



SPURS-2 Wave Glider observations

Ben Hodges

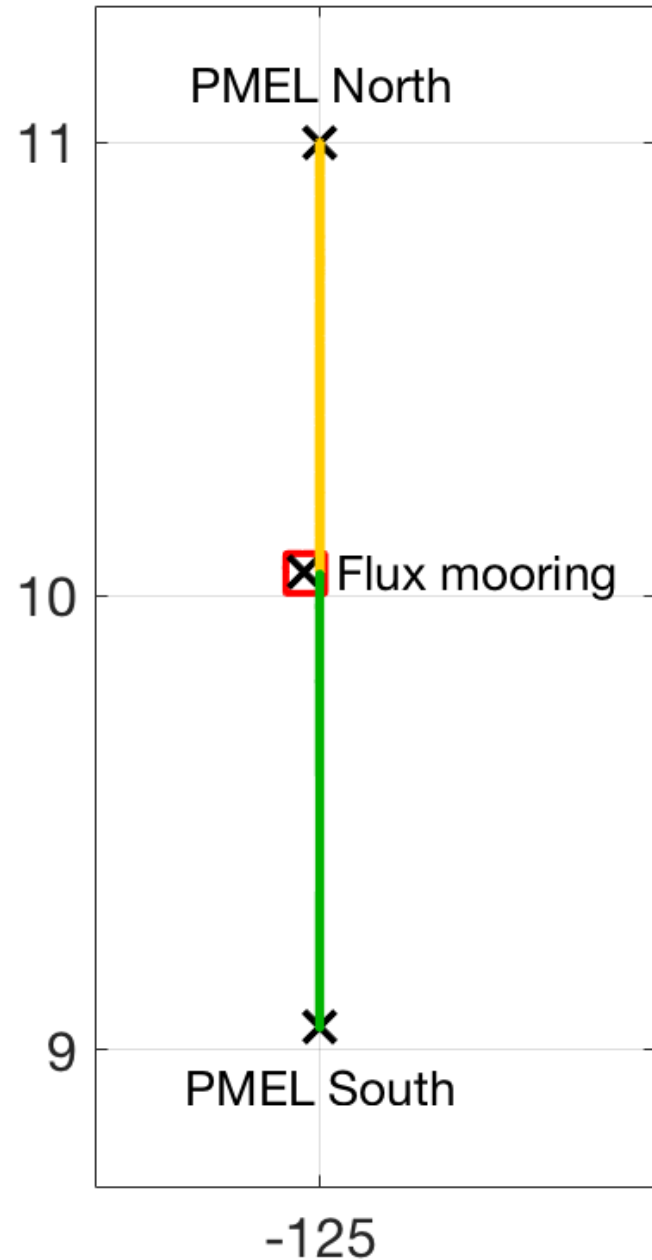
March 12, 2018

SPURS-2 Analysis and Synthesis Meeting



SPURS-2 Wave Glider sampling

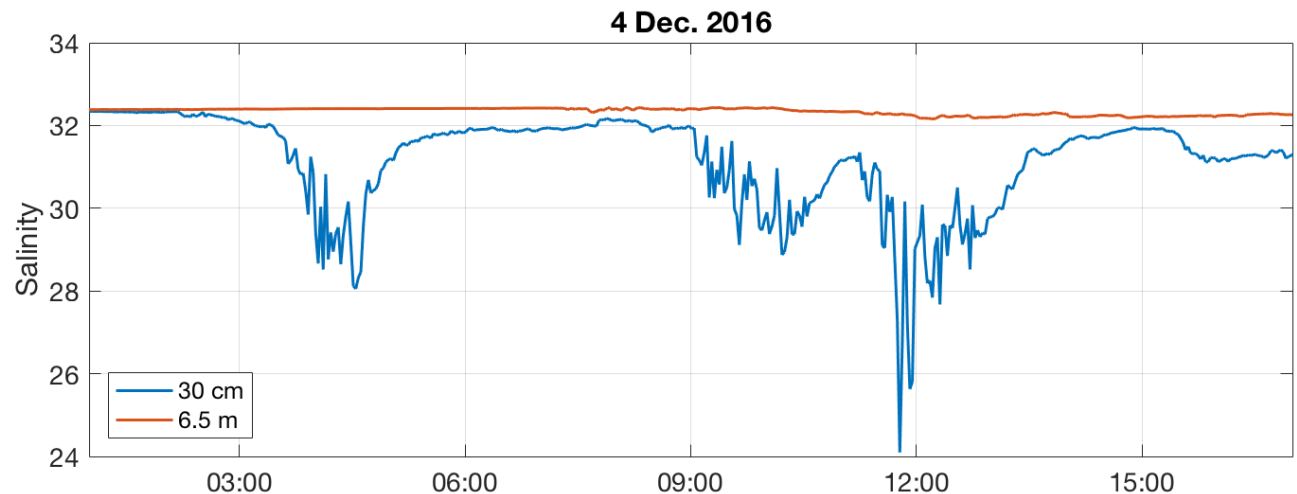
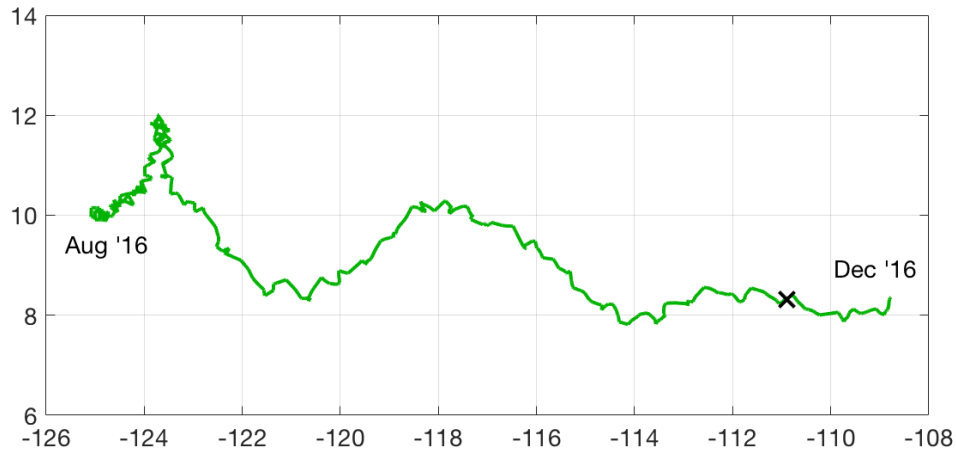
- 3 SV-2 Wave Gliders
 - “Red”
 - “Yellow”
 - “Green”
- 200-km transect
- 14+ months
- Sea-Bird GPCTDs
 - 30 cm/6.5 m
 - 2-minute sampling (~100 m)
 - ~1.5 M samples
- Wind (Airmar WX200)
- Surface current
- SBE-56
 - (5-s sub temperature, first 8 months)
- Salinity rake
 - (3 deployments ~5 days each)



