

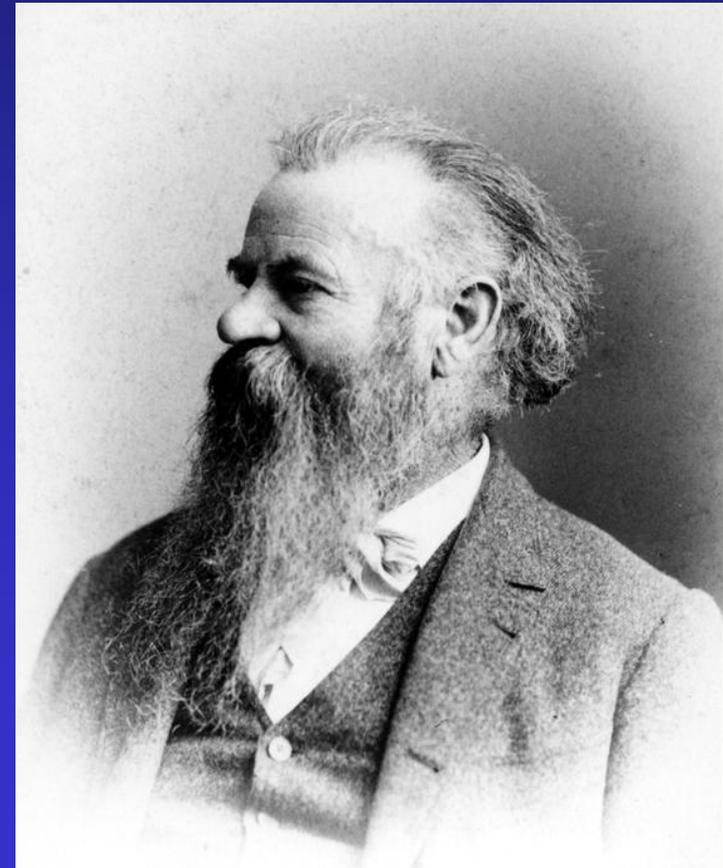


# An overview of The National Map, NSDI and data challenges in Alaska



“A Government cannot do any scientific work of more value to the people at large, than by causing the construction of proper topographic maps of the country.”

John Wesley Powell, 2nd Director of the U.S. Geological Survey (USGS), in testimony to Congress on December 5, 1884.





# USGS Mapping History

1807    1879    1889    1925    1975    1991    2000    2004



Survey of the Coast

U.S. Geological Survey

U.S. Geological Survey  
Mapping Funds

Temple Act  
Congressional \$\$

National Topographic  
Mapping Program  
USGS

1:24K Mapping  
Program  
Completed

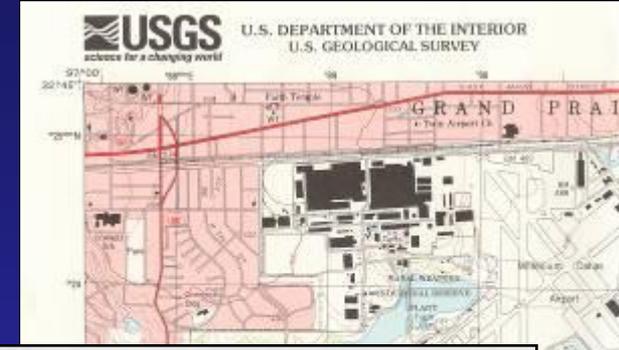
GIO Created

NGPO  
Established



# Mapping the United States...

- ~58,000 maps made from 1930s – 1990s
- 600 – 1000 labor hours per map
- 35 – 40 million total hours of labor
- ~ \$2.0 billion “2009” dollars in cost





With the advent of technology...a new approach was needed: Some brief Chronology...

