A red and white glider is shown floating on the surface of the ocean. The glider has a white body with red wings and a red tail. The text is overlaid on the image.

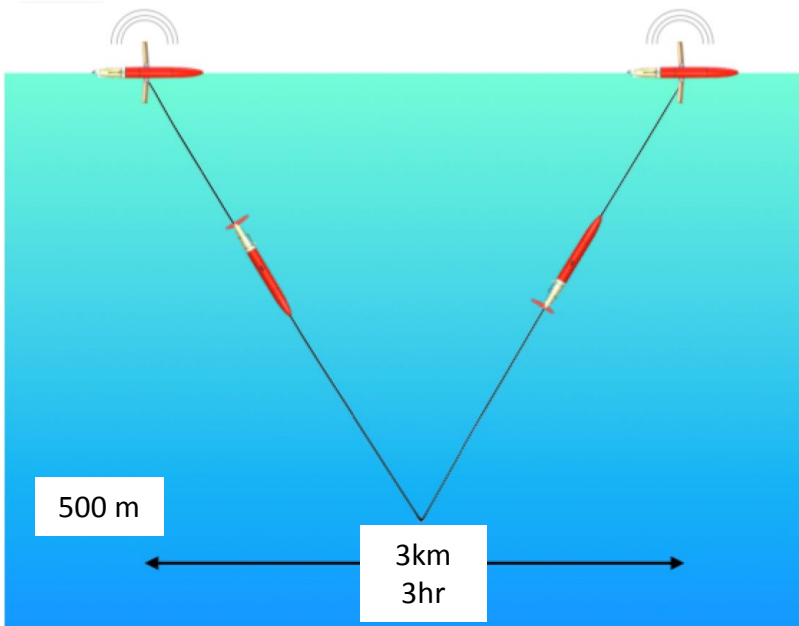
Glider Observations of the 2014-2015 Temperature Anomalies in the Southern California Current System

Katherine Zaba, Daniel Rudnick
Scripps Institution of Oceanography

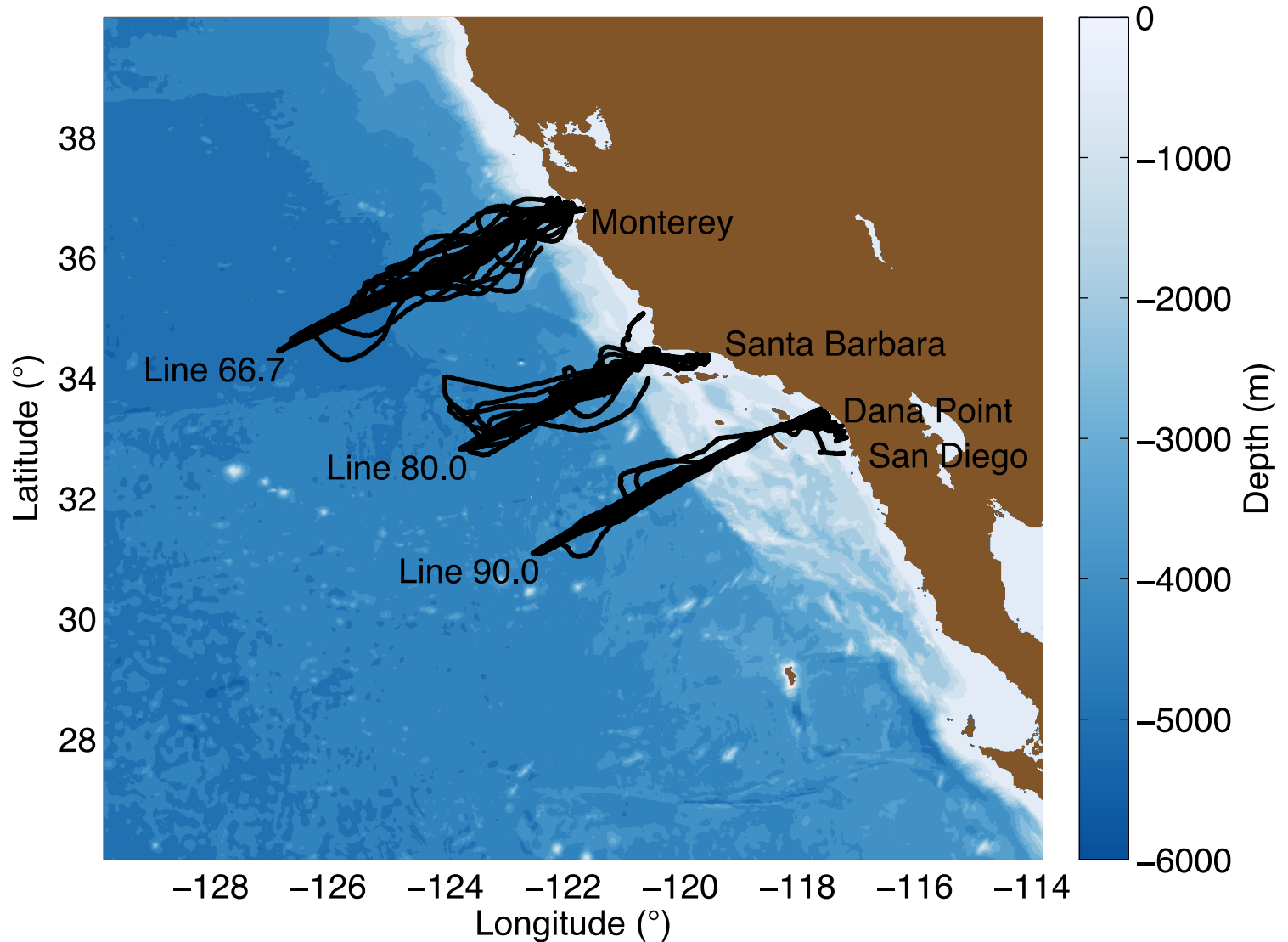
Spray Glider



- Autonomous underwater vehicle
- Buoyancy-driven
- Steering: changes center of mass, battery packs (pitch & roll)
- Deployment duration: 3-5 months
- Horizontal velocity: 0.25 m/s
- Vertical velocity: 0.1 m/s
- Measured variables:
 - Pressure
 - Temperature
 - Salinity
 - Velocity (depth-averaged and depth dependent)
 - Fluorescence
 - Acoustic backscatter, nitrate, dissolved oxygen



