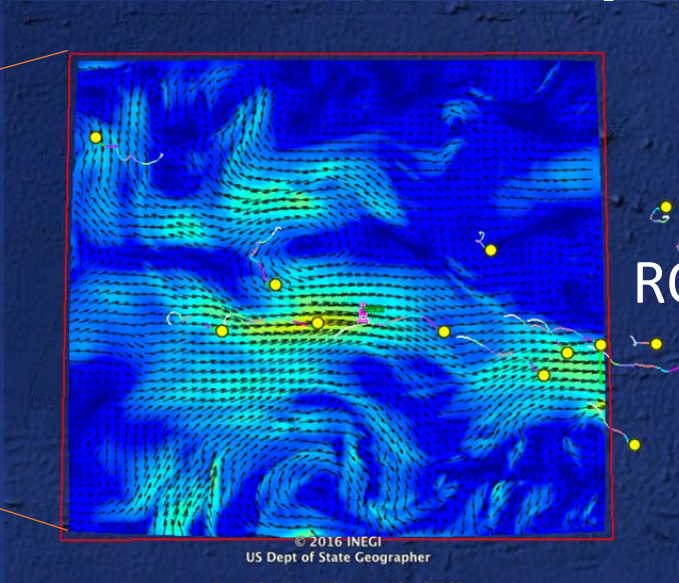
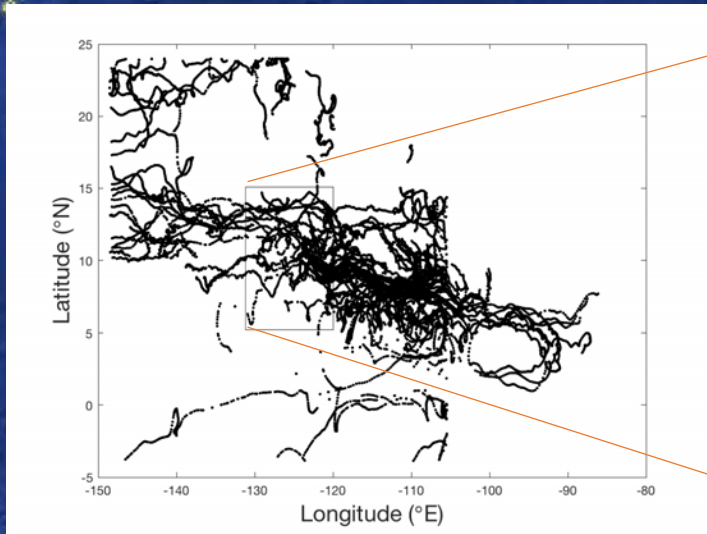


A satellite map of the Pacific Ocean, showing the western coast of North America and the Hawaiian Islands. A small pink lighthouse icon is positioned in the center of the image, below the title.

SPURS-2 Model Evaluation

Frederick Bingham and Zhijin Li

Model-data Comparisons



ROMS inner domain

Purpose:

- To understand how well ROMS depicts the surface velocity, temperature and salinity fields, and the vertical T/S structure of the SPURS-2 region
- To improve model usefulness for field work
- If model fails to correctly simulate surface fields is it due to missing physics in the model or inadequate data

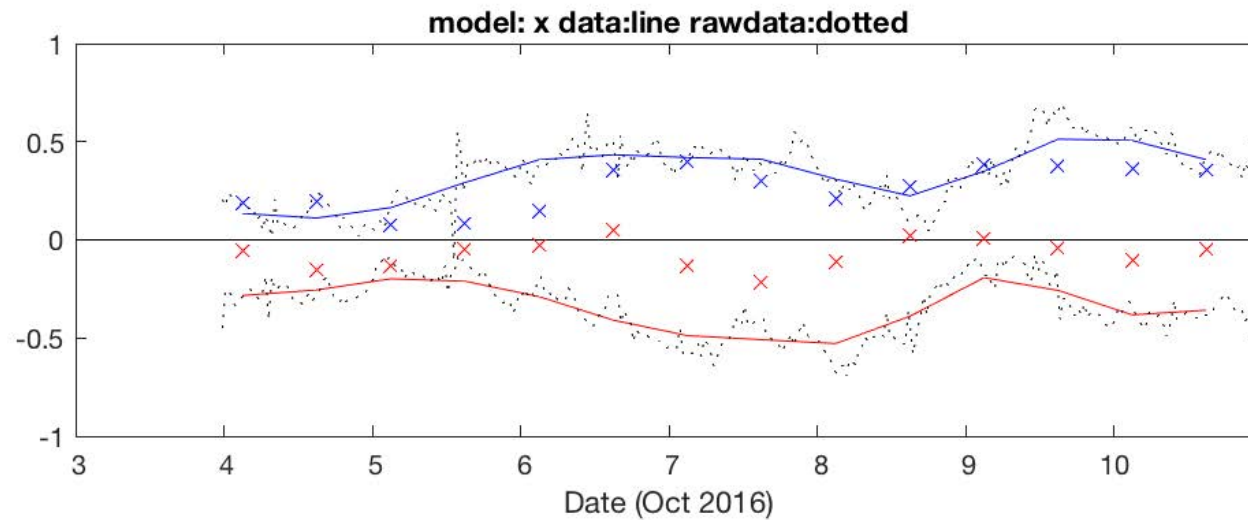
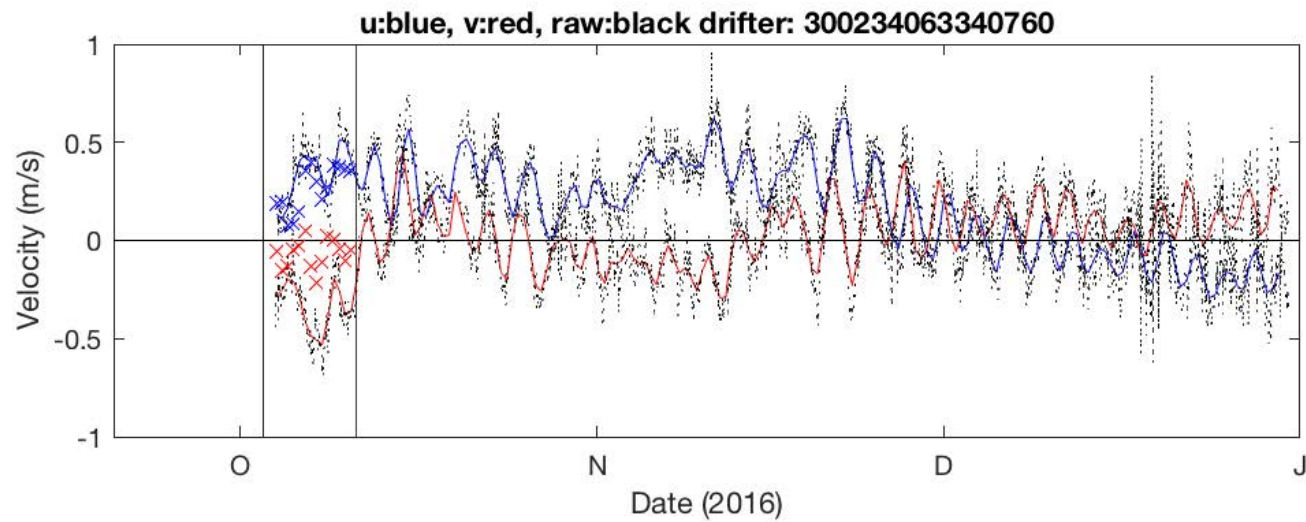
Drifter Data

