

# Real-time, GIS Satellite Data Feeds to NWS Alaska Sea Ice Program

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## About GINA

The Geographic Information Network of Alaska (GINA) is a mechanism within the University of Alaska (UA) for sharing data and technical capacity among Alaskan, Arctic, and world communities. GINA's primary purpose is to:

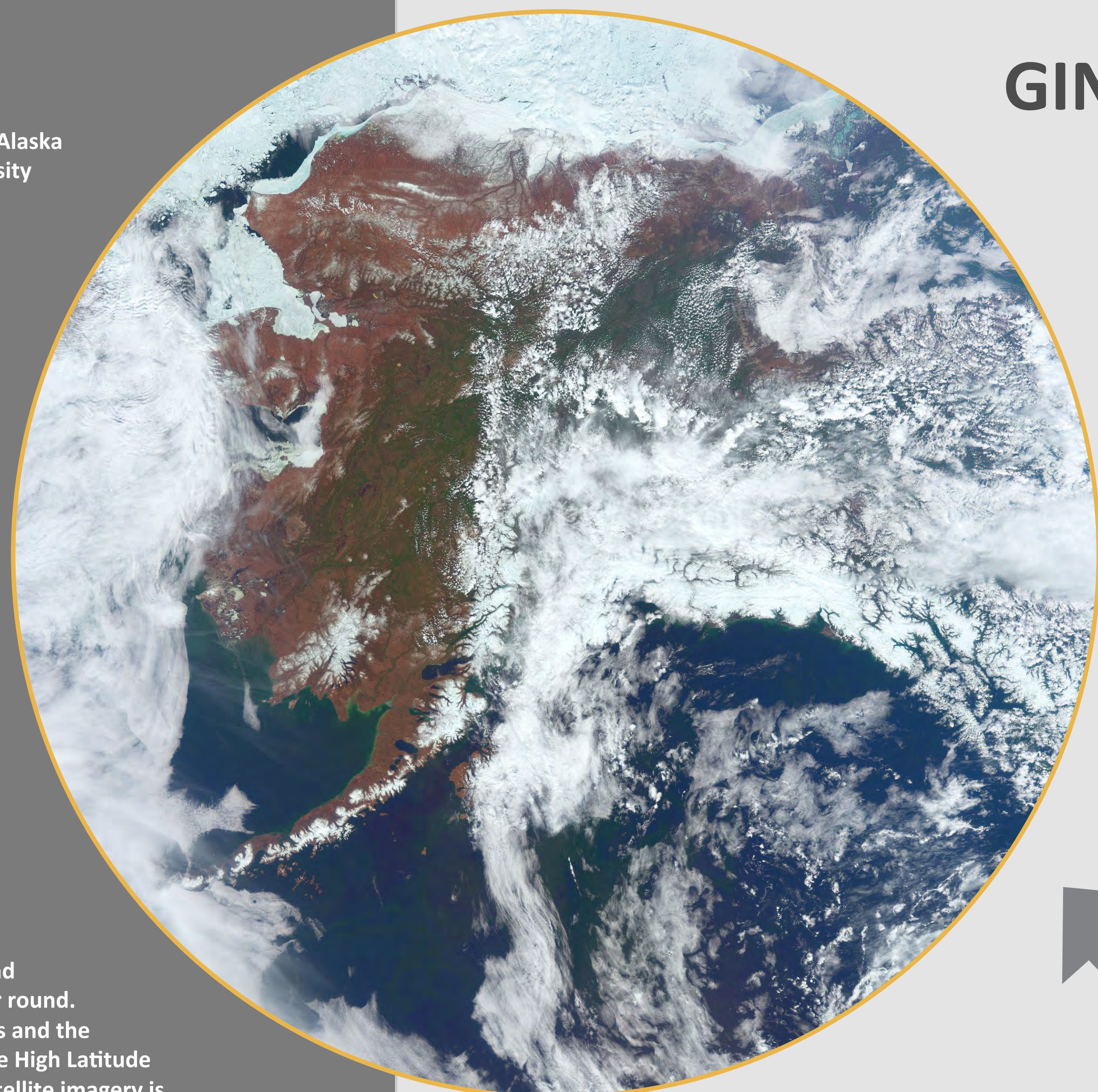
- Capture and distribute real-time satellite imagery and data products to operational and science users
- Manage large-scale, high-resolution, and ortho imagery and elevation mapping products
- Manage and distribute a variety of data and images using open standards web services

