dynamics in the northern California Current.
- S5-7155 **Noyan Yilmaz and Ahsen Yuksek**
Climate, hydrography and invasive species driven decadal variability in zooplankton of the highly stratified Sea of Marmara
- S5-7164 **Manuela Pérez-Aragón, Camila Fernández and Rubén Escribano**
Nitrogen excretion by mesozooplankton in a coastal upwelling area: Seasonal comparison and implications for biological production
- S5-7195* **Xanthippi Geraki, Dimitris Christodoulou, George Papatheodorou and Nina Fragopoulou**
(Presenter: Ioanna Siokou on behalf of Xanthippi Geraki)
Zooplankton in a groundwater formatted pockmark field (Eastern Mediterranean)
- S5-7247 **Per B. Holliland, Ida Ahlbeck, Erica Westlund and Sture Hansson**
Ontogenetic and seasonal changes in diel vertical migration amplitude of the calanoid copepods *Eurytemora affinis* and *Acartia* spp. in a coastal area of the northern Baltic Proper
- S5-7249 **Jean Blanchot, Gisèle Champalbert, Marc Pagano, LoMartine Rodier and Robert Arfi**
Tidal effects on the zooplankton composition and abundance in a coral reef lagoon (Toliara, Madagascar)
- S5-7263 **María Muñoz, Andreas Reul, Begoña Bautista, José M. Blanco, Jaime Rodríguez, José A. Fernandes, Pablo I. León and Valeriano Rodríguez**
Spatial structure and diel changes of the zooplankton community along the Garrucha canyon (SW-Spain) as derived from dissecting microscope, ZooImage, and FlowCAM analysis
- S5-7272 **Sonia Yáñez, Paula Ruz, Rubén Escribano and Pamela Hidalgo**
How copepod growth may respond to distinct upwelling regimes?
- S5-7273 **Sergio Hernández-Trujillo, Gabriela Ma. Esqueda-Escárcega and Ma. del Rocío Pacheco-Chávez**
Temporal variability of copepod community in the Bahía de La Paz, México
- S5-7282* **Augusto César Crespi Abril, Pedro José Barón and Enrique Mario Morsan**
(Presenter: Pedro José Barón on behalf of Augusto César Crespi Abril)
Seawater temperature, α -chlorophyll and zooplankton samples support a new paradigm: Coastal waters off northern Patagonia play a major role as spawning and nursery areas for early life-cycle planktonic stages of the Argentine squid *Illex argentinus*
- S5-7295* **Carmela Nakazaki, Katia Aronés and Patricia Ayón**
(Presenter: Co-Authors on behalf of Carmela Nakazaki)
Planktonic amphipods distribution in upwelling zones in northern Humboldt Current System

- S5-7303 **Roberto Quesquén and Patricia Ayón**
Key copepods in a coastal upwelling area in the Northern Humboldt Current System
- S5-7304 **Luciana Pinto Sartori and Rubens M. Lopes**
Zooplankton size spectra obtained by LOPC from Abrolhos Bank
- S5-7306 **Paula Ruz, Sonia Yáñez, Daniela Araya, Pamela Hidalgo and Rubén Escribano**
Production of copepods upon a nearly-continuous coastal upwelling regime in the northern Humboldt Current system off Chile
- S5-7315 **Beatriz Yannicelli, Kurt Paschke, Rodrigo Gonzalez and Leonardo Castro**
Metabolic responses of *Pleuroncodes monodon* larvae to low oxygen concentration

March 17

Session 7 (S7)

Zooplankton physiology and bioenergetics

Convenors:

Andrew Hirst (Queen Mary University of London, UK)

Maria Koski (National Institute of Aquatic Resources, Technical University of Denmark)

Invited Speaker:

Robert Campbell (University of Rhode Island, USA)

The physiological and bioenergetics of zooplankton are central to nutrient recycling, food-web transfer efficiency and biogeochemical transformations (such as the modification of sinking flux) in the world oceans. If we are to understand and model biogeochemical processes across a range of scales, we need to continue to refine our understanding of the transformations which zooplankton make. Further, physiology and bioenergetics are closely allied to a species fitness, and hence species success. This session aims to describe zooplankton physiology, to present frameworks on what shapes these rates, and our ability to improve their prediction. We expect to provide insights into the effects of physiological adaptations on individual fitness, food-web processes and global biogeochemical cycles, including considerations of changing environmental conditions.