**Executive Order "12906" Signed –April 1994**

Established the

National Spatial Data Infrastructure (NSDI)

and the

Federal Geographic Data Committee (FGDC)



# What is the NSDI?

**NSDI** = the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve the use of geospatial data *for decision-making and solving problems*

Clearinghouse/Portal

Metadata

Framework

GEOdata

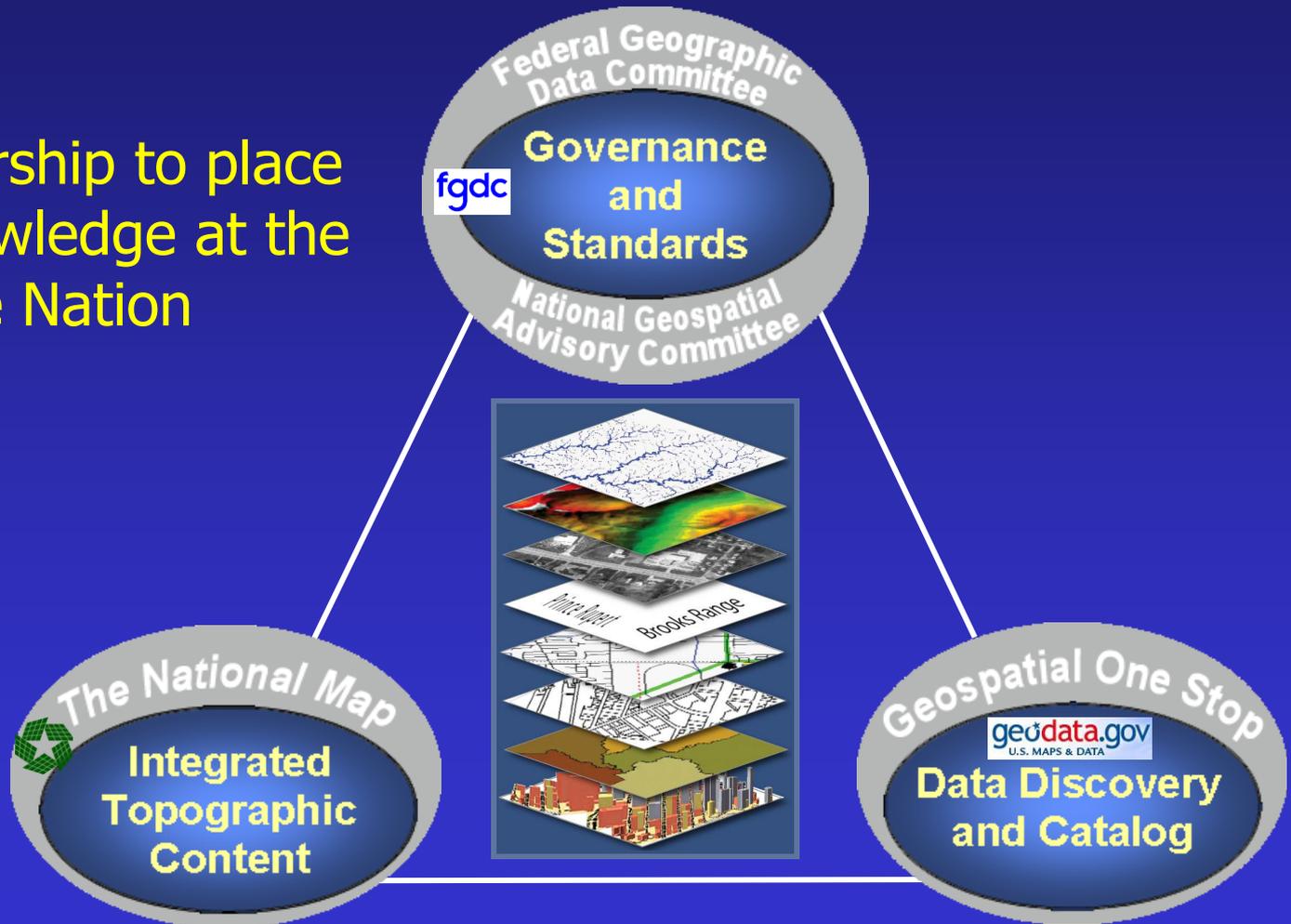
Standards

*Partnerships*



# National Geospatial Program Role in the NSDI

Providing leadership to place geographic knowledge at the fingertips of the Nation





