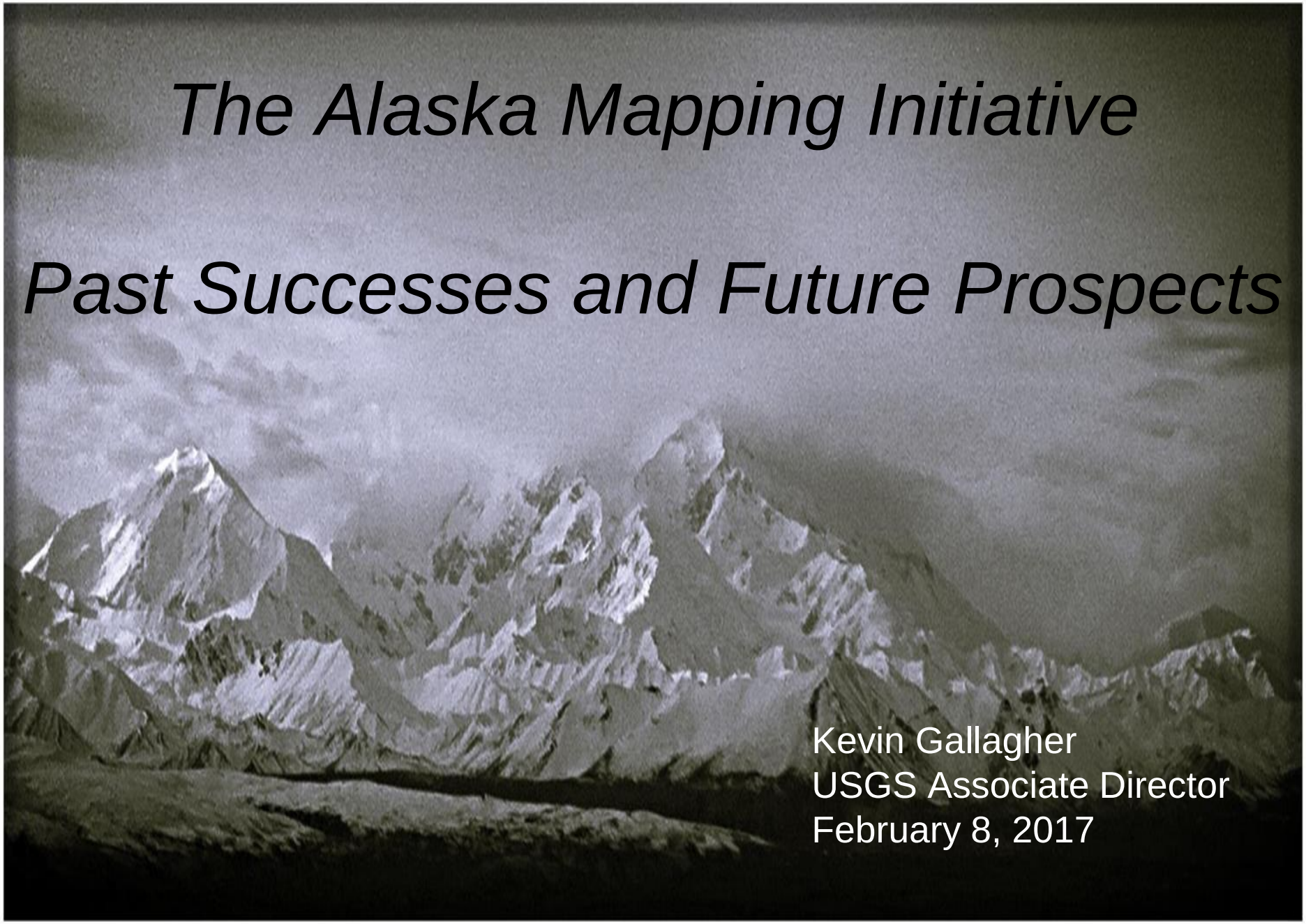
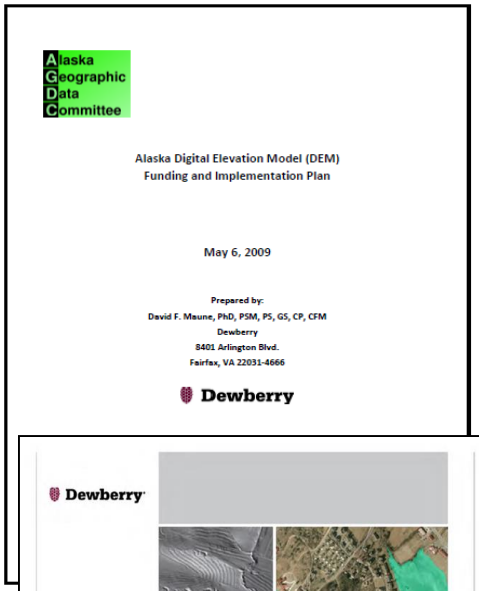


The Alaska Mapping Initiative

Past Successes and Future Prospects

Kevin Gallagher
USGS Associate Director
February 8, 2017

Alaska Mapping History - Beginnings

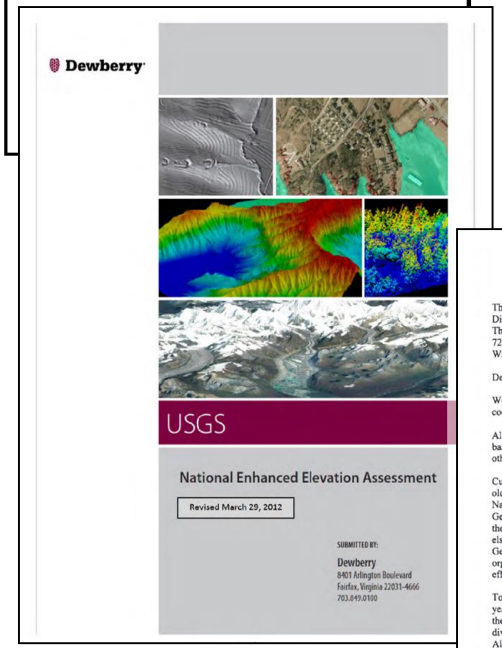

Alaska Geographic Data Committee

Alaska Digital Elevation Model (DEM)
Funding and Implementation Plan

May 6, 2009

Prepared by:
David F. Maune, PhD, PSM, PS, GS, CP, CFM
Dewberry
8401 Arlington Blvd.
Fairfax, VA 22031-4666

