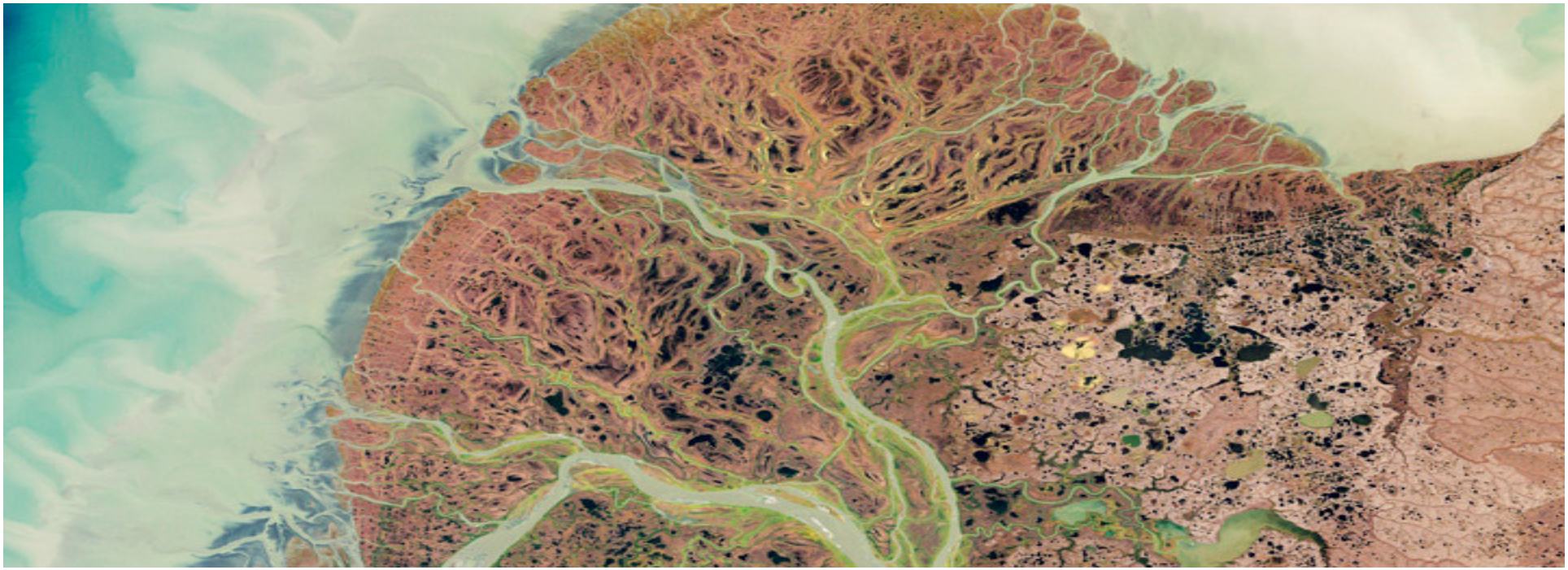
Lidar Data Collection in the Yukon-Kuskokwim Delta, Alaska



WOOLPERT

ARCHITECTURE | ENGINEERING | GEOSPATIAL

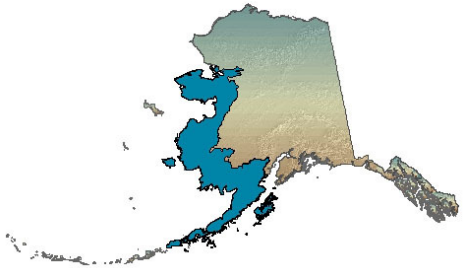
John Gerhard, CP
Vice President
Program Director
Woolpert

