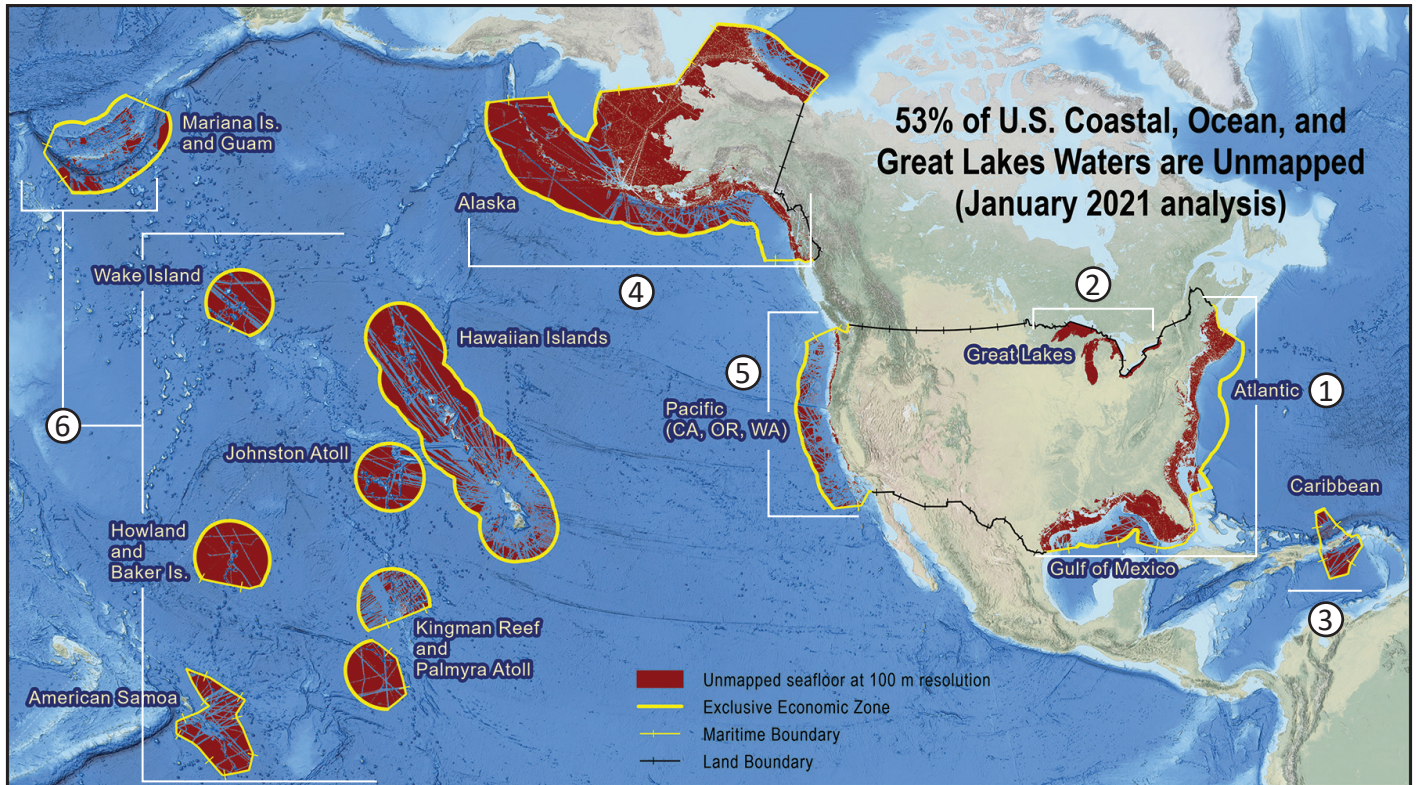