Dewberry


Dewberry

USGS

National Enhanced Elevation Assessment

Revised March 29, 2012

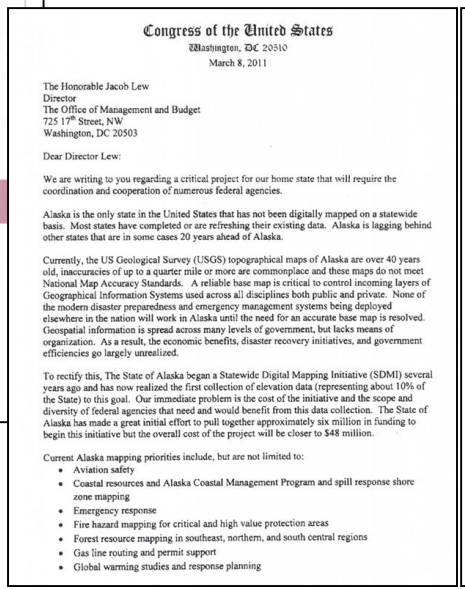
SUBMITTED BY:
Dewberry
8401 Arlington Boulevard
Fairfax, Virginia 22031-4666
703.849.0100

Alaska Digital Elevation Model Funding and Implementation Plan, May 2009, Dewberry

- Stressed the need for new elevation data for Alaska .
- Airborne radar data (IfSAR), was selected as the best possible technology to produce accurate and consistent 5-meter DEMs statewide for Alaska.

National Enhanced Elevation Assessment, March 2012, USGS/Dewberry

- Drew similar conclusions to the 2009 Alaska DEM study, supporting the requirement for IfSAR as the optimum cost/benefit solution.
- The 3D Elevation Program (3DEP) was developed in response to the NEEA study, and actively supports and tracks the acquisition of 5-meter IfSAR data for Alaska as a priority objective.
- Benefits of statewide Alaska IfSAR are conservatively estimated in the NEEA report at over $19M annually.


Congress of the United States
Washington, DC 20510
March 8, 2011

The Honorable Jacob Lew
Director
The Office of Management and Budget
725 17th Street, NW
Washington, DC 20503

Dear Director Lew:

We are writing to you regarding a critical project for our home state that will require the coordination and cooperation of numerous federal agencies.

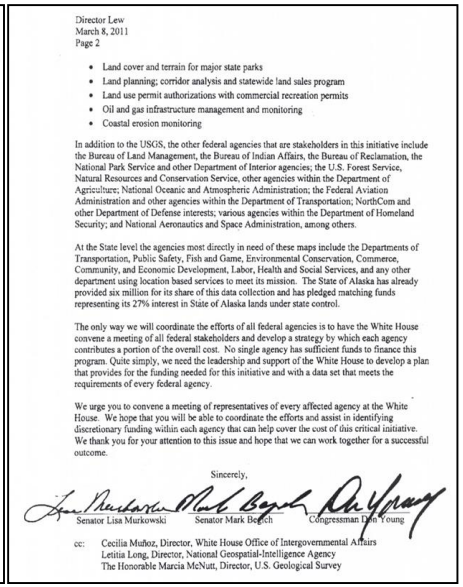
Alaska is the only state in the United States that has not been digitally mapped on a statewide basis. Most states have completed or are refreshing their existing data. Alaska is lagging behind other states that are in some cases 20 years ahead of Alaska.

Currently, the US Geological Survey (USGS) topographical maps of Alaska are over 40 years old, inaccuracies of up to a quarter mile or more are commonplace and these maps do not meet National Map Accuracy Standards. A reliable base map is critical to control incoming layers of Geographical Information Systems used across all disciplines both public and private. None of the modern disaster preparedness and emergency management systems being deployed elsewhere in the nation will work in Alaska until the need for an accurate base map is resolved. Geospatial information is spread across many levels of government, but lacks means of organization. As a result, the economic benefits, disaster recovery initiatives, and government efficiencies go largely unrealized.

To rectify this, The State of Alaska began a Statewide Digital Mapping Initiative (SDMI) several years ago and has now realized the first collection of elevation data (representing about 10% of the State) to this goal. Our immediate problem is the cost of the initiative and the scope and diversity of federal agencies that need and would benefit from this data collection. The State of Alaska has made a great initial effort to pull together approximately six million in funding to begin this initiative but the overall cost of the project will be closer to $48 million.

Current Alaska mapping priorities include, but are not limited to:

- Aviation safety
- Coastal resources and Alaska Coastal Management Program and spill response shore zone mapping
- Emergency response
- Fire hazard mapping for critical and high value protection areas
- Forest resource mapping in southeast, northern, and south central regions
- Gas line routing and permit support
- Global warming studies and response planning


Director Lew
March 8, 2011
Page 2

- Land cover and terrain for major state parks
- Land planning; corridor analysis and statewide land sales program
- Land use permit authorizations with commercial recreation permits
- Oil and gas infrastructure management and monitoring
- Coastal erosion monitoring

In addition to the USGS, the other federal agencies that are stakeholders in this initiative include the Bureau of Land Management, the Bureau of Indian Affairs, the Bureau of Reclamation, the National Park Service and other Department of Interior agencies; the U.S. Forest Service, Natural Resources and Conservation Service, other agencies within the Department of Agriculture; National Oceanic and Atmospheric Administration; the Federal Aviation Administration and other agencies within the Department of Transportation; NorthCom and other Department of Defense interests; various agencies within the Department of Homeland Security; and National Aeronautics and Space Administration, among others.

At the State level the agencies most directly in need of these maps include the Departments of Transportation, Public Safety, Fish and Game, Environmental Conservation, Commerce, Community, and Economic Development, Labor, Health and Social Services, and any other department using location based services to meet its mission. The State of Alaska has already provided six million for its share of this data collection and has pledged matching funds representing its 27% interest in State of Alaska lands under state control.

