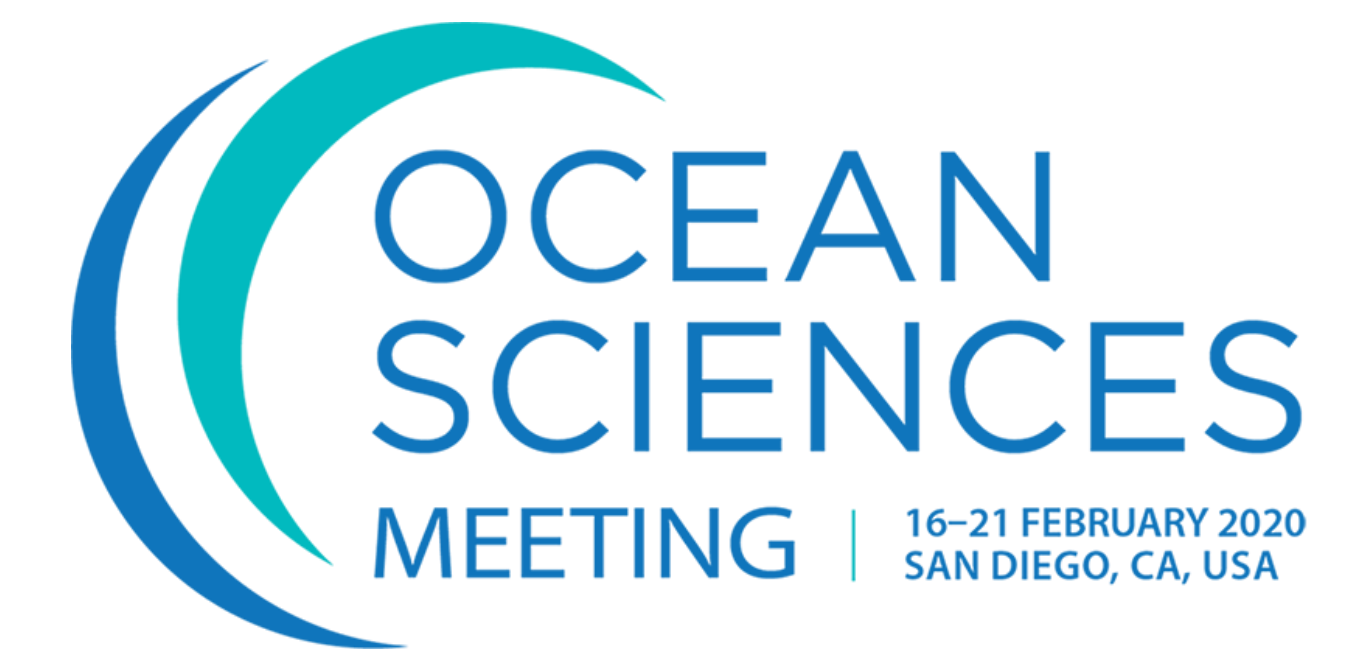




Cross-platform Ecosystem Assessment Through Characterization of Prey Habitat Suitability and Predator Occurrence off Newport, Oregon



Elizabeth Ferguson,
CEO & Founder
eferguson@oceanscienceanalytics.com
Ocean Science Analytics

INTRODUCTION

- Capabilities in marine ecosystem assessment are expanding given the availability of diverse and extensive oceanographic data. Associations of historical predator observations with current environmental variables can provide insight into likely prey habitat suitability.
- The Ocean Observatories Initiative (OOI) maintains the Coastal Endurance Array, a series of coastal and offshore monitoring platforms off Newport, Oregon that include cabled sensors and gliders.
- This initial step in a larger project explores the feasibility of combining cross-platform data across varying temporal and spatial scales in order to characterize current prey habitat suitability for several northwest Pacific Ocean predators.

METHODS

- Three predators were identified in this effort along with likely preferred prey in the region. OBIS Seamap (<http://seamap.env.duke.edu/>) was queried for all observations within the study area (1).
- After exploration of available data, killer whales and sperm whales were determined as focal species.
- Sperm whales are known to prefer Humboldt squid, which are documented in the region during low oxygen saturation (hypoxic) conditions.
- Killer whales (resident) prefer Chinook salmon that are documented to prefer warm (9-12 °C) waters.

