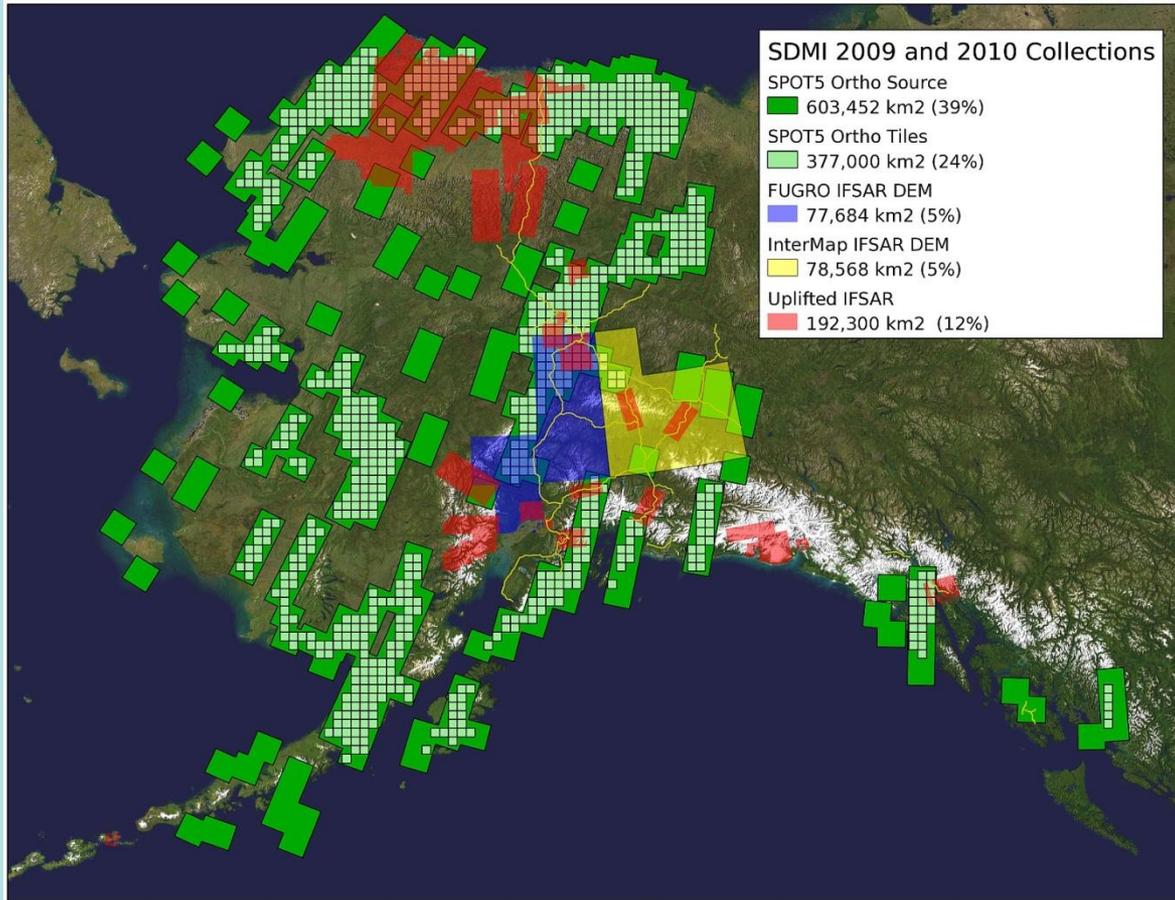


www.alaskamapped.org



Historic and Current Status of Orthoimagery and Elevation Mapping and SDMI

Tom Heinrichs

Joint Agency Commercial Imagery Evaluation (JACIE)
Boulder, Colorado
March 31, 2011

www.gina.alaska.edu

www.alaskamapped.org

tom.heinrichs@alaska.edu

Dayne Broderson

dayne@gina.alaska.edu



Topics for talk

- Introduce UAF-GINA
- Alaska Statewide Digital Mapping Initiative (SDMI) program overview
- Status update for IfSAR DEM collection and statewide orthoimagery collection
- 1950s and 1980s work in Alaska
- Web services
- Options for user input

SDMI 2009 and 2010 Collections

SPOT5 Ortho Source

603,452 km² (39%)

SPOT5 Ortho Tiles

377,000 km² (24%)

FUGRO IFSAR DEM

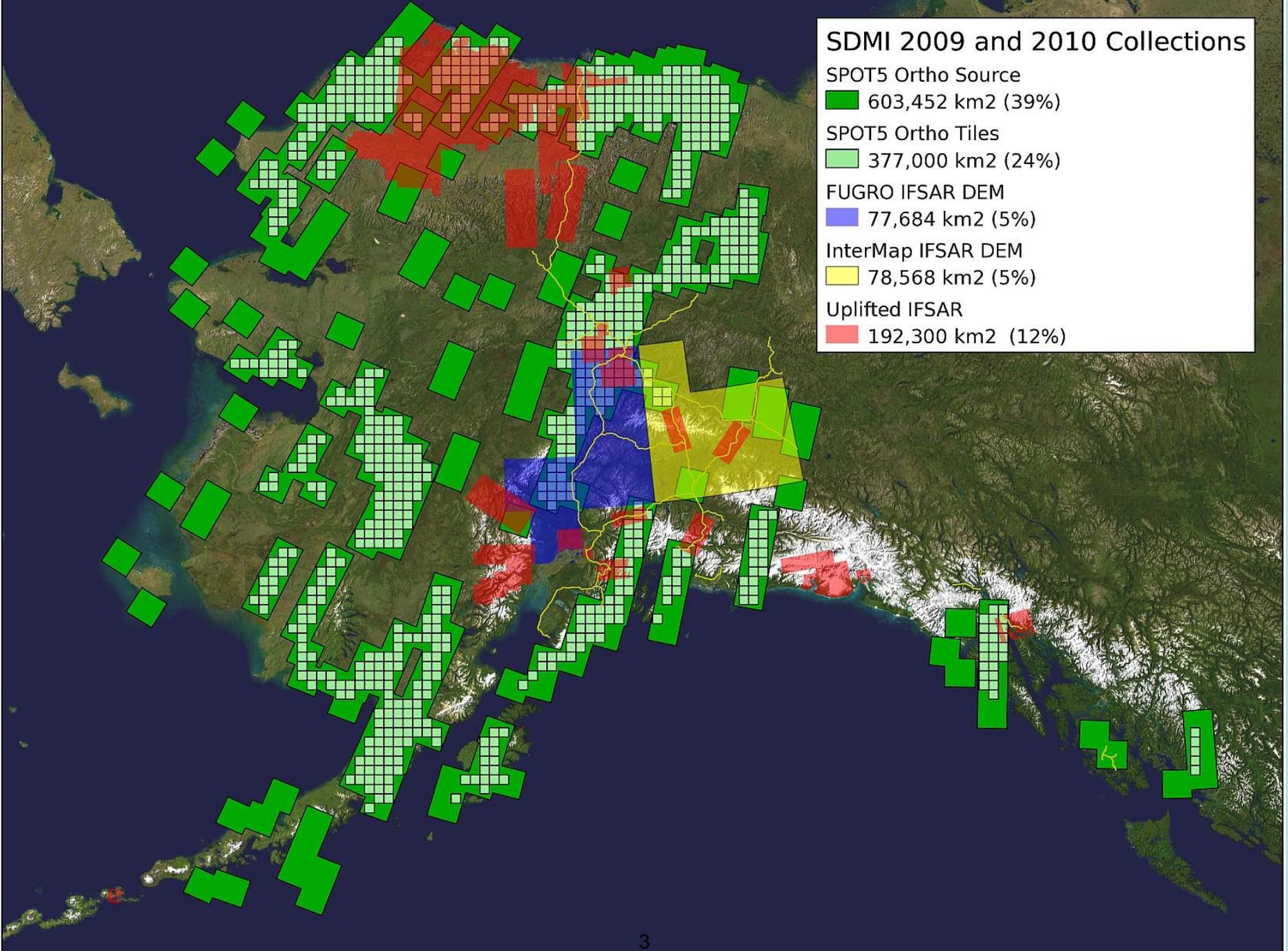
77,684 km² (5%)

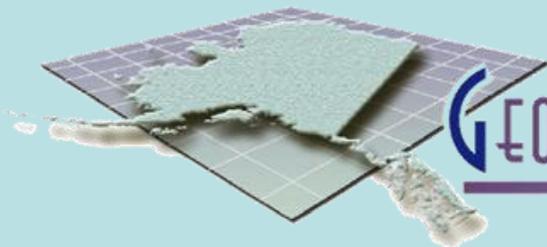
InterMap IFSAR DEM

78,568 km² (5%)

Uplifted IFSAR

192,300 km² (12%)





