

UAVSAR Support at the Alaska Satellite Facility

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ASF Data Center



- NASA SAR Data Center
- Over 1 PB of SAR data in Archive
 - ERS-1,2
 - JERS-1
 - Radarsat-1
 - ALOS PALSAR
 - AIRSAR, UAVSAR

UAVSAR as Unrestricted Dataset – Instant Download
<http://www.asf.alaska.edu/>



UAVSAR InSAR Products



Repeat Pass Interferometry Products:

- Slant Range Multi-looked Products
- Ground Range Multi-looked Products
- KMZs of Ground Range Multi-looked Products

Each category consists of:

- Interferogram
- Unwrapped Phase
- Correlation Image
- Amplitude Image

Available for immediate download



UAVSAR PoISAR Products



JPL Polarimetric SAR Products:

- Covariance matrix elements (GRD binary files)
 - Fully terrain corrected
 - Three real, three complex
- Covariance matrix elements (MLC binary files)
 - Three real, three complex
- Annotation file for metadata
- Digital Elevation Model (DEM)
- GIF image (HH, HV, VV)
- KMZ file
- Stokes Matrix

Available for immediate download



ASF PoISAR Products



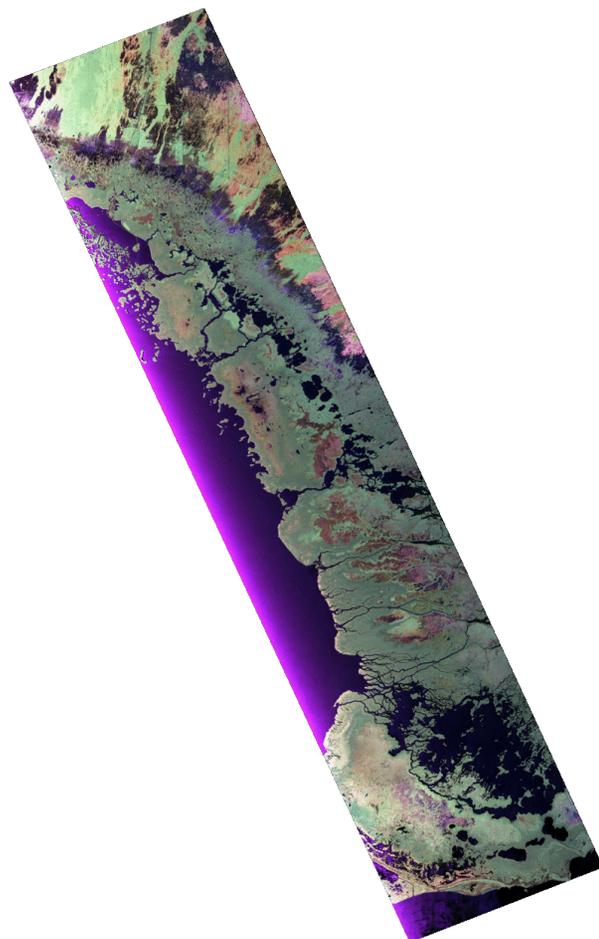
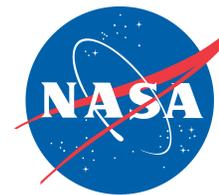
Additional UAVSAR PoISAR products available from ASF

- GRD files *zipped in logical groups* to reduce download times
 - 1x1
 - 3x3 Multilooked
 - 5x5 Multilooked(Products multi-looked 3X3 and 5X5 for ease of use)
- *Pauli decomposition GeoTIFF*
- *DEM in GeoTIFF*

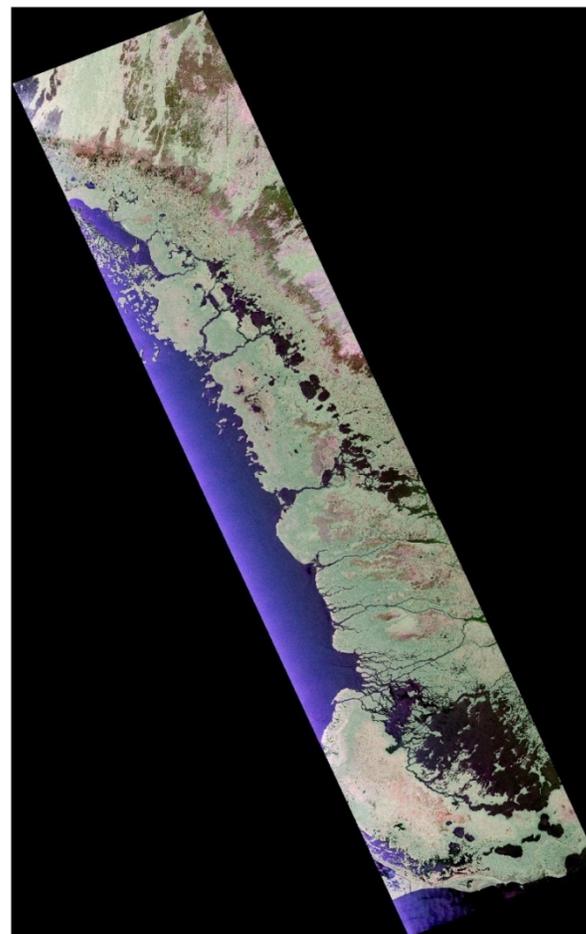
Available for immediate download



Value-Added PolSAR Products



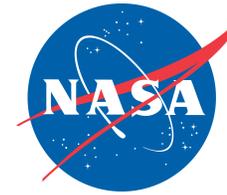
500 x 800 GIF Image in KMZ:
HH HV VV



Pauli Decomposition GeoTIFF:
HH-VV HV HH+VV



Getting Data



http://www.asf.alaska.edu/

Alaska Satellite Facility *ASF* Remote Sensing Data Access

Wetlands Vertex **DAAC Specific URSA** non-DAAC URSA

ASF : Home SAR Data Center ASF Enterprise Satellite Tracking Ground Station GeoData Center

About ASF Events Publications Software Tools Citation Information Education Contact ASF

SDC SAR DATA CENTER

ASF-E ASF ENTERPRISE

STGS SATELLITE TRACKING GROUND STATION

GDC GEODATA CENTER

Alaska Satellite Facility

The Alaska Satellite Facility (ASF) of the Geophysical Institute (GI) at the University of Alaska Fairbanks (UAF), downlinks, processes, archives, and distributes remote-sensing data to scientific users around the world.

ASF's mission is to make remote-sensing data accessible.

Search ASF Data

DAAC URSA Vertex

Wetlands

News and Events

AKSatelliteFacility @AK_Satellite 6h

If you have been working with SAR data from ASF and your work has been published, let us know. We'd love to share... fb.me/2AozBDUr7

NASA_WhatonEarth @NASAWhatonEarth 11 Mar

Warmer Earth, greener north -- satellites observe increased Arctic/boreal plant growth in past 30 years. 1.usa.gov/12Amv2t #NASA

Retweeted by AKSatelliteFacility

URSA ASF DAAC User Remote Sensing Access

User Login new user | forgot password? Username Password Login

Search & Order My Orders My Accounts Links Help

Welcome to DAAC URSA

Unrestricted Restricted

- +AirSAR
- +UAVSAR
- +IPY Data Pool
- +RGPS
- +RADARSAT-1
- +ERS-1/ERS-2
- +JERS
- +ALOS PALSAR
- +InSAR Product

Click Here to Install Required Software for Bulk Downloads!

GEOGRAPHIC SEARCH **EXPRESS SEARCH** **ACQUISITION REQUEST**

Other Products

- IPY Data Pool** The IPY data pool contains free data associated with the International Polar Year.
- Ends of the Earth** Synthetic Aperture Radar Mosaics of Alaska and Antarctica

Useful Links

- + ASF Forum
- + ASF's DARNET
- + RGPS Downloadable Products
- + InSAR
- + UAVSAR



Getting Data



URSA ASF DAAC ALASKA SATELLITE FACILITY DISTRIBUTED ACTIVE ARCHIVE CENTER

EXPRESS ORDERS

Shopping Cart

	ITEMS	COST
Data	0	0
Credit	0	0
USD	0	0

Site Map

Order Options

My Orders

My Accounts

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External Options

Year 2011

- San Andreas Fault, CA
- Sierra, CA
- San Francisco Delta, CA

Year 2010

- Gulf Coast, LA
- Gulf of Fonseca, Honduras
- Haiti Earthquake
- Hawaii
- Howard Hanson Dam, WA
- Kenaston, SK, Canada
- La Avispa, Guatemala
- Levees, LA/MS/AR
- Louisiana Marsh - Mississippi Delta, LA
- Northwest Coast, FL
- Pascagoula, MS
- Sabine Refuge, LA
- San Andreas Fault, CA
- San Joaquin Valley (SMAP), CA
- SanAnd
- West Central Coast, LA
- Yellowstone National Park, WY
- Aleutians, AK
- Cascades volcanoes
- Duke Forest, NC
- Glaciers, Greenland
- Greenland
- Harvard Forest, MA
- Howard Hanson Dam, WA
- Alabama and Florida Panhandle
- Barataria Bay, LA
- Barro Colorado Island, Panama
- Bogquete, Costa Rica
- Capitol Forest, WA
- Central Coast, FL
- Central West Coast, FL
- Corcovado National Park, Costa Rica
- Desembocadura, Centro, Nacimiento, Panama
- Dominican Republic
- East Central Marsh, LA
- Eastern Coast, TX
- Everglades, FL
- Guatemala Volcanoes
- Gulf Coast, TX
- Gulf of Mexico Oil Spill
- HaitiQ
- Hayward Fault, CA
- Isla de Coiba, Panama
- La Amistad International Park
- La Selva, Costa Rica
- Lost Aircraft Site in Telire, Costa Rica
- Nicaragua Volcanoes
- Ocean East of Florida Keys
- Rosamond, CA
- Salton Sea, CA
- San Francisco Delta, CA
- San Joaquin Valley, CA
- Southeast Oahu, HI
- West Panhandle, FL
- Bartlett/Hubbard Brook, NH
- Channel Islands, CA
- Everglades, FL
- Glaciers, Iceland
- Gulf Coast, LA
- Hayward Fault, CA
- Howland Forest, ME

URSA ASF DAAC ALASKA SATELLITE FACILITY DISTRIBUTED ACTIVE ARCHIVE CENTER

EXPRESS ORDERS

Shopping Cart

	ITEMS	COST
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USD	0	0

Site Map

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Help

External Options

View search results in Google Earth
NOTE: You must have Google Earth installed in order to use this feature.

