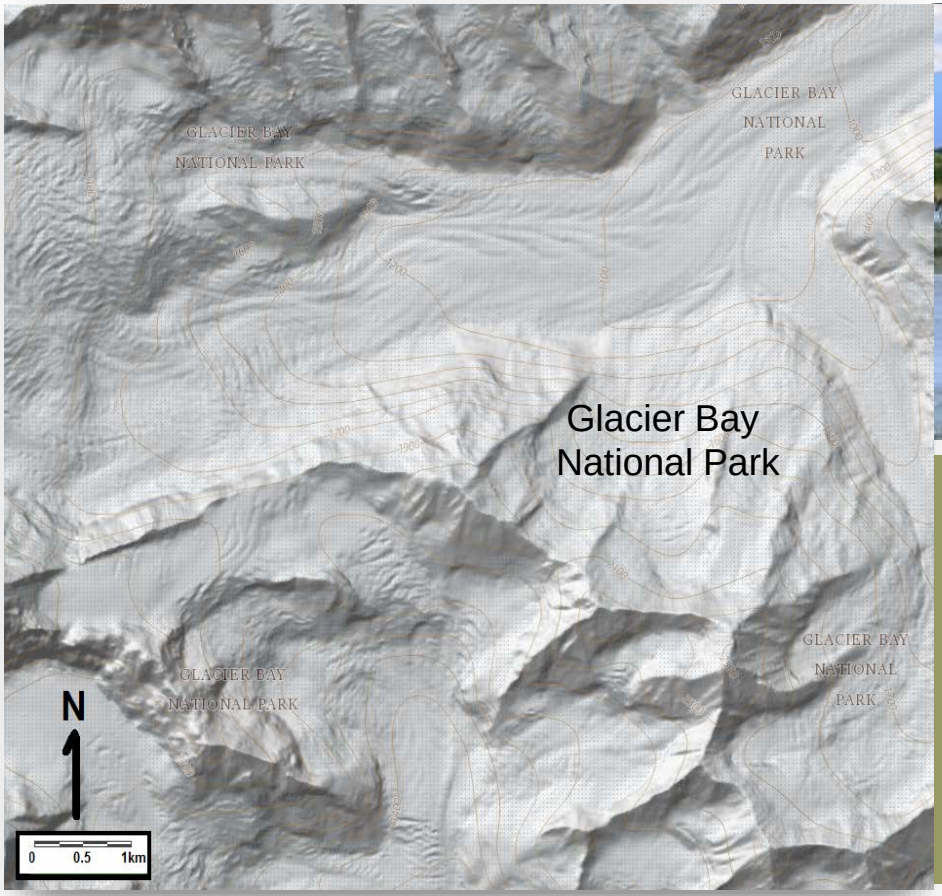


Alaska Mapping Executive Committee (AMEC) – Juneau, AK

August 29, 2018

Agenda

- *Welcome and Introductions – James Reilly, USGS and Tim Gallaudet, DOC*
- *AMEC Theme Status Report - Kevin Gallagher, USGS*
- *IfSAR Success Story and Lessons Learned – Dewberry, Fugru, InterMap*
- *State of Alaska Report - Steve Masterman, State of Alaska*
- *Alaska Regional Mapping Coordination – Aimee Devaris, USGS*
- *3D Nation Update – Ashley Chappell, NOAA*
- *Break*
- *Alaska Terrestrial Hydrography Report – Kacy Krieger, University of Alaska-Anchorage*
- *GRAV-D and Shoreline Mapping Update - Juliana Blackwell, NOAA*
- *Alaska Coastal Mapping Strategy and Implementation – Nicole Kinsman, NOAA*
- *USACE Topographic/Bathymetric Mapping in Alaska – Chris Macon, USACE*
- *Discussion and Wrap Up - Kevin Gallagher, USGS*
- *Closing Comments – James Reilly, USGS and Tim Gallaudet, DOC*

Status of Actions from April Meeting

- IfSAR was fully funded and collected for the Yukon Delta, the Alaska Peninsula, and the National Petroleum Reserve – Alaska.
- Over $865,000 was contracted toward AK terrestrial hydrography edits.
- The Technical Subcommittee investigated options for collecting lidar for the Kodiak Island Archipelago. Potential partners may develop a 3DEP BAA lidar proposal depending on FY2019 budget appropriations.

Status of Actions from April Meeting

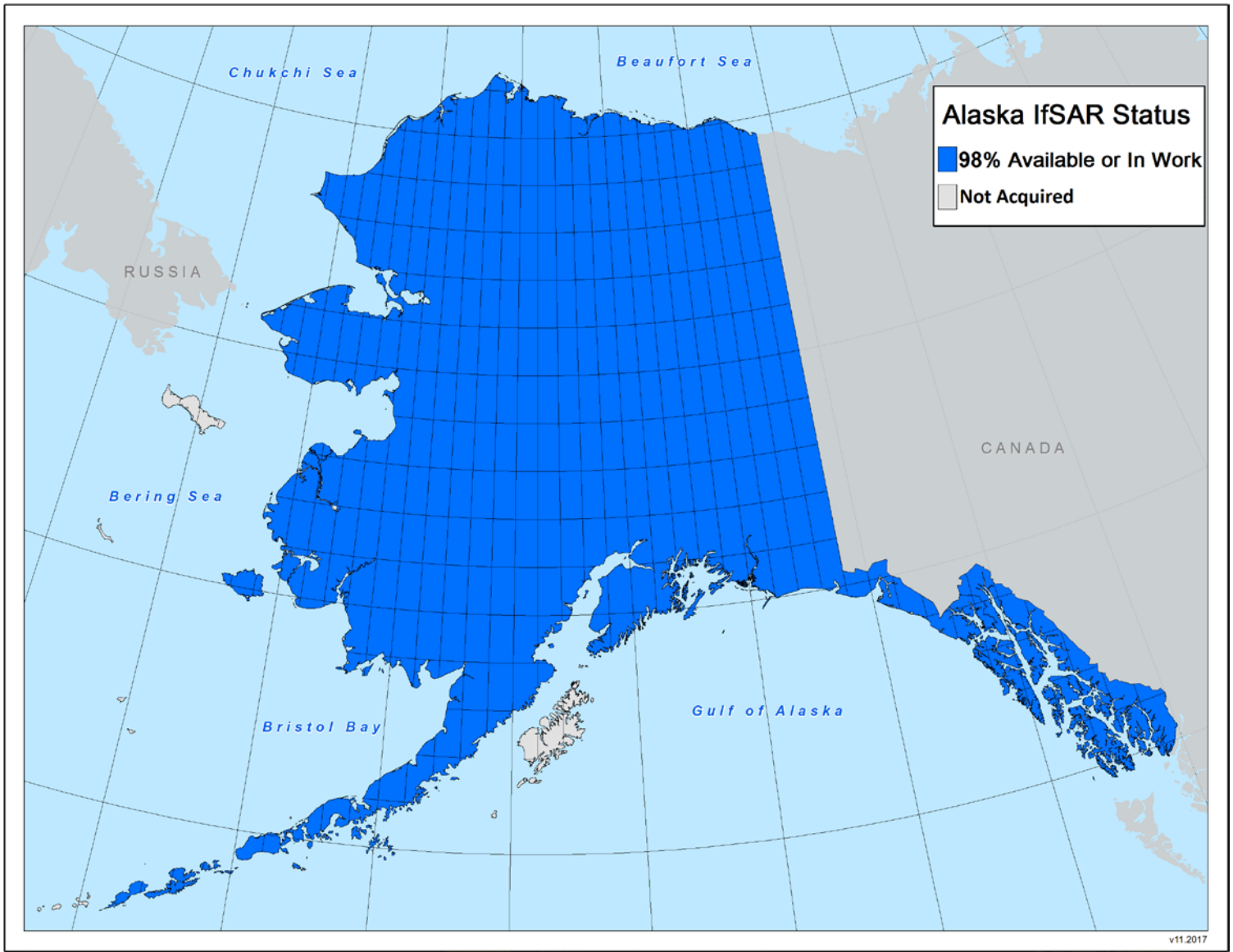
- Lidar and imagery-derived high resolution elevation options for the 1002 area within the Arctic National Wildlife Refuge were investigated, but no immediate action was taken.
- USGS, USFWS, and the Alaska Hydrography Technical Working Group are coordinating wetland and surface water mapping.
- The Alaska Mapping Technical Subcommittee and the Alaska Geospatial Council are reviewing State and Federal agency mapping requirements to identify future AMEC priority layer(s). A joint recommendation to AMEC is expected at the spring 2019 AMEC meeting.

Data Acquisition Accomplishments

Theme,	Metric	2013 Goal	August 2018 Status
Elevation	% IFSAR acquired	Complete in 4 years	98% coverage acquired
Hydrography	% NHD updated	Complete in 6 years	25% updated
Transportation	% of State completed	Complete in 5 years	100% complete; ongoing maintenance
Gravity	% GRAV-D acquired	Mainland by 2019 Aleutians by 2021	100% Mainland complete, Aleutians remain
Shoreline Mapping	% AK shoreline updated	Complete in 5 years with budget increase, longer term if no budget increase	55.5%

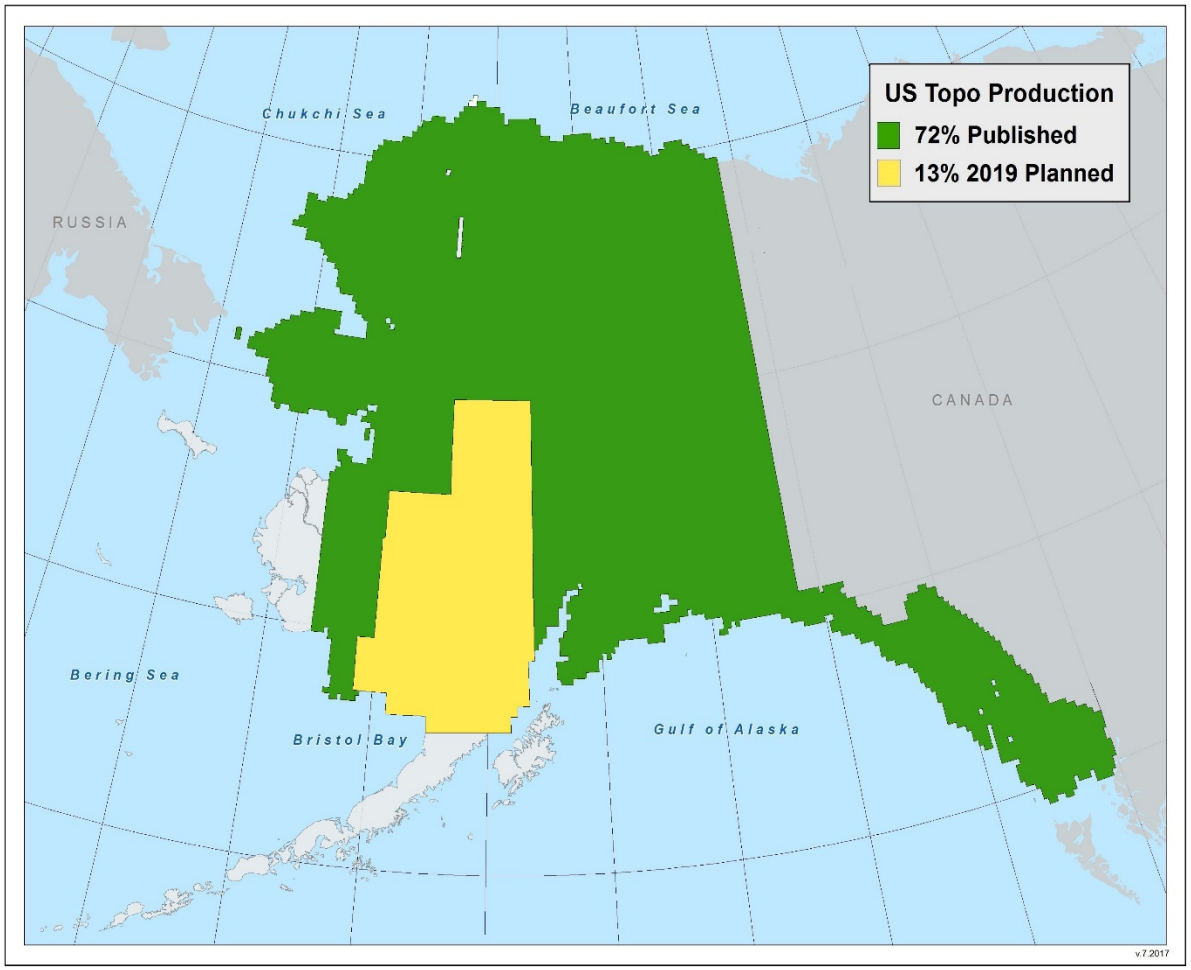
Alaska IfSAR Status August 2018

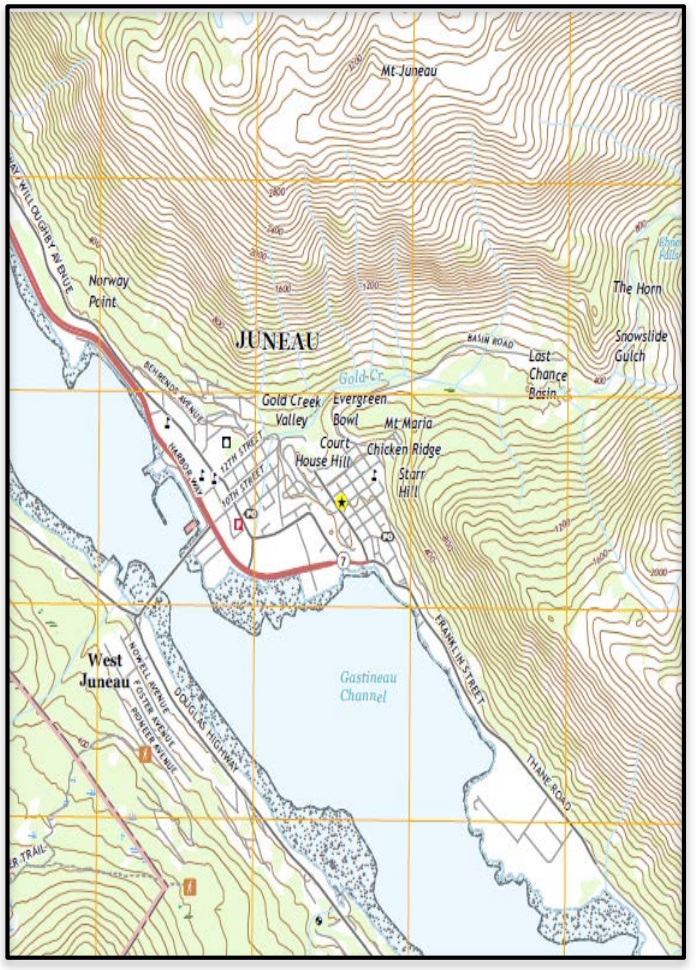
- 98% now fully funded and collected.
- 78% available. 20% in work.



Alaska US Topo August 2018

- 72% Statewide coverage achieved.





Alaska's IFSAR Mapping Success Story

Alaska Mapping Executive Committee (AMEC)

August 29, 2018

David F. Maune, Ph.D., PSM, PS, GS, SP, CP, CFM

Dewberry Engineers, Inc.

8401 Arlington Blvd., Fairfax, VA 22031

(703) 849-0396

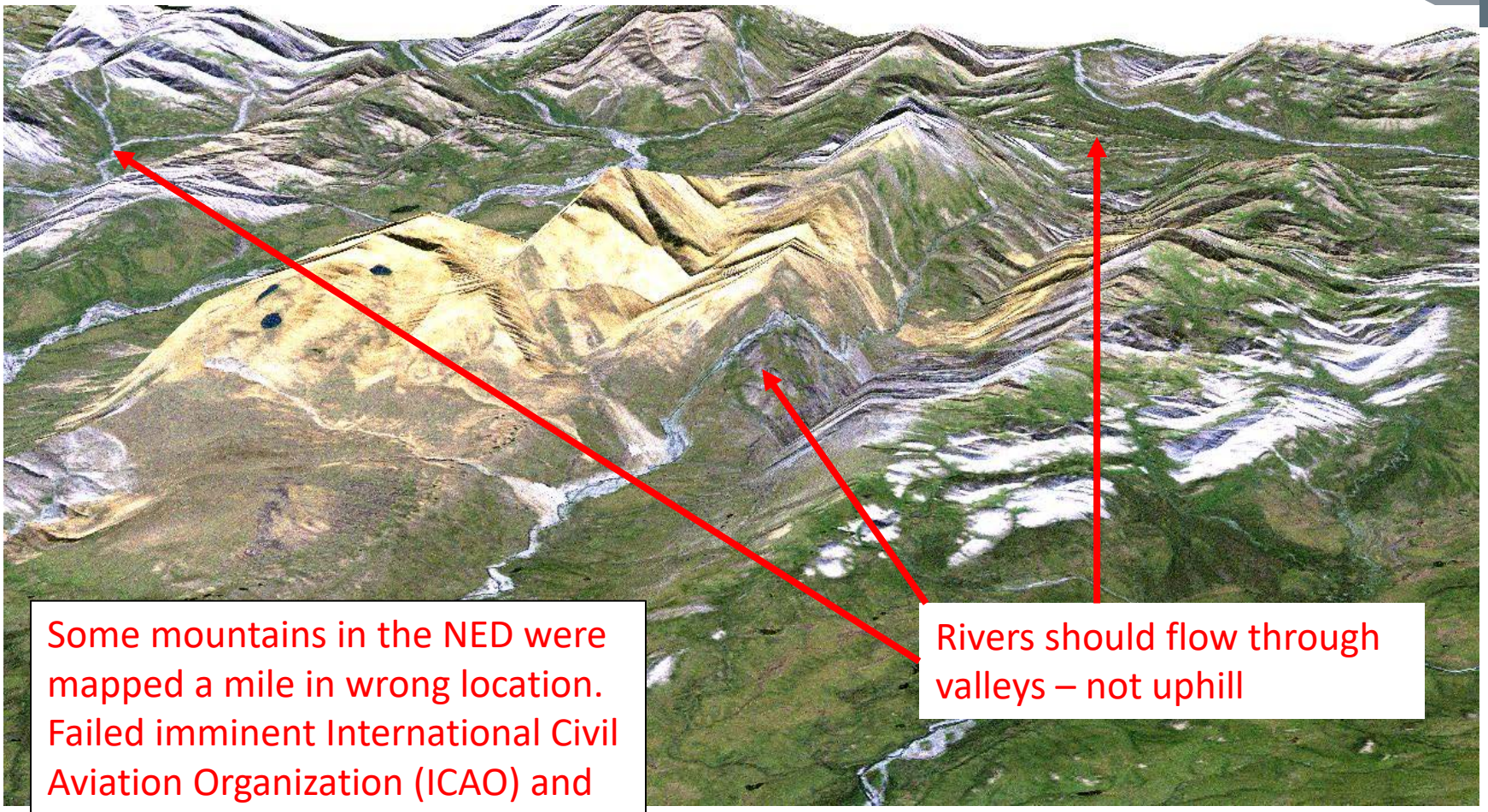
Vision started with the ASMC, 2008 – The DEM layer is foundational

1. Intro to DEMs, 3-D Surface Modeling, Tides
2. Vertical Datums
3. Accuracy Standards
4. National Elevation Dataset
5. Photogrammetry
6. IFSAR
7. Topographic & Terrestrial Lidar
8. Airborne Lidar Bathymetry
9. Sonar
10. Enabling Technologies
11. DEM User Applications
12. DEM Quality Assessment
13. DEM User Requirements
14. Lidar Processing & Software
15. Sample Elevation Datasets

