

Infrastructure and Joint Goals for Topographic Mapping in Alaska



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+ Objectives of the Discussion

Build on Roundtable Discussion – 3 Charter Goals

■ Inventory data

- Inventory existing data and data intended to be acquired in the near future to validate and characterize the gap

■ Enterprise approach

- Identify a lead agency and use an enterprise approach to data acquisition to leverage agency funding

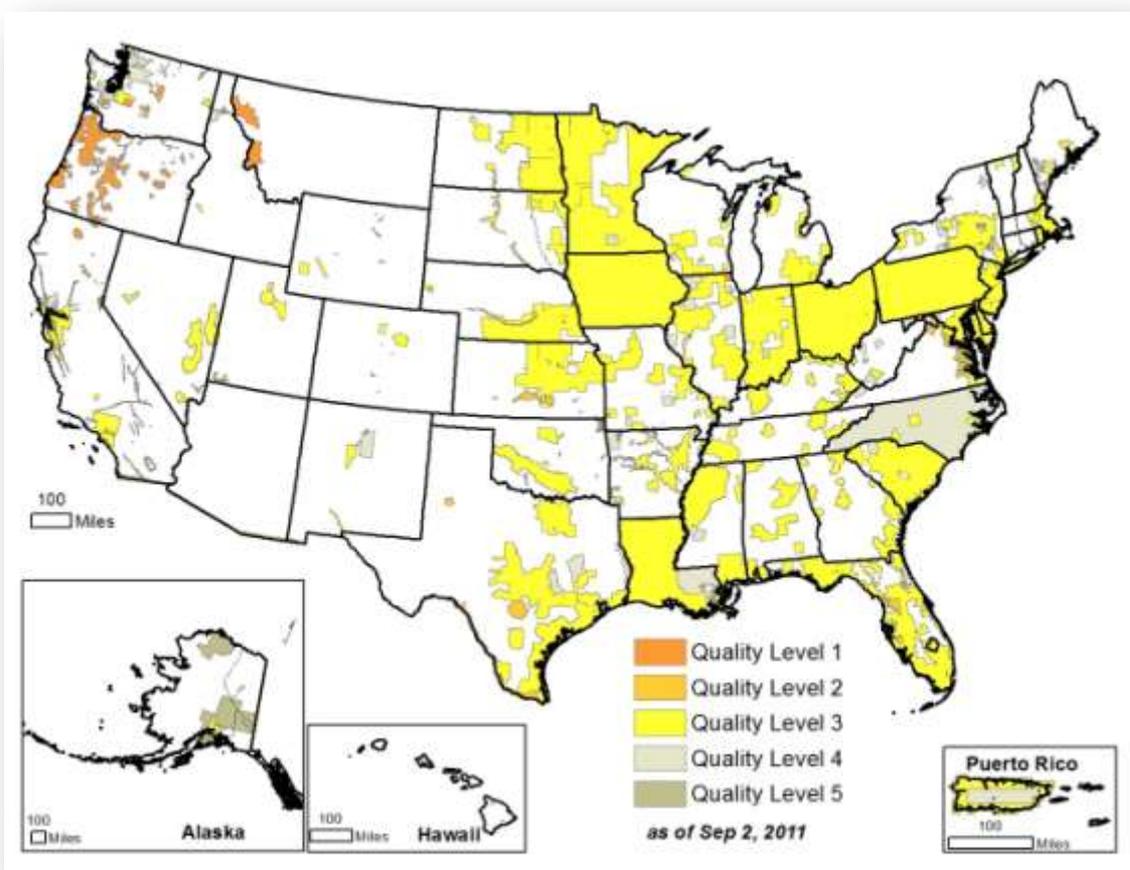
■ Joint data acquisition goals

- Coordinate the acquisition of data to ensure completeness of coverage in accordance with standards for openness, quality, interoperability, and resolution

+ Status of the Nation's Elevation Data

National Enhanced Elevation Assessment Inventory

Map depicts public sources of LiDAR in all states
plus IfSAR data in Alaska



1996 - 2011

- 28% coverage - 49 states
- 15% coverage – Alaska
- 30+ year replacement cycle
- Program is well coordinated – less than 10% overlap of coverage
- Data quality variable

Why is this a problem?

