

Helping Mariners Catch the Digital Wave

Rear Admiral Gerd Glang
Director, NOAA Office of Coast Survey

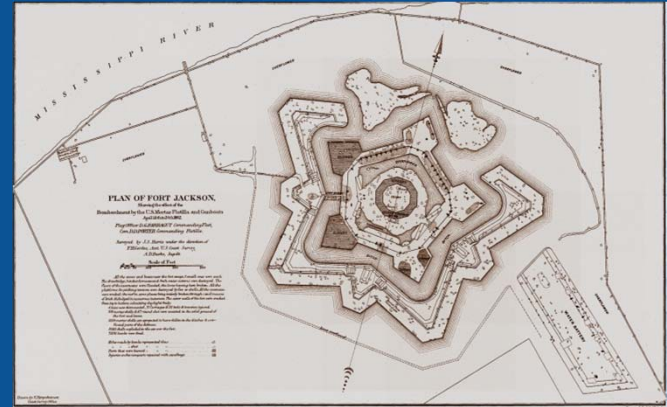
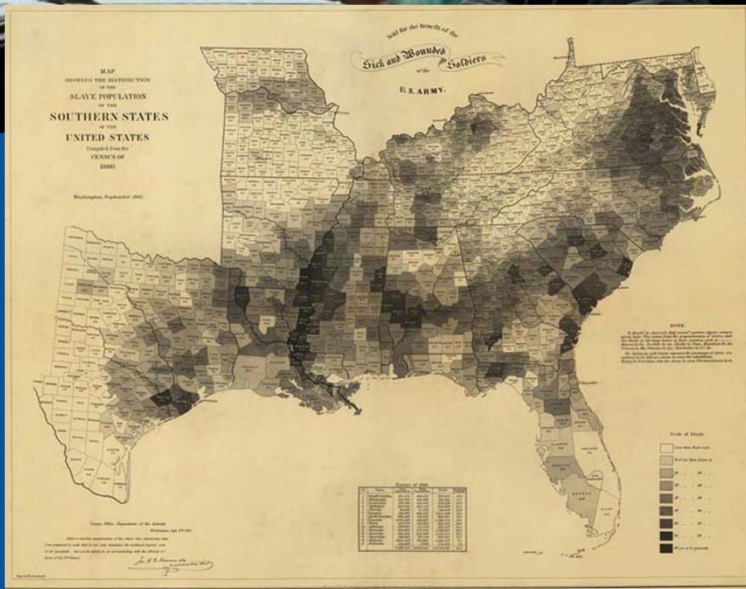
TRB-CMTS
3rd Biennial Research & Development Conference
June 24, 2014

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Coast Survey cartographers have a proud history of innovation

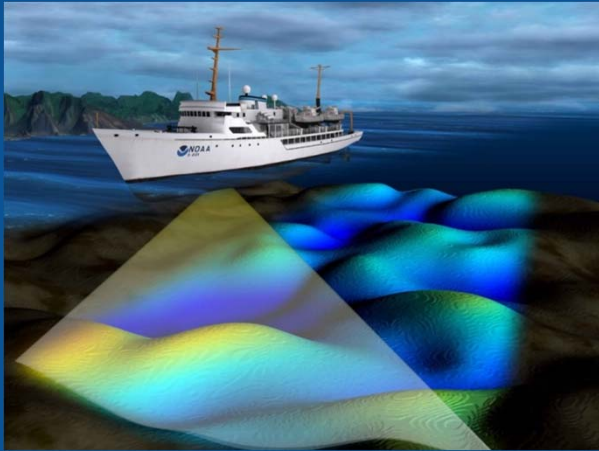
Image from the movie "Lincoln"



