

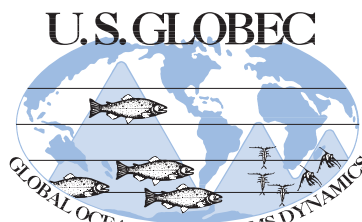
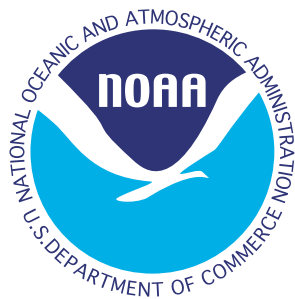
**Report of the  
U.S. GLOBEC Northeast Pacific  
Scientific Investigator's Meeting  
November 13 - 16, 2001**

**Edited by Harold P. Batchelder**

**Acknowledgements**

This meeting was organized by the U.S. GLOBEC Northeast Pacific Coordination Office. We gratefully acknowledge the contributions from the scientific investigators who attended the meeting and provided the summaries and figures for this report. A special thanks go to Linda Hunn, Allen Macklin, and Phyllis Stabeno for arranging logistical support prior to and throughout the meeting.

The U.S. GLOBEC Northeast Pacific Scientific Investigator's Meeting and this report were sponsored by the National Science Foundation and the National Oceanic and Atmospheric Administration.



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**Report of the U.S. GLOBEC Northeast Pacific  
Scientific Investigator's Meeting  
Pacific Marine Environmental Laboratory, Seattle, Washington  
November 13 - 16, 2001**

This workshop was organized by the U.S. GLOBEC Northeast Pacific Coordination Office. The scientific investigators who attended the workshop provided the abstracts, posters, and figures for this report. Hal Batchelder and Linda Hunn put this report together.

The U.S. GLOBEC Northeast Pacific Scientific Investigator's Workshop and this report were sponsored by the National Science Foundation and the National Oceanic and Atmospheric Administration.

## **Introduction**

The U.S. GLOBEC Northeast Pacific (NEP) Program is a large multidisciplinary, multi-year oceanographic effort focusing on the biology and ecology of juvenile salmon, euphausiids, large copepods, and forage fish in coastal regions of the North Pacific, and how these populations are controlled by physical and biological processes at large- to meso-scales. Two specific regions have been targeted for intensive field studies and long-term observations: (1) the wind driven, coastal upwelling California Current System (CCS), especially the region extending from central Oregon south to Northern California, and, (2) a coastal Gulf of Alaska (CGOA) shelf region southwest of Prince William Sound. U.S. GLOBEC studies in the NEP have been phased in gradually. NEP research began in 1997 with integrated, multi-investigator, interdisciplinary programs of modeling, retrospective analysis, and long term observation programs (LTOPs). Focused process-oriented and field surveys of the CCS were planned for the summers of 2000 and 2002; these will alternate with intensive field studies in the CGOA in 2001 and 2003. The U.S. GLOBEC research effort in the NEP has an ultimate goal of improving the predictability and management of living marine resources in the region by developing better insights and understanding of ecosystem interactions and the coupling between the physical environment and the living resources at multiple temporal and spatial scales. The physical environment and biological populations of the eastern Pacific respond strongly to climate variability at several temporal scales: interannual changes like El Niño-La Niña oscillations; and, longer-term, lower frequency, probably atmospherically forced, changes like the regime shift that occurred in the winter of 1976-77, and perhaps more recently in the late 1990's. The U.S. GLOBEC research program is supported primarily by the

U.S. National Science Foundation Division of Ocean Sciences, and by the U.S. National Oceanic and Atmospheric Administration's Coastal Ocean Program and National Marine Fisheries Service. Ancillary funding for some projects within the program is provided by the National Aeronautics and Space Administration. U.S. GLOBEC is a component of the U.S. Global Change Research Program.

