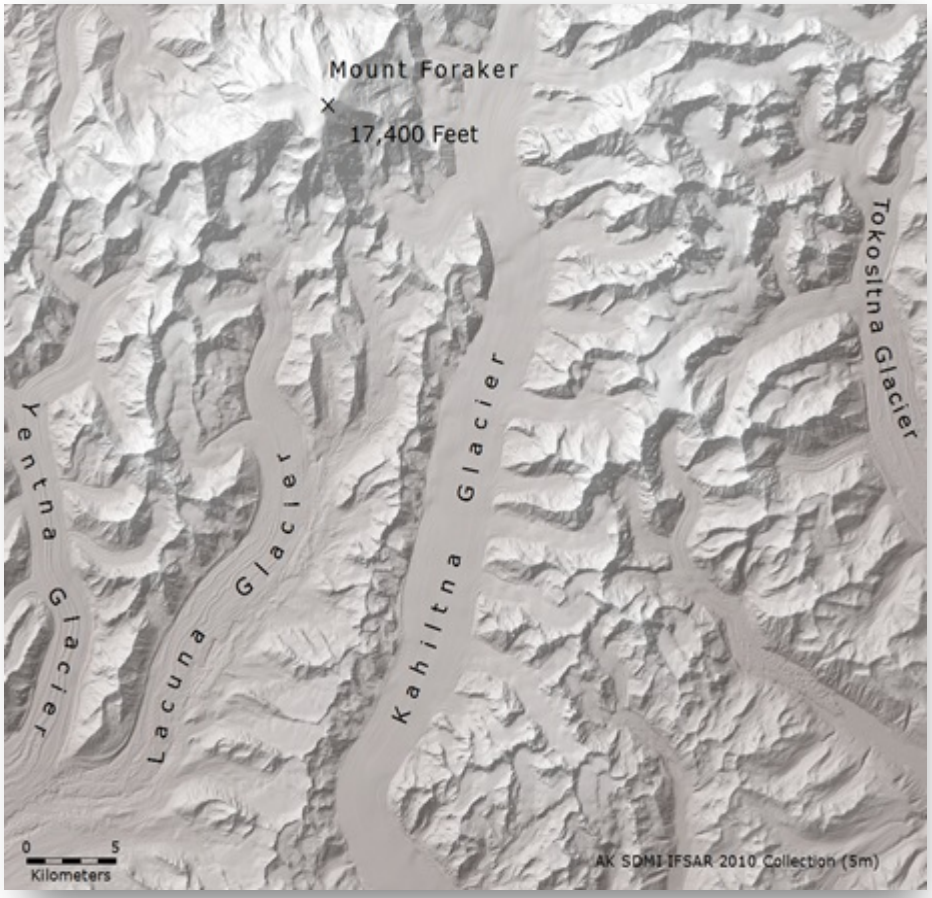


Alaska Mapping Executive Committee (AMEC) – Anchorage, Alaska

October 26, 2017

Agenda

- *Welcome and introductions, Andrea Travnicek, DOI*
- *AMEC objectives and status report, Kevin Gallagher, USGS*
- *Review new 2018-2022 Charter, Kevin Gallagher, USGS*
- *Review new 18-month tactical plan, Tracy Fuller, USGS*
- *State of Alaska Status Report, Steve Masterman*
- *Alaska Federal Executive Group Activities, Aimee Devaris, USGS*
- *IfSAR collection status, FY18 objectives, Dave Saghy, USGS*

- *Break*

- *Imagery requirements submission, Chris Noyles, BLM*
- *NOAA Update, Nicole Kinsman, NOAA*
- *Alaska federal priority mapping requirements post-IfSAR, BLM, FWS, NPS, NRCS, USFS*
- *Alaska Hydrography, Kacy Krieger, UAA; National Hydrography Dataset (NHDPlusHR), Becci Anderson, USGS*
- *Actions, next steps, schedule spring DC meeting, Andrea Travnicek, DOI*
- *Adjourn*

AMEC History

- Alaska Mapping Roundtable convened June, 2012 to review the need to improve the state of mapping in Alaska
- The Alaska Mapping Executive Committee (AMEC) was formed as an outcome of the Roundtable
- AMEC held its first meeting in November, 2012

Data Acquisition Accomplishments

Theme	Metric	2013 Goal	October 2017 Status
Elevation	% IFSAR acquired	Complete in 4 years	92% statewide coverage achieved
Hydrography	% NHD updated	Complete in 6 years	20% updated
Transportation	% of State completed and publicly available	Complete in 5 years	Baseline AK DOT roads dataset 100% complete; ongoing maintenance
GRAV-D	% GRAV-D acquired	Complete in 2019	78.4%
Coastal Mapping	% AK shoreline updated	Complete in 5 years with budget increase, longer term if no budget increase	48.5%

AMEC Activity Since April Meeting

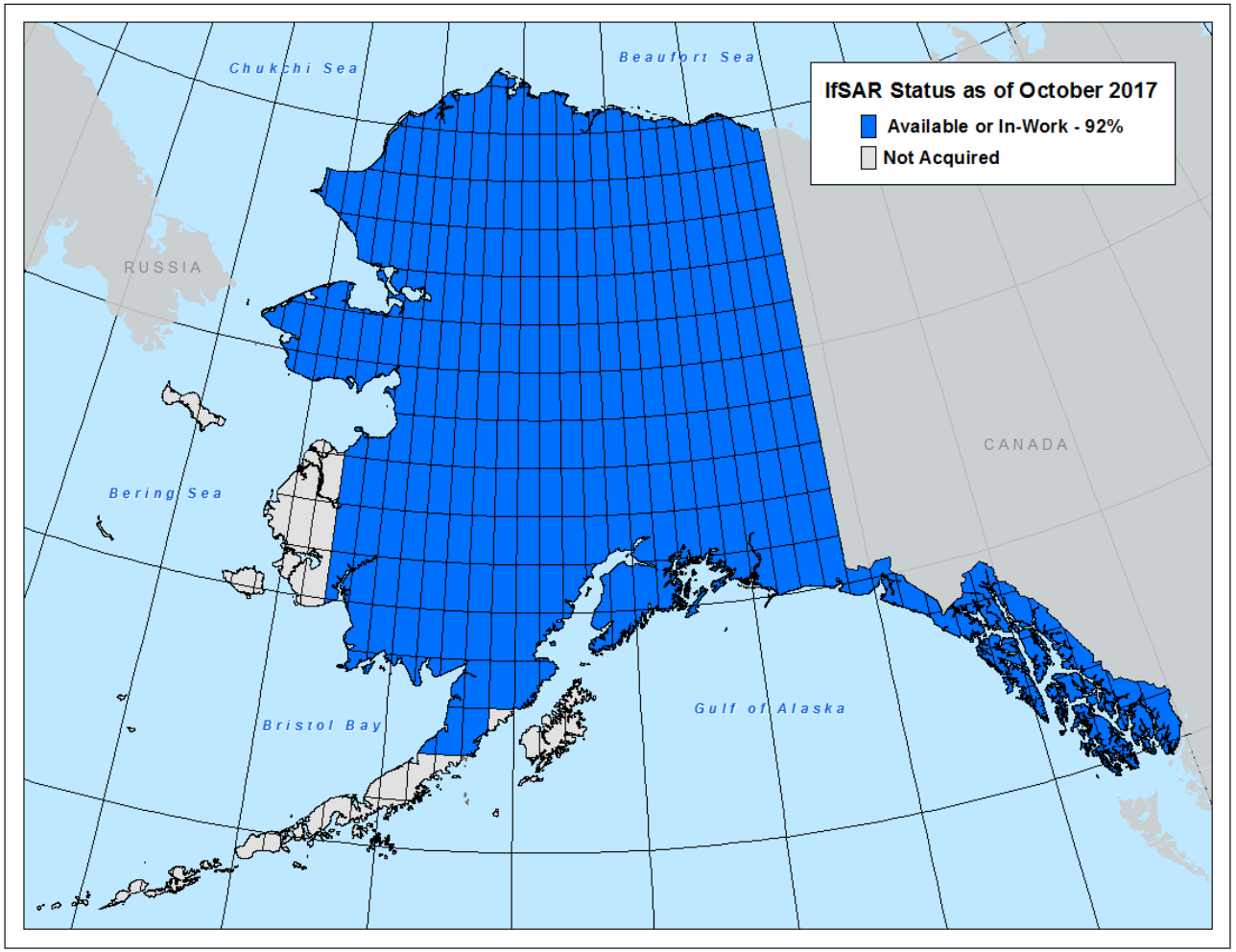
Major Actions Completed (some awaiting final AMEC approval):

- Technical Subcommittee updated the AMEC Charter
- Technical Subcommittee updated the 18-month Tactical Plan
- $997,000 EOY funds were contributed to accelerate IfSAR collection; 15% coverage added in 2017 and total coverage is now 92%
- AK DOT made significant improvements to the Alaska Statewide Road Layer; data was submitted to USGS for use on 2017 AK Topo maps
- National Weather Service funded a critical NHD update project on the Kenai Peninsula
- NOAA GRAV-D coverage increased 2.4%
- NOAA shoreline mapping increased 5.5%
- USFS and USGS funded a large lidar collection on Prince of Wales Island through the 3DEP BAA process

"The Alaska Mapping Executive Committee is Accomplishment Focused"

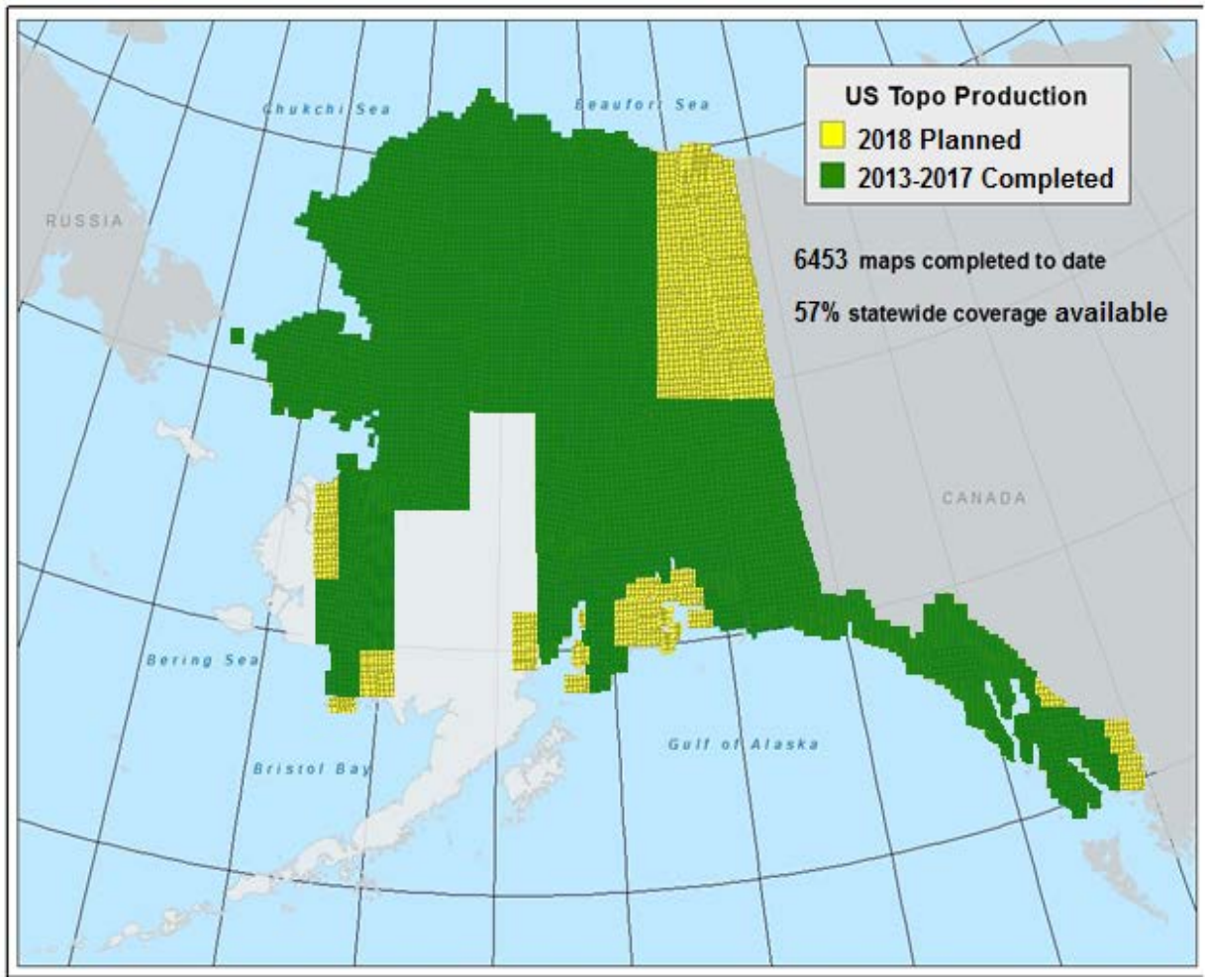
Alaska IfSAR Status EOY FY2017

- 15% Statewide coverage acquired in FY2017
- 92% of the State Available or In-Work at end of FY2017



US Topo Map Production Status

- Map production follows IfSAR delivery
- 6453 new US Topo maps published
- Approximately 1500 maps planned for FY18 production
- 11,273 total maps cover Alaska at 1:25,000 scale
- 57% complete
- 70% expected by September 30, 2018



Updated AMEC Charter

- Proposed new AMEC charter runs 2018 through 2022
- Technical Subcommittee reviewed and commented
- Language expanded to note additional Alaska mapping requirements that AMEC can consider in the future:
  - imagery
  - bathymetric mapping
  - targeted lidar acquisitions
  - continued improvements to hydrography
  - geologic mapping
  - geophysical surveys
  - land classification
- *Potential Action: Ratify the new charter now, or allow two weeks for final comments*

Updated 18-Month Tactical Plan

- New tactical plan runs from November 1, 2017 through April 30, 2019
- Technical Subcommittee members reviewed and commented
- Provides similar guidance to previous document
  - Plans for completing IfSAR
  - Accelerated topographic mapping
  - Highlights NOAA's Shoreline and GRAV-D goals
  - Promotes continued investigations into imagery, lidar and ground control requirements
- *Potential Action: Ratify the new plan now, or allow two weeks for final comments*

Alaska Geospatial Council

Alaska Mapping Executive Committee Update

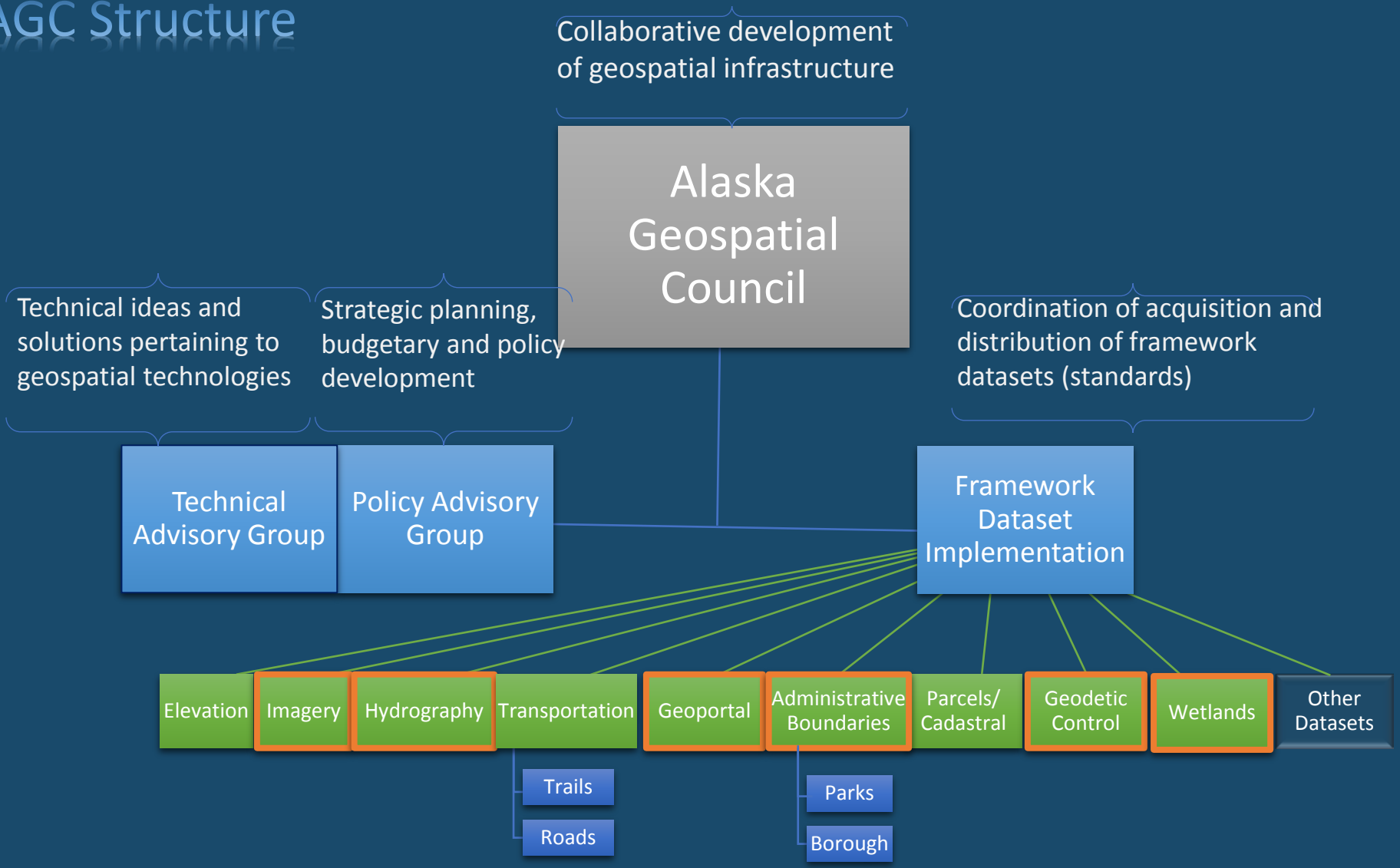
October 26, 2017

Steve Masterman, State Geologist

AGC Members and Technical Representatives

Agency	Delegate/Alternate	Technical Advisor(s)
Alaska Dept. of Natural Resources	Steve Masterman, State Geologist	Anne Johnson
Alaska Dept. of Transportation and Public Facilities	Commissioner Marc Luiken	Gerry Remsberg
Dept. of Military and Veteran's Affairs	Commissioner Brig. Gen. Laurel Hummel; Mike O'Hare alternate	Dave Caplan
Dept. of Fish & Game	Commissioner Sam Cotton; David Rogers alternate	Jason Graham
Dept. of Commerce, Community & Economic Development	Commissioner Chris Hladick; Fred Parady alternate	George Plumley
Dept. of Environmental Conservation	Commissioner Larry Hartig; Alice Edwards alternate	Jason Seifert
University of Alaska Geophysical Institute	Director Robert McCoy	Lisa Wirth
USGS	Steve Wackowski, Alaska DOI liaison	Brian Wright
NOAA	Amy Holman	Nicole Kinsman
USDA-NRCS	Bob Jones	Sydney Thielke
ANCSA Regional Association	Mischa Ellanna	
Alaska Municipal League	Eric Wyatt	Matt Rykazewski

AGC Structure



Working Groups: develop strategic plans and implementation plans for data acquisition, maintenance and distribution, set data standards, and define data models. Additional working groups and subgroups can be deployed as needed. Orange border indicates groups with approved charters.

2017 Accomplishments

- Active, chartered technical working groups identifying existing data and authoritative data sources for framework themes
- Coastal Strategist position NOAA/AGC/AOOS jointly funded for 2018
- Data Distribution & Access
  - Elevation

    http://elevation.alaska.gov ~263GB downloaded per day. 71.86TB total (through 30 Sept) 539,425 square miles of ifsar, lidar, and SfM data available for download via map interface.
  - AK hydro

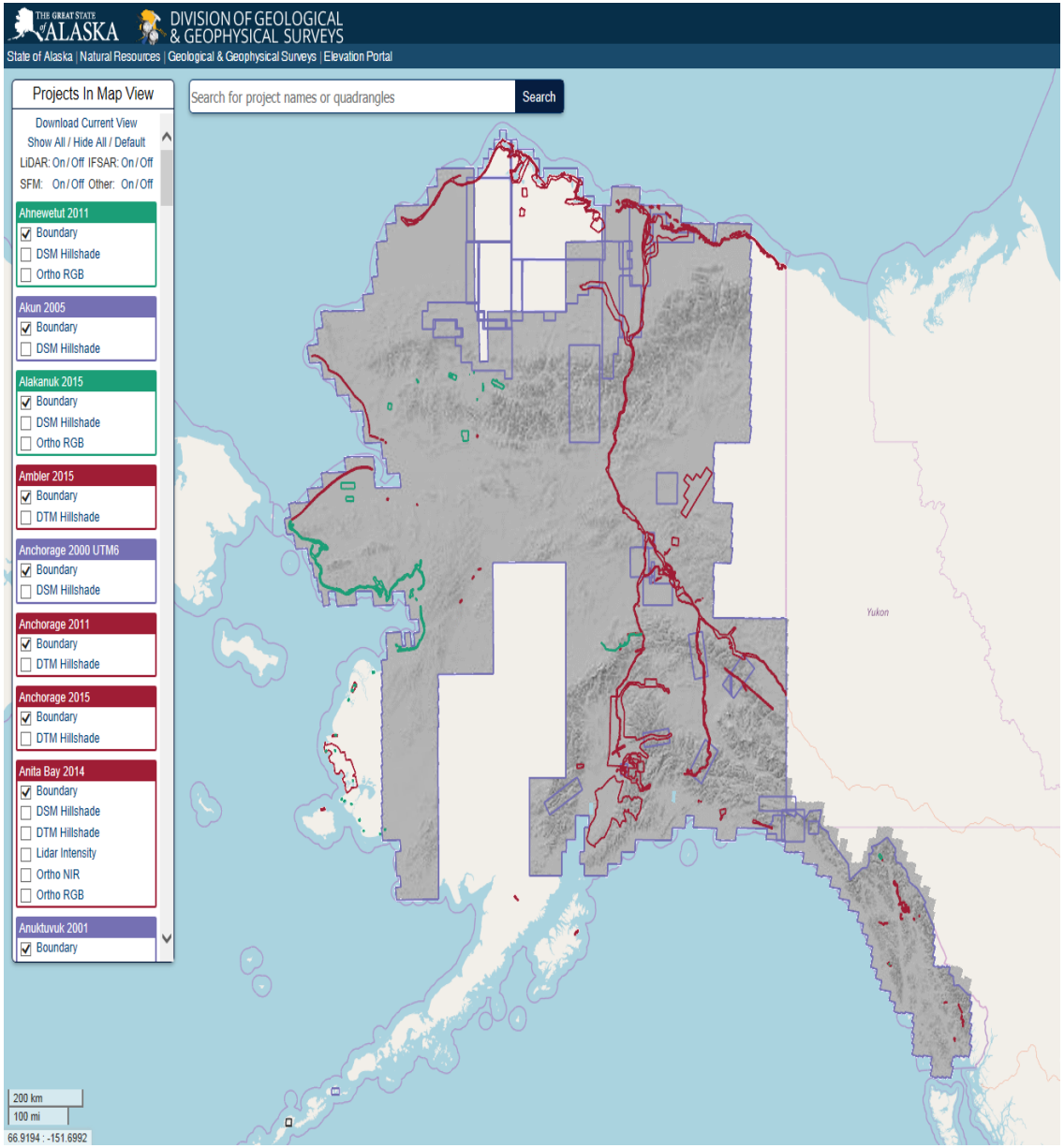
    State hydrography layer used to inform the National Hydrographic Dataset with high-resolution updates hosted at AK DNR
  - Imagery

    14M data requests from 1,487 unique IPs (the State of Alaska is recorded as just one IP), for the first 6 months of service starting in April. Demand is growing exponentially.