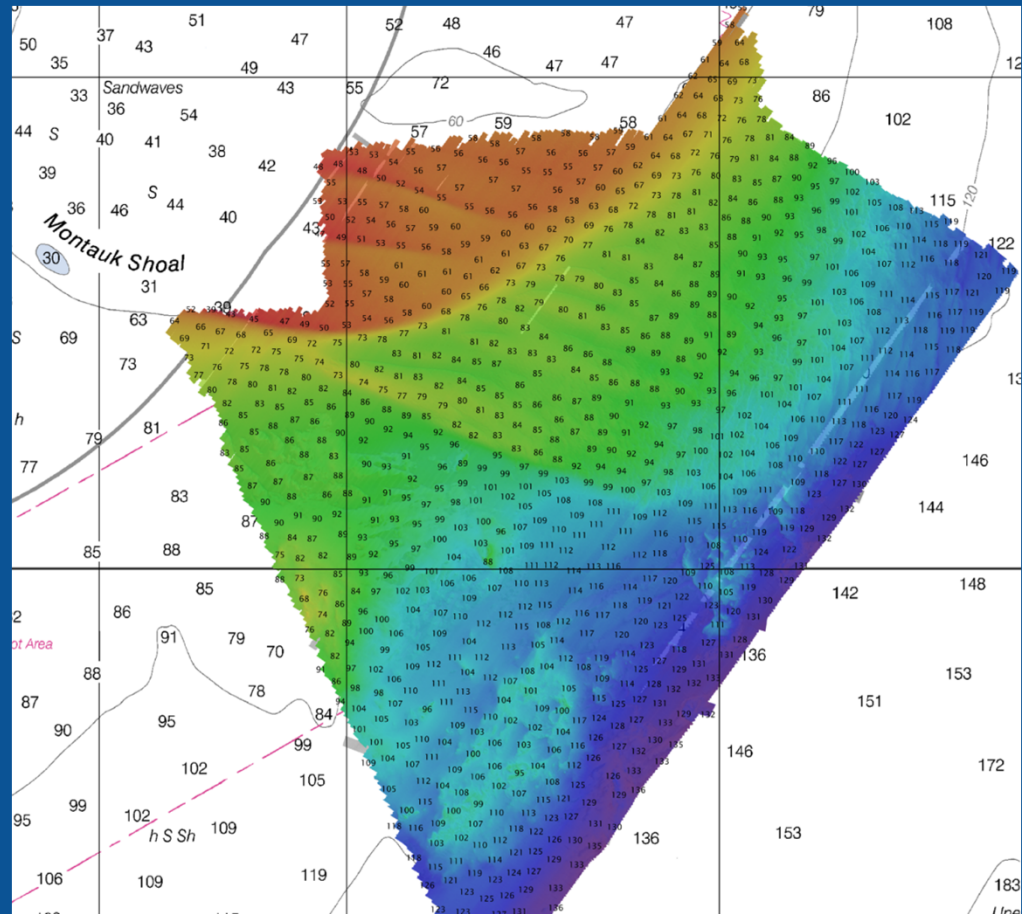
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Charts provide info relevant to the mariner



Hydrographic surveys collect millions of soundings



Paper charts need to show “least depth” for safe navigation, so we discard 99% of the soundings

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We are now in a new era of innovation



*Nautical chart
printing presses in
the 1950s*

The federal government printed nautical charts for 150 years.

In October 2013, FAA announced they were ending lithographic nautical charts.