Alaska DEM Whitepaper

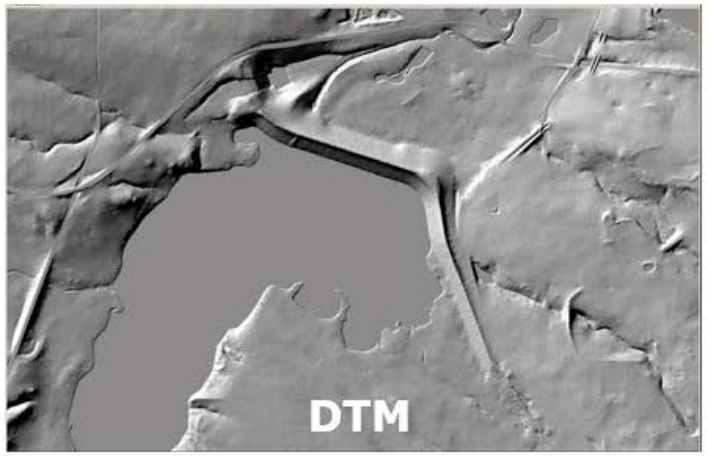
Dewberry

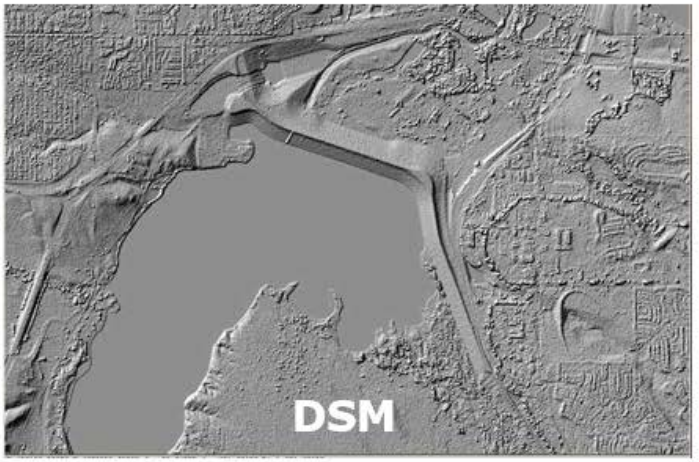
Alaska DEM Whitepaper – The Problem



Dewberry

Alaska DEM Whitepaper –The Mid-Accuracy Solution





- Three normal airborne IFSAR products that map through clouds
- Higher-resolution ORI could be used to pan-sharpen lower-resolution satellite imagery for orthoimagery

Dewberry

Consensus points from NDEP and NDOP

We have no time to waste	We must remain true to Alaska's requirements	We must find timely, cost-effective solution
• ICAO Area 1 Requirements: 11/20/2008 • ICAO Area 2 Requirements: 11/20/2010 • Other statewide user requirements: Immediate • Alaska's mapping needs have been neglected for 50 years; unmet needs in Alaska are dire, especially aviation safety	• 20' contour accuracy or better • Both DSM and DTM, especially mountain peaks, ridgelines and hydrology • Technology that maps through clouds, overcomes adverse weather conditions • Technology that maps snow-capped mountains & glaciers • Technology that is cost-effective	• Only airborne mapping options can satisfy AK's technical and accuracy requirements • Airborne IFSAR costs are significantly less than airborne LiDAR or photogrammetry • Multiple contracting options are available to obtain the most cost-effective solution for timely delivery of quality products • Need both federal and state funding

Alaska DEM Funding & Implementation Plan; Program Mgt.

Dewberry

2009: Dewberry Team unsolicited proposal to USGS

Proactive Offer to USGS for the

Alaska Digital Elevation Model (DEM)

November 16, 2009

Prepared by:
Dewberry
8401 Arlington Blvd.
Fairfax, VA 22031-4666

Dewberry

In coordination with:

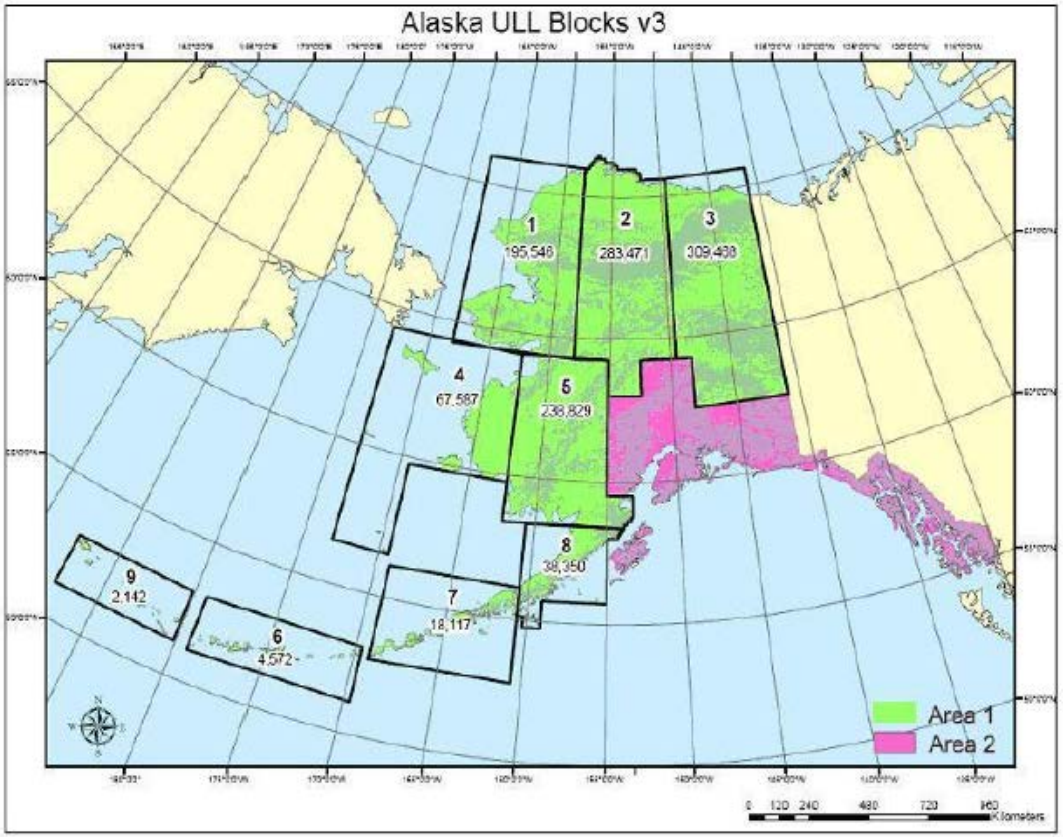
Intermap Technologies Inc. and

Fugro EarthData, Inc.

INTERMAP TECHNOLOGIES

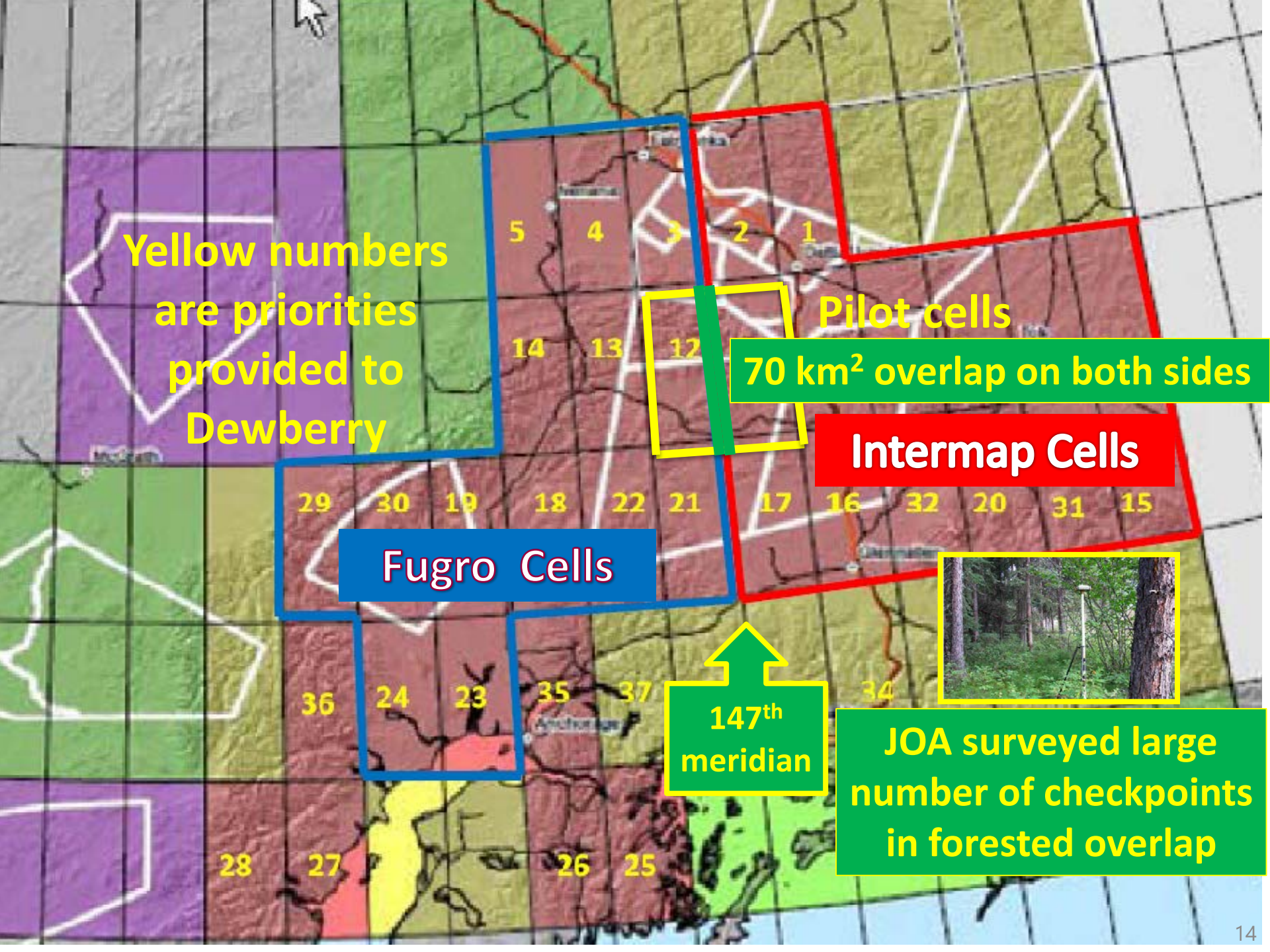
FUGRO

This Proactive Offer is valid until February 28, 2010.

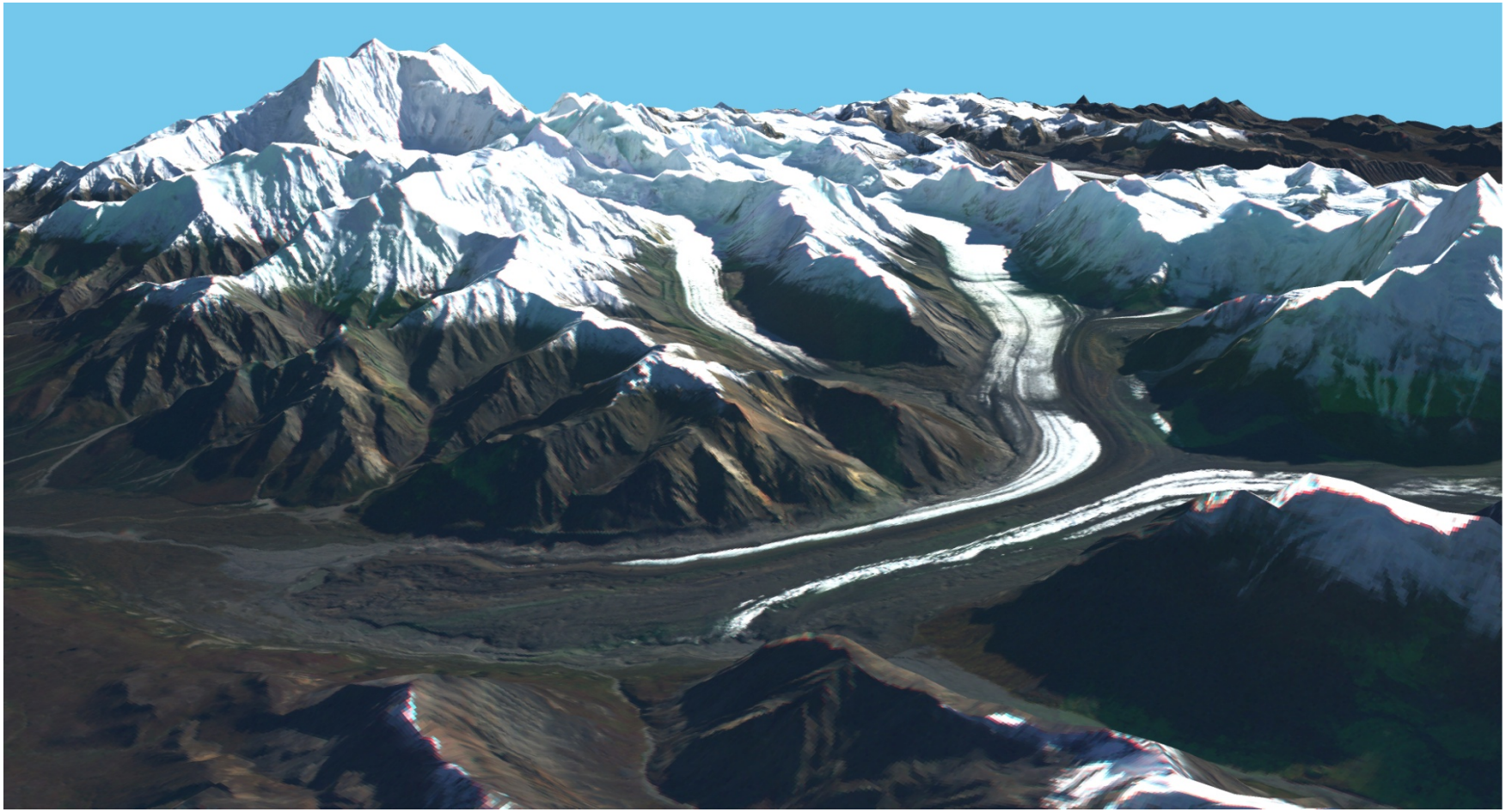


Fugro proposed that it map the 23% of the state that is most difficult (pink), with Intermap mapping the less-difficult 77% of the state (green). Our combined statewide total cost estimate equaled $77.3M

Dewberry


Yellow numbers are priorities provided to Dewberry
5 4 3 2 1
14 13 12
29 30 19 18 22 21
17 16 32 20 31 15
36 24 23 35 37
34
28 27 26 25
Pilot cells
70 km² overlap on both sides
Intermap Cells
Fugro Cells
147th meridian
JOA surveyed large number of checkpoints in forested overlap

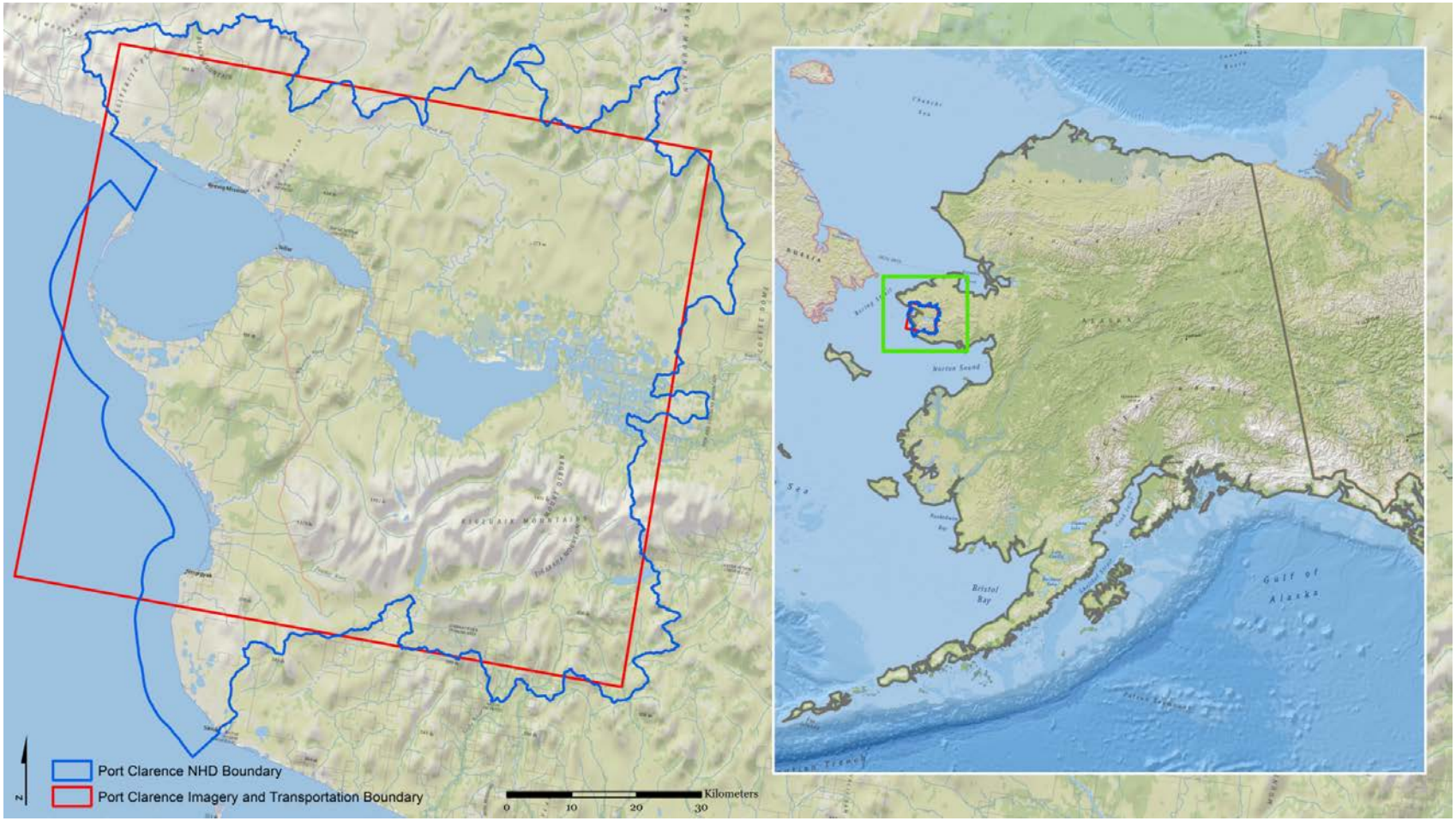
Satellite image draped over IFSAR – Mt. Hayes



Satellite imagery now fits IFSAR data from Intermap and Fugro

Dewberry

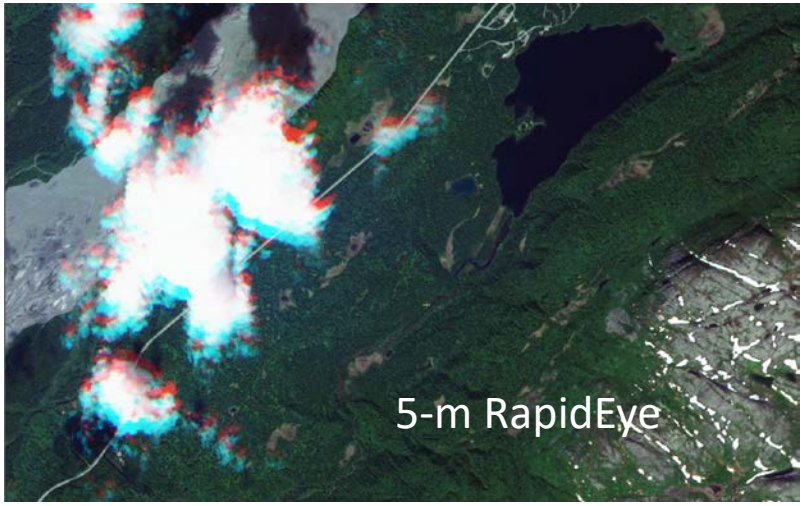
Port Clarence Hi-Res NHD & NHD Plus Pilot Study