Yukon-Kuskokwim Delta Lidar

U.S. FISH & WILDLIFE SERVICE

FEDERAL EMERGENCY MANAGEMENT AGENCY

Western Alaska LCC



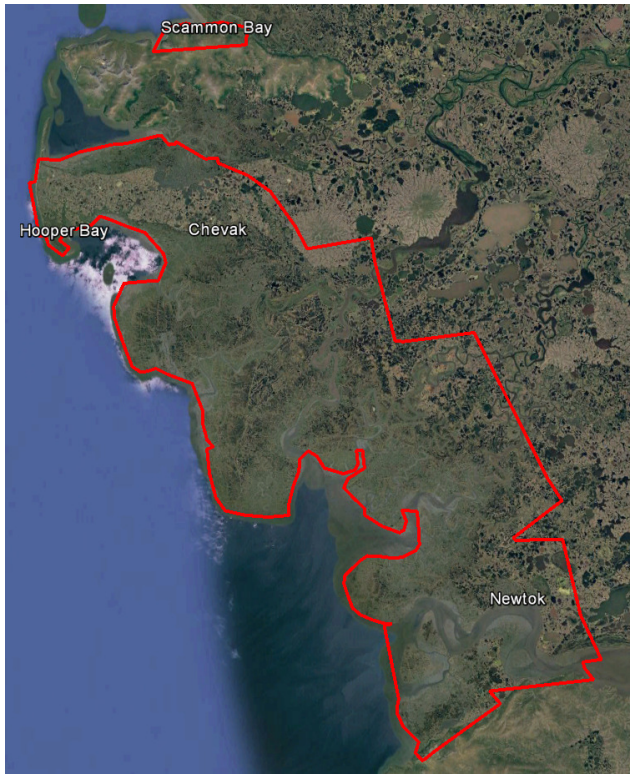
ALASKA DEPARTMENT OF NATURAL RESOURCES

NRCS Natural Resources Conservation Service

AOOS Alaska Ocean Observing System

USGS

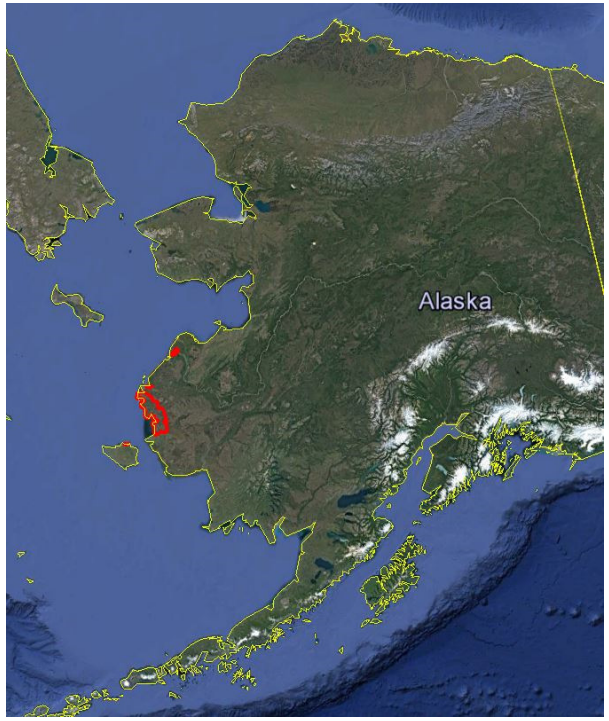
Yukon-Kuskokwim Delta Lidar



Yukon-Kuskokwim Delta Lidar

Data Collection by Kodiak Mapping

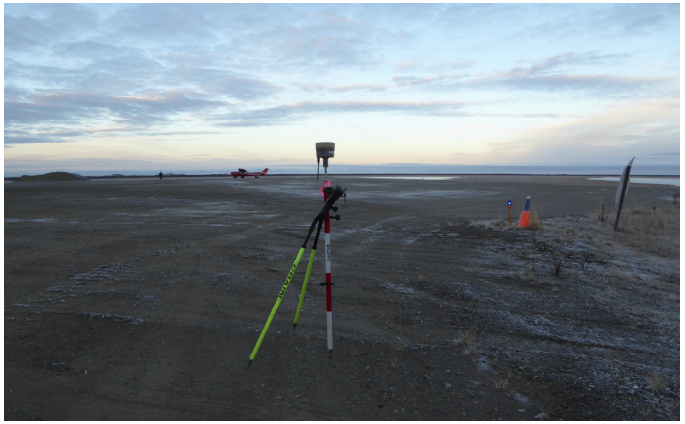
- August 30, 2016 – October 16, 2016
- C-182 Katmai Aircraft
- Riegl LMS-Q780
- RCD30 Digital Camera



Yukon-Kuskokwim Delta Lidar

Survey Effort

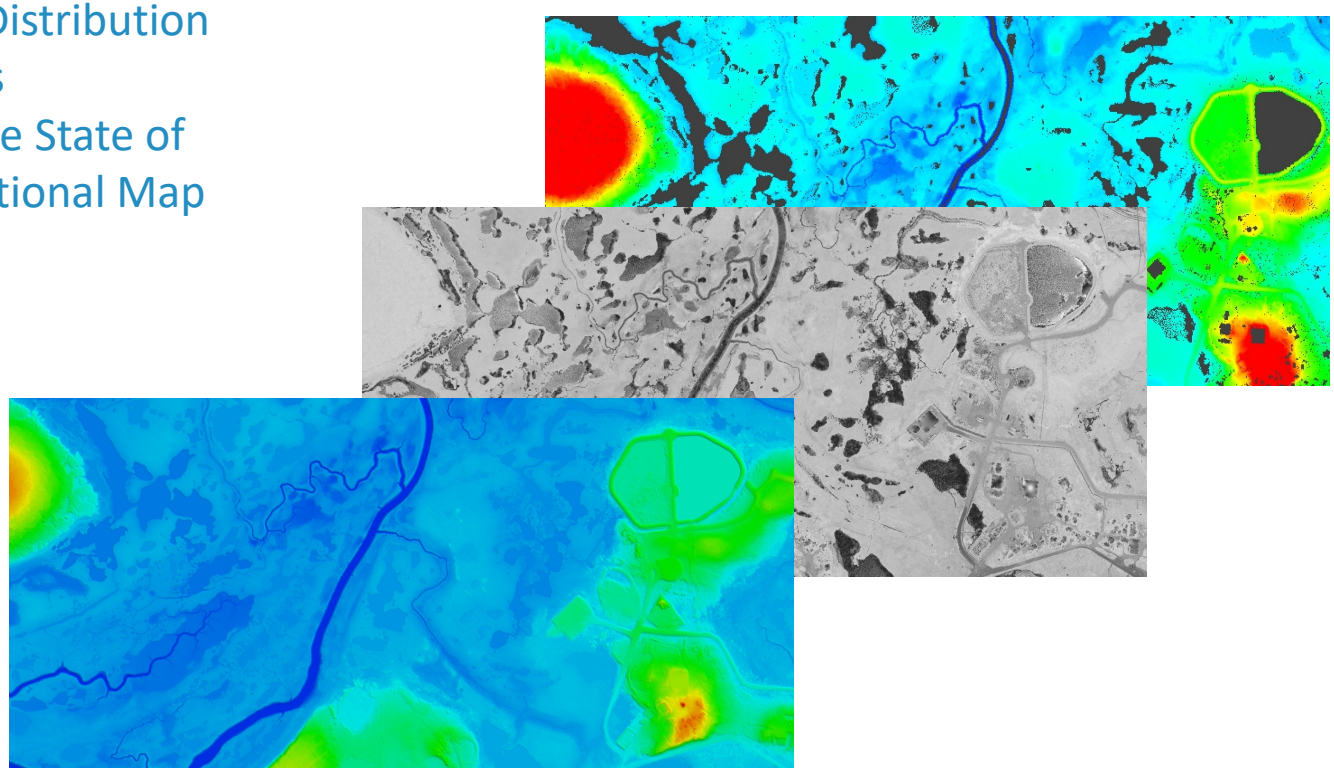
- November 2, 2016 – November 6, 2016
- Kodiak Mapping
- Control and checkpoints
- Accessibility difficulties
- Community outreach



