

A20 Operational Plan Information

Cruise Track Info:

- 1.) Transit from Woods Hole, MA (40.53° N, 70.67° W) to the initial station of the hydrographic A20 line (43.11°N, 50.73° W). A test cast will occur on the transit to the first station.
- 2.) From there, the cruise will proceed on a southwestward angle until 41.10°N, 52.33°W and then due southward until 9.20°N, 52.33°W. The cruise will then bend southwestward, entering in the French Guiana EEZ at 8.76°N, 52.46°W. The scientific stations will end at 6.89°N, -53.31°W.
- 3.) Transit from the end of the A20 hydrographic line to St. Thomas USVI (18.3° N 64.9° W).

Description of Operations:

An oceanographic transect in the Atlantic Ocean, nominally along 52° 20' W, a repeat of the GO-SHIP Hydrographic Program section A20, is scheduled on R/V *T.G. Thompson* in March-April 2021. A proposed cruise track is shown in Figure 1. The science portion of the current track closely follows the previous occupation in 2012, except with closer station spacing on the interior portion of the line.

The operations will consist of a series of 1) Rosette/CTD/LADCP; 2) Six Argo float deployments 3) eight BGC-Argo float deployments; 4) three RAFOS float deployments.

98 stations and 1 test station are planned, with a spacing of approximately 30 nm, except over the shelf and boundary currents at the beginning and end of the lines (stations 1 – 15 and 77 – 98) where spacing will range from ~3 – 13 nm. At every station, full depth Rosette/CTD/LADCP/FLBB/Transmissometer casts will be done. The Rosette will be lowered to approximately 10 m from the bottom. During each station, we will collect up to 36 water samples for measurement of various water properties, such as CO₂-related parameters, dissolved CFCs, oxygen, salinity, nutrients, etc. CTD, LADCP, oxygen, fluorometer and backscatter data will be also collected at each station. The collected water samples will be analyzed on board or stored and shipped later to shore (US) for subsequent analysis.

We will monitor and collect data from the standard meteorological sensors (wind speed and direction, air temperature) mounted on the ship's meteo tower. We will also monitor the ship-mounted underway bathymetry from the multibeam (full swath not required).

For the deployment of the Rosette, chief and co-chief scientists/ODF personnel/students will communicate with the marine technicians/crew for winch

operations. At the end of each cast, scientists and technicians will draw water samples from the Rosette Niskin bottles, while the ship is underway.

Several different types of floats will be deployed; 6 WHOI Argo floats, 8 UW biogeochemical (BGC) floats from the biogeochemical Argo project, and 3 WHOI RAFOS floats will be deployed. All floats will be deployed at CTD stations. The Argo and BGC Argo floats will be deployed at the station closest to the desired location (Table 1). The RAFOS floats will all be deployed at the same station, with water depth greater than 4500m and not near a seamount (ideally between stations 17 – 25, with 19 preferred). BGC floats will require slow steaming away from station during deployment. Tests and main preparation of the floats will be done at port, during the mobilization. The co-chief scientist will be charge of the deployment operations and he, or a designated scientist, will assist the marine technician with the deployment procedure from the aft deck of the vessel.

Table 1: Nominal location of Argo and BGC Argo Float Deployments

Float Type	Latitude	Longitude
BGC	40° N	52° 20'W
BGC	36° N	52° 20'W
BGC	32° N	52° 20'W
BGC	28° N	52° 20'W
BGC	24° N	52° 20'W
BGC	20° N	52° 20'W
BGC	16° N	52° 20'W
BGC	12° N	52° 20'W
CORE	29° N	52° 20'W
CORE	27° N	52° 20'W
CORE	25° N	52° 20'W
CORE	23° N	52° 20'W
CORE	18° N	52° 20'W
CORE	15° N	52° 20'W