The only way we will coordinate the efforts of all federal agencies is to have the White House convene a meeting of all federal stakeholders and develop a strategy by which each agency contributes a portion of the overall cost. No single agency has sufficient funds to finance this program. Quite simply, we need the leadership and support of the White House to develop a plan that provides for the funding needed for this initiative and with a data set that meets the requirements of every federal agency.

We urge you to convene a meeting of representatives of every affected agency at the White House. We hope that you will be able to coordinate the efforts and assist in identifying discretionary funding within each agency that can help cover the cost of this critical initiative. We thank you for your attention to this issue and hope that we can work together for a successful outcome.

Sincerely,

Senator Lisa Murkowski Senator Mark Begich Congressman Don Young

cc: Cecilia Muñoz, Director, White House Office of Intergovernmental Affairs
Letitia Long, Director, National Geospatial-Intelligence Agency
The Honorable Marcia McNutt, Director, U.S. Geological Survey

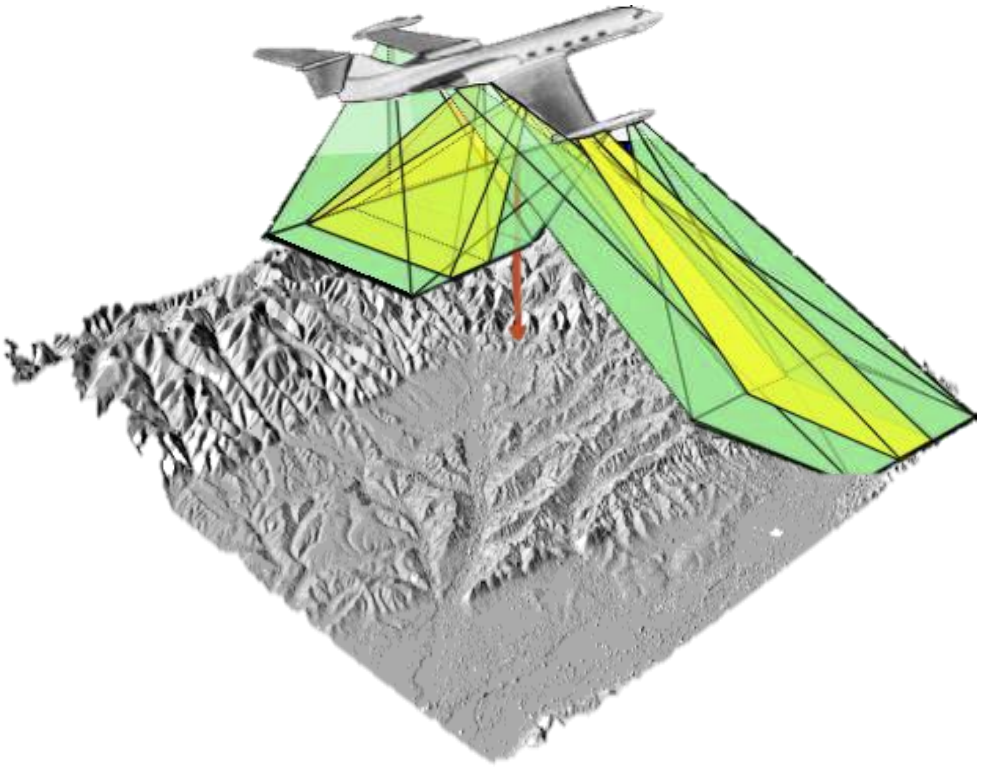
The 2011 letter from the US Congressional Delegation from Alaska to the Office of Management and Budget set in motion the activities that would address Alaska's mapping needs.

Alaska Mapping History – Formation of the Alaska Mapping Executive Committee (AMEC)

- In June of 2012, the Alaska Mapping Roundtable was held in Washington, D.C., where Executives from the State and over 20 Federal agencies, bureaus, and departments met to promote Alaska mapping .
- The Roundtable led to the formation of the Alaska Mapping Executive Committee (AMEC).
- AMEC executive representatives have met at least twice annually since November 2012, coordinating major Alaska mapping objectives.

Alaska Is Being Mapped With IfSAR

Airborne radar technology called IfSAR, short for *Interferometric Synthetic Aperture Radar*, is being used to collect *5-meter* resolution elevation data for Alaska almost statewide.

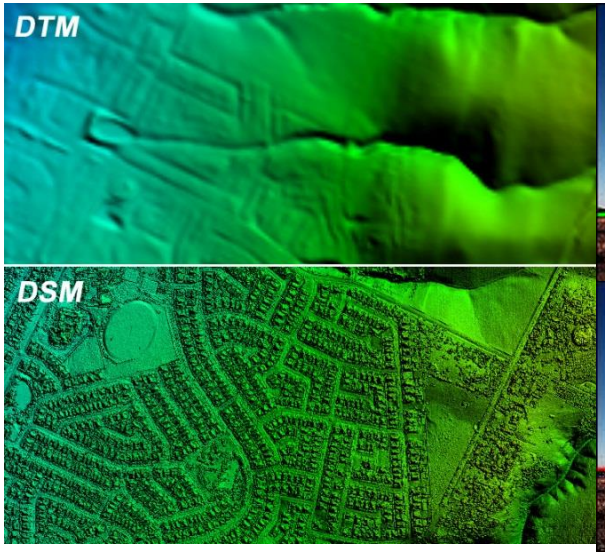


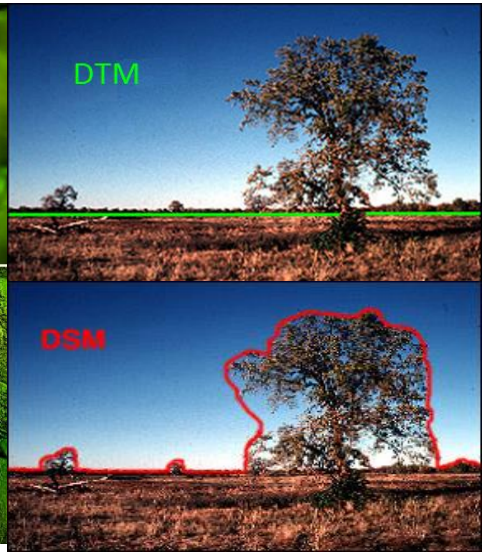
Radar penetrates clouds, smoke, and haze. Alaska IfSAR is collected at the height of summer to avoid non-perennial snow.