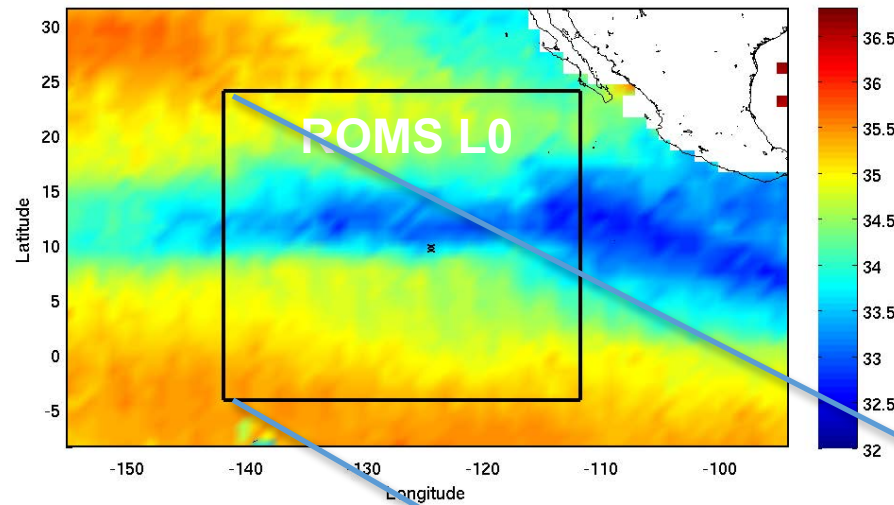
Drifters:

- Adjacent drifter fixes were first-differenced to get velocity. Velocities averaged in 12-hour time intervals to match ROMS.
- Additional comparisons were done with the SCUD data and Aviso geostrophic velocity during the same time frame as ROMS

*<http://apdrc.soest.hawaii.edu/datadoc/scud.php>

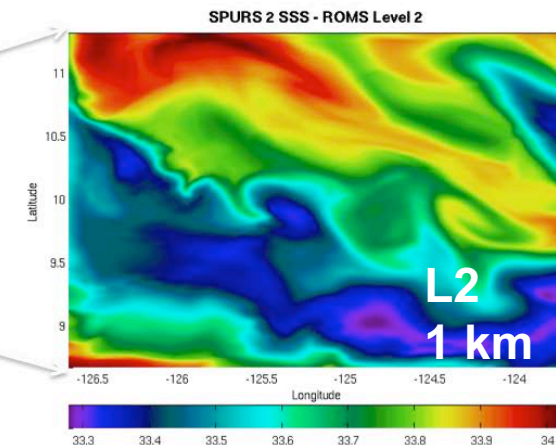
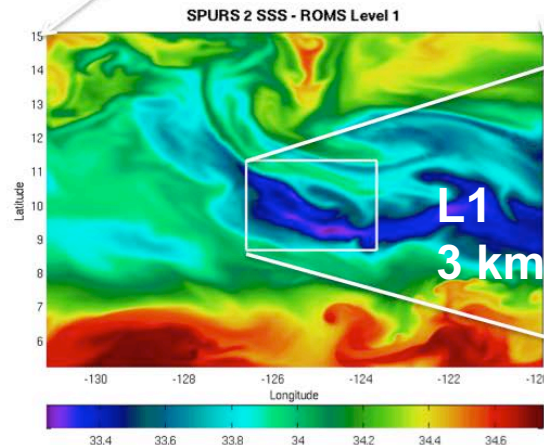
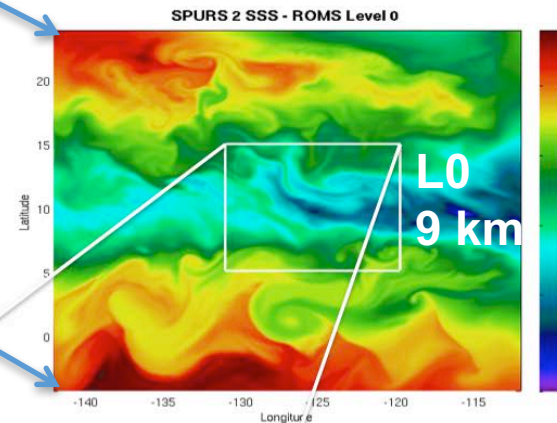
October 2016





ROMS Configuration

- 50 levels in the vertical with a resolution of about 2 m near surface
- Embedded within global HYCOM
- Assimilates AVISO SSHA, microwave SST, MODIS SST and T/S profiles from TAO moorings
- I had access to about 6 weeks of 1 km model output



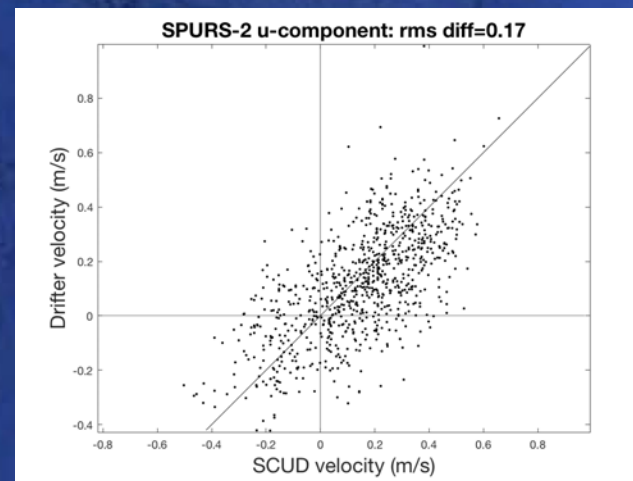
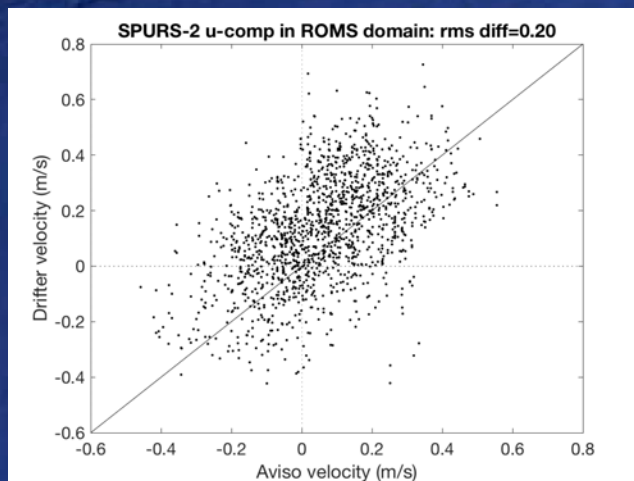
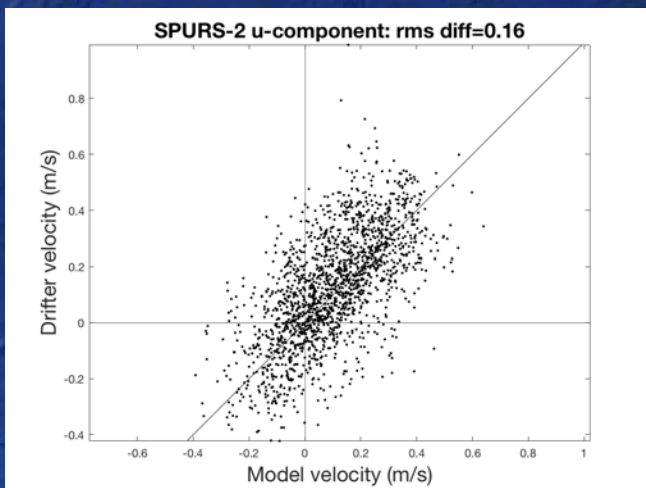
Component comparisons