- 8:30 **Introduction by Convenors**
- 8:35 **Robert G. Campbell (Invited)**
The physiology, bioenergetics, and life history traits of *Calanus* species in Arctic and Subarctic seas (S7-7073)
- 9:00 **Delphine Bonnet, Carmen García-Comas and Roger P. Harris**
Does fit mean productive? (S7-6935)
- 9:20 **Christine J. Cass and Kendra L. Daly**
Effects of temperature and oxygen on metabolic parameters for eucalanoid copepods of the eastern tropical north Pacific: Implications for biogeochemical cycles (S7-7224)
- 9:40 **Ramiro Riquelme-Bugueño, Jaime Gómez-Gutiérrez, Jennifer Menkel, Leah R. Feinberg, William T. Peterson and Rubén Escribano**
Health condition and body growth rates of euphausiids of the California and Humboldt Current Systems and the Gulf of California using the hepato-somatic index (S7-7276)
- 10:00 **Coffee/Tea Break**
- 10:30 **Jennifer Menkel, William T. Peterson and Ramiro Riquelme-Bugueño**
Krill physiological condition and growth in relation to changing environmental conditions in the Northern California Current, USA (2007-2010): *Euphausia pacifica* and *Thysanoessa spinifera* (S7-7143)
- 10:50 **Kazutaka Takahashi, Keiichiro Ide, Kazuya Yoshimura, Akira Kuwata, Hiroaki Saito and Takeo Hama**
Effect of spring diatom bloom on reproductive activity, egg production and hatching success of *Eucalanus bungii* in the Oyashio region, western subarctic Pacific (S7-7324)
- 11:10 **Juan Bueno and Ángel López-Urrutia**
A unifying theory of metabolic scaling and life history evolution for developmental time (S7-7212)

- 11:30 **Peter Thor and Ida Wendt**
Functional response of carbon absorption efficiency in the calanoid copepod *Acartia tonsa* (S7-7332)
- 11:50 **Elena Gorokhova, Lisa Mattsson, Rehab El-Shehawy, Claire Holeton, Hedvig Hogfors, Towe Holmborn, Anu Vehmaa, Andreas Brutemark and Jonna Engström-Öst**
Oxidative stress and antioxidant responses in copepods: Effects of food quantity and quality (S7-7316)
- 12:10 **Lutz Postel**
Productivity of mesozooplankton: Scaling of aspartate transcarbamylase activity (ATC) measurements by allometric model calculations (S7-6971)
- 12:30 Session ends

Posters

- S7-6881 **Stamatina Isari and Enric Saiz**
Feeding performance of the copepod *Clausocalanus lividus* (Frost and Fleminger, 1968)
- S7-6882 **Lidia Yebra, Elisa Berdalet, Rodrigo Almeda, Verónica Pérez, Albert Calbet and Enric Saiz**
Protein and nucleic acid metabolism as proxies for growth and fitness of *Oithona davisae* early developmental stages
- S7-6894 **Toru Kobari, Shigeki Kori and Haruko Mori**
Nucleic acids and protein contents as proxies for protein-specific growth of *Artemia salina*
- S7-6903 **May Gómez, Igor Fernández-Urruzola, Alicia Herrera, F. Maldonado, I. Martínez, Natalia Osma and Ted T. Packard**
The R/ETS ratio: Where we are now
- S7-6906 **May Gómez, I. Martínez, I. Mayo, J.M. Morales and Ted T. Packard**
Zooplankton secondary production models in cultures of *Daphnia magna*: A comparison study
- S7-6907 **Victor Aguilera-Ramos, Rubén Escribano, Katty Donoso, Serge Poulet and José Martínez**
Experimental evidence that sustained and environmentally realistic diatoms bloom conditions may lead to a decrease in the reproductive fitness of copepods
- S7-6916* **Daniel J. Mayor, Kathryn Cook, Barry Thornton, Pamela Walsham, Ursula F.M. Witte, Alain F. Zuur and Thomas R. Anderson**
(Presenter: Sari Giering on behalf of Daniel J. Mayor)
Absorption efficiencies and basal turnover of carbon, nitrogen and fatty acids in *Calanus* spp.
- S7-6939 **Alicia Herrera-Ulibarri, May Gómez and Ted T. Packard**
The effect of starvation on respiratory metabolism in *Leptomysis lingvura*
- S7-6953 **Fabien Lombard, Laurent Labeyrie, Elisabeth Michel, Laurent Bopp, Elsa Cortijo, Sophie Retailleau, Helene Howa and Frans Jorissen**
Reproducing planktic foraminiferan growth, habitat and abundance using an ecophysiological multispecific approach
- S7-7011 **Sara Zamora and Enric Saiz**
Reproductive performance of *Oithona davisae* (Copepoda, Cyclopoida) feeding on different concentrations of the heterotrophic dinoflagellate *Oxyrrhis marina*

