

Gliders in the South West Pacific

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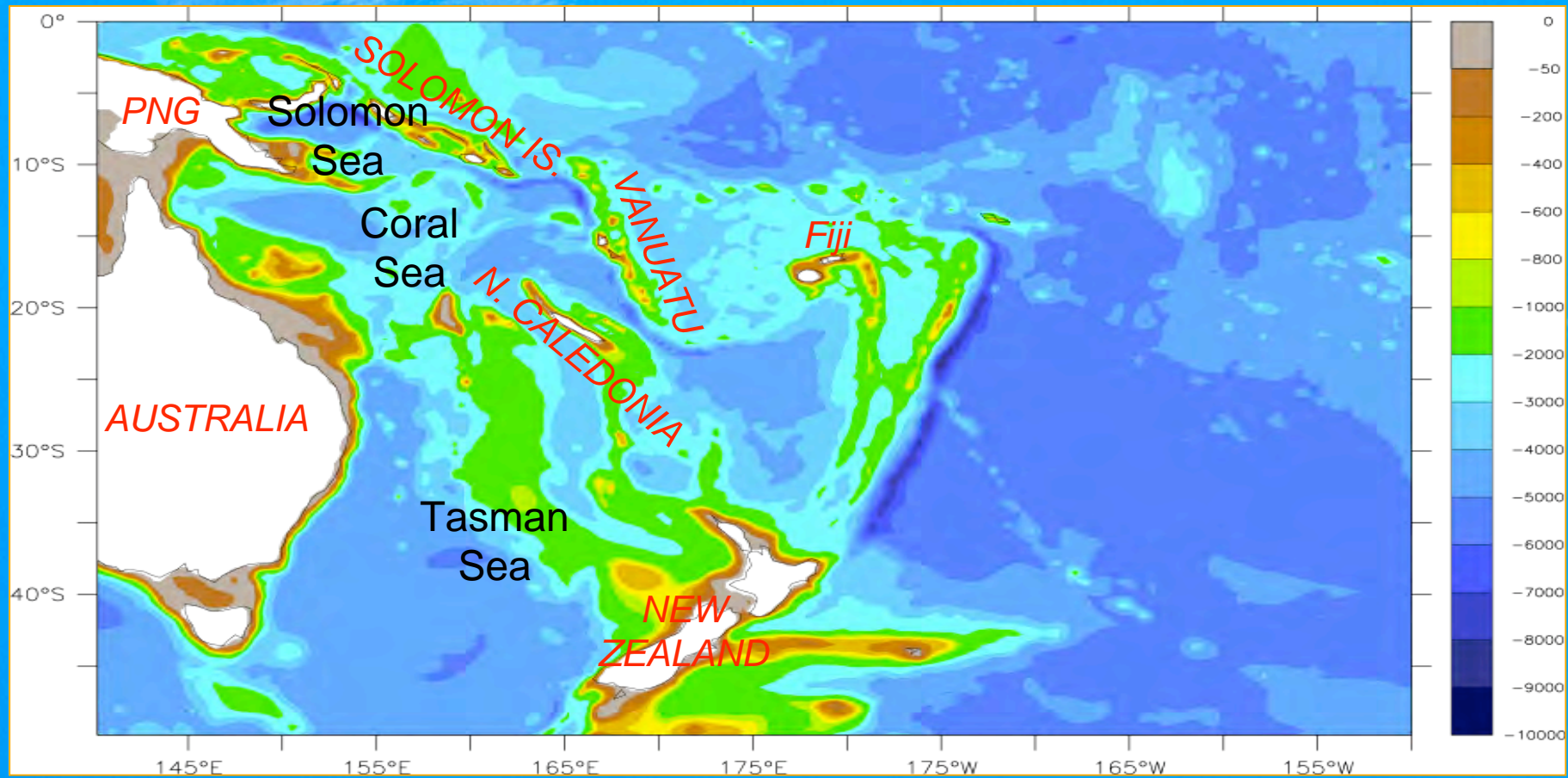
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SPICE

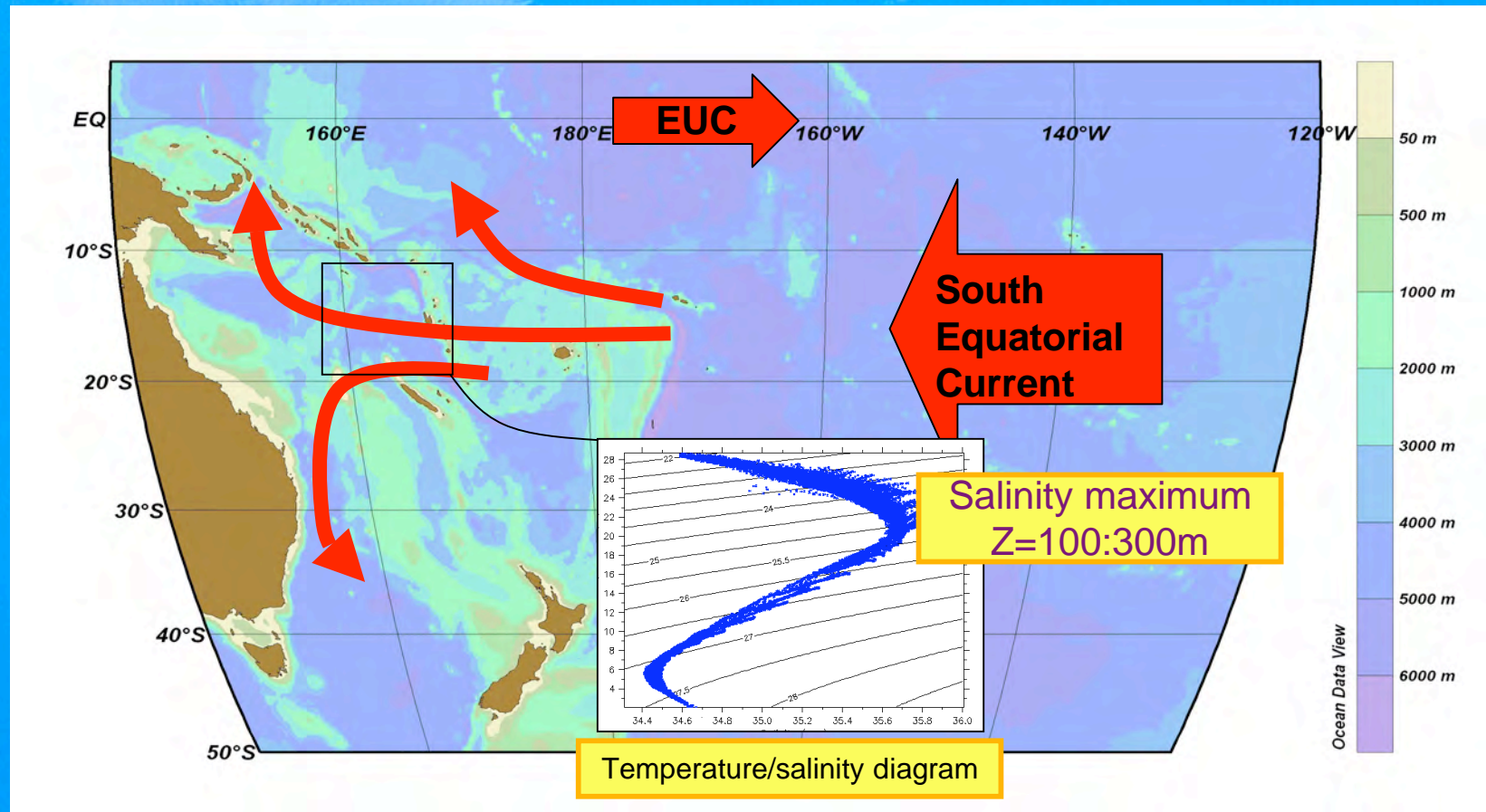
Southwest Pacific Ocean Circulation and Climate Experiment

