Float Deployments

Prepared by Lauren Moseley

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A total of 10 GO-BGC Argo floats were deployed during the 2022 P02W research cruise. The GO-BGC floats measure temperature, salinity, pressure, |O2|, |NO3|, pH, and bio-optics.

GO-BGC Argo Floats

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PIs:

\* Kenneth Johnson (MBARI)

\* Lynne Talley (UCSD/SIO)

\* Susan Wijffels (WHOI)

\* Curtis Deutsch (Princeton)

\* Steven Riser (UW)

\* Jorge Sarmiento (Princeton)

Shipboard personnel:

\* Lauren Moseley (Columbia/LDEO)

\* Shuwen Tan (Columbia/LDEO)

10 biogeochemical (BGC) Argo floats were deployed on P02W as part of the Global Ocean Biogeochemistry (GO-BGC) program (https://go-bgc.org), which is funded by NSF Award OCE-1946578. GO-BGC contributes to international and US BGC-Argo, and all floats conform to Argo mission requirements. BGC-Argo floats will help to resolve seasonal cycles of many key properties relevant to global biogeochemical processes.

All floats deployed were UW-modified Teledyne Webb Apex floats equipped with SBE41-CP CTDs, |O2|, |NO3|, pH, and FLBB bio-optical sensors. The floats for the P02 cruise were provided by the UW float lab (S. Riser Argo lab).

At sea, CTD watchstander Lauren Moseley and co-chief scientist Shuwen Tan were in charge of deployments. Before each deployment, they carefully cleaned the |NO3| and FLBB bio-optical sensors. Each sensor was rinsed with DI water, wiped/dabbed with lens wipes, rinsed with DI water again, then wiped/dabbed with lens paper. The floats were set to self-activate, so sensor cleaning was the only pre-deployment preparation required. Floats were deployed from the aft stern as the ship steamed slowly away from the CTD station. Floats were lifted over the stern, then carefully lowered into the water with a slip-line strung through the deployment collar of the float. Deployments were completed by Lauren Moseley (deployments #1 and #10), Shuwen Tan (deployments #2 and #7), Sophie Shapiro (deployment #3), Mariana Aguirre Nunes (deployments #4, #6, and #8), and Vic Dina (deployments #5 and #9), with assistance from the ResTechs on watch (Royhon Agostine and Josh Manger, SIO). All deployments were clean with no tangling or hangups of the slip-line.

All floats operate on a standard Argo profiling 10-day cycle. After an initial test dive, the floats descend to a parking depth of 1000 m, and then drift for 10 days with the ocean currents. After 10 days, the floats dive to 2000 m and then ascend to the surface, during which data are measured and saved. The data are then sent to shore via Iridium Satellite communication. All of the floats began reporting data immediately and the sensors are operating well. All data is publicly available via the GO-BGC data portals and the Argo GDAC.

All deployments occurred at “full” carbon stations so that all GO-SHIP carbon parameters were analyzed for each depth sampled (34 depths from surface to 10 m off bottom). Additionally, duplicate bottles were tripped at the surface (~5 m) and at the depth of the chlorophyll maximum to allow for the addition of POC and HPLC sampling at these stations. POC and HPLC samples were collected and filtered by the Bio team (Star Dressler and Adam Fagan) and will be sent frozen for analysis at NASA for HPLC and SIO/UCSD for POC.

All floats were adopted by different schools and organizations in the US as part of the Adopt-a-float program (https://www.go-bgc.org/outreach/adopt-a-float). Names and images provided by the adoptees were skillfully drawn onto the floats by P02 science and crew party members. Each class received the details their deployment via posts to the GO-BGC expeditions webpage by onshore personnel George Matsumoto (MBARI). Together with their teachers, the students will follow the float data, which can be easily downloaded and plotted from the website.

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| Deployment | WMO | Lat | Lon | Date and Time (UTC) | CTD Station |
| 1 | 5906519 | 21.00 | 140.05 | 05/01/2022 23:25 | 1 |
| 2 | 5906513 | 26.67 | 136.68 | 05/03/2022 07:39 | 2 |
| 3 | 5906510 | 30.54 | 134.46 | 05/06/2022 20:12 | 11 |
| 4 | 5906511 | 30.00 | 138.37 | 05/08/2022 11:57 | 15 |
| 5 | 5906522 | 30.00 | 143.18 | 05/10/2022 07:06 | 23 |
| 6 | 5906518 | 30.00 | 151.25 | 05/14/2022 09:33 | 35 |
| 7 | 5906515 | 30.00 | 161.07 | 05/19/2022 08:43 | 50 |
| 8 | 5906512 | 30.00 | 169.72 | 05/24/2022 03:00 | 65 |
| 9 | 5906516 | 30.00 | 179.17 | 05/29/2022 08:53 | 83 |
| 10 | 5906521 | 30.00 | -170.45 | 06/03/2022 16:08 | 101 |