California Glider Network

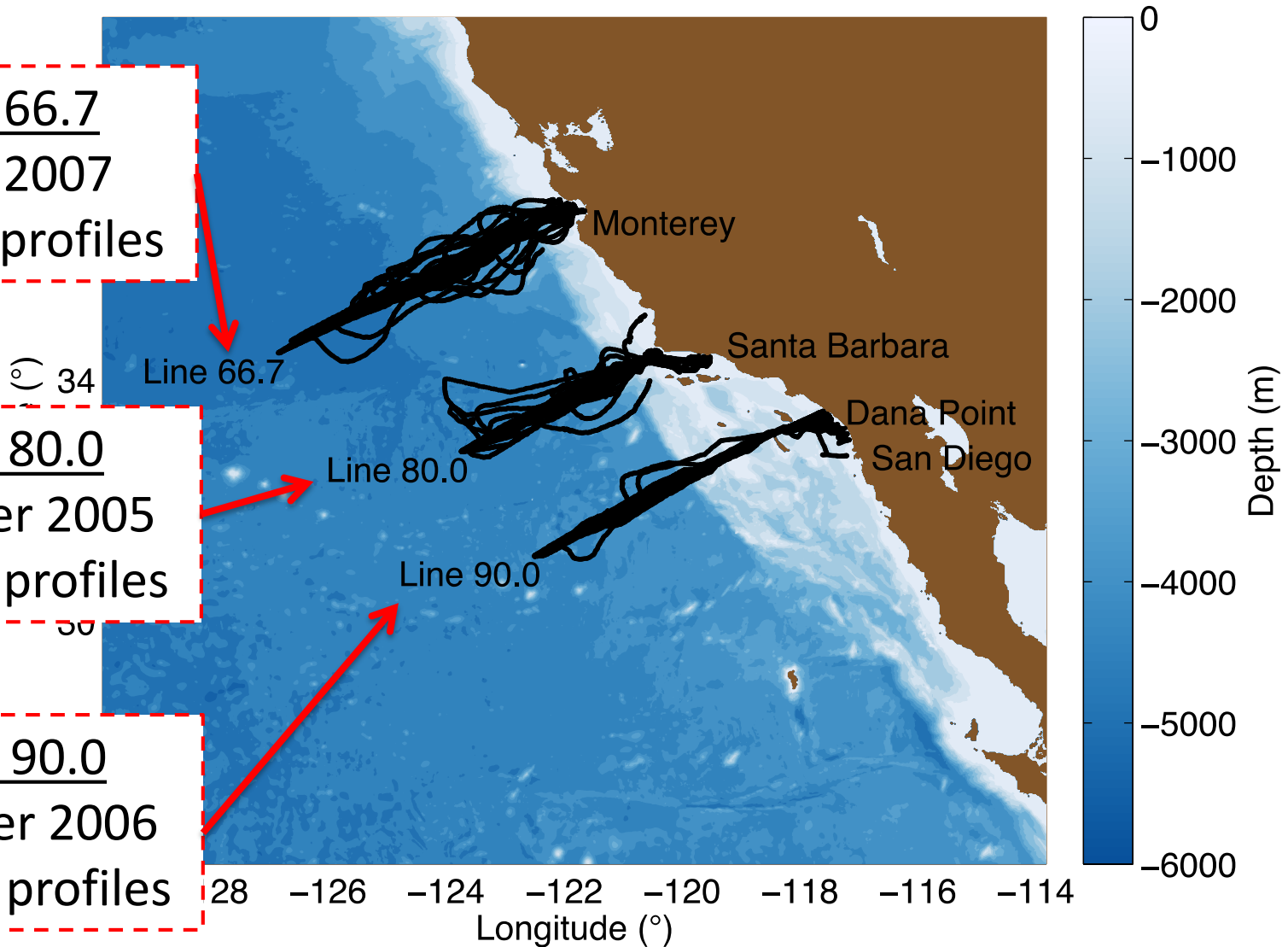


California Glider Network

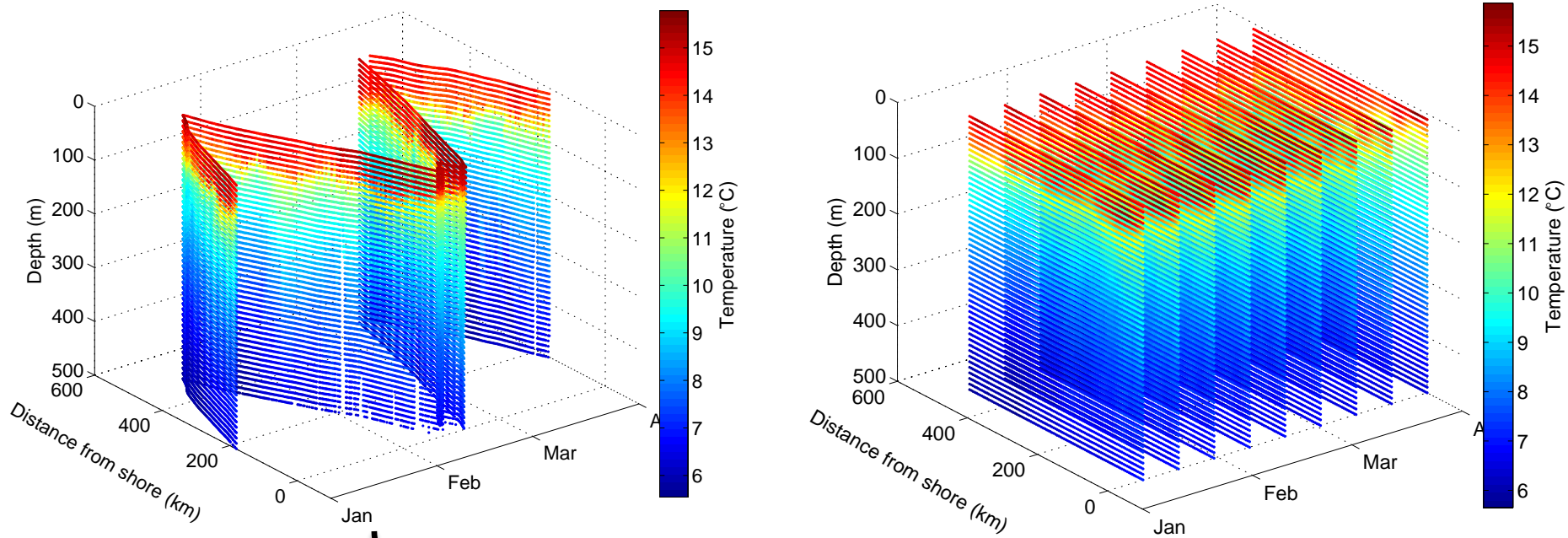
Line 66.7
April 2007
24,953 profiles

Line 80.0
October 2005
28,518 profiles

Line 90.0
October 2006
26,924 profiles



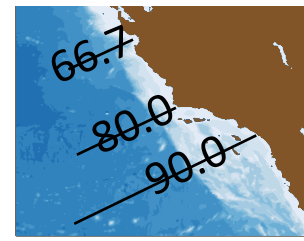
Objective Mapping



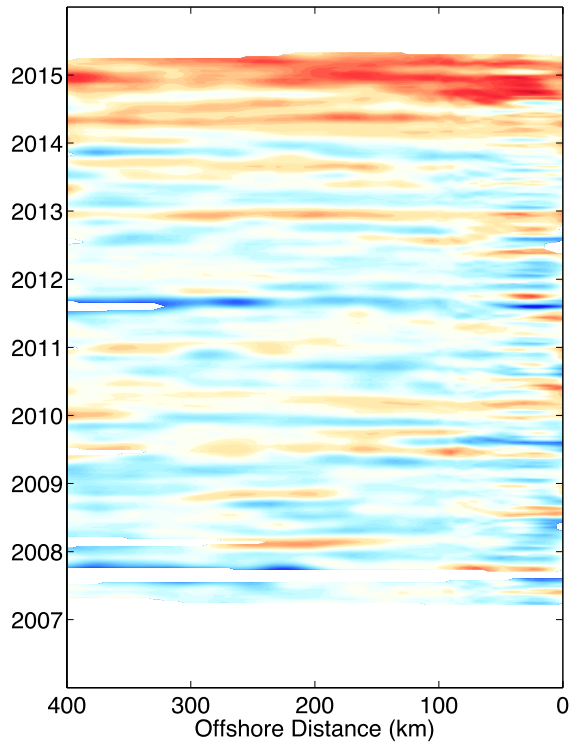
- Non-uniform sampling pattern
- One dive cycle: roughly every 3km, 3hrs
- One section: 2-3 weeks