ROMS-Drifter

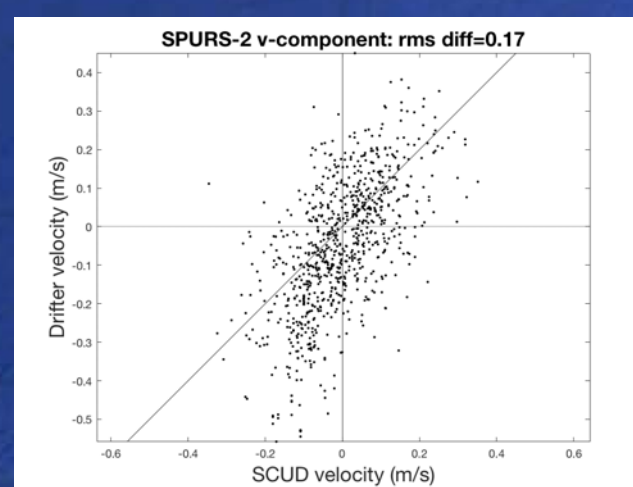
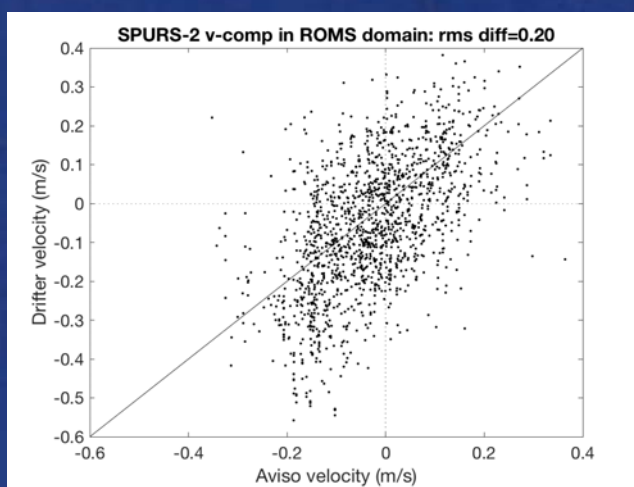
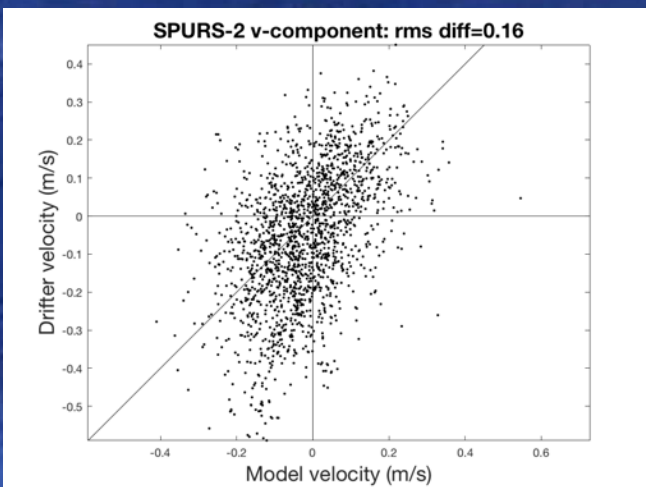
AVISO-Drifter

SCUD-Drifter

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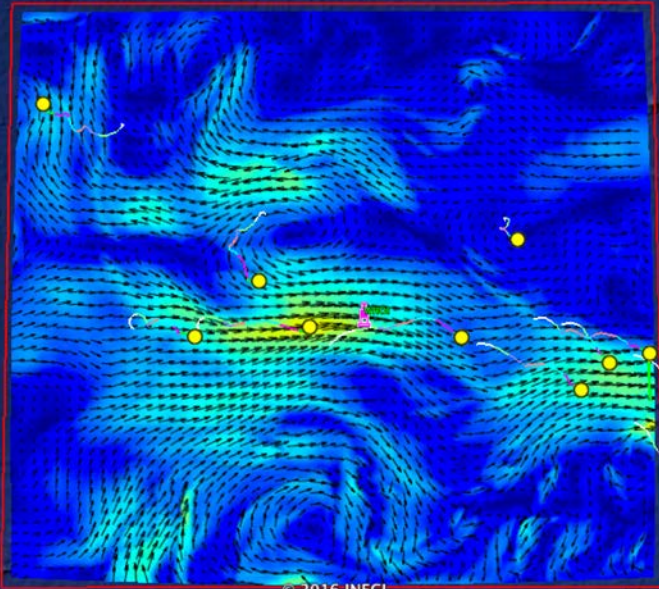


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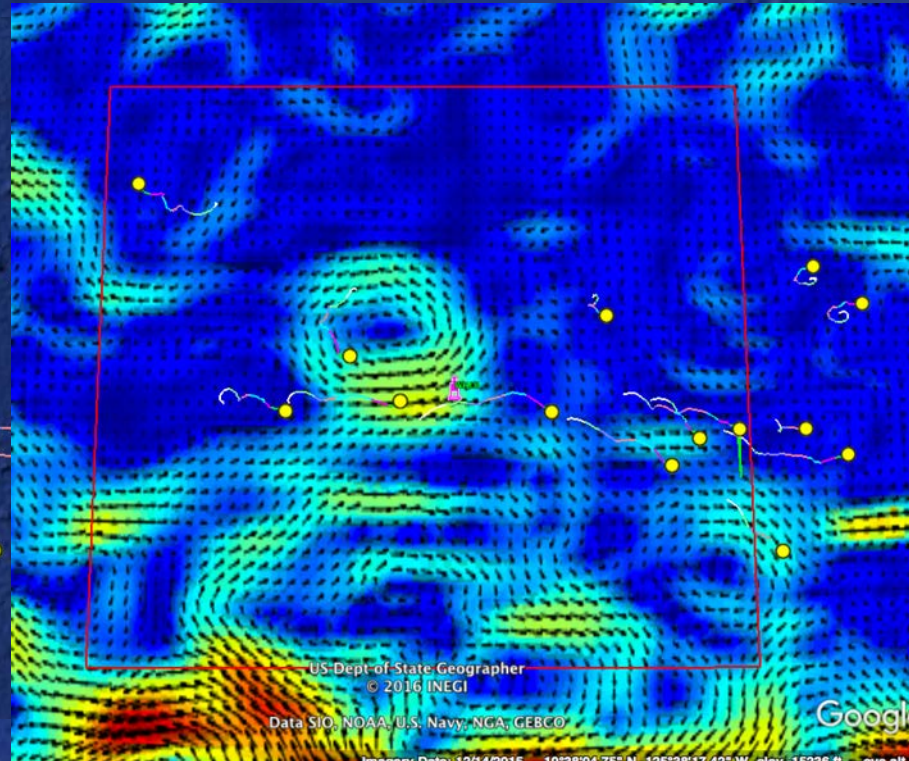
ROMS

