**xx.1 Deployments**

A total of 8 biogeochemical (BGC) Argo floats were deployed as part of the NSF-funded Global Ocean Biogeochemistry (GO-BGC) program (https://go-bgc.org). Each deployment occurred with the use of a line strung to the float. Deployments were done on departure from a CTD station while the ship was steaming at ~2 knots. The floats are self-activating, so no initial operations were required before their deployment to activate them.

**xx.1.1 GO-BGC profiling floats**

**PIs**: Kenneth Johnson (MBARI), Steven Riser (UW), Jorge Sarmiento (Princeton), Lynne Talley (UCSD/SIO), Susan Wijffels (WHOI)

**Shipboard personnel**: Andreas Thurnherr (LDEO), Elizabeth Ricci (UW SSSG), Stephen Jalickee (UW SSSG)

8 biogeochemical (BGC) Argo floats were deployed on A20 as part of the Global Ocean Biogeochemistry (GO-BGC) program (<https://go-bgc.org>), which is funded by NSF Award 1946578. These BGC Argo floats on A20 were the first in this program, which is slated to grow to 500 floats globally over the next 5 years. GO-BGC contributes to international and US BGC-Argo, and all floats conform to Argo mission requirements. Data are freely available through the Argo data portals and from the GO-BGC website. BGC-Argo floats are helping to resolve seasonal cycles of many key properties that are relevant to global biogeochemical processes.

The Atlantic sector for GO-BGC is led by the WHOI Argo group (Susan Wijffels, Roo Nicholson; planning Pelle Robbins), who planned the float deployment locations to span the length of both A20 and A22.

The floats have a 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 the 10-day drift, the floats dive to 2000 m and then ascend to the surface, during which data are measured and saved. The 2000 m-surface data profiles are then sent to shore via Iridium Satellite communication, using an antenna located at the top of the float. The floats deployed were UW-modified Teledyne Webb Apex floats. The floats are equipped with CTD, oxygen, nitrate, FLBB bio-optical, and pH sensors.

These 8 floats and 4 additional floats for the subsequent A22 voyage were readied at U. Washington (S. Riser Argo lab), and shipped to Woods Hole Oceanographic Institution (WHOI). In Woods Hole, UW Argo engineer Greg Brusseau tested each float prior to loading on R/V Thompson. WHOI provided excellent high-bay lab space with an adjacent outdoor parking lot where it was possible to test the floats, to satisfy the Covid19 pandemic isolation requirements.

Before the deployment of each float, the FLBB and the nitrate sensors were carefully cleaned using lens wipes, DI water and lens paper. Co-chief scientist Andreas Thurnherr and Thompson marine technicians Elizabeth Ricci and Stephen Jalickee were in charge of the GO-BGC float deployments. Additional assistance was provided by Stephanie O’Daly and the ABs on watch. The procedure required the use of a line strung through the deployment collar of the float. Each deployment occurred off the fantail while the ship was steaming at about 2 knots. Deployments were smooth with the exception of float 5906440 (UW ID 19107), during which the line tangled and the float was freed with a hook; a slight line hangup also occurred for float 5906434 (UW ID 19970).

Float deployments occurred after the completion of a CTD station. For all deployments, samples of nutrients, salinity, POC/HPLC, DIC, pH and alkalinity were taken at each depth, at least down to 2000 m. The HPLC and POC samples were taken from Niskin bottles tripped as duplicates, at the surface and at the chlorophyll maximum depths (DCM). The samples were filtered by Susan Becker, and will be sent frozen to the U.S. for analysis (NASA for HPLC and SIO for POC).

The floats were adopted by different schools and organizations in the U.S. as part of the outreach program “Adopt-a-float” (https://www.go-bgc.org/outreach/adopt-a-float). Each class named the float and received the details (and pictures) of their deployment from Andreas Thurnherr, via GO-BGC personnel onshore George Matsumoto (MBARI). Together with their teachers, the students will follow the float data, which can be easily downloaded and plotted from the website.

Seven of the floats began reporting data immediately, beginning with the engineering profile followed within a day by the first profile. The second float deployed (5906341, UW ID 19061) reported its engineering profile, but has not produced full profiles as of the end of the cruise. It appears that all sensors are working well, with the exception of pH on float 5906343 (UW ID 19881), which provided only a partial first profile. This was not related to issues with the float deployment.

The location and date of the float deployments are indicated in the table below, with WMO and UW ID numbers and the CTD cast at the deployment location.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **WMO ID** | **UW ID** | **Longitude** | **Latitude** | **Date and Time (UTC)** | **CTD**  **Station #** | **Comments** | **Deployer** |
| 5906342 | 19142 | -52.3364 | 40.0657 | 03/24/2021  2347 | 18 | Clean | Stephen Jalickee |
| 5906341 | 19061 | -52.3324 | 35.8859 | 03/27/2021  0800 | 25 | Clean; No first profile | Elizabeth Ricci |
| 5906440 | 19107 | -52.33 | 31.66 | 3/29/2021  1240 | 30 | Line tangled | Elizabeth Ricci |
| 5906435 | 19512 | -52.33 | 27.64 | 3/31/2021  1515 | 39 | Clean | Elizabeth Ricci |
| 5906340 | 19364 | -52.33 | 24.14 | 4/02/2021 1215 | 45 | Clean | Elizabeth Ricci |
| 5906339 | 19588 | -52.33 | 20.06 | 4/04/2021  1340 | 52 | Clean | Elizabeth Ricci |
| 5906343 | 19881 | -52.33 | 15.97 | 4/06/2021  1400 | 59 | Clean; pH partial | Elizabeth Ricci |
| 5906434 | 19970 | -52.33 | 11.89 | 4/08/2021  1425 | 66 | Clean | Elizabeth Ricci |

**Table 1**. Summary of deployment details for the GO-BGC profiling floats.