http://www.clivar.org/organization/pacific/pacific_SPICE.php



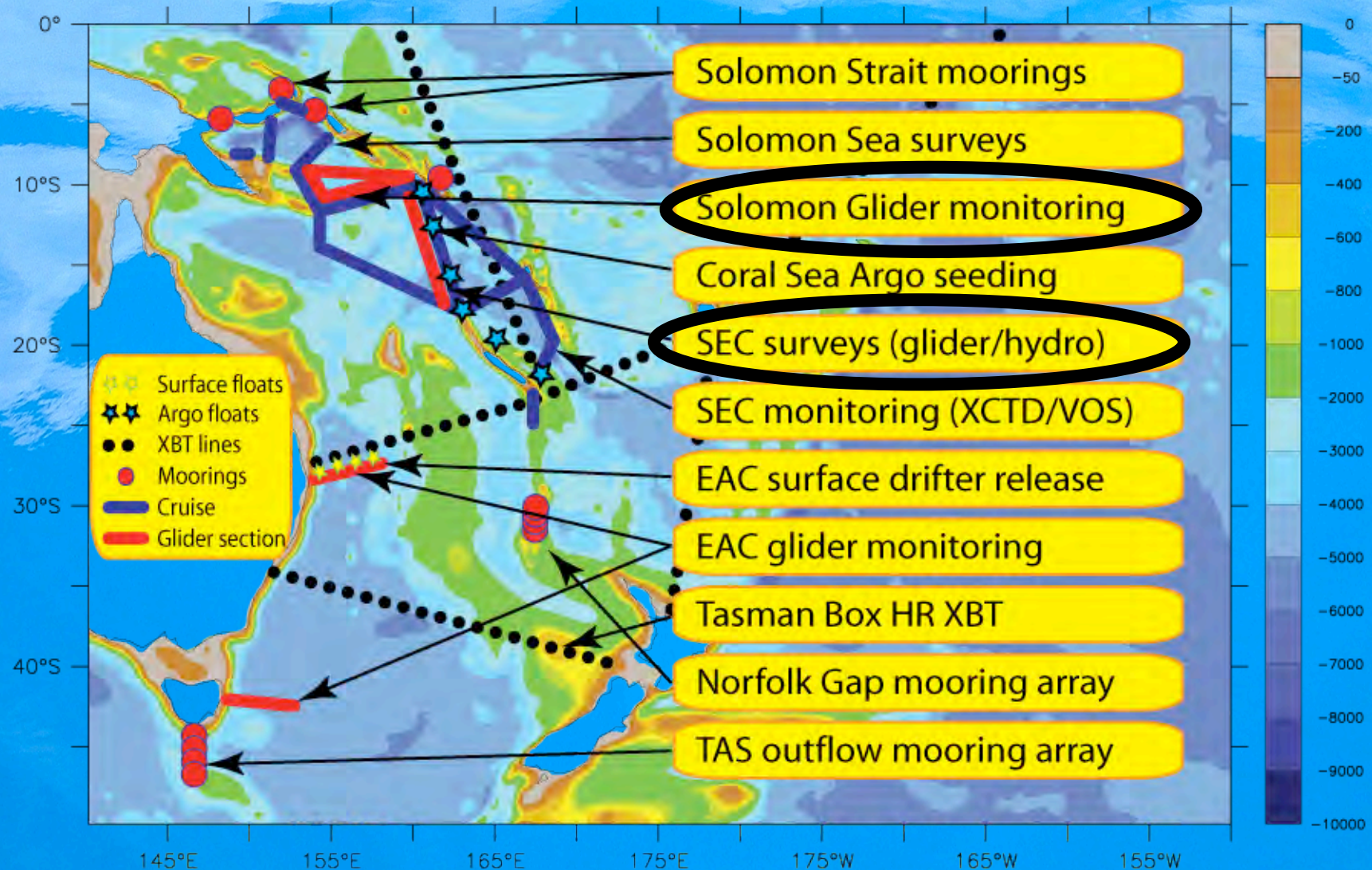
The South Pacific "Thermocline" waters

connection between the subduction zone of the South East Pacific and the equator: Decadal influences



The Coral Sea is the primary source of the high-salinity waters of the EUC in the western Pacific (Tsushiya et al., 1968).