- Uniform grid
- $dx = 5$ km
- $dt = 10$ days

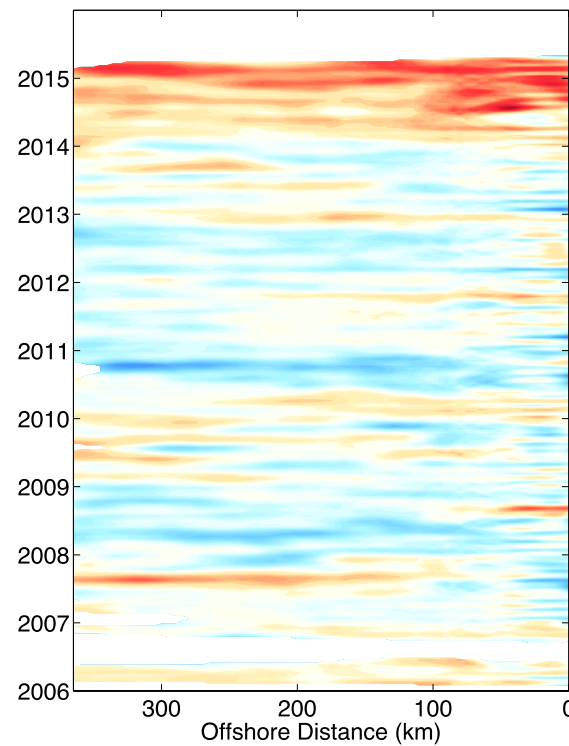
Interannual Anomalies



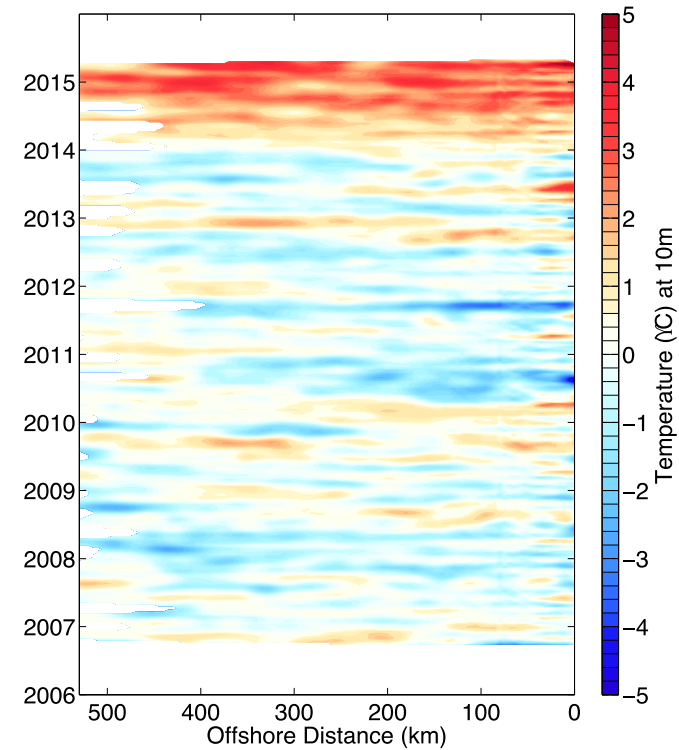
Line 66.7