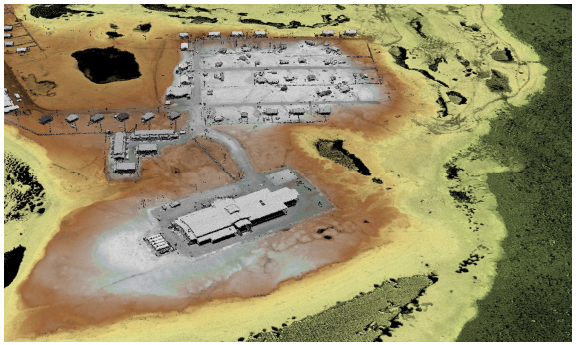
Yukon-Kuskokwim Delta Lidar

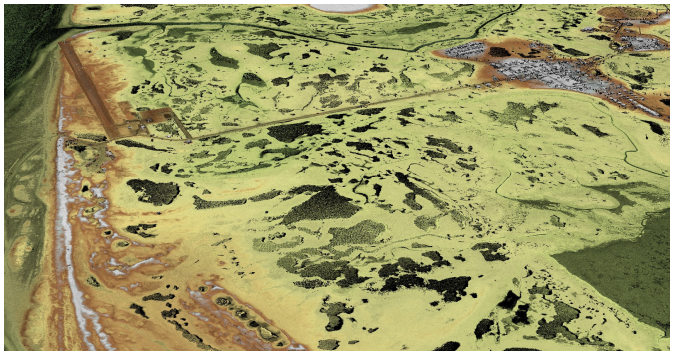
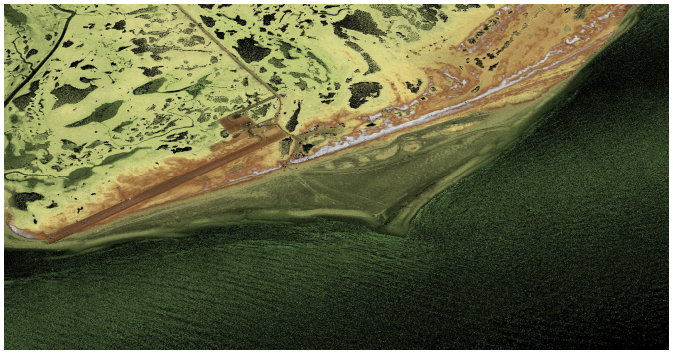
Data Deliverables and Distribution

- USGS 3DEP Products
- Available through the State of Alaska and USGS National Map Viewer



