

HYDROGRAPHIC SERVICES REVIEW PANEL

A federal advisory committee, advising the NOAA administrator

Electronic Navigation Charts (ENC's) and Paper Charts for Small Vessels

With NOAA's plan to retire the production of traditional paper charts by 2025, NOAA should take prompt and additional actions to ensure that small boat mariners, both professional and recreational, are better prepared for the 2025 transition from paper to digital charts and to ensure they will have access to the best possible information to support safe navigation.

Nautical charts are foundational components of every mariner's toolkit. Navigation requires a knowledge of how the earth's surface is represented on either a printed paper chart or on the screen of an electronic navigation system. Both forms of navigation require the navigator to understand the symbols, numeric notations, language used, and how the graphic presentation relates to a physical position on the earth. Mariners who do not understand how to use nautical charts, paper or electronic, significantly decrease their ability to navigate safely. The study of navigation usually begins with discussion of the printed chart. How is direction indicated? How is distance measured? What do the various symbols and abbreviations stand for? How do latitude and longitude provide a position? Is the information current and accurate? Digital navigation tools can eliminate a significant amount of tedious work when used properly. Route planning is simplified, waypoints can be automatically uploaded to steering systems, travel time and fuel consumption can be estimated, and potential hazards can be marked with alarms or routed around.



Recreational Boater; credit Office of Coast Survey

CHALLENGES

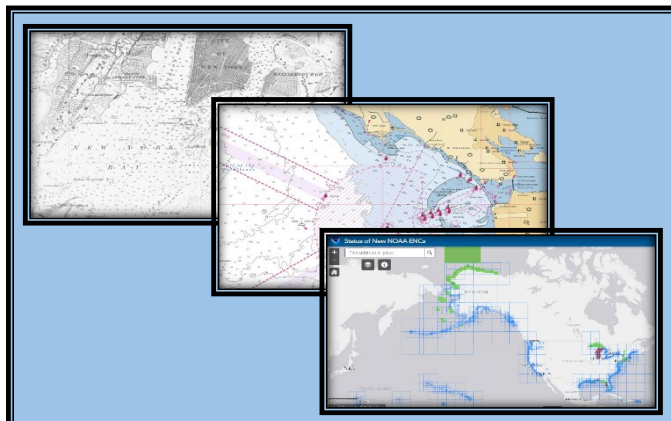
- **Digital navigation can provide a false sense of confidence for those who are not trained properly.** Automatic updating, geographic positioning, and the similarities that they have with common automotive and cellular mapping, can make it seem as if there is no extra preparation needed when using digital systems for navigation. There is potential for error either from poor understanding of the information shown, from operator inexperience or error in using that information. Mariners who rely on digital navigation should take precautions to protect against some of the possible vulnerabilities of electronic systems operating in the harsh marine environment (including loss of power or other electronic failure), and from possible interference from other digital sources.

CRITICAL NEEDS: NOAA SERVICES

- We commend NOAA in transitioning to Electronic Nautical Charts. Savings in time, costs, and manpower resulting from elimination of the manually maintained raster chart database are significant. **Recognizing the inherent vulnerabilities of digital systems, NOAA should ensure that mariners have access to non-digital – paper – charts and publications.** It is particularly important for NOAA to provide an option for mariners to supplement, or backup, digital systems with a paper option.
- Two general classes are most in need of this type of backup: small, recreational vessels, and the smaller classes of inspected vessels subject to Coast Guard requirements. In its "Recreational Boating Statistics 2020" report, the USCG identified 10.99 million mechanically propelled registered recreational vessels, and indicated that the vast majority, over 94 percent, are less than 24 feet in length. While recreational boats are moving steadily toward

digital navigation systems, it is likely that many in this group do not have the physical space or power sources to maintain totally separate and fully redundant systems.

- The second fleet of concern is US Flag Vessels with an active and valid USCG Certificate of Documentation (COD) that are inspected and measure less than 500 Gross Tons and do not have a fishery or recreational endorsement on their COD with approximately 7,167 vessels. While these vessels are not required to maintain dual ECDIS systems, they are required to have backup navigation materials readily available.



NOAA'S nautical charts through the years; *credit OCS*

RECOMMENDATIONS FOR NOAA ACTION

- Recognizing that paper charts are a valuable supplement to electronic systems during the transition period to electronic charts or ECDIS, NOAA should work with the USCG to ensure that carriage requirements are updated and that the chart update process, including Notice to Mariners, is streamlined and communicated clearly to the public.
- NOAA should develop standard guidance for the use of paper charts as a supplement or backup for electronic navigation and ensure it is internationally agreed upon. Guidance should include specifications like appropriate scale, update frequency, red light readability, etc.
- NOAA should improve the Custom Chart Tool so that both the process and the charts produced meet the needs of the fleets with minimal technical expertise required.
- NOAA custom charts should include topography and significant landmarks, particularly in areas where elevation and environmental conditions impact navigation.
- To assist Print On Demand (POD) vendors, NOAA should create two or three templates of fixed scale and physical size that can be easily applied and produce printed charts that are relatively similar to charts in the existing suites of raster charts. Relevant scales might be 1:12,000 for harbor charts, and 1:100,000 and 1:200,000 for coastal approach charts.
- The NOAA Custom Chart should regularly export key fixed suites of charts to assist with consistency among users and to simplify the process for POD vendors to produce those paper charts.
- NOAA should work with professional maritime institutes and the major providers of instruction to recreational boaters to ensure that mariners are learning the best practices in using NOAA's ENC for navigation and utilization in an Electronic Chart Display and Information System (ECDIS) when applicable. Paper charts should be considered a valuable tool during the learning process, as they have always been.
- NOAA should periodically assess the state of mariners transitioning to digital charts to update the milestone for NOAA support for paper charts production.
- NOAA should encourage private industry to produce paper versions of NOAA's ENC once NOAA ceases all production of raster paper charts.

In October 2003, Secretary of Commerce Don Evans established the HSRP as directed by the Hydrographic Services Improvement Act of 2002, Public Law 107-372. Panel members, appointed by the NOAA Administrator, include a diverse field of experts.

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