3.6-meter Antenna

SeaSpace X-band Ground Station

MODIS on NASA Terra and Aqua

1.2-meter Antenna

SeaSpace L-band Ground Station

AVHRR on NOAA polar orbiters

SeaWiFS



NOAA / NESDIS Fairbanks



NOAA Satellite and Information Service

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

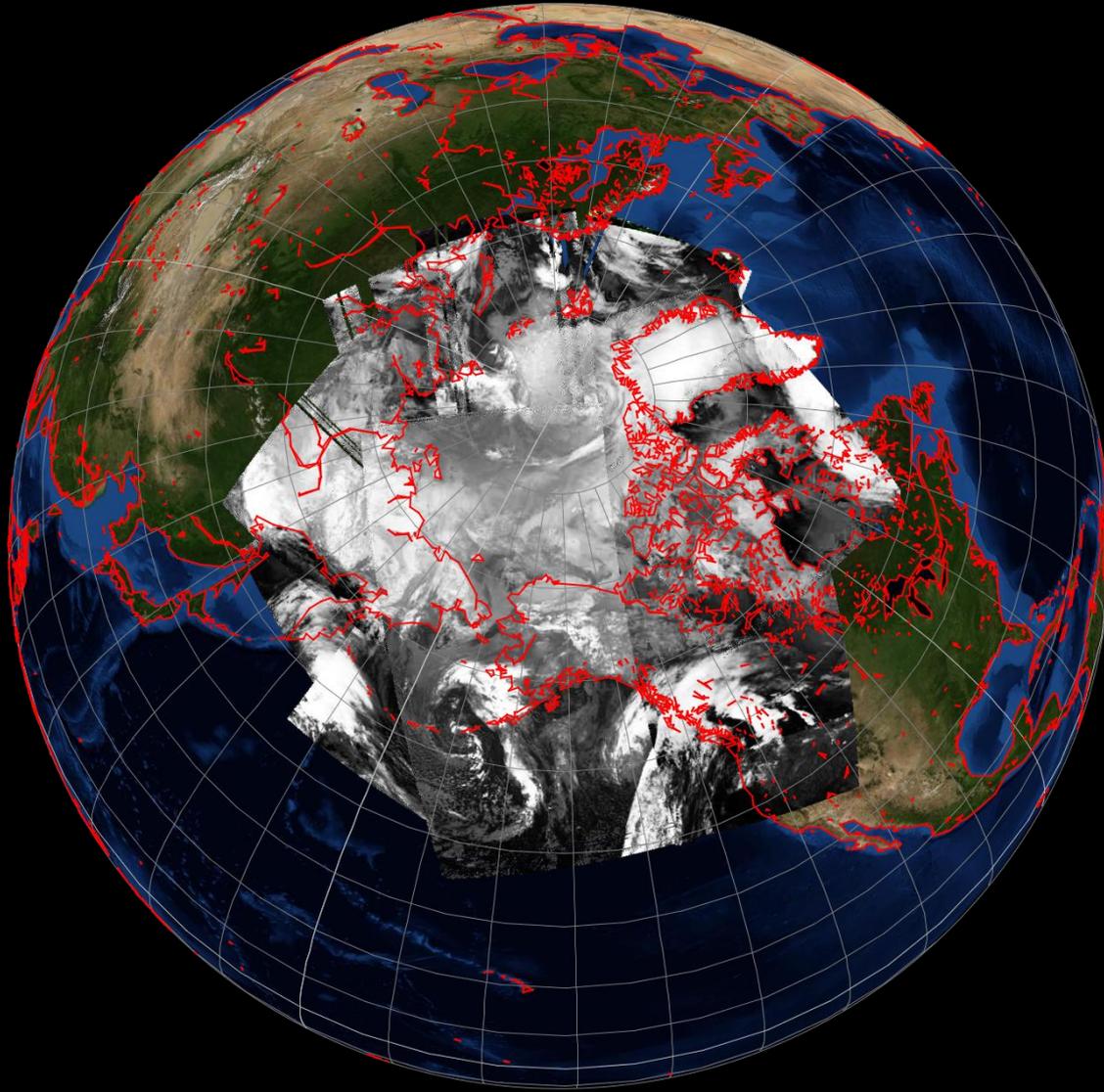




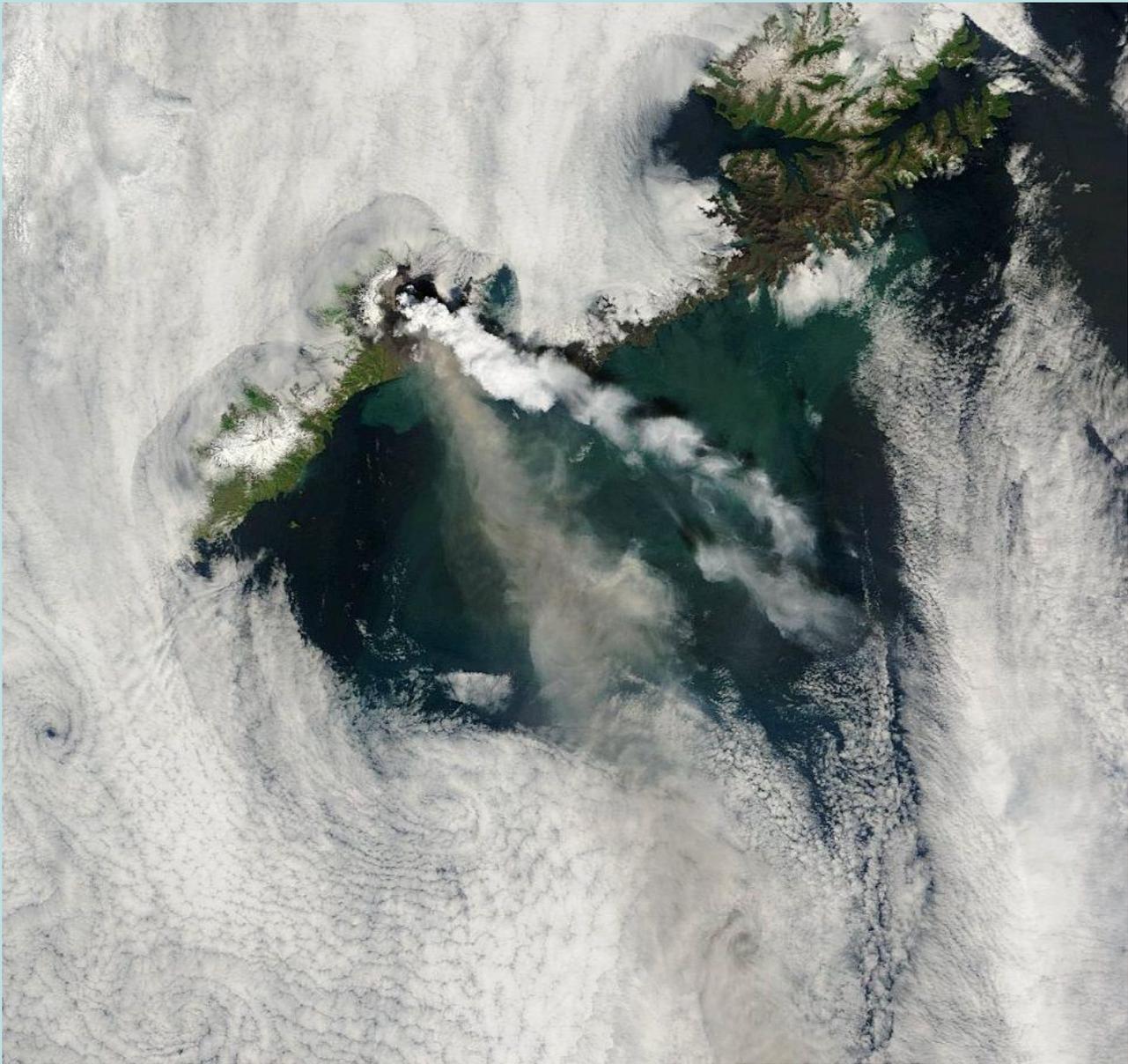
NOAA Satellite and Information Service

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

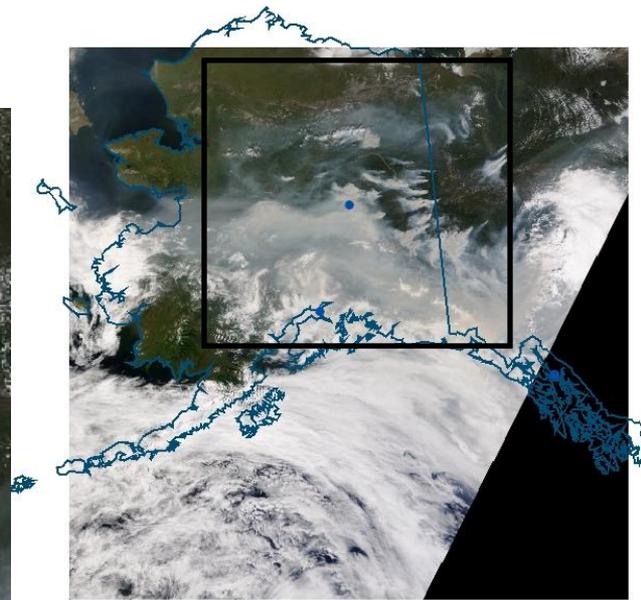
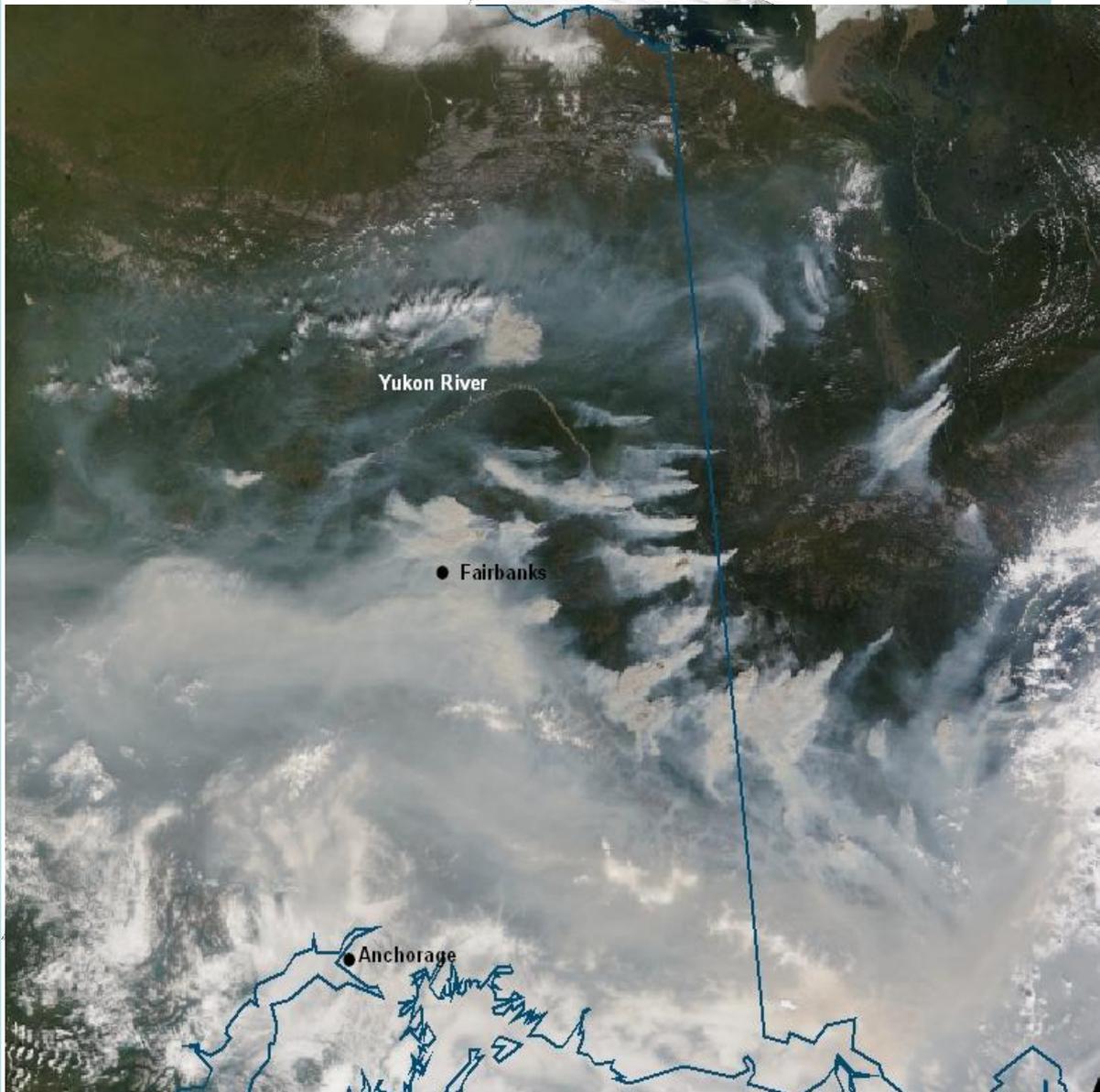




- FCDAS Barrow station increases AVHRR mask over critical areas
- FCDAS Fairbanks antennas provide critical backup to GINA reception
- Users include:
 - National Weather Service
 - Alaska Volcano Observatory
 - Oil field service companies
 - Alaska Fire Service
 - and many more...

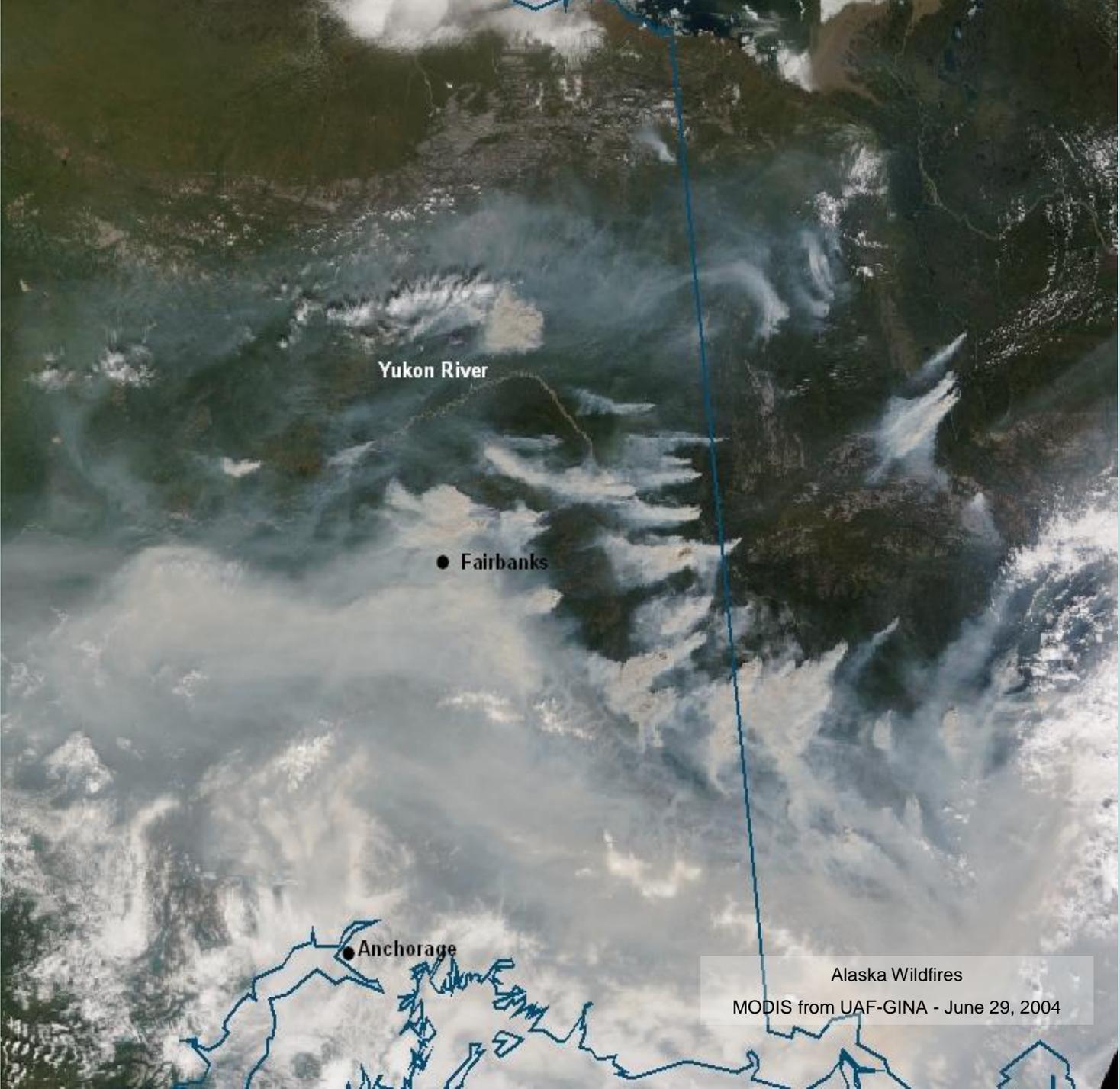


Okmok Volcano July 13, 2008
(MODIS from UAF-GINA)



MODIS
250-meter
Imagery

June 29, 2004

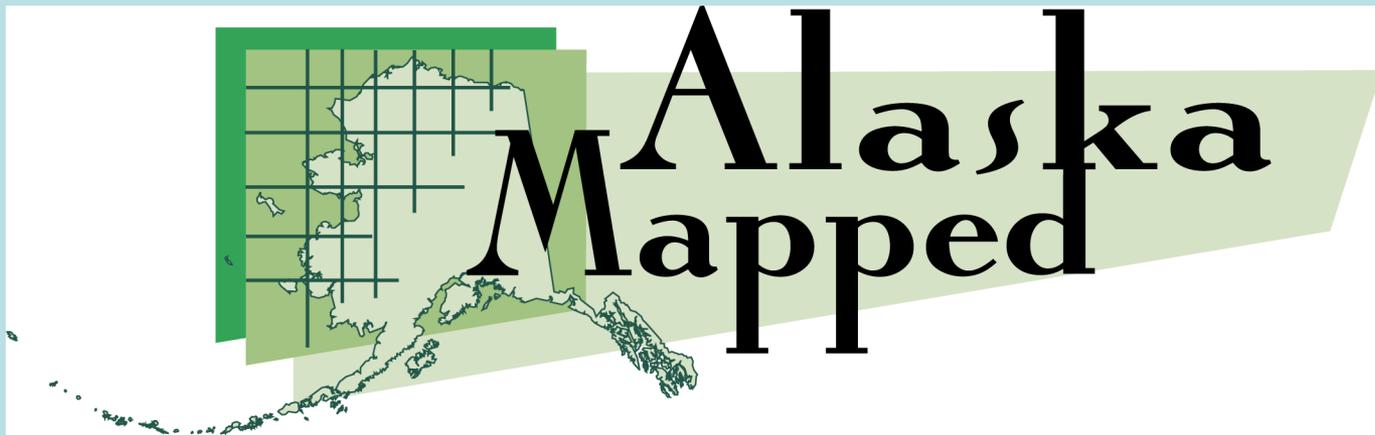


Yukon River

● Fairbanks

● Anchorage

Alaska Wildfires
MODIS from UAF-GINA - June 29, 2004



Alaska Statewide Digital Mapping Initiative

www.alaskamapped.org

The Alaska Statewide Digital Mapping Initiative's primary goals are to **acquire new and better maps** for Alaska and to **make existing map products more easily available**.

The SDMI seeks to make ongoing improvements to Alaska maps on a **broad, statewide scale**. Alaska is the only state in the nation lacking current, accurate, high-resolution maps.

SDMI Program Background

- Cooperative program endorsed by the Governor implemented by six state Departments and the University
- Established 2006
- Governed by Executive Team of senior managers from the agencies
- Informed by agency Technical Advisory Group
- Advised by an external panel of experts

SDMI Member Agencies

- DCCED: Commerce, Community, and Economic Development
- DEC: Environmental Conservation
- DF&G: Fish and Game
- DMVA: Military and Veterans Affairs
- DNR: Natural Resources
- DOTPF: Transportation and Public Facilities
- UA: University of Alaska

2010 Funding Partners

- Orthoimagery
 - BOEM Coastal Impact Assistance Program
 - SDMI
- IfSAR DEM
 - National Geospatial-Intelligence Agency (NGA)
 - SDMI
 - USGS
 - NRCS
 - BLM
 - NPS

Stakeholder Engagement

- [User Survey](#) (180+ respondents)
- [Alaska DEM Workshop](#) (100+ attendees)
- [Alaska Ortho-Imagery Workshop](#) (60+ attendees)
- NDEP and NDOP workshop
- Public feedback on whitepapers
- Participation in public forums and events:
ASMC, AGDC, ASPRS, AAUG, NASDUG, etc.

Historical Work in Alaska

FIELD SURVEYING AND TOPOGRAPHIC MAPPING IN ALASKA: 1947-83

By Robert C. Foley

U.S. GEOLOGICAL SURVEY CIRCULAR 991

A chronological review of surveying activities in Alaska from 1947 to 1983, including a brief description of camp life and some of the hardships and unusual experiences encountered

1987

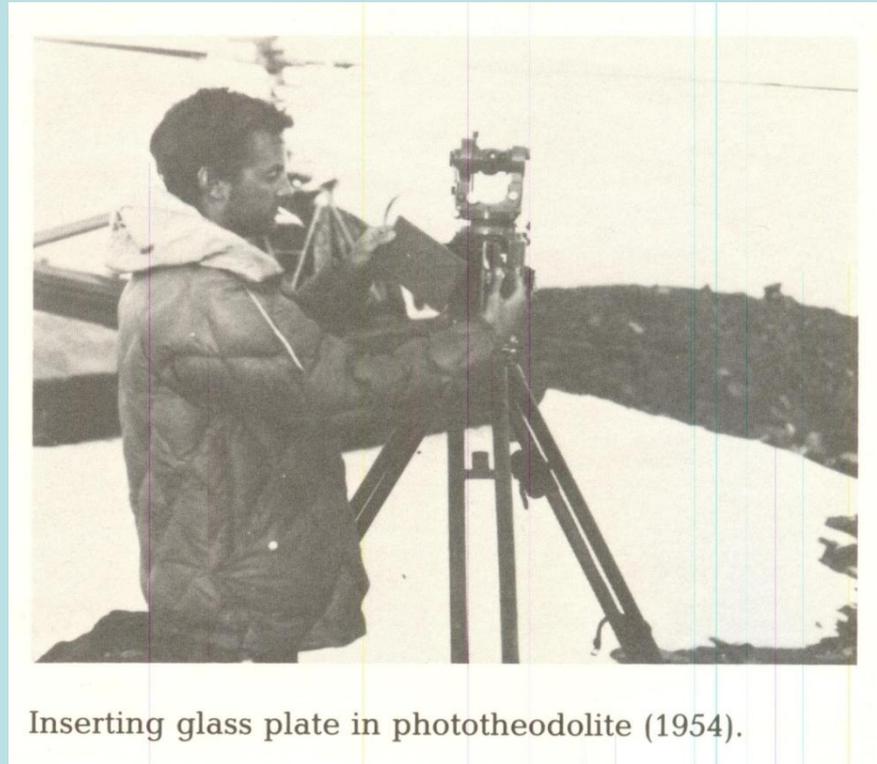


Crew at Glacier Bay (1949). (Photograph by Ansel Adams. Courtesy of the Trustees of the Ansel Adams Publishing Rights Trust. All rights reserved.)

Historical Work in Alaska



First helicopter used in Alaska, near Big Delta. This Bell helicopter was rated at 78 horsepower and carried Civil Aeronautics Administration license 11-H, the eleventh helicopter certified in the United States (1948).



Inserting glass plate in phototheodolite (1954).