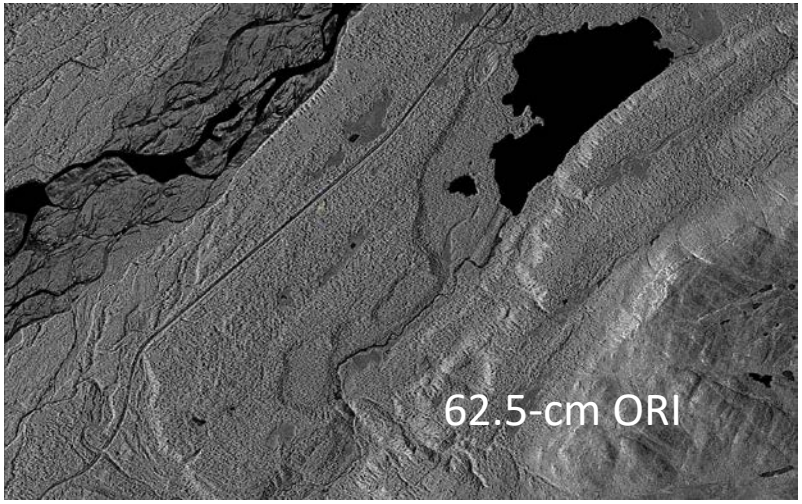


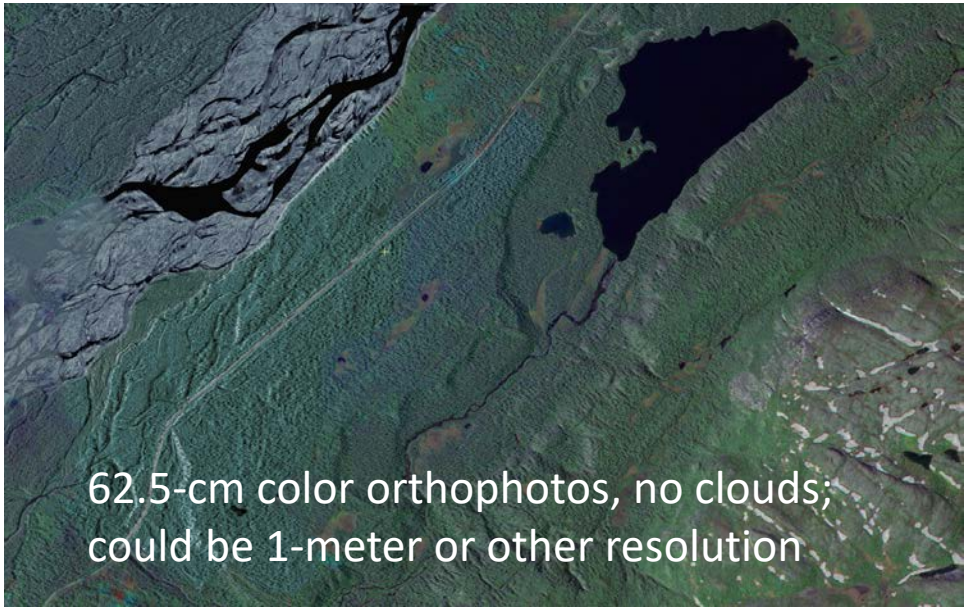
Used IFSAR for NHD, NHD Plus, transportation update & orthos

Dewberry

How to produce cloud-free hi-resolution color orthos





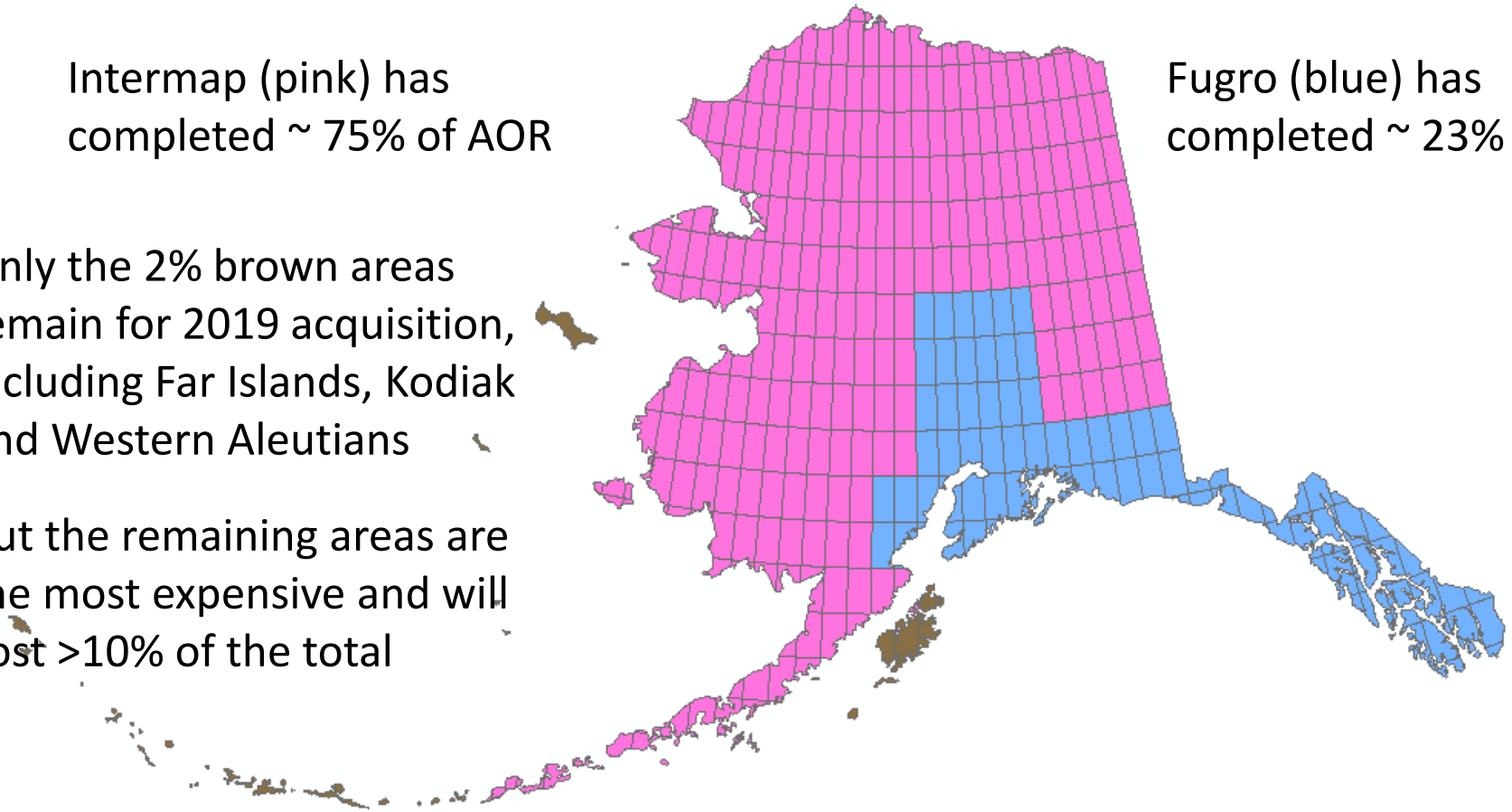


Dewberry

As of August 2018, 98% complete by area

Intermap (pink) has completed ~ 75% of AOR

Fugro (blue) has completed ~ 23%



Only the 2% brown areas remain for 2019 acquisition, including Far Islands, Kodiak and Western Aleutians

But the remaining areas are the most expensive and will cost >10% of the total

Dewberry

IFSAR Mapping Partnership Contributions

Land Ownership	% of Land Owned	% of dollars paid
State of Alaska	24.1%	21.44%
BLM	22.1%	5.25%
F&WS	21.1%	1.53%
NPS	14.1%	4.90%
AK Native Corps	10.5%	0.00%
USFS	6.0%	2.87%
Other Private	1.6%	0.00%
DOD	0.5%	3.86%
USGS	0.0%	54.20%
NRCS	0.0%	5.95%
TOTALS	100.0%	100.00%

To minimize costs and acquire data more cost-effectively, Fugro, Intermap and Dewberry acquired data on speculation, valued at nearly $17M (areas were subsequently funded)

We paid for lobbyists at state & federal levels

USGS knew to the penny what Dewberry paid its subcontractors

Total to date: $62.237 M, incl. USGS management fee

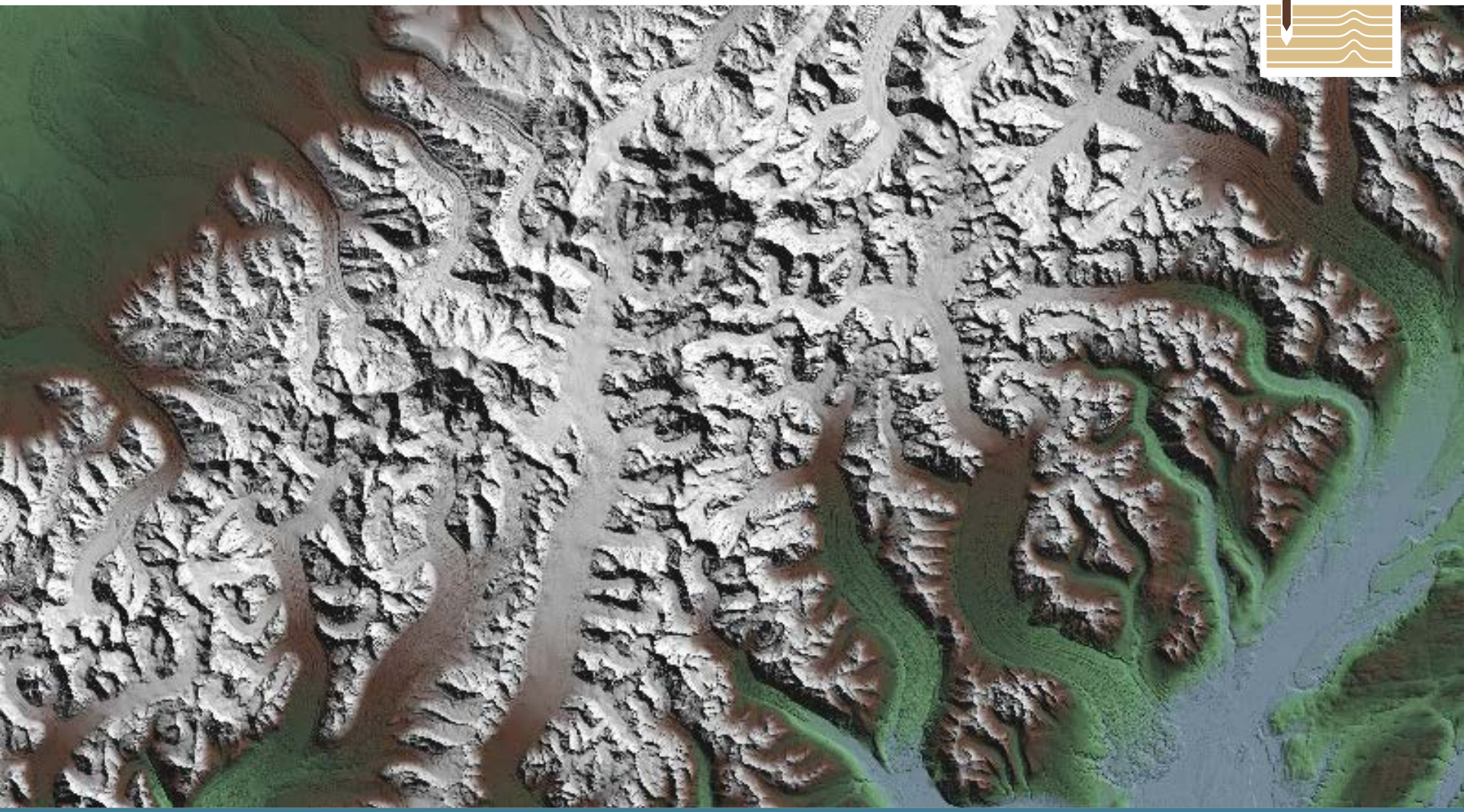
Dewberry

Cost Summaries

	Dewberry	USGS
2018 Cost to Date	$60.667 M	$62.237 M
2019 Type II, all Remaining Islands	$7.829 M	?
Estimated Total when Complete	**$68.496 M**	**?**

- Dewberry's 2009 Cost Estimate: **$77.300 M**, based on assumption of most efficient acquisition areas, which did not happen
- Even with large blocks acquired on spec, W. and E. Aleutians and Far Islands would have been less expensive if acquired in the same year, or in the same year as adjacent acquisition areas
- The Dewberry team is very proud of initiatives we have taken to minimize costs, every step of the way.

Dewberry

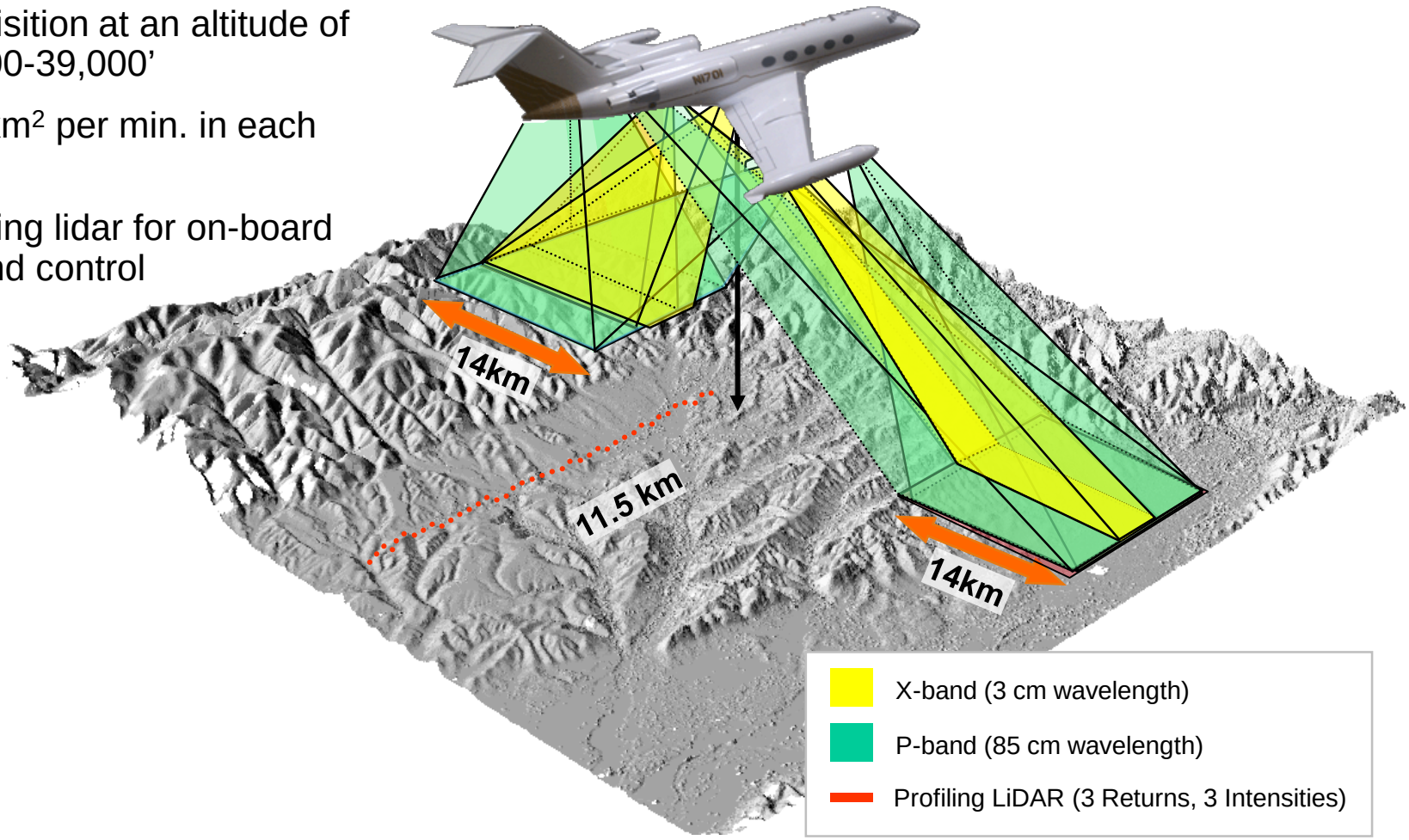


Statewide Digital Elevation Mapping Program

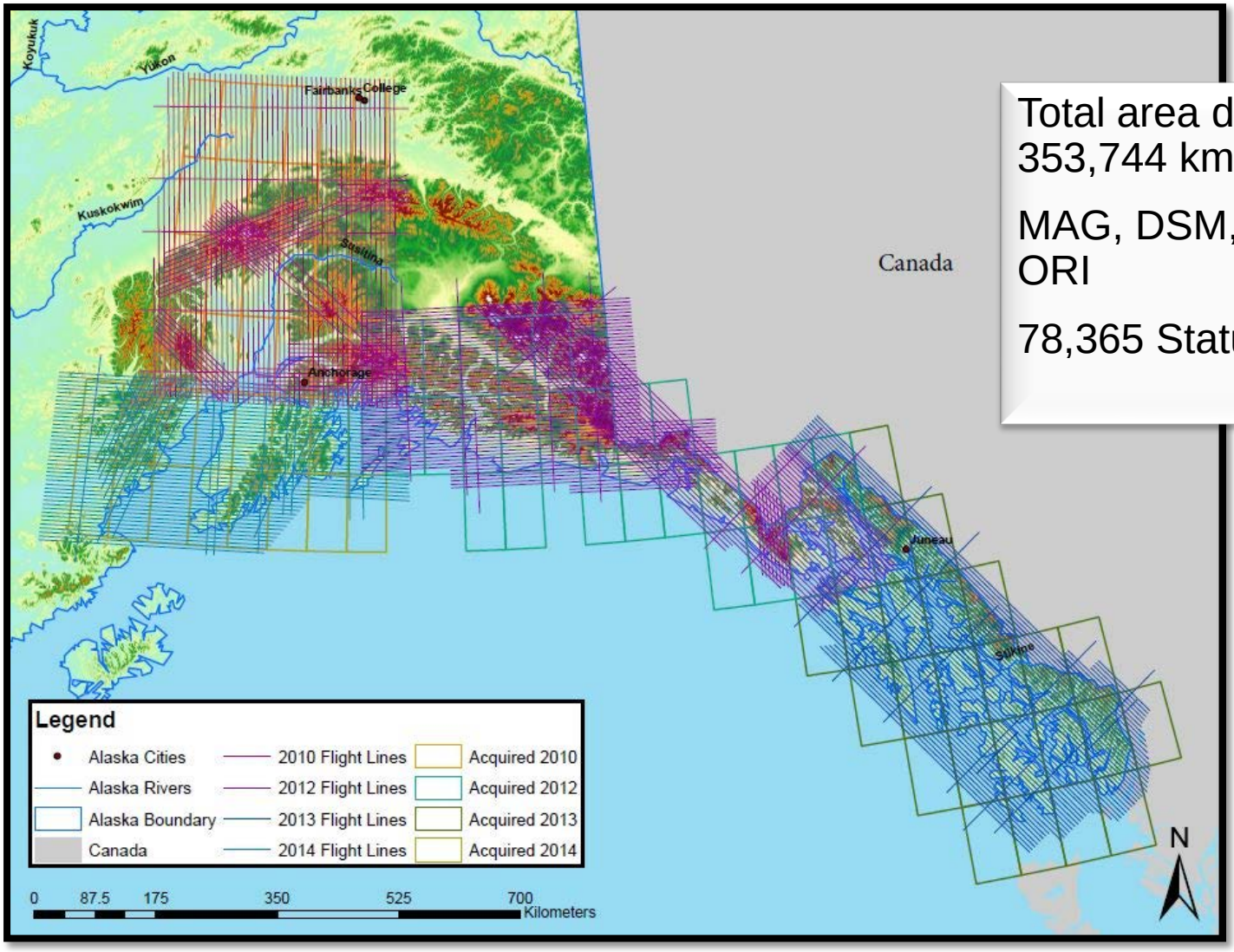
Alaska Mapping Executive Committee, August 2018