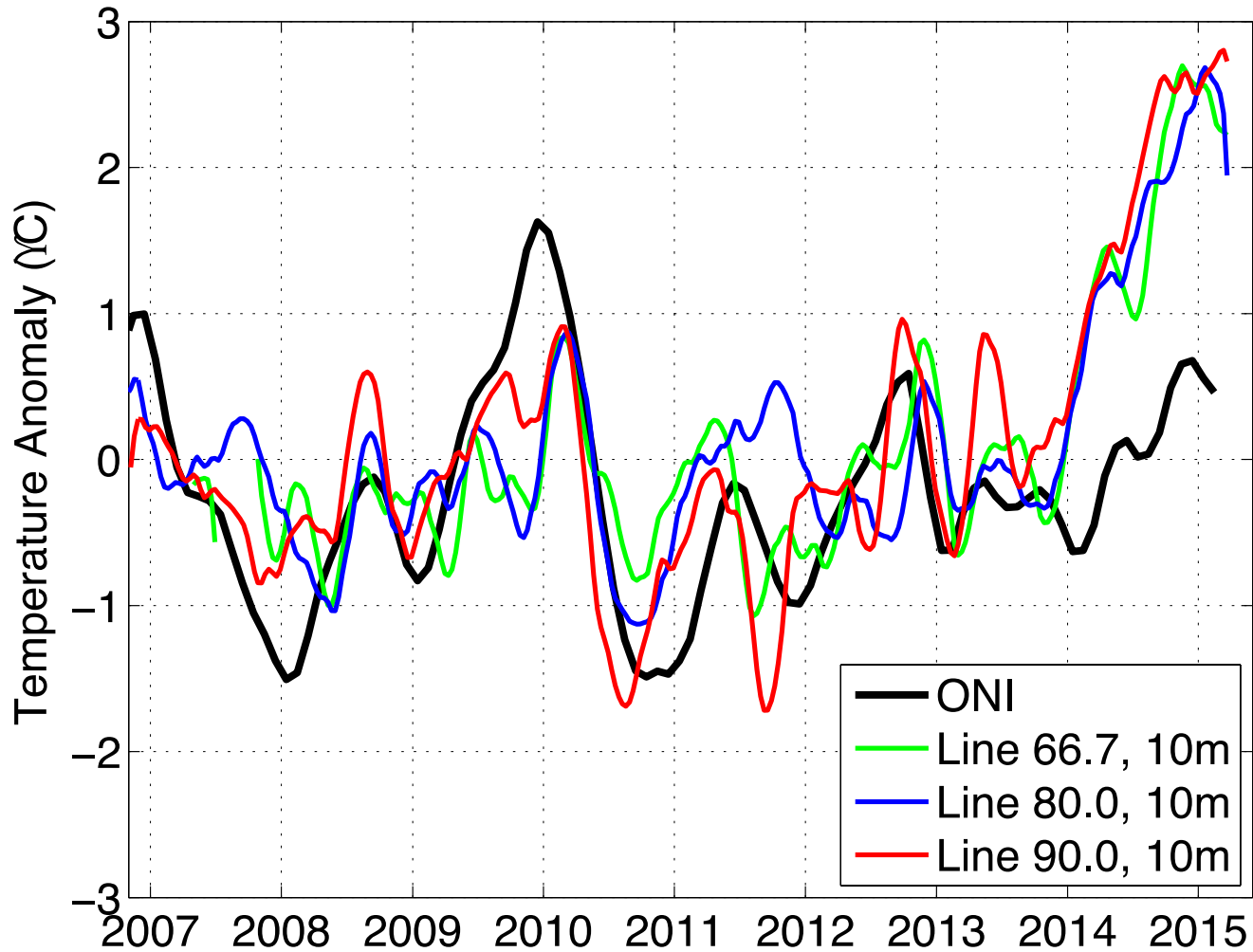
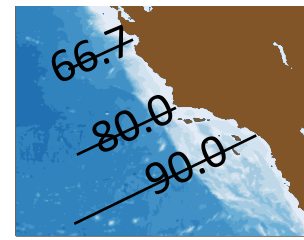
Line 80.0



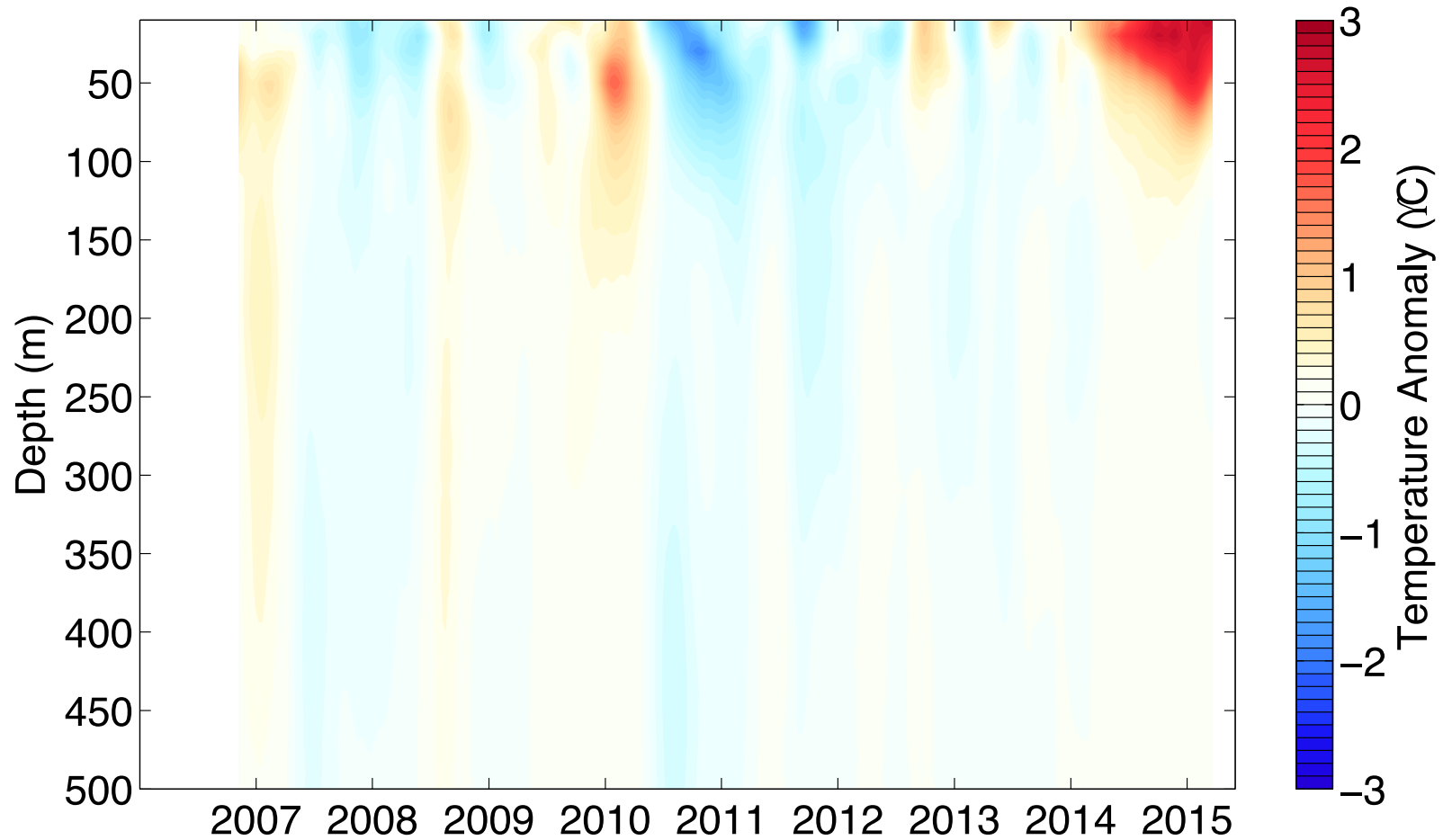
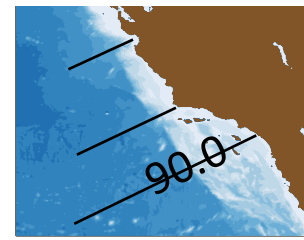
Line 90.0



