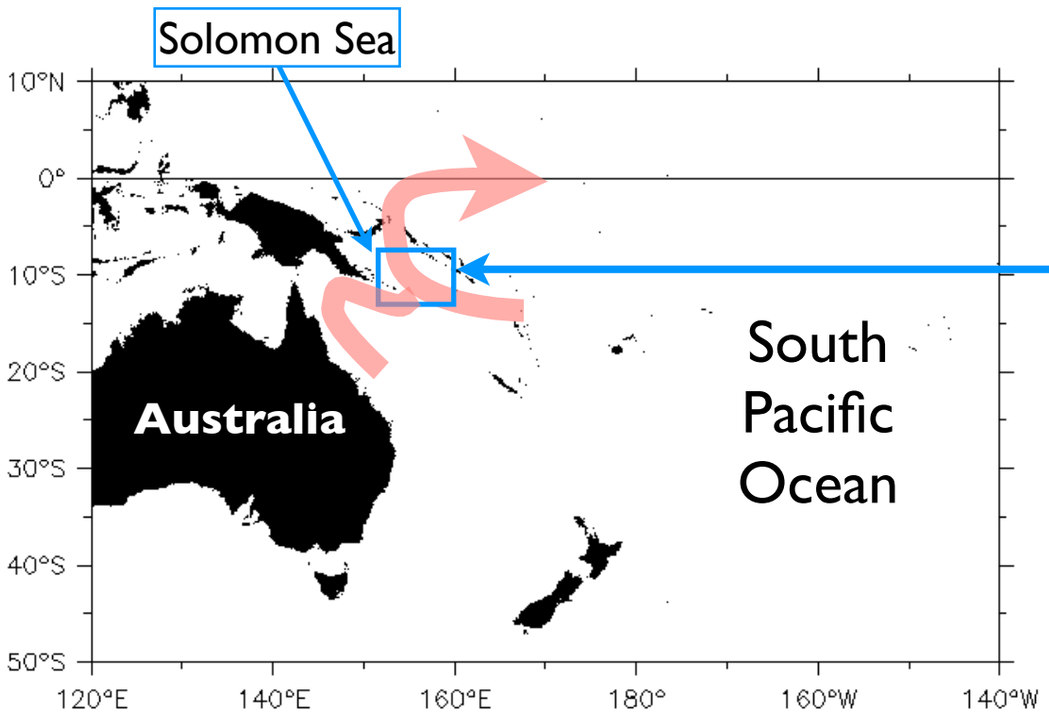
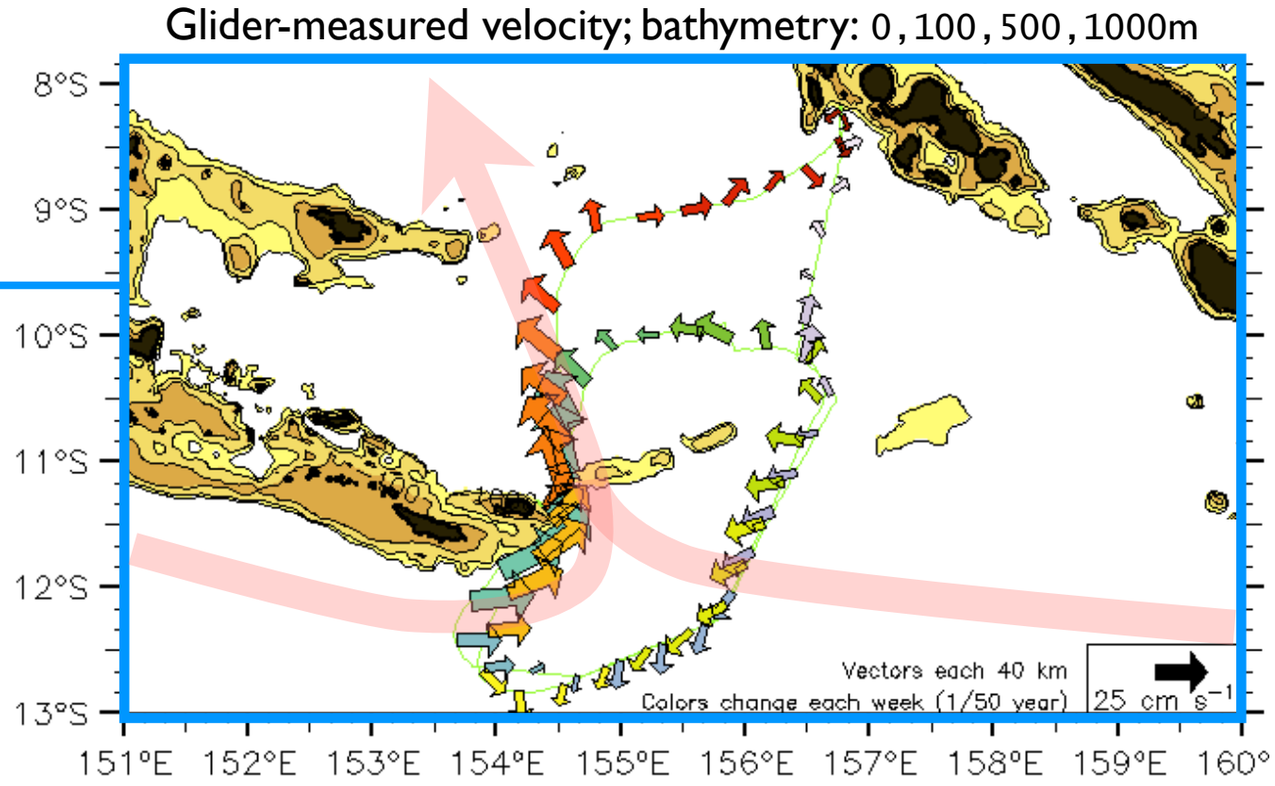
Glider observations to diagnose meso/submesoscale SSH signatures in the Solomon Sea western boundary current system