## ***The National Map***

*The National Map* is a collaborative effort to improve and deliver topographic information for the nation

The goal of *The National Map* is to become the nation's source for trusted, nationally consistent, integrated and current topographic information available online for a broad-range of uses



## Roles of government in developing an effective NSDI

- **Local**

- Acquire and maintain data to support local services to the public

- **State**

- Acquire and maintain data to support state-level services to the public
- Draw on and bring together the wealth of local and other data into a statewide infrastructure for broader use

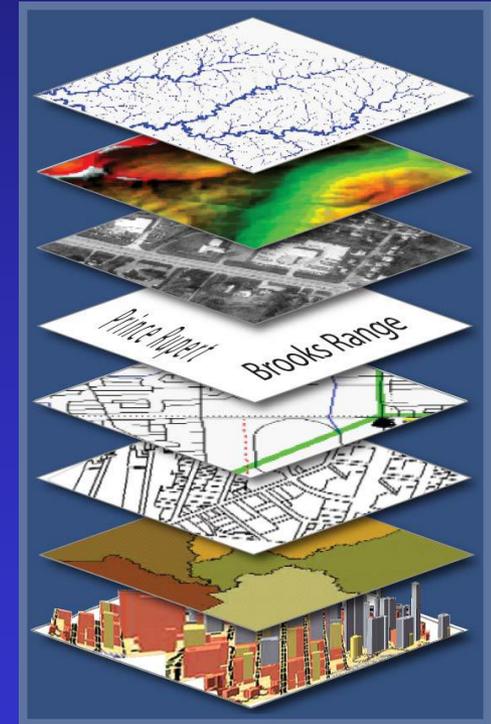
- **Federal**

- Acquire national-level data to support federal services to the public
- Draw on and bring together the wealth of statewide and other data into a national infrastructure for broader use



# *The National Map*

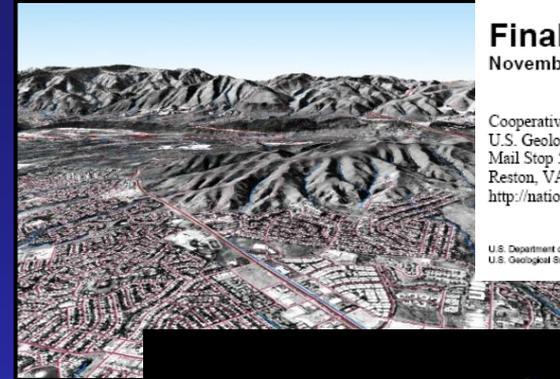
- *The National Map* contributes to the NSDI
- *The National Map* includes eight data layers: hydrography, elevation, orthoimagery, geographic names, boundaries, transportation, land cover, structures
- Public domain data to support
  - USGS topographic maps at 1:24,000-scale
  - Products and services at multiple scales and resolutions
  - Analysis, modeling and other applications at multiple scales and resolutions
- *The National Map* is built on partnerships and standards





# The National Map Vision

- A **seamless, continuously maintained, nationally consistent** set of base geographic data
- Developed and maintained through **partnerships**
- A national **foundation** for science, land and resource management, recreation, policy making, and homeland security
- Available over the **Internet**
- The source for revised **topographic maps**