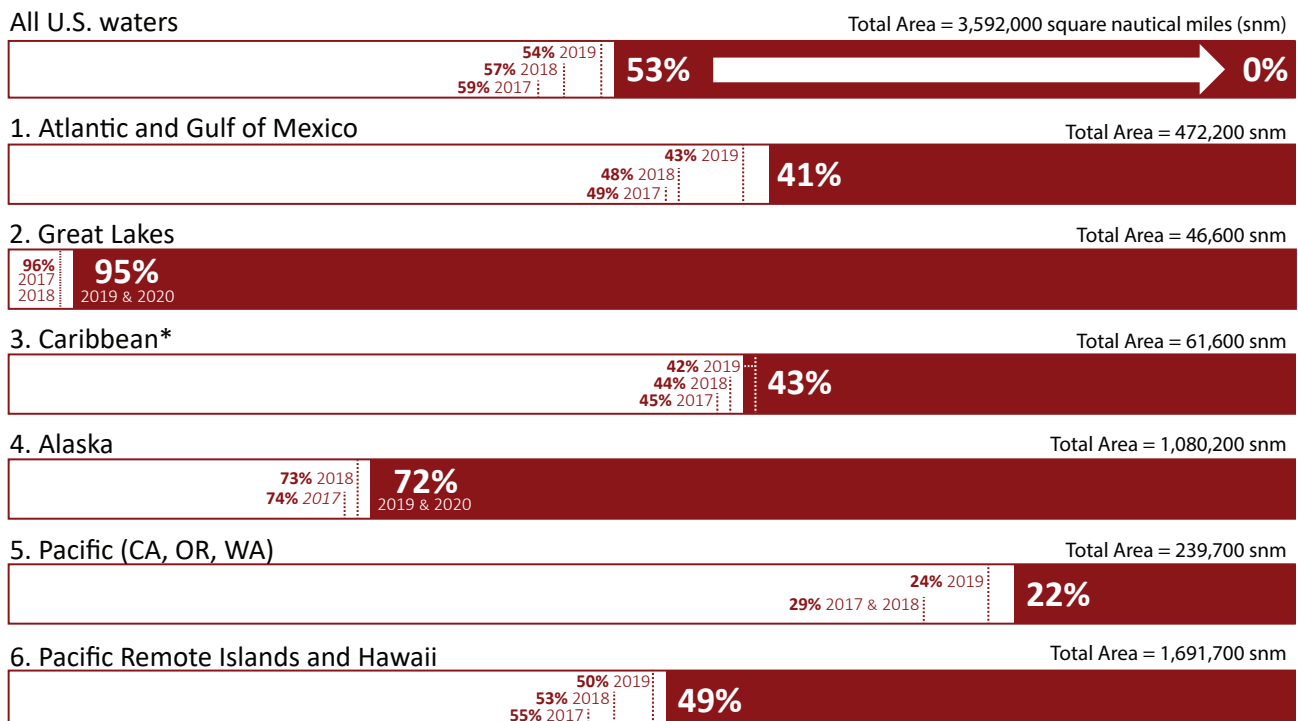# PROGRESS REPORT: Unmapped U.S. Waters