Hazardous, Remote Conditions

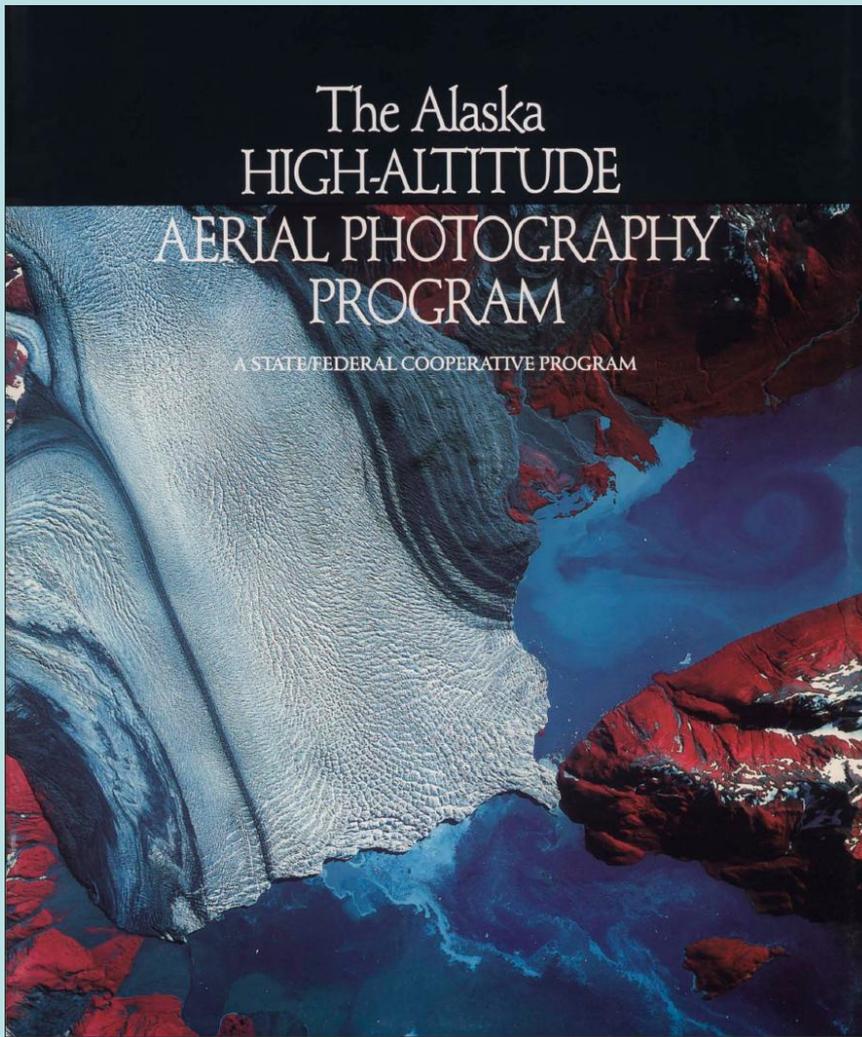


Bell Model 476 helicopter after a bad landing near Northway (1955).

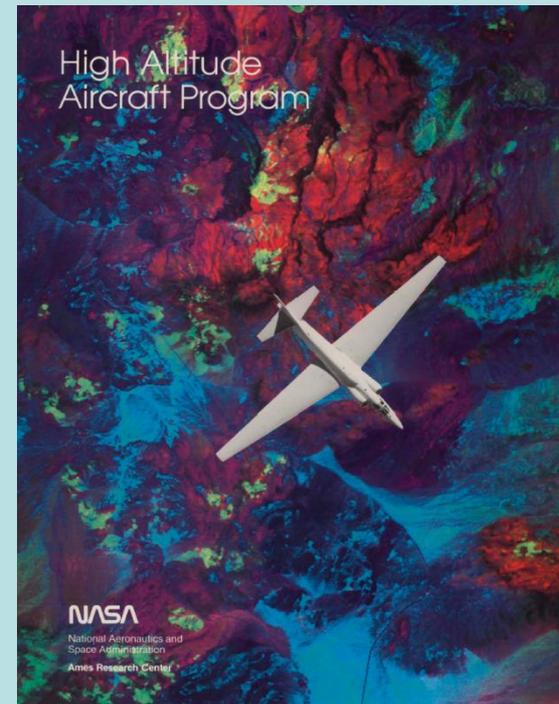


Triangulation station near Taku Harbor (1951).

Alaska High-Altitude Aerial Photography Program



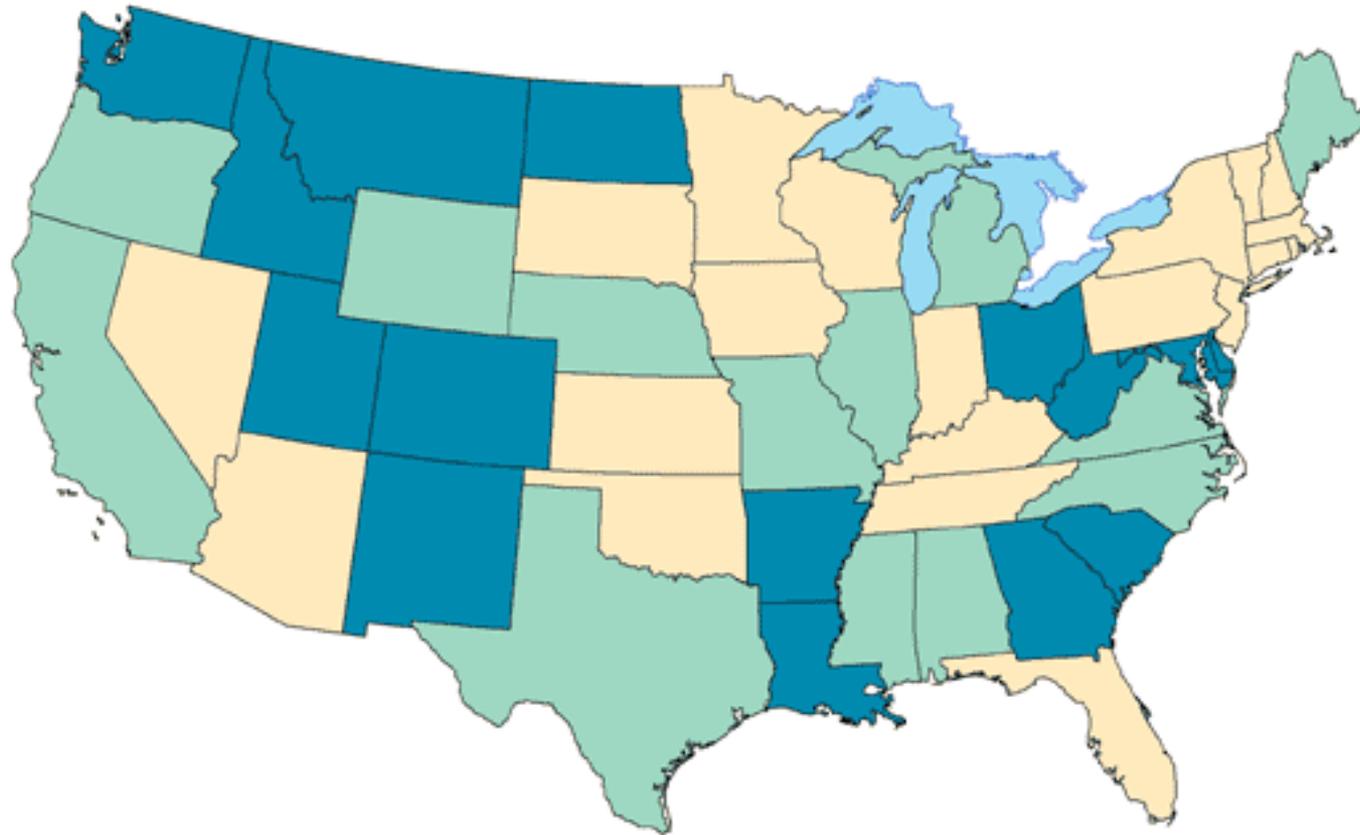
- 1978-1986
- \$2.7M multi-agency funding (\$5.9M in 2009 dollars)
- 1:60,000 color infrared
- 90%+ statewide coverage
- Not orthorectified systematically



(A very incomplete list of historic) USGS Investment in Alaska

- 1902-1907
 - \$7.1M
 - 100,000 sq-mi, 1:250k reconnaissance
- 1913-1917
 - \$5.2M
 - 51,000 sq-mi 1:500k; 152,000 sq-mi 1:250k reconnaissance
- 1947-1983
 - Creation of statewide 1:63,360 map
 - \$11.5M on helicopter time
 - \$25M on field personnel
 - \$??M on photography
 - \$??M on map production
- 1978-1986
 - AHAP photography
 - \$5.9M for high altitude photography

Proposed NAIP Acquisition Cycle



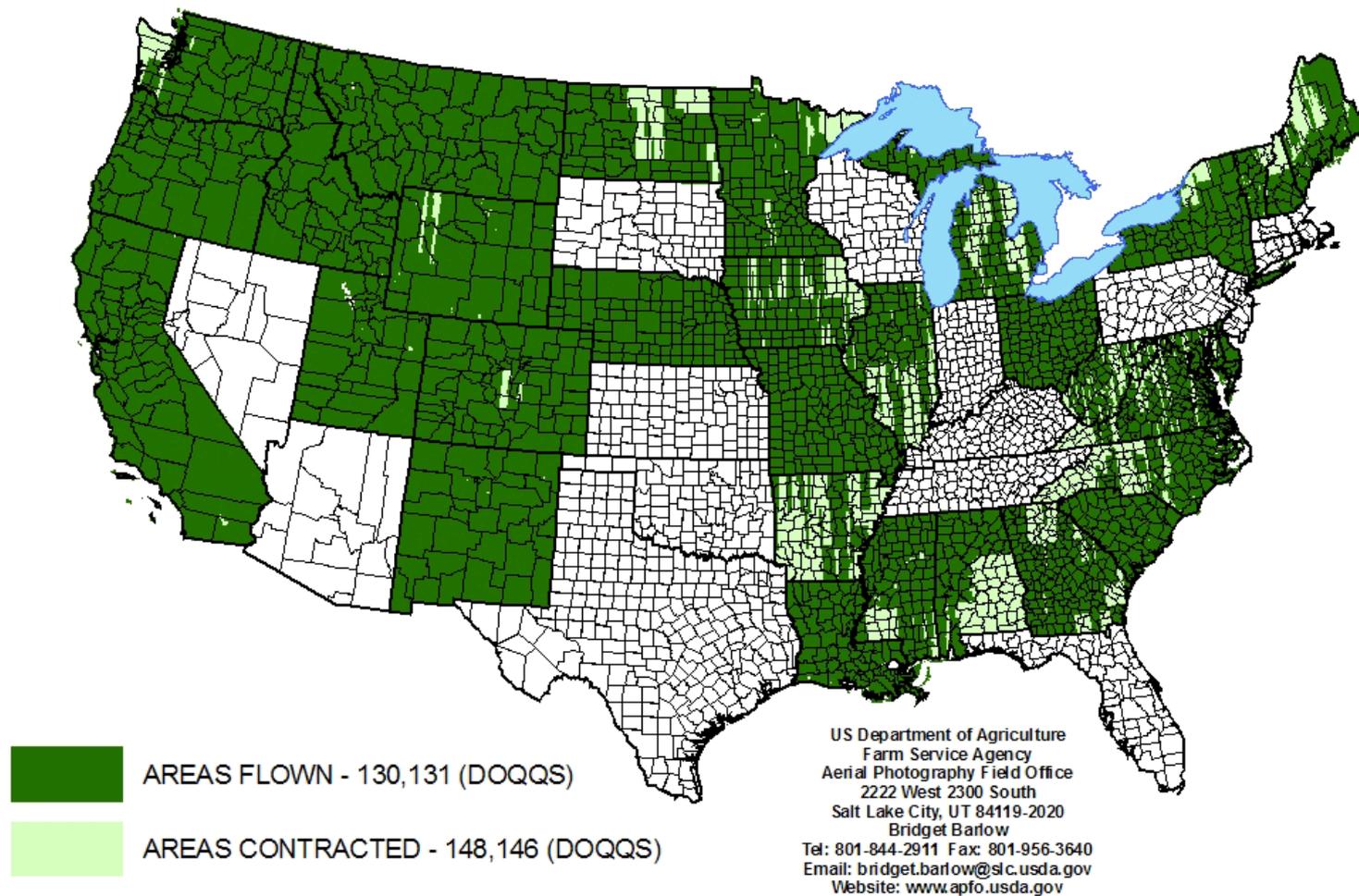
Cycle Dates



June 3, 2008

http://www.fsa.usda.gov/Internet/FSA_Image/naip_3yr_cycle.gif

2009 NAIP IMAGERY STATUS





www.alaskamapped.org

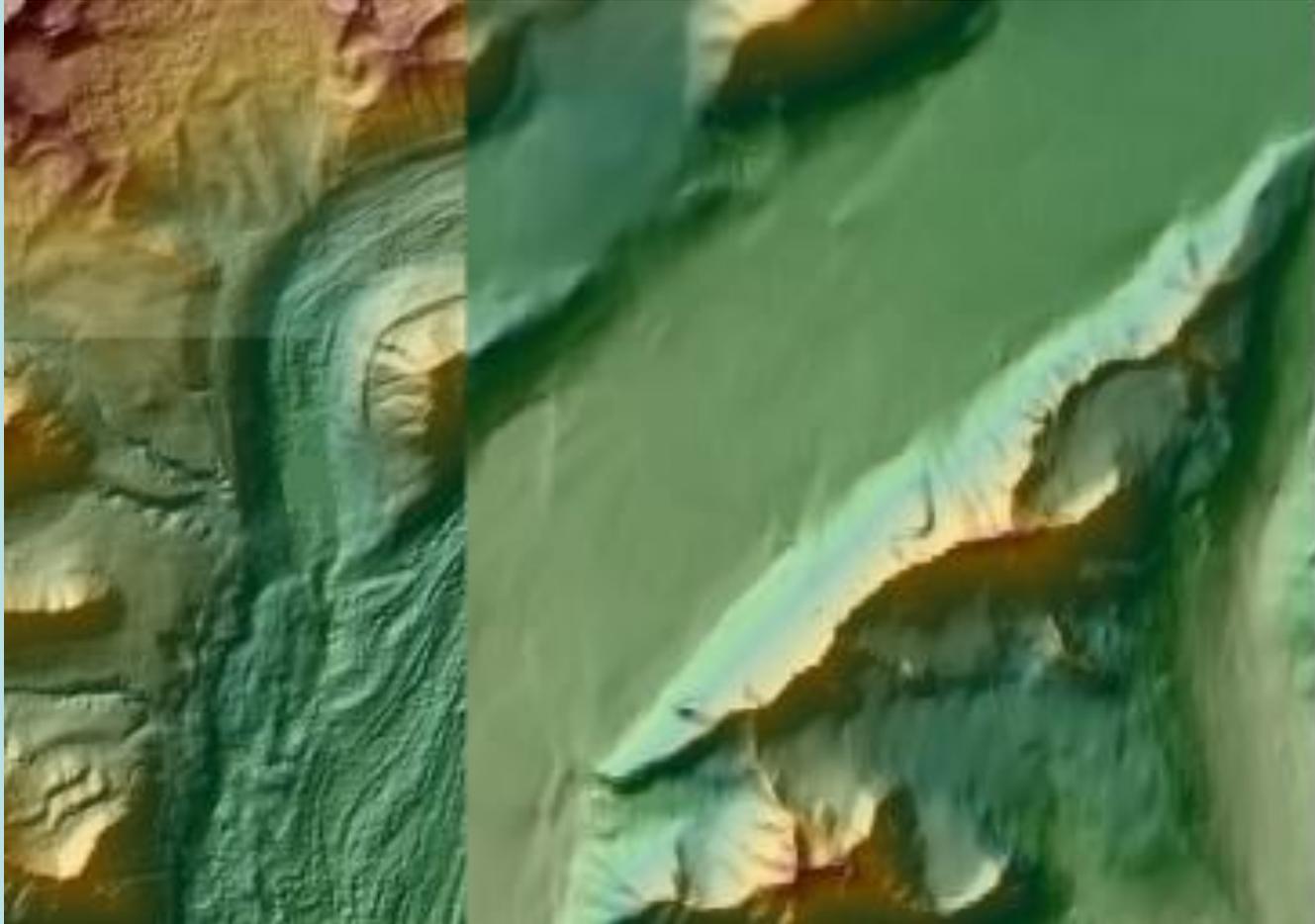
SDMI Statewide 2009 & 2010 Collections

Area (km²)