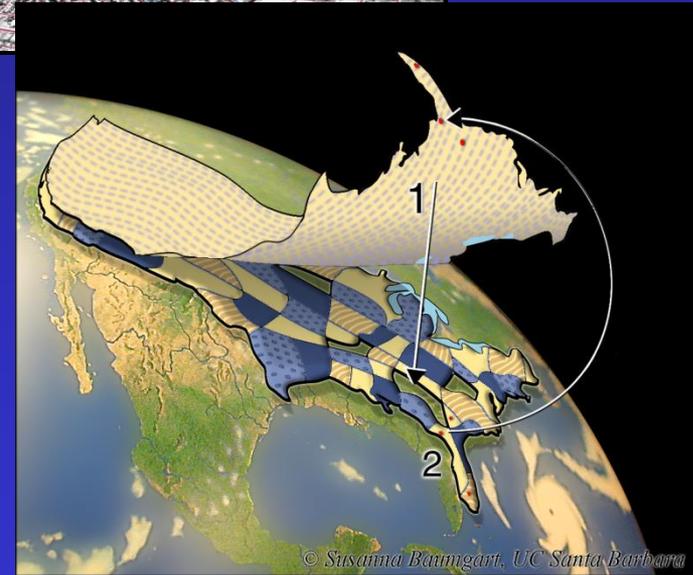
## The National Map

Topographic Mapping  
for the 21<sup>st</sup> Century

**Final Report**  
November 30, 2001

Cooperative Topographic Mapping Program  
U.S. Geological Survey  
Mail Stop 511  
Reston, VA 20192  
<http://nationalmap.usgs.gov>

U.S. Department of the Interior  
U.S. Geological Survey



© Susanna Baumgart, UC Santa Barbara



## Taking Stock of *The National Map*

- The value of the data and partnerships of *The National Map 1.0* is significant, but the goal of nationally consistent, trusted, and integrated data and maps has not been fully met
- The nation's need for a common base map across jurisdictional boundaries was dramatically demonstrated during the 2005 hurricane season
- The recognition of the need for greater consistency, integration and direct access to data has lead NGP to move toward a centralized approach for the next phases of development in *The National Map 2.0*



## *The National Map* Accomplishments

- Expansion of a large and complex network of NSDI partnerships and significant role of partners
- Public accessibility of a vast amount of data from a broad range of sources
- Increased availability of metadata
- Through *The National Map* partnerships, the language and concepts of NSDI have spread to more agencies and partner groups
- Use of state and local data at national level



## The Future: Planned Enabling Activities

- **Partnerships in support of products and services**
  - Liaisons develop a business plan focused on data discovery and acquisition for each State
  - Data acquisition efforts, footprint, specifications, and work priorities aligned with a joint schedule and plans for *The National Map*
  - Products and services feedback collected from partners and customers
- **Systems in support of products and services**
  - Agreements Management System
  - Performance Management and Status System
  - Portal and User Interface Improvements to GOS and *The National Map*
  - Services, Dissemination, and Product Generation
- **Integration of data themes in support of products and services**
  - Horizontal integration – product sectors & markets
  - Vertical integration – managerial product segments



So what about Alaska?

# Data Challenges in Alaska



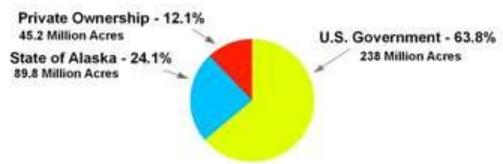
## The importance of Alaska's geospatial data: Alaska is *an environmental indicator of future global implications...*

- Effects of Climate Change - Species, Ecosystems, Societies, Economies, and Health
- Ecosystem Change - Causes and Consequences
- Avian and Pandemic Influenza - Environment, Wildlife, Human Health
- Energy & Minerals - Economy, Homeland & Strategic National Security
- Circumpolar Policies - Oceanic Trade Routes

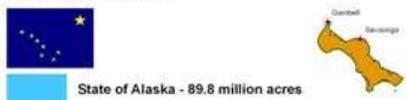


# Who owns what ?

## Who Owns/Manages Alaska?



Russian traders arrived in Alaska in the mid-1700's and established small, scattered trading posts and settlements. Alaska Natives (the Eskimo, Indian, and Aleut peoples) continued as the primary landowners during this period of Russian occupation. On October 18, 1867, Russia sold Alaska to the United States government. As a result, the federal government owned the Alaska Territory, approximately 373 million acres - about one-fifth the size of the rest of the U.S.



Under the terms of the Alaska Statehood Act of 1956, the federal government granted the new state 25% ownership of its total area. Approximately 103,350,000 acres were to be selected under three types of grants:

- 1) Community - 400,000 acres
- 2) National Forest Community - 400,000 acres
- 3) General - 102,550,000 acres

Additional territorial grants, for schools, university and mental health trust lands, totaling 1.2 million acres were confirmed with statehood.