Lagrangian experiment

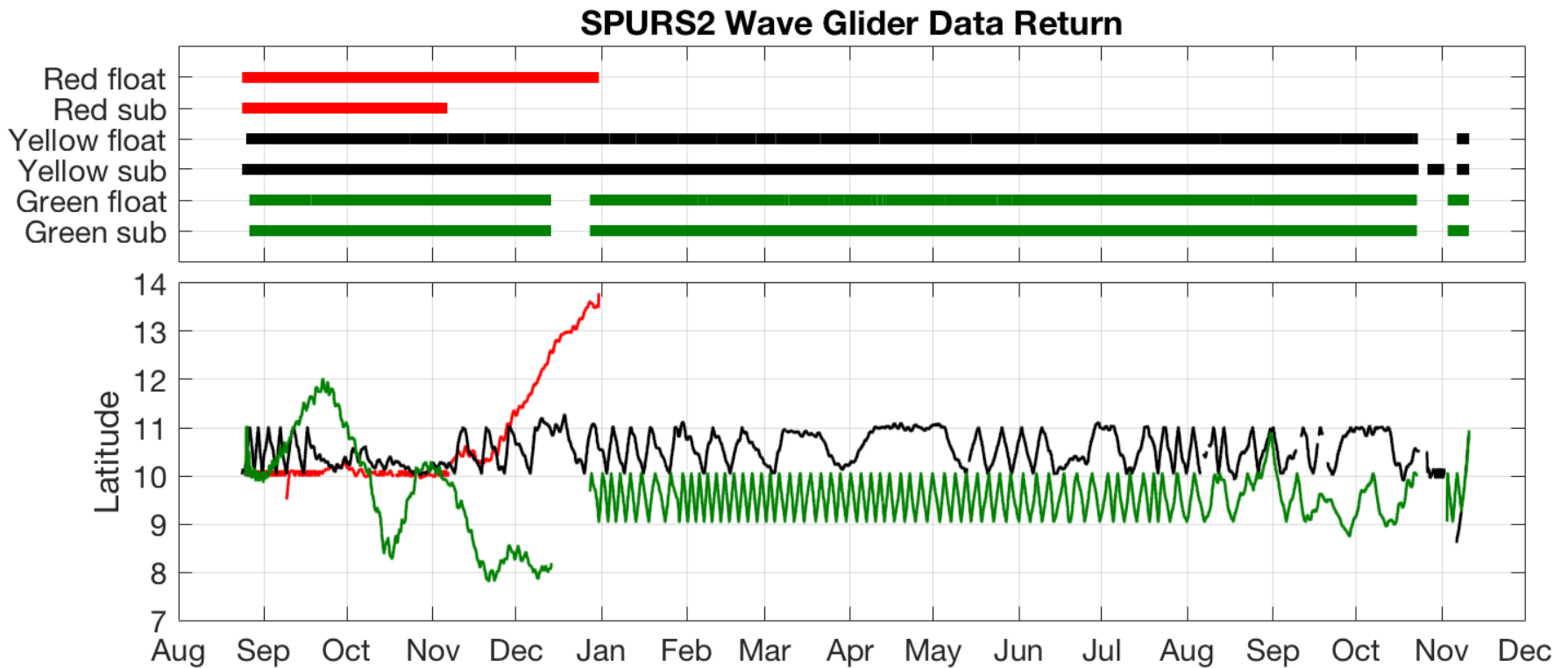
"Green" spent >3 months with Lagrangian array

- Followed MLF ~1600 km east
- Attempted to repeatedly intercept MLF along O(10km) transects with varying headings
- Planned and piloted mainly by Andrey S.
- Whisked back to SPURS-2 site by R/V Lady Amber