USGS Alaska Mapping Objectives

PRIORITY 1: Complete Statewide IfSAR Coverage

- IfSAR provides three required deliverables:
  - Digital Terrain Model (DTM) – 5-meter bare earth elevation grid.
  - Digital Surface Model (DSM) – 5-meter 'first return' or 'tops of trees and buildings' grid.
  - Radar Intensity Image - 0.62 cm resolution pseudo image used in many applications to augment color imagery.





USGS Alaska Mapping Objectives

PRIORITY 1: Complete Statewide IfSAR Coverage

USGS and the AMEC partner members are committed to completing IfSAR for the main body of Alaska because it meets the requirements listed in the 2009 Dewberry study.

- 5-meter resolution IfSAR replaces 60-meter legacy elevation grid.
- IfSAR collection under the USGS contract occurs only during summer 'snow off' season to get to true ground.
- IfSAR penetrates clouds and smoke, limiting data voids.
- IfSAR is highly processed after initial collection to ensure topographic integrity.

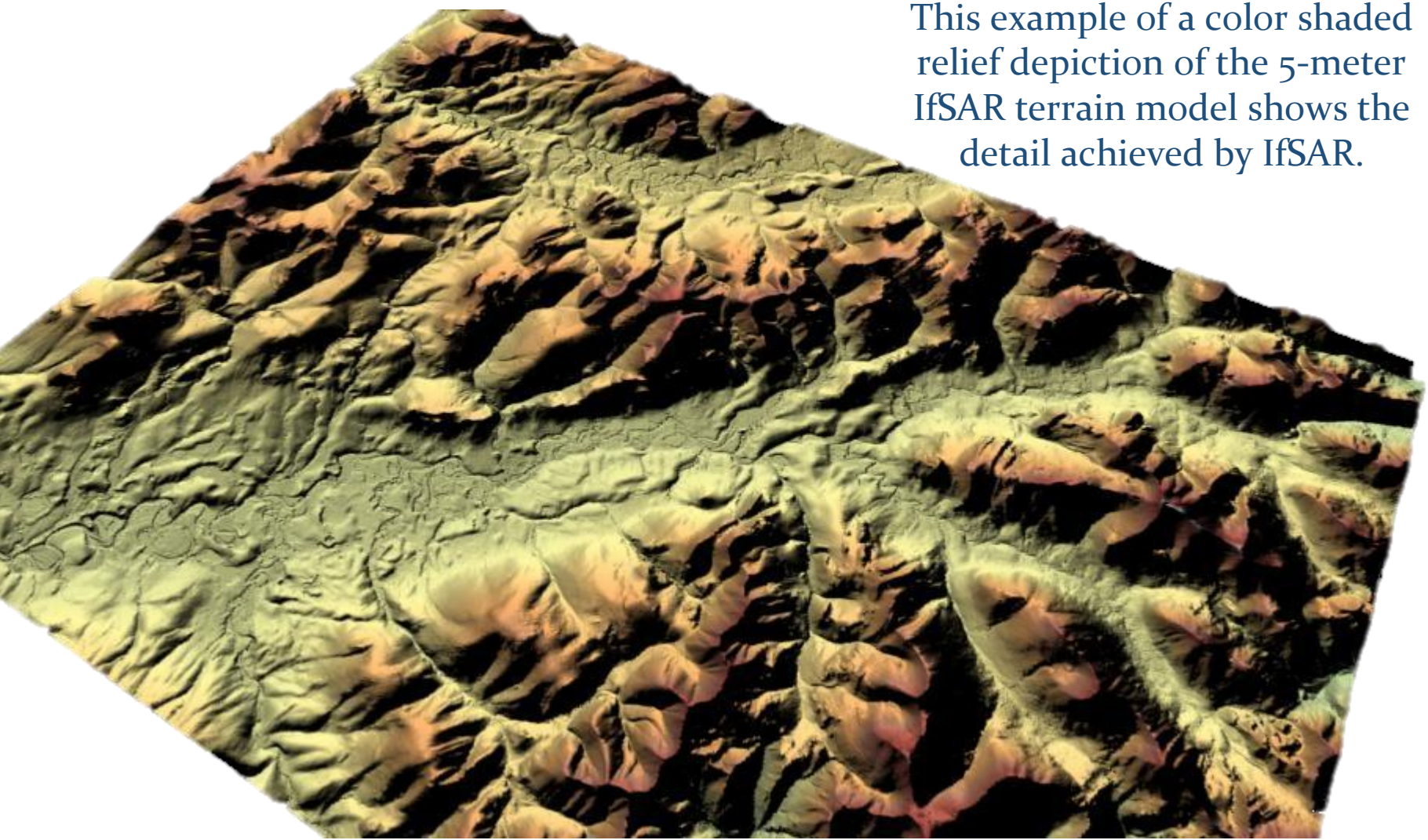
IfSAR APPLICATIONS

Emergency Response
Aviation Safety
Minerals Assessment
Seismic Risk Analysis
Wildlife Management
Infrastructure
Terrain Mapping