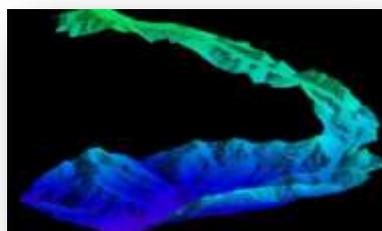
- Remaining 72% coverage is 30 or more years old.
- Alaska – very poor quality
- Meets 10% of reported needs
- Current and emerging needs require higher quality data

+ 3D Elevation Program (3DEP)

- The National Enhanced Elevation Assessment demonstrated the potential to generate \$1.2 billion to \$13 billion new benefits annually
- Based on the findings, a cooperatively funded national enhanced elevation program executed by USGS is being developed
- 3DEP will acquire LiDAR data for 49 states, IfSAR in Alaska
- The goal is to achieve an 8-year acquisition cycle
- Provide bare earth elevation, point cloud and other data derivatives
- 3DEP starts in Alaska!



Hazards Mitigation



Land Navigation and Safety



Flood Risk Mitigation



Infrastructure Management



Precision Farming



Natural Resources Conservation

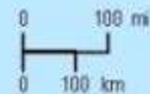
NEEA Inventory Results for Alaska

Explanation

Enhanced Elevation - Publicly Available

Quality Level

- Quality Level 1
- Quality Level 2
- Quality Level 3
- Quality Level 4
- Quality Level 5
- Quality Unknown
- Non-Public Elevation Data

