Boat Smart, Update Your Charts

by Ken Cirillo, Business Development Executive

You're on an evening cruise, and as you approach an unfamiliar harbor, you suddenly notice that the NavAid lights you see out of the pilothouse window don't match up with what you see on your vessel's chart plotter. A glance at the echosounder shows the bottom quickly shoaling, and you're forced to make a quick decision about which way to steer to find deeper water. *Hard to port. No, starboard. Wait, you think, it's got to be to port.*

Unfortunately, your guess doesn't work out. You pull back on the throttle, then try to reverse your boat to a stop. But it's too late. You wince as you hear that horrible sound and feel the boat shudder and grind its way to a humiliating halt. Your mind is flooded with feelings of embarrassment, until you suddenly realize that you may have real flooding or other serious damage to contend with.

Don't Go Bump in the Night!

Grounded in Truth

The above scenario is more than just a compelling example of a boating misfortune. It's an all-too-common occurrence that might have been avoided if this boater just kept his electronic navigation charts up to date. The *Alliance for Safe Navigation* partners strongly suggest that updated paper charts — coupled with updated electronic charts and proper attention to the surroundings — are the best approach to safe navigation. The Alliance is a combined government/marine industry task force formed in 2010 to address boating safety issues and includes representatives from OceanGrafix® (Print-on-Demand nautical chart provider), Jeppesen (formerly C-Map/USA), United States Power Squadrons®, BOAT/US and the SeaTow® Safe Boating Foundation, with the sponsorship of NOAA.

While recreational boating is generally a safe activity, the enormity of the United States' navigable waters and the popularity of the sport make a certain number of mishaps inevitable.

Fast Facts

- There were 12,692,892 boats registered by states in 2008.
- The U.S. has 500,000 square nautical miles of navigationally significant areas and 95,000 miles of shoreline.[1]
- In 2006, recreational boaters accounted for 70 million travelers using those waters.[2]

According to the National Oceanic and Atmospheric Administration (NOAA), there are approximately 6,400 recreational boating accidents in the United States each year. A 2007 Hydrographic Services Review Panel Report stated that collisions account for 80% of all reportable recreational boating accidents and 78% of non-reportable accidents, totaling an estimated insurance loss of more than $450 million annually from nearly 100,000 claims.[2] If these statistics aren't jarring enough, consider this: Over the past five years, there have been more than 2,500 accidents as result of striking a fixed object at a cost of more than $27.5 million. Also since 2004, there has been more than $16 million in damages from more than 1,400 groundings. This adds up to considerable personal injury, property damage and financial liability that could be potentially avoided or reduced by simply having up-to-date electronic charts. [2]

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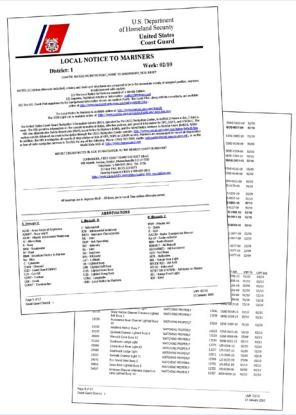
This paper addresses the importance and need for boaters to keep their navigation charts up to date, whether they are paper (Print On Demand or official NOAA charts), raster or vector electronic charts. For the purpose of this paper, we are not referring to chart books or cruising guides. All include chart data that changes. In today's technology-driven society, consumers have come to expect the most up-to-date data possible, whether it's computer software, virus-protection or web browsers, or navigation data for recreational pilots. Yet the same cannot be said for navigational charts used by recreational boaters. The reasons may be multifold, ranging from perceived lack of need or awareness of update availability to misunderstanding the costs/benefits.

1 2008 Coast Guard Boating Safety Report
2 2007 Hydrographic Services Review Panel Report

Nine U.S. Coast Guard districts issue weekly Local Notice to Mariner reports containing information on sunken vessels,


U.S. Department of Homeland Security
United States Coast Guard
LOCAL NOTICE TO MARINERS
District: 1
Week: 02/09

buoy changes, obstructions, changes in channel markers, and navigation aids that are missing or non-operational.