## **Workshop Structure**

The 2001 U.S. GLOBEC Northeast Pacific Scientific Investigator's (SI) workshop was held at the Pacific Marine Environmental Laboratory (PMEL) in Seattle, Washington. This was the first NEP SI meeting at which the SIs in California Current System and the Coastal Gulf of Alaska met jointly. The meeting was well attended; a list of attendees is provided in Appendix II. The meeting was structured (Appendix I) around Plenary sessions (CCS and CGOA meet together) and Breakout sessions, in which the CCS and CGOA SIs had separate discussions. In the Plenary Sessions, several longer "invited" talks and discussion periods emphasized the core hypotheses of the NEP program (HS sessions; Figure 1). To foster communication between the CCS and CGOA SIs, component summaries (CS sessions; Figure 1) were done in plenary. Component summary sessions included presentations on remote sensing, LTOP, process, mesoscale surveys, moorings, and modeling from both regions. Component summary presenters were asked to collect and summarize information from all projects within their topic; overall, this was successful, with the presentations providing an excellent introduction and status report for all attendees. A room and foyer area were devoted to the display of detailed scientific results from the NEP projects using posters. There were 74 posters displayed, and three periods of the meeting were devoted exclusively to poster sessions (PS sessions; Figure 1), so that there was plenty of opportunity to discuss project science among colleagues.

Breakout sessions were devoted to two types of working groups: Regional Breakout Sessions (RBS; Figure 1), and Topical Breakout Sessions (TBS; Figure 1). Regional Breakout Sessions were used to discuss within region interests. For example, within the CGOA RBS, much of the discussion concerned the findings from the

recently completed 2001 field season; how those field data were or were not compromised by not having a mesoscale survey; and, what might be done differently in the 2003 field season under different assumptions of CGOA mesoscale survey support. In the CCS RBS, discussions included 1) logistics and ship needs for the 2002 cruises in the California Current, and 2) integration and synthesis of the results of the 2000 field season. Topical Breakout Sessions were used to enable investigators with common interests across the CGOA and CCS programs to meet for discussions. Examples of TBS groups are: 1) zooplankton SIs meeting to discuss the measurements made in the CCS and CGOA on vital rates (development, feeding, growth, reproduction) of zooplankton; 2) similar meetings of the fish ecologists to discuss salmon prey, salmon diet and trophodynamics connections to fish in the two regions; 3) discussions of conceptual climate models of the North Pacific; 4) discussions of topography-flow interactions; 5) a mooring synthesis group; 6) a group discussing the evidence for a 1998 regime shift in the North Pacific, and several others.

A principal goal of the meeting was for the CCS SIs to inform the CGOA investigators of what was being done and learned, and vice versa. This meeting was the first step in a process that will lead to cross-region, NEP-wide synthesis of how the coastal ecosystems of the NEP respond to large and meso-scale forcing. All who attended would agree that the meeting was a success.

## Narrative

### Tuesday, 13 November 2001

The workshop began on Tuesday, 13 November 2001. Hal Batchelder, executive director of the NEP coordinating office, welcomed and thanked all of the SIs for attending. After the agenda was reviewed and accepted, Hal described the objectives and possible products of the workshop. Investigators were asked to consider potential changes to the Northeast Pacific Executive Committee (NEPEXCO), since the terms of about half of the members were scheduled to expire this year. Lacking substantial feedback from the SIs, it was decided to extend the term of all NEPEXCO members to expire in December 2002.

Hal provided an update on the status of the special Northeast Pacific issue of *Progress in Oceanography*—twelve papers, plus an introduction have been recommended for publication by the guest editors and forwarded to the journal.

Ted Strub, chair of the NEP Executive Committee, then gave a presentation in which the goals and present status of the NEP program were summarized. He showed the timeline of NEP activities and noted the other national and international programs that were also conducting ocean investigations in coastal regions of the NEP. Ted concluded by noting the fortunate timing of the program to

capture (e.g., sample) an El Niño, La Niña, and a possible NEP regime shift.