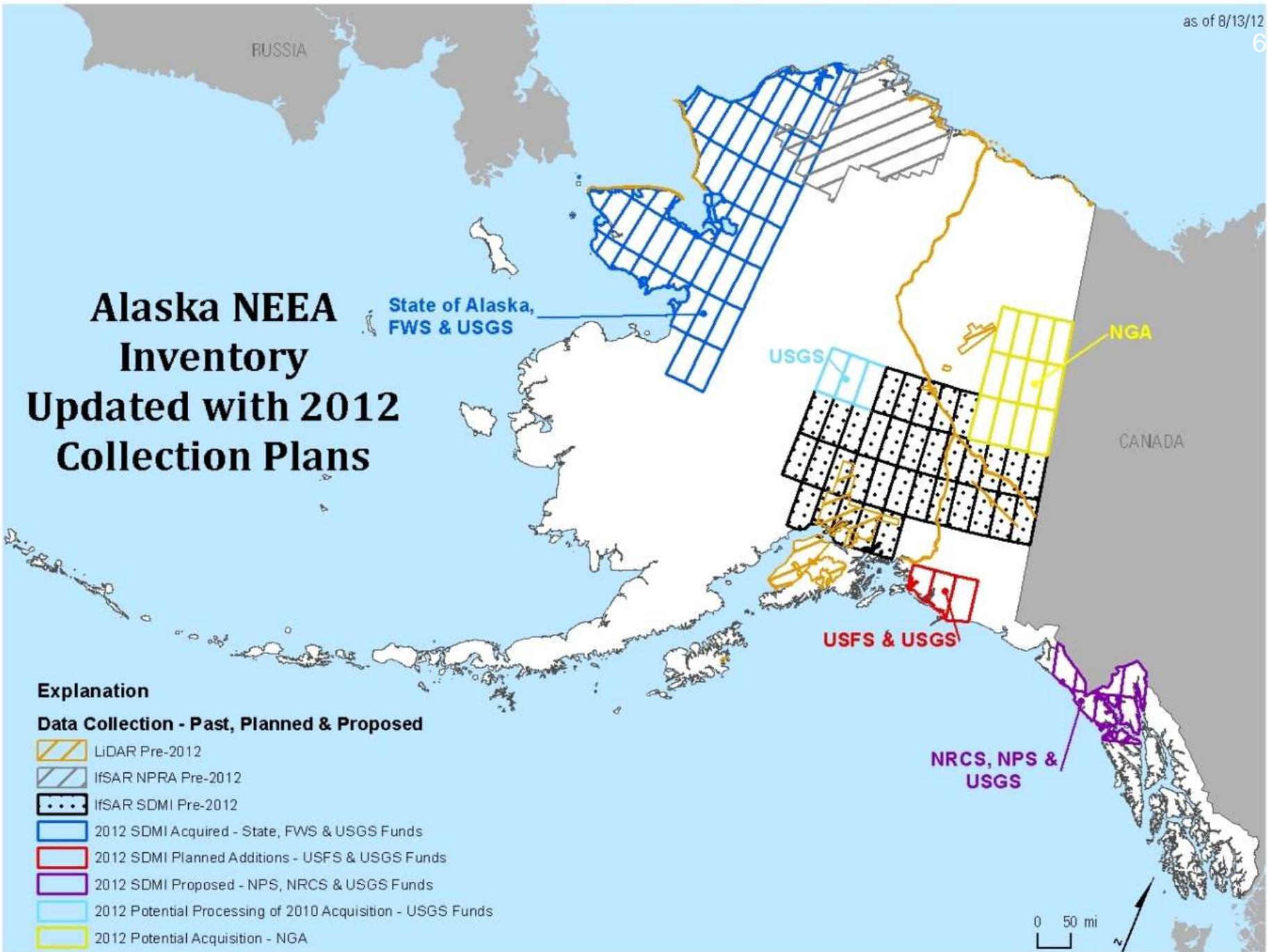


CANADA

RUSSIA



Alaska NEEA Inventory Updated with 2012 Collection Plans



Explanation

Data Collection - Past, Planned & Proposed

-  LiDAR Pre-2012
-  IfSAR NPRA Pre-2012
-  IfSAR SDMI Pre-2012
-  2012 SDMI Acquired - State, FWS & USGS Funds
-  2012 SDMI Planned Additions - USFS & USGS Funds
-  2012 SDMI Proposed - NPS, NRCS & USGS Funds
-  2012 Potential Processing of 2010 Acquisition - USGS Funds
-  2012 Potential Acquisition - NGA

0 50 mi

+ Agency Inventory - Results

DEPT	AGENCY	Additional Data Availability
DHS	FEMA	No additional data to report
DOC	NOAA	No additional data to report
DOI	BLM	Waiting for response
	FWS	No additional data to report
	NPS	Several small LiDAR collection areas over Park lands
	USGS	No additional data to report
DOD	USACE	3-meter IfSAR over most of Kodiak Island
	NGA	Waiting for response
	USCG	Waiting for response
DOT	FAA	No additional data to report
EPA	EPA	No additional data to report
USDA	NRCS	Waiting for response
	USFS	Planned 2012 LiDAR collect over Heen Latinee Experimental Forest 2012 Copper River Delta IfSAR (already shown in planned collection)

+ Enterprise Approach

For Alaska Topographic Mapping Data

- The Federal Geographic Data Committee (FGDC)
 - Standards
 - Geospatial Platform
- *The National Map*
 - Data archive and access
 - Data acquisition
 - Standards and specifications



Federal Geographic Data Committee

Federal Enterprise Coordination - Standards

- Geographic Information Framework Data Standard
- Content Standard for Digital Geospatial Metadata (version 2.0)
- Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy
- Standard for a U.S. National Grid
- GeoTIFF Revision 1.0



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USGS - Governmental Unit
Boundaries from The National



USGS National Hydrography
Dataset



USGS National Land Cover
Database - The National Map -



National Wetlands Inventory



Atlantic Offshore Seabird
Dataset Catalog



EPA Cleanup sites



United States Omernik
Ecoregions



USA Soil Survey

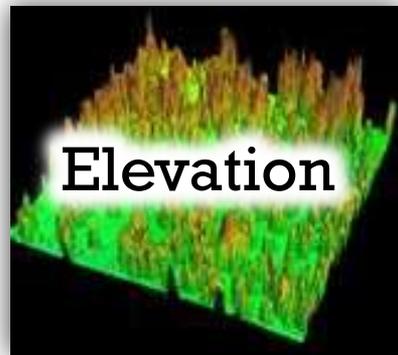


- Provides access to federally maintained geospatial data, services and applications
- Federal content has been verified to be consistent with Federal privacy, national security, and information quality policies
- Also provides access to data from partners across State, Tribal, Regional and local governments as well as non-governmental organizations

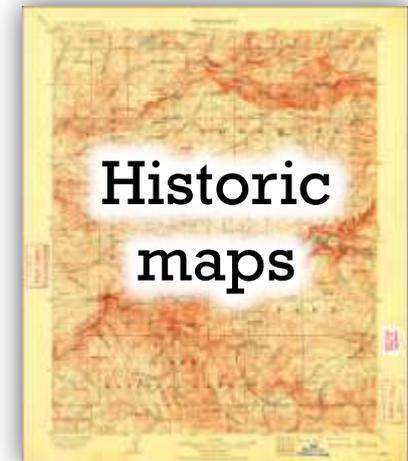
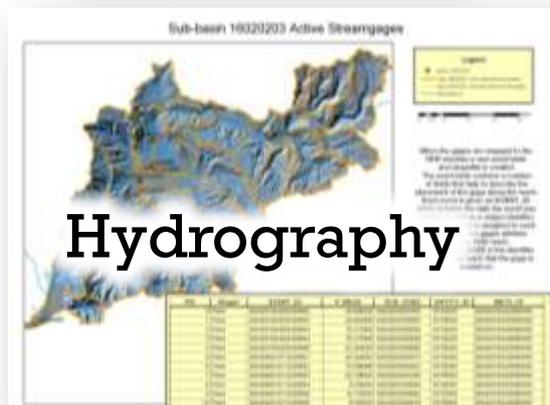
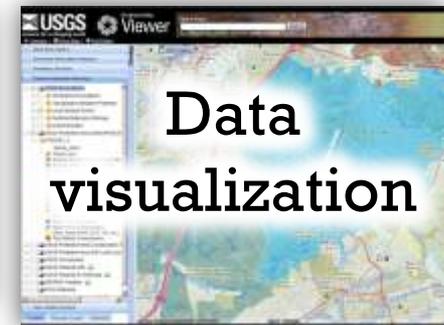
+ National Geospatial Program: *The National Map*

