

GLOBEC/PICES/ICES

Workshop on Forecasting Ecosystem Indicators with Process-based Models

Friday Harbor Labs (WA)

September 7-11, 2012

<http://wg27.pices.int/ecofor>



Friday Harbor , September 7-11, 2012

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Workshop Agenda & Logistics

DAY 0: Friday September 7, 2012

4:00pm - 5:00pm	Registration and pick up of keys on deck of dining hall
5:00pm-	Wine reception begins on deck of dining hall
6:00pm - 6:30pm	Dinner in dining hall
7:30pm - 8:30pm	Wine reception and registration continues on deck of dining hall

DAY 1: Saturday September 8, 2012

7:45am - 8:15am	Breakfast in dining hall
8:30am	Workshop begins in Commons
	Scientific Program DAY1 AM
12:00pm	End of morning activities
12:15pm - 12:45pm	Lunch is served in dining hall
1:00pm	Boating orientation with Mrs. Kristy Kull (FHL pier, first shed on the right)
1:45pm	Rejoin at Commons for workshop
	Scientific Program DAY1 PM
4:30pm	End of Workshop DAY 1
6:00pm - 6:30pm	Dinner in dining hall and Wine reception

DAY 2: Sunday September 9, 2012

7:45am - 8:15am	Breakfast in dining hall
8:30am	Workshop begins in Commons
	Scientific Program DAY2 AM
12:00pm	End of morning activities
12:15pm - 2:15pm	Departure for sack lunch / whale watching (J. King)
2:30pm	Rejoin at Commons for workshop
	Scientific Program DAY2 PM
5:30pm	End of Workshop DAY 2
6:00pm - 6:30pm	Dinner in dining hall and Wine reception

DAY 3: Monday September 10, 2012

7:45am - 8:15am	Breakfast in dining hall
8:30am	Workshop begins in Commons
	Scientific Program DAY3 AM
12:00pm	End of morning activities
12:15pm - 12:45pm	Lunch is served in dining hall
1:00pm	Rejoin at Commons for workshop
	Scientific Program DAY3 PM
3:00pm	End of Workshop
3:00pm - 6:00pm	Free time
6:00pm - 6:30pm	Dinner in dining hall and Wine reception

DAY departure: Tuesday September 11, 2012

7:45am - 8:15am	Breakfast is served in the dining hall
	Rooms must be cleared by 11:30AM.
	All group must depart.

Scientific Program

DAY 1 AM : Introduction and simple ecosystem process models

SECTION 0: Introduction, workshop goals and outcomes		
Overview of FHL and group logistics and activities	C. Greene	10 min
Scientific program and estimated outcomes	A. Miller	15 min
Climate-driven ecosystem process model & PICES WG27	S. Minobe	15 min

SECTION 1: Examples of simple diagnostic models of ecosystem response to climate forcing	M. Hufnagl	
<i>Lower Trophic levels: Ocean Transport drives low-frequency Zooplankton Variability</i>		
Example #1: Northeast Pacific zooplankton (CASE 1 California Current)	E. Di Lorenzo	10 min
Example #1: Northeast Pacific zooplankton (CASE 2 Oregon Shelf)	J. Keister	15 min
Example #2: Northwest Pacific zooplankton	S. Chiba	15 min
Example #3: North Atlantic copepods	C. Greene and R. Ji	20 min
<i>Higher Trophic Levels: The role of mesoscale circulation in fish recruitment</i>		
Example #4: Sablefish off Sitka Island linked to anticyclonic eddies in the Gulf of Alaska	A. Smith and K. Shotwell	15 min
Example #5: Arrowtooth flounder in Kodiak Island linked to instability of the Alaskan Stream	M. Stachura	15 min
<i>Higher Trophic Levels: coherent response of species to large-scale climate forcing</i>		
Example #6 North Pacific salmon survival	P. Kilduff and L. Botsford	15 min
Example #7 Linkages between Japanese sardines and gyre spin-up	S. Minobe	15 min
Example #8: North Atlantic herring	M. Hufnagl	15 min

DAY 1 PM : Ecosystem data archives & indicators

SECTION 2: Ecosystem and fish population data archives	S. Minobe	
Lower Trophic Level: copepods and krill		
Northwest Pacific	K. Tadokoro	15 min
Northeast Pacific	B. Peterson	15 min
North Atlantic	M. Hufnagl	10 min
Higher Trophic Level: ground fish, salmon, herring and whales		
North Atlantic	M. Hufnagl	10 min
Northeast Pacific	M. Stachura	15 min
Northwest Pacific	S. Minobe and K. Tadokoro	15 min
North Atlantic whales	E. Meyer-Gutbrod	15 min
Marine life observing system data archive	S. Bograd	15 min
Pelagic CalCOFI data archive	T. Koslow	15 min