AVISO

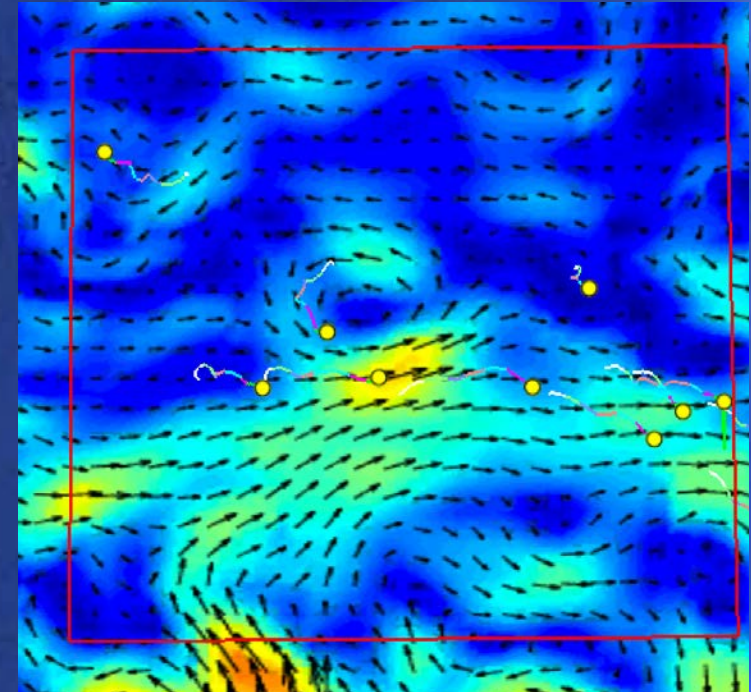
SCUD



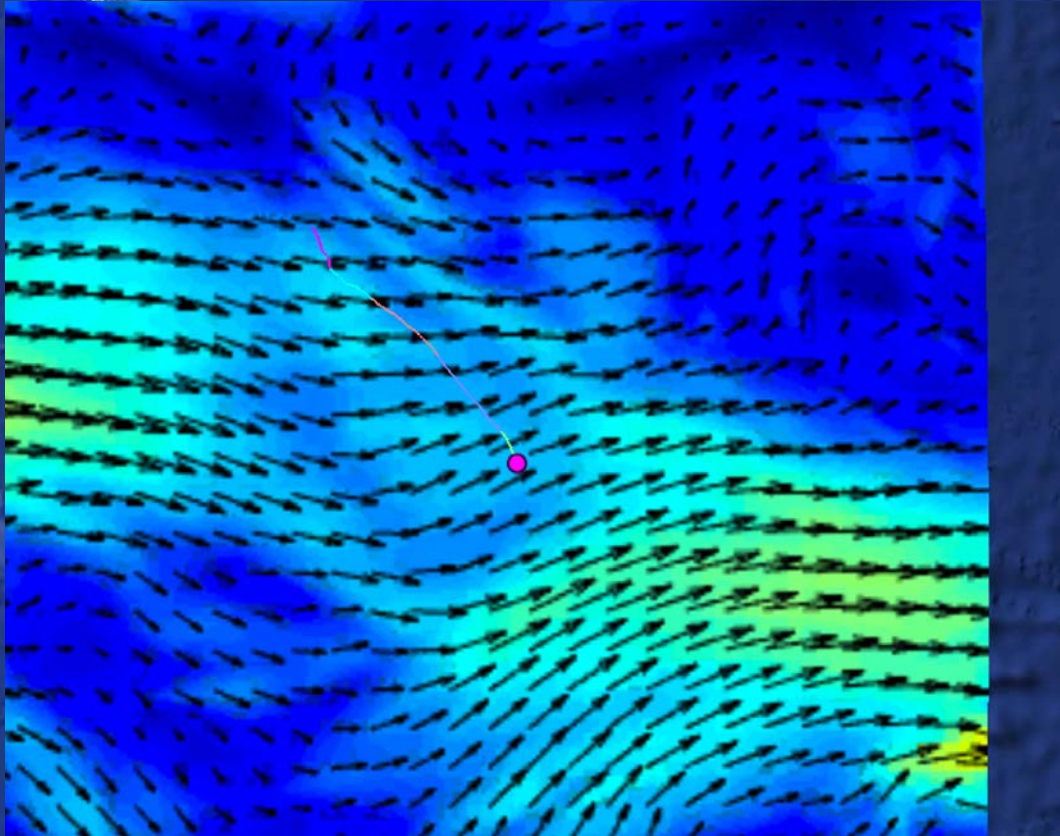
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US Dept of State Geographer



