Amid the rise of GPS, NOAA weighs a move away from paper charting

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Growing up boating in Annapolis, Jan Majer remembers his father marking up his nautical charts by hand each year with the latest information on buoy and shoal movements.

Majer's father taught him how to read the paper charts, and he still buys them as backups. But with two laptops, two tablets, a built-in plotter, a hand-held GPS tracker and as many as a dozen cellphones aboard, the captain of the "Warrior" Volvo 70 racing sailboat hasn't used the 3-foot-by-4-foot charts in 15 years.

Still, he said, "It's a skill I'm really glad I have."

U.S. mariners have relied on paper nautical charts - displaying water depth, coastlines, obstacles and other navigational information - produced by the government since President Thomas Jefferson in 1807 ordered the charting of U.S. coastal waters to allow the nascent country's shipping industry to grow and thrive.

But as with cars and planes, GPS technology and advanced on-board navigational systems have largely replaced paper as the first point of reference for many boaters. In a potential sea change for a nautical industry heavy on tradition, the National Oceanic and Atmospheric Administration's recent National Charting Plan suggested that, eventually, "the reduction or elimination of traditional paper nautical charts seems likely."

The 30-page plan says it seeks "comprehensive improvements across the entire suite of NOAA nautical chart products" for the 3.4 million square nautical miles of water and 95,000 miles of U.S. coastline the agency charts.

The Office of Coast Survey, which released the report, offered no timeline for when a move away from paper charts might occur. It recently extended the public comment period on the charting plan until July 1.

The notion of relying solely on electronics, which could fail with as little as an inopportune wave crashing over the side of a boat, is ludicrous to Lee Estes, president of Maptech, a New Bedford, Mass.-based firm that sells pocket-sized, waterproof charts of converted NOAA charting data.

"If your car GPS breaks, you can pull over and get directions," he said. "You're not necessarily going to lose your ability to stay safe. If you lose your electronic screen (on a boat) in the middle of being close to hazards, it's a lot more difficult."

"If something goes wrong, you want to have that paper chart available to you immediately," Estes added. "The sea can be an unforgiving place, and having the right tools available can be the difference between safety and being in harm's way."

NOAA hasn't printed and distributed the charts for years, ceding those functions instead to a handful of certified private companies, including Maptech. The agency also puts them online to be downloaded - and printed - for free. That won't change, said John Nyberg, chief of NOAA's National Ocean Service marine chart division.

"When you talk about a paper backup to an electronic system, we're keeping that in mind and continuing to provide options," he said.

The agency releases charting data in two formats: raster charts, which resemble PDF maps that can be easily printed, and vector charts, which are a more dynamic GPS display, overlaid with hyperlinks and other interactive features tailored to computers, smartphones and navigational systems.

NOAA eventually expects to phase out the raster charts, dedicating its resources instead to making the vector charts the premier nautical guide, Nyberg said. That transition will require improving the detail in the vector charts, he said, to make them comparable to the raster charts so they can be printed and used in the same way charts are today.

The vector charting, NOAA acknowledged in a follow-up clarification to its Charting Plan, is "still relatively new and needs some improvement."

While they're good as backups to electronic systems, paper charts are not without their own pitfalls.

Bill Brandon, who works at Tidewater Yacht Service marina in Port Covington, remembered a customer who had reserved a boat slip for a weekend calling him from the Inner Harbor to say he couldn't find it. The customer, it turned out, had followed an old chart to Tidewater's previous location, near Domino Sugar. The company moved in 2005.

"People don't think about updating their charts," Brandon said.

Keeping paper charts up-to-date either requires regularly buying new ones or correcting them by hand, like Majer's father used to do. That's a problem digital ones don't have, Nyberg said.

"If you're using a digital version of a chart, your system will update your charts automatically," Nyberg said.

Brian McDermott, dockmaster at Henderson's Wharf, a 280-slip marina in Fells Point, has had a captain's license for 35 years and sailed the Intracoastal Waterway along the East Coast more than 80 times. For each trip, he spread out a paper chart in the bridge of his boat.

"For any prudent mariner, a typical traditional chart will always play a very important role in navigating, without a doubt," he said. "These electronics - you cannot rely on them 100 percent."

Larger vessels are required to have up-to-date charts aboard, but McDermott said he sometimes sees novices take their recreational boats out into the Baltimore Harbor without buying charts. They usually get back without incident, but, despite his years of experience, he won't chance it.

"To ever not have a hard chart on the bridge? That'll never happen with me," he said.

Majer's sailboat was tied up in Baltimore last week between a 1,000-mile race from Antigua to Bermuda and a 475-mile race from Annapolis to Newport, R.I. He ducked into a seat in a dark crawl space below deck on a recent morning, where his two laptops displayed charts, winds and blips representing nearby boats. Using only paper charts for either race, he said, "we would have a hard time being competitive."

Still, racing rules - and common sense - dictate having paper charts aboard, he said.

"The more we take advantage of modern technology, the easier it's going to be to do our jobs well and better," Majer said. "But if and when it stops working, you have to have paper and you should practice to use those skills."

Joe Parvana, manager of the West Marine supply store in Canton, said he recently printed NOAA charts for a customer planning a trip from Egg Harbor, N.J., to Fenwick Island, Del.

Boaters still come in looking for paper charts and chart books, but not nearly as frequently as they used to, he said.

"In this digital age, we're getting less and less people looking for paper charts because they're relying on their electronics," Parvana said.

The Boat Owners Association of the U.S., a recreational boaters' organization known as BoatUS, recommends having a range of charting and other navigational tools aboard, said David Kennedy, the group's government affairs manager. But he didn't write off the idea of eventually moving in a digital direction.

"We appreciate that NOAA is working to be forward thinking in what they're doing when it comes to charting," he said.

The Office of Coastal Surveys, which received $88.6 million in federal funding last year, is working to adapt and improve how it supplies critical chart data to mariners, Nyberg said. He emphasized that the Charting Plan was a draft document and any changes could be a decade or more away.

"We wanted to talk about possibilities for the future," he said. "It's irresponsible to not discuss moving toward an electronic world."