Dual Band, Dual Sided IFSAR

- Simultaneous collection from both sides of the aircraft
- Acquisition at an altitude of 32,000-39,000’
- 288 km^2 per min. in each band
- Profiling lidar for on-board ground control



Areas Mapped – Most Difficult Terrain



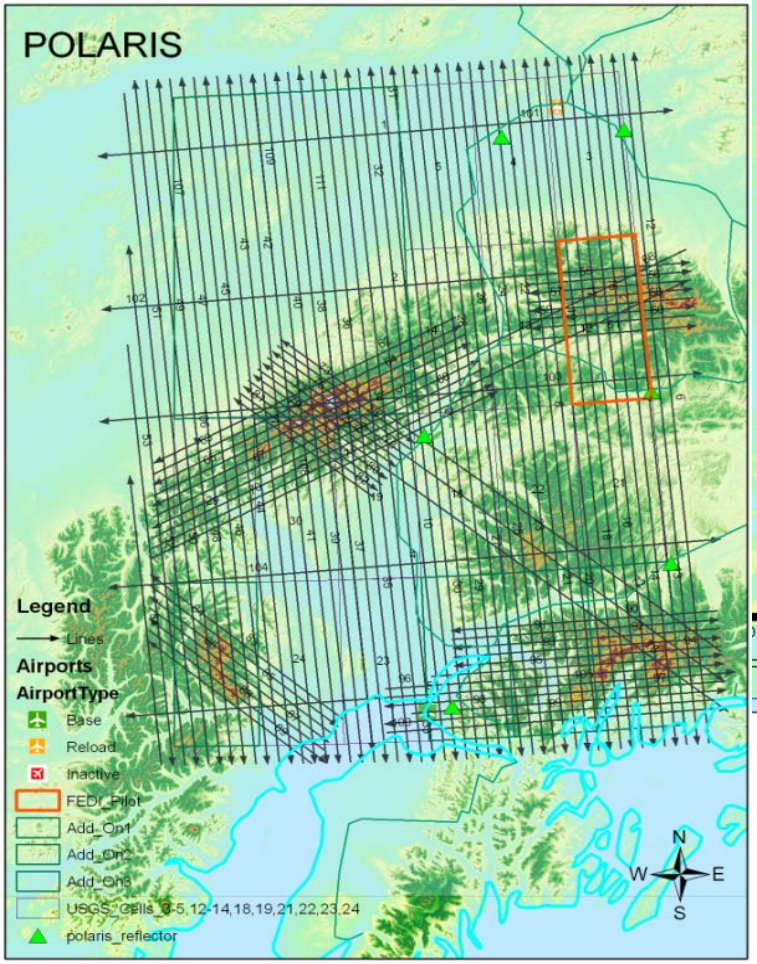
Total area delivered: 353,744 km^2

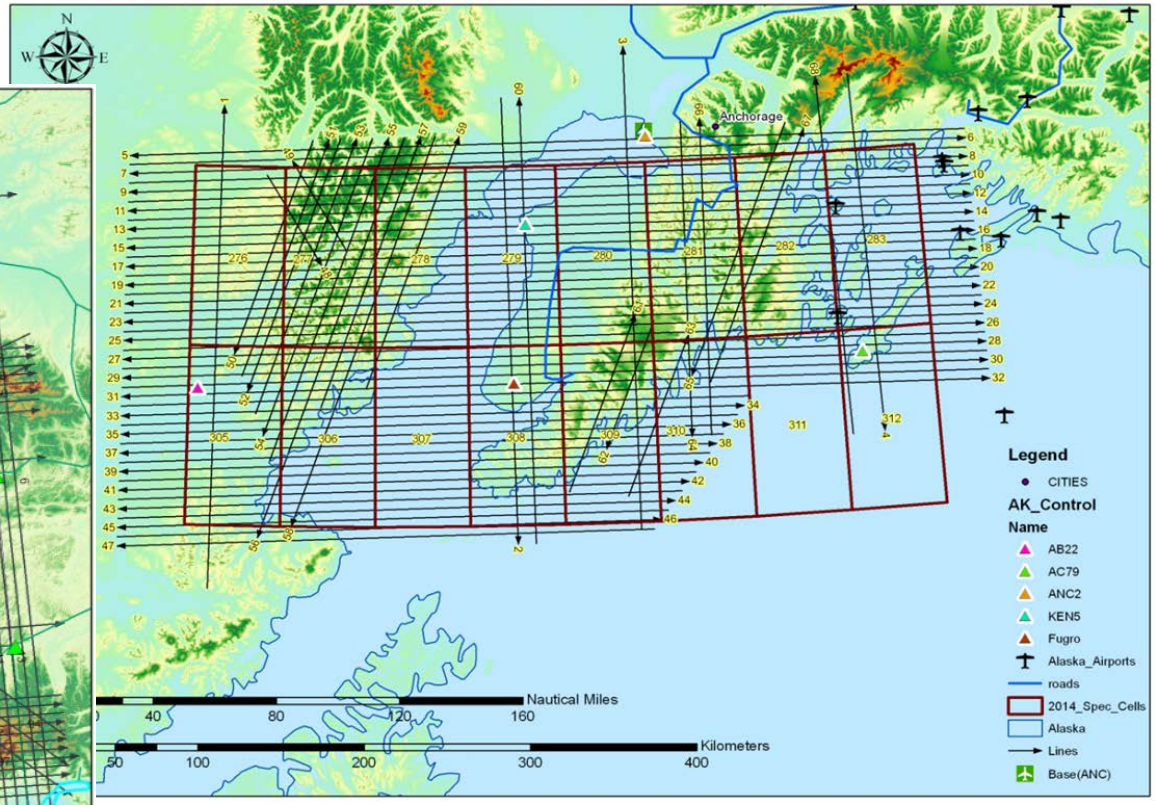
MAG, DSM, DTM and ORI

78,365 Statute Miles

Sophisticated Flight Planning

Southcentral Alaska (2010)





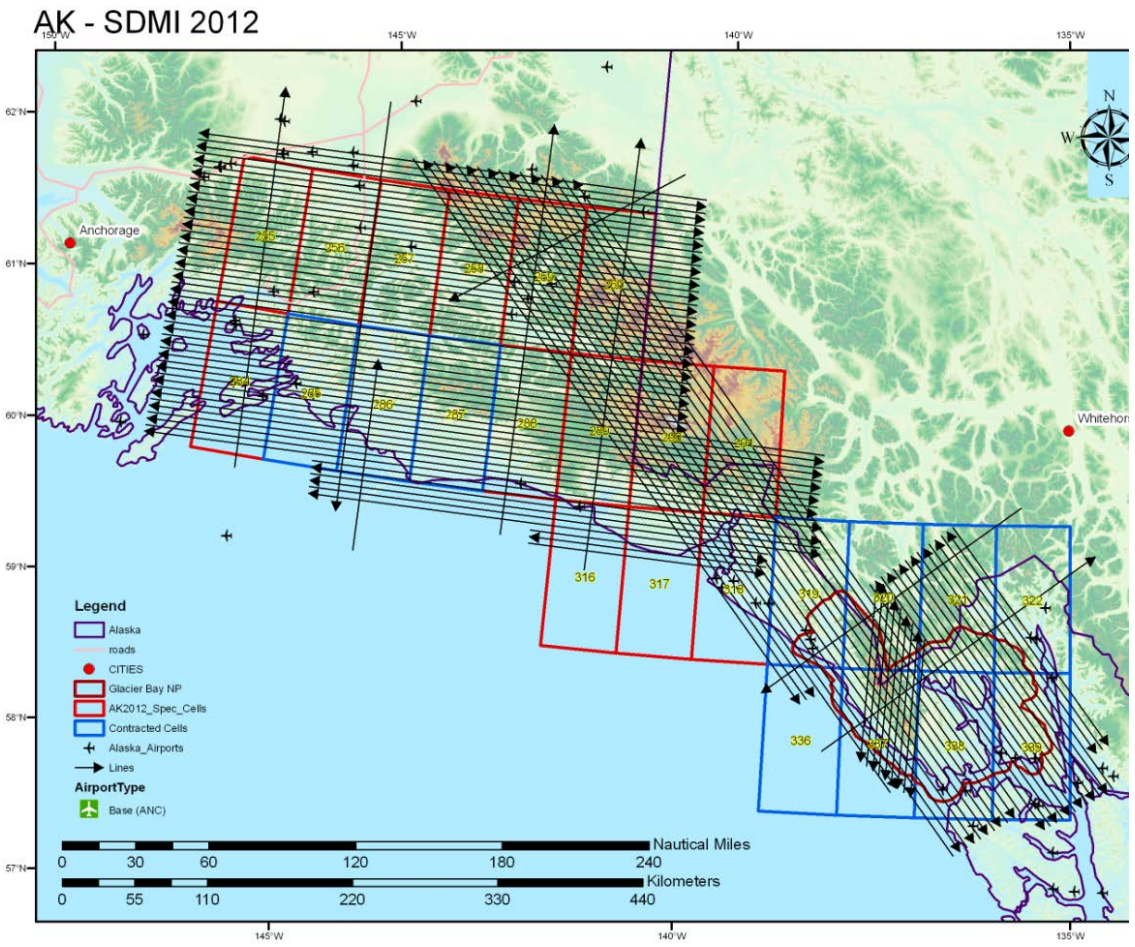
Kenai Peninsula, Alaska (2014)

Success Stories – Partnership

1. Collected on Spec
   - Efficient flight plan
   - Temporal continuity
   - Lowest cost possible
   - $ 10M Fugro outlay

2. Stakeholder Engagement
   - Identified funding partners
   - Educational outreach
   - PR & Lobbying

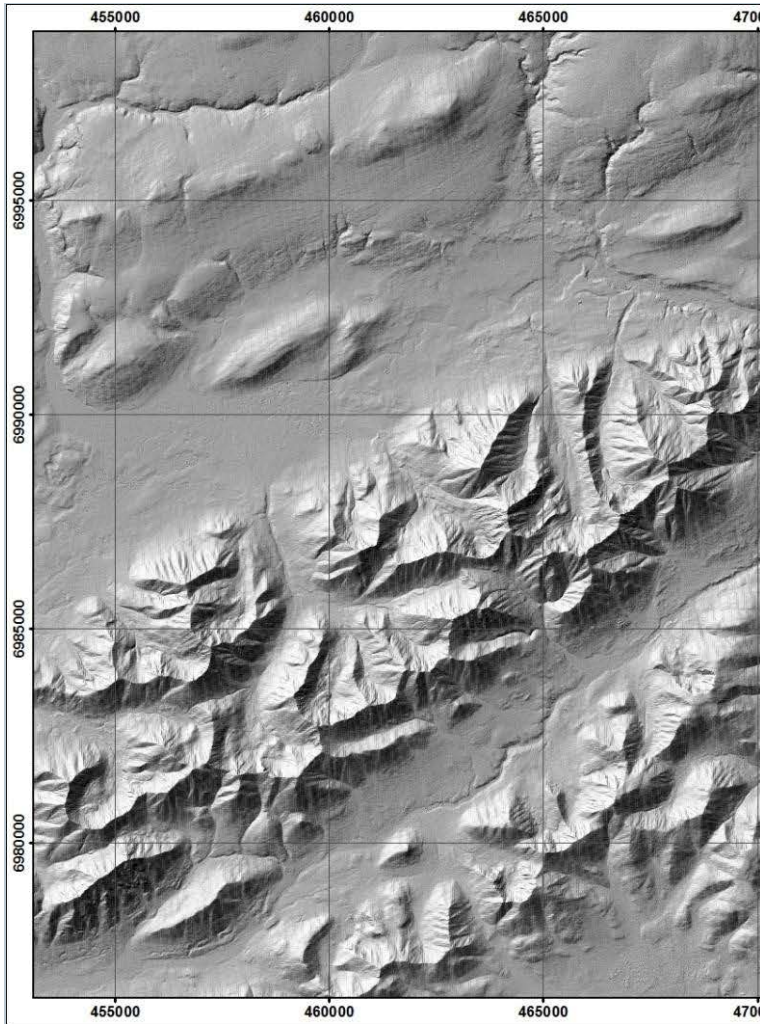
3. Contracting and Budgeting
   - Lowest possible pricing
   - No escalations – fixed
   - Predictable budget planning



Blue cells represent the original tasking; red cells represent over-collects

Success Stories

- **Search and rescue:** F-22 Raptor Crash in 2010. Fugro provided unscheduled emergency delivery of IFSAR data to help assess avalanche danger for recovery crews. The data proved essential in assessing potential avalanche danger for recovery crews on the scene.
- **Ice thickness mapping:** While mapping in high elevations and over glaciers, Fugro determined that P-band radar could penetrate deep into snow and ice. This discovery led to a new mapping capability developed in partnership with oil and gas majors and the University of Alaska Fairbanks to characterize ice type and thickness for engineering purposes, safety of offshore operations, and scientific pursuits.



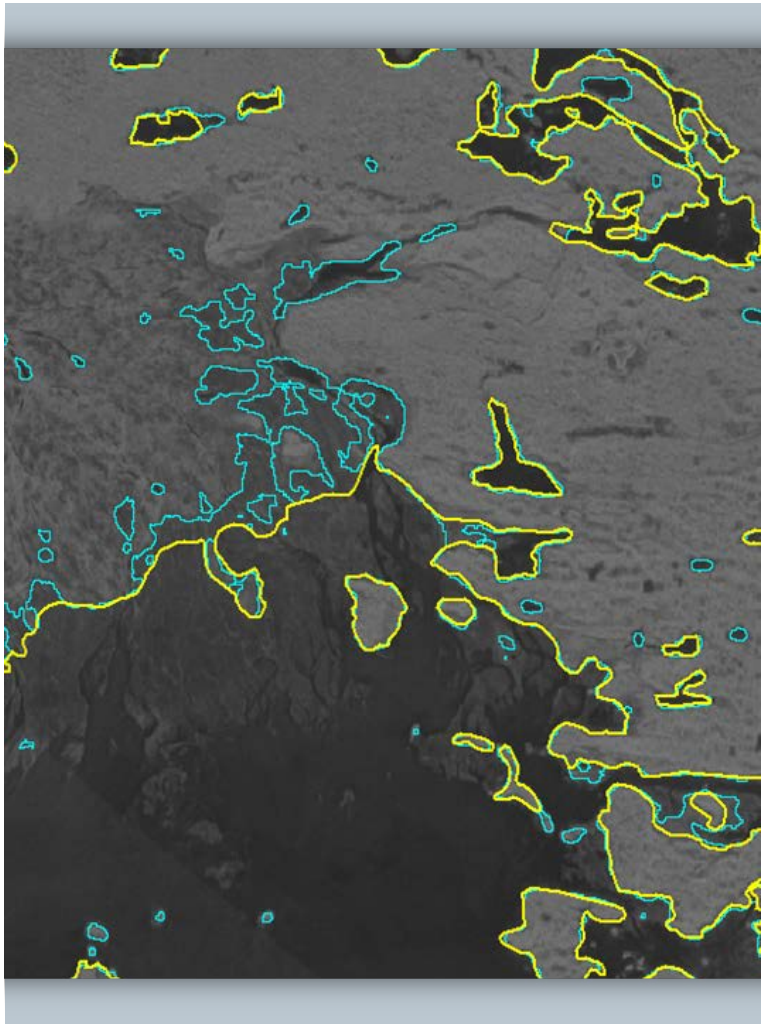
Recognition of Excellence

Based on the ice thickness mapping technique born from the Alaska elevation mapping program, Fugro won the 2015 Governor's North Star Award for International Excellence in the category of scientific exchange. The year prior, Fugro was awarded a Spotlight on Arctic Technology at the annual Arctic Technology Conference.

More Value To Be Explored

New application of existing data

1. Intertidal zone topography from existing raw data can be extracted and used to improve coastal zone dataset
2. X- and P-band data can be made available for further ice thickness analyses over some of the most important glaciers and icefields in the world
3. P band ORI can be used to search for downed aircraft or other archeological objects in forested areas.
4. Tighter hydro specification can be compiled from existing data



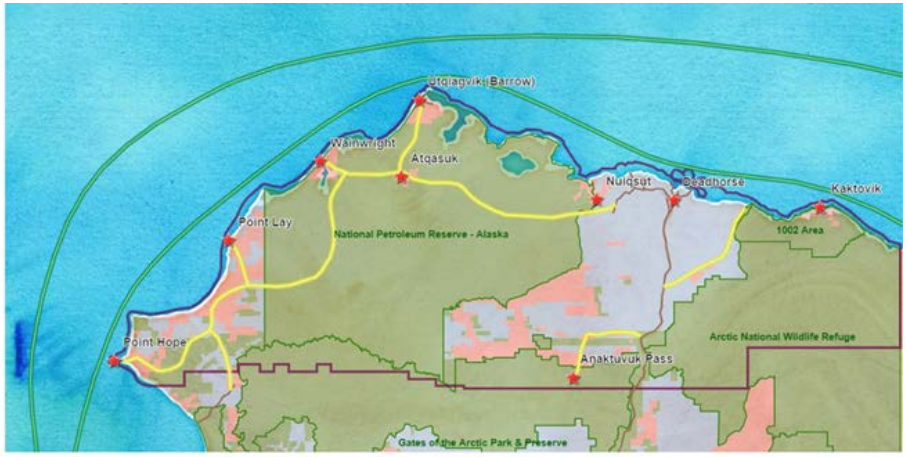
FUGRO

5761 Silverado Way, Suite O
Anchorage, AK 99518
907 561 3478 / akprojects@fugro.com
www.fugro.com
Rada Khadjinova, Alaska General Manager

What's next?