Topographic Maps and Data for the Nation

National Leadership



Products and Services



+ National Datasets

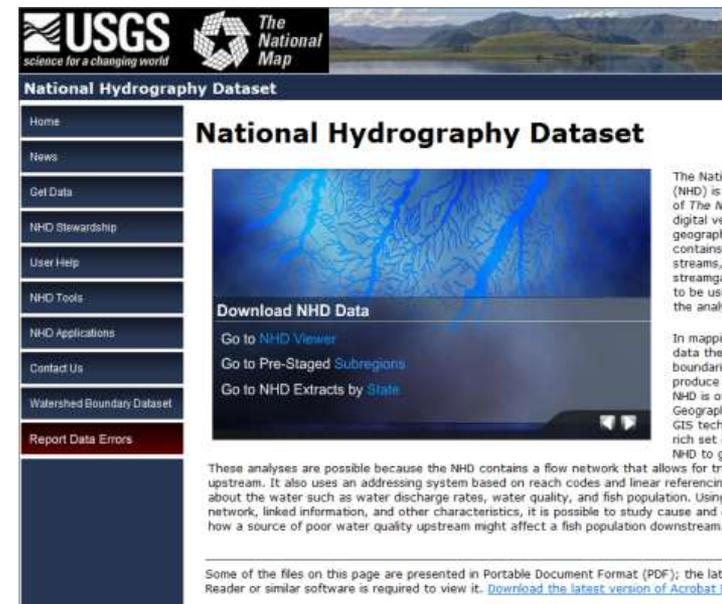
Archiving and Public Access Point

■ National Elevation Dataset

- Multi-resolution seamless raster elevation dataset
- National coverage
- Derived from diverse source data sets, processed to consistent specifications
- Updated bimonthly to integrate new data
- Over 200 TB of elevation data distributed between Jan and July 2012

■ National Hydrography Dataset

- Digital dataset of nation's surface water and watershed boundaries
- Continuously updated by stewards across the nation
- Standardized editing and application tools

National Hydrography Dataset

The National Hydrography Dataset (NHD) is a digital vector geographic dataset containing streams, streamlines, and stream networks. It is used for a variety of applications, including water resource management, flood risk assessment, and environmental planning.

Download NHD Data

- Go to NHD Viewer
- Go to Pre-Stage Subregions
- Go to NHD Extracts by State

These analyses are possible because the NHD contains a flow network that allows for tracing upstream. It also uses an addressing system based on reach codes and linear referencing about the water such as water discharge rates, water quality, and fish population. Using network, linked information, and other characteristics, it is possible to study cause and effect. For example, how a source of poor water quality upstream might affect a fish population downstream.

Some of the files on this page are presented in Portable Document Format (PDF); the latest Reader or similar software is required to view it. [Download the latest version of Acrobat](#)

+ Geospatial Products and Services Contract

Enterprise Data Acquisition

- **A suite of contracts** used by Federal, State, and municipal government entities to fulfill their geospatial data requirements
- **Services include:** imagery, IfSAR and LiDAR data acquisition, geographic information systems development, surveying and control acquisition, image analysis, the production or revision of geospatial products, and more
- **Plans include:** providing as a Data Acquisition service on the Federal Geospatial Platform.
- **Advantages include:**
 - Provides established product standards and expertise in geospatial data standards
 - Experienced USGS contract and technical staff manage contracts from inception through completion
 - Immediate connections to quality-based contractors eliminate the search for and uncertainties of selecting firms capable of meeting requirements.
 - USGS source material is made available to the contractor (for example, geodetic control, map manuscripts, and so on)