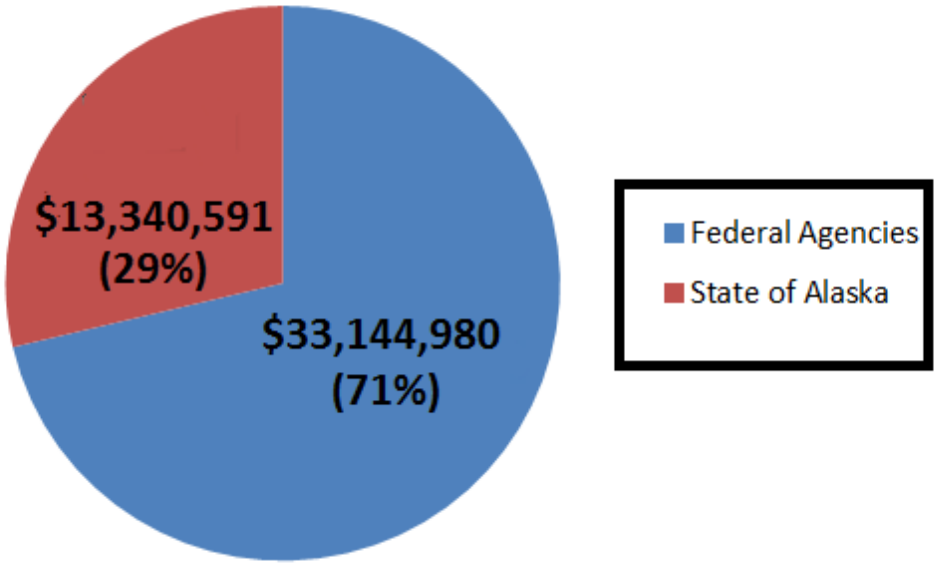
IfSAR Example – 5m DEM

Cutler River, Noatak National Preserve

This example of a color shaded relief depiction of the 5-meter IfSAR terrain model shows the detail achieved by IfSAR.



IfSAR Funds Contributed FY2010-FY2016



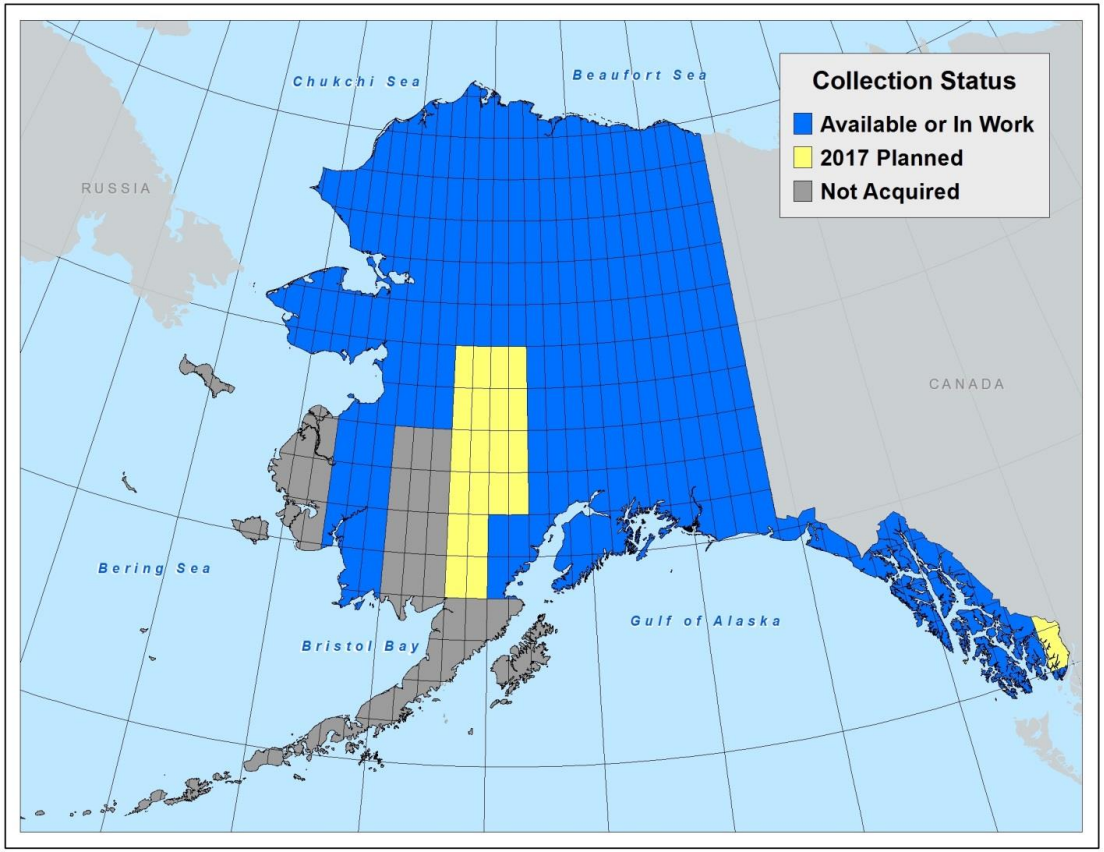
Current contribution mix is close to the 66/33 ratio sought at project outset.

IfSAR and Alaska Economic Growth

- Over $33M Federal dollars have been spent acquiring IfSAR over the past seven years.
- These funds support many local Alaska businesses and individuals that are employed directly during data collection and processing phases.
- Commercial industry benefits from revenue associated with Post-acquisition data analysis and distribution.