- S7-7020 **Marja Koski and Sigrun Jónasdóttir**
Critical stages of nauplii growth: Is the early development determined by maternal reserves or initial feeding?
- S7-7097 **Jörg Dutz, J.E.E. van Beusekom and R. Hinrichs**
Factors controlling the seasonal dynamics of fecundity and recruitment of *Temora longicornis* in the Baltic Sea
- S7-7117* **Federico Maldonado Uribe, Ted T. Packard and May Gómez**
(Presenter: Ted T. Packard on behalf of Federico Maldonado Uribe)
Absence of substrates underestimates the measurement of electron transport system activity in zooplankton
- S7-7132* **Igor Fernández-Urruzola, May Gómez and Ted T. Packard**
(Presenter: Ted T. Packard on behalf of Igor Fernández-Urruzola)
The impact of body size and starvation on the biochemistry and the physiology of ammonium excretion in the mysid *Leptomysis lingvura*
- S7-7133* **Natalia Osma, Ted T. Packard and May Gómez**
(Presenter: Ted T. Packard on behalf of Natalia Osma)
Role of pyridine nucleotides in controlling the respiration of the dinoflagellate *Oxyrrhis marina*
- S7-7163* **Rodrigo Almeda, Enric Saiz, Miquel Alcaraz, Albert Calbet and Lidia Yebra**
(Presenter: Enric Saiz on behalf of Rodrigo Almeda)
Ecophysiology of the naupliar stages of the cyclopoid copepod *Oithona davisae*
- S7-7179 **Claudia Castellani and Yener Altunbaş**
Seasonal acclimatisation of the respiration rate of *Temora longicornis* (Müller)
- S7-7242 **Roswati Md Amin, Marja Koski and Ulf Båmstedt**
Species and strain- specific effect of *Skeletonema marinoi* on copepod physiology
- S7-7279 **Lars J. Hansson**
Mnemiopsis leidyi feeding response to temperature is size dependent
- S7-7286 **Stephanie L. Bush**
Physiological ecology of the diel vertically migrating squid *Pterygioteuthis* sp.
- S7-7289 **Susana Garrido, Joana Cruz and Chiara Coniglione**
Effect of temperature, food type and concentration on the grazing and reproduction of the calanoid copepod *Centropages chierchiae*

March 18

Session 8 (S8)

The role of zooplankton in biogeochemical cycles

Convenors:

Hiroaki Saito (Tohoku National Fisheries Research Institute, Japan)

Deborah Steinberg (Virginia Institute of Marine Science, USA)

Invited Speaker:

Santiago Hernandez-Leon (Universidad de Las Palmas de GC, Spain)

Zooplankton play an integral role in the cycling of elements in the sea. As key drivers of the biological pump, zooplankton feed in surface waters and produce sinking fecal pellets, and actively transport dissolved and particulate matter to depth via vertical migration. Zooplankton grazing and metabolism transforms particulate organic matter into dissolved forms, affecting primary producer populations, microbial remineralization, and particle export to the ocean's interior. The elemental stoichiometry of zooplankton and their prey often differ, resulting in non-Redfield cycling of C, N and P. We invite papers on role of zooplankton (both metazoan and protozoan) in biogeochemical cycles reflecting the significant strides that have been made in this area, as well as identifying crucial gaps in our knowledge. Topics may include, but are not limited to: the role of zooplankton in the biological pump, mesopelagic and deep sea processes, trophic interactions and nutrient cycling, ecological stoichiometry, effects on biogeochemical cycling (measured or modeled) of human or climate influenced changes in zooplankton community structure, and regional comparisons or global syntheses of the importance of zooplankton in biogeochemical cycles. This session theme is closely related to research goals within IMBER (Integrated Marine Biogeochemistry and Ecosystem Research).