The Old Adage: The Only Constant is Change

From the bayous of Louisiana to the shoals of Rudee Inlet and everywhere in between, the nation's waterways are always changing. Changes both natural and manmade provide a gauntlet of both visible and subsurface obstacles to safe passage. Boaters must contend with things like underwater hazards, shifting sandbars or a new marker, not to mention rising and falling tides that can affect safe vessel clearance above and below the waterline.

An introductory paragraph on a NOAA website page ***How a Chart is Updated*** sums it up pretty well: "The coastal waters of the U.S. are in a constant state of change. Channels are dredged and sometimes re-routed; new aids to navigation are established or deleted; new wrecks or obstructions are discovered; natural shoaling occurs in many areas; and new berthing facilities are built along the shoreline. In order for the mariner to transit safely, it is imperative that these changes be reflected on nautical charts as soon as practicable."

Because the changes that take place on our navigable waterways are constant, so is the task of bringing this information to the boating public. Nine U.S. Coast Guard districts issue weekly Local Notice to Mariner reports (knows as LNMs or local NTMs) containing information on sunken vessels, buoy changes, obstructions, changes in channel markers, navigation aids that are missing or non-operational, and others. Additional updated data also comes through the National Geospatial Intelligence Agency's (NGA) Notice to Mariners and, for the Great Lakes and St. Lawrence Seaway, Canadian Coast Guard Notice to Mariners.

These NTMs provide dozens of updates per week for official NOAA charts, and when it deems necessary, the administration issues a new chart edition that contains all changes since the previous edition. Of the 1,019 official NOAA nautical charts available for U.S. waters, only about 100 of these receive new editions annually.

Great strides have been made to gather this information and make it available to the boating public. For example, since 2000, mariners

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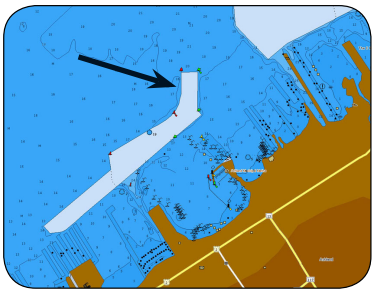
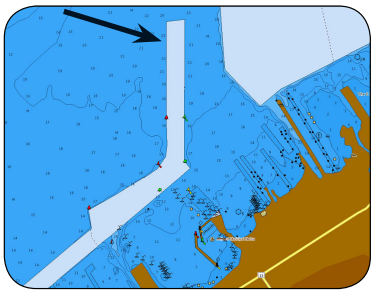
BEFORE CHANNEL DREDGING



AFTER CHANNEL DREDGING



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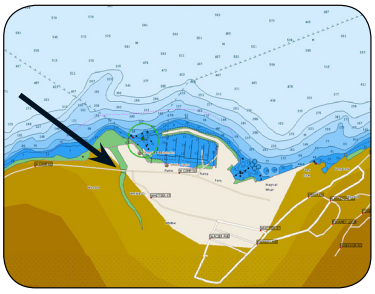

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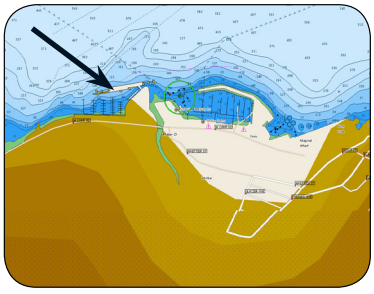


have been able to obtain Print On Demand official NOAA nautical charts through OceanGrafix (with changes and corrections updated on a daily basis). Yet studies have shown that the majority of boaters are sailing with out-of-date charts. When they do so, they are placing themselves and their vessels in unnecessary peril. As stated in a NOAA report, "when charted information becomes obsolete, further use of the chart for navigation may be dangerous. Natural and artificial changes, many of them critical, are occurring constantly."