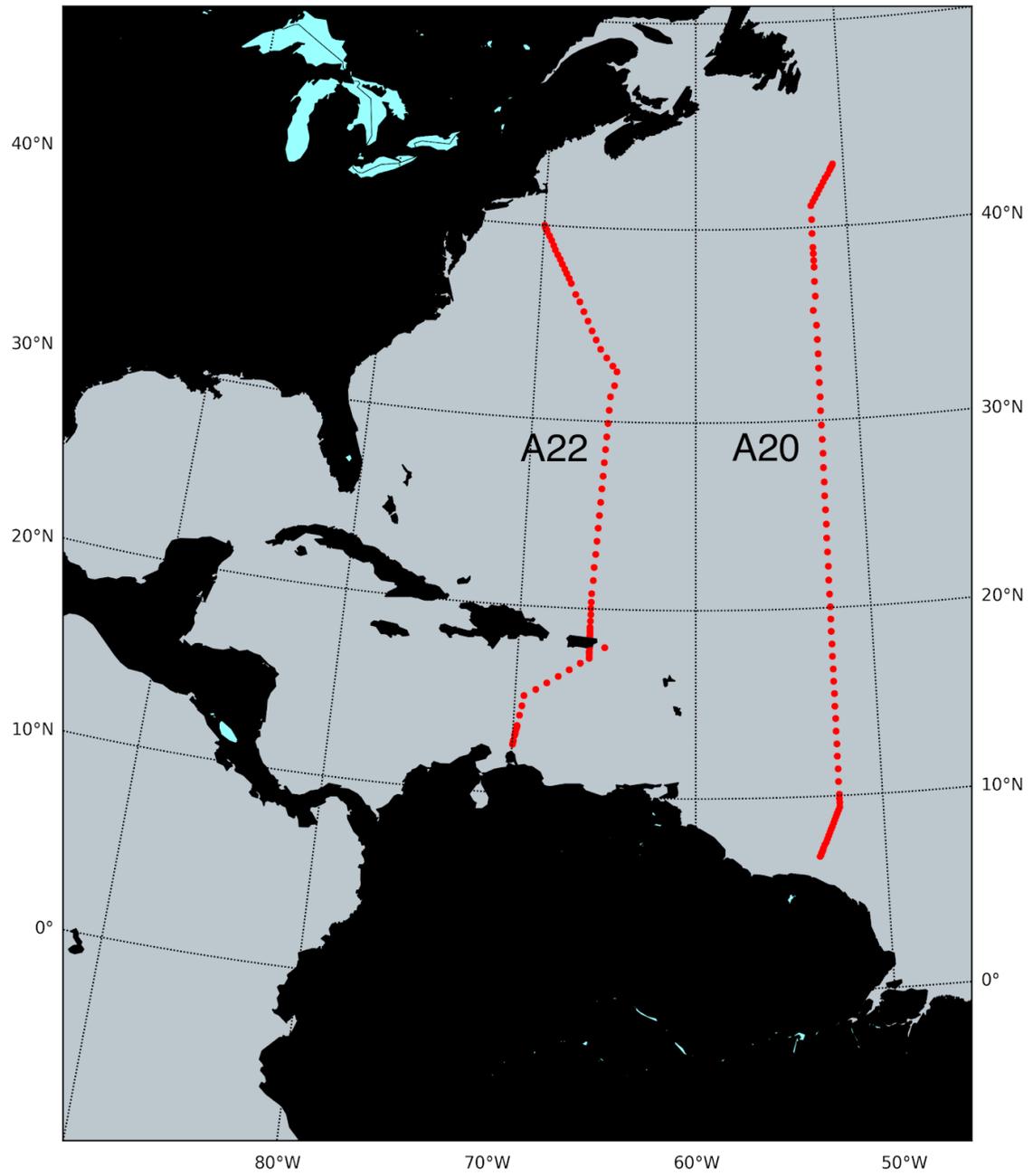


Figure 1: U.S. GO-SHIP A22 and A20 planned cruise tracks.