Found 17 granules.
Displaying granules 1 - 17

Proceed to checkout

Enter Search Name:

Place Selected Granules In Cart

View Selected Granules In Google Earth

Export Selected Granules To CSV

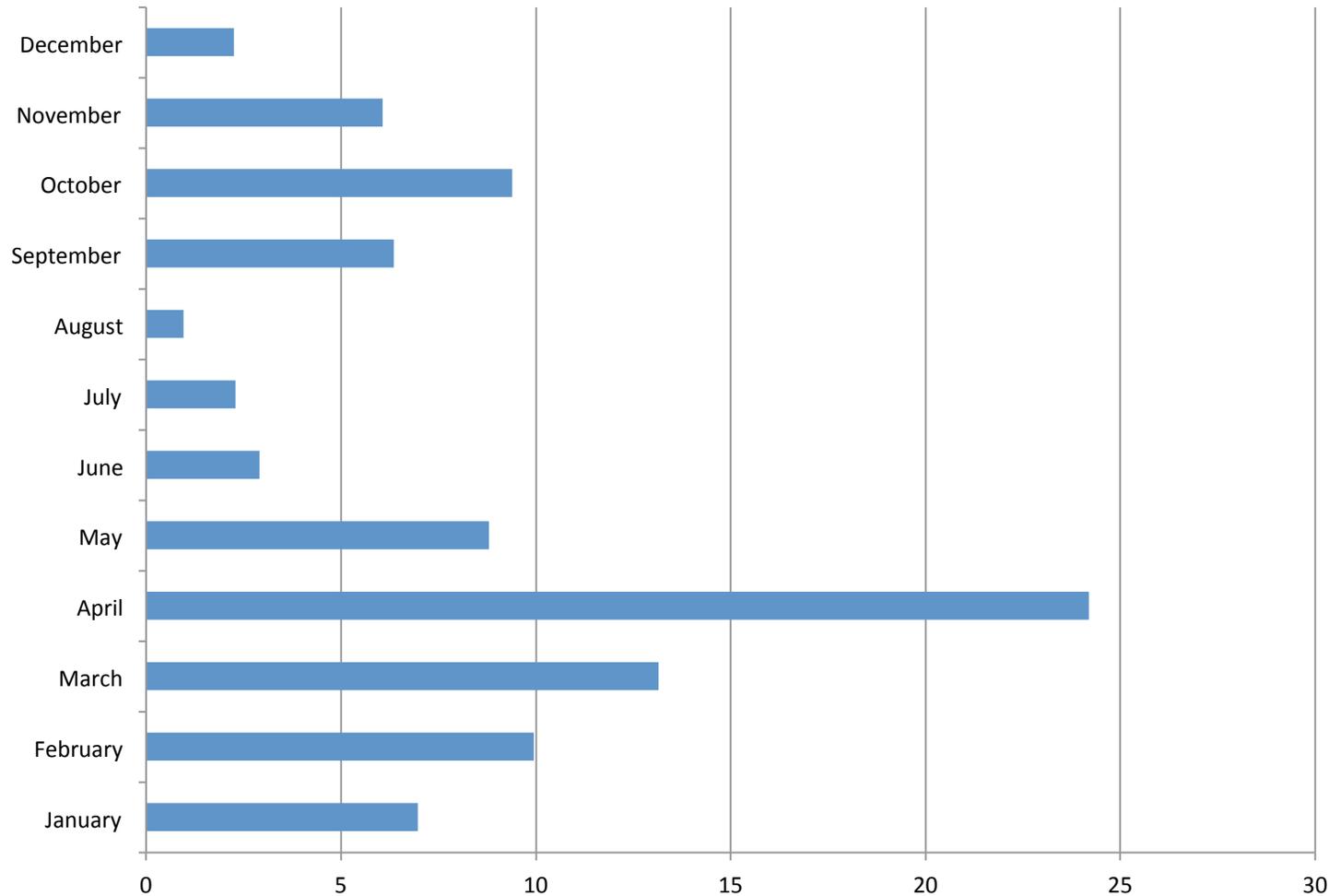
Available for purchase

Not available for purchase. You must be approved and logged-in to purchase this data.
Data not yet received from foreign station. Processing is delayed.

Granule Info	Order Options	Browse Image & Cloud Cover	More Info
Granule Name: UA_gulfco_32017_10054_001_100623_L090_CX_01 Date: JUN-23-2010 Scene Type: UAVSAR PolSAR Scene Mission Name: Gulf Coast, LA	Download Now	gulfco_32017_10054_001_100623_L090_CX_01.gif	Summary
Granule Name: UA_gulfco_14011_10010_004_100126_L090_CX_01 Date: JAN-26-2010 Scene Type: UAVSAR PolSAR Scene Mission Name: Gulf Coast, LA	Download Now	gulfco_14011_10010_004_100126_L090_CX_01.gif	Summary
Granule Name: UA_gulfco_27010_10009_001_100125_L090_CX_01 Date: JAN-25-2010 Scene Type: UAVSAR PolSAR Scene Mission Name: Gulf Coast, LA	Download Now	gulfco_27010_10009_001_100125_L090_CX_01.gif	Summary
Granule Name: UA_gulfco_14015_10010_006_100126_L090_CX_01 Date: JAN-26-2010 Scene Type: UAVSAR PolSAR Scene Mission Name: Gulf Coast, LA	Download Now	gulfco_14015_10010_006_100126_L090_CX_01.gif	Summary
Granule Name: UA_gulfco_14018_10010_002_100126_L090_CX_01			

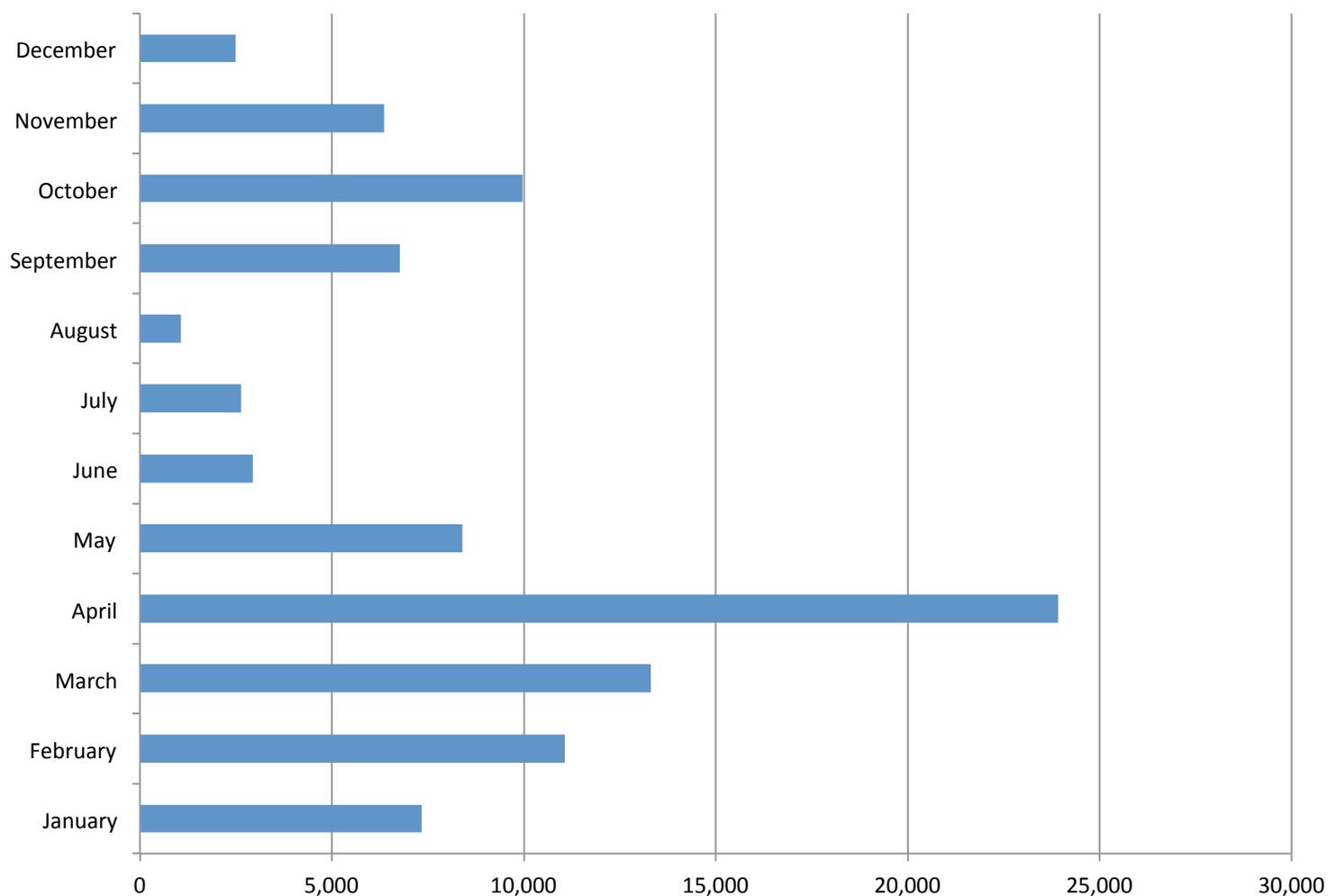
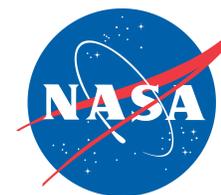