Alaska IfSAR Status and 2017 Plan

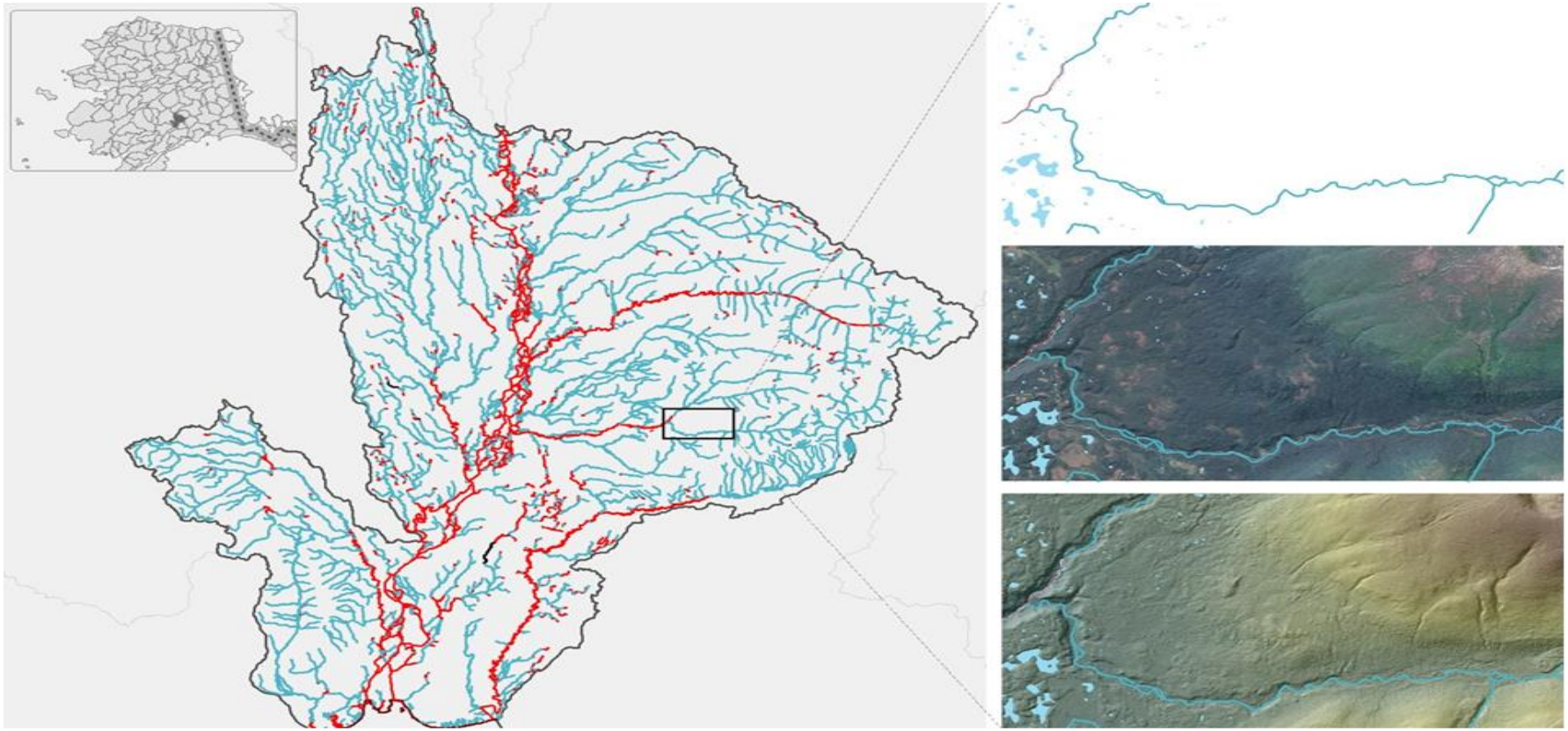
- 77%: Percent of Alaska IfSAR that is complete or in work.
- 47,000 square miles: estimated 2017 collection over SE and Central Alaska.
- 82%: estimated total IfSAR coverage at end of 2017.
- $14M: estimated amount to complete remaining 23% of Alaska IfSAR.
- Alternative technologies are being considered for coverage over the Aleutian Islands and other remote areas, where collection of IfSAR is cost prohibitive



USGS Alaska Mapping Objectives

PRIORITY 2: Update Alaska Hydrography Dataset to meet modern mapping specifications

The initial National Hydrography Dataset (NHD) for Alaska was compiled from decades-old data at a moderate scale

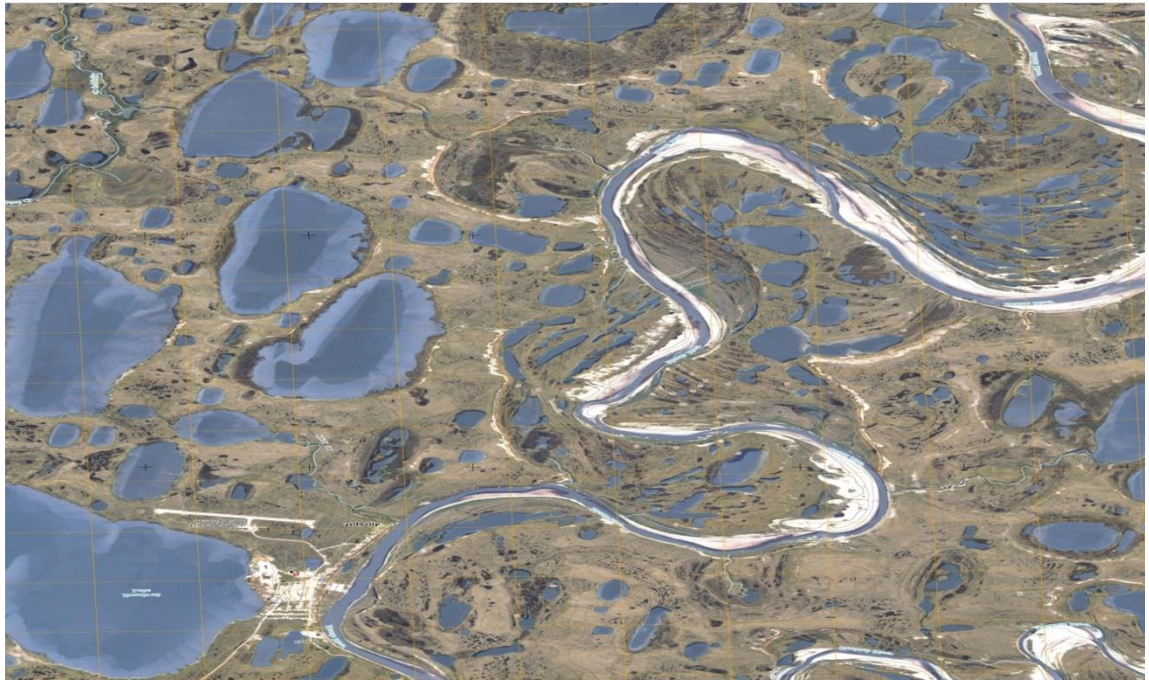


National Hydrography Dataset, Lower Susitna Subbasin

USGS Alaska Mapping Objectives

PRIORITY 2: Update Alaska Hydrography Dataset to meet 1:24,000-scale mapping specifications

- 15% of Alaska hydrography has been updated since 2010.
- The estimated cost to update the remaining 85% is $8.5M.
- The recent USGS-sponsored Hydrography Requirements and Benefits Study conservatively estimates that an updated hydrography dataset for Alaska would provide an annual benefit of at least $17.9M.