1. Elevation 92%

Nick Mastrodicasa, AKDOT

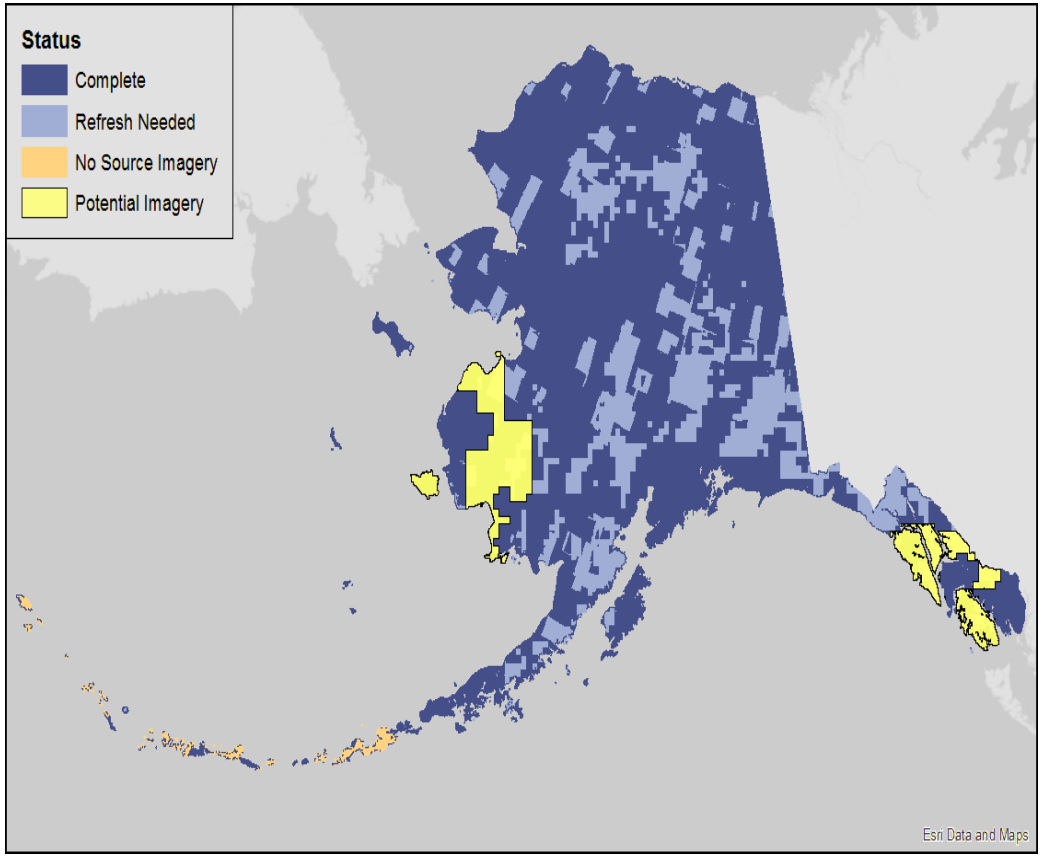
Chris Noyles, BLM



2. Imagery

72%

Sydney Thielke, USDA-NRCS
Parker Martyn, NPS
Dayne Broderson, UA



2. Imagery, continued

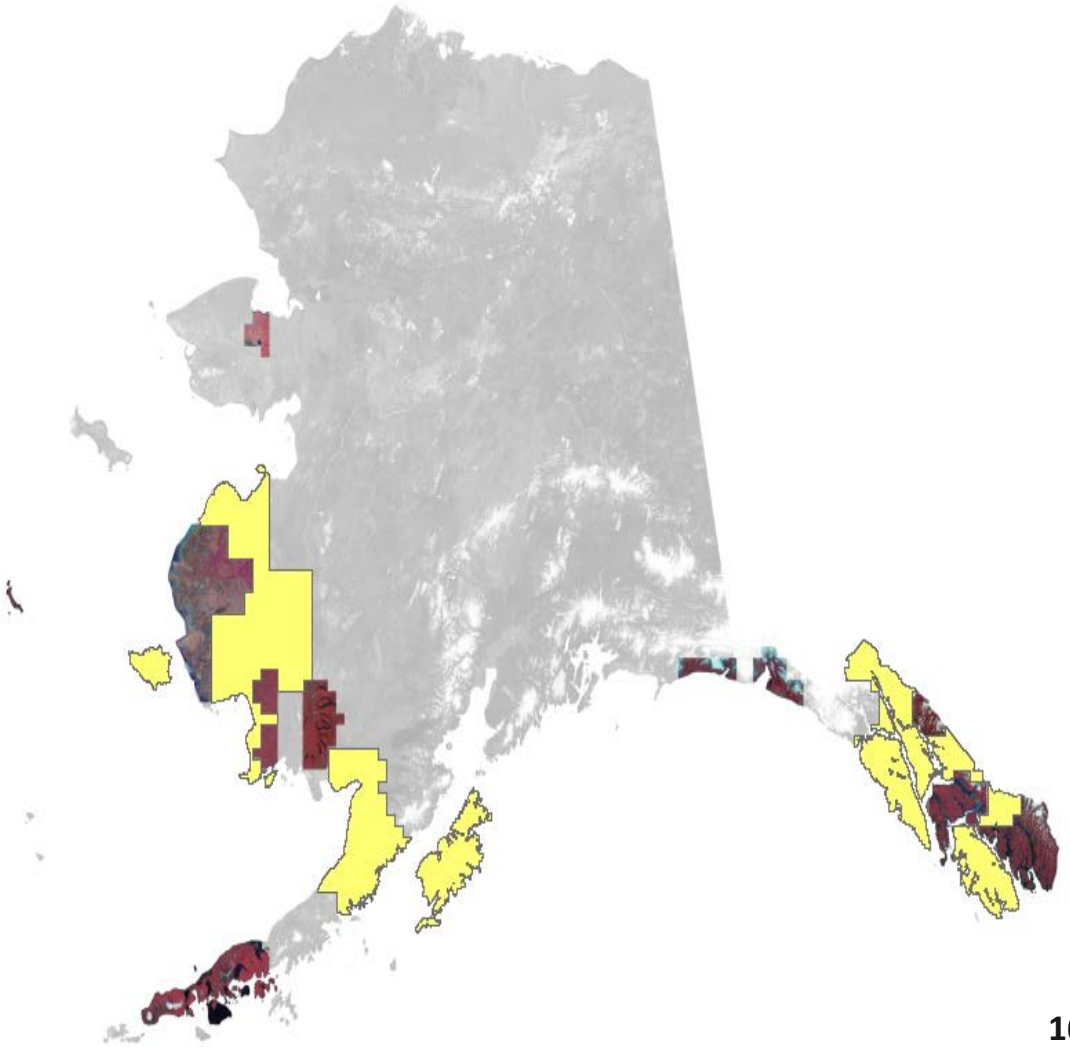
2016 Refresh

- 96,000 sq. kilometers refreshed
- ~300,000 sq. kilometers unprocessed source imagery

SE, YK Delta and Kodiak

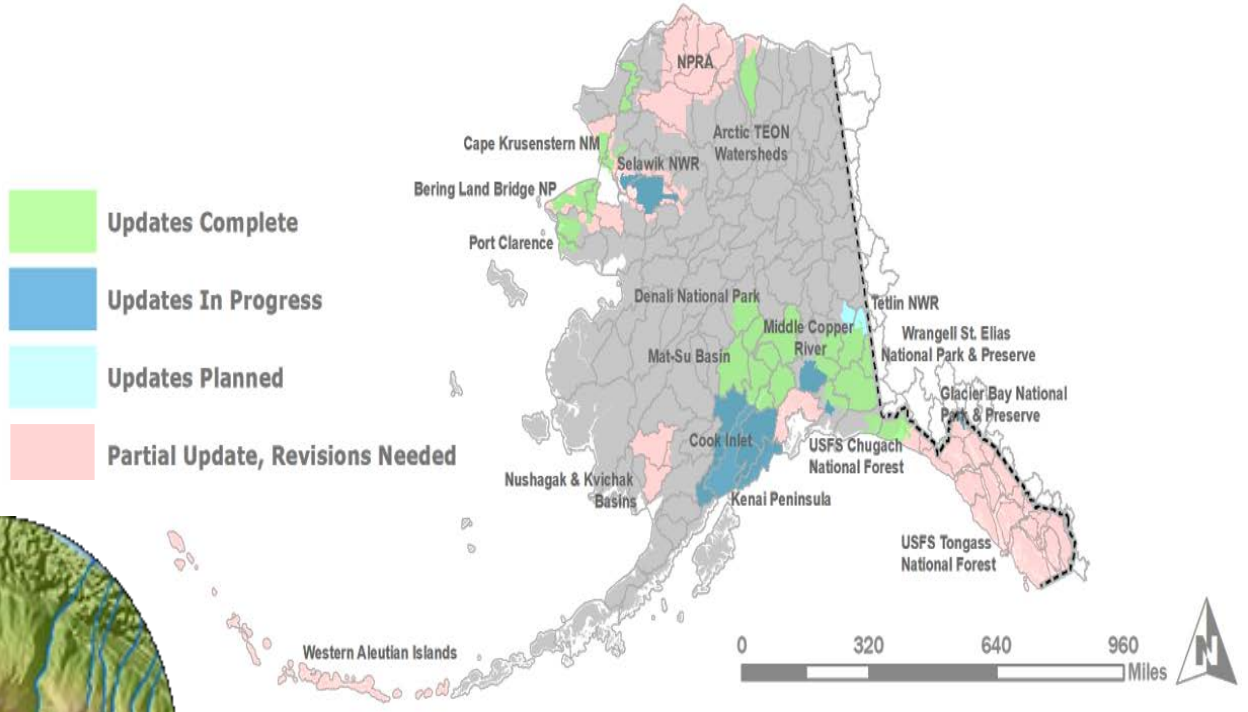
Refreshed ortho tiles (96,000 sq. kilometers)

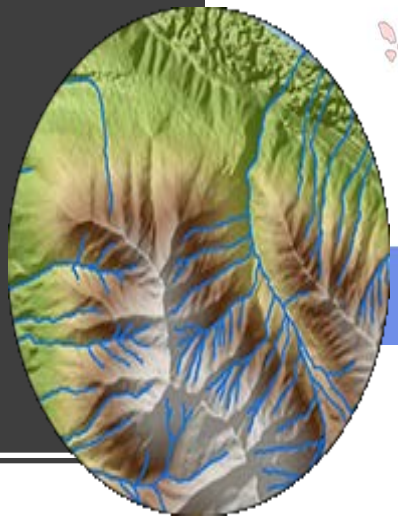
Unprocessed imagery (~300,000 sq. kilometers)



3. Hydrography

20%





4. Wetlands

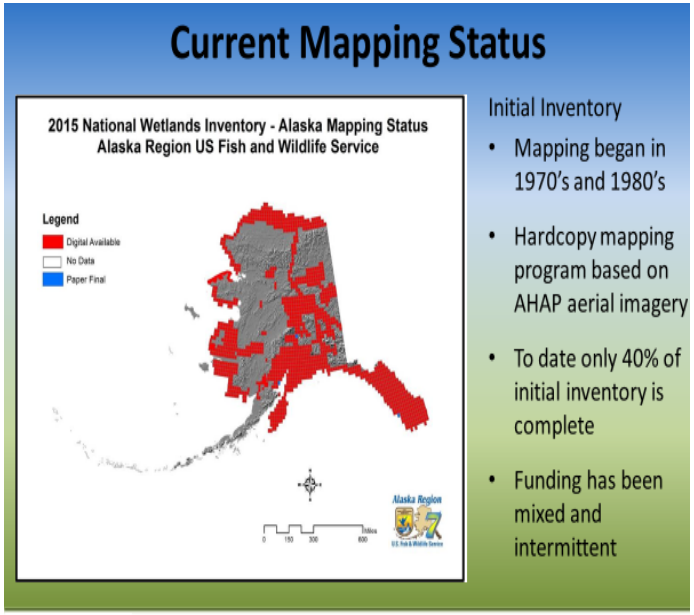
5%

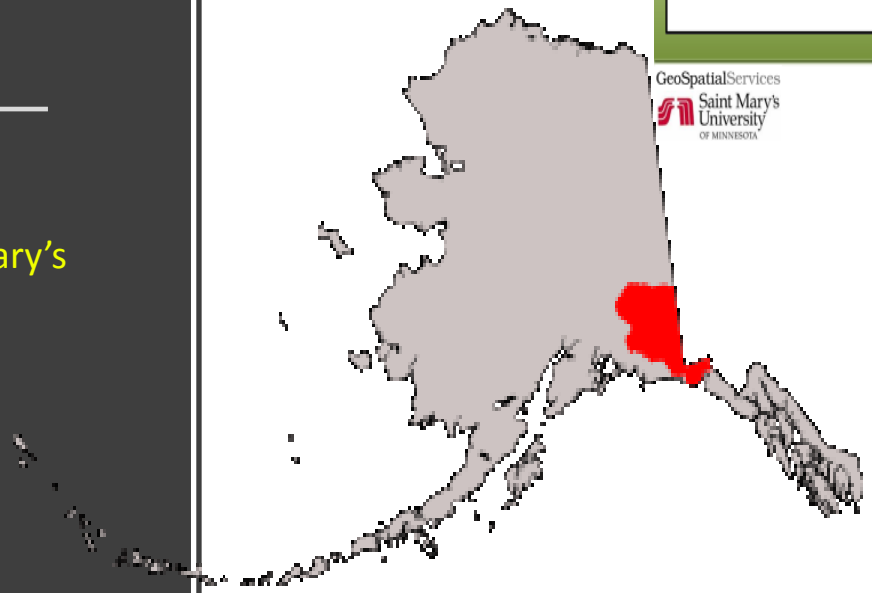
Jason Seifert, DEC

Andy Robertson, St. Mary's University

Inventory of existing data: 40% complete

High-resolution updates complete for Wrangell-St. Elias National Park



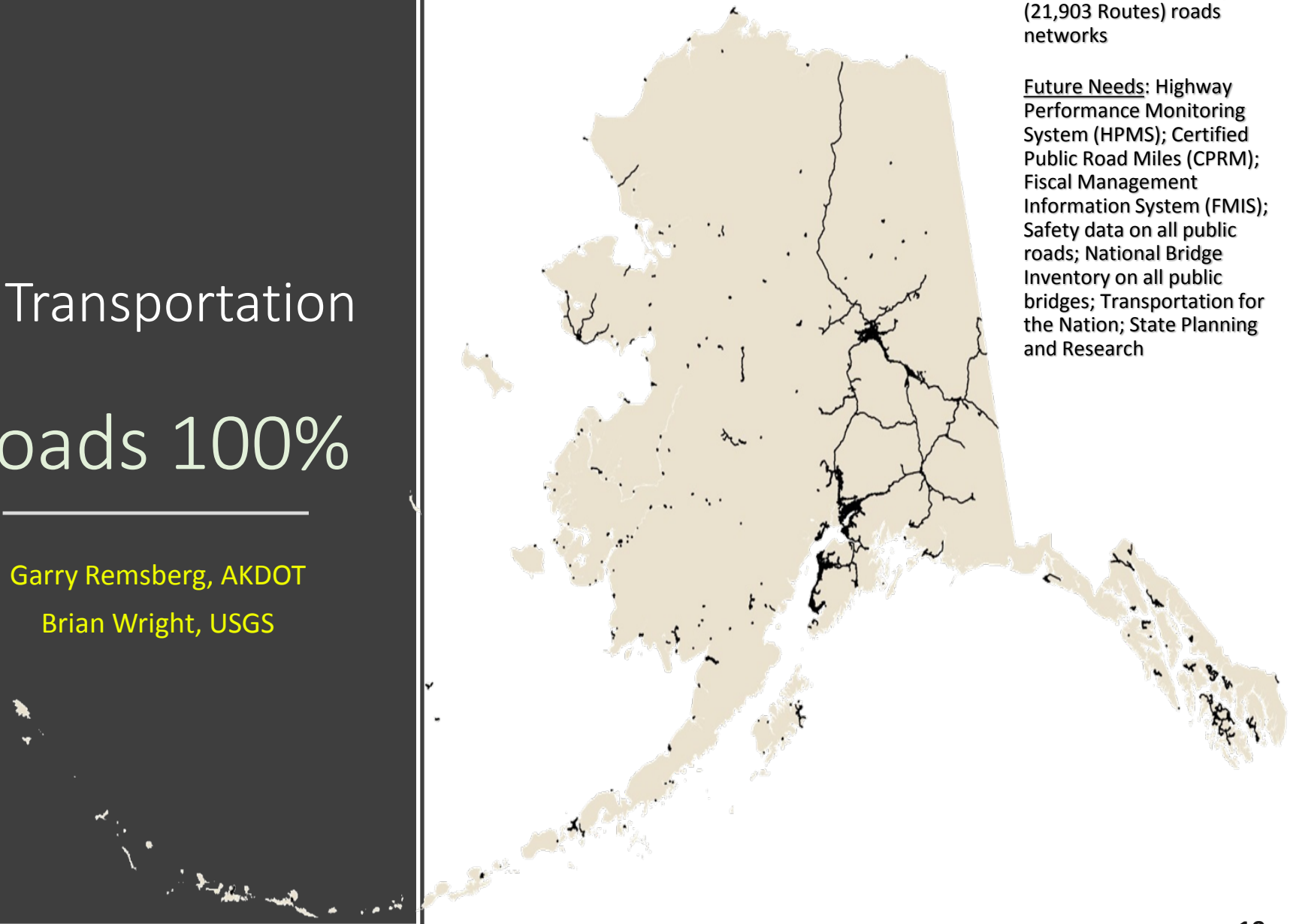


5. Transportation

Roads 100%

Garry Remsberg, AKDOT

Brian Wright, USGS



Completed to date: 100% primary and secondary (21,903 Routes) roads networks

Future Needs: Highway Performance Monitoring System (HPMS); Certified Public Road Miles (CPRM); Fiscal Management Information System (FMIS); Safety data on all public roads; National Bridge Inventory on all public bridges; Transportation for the Nation; State Planning and Research

6. Administrative Boundaries

unknown %

Carrie Marvel, AKDNR

Examples:

ANCSA boundaries

city limits

coastal zone boundary

designated scenic areas

drinking water protection areas

election districts

emergency communications districts

federal agency organizational boundaries

fire management zones

fish management districts

forest protection districts

health districts

highway lighting districts

national memorials, parks, scenic areas, etc.

national forest boundaries

natural hazard regions

neighborhood associations

oil spill geographic response areas

park and recreation districts

places

rural fire protection districts

sanitary districts

school districts

service districts

shellfish management program areas

soil & water conservation districts

soil water conservation district zones

special road districts

state agency administrative subdivisions

state boundary

state forest boundaries

state park boundaries

transportation districts

voting precincts

wilderness areas

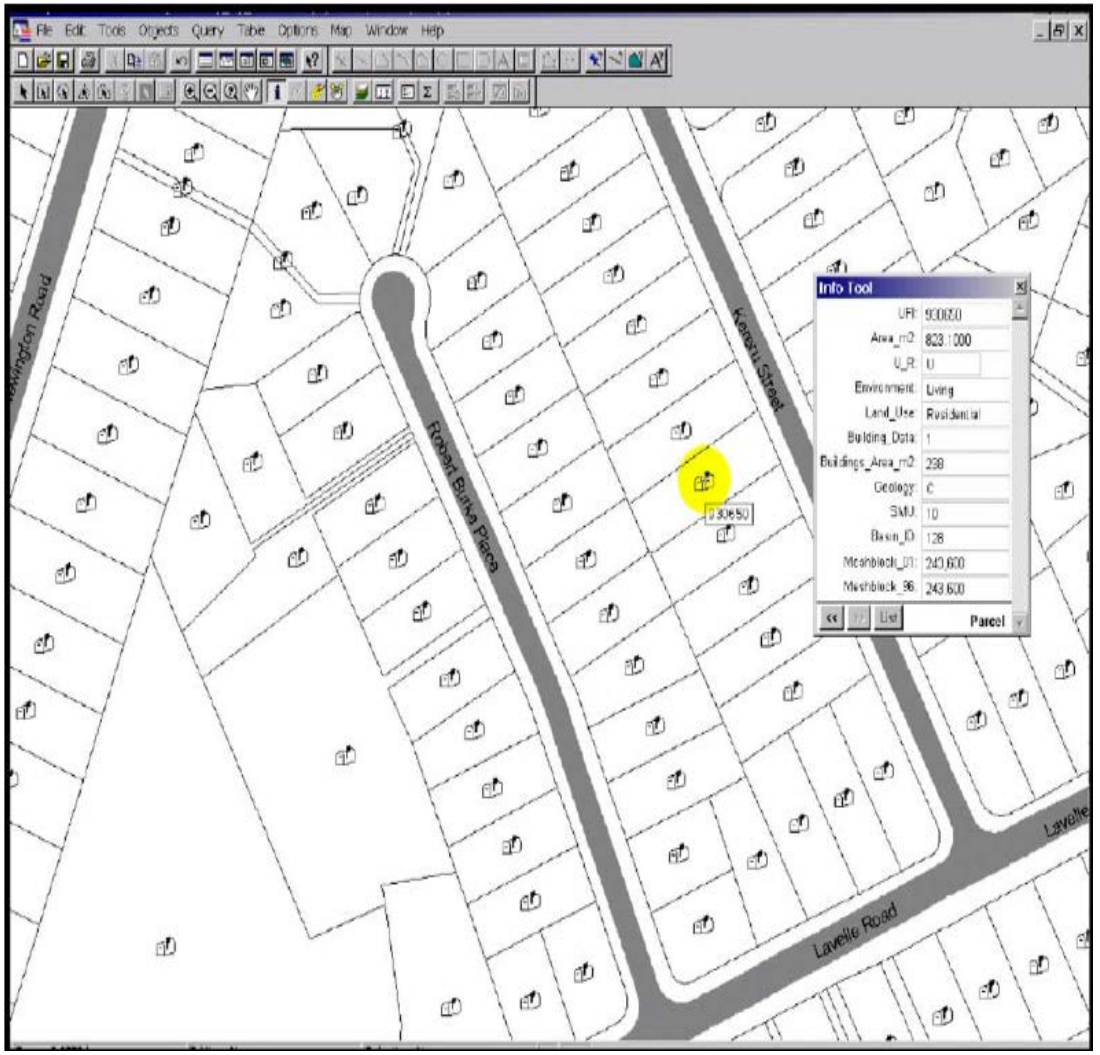
wildlife management units

zoning (all lands)

7. Cadastral

unknown %

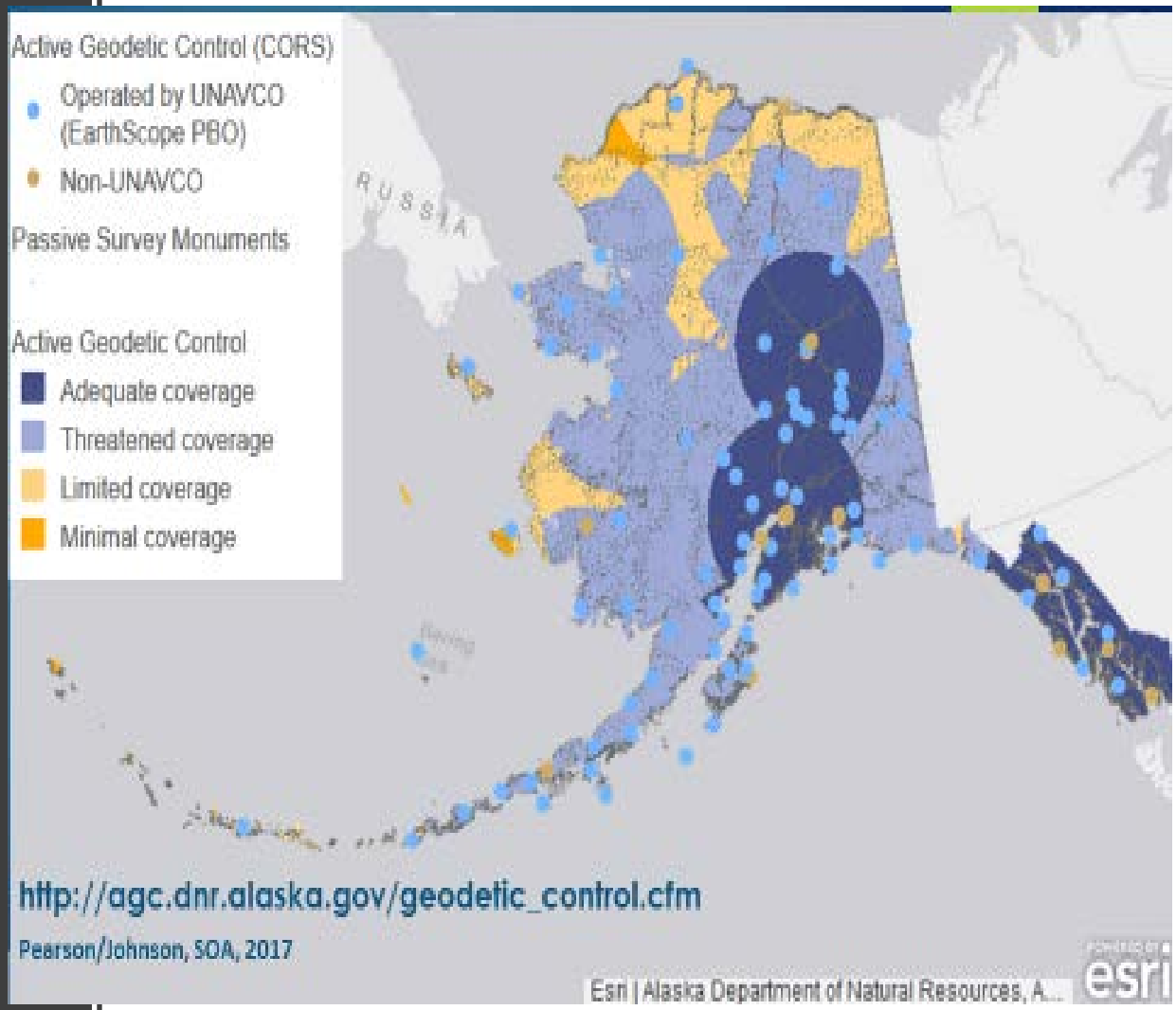
Gwen Gervelis, AKDNR



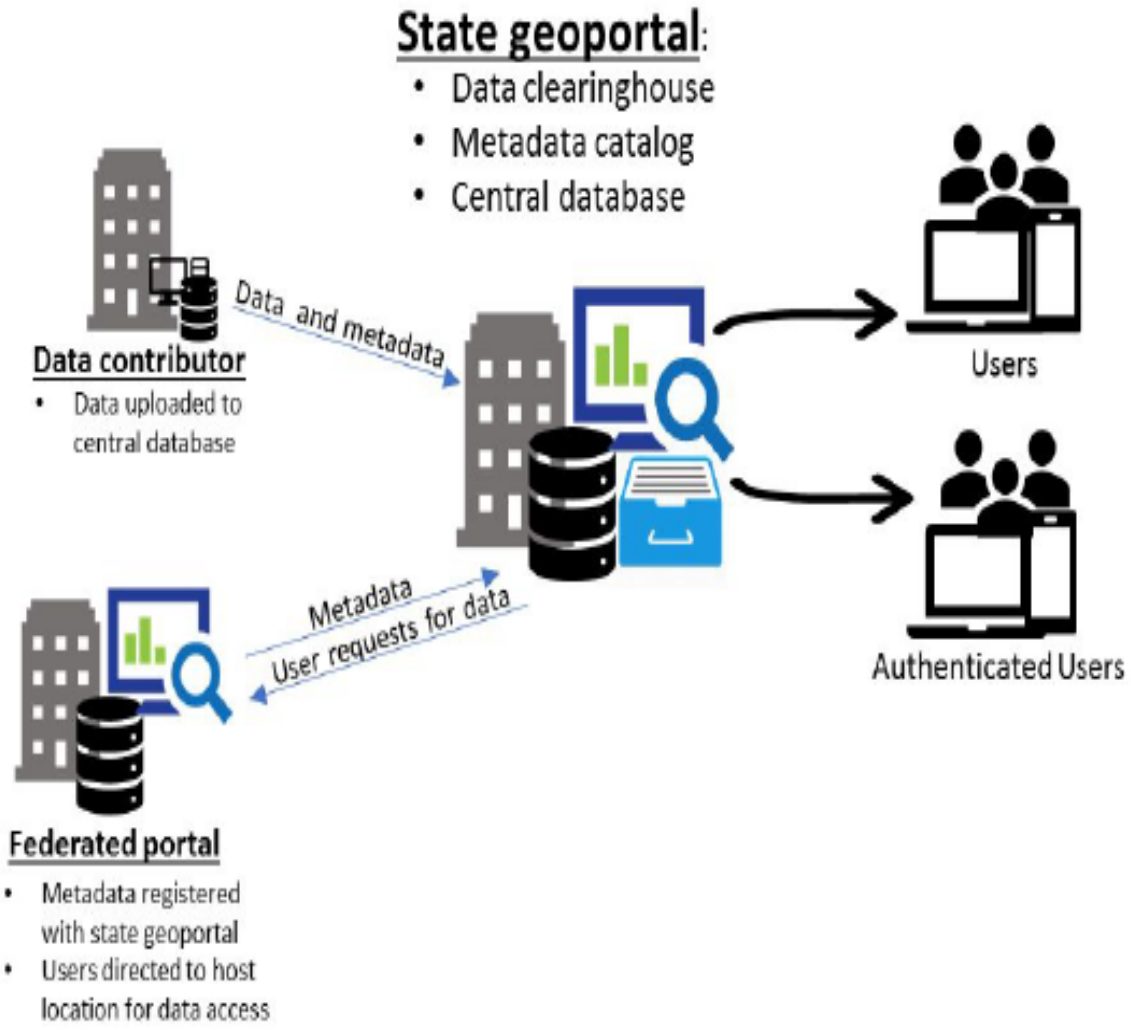
8. Geodetic Control

74%

- Nicole Kinsman, NOAA
- Jeffrey Freymueller, UA



Geoportal


State geoportal:
• Data clearinghouse
• Metadata catalog
• Central database
Data contributor
• Data uploaded to central database
Data and metadata
Users
Authenticated Users
Metadata
User requests for data
Federated portal
• Metadata registered with state geoportal
• Users directed to host location for data access

Top State Priorities, in order:

1. Complete IfSAR elevation coverage for the state
2. Sustainable imagery refresh program
   - Leaf-on
   - 1-meter pixel resolution or better
   - Refresh every 3-5 years (collect 1/3 to 1/5 state annually)
3. Modernize hydrography and wetlands framework datasets, including coastal mapping

Concerns

- Remaining $414k Capital funds set to run out March 2019
  - Funds DNR GIO, imagery distribution, and AK hydro infrastructure
- In 2018, 72% of state's high-resolution satellite imagery will be >5 years old
- Support for ongoing hydrographic updates (currently funded through 2018 by LLC's)

Budget Planning: current funds

(DNR funding, In thousands)

	2016	2017	2018	2019	Total
Personnel Services	$84	$197	$167	$38	**$486**
AK IfSAR	$1,313				**$1,313**
AK Hydro		$25	$25		**$50**
Training	$5	$3	$9	$9	**$26**
Software licensing		$15	$15	$15	**$45**
Commodities	$15	$2	$2	$2	**$21**
Data distribution		$190	$140	$70	**$400**
TOTAL	$1417	$432	$358	$134	**$2,341**

Budget Planning: future need

(In thousands)

	2016	2017	2018	2019	2020	2021
Geodetic Control	$xx	$xx	$xx	$xx	$xx	$xx
IfSAR	$8,700	$8,500	$8,100			
Imagery*	$1,450	$2,000	$2,000	$2,000	$2,000	$2,000
AK hydro	$200	$2,000	$2,000	$2,000	$2,000	$1,200
Wetlands**		$1,600	$1,600	$1,600	$1,600	$1,600
Transportation (inc trails, etc)	$xx	$xx	$xx	$xx	$xx	$xx
Administrative Boundaries	$xx	$xx	$xx	$xx	$xx	$xx
Cadastral	$xx	$xx	$xx	$xx	$xx	$xx
Data distribution	$500	$500	$500	$500	$500	$500
TOTAL	**$10,850**	**$14,600**	**$14,200**	**$6,100**	**$6,100**	**$5,300**
Available funds	**$1,417**	**$432**	**$358**	**$134**	**$0**	**$0**
Shortfall	**$9,433**	**$14,168**	**$13,842**	**$5,966**	**$6,100**	**$5,300**

Once datasets are complete, ~$2-3M annual costs for data stewardship programs, including maintained data updates and distribution.