Near term data needs:

1. Oil and Gas industry
2. Transportation infrastructure
3. Coastal zone



State of Alaska ASTAR Project

Alaska's North Slope – Home to one of the largest oil fields in North America

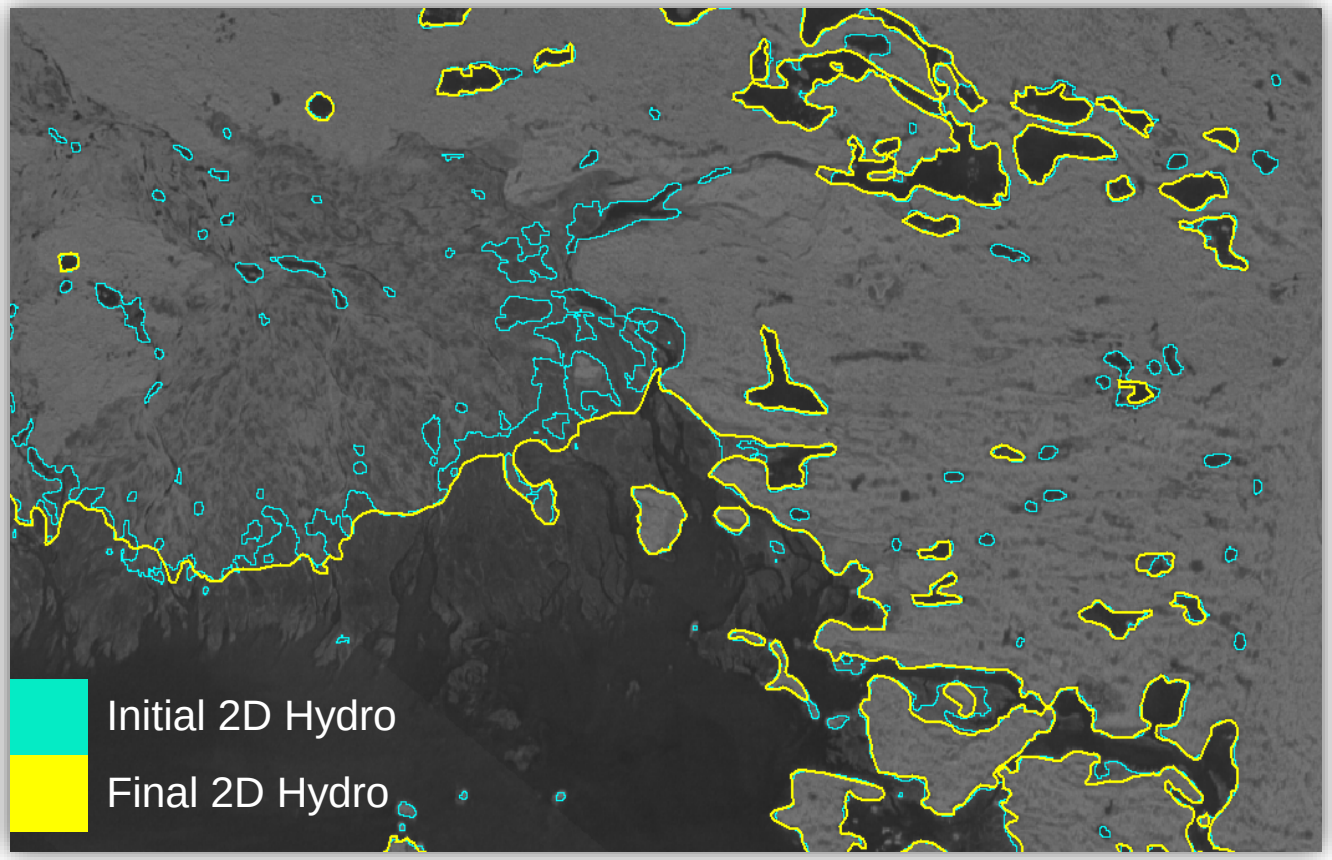
Alaska Mid-Accuracy DEM: Hydro Specification

Feature Types

- Lakes
- Streams
- Islands
- Ocean

Challenges

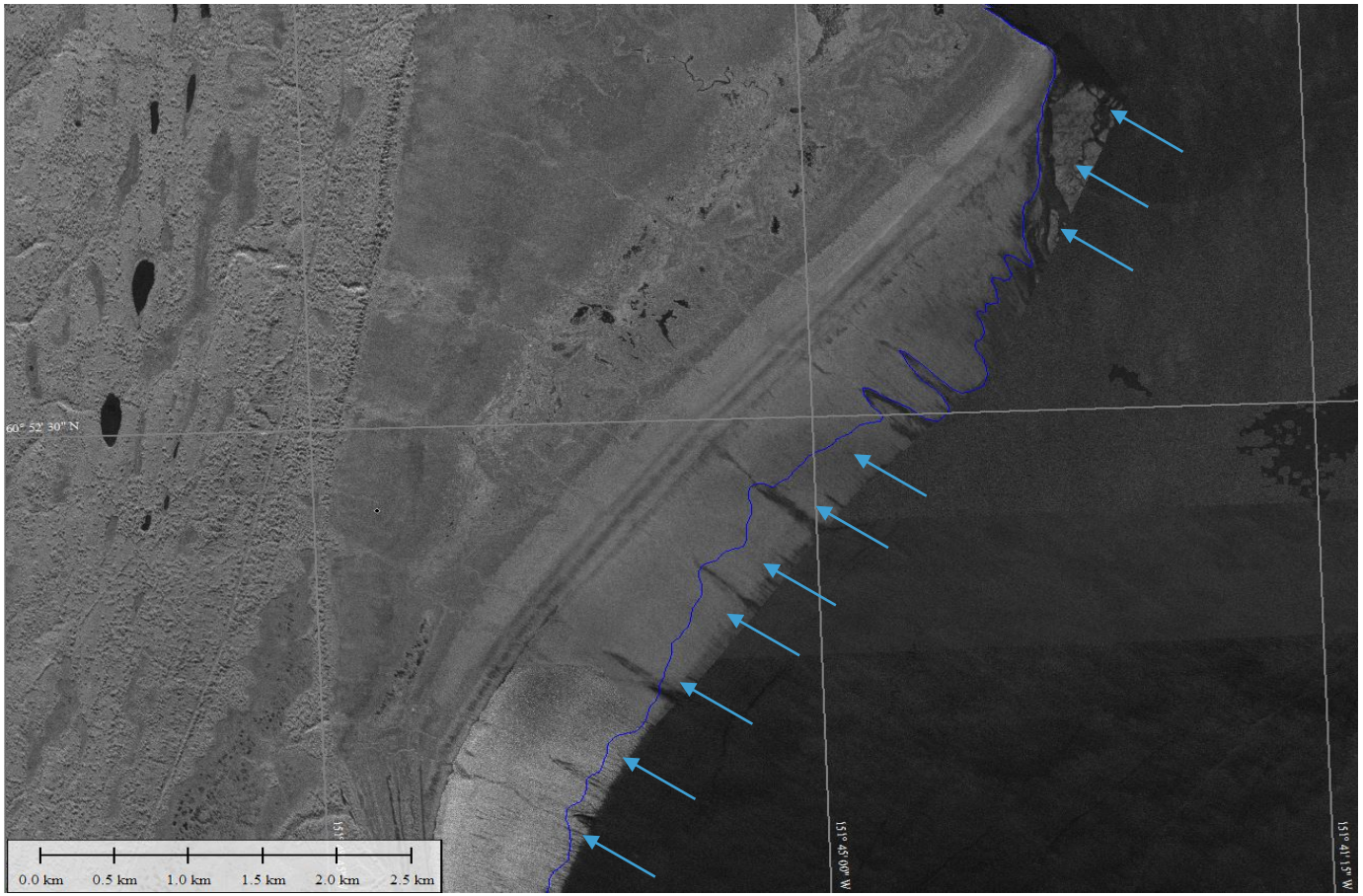
- Missing features
- Misalignment
- Speckle/Noise
- No Tide Spec



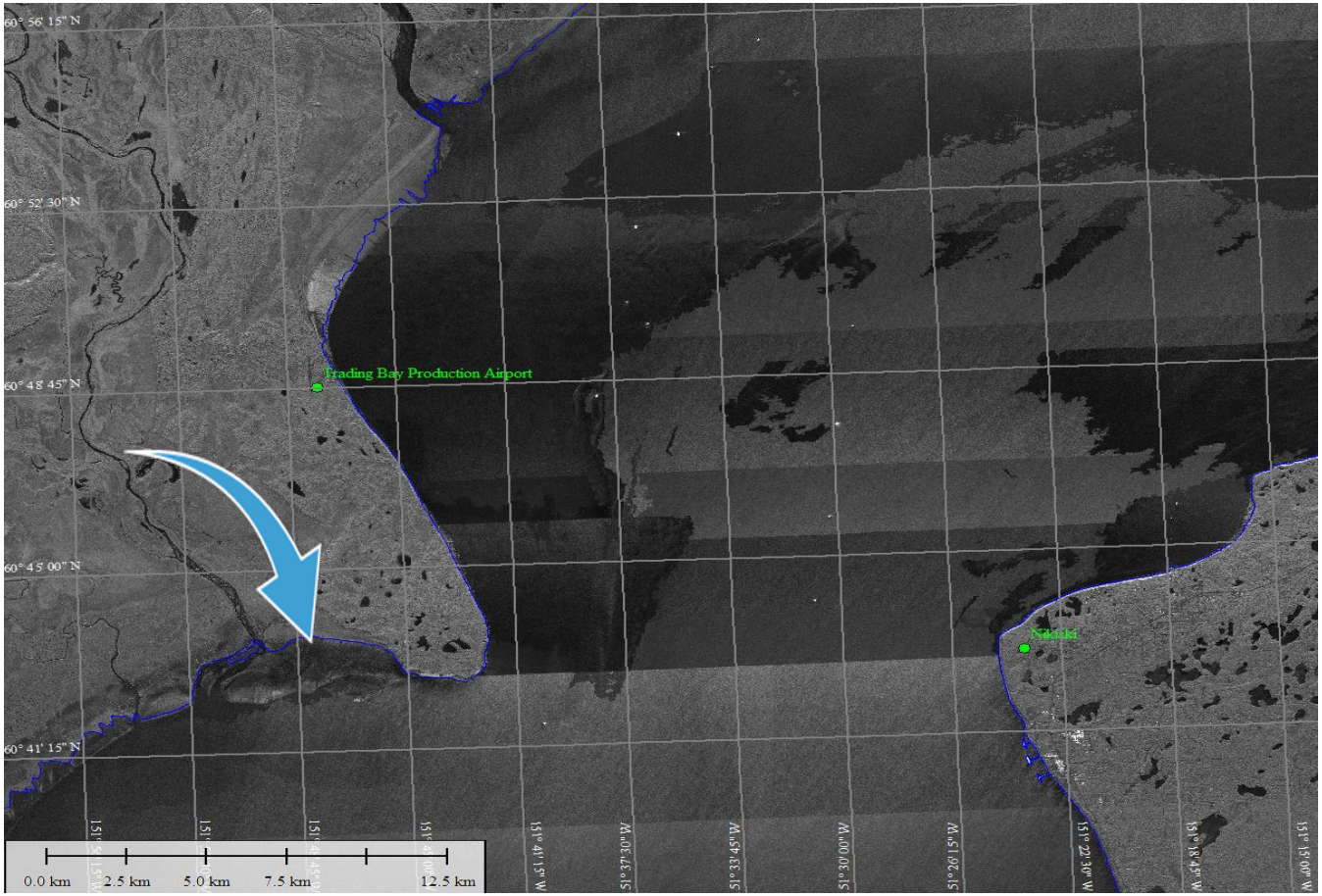
USGS Hydrological Feature Collection specifications:

- Lakes > 7500 m^2 (150 m x 50 m); Lakes > 2500 m^2 (50m x 50m)
- Streams collected as double line drain if at least 50m wide for an extent of 300m or 30m wide for length of 300m;
- Ocean set at zero elevation

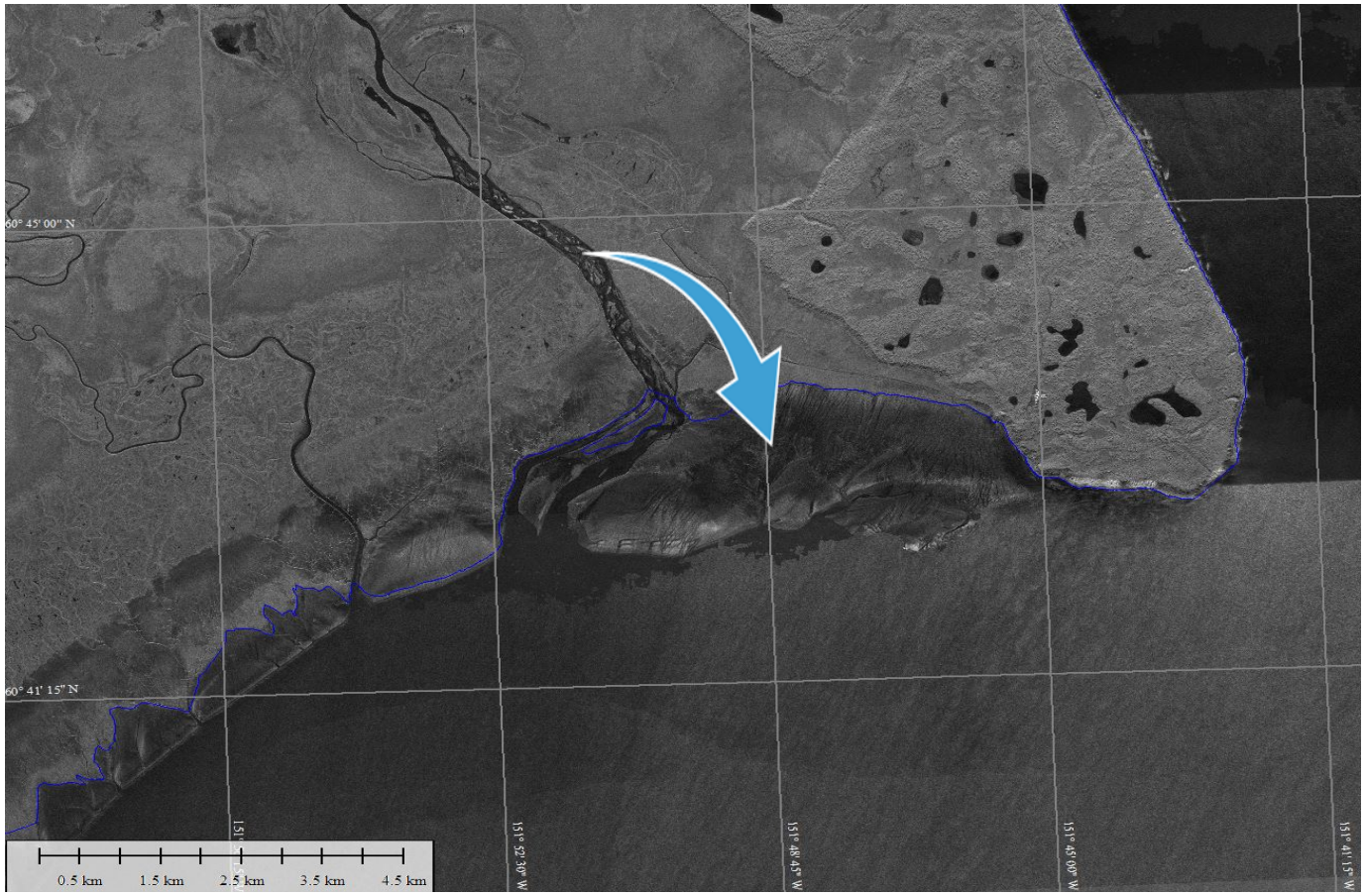
Alaska Mid-Accuracy DEM: High Tide vs Low Tide Shoreline Collection



Alaska Mid-Accuracy DEM: Shoreline flattened and intertidal zone deleted



Alaska Mid-Accuracy DEM: Shoreline flattened and intertidal zone deleted



Cultural Feature Detection and Analysis

Alaska IFSAR Mapping – Results and Reflections 2008-2018

Alaska Mapping Executive Committee

Ian Wosiski, Managing Director, National Sales
iwosiski@intermap.com
August 29th, 2018

About Intermap

- Headquartered in Denver, Colorado
  - Engineering office in Calgary, Canada
  - Europe office in Prague, CZ
  - Data Finishing in Jakarta, Indonesia

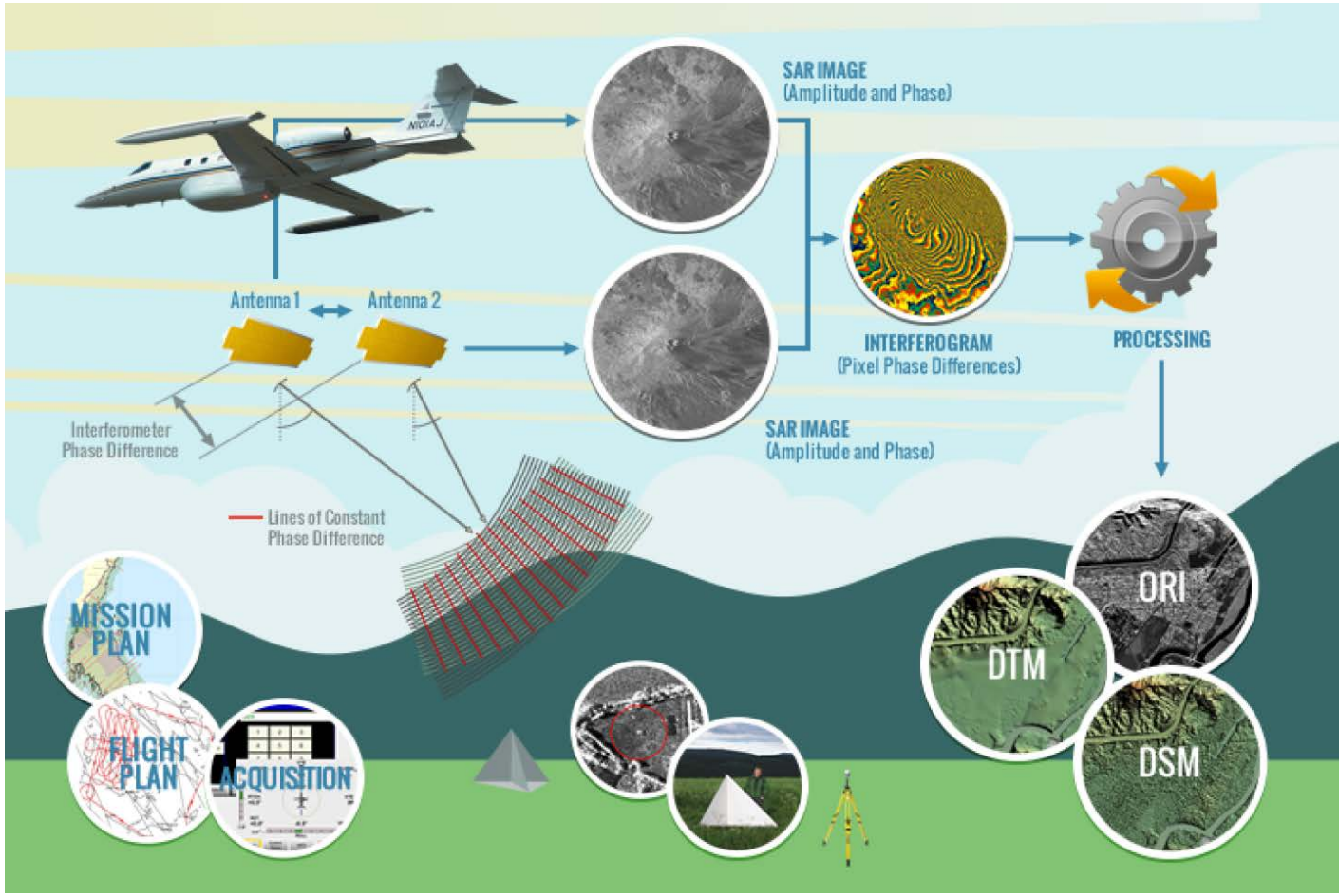
- World leader in geospatial intelligence solutions
  - Founded in 1997 - Decades of experience in spatial services
  - High accuracy imagery and elevation data
    - X-Band IFSAR, P-band SAR, LiDAR, & Data Fusion
  - Over 15,000,000 sqkm of IFSAR data collected
  - Successful operations in over 40 countries

37

High-Volume Airborne IFSAR Mapping

Intermap has developed a rigorous production Enterprise Work-Flow controlling every step from flight planning to final deliverables QAQC.

This enables high volume production of standardized core products that meet and exceed USGS AK specifications.



