

RVIB N. B. Palmer, NBP17-06/P06 Leg 1: Weekly Scientific Report 06 (last one)

26.78°S, 148.93°W

4:45pm, Monday, 14 August 2017 (local time and day)

air: 19.1°C, water: 21.2°C, winds: 21.5 kn from SE

on route from last station (#143) to Tahiti

Over the past week, we had a lot of “lasts” on p06, leg 1: last storm moving by, last SOCCOM float going in, last SIO Deep SOLO float being deployed, last drifter going over the side, last midrats (the midnight meal) being served, and finally the last station being completed early Sunday morning (5:15am), followed by the last UW Argo float. We also had our last time change on Friday, meaning that we are now on Tahiti Time, aka Hawaiian Standard Time, and basically back within U.S. time zones.

The station work ended with a cook-out for lunch on the heli-deck, our first party! Other excitements while steaming to Tahiti include a scavenger hunt, a date line crossing ceremony, an engine room tour, and just wrapping up the data reporting.

While we had a lot of delays on this cruise due to weather and medevac, with a total of about 5.5 days of station time lost, we are happy that we could still make it just past the longitude of Tahiti (~150°W) without too much compromising in station spacing (34nm at the end), completing our last station (#143) at 32.5°S, 148.9°W. There were also some things that went remarkably well and that helped make up time. The winch in the Baltic room performed pretty much flawlessly, even with 49 of the 143 stations at depths >5000m, allowing for fast station times when the weather was good. There were no communication/data transfer problems with the CTD package, and the new SIO 36-place carousel, once installed, also operated without any further bottle-closing issues. Station positioning was pretty speedy most of the time, and the steam speed of the NBP was somewhat faster (>9 knots) than planned for which also helped.

The CFC group, in particular, made good use of some of the weather delays which provided the time to get their system fixed and back running just when needed. What resulted was a beautiful section across the Southwest Pacific Basin, showing elevated CFC values within the deep and bottom water layers below 3000m (compared to values above). Particularly within the deep western boundary current on the eastern flank of the Tonga Kermadec Ridge, CFC concentrations are high, reflecting (relatively) recent ventilation (surface layer contact) and formation of the water around Antarctica.

Data from all other measurement groups onboard (O₂, nutrients, salts, DIC, pH, alkalinity) are coming in as well and are being merged and used for calibrations by ODF. SOCCOM float profiles were sent to us after each deployment from shore. While the SOCCOM floats can collect several of the biogeochemical parameters autonomously, the ship board data are crucial for calibration and ground-truthing of the float sensors.

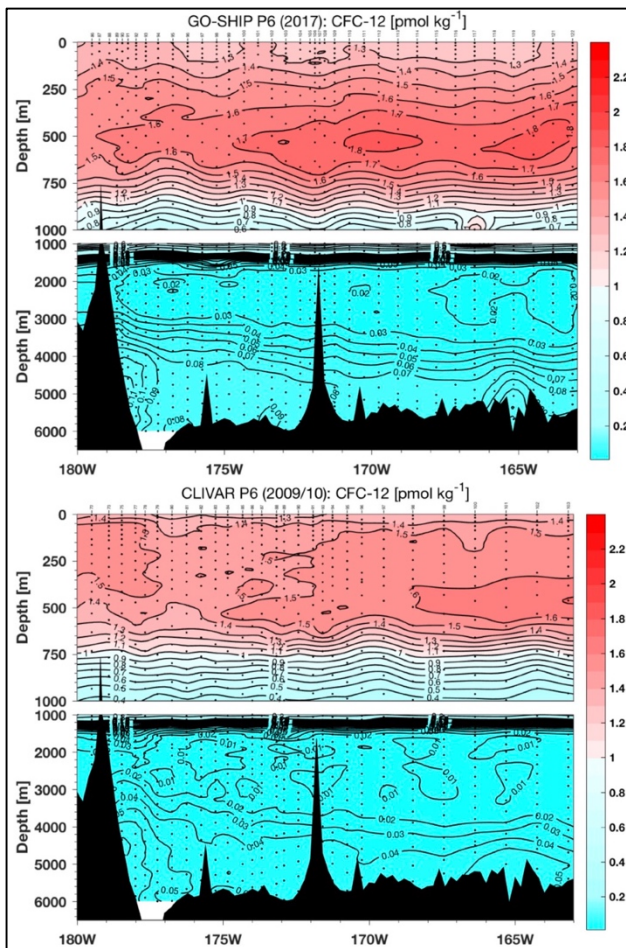
We have many thanks to give for a successful completion of P06, leg 1. Jim Swift, Lynne Talley, and Alison Macdonald were essential in organizing the cruise. The GO-SHIP exec committee and PIs gave advice when needed. ODF provided the brand new rosette and related equipment, and made sure everything was working well on board. NSF and NOAA provided the funding. ASC and ECO (with Captain Brandon Bell) were in charge of pre-cruise logistics/marine operations and keeping the ship moving. All scientists on board worked extremely hard and kept spirits high. Thanks to all!