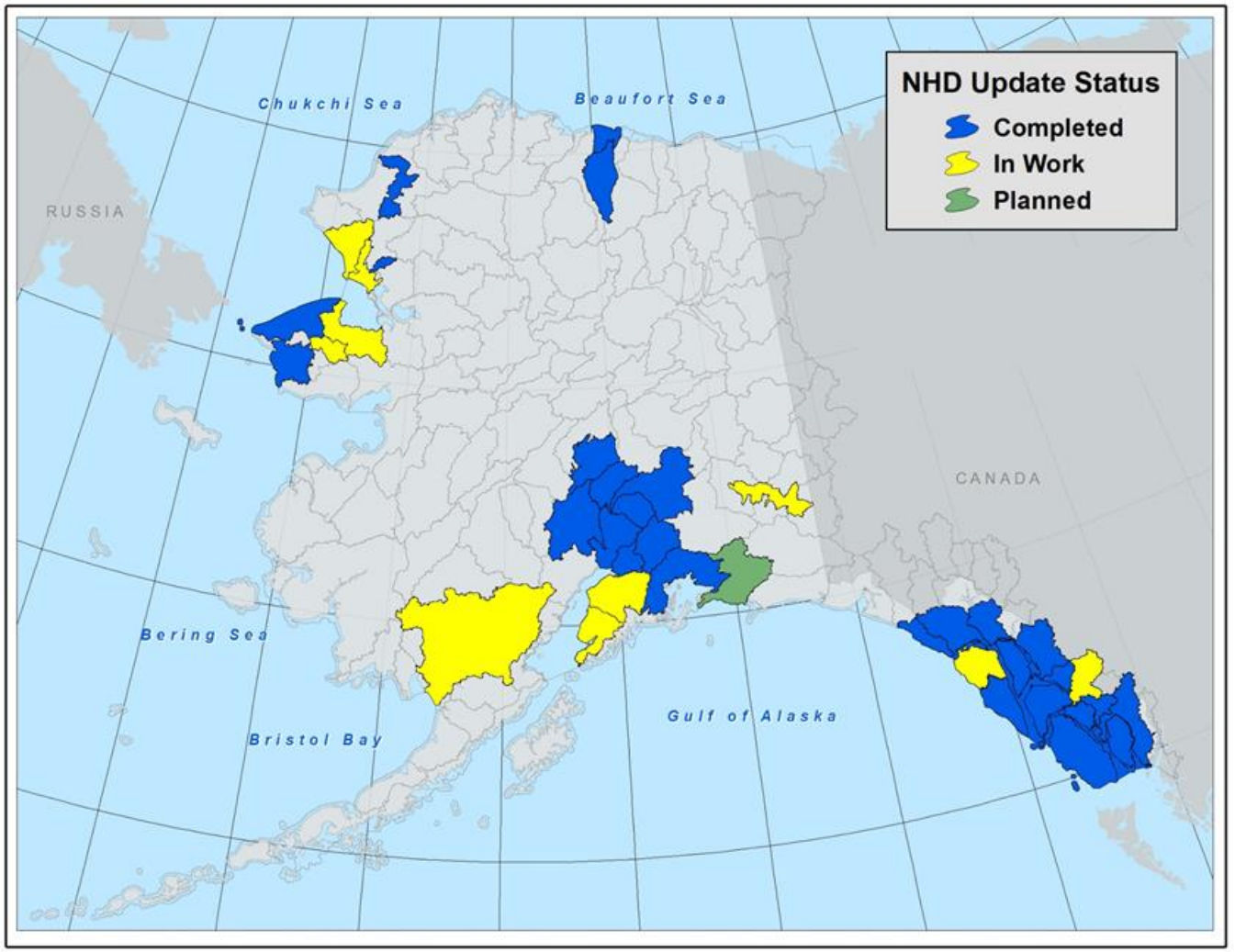


HYDROGRAPHY APPLICATIONS

Fishery Management
Water Quality
Flood Mitigation
Agriculture
Cartography
Pollution Control
Groundwater Analysis

Alaska Hydrography Status and 2017 Plan

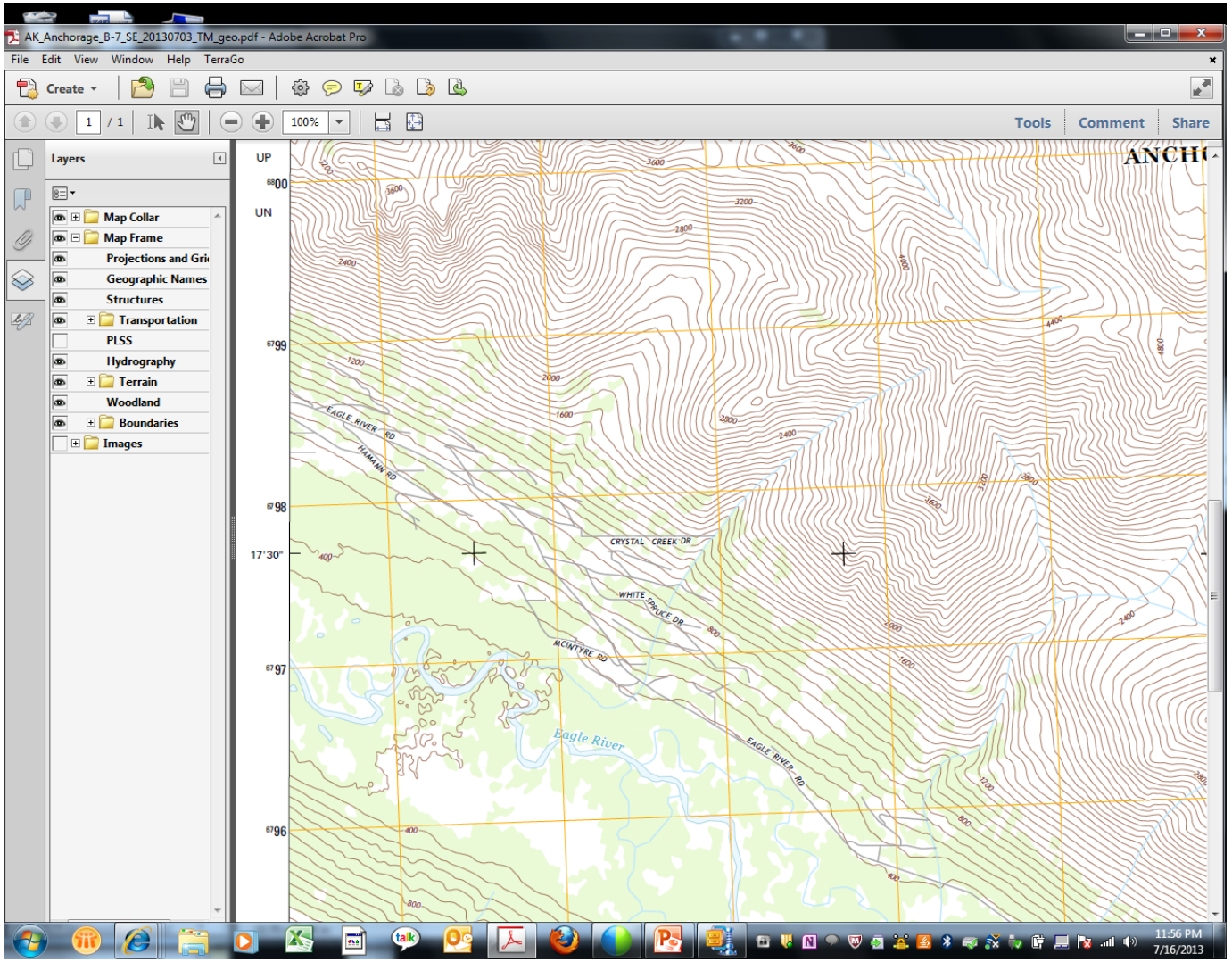
Hydrography will be updated for more than 52,000 square miles in Alaska in 2017