+ Specifications and Quality Control

Documented Specifications for Collection and Quality Control

■ **LiDAR Acquisitions**

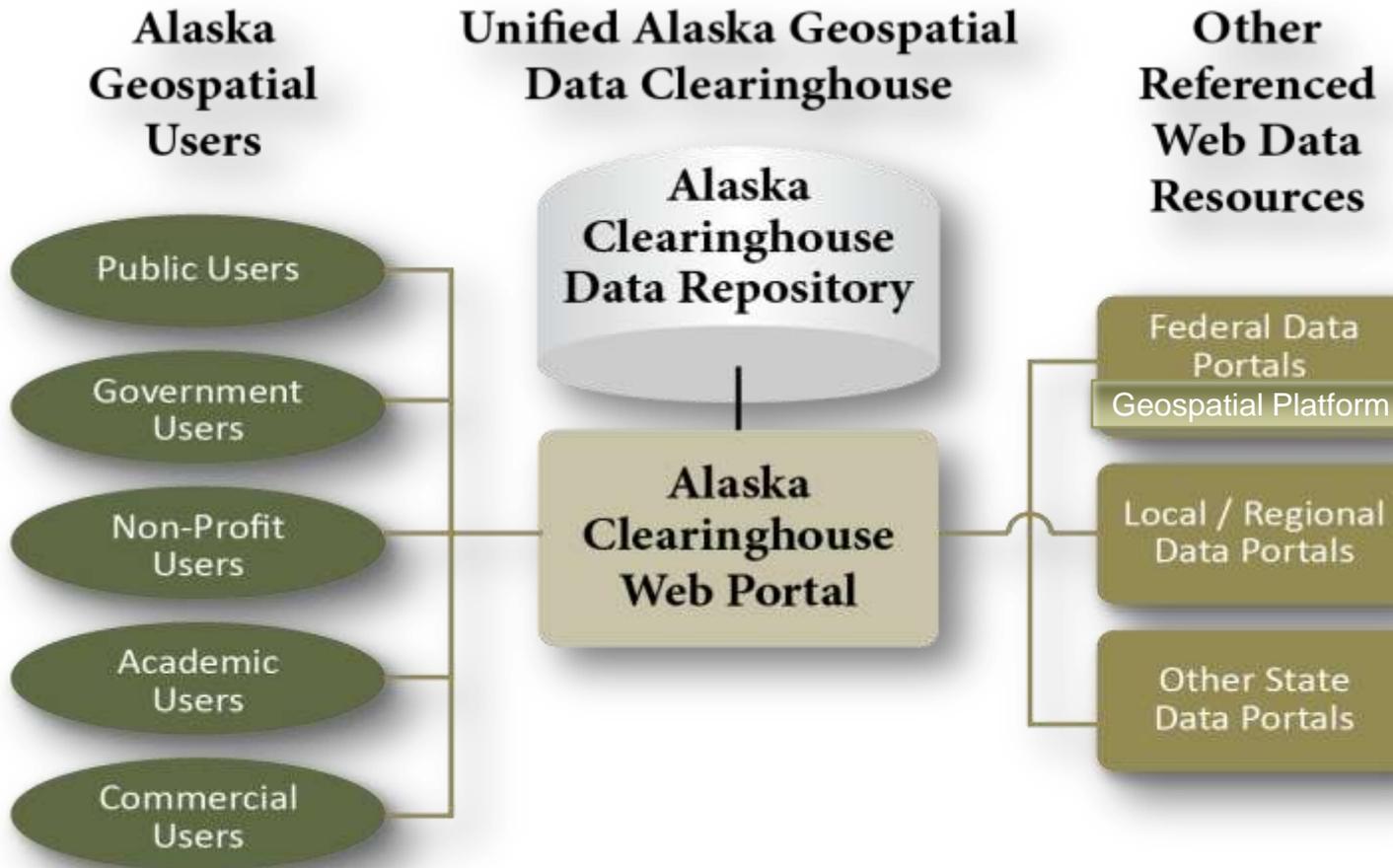
- USGS Base LiDAR Specification version 13 was collaboratively developed and is widely accepted and implemented across the geospatial community
- Extensive vendor and USGS QA/QC program established under GPSC

■ **IfSAR Acquisitions**

- Collection specifications included in contract task orders
- Well-defined collection and processing specifications, including hydro-enforcement, ground control requirements, handling of perennial ice, others
- ISO 9001 data quality certification report required of vendor
- Vendor QC includes visual and automated checks for visible defects, voids, vertical offsets, terrain and surface model accuracy, etc.
- All datasets reviewed in their entirety (no statistical sampling)
- Extensive USGS QC prior to acceptance of the data