Yukon-Kuskokwim Delta Lidar

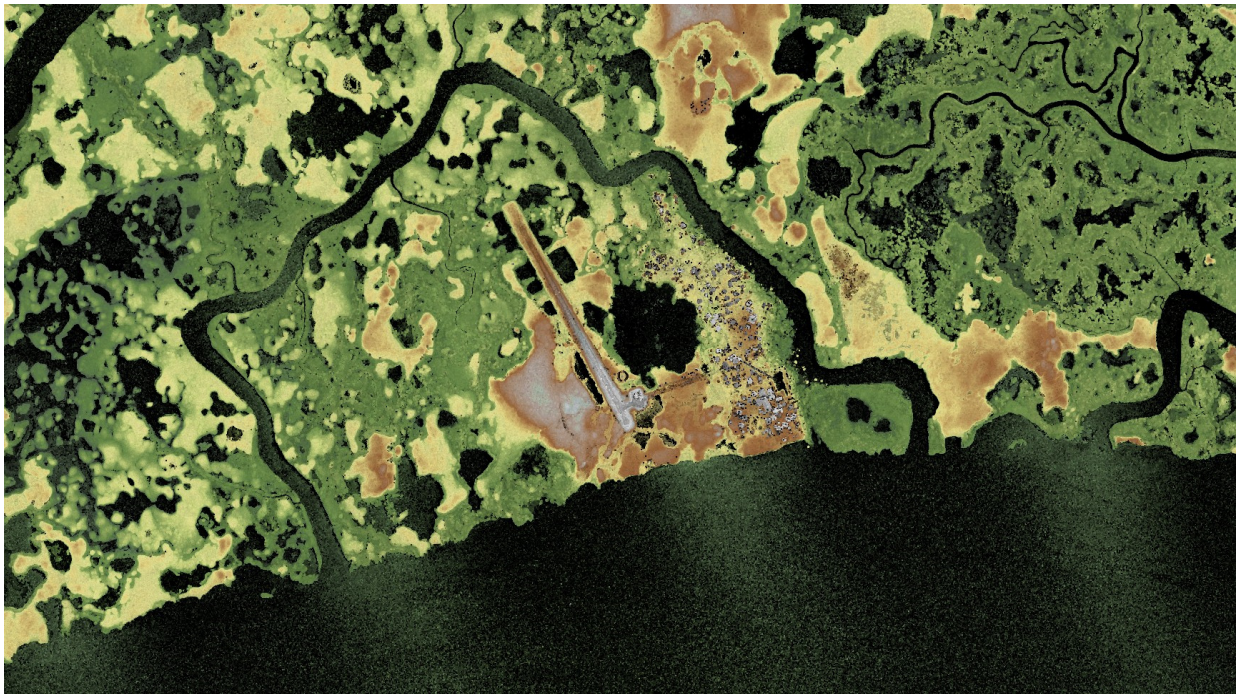


Hooper Bay, AK

Yukon-Kuskokwim Delta Lidar

2007

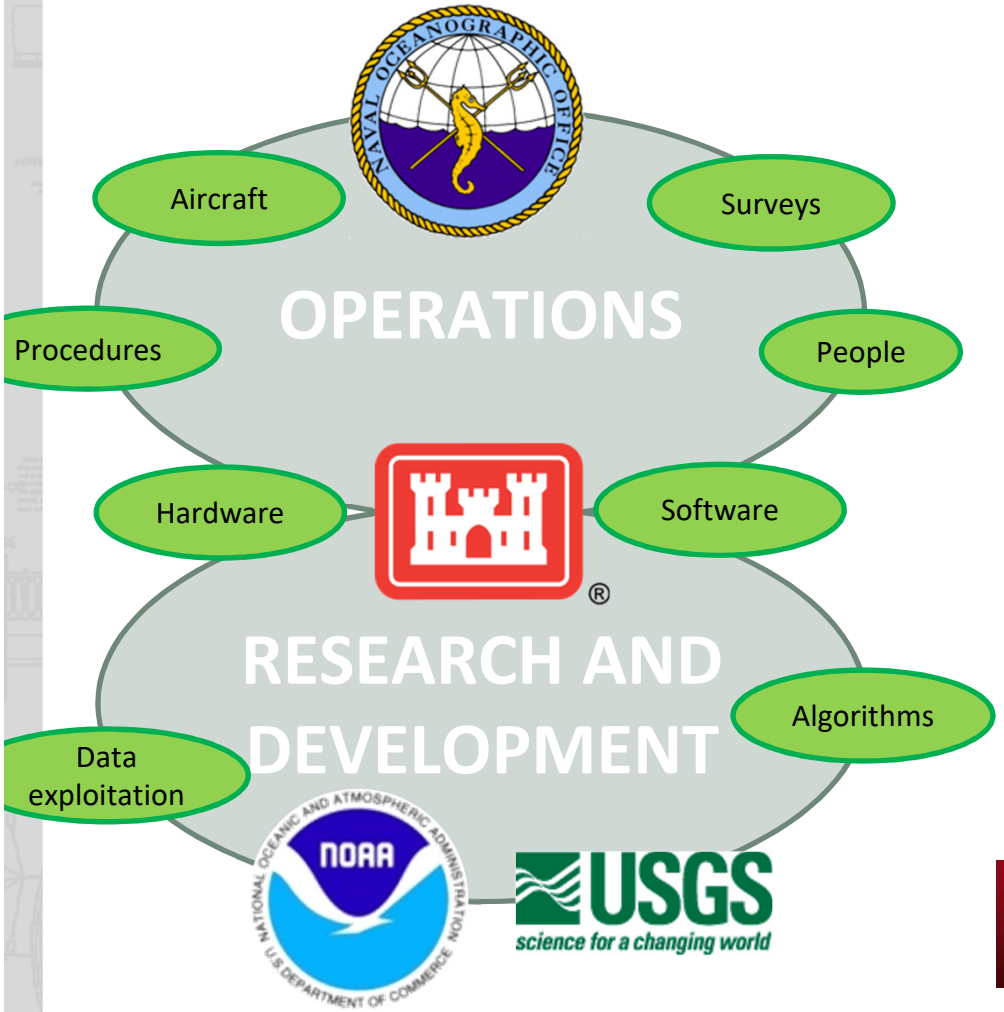


2016

Yukon-Kuskokwim Delta Lidar

- Storm surge and inundation research
- Emergency response planning
- Wildlife conservation
- Community planning
- Relocation planning
- Source of improved elevation data