All grants combined gave the State of Alaska approximately 105 million acres. To date, 89.9 million acres has been granted, with the balance expected to be granted by 2009.

### ANCSA Native Corporation (Private) 39.3 million acres

On December 18, 1971, P. L. 92-203, the Alaska Native Claims Settlement Act was signed into law. The purpose of ANCSA was to legislate the terms by which Alaska Natives could acquire title to their lands. This claim had been unresolved for more than 100 years since the United States purchased Alaska from Russia in 1867.

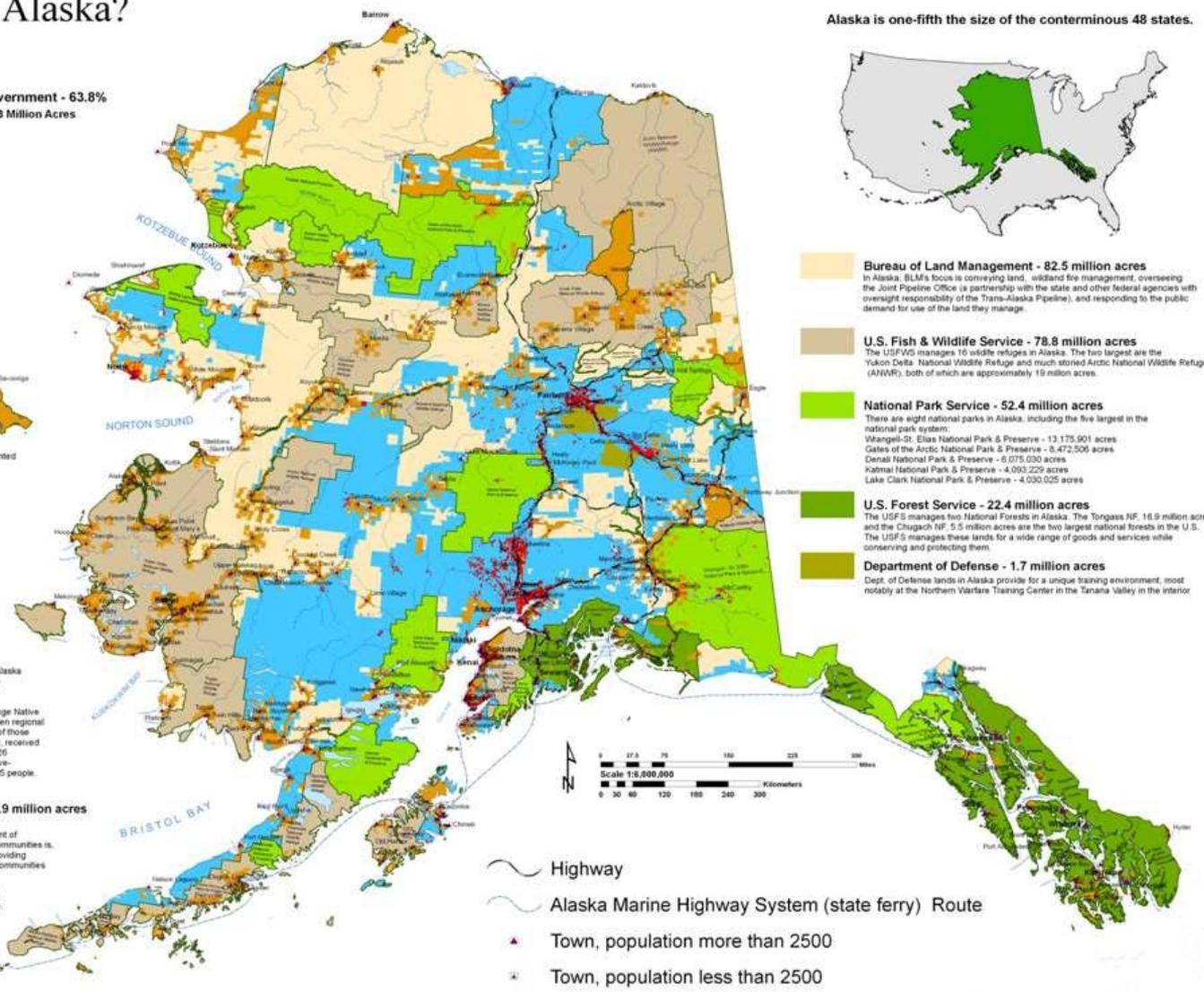
Native lands are private lands. ANCSA mandated the creation of regional and village native corporations to manage 44 million acres and payment of one billion dollars. Thirteen regional corporations were created for the distribution of ANCSA land and money. Twelve of those shared in selection of 16 million acres, the thirteenth corporation, based in Seattle, received a cash settlement only. 224 village corporations, of 25 or more residents, shared 26 million acres. The remaining acres, which include historical sites and existing native-owned lands, went into a land pool to provide land to small villages of less than 25 people. To date, 39.3 million acres have been transferred to ANCSA corporations.