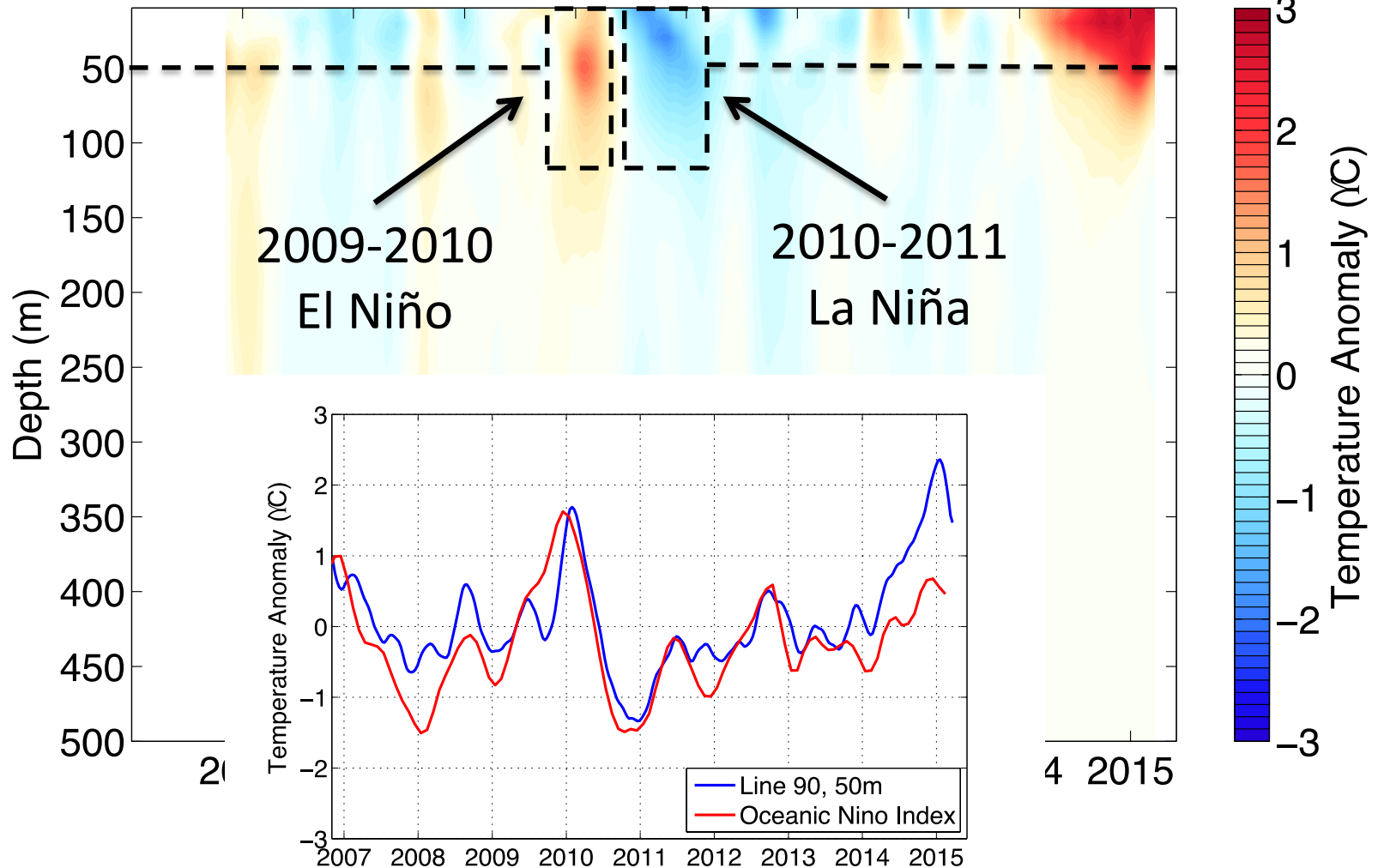
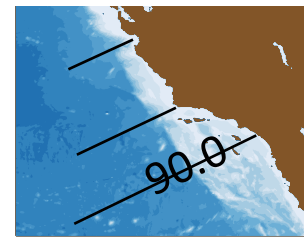
Interannual Anomalies