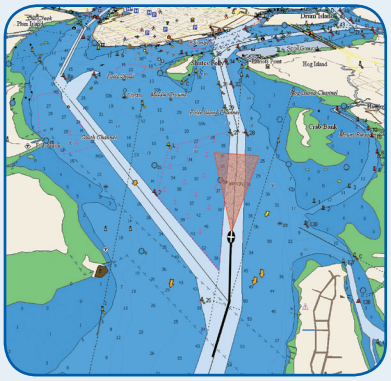
When you consider this, it's easy to understand how up-to-date charts can help navigators steer clear of trouble in many forms. It's logical to expect that by increasing the number of recreational boaters using up-to-date paper, raster or vector charts, we should be able to improve safety, reduce property damage and financial loss, and create more confident boaters.

Whether they're navigating with printed nautical charts, digital charts in an electronic navigation system (or both), there's a good chance the typical boater is relying on outdated information. An OceanGrafix survey conducted with the USPS seemed to confirm a convention: Most recreational mariners (78%) use official NOAA paper charts in some capacity, yet only about 26% used them as their primary tool for navigation. Almost 70% reported using paper charts as a backup to their electronic navigation systems. Based on a reported lack of awareness of LNM corrections and new chart editions by respondents, this same survey concluded that most recreational mariners were likely sailing with out-of-date printed charts.

The situation is much the same with regard to digital charts used with chart plotters or PC-based navigation systems. Many recreational mariners who depend on these electronic systems are navigating with outdated electronic charts. By doing so, they are not only putting their vessels at unnecessary risk; they are missing out on one of the inherent advantages of electronic charting. Unlike traditional printed charts, digital charts can easily be upgraded or traded in for updated versions (depending on the format), delivering not only Notice-to-Mariner corrections, but also additional data that can improve the system's functionality.

Guardian Alarm Technology Steers You Clear of Trouble

A recent study determined that in 98% of all grounding cases, the navigation chart clearly indicated that the vessel did not have enough water to operate in when examined "after the fact." Clearly, this information would be more useful "before the fact." The very same technology used by professional mariners, Guardian Alarm technology lets the operator



key in vessel measurements to create a protective "Guard Zone" ahead of the vessel. An alarm will sound if the navigator's course will encounter low mean water depths below a selected setting, charted rocks, shoals or obstructions. Electronic charts can always be "watching out" for you — even when the person at the helm might not be.

Electronic charts are dynamic, interactive and "smart," allowing manufacturers to enable the chart plotter to enhance the boaters situational awareness. For example, electronic charts allow mariners to access aerial imagery, view NavAids on the chart that flash the same color and sequence as what's found out the pilothouse window, look at 3D representations, or receive warnings of dangerous waters ahead with Guardian Alarm™ technology. When you consider the potential value of these features to the navigator (and the ability to enhance/expand upon them with newly added data), it's even more important for users of digital charts to keep them updated.

This is why digital chart manufacturers put so much emphasis on integrating Notice-to-Mariner corrections and other changes into their chart databases. Just as important is making this updated electronic information accessible and affordable to recreational mariners. The industry as a whole has demonstrated an ongoing commitment to improving its chart updating processes and distribution systems.

Making changes and adding features to the chart database is an ongoing job. Most digital chart manufacturers offer inexpensive updates either annually or semi-annually by providing replacement chart cards or by downloading updates direct from the manufacturer's website. Jeppesen, for example, releases updated versions of its C-MAP MAX and NT+ charts at least twice each year, and has focused on innovative ways to get updated charts into boaters' hands.

Bringing Commercial Technology to Recreational Boating

Commercial mariners are required by law to use paper charts that are up to date. Notices to Mariners and new editions of paper charts are closely followed and play a key role in safe sailing. In addition, commercial navigation products such as Jeppesen's C-MAP Professional+ cartography allows professional mariners to update their digital charts on demand. The captains of tankers, freighters, cruise ships and other commercial vessels would never sail with old, out-of-date charts. They recognize that lives and livelihoods depend on the accuracy of their chart data.