JOINT AIRBORNE LIDAR BATHYMETRY TECHNICAL CENTER OF EXPERTISE



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Kiln, MS

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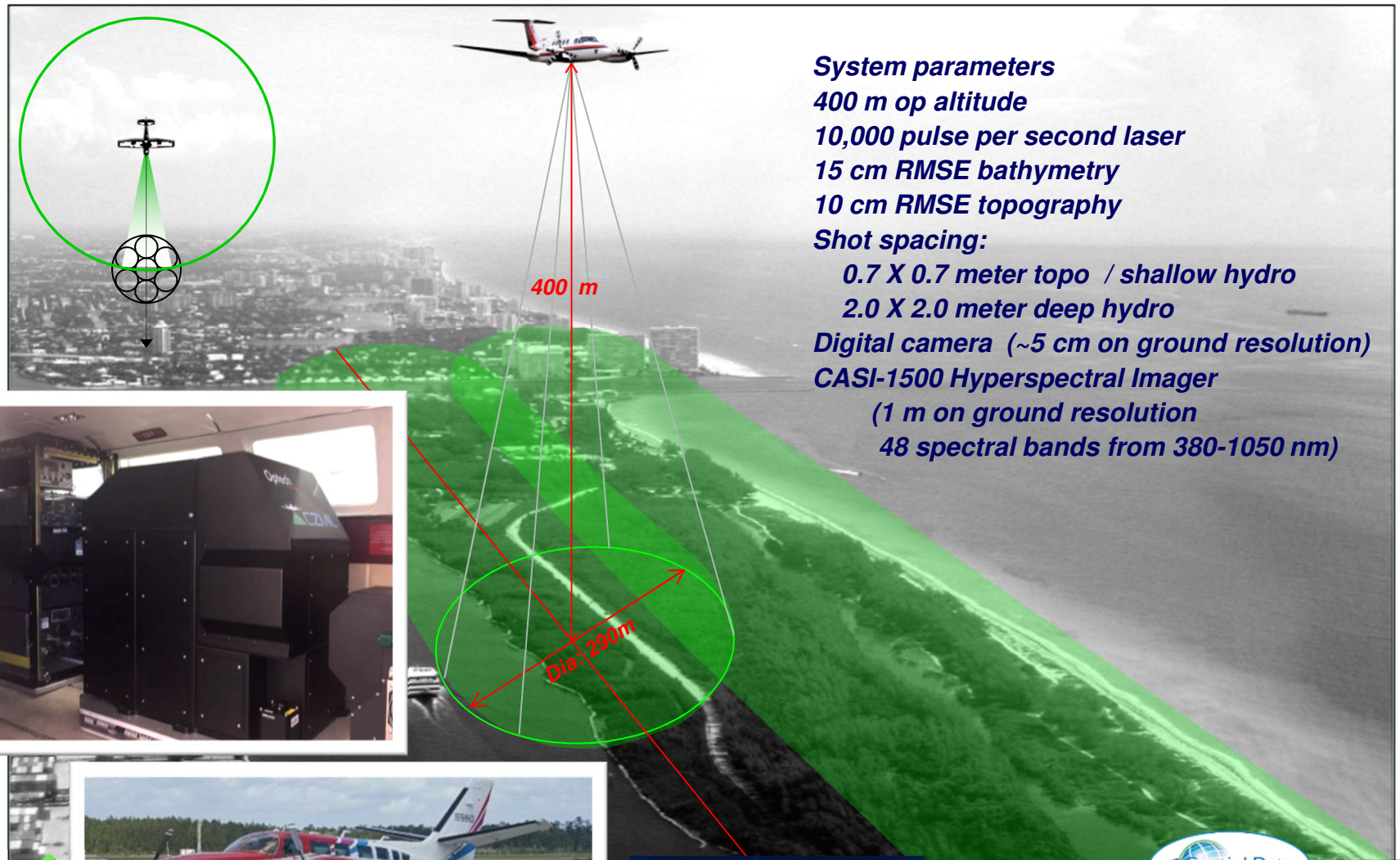
CZMIL Coastal Zone Mapping and Imaging Lidar



System parameters
400 m op altitude
10,000 pulse per second laser
15 cm RMSE bathymetry
10 cm RMSE topography
Shot spacing:
0.7 X 0.7 meter topo / shallow hydro
2.0 X 2.0 meter deep hydro
Digital camera (~5 cm on ground resolution)
CASI-1500 Hyperspectral Imager
(1 m on ground resolution
48 spectral bands from 380-1050 nm)

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TELEDYNE OPTECH Everywhereyoulook™

