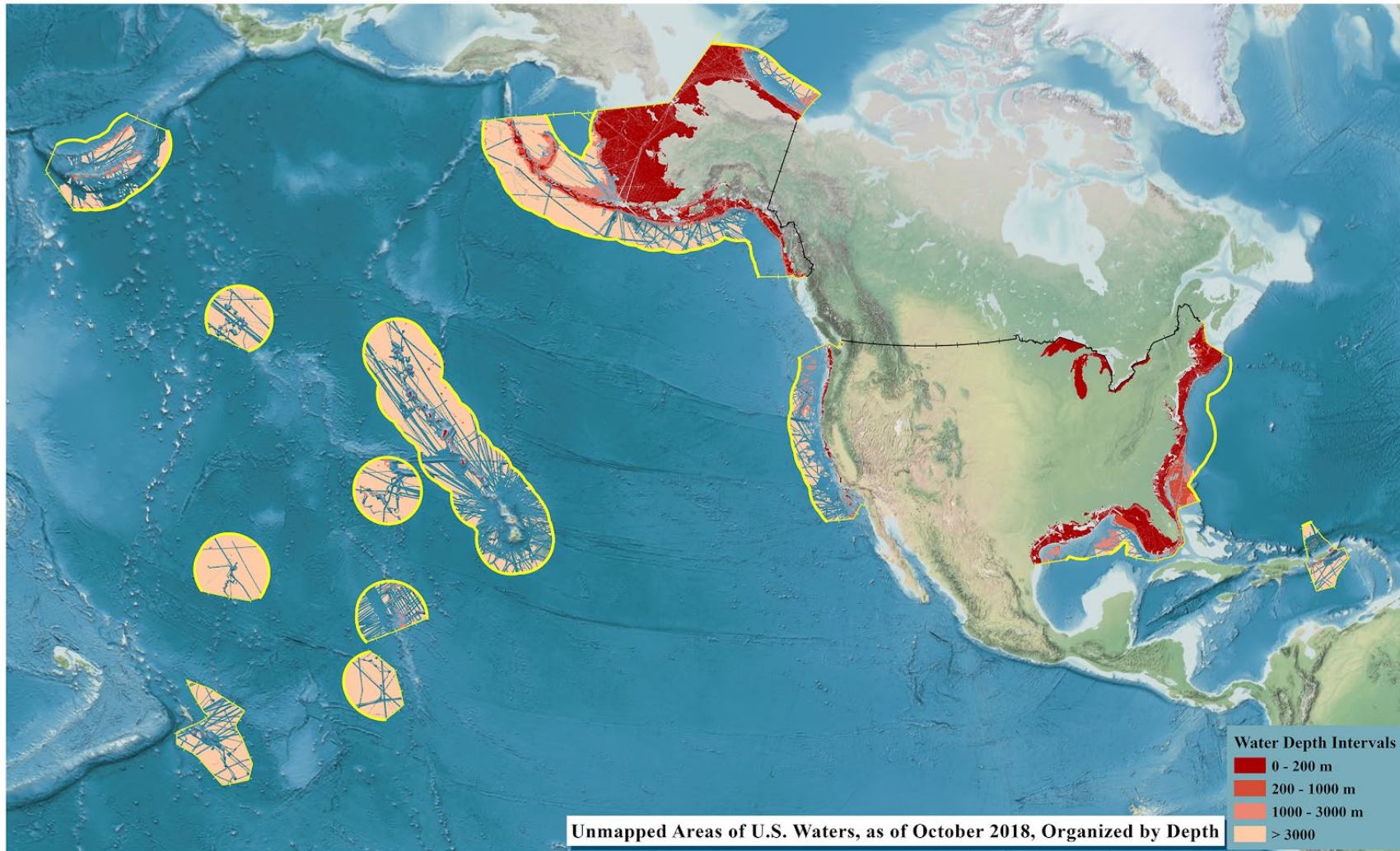


Progress Report: Unmapped U.S. Waters

Rear Admiral Shepard M. Smith



Gap Analysis



Level of Effort

| Remaining to complete to modern standards | Effort - (ship years) | | | | | | | | |
|---|-----------------------|-------------|-------------|-------------|----------------|------------------|---------------|------------|--------------|
| | 5-20 m | 20-40 m | 40-200 m | 200-1,000 m | 1,000 - 1500 m | 1,500 to 3,000 m | 3,000-5,750 m | 5750 + | Total |
| New England | 2.3 | 1.5 | 3.4 | 0.2 | 0.0 | 0.0 | 0.0 | - | 7.4 |
| Atlantic | 9.5 | 6.3 | 3.3 | 0.3 | 0.0 | 0.0 | 0.0 | - | 19.5 |
| Caribbean | 0.7 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 1.1 |
| Florida | 13.9 | 7.0 | 3.7 | 0.6 | 0.0 | 0.0 | 0.0 | - | 25.3 |
| Gulf | 7.3 | 4.1 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | - | 14.1 |
| Great Lakes | - | - | 2.8 | 0.0 | - | - | - | - | 2.8 |
| West Coast | 1.2 | 0.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.1 | - | 2.9 |
| Alaska | 32.5 | 25.3 | 40.1 | 1.3 | 0.1 | 0.2 | 0.9 | 0.0 | 100.4 |
| Hawaii & Pacific Isl. | 0.9 | 0.6 | 0.2 | 0.0 | 0.0 | 0.1 | 2.0 | 0.1 | 3.9 |
| total | 68.4 | 45.5 | 57.2 | 2.5 | 0.2 | 0.4 | 3.0 | 0.1 | 177.4 |
| | 39% | 26% | 32% | 1% | 0% | 0% | 2% | 0% | 100% |