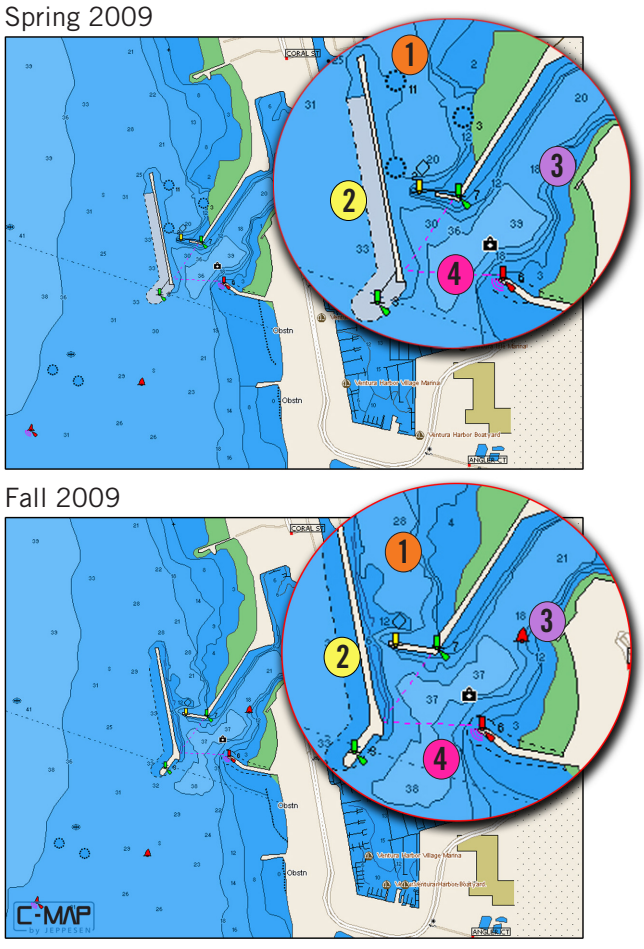
Pre-Departure Checklist

- ☑ Personal Flotation Devices
- ☑ Sound Producing Devices
- ☑ Lights and Shapes
- ☑ Distress Signals
- ☑ Tools and Spares
- ☑ Fuel and Oil
- ☑ Fire Extinguishers
- ☑ Ventilation
- ☑ Bilges
- ☑ Weather Forecast
- ☑ Battery Care
- ☑ Docking/Anchoring Tips
- ☑ **Updated Charts**

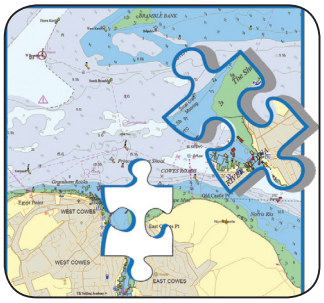
No such rules exist for recreational vessels — even though they arguably have as much at risk. Any boater, whether he's piloting a 20-foot center console or a 45-foot sportfisher, needs to be sailing with up-to-date charts. It's too easy, too inexpensive and too important not to. "Why do we permit recreational boaters to sail with outdated paper or electronic charts — or no charts at all?," asks Ken Cirillo, Business Development Executive for Jeppesen. "This is a hard question to answer, especially when you consider that we produce and maintain these digital charts under exacting standards for accuracy and consistency," Cirillo added. For example, Jeppesen's marine cartography carries a variety of international quality standard certificates, including ISO 9001 Chart Production Process Certification, Det Norske Veritas (DNV) Certification and ISO 16739 Standards for Database Quality. "Still, all of this is for naught if a boater is unaware that an important channel marker has been moved and he's navigating by what he sees on his old charts," added Cirillo.

Examples of Chart Changes:

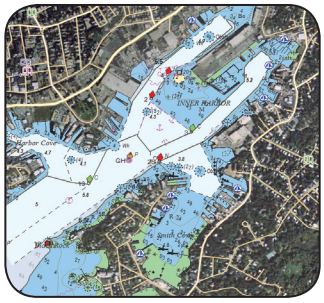
1. Obstructions Removed
2. Jetty Dredged
3. Buoy Added
4. Contour Lines Changed



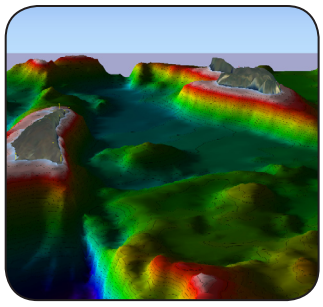
Jeppesen's MAX Pro was the first recreational cartography to offer Quick Sync updating.