Outset for a regional field experiment



SPRAY Glider operations in the South West Pacific: A collaboration



SEC Surveys

Two Experiments: July-October 2005

November 2006 – February 2007

Deployment from the N/O ALIS at Guadalcanal

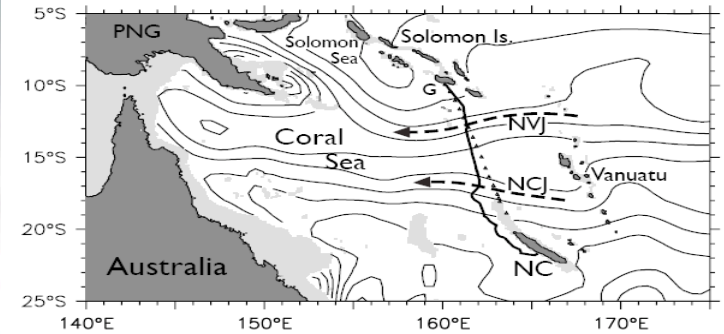
Recovery from a zodiac in New Caledonia

≈100 days, 1600 km

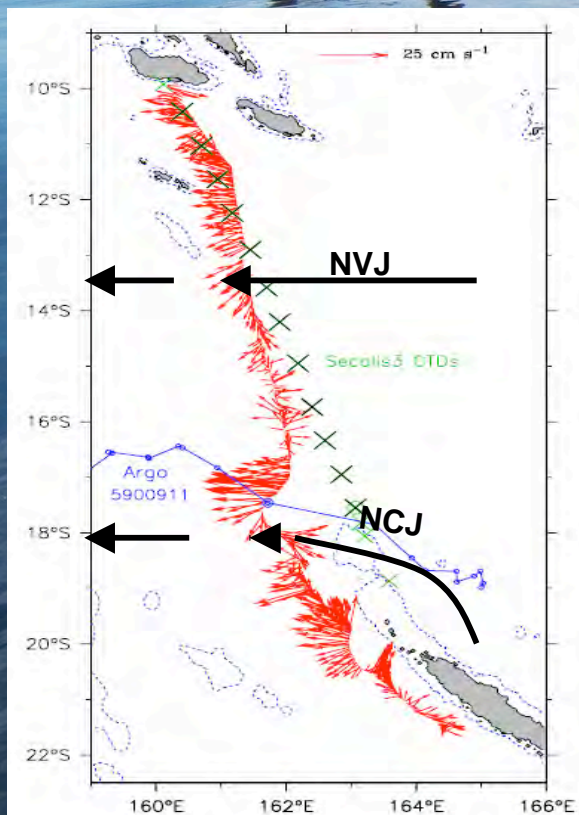
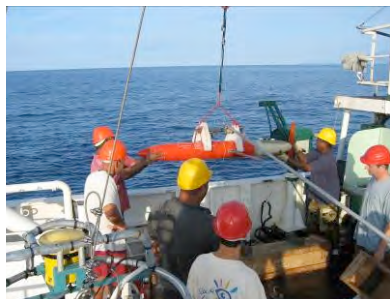
Dives: 600 m @ 17°- ~25 cm/s (4 hours, 3 km)