SECTION 3: Ecosystem Indicators	A. Hollowed	
Definitions and use of Ecosystem Indicators in fisheries science and management	J. King	30 min
Successes and failures of using ecosystem indicators	N. Mantua	20 min

DAY 2 AM : Modeling methods & physical forcing

SECTION 4: Methods for implementing climate-driven ecosystem process models	A. Miller	
Linear multivariate autoregressive inverse models	M. Newman and M. Alexander	40 min
Bayesian hierarchical models	R. Herbei, C. Wilke and R. Millif	40 min
Internal population dynamics	L. Botsford	30 min
Determining uncertainties in the process models	S. Minobe	15 min

SECTION 5: Physical environmental forcing data from observation, regional and climate models	M. Alexander	
Large-scale climate indices: advantages and limitaitons	N. Mantua	15 min
Regional and coastal models	A. Miller	15 min
Climate models IPCC	N. Bond	15 min

DAY 2 PM : Plenary Discussions 1

DAY 3 AM : Plenary Discussions 2

The plenary discussions listed below will take place on DAY 2 PM and DAY 3 PM without a fixed time schedule.

PLENARY DISCUSSION TOPICS		
Isolating and modeling the climate controls on marine ecosystems and fish populations	J. Overland	30 min
1) New hypothesis linking ecosystem to climate forcing	Plenary Discussion (Mantua/Sydeman)	
* Ecosystem considerations vs recruitment		
* Diagnostic vs. prognostic physical variability		
* Predicting recruitment with climate-driven forced process models		
2) What climate forcing can be predicted and lead to ecosystem forecast skill	Plenary Discussion (Bond/Miller)	
3) Discussion Topics based on group preference	Plenary Discussion (TBD)	

DAY 3 PM : Summary and Future Planning

SUMMARY & FUTURE PLANS		
Report on group discussions form graduate student summaries	Graduate Student	
New group collaborations to work on the development of climate-driven ecosystem process models	S. Minobe and N. Mantua	
Future plans (e.g. publications, Topic Session PICES or ICES 2013, PICES WG27 activtieis, topic sessions)	A. Miller and J. King	

Description of Workshop SECTIONS

SECTION 0: Introduction, workshop goals and outcomes

This section will introduce the logistics and group activities at FHL. It will also provide some background for the motivation and goals of the workshop, and also clarify our definition of climate-driven process models

SECTION 1: Examples of simple diagnostic models of ecosystem response to climate forcing

The goal of this section is to provide a set of simple examples (15-20min talks) of recently developed simple diagnostic models of ecosystem variability. These models use few indices of environmental forcing that represent selected/relevant physical processes (e.g. advection, mesoscale eddies) to reconstruct existing time series of marine populations in the lower and higher trophic levels.

SECTION 2: Ecosystem and fish population data

The goal of this section is to introduce and present to the participants the available observational ecosystem and fish data archives in the Northeast and Northwest Pacific, and the North Atlantic. The talks may also present some statistical characterization of the data and climate relationships.

SECTION 3: Ecosystem Indicators

The goal of this section is to introduce the concept of ecosystem indicators, how their used in fisheries science and management.

SECTION 4: Methods for implementing climate-driven ecosystem process models

The goal of this section is to provide short lectures on methodologies that can be useful to implement climate-driven process models. These examples include (a) linear inverse models as applied to reconstructing climate variability using a reduced set of variables and degrees of freedom, (b) Bayesian statistics as applied to testing the ability of simple process models to capture the variability in ecosystem timeseries, (c) a review of internal marine population dynamics -- (as we build climate-driven process models of the ecosystem it is likely that we must include some terms in the equations to account for internal population dynamics), and (d) a sort lecture on methods for assessing uncertainties in the outputs of process models.

SECTION 5: Physical environmental forcing data from observation, regional and climate models

The goal of this section is to introduce the variety of physical data that can be used to derive physical forcing terms for the ecosystem process models.

SECTION 6: Plenary Discussion Topic

In this section we will have plenary discussion on selected topics. So far we have two topics on the list. We anticipate that participants will suggest some additional topics based on interest and the evolution of the workshop.