WMR 532 Wood pot | Magnolia River Joint Venture

THE UNIVERSITY OF SOUTHERN MISSISSIPPI 1910

US Army Corps of Engineers

Spatial Data MOBILE DISTRICT

COASTAL AND HYDRAULICS LABORATORY

U.S.ARMY

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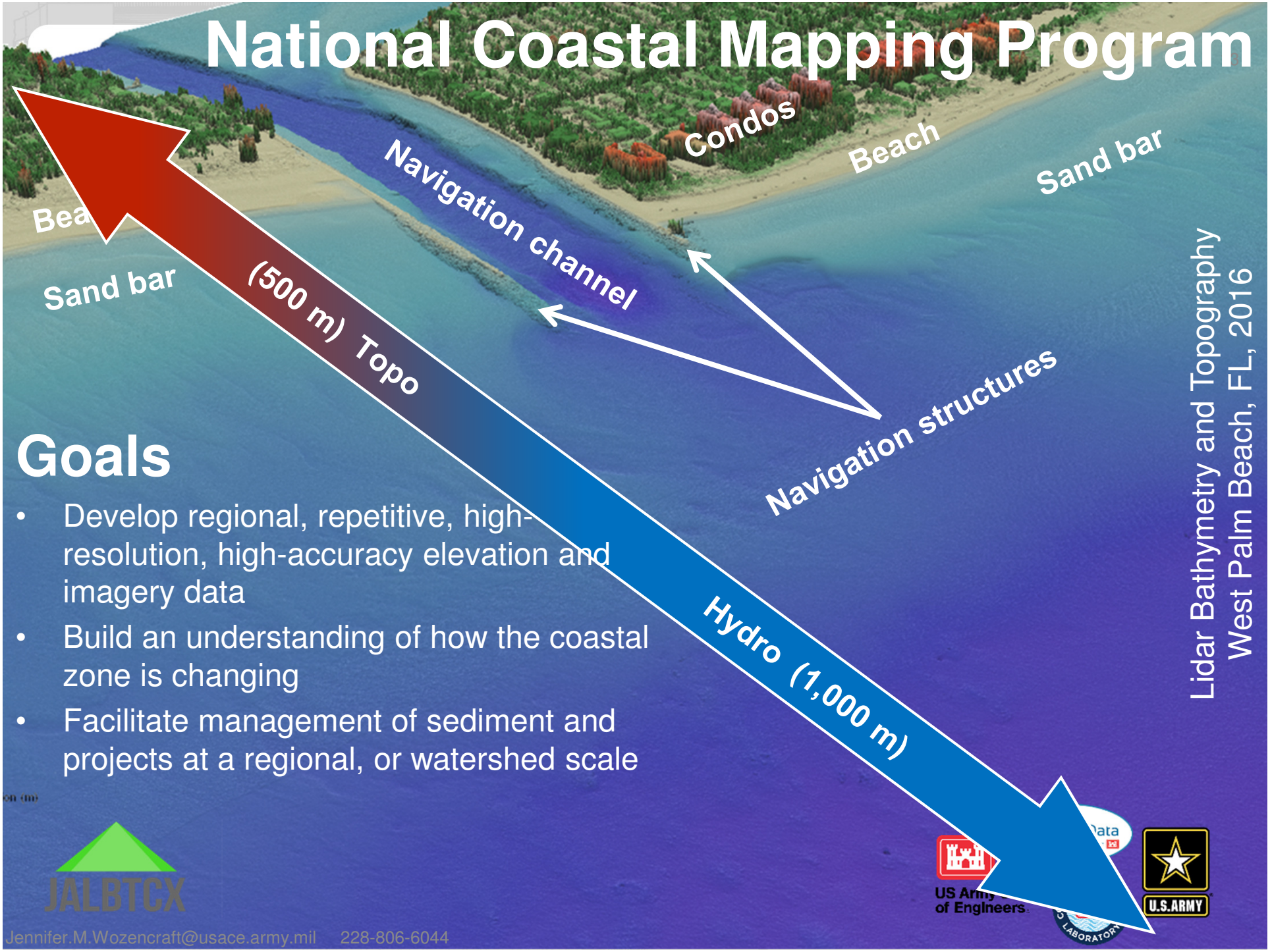
National Coastal Mapping Program



Goals

- Develop regional, repetitive, high-resolution, high-accuracy elevation and imagery data
- Build an understanding of how the coastal zone is changing
- Facilitate management of sediment and projects at a regional, or watershed scale

Lidar Bathymetry and Topography
West Palm Beach, FL, 2016

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US Army of Engineers

U.S.ARMY

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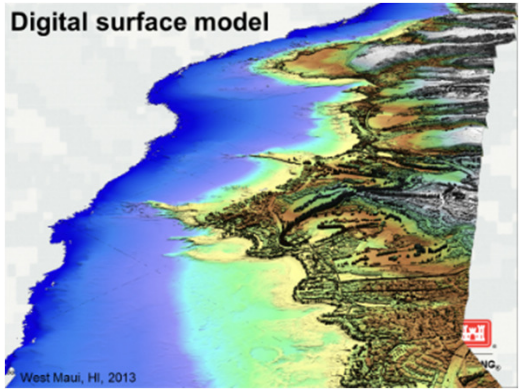
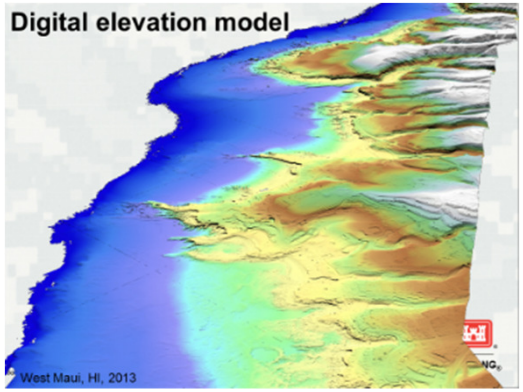
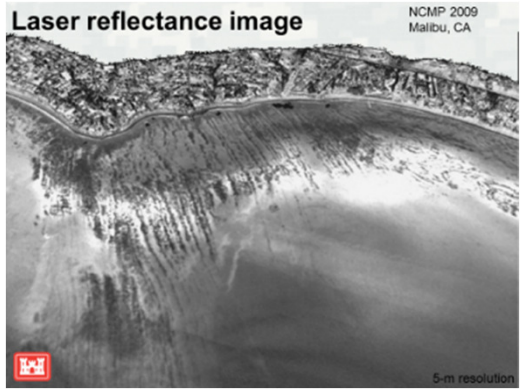
JALBTCX PRODUCTS FOR COASTAL ENGINEERS