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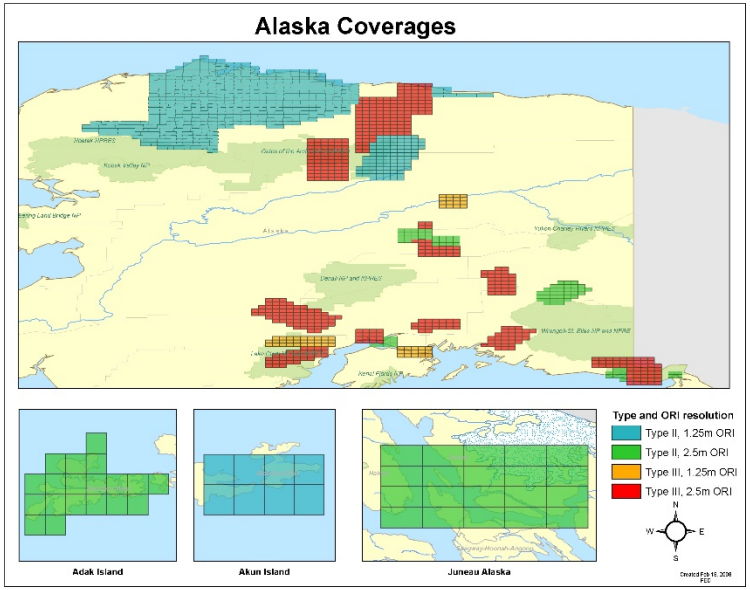
Intermap's Alaska Mapping Legacy

- Intermap's initial mapping missions in Alaska began in 1998-2006 for NASA and NSF.
- These data were collected using early iterations of Intermap's proprietary X-Band IFSAR sensors and Enterprise Workflow.
  - Early projects were Type III DSM only, with 2.5m pixel resolution ORI
  - Later projects included Type II DSM & DTM, with higher resolution 1.25m pixel ORI.
- By 2006, over 230,000 sqkm of AK IFSAR data were collected, processed and delivered to NASA and cooperating agencies
- These "Legacy Data" were included, at no charge, in our initial 2010 deliverables to USGS under the Alaska Mapping Initiative



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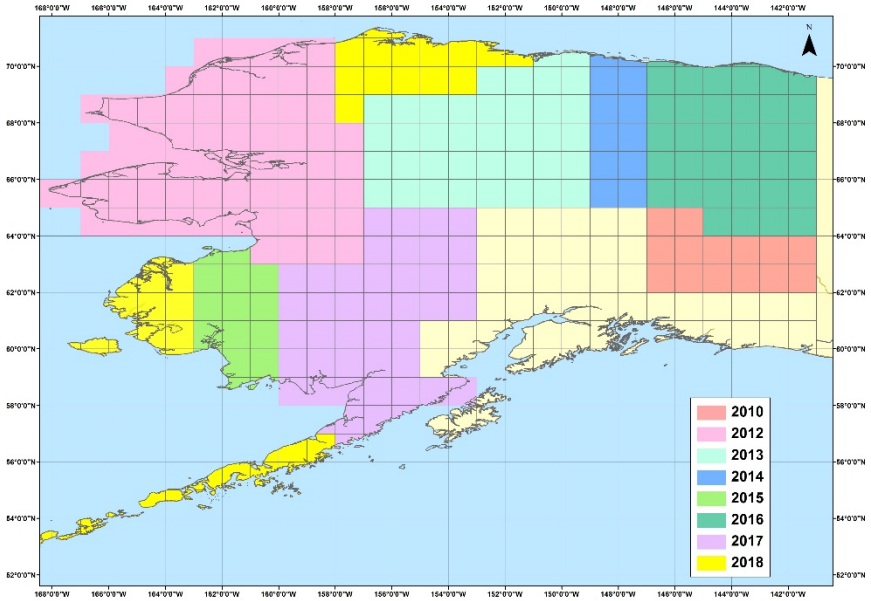
AK IFSAR task orders 2010-2018

Since starting USGS 3DEP Alaska IFSAR operations in 2010, Intermap has successfully collected:

- 1,163,188 sqkm of ORI, DSM and DTM data covering ~75% of the State
- Flying over 355,400 line km in total, producing 289 1-degree cells
- This required 321 sorties, with an average data acceptance rate of ~85%



2010-2018 AOIs

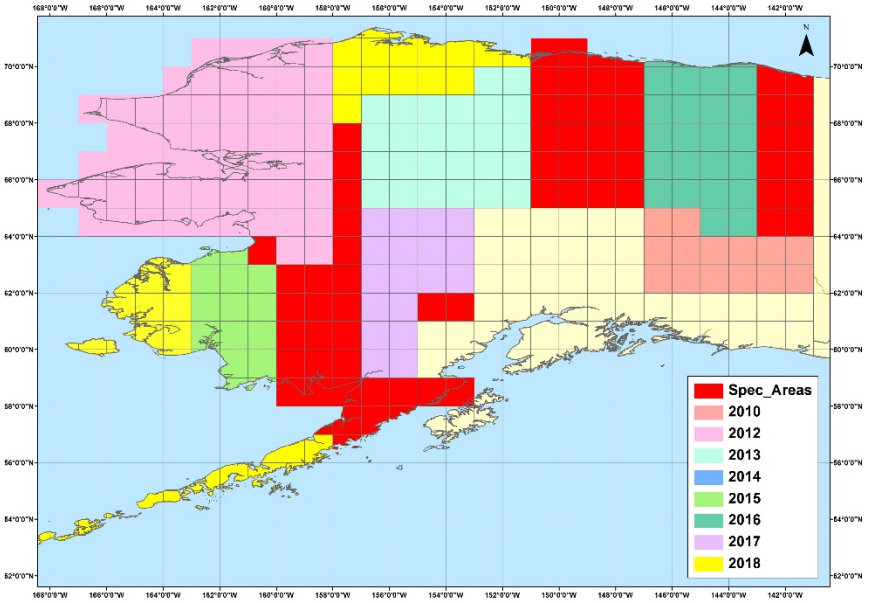
40

Intermap Spec Cells 2010-2018

By working closely with our trusted partners in Alaska, Intermap was able to take calculated risks associated with speculative acquisition, thereby maximizing efficiency of short collection seasons and reducing overall program costs.

The 69 spec cells shown in red were collected prior to receiving formal task orders.

Total Area: 201,781 sqkm.
Total value: ~$7,000,000



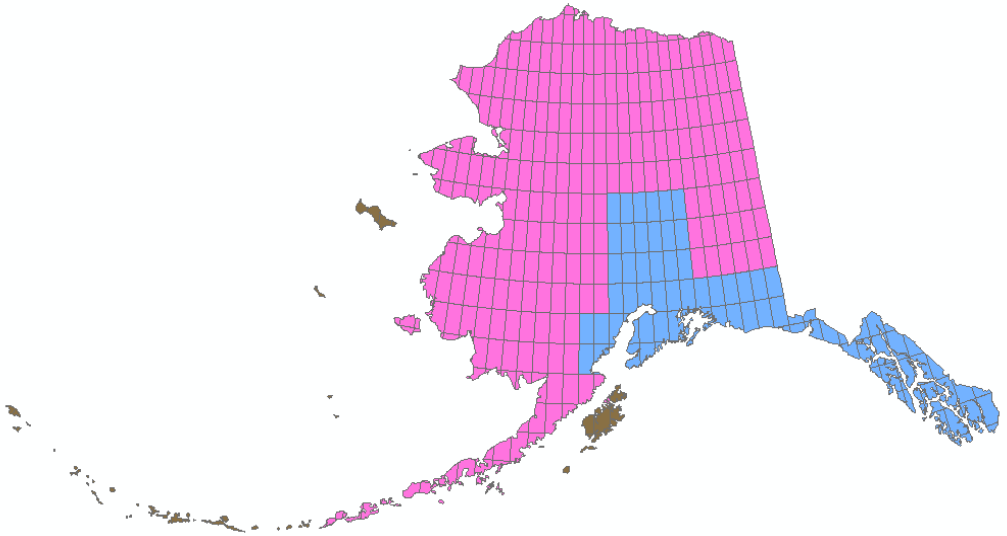
2010-2018 AOIs, with spec cells in red

41

To date, Intermap (pink) has completed ~75% of the State, with delivered data far exceeding contract accuracy requirements:

Based on Dewberry's 3rd party QAQC of Intermap's delivered data, using hundreds of QAQC checkpoints:

- Intermap's tested RMSEz = 0.55m
- LE90 = 0.89 m at the 90% confidence level (compared with 3m specification)
- ACCz = 1.06m at 95% confidence level

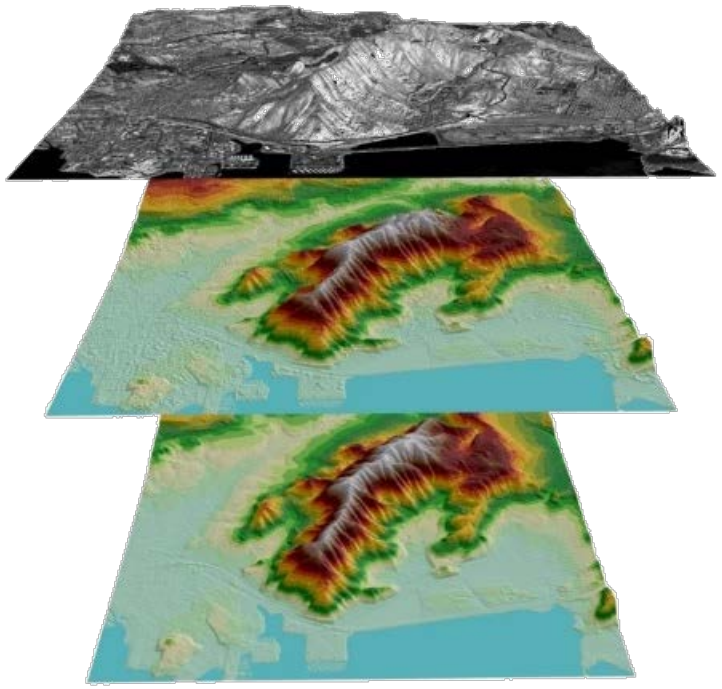


Only the 2% brown areas remain for 2019 acquisition, including Far Islands, Kodiak and Western Aleutians

42

Key factors of success

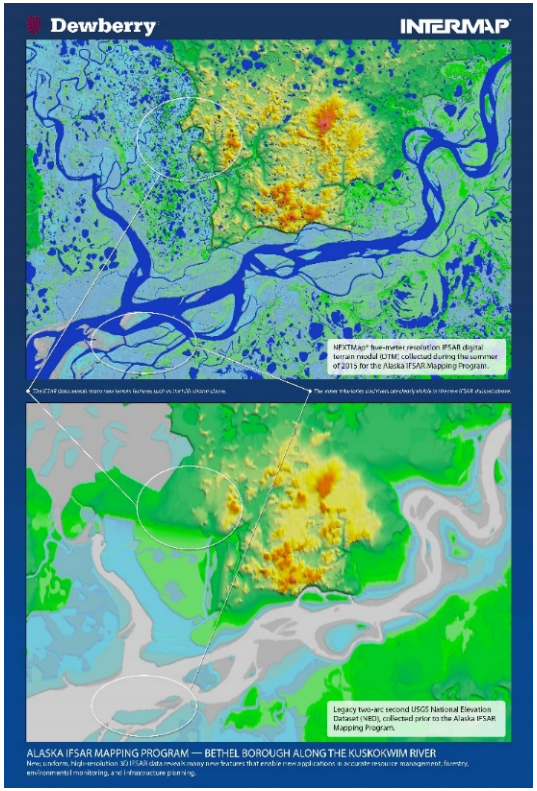
- Delivering standardized products, that exceed USGS specs, using a rigorous ISO 9001:2008 certified Enterprise WorkFlow incorporating QAQC at every step of the process.
- Experienced, well trained staff who have delivered over 15M sqkm of IFSAR data in 40+ countries.
    - A majority of Intermap's staff on Alaska task orders have been working on the program since 2010.
- Continual investment in R&D to enhance:
    - Sensors
    - IP Processing
    - Edit Tools
    - QAQC
    - Data finishing



43

Additional factors of success

- Two high altitude jet aircraft, providing redundancy
- Automation of radar operation, aspects of IP processing, mosaicking, and data finishing.
- Enhanced tactical flight planning tools and DTM editing tools developed iteratively over time
- High collection rate - 12km swath width coupled with ultra-long flight lines up to 1,200km
- Exceeding contract specifications with standardized products:
  - Data delivered on time, often ahead of schedule
  - Data passed fundamental accuracy tests on first delivery
  - ORI with 62.5 cm resolution, exceeding 5m contract spec
  - DTM tested vertical accuracy of 0.89m LE90, exceeding spec
  - Detailed hydro vectors far exceeding the contract spec, which can be further refined by Intermap to meet NHD+ specifications statewide

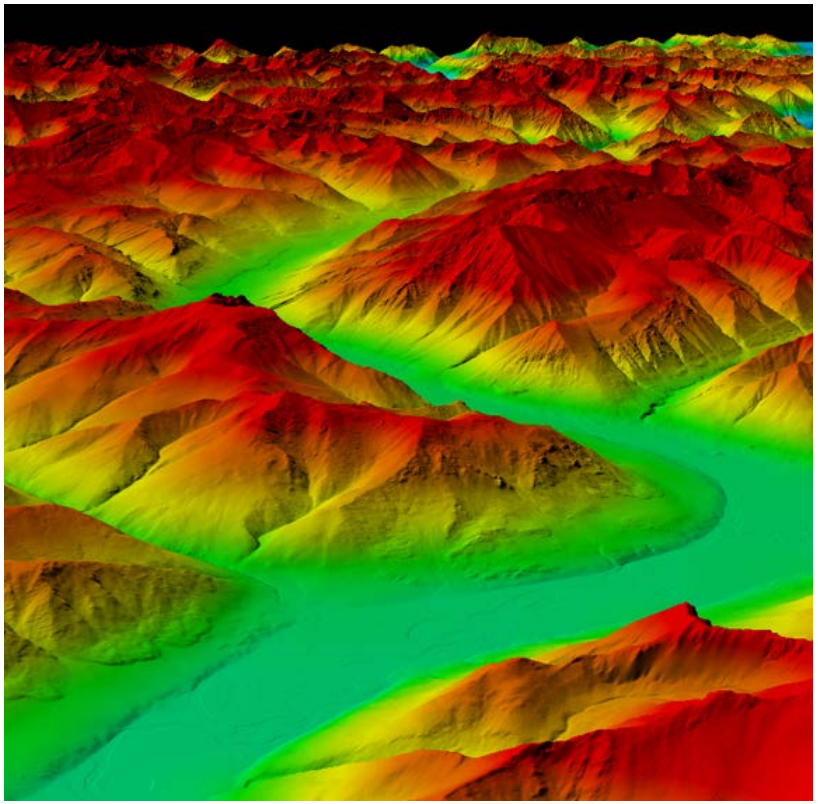


New IFSAR and hydro vectors (top) vs. old NED (bottom)

44

The key factor of our success – Trust

- Trust, communication, and coordination have been critical to the success of this team and this program.
- Our trusted partnerships and close coordination with Dewberry, USGS, and stake-holders allowed us to take calculated risks, collecting over 200,000 sqkm of data speculatively.
- The use of Fly&IP tasking also allowed us to capture maximum data per season, using task order options and end-of-year funds to complete Processing & Delivery of Fly&IP cells
- Without deep trust and coordination, these approaches would not have been possible.



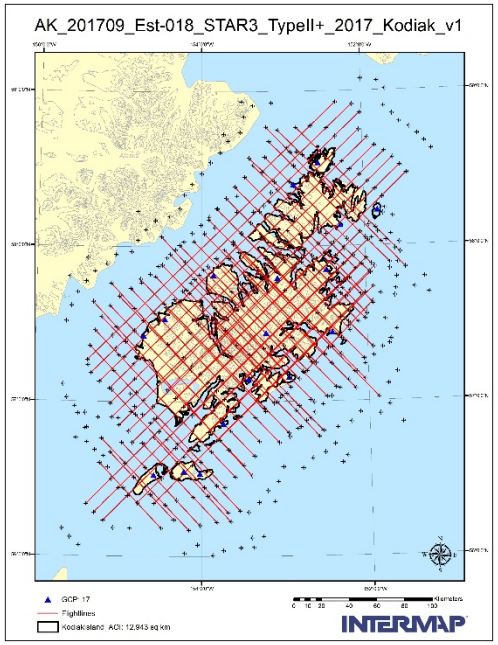
45

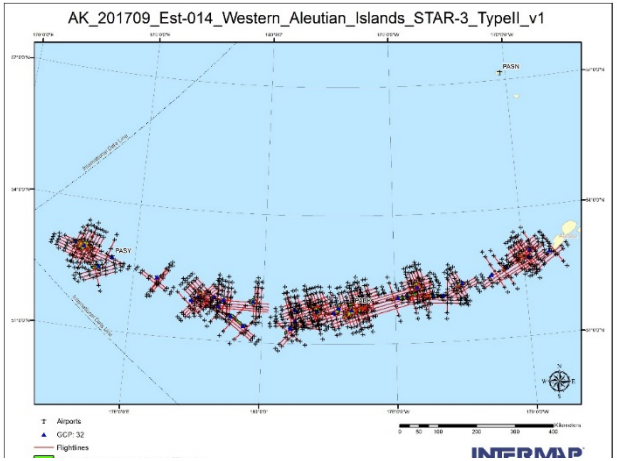
2019 Planning is well underway for the remaining three AOIs to complete the State

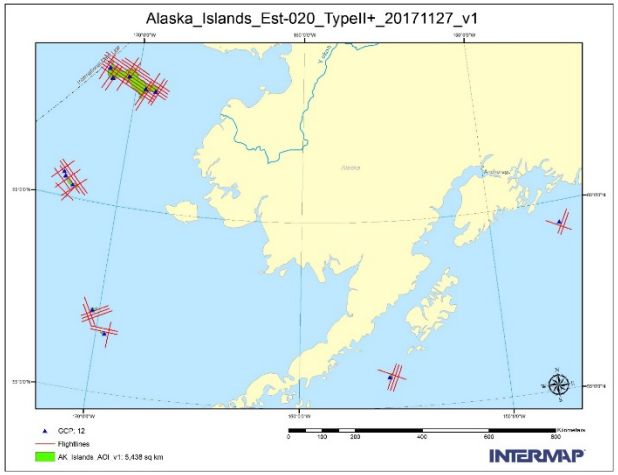
Kodiak Island:
- 12,943 sqkm
- 17 GCPs

Western Aleutians:
- 6,778 sqkm
- 32 GCPs

Six Remote Islands:
- 5,438 sqkm
- 12 GCPs







46

Thank You

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State of Alaska Mapping Priorities

Imagery Refresh, facilitates:

- ✓ Terrestrial Hydrography
- ✓ Coastal Mapping

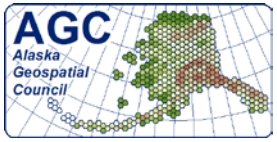
Imagery:

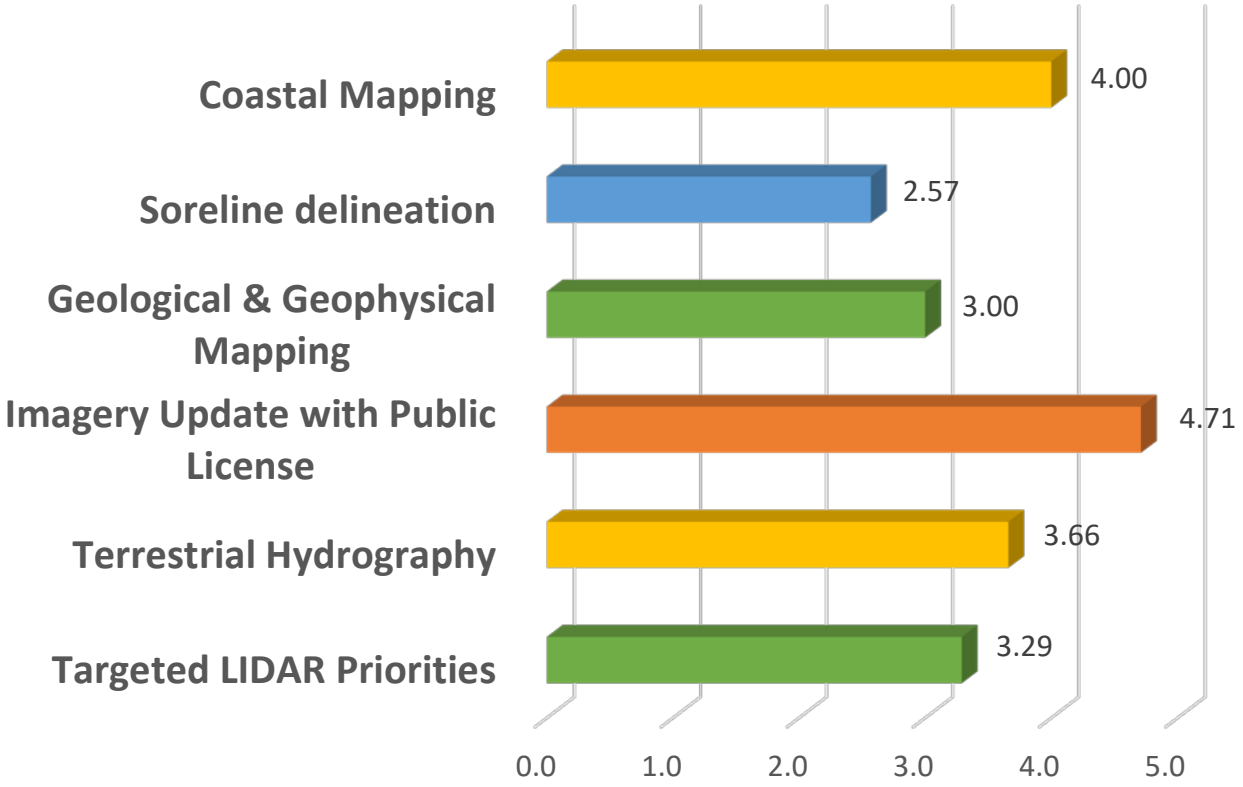
- Public license
- Resolution
- Refresh rate