≈550 T-S profiles

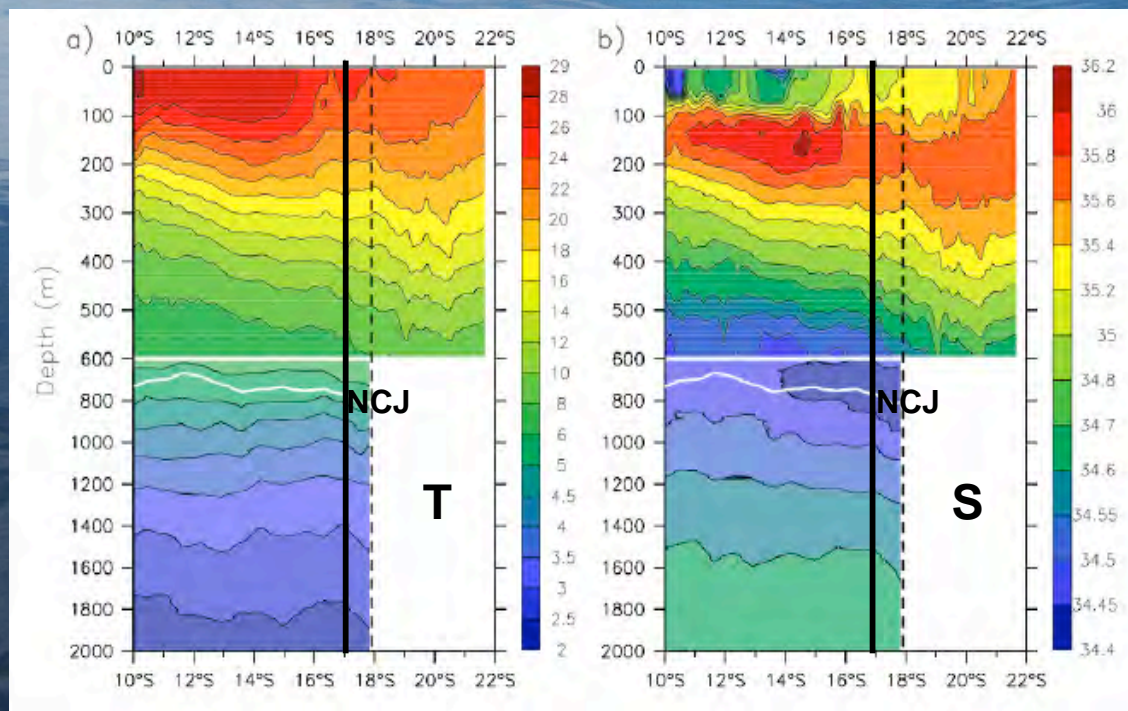
→DATA : <http://spray.ucsd.edu>



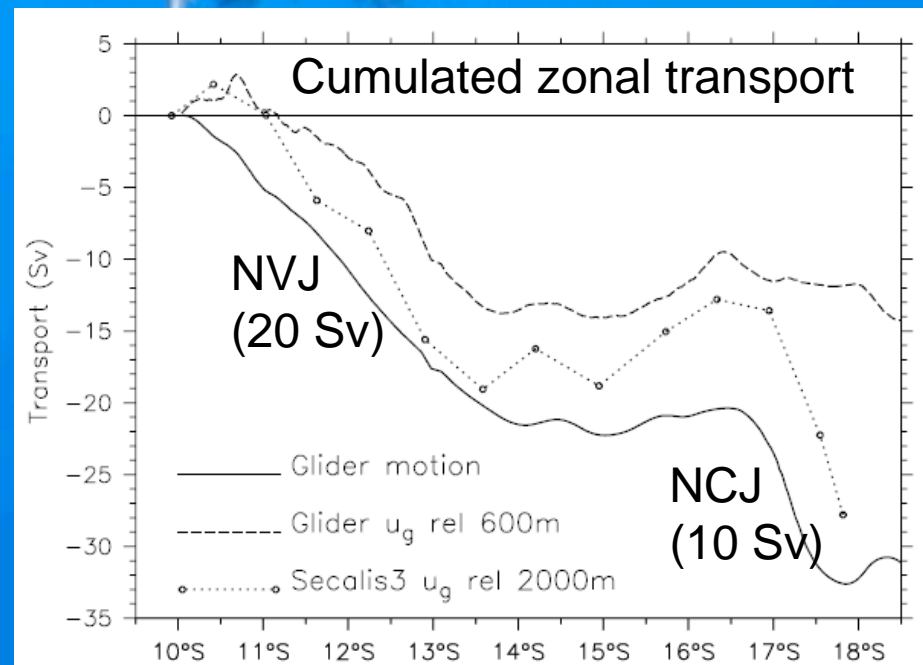
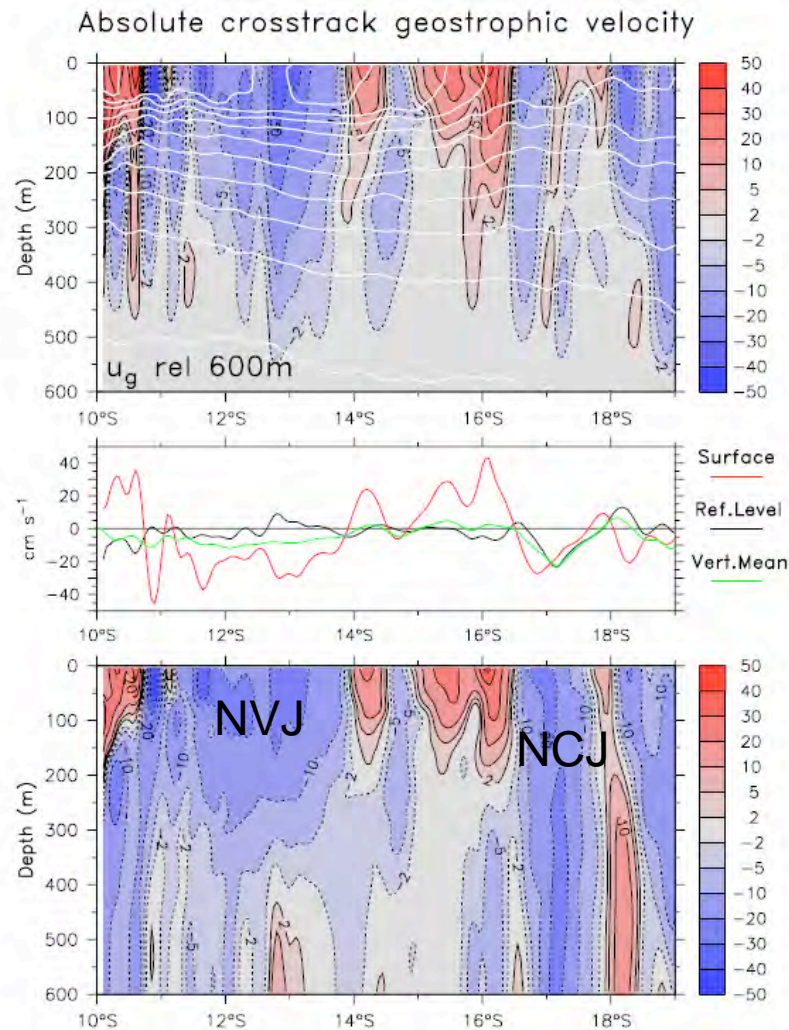
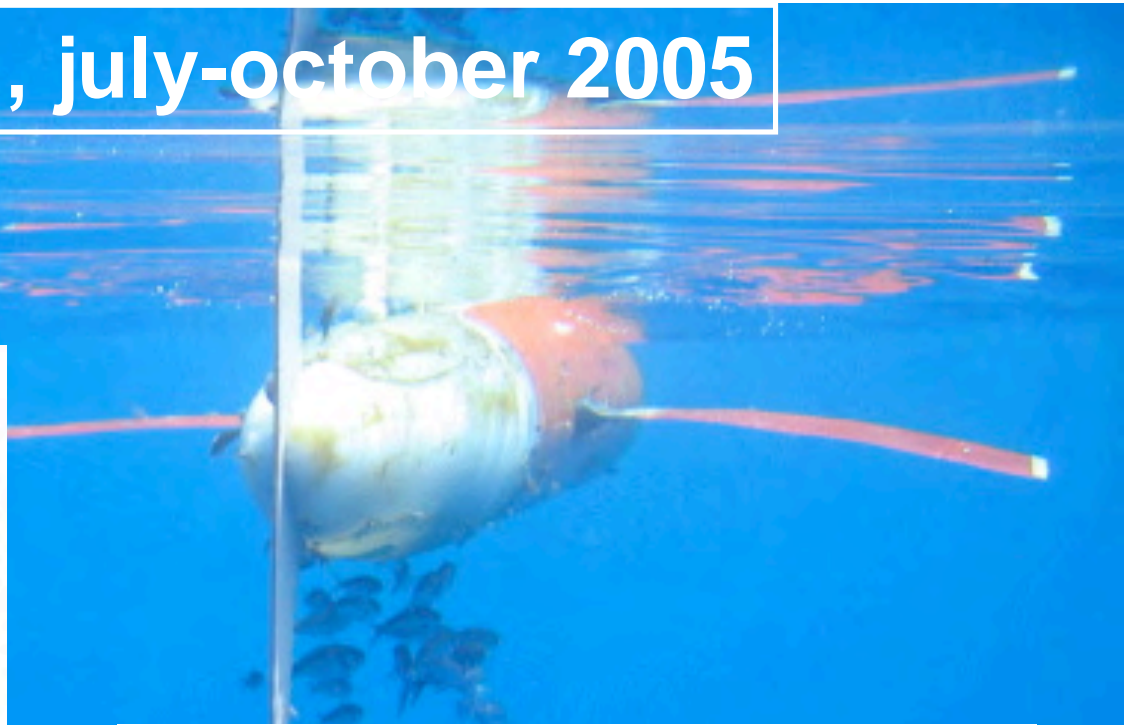
Section 1, july-october 2005