*Imagery total includes full public license uplift, 5-yr refresh cycle.
**wetlands total assumes cost savings by performing updates in parallel with AK hydro

The Alaska Geospatial Council

- AK Dept. of Natural Resources
- AK Dept. of Transportation
- AK Dept. of Military and Veterans Affairs
- AK Dept. of Commerce, Community and Economic Development
- AK Dept. of Fish and Game
- AK Dept. of Environmental Conservation
- University of Alaska
- Dept. of the Interior Alaska Liaison
- National Oceanic and Atmospheric Administration
- Natural Resources Conservation Service
- ANCSA Regional Association
- Alaska Municipal League

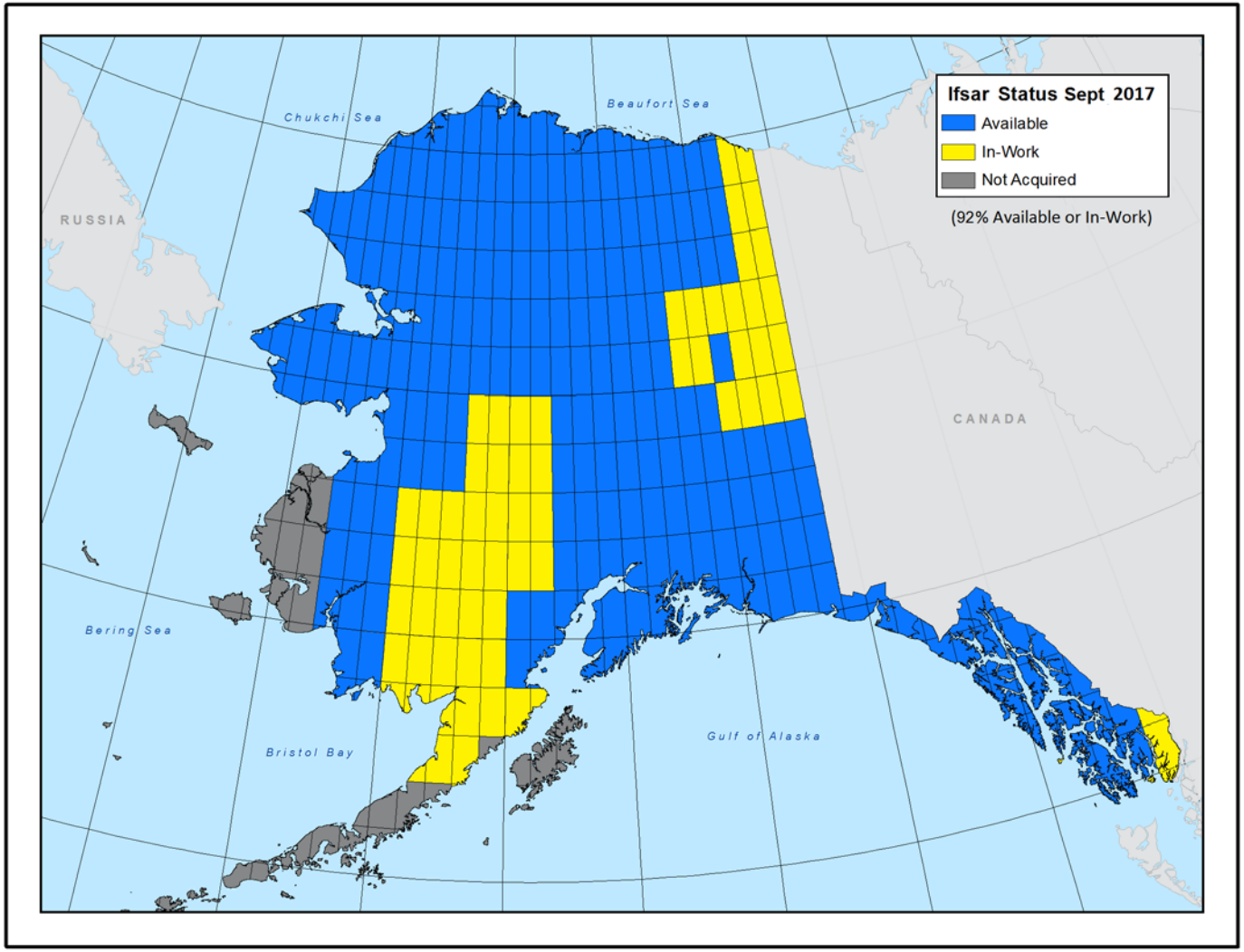
Questions?

Alaska Regional Coordination

- USGS Regional Director convenes meetings with the agency Executives in Alaska to discuss mapping issues and coordinate actions.
- Primary focus has been continuity through the leadership transition (Fed and state).
- The Alaska Cooperative Planning Group met on March 22, 2017 and June 5, 2017.
  - Updates on IfSAR completion status and plans, and production status of US Topo maps
  - Discussions about challenges associated with data collection in Aleutians and remote islands
  - Discussions about changes affecting the availability of statewide imagery and imagery services; ACPG will review recommendations developed by the Imagery Technical Working Group of the Alaska Geospatial Council (AGC)
  - Discussions about the need to more closely involve NOAA in regional coordination efforts
  - The DOI Special Assistant for Alaska will sit on the AGC
- The Alaska Climate Change Executive Roundtable met on June 29, 2017.
  - Discussions about hydrography priorities, and gaining multi-agency support to help address need for hydrography coordinator.

Alaska IfSAR Status October 26, 2017

- 92% is now available or in-work



IfSAR Contribution Summary

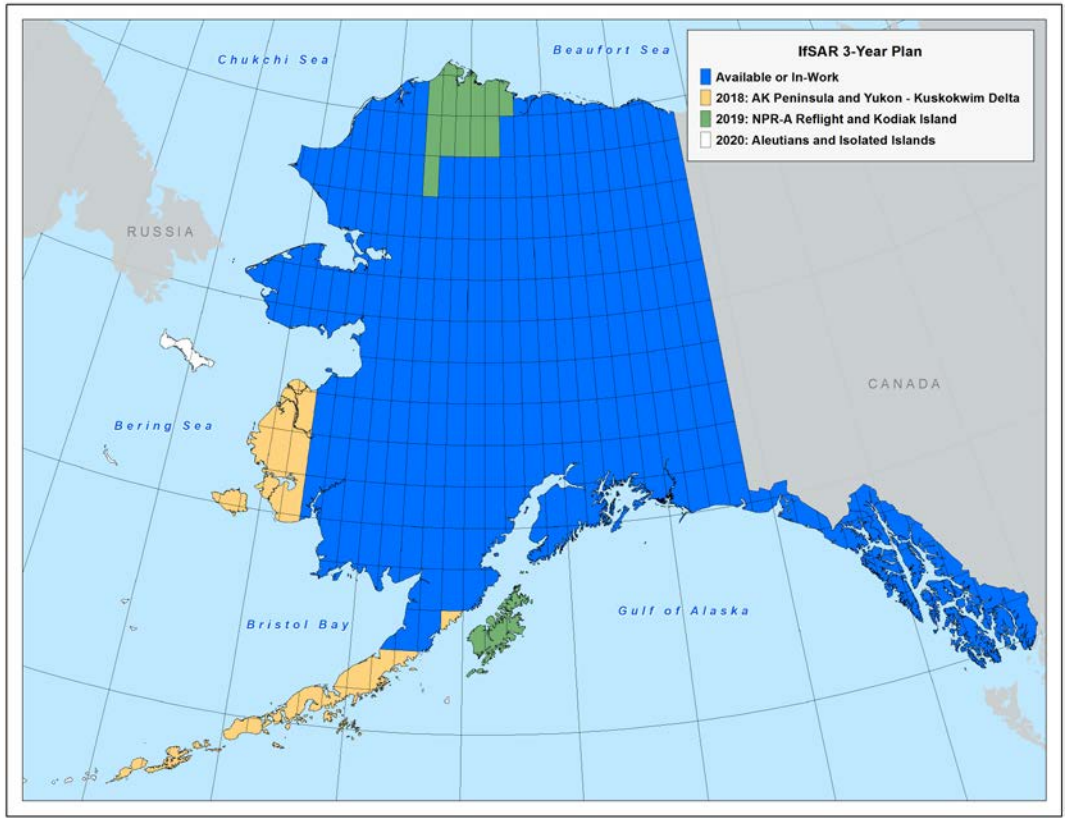
Partner	2017 Contribution	2010-2017 Contributions
BLM	$50,000	$3,267,355
USFWS	$0	$950,000
NGA	$0	$2,399,895
NPS	$975,000	$3,050,348
NRCS	$700,000 (carried over to 2018)	$3,703,472
USFS	$150,000	$1,786,842
USGS	$7,212,088	$27,074,156
State of Alaska	$0	$13,340,591
Total	$9,087,088	$55,572,659

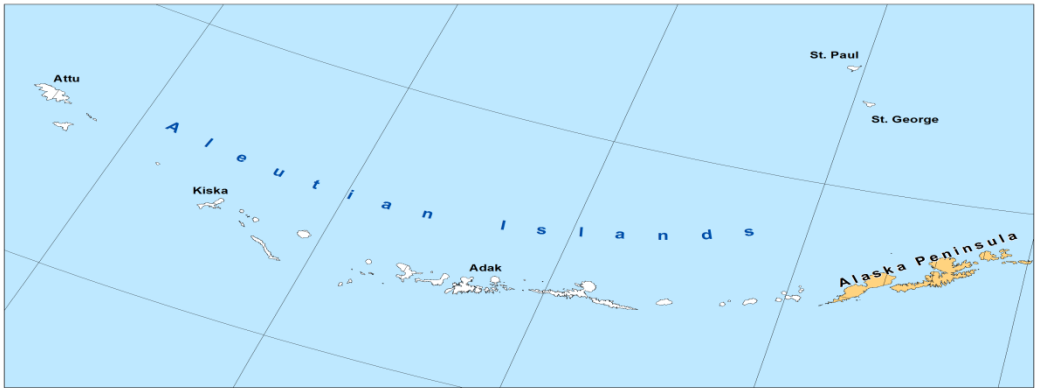
IfSAR Completion Plan

FY2018: Alaska Peninsula and Yukon-Kuskokwim Delta

FY2019: NPR-A Reflight (BLM seeking funding) and Kodiak Island

FY2020: Complete Aleutian Islands and isolated Islands





Aleutian Elevation Recommendation

Technical Subcommittee Responses to Survey:

Five organizations responded with their requirements as follows:

- Class III 5-meter airborne IfSAR: BLM, USGS, NGP, USFWS, State of Alaska
- 12-meter resolution WorldDEM: NOAA
- Technical Subcommittee *recommends* acquiring Class III IfSAR for the Aleutians to maintain consistent statewide resolution and deliverables, while compromising slightly on accuracy to reduce cost by 60%

- *Potential Action: AMEC approve collection of Class III Airborne IfSAR for the Aleutians. Standard class II accuracy 'AK IfSAR' has higher accuracy but would cost 60% more. Agencies felt the additional accuracy is not worth the additional cost, as Class III IfSAR would support studies there.*

Type	Cost	Resolution	Vertical Accuracy at 95% Confidence
Class II IfSAR	$3.4M	5 meters	2 meters
Class III IfSAR	$1.5M	5 meters	6 meters

Alaska Statewide Imagery Requirement

- The way forward

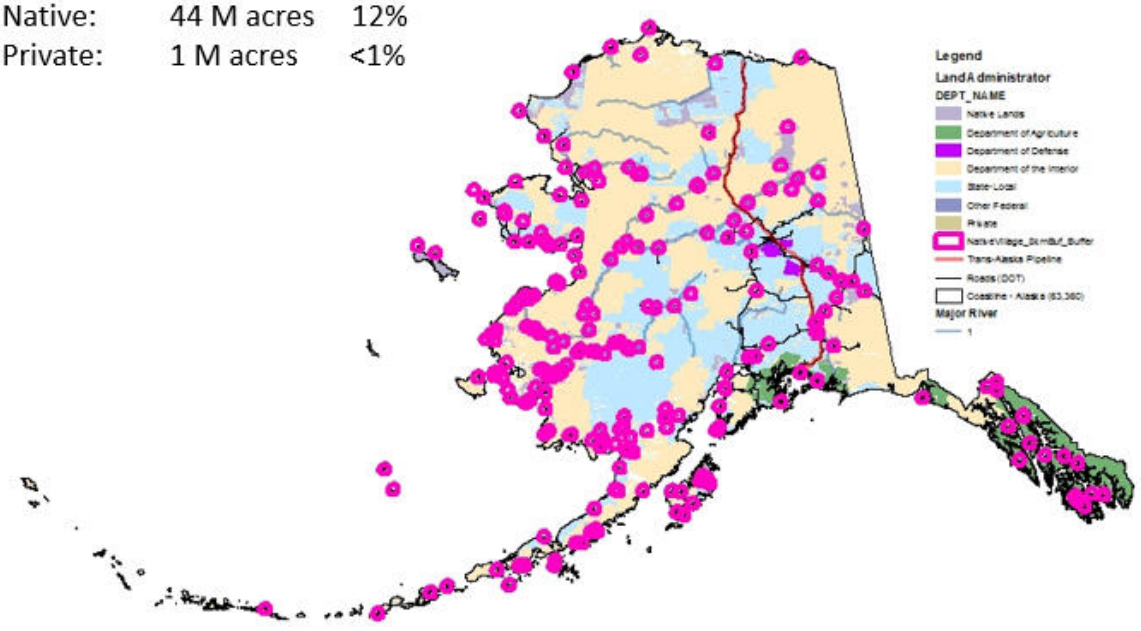
Imagery Requirements Submission

- Background
  - Goal: Collecting commercial satellite imagery with a combined resolution of better than 1 meter.
  - Short term:
    - Define imagery requirements across Alaska - collect multi-agency requirements along with the language that supports their mission interest.

Scope

Alaska Land Ownership

Federal:	222 M acres	60%
State:	105 M acres	28%
Native:	44 M acres	12%
Private:	1 M acres	<1%



225 Federally Recognized Native Villages

Precedence

- NGA accepted a National Science Foundation (NSF) proposal from the Polar Geospatial Center to create a large scale Pan-Arctic Dem from Digital Globe data under the Nextview contract
  - Commercial imagery collection capacity exists

Initial Imagery Sponsorship

- BLM Outreach
  - Conduct informal outreach to Federal agencies to determine imagery requirements
    - Resolution
    - Spectral needs
    - Area of Interest
    - Method of delivery

Initial Requirement Submission

- From:
  - The Bureau of Land Management (BLM) Alaska, Alaska State Office
    - interagency requirement in partnership with federal land managers and agencies with federal or congressionally mandated missions in Alaska
- To:
  - Civil Applications Committee
    - USGS Department Requirements Officer to NGA

Requirement – Part 1

- Acquisition
  - Statewide commercial hi-res imagery <1m
    - Summer seasonal, predominantly snow free
    - May 15 to September 15 (+/- flex on weather)
  - Worldview 2/3 preferred
    - Panchromatic, Multispectral, Near Infrared
    - Off NADIR <30°
    - Pan-sharpened Natural Color

Requirement – Part 2

- Production and Hosting
  - Orthoimagery mosaic
  - Web Mapping Service (WMS)
    - NGA Enhanced View Web Hosting Service (EVWHS)
    - USGS Earth Explorer
    - AGC Sponsorship
      - In-State for disaster and emergency response

Requirement – Part 3

- License Uplift
  - Enterprise Premium (non-commercial use)
    - Maximum geospatial benefit to ALL who live, work, manage, study and research Alaska
      - Use in WMS
      - US Topo

Endorsement

Civil Applications Committee

National Civil Applications Center
Reston, VA 20192

The need for a Satellite Imagery Collection of the State of Alaska has been submitted to the Civil Applications Committee (CAC) for its consideration. This request encompasses the entire land surface area of the State of Alaska, to be used by the Bureau of Land Management, Department of the Interior, in support of the Alaska Geospatial Council (AGC) and the Alaska Mapping Executive Committee (AMEC) and other Federal Agency purposes.

This collection also supports the mission of the Department of the Interior, U.S. Geological Survey, related to its conduct of civil Land Remote Sensing, including the storage and distribution of satellite data from its Earth Resources Science Center, Sioux Falls SD, for the greater benefit of civil purposes of the United States.

As Chair and Vice-Chair of the CAC, we endorse this collection and submit this request through the National System for Geospatial-Intelligence for consideration by the GEOINT Functional Manager. On a parallel basis, the CAC has also submitted this request directly to the National Geospatial-Intelligence Agency (NGA) Foundation Based Operations for implementation, in order to maximize timely summer collection in the northern latitudes.

This novel approach, a general specification of need, bulk collection on a Statewide and regional scale, and direct transmittal to the USGS for further distribution and use by civil agencies, is proposed as a new method of data collection and transfer from the NGA to the USGS and CAC member agencies. The approach is designed to both streamline and expedite data collection and transfer from NGA to the USGS, and to greatly improve USGS ability to fulfill its responsibilities in Land Remote Sensing.

Suzette McKimball 9/5/2017

Civil Applications Committee Chair

9/5/2017

Civil Applications Committee Vice-Chair

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IMAGERY COLLECTION REQUEST

PURPOSE This Imagery Collection Request is submitted by the U.S. Geological Survey (USGS) via the Civil Applications Committee (CAC) to the National Geospatial-Intelligence Agency (NGA) for secure transfer of a complete, Summer-seasonal record of the State of Alaska. Its intended use is supported by the U.S. Department of the Interior (DOI) and the U.S. Department of Agriculture (USDA) – to obtain a Summer-seasonal record of the land surface of the State of Alaska for a wide variety of uses, among them production of a high-resolution digital orthoimage record of the physical surface of land and water resources of the State of Alaska for purposes of topographical mapping and other uses.

AUTHORITY This request is consistent with the authorities and responsibilities of the USGS pertaining to the administration of imagery collection, processing, archiving, and distribution for the DOI and in the public interest, including support of the CAC and its member agencies.[1] The CAC is an interagency body, led by the DOI and composed of the Federal-Civil departments and agencies of the United States, that oversees the civil administration of satellite data collected by U.S. national security space systems that is provided to U.S. civil government for its use. Among these satellite sources of data are U.S. and foreign commercial remote sensing satellite systems used to gather geospatial intelligence (GEOINT) data in support of the National System for Geospatial-Intelligence, of which the USGS is a member agency.

COMPLIANCE This request and the civil management and administration of satellite data obtained from the national security community is compliant with Department of Defense (DoD) Manual 5240.01 *Procedures Governing the Conduct of DoD Intelligence Activities.*

PUBLIC NEED This Imagery Collection Request is made pursuant to user needs specified by the Bureau of Land Management (BLM), Alaska State Office, on behalf of DOI and all other Federal agencies that carry out missions related to public lands, inland and coastal waters, natural resource management, and other public responsibilities in and for the State of Alaska.

Among public needs served by this request are U.S. Forest Service (USFS) Inventory Analysis, Natural Resources Conservation Service National Soils Inventory, the U.S. Census Bureau remote area collection, Federal Emergency Management Agency first responder support, DHS critical infrastructure management, National Oceanic and Atmospheric Administration (NOAA) coastal area management, DOI's Landscape Conservation Cooperatives, National Wetlands Inventory, National Hydrography Datasets, and production of USGS Alaska Map Series.

DISCUSSION The State of Alaska represents a unique set of special needs owing to its importance to U.S. civil and economic interests combined with its strategic importance to U.S. national security. BLM is among the largest land managers within the State of Alaska. The public lands over which BLM has jurisdiction are discontinuous and located throughout the state. BLM collaborates with other Federal offices, and with Alaska State, local, and tribal agencies and affiliates, on a multitude of land

[1] Reference 51 USC 601 *Land Remote Sensing Policy Act of 1992*, as amended, and Presidential Policy Directive (PPD) 4, *National Space Policy of the United States of America* (2010).

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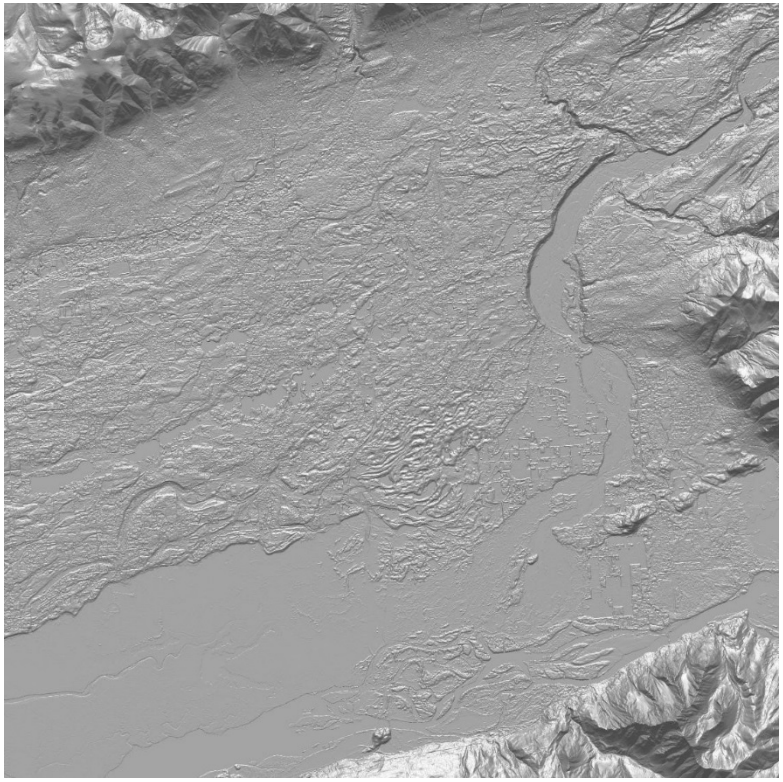
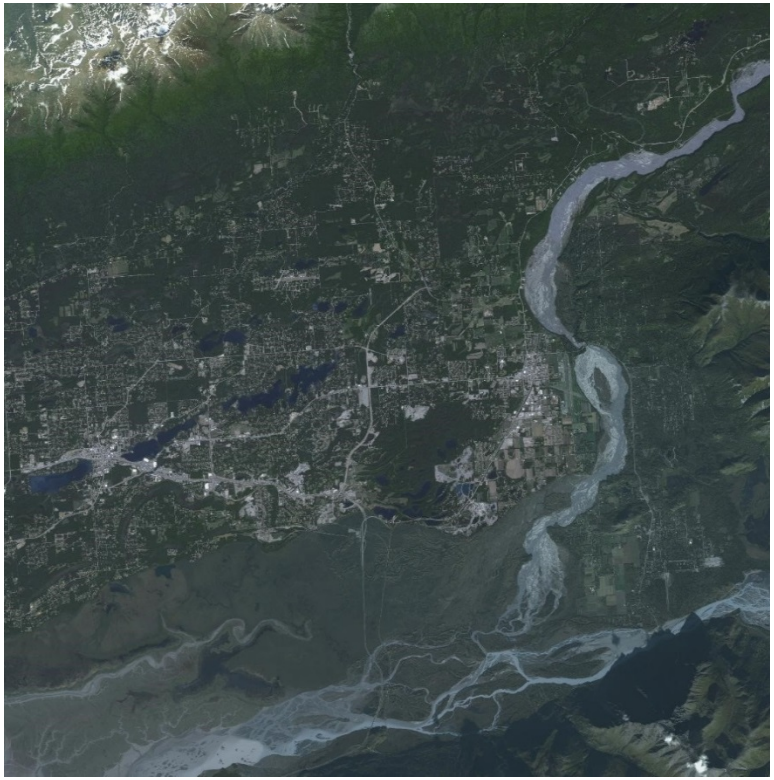
FOR OFFICIAL USE ONLY (FOUO)