RESULTS

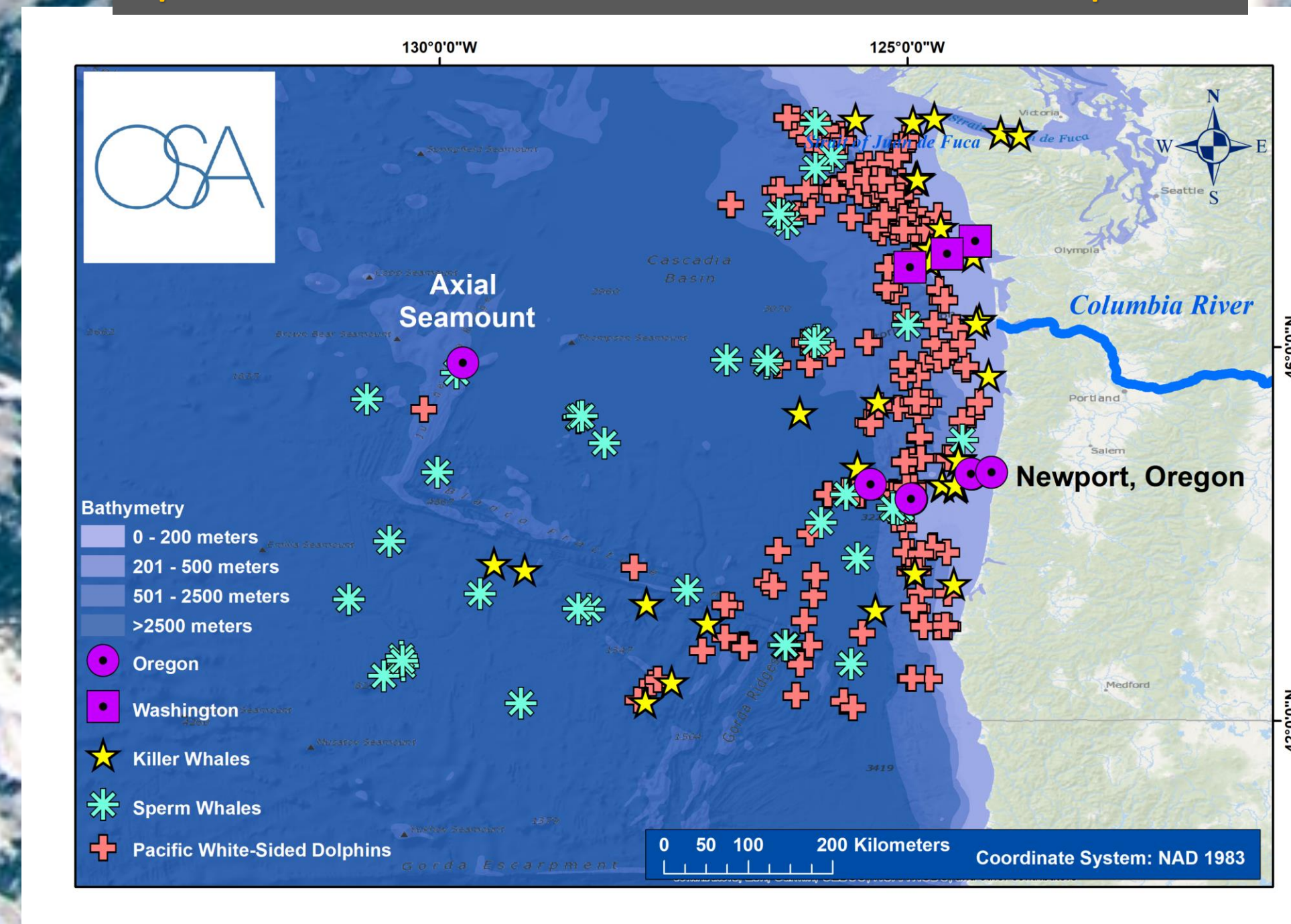
- Glider data determined to be most valuable due to collection depth and spatial resolution.
- Preferred conditions for Humboldt squid (low oxygen saturation) occurred in Spring 2018 (2).
- Ideal temperatures for Chinook salmon at typical depth of 100m were absent in two seasons (3A & 3B).