Knowledge of the depth, shape, and composition of the seafloor is necessary to explore, characterize, conserve, and manage our coastal and offshore natural resources. The 2020 **National Strategy for Ocean Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone** and the global **Seabed 2030** initiative make comprehensive ocean mapping a priority for the coming decade. This second annual report tracks our progress toward mapping the U.S. Exclusive Economic Zone.

53% of U.S. Coastal, Ocean, and Great Lakes Waters are Unmapped (January 2021 analysis)

Map labels: Mariana Is. and Guam, Alaska, Wake Island, Hawaiian Islands, Johnston Atoll, Howland and Baker Is., Kingman Reef and Palmyra Atoll, American Samoa, Great Lakes, Atlantic, Caribbean, Gulf of Mexico, Pacific (CA, OR, WA)

Legend:
- Unmapped seafloor at 100 m resolution
- Exclusive Economic Zone
- Maritime Boundary
- Land Boundary

Percent of U.S. waters still unmapped in 2020

All U.S. waters — Total Area = 3,592,000 square nautical miles (snm)
- 54% 2019
- 57% 2018
- 59% 2017
- **53%** → 0%

1. Atlantic and Gulf of Mexico — Total Area = 472,200 snm
- 43% 2019
- 48% 2018
- 49% 2017
- **41%**

2. Great Lakes — Total Area = 46,600 snm
- 96% 2017
- 2018
- **95%** 2019 & 2020

3. Caribbean* — Total Area = 61,600 snm
- 42% 2019
- 44% 2018
- 45% 2017
- **43%**

4. Alaska — Total Area = 1,080,200 snm
- 73% 2018
- 74% 2017
- **72%** 2019 & 2020

5. Pacific (CA, OR, WA) — Total Area = 239,700 snm
- 24% 2019
- 29% 2017 & 2018
- **22%**

6. Pacific Remote Islands and Hawaii — Total Area = 1,691,700 snm
- 50% 2019
- 53% 2018
- 55% 2017
- **49%**

* The Caribbean "lost" 600 snm of bathymetry in 2020 due to a minor correction to remove known bad/poor quality surveys from the calculation.

Mapping the Seafloor

primary sources of bathymetry

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

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. Navigation safety is not a primary concern in this area.
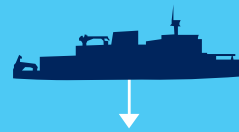
other sources
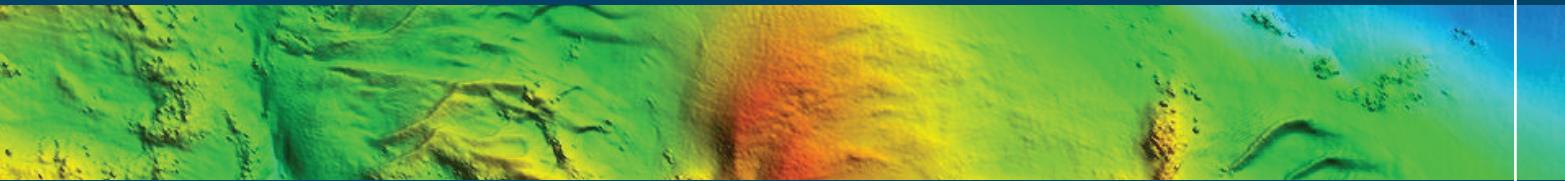
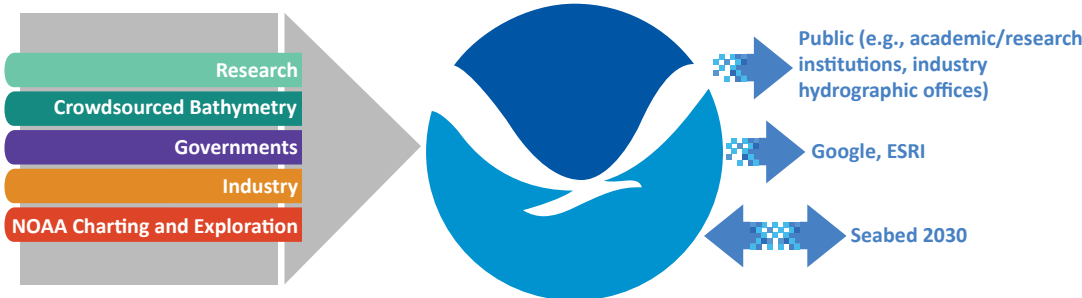| Unmanned aerial vehicles	Satellite-derived bathymetry	Sidescan sonar	Single beam bathymetry	Crowdsourced bathymetry

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.

- Research
- Crowdsourced Bathymetry
- Governments
- Industry
- NOAA Charting and Exploration

→ Public (e.g., academic/research institutions, industry hydrographic offices)

→ Google, ESRI

→ Seabed 2030

Crowdsourced bathymetry is the collection of depth measurements from vessels with standard navigation instruments during routine maritime operations. It is a powerful source of information that helps to fill gaps where data is sparse, especially in places where government survey vessels do not have the resources to go in the next ten years.