+ AK Geospatial Strategic Plan

Building an Enterprise Approach for Alaska



+ AK Geospatial Strategic Plan

AK's proposed organizational interface with ExCom



+ IfSAR Requirements for Alaska

DEPT	AGENCY	BUSINESS USE	SQ MI	
DHS	FEMA	Flood Risk Management	485,128	
DOC	NOAA	Flood Risk Management	485,128	
DOI	BIA	Natural Resources Conservation	1,457	
	BLM	Natural Resources Conservation	577,693	
	FWS	Wildlife and Habitat Management	103,107	
			571,484	
	NPS	Natural Resources Conservation	83,567	
	USGS	Geologic Resources Assessment and Hazard Mitigation	573,105	
DOT	FAA	Aviation Navigation and Safety	577,693	
EPA	EPA	Natural Resources Conservation	577,693	
		Water Supply and Quality	577,693	
FCC	FCC	Telecommunications	577,693	
FERC	FERC	Homeland Security, Law Enforcement and Disaster Response	118,919	
		Oil and Gas Resources	577,693	
HHS	CDC	Health and Human Services	577,693	
NASA	NASA	Education K-12 and Beyond	577,693	
USDA	NRCS	Natural Resources Conservation	178,644	
			573,104	
	USFS	Natural Resources Conservation	Forest Resources Management	156,330
			Infrastructure and Construction Management	35,354
			35,354	
			35,354	
			River and Stream Resource Management	68,261
Wildfire Management, Planning and Response	156,330			

Alaska NEEA Inventory & Requests Updated with 2012 Collection Plans

State of Alaska, FWS & USGS

NGA

USGS

CANADA

USFS & USGS

NRCS, NPS & USGS

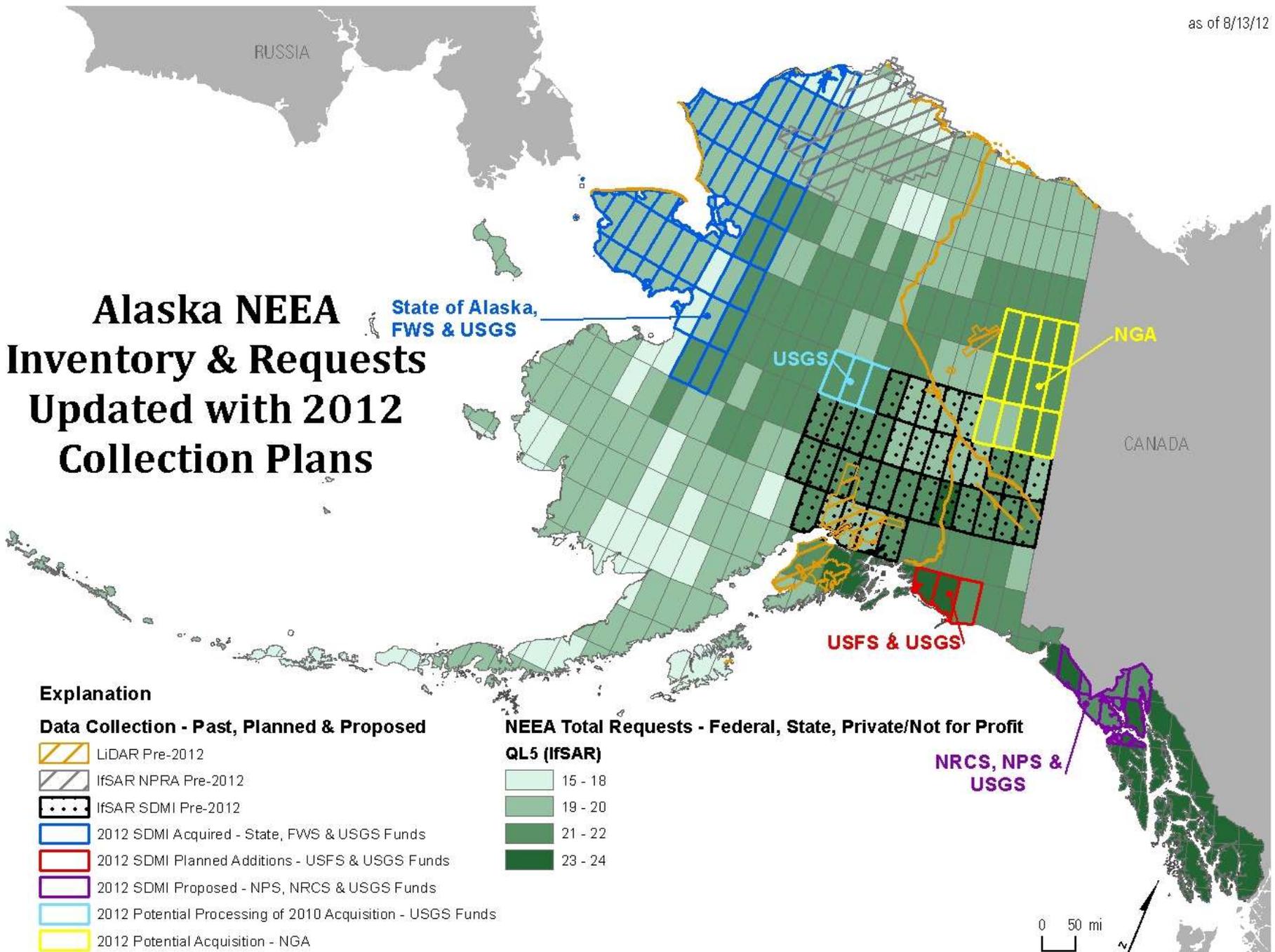
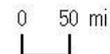
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NEEA Total Requests - Federal, State, Private/Not for Profit