Putting the Pieces Together

Digital Elevation model

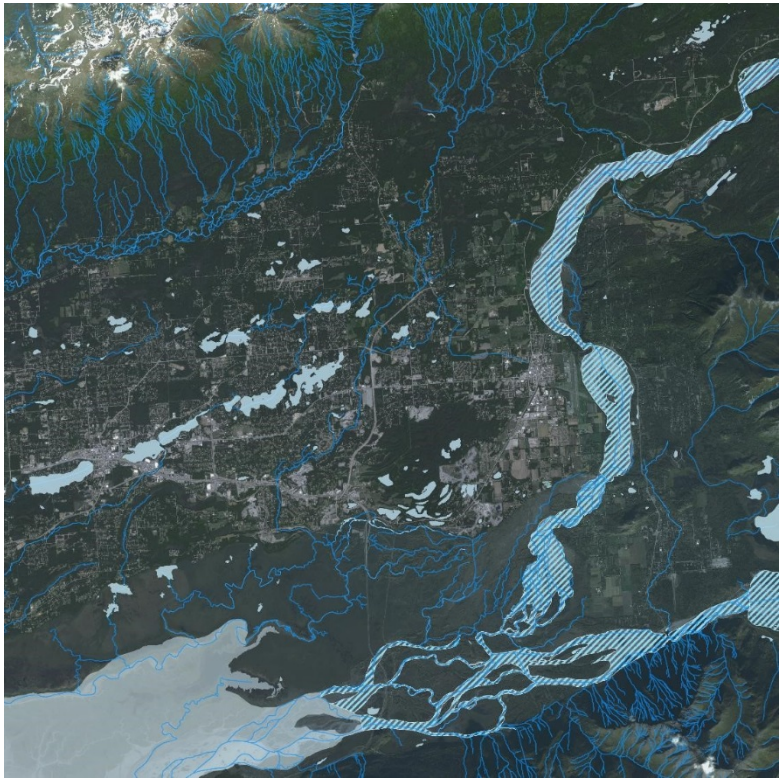
- Elevation + Imagery = Orthoimagery



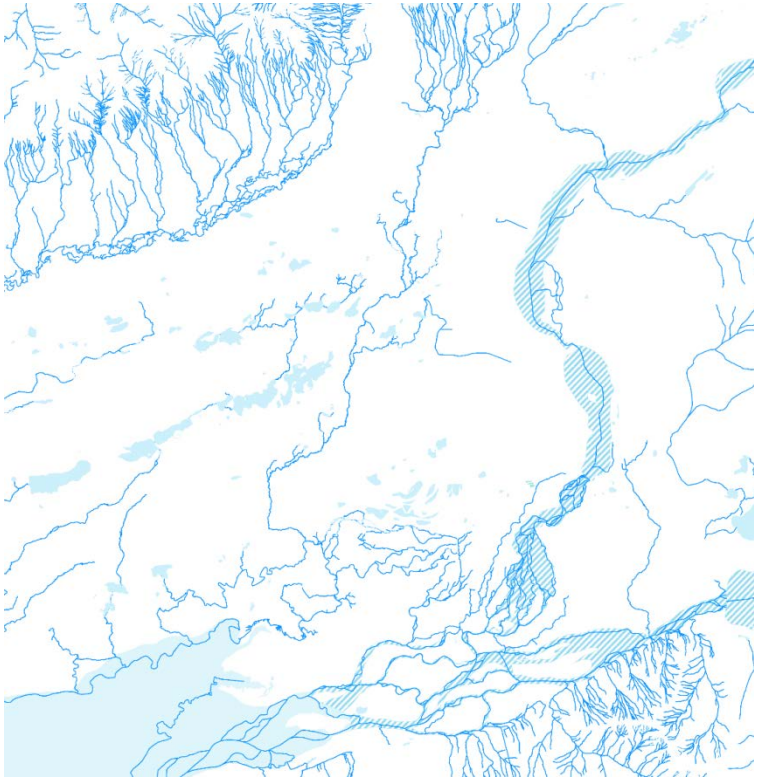


Putting the Pieces Together

Elevation + Orthoimagery = Hydro



- NHD Vector Layer



Putting the Pieces Together

NHD supports the US Topo production

The Good News

- NGA accepted Alaska statewide imagery as a multi-year Foundation Mapping requirement

- Digital Globe data collected under the Nextview Contract
  - Commenced summer seasonal collection in July 2017

Question

- What do the following Imagery Services have in common over Alaska:
  - Google Earth
  - Bing Maps
  - ESRI Base Map
  - Enhanced View Web Mapping Service

Answer

- An incomplete Hi-resolution dataset for Alaska

Option for AMEC Future Consideration

- Add Imagery as an AMEC Theme in support of NHD and US Topo Alaska
- Endorse efforts to secure a license uplift

Data Acquisition Accomplishments

Theme	Metric	2013 Goal	October 2017 Status
Elevation	% IFSAR acquired	Complete in 4 years	92% statewide coverage achieved
Hydrography	% NHD updated	Complete in 6 years	20% updated
Transportation	% of State completed and publicly available	Complete in 5 years	Baseline AK DOT roads dataset 100% complete; ongoing maintenance
GRAV-D	**% GRAV-D acquired**	**Complete in 2019**	**78.4%**
Coastal Mapping	**% AK shoreline updated**	**Complete in 5 years with budget increase, longer term if no budget increase**	**FY15 4.1% FY16 3.1% FY17 2.5%**

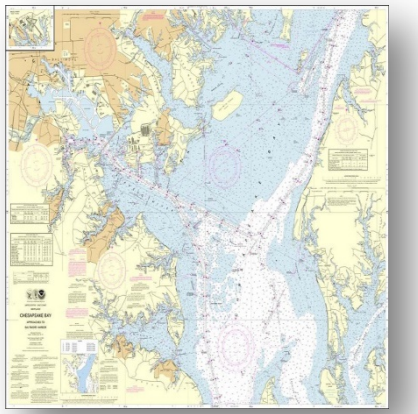
The National Spatial Reference System (NSRS)

- A **consistent** geospatial framework to meet the economic, social, and environmental positioning needs of our Nation.
- Foundational elements include:
- Inc. NAD 83(2011) and NAVD88

Latitude • Longitude • Elevation •
Gravity • Shoreline Position
+ changes over time

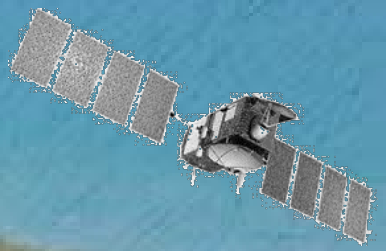

+

+

=


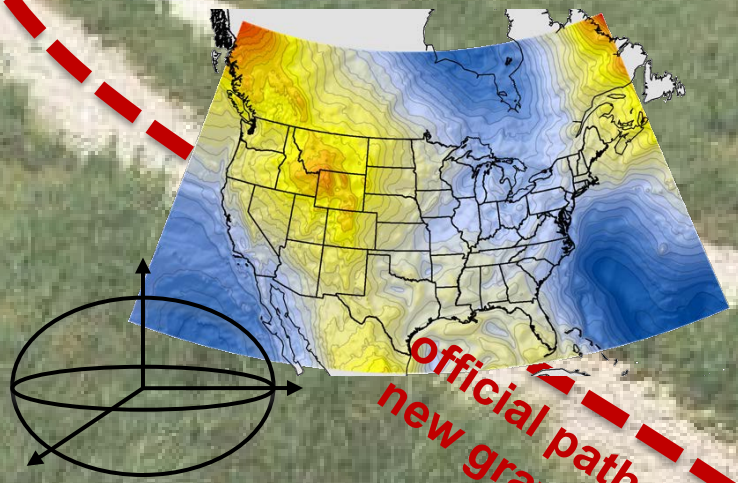
Reliable maps and charts require data from disparate sources and dates be aligned