USGS Alaska Mapping Objectives

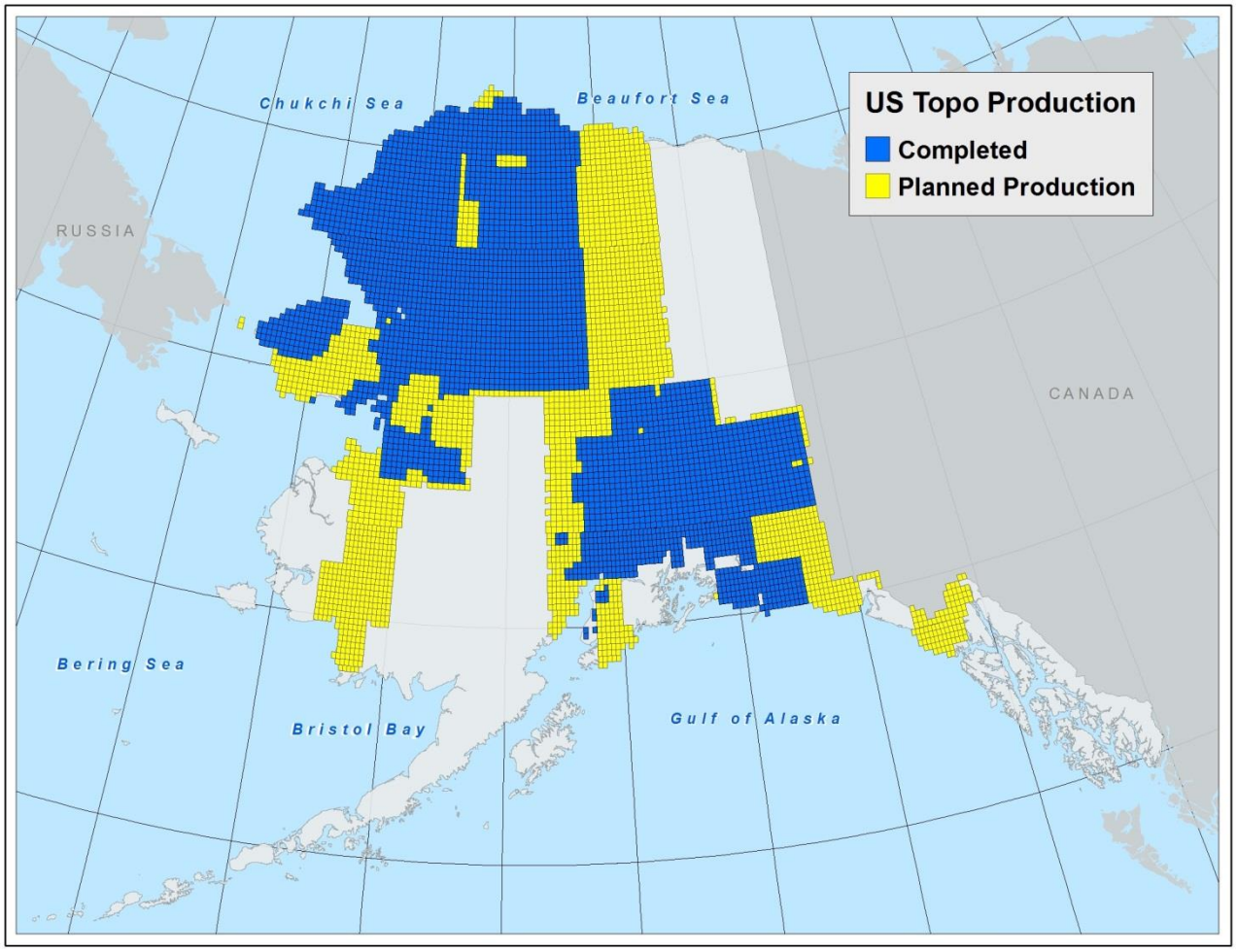
PRIORITY 3: Create a new series of Alaska topographic maps

Replace the decades old moderate-scale paper maps with updated landscape-scale digital maps statewide using updated source information.



US Topo Map Production Status

- 11,275 new Alaska maps will be published at 1:25,000 scale
- 3731 new maps were published from 2013-2016
- 3038 new maps are scheduled for 2017 production
- By October 2017, 60% of the State will have updated topographic maps



Alaska Mapping: A significant achievement, with more work ahead

- USGS will focus its efforts on completing IfSAR, NHD editing, and US Topo map generation for Alaska over the next three years.
- AMEC is also considering future Alaska mapping needs. Examples include geologic mapping, permafrost mapping, bathymetry mapping, lidar acquisitions (very high resolution elevation data), and a statewide imagery update.

Thank you!