

## Pacific Anomalies Workshop 2, University of Washington Tower, Seattle, WA, 20-21 January 2016

### Day 1

8:00-9:00 *Mingling and breakfast goodies*

9:00-9:20 **Welcome and Introductions**

9:20 – 11:20 **To recap regional findings and set the stage for discussion of mechanisms:**

“What happened?: A knowledge synthesis” 15 min talks / 5 min Q&A

9:20-9:40 Alaska: Russell Hopcroft, University of Alaska, Fairbanks

9:40-10:00 Canada: Richard Dewey, Ocean Networks Canada and University of Victoria

10:00-10:20 Pacific Northwest: Julie Keister, University of Washington

10:20-10:40 *Coffee/tea break*

10:40-11:00 North-Central California: Eric Bjorkstedt, NOAA NMFS Southwest Fisheries Science Center and Humboldt State University

11:00-11:20 South-Baja California: Mark Ohman, Scripps Institution of Oceanography

11:30-12:00 The 2015-6 El Niño: Mike McPhaden, NOAA PMEL

12:00-13:00 *Lunch, provided*

13:00-16:30 **Guided discussion: What do we know about the mechanisms involved?**

Two leaders will give short syntheses: At any point, audience members can contribute slides on a second screen relevant to this discussion, which will be facilitated. At end of each session, ID breakouts & leads.

**Note:** While we are not focusing on El Niño specifically, comparison and contrast with this event and looking at interactions will be covered.

13:00-14:00: **Q1) Atmosphere-ocean interactions:** e.g., what is the 'blob' generating mechanism and is it unprecedented? Could we have/how could we have predicted this? Is this representative of a new state of the ocean? Is there a mechanism for this be linked to long-term effects of greenhouse gases?  
*Led by: Nicholas Bond, University of Washington / Manu Di Lorenzo, Georgia Institute of Technology*

14:00-15:00: **Q2) Open ocean-coastal interactions:** e.g., what large and meso-scale processes, including upwelling, kept the blob offshore on the west coast? How did the offshore ocean interact with the upwelling zone? Was this predictable or where there interactions with El Niño that made it complicated? What was the geographical variation, relative balance of atmospheric forcing, alongshore advection and propagation? *Led by: Mike Kosro, Oregon State University (OR north) / Uwe Send, Scripps Institution of Oceanography (CA south)?*

15:00 *Coffee/tea break*

1530-1630: **Q3) Ecosystem responses:** e.g., what are the mechanisms of ecosystem responses from plankton to predators, including effects from physical and chemical states associated with the blob? Can we extrapolate physical drivers to biological response?  
*Led by: Bill Sydeman, Farallon Institute / Art Miller, Scripps Institution of Oceanography*

16:30-17:00 **Contributed Posters: drilling down on further information: 1 min presentation briefs\***

17:00-18:30 Poster session, mingling, and hosted reception with heavy hors d'oeuvres

## Day 2

8:00-8:30 *Mingling and breakfast goodies*

8:30-9:00 Breakout charge for the day: Focusing in

Within each of the three breakout groups, aligned to the three question topics (1, 2, 3) from day 1: ***Succinctly synthesize what is known re mechanism; identify what observational and modeling info gaps would aid our understanding of the topic; identify if there are indices we could have used or could be developed to enhance prediction or knowledge of status; identify what we would need to better predict these dynamics, or is that possible? Can we improve event response?***

9:00-12:00 Three breakout groups split to Q1, 2, or 3; *Coffee/tea break at 10:30*

12:00-13:00 *Lunch, provided*

13:00-15:00 ***Breakout reports and recommended needs:***

13:00-13:40 Q1 Report out

13:40-14:20 Q2 Report out

14:20-15:00 Q3 Report out

15:00-15:20 *Coffee/tea break*

15:20-16:00 ***General discussion and prioritization of needs***

16:00-16:30 ***Next steps***

### ***Desired outcomes:***

1. A workshop document that will succinctly provide: 1. Brief synthesis of what we know; what the gaps are (observational, modeling, mechanistic understanding); desired indices; what we would need in order to have predicted the blob and its effects or if that is possible.
2. A forum for PIs to discuss plans for scientific publication (group documents, dedicated journal, etc.).