- Sabine Mecking and Isa Rosso

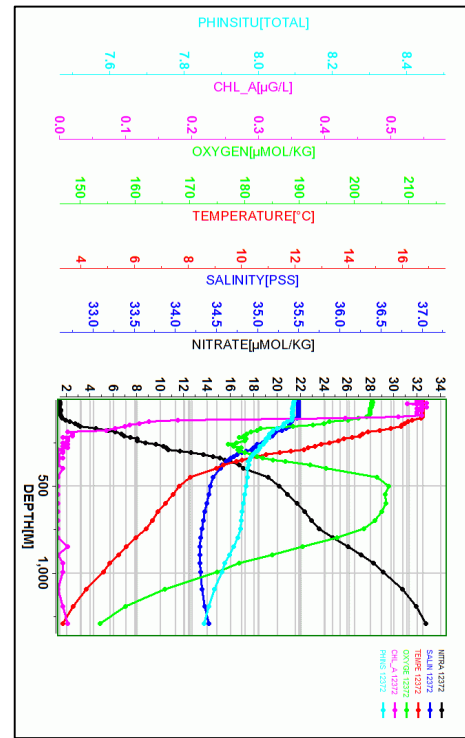
<http://usgoship-p062017.blogspot.com>



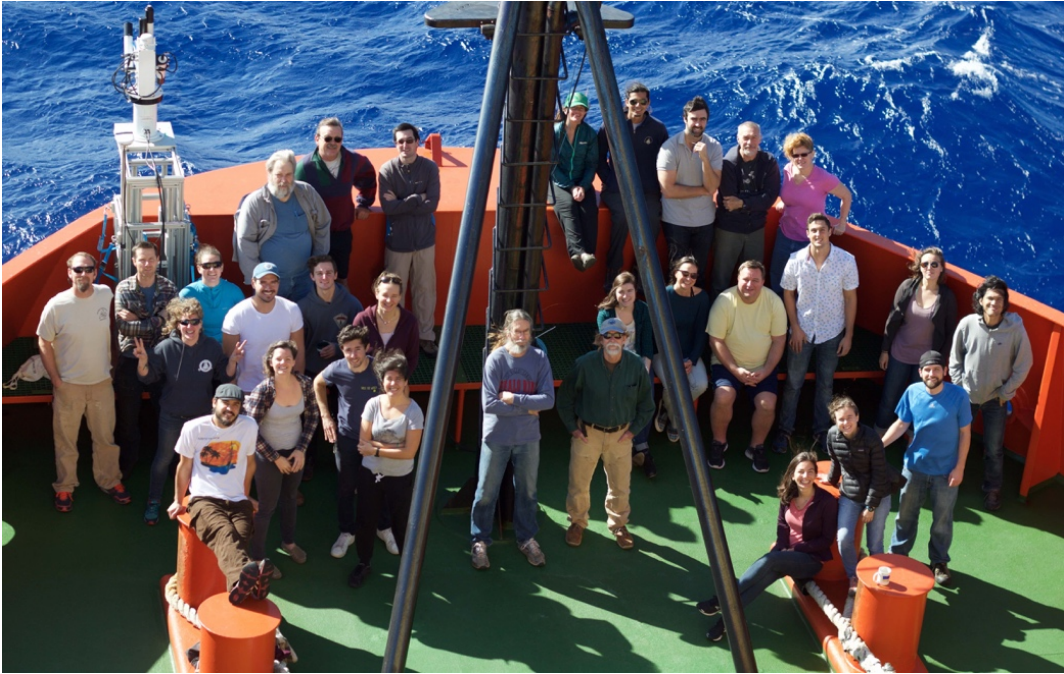
Last SOCCOM float before deployment, day watch sampling for the last time (DIC & O₂), ladies of the night after setting the rosette for the last station (#143), and CTD rosette going out the Baltic room door for the last time.



CFC-12 in 2017 and 2009 in the Southwest Pacific Basin to the east of the Tonga Kermadec Ridge (~179°W). CFC-12 concentrations increased everywhere below ~250m from 2009 to 2017 because of the increase in atmospheric concentrations until recently. Particularly noteworthy are the elevated CFC-12 concentrations at the bottom within the deep western boundary current at 176–179°W (above the Kermadec Trench and on the flank of the ridge).



Profile of pH, chlorophyll, oxygen, T/S, and nitrate from SOCCOM float #12372, deployed at 32.5°S, 154.6°W after station 134 (Figure provided by K. Johnson). pH and nitrate profiles show the opposite trends with depth because of the decomposition of organic matter below the surface that increases nitrate concentrations and decreases pH.



Group photo of science party and ASC today on the bow (photo by L. Zeller).