Strub and Beth Turner then summarized the current status and prospects for obtaining additional funds to support mesoscale spatial surveys in the CGOA in 2003. Strub and many others developed a whitepaper justifying the need for mesoscale surveys, and indicating how specific core goals of the NEP program could not be achieved without one or by only having a piecemeal replacement for a mesoscale program. The agencies (NSF and NOAA) acknowledge the importance of spatial surveys, but must wait to see if funds can be found to support these. Beth specifically requested that the SIs consider several scenarios that ranged from no new funding to full funding of a mesoscale survey—what measures could be done to mitigate not having a fully funded mesoscale survey and what goals of the NEP program would be adversely impacted.

We then had a first Component Summary (CS-I) session, in which each speaker was allotted 15 minutes to summarize their component. As usual, most presentations ran long. This reflects the breadth of the program and the interesting results that have been generated over the past few years.

After lunch, we had our first dedicated poster session (PS-I). Posters seem to be an excellent and efficient way to convey the detailed results from each project. Some projects had 5-6 posters, while others had fewer. Following a mid-afternoon break, we reassembled in Plenary for an invited presentation by Nick Bond on the potential use of Aircraft for Understanding Ocean Processes and especially documenting spatial patterns. To conclude the first day, the CCS and CGOA groups met for their first Regional Breakout Session (RBS-I).

### Wednesday, 14 November 2001

Day two (Wednesday) of the workshop began with Hypothesis Session (HS-I), addressing the first core NEP hypothesis on *how production regimes in the CCS and CGOA covary (out of phase) and are coupled through atmospheric and ocean forcing*. The presentation was made by Frank Schwing (mostly on atmospheric forcing and ocean physics), and was followed by shorter presentations by Bill Peterson (on zooplankton abundance in the CCS) and Loo Botsford (on salmon catches). Frank's presentation showed that there have been significant changes in ocean biota of the CCS since 1998 (a regime shift). Moreover, atmospheric pressure systems and winds of the North Pacific changed also during this time—in a way that would be expected to impact ocean conditions in the CCS, but may not have changed ocean conditions in the CGOA. It is unknown to what extent ocean biota in the CGOA changed significantly in the late 1990s—aside from fisheries catch records, there are few long-term time series in the CGOA for examining for recent shifts in trends or

species compositions. Fruitful discussion occurred after these presentations.

We then heard summaries of the physical and biological modeling programs in the CCS and CGOA (CS-II). The final hour before the lunch break was devoted to continuation of the Regional Breakout Sessions from the prior day (RBS-II). After lunch we had time for viewing posters and informal discussions (PS-II), followed by a short plenary session for brainstorming potential topics for TBS-I, which occurred during the remainder of the afternoon. Breakouts occurred for the following topics: 1) methods/approaches for including microzooplankton in ecosystem models, 2) salmon biology, food web interactions and trophic connections, 3) conceptual climate models, and 4) topographic and cross-shelf exchanges. The NEPEXCO met for about one hour Wednesday evening to discuss a number of topics, foremost among them the production of articles on the CCS and CGOA for the special GLOBEC issue of Oceanography Magazine, future GLOBEC NEP special publications, and a review of potential options for mesoscale surveys (or not) in the CGOA in 2003.

#### Thursday, 15 November 2001

Day three (Thursday) began with separate regional presentations relating to core hypothesis II of the NEP program: *Spatial and temporal variability in mesoscale circulation constitutes the dominant physical forcing on zooplankton biomass, production, distribution, species interactions, and retention and loss in coastal regions of the NEP*. Jack Barth presented on the CCS and Tom Weingartner on the CGOA. Both summarized the results, sometimes preliminary, from the first complete process intensive field studies in their respective regions.

Batchelder reviewed the program requirements for making data available as soon as it is in a form that will be useful for other program scientists. Compliance on getting cruise reports into the NEP office has been pretty good, although a few still remain to be completed and made available on-line. Exchange of data and providing of data on-line is proceeding slowly, although in many cases individual datasets are available by contacting the Principal Investigator, rather than residing on-line. Batchelder urged all SIs to make their data accessible on-line.