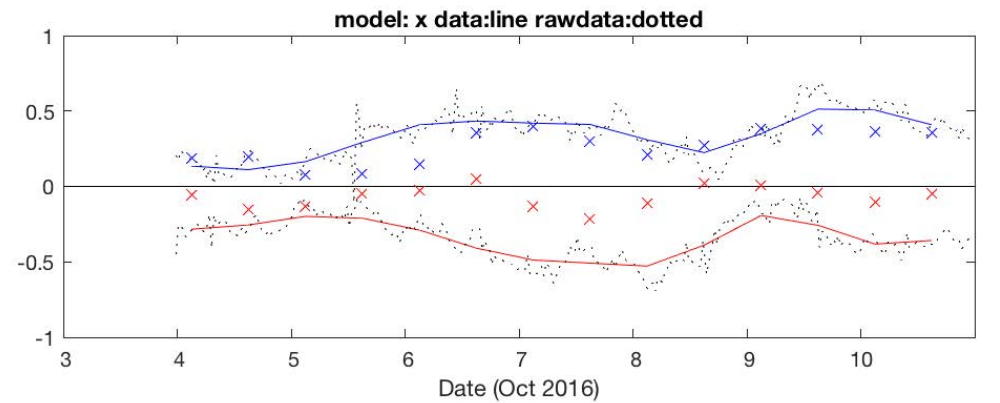
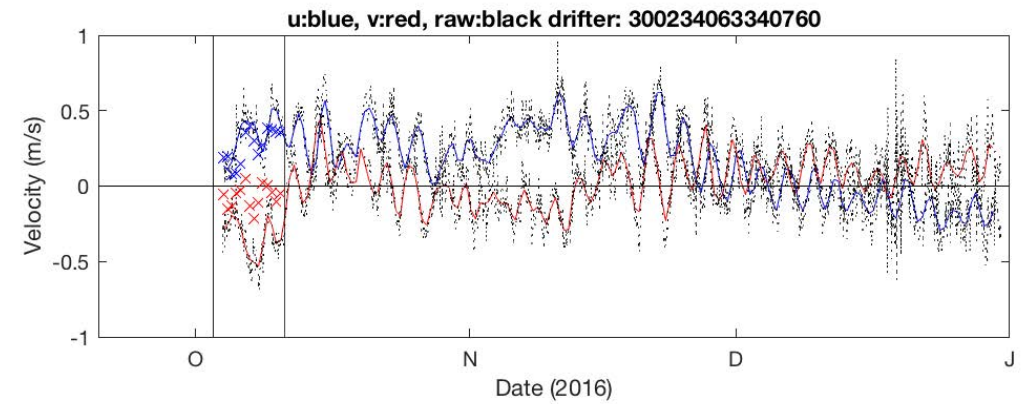
US Dept of State Geographer
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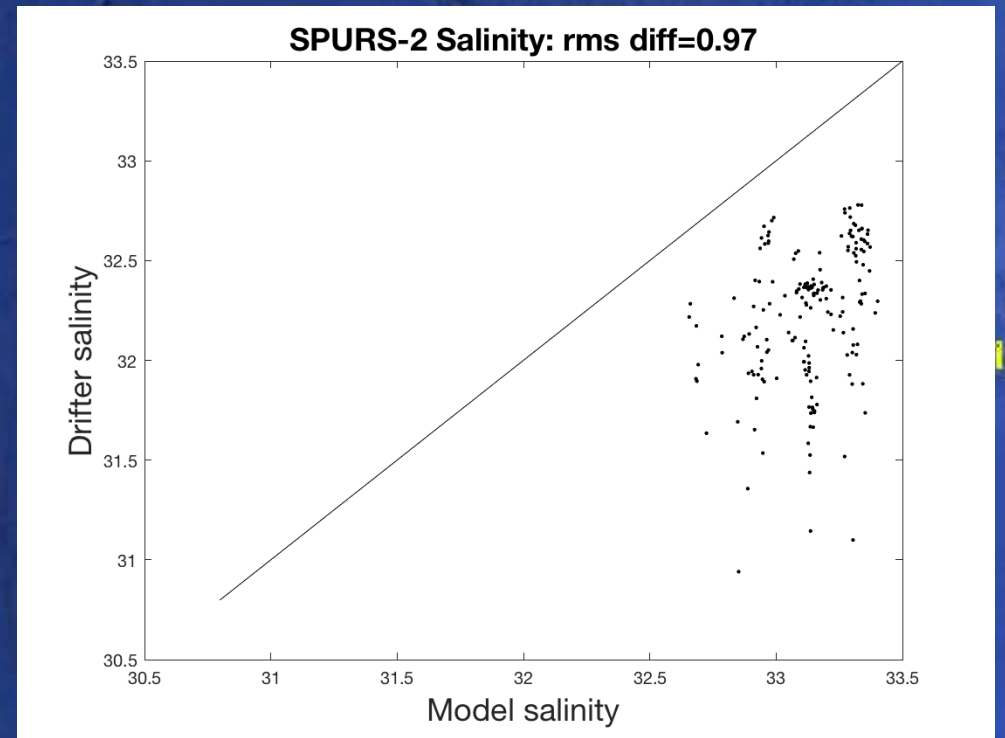
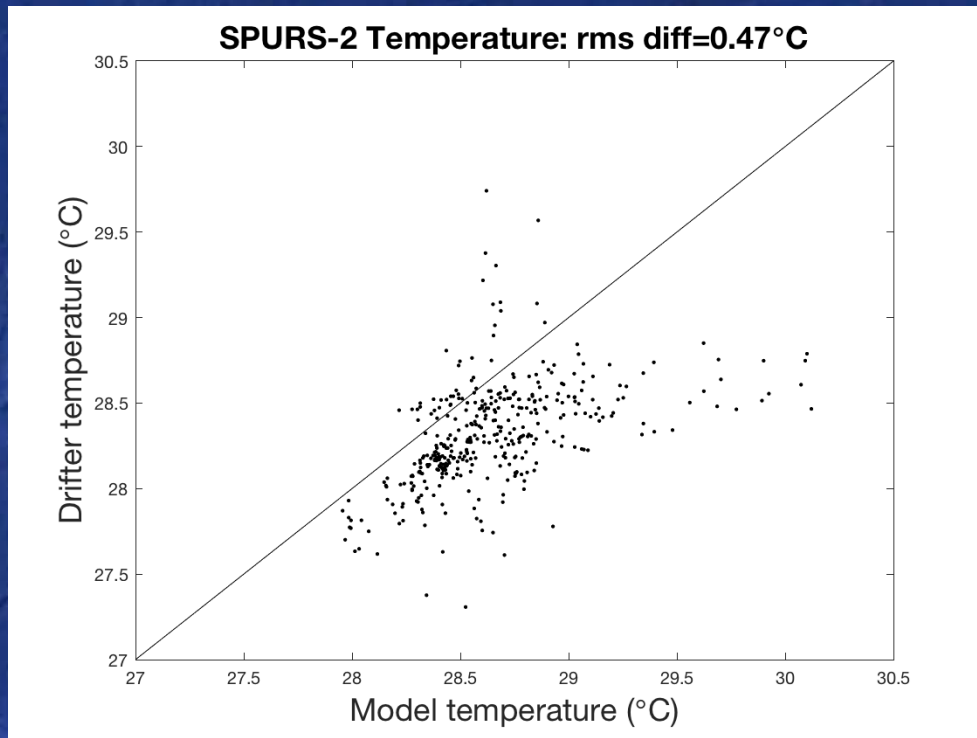
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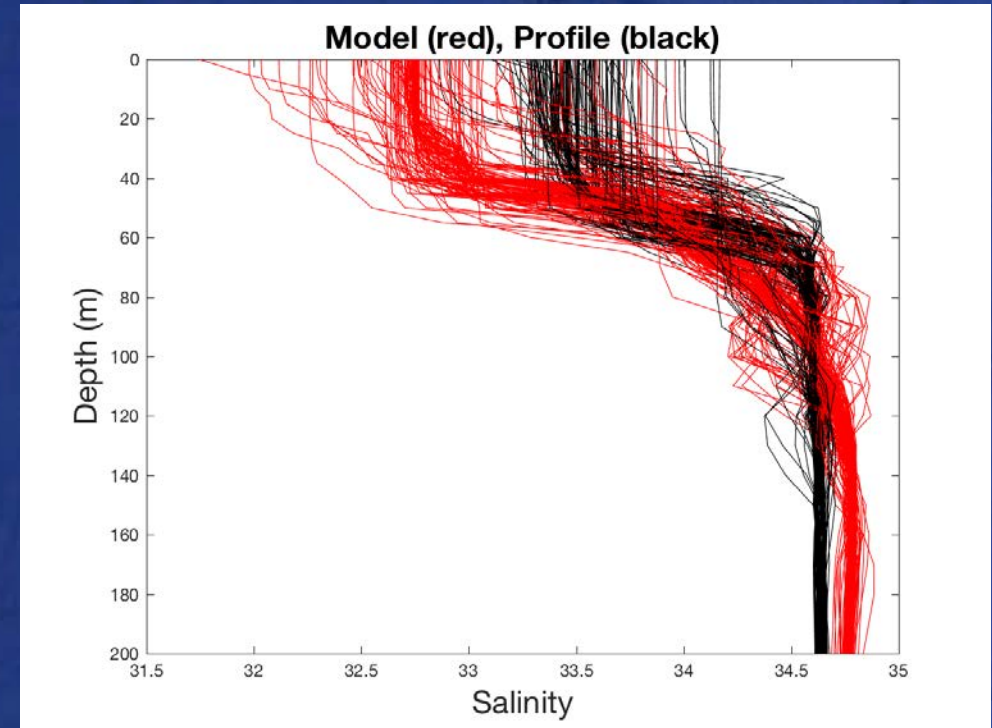
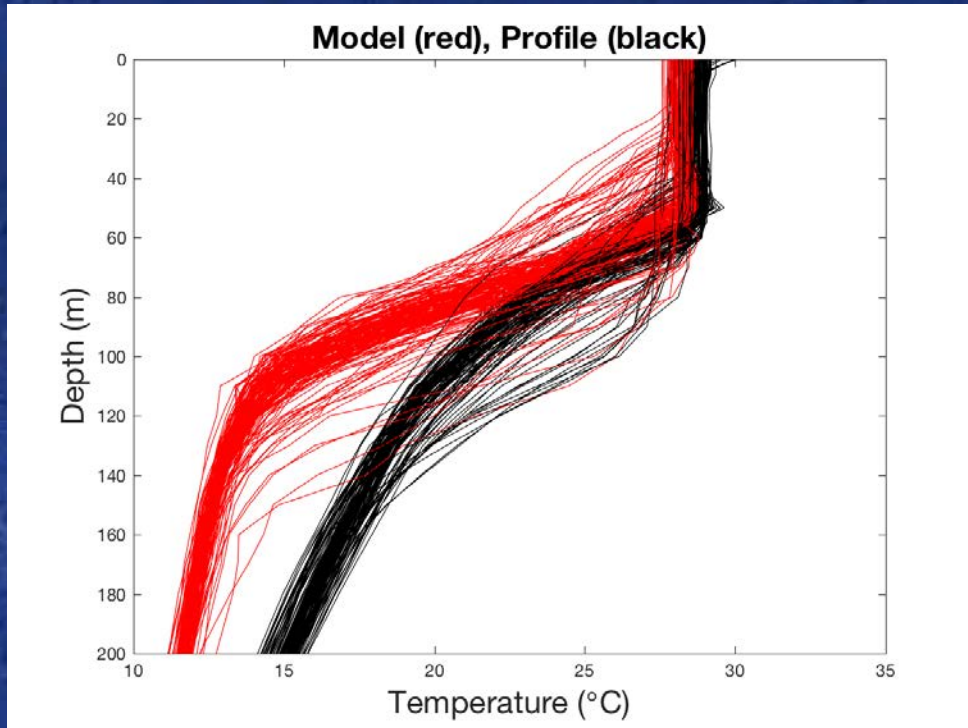
ROMS