DISCUSSION

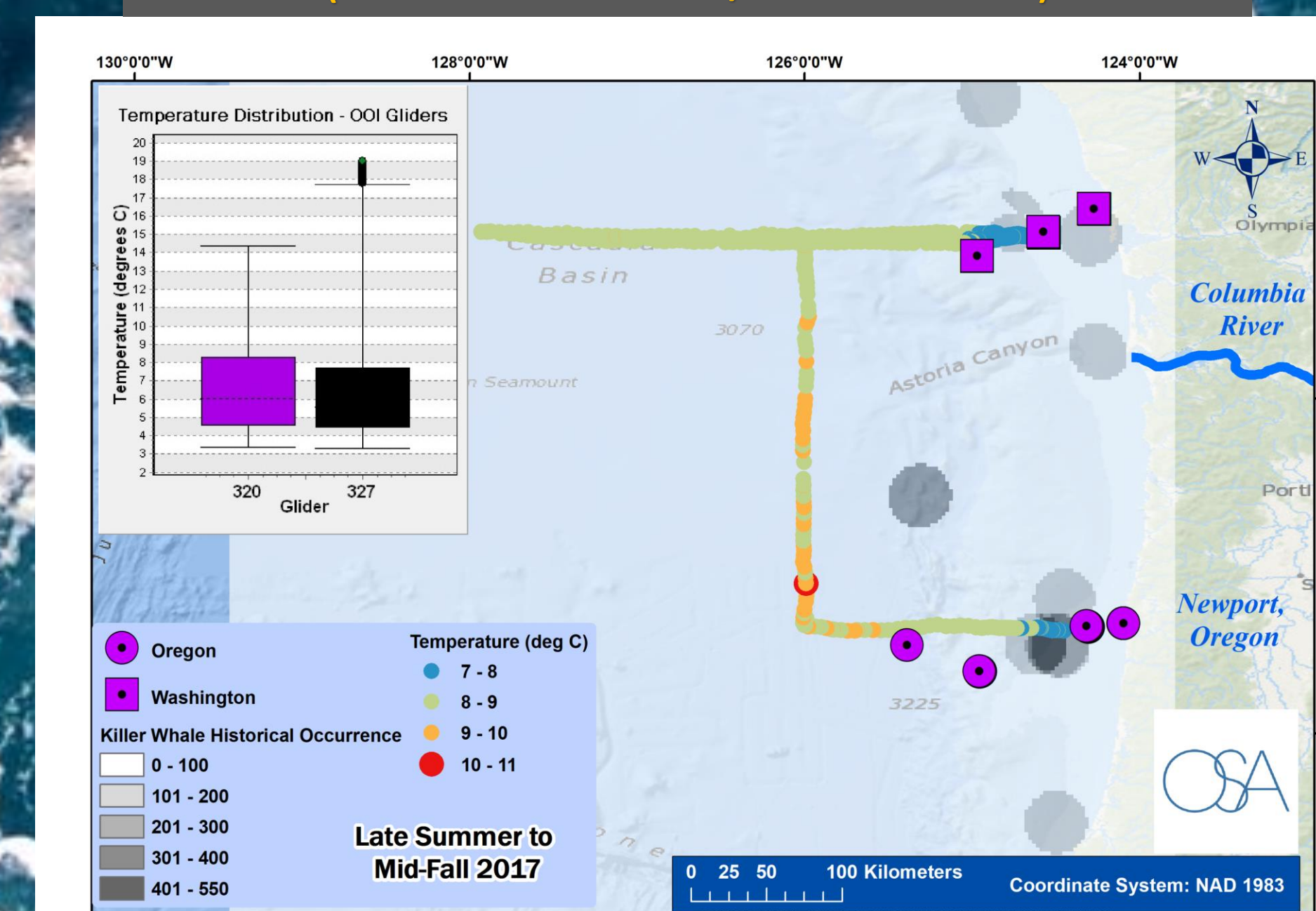
- Greater temporal resolution needed to better characterize prey habitat, but information suggests some indication of suitability can be assessed from the observatory datasets.

The compilation of oceanographic variables from multiple sources can provide useful insights into dynamic environments but require caution when interpreting results.