The CGOA and CCS groups met independently in RBS-III to complete their discussions prior to lunch. The CGOA group revisited options for providing spatial information in 2003 under scenarios ranging from no new funds for mesoscale surveys (repeat the piecemeal coverage used in 2001) to having a fully funded program of mesoscale surveys. The CCS group discussed model-data comparisons of physics, lower trophic levels and salmon.

After lunch, a plenary session was held to have reports from the RBS discussions of the past three days. Tim Cowles and Suzanne Strom reported on the discussions from the CCS and CGOA groups, respectively.

The remainder of Thursday afternoon was devoted to topical breakout sessions (TBS-II,III) which included groups that discussed: 1) Zooplankton acoustics and calibration, 2) Recent NEP regime shifts, and a few others, and also provided additional poster viewing time.

#### Friday, 16 November 2001

Day four (Friday) began in Plenary with a talk on the NEP Core hypothesis related to salmon survival: *Ocean survival of salmon is primarily determined by survival of the juveniles in coastal regions, and is affected by interannual and interdecadal changes in physical forcing and by changes in ecosystem food web dynamics*. Ric Brodeur gave an excellent overview of progress that has been made in addressing this higher trophic level by summarizing the work that has gone on in both the CGOA and CCS. After general discussion of this and the other core hypotheses, we wrapped up the 4-day meeting by setting tentative dates for next year's meeting. We discussed and decided that the CGOA and CCS SIs should have separate meetings in winter 2002-3, and that the next joint meeting would be held in two years (ca. November 2003) after both regions had completed their second field year. The next CCS SI meeting will be held 19-21 November 2002 at Oregon State University in Corvallis, OR. The next CGOA SI meeting will be held in conjunction with the EVOS and GEM annual meeting that is tentatively scheduled for January 2003 in Anchorage, AK [it appears the dates of this meeting will be 13-16 January 2003]. The rationale for having the meeting joint with EVOS/GEM would be the opportunity it affords to communicate in a public forum the scientific objective and results of the GLOBEC CGOA program and how it relates to future EVOS/GEM research.

The workshop adjourned at 10:10 AM.

# **APPENDIX I**

## **AGENDA**

## Agenda

### NEP SI Meeting

13-16 November 2001  
Pacific Marine Environmental Lab  
Seattle, Washington

(Note that bold italicized names in agenda were eventual speakers.)

#### Introductory Remarks about NEP SI Meeting

The agenda below is offered for your review and comment. Given the large number of individual projects involved in the combined CCS/CGOA programs of the NEP project, Ted and I feel that having each project present a summary of their progress during the past year to the group (10-15 minute talks) in plenary is not an efficient use of time. Instead we have structured the SI meeting around a couple of longer talks emphasizing the core hypotheses, "Core Hypothesis", with a series of shorter selected presentations on specific research components (LTOP, process, moorings, etc.), "Component Summaries", within the NEP. At last years CCS SI meeting posters were used to convey research progress of specific projects. Comments from the participants was that it was an effective way to summarize their progress and to foster discussions among the SIs, but that there wasn't enough time devoted to poster sessions. In fact, several projects had 4 or more posters on various aspects of their research. We include lots of "Poster Session" time in the agenda below. We devote substantial time to plenary sessions that will include SIs from both the CCS and CGOA. We want to encourage sharing of information and begin building NEP synthesis efforts now that may be able to address some of the larger scale (climate-related) questions that were posed in the IP. Conversely, we also provide substantial time for the CGOA and CCS SI's to meet in separate sessions, for both scientific analysis/collaborations and logistical planning ("Regional Breakout Sessions"). Finally, we provide several times for "Topical Breakout Session". These are for smaller breakout groups to meet to discuss topics of interest. Since it is likely that many topical breakout sessions may be of interest to individual PI's, we have scheduled four periods, each of 1.5 hrs. As noted, this is a preliminary agenda and we welcome suggestions/improvements that will enhance the usefulness to the SIs of this meeting.