**This workshop was sponsored by U.S. IOOS, NOAA OAR Ocean Climate Observation Program, NOAA Western Regional Team, Washington Sea Grant, California Sea Grant, and the University of Washington's College of the Environment, Applied Physics Laboratory, and Joint Institute for the Study of Atmosphere and Ocean.**



**\*Poster contributions:**

- Alexander Kurapov - Analysis of anomalous oceanic conditions along the US West Coast in 2014 using a high resolution regional ocean model
- Alfonso Hernández-Ríos - Nesting of two seabird species on Mexican Pacific islands and its relationship with environmental anomalies
- Anne Hollowed - Preliminary observations of the impact of anomalous ocean temperatures on the summer distribution of marine fish in the Gulf of Alaska and California Current
- Bill Peterson - Biological response to the Warm Blob of 2013-2015 on phytoplankton, harmful algal blooms, zooplankton, Pacific Salmon and other pelagic fish in the northern California Current
- Brian Beckman - Waiting for the blob: marine growth of juvenile coho salmon in the Northern California Current, 2000-2014
- Christopher Krembs - Did the east-Pacific temperature anomaly change recent water quality trends in the urban fjord, Puget Sound?
- Emanuele Di Lorenzo - Persistent record-high temperatures in the North Pacific in 2014/2015: a climate hypothesis
- Eric Bjorkstedt - Responses of copepod and euphausiid communities off northern California to the warming event of 2014-2015
- Ian Miller - Characteristics of nearshore bottom water temperature anomalies in the Strait of Juan de Fuca in 2013 and 2014
- Jaime Jahncke - Farallon Island wildlife status update for 2014-2015  
- North Central California ecosystem status update for 2014-2015
- Jennifer Jackson - Physical, biological, and chemical observations of 'the Blob' on the British Columbia central coast
- Jim Johnstone - The role of the atmosphere in northeast Pacific warming: Century-long trends and recent anomalies
- Joe Needoba - Observations of biogeochemical conditions in the Columbia River estuary associated with the 2014-2015 North Pacific temperature anomaly
- John Farrara - The anomalous 2014 warming of the California coastal ocean and San Francisco Bay: Observations and Model Simulations
- John Mickett - The response of Puget Sound to the 2014–2015 North Pacific warm anomaly
- Katherine Zaba - Glider observations of the 2014–2015 warming anomaly in the Southern California Current System
- Kirsten Lindquist - Biological mortality anomalies in the northern and central California ecosystem, 2014-2015
- Kris Holderied - Oceanographic and ecosystem response to the 2013-2015 Pacific warm anomaly in Kachemak Bay Alaska

Laura Lilly - Tracking 2014-15 sea surface temperature anomalies using Coastal Data Information Program (CDIP) nearshore buoys

Matthew Baker - North Pacific Research Board investment in understanding the mechanisms driving the persistence of North Pacific anomalous warming and consequences for ecological interactions in the Gulf of Alaska

Mark Ohman - Zooplankton anomalies in the southern sector of the California Current System, 2014-2015

Melissa Carter - Major decline in coastal phytoplankton population and species diversity in the Southern California Bight during anomalous warm conditions of 2014-2015

Nathan Mantua - Warm events in the California Current: El Niño or not

Nicholas Bond - Hot times in the NE Pacific: How much precedence in the historical record?

Parker MacCready - Effect of the "Blob" on shelf water properties in the NE Pacific

Richard Dewey - The warm NEP conditions – A Canadian assessment of the dynamics and status

Richard Dugdale - Effects of changing coastal conditions in 2014 on nutrients and productivity in the northern California upwelling ecosystem

Richard Feely - Anomalously high surface water fCO<sub>2</sub> values in the 2014-15 NE Pacific warm water "blob"

Rob Campbell - Effects of the 2013-2015 warm anomaly in Prince William Sound

Seth Danielson - Thermohaline anomalies in the northern Gulf of Alaska, 1970 to 2015

Sonia Batten - The effects of the anomalous warming on lower trophic levels in the NE Pacific, from Continuous Plankton Recorder sampling

Stephani Zador - Using ecosystem indicators to track effects of recent warm conditions in Alaska's Large Marine Ecosystems

Sue Chen - AXBT observation of upper-ocean temperature during CalWater2

Ted Strub - Tropical connections to the Eastern Pacific warm anomalies

Timothy Jones - Mass mortality of Cassin's auklets in 2014-15: Legacy of the Blob?

Toby Garfield - Three years of NE Pacific Ocean variability observed with satellite imagery

Tom Bell - Decreases in standing biomass and physiological state of giant kelp canopy during the 2014 – 2015 warming event in the Santa Barbara Channel

Tyler MacCready – "Blob" tracking with robotic swarms

**Wireless Info:**

UW NetID: event 0210

Password: do77+ap74+sj85