% of State Buffer Covered

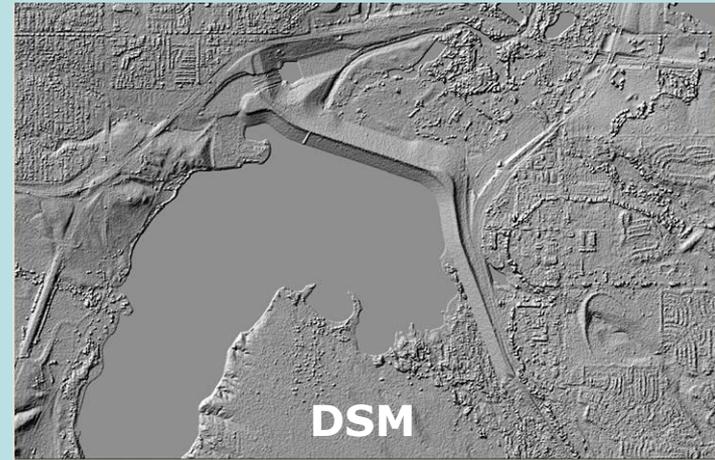
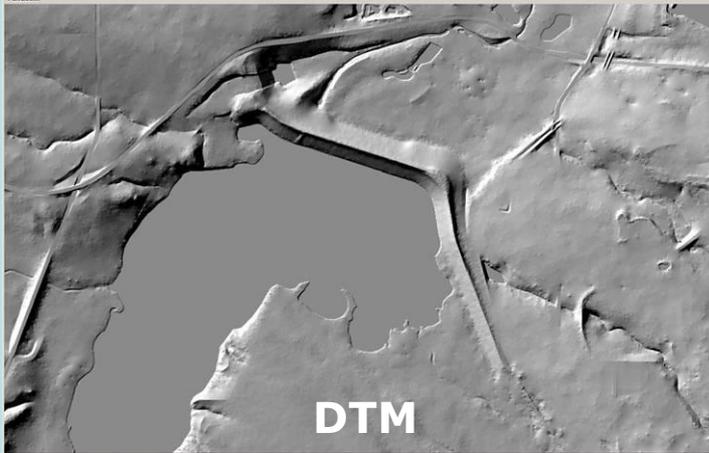
	Non-overlapping SPOT5 Orthos	603,452	38.64
	FUGRO IFSAR DEM	77,684	4.97
	InterMap IFSAR DEM	78,568	5.03
	Alaska State Boudary 1km Buffer	1,561,622	

Resolution/content significantly different



IFSAR (left) and NED (right)

The Solution



- Three normal airborne IFSAR products
- Could register satellite imagery to ORI to improve positional accuracy with minimal GCPs



SDMI DEM Status

- 2-meter RMSE (20-foot contour accuracy)
- 5-meter post spacing
- Both DSM (top surface) and DTM (bare earth) products
- Includes 5-meter or better Ortho Radar Image (ORI)
- Public Domain licensing (into NED)
- 28 geocells – 157,434 sq-km of new collections in 2010
- 150,000+ sq-km Intermap existing legacy IfSAR DEMs uplifted to public domain
- Products – Phased delivery; all by August 31, 2011
- Dewberry prime – let under USGS GPSE contract
- Work split between Intermap Star3i and Fugro Earthdata GeoSAR
- \$35 / sq-km
- \$6M total
 - \$2.6M NGA
 - \$1.9M SDMI
 - \$1M USGS
 - \$240k BLM
 - \$100k NRCS
 - \$100k NPS

SDMI DEM collections

Uplifted IFSAR

192,300 km² (12%)

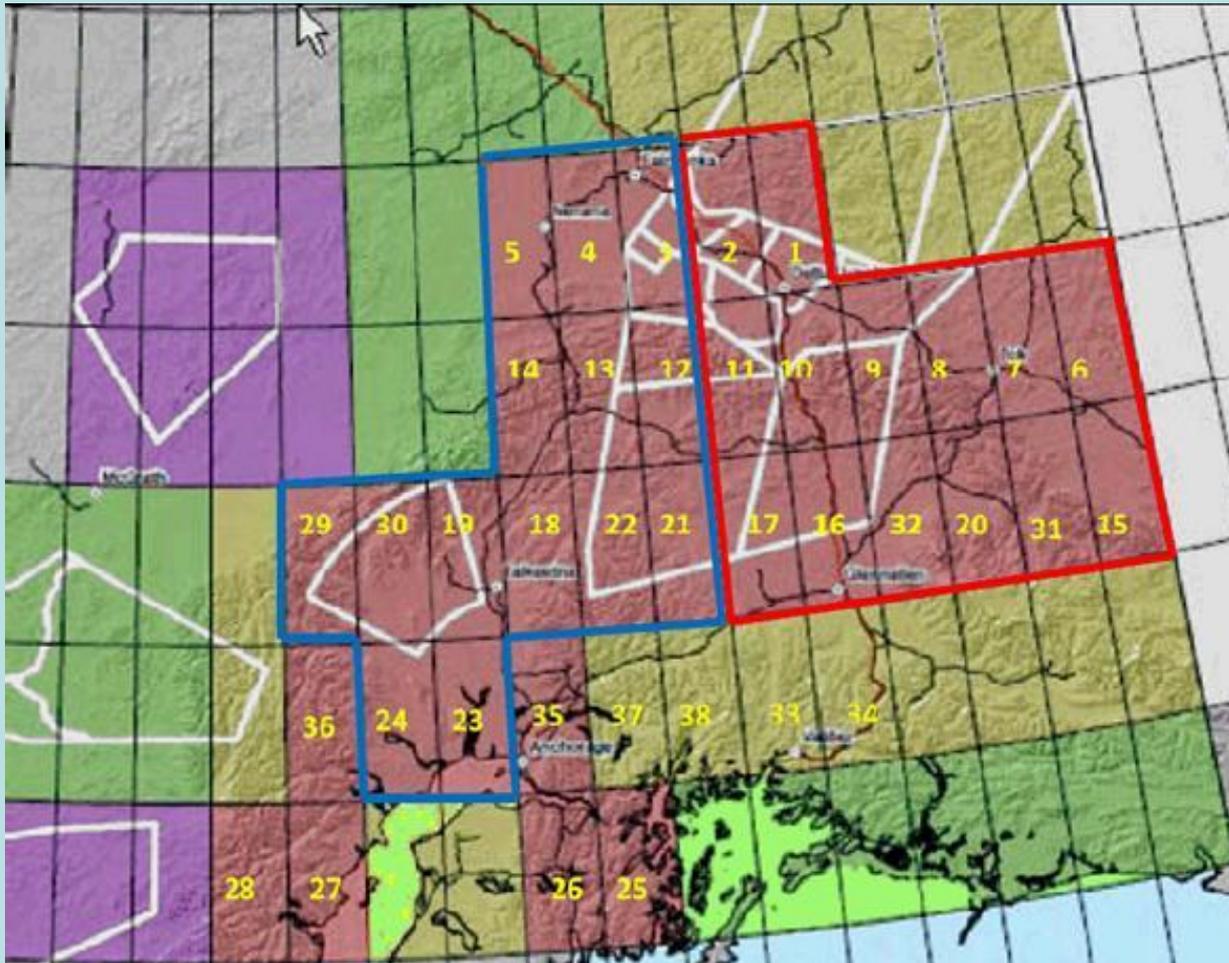
FUGRO 2010 IFSAR DEM

77,684 km² (5%)

InterMap 2010 IFSAR DEM

78,568 km² (5%)