Digital technology replaces print

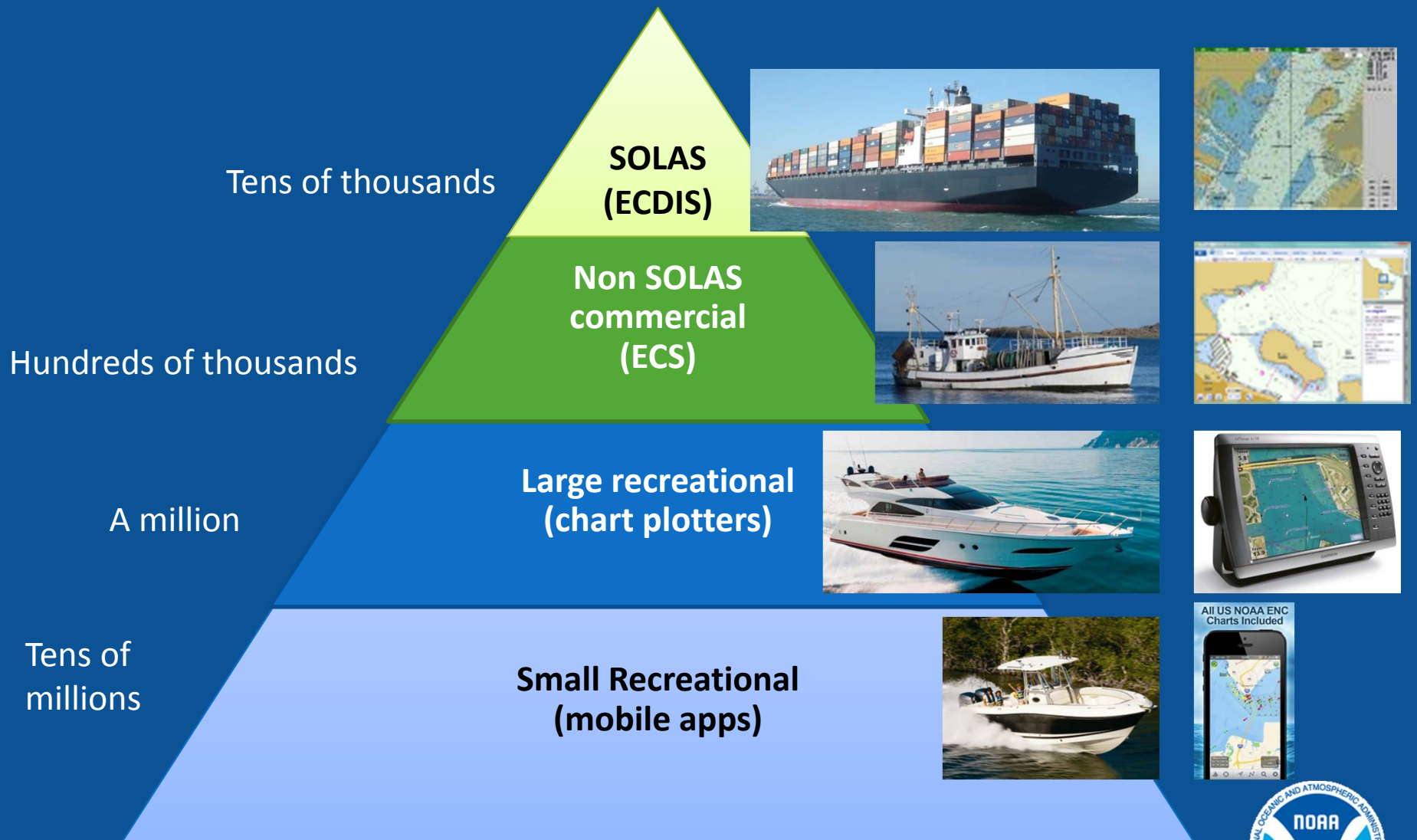
All digital products

- NOAA privatized chart printing and distribution April 14, 2014
 - 13 NOAA-certified printers have capacity to absorb commercial demand
- Defense Logistics Agency prints for government and military
- NOAA makes free PDF charts available
- NOAA BookletCharts usable for recreational boating

All produce paper charts



Expanding user base & new use modes



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Making all nautical charts easier to access

The screenshot displays the NOAA ChartViewer web application. The interface includes a top navigation bar with tabs for "Paper Charts (RNC & PDF)", "Electronic Charts (ENC)", "Coast Pilot", and "Help". The main map area shows a coastal region with labels for "Hollywood", "Lusby", "Solomons", "California", "Lexington Park", "Fishing Bay", "Leonardtown", "Saint Clements Bay", "Bretton Bay", "Rappahannock", "River Valley National Wildlife Refuge", "Kinross", "Farnham", "Heathsville", "Burgess", "Redville", "Ingles Bay", "Lancaster", "Martin National Wildlife Refuge", and "Deal Island State Wildlife Management". A red location pin is placed on the map. The map includes a search bar, a "Standard Place Name Search..." dropdown, and a "Search" button. A "Map" button is also visible. The map data is attributed to "Map data ©2014 Google".