### Non-ANCSA Private & Local Government - 5.9 million acres

Land in private ownership (other than Native land) comprises less than one percent of the total land in Alaska. Much of the best land for development around Alaska's communities is, or will be, privately owned. Private land development meets people's needs by providing places to live, work, shop and recreate. It also provides a tax base for cities and communities to help support public services.

Because local governments in Alaska have individual methods of transferring land into private ownership, land currently owned by them is grouped into this category.

Alaska is one-fifth the size of the conterminous 48 states.



- Bureau of Land Management - 82.5 million acres**  
In Alaska, BLM's focus is conveying land, wildland fire management, overseeing the Joint Pipeline Office (a partnership with the state and other federal agencies with oversight responsibility of the Trans-Alaska Pipeline), and responding to the public demand for use of the land they manage.
- U.S. Fish & Wildlife Service - 78.8 million acres**  
The USFWS manages 16 wildlife refuges in Alaska. The two largest are the Yukon Delta National Wildlife Refuge and much storied Arctic National Wildlife Refuge (ANWR), both of which are approximately 19 million acres.
- National Park Service - 52.4 million acres**  
There are eight national parks in Alaska, including the five largest in the national park system:  
Wrangell-St. Elias National Park & Preserve - 13,175,901 acres  
Gates of the Arctic National Park & Preserve - 8,472,500 acres  
Denali National Park & Preserve - 6,075,030 acres  
Katmai National Park & Preserve - 4,093,229 acres  
Lake Clark National Park & Preserve - 4,030,025 acres
- U.S. Forest Service - 22.4 million acres**  
The USFS manages two National Forests in Alaska. The Tongass NF, 16.9 million acres, and the Chugach NF, 5.5 million acres are the two largest national forests in the U.S. The USFS manages these lands for a wide range of goods and services while conserving and protecting them.
- Department of Defense - 1.7 million acres**  
Dept. of Defense lands in Alaska provide for a unique training environment, most notably at the Northern Warfare Training Center in the Tanana Valley in the interior.



## Alaska Upland Land Ownership/Mgt (Statewide total $\approx$ 1.8 million Km<sup>2</sup>) (DOI holds nearly 60%)

	Million acres	Km <sup>2</sup>	% of total
State of Alaska	89.8	363,408	24.1
BLM	82.5	333,866	22.1
USF&WS	78.8	318,892	21.1
NPS	52.4	212,055	14.1
ANCSA	39.3	159,041	10.5
USFS	22.4	90,650	6.0
Other private	5.9	23,876	1.6
DoD	1.7	6,880	0.5
<b>TOTALS</b>	<b>372.8</b>	<b>1,508,668</b>	<b>100.0</b>

An additional 65 million acres of Tide and Submerged Lands are mapped for offshore drilling activities and sea ice monitoring.