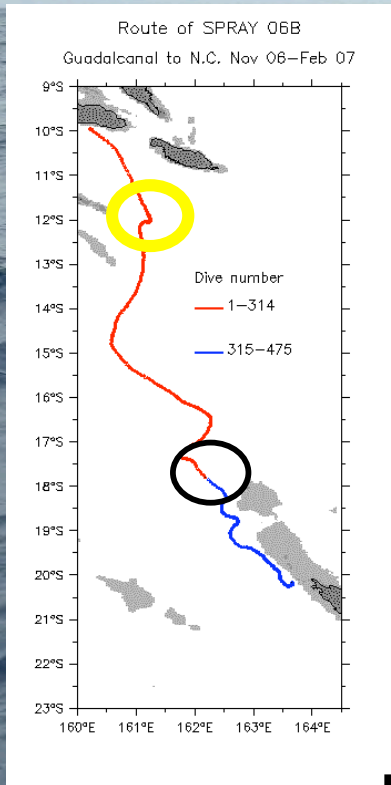
Averaged Current 0-600 m



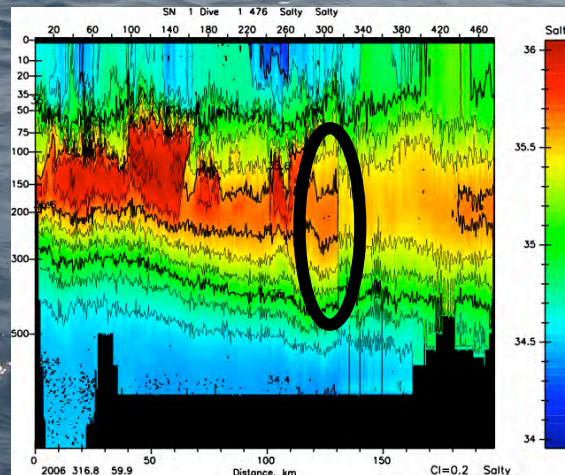
Section 1, july-october 2005



Section 2, november 2006- march 2007



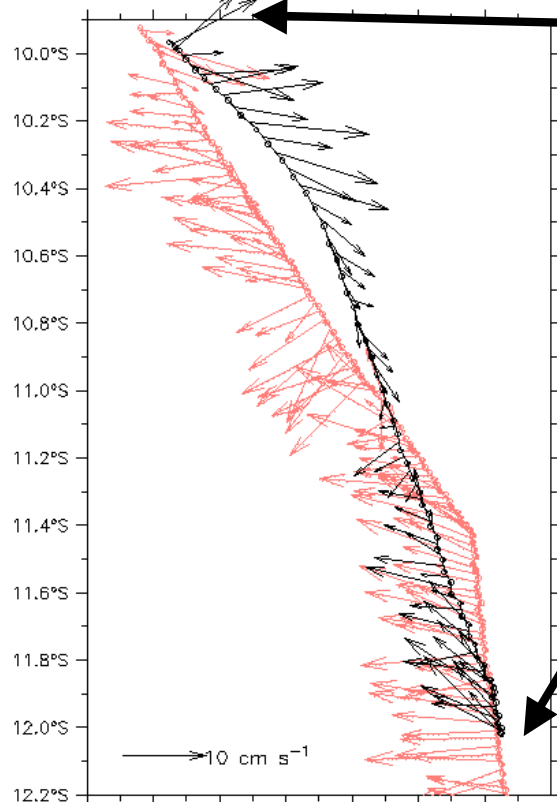
Some trouble...



Section 2, november 2006- march 2007

Absolute velocity in 2005 vs 2006

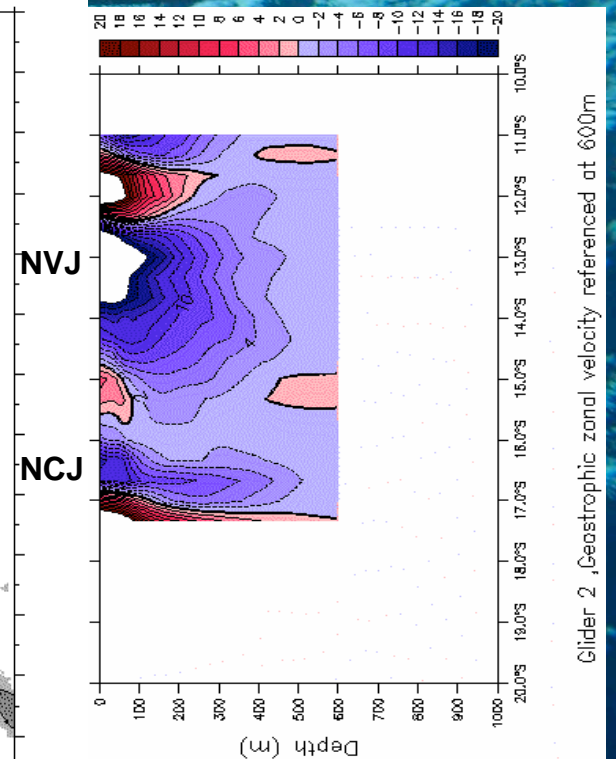
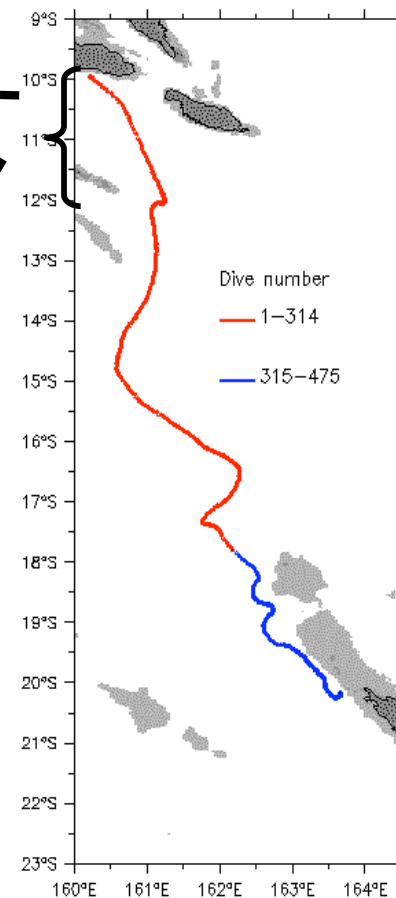
2005 are 600m, 2006 are variable depth