Volume of PolSAR product downloads/month in 2012 (TB)



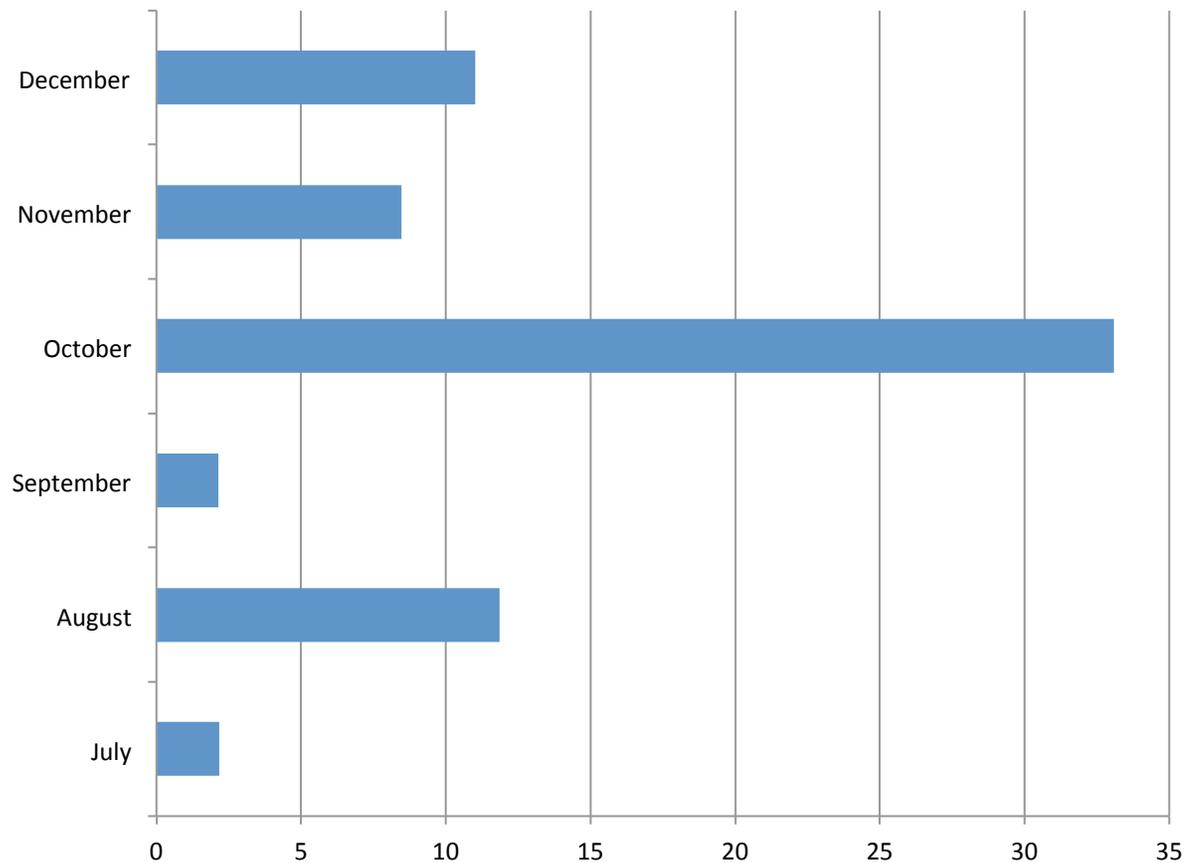


Number of PolSAR products downloaded/month in 2012



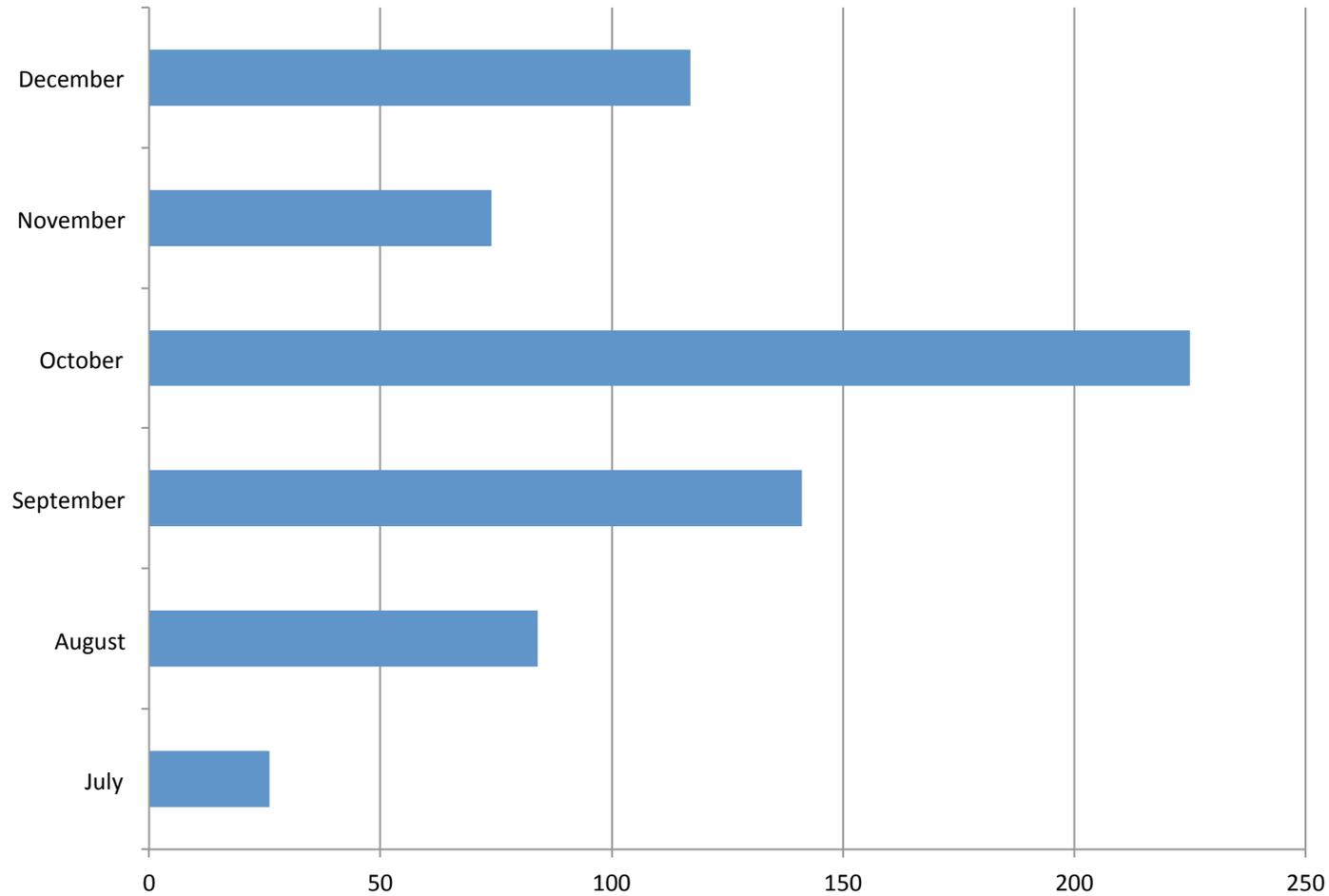


Volume of UAVSAR RPI product downloads/month in 2012 (GB)