Quick Sync updating allows owners to download the latest chart updates.



Satellite image overlays provide a real-life visual reference of surroundings.



3D charts help navigators see the world around them as it really is.

"Ask a recreational boater the date on his or her electronic charts — typically their chart information is three to five years out of date," said Bob Sweet, National Education Officer, United States Power Squadrons. "There is a reason professional mariners are required to keep their charts up to date. You also need to understand that recreational boaters, with their shallower draft vessels, tend to go places commercial mariners do not. Places where lots of hazards lurk with newly discovered hazards identified and charted on a regular basis. Why then would anyone go to sea with old charts," inquired Sweet.

When it comes to digital chart updating, the industry has been working to close the gap between professional mariners and recreational boaters. Jeppesen's MAX Pro cartography was the first recreational cartography to offer ***Quick Sync*** updating, allowing owners of select navigation systems to download from the web the latest chart updates for their region. For the first time, this technology provided pleasure boaters with the ability to update their own charts and cruise with the highest level of confidence and safety.

The majority of existing chart plotters on the water, however, operate with digital charts contained on cartridges or embedded into the plotter. Chart plotters with embedded chart data should also be updatable; this is an important point when selecting a plotter. Electronic charts provide much more than navigational chart data. They also provide many of the chart plotter's advanced functions. These functions might include, for example, the ability to view aerial photographs to verify your position as you enter a tricky inlet or pull up detailed marina charts to find services or a guest slip hidden somewhere among hundreds of docks.

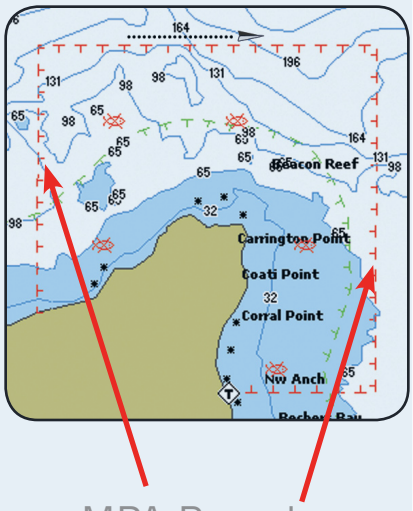
There's More at Stake Than NTM Changes

The more advanced today's chart plotters become, the more important it is to keep their digital charts up to date. Safety is a primary reason, of course, but regular updating also ensures that boaters have access to the latest "value added" content, new features and expanded coverage

areas. In addition to official NOAA notices and corrections, for example, digital chart manufacturers have the ability to add a wide range of useful data and information. This can include information to enhance the boating experience for specific user groups, such as preferred anchorages or popular dive spots for cruisers, or the location of wrecks, reefs and "local expert" fishing spots for anglers.

Information about and boundaries for local Exclusion Zones can also be added to keep boaters safe and on the right side of the law, ranging from manatee protection areas to coral reef "no-anchor" zones. Another example of this is the constantly evolving situation with Marine Protected Areas (MPAs) along the entire length of the California coast. Networks of No-Take Reserves and Restricted State Marine Reserves are being put in place, and it is the boater's responsibility to know where he is fishing and what the rules are. The consequences of not knowing can be costly fines and a misdemeanor infraction on the boater's record. Updated digital charts can also show boaters "no go" zones put in place for national security reasons or areas with restricted boating access for safety/environmental reasons.

Up-to-date charts provide information on constantly changing fishing closures, environmentally sensitive areas and other boating exclusion zones.



MPA Boundary

A Concerted Effort to Improve Navigation Safety

To help increase the number of boaters using updated charts, the industry is building awareness by educating boaters on the need for regular updating. Another area of focus is overcoming obstacles to updating and making the process more convenient, accessible and affordable for recreational boaters.

