

## **An Investigation of the Sedimentary Environments of Smith Cove and Nautilus Cove, Maine**

Seafloor mapping consists of using types of sonar, such as side scan sonar, to create an accurate depiction of seafloor features. Seafloor mapping provides crucial information about potential navigational hazards, changes in geological formations, and opportunities for aquaculture development (Artur et al. 2015; Hamouda et al. 2016; NOAA Fisheries). Sedimentary environment maps are a type of seafloor map that assists with revealing this information. These maps rely on sonar imagery and sediment samples to provide crucial information on seafloor sediment types to mariners, scientists, and local communities (Bellec et al. 2017; Coolen et al. 2015). While sonar mapping has been done in Smith Cove and Nautilus Cove, Maine, the mapping was both incomplete and lacked enough detail to be useful to these communities (Barnett 2015; Marvinney 1996). Therefore, the objective of this study was to create a detailed sedimentary environment map depicting the sediment types of Smith Cove and Nautilus Cove. Side scan sonar was used to obtain sonar imagery of these areas, while sediment samples were taken to ground truth and add more detail to this imagery. The Barnhardt et al. (1998) and the Folk (1980) classification schemes were used to identify different sediment types in these survey areas, and the resulting sediment types were able to be incorporated into a map depicting the sedimentary environments of these survey areas on GoogleEarth Pro. Overall, it was found that coarser sediments were closer to the entrance of the coves, while mud was primarily in the center of the coves and dominated the survey areas. These patterns are most likely due to the current and tidal movements of the survey region. However, there is more research that can be done to enhance the details of this map and add more information about these sedimentary environments.

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