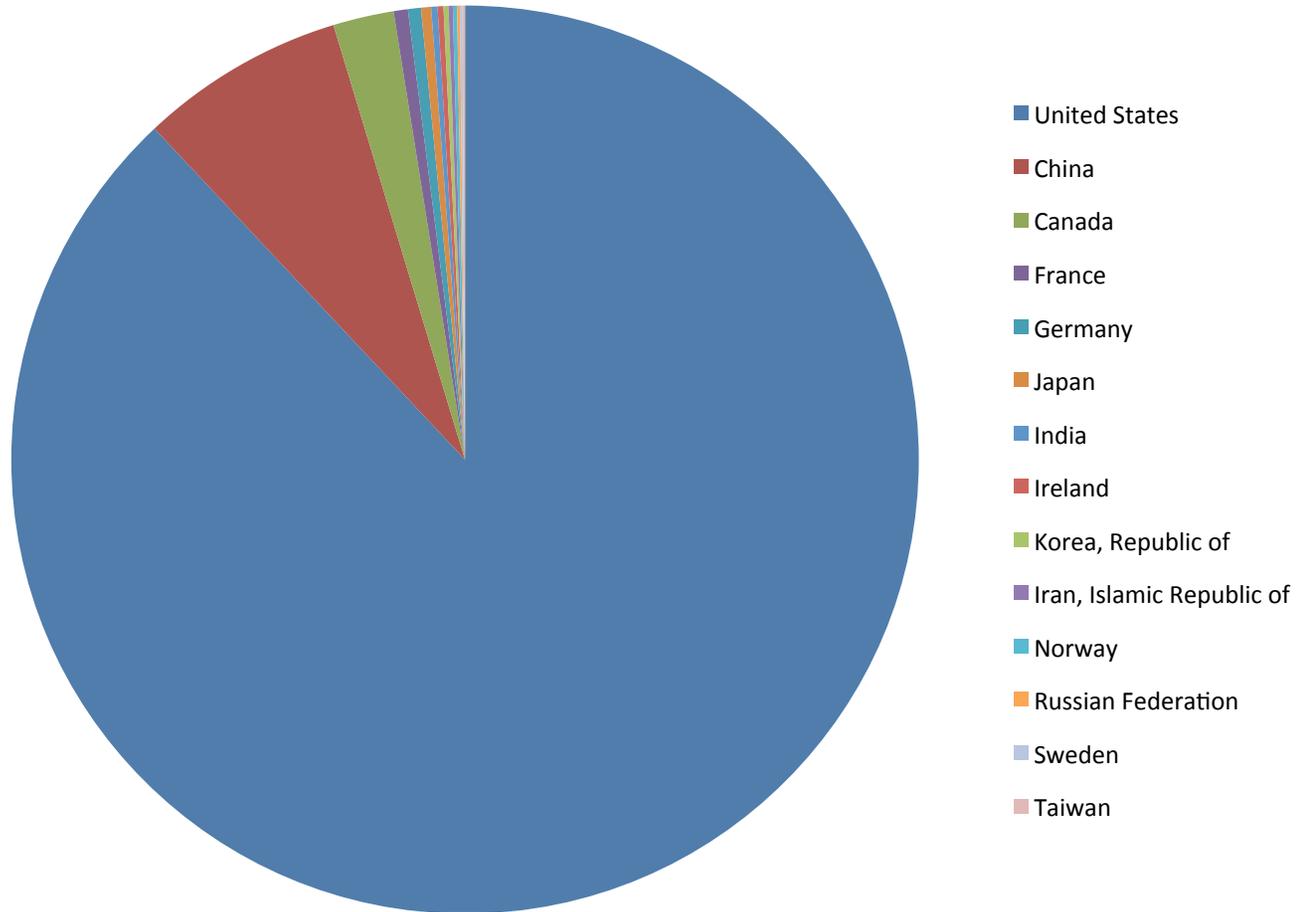


Number of UAVSAR RPI products downloaded/month in 2012



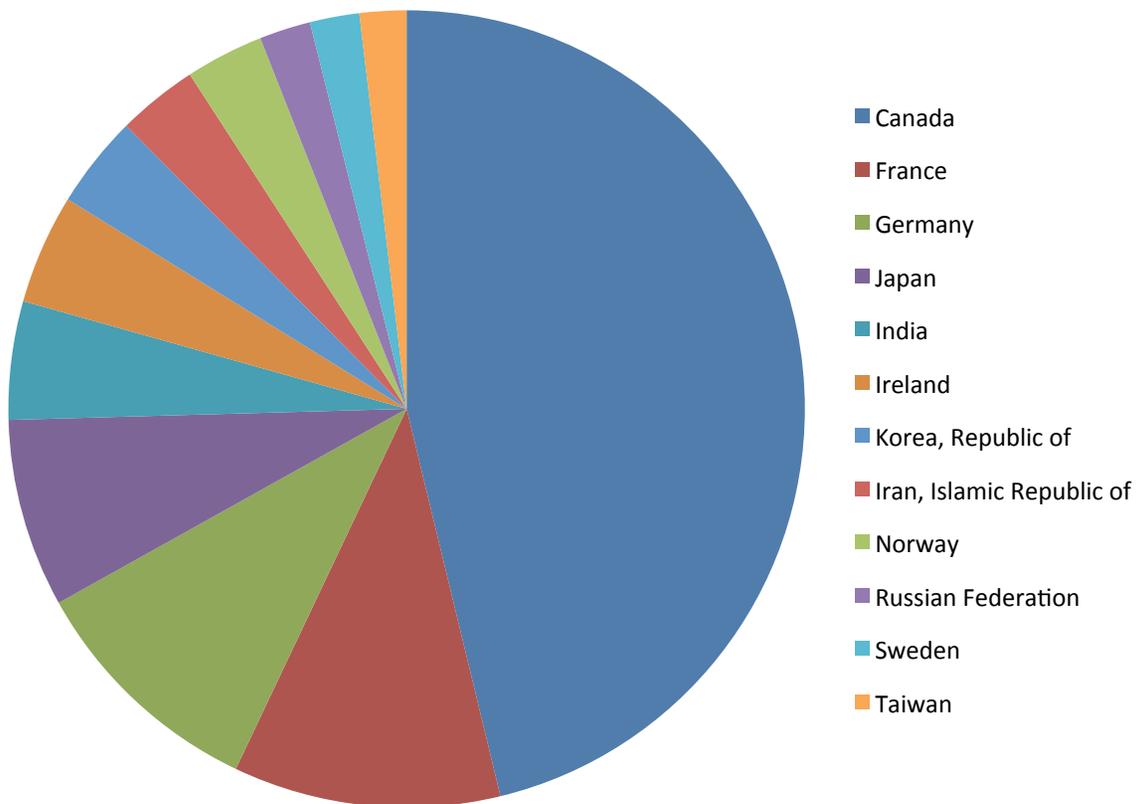
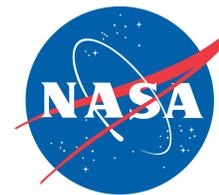


Countries with highest (100+) UAVSAR downloads in 2012



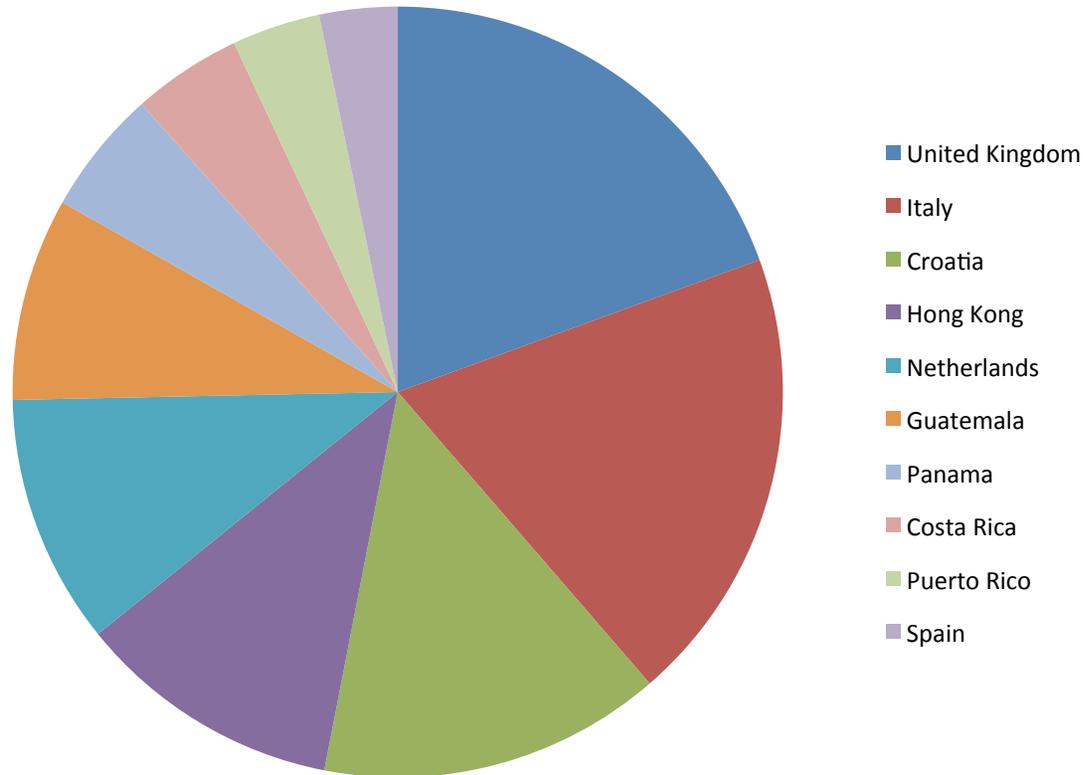


Highest UAVSAR downloads (100+) excluding the U.S. and China





Countries with small downloads 10-99/year

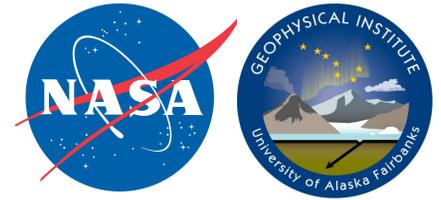




UAVSAR products at ASF



- As of February 28, 2013
 - UAVSAR PolSAR products in the ASF archive: 2,876
 - Total PolSAR product volume: 54.1TB
 - UAVSAR RPI products in the ASF archive: 320
 - Total RPI product volume: 3.9TB