General Information & Links

- NOAA ChartViewer (View):** Displays charts in web browser.
- NOAA PDFs (PDF):** Full-size, 400dpi printable charts.
- NOAA BookletChart (BC):** 8.5" x 11" printable panels of the charts.
- NOAA RNCs (RNC):** Geo-referenced charts in BSB format.
- Notice to Mariner (NM):** Weekly corrections to the RNCs.
- Print-on-Demand (POD):** Order POD charts from **Certified Agents**.

Chart Selection Information

Chart: 12233 1:40,000

Title: Potomac River Chesapeake Bay to Piney Point
Type: Harbor Chart
Scale: 1:40,000
Edition: 38
Print Date: 1/1/2014

Available Products

View PDF BC RNC NM Buy

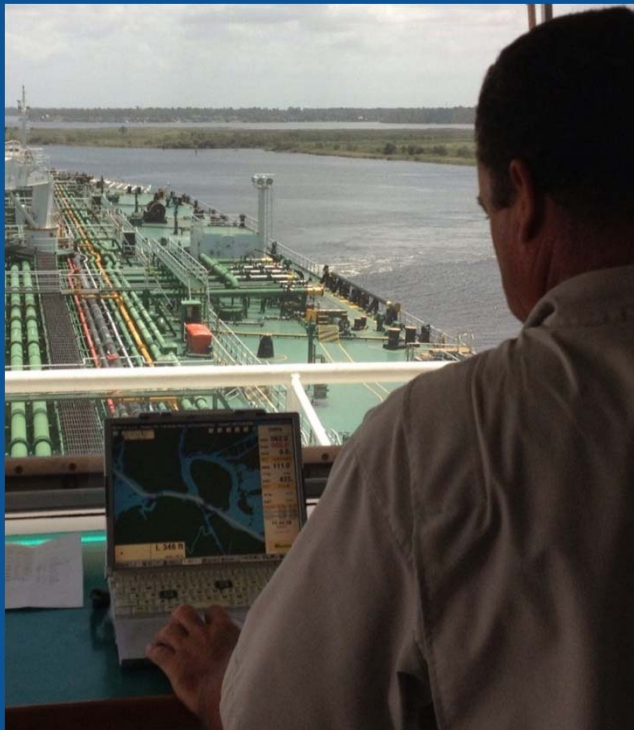
Chart: 12285 1:40,000
Chart: 12230 1:80,000
Chart: 12285 1:80,000
Chart: 12280 1:200,000

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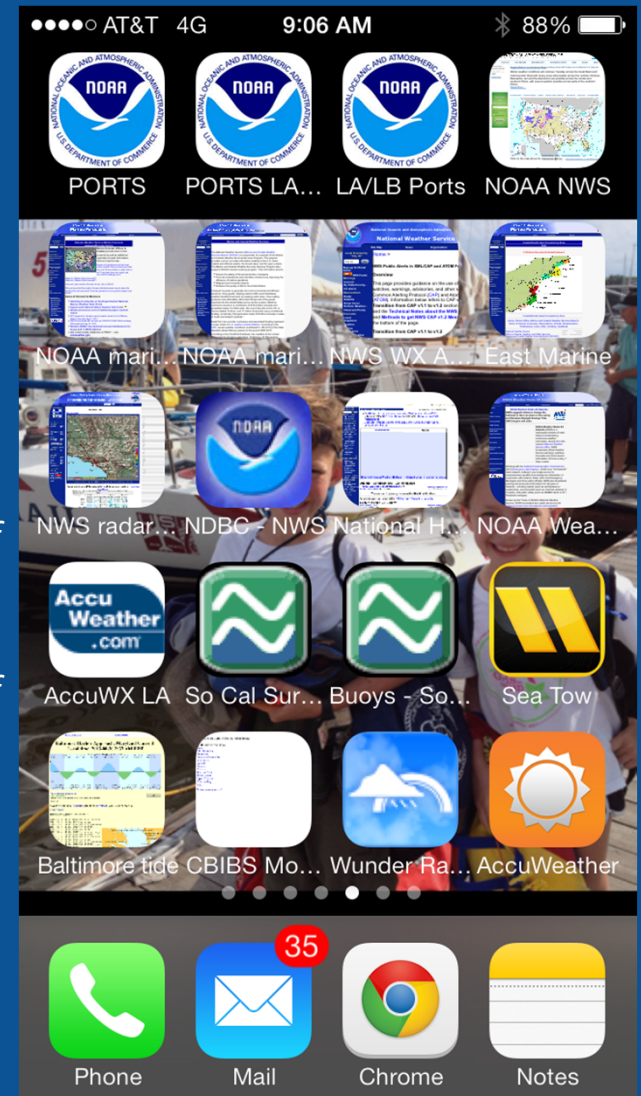
Digital technology