- 8:30 **Introduction by Convenors**
- 8:35 **Santiago Hernández-León (Invited)**
Zooplankton and biogeochemical cycles: Who is conducting the orchestra? (S8-7318)
- 9:00 **Housseem E. Smati, Songniang Jiang, Maureen H. Conte and Tommy D. Dickey**
Physical forcing, zooplankton dynamics and particulate carbon export to the deep ocean in the northwestern Sargasso Sea (S8-6890)
- 9:20 **Jillian L. Schneider, Leanne Elder, Rui Rosa, Amy Maas, Lillian Hancock and Brad A. Seibel**
Hypoxia induced metabolic suppression in migratory zooplankton living in oxygen minimum zones (S8-7162)
- 9:40 **Sari L.C. Giering, Richard Sanders, Richard S. Lampitt, Chris Marsay and Daniel J. Mayor**
Mesozooplankton demands exceed carbon flux in the twilight zone (S8-6992)
- 10:00 **Coffee/Tea Break**
- 10:30 **Marja Koski, Kristine Engel Arendt, Fabien Lombard, Sigrun Jónasdóttir, Jörg Dutz and Sanne Kjellerup**
Copepods and the biological pump: The potential effects of large vs. small copepods on vertical flux (S8-7019)
- 10:50 **Christian Wexels Riser, Camilla Svensen, Marit Reigstad, Lena Seuthe and Tobias Tamelander**
Degradation of copepod faecal pellets: The role of small-sized, <180µm, plankton and *Calanus finmarchicus* (S8-7215)

- 11:10 **Fabien Lombard and Thomas Kjørboe**
Marine snow originating from appendicularia: Age-changes in houses settling characteristics and the effect of ballast material (S8-6952)
- 11:30 **Hiroaki Saito**
Geochemical biogeography: Bridging the gap between zooplanktology and biogeochemistry (S8-6949)
- 11:50 **Gérald Darnis and Louis Fortier**
Zooplankton mediation of carbon cycling and export in the Amundsen Gulf system (southeastern Beaufort Sea) (S8-7226)
- 12:10 **Julie E. Keister and Stephen D. Pierce**
The impact of upwelling filaments on carbon cycling and advection of coastal zooplankton: A synthesis with new observations (S8-7311)
- 12:30 Session ends

Posters

- S8-6905 **Ted T. Packard and May Gómez**
Zooplankton respiration and vertical carbon flux
- S8-6915 **Toru Kobari, Minoru Kitamura, Masato Minowa, Hiroshi Isami, Hiroyasu Akamatsu, Hajime Kawakami, Kazuhiko Matsumoto and Makio C. Honda**
Comparison of depth distribution of mesozooplankton communities between the subarctic and subtropical Pacific Oceans: Relative importance of vertical migrants to downward carbon flux
- S8-6919 **Hiroshi Isami, Minoru Kitamura, Masato Minowa, Toru Kobari, Hiroyasu Akamatsu, Hajime Kawakami, Kazuhiko Matsumoto and Makio C. Honda**
Relative importance of respiratory carbon flux by *Pleuromamma* copepods in the subarctic and subtropical Pacific Oceans
- S8-6921 **A. David McKinnon, Felipe Gusmão, Miles Furnas and Ruth Böttger-Schnack**
The contribution of metazooplankton to carbon flux in waters adjacent to an eastern Indian Ocean coral atoll
- S8-7039 **Cristian A. Vargas, Paulina Y. Contreras, Alejandra Lafon, Nelson Silva and Rodrigo A. Martínez**
How significant are allochthonous subsidies for zooplankton production in coastal areas?
- S8-7045 **Gara Franchy and Santiago Hernández-León**
A simple model to estimate active flux in relation to zooplankton lunar cycles in subtropical waters
- S8-7052* **Florencia Biancalana, M. Sofía Dutto, Germán A. Kopprio, Rubén J. Lara and Mónica S. Hoffmeyer**
(Presenter: *Anabela Berasategui on behalf of M. Sofía Dutto*)
Variation in nitrogen and carbon isotopes in the Bahía Blanca Estuary: Implications for ecological studies in a human-disturbed system
- S8-7060 **Alejandro V. Ariza, Natacha Aguilar and Santiago Hernández-León**
Daily ration and feeding chronology of dominant diel vertical migrant fishes in the Subtropical Eastern North Atlantic Ocean