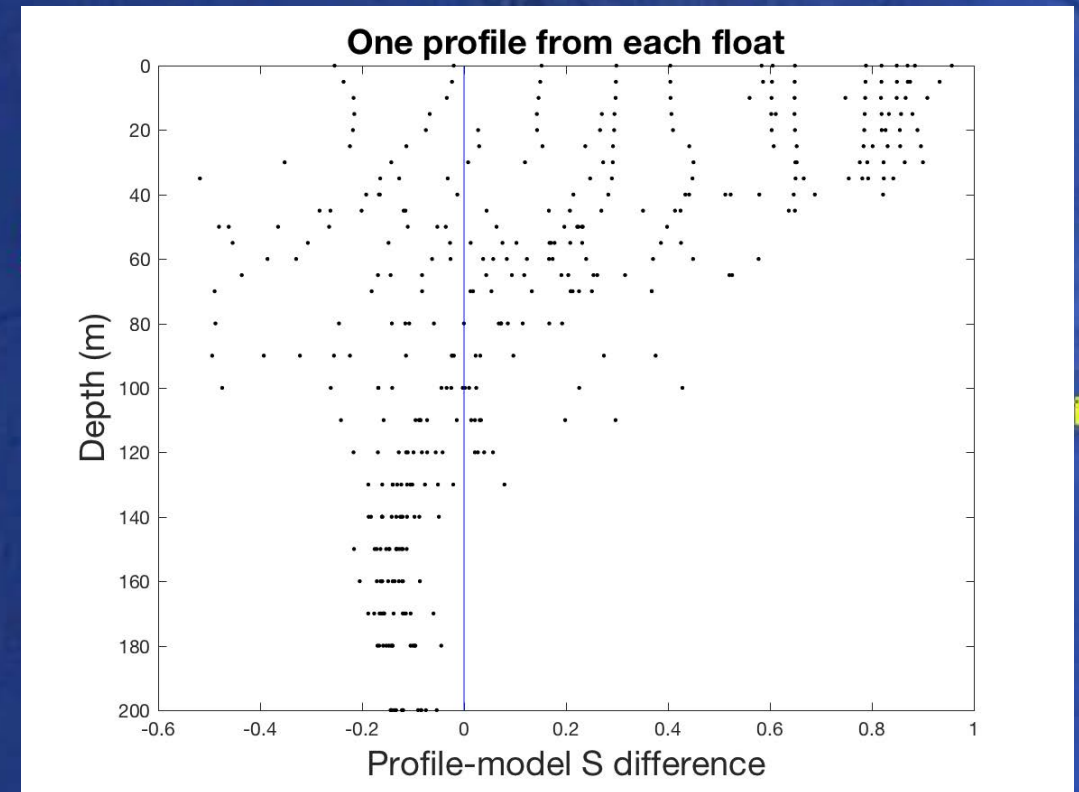
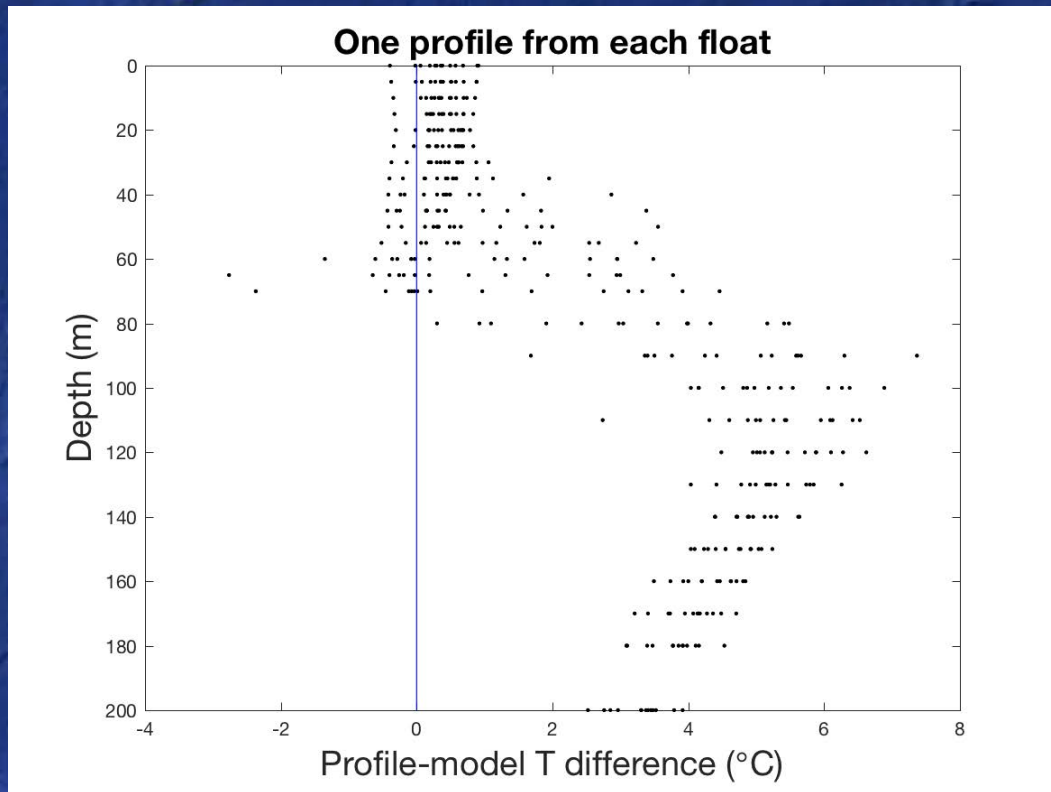
Surface Temperature and salinity