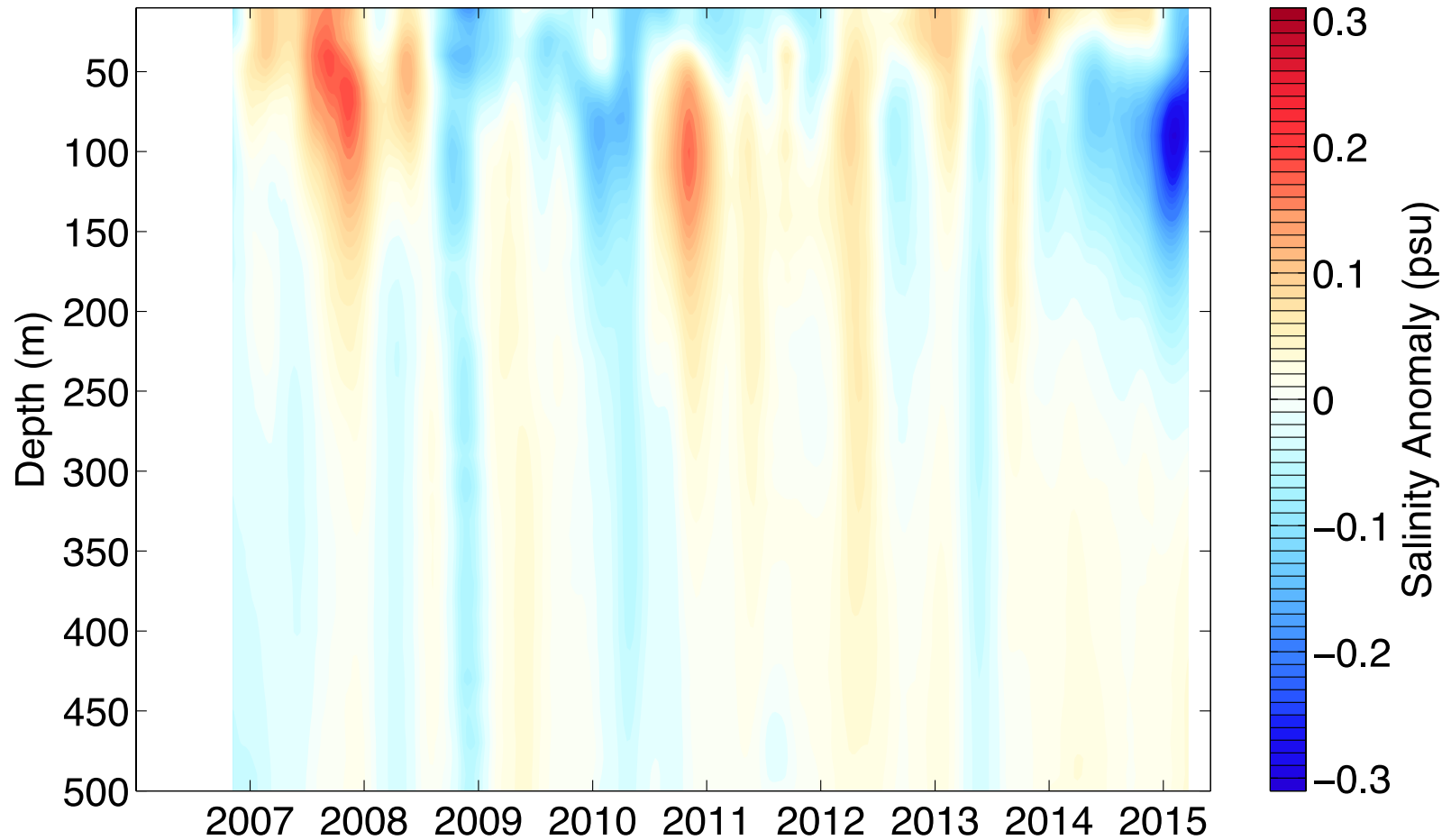
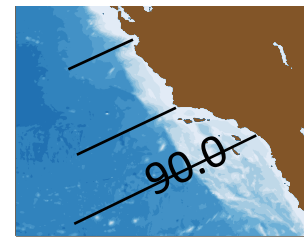
Interannual Anomalies



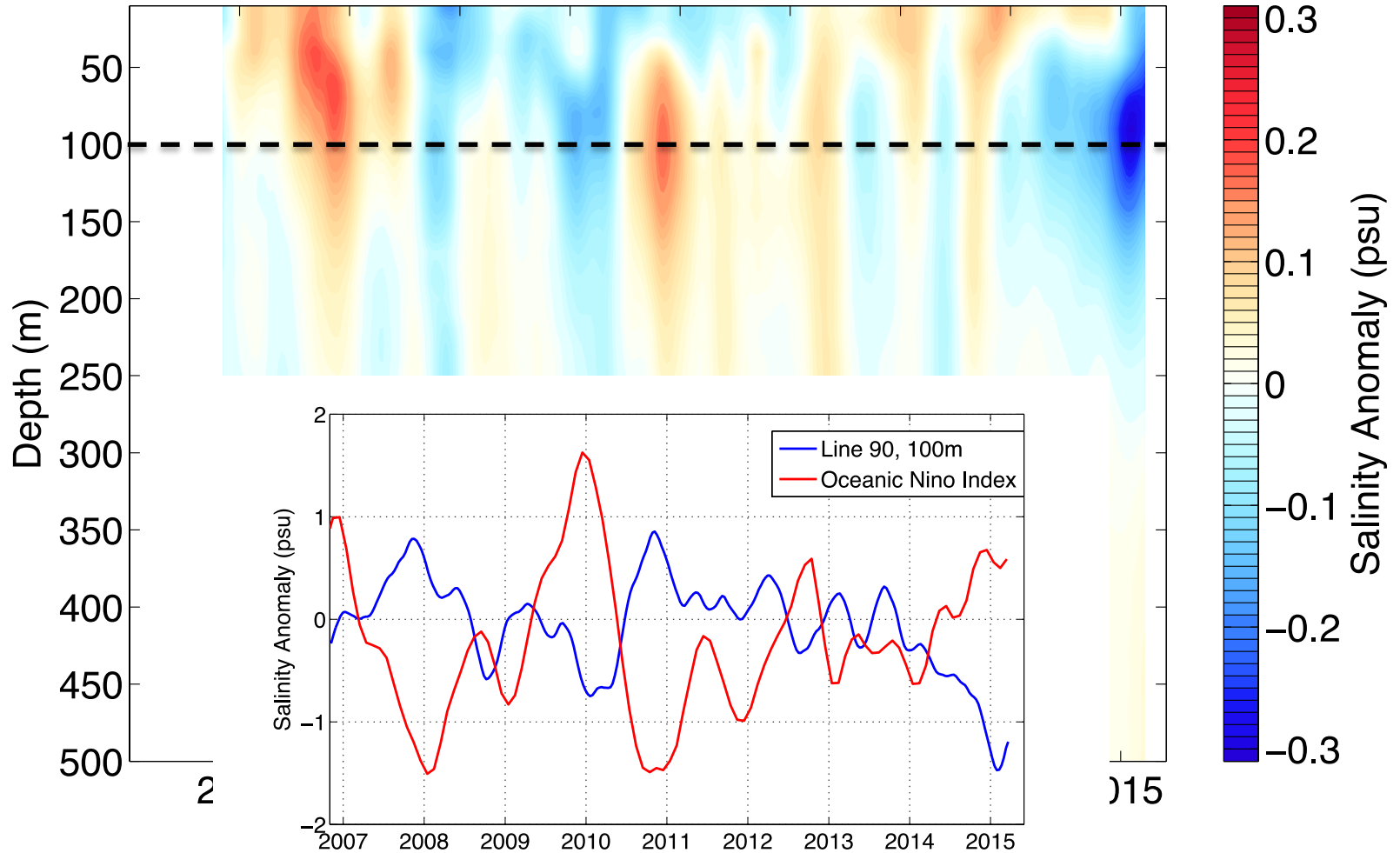
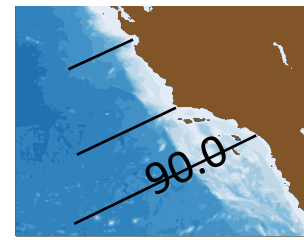
Interannual Anomalies