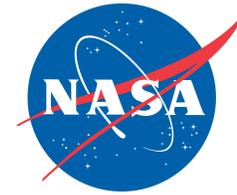


SAR Processing Tools At ASF

UAVSAR Support Software
designed by ASF



ASF Map Ready Software



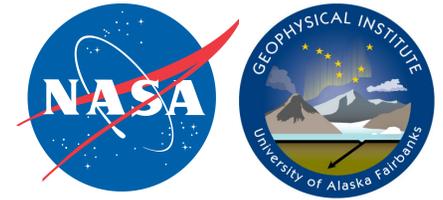
- Map Ready Remote Sensing Tool Kit
 - Accepts level 1 detected SAR data, single look complex SAR data, and optical data from ASF and some other facilities.
 - It can terrain correct, geocode, apply polarimetric decompositions to multi-pol SAR data, and save to several common imagery formats including GeoTIFF.
 - Other software included in the package are an image viewer, metadata viewer, a projection coordinate converter, and a variety of command line tools.



Mapready and UAVSAR

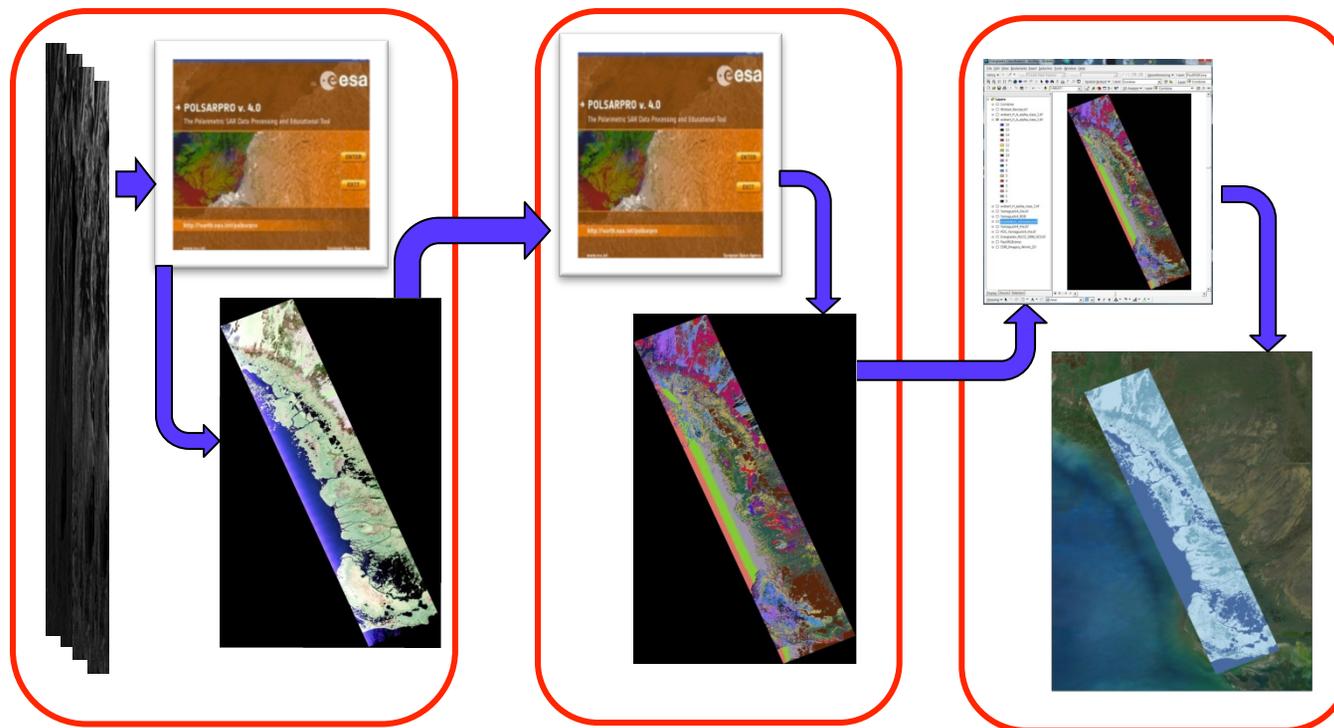


- Map Ready will ingest UAVSAR products
 - GRD data is already geocoded, but can be reprojected to other common map projections
 - MLC data is in slant range projection and can be geocoded using MapReady
 - Data can be exported to many common image formats, including some immediately usable in GIS:
 - jpeg, tiff, pgm, png
 - geotiff, polsarpro, hdf5, netcdf



UAVSAR Classification Work

Contact: Don Atwood,
ASF Chief Scientist
dkatwood@alaska.edu



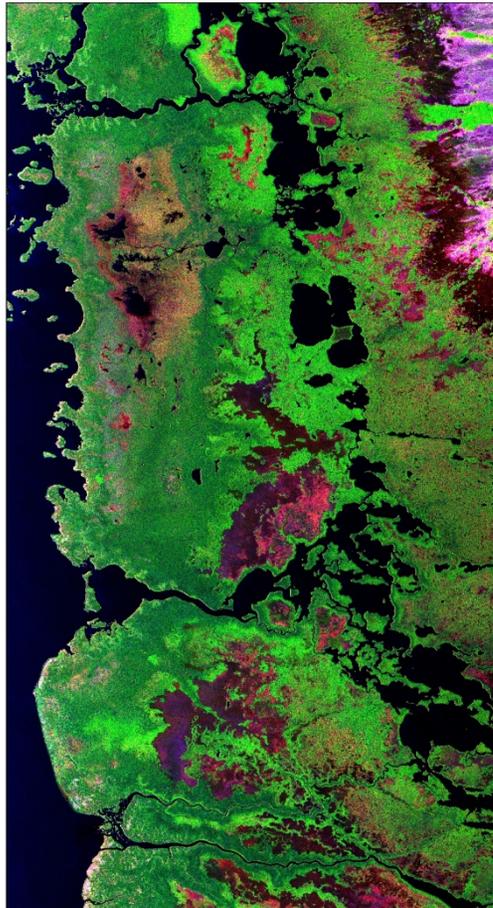
Generate **Multilooked C3**
Radiometric Correction
 POA Compensation

Perform Wishart
 Unsupervised
 Classification

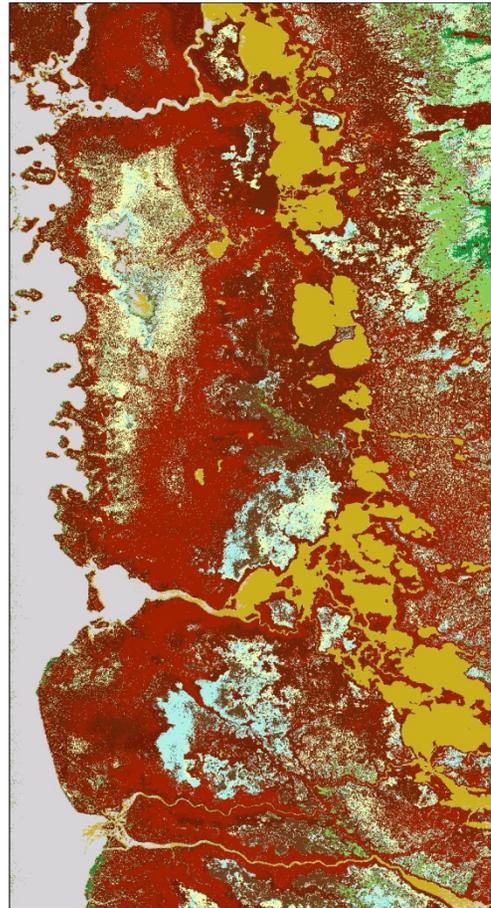
Convert to GeoTIFF
 Export to GIS
 Assign Classes