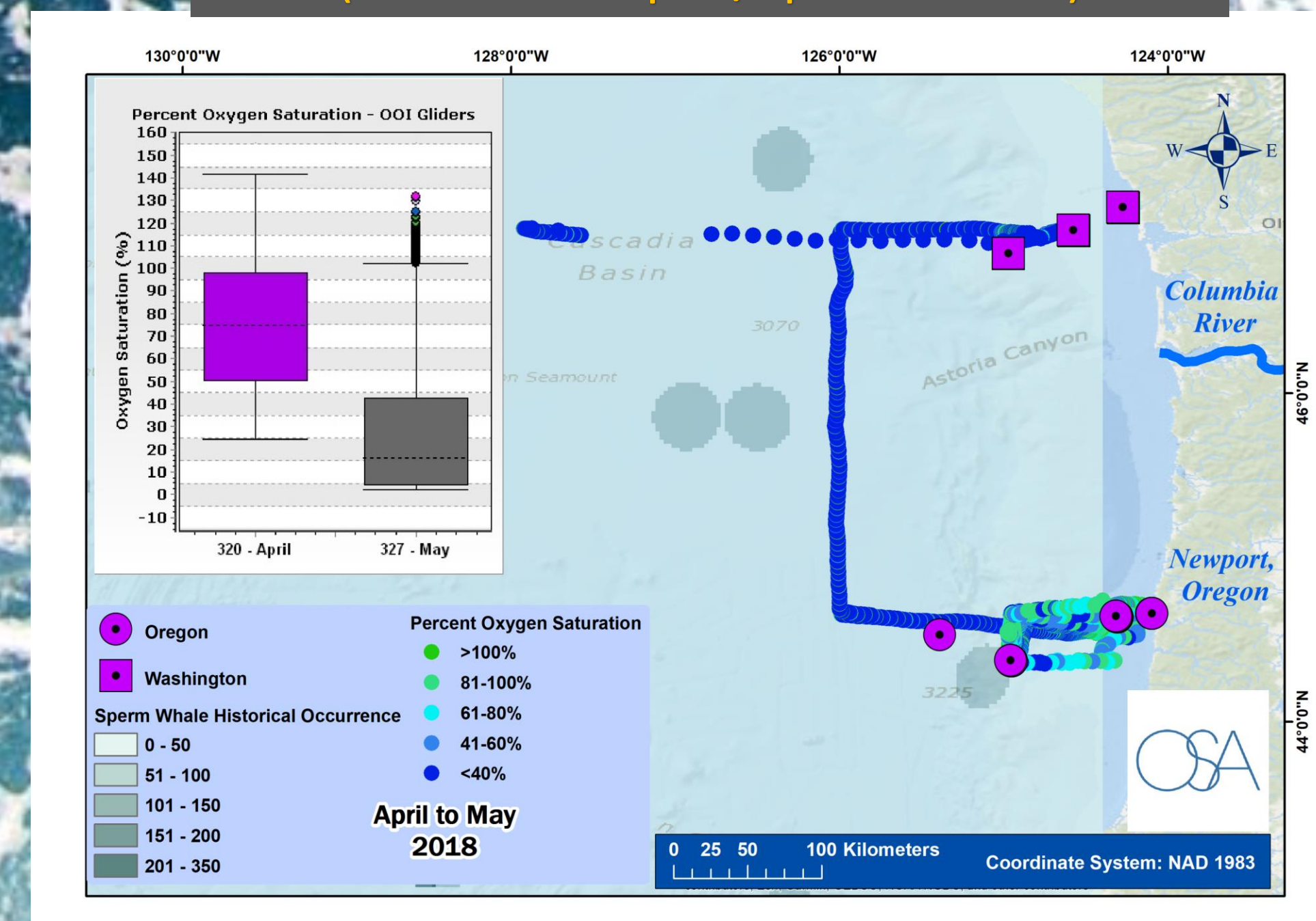
1: OBIS Seamap observations of killer whales, sperm whales and Pacific white-sided dolphins