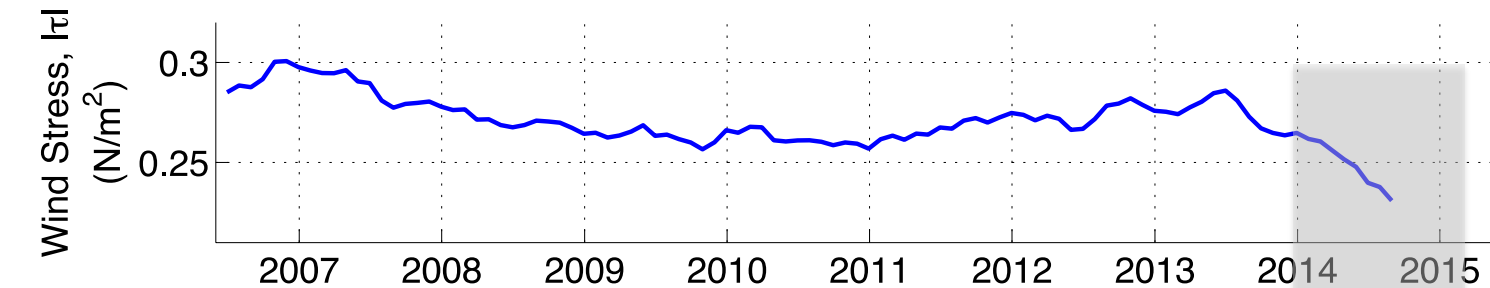
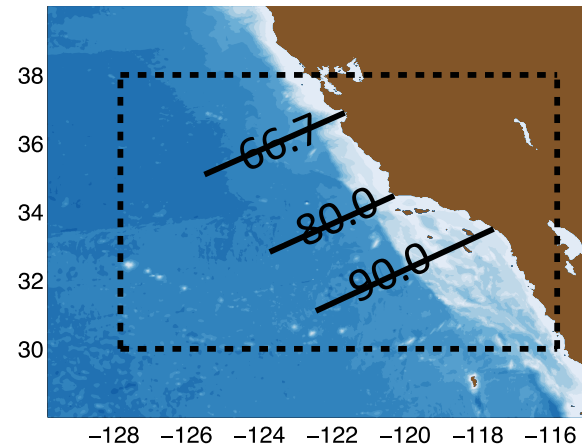
Interannual Anomalies