Hal Batchelder (hbatchelder@coas.oregonstate.edu)  
Ted Strub (tstrub@coas.oregonstate.edu)

#### DAY ONE: Tuesday, 13 November 2001

0800 Coffee setup, not a full continental breakfast

0830 Introductory Comments (Plenary, Auditorium)

- Review of Agenda/Goals of Meeting (**Batchelder**)
- Meeting Structure
- NEPEXCO Membership
- Introductions

0900 Overview of Program Goals/Status (**Strub**)

0930 CGOA Mesoscale Survey Component Update (**Strub, Turner**)

1000 Break (coffee, pastries and posters)

1030 Component Summaries I (CS-I). (Plenary, Auditorium; 15 min each)

Note: since only one or at most two SIs will summarize these components, it is important that the SI contact PIs from other projects for information in order to prepare a broader, multiproject summary.

- Remote Sensing (**Strub/Thomas**)
- LTOP-CGOA (**Weingartner/Hopcroft**)
- LTOP-CCS (**Huyer/Wheeler**)
- Processes-CGOA (**Strom/Napp**)
- Processes-CCS (**Peterson**)
- Surveying-CGOA (**Farley/Haldorson**)
- Surveying-CCS (**Cowles/Brodeur**)
- Moorings-CGOA (**Stabeno**)
- Moorings-CCS (**Kosro**)
- General Discussion Follows

1300 Lunch (PMEL Cafeteria)

1400 Poster Session I (PS-I).

1530 Break (snacks and posters)

1545 Oceanography from Aircraft (Plenary, **Nick Bond**)

1600 Regional Breakout Session I (RBS-I). (CCS and CGOA separate)

- CCS Topics:
  - o 2002 Cruise Logistics/Status
  - o Integrate and Synthesize Findings
  - o Prepare for National Meetings

- o Prepare Oceanography Article
- CGOA Topics:
  - o Share LTOP, mooring and process results
  - o Integrate and Synthesize Findings
  - o Prepare for National Meetings
  - o Identify Research Nuggets of Broad Appeal
  - o Prepare Oceanography Article
  - o Discuss 2003 field research wrt what was done/learned from 2001 research; identify improvements; begin logistical planning
  - o GEM Plans for Long-Term GOA Monitoring

1730 Adjourn for Day

**DAY TWO: Wednesday, 14 November 2001**

0800 Coffee setup, not a full continental breakfast

0830 Plenary Session: Core Hypothesis I: Production regimes in the CCS and CGOA covary and are coupled through atmospheric and ocean forcing. (Auditorium)

Where are we with regard to addressing this hypothesis? Evidence of a recent (1999) regime shift.

**Botsford, Schwing, Peterson**

0915 Component Summaries II (CS-II). (Plenary, Auditorium; 15 min each)

- Modeling-Physics (**Haidvogel**)
- Modeling-Biology (**Hinckley**)
- General Discussion Follows

1000 Break (snacks and posters)

1030 Regional Breakout Session II (RBS-II).

- CGOA and CCS meet separately to continue discussions from DAY ONE.

1300 Lunch (PMEL Cafeteria)

1400 NEP Climate Conceptual Model—Plenary, Auditorium (**Mantua**)

1410 Brainstorming Topics for TBS—Plenary, Auditorium (**Batchelder, Strub**)

1430 Topical Breakout Session I (TBS-I).

Possible topics:

- Zooplankton Vital Rates/Populations
- Salmon Vital Rates/Population Dynamics
- Predation Group
- Microzooplankton-Mesozooplankton Connections
- Topographic Interactions
- Cross-shelf Exchange
- Model-Data Comparisons - Physics
- Model-Data Comparisons - Ecosystems