opens a world of navigation possibilities



Home screen of phone belonging to the director of the Marine Exchange of Southern California

Lake Charles pilot navigates on Calcasieu Ship Channel



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Digital navigation products improve navigation risk management

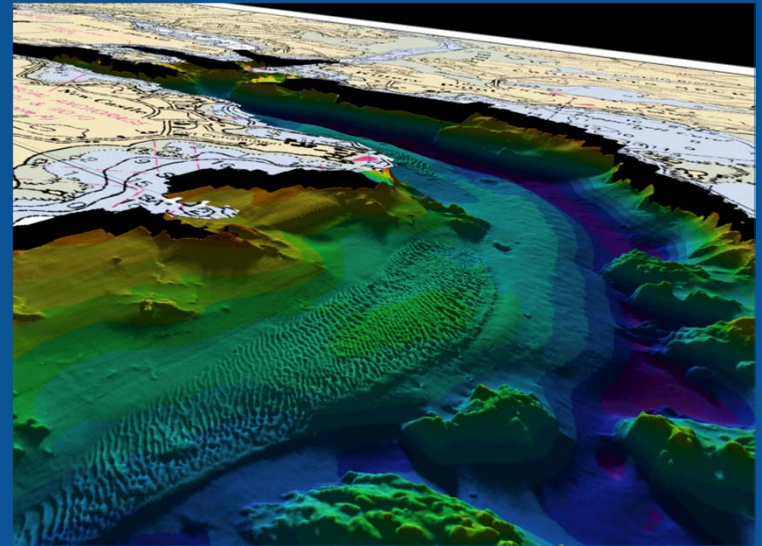


“Tell me the real depth of the water at the exact time I’m going to be at a specific location.”

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Digital products make coastal intelligence *accessible for navigation*



- Present all of the information that is relevant
 - No “hard copy” space restrictions
- Build models in addition to charts
- Make data interoperable
 - i.e., for use in habitat mapping, geology, marine architecture
- Improve usability by mariners