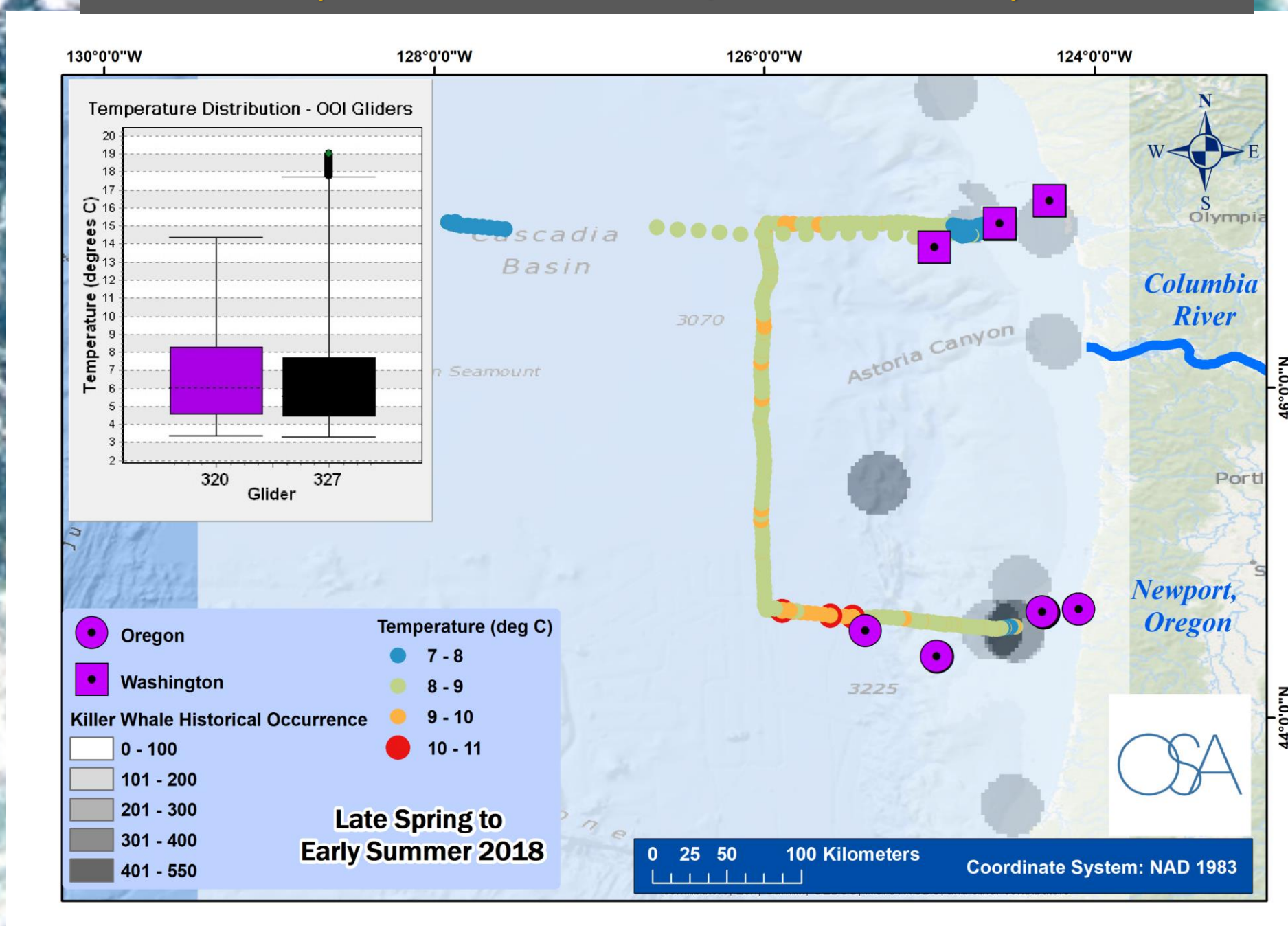
3A: Glider temperature in Summer-Fall 2017 (Chinook salmon/Killer whale)



2: Glider oxygen saturation in Spring 2018 (Humboldt squid/Sperm whale)



3B: Glider temperature in Spring-Summer 2018 (Chinook salmon/Killer whale)



Next Steps in the Project...

- Expand effort to include larger datasets, explore additional oceanographic variables, and determine better uses of mooring data for this effort.
- Incorporate remotely sensed data products to fill temporal and spatial gaps in data.
- Explore acoustic backscatter and shipboard data collections for direct prey information.
- Utilize the broadband hydrophone data along the Oregon line and Axial Seamount to provide concurrent information regarding the vocal occurrence of marine mammals in the study area

Visit our website for future project and training updates! OSA develops online training opportunities related to our research and we envision offering training using OOI data in the future.



SCAN ME

Ocean
Science
Analytics