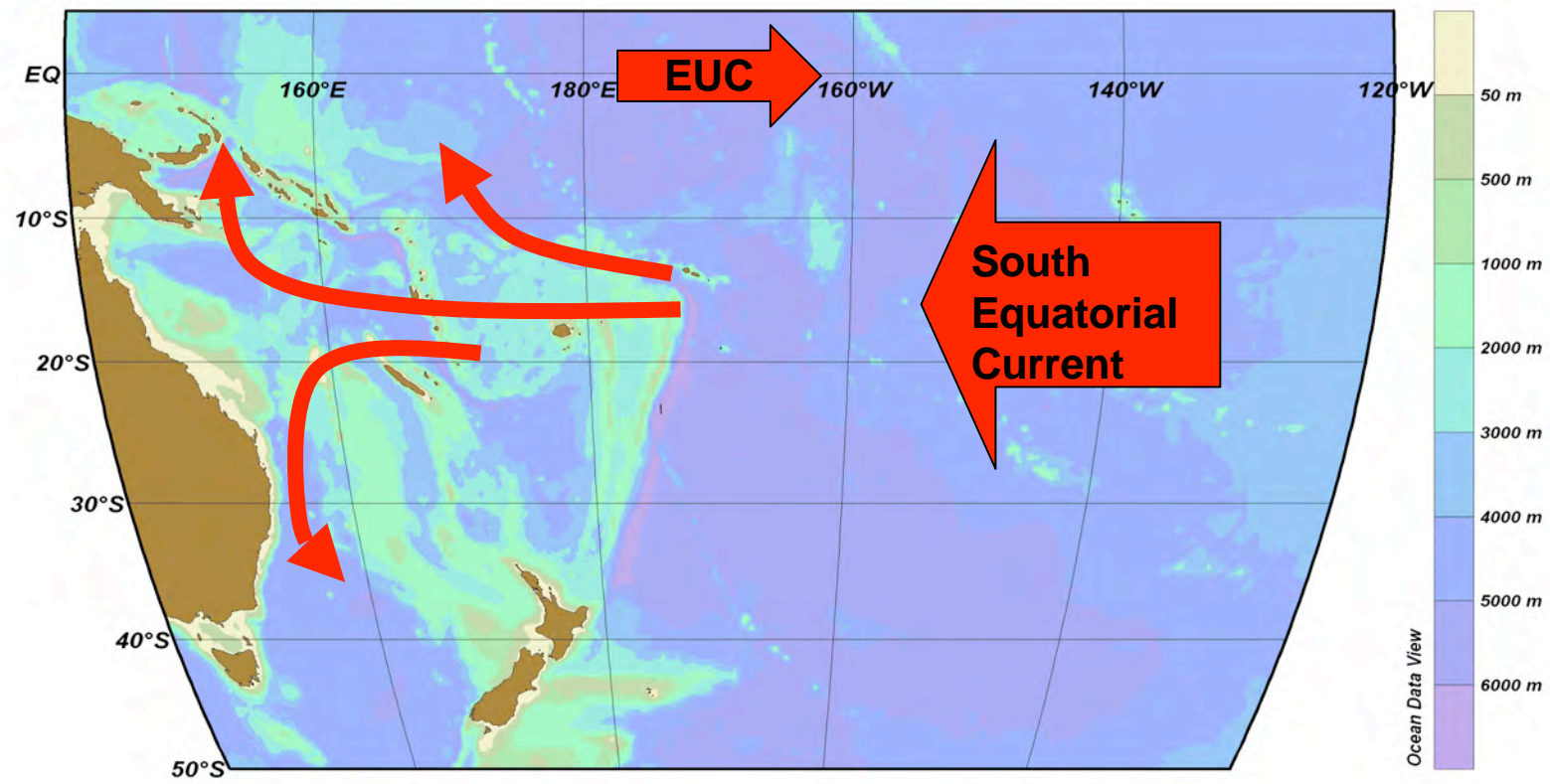


Variability of the flux entering the Solomon Sea

Route of SPRAY 06B

Guadalcanal to N.C. Nov 06–Feb 07





Preparation, deployment and recovery at

Honiara

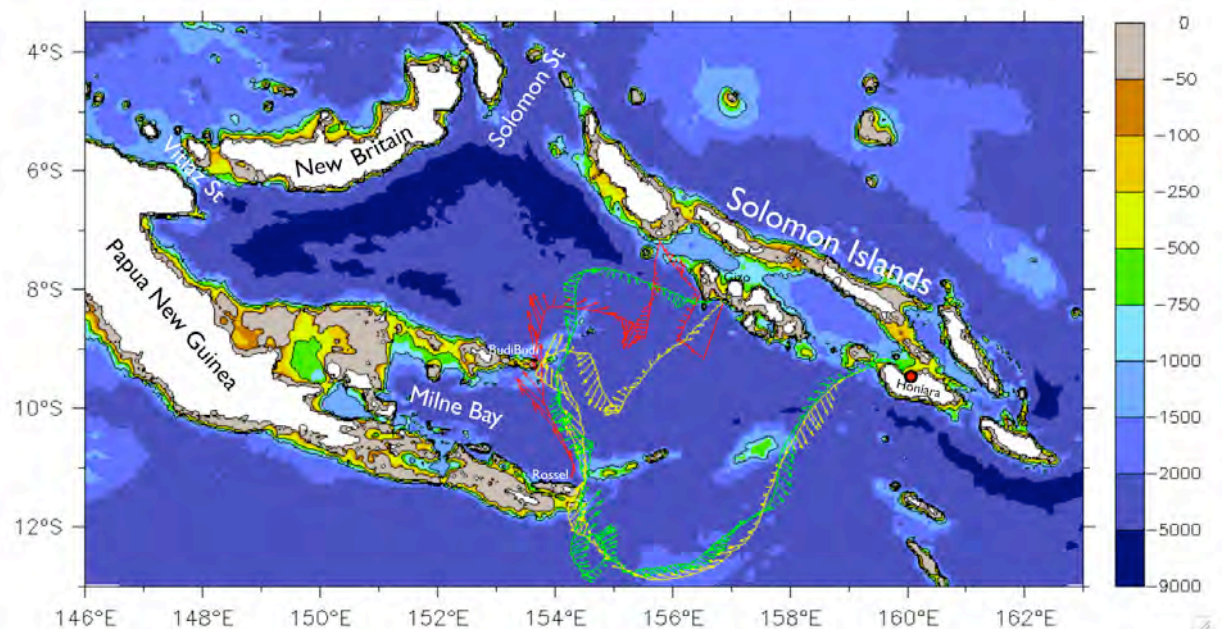


Gizo Island



Solomon glider operations: Monitoring the entering flux

4 glider surveys so far (3 completed, 1 in progress)