This work is designed to answer the questions:

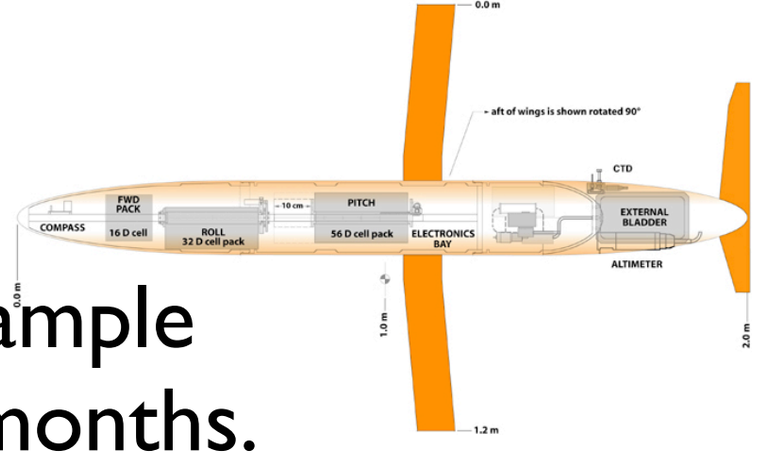
- How can SWOT SSH be interpreted as (depth-dependent) oceanic variability?
- Given SWOT space/time sampling, what meso/sub-mesoscale signals will SWOT see or not see?
- By clarifying the processes driving small-scale SSH signals, can we interpret changes that occur between the 11-day SWOT repeat intervals in the tropics?

The Solomon Sea offers a testbed to observe the vigorous mesoscale eddies generated as a western boundary current (WBC) turns a sharp corner and threads among islands and channels; also what SWOT can see of WBC variability itself.



