Navy Relents in Battle Over Mapping Sea Floor

Detailed topographical images of the 200-mile coastal zone can now be made available to researchers outside the government

FIVE YEARS AGO, the National Oceanic and Atmospheric Administration (NOAA) drew up an ambitious plan to map the largest unexplored piece of real estate claimed by the United States: the sea floor from the coastline to 200 miles offshore. Using a newly developed sonar scanning technology, NOAA aimed to produce topographical charts of the entire area, displaying geological features in breathtaking detail.

A few charts have since been made, but hardly anybody outside the federal government has seen them, for they are classified. The Navy, fearing that the charts could be used by the Soviet Union to find hiding places for submarines, persuaded the White House to issue an order in January 1985 prohibiting their release without the Defense Department's approval. The Navy has stood by its objections, and NOAA's ambitious plan has languished.

Last week, however, in a move that surprised and delighted many researchers, Rear Admiral Richard Pittinger, the Oceanographer of the Navy, informed NOAA that the Navy is lifting its opposition to publication of charts of most areas of the sea floor. The only regions from which information will continue to be controlled are broad areas around the routes that U.S. ballistic missile submarines follow when they leave port. These areas will be defined in the next few weeks, Pittinger said.

Thomas Maginnis, head of NOAA's National Ocean Service, says that the Navy's change of mind will permit the agency to issue about 30 charts and associated information in the next few months. NOAA, he says, still plans to map the entire 200-mile coastal zone with the new high-resolution scanning technology, but how long it will take is far from certain.

So far, says Fred Ganjon, a NOAA oceanographer, the agency has charted just a tiny portion of the zone. It has surveyed a few areas off the West Coast, Hawaii, Alaska, the Gulf of Mexico, and a small area off the Atlantic Coast, producing images of individual features rather than mapping large regions, as originally intended. Proposals to increase the coverage have been stalled, he said, because of the classification problem.

When NOAA first drew up its plan 5 years ago, the idea was greeted with enthusiasm from industry and academic scientists. The detailed topographical information could be useful for a variety of purposes, including minerals exploration, fishing, and geological research.

Surveys already completed in the Gulf of Alaska have detected previously unidentified salt domes that could be associated with oil deposits, for example, and fishermen will be "absolutely delighted" with the charts, predicts Ganjon. John Knauss, a researcher at the University of Rhode Island, says that the information generated from a systematic mapping effort could provide valuable data on the geological history of the sea floor.

University researchers are pleased by the decision for another reason. Ever since the Navy raised objections to NOAA's program, there have been fears that it would also try to restrict academic research in parts of the 200-mile zone. Some academic vessels are fitted with the new sonar scanning technology and they have been producing charts of specific geological features for the past few years. Pittinger's statement should put those fears to rest. It says that the Navy "will impose no review or classification on academic surveys, including those funded by the Office of Naval Research."

Sea-beam charts show geological features on the sea floor in photographic detail.

The Navy points out, however, that the scanning technology itself is considered militarily sensitive and its export is restricted by the nation's export control laws. This could affect international scientific programs involving researchers from communist countries. "The Chief of Naval Research and I will be advising academic users of their responsibilities under U.S. export law when using HRB [high-resolution bathymetry] technology in international cooperative efforts," Pittinger said. The technology is not the exclusive preserve of the United States, however. French, West German, Canadian, and Japanese research ships are also equipped with the scanners, and in some cases the technology is said to be better than is available in the United States.

Highly detailed topographical surveys of the sea floor are made possible by a combination of a sonar scanning system called Sea-beam, which produces computerized depth information from a broad swath beneath the ship, and a new satellite system called the Global Positioning System that pinpoints the exact position of the survey ships. Information from the scanners is fed into a computer, which generates detailed topographical charts.

In the past, charts of the ocean floor have been developed from scans with single sonar instruments, which provide information only on the depth immediately beneath the ship. Thus, many passes have to be made to build up a detailed chart, and the readings are generally correlated manually. In many deep-water regions, charts have been developed from widely spaced readings and "a lot of artistic license," says one researcher. Paul Wolff, Maginnis's predecessor at NOAA, told a congressional subcommittee a few years ago that when the charts developed by Sea-beam are placed alongside old ones of the same area, the differences "are really striking." The Sea-beam data depict geological features such as old canyons and river beds in photographic detail.

Whether NOAA will now be able to carry out its complete mapping of the 200-mile zone will depend partly on the availability of funds and partly on the development of new technology to scan shallow inshore areas. Deep-water areas can be mapped relatively quickly because the sonar beam spreads out to cover a swath of sea floor about 1 mile wide. In shallow areas, the swath is much narrower, so many more passes are needed to provide complete coverage. According to Maginnis, several years ago it was estimated that 192 ship-years would be required to map the shallower areas of the zone.

Why has it taken so long for the Navy to come up with its new policy? According to some observers, in spite of appeals from NOAA and outside scientists, the matter was accorded low priority in the Navy until Pittinger was appointed to the post of Oceanographer of the Navy last September. "He took this under his wing and really moved things along," says one official.

"I think everybody who has spent years and years of their lives working on this is tickled that this information is going to see the light of day," says Maginnis.

■ COLIN NORMAN