Classification of Florida Everglades



Yamaguchi Decomposition



Wishart Segmentation



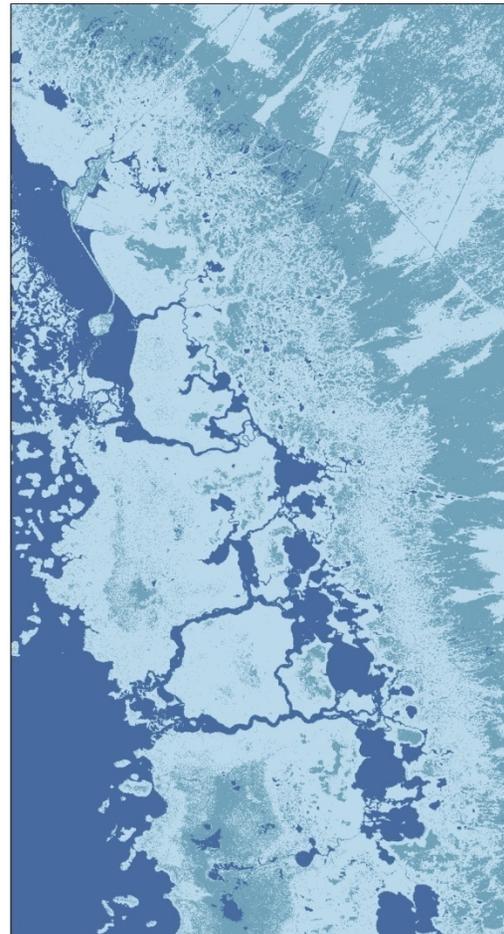
Land Cover Classification



Classification Results



USGS NLCD 2006



PoISAR Classification

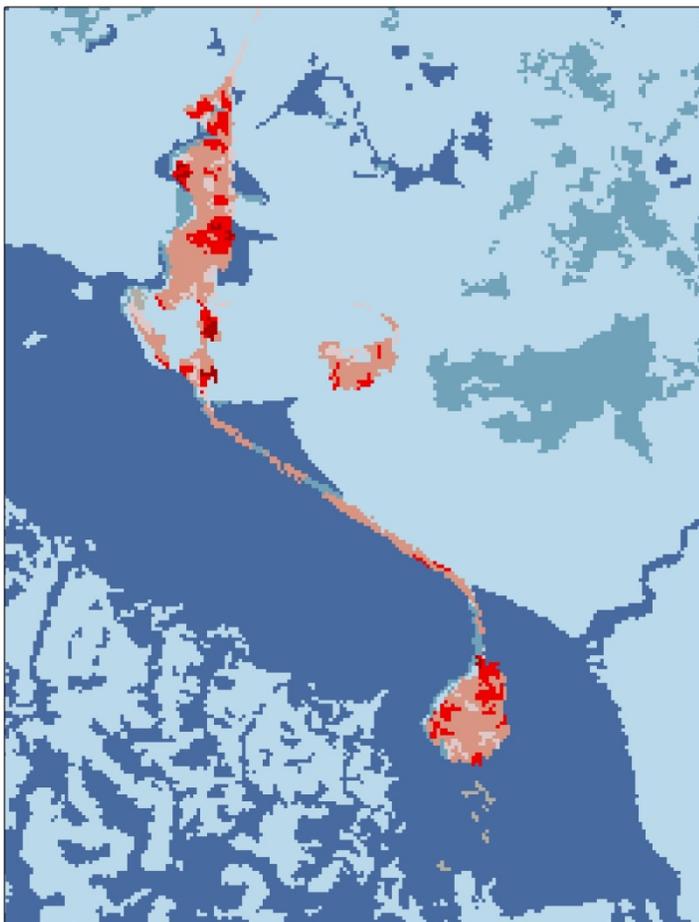
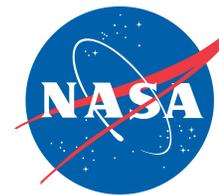
NLCD 2001 Land Cover Classification Legend

- 11 Open Water
- 12 Perennial Ice/Snow
- 21 Developed, Open Space
- 22 Developed, Low Intensity
- 23 Developed, Medium Intensity
- 24 Developed, High Intensity
- 31 Barren Land
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest
- 51 Dwarf Scrub*
- 52 Shrub/ Scrub
- 71 Grassland/ Herbaceous
- 72 Sedge/ Herbaceous *
- 74 Moss *
- 81 Pasture Hay
- 82 Cultivated Crops
- 90 Woody Wetlands
- 95 Emergent Herbaceous Wetlands

* Alaska Only



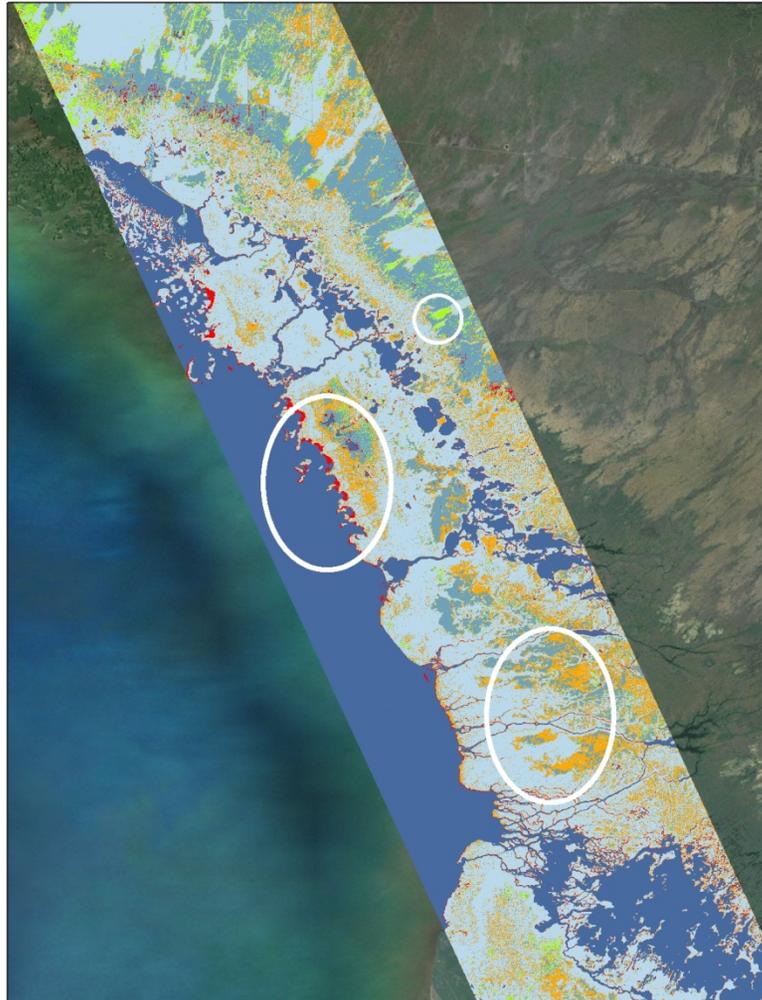
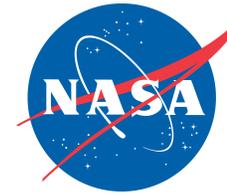
Classification Results