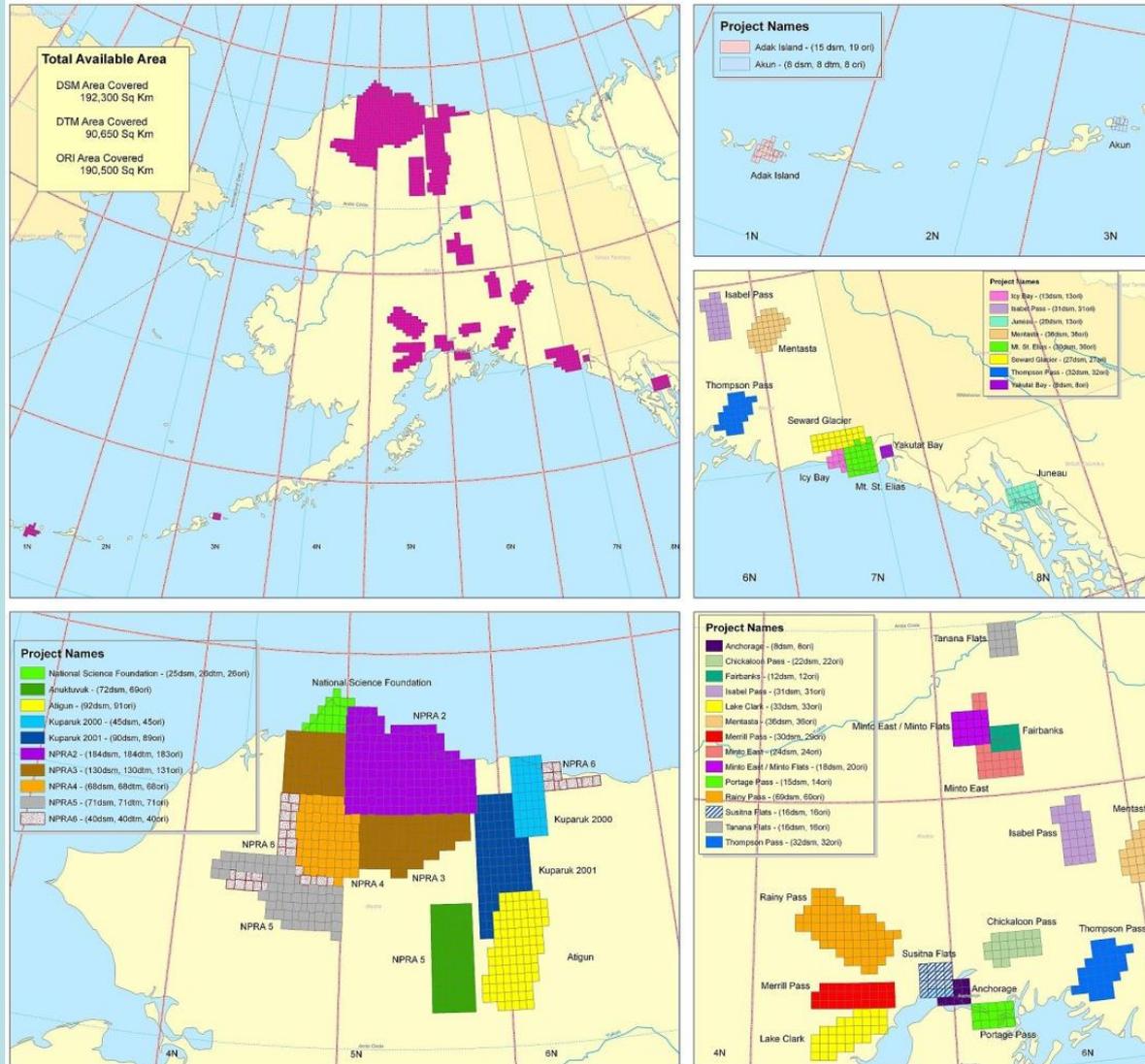
2010 IfSAR Collections

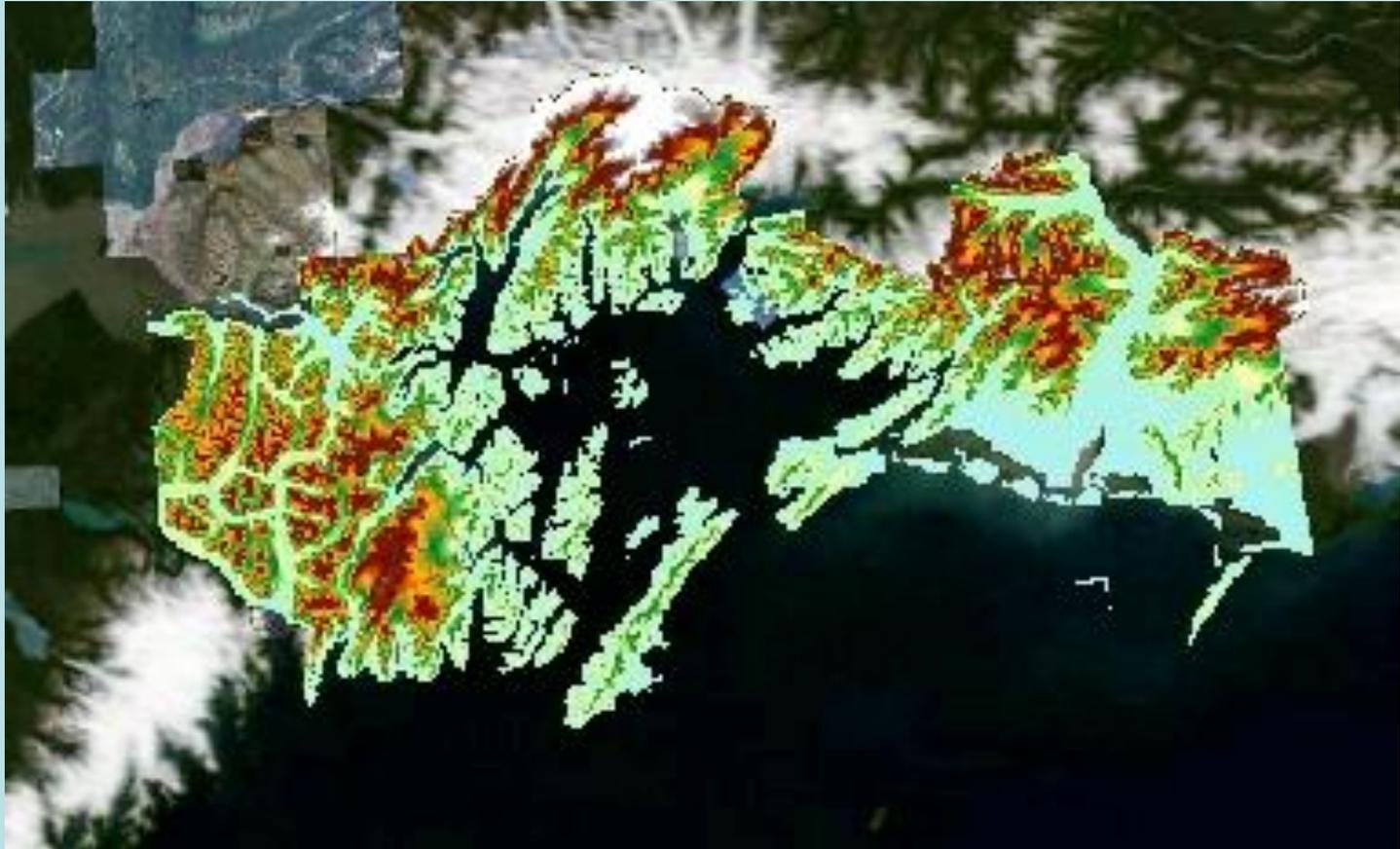


BLUE Fugro Earthdata GeoSAR
RED Intermap Star3i

Intermap Data uplifted to public domain

ALASKA

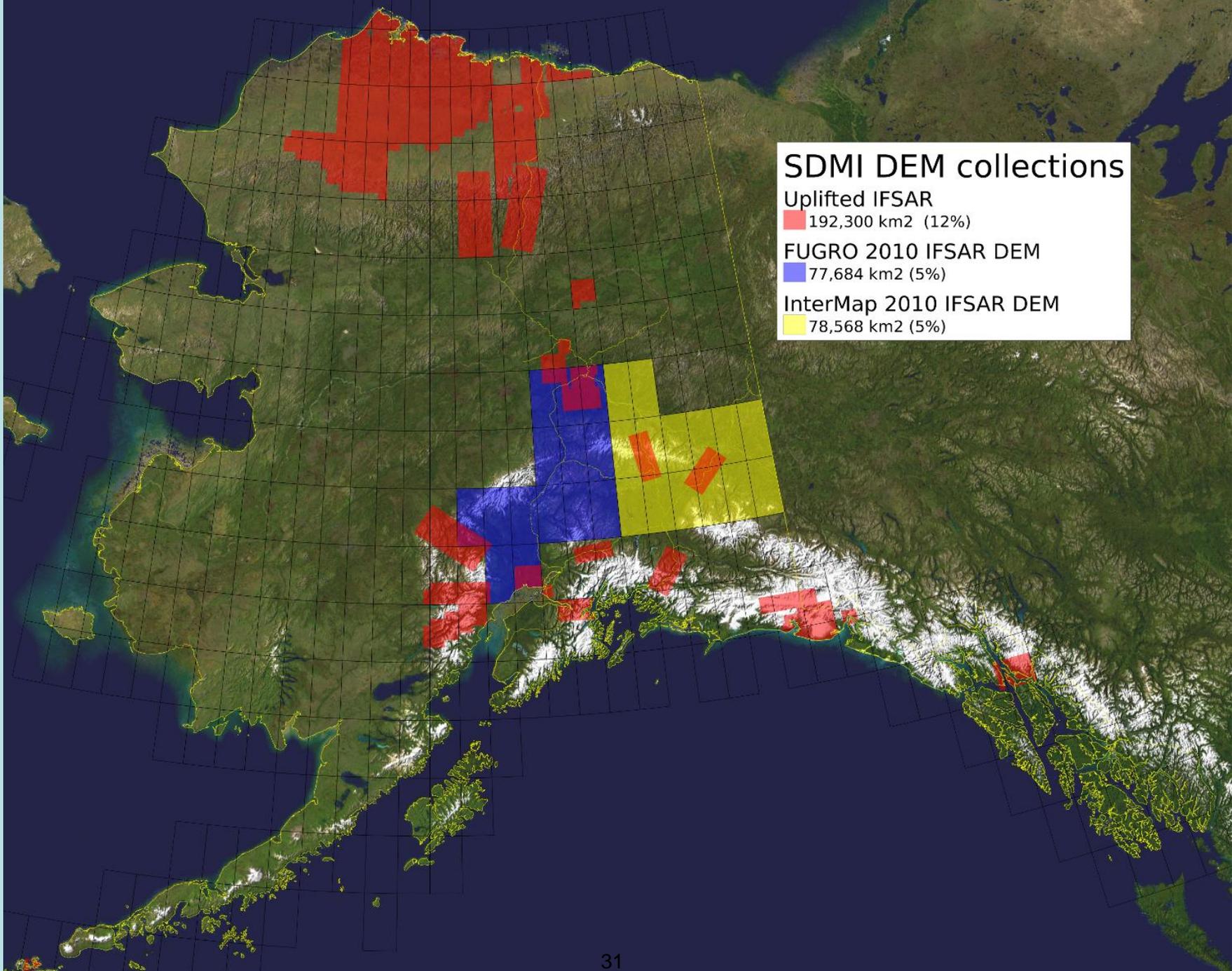


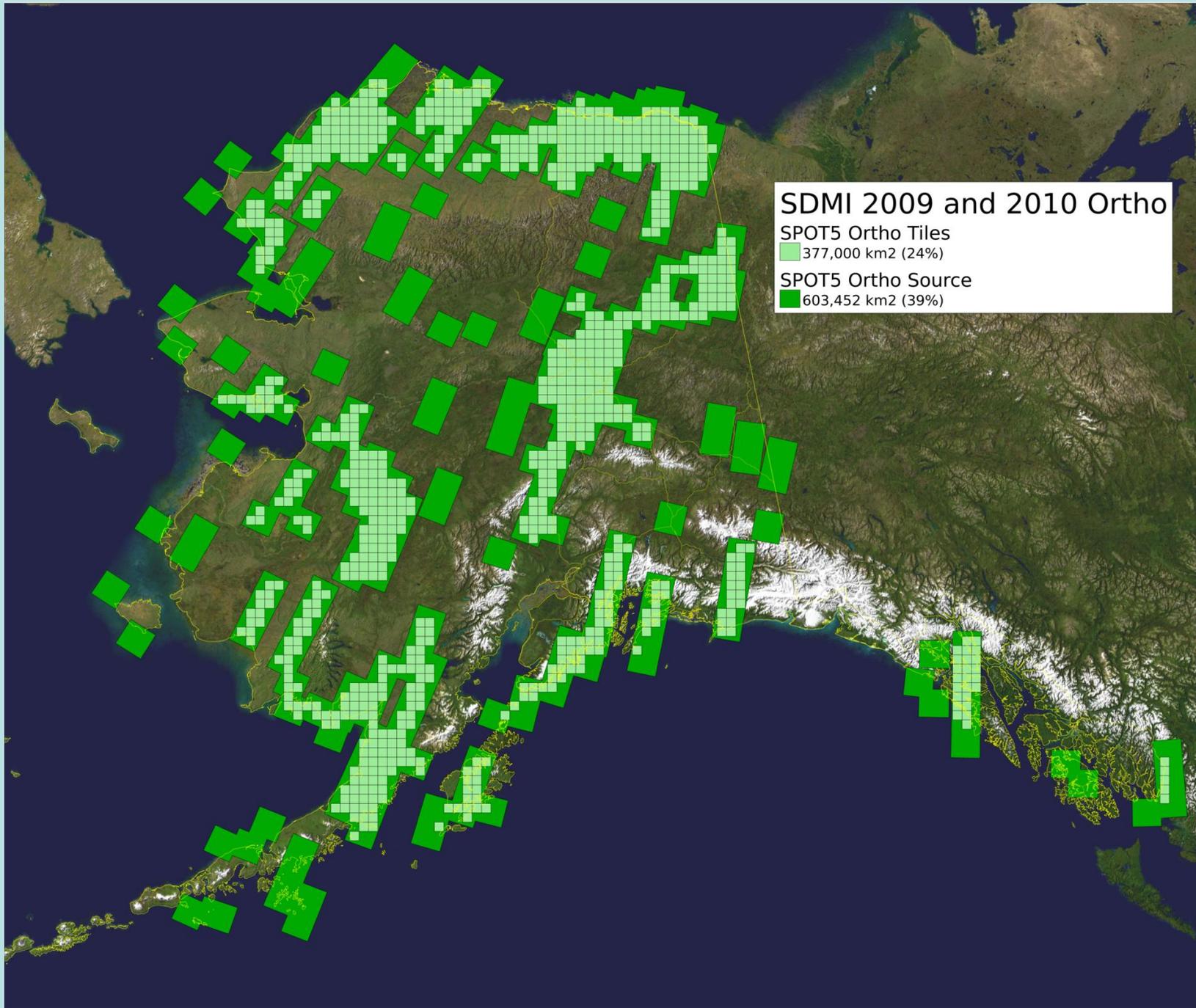


US Forest Service DEM Work in Southeast – DTED-2 accuracies

Chugach NF - SPOT HRS DEM – Complete

Tongass NF - SPOT HRS DEM – Under Contract – US Forest Service



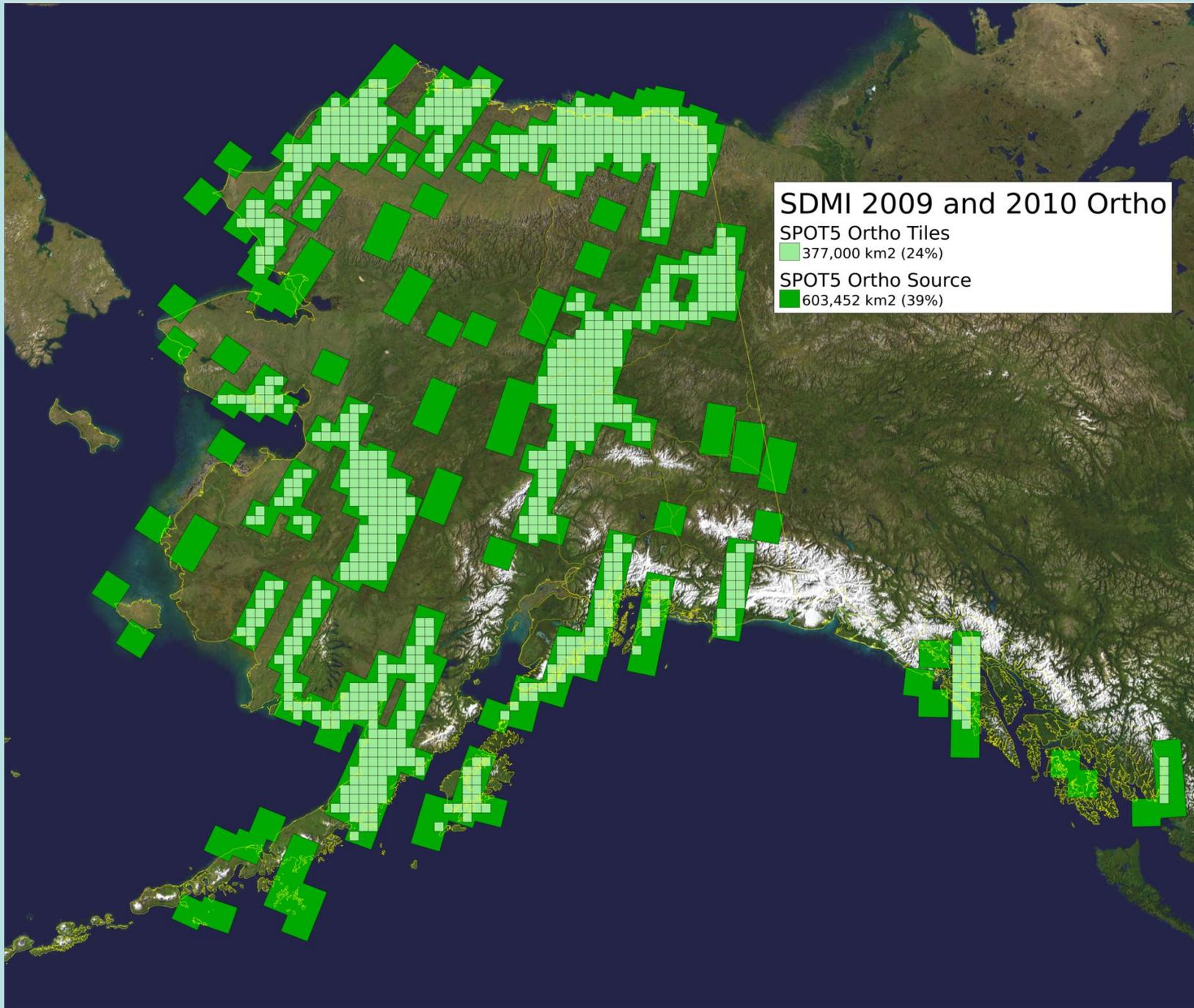


SDMI Orthoimagery Status

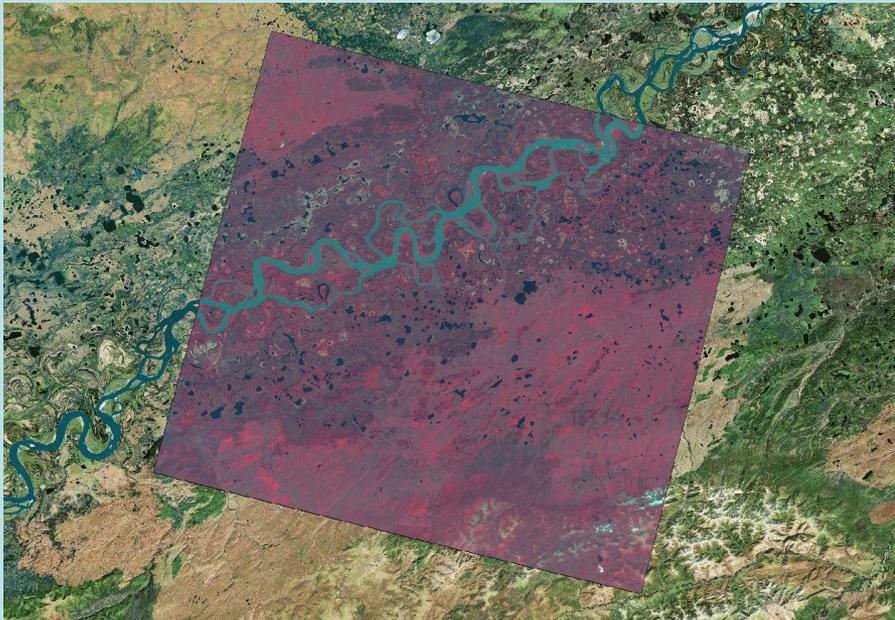
- 1:24,000 NMAS accuracy – 12.2-m CE90
- 2.5-meter spatial resolution
- 10-m multispec pan sharpened to 2.5-m
- Three statewide 2.5-m mosaics
 - Pseudo natural color
 - CIR
 - Panchromatic
- Entire state – 1.56 million sq-km
- 600,000+ sq-km of new collections in 2009 & 2010
- Five seasons of collection (2009-2013): project completion – 2014
- Aero-Metric prime – project management and QA
 - Astrium / Spot Image – source data
 - Fugro EarthData – orthomosaic processing

SDMI Orthoimagery Status, cont'd

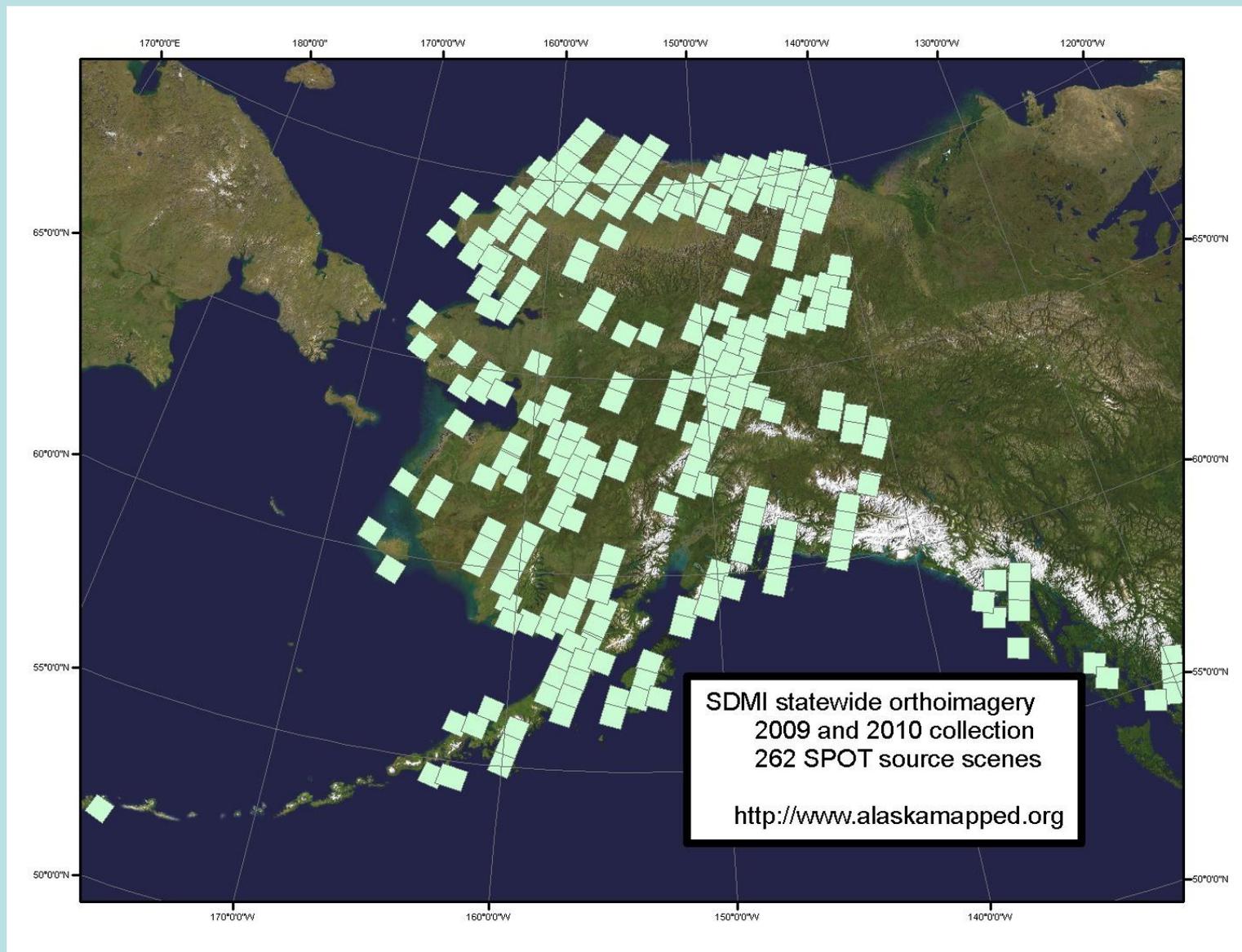
- 288 source scenes available at www.alaskamapped.org/ortho
- Sample ortho products from pilot areas in WMS for testing
- First 377,000 sq-km of orthomosaics out in spring 2011
- License
 - Source data (Level 1a): Federal, State, Local, Tribal Government, and Academia
 - Orthomosaics: available to all via open standards web services (WMS)
- \$3.45M total
 - \$1.8M MMS
 - \$1.65M SDMI
- Additional options being added to contract via amendment
 - Additional scenes
 - Access to archive
 - License uplifts
 - HRS DEM