## Abstract

The Anchorage WFO includes the Alaska Sea Ice Program, whose analysts chart and forecast sea ice three times per week year round. Their work impacts major shipping routes and the largest fisheries in the world. Through the High Latitude Proving Ground (HLP), near real-time satellite imagery is provided to the Sea Ice Program in formats that explicitly suit their operational needs. Unlike the general forecasters at the Anchorage WFO who use AWIPS as their primary decision support and forecasting tool, the Sea Ice Program works primarily in the desktop GIS package ArcGIS. Sea ice analysts consult model and satellite data using AWIPS, especially for forecasting, but their primary work is executed using desktop GIS. Environmental prediction has been greatly enhanced through close collaboration between the Sea Ice Program staff and University of Alaska Fairbanks Geographic Information Network of Alaska (UAFGINA) HLP staff. GINA created a web application specifically to serve the Sea Ice Program, called Puffin Feeder [feeder.gina.alaska.edu](http://feeder.gina.alaska.edu), that serves data in GIS-ready formats to sea ice analysts. Feedback and collaboration has been informal, but very close and effective. Sea Ice Program staff express needs and critique products through routine phone calls, email exchanges, and site visits. UAFGINA HLP staff have suggested various natural color, infrared, day night band, and RGB satellite products and then refined them based upon analyst feedback. The advantages that this type of collaboration has include: a small number of staff involved on both sides which enables relationship building and a highly visible, impactful product to collaborate in creating. The primary disadvantage and risk is: a small number of staff involved puts corporate knowledge in a few hands making it at risk to personnel changes. The HLP and Sea Ice Program working together provides an excellent model for collaborations on nonmainstream but locally vital applications with the NWS. The High Latitude Proving Ground is supported by the GOES-R and JPSS program offices. Work is executed in a close partnership among NWS Alaska Region, NESDIS Fairbanks Command and Data Acquisition Station, and UAF-GINA.

## Looking Ahead

The collaboration between UAF GINA and Alaska NWS Sea Ice Program was developed through the High Latitude Proving Ground (HLP). The satellite reception and processing systems that supply this data to the NWS sea ice analysts and weather forecasters are being upgraded and made more operationally robust through Sandy supplemental funding. Enhancements to Puffin Feeder have been proposed and are pending funding decisions. HLP-provided data is being used operationally by the NWS. The HLP systems that supply it need to be made more robust and transitioned from quasi-operational to fully operational systems.