# The Alaska Geospatial Framework

- Is unique and atypical given predominant federal jurisdiction
- Geospatial Coordination Environment
  - No formal GIO or state GIS council / coordinating body
  - Several user groups engaged in geospatial activities (only SDMI is executive recognized)
    - SDMI (State Data Mapping Initiative) – A state group of three agencies & UAF
    - AGDC (Alaska Geographic Data Committee) – Federal, State, Tribal stakeholders
      - Co-chaired by USGS and AKDNR, AKDNR Co-chair also in SDMI
    - AAUG (Alaska Arc User Group) – Mostly GIS
    - ASPRS (American Society of Photogrammetry and Remote Sensing) – Mostly imaging



## Alaska's historical geospatial data disparity

- The State of Alaska is not accurately mapped and represents America's worst geodetic and geospatial infrastructure
- The last time the state was uniformly and comprehensively mapped was at the time of statehood 50 years ago
  - Last statewide Orthoimagery acquisition was in 1978
  - Only state with a statewide 60 meter elevation model
    - All geospatial data layers rely on the accuracy of an elevation model base layer
- The existing map of Alaska does not meet National Map Accuracy Standards (NMAS).
- Alaska is the only state with such a deficiency within the National Spatial Data Infrastructure (NSDI)



## Implications of lacking an accurate base elevation model :

- Comprehensive national geospatial plans will always require Alaska to have stated inaccuracy caveats in order to be included:
  - Imagery For The Nation (IFTN)
  - The USGS *Digital Topo-Quad*
  - The National Land Imaging Program (Future Landsat 8 processing)
- Future financial investments in geospatial infrastructure will not be fully optimized to potential accuracy levels (control issues, thematic derivation, etc.)
- Existing NSDI data themes derived from current elevation data do not meet NMAS and will require complete production revision in the future.
  - Watershed Boundary Data (WBD)
  - National Hydrography Data (NHD)
- Aviation Safety – In violation of current International Civil Aviation Organization treaties (ICAO, Doc. #9881 Minimum Terrain Data Requirements)



**GEOGRAPHIC INFORMATION NETWORK OF ALASKA**  
 GATEWAY TO THE UNIVERSITY'S GEOSPATIAL INFORMATION RESOURCES

UNIVERSITY of ALASKA

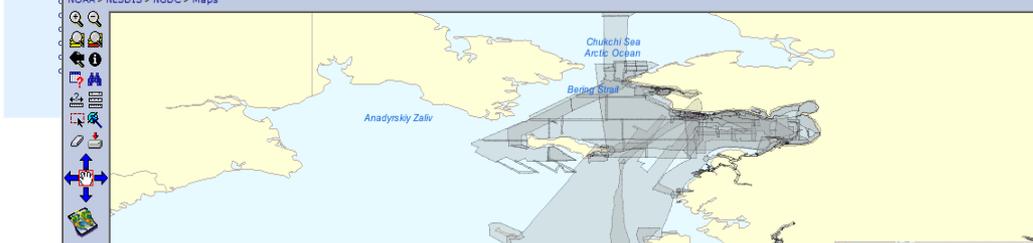
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**Data Links : Alaska**

- Alaska Images and Maps
- Data Links : Alaska
- Data Links : National
- GINA Data Submission
- GINA Global - Integrated

**Alaska Mapped**  
 Alaska Statewide Digital Mapping Initiative  
 High resolution satellite orthoimagery and aerial orthophotography are available for viewing and download.

**NOAA Satellite and Information Service**  
 National Environmental Satellite, Data, and Information Service (NESDIS)



**AOOS Alaska Ocean Observing System**  
 The Eye on Alaska's Coasts and Oceans

Home Access Data About AOOS Help Web cams

Learn more about the **Base Maps**. Choose layers to activate on the left, {changing to white/*italicized*} .