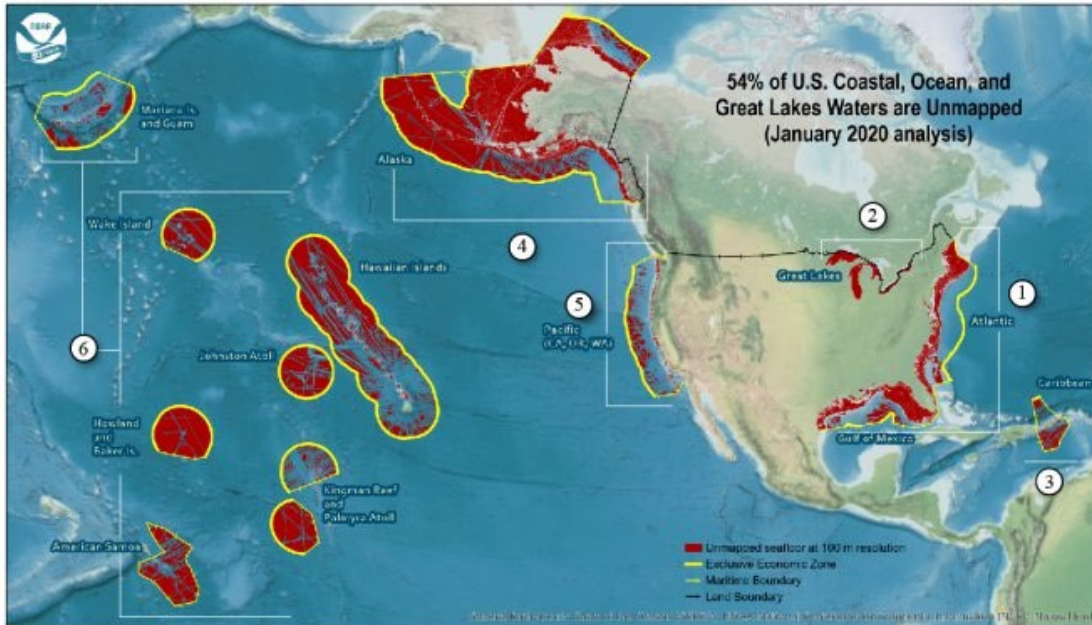
Greenaway et al. "Are we done yet? An empirical estimator of level of effort for seafloor surveys - including an estimate for the full survey of U.S. waters". Submitted for publication.



Progress Report

PROGRESS REPORT: Unmapped U.S. Waters

Knowledge of the depth, shape, and composition of the seafloor are foundational data elements necessary to explore, sustainably develop, understand, conserve, and manage our coastal and offshore natural resources. The 2019 Presidential Memorandum on Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and Nearshore of Alaska and the global Seabed 2030 initiative make comprehensive ocean mapping a priority for the coming decade. This report, updated annually, will track our progress to this important goal.



Percent of U.S. Waters Still Unmapped in 2019

| U.S. waters | Total Area = 3,592,000 square nautical miles (sqnm) |
|---|---|
| 54% | 57% - 2018 59% - 2017 |
| 1. Atlantic and Gulf of Mexico | Total Area = 472,200 sqnm |
| 43% | 48% - 2018 49% - 2017 |
| 2. Great Lakes | Total Area = 46,600 sqnm |
| 95% | 96% - 2017 96% - 2018 |
| 3. Caribbean | Total Area = 61,600 sqnm |
| 42% | 44% - 2018 45% - 2017 |
| 4. Alaska | Total Area = 1,080,200 sqnm |
| 72% | 73% - 2018 74% - 2017 |
| 5. Pacific (CA, OR, WA) | Total Area = 239,700 sqnm |
| 24% | 29% - 2018 29% - 2017 |
| 6. Pacific Remote Islands & Hawaii | Total Area = 1,691,700 sqnm |
| 50% | 53% - 2018 55% - 2017 |



National Oceanic and Atmospheric Administration

March 2020



Office of Coast Survey
National Oceanic and Atmospheric Administration

Progress Report

Mapping the Seafloor

Multibeam and LIDAR surveys
by trained hydrographers and other personnel
from government, academia, and private sector

primary sources of bathymetry

Coastline

Representing ~0-40 meters water depth, mapping in this area is ideal for aircraft using LIDAR technology and autonomous systems using multibeam sonar technology. Concerns about safe navigation require a high level of data accuracy.

unmanned

Shallow water

Representing ~40-200 meters water depth, mapping this area is ideal for ships using multibeam sonar technology alongside autonomous systems as a force multiplier. Conditions are not usually suitable for aerial survey methods. Concerns about safe navigation require a high level of data accuracy.

Deep water

Representing water depths >200 meters, mapping this area is ideal for ships using multibeam sonar technology. Conditions are not suitable for aerial survey methods and navigation safety is not a primary concern in this area.

other sources

Unmanned aerial vehicles



Satellite-derived bathymetry



Sidescan sonar



Single beam bathymetry



Crowdsourced bathymetry



Strategies for Filling Gaps

Partnerships and technology innovations are key to fulfilling seafloor mapping goals. As technology improves, there are two primary ways to contribute: (1) participate in U.S. mapping coordination activities, and (2) share your data. Publicly accessible bathymetry benefits numerous communities of users and the coordinated collection of new data promotes the integrated ocean and coastal mapping goal to "map once, use many times." For the latest status on these efforts, visit <http://iocm.noaa.gov/seabed-2030.html>.