- S8-7078* **Sébastien Putzeys, Lidia Yebra, Carlos Almeida, Pierrick Bécognée and Santiago Hernández-León**
(Presenter: Lidia Yebra on behalf of Sébastien Putzeys)
Influence of the late winter bloom on migrant zooplankton metabolism and its implication for export flux
- S8-7096 **M^aLuz Fernández de Puellas, Alejandro Isla, Renate Scharek, Mikel Latasa Antonio Bode and Sandra Gregorés**
Changes in zooplankton population structure during and after the north-western Mediterranean open sea spring bloom
- S8-7113 **Felipe Gusmão, Joanna Strzelecki and A. David McKinnon**
Mesozooplankton growth as measured by enzymatic activity off the Western Australia coast
- S8-7156 **Catherine Lalande, Eduard Bauerfeind, Eva-Maria Nöthig, Michael Klages and Antje Boetius**
Zooplankton fecal pellet export during spring in the eastern Fram Strait
- S8-7211* **Mario Lebrato, Andreas Oschlies, Markus Pahlow, Juan Carlos Molinero, Kylie A. Pitt, Andrew K. Sweetman, Daniel O.B. Jones and Robert H. Condon**
(Presenter: Juan Carlos Molinero on behalf of Mario Lebrato)
Depth attenuation of organic matter export associated with jelly-falls
- S8-7248 **I. Herrera-Rivero, Gara Franchy, Alejandro V. Ariza, Lidia Yebra and Santiago Hernández-León**
Zooplankton biomass and indices of grazing, metabolism and growth after a dust deposition event in subtropical waters
- S8-7261 **Isabelle Rombouts and Grégory Beaugrand**
A global approach linking climate and marine copepod diversity to ecosystem functioning
- S8-7302 **Maarten Boersma, Arne M. Malzahn, Katherina L. Schoo and Karen H. Wiltshire**
Ecological stoichiometry and trophic interactions: The role and fate of nutrients

March 18

Session 9 (S9)

The diverse role of meroplankton in the biology and ecology of marine systems

Convenors:

Claudio DiBacco (*Bedford Institute of Oceanography, Fisheries and Oceans Canada*)

Heidi L. Fuchs (*Institute of Marine and Coastal Sciences, Rutgers University, USA*)

Fabian Tapia (*Centro FONDAP-COPAS, Universidad de Concepción, Chile*)

Invited Speaker:

Jesús Pineda (*Woods Hole Oceanographic Institution, USA*)

Meroplankton are transient members of the plankton and crucial to the establishment and sustainability of marine communities. Local and global marine stressors (e.g., habitat destruction, resource over-harvesting, contaminant loading, climate change, introduction of non-native species) will impact some species in diverse ways as individuals move through both planktonic and benthic life stages. It is thus imperative to develop a better understanding of larval processes at all functional levels, from species to ecosystems. In this session, we welcome submissions on all meroplankton-related topics, including but not limited to larval behaviour and sensory ecology, dispersal and connectivity, invasions and fisheries, design of marine reserves and effects of climate change on larval processes.

- 8:30 **Introduction by Convenors**
- 8:35 **Jesús Pineda, Brian L. White and Victoria S. Starczak (Invited)**
Species rarity in mangrove coastal lagoons: Timing of spawning, larval transport and settlement (S9-7152)
- 9:00 **Dafne Eerkes-Medrano, Lorenzo Ciannelli, Angela Johnson, Chris Langdon, Christine Sislak and Bruce Menge**
Effects of nearshore hypoxia on invertebrate meroplankton of the Oregon coast (S9-7081)
- 9:20 **Lu Guan, John F. Dower and Skip McKinnell**
Quantifying mesoscale patterns of spatiotemporal variability of four temperate larval fish species on Canada's west coast (S9-6943)
- 9:40 **Pennie Lindeque, Elaine Fileman and Claudia Halsband-Lenk**
Meat and two veg? Determining feeding selectivity of bivalve larvae in the Western English Channel with traditional and molecular techniques (S9-6959)
- 10:00 **Coffee/Tea Break**
- 10:30 **Rhiannon L. Rognstad, Davis S. Wethey and Thomas J. Hilbish**
Intertidal population connectivity: The role of larval supply (S9-7257)
- 10:50 **Jennifer L. Fisher, William T. Peterson and Steven G. Morgan**
Nearshore larval retention among years and between regions of varying upwelling intensity (S9-7006)
- 11:10 **Claudio DiBacco, Heidi Fuchs, Jesús Pineda and Karl Helfrich**
Assessing swimming behavior and velocities of barnacle larvae in a downwelling flume (S9-7118)
- 11:30 **Diego A. Narváez, John M. Klinck, Eric Powell, Eileen E. Hofmann, John Wilkin and Dale B. Haidvogel**
Interannual and intraseasonal variability in dispersion of oyster larvae: A numerical study coupling an Individual-Based model to a hydrodynamic model. (S9-7269)