Performance

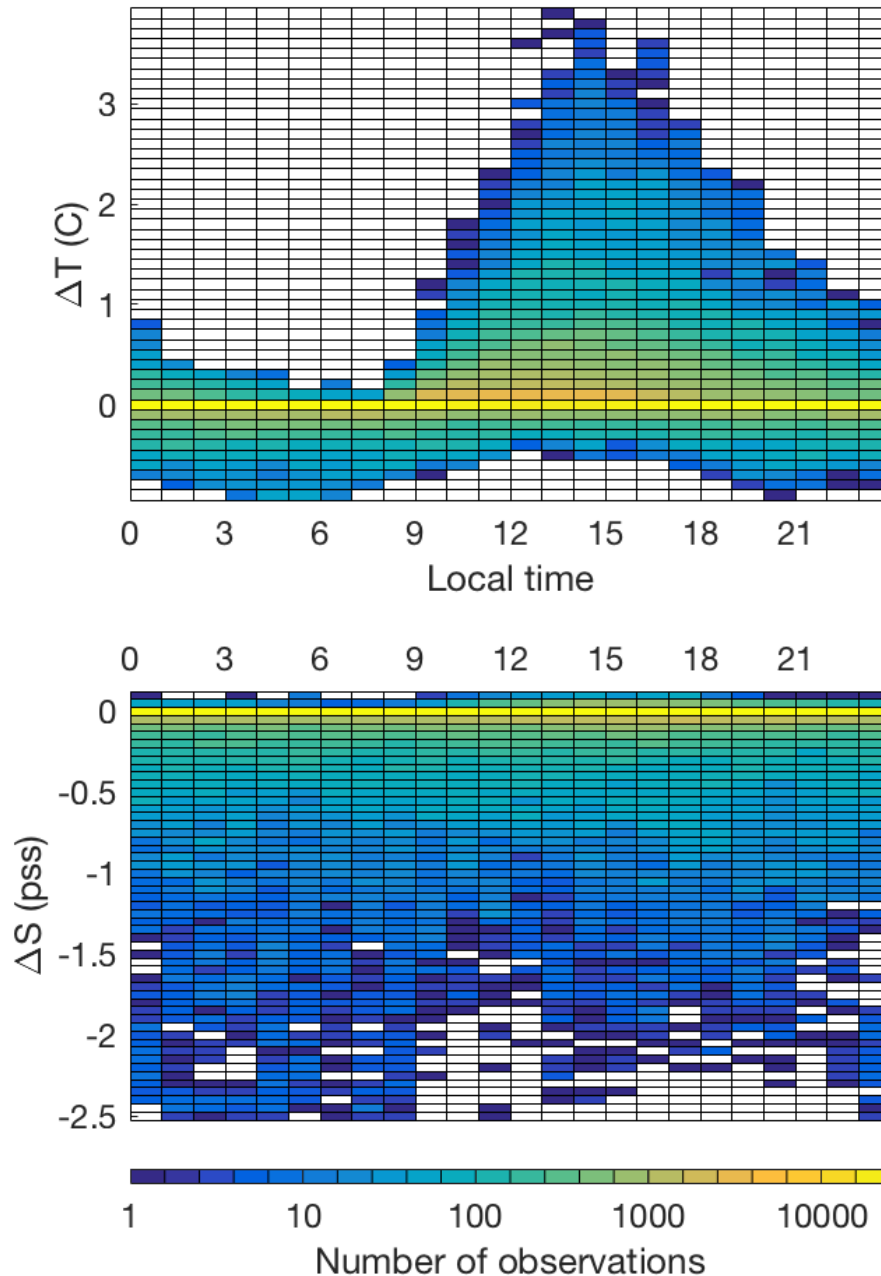
- 1 early failure ("Red")
- Data return otherwise good: 32 Wave Glider months total
- Endurance (Red aside) better than anticipated
- Some difficulty overcoming current at times
- After completion of Lagrangian experiment, monthly or better repeats of transect from 9°N to 11°N



Statistics

With a record spanning a full year, we can make robust statistics of the properties of fresh puddles—frequency, size, intensity, duration, seasonality, horizontal structure, etc.

Some evidence that intense surface freshening is most frequent within a few hours of dawn.



Salinity rake

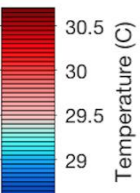
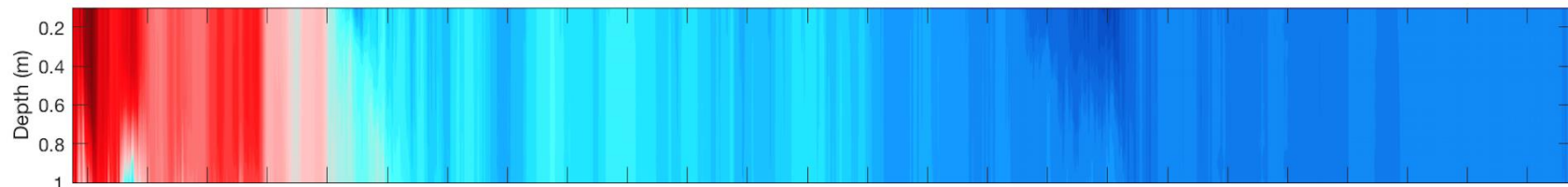
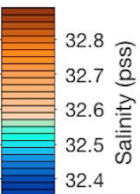
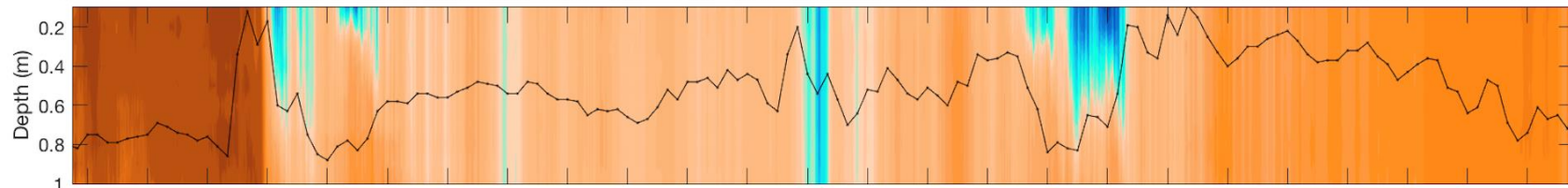
- 10 NBOSI CT sensors
 - 10-cm spacing over upper meter
 - 1-Hz sampling
 - UV antifouling
 - On-board data logging
- 5 days of sampling in 2016, 10 days in 2017
(some with reduced vertical resolution)
- Intended to resolve structure of shallow "fresh puddles"