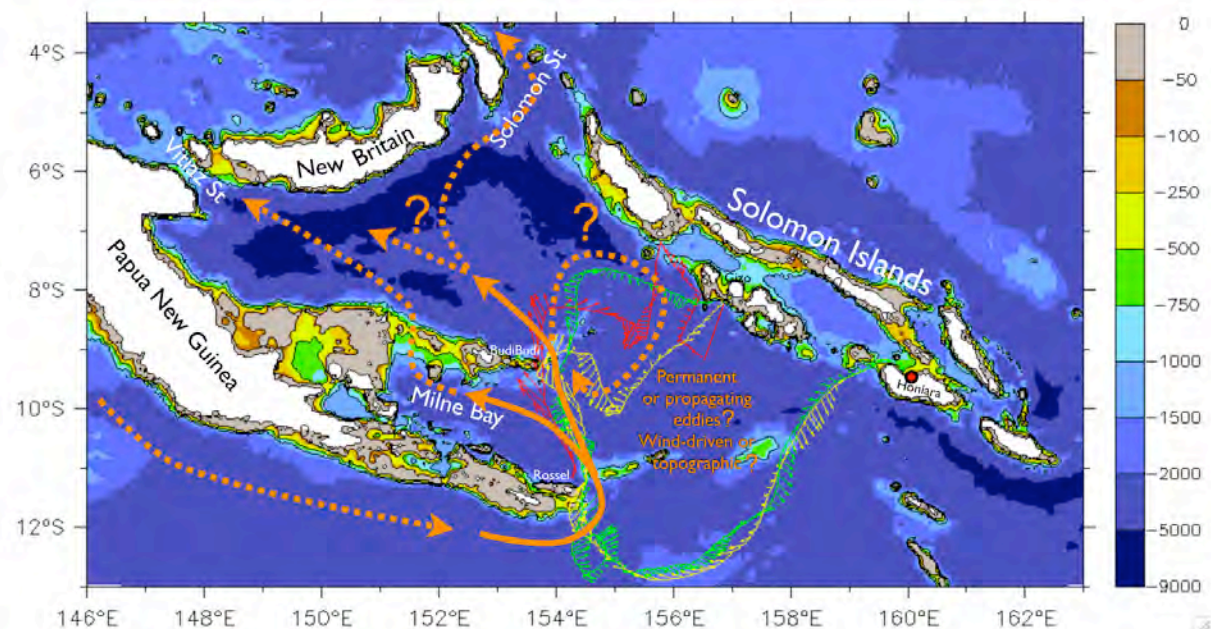


Red = Aug-Nov 07 (Rossel, PNG to Gizo, Solomon Islands)
Yellow = Nov 07-Feb 08 (Honiara to Gizo via Rossel)
Green = Feb-Jul 08 (Honiara to Gizo via Rossel)

4 months; 2000 km

Solomon glider operations: Monitoring the entering flux

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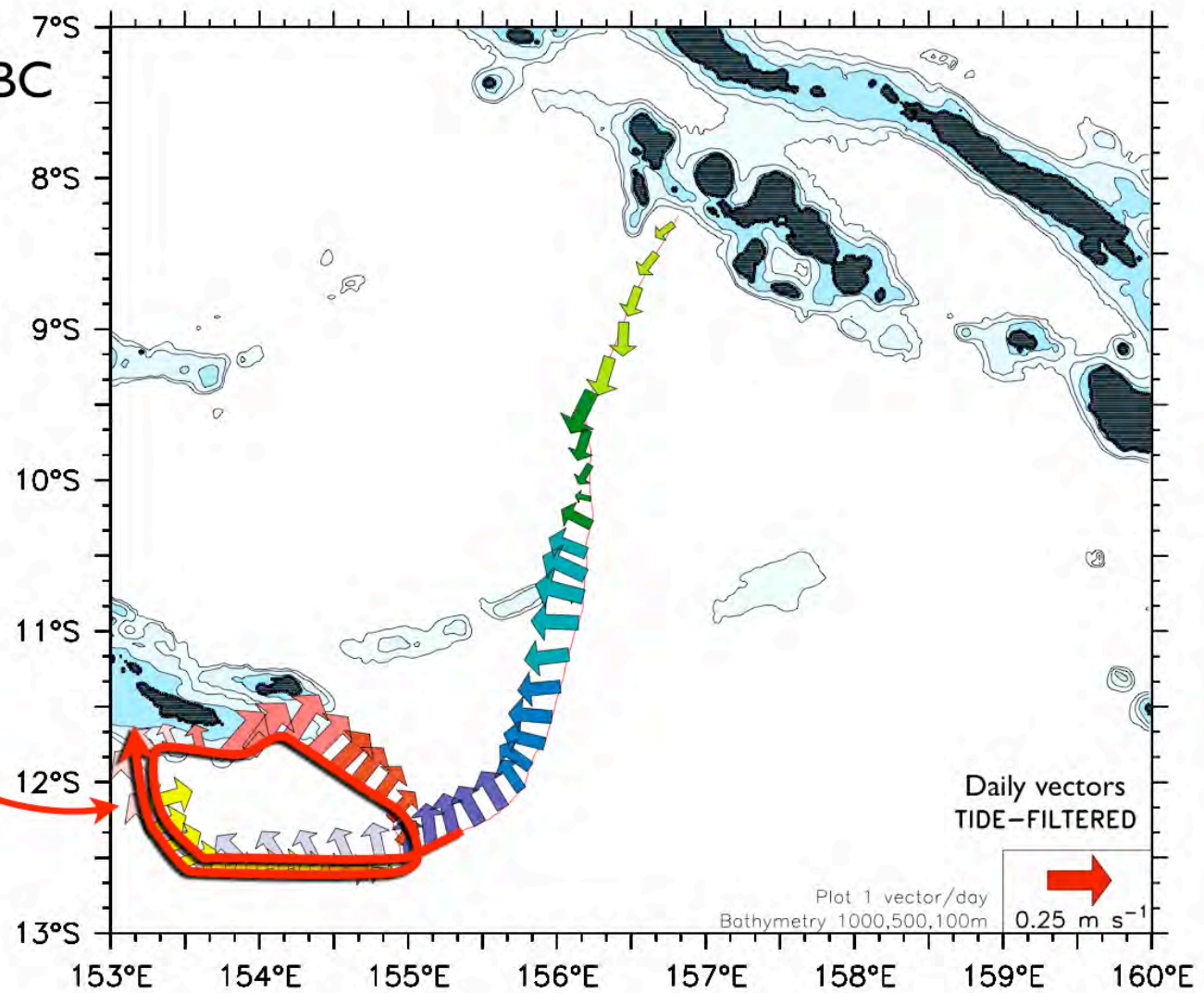
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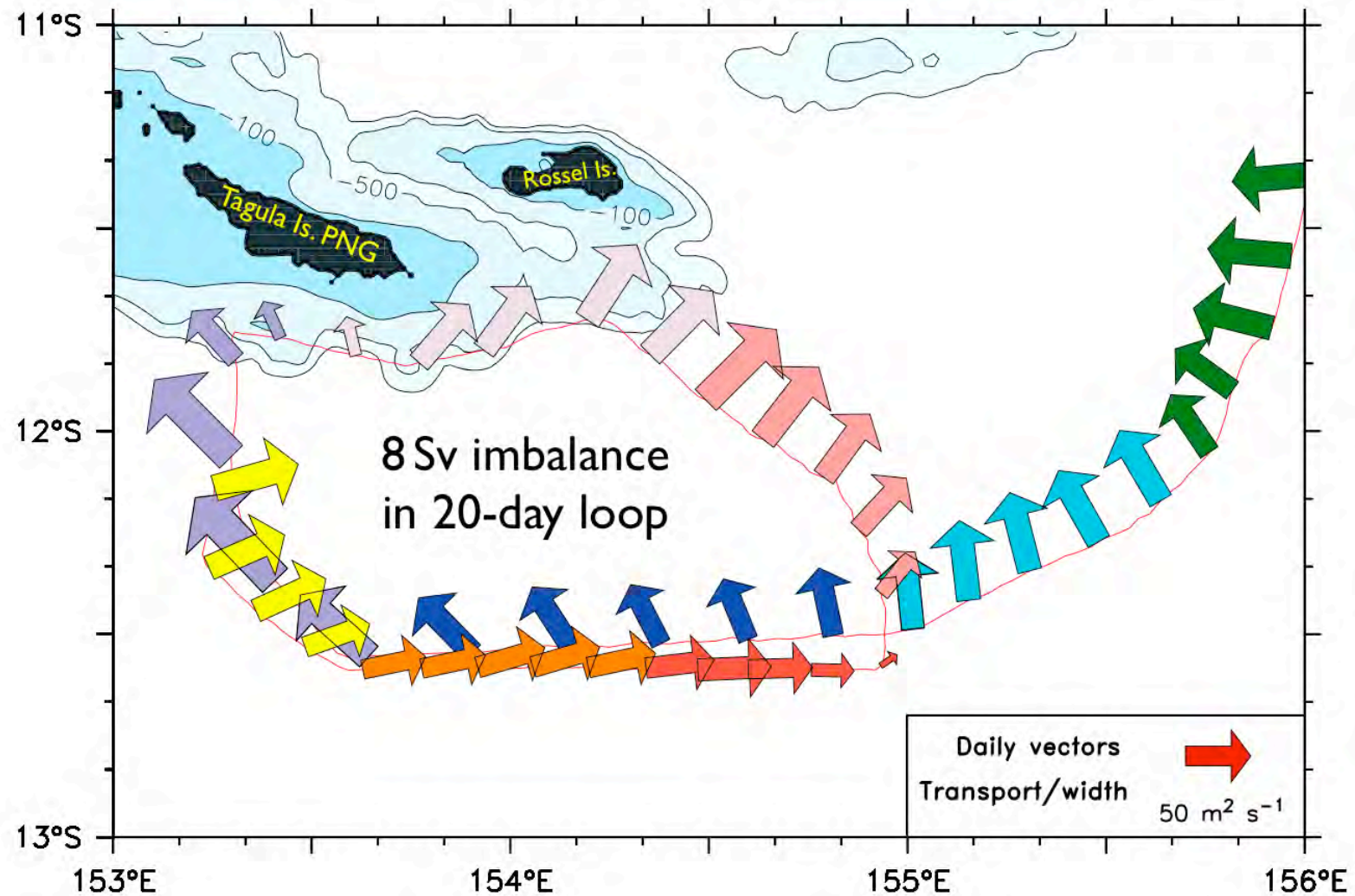
Glider velocity: 4th mission underway