- 11:50 **Chad S. Gilbert, Wendy C. Gentleman, Catherine L. Johnson and Claudio DiBacco**
Modelling the influence of adult distribution, size-dependent fecundity and larval mortality on the dispersal of sea scallop (*Placopecten magellanicus*) larvae (S9-7292)
- 12:10 **Luis Felipe Skinner**
Daily larval availability and settlement of *Tetraclita stalactifera* (Cirripedia) at Cabo Frio, Brazil: Effect of tidal and upwelling transport (S9-7314)
- 12:30 Session ends

Posters

- S9-6990 **Ali M. AlAidaros**
Studies on the species diversity of selective brachyuran larvae from the Red sea along Jeddah coastline
- S9-7016* **Elaine Fileman, Claudia Halsband-Lenk, Rachel Harmer and Pennie Lindeque**
(Presenter: Co-Authors on behalf of Elaine Fileman)
What's on the menu? Feeding rates and selectivity of meroplankton (decapod) larvae in the Western English Channel
- S9-7061 **Lohengrin D. Fernandes, Jurema T. Quintanilha, Eliane Gonzalez-Rodriguez and Ricardo Coutinho**
Trend and seasonality in larval supply: A 15-year time series analysis of meroplankton in a coastal upwelling area in Southwestern Atlantic Ocean
- S9-7104 **Andréa G. Koettker and Rubens M. Lopes**
Meroplankton assessment on the Abrolhos Bank, Brazil: Observations on major larval groups
- S9-7159 **Cátia Bartilotti, Margarida Castro, A. Miguel P. Santos, Henrique Queiroga and Antonina dos Santos**
Distribution of decapod larvae off the Northwestern Iberia: Ontogenetic vertical migrations in the Portuguese upwelling ecosystem
- S9-7239 **Juan Bueno, Ángel López-Urrutia and Antonina dos Santos**
Phenology and dispersion patterns of decapod larvae in the Cantabrian Sea during 2006
- S9-7267 **Ernesto Díaz-Cabrera, Eduardo Hernández-Miranda, Cristián E. Hernández and Renato A. Quiñones**
Mesoscale beta diversity and spatial nestedness of crustacean larvae in the coastal zone off central-southern Chile

List of Posters from General Poster Session (GP)