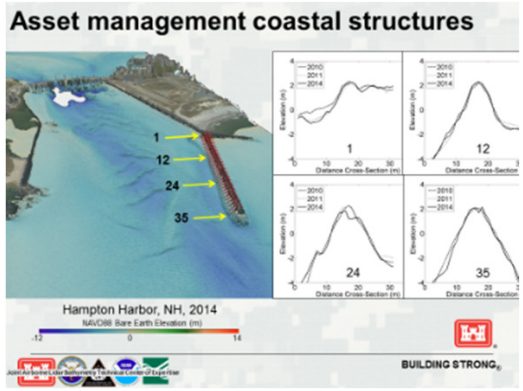
Basic lidar and imagery products





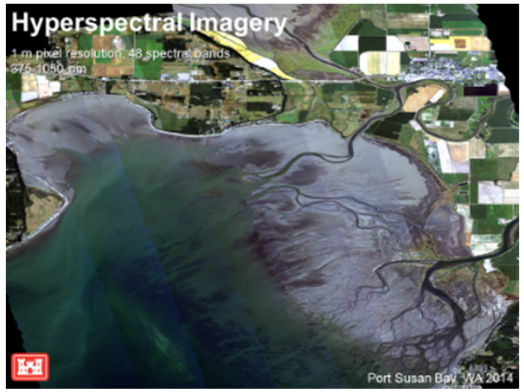
Advanced lidar products*

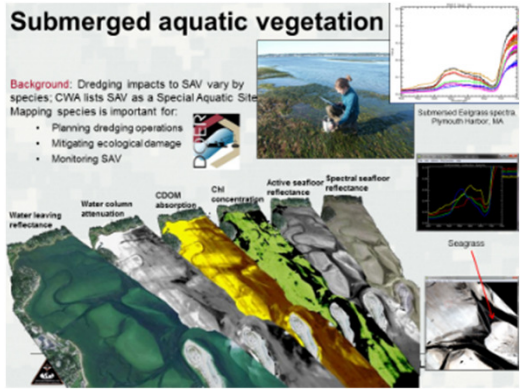


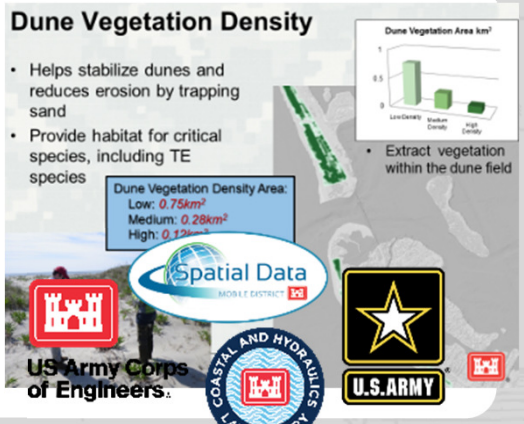


Fusion products*

**Leveraging ERDC CHL and EL R&D*







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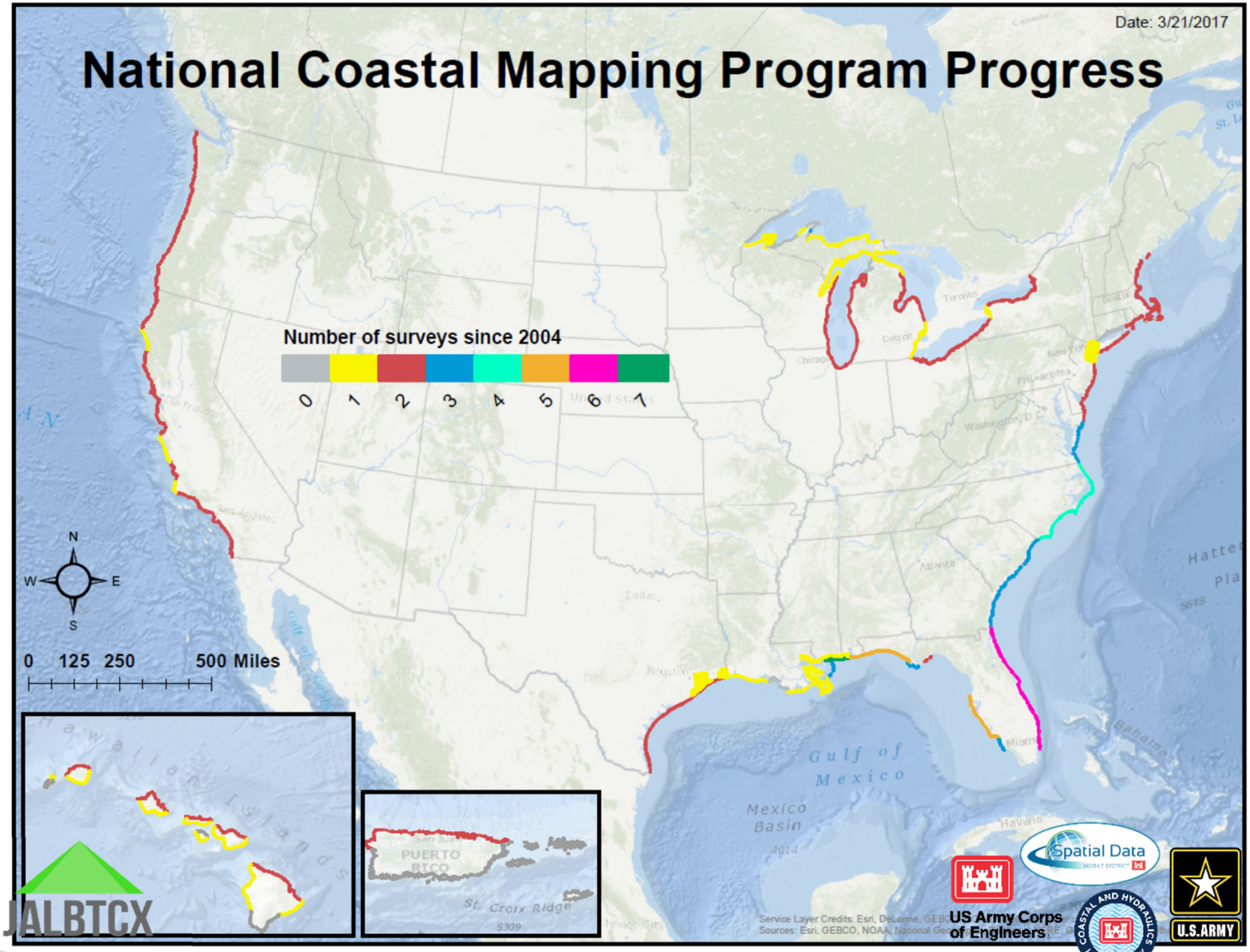
National Coastal Mapping Program Progress