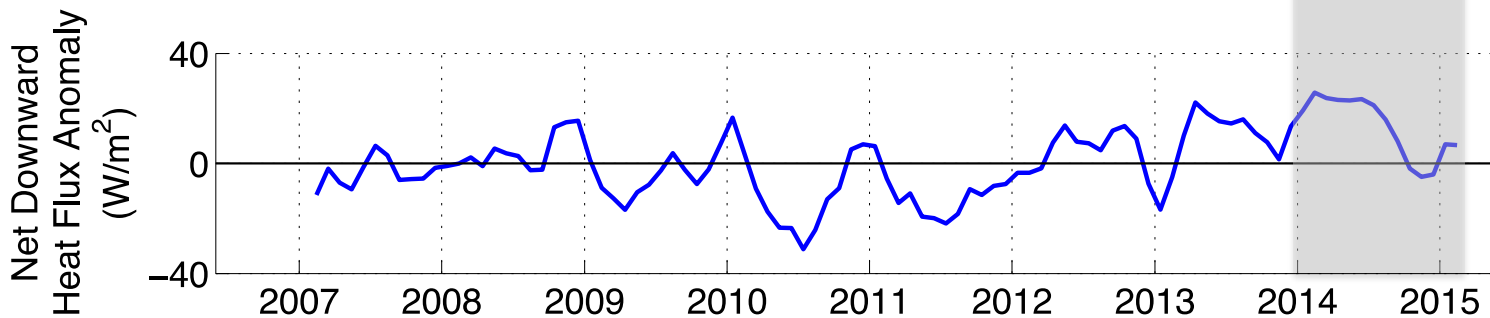
Interannual Anomalies



2014-2015 Atmospheric Anomalies

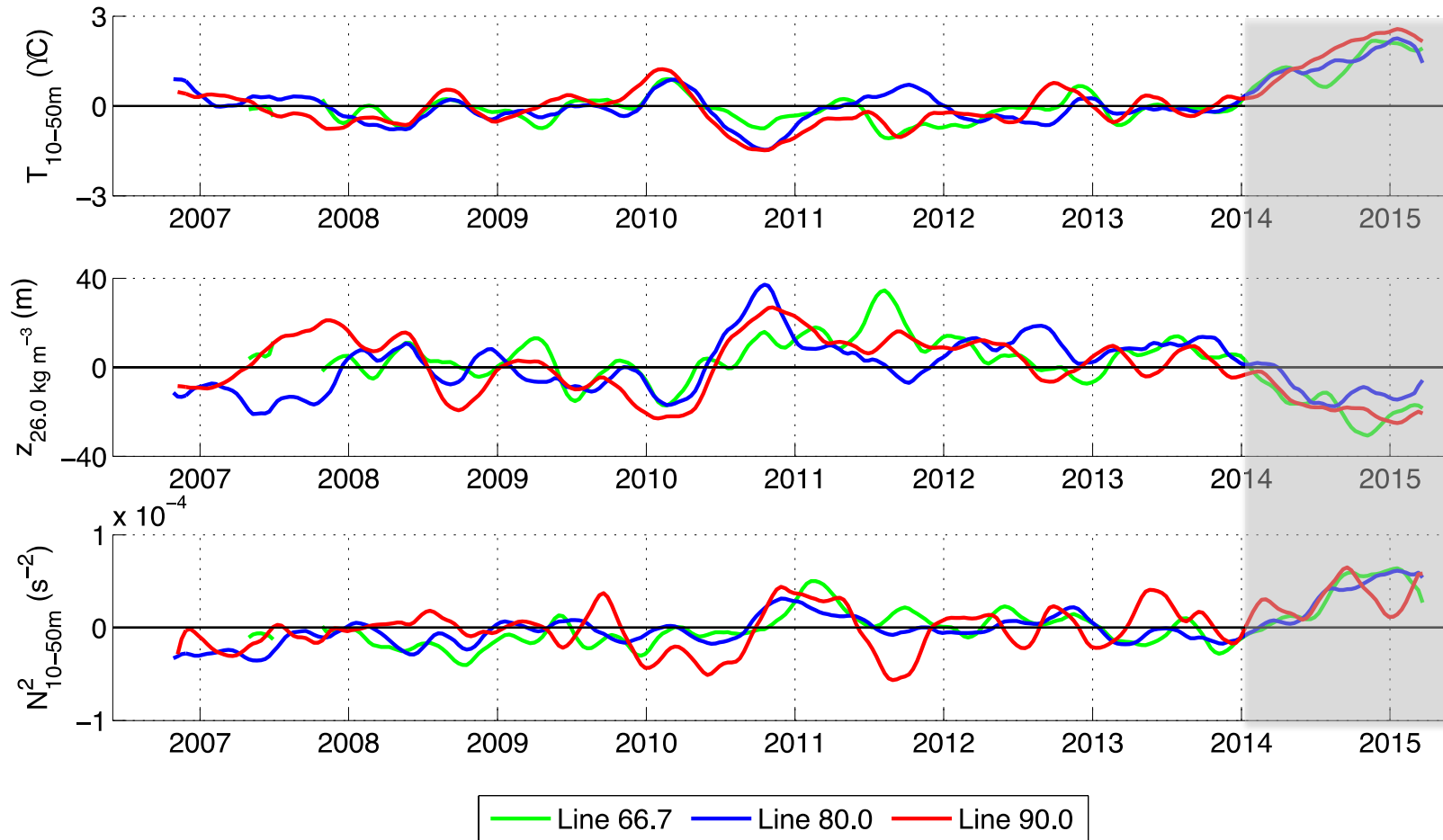
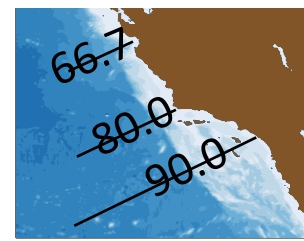


COAMPS

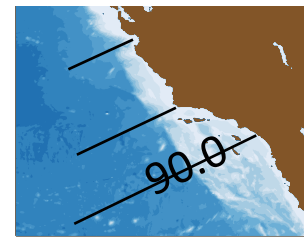


**NCEP
NAM**

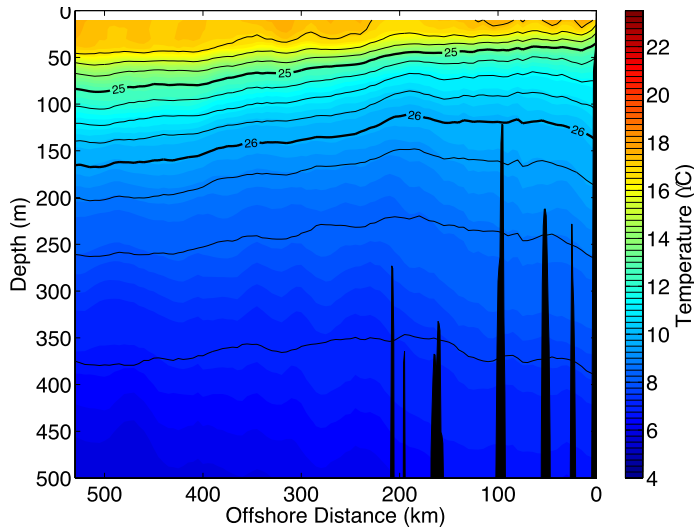
2014 – 2015 Oceanic Anomalies



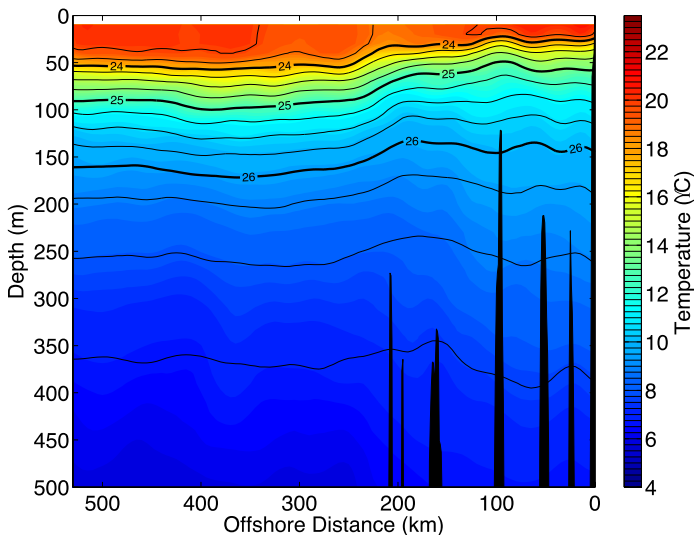
Summary



Average November 6



November 6, 2014



- Spray gliders reveal surface intensified positive temperature anomalies along CalCOFI lines 66.7, 80, 90
- Observed 2014-2015 conditions:
 - Anomalously **low wind stress**
 - Weak upwelling
 - Weak mixing
 - Anomalously **high surface heat flux** from the atmosphere to the ocean
 - Warm, highly-stratified upper ocean