Unregulated navigation technology



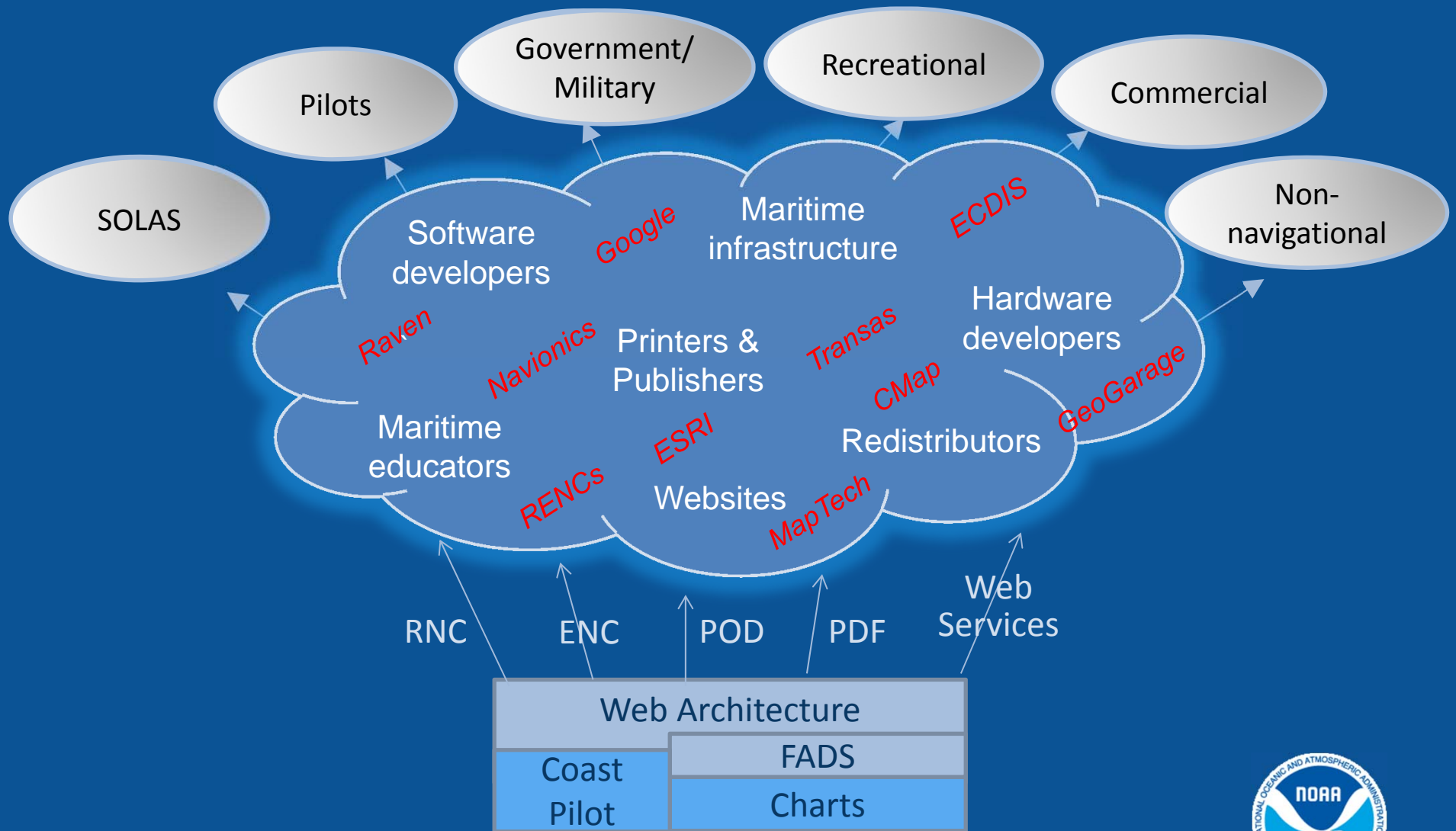
Image courtesy of EarthNC

- Tremendous source of innovation
- Medium for chart delivery to millions of customers
- Connectivity creates new opportunities

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Entrepreneurs provide additional value



Today's NOAA charting challenge:

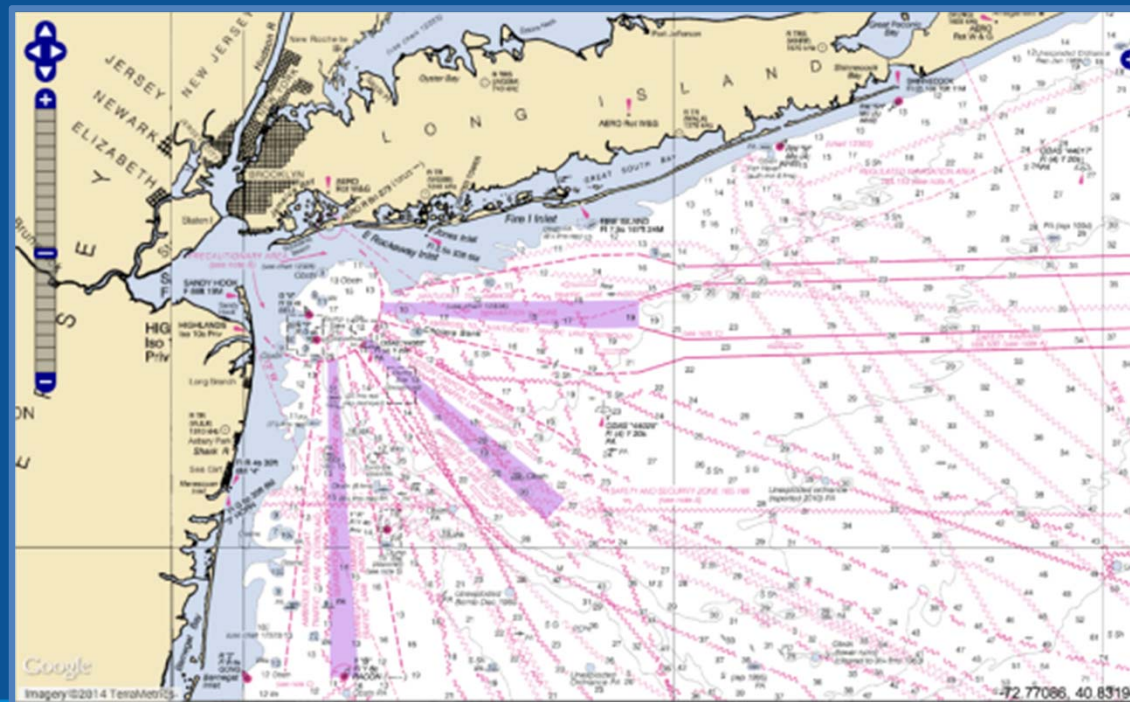
Format data to allow quicker uptake and better products by private app developers

Online Tile Service

- Quilted and single-chart tilesets
- Published weekly to a public-facing web server
- Compatible with Google Maps, Bing Maps, and OpenLayers APIs
- Planning metadata support
- Targeting this summer

Offline Tile Service

- Published weekly
- Distributed through navigation systems or chart data providers
- Packaged in offline format (e.g. MBTiles)
- Offline metadata support (e.g. UTFGrid)
- Delta updates
- Targeting early fall