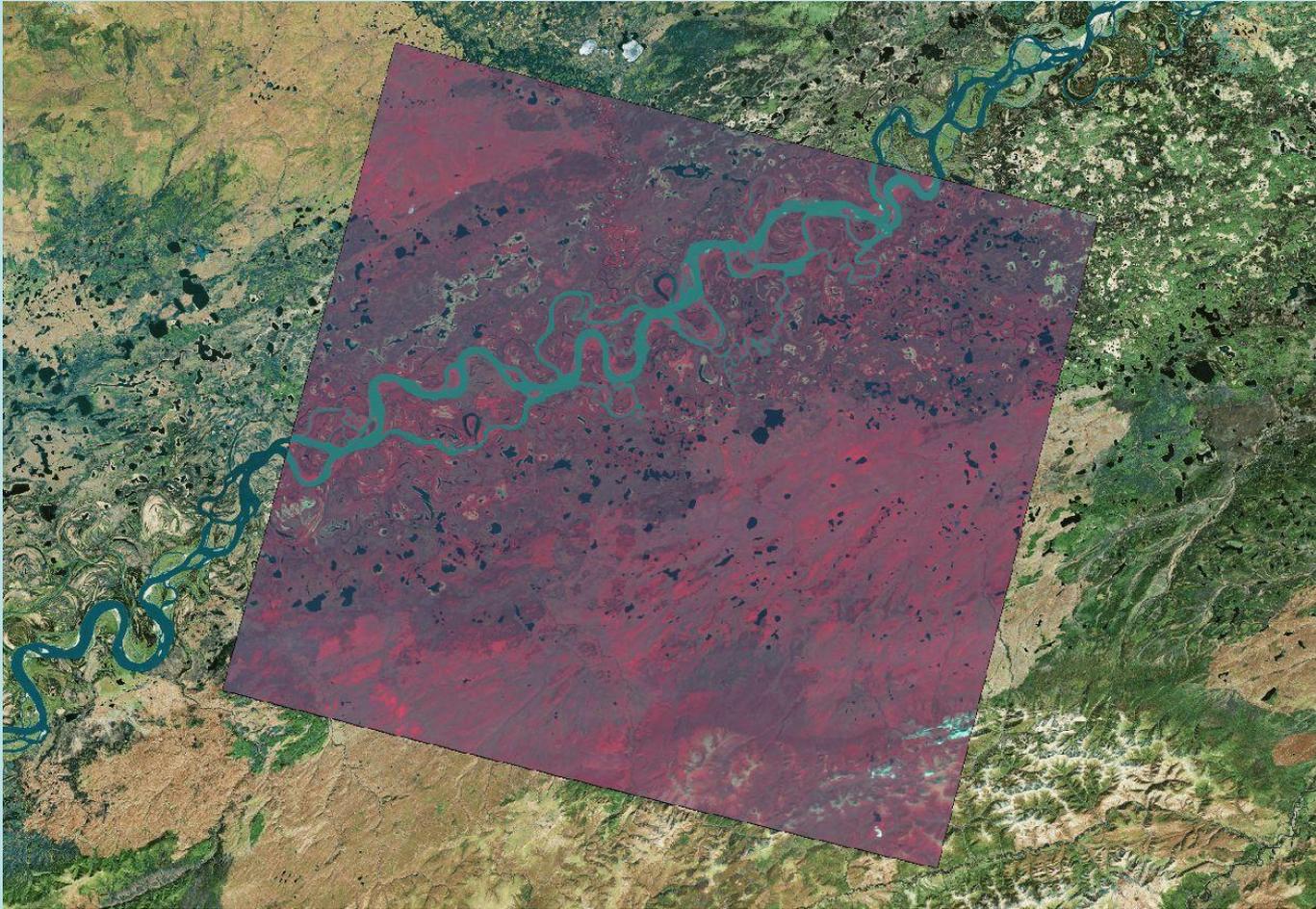
Source Imagery and Pilot Project Data



2009 & 2010 Source Data – Initial Delivery



First image



browse.alaskamapped.org

ALASKA MAPPED

Search [?] [↑]

Clear Search

Go To Location [?] [↑]

Latitude: []
Longitude: []

Go

Make Map [?] [↓]

Show Available Data [?] [↑]

Refresh Options ▾

- GINA Data Vault
 - By Resolution
 - By Year
 - By License Type
 - By Data Type
 - Aerial Photos
 - Elevation Data
 - Landsat Terracolor
 - SDMI Ortho & DEM
 - By Resolution
 - 10.00 m
 - 2.50 m

SPOTS.SDMI.SOURCE-L1A.2009.541722
SPOTS.SDMI.SOURCE-L1A.2009.541722
SPOTS.SDMI.SOURCE-L1A.2009.543322
SPOTS.SDMI.SOURCE-L1A.2009.543723
SPOTS.SDMI.SOURCE-L1A.2009.543723
SPOTS.SDMI.SOURCE-L1A.2009.543723
SPOTS.SDMI.SOURCE-L1A.2009.543723

view | contact info

use | Cart | Log In

link to this map

SDMI BDL

POWERED BY Google

Center: 58.791, -161.367 Mouse: 62.032, -160.115 Zoom: 6

Terms of Use

Select Scene – Add to Cart – Download

The screenshot displays the ALASKA MAPPED website interface. At the top, the header includes the "ALASKA MAPPED" logo, the SDMI (Statewide Digital Mapping Initiative) logo, and navigation links for "program overview" and "contact info". Below the header, there are links for "Home", "Browse", "Cart", and "Log In".

The main content area is divided into several sections:

- Search:** A search bar with "Clear" and "Search" buttons.
- Go To Location:** Input fields for "Latitude:" and "Longitude:" with a "Go" button.
- Make Map:** A section with a "Show Available Data" button.
- Show Available Data:** A list of data sources under a "Refresh" button and "Options" dropdown. The list includes "GINA Data Vault" and "SDMI Ortho & DEM" (with sub-options for "By Resolution" at 10.00 m and 2.50 m). The selected item is "SPOTS.SDMI.SOURCE-L1A.2009.541722".
- Map:** A central map view showing a satellite image of a coastal area. A red rectangle highlights a specific scene. A "View" dropdown menu is visible above the map, and a "Link to this map" link is to the right. A "SDMI BDL" dropdown menu is also present in the top right of the map area.
- Additional Information:** A section on the right providing details for the selected scene:
 - Download Add to Cart Zoom To
 - Scene: SPOTS.SDMI.SOURCE-L1A.2009.54172230909042245122B0
 - Date: 09/05/2009 to 09/05/2009
 - Resolution: 2.5 m
 - Agency: SDMI ([more info](#))
 - Contact: Dayne Broderson ([more info](#))
 - Project: SDMI Ortho 2010 ([more info](#))
 - License: SDMI SPOT5 Ortho ([more info](#))
- File List:** A section below the additional information, currently empty.

At the bottom of the page, there is a "POWERED BY Google" logo and a "Terms of Use" link. The footer also displays the URL "browse.alaskamapped.org/#" and the coordinates "Center: 61.840, -166.557 Mouse: 61.895, -164.998 Zoom: 8".

Orthoimagery

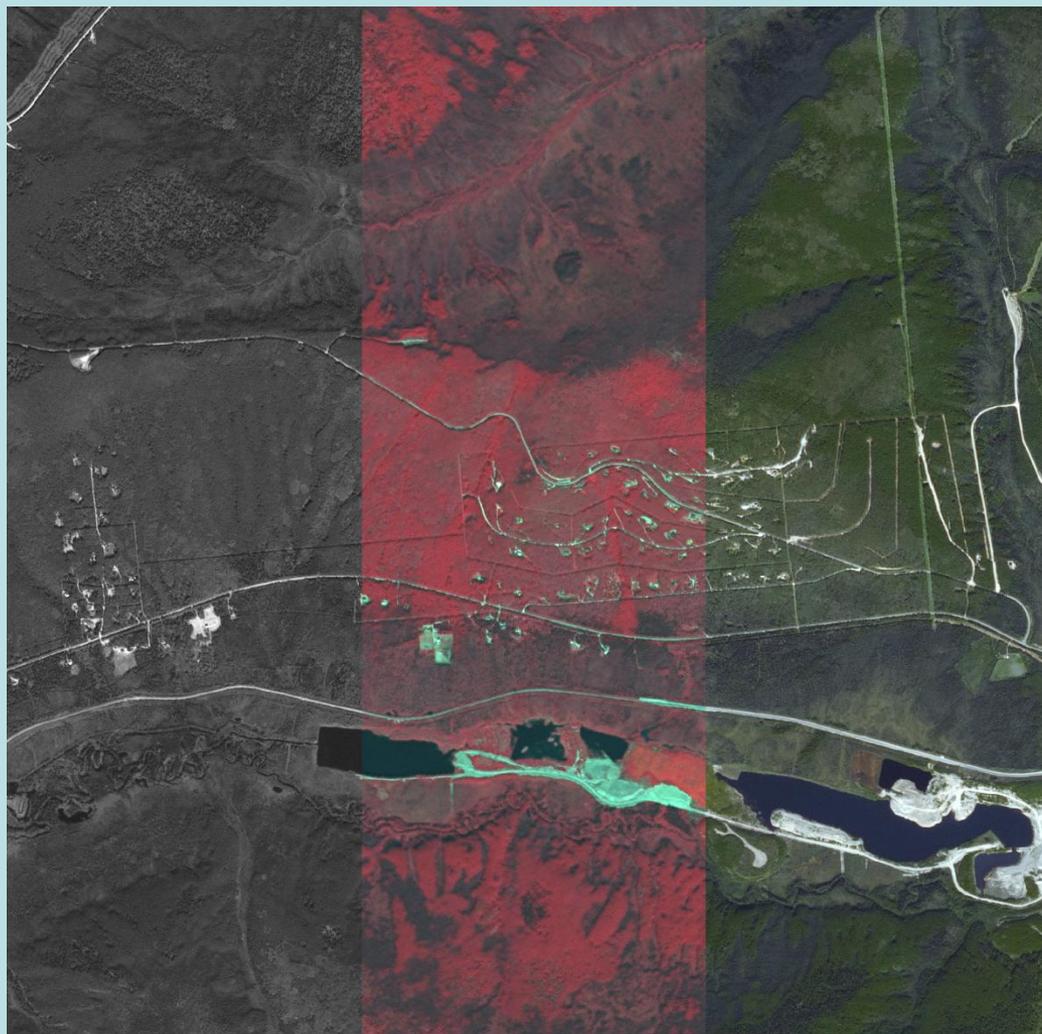
- Delivered as 20-km x 20-km tiles
 - Pseudo natural color
 - CIR
 - Panchromatic
 - Public sector licensed
- All available through WMS to all US users
- Delivery starting February 28, 2011
 - Up to 60 days for acceptance

Pilot Project Data:

Nineteen 20-km x 20-km ortho tiles
2.5 meter: pseudo natural color, CIR, and grayscale



Pilot Project Data: Pseudo Natural Color – 2.5 meter pan sharpened



Pilot Project Data: Pseudo Natural Color – 2.5 meter pan sharpened



Pilot Project Data: Pseudo Natural Color – 2.5 meter – at full resolution



Web Services

<http://browse.alaskamapped.org>

ALASKA MAPPED program overview | contact info

SDMI
Statewide Digital Mapping Initiative

Home | Browse | Cart | Log In

Search ? ▲

Clear Search

Go To Location ? ▲

Latitude:

Longitude:

Go

Make Map ? ▼

Show Available Data ? ▲

Refresh Options ▼

- GINA Data Vault
 - By Resolution
 - By Year
 - By License Type
 - By Data Type
- Aerial Photos
- Elevation Data
- Landsat Terracolor
- USGS DRG

View ▼ Link to this map ⏪

SDMI:BDL w/ Line Art ▼

Alaska

Yukon-Charley Rivers National Preserve

Denali National Park

Denali Park & Wilderness

Cartwright

Healy

Anderson

Nenana

Fairbanks

North Pole

Moose Creek

Pleasant Valley

Chena River State Recreation Area

Eielson AFB

Salcha

Big Delta

Delta Junction

Fort Greely

Tanana Valley State Forest

Tox

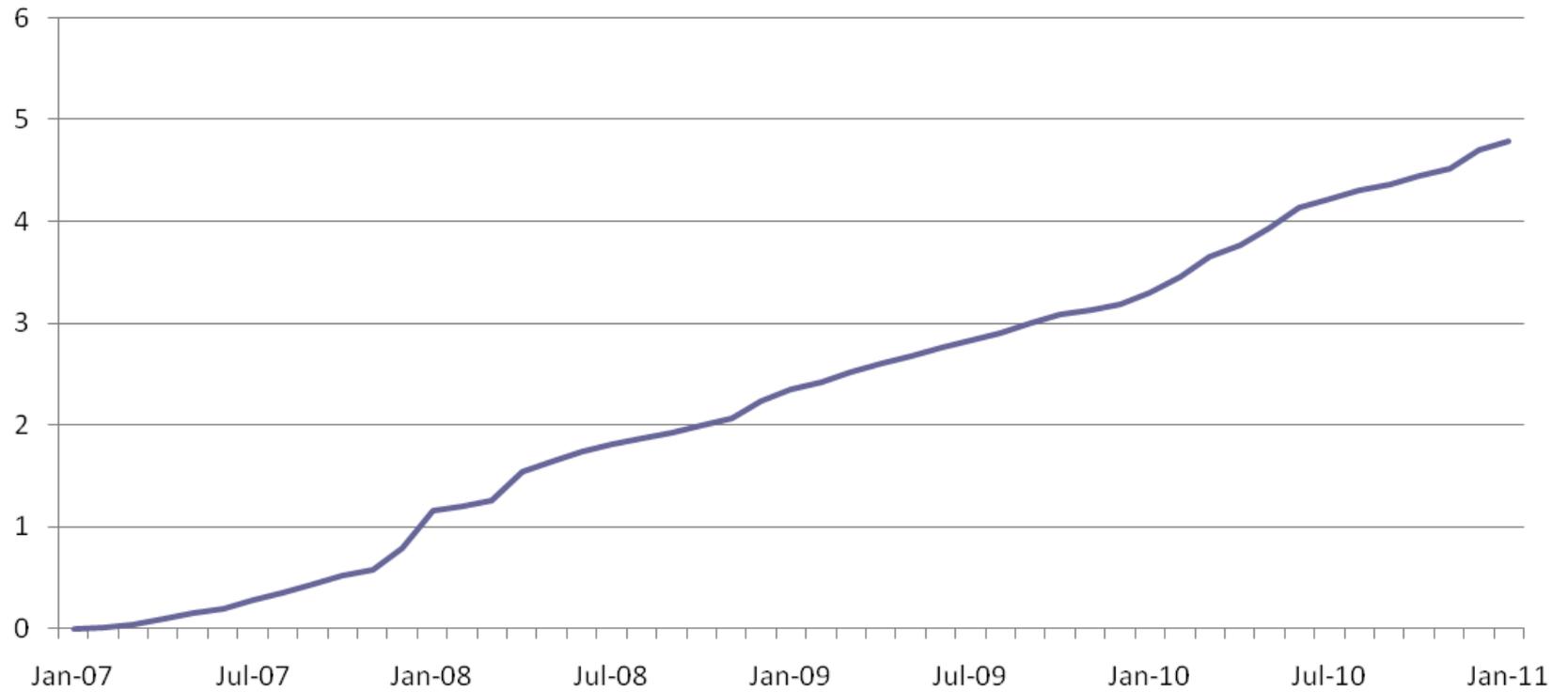
Denali

POWERED BY Google

Map data ©2010 Google [Terms of Use](#)