Additional suggestions:

- ❖ Hazards mapping
- ❖ Cadastral

8 of 11 AGC members responded



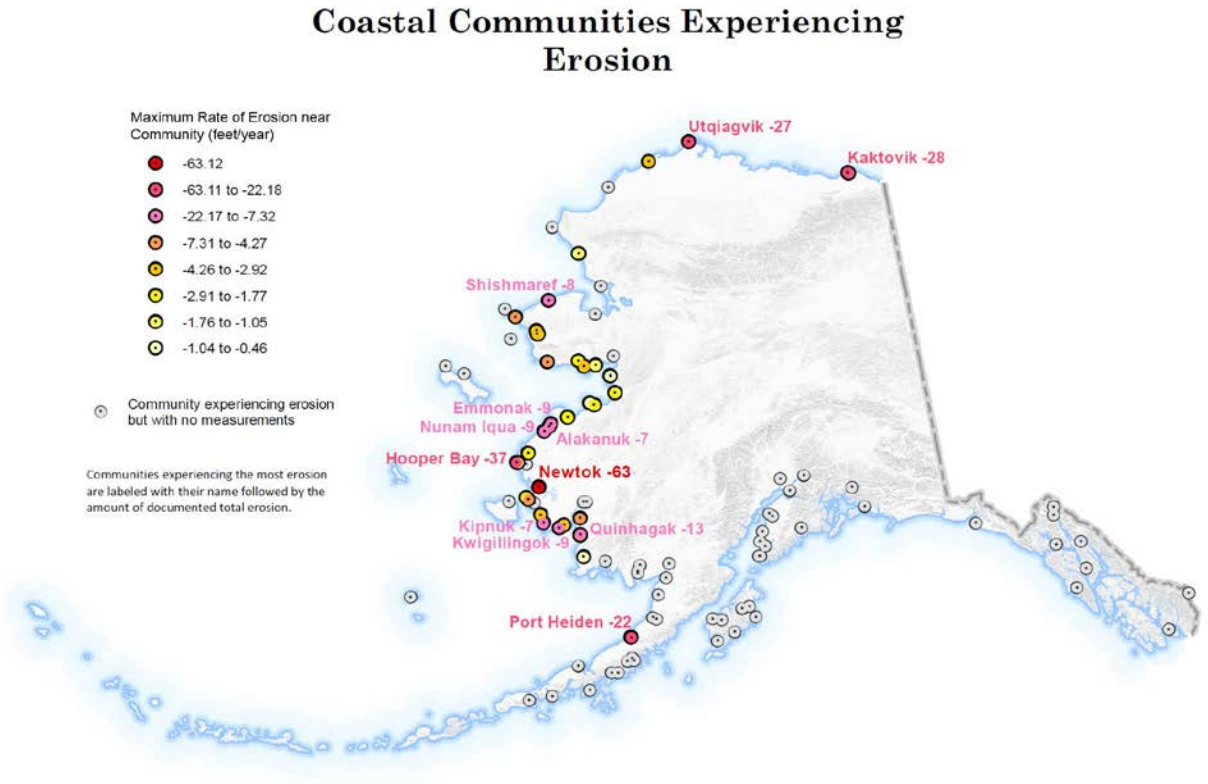


Coastal Mapping

- ✓Shoreline topobathy (include major rivers)
- ✓Detailed ortho imagery

- Shoreline change rates
- Storm surge forecasting
- Tsunami modelling

➢ Community Resilience

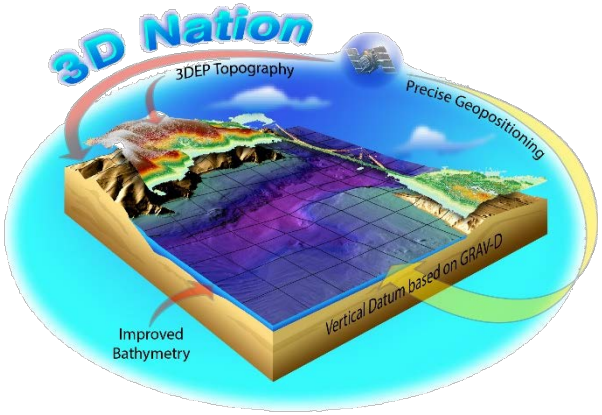


Alaska Regional Coordination

- Stakeholder relationships have been key to success
  - Federal partners, state, and boroughs important sources of requirements and collaborative solutions
  - Alaska Coastal Mapping Summit, Alaska Surveying and Mapping Conference, Alaska Geospatial Council
- New developments
  - DOI strengthening regional management model – Alaska Cooperative Planning Group remains a key convening body
  - New co-chair role in NOAA supported by quarterly meetings between USGS and NOAA at national and regional levels
  - US Arctic Research Commission recently stood up monthly meetings to coordinate scientific research efforts across Feds
- Discussion
  - Reviewing priorities for work beyond IfSAR/DEM/Topo completion – Hydrography, Imagery, Coastal, Refresh cycle
  - Other opportunities for leveraging partnerships and assets

3D Nation Elevation Requirements and Benefits Study

August 29, 2018



Mapping a 3D Nation from the tops of the mountains, to the depths of the seas, to include our inland rivers and lakes.

USGS science for a changing world

The National Map
Your Source for Topographic Information

Dewberry

Interagency Working Group on Ocean and Coastal Mapping

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

Study Phases - Timeline

Information Gathering Phase

Follow on Study Tasks

Study Preparation
(7 months)

- Study Design
- Questionnaire Development
- OMB Approval

9/2017 – 3/2018

Initial Data Collection
(8 months)

- Identify Fed POCs/ State Champions
- Questionnaire Open
- Summary Reports for Interviews/ Workshops

1/2018 – 9/2018

Data Validation
(5 months)

- Conduct Interviews/ Workshops
- Validate Interview Results (Reports & Geodatabase)

9/2018 – 1/2019

Aggregate/ Report
(6 months)

- Aggregate Benefits by Business Use
- Final Report & Geodatabase

2/2019 –7/2019

Analysis/ Development
(6 months)

- Develop Program Scenarios
- Analyze Benefit/Cost and ROI
- Determine Program Direction

8/2019 – 1/2020

2017 2018 2019

USGS science for a changing world

The National Map Your Source for Topographic Information

Dewberry

Interagency Working Group on Ocean and Coastal Mapping

NOAA

AMEC 3D Nation Fed Responses

Green: Responses look sufficient to cover AK

Yellow: Responses light; may be worth assessing responses to see if Alaska covered

Orange: No response completed

Black: Not participating

Status	Agency
	USDA
	DOD
	DHS
	DOI
	DOT
	EPA
	OMB
	OSTP
	FAA
	FEMA
	NGA
	NOAA
	NSF
	NORTHCOM
	USFS
	USACE
	USGS
	BLM
	FWS
	NPS

Alaska 3D Nation State Responses

Dept. of Environmental Conservation
Dept. of Natural Resources
Dept. of Military and Veterans Affairs
Dept. of Commerce, Community, and Economic Development
Dept. of Natural Resources
Alaska DFG
Dept. of Natural Resources
Dept. of Transportation & Public Facilities
Alaska DNR
Kodiak Borough
University of Alaska Fairbanks
Alaska Municpal League
ANCSA Regional Association
Dept. of Transportation & Public Facilities
Northstar Borough --
Fairbanks North Star Borough

10 Minute Break

Hydrography In Alaska

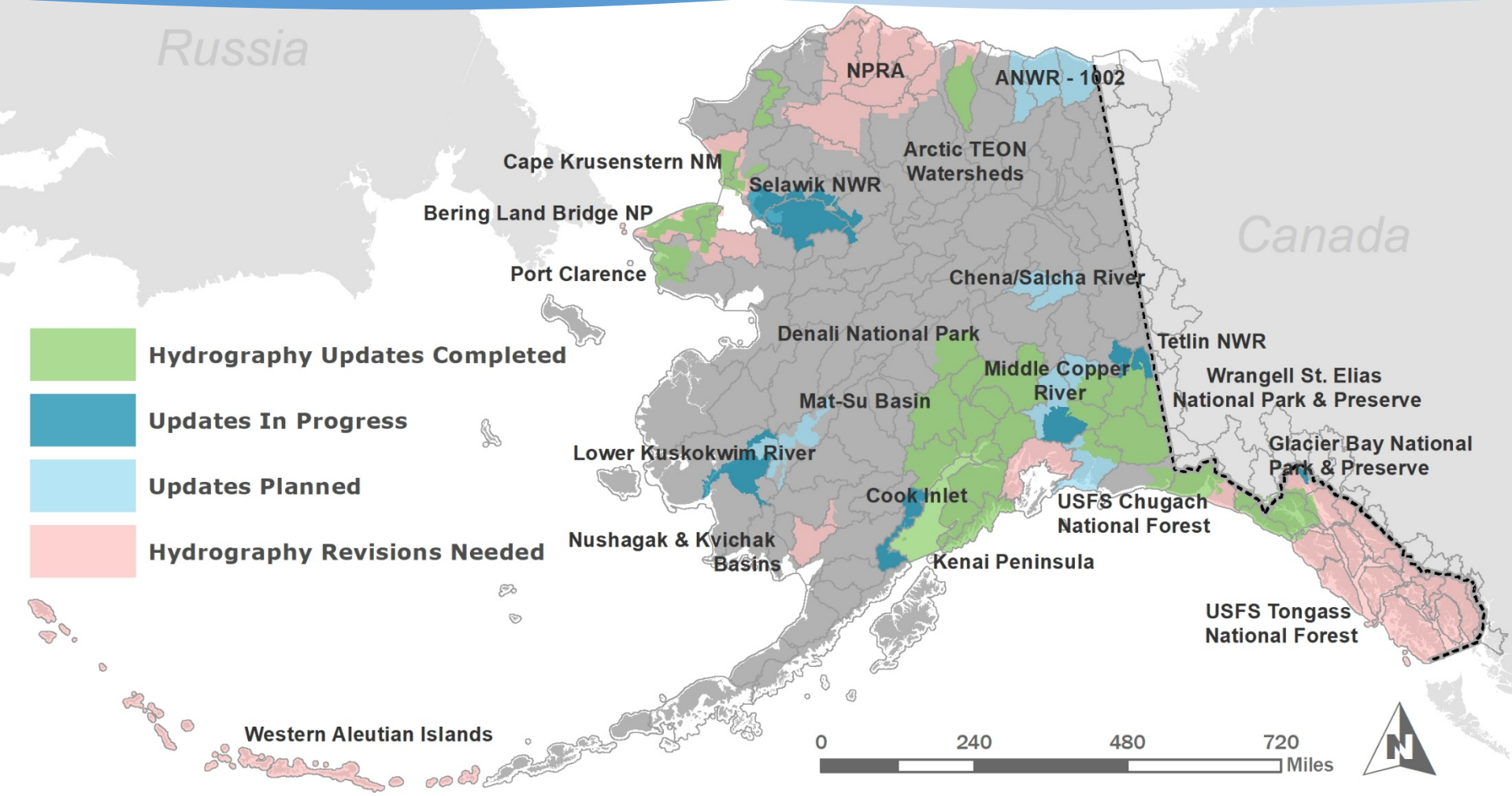
NHD

- National surface water database.
- Mandated use by federal agencies.
- National Standards.
- Used in countless applications.
- Needs significant updates in Alaska.
- Does not meet the needs of all Alaskan Agencies.

AK Hydro

- Statewide coordinated collaborative editing platform.
- Simplified editing workflow.
- Alaska specific database and standards.
- Staffed by experts in NHD updates.
- Used to update the NHD in Alaska.

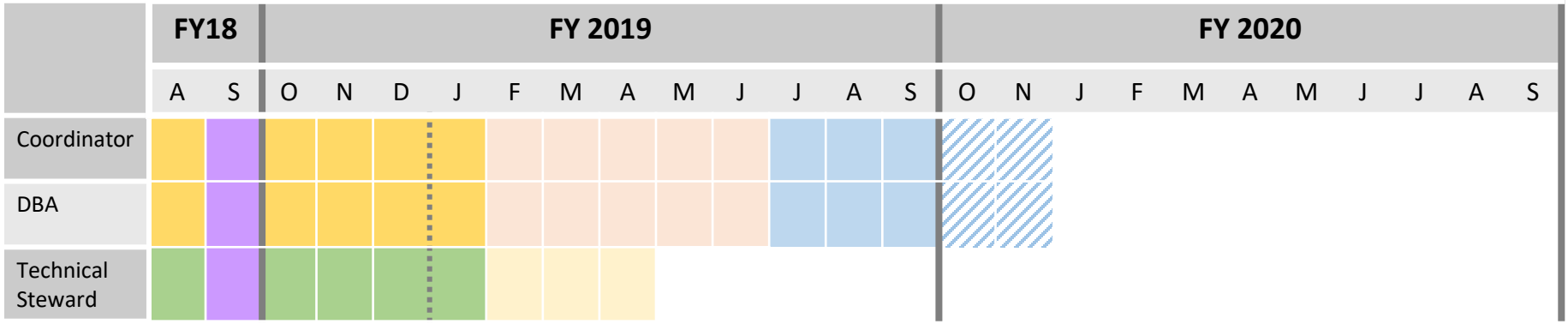
Alaska Hydrography Update Status



Alaska Hydrography Discussion

- To help plan for future hydrography updates, what funding will be made available for hydrography updates?
- What approach to completing updates does AMEC prefer?
  - Collaborative, agency driven
  - GSPC projects
- What is the funding timeframe for hydrography updates?

AK Hydro Staff Funding



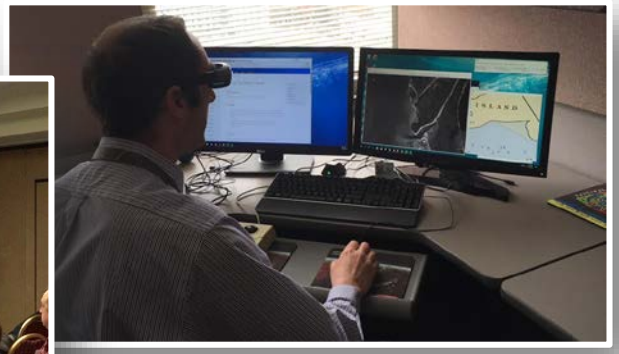
USGS (2019)	*Agreement in discussion, Not yet in Place*
USFWS (2013-2019)	*Agreement in Place, 2019 agreement in Progress*
USFS (2010-2019)	*Agreement in Place, 2019 agreement in Progress*
NOAA NWS (2018)	***Agreement in Progress, Not yet in Place***
Other	*Other Funding Sources (Not Alaska Hydrography related)*

National Geodetic Survey

Alaska Mapping Executive Committee Update

GRAV-D Surveys

NSRS Modernization



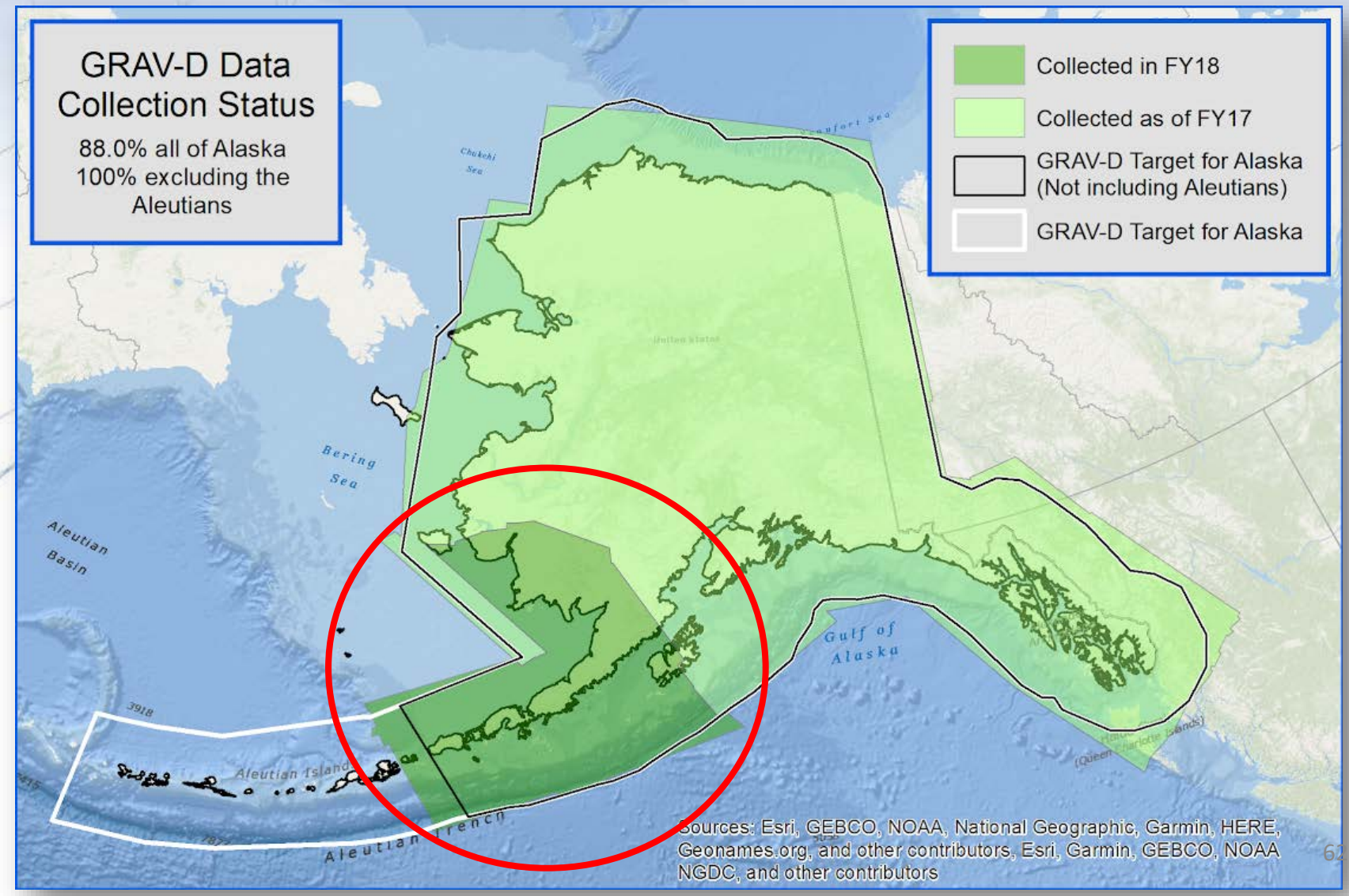
Shoreline Mapping

Juliana Blackwell
Director, National Geodetic Survey

Data Acquisition Accomplishments

Theme	Metric	2013 Goal	August 2018 Status
Gravity	**% Airborne GRAV-D acquired**	**Mainland by 2019 Aleutians by 2021**	**100% Mainland 88% w/ Aleutians**
Shoreline Mapping	**% Alaska shoreline updated**	**Complete in 5 years w/ budget increase, longer w/o increase**	**55.5%**

Gravity for the Redefinition of the American Vertical Datum (GRAV-D) Airborne Survey

