ASPIRE

Atlantic Seafloor Partnership for Integrated Research and Exploration

SCIENCE PLANNING WORKSHOP EXECUTIVE SUMMARY

November 15-16, 2018
Sheraton Silver Spring Hotel
Silver Spring, MD

On November 15-16, 2018, over 50 experts in deep-sea exploration convened in Silver Spring, Maryland to discuss North Atlantic Ocean exploration interests and priorities as part of the NOAA Office of Ocean Exploration and Research (OER) Atlantic Seafloor Partnership for Integrated Research and Exploration (ASPIRE) Science Planning Workshop (Figure 1). Participants consisted of a mix of early to late career professionals and represented diverse backgrounds and interests from academia, industry, and government from across the United States, European Union, Iceland, Russia, and Canada. The objectives of the workshop were to determine Atlantic Ocean-based mapping and characterization needs from a variety of deep-sea exploration interests. Workshop outputs will guide exploration in the North Atlantic Ocean in 2019-2021, both through the development and execution of NOAA Ship *Okeanos Explorer* field seasons and through external partnerships with government, academia, industry, and non-governmental organizations. ASPIRE workshop results, with an expected public release in April 2019, are intended to be used to inform other expeditions and platforms that are planning cruises in the North Atlantic.

FIGURE 1. The ASPIRE Science Planning Workshop in Silver Spring, MD had over 50 attendees representing interests in Atlantic Ocean basin exploration and research from the U.S., Canada, European Union, Iceland, and Russia.

ASPIRE under the Galway Statement on Atlantic Ocean Cooperation, is a multi-year, multi-national collaborative campaign to explore and characterize the North Atlantic Ocean. Building on the successes of NOAA's 2012-2013 Atlantic Canyons Undersea Mapping Expeditions (ACUMEN), the ASPIRE campaign broadens both the geographic focus to include more of the U.S. Atlantic and the high seas. ASPIRE also broadens the scope of partnerships to include federal agencies, such as BOEM and USGS, as well as international partners from the European Union and Canada. Fieldwork thus far has included missions to explore the submarine canyons of the U.S. and Canadian Atlantic continental margins, characterize the sensitive habitats of the U.S. mid- and South Atlantic, and map deepwater areas within international waters supporting the Atlantic Seabed Mapping International Working Group (ASMIWG). NOAA Ship *Okeanos Explorer* began working in the region in 2018 and has so far completed six ASPIRE missions (Figure 2). While these efforts are coordinated at the project-level, the ASPIRE Workshop was convened to better facilitate collaborative planning and develop a cohesive set of exploration priorities to work toward for the remainder of the ASPIRE campaign.

FIGURE 2. This map of the North Western Atlantic Ocean basin identifies all expeditions from 2016-2020 that fall under the auspices of the ASPIRE campaign. Expeditions for 2021 are in the early planning stages and are not shown in this figure.

In advance of the workshop, OER distributed a 'Call for White Papers' to the North Atlantic deep-sea community and received 47 submissions. In these two-page submissions, authors identified exploration targets across the North Atlantic and provided brief summaries of why each target was worthy of exploration. These submissions provided the framework for workshop discussions and will be made available with the final workshop report . All white paper authors were invited to participate in the workshop, along with additional experts in the ocean community as established and potential future partners representing governments, academia, industry, and nonprofits.

The workshop began with a welcome to participants from OER Director Alan Leonardi and former OER Deputy Director CAPT William Mowitt with an in-depth overview of the OER mission, past accomplishments, capabilities, and vision for ASPIRE—providing the framework for discussions. In addition, the workshop featured a live-streamed interaction with those aboard NOAA Ship *Okeanos Explorer*. Presentations by Terry Schaefer (NOAA Office of Oceanic and Atmospheric Research International Activities Office), Joana Xavier (University of Bergen), Marina Carreiro-Silva (University of the Azores), and Jennifer Higdon (DFO - Fisheries and Oceans Canada) provided insights into additional capabilities, assets, exploration goals for ASPIRE partners, and highlighting projects currently underway in the North Atlantic Ocean, including the Atlantic Ocean Research Alliance (AORA), Horizon 2020 projects SponGES and ATLAS, and DFO programs.