- QL5 (IfSAR)**
-  15 - 18
 -  19 - 20
 -  21 - 22
 -  23 - 24



+ USGS Alaska Mapping Initiative

Digital US Topo for Alaska

- Finalize specifications this year and begin full production of US Topo maps for Alaska in FY13
- Partner with the Alaska Statewide Digital Mapping Initiative (SDMI) and others for source data
- With current holdings, source data run out after production of about $\frac{1}{4}$ of the 12,000 quads



+ Joint State and USGS Goals

20

Theme	USGS	State of Alaska	Status	Joint Priority
Elevation (IfSAR)	#1	#1	1/3 of State complete	1
Imagery	H	#1	Statewide coverage funded and in progress	
Cadastral	M - Federal lands only	H	Multiple, incomplete datasets available	
Administrative boundaries	L	H	Multiple, incomplete datasets available	
Hydrography	H	H	No coverage at 1:24,000 scale	2
Transportation	H	H	Multiple, incomplete datasets available	3
Geodetic Control	M	H	Grav-D in progress	
Structures	L		Use best available data	
Geographic Names	M		Use best available data	

+ Proposed Approach

Funding Topographic Mapping Priorities for Alaska

Priority	Theme	Funding Gap	Proposed Funding Approach
1	Elevation (IfSAR)	\$37.3 M*	\$12 M/year for 3 years with 1/3 from State, 2/3 Federal
2	Hydrography	\$20 M	\$2 M for FY13 for project start up, out-years TBD
3	Transportation	TBD	\$100K for FY13 to develop approach and project plan

* Calculated as of Roundtable, will be adjusted downwards for new investments

+ Potential Next Steps

For Committee Action

- Adopt or adapt joint State/USGS goals?
- Prioritize acquisition areas
- Identify funding sources
- State requests feedback on the AK Strategic Plan
 - propose:
 - The Alaska Mapping Executive Committee will effectively interface with the State through the organizational structure outlined in the Alaska Strategic Plan, when established

+ Discussion

- **State request** for Committee statement on the AK Geospatial Business Plan, proposed:
 - The Alaska Mapping Executive Committee will effectively interface with the State through the organizational structure outlined in the Alaska Strategic Plan, when established
- **Inventory** – Did we miss anything?
- **Enterprise architecture** – Did we miss anything?
- **Data Acquisition** - Determine the Committee's goals and metrics
- **Coordination** with other Alaskan Cooperative Efforts
- **Additional agency topics**

+ Data Acquisition Goals and Metrics

Proposed Approach

Priority	Theme	Funding Gap	Proposed Funding Approach	Metric	Goal
1	Elevation (IfSAR)	\$37.3 M*	\$12 M/year for 3 years with 1/3 from State, 2/3 Federal	% new coverage each year	22.3% annually
2	Hydrography	\$20 M	\$2 M for FY13 for project start up, out-years TBD	#s of 24k sub-basins produced annually	10 sub-basins in year 1, up to 30 per year for 5 additional years
3	Transportation	TBD	\$100K for FY13 to develop approach and project plan	% completed, publicly available coverage produced annually	20% annually for 5 years