## GINA's Puffin Feeder Site Serves GIS-ready Images to Sea Ice Analysts



### *feeder.gina.alaska.edu*

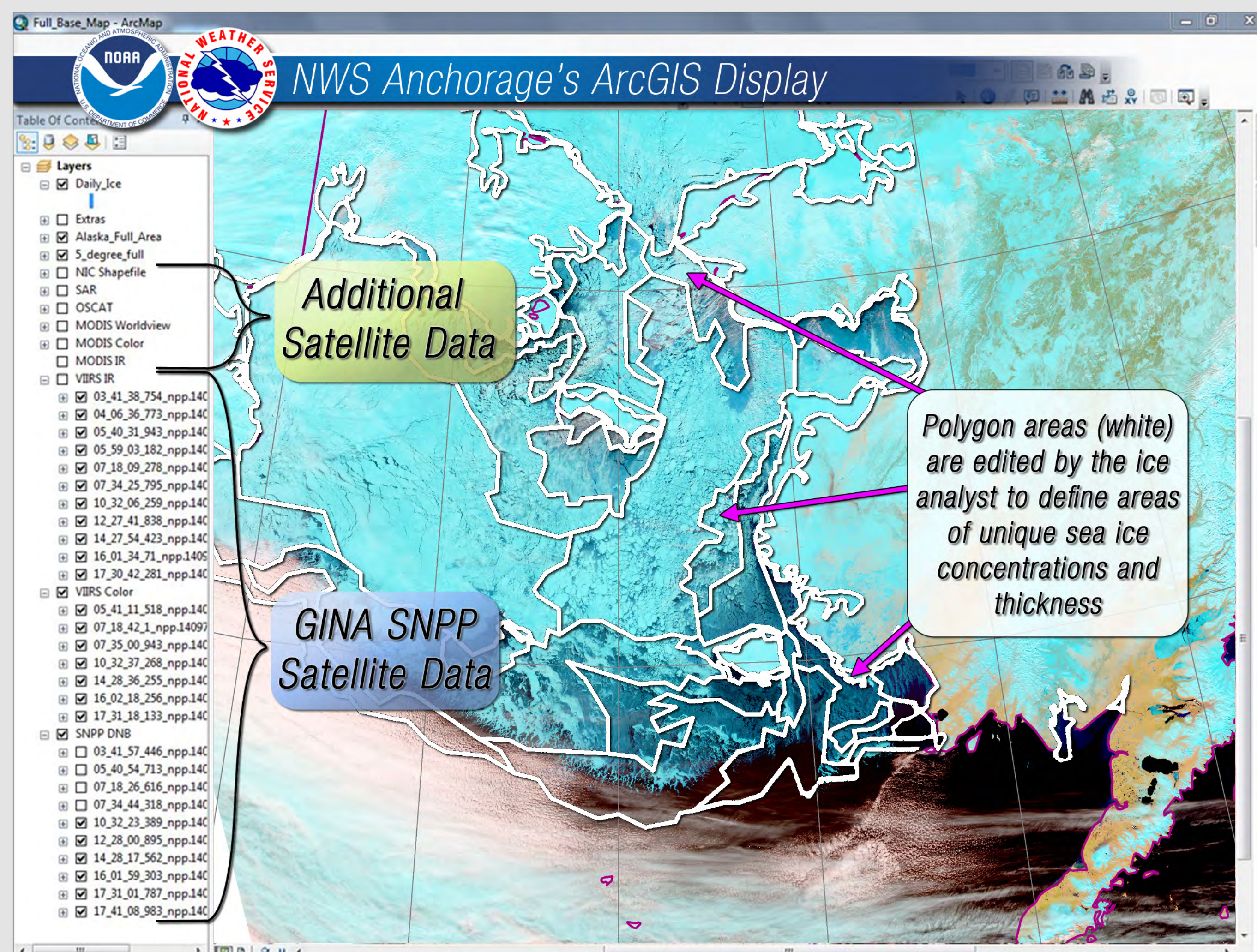
GINA created the Puffin Feeder web site to serve data in GIS-ready formats to sea ice analysts, scientific users, and the public online. Products include:

- GINA direct broadcast MODIS and SNPP VIIRS. Image products include: Day-Night Band, Thermal Infrared, Natural Color, Snow/Ice-enhanced Landcover RGB
- Barrow Sea Ice Webcam & Radar (10 kW X-band marine radar provides sea ice animations in Barrow, Alaska)

(left circle) Landfast ice along Alaska's arctic coastline. This satellite image from June 3, 2013 shows a mostly snow-free land surface. A strip of sea ice attached to land persists along the north coast until break-up in July.

SATELLITE Suomi NPP (National Polar-orbiting Partnership)  
SENSOR VIIRS; bands M543 (+101 for sharpening)  
DATE 2012-06-03 22:15 UTC  
Supported by NOAA NESDIS JPSS and GOES-R Program Offices.