Difficulty in classifying urban areas with PolSAR



Classification Results



Address differences between Wishart Classification and USGS 2006 Land Cover

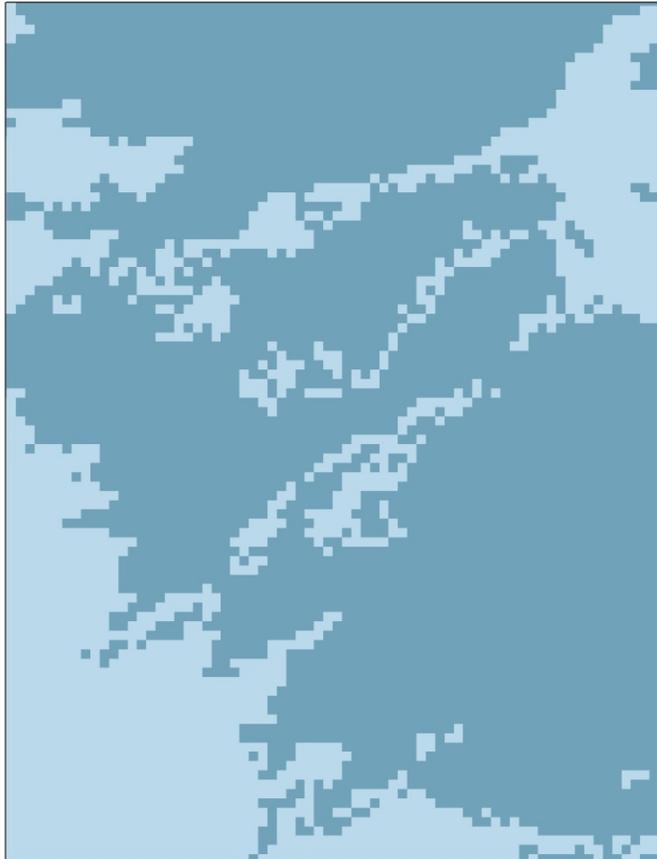
Color-coded Differences

- Coastal Change
- Gain in Woody Wetland
- Loss in Woody Wetland

In every instance, UAVSAR offers the better classification



Gain in Woody Wetlands



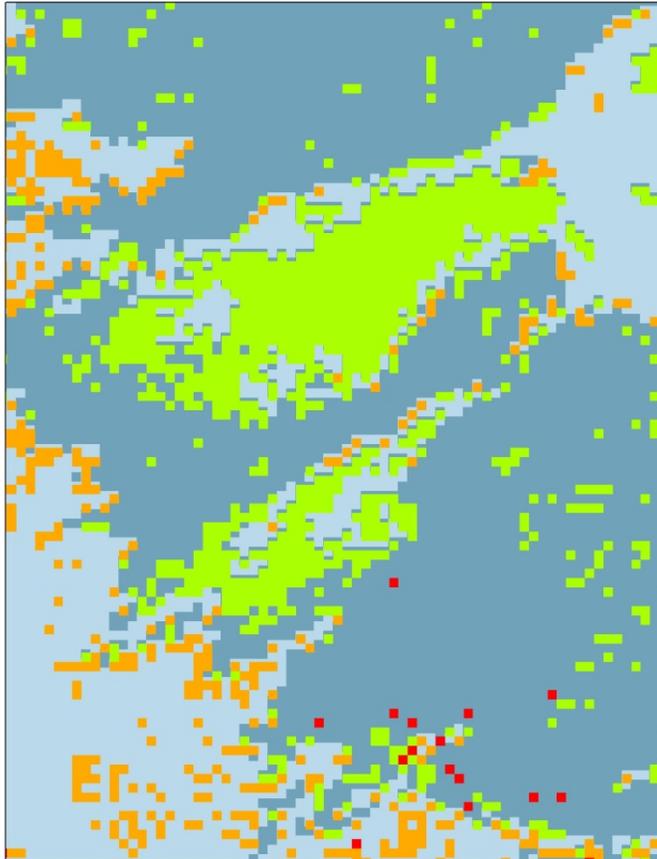
USGS NLCD 2006



PoISAR Classification



Gain in Woody Wetlands



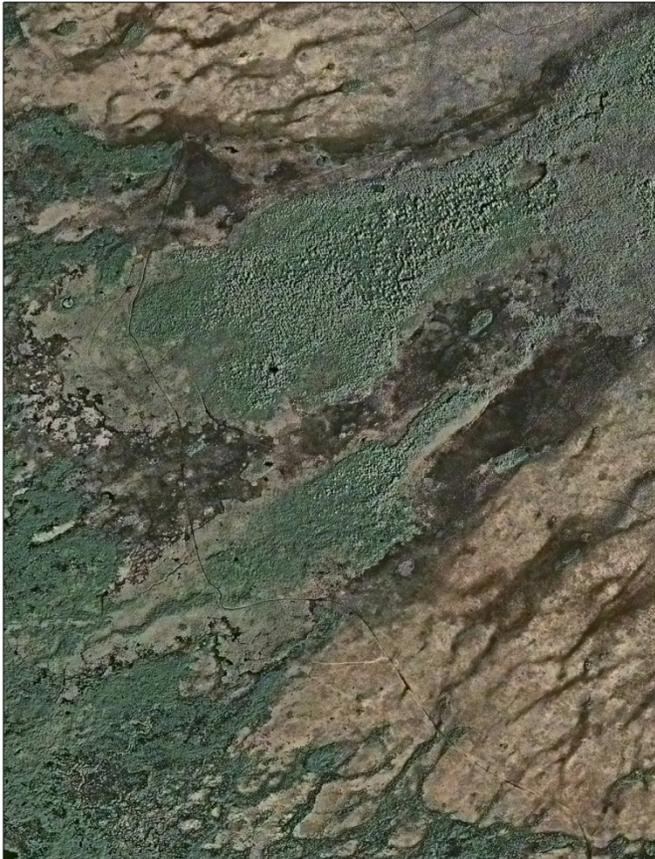
Difference in Woody Wetlands



PoISAR Classification



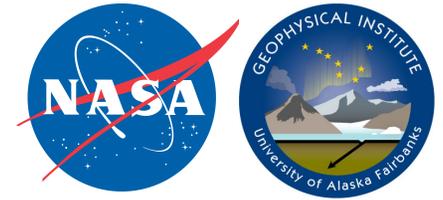
Gain in Woody Wetlands



Optical Image



PolSAR Classification

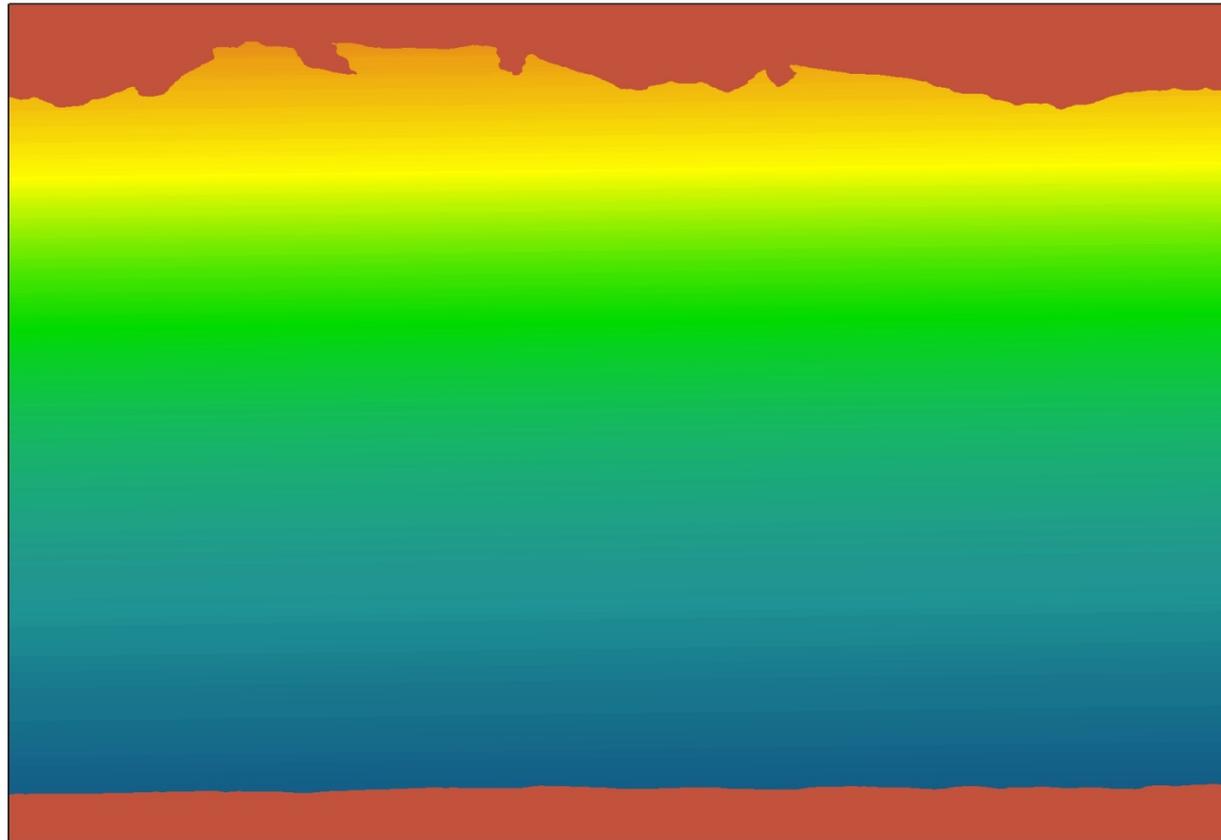
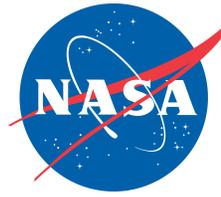


UAVSAR Incidence Angle Investigations

Contact: Don Atwood,
ASF Chief Scientist
dkatwood@alaska.edu



Incidence Angle Variability

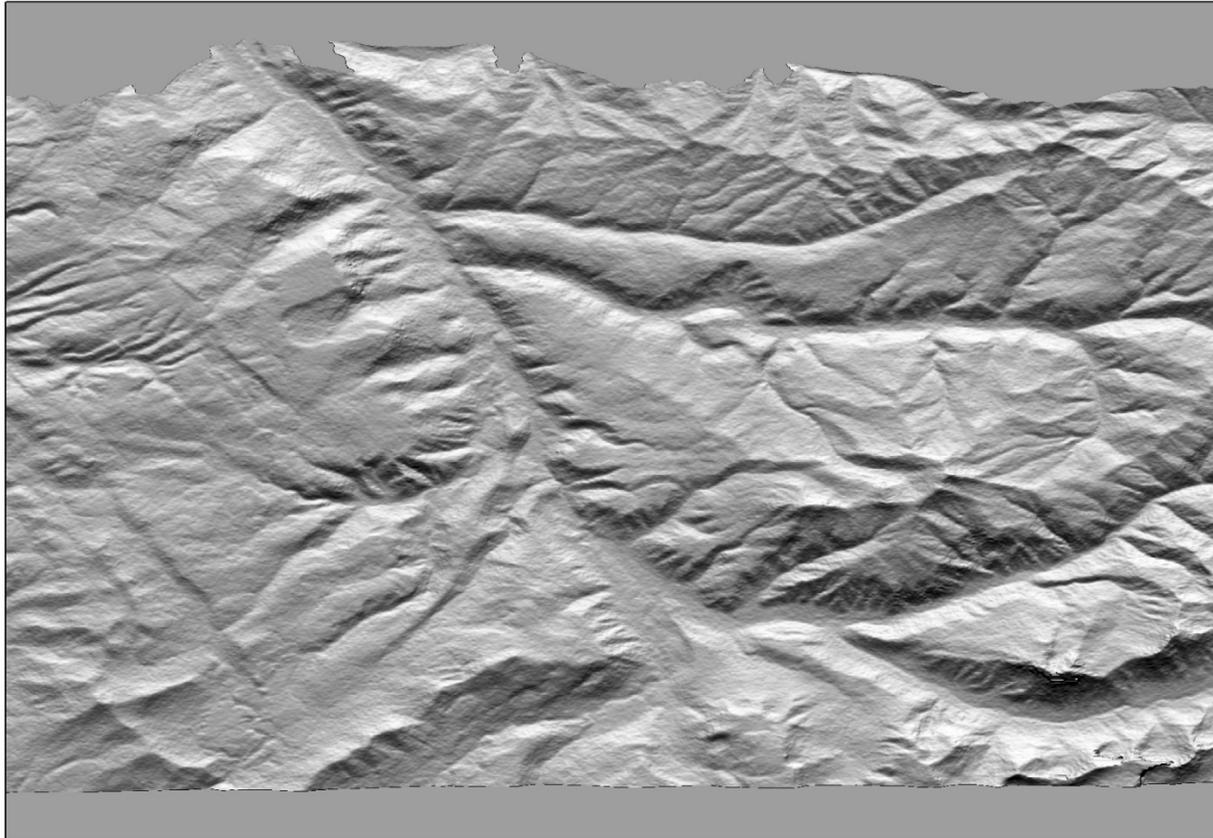
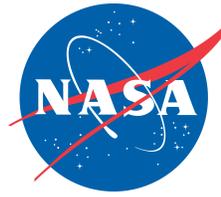


