NOAA Office of Coast Survey

LT Matthew Forney, NOAA
Navigation Manager – Alaska Region
Bering Strait Maritime Symposium
Who is Coast Survey?

• First science agency of the U.S.
• Formed in 1807
• Responsible for surveying 3.4 million square nautical miles
• Prepares and maintains more than 1,000 nautical charts
• Responds to disasters and other emergencies
• Develops hydrodynamic models to support coastal management
U.S. marine transportation system: 95,000 miles of coastline
25,000 miles of navigable channels

Alaska accounts for ~40% of total
OCS Navigation Managers

• Resolving charting and navigation questions
• Bringing NOAA technologies to maritime community
• Taking maritime industry feedback to NOAA scientists and management
• Assisting in Storm, Tsunami, or disaster preparation and incident response

• Alaska Nav Manager
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Warning coastal populations of a tsunami

Tide gauges confirm tsunami generation and provide input for National Weather Service models forecasting arrival times and intensity.

Hydrographic survey data is used to build tsunami digital elevation models.
Responding to requests from Coast Guard and Army Corps of Engineers

Navigation Response Teams deploy to Crescent City and Santa Cruz after March 11 tsunami
Responding to a release of hazardous materials / oil spill
NOAA keeps mariners safe and commerce moving

Helping the maritime system handle more traffic and larger vessels in crowded ports & sea-lanes

Evolution of Container Ships

NOAA provides up-to-date, accurate, and accessible navigation information

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What is bathymetry? How is it collected?

- the measurement of water depth at various places in a body of water; *also*: the information derived from such measurements.
Data collection through time and coverage

**Bottom Coverage Comparison by Survey Method**

- **Leadline**
- **Single Beam**
- **Multi Beam**

<1940  1940-1990  >1990

**Office of Coast Survey**
Hydrographic Surveying

• More than just GPS and an echosounder
• Correctors to hydrographic data
  – Water levels
  – Settlement and Squat
  – Sound speed through the water
  – Vessel motion (heave/roll/pitch)
  – GPS base stations

• Millions of soundings processed, corrected, visualized and analyzed to find final “least depth”
Navigation product production

Acquires data

Processes data

Smart phone programs

E-navigation products

Paper charts

Office of Coast Survey
NOAA is the nation’s provider of navigation products...

- 1019 paper / raster charts
- 876 electronic navigational charts
- Coast Pilot
- PocketChart™
- 1002 Print on Demand charts
- Weekly updates
- PORTS

Over 100 companies are agents for NOAA’s nautical charts, selling to millions of recreational boaters, commercial fishermen, and maritime pilots

Dozens of companies sell systems or software that give mariners access to NOAA’s electronic navigational charts
NOAA survey platforms in Alaska

**NOAA Ship Rainier (S-221)**
- Commissioned 1968
- Homeport: Newport, OR
- 231 ft / 1591 GRT / 2600 HP
- 6 survey launches

**NOAA Ship Fairweather (S-220)**
- Commissioned 1968
- Deactivated 1989
- Reactivated 2004
- Homeport: Ketchikan, AK
- 231 ft / 1591 GRT / 2600 HP
- 4 survey launches
Arctic Research and Policy Act of 1984
Summer 2011 Kotzebue Sound Survey

Surveyed By NOAA Ship Fairweather
Kotzebue Sound 2011
July 13 – September 2, 2011

201 E NM 3822 LNM
Predicted Tides Applied
Subject to Office Review

NOT FOR NAVIGATION

Office of Coast Survey
Surveyed by the NOAA Ship Fairweather

North Arctic Reconnaissance Trackline

Data collected with Reson 7111, 8160 & 7125
August 6-24, 2012

Total Linear Nautical Miles: 3,047
Chart 16004 & 16005

NOT FOR NAVIGATION
Planned surveys for 2013 field season*

*Subject to change
Multibeam Echosounder Effects on Mammals

- NOAA Multibeam Echosounders are High Frequency and Low Power, largely out of the hearing range for most marine mammals and humans alike. The sound does not propagate far from the source because it is attenuated. Also due to the narrow band width and fast ping rate, if exposure is encountered, it is for a very short time.
Arctic Charting Plan

Arctic Nautical Charting Plan

A Plan to Support Sustainable Marine Transportation in Alaska and the Arctic

Office of Coast Survey
Marine Chart Division

June 1, 2011

Office of Coast Survey
State of Arctic Charts!

- Very Poorly Charted
- Most Surveys Pre date 1900
- Most areas Never Surveyed By US, Russian or British Admiralty Surveys.
- 100 Square NM between Soundings.
Thank You
Please do not hesitate to contact me!

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Questions?