NGS Supports Access to NSRS Elevations



official path today

GEOID12B



official path in 2022 w/ new gravimetric geoid

The NGS Data Sheet

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1         National Geodetic Survey,    Retrieval Date = SEPTEMBER 27, 2017
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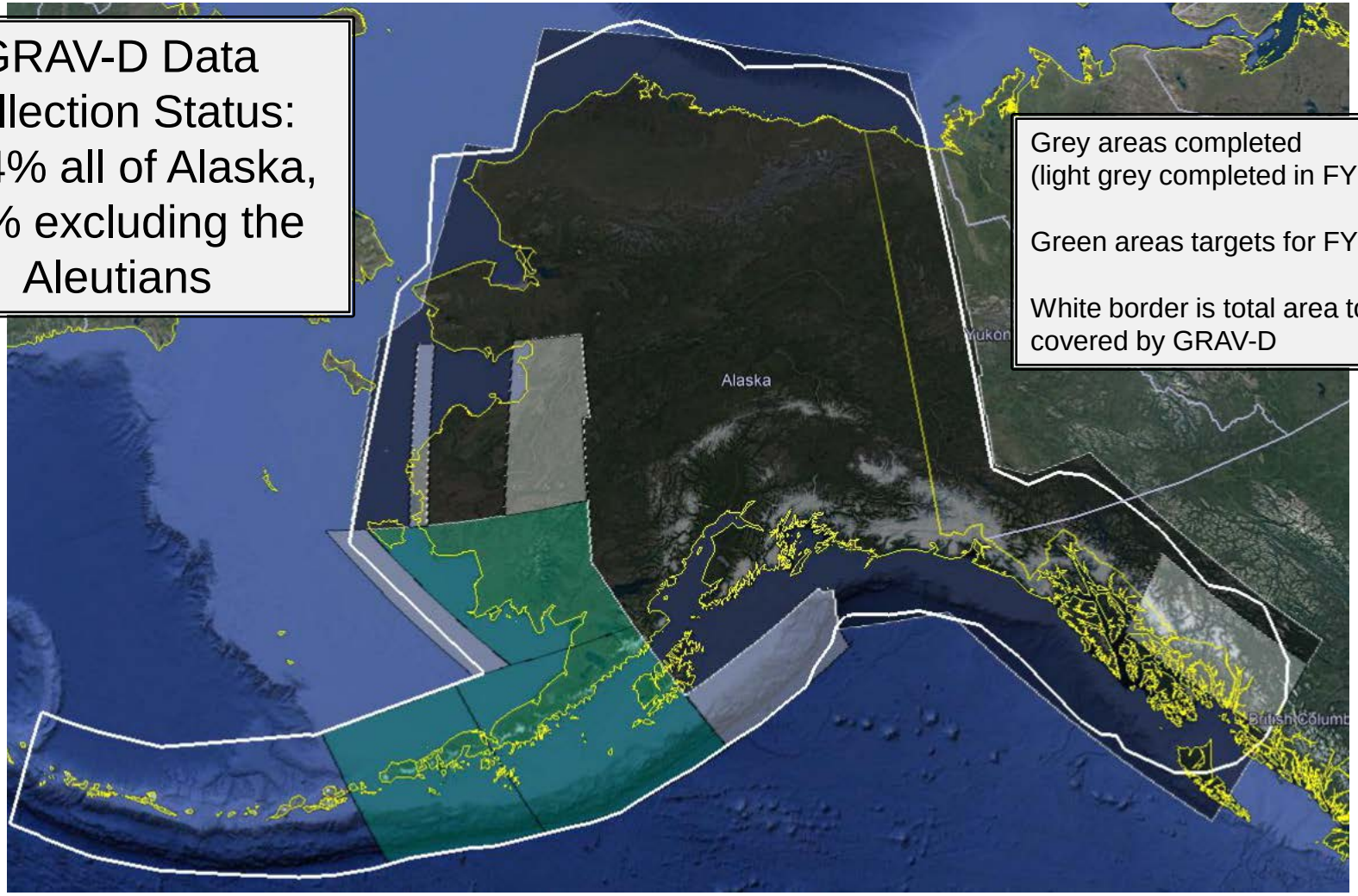
CJ0146  TIDAL BM    -  This is a Tidal Bench Mark.
CJ0146  DESIGNATION -  JOHNSON
CJ0146  PID         -  CJ0146
CJ0146  STATE/COUNTY-  SC/CHARLESTON
CJ0146  COUNTRY     -  US
CJ0146  USGS QUAD   -  CHARLESTON (1983)
CJ0146
CJ0146                      *CURRENT SURVEY CONTROL
CJ0146 ______________________________________________________________________
CJ0146* NAD 83(2001) POSITION- 32 45 05.94606(N) 079 53 51.69504(W)   ADJUSTED
CJ0146* NAVD 88 ORTHO HEIGHT -      2.446 (meters)          8.02  (feet) ADJUSTED
CJ0146 ______________________________________________________________________
CJ0146  GEOID HEIGHT    -        -33.300 (meters)                      GEOID12B
CJ0146  LAPLACE CORR    -         -2.01  (seconds)          8.02  (feet) DEFLEC12B
CJ0146  DYNAMIC HEIGHT  -          2.443 (meters)                      COMP
CJ0146  MODELED GRAVITY -    979,535.3   (mgal)                         NAVD 88
CJ0146
CJ0146  HORZ ORDER      - THIRD
CJ0146  VERT ORDER      - FIRST     CLASS I
CJ0146
CJ0146.The horizontal coordinates were established by classical geodetic methods
CJ0146.and adjusted by the National Geodetic Survey in March 2004.
CJ0146.
CJ0146.The orthometric height was determined by differential leveling and
CJ0146.adjusted by the NATIONAL GEODETIC SURVEY
CJ0146.in June 1991.
CJ0146
CJ0146.Significant digits in the geoid height do not necessarily reflect accuracy.
CJ0146.GEOID12B height accuracy estimate available here.
CJ0146
CJ0146.This Tidal Bench Mark is designated as VM 4219
CJ0146.by the CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.
CJ0146
CJ0146.The Laplace correction was computed from DEFLEC12B derived deflections.
CJ0146
CJ0146.The dynamic height is computed by dividing the NAVD 88
```

2022 Modernization

NOAA GRAV-D Update

- GRAV-D will be collecting airborne gravity data in southwest AK in FY18

GRAV-D Data Collection Status: 78.4% all of Alaska, 89% excluding the Aleutians



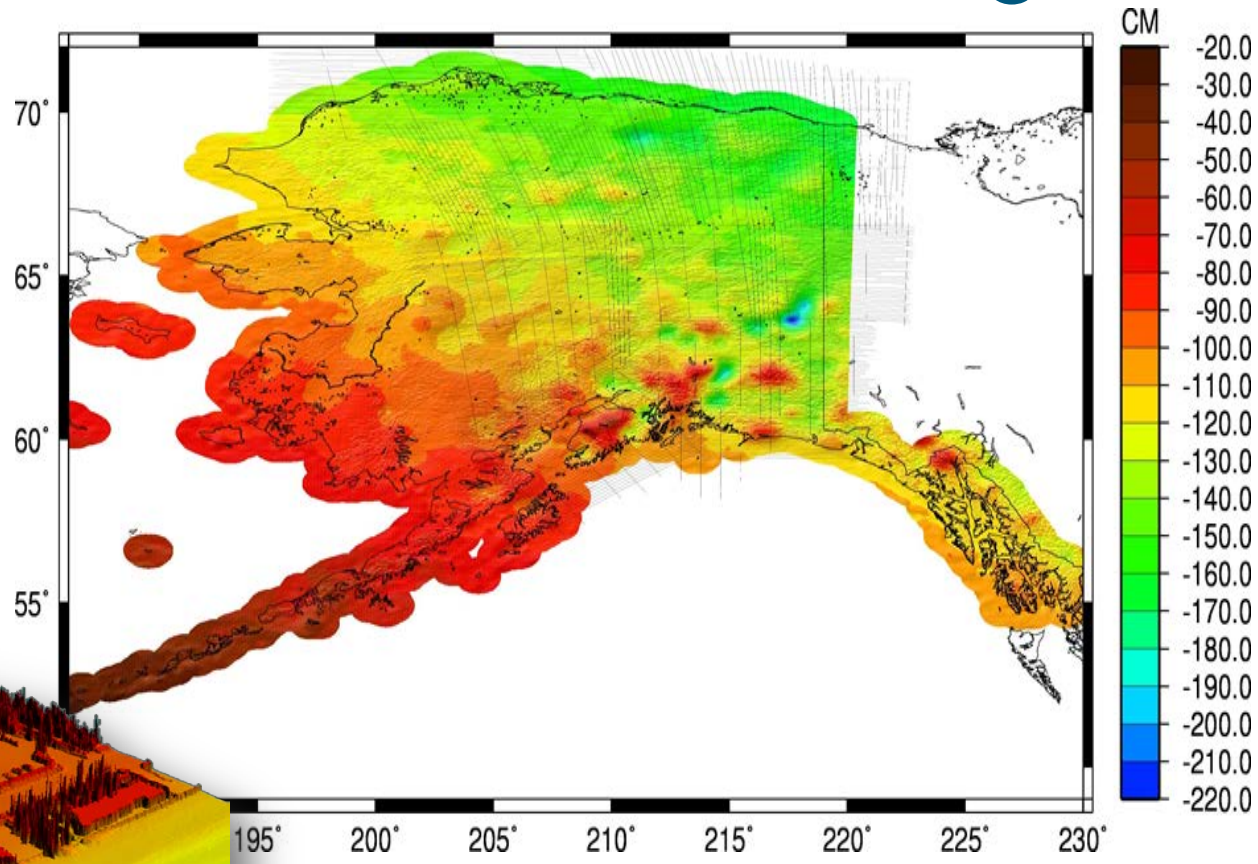
Grey areas completed
(light grey completed in FY17)

Green areas targets for FY18

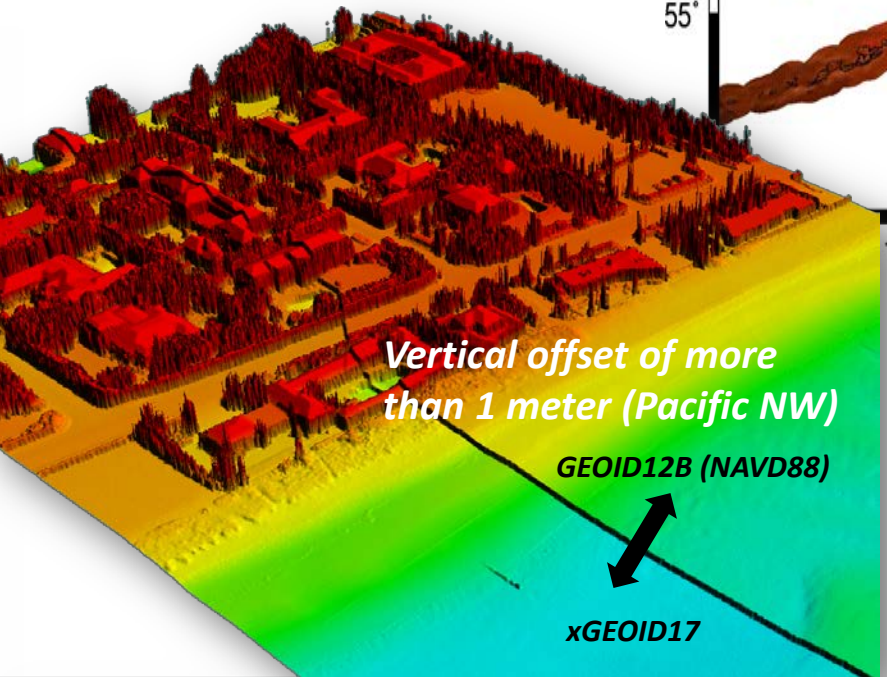
White border is total area to be covered by GRAV-D

NSRS Modernization: Vertical Change

Absolute Vertical Change

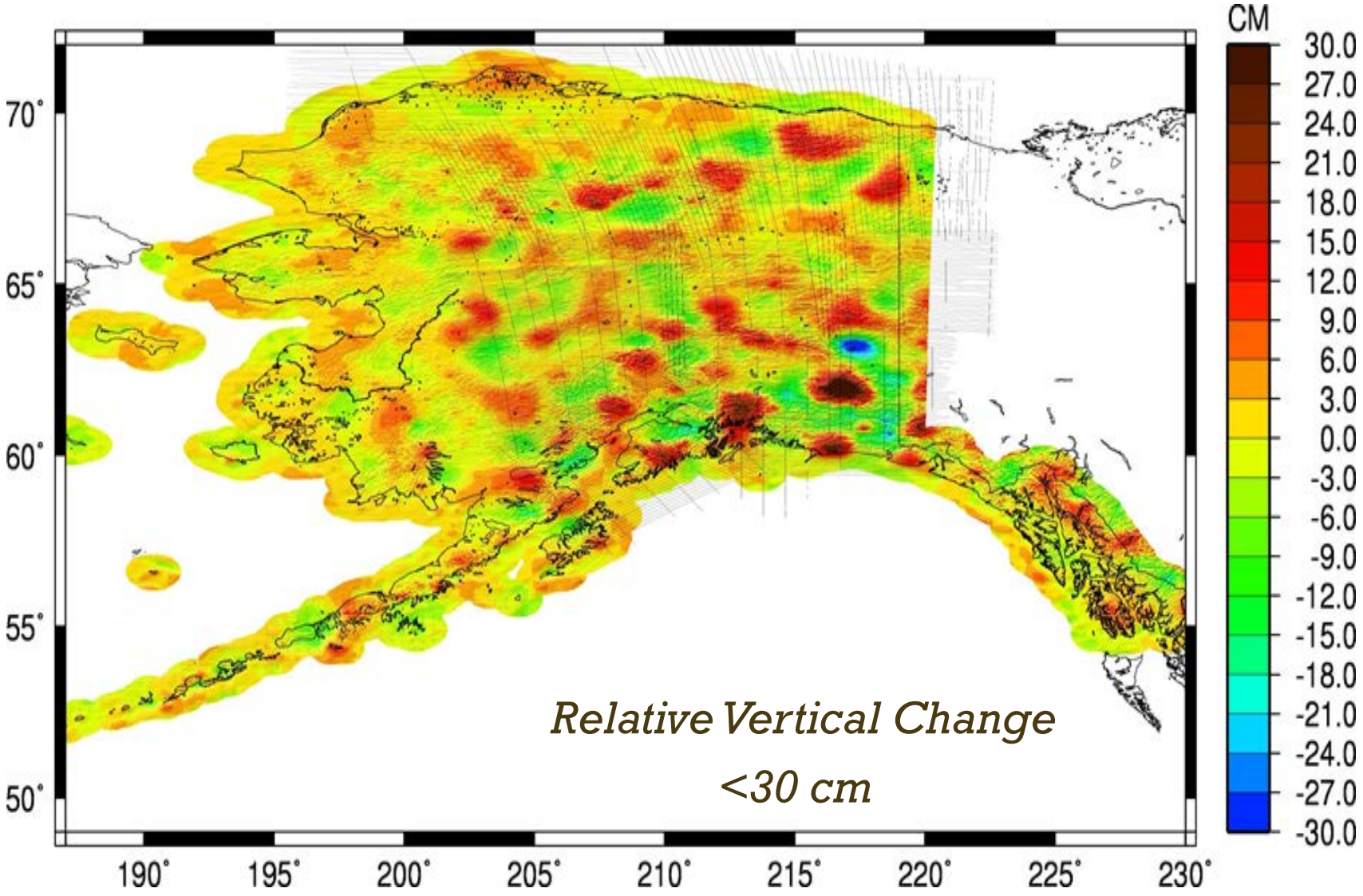


Experimental Geoid Compared to Hybrid Geoid: xGeoid16B – Hybrid Geoid12B



Elevations lowered ~20 cm to ~2.2 m

NSRS Modernization: Vertical Change



Geoid Compared to Gravimetric Geoid: xGeoid16B – USGG12

NOAA Geospatial Framework Status

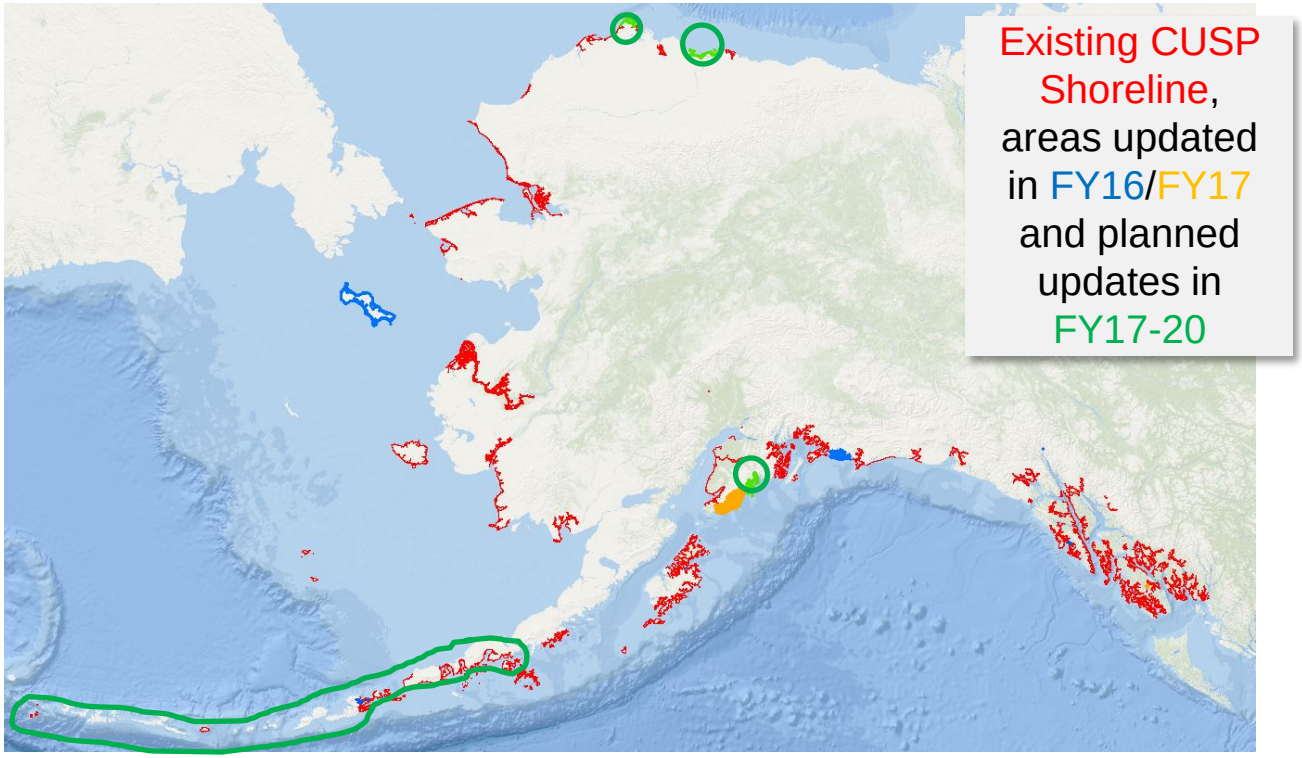
- Modernization is on schedule for 2022
- NGS/USGS National Geospatial Technical Operations Center coordination meeting September 2017
- 2018 Alaska Surveying an Mapping Conference will feature a 4-hr *Alaska Preparedness Panel*

NOAA Coastal Imagery Update

- 2017 semi-oblique imagery (red) extends 2016 areas
- Nadir imagery collected for Arctic Ports

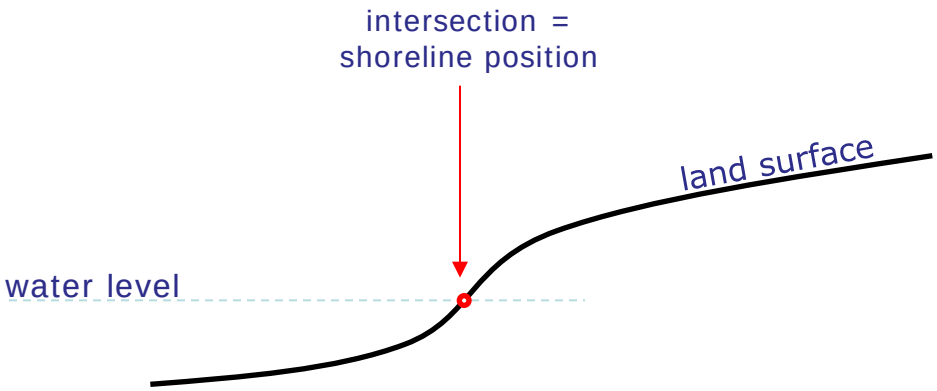
NOAA Shoreline Update

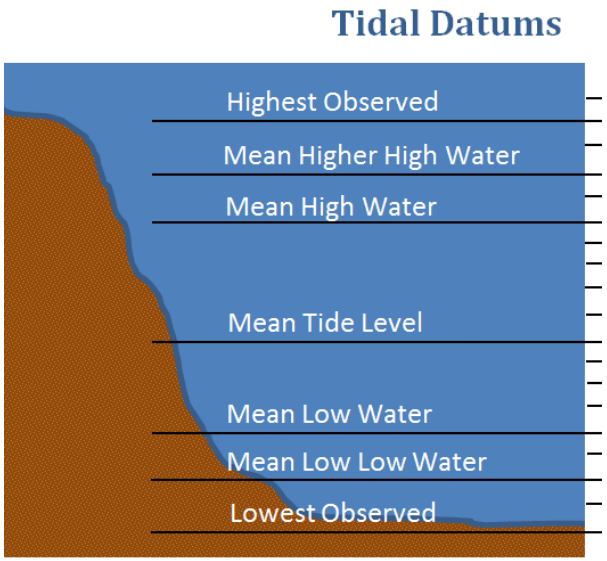
Continually Updated Shoreline Product (CUSP)



POC: Doug Graham

Datum-Based Shorelines



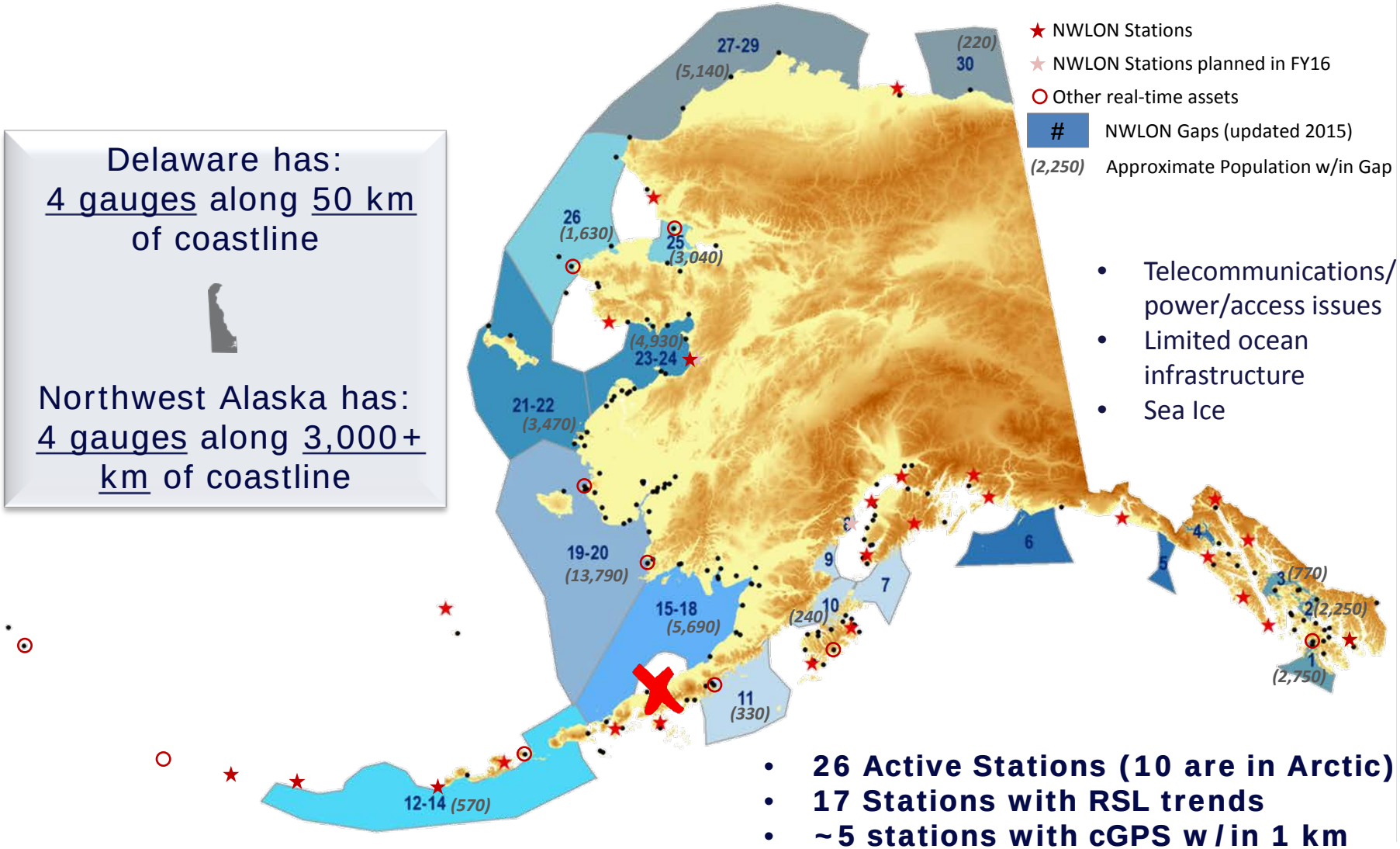


- Specialized contour lines
- Highly consistent/repeatable
- Limited feasibility in Alaska

Alaska's Limited Tide Gauge Network

Delaware has:
4 gauges along 50 km of coastline

Northwest Alaska has:
4 gauges along 3,000+ km of coastline



- Telecommunications/ power/access issues
- Limited ocean infrastructure
- Sea Ice

- **26 Active Stations (10 are in Arctic)**
- **17 Stations with RSL trends**
- **~5 stations with cGPS w/in 1 km**
- **Only ~60% of tidal datum sites have established relationship to NSRS**

Integrated Ocean and Coastal Mapping Activities in Alaska

- 2016/2018 Coastal Mapping Summits
- 3D Nation Requirements and Benefits Study
- Prioritization and collaborative mapping successes in other states
- Identified need for nested data qualities at coast (?)

WHO

- **Co-chaired by NOAA, USGS, and USACE**
  - NAVO, BOEM, NSF, NGA, USCG, EPA, FEMA, NASA, others

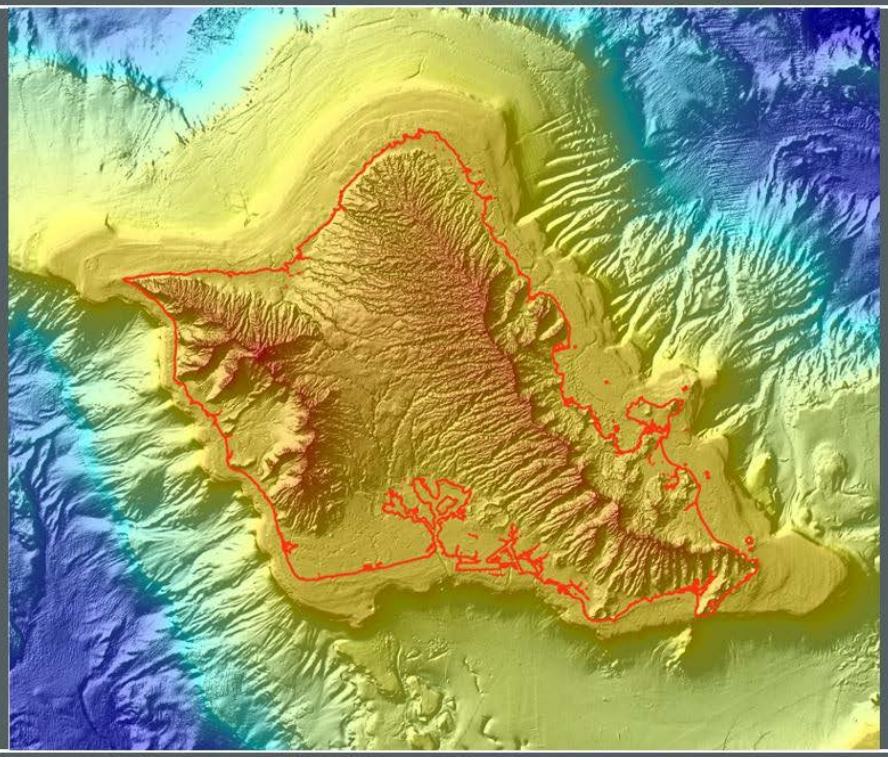
WHAT

- **Charged with facilitating "the coordination of ocean and coastal mapping activities and avoid[ing] duplicating mapping activities…"**

3D Nation Requirements and Benefits Study

Understand 3D data requirements and benefits and how they dovetail in the coastal zone