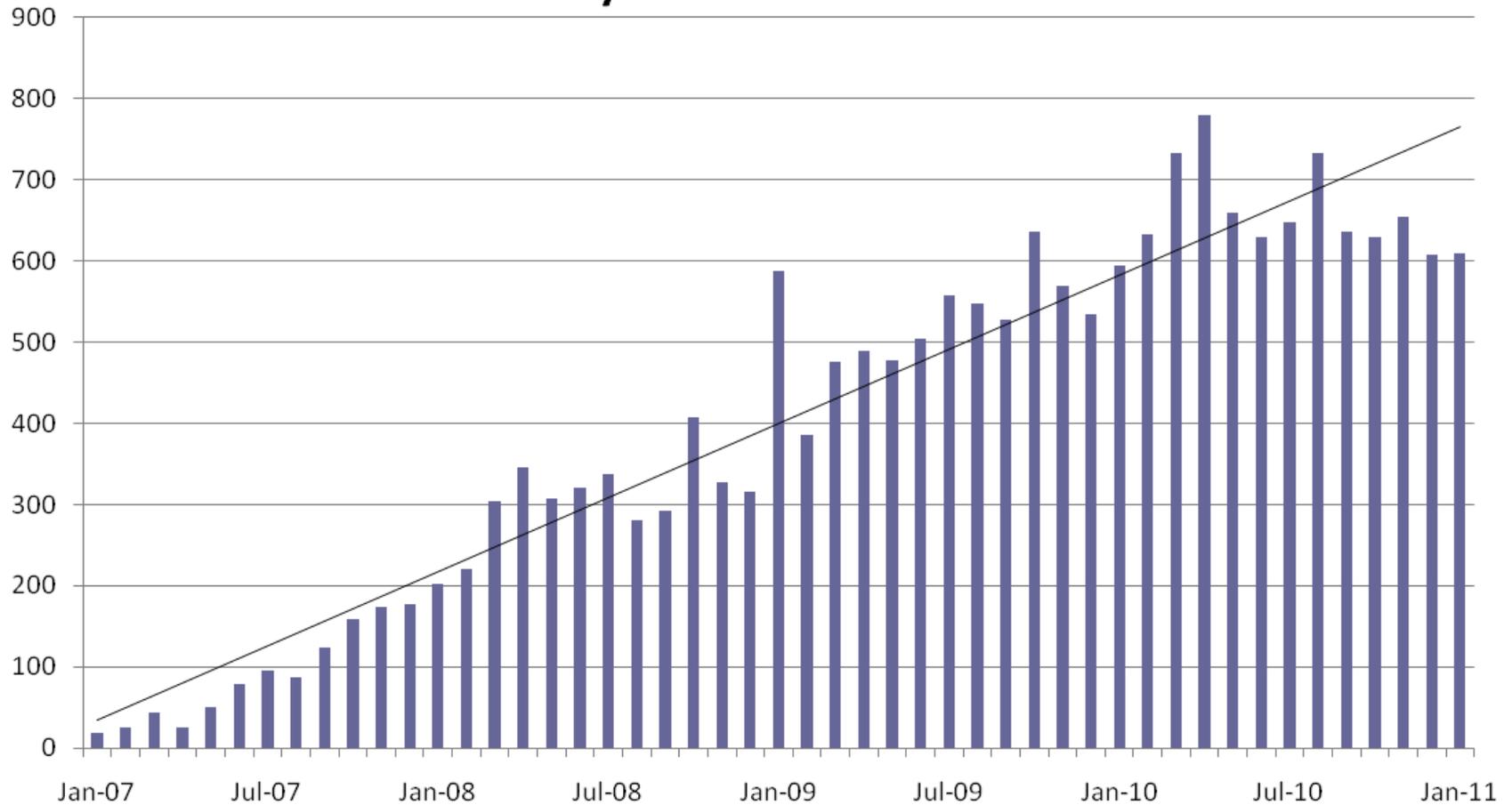
Center: 64.139, -146.547 Mouse: 63.105, -151.732

WMS Cumulative data served (terabytes) - 8.8 million total requests served



Web Mapping Service Unique Internet (IP) Addresses by month

■ IPs Seen
— Linear (IPs Seen)



Data Gallery

www.alaskamapped.org/data/gallery



ALASKA MAPPED

Data Gallery



SDMI

Statewide Digital
Mapping Initiative

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Data Services Overview

Here is a quick overview of the data provided by SDMI via Web Mapping Services (WMS), Web Coverage Services, and Web Feature Services (WFS). Please let us know if you have any suggestions as how to make the services more useful. We also welcome discussion of these services on our online support forum .

Services

1. [Web Mapping Services](#)
2. [Web Coverage Services](#)
3. [Web Feature Services](#)

Web Mapping Services

We provide a number of Web Mapping Services (WMS) that provide raster (imagery) data and are intended to be used by desktop GIS clients as a base layer.

We provide a wide range of Web Mapping Services:

1. [WMS: Best Data Available](#)
2. [WMS: Extras](#)
3. [WMS: NOAA Raster Nautical Charts](#)
4. [WMS: NOAA Raster Nautical Charts, Unclipped](#)

Data Services

[WMS, WFS, and WCS web services](#)
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[Data in Action](#)
[Bulk Data Exports](#)
[Contribute Data](#)
[Google Maps API tile interfaces](#)
[Tile Interfaces](#)
[Data Gallery](#)



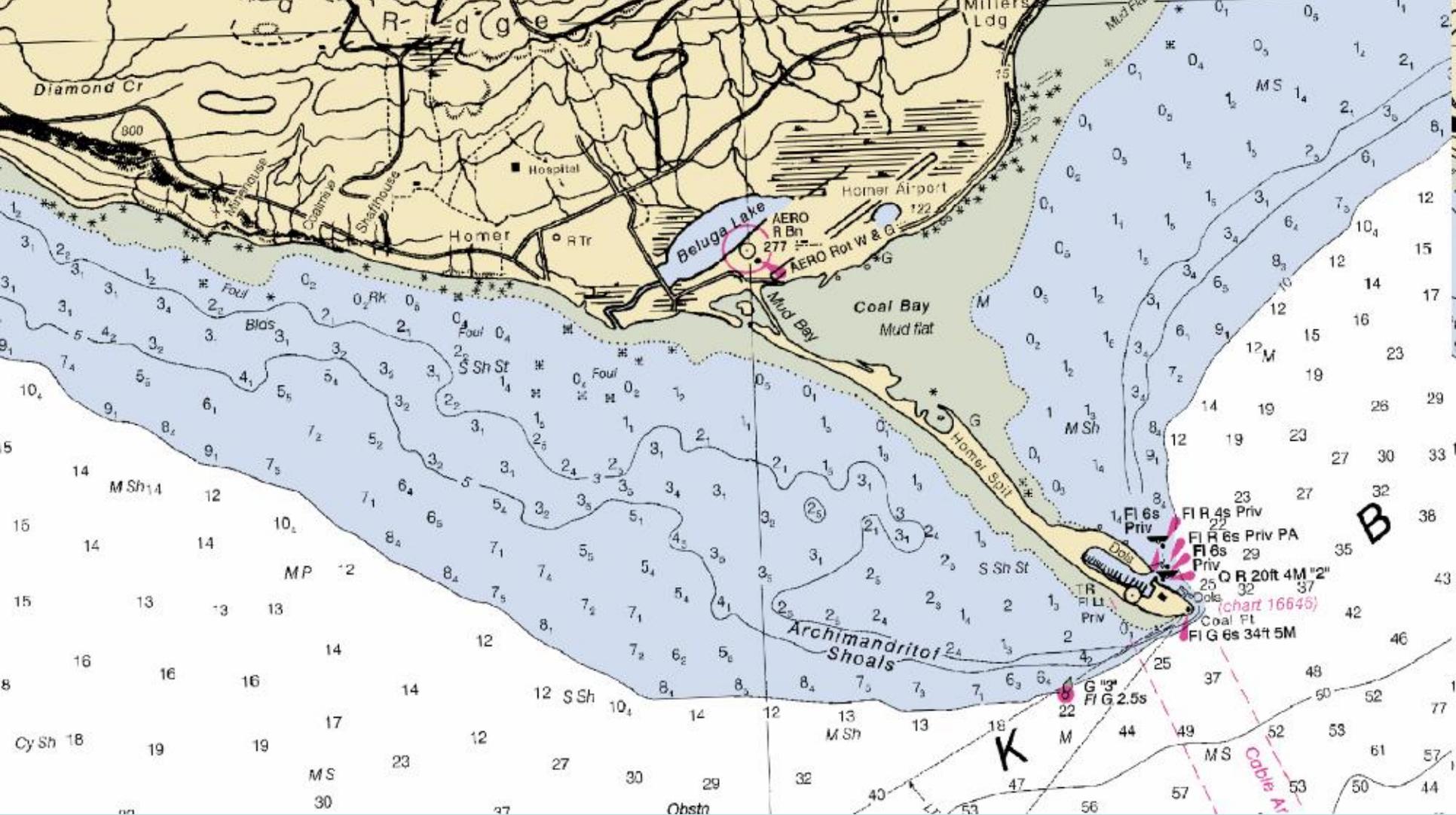
The **bdl_low_res** layer contains the Blue Marble Next Generation July dataset. It is intended to be viewed at scales greater than 250m per pixel



The **bdl_mid_res** layer contains a Landsat mosaic generated by the USGS from data acquired from 1988 to 1992 and a simulated true colour Landsat mosaic provide by Earthstar Geographics LLC. It is intended to be viewed at scales greater than 15m per pixel. Imagery copyright Earthstar Geographics (<http://www.terracolor.net>).

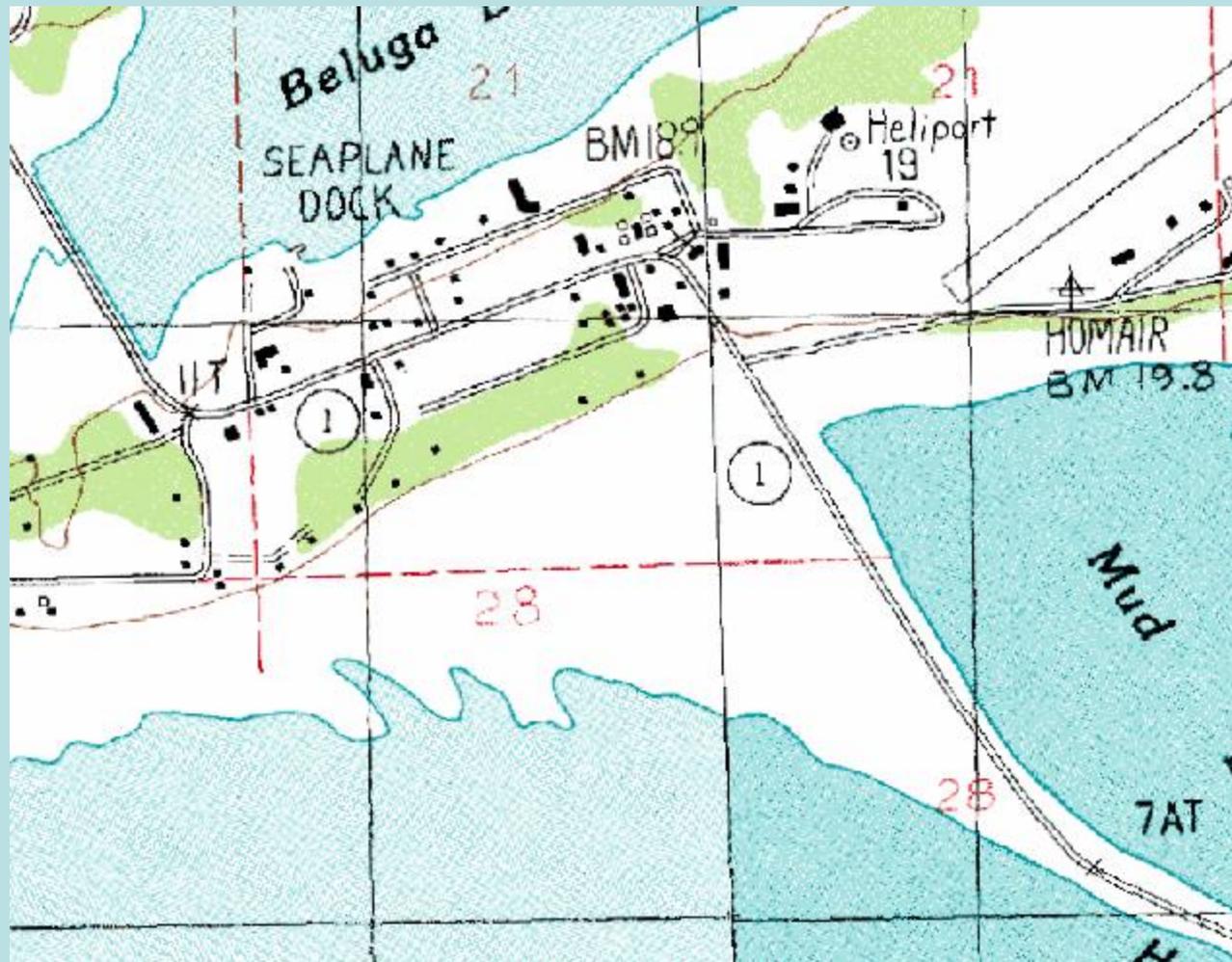


The **bdl_high_res** layer contains data from a variety of sources and is intended to be viewed at scales from 25m per pixel to 1m per pixel. Images courtesy of Digital Globe, USDA-NRCS, USDA-FS, USGS, BLM, NPS, FAA, Alaska DNR, DMVA, DCED, DOT&PF



NOAA Charts

The Charts service is meant to provide a unified view of the RNC data, without the collar information. The service is designed to only display charts that are meaningful at the requested scale.



DRGs

This group provides four layers, “**drg_24k**”, “**drg_25k**”, “**drg_63k**”, “**drg_250k**”, which contain the USGS topographic maps for the scales 1:24,000, 1:25,000, 1:63,360, and 1:250,000 respectively.