- GP-6879 **C.O. Olaniyi**
Comparative studies on the performance and survival rate of fish larvae fed *Artemia* vs. cultured freshwater zooplankton
- GP-6984* **Tania FitzGeorge-Balfour, Andrew G. Hirst, Cathy H. Lucas and Jamie Craggs**
(Presenter: Andrew G. Hirst on behalf of Tania FitzGeorge-Balfour)
Digesting the errors associated with gut-content analysis in gelatinous zooplankton: An intercomparison of digestion time methods and recommendations
- GP-7084* **Rodrigo J. Goncalves, Mariela L. Spinelli, Rodrigo D. Hernández Moresino, Virginia E. Villafaña, Fabiana L. Capitanio and E. Walter Helbling**
(Presenter: Mariela L. Spinelli on behalf of Rodrigo J. Goncalves)
UVR effects on nauplii from South Atlantic coastal waters (Patagonia, Argentina): Does food with high concentrations of UV-absorbing compounds make a difference?
- GP-7107 **Peter H. Wiebe, Molly D. Allison, Robert C. Groman and Cynthia L. Chandler**
Data management in support of zooplankton research
- GP-7144 **Shivanagouda N. Sanagoudra and M. Venkateshwarlu**
Zooplankton diversity in freshwater lakes with relation to trophic status, Shimoga district, Karnataka, South India
- GP-7146 **Peter H. Wiebe, Gareth L. Lawson, Andone C. Lavery, Nancy J. Copley, Erich Horgan and Albert Bradley**
Enhanced capture of krill using an LED based strobe light on a 1-m² MOCNESS
- GP-7157 **Matilda Haraldsson, Cornelia Jaspers, Josefin Titelman, Dag L. Aksnes and Peter Tiselius**
A place for *Mnemiopsis*: Spatio-temporal habitat characterization in Scandinavian waters
- GP-7184* **Astrid Cornils, Leocadio Blanco-Bercial, Sigrid B. Schnack-Schiel and Ann Bucklin**
(Presenter: Ann Bucklin on behalf of Astrid Cornils)
Molecular and morphological phylogeny of Paracalanidae, Giesbrecht 1892 (Copepoda: Calanoida)
- GP-7200 **Lai Peng Foong, Tomohiko Kikuchi and Tatsuki Toda**
Chromosome studies on the marine harpacticoid copepod *Euterpina acutifrons* (Dana, 1848)
- GP-7205 **Leslie E. Nasmith, Claudio DiBacco, Donald B. Humphrey and Colin D. Levings**
Assessing the relative risk of inter- vs. intra- coastal ballast water transport of non-indigenous zooplankton
- GP-7214* **Erik Muxagata and John A. Williams**
(Presenter: Felipe Gusmão on behalf of Erik Muxagata)
Barnacle larvae production on Southampton Water, England
- GP-7231 **Todd D. O'Brien**
COPEPOD: A global plankton database with data and DATA
- GP-7243* **M. Loreto Torreblanca, Carmen E. Morales, Marco Correa-Ramírez, Samuel E. Hormazábal and Pamela Hidalgo**
(Presenter: Co-Author on behalf of M. Loreto Torreblanca)
Copepod distribution in a pair of mesoscale eddies off Concepción, central-southern Chile
- GP-7260 **Hege Vestheim, Paolo Simonelli, Jorun Egge, Tom Andersen, Frede Thingstad and Ketil Hylland**
Zooplankton community response to multiple anthropogenic stressors

- GP-7262 **Josefin Titelman, Kazutaka Takahashi, Kajsa Tönnesson, Danilo L. Calliari, Lene Friis Möller and Peter Tiselius**
Predation and diel behavioral patterns in a Chaetognath
- GP-7264 **Elvire Antajan, Morgane Travers-Trolet, Christophe Loots and Sandrine Vaz**
Winter distribution of *Mnemiopsis leidy* (Agassiz, 1865) in the southern North Sea and first record in French waters
- GP-7274 **Christian Briseño-Avena, Jules Jaffe, Mark D. Ohman and Paul L.D. Roberts**
Dormancy in *Calanus pacificus californicus*: Are copepods safe from predators while overwintering?
- GP-7281* **Erik Muxagata, Waldemar J.A. Amaral and Carla N. Barbosa**
(Presenter: Felipe Gusmão on behalf of Erik Muxagata)
Secondary production of Acartia (Copepoda: Calanoida) in Patos Lagoon Estuary
- GP-7291 **Mark C. Benfield**
Industry ADCPs reflect the responses of zooplankton and micronekton to the Deepwater Horizon oil spill in the Gulf of Mexico
- GP-7294 **M. Sonia Barría de Cao, M. Celeste López Abbate, Rosa E. Pettigrosso, Karin Fulco and Mónica S. Hoffmeyer**
Microzooplankton dynamics in the Bahía Blanca Estuary, Argentina
- GP-7301* **M. Loreto Torreblanca and Carmen E. Morales**
(Presenter: Co-Author on behalf of M. Loreto Torreblanca)
Distribution of the copepods *Calanus chilensis* and *Calanus australis* in the coastal band, coastal transition zone, and oceanic waters off central-southern Chile
- GP-7313 **Sergio Núñez, Carolina Parada and Ramiro Riquelme-Bugueño**
Advances in biophysical modeling of *Euphausia mucronata* in the Southeast Pacific
- GP-7325 **Kazutaka Takahashi, Tadafumi Ichikawa, Hiroaki Saito, Shigeo Kakehi, Yasunori Sugimoto, Kiyotaka Hidaka and Koji Hamasaki**
Sapphirinid copepods as predators of doliolids: Their contribution to doliolids mortality and sinking flux
- GP-7357 **Gary Borstad, Leslie Brown, Mei Sato, David Lemon, Randy Kerr and Peter Willis**
Analysis of zooplankton time series from an upward looking sonar: The data-cube concept
- GP-7549 **Tao Zuo, Rong Peng and Qun Lin**
Spring size spectra and production of net zooplankton in Laizhou Bay, Bohai Sea