Following the comprehensive overview on current North Atlantic exploration and research activities, participants dispersed into small groups for a series of three separate breakout sessions tasked with identifying and refining areas and features of interest for ocean exploration across the North Atlantic basin. Initially groups were broken into regions of interest (as aligned with white paper submissions): Eastern, Central, Northwestern, and Southwestern Atlantic. The groups were each tasked with identifying areas lacking any or sufficient exploration. A fifth group was tasked with the same challenge but asked to consider a basin-wide assessment. Collaborative real-time geospatial tools were used to capture geospatial priorities generated from these discussions. The workshop built upon these discussions, which served as a guide for a subsequent breakout session on subject area interests to be prioritized for ASPIRE: archaeology, benthic ecology, connectivity, geology/minerals/mapping, and water column exploration. During both sessions, groups discussed assets, partners, challenges, and potential expedition plans within their regions and subject areas. Staff from OER's Expeditions & Exploration Division, Science & Technology Division, and Engagement Division captured this input in geospatially annotated notes that participants then used in their final breakout session to make recommendations.

Prior to reconvening for the third and final breakout session, OER leadership and expedition coordinators led a panel discussion to communicate the OER planning process and timelines associated with both the *Okeanos Explorer* schedule development and the OER Federal Funding Opportunity (FFO) process. This panel also served as a mechanism to further engage participants in NOAA and OER collaborative science programs while providing transparency regarding federal processes. The panel concluded with a modified charge for the final breakout session; returning to their original North Atlantic regional sections, participants were asked to refine regional and subject area interests into two to three management-relevant (i.e. fisheries, offshore energy, protected areas, etc.) expedition-sized priority areas.

The Southwestern, Northwestern, and Central Atlantic groups collectively identified eight priority areas for exploration, as noted in the list below and geographically represented in Figure 3. The Eastern Atlantic group focused their recommendations on cruise planning processes and information gaps, given the diversity of stakeholder interests in the region. The priority area recommendations for exploration are as follows:

NORTHWESTERN ATLANTIC OCEAN

1. Bermuda, the New England Seamount Chain, and the Northeast Canyons and Seamounts Marine National Monument
    - Subject area relevance: archaeology, benthic ecology, connectivity, water column
    - Management connections: Northeast Canyons and Seamounts Marine National Monument, deep sea coral and sponge grounds, fisheries interests
2. New England and Canadian shelf break canyons to Laurentian Fan
    - Subject area relevance: archaeology, benthic ecology, water column, connectivity, geology/mapping/minerals
    - Management connections: U.S. and Canadian protected areas, deep sea coral and sponge grounds, fisheries interests
3. Davis Strait/Iceland Transect
    - Subject area relevance: archaeology, benthic ecology, connectivity, water column
    - Management connections: fisheries, deep sea coral and sponge grounds, ocean acidification

SOUTHWESTERN ATLANTIC OCEAN

4. Blake Plateau
    - Subject area relevance: archaeology, benthic ecology, geology/mapping/minerals
    - Management connections: potential rare earth minerals and hydrocarbons, potentially polluting wrecks, Seabed 2030 mapping
5. U.S. southeastern continental margin and Bahamas
    - Subject area relevance: benthic ecology, connectivity, geology/mapping/minerals
    - Management connections: fisheries, deep sea coral habitat areas of particular concern, offshore energy management

CENTRAL ATLANTIC OCEAN

6. Azores Plateau
    - Subject area relevance: archaeology, benthic ecology, geology/mapping/minerals, connectivity
    - Management connections: fisheries, deep sea coral and sponge habitats, first deepwater exploration of Marine Protected Areas (MPAs), geohazards, global habitat models
7. Northern Mid-Atlantic Ridge/Charlie Gibbs Fracture Zone
    - Subject area relevance: benthic ecology, connectivity, geology/mapping/minerals
    - Management connections: High Seas MPAs (e.g. Charlie-Gibbs Fracture Zone MPA), global climate models, global seabed models, potential future minerals mining, Atlantic highly migratory species (HMS)
8. Southern Mid-Atlantic Ridge
    - Subject area relevance: benthic ecology, connectivity, water column, geology/mapping/minerals
    - Management connections: International Seabed Authority lease areas, global climate models, deep sea coral and sponge habitats, global seabed models, habitat suitability models