Profile Temperature and salinity



Profile Temperature and salinity



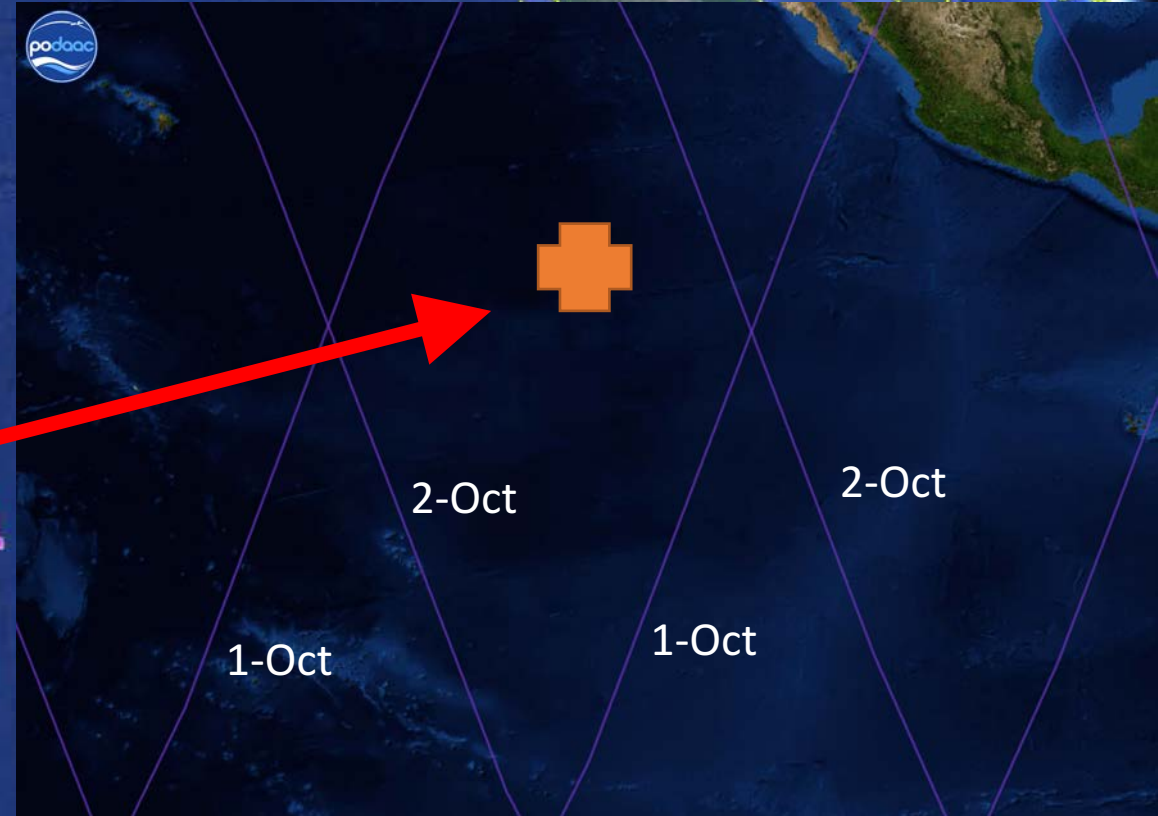
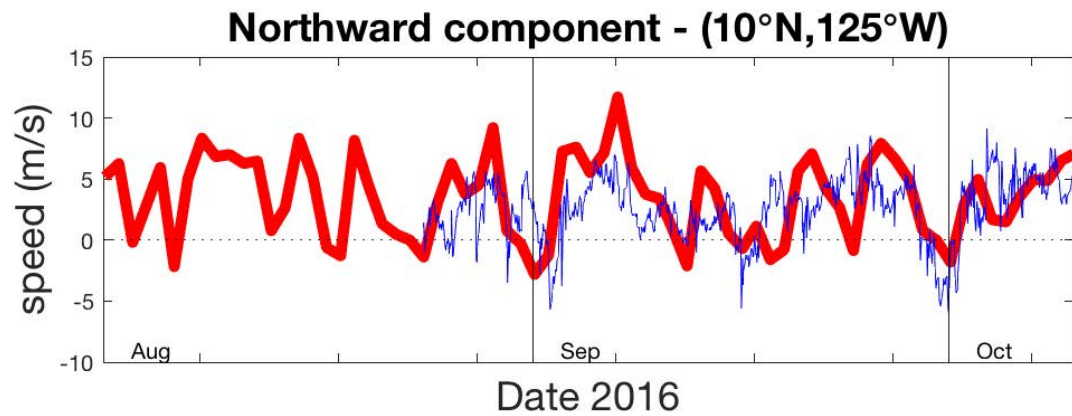
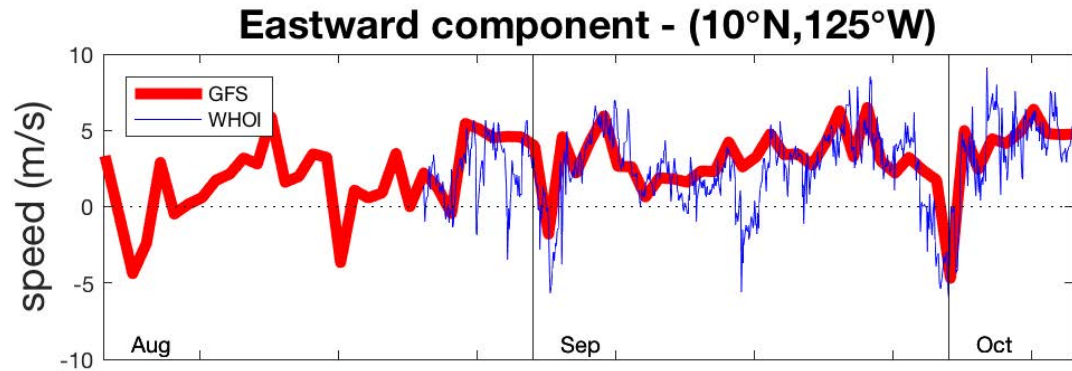
Summary

Comparisons were done between drifter velocities and ROMS and 2 different velocity products

- RMS differences were 0.16-0.20 m/s
- There was little bias (median difference of 0.03-0.04 m/s) between drifters and ROMS
- Velocity products all missed the southward (but not eastward) component of a strong burst of flow in early October 2016.
- Why? Is this a persistent condition, or just one time? Is it a deficiency in the model physics or the data being assimilated into the model?
- ...