The *Alliance for Safe Navigation* is working together to increase awareness of chart updating through the Internet, printed educational materials, boating news media, trade and consumer shows, and more. This level of cooperative effort is yet another indicator of how important up-to-date chart information — whether printed or electronic — is to improving safety of recreational mariners.

Making recreational boaters aware of the need to update is one important step. Motivating them to take action is another. "Changes

are happening - daily, weekly and monthly - and you will be surprised how important one little bouy can be," said Cirillo. Consumers need to see a strong perceived value to invest in updated charts, especially in today's tough economy. Electronic chart manufacturers have the ability to add features and value to the product, along with NTM corrections and other chart changes. A boater who is sailing with two- or three-year-old digital charts might be missing out on more than a shifted channel entrance that could cost him his expensive running gear. He is also likely to miss out on new photographic images, enhanced levels of chart detail or an increased area of coverage.

Studies have shown that the majority of boaters are sailing with out-of-date charts. When they do so, they are placing themselves and their vessels in unnecessary peril.

"Too many boaters think that the chart or chart chip they got when they purchased the boat is good forever," said Joe Frohnhoefer III, Chief Operating Officer, Sea Tow. "They don't realize that buoys get moved or renumbered, shoals shift and new navigational hazards are continuously appearing. Safe navigation begins with accurate charts, which when used correctly, help keep boaters in the channel and away from the shallows, rocks, sandbars, shoals and more. Boaters who have, understand and use up-to-date charts are more confident — and that leads to an overall better boating experience," added Frohnhoefer.

In addition to creating a better product, chart manufacturers have focused on ways to make the process easier. Club Jeppesen Marine has been developed over many years to make the updating process automatic and affordable, while providing a variety of other benefits and discounts. For club dues that are less than the cost of a single updated chart, C-MAP by Jeppesen chart owners automatically receive an annual update chart, sent at the time and place of their choosing. Thousands of members have signed up for this service and continue on for the life of their plotter.

Membership in the club also provides boaters with a range of programs and benefits designed to save them money and increase satisfaction with their plotter brand. More importantly, according to Cirillo, it also reinforces the message that the industry cares about their navigational safety.

What if?

There could be serious consequences from sailing with outdated charts. "An act of omission is an act of commission," Cirillo explained. What if you have a chart plotter on your vessel and you're using out of date charts? Say you run aground on a reef that is marked on a new edition. You could have your insurance claim denied because the updated data was available and you weren't using it.

Alliance for Safe Navigation

OceanGrafix
Accurate Charts. Confident Boating.™

C-MAP by JEPPESEN

United States Power Squadrons®

BoatU.S.

Sea Tow Foundation
for Boating Safety and Education

Are Updated Boaters Safer Boaters?

In the insurance industry, preferential rates have always been offered to people who are better risks. Discounts are given for completion of safe boating classes, meeting requirements for vessel safety check, years of experience, etc. Can a link be drawn between updated navigation charts and improved boating safety? Based on the program of at least one leading marine insurer, the answer is yes. Sea Insure™, the insurance division of leading nationwide marine assistance provider (and Alliance member) SeaTow, offers significant discounts on premiums to Club Jeppesen Marine members. This is due in part to the fact that club members will always have recently updated charts at their disposal. Navigating with annually updated charts makes these mariners less likely to encounter dangerous navigational situations. Having accurate chart information is key to avoiding some of the most common causes of boating accidents.

In Conclusion

Out of date charts, whether paper or electronic, put you, your boat and your crew in danger. With a concerted marine industry effort to make updated charts easy to get, affordable and beneficial to use, there is simply no excuse for any navigator to put himself in harm's way because of outdated charts. The best available chart data is out there and readily accessible for recreational boaters, just as it is for professional mariners.

For boaters navigating with electronic charts, the process starts by checking their existing charts to determine the edition date. Chart cartridges should be clearly marked with a date; chart plotters should provide the data source/date for embedded charts. Check with your electronic chart supplier/or chart plotter manufacturer for more information.

Boat smart. Update your charts.