Ellipsoidal Incidence Angle

Ranges from 12 to 64 degrees



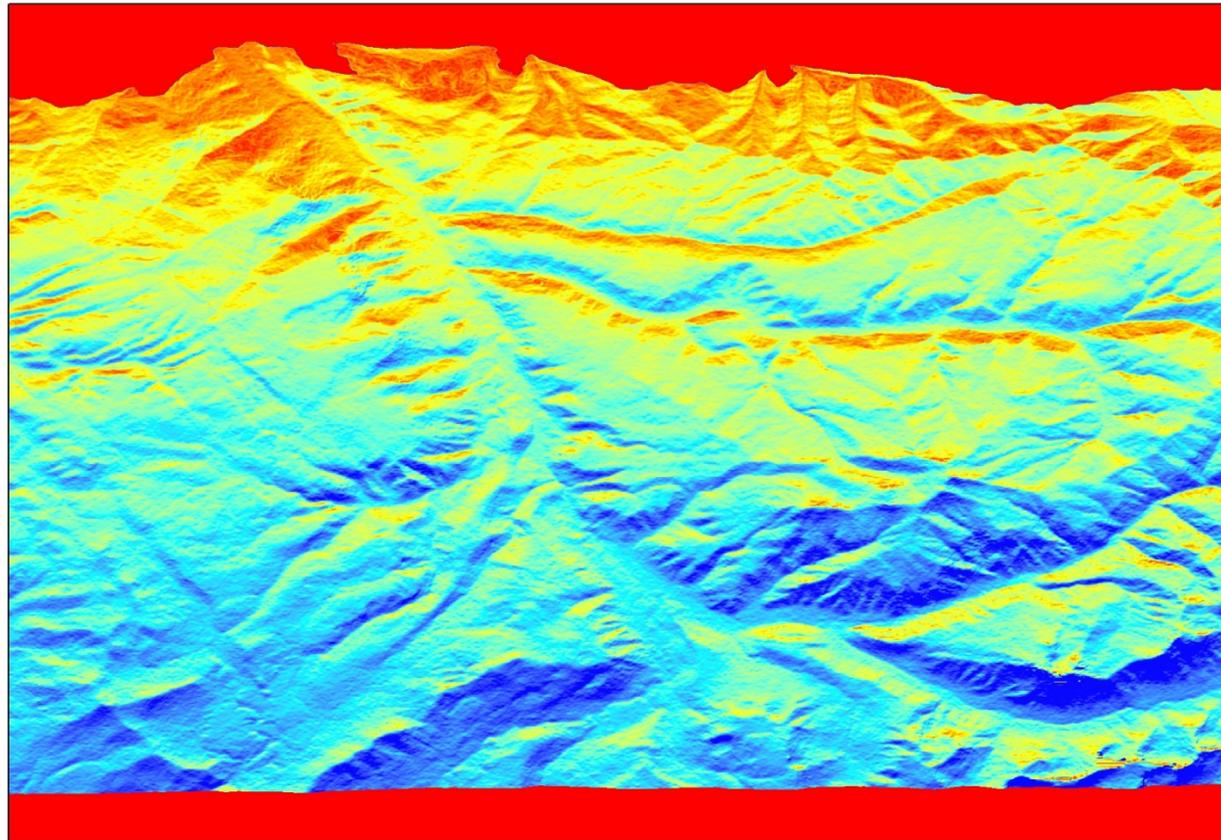
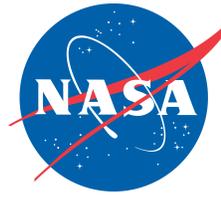
Incidence Angle Variability



Hillshade DEM



Incidence Angle Variability



90 degrees

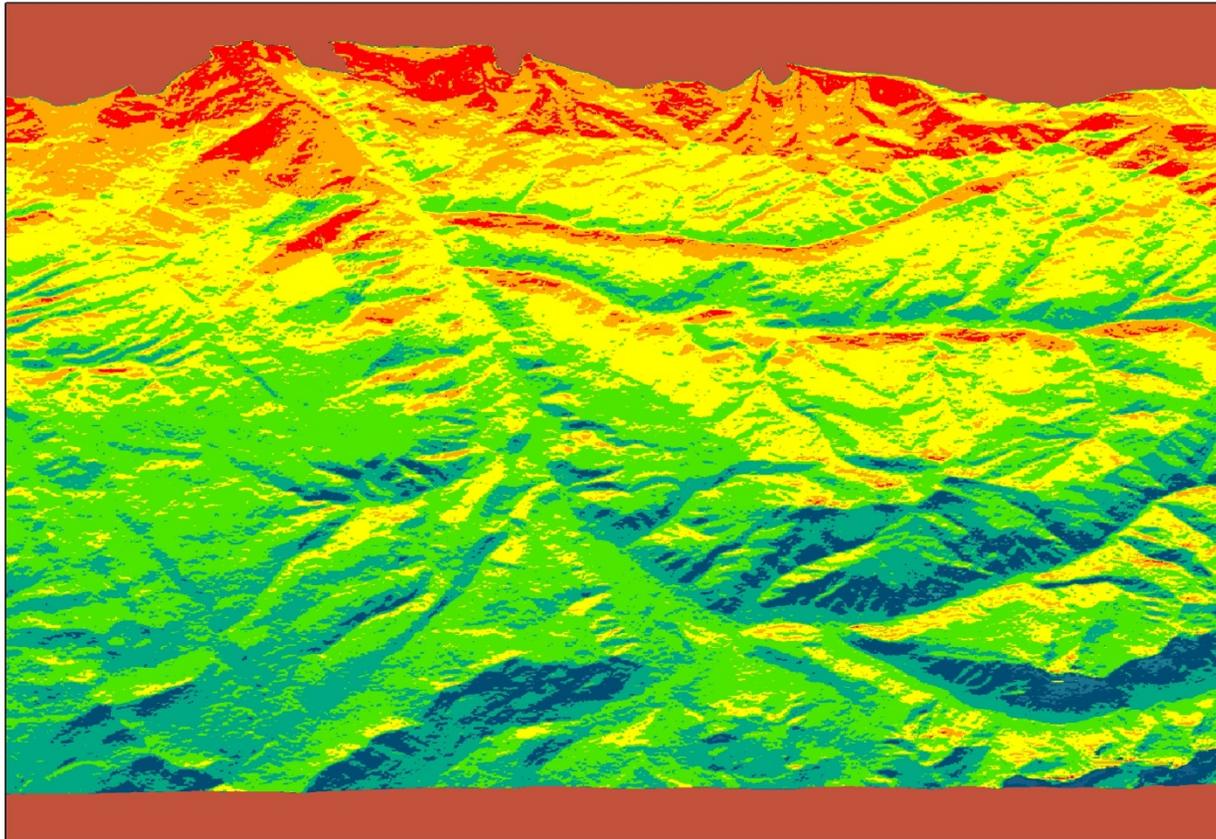
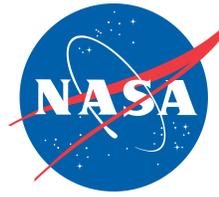


0 degrees

Local Incidence Angle



Incidence Angle Variability



Incidence_Angles

-  0 - 15
-  15 - 30
-  30 - 45
-  45 - 60
-  60 - 75
-  75 - 90

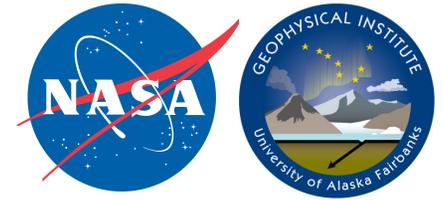
Segmentation of Local Incidence Angle



ASF UAVSAR Presentations



- Atwood, D., S.A. Arko, R. Gens, and R. Sanches, "Enhancing the Accessibility and Utility of UAVSAR L-band SAR Data," American Geophysical Union, 2011 Fall Meeting, San Francisco, CA, 2011.
- Atwood, D., S. Arko, and R. Gens, "Accuracy Assessment of Yellowstone Land Cover Classification Using Polarimetric UAVSAR," IEEE Geoscience and Remote Sensing Symposium (IGARSS), Vancouver, Canada, 2011.
- Guritz, R., D. Atwood, and J. Nicoll, "Polarimetric Implications of Incidence Angle Variability for UAVSAR," *IEEE Geoscience and Remote Sensing Symposium (IGARSS)*, Vancouver, Canada, 2011.



Questions?

Comments?