**Map Controls**

Mouse Tools

- Zoom in
- Zoom out
- Information

Map Size: medium (600x450)

Regions: AOOS Regions

Projection: Alaska

Time: 2009-06-17-21

Current Time: 2009-06-17-21

Elevation: 0 meters

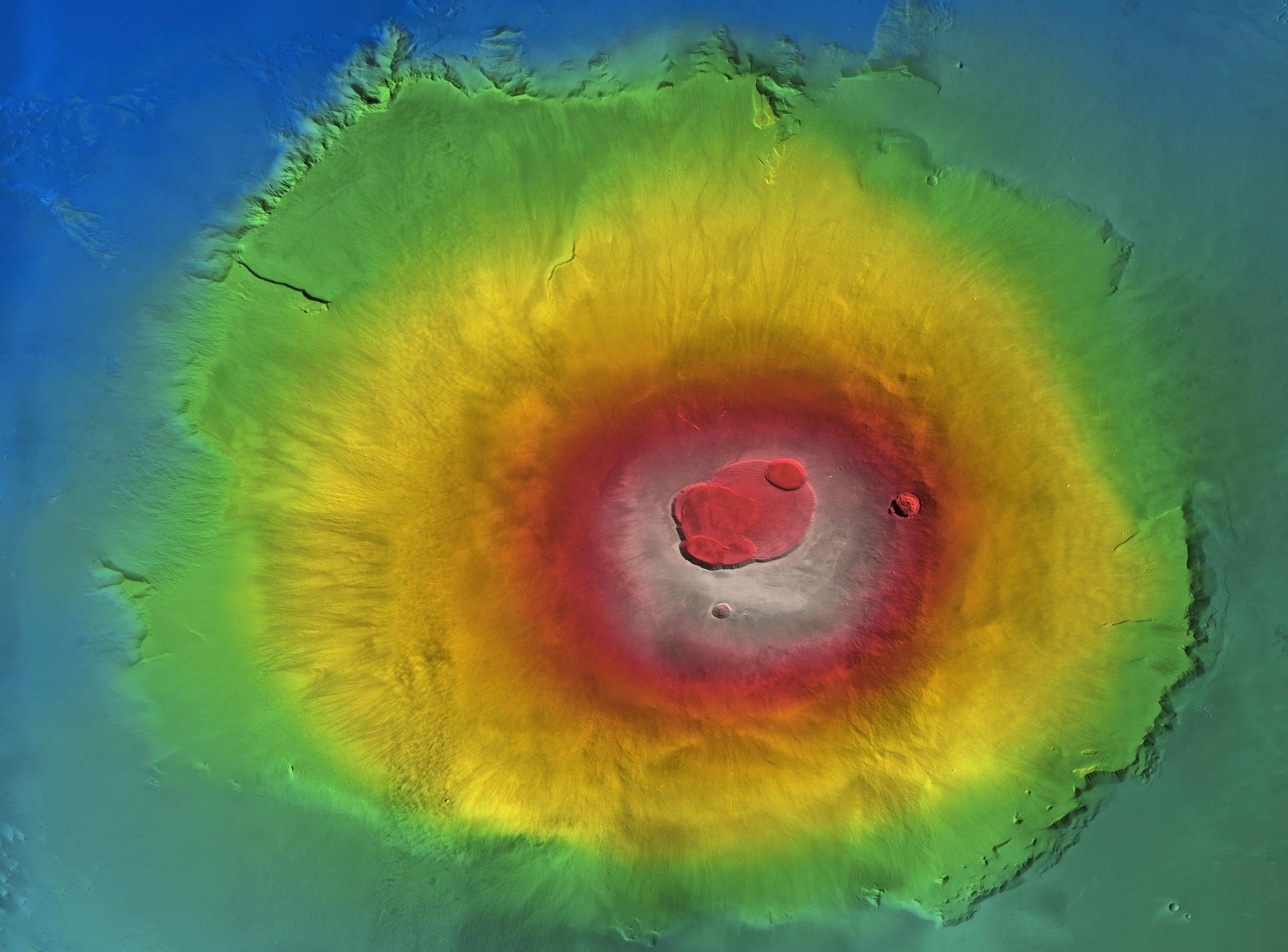
**Data Layers**

- Base Map
- Weather Data
- Ocean Surface
- Satellite Data
- Forecast Data
- Forecast: Regional
- Ocean Forecast
- Ocean Forecast: Regional
- Stations
- Bathymetry Data



## Future Steps...

- Continue refining the acquisition areas through the planning processes and scientific research requirements
- Continue to seek to identify additional funding and potential partners
- Consider scaled approaches
  - state-wide, regional & local





Questions ?