Page loading tiles

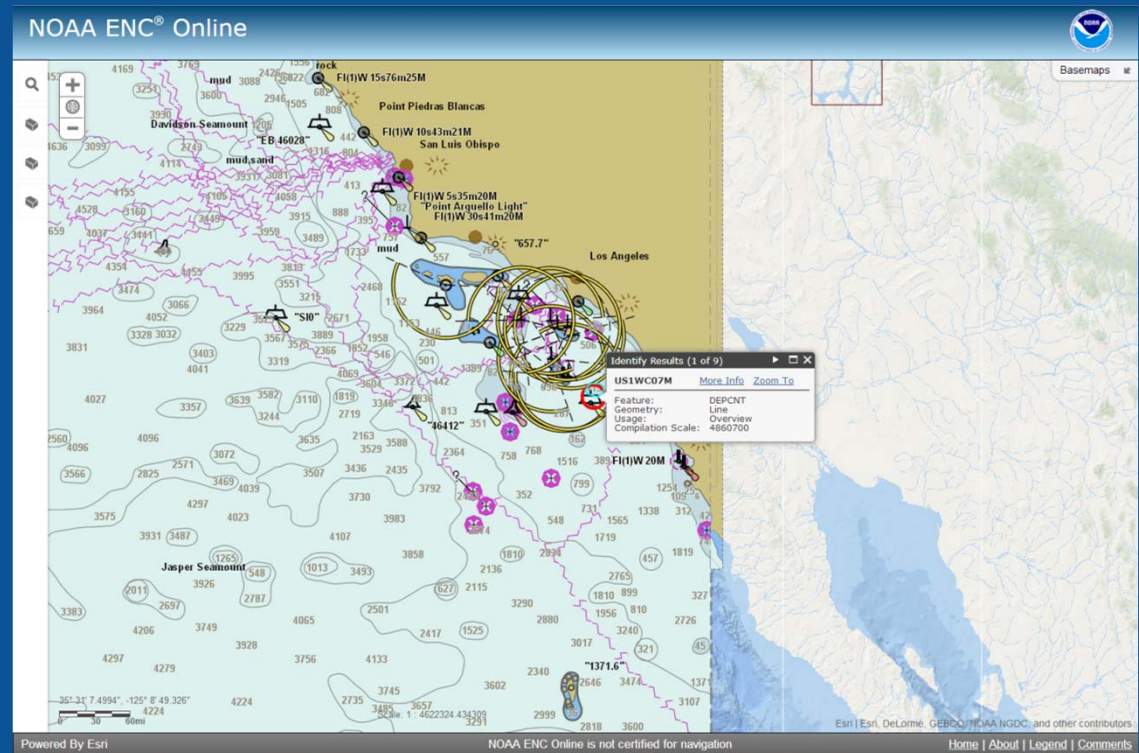
Page complete



Coordinating and distributing data from the Web

Newly developed web service allows us to:

- host ENC data as a layer
- add a geographic component to planning and coordination
- ease public access to a wide variety of authoritative datasets



Next up: *crowdsourcing hazards and comments*

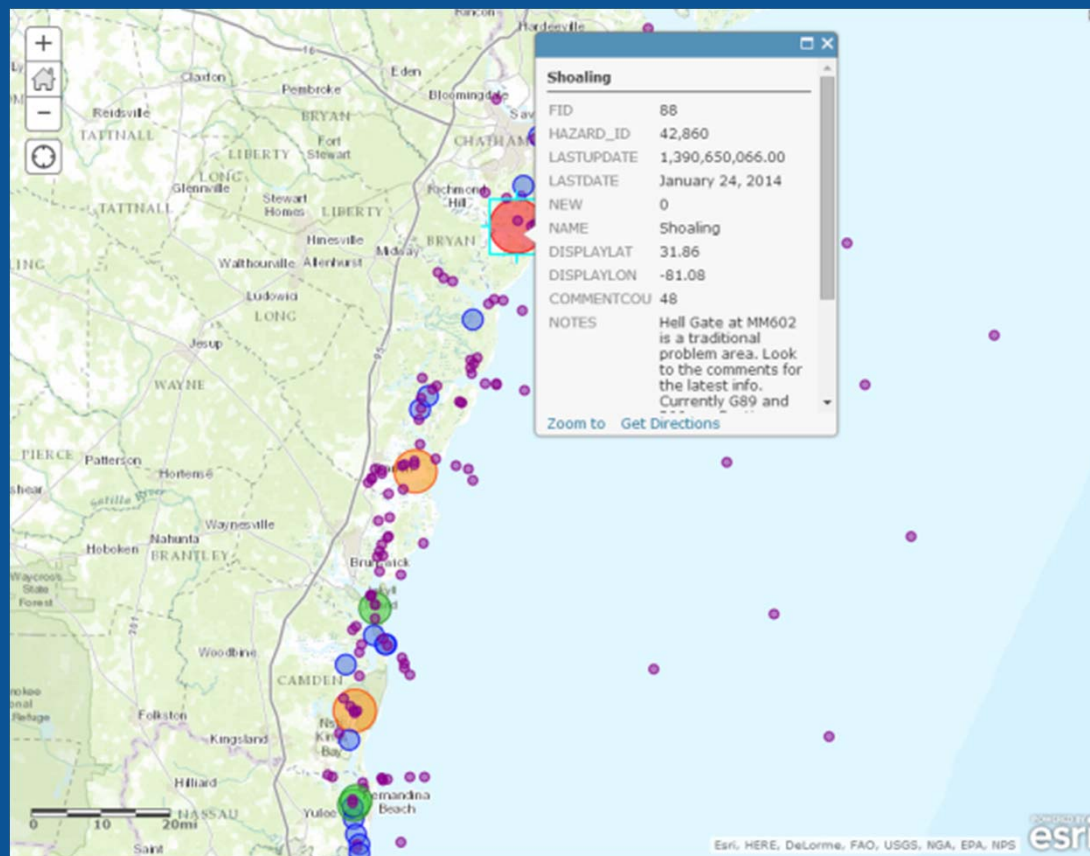


Image from ActiveCaptain

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What charting innovations will help future mariners?



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The future is as open as our imagination...



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