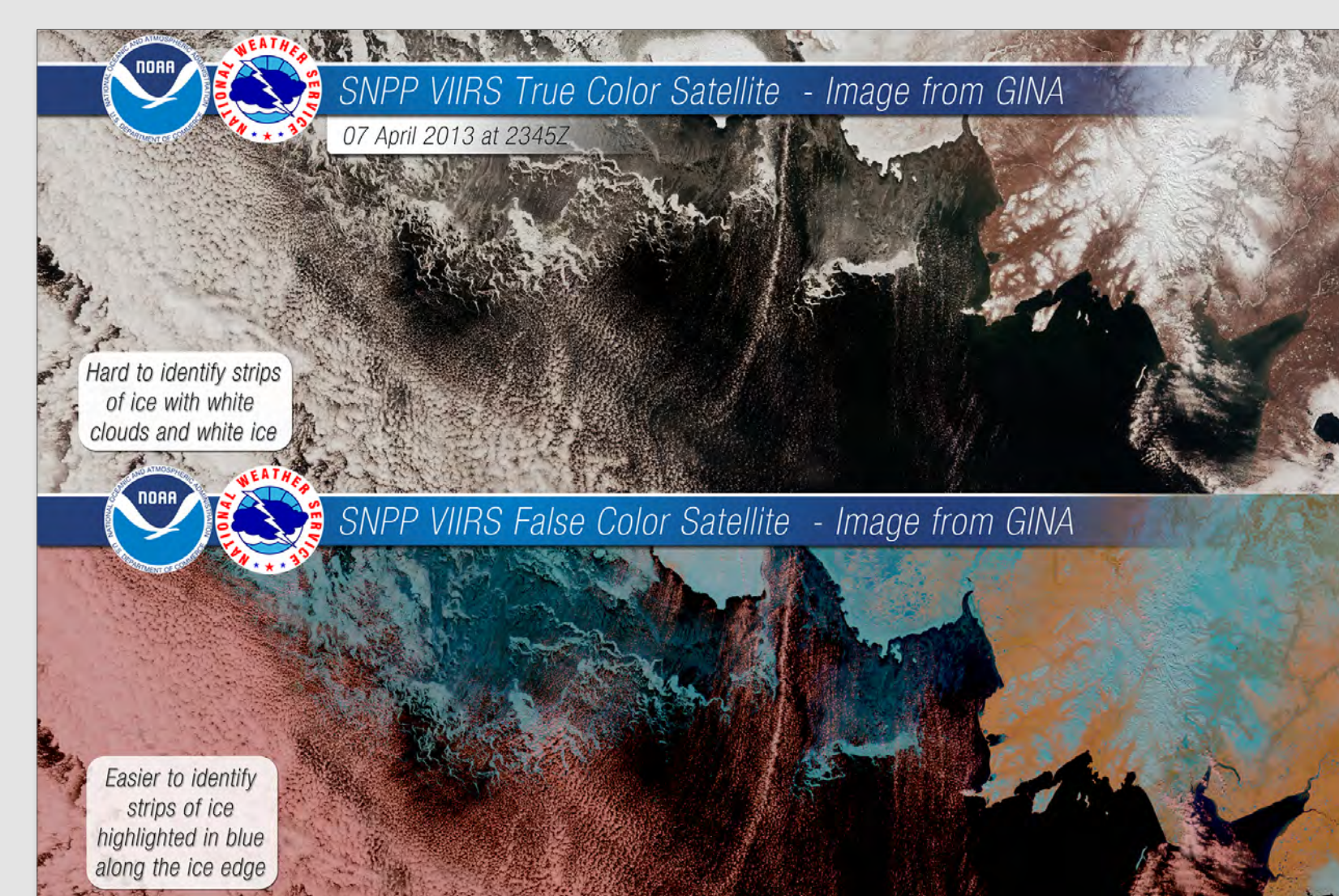
## NWS Sea Ice Experts Use GINA Images and Data to Analyze Current Conditions