Integrated 1-Meter Topobathymetric Elevation Model (TBDEM) for Oahu, Hawaii (USGS CoNED)

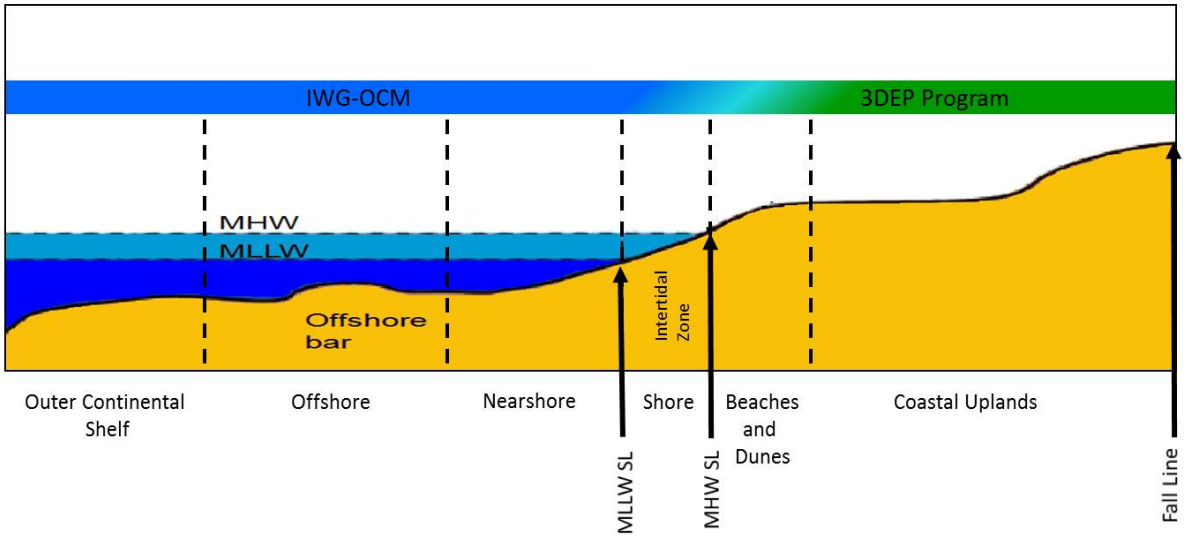


National Coastal Mapping Strategy 1.0

Coastal Lidar Elevation for a 3D Nation

Components:

Regional Coastal Mapping Summits for coordination
Common standards – Bathy Quality Levels aka 3DEP topo QL's
Whole life cycle approach to data
R&D on new tools/techniques for data collection and use.



3D Nation?
Refresh cycle?
ROI?
NEEA-like study?

USGS science for a changing world | The National Map Your Source for Topographic Information | Dewberry | Interagency Working Group on Ocean and Coastal Mapping | NOAA

Updating User Requirements and Benefits for 3DEP

- Be able to assess new technologies against user requirements and identify the tradeoffs between different approaches
- Plan for the next round of 3DEP after nationwide coverage has been completed
- Improve our understanding and data about requirements and benefits at the state level for the existing and future program
- Improve our understanding of needs to guide development of the next generation of 3DEP Products and Services

Mapping a 3D Nation: Requirements and Benefits Study Goals

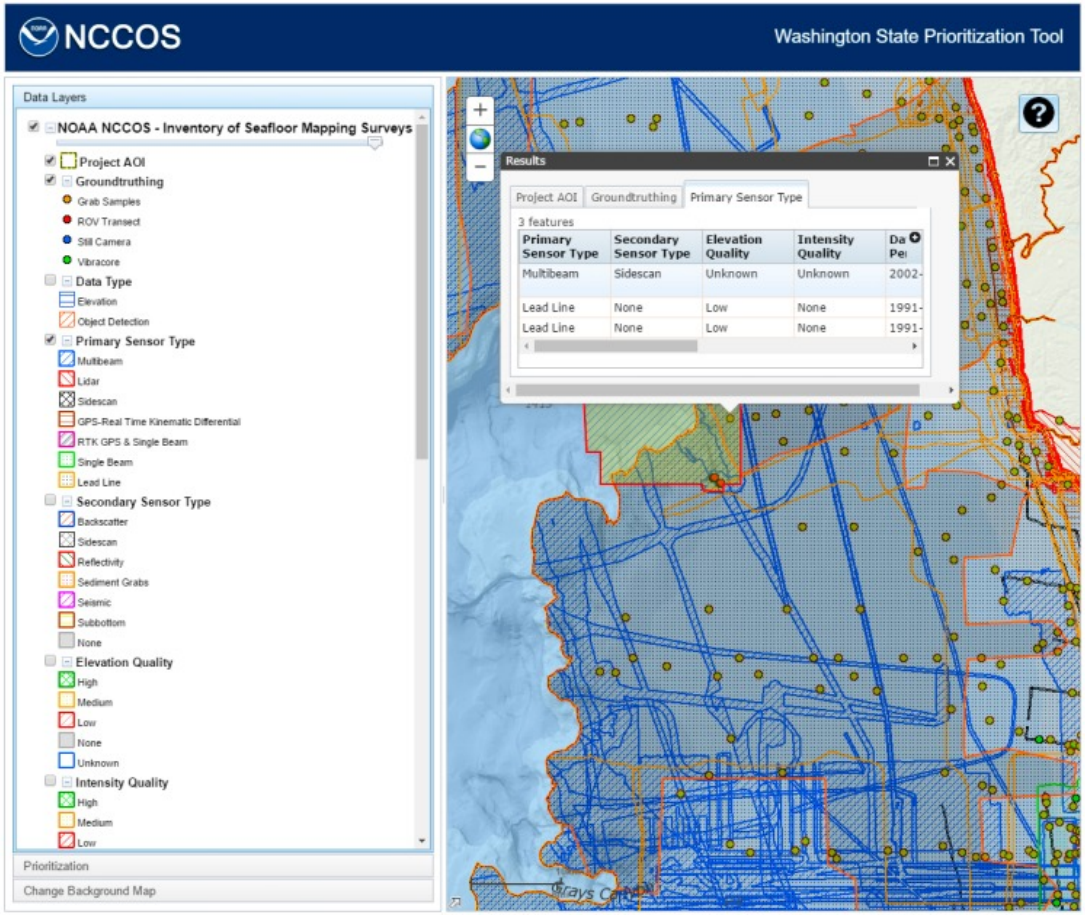
- Understand 3D Data Requirements
- Refresh NEEA for the years beyond the initial 8-year acquisition program
- Understand inland and nearshore bathymetric data requirements and benefits
- Understand offshore bathymetric data requirements and benefits
- Understand how requirements and benefits dovetail in the coastal zone
- Sensor agnostic
- Focused on need for, and value of, elevation data

New Alaska Coastal Mapping Strategy

- Strategist position jointly funded by State of Alaska and NOAA
- 2nd Alaska Coastal Mapping Summit (Feb 9, 2018)
- Prioritization plan scheduled for 2018

New Alaska Coastal Mapping Strategy

- Examples of successes in progress
  - Washington
  - California



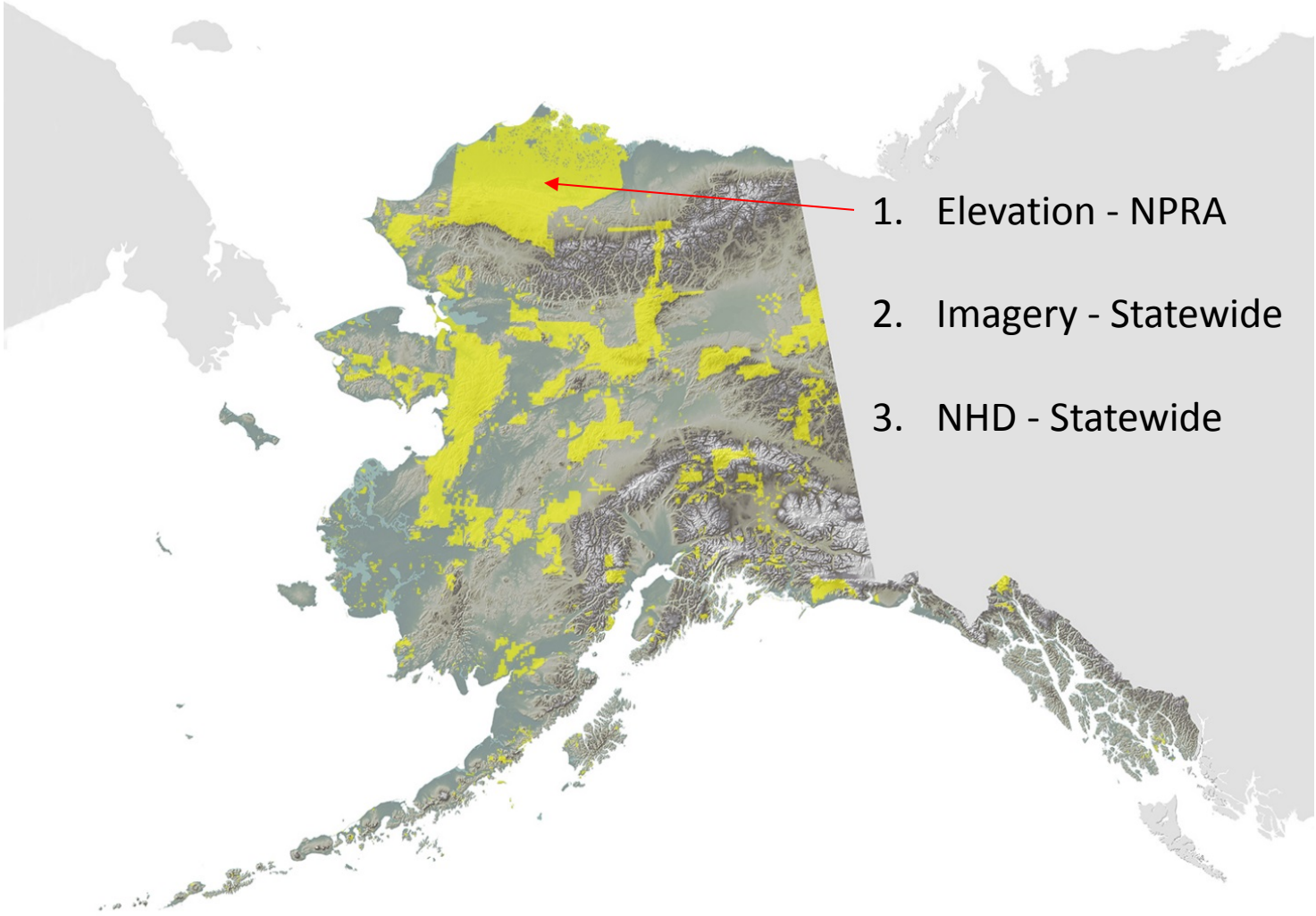
HSRP 2018 - Alaska

- Hydrographic Services Review Panel, Federal Advisory Committee. Reports to NOAA Administrator
- 3-day meeting with technical site visit:
  week of August 27, 2018
- HSRP has 11 issue papers with over 50 recommendations, inc. Arctic Maritime priorities
- 2018 Alaska discussion topics and panel sessions are preliminary and *may* include:
  - Lack of infrastructure for Arctic surveying
  - Effect of 2022 datums update on charting in Alaska
  - Discussion on the proposed deep water port
  - Other TBD

Priority Mapping Requirements for AMEC Future Consideration

- BLM
- FWS
- NPS
- NRCS
- USFS

Priority Mapping Requirements for AMEC Future Consideration



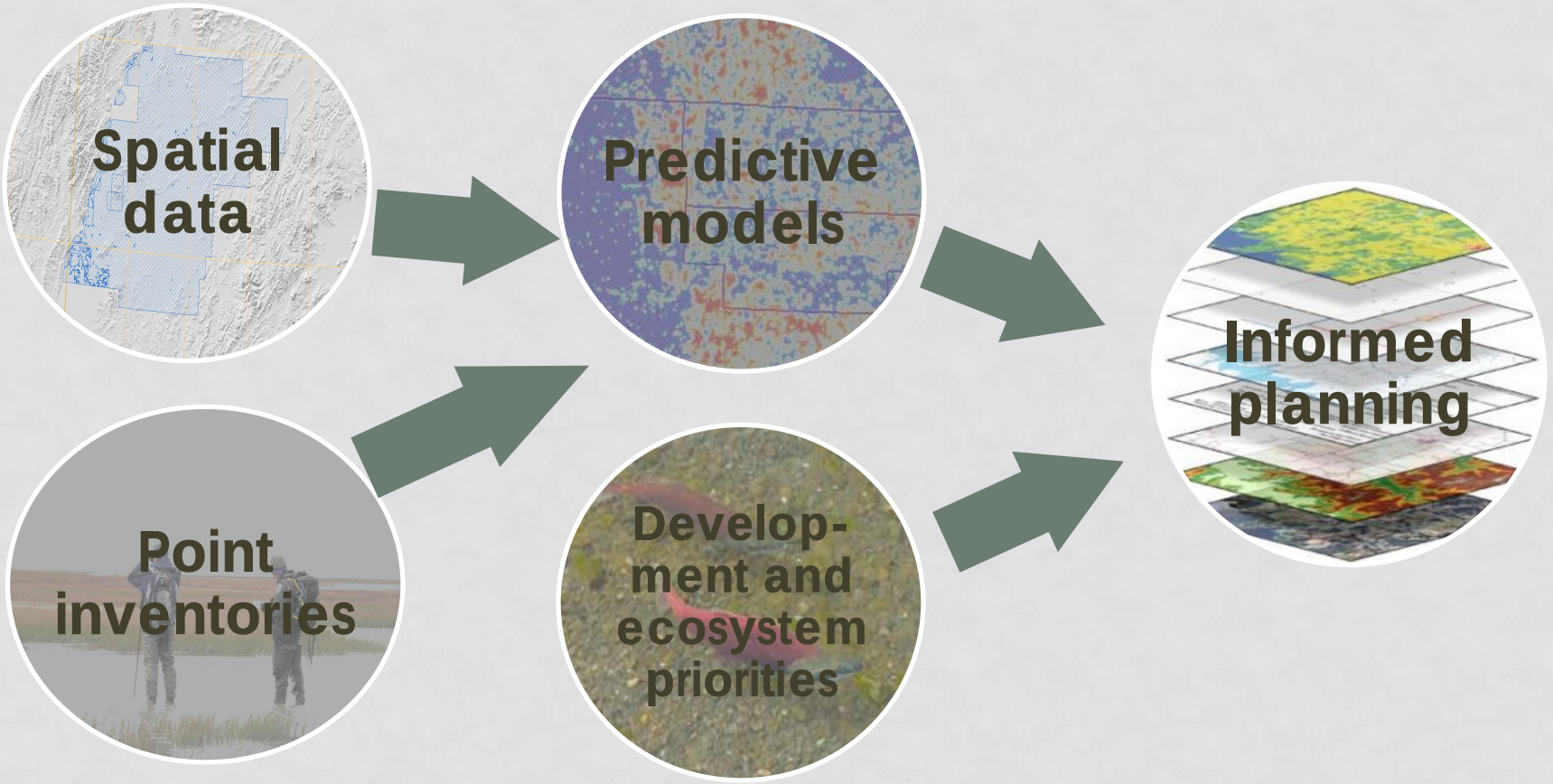
US FISH AND WILDLIFE SERVICE

- FWS mission: working with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the benefit of the American people.
- FWS is engaged with our partners in landscape scale planning
  - In the lower 48, this identifies which areas will benefit most from restoration and enhancement
  - In Alaska, it allows us to be proactive in making wise development and management decisions with minimal impacts
- FWS supports the overall goals of the AMEC to provide a collaborative funding strategy of federal agencies to acquire geospatial baseline data in Alaska in support of informed resource management decisions.
  - Acquiring and updating geospatial data across Alaska is critical to the mission of the FWS

US FISH AND WILDLIFE SERVICE

- Developing updated and finer scale hydrography is of highest priority to support ongoing work within the refuge system and to support fisheries management.
  - Hydrography is a basic component used by the National Wetland Inventory program
  - Both NHD and NWI are foundational data for developing predictive models across the landscape, instead of relying on sparse data collections
  - Such models can inform scenario planning, and provide shared knowledge of areas that may be developed, and areas that need the most protection

US FISH AND WILDLIFE SERVICE



US FISH AND WILDLIFE SERVICE

- Additional Priorities:
  - LiDAR for low lying areas – i.e., Yukon Delta and Yukon Flats
  - Updated imagery to support NHD and NWI

National Park Service
Alaska Mapping Priorities

Bert Frost

National Park Service

Alaska Regional Director

October 26, 2017

Autumn on Telaquana Lake in Lake Clark National Park & Preserve.
Photo Taken By: Jeanette Mills

NPS Parks in Alaska

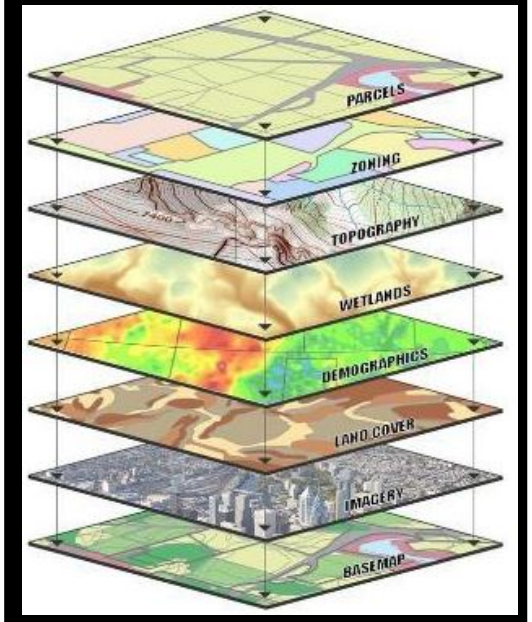
National Park Service
Alaska Region Inventory and Monitoring

- 54.6 million acres.
- 2/3 of all NPS area.
- Largest Parks in all NPS.
- Tallest point in North America.
- Volcanoes, wild rivers, glaciers, icecaps, waterfalls, lakes, sand dunes, etc.
- Land bridge connecting Asia-North America