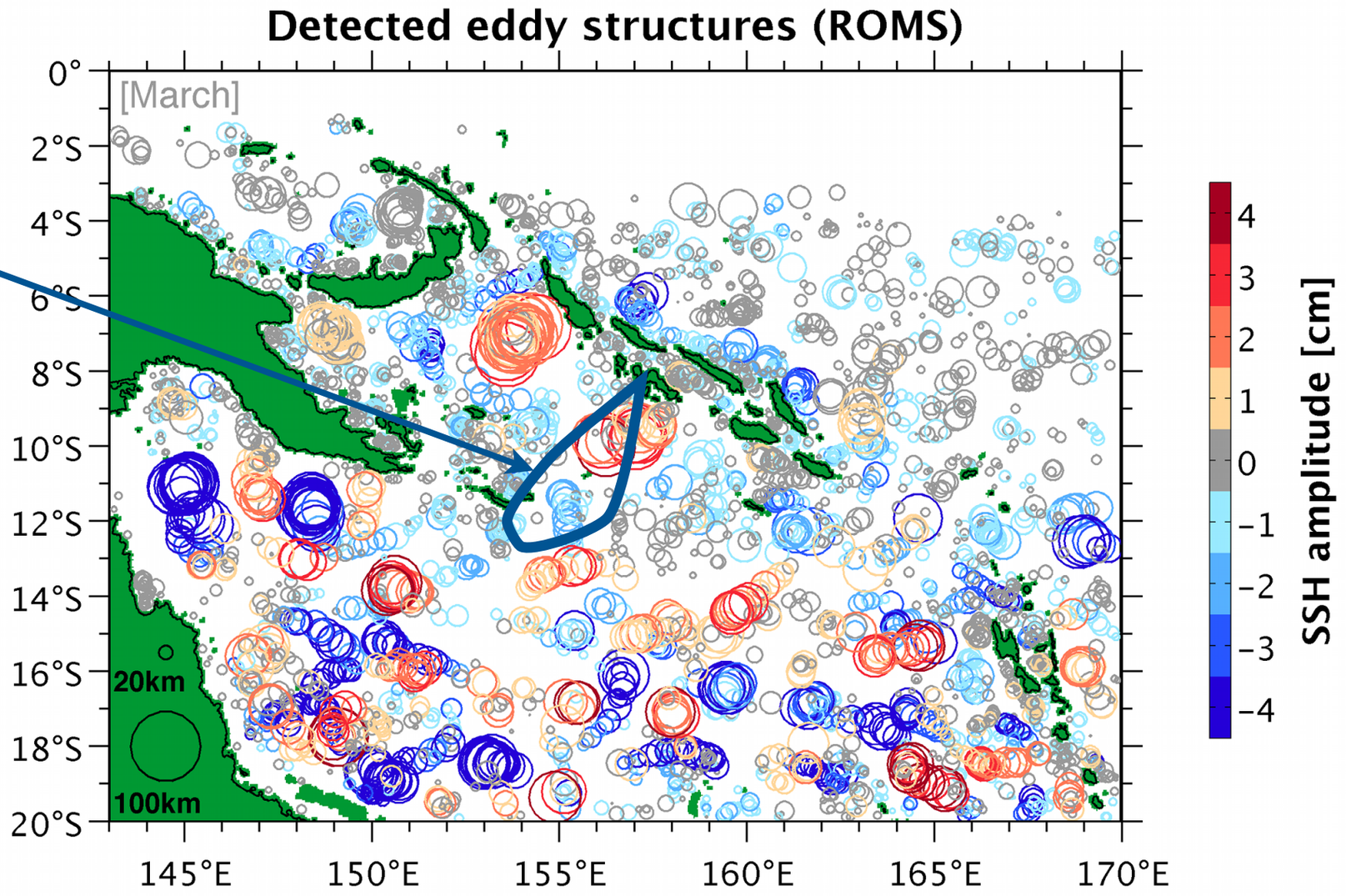


Our tools:



- Ongoing (NOAA-funded) glider missions sample **u**, T, S at 3–4km scales to 700m every 2 months.
- Nested 4km-resolution ROMS model of the SW Pacific, with eddy-detection algorithms.

Repeated glider track



Addressing key Phase-A SWOT issues

- Gliders observe and resolve semi-diurnal (internal) tide:
  thus is able to identify true sub-mesoscale signatures.
- Gliders show the vertical structure of meso and sub-mesoscale SSH.
- ROMS model shows timing and spatial structure of m & s-m SSH in relation to background currents (western boundary jet vs interior).
- ROMS model shows the variability and motion of features between 11-day SWOT crossovers: What is missed? How to interpret changes between repeats? Helps define utility of fast-repeat cycle.
- Both gliders and ROMS model show magnitude of few-km signals (simulated SWOT sampling shows what is missed at different scales).