photo credit: A. Jessup

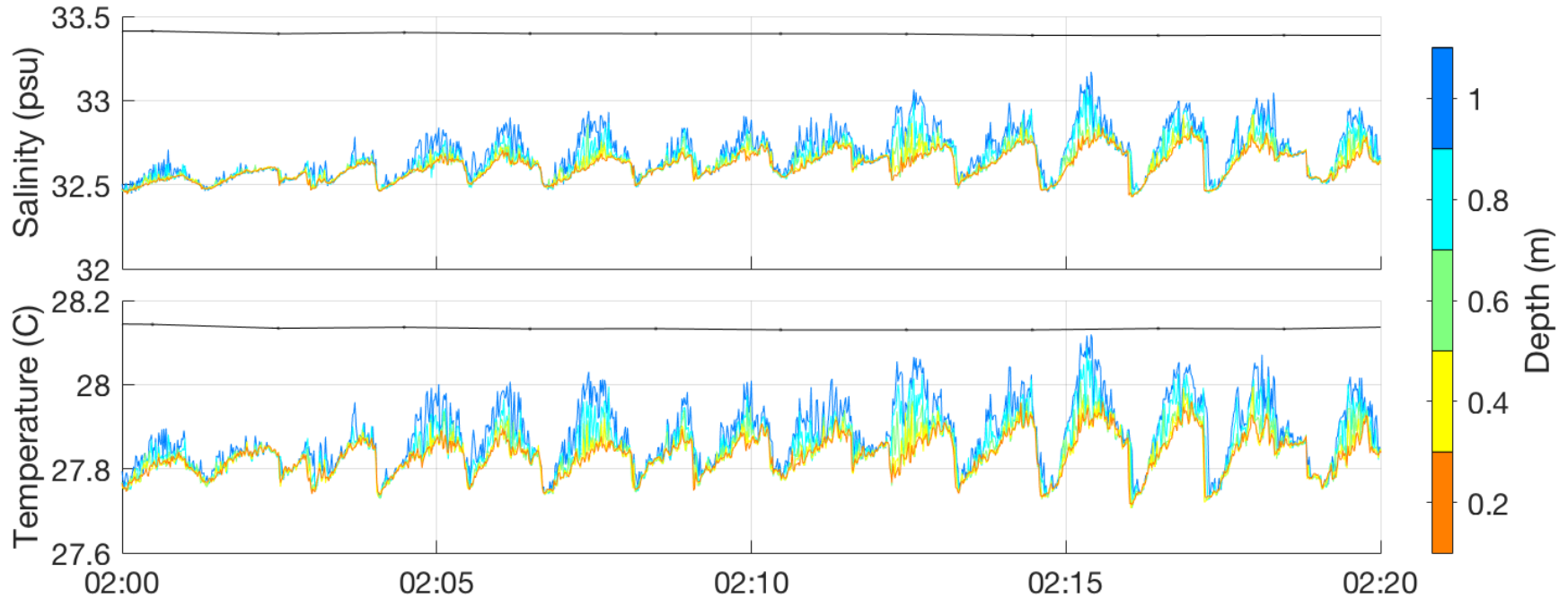
August 24, 2016; Wind speed in black from 0-9 knots

01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00



Rake observations

Asymmetrical "sawtooth" internal waves on the diurnal pycnocline



- ~40 m wavelength
- Amplitude increases with depth
- Tight TS coupling