- Cultural sites dating back 4,500 years.
- And more…

National Park Service
Alaska Region Inventory and Monitoring

How many AMEC themes are in this landscape?

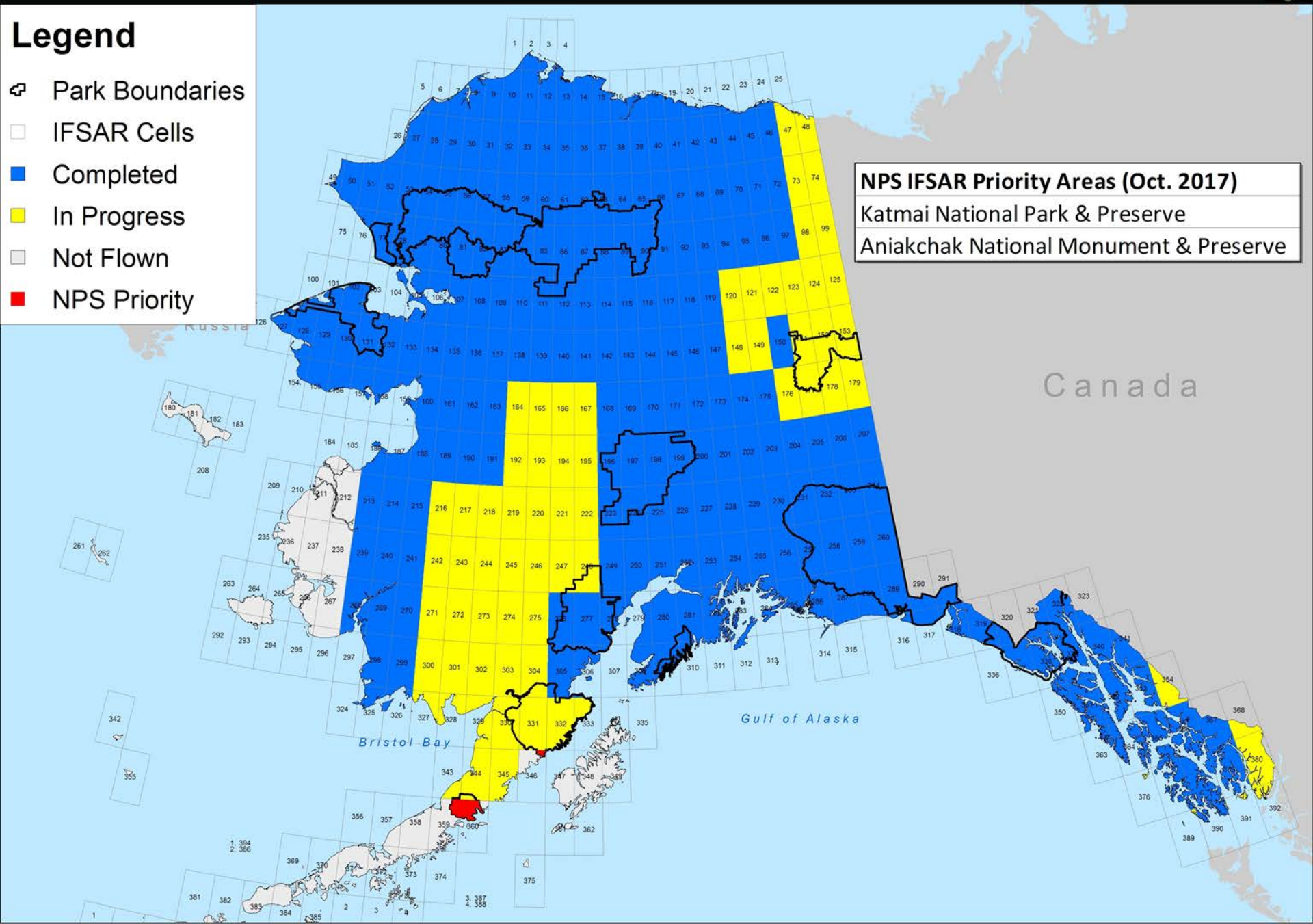
Geospatial Themes Help Describe the Places We Manage



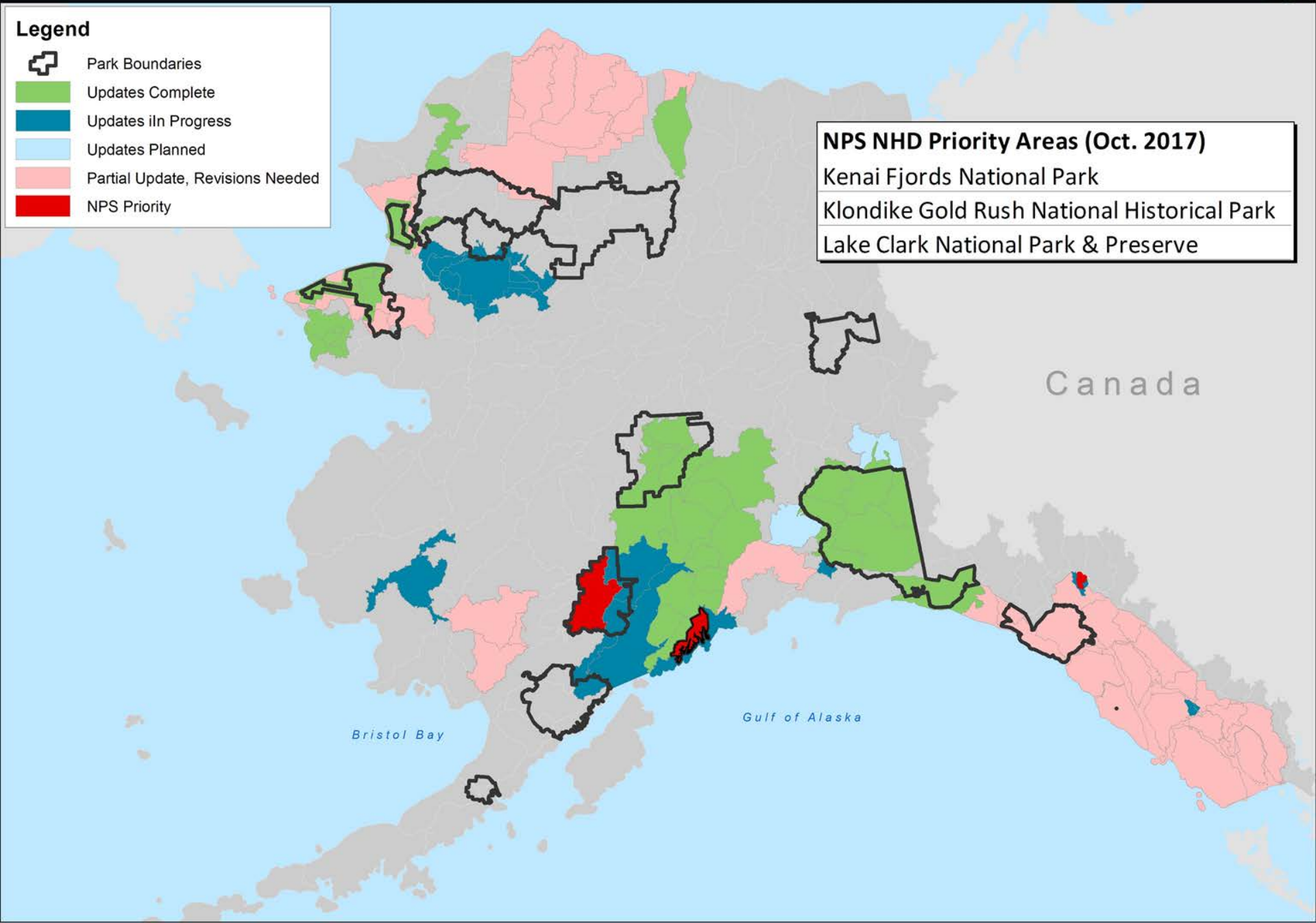
Science in Parks Use Geospatial Data To…

- Determine status and trends
- Provide early warning of abnormal conditions
- Understand the dynamic nature and condition of park ecosystems
- Conduct planning and mitigation activities
- Meet legal and Congressional mandates to protect natural resources and visitor enjoyment

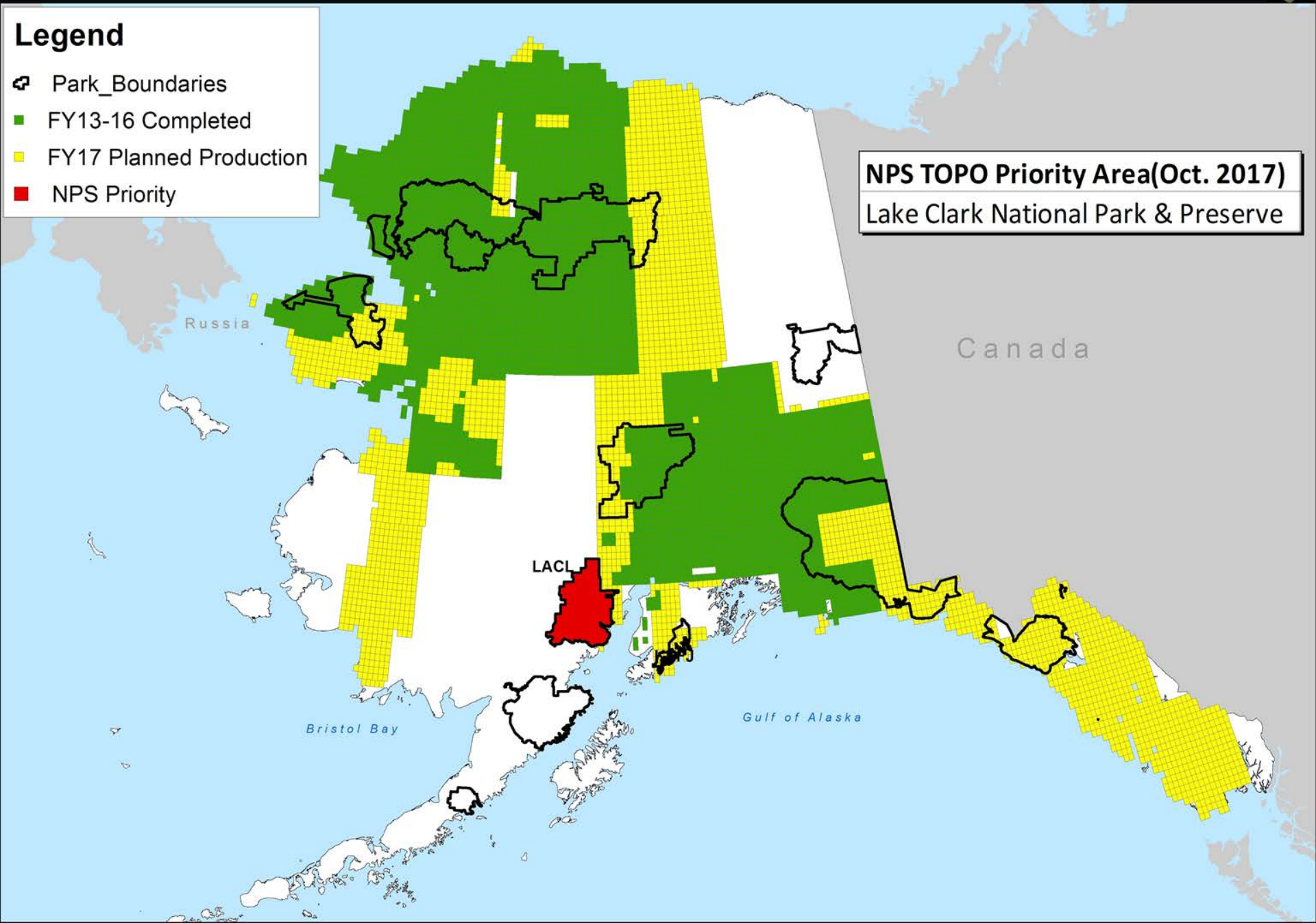
NPS IFSAR Priority Areas (OCT 2017)



NPS NHD Priority Areas (OCT 2017)



NPS Topo Priority Area (OCT 2017)



Additional NPS Priorities (All Park Units)

- **Imagery Refresh**
  - All Parks (~10 yrs old now)
  - Used for NHD Updates
  - Used for Topo Products
  - Used for Vegetation Mapping

- **Vegetation Mapping (Land Classification)**
  - All Parks (oldest maps ~20 yrs. old)
  - Uses Elevation Updates
  - Uses Current Imagery
  - Uses NHD Updates

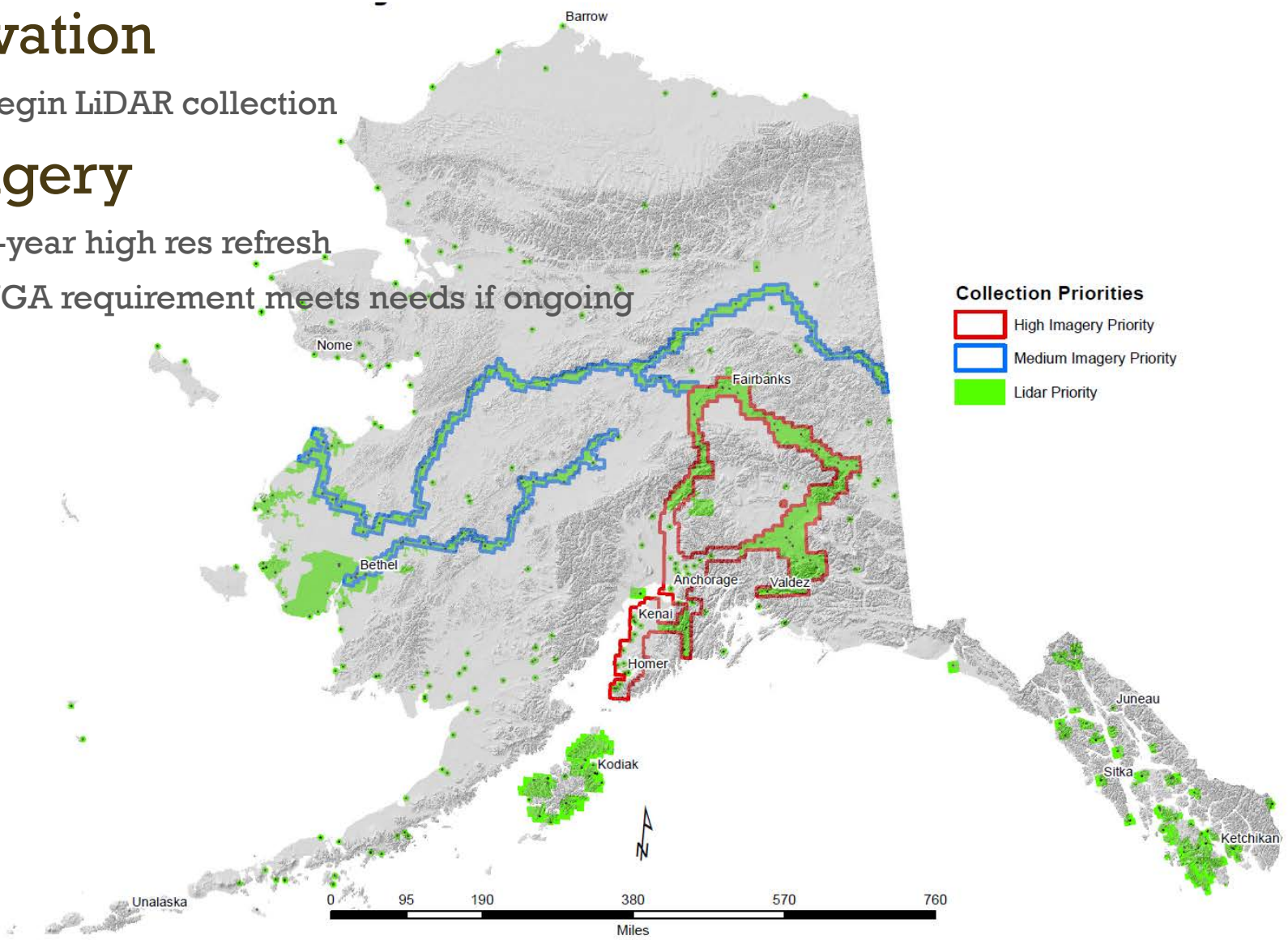
NPS Mapping Priorities - Summary

1. Complete Statewide **Elevation** Dataset
   - Katmai National Park & Preserve
   - Aniakchak National Monument & Preserve
2. Continue **NHD** Production
   - Kenai Fjords National Park
   - Lake Clark National Park & Preserve
   - Klondike Gold Rush National Historical Park
3. Continue **Topo Map Series** Updates
   - Lake Clark National Park & Preserve
4. **Imagery** refresh
   - All Parks
5. Update NPS **Vegetation** Maps
   - All Parks


Questions?

NRCS Mapping Requirements

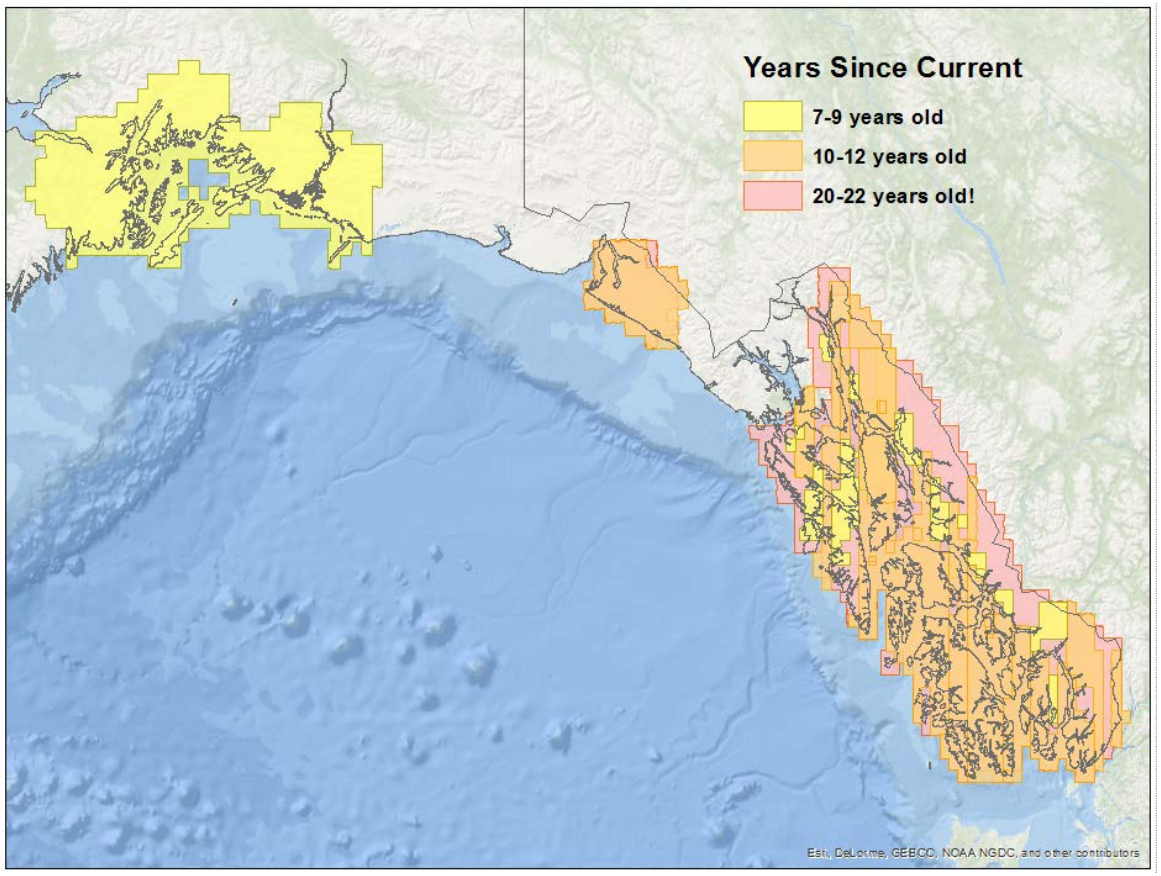
- Elevation
  - Begin LiDAR collection
- Imagery
  - 3-year high res refresh
  - NGA requirement meets needs if ongoing



Priority Mapping Requirements for AMEC Future Consideration – USDA Forest Service; Alaska Region

- Orthoimagery Refresh
- 1:24k Hydrography
- Vertical Integration Tool (Shoreline)
- Elevation – LiDAR
- Vegetation Mapping
- *Historic Image Scanning*
- *Alaska Collaborative (Federal Lands) Long Range Transportation Plan Update*
- *USGS Topos/FS Topos*

USFS Orthoimagery Currency



USFS Orthoimagery example

***Preferred imagery for new forest wide acquisition**
4-band,
30cm,

This sample is from 2009-2010, Tongass NF (incomplete, 15% coverage)

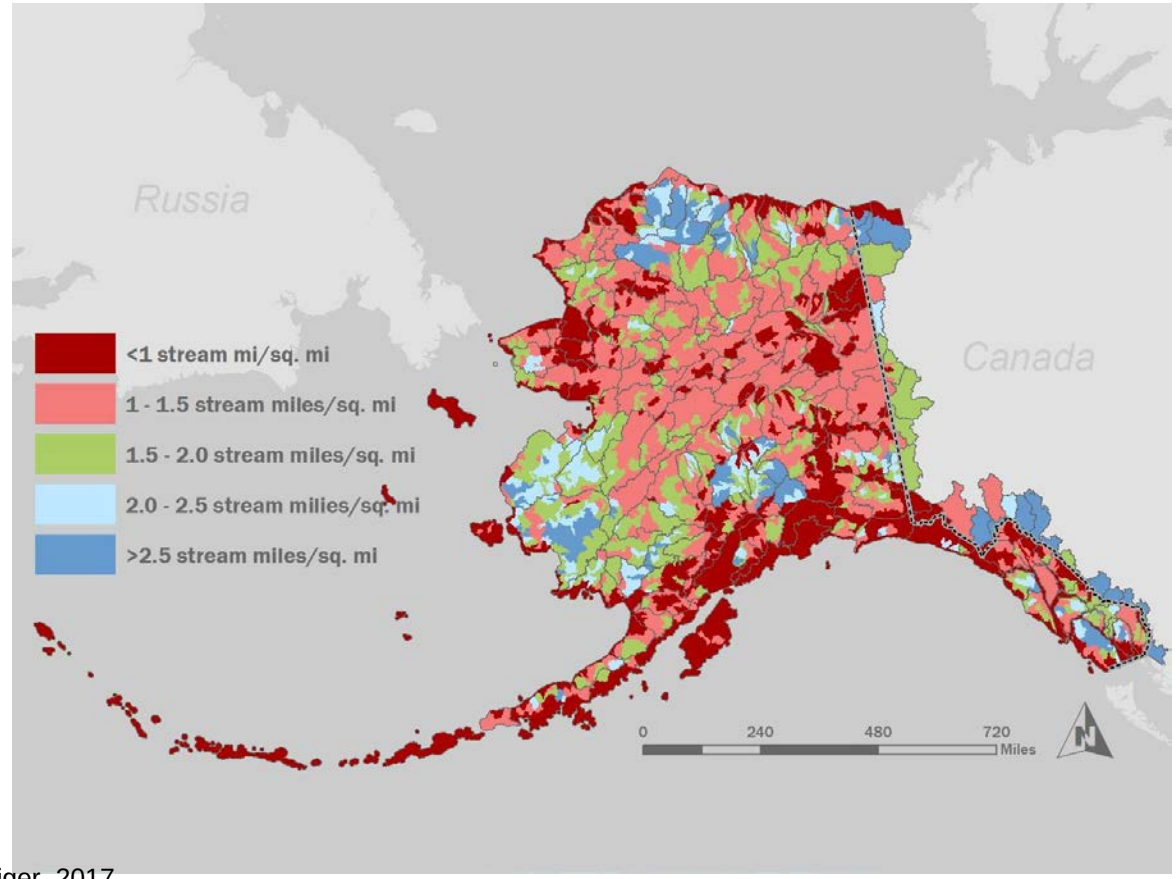
Current Statewide image data,

2007-2016
pan sharpened 4 band data,
2.5m HRS SPOT5 Satellite imagery (complete statewide)

USFS Hydrography

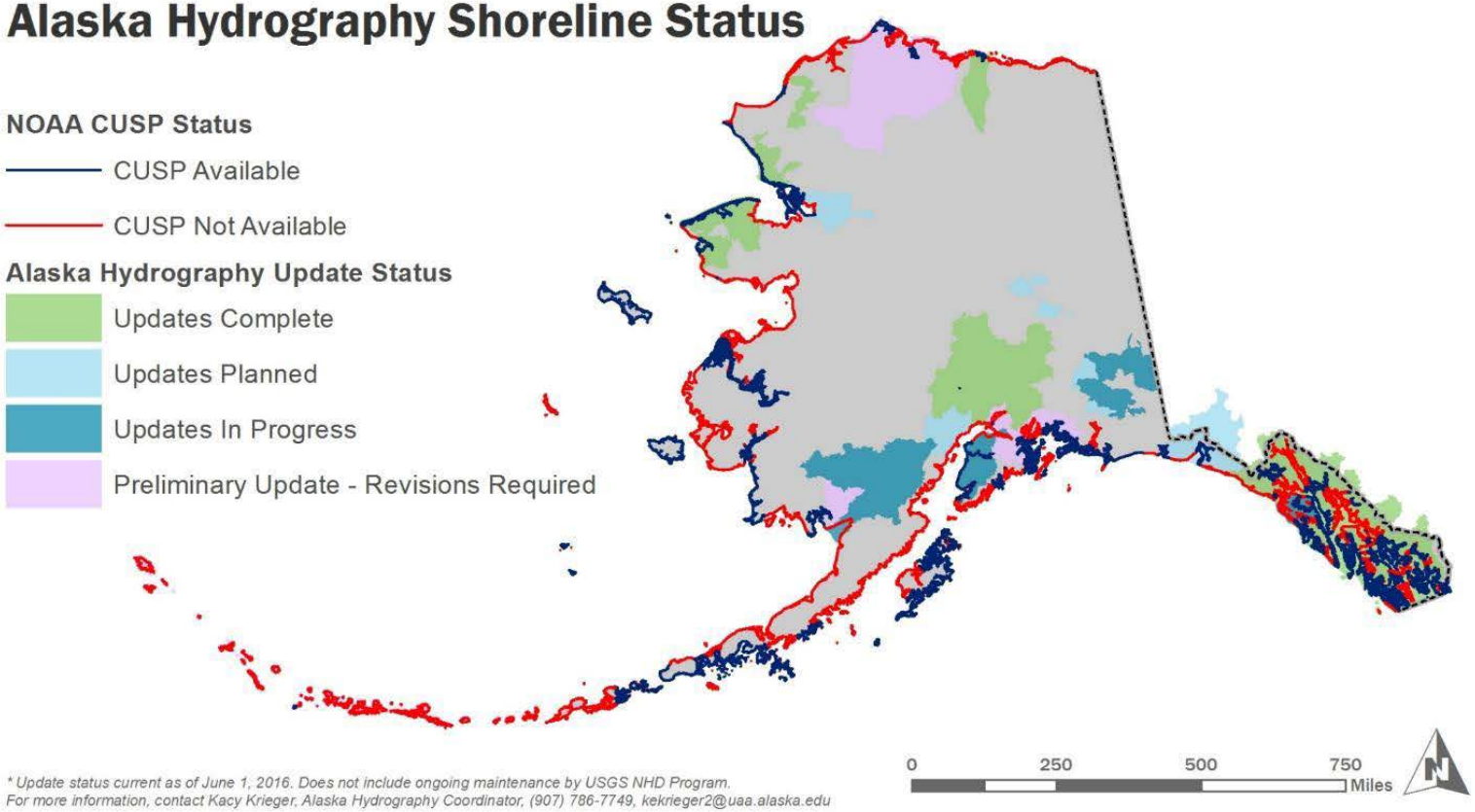
- 1:24,000 high resolution (HR) elevation derived hydrography (ele-hydro) across the Alaska Region (~20% completion)
- Propose a region wide ele-hydro model derived from IfSAR
- Vertical Integration Tool for Shoreline
- Continued support of AK Hydro, $40k yearly
- Active participation in NHD Advisory Group, State of Alaska Hydrography Technical Working Group (ACCER), Alaska Mapping Executive Council Technical Working Group

AK Hydro Stream Density



Kacy Kreiger, 2017

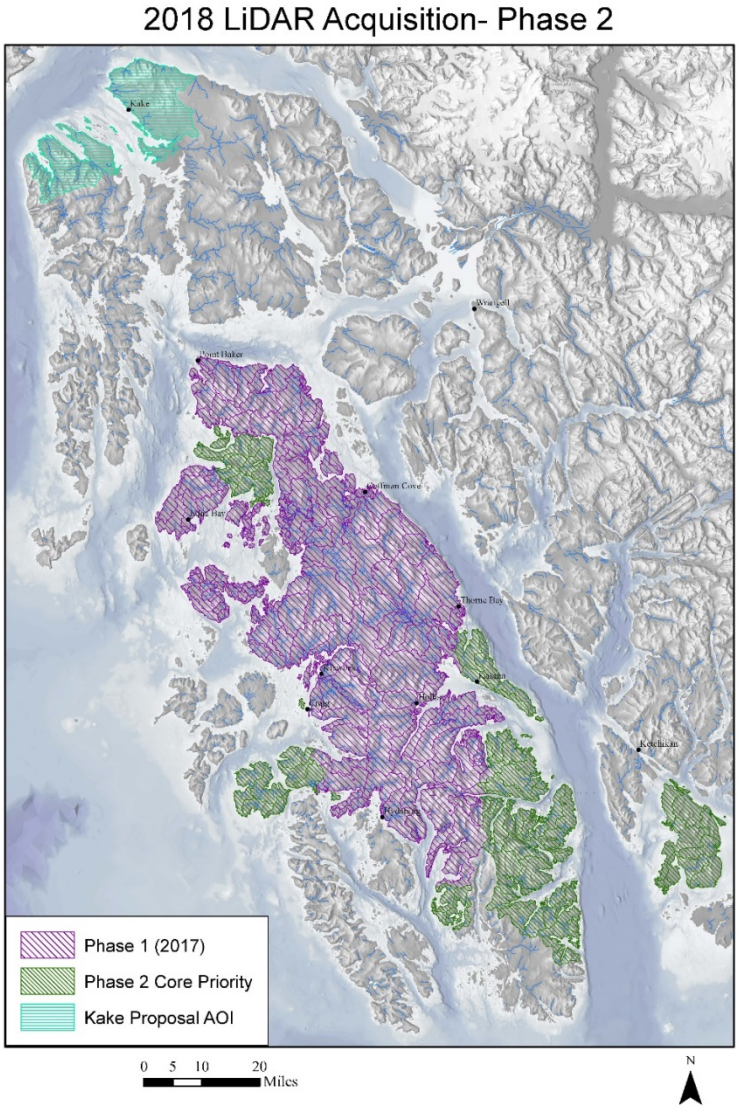
Alaska Hydrography Shoreline Status



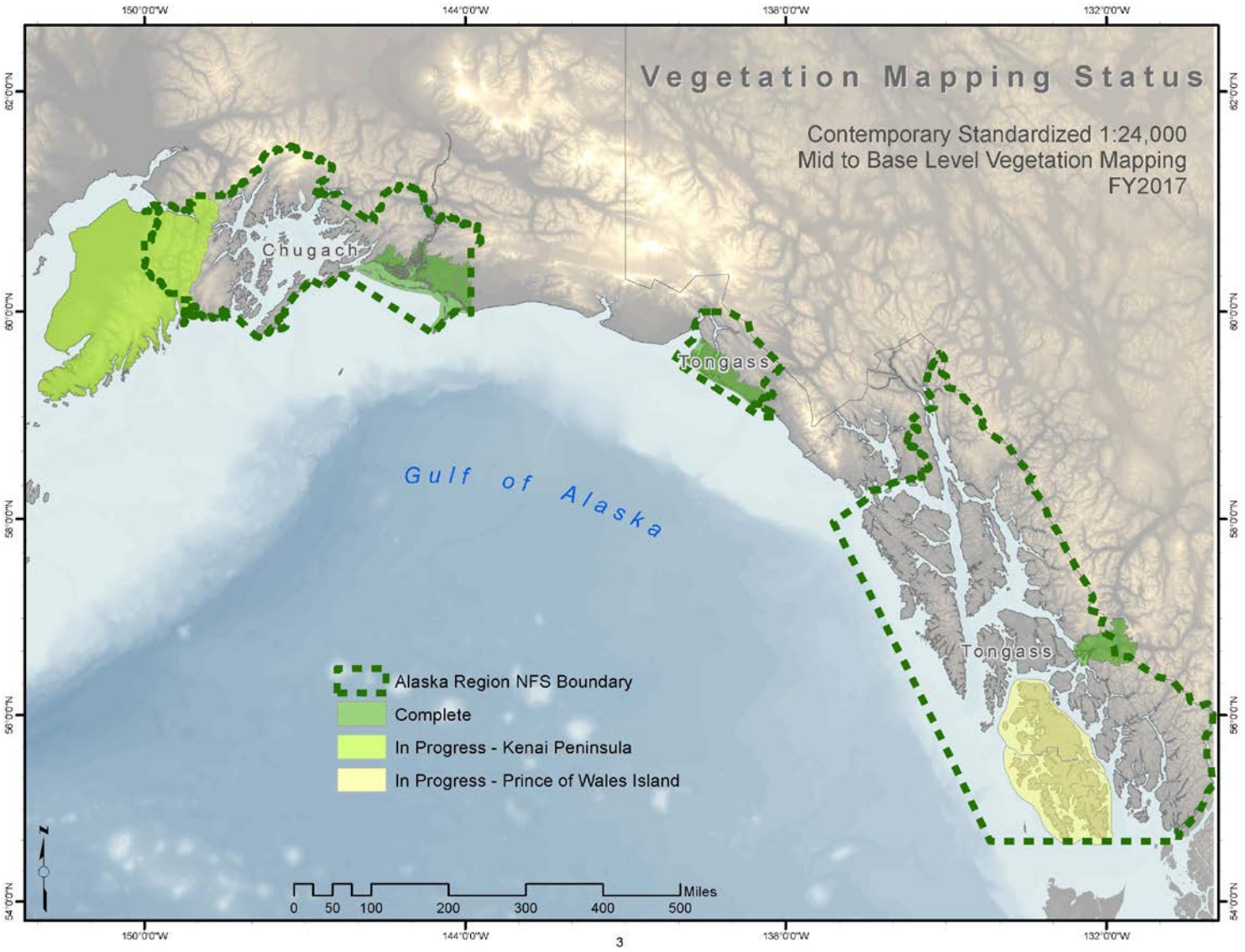
** Update status current as of June 1, 2016. Does not include ongoing maintenance by USGS NHD Program.*
For more information, contact Kacy Krieger, Alaska Hydrography Coordinator, (907) 786-7749, kekrieger2@uaa.alaska.edu

Elevation – 2018 Lidar Acquisition Phase 2

- USGS 3DEP Program
- Partners: **USFS, TNC, Sealaska, AK DNR, NRCS, Organized Village of Kake, Metlakatla Indian Tribe, & Seawead**

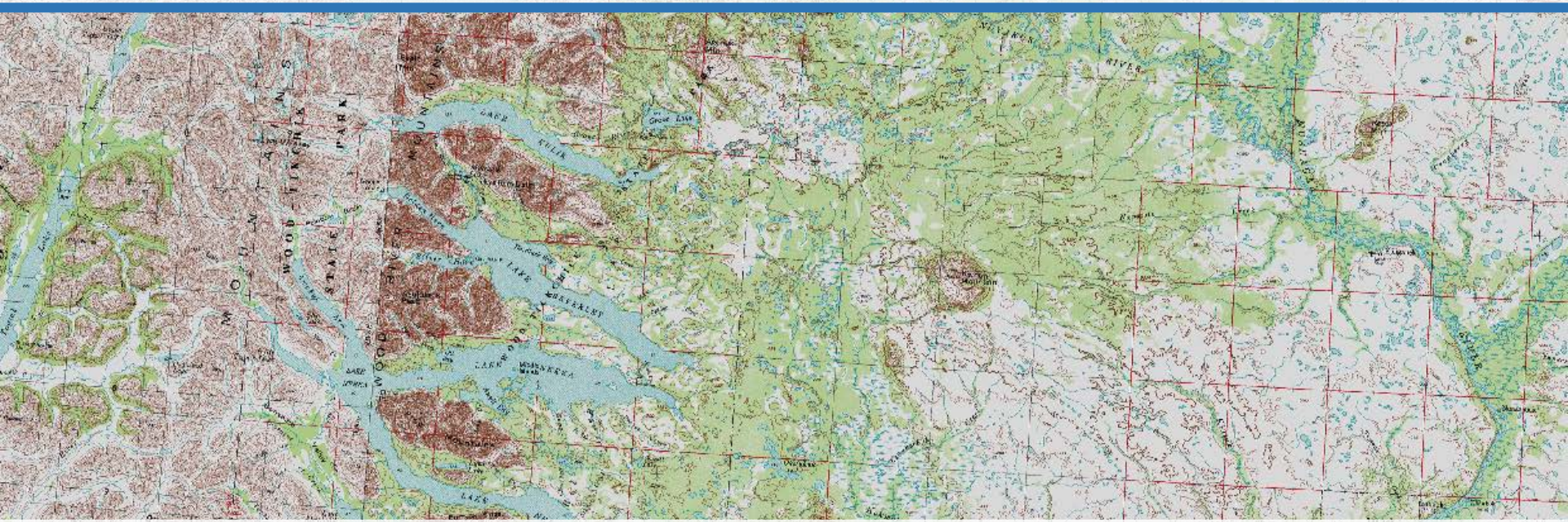


USFS Vegetation Mapping



ALASKA HYDROGRAPHY

ALASKA HYDROGRAPHY TECHNICAL WORKING GROUP



Complete high-resolution statewide hydrography updates that meet national mapping standards and local partners' needs.

Alaska Hydrography Technical Work Group

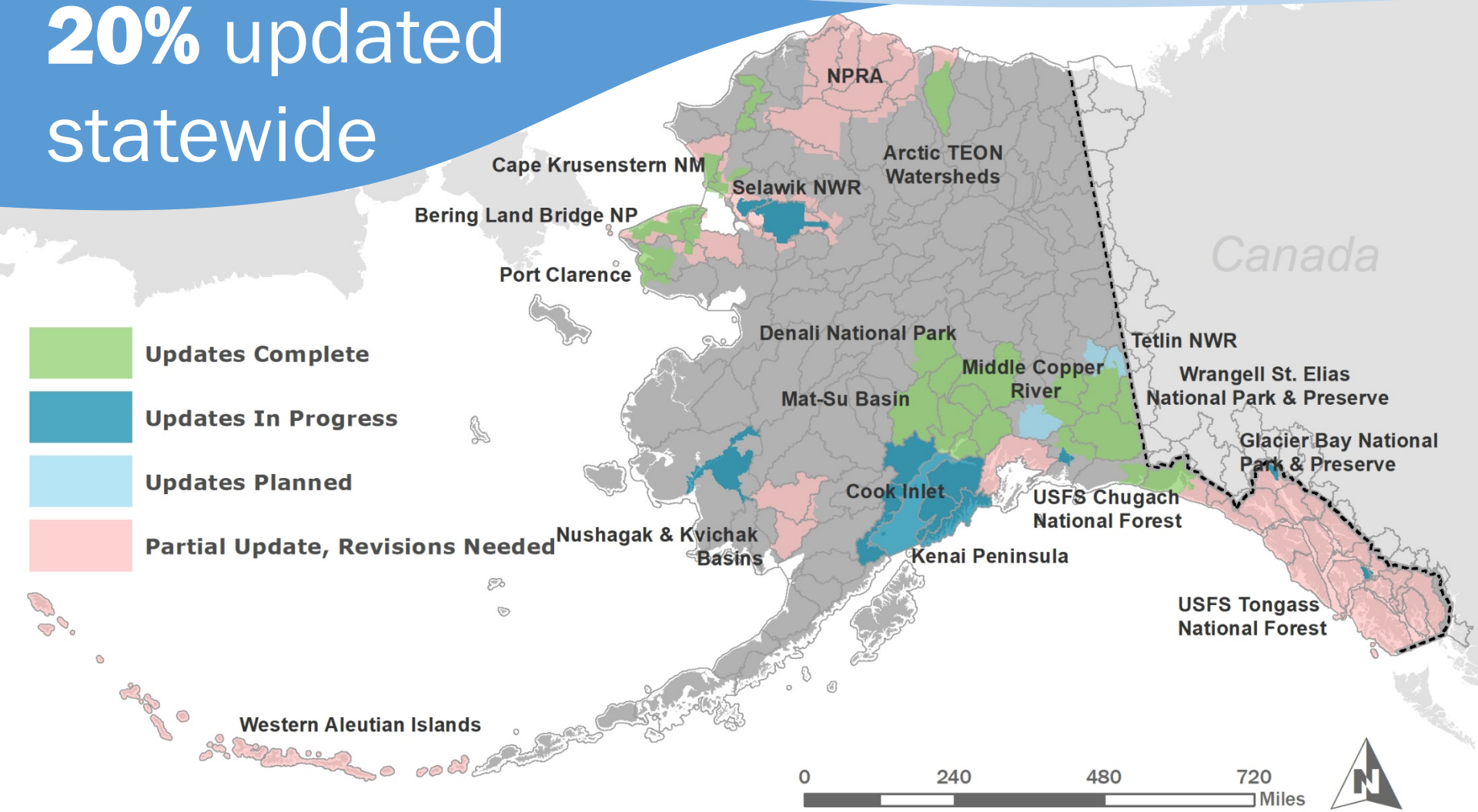
1. Map **Alaska's Water**
2. Support **Alaska's Needs**
3. Establish a **Sustainable Program**
4. Allow for **Data Integration**
5. Provide **Services & Coordination**

Works with **AK Hydro**

(Alaska Hydrography Database)

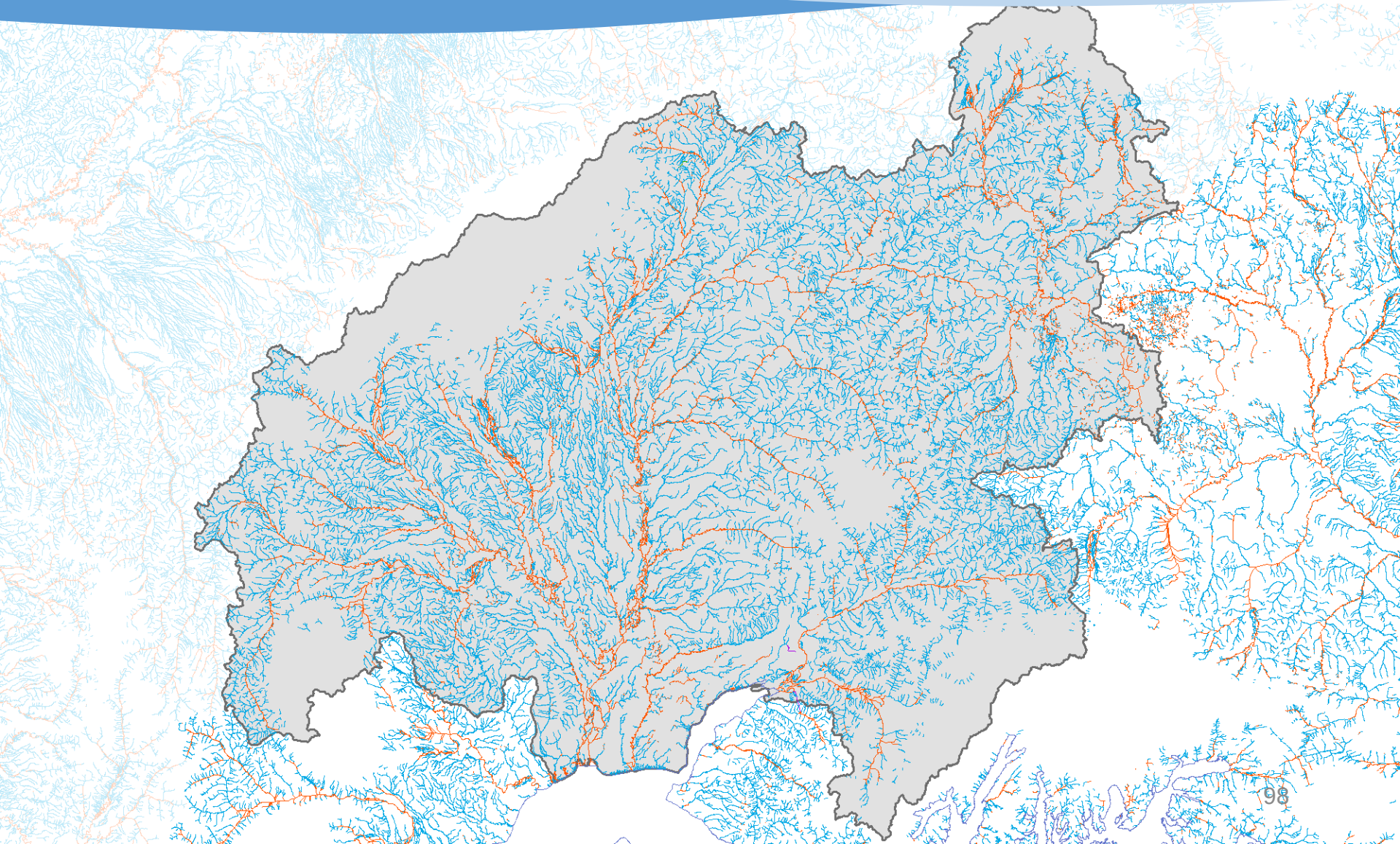
Alaska Hydrography Update Status

20% updated statewide



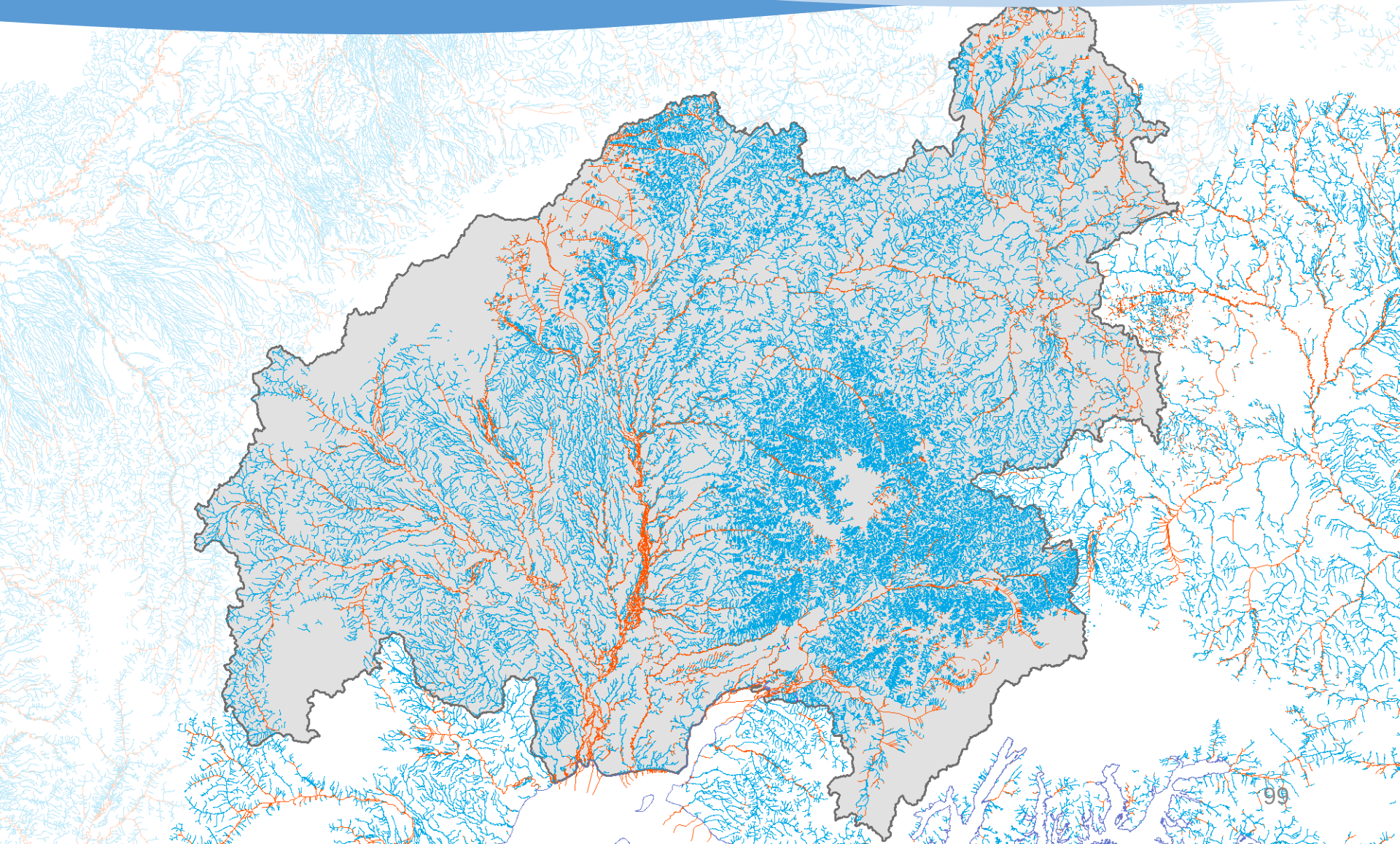
Original National Hydrography Dataset

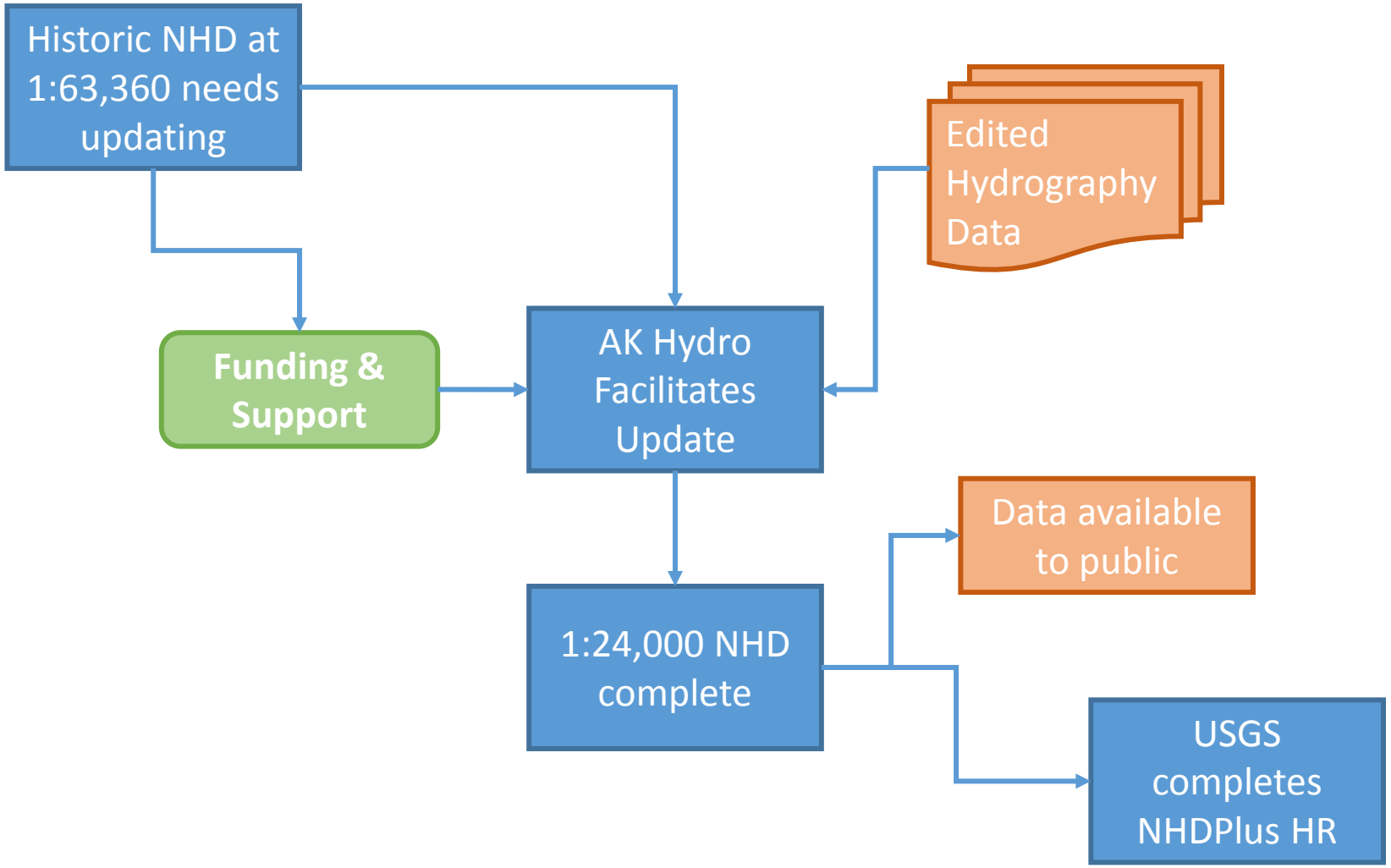
Southcentral Alaska, 2009



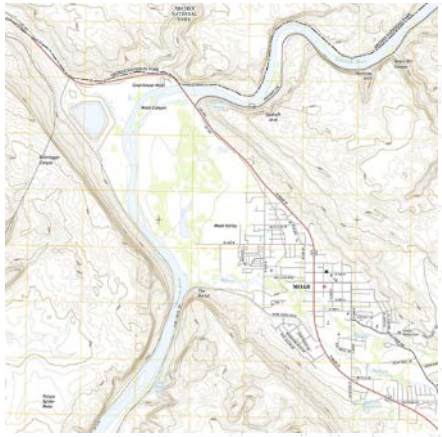
Updated National Hydrography Dataset

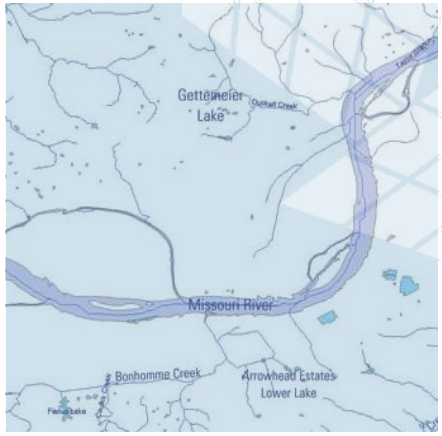
Southcentral Alaska, 2016

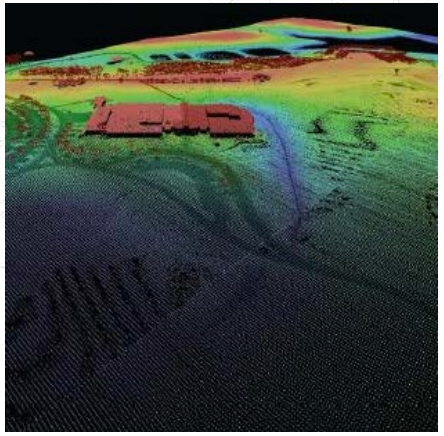



Historic NHD at 1:63,360 needs updating
Edited Hydrography Data
Funding & Support
AK Hydro Facilitates Update