2 arc second NED

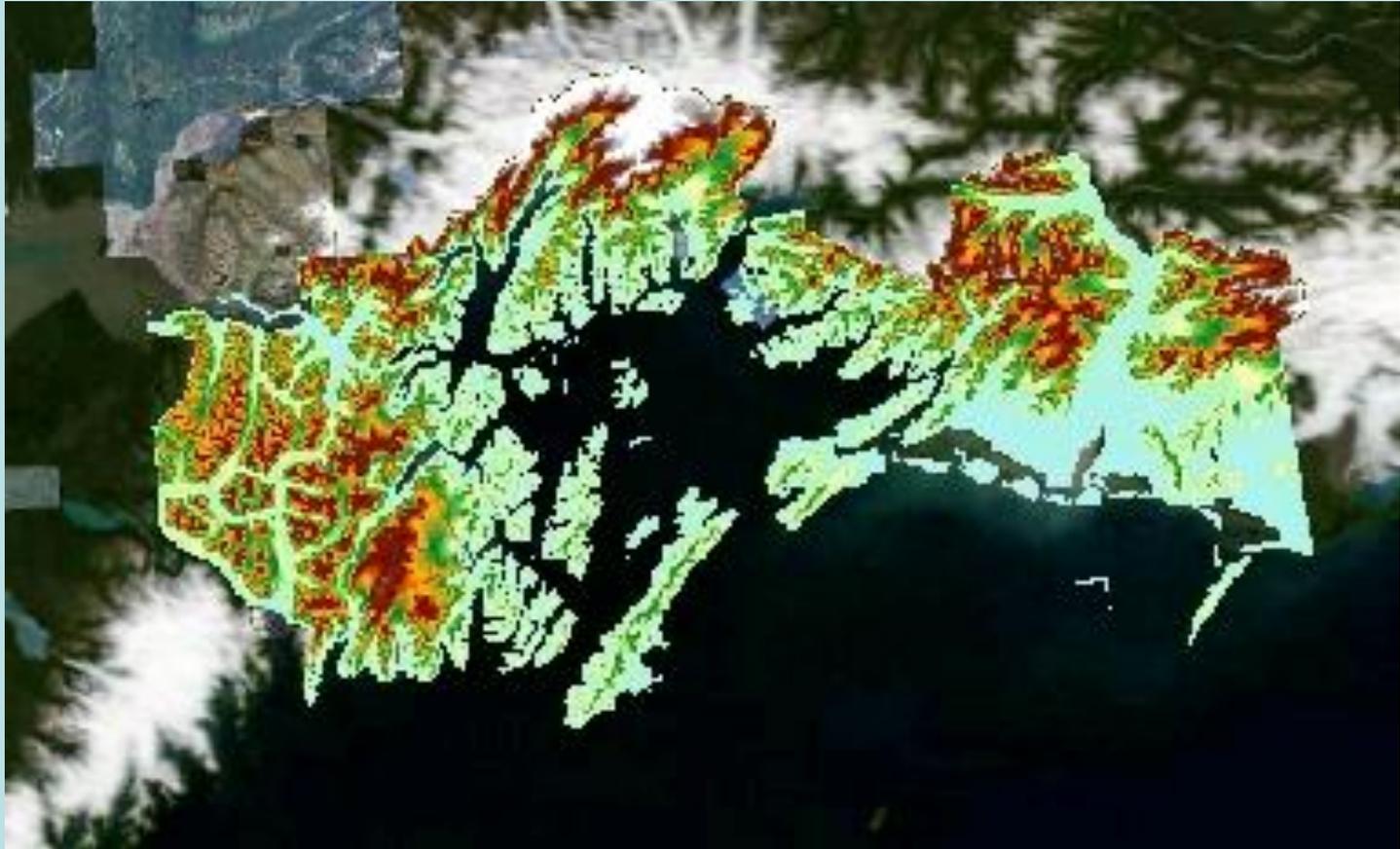
Standard National Elevation Dataset (NED) for Alaska.



NED -- 1/3 arc second
Airborne IfSAR For NPR-A.



SRTM 1 arc second
Shuttle Radar Topography Mission



Chugach SPOT DEM

This layer is named “Chugach Spot DEM” and contains a 20 meter resolution DEM covering the greater Chugach National Forest area. The vertical datum is “altitude over GEM 96”. Source: U.S. Forest Service



LIDAR – various patches around the state
Kenai Peninsula piece shown here

Available KML Feeds



[All Feeds](#)



[Firepoints](#)



[SDMI Best Data Layer](#)



[USGS Topo Maps](#)



[Real-Time Modis Imagery](#)



[2009 Iditarod](#)

kml.gina.alaska.edu

ESRI ArcGIS Layer Files (.lyr)



ALASKA MAPPED

ArcGIS Layer Files



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ESRI Layer files for the AlaskaMapped services:

- DEM: ASTER (alaska)
- DEM: Chugach Spot
- DEM: Eagle_River
- DEM: Kenai Lidar Area A QC
- DEM: Kenai Lidar Area B QC
- DEM: Kenai Lidar Area C QC
- DEM: Kenai Lidar Area D QC
- DEM: Kenai Lidar Area E QC
- DEM: Kenai Lidar Area H QC
- DEM: LIDAR Katalla NCALM
- DEM: NED One Third Arc Second (NPR-A)
- DEM: NED Two Arc Second
- DEM: SRTM
- Imagery: Best Data Layer
- Imagery: Extras (Topos, Charts, Landsat, Shaded Reliefs, and others)

Recommended: For more details and sample images for these layer files, take a look at our [data gallery](#).

Google Earth users can use our [KML files](#).

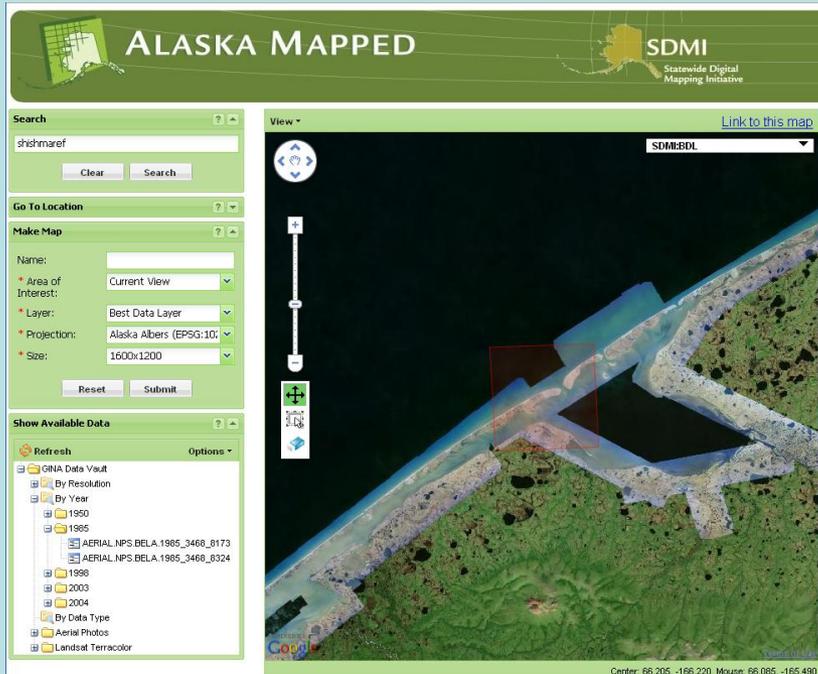
Detailed documentation on how to setup or configure these services manually is available in the following PDF: [Using the SDMI OGC Web Services in ESRI ArcGIS \(pdf\)](#).

[Go To
Online Maps](#)

Data Services

[WMS, WFS, and WCS web services](#)
[ArcGIS Layer Files](#)
[Google Earth KML Files](#)
[Data in Action](#)
[Bulk Data Exports](#)
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[Google Maps API tile interfaces](#)
[Tile Interfaces](#)
[Data Gallery](#)

GINA Tile Services



Web mapping toolkits

- Google Maps
- Google Earth
- Open Layers
- ArcGIS API for JS
- Virtual Earth
- Yahoo Maps
- Bing
- and many others....

ArcGIS Server JavaScript APIs

You can build ArcGIS Server Web applications using pure JavaScript APIs powered by backend REST services that are hosted on any ArcGIS Server. No development or deployment license is required on the Web server hosting your application.

[ArcGIS API for JavaScript](#)



Embed maps and tasks from any ArcGIS Server into your Web site.

[ArcGIS JavaScript Extension for the Google Maps API](#)



Combine your organization's GIS content with content from other organizations on top of Google Maps base maps.

[ArcGIS JavaScript Extension for Bing Maps](#)



Combine your organization's GIS content hosted in ArcGIS Server with content from other organizations on top of Bing Maps base maps.

Google Maps API

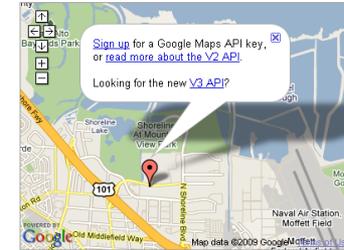
Home

What is the Google Maps API?

The Google Maps API lets you embed Google Maps in your own web pages with JavaScript. The API provides a number of utilities for manipulating maps (just like on the <http://maps.google.com> web page) and adding content to the map through a variety of services, allowing you to create robust maps applications on your website.

New! Test out [version 3 of the Maps API](#), which we've just released in Google Labs!

New! We've updated the [Static Maps API](#) significantly with new features including geocoding, polygons, and encoded polylines!



The Maps API is a free service, available for any web site that is free to consumers. Please see the [terms of use](#) for more information.

To use the Maps API on an intranet or in a non-publicly accessible application, please check out [Google Maps API Premier](#).

Developers using Bing Maps for Enterprise have access to rich tool sets, user forums, and enterprise-level Microsoft support for building map-based solutions. The Bing Maps platform is supported by three flexible APIs that developers can use to design and build customized, immersive end-user experiences.

How to Get Started

- | | | |
|---|--|--|
| 1. Learn
To see quick visual examples of how to implement features into a Bing Maps solution, explore the interactive SDK . | 2. Engage
With a developer account , you can develop and evaluate the latest Bing Maps features, download the latest SDKs, and test new applications in a staging environment. | 3. Deploy
When you with your licensing o |
|---|--|--|

The ArcGIS API for Flex allows the creation of Rich Internet applications on top of ArcGIS Server. It is based on the free Adobe Flex framework. The Flex framework is a client-side technology that is rendered by Flash Player 9 and above, or by Adobe AIR. The supported Flex SDK versions are 3.0, 3.1, 3.2 and 3.3.

Latest version of ArcGIS API for Flex is [version 1.2](#) which was released on May 22, 2009 - see [What's New](#) for more information.

To use the API you simply [download the ArcGIS API for Flex library](#) and start creating your [Flex](#) applications using [Flex Builder 3](#) (or your Flex tool of choice).

Play around with the [Flex sample below](#) or see [more samples](#) in action!



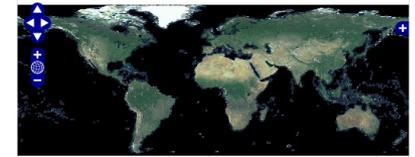
OpenLayers

OpenLayers: Free Maps for the Web

Get OpenLayers Now!!

- Latest code:
- [Link to the hosted version](#)
 - [2.8 \(Stable\).tar.gz | zip](#)
 - [2.8 Release Notes](#)
 - [Class Documentation, More documentation](#)
 - [See Screenshots](#)
 - [See examples of OpenLayers usage](#)

mic map in any web page. It can display map tiles e. [MetaCarta](#) developed the initial version of) further the use of geographic information of all . Open Source JavaScript, released under a

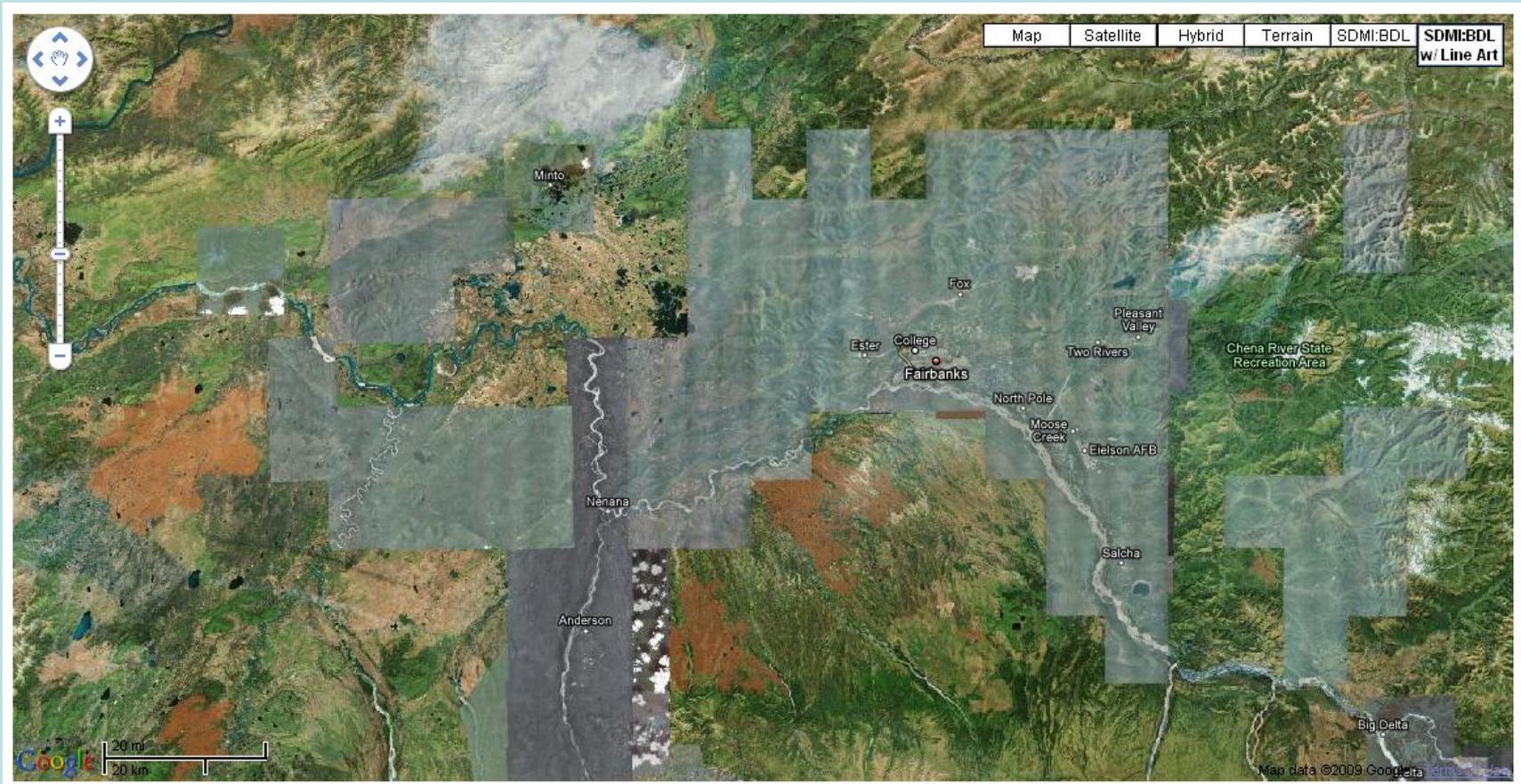


Put an open map widget in any web page!

Double-click to zoom in, and drag to pan. Hold down the shift key and drag to zoom to a particular region.

msdn Bing Maps Developer Resources

Google Maps API



- GINA/SDMI layers encapsulated in a one-line include

Google Maps API

```
1 <html>
2 <head>
3   <title>super simple example map</title>
4
5   <!-- standard issue Google Maps API line given to you when you sign up for an API key -->
6   <!-- This one is for BEEF.gina.alaska.edu -->
7   <script src="http://maps.google.com/maps?
8   file=api&v=2&key=ABQIAAAAzR2ryGL9OGHsZdEF6h5fRRwVzh7CWTJd5xKqoPsacKLZogsfRRMmLo7RaidPmwTgLoMrjLlrv7Gsw&sensor=false"
9   type="text/javascript"></script>
10
11   <!-- Include AlaskaMapped wmslayers -->
12   <script src="http://glink.gina.alaska.edu/cdn/1.4/javascripts/gina/wmslayers.js" type="text/javascript"></script>
13
14   <!-- standard issue Google Maps initialization with two additional layers from GINA -->
15   <script type="text/javascript">
16     function initialize() {
17       if (GBrowserIsCompatible()) {
18         var map = new GMap2(document.getElementById("map_canvas"));
19         map.setCenter(new GLatLng(64.82, -147.87), 10); // center on fairbanks
20         map.setUIToDefault();
21
22         /* magic to add the GINA AlaskaMapped Layers */
23         map.addMapType(SDMI_BDL);
24         map.addMapType(SDMI_BDL_HYBRID);
25       }
26     }
27
28   </script>
29
30 </head>
31 <body onload="initialize()" onunload="GUnload()">
32
33   <div style="height: 2em; width: 100%; text-align: center;">
34     right click -> view page source.
35     An <a href="extended.html">extended example</a> shows additional layers being added.
36   </div>
37
38   <div id="map_canvas" style="width: 100%; height: 80%;"> map canvas content replaced by a google map </div>
39
40 </body>
41 </html>
```

- GINA/SDMI layers encapsulated in a one-line include

Conclusion

- Tremendous progress in 2010
- DEM
 - new: 10% of the state at 20-foot contour accuracy
 - legacy: uplift ~10% non-overlapping at similar accuracy
- Orthoimagery
 - new: 39% of the state captured in 2009 & 2010
 - new: 24% processed to ortho tiles in 2011
 - future: fully funded to complete the job statewide by 2014
- Excellent work by all contractors

SDMI 2009 and 2010 Collections

SPOT5 Ortho Source

603,452 km² (39%)

SPOT5 Ortho Tiles

377,000 km² (24%)

FUGRO IFSAR DEM

77,684 km² (5%)

InterMap IFSAR DEM

78,568 km² (5%)

Uplifted IFSAR

192,300 km² (12%)