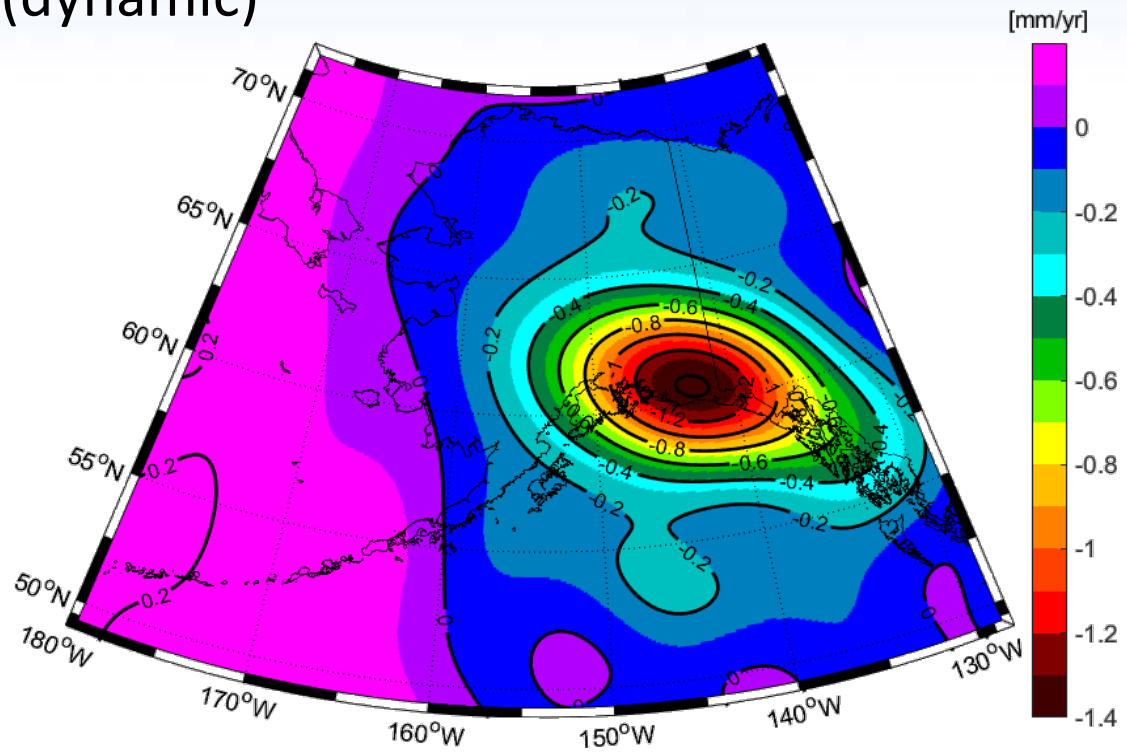


National Spatial Reference System (NSRS) Modernization - Gravity Program

- Complete **GRAV-D** (static)
- Begin **Ge**oid **M**onitoring **S**ervice **(GeMS)** to monitor gravity/geoid model changes over time (dynamic)
- Coming soon in 2019:
  - Technical report
  - Launch in Alaska

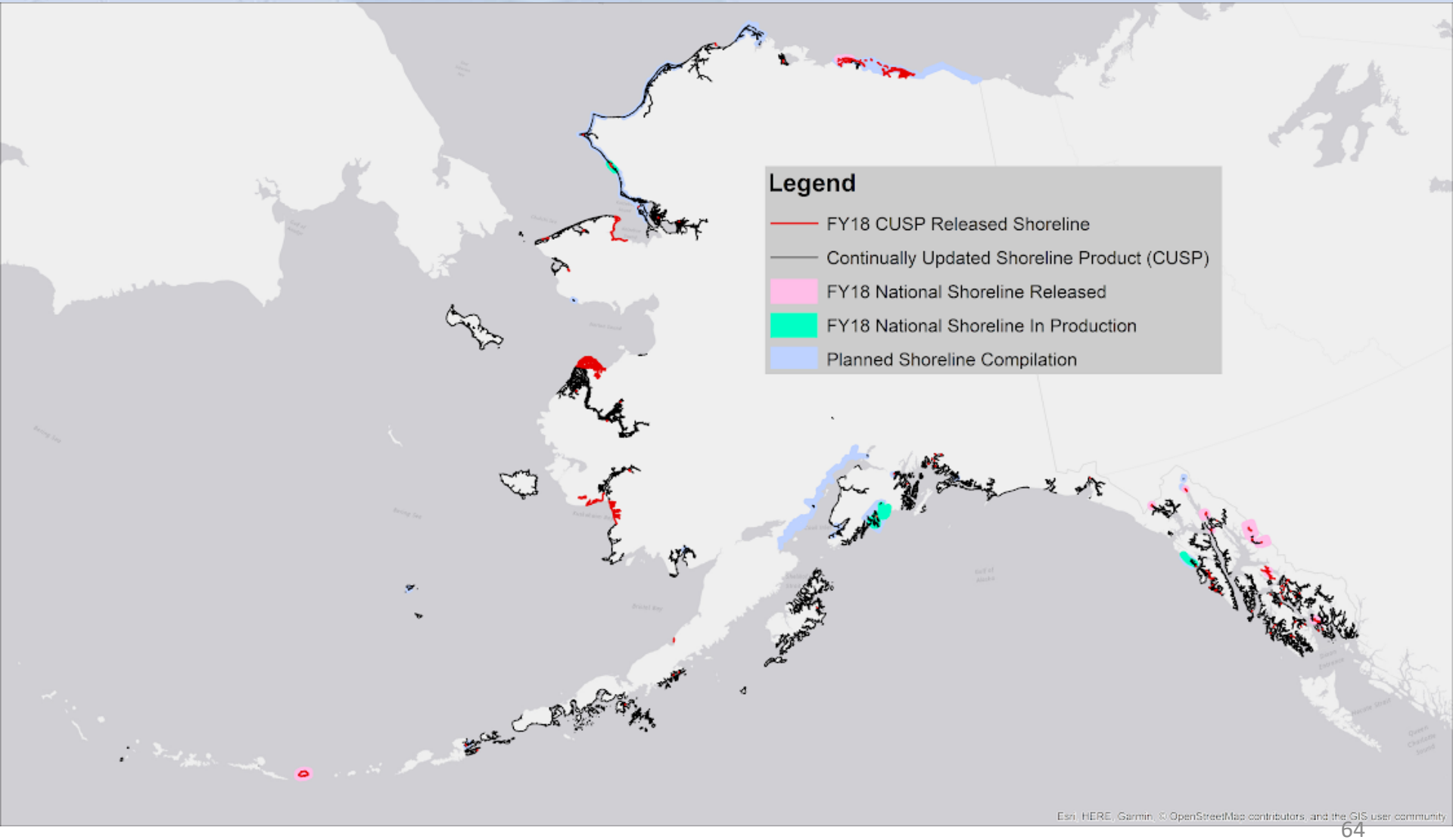
Most significant area of change:

Alaska -1.4 mm/year



Annual geoid rate of change in mm/year, from 15 years of GRACE data (2002 - 2017)

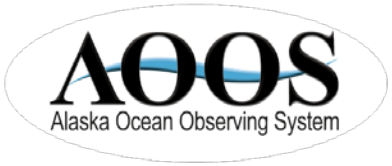
Shoreline Mapping Update



Committee Discussion Topics

- Are NOAA AMEC contributions being utilized to their fullest potential?
- What pace of shoreline mapping progress is needed by AMEC partners?
- What existing NOAA capacity and expertise could further enable AMEC objectives?
- Are there Federal partners that would benefit from renewed role in expanded AMEC theme discussions?

Alaska Coastal Mapping Strategy and Implementation



AMEC
August 2018
Presented by Nic Kinsman, NOAA
On behalf of Marta Kumle, AOOS & Alaska DNR

Alaska Coastal Mapping Strategist

Motivation:

- 85% of Alaska's population resides in coastal watershed boroughs
- Coastal geospatial data products have requirements and refresh rates that differ from inland areas
- Alaska Geospatial Council has prioritized unmet coastal data considerations
- Limited in-state expertise/human resources for dedicated working group

Strategist Position:

- One year, Part time position, started in January 2018
- Joint position at AOOS funded by AK DNR, IOCM and NOAA OCM
- Housed under Alaska Geospatial Council

Marta Kumle

Objectives:

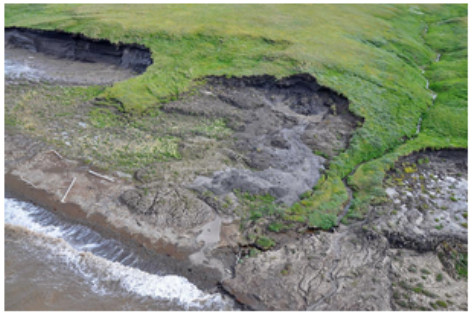
- Central point of contact for coastal mapping community
- Alaska Coastal Mapping Summit Report
- Alaska Coastal Mapping Strategic Plan

http://agc.dnr.alaska.gov/coastal.html

Coastal Strategy

Remote and rugged terrain, unpredictable weather and short field seasons make mapping Alaska's expansive coastal areas uniquely challenging, but data on coastal dynamics and nearshore bathymetry are urgently needed. Coastal erosion and flooding threaten coastal communities while marine traffic including passenger cruise ships and oil tankers is increasing in Alaska's waters.

The National Oceanic and Atmospheric Administration (NOAA), the Alaska Ocean Observing System (AOOS) and the Alaska Geospatial Council (AGC) have partnered to evaluate Alaska's coastal mapping needs. The Coastal Strategist provides guidance, coordination, and leadership in the development of a cohesive statewide strategy for geospatial data collection in the Alaskan coastal and nearshore areas (broadly defined as <30 m MLLW depth to areas on land that may be subject to flooding within 1 km of tidally influenced water).



Rapidly eroding bluffs are one aspect of Alaska's dynamic coastal zone that require special consideration in mapping requirements and refresh rates. (Photo: North of Cape Sabine, Chukchi Sea, Alaska; August 17, 2012; www.ShoreZone.org)"

To ensure broad stakeholder engagement, the Coastal Strategist works with established mapping committees, agency liaisons, Native Corporations, NGOs, the private sector, and academia to organize the diverse coastal mapping needs in Alaska by location, quality-level, partner, capacity, feasibility, and refresh-rate, with the overall objective of developing a long-term strategy for prioritizing coastal mapping activities. The outcome of this strategic planning effort will be a roadmap of options to meet stakeholder requirements and priorities for the longest shoreline in the United States.

Contact

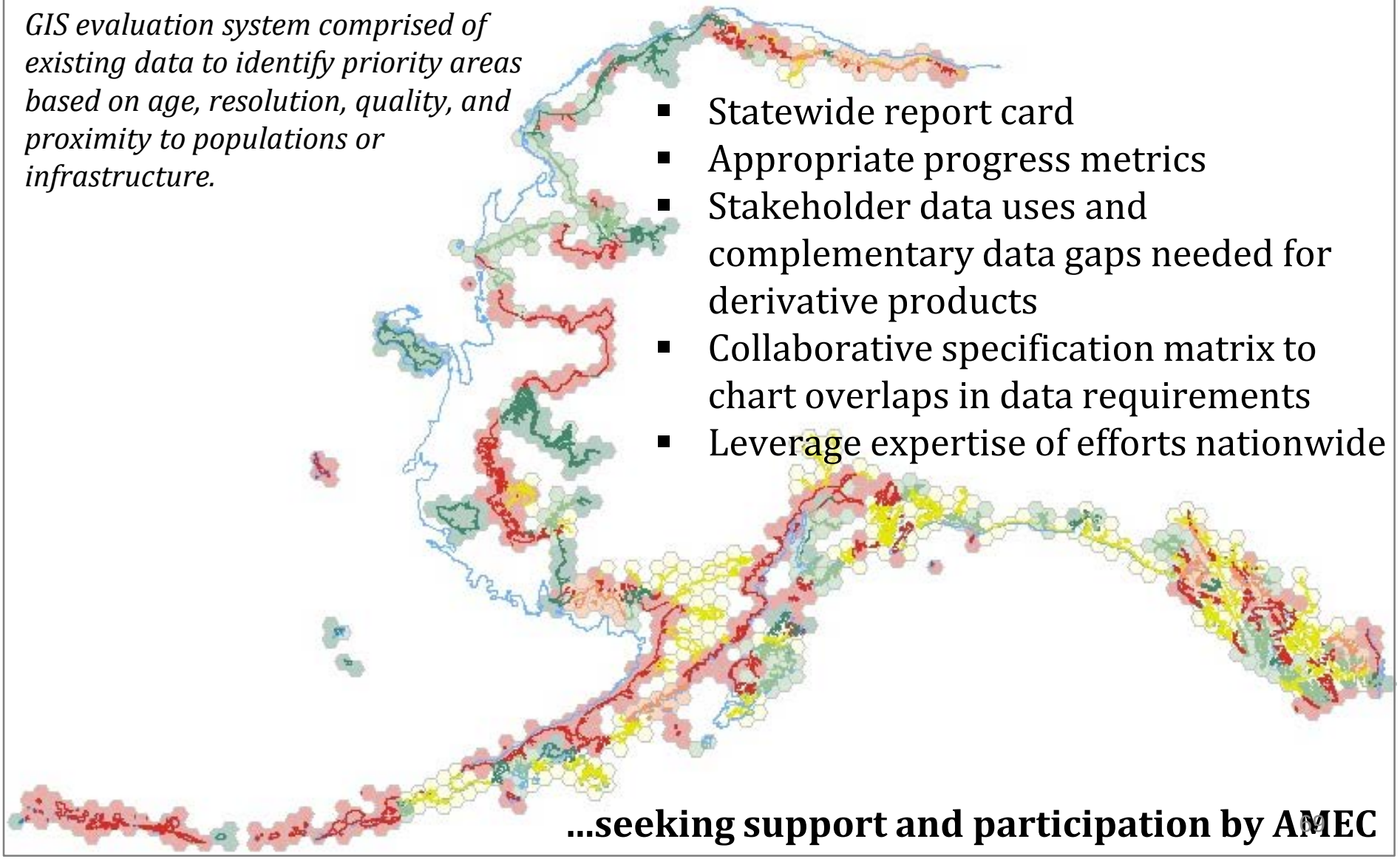
Contact the Coastal Mapping Strategist Marta Kumle by email or submit

LINKS

ALASKA GEOSPATIAL COUNCIL ▸
GEOSPATIAL PLANS
FEDERAL COLLABORATION
COASTAL STRATEGY
FUNDING
PUBLIC BENEFITS
PUBLIC SUPPORT
IMAGERY SERVICES
TECHNICAL ADVISORY GROUP
TECHNICAL WORKING GROUPS ▸
ELEVATION
IMAGERY
GEOPORTAL
HYDROGRAPHY
TRANSPORTATION
ADMINISTRATIVE BOUNDARIES
PARCELS/CADASTRAL
GEODETIC CONTROL
WETLANDS
VEGETATION

AK Coastal Mapping Strategic Plan

GIS evaluation system comprised of existing data to identify priority areas based on age, resolution, quality, and proximity to populations or infrastructure.



- Statewide report card
- Appropriate progress metrics
- Stakeholder data uses and complementary data gaps needed for derivative products
- Collaborative specification matrix to chart overlaps in data requirements
- Leverage expertise of efforts nationwide

...seeking support and participation by AMEC

U.S. Army Corps of Engineers National Coastal Mapping Program
Homer, AK Pilot Project

The U. S. Army Corps of Engineers (USACE) National Coastal Mapping Program (NCMP) conducted a Pilot Project along Alaska's Homer Spit from June 10-12, 2018. This project was designed to evaluate the capabilities of the latest generation bathymetric lidar system along the Alaska Coastline. The Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX) team used in-house survey capability called CZMIL (Coastal Zone Mapping and Imaging Lidar) to perform two full coverage flights, along with a third partial flight under different tide conditions. Standard NCMP products were generated from data collected during the flights:

- **seamless bathy/topo grids**
- **bare earth bathy/topo grids**
- **true-color aerial image mosaics**
- **hyperspectral image mosaics**

Location:

Homer, Alaska: Is located about 200 miles south of Anchorage on the Kachemak Bay. Its most prominent feature is the 4.5 mile long gravel spit that extends into the bay. Widely known as "the halibut fishing capital of the world", the town is also Alaska's eco and adventure tourism capital.

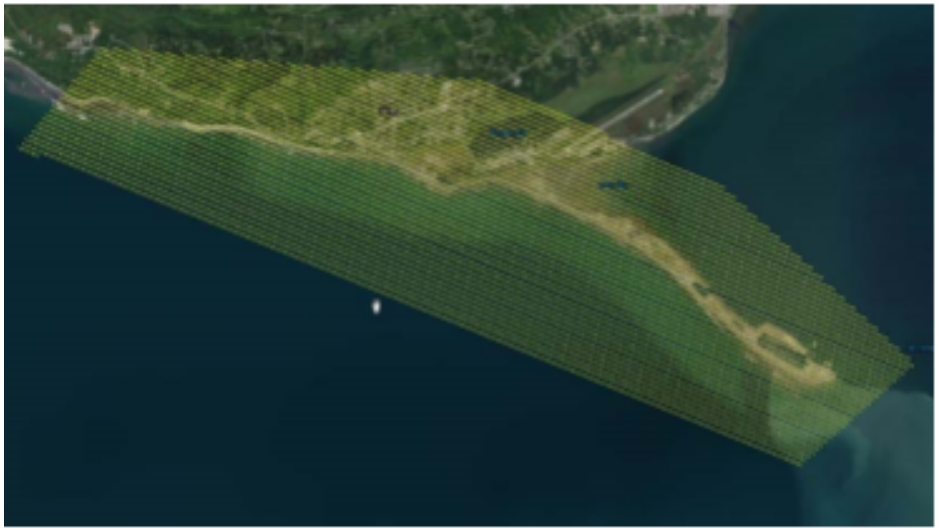
Homer's Port Facility

Site Selection: Homer Spit was selected for the pilot project due to broad interest by a number of federal and state agencies in obtaining updated topographic and seafloor maps for the area. For example, USACE maintains navigation channels and erosion protection structures for the harbor and spit. Requirements for the test were developed based on discussions during the Alaska Coastal Mapping Summit. Specifically, the project was designed to test bathymetric lidar performance in Alaska's challenging operational environment, including short survey season, remote location, turbidity, high terrain, large tide range, and dark substrate.

Turbidity plume from glacial runoff

Airborne Survey:

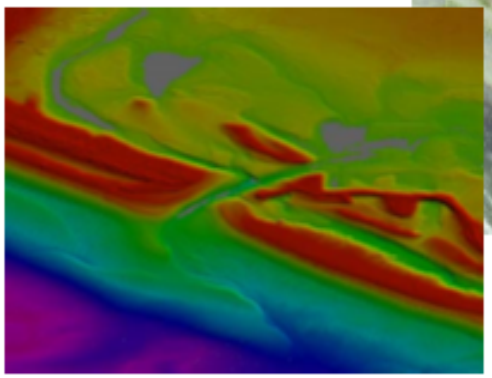
Flight Information: The primary survey area consisted of 47 flight lines and 585 line KM. The flight block was flown in it's entirety two times at high tide. A third flight was conducted to target low tide in the early morning while the winds were light.



Planned survey lines

Outcomes: Bathymetric lidar, topographic lidar, aerial photography, and hyperspectral imagery were collected for 53 km^2 on Homer Spit, AK. Depths were measured up to 19 m, beneath suspended sediment layers and submerged aquatic vegetation. The data support coastal navigation, planning for resilience, and resource management.

Topo/Bathy DEM



True Color Mosaic

The pilot project at Homer demonstrated the cost effectiveness of using the JALBTCX aircraft as it transited back to the U.S. from its annual summer work in the Pacific. Timing of transit coincided with ideal environmental conditions in Alaska. Long duration aircraft makes remote locations in Alaska accessible for airborne surveys. The depth performance capability of modern bathymetric lidar systems like CZMIL is ideally suited to the high-turbidity and dark substrate characteristic of many areas in Alaska.

JALBTCX
Joint Airborne Lidar Bathymetry Technical Center of Expertise

POC: Jennifer Wozencraft (228) 806-6044
jennifer.m.wozencraft@usace.army.mil
http://www.jalbtcx.org

Discussion and Wrap Up

- Open Discussion
- Next meeting
- Action Item Review

Closing Remarks

- Dr. James Reilly, Director USGS, acting co-Chair for the meeting.
- RDML Tim Gallaudet, Ph.D., USN Ret., Assistant Secretary of Commerce for Oceans and Atmosphere and Acting Under Secretary of Commerce for Oceans and Atmosphere, AMEC co-Chair.

Visit https://www.usgs.gov/amec