Loop with multiple crossings of the WBC to test sampling



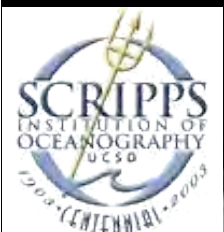
Glider transport: 3 crossings of the WBC in ~25 days

⇒ Non-synoptic sampling: Need additional information!



Conclusion

- **The South West Pacific:** much of the transport in narrow, swift coastally-trapped currents (difficult to measure)
- **Gliders have proven their ability in measuring the South Pacific LLWBC**
- **Glider operations are relatively cheap**
- **a sustained monitoring program in the Solomon Sea.**
- **a Spray glider at Noumea IRD centre (march 2009)**



4 surveys → high variability

Pre La Nina:

Strong NGCC (18 Sv)

Arrival of the La Nina:

NGCC seemed to reverse

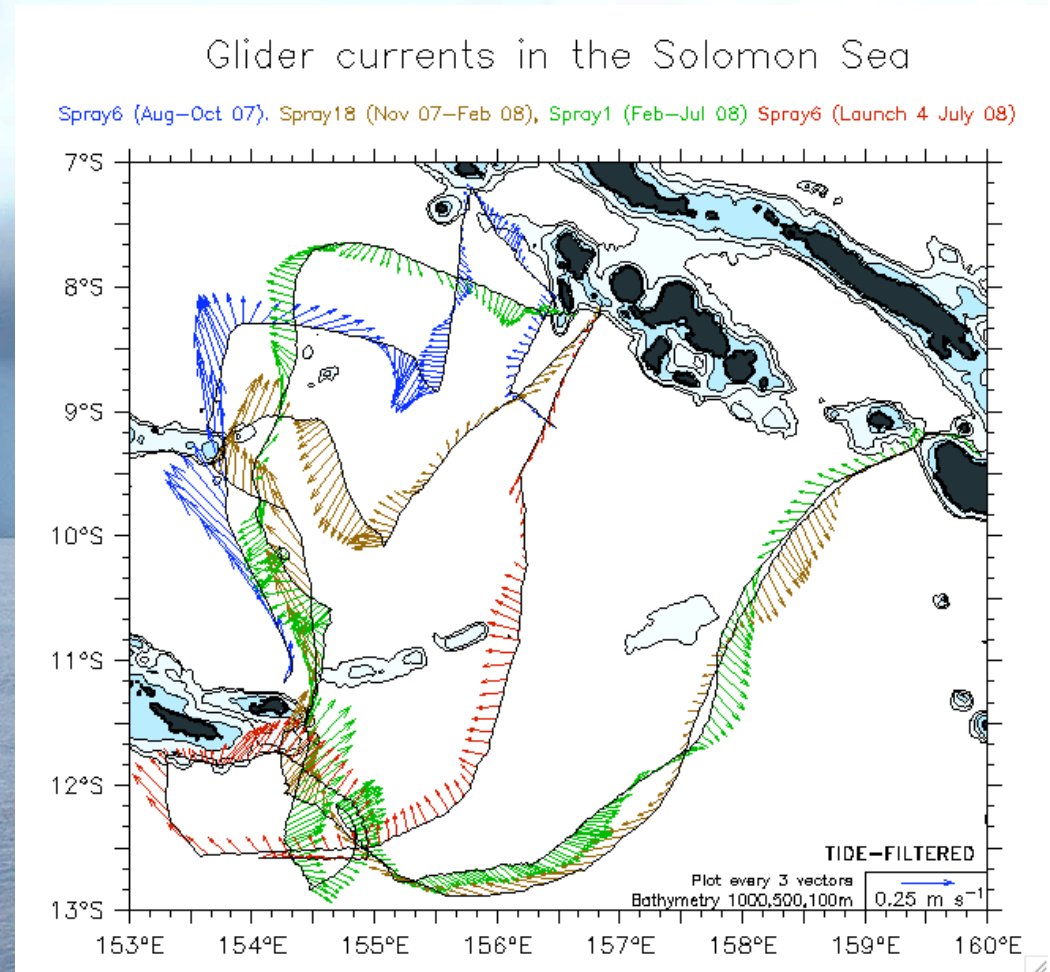
Late in the La Nina:

**SEC reversed
Weak NGCC**

Post La Nina:

**SEC restored
NGCC ??**

**The NGCC is the only consistent feature,
Permanent or propagating eddies in the east**



Absolute cross track geostrophic current :

