

## Integrated National Maps and Assessments

At least ten federal agencies, almost all coastal states, and many local agencies, academic institutions, and private companies are involved in mapping, charting, and assessing living and nonliving resources in U.S. waters. However, different organizations use varying methods for collecting and presenting these data, leading to disparate products that contain gaps in the information they present.

### Primary Federal Agencies that Conduct Science-based Marine Operations

U.S. Environmental Protection Agency	U.S. Coast Guard
Minerals Management Service	U.S. Fish and Wildlife Service
National Geospatial-Intelligence Agency	U.S. Geological Survey
National Oceanic and Atmospheric Administration	U.S. Navy
U.S. Army Corps of Engineers	National Science Foundation

Ideally, a variety of information (e.g., bathymetry, topography, bottom type, habitat, salinity, vulnerability) should be integrated into maps using Global Positioning System coordinates and a common geodetic reference frame. In addition, these maps should include living marine resources, energy resources, and environmental data when available, to create complete ocean characterizations necessary for developing and implementing science-based ecosystem-based management approaches. Achieving this integration in the coastal zone is an extremely complex proposition.

By launching the Geospatial One-Stop Portal, the Office of Management and Budget has taken steps to curtail the collection of redundant data, facilitate information sharing, and plan for future integrated mapping and charting. This Web-based server will provide national base maps with administrative and political boundaries that can also incorporate information on agriculture, atmosphere and climate, ecology, economics, conservation, human health, inland water resources, oceans, estuaries, transportation networks, and utilities. In addition, the Federal Geographic Data Committee is developing the National Spatial Data Infrastructure in cooperation with organizations from state, local, and tribal governments, the academic community, and the private sector. This initiative includes policies, standards, and procedures for organizations to cooperatively produce and share geographically-linked data.

The relevant federal agencies must continue to integrate and share data in the quest to create readily accessible maps that track geological, physical, biological, and chemical resources in three dimensions. The fourth dimension—time—should be incorporated wherever possible so changes in ocean resources can be tracked over the short and long terms.

The National Research Council's 2003 study of national needs for coastal mapping and charting includes an examination of the major spatial information requirements of federal agencies and the principal user groups they support, identifies the highest priorities, and evaluates the potential for meeting those needs based on the current level of effort.<sup>12</sup>

## Federal Mapping and Charting Activities

Maps of coastal land areas, and charts of nearshore and offshore areas, are essential for safe navigation and for defining boundaries, mitigating hazards, tracking environmental changes, and monitoring uses. Because so many federal agencies have mapping and charting responsibilities (Appendix 5), there are significant overlaps. This situation results in multiple entities within government, industry, and academia undertaking the expensive and time-consuming task of repeating surveys of the same area for different purposes. Furthermore, differences in scale, resolution, projection, and reference frames inhibit the integration of

onshore and offshore data. It is impossible to merge most existing maps and charts to provide a continuous picture of the coastal zone. However, recent advances in the development of satellite positioning systems, mapping sensors, and the manipulation of data have created a new generation of geospatial data products that address some of the key challenges faced by ocean and coastal managers and policymakers.

The U.S. marine transportation system is in particular need of better charts. As this industry prepares for exponential growth over the next twenty years, a backlog of required surveys is developing. Approximately 35,000 square nautical miles of navigationally significant U.S. waters have been designated as critical areas requiring updated information on depth and obstructions.<sup>13</sup> New maps and charts of these waters and ports are essential to minimize shipping accidents and to support the national security missions of the U.S. Navy and U.S. Coast Guard.

Another significant issue is the need to conduct extensive multi-beam sonar mapping of the U.S. continental shelf, where a potential \$1.3 trillion in resources (including oil, minerals, and sedentary species) could become available under United Nations Convention on the Law of the Sea (LOS Convention) provisions concerning extensions of the continental shelf. If the United States accedes to the LOS Convention, it would be able to present evidence to the United Nations Commission on the Limits of the Continental Shelf in support of U.S. jurisdictional claims to its continental shelf. The University of New Hampshire's Center for Coastal and Ocean Mapping/Joint Hydrographic Center, in conjunction with NOAA and USGS, has already identified regions in U.S. waters where the continental shelf is likely to extend beyond 200 nautical miles and is developing strategies for surveying these areas.<sup>14</sup> Bathymetric and seismic data will be required to establish and meet a range of other environmental, geologic, engineering, and resource needs.

Consolidation and coordination of the many existing federal mapping activities will increase efficiency and help ensure that all necessary surveys are conducted. NOAA, which has responsibility for collecting hydrographic and bathymetric data and creating navigational charts for safe and efficient maritime commerce, is the logical agency to lead the nation's coastal and ocean mapping and charting activities. Where consolidation is not feasible because of another agency's mission needs, clearer definitions of roles and responsibilities will be helpful. Drawing upon the mapping and charting abilities found in the private sector and academia will also be necessary to achieve the best results at the lowest cost.

**Recommendation 25–5. The National Ocean Council (NOC) should coordinate federal resource assessment, mapping, and charting activities with the goal of creating standardized, easily accessible national maps that incorporate living and nonliving marine resource data along with bathymetry, topography, and other natural features.**

*In addition, the NOC should:*

- *review and make recommendations on consolidation of appropriate federal, nonmilitary ocean mapping and charting activities within a strengthened National Oceanic and Atmospheric Administration.*
- *ensure that federal mapping and charting activities take full advantage of resources available in the academic and private sectors.*