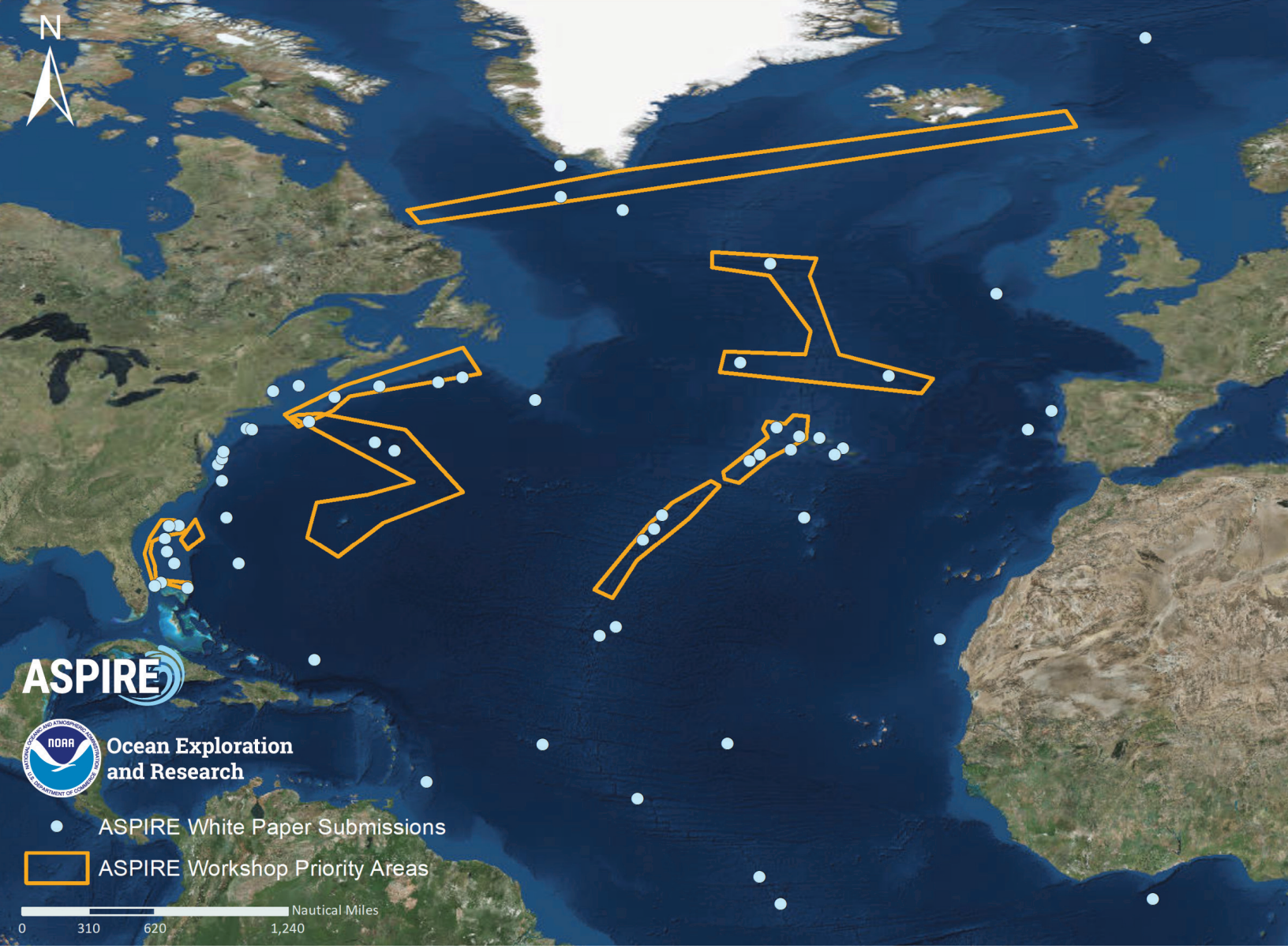

FIGURE 3. Map identifying feedback received during the ASPIRE Science Planning Workshop. Breakout groups were asked to identify priority operating areas (outlined in orange) for upcoming expeditions in the Southwest Atlantic, Northwest Atlantic, and Central Atlantic regions. Relative locations of pre-workshop white paper submissions are indicated by white dots - these papers served as the framework for the ASPIRE workshop.

These recommendations serve as the basis for expeditions being planned for 2019-2021. All recommendations are now under consideration by NOAA OER and partners as outyear ASPIRE planning is completed. Relevant partners have or will be engaged in 2019-2021 *Okeanos Explorer* expedition planning. A full ASPIRE workshop report (April, 2019) will provide additional details based on breakout group discussions and recommendations. The ASPIRE workshop was organized by NOAA's Office of Ocean Exploration and Research (OER) and made possible with the organizational support of the University Corporation for Atmospheric Research (UCAR).