

S11 BIO/FIS/POC Topic Session

Phenology and climate change in the North Pacific: Implications of variability in the timing of zooplankton production to fish, seabirds, marine mammals and fisheries (humans)

Co-Convenors: Elizabeth A. Logerwell (U.S.A.), David L. Mackas (Canada), Shoshiro Minobe (Japan) and William J. Sydeman (U.S.A.)

Ecosystems of the North Pacific Ocean are characterized by strong seasonal variability in productivity. The Inter-governmental Panel for Climate Change projections indicate that substantial changes in phenology (timing events) and the biological interactions that depend on the seasonal cycle are likely. Several mechanistic hypotheses have been set forth to explain changes in fish production in relation to phenology, including “match-mismatch” and “optimal environmental window”, yet there have been few tests of these ideas. In light of climate change predictions and recent changes in phenology in some North Pacific ecosystems (*e.g.*, late upwelling in the California Current in 2005/2006), the session will focus on the implications of changes in the timing of seasonal zooplankton production to upper trophic level organisms through changes in their trophic ecology, physiology and behavior. Physical environmental changes that influence phenology also are within the scope of this session. Papers which test hypotheses, present new theoretical treatments, and/or provide models of life history variation are encouraged. In particular, integrated, multi-trophic level, multi-disciplinary analyses are sought. We anticipate publication of the papers from this topic session in primary literature.

Friday, November 2, 2007 09:00 – 17:10

- 09:00 **Introduction by convenors**
- 09:10 **Joël M. Durant (Invited)**
Match-mismatch, trophic interactions and climate change (S11-4045)
- 09:40 **Ronald W. Tanasichuk**
The effect of variations in timing and magnitude of euphausiid productivity on return variability of Somass River sockeye (*Oncorhynchus nerka*) salmon (S11-4047)
- 10:00 **Rubén Rodríguez-Sánchez, Marlene Manzano, Héctor Villalobos, Mati Kahru, Daniel Lluch-Belda and Sofía Ortega-García**
Possible mechanisms underlying abundance changes of Pacific sardine (*Sardinops caeruleus*) in the California Current System during the last warming regime (1980-1997) (S11-4053)
- 10:20 **Jennifer E. Purcell**
Effects of temperature and light on the phenology of jellyfish (S11-4063)
- 10:40 **Coffee / tea break**
- 11:00 **Benjamin J. Laurel, Thomas P. Hurst and Lorenzo Ciannelli**
An experimental examination of temperature interactions in the ‘match-mismatch’ hypothesis for Pacific cod larvae (S11-4091)
- 11:20 **Yulia N. Tananaeva and Marat A. Bogdanov**
SST and ice conditions’ variability in different parts of North West Pacific, its influence on phytoplankton production and fishery resources (S11-4105)
- 11:40 **Richard J. Beamish, Ruston M. Sweeting and Chrys M. Neville**
Managing a Strait of Georgia ecosystem (S11-4125)

- 12:00 **Sanae Chiba and Kosei Sasaoka**
Climatic forcing and phytoplankton phenology over the North Pacific 1997-2006 (S11-4138)
- 12:20 **Lunch**
- 13:30 **Yutaka Watanuki, Motohiro Ito, Tomohiro Deguchi and Shoshiro Minobe (Invited)**
Timing of breeding and prey switching in Rhinoceros Auklets; match-mismatch of the phenology explains between year variation of chick growth (S11-4177)
- 14:00 **Andrew Thomas, Peter Brickley and Stephanie Henson**
Large-scale time and space patterns of chlorophyll phenology in the NE Pacific (S11-4183)
- 14:20 **Sonia D. Batten and David L. Mackas**
Changes in development timing and cohort width of *Neocalanus plumchrus* / *flemingeri* copepods in the eastern North Pacific (S11-4185)
- 14:40 **Kazuaki Tadokoro, Yuji Okazaki and Hiroya Sugisaki**
Decadal scale variations in developmental timing of *Neocalanus* copepod populations in the Oyashio waters, western North Pacific (S11-4193)
- 15:00 **Atsushi Tsuda, Takumi Nonomura, Mitsuhiro Toratani and Sachihiko Itoh**
Food availability for Japanese sardine larvae in the Kuroshio extension area (S11-4178)
- 15:20 **Coffee / tea break**
- 15:50 **Steven J. Bograd, William J. Sydeman and Christine Abraham**
The phenology of coastal upwelling in the California Current System (S11-4206)
- 16:10 **Lorenzo Ciannelli, Benjamin J. Laurel, Thomas Hurst, Janet Duffy-Anderson and Michael Behrenfeld**
Environmental effects on food and larval mismatch (S11-4225)
- 16:30 **William T. Peterson, Leah Feinberg, Tracy Shaw, Jennifer L. Menkel and Jay Peterson**
Phenology of coastal copepod species: Implications for productivity at various trophic levels in the Oregon upwelling zone (S11-4407)
- 16:50 **Douglas F. Bertram, Anne Harfenist and April Hedd**
Cassin's Auklet nestling diet reveals latitudinal variation in surface timing of *Neocalanus cristatus* prey biomass in BC: Mismatch likelihood is greater in warmer, southern waters (S11-4457)

S11 Posters

- S11-4400 **Rana W. El-Sabaawi, Akash R. Sastri and John F. Dower**
Potential consequences of interannual variability in lower trophic level dynamics on energy transfer in the Strait of Georgia
- S11-4520 **Christine L. Abraham, William J. Sydeman and G. Vernon Byrd**
Seabird-sockeye salmon co-variation in the eastern Bering Sea: Phenology as an ecosystem indicator and salmonid predictor?