### <http://pafc.arh.noaa.gov/ice.php>

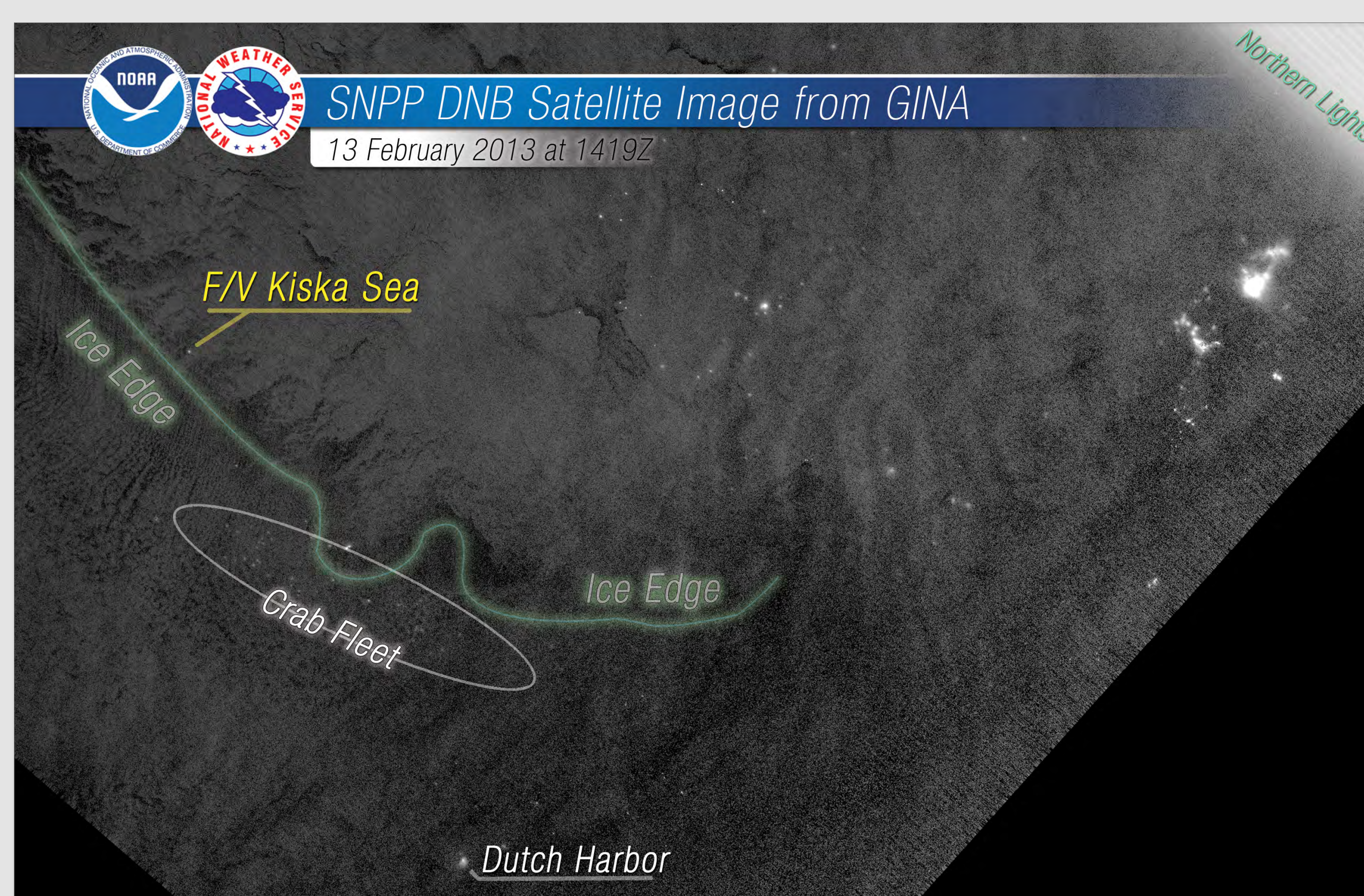
The NWS Sea Ice Program in Anchorage, AK utilizes ArcGIS 10.2 to bring in data from numerous sources including GINA. After data is ingested into the program the sea ice analyst turns on recent satellite images to discern areas of unique sea ice thickness and concentration. These areas are then outlined in polygon shapes and the attributes of each shape are determined to label the areas ice

characteristics. Once the analysis has been completed the ice analyst creates analysis image graphics and ArcGIS shapefiles that are posted to the webpage every Monday, Wednesday, and Friday.



(far left) NWS sea ice charts and forecast are created in ArcGIS using satellite imagery from GINA Puffin Feeder and other sources.

## Crabbing Vessel Calls on the NWS Sea Ice Program for Navigation Help



The northern most vessel in the Bering Sea Crab fleet, the Kiska Sea, contacted the NWS Sea Ice Program on February 10, 2013 asking if their crab pots were in danger of being overrun by sea ice. Calls between the Kiska Sea and the Sea Ice Program over the next three days continued the exchange of ice information, assisting the captain in finding his lost gear through the increasing ice field. On February 13 the vessel was surrounded by sea ice, some in excess of three feet thick. DNB images from the previous night clearly showed the lights from Kiska Sea and the ice pack around the vessel. NWS Sea Ice personnel were able to assist the captain to plot a track out of