- Model-Data Comparisons - Salmon
- Zooplankton Acoustics
- Inter-regional LTOP Comparisons
- Recent (1999-2000) Regime Shift
- Salmon Prey Fields/Diets
- De-tiding ADCP records
- Mooring Group
- CCS-Mesoscalers (prob. more appropriate in RBS)

1530 Break (snacks and posters)

1600 Topical Breakout Session II (TBS-II).

1730 Adjourn for Day

**DAY THREE: Thursday, 15 November 2001**

0800 Coffee setup, not a full continental breakfast

0830 Plenary Session: Core Hypothesis II. Spatial and temporal variability in mesoscale circulation constitutes the dominant physical forcing on zooplankton biomass, production, distribution, species interactions, and retention and loss in coastal regions. (Auditorium)

Where are we with regard to addressing this hypothesis?

**Barth, Weingartner**

0915 Data Management Status/Compliance (**Batchelder**)

1000 Break

1030 Regional Breakout Session III (RBS-III).

1200 Poster Session II (PS-II).

1300 Lunch (PMEL Cafeteria)

1400 Topical Breakout Session III (TBS-III).

1530 Break

1600 Topical Breakout Session IV (TBS-IV).

1730 Adjourn for Day

**DAY FOUR: Friday, 16 November 2001**

0800 Coffee setup, not a full continental breakfast

0830 Plenary Session: Core Hypothesis III. Ocean survival of salmon is primarily determined by survival of the juveniles in coastal regions, and is affected by interannual and interdecadal changes in physical forcing and by changes in ecosystem food web dynamics. (Auditorium)

Where are we with regard to addressing this hypothesis?

**Brodeur, Casillas, Haldorson**

0915 (45 mins available here--UNASSIGNED)



1000 Break

1030 (half hour available here--UNASSIGNED)

1100 Final Plenary Session

- Future Meetings
- Special Sessions
- Publications
- Marching Orders
- Other General Discussion

1200 Adjourn Meeting

## **APPENDIX II**

### **LIST OF ATTENDEES**

**U.S. GLOBEC Northeast Pacific Program  
SI Meeting Attendance  
November 13-16, 2001  
Seattle, Washington**

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## **APPENDIX III**

### **TOPICAL BREAKOUT SESSIONS**

- 1) Conceptual Climate Models (Nate Mantua, rapporteur)
- 2) Microzooplankton in Ecosystem Models (Sarah Hinckley, rapporteur)
- 3) Topographic-Flow Interactions (Jack Barth, Tim Cowles, rapporteurs)
- 4) Salmon Biology—Food Web Interactions (Ric Brodeur, David Ainley, rapporteurs)
- 5) Zooplankton Vital Rates (Russ Hopcroft, rapporteur)
- 6) Physics-Biology Coupling in Models (Dale Haidvogel, Tom Powell, rapporteurs)
- 7) Salmon Vital Rates (Loo Botsford, rapporteur)
- 8) Zooplankton Acoustics (Anders Roestad, rapporteur)
- 9) Recent Regime Shifts (Bill Peterson, rapporteur)

## **APPENDIX IV**

### **POSTER TITLES AND LINKS**

## CALIFORNIA CURRENT

- 1 Jacobson – “Juvenile Salmonids in the Northern California Current: Differences in Parasites Obtained Through Trophic Interactions.”
- 2 Sandell, House, Jacobson, and Casillas – “Pathogen Prevalence and Effects on Juvenile Salmon in the Northern California Current.”
- 3 Schwing, Mendelssohn, Parrish, deWitt, Green, Moore, Murphree, Tokmakian, Semtner, Ford – “Northeast Pacific Climate Change Mechanisms.” ([http://globec.oce.orst.edu/groups/nep/reports/si\\_mtgs/si\\_nov01/si01\\_schwing\\_01.pdf](http://globec.oce.orst.edu/groups/nep/reports/si_mtgs/si_nov01/si01_schwing_01.pdf)).
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