WHOI Mooring and GFS Wind



...Summary

Comparisons were done between float profiles and ROMS

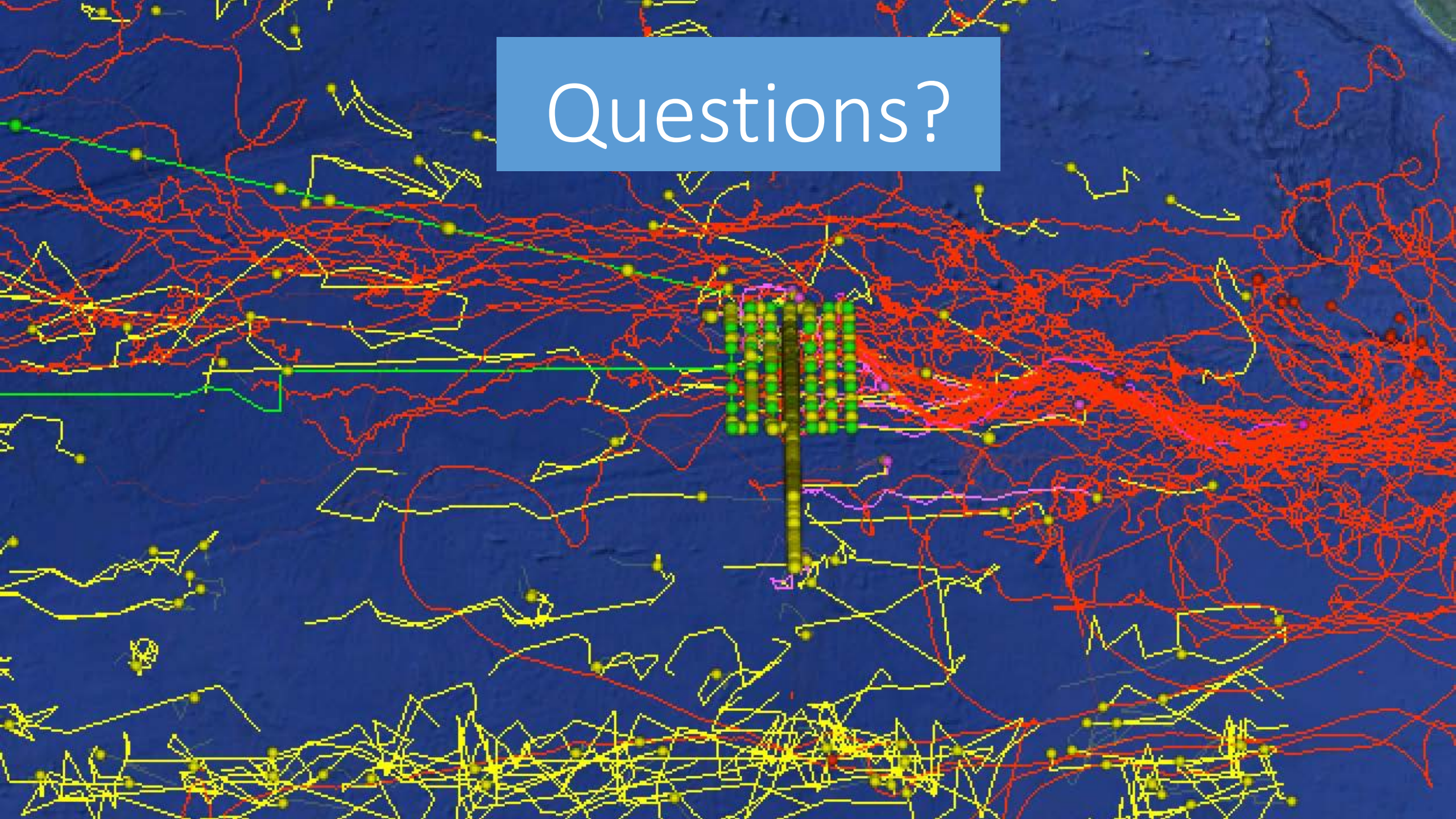
- ROMS depicts the thermocline as being too sharp, but the mixed layer is about the correct thickness
- Future runs of ROMS will assimilate profile data to improve depiction of the vertical structure and AVISO absolute SSH to improve flow field

Future directions

- Velocity comparisons with the OSCAR data
- Expand comparison in space and time, using lower-res levels of ROMS
- Comparison with other datasets



Questions?



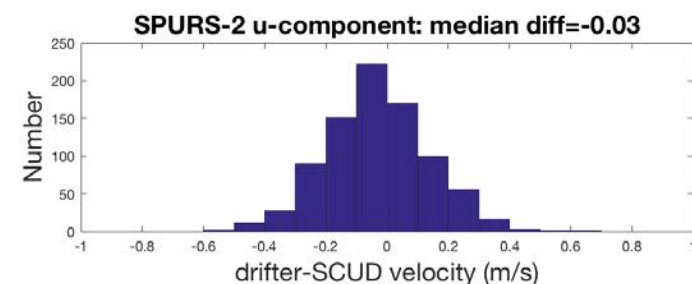
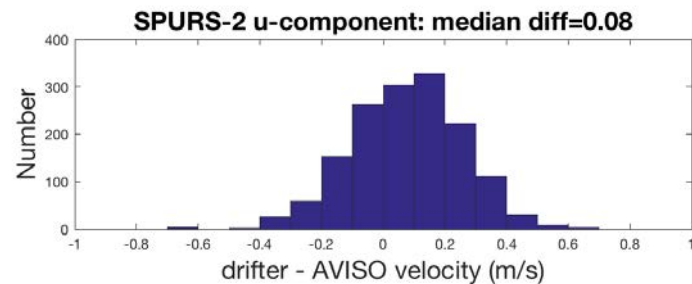
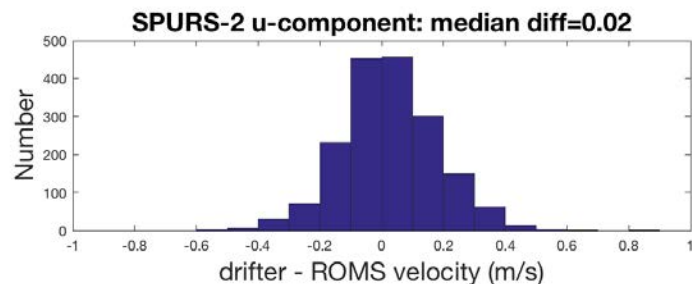
Component comparisons

ROMS-Drifter

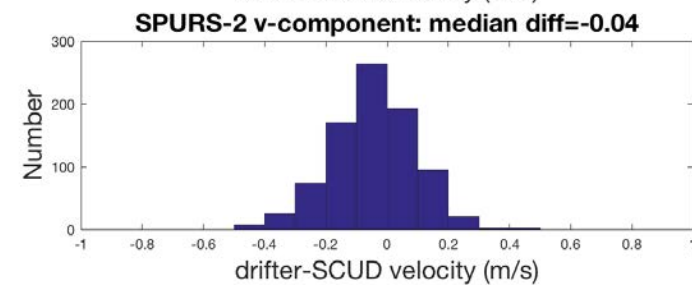
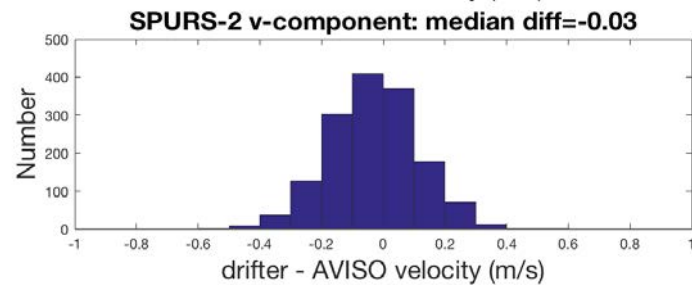
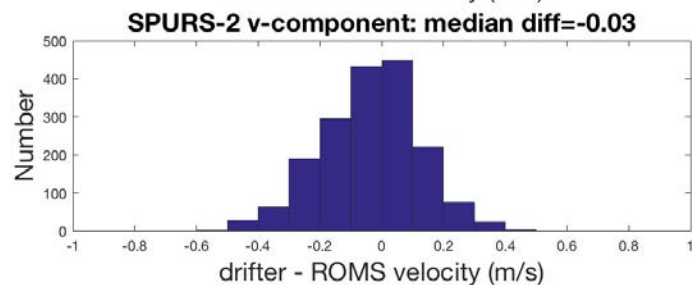
AVISO-Drifter

SCUD-Drifter

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Duplicate slide

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