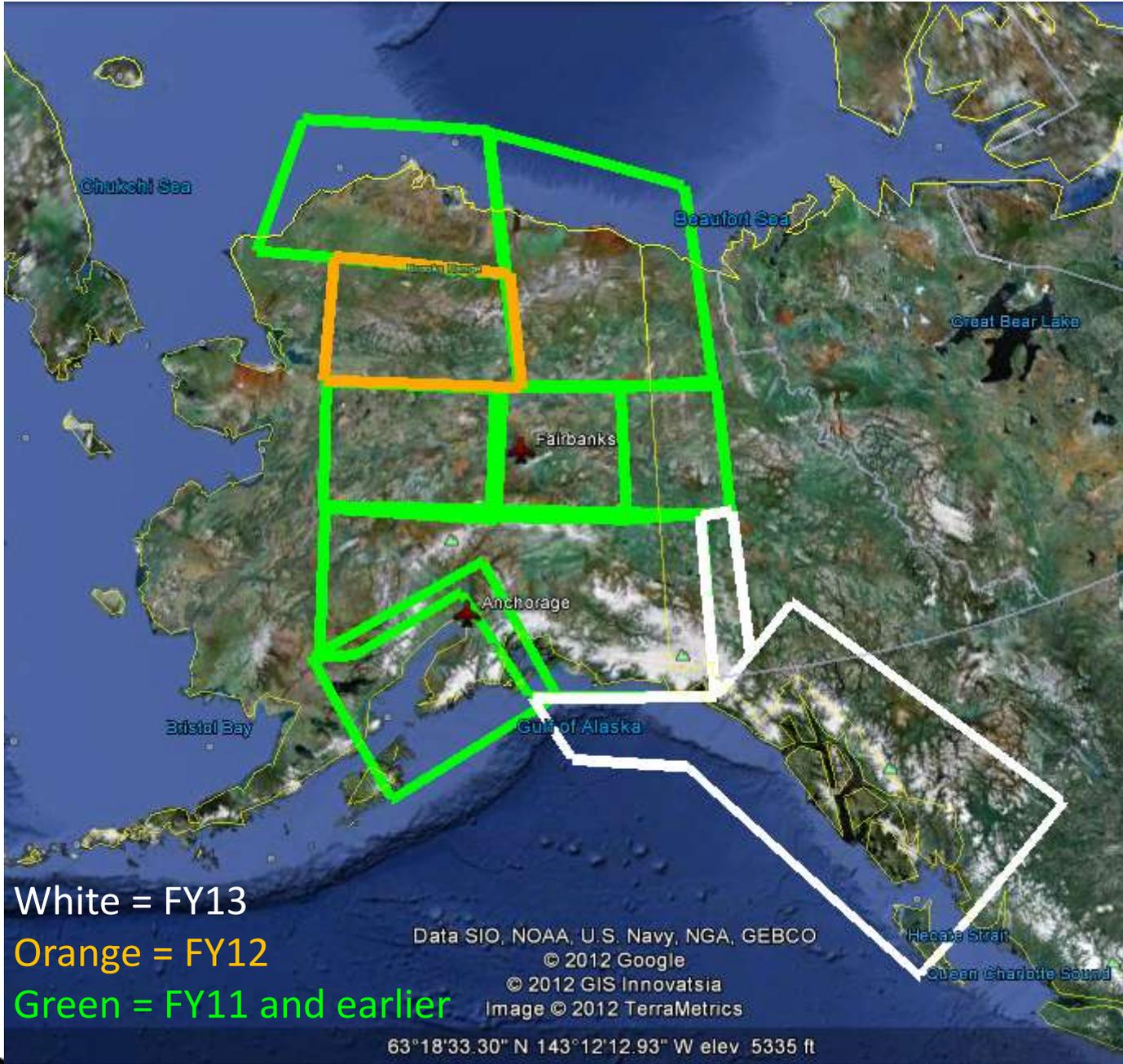
Relationship to Other Efforts in AK

Alaska Mapping is a Foundation to other efforts to coordinate and cooperate within AK such as:

- Alaska Interagency Working Group (Executive Order :13580)
 - Alaska Data Integration Working Group
 - Artic Research Commission
 - US Interagency Arctic Research Policy Committee
- These and other efforts will rely upon this committee to plan for, acquire, and make accessible, digital topographic information for the State which will serve as a base Geospatial layer, underpinning a variety of applications and supporting the integration of place-based data in AK

+ Additional Agency Topics

- NOAA
 - Grav-D critical to improving base map accuracy in Alaska
 - Redefining the Vertical Datum
 - Nearly 50 percent complete
- FAA - Requested that the Committee define mechanisms for transfer of funds for IfSAR collection
- NPS – Has specific areas of interest for prioritizing future IfSAR collections



White = FY13

Orange = FY12

Green = FY11 and earlier

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Vicki Childers, GRAV-D Project Manager 8-10-12

+ Next Steps

For Member Action

Please provide the following to Tracy Fuller (tfuller@usgs.gov, 303-202-4532) by September 14 for compilation and discussion at next meeting:

- Current priority areas for IfSAR, hydrography and transportation data
- Suggested funding sources
- Any known agency preferences for an agreement or other vehicle for transferring funding