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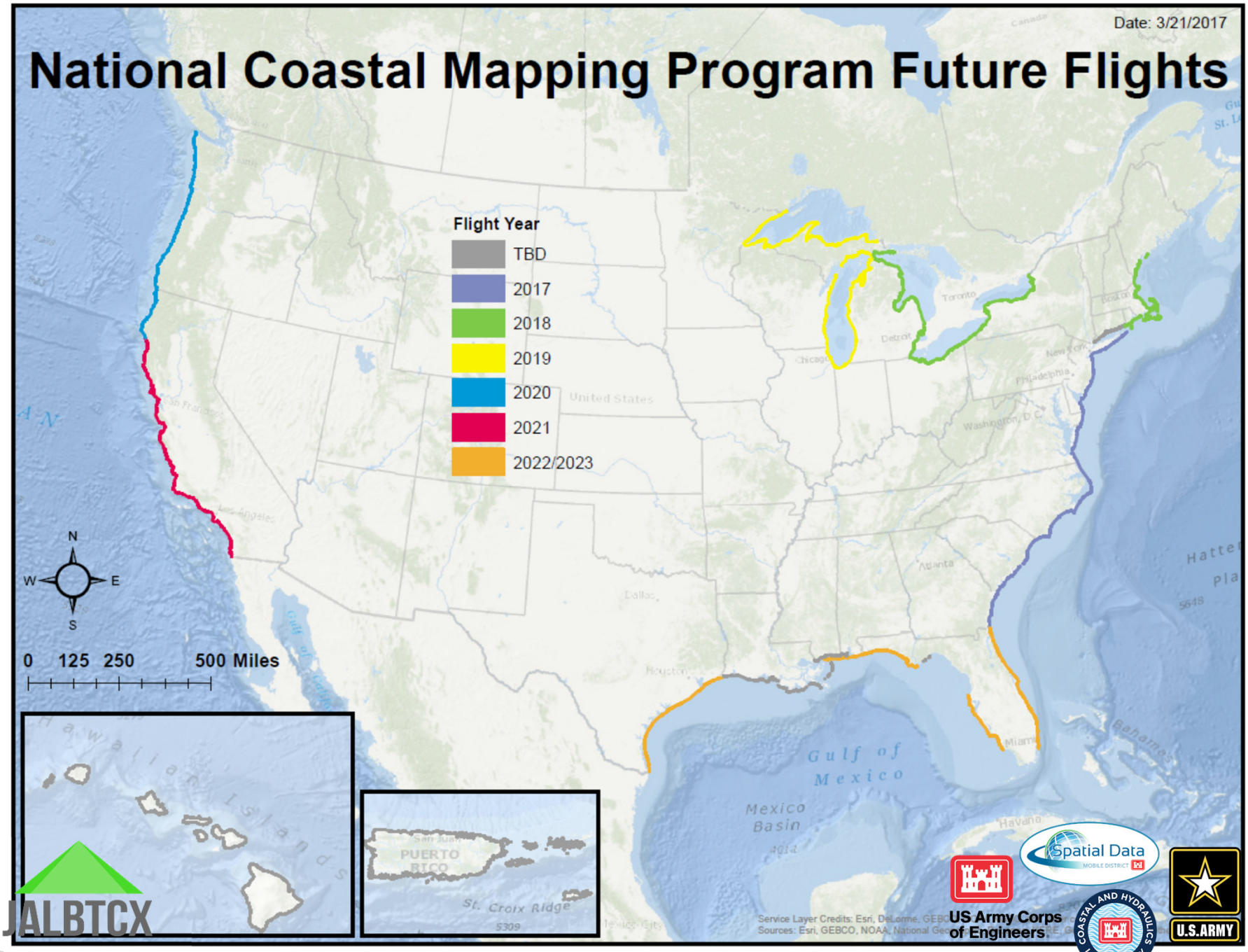

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- Long endurance aircraft, ~11 hours.
- Transits annually through AK at the completion of the NAVO mission.
- Very experienced operating in remote and challenging locations.

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MULTI-MISSION SURVEY AIRCRAFT

- Enhanced global reach
- Carry survey equipment & aircraft parts
- Multi-mission capable with space, power, and additional bottom ports for additional sensors as needed

BT-67 Specifications (with options)

Range	2,140 nm
Max Cruise	215 kts
Standard Cruise	205 kts
Fuel Capacity	1,542 gal
Endurance	~11 hrs
Max take-off wt.	28,750 lbs
Survey Altitude	1200 ft
Survey Speed	140 knots

Approved for public release: Distribution unlimited

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Spatial Data

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COASTAL ZONE MAPPING & IMAGING

LIDAR (CZMIL) SYSTEM

The right tool for safe and efficient shallow-water hydrographic and near-shore topographic data collection in support of Navy requirements

Hydro/Topo Lidar

Hyperspectral

RGB Imagery

- 10,000 Hz Pulse Rate Laser for Hydro / Topo
- 25 Megapixel Digital camera (~20 cm pixel)
- CASI-1500 Hyperspectral Imager
  - 1500 pixels
  - 380 – 1050 nm wavelength
  - 288 possible bands

Shot spacing:
- 0.7 X 0.7 meter topo / shallow hydro
- 2.0 X 2.0 meter deep hydro

Approved for public release: Distribution unlimited

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