Data available to public
1:24,000 NHD complete
USGS completes NHDPlus HR

Alaska and the NHDPlus High Resolution







Becci Anderson and Al Rea
National Hydrography Co-Leads
USGS National Geospatial Program

October 26, 2017

National Hydrography Datasets

Hydrologic networks, units, catchments, and more…

National Hydrography Dataset (NHD)

- The drainage network with features such as rivers, streams, canals, lakes, ponds, and stream gages

National Hydrography Dataset

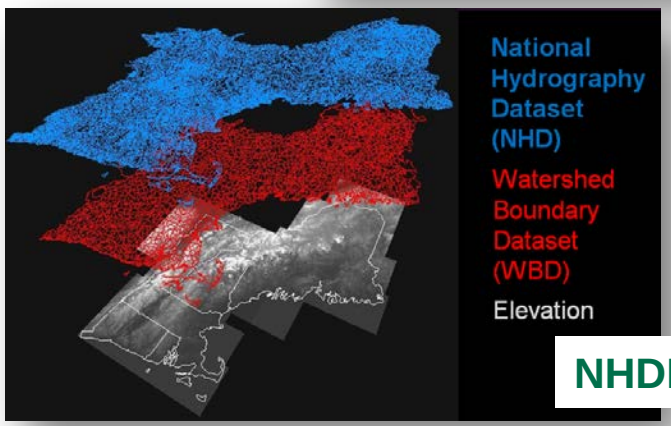
Watershed Boundary Dataset (WBD)

- The drainage basins at 8 scales of a nested hierarchy

Watershed Boundary Dataset

NHDPlus

- Incorporates features of the NHD, WBD and 3DEP elevation data; completed for CONUS at 1:100,000 scale



NHDPlus

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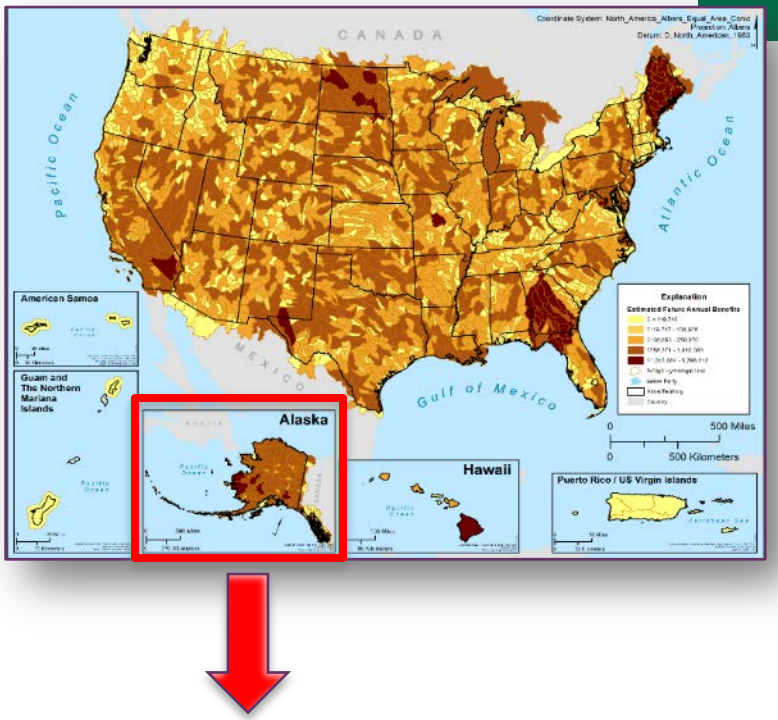
Hydrography Requirements and Benefits Study

- HRBS documented 420 mission critical business uses
  - Ecological flows
  - Drought
  - Flooding
  - Spill response
  - StreamStats
  - Modeling and prediction
  - And more…
- 23 Federal Agencies, 50 States, 8 Tribal governments and 3 national associations
- Current Annual Benefits - $538M
- Total Potential Annual Benefits for meeting all needs - $1.14B



- Additional annual benefits for AK for moving to 1:24,000 = $17.9M

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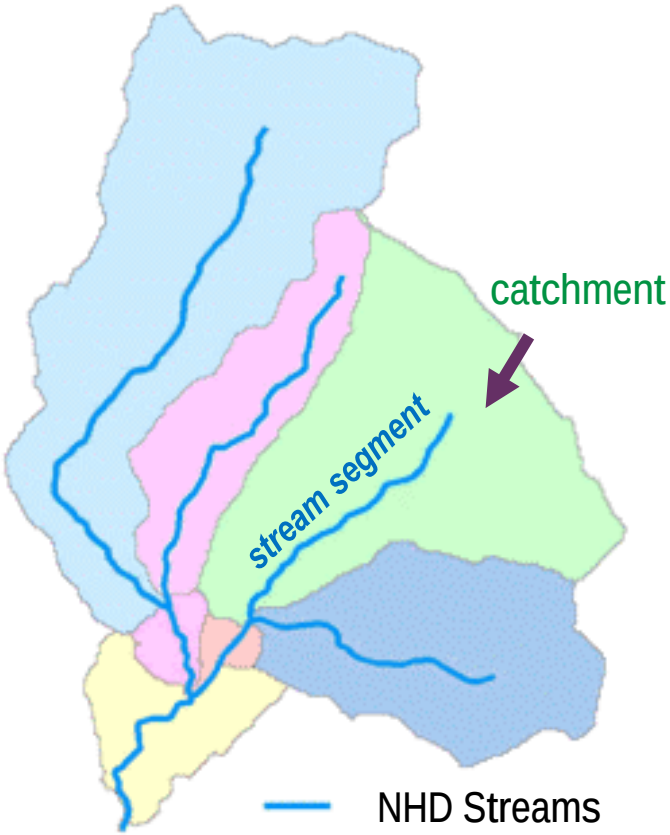
NHDPlus High Resolution

Combines functionality of NHDPlus and resolution of NHD

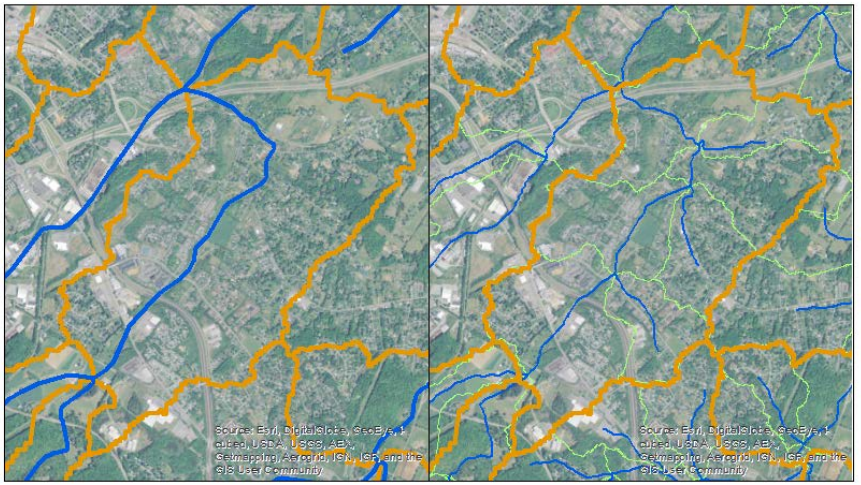
- The HRBS showed that ~ 80% of users need the functionality of 1:100,000-scale NHDPlus but ***at a higher resolution***
- USGS is building NHDPlus HR from 1:24,000 NHD, nationally consistent WBD, and 10m 3DEP data
- Provides a national, scalable mapping framework for water-related information



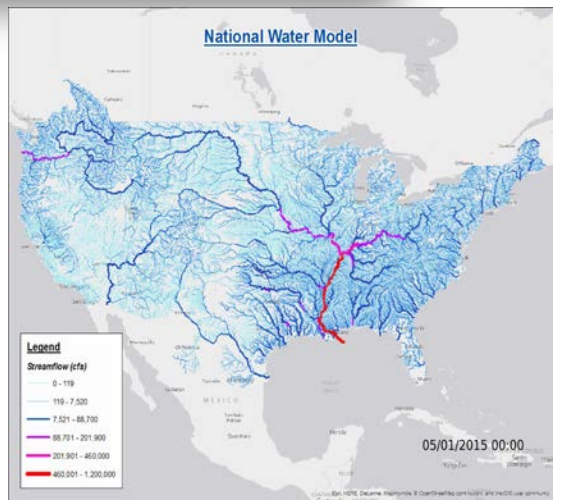
NHDPlus HR Applications

The power of a high resolution hydrography framework

- Will enable complex models such as the **National Water Model** to bring flood forecasting down to the neighborhood level
- **Observational data can be linked** to NHDPlus HR to supporting limitless applications such as:
  - Estimating when and where an event such as a toxic spill will affect downstream drinking water intakes and ecosystems
  - Enabling property owners to better understand upstream water availability impacts



Comparison of medium (1:100,000, left) and high (1:24,000, right) resolution NHDPlus. Blue lines represent the stream network. Orange lines delineate medium-resolution catchments and green lines are catchments of the streams added at the higher resolution.



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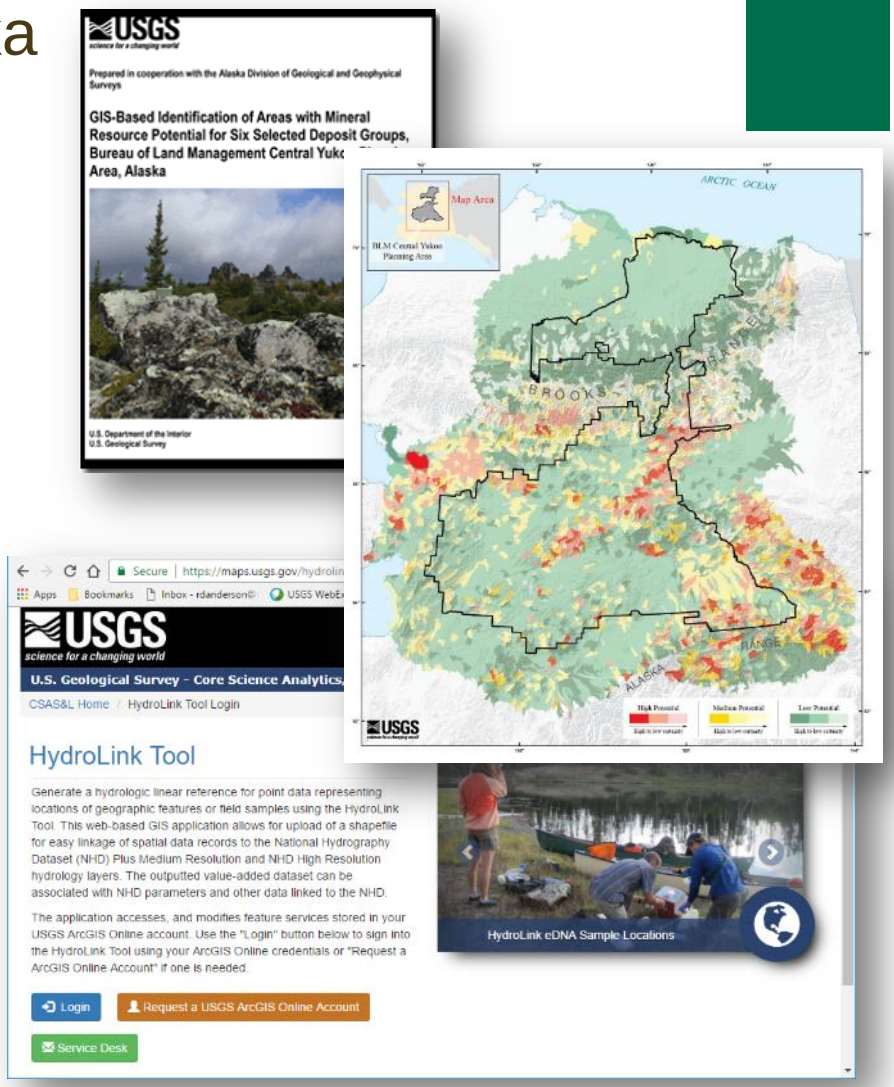
NHDPlus HR AK Applications

Potential applications in Alaska

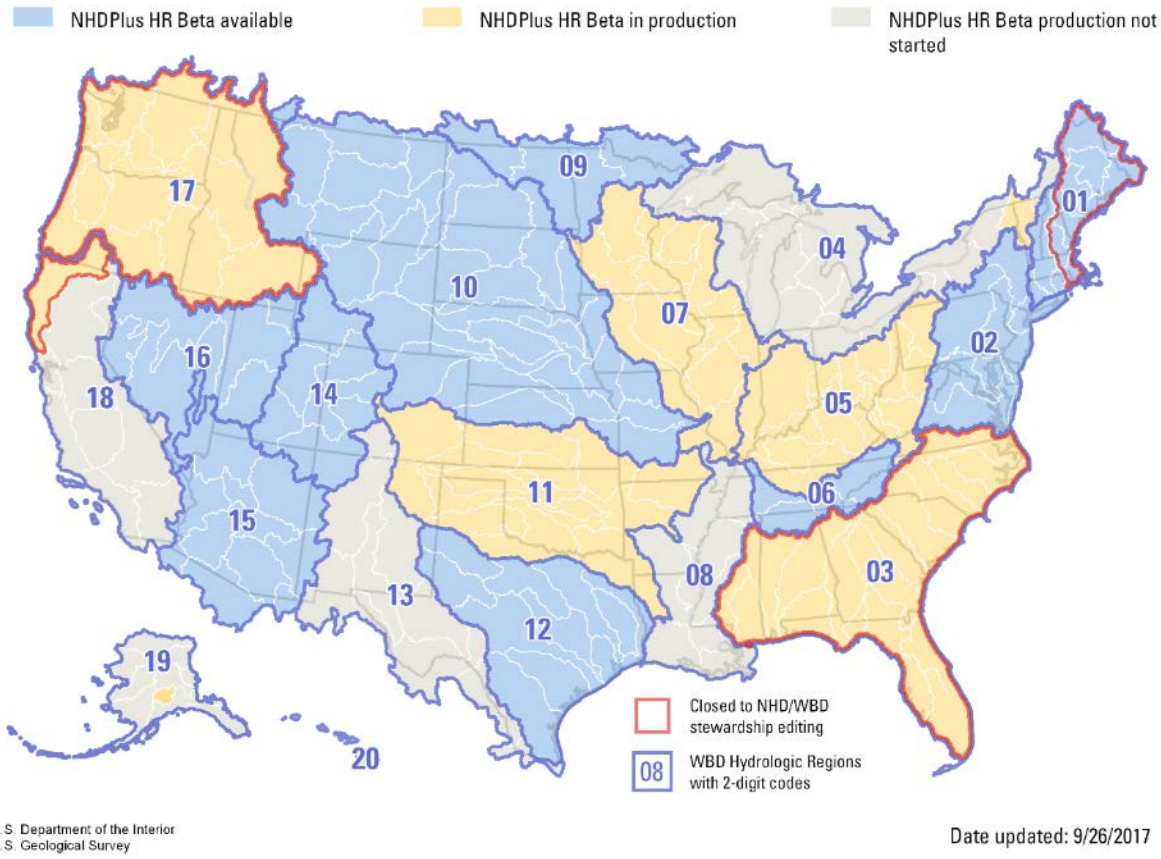
- Infrastructure and Development
- Salmon
- Flooding
- Spill response
- StreamStats
- Water availability and use
- Watershed condition reporting and analysis
- Resource reporting and analysis
- Potentially minerals analysis
- And more…



NHDPlus High Resolution Beta

Over one third of CONUS area completed

- NHDPlus HR Beta will be completed in 2018 for the conterminous U.S., followed by AK, HI, and territories in later years



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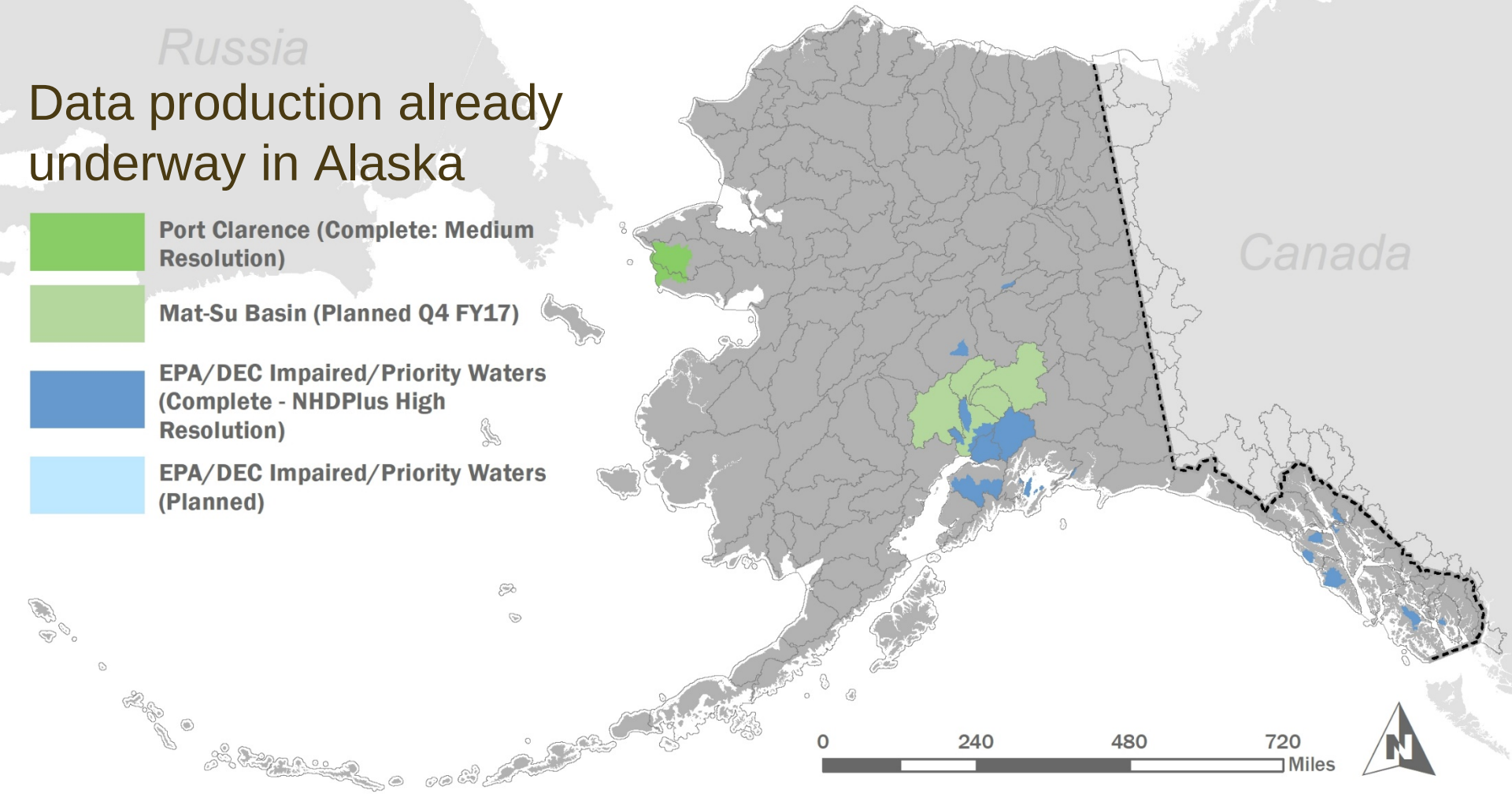
NHDPlus HR Alaska Projects

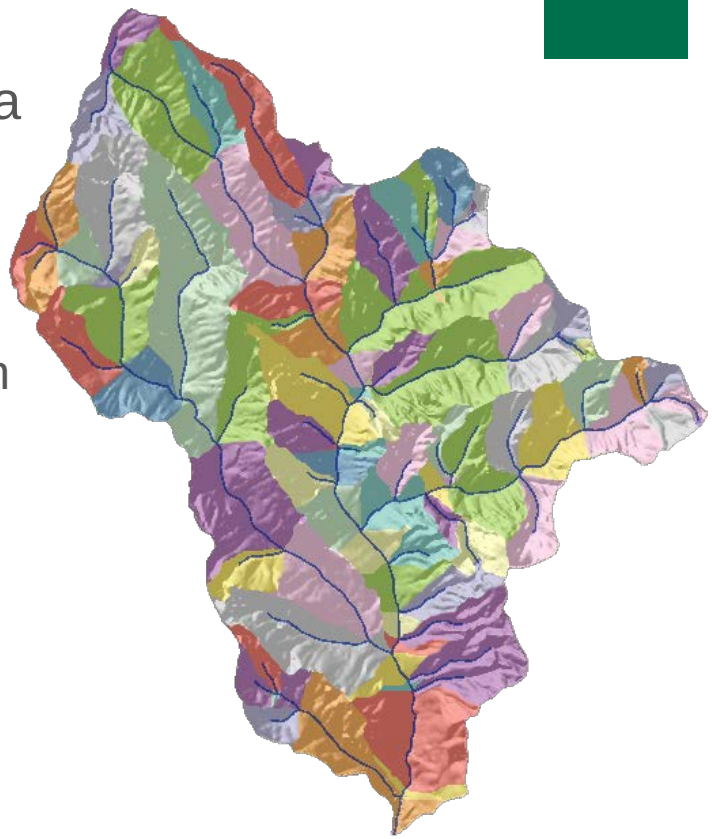
Data production already underway in Alaska



NHDPlus HR Future in Alaska

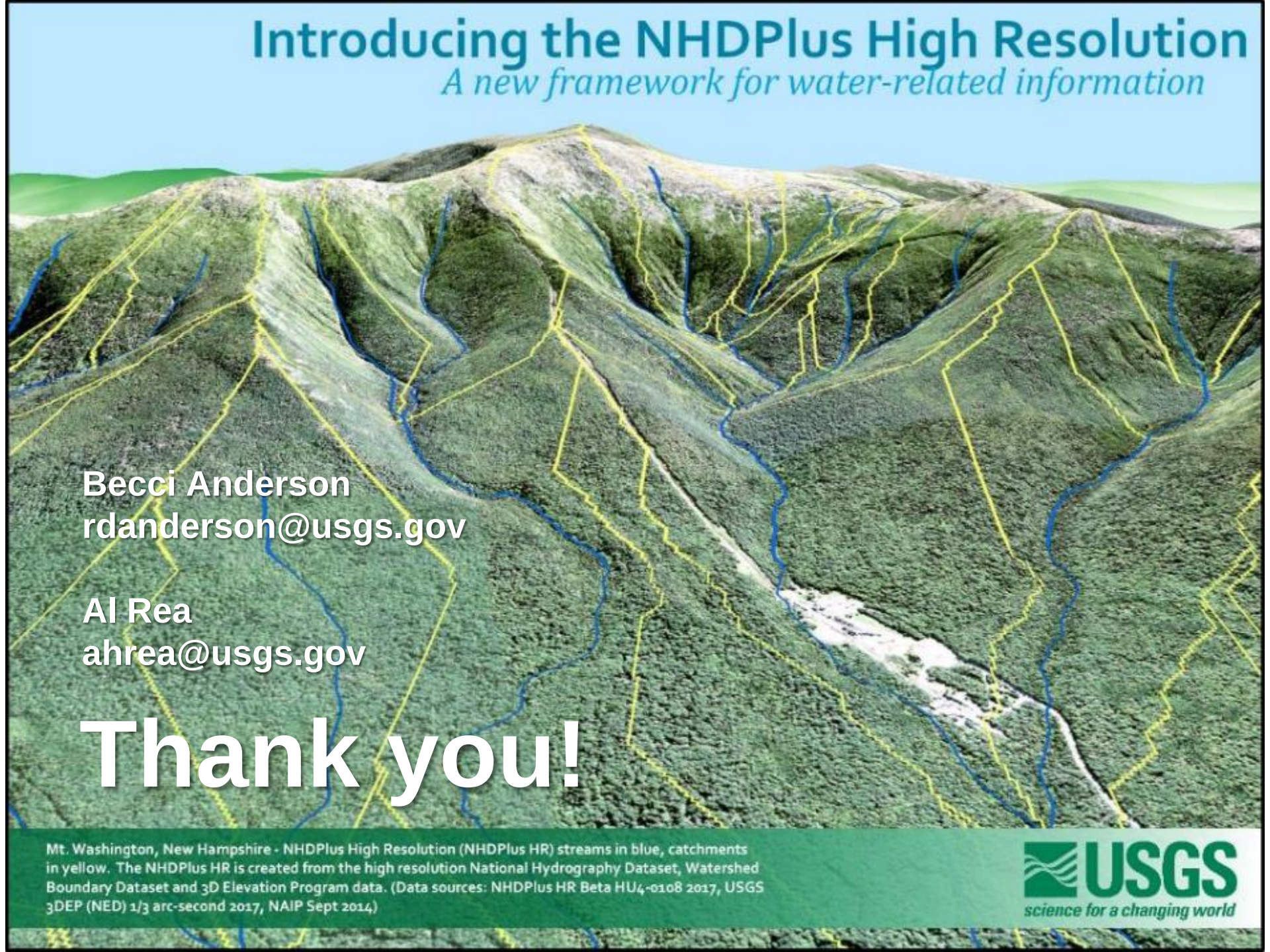
What's needed to develop NHDPlus HR statewide

- To initially build the Beta version of the data
  - NHD at 1:24,000 scale
  - WBD properly delineated
  - Elevation data at 10 meter or better resolution (IfSAR)
- ~20-30% of NHD in Alaska is ready for NHDPlus HR or in progress
- 92% of Alaska is ready with elevation data
- USGS will work with AHTWG to find solutions to upgrading the NHD and WBD



Introducing the NHDPlus High Resolution

A new framework for water-related information



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Thank you!

Mt. Washington, New Hampshire - NHDPlus High Resolution (NHDPlus HR) streams in blue, catchments in yellow. The NHDPlus HR is created from the high resolution National Hydrography Dataset, Watershed Boundary Dataset and 3D Elevation Program data. (Data sources: NHDPlus HR Beta HU4-0108 2017, USGS 3DEP (NED) 1/3 arc-second 2017, NAIP Sept 2014)

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Actions and Next Meeting

- Respond to 18-month tactical plan by 09-November
- Respond to new charter by 09-November
- Move forward with acquisition of Class III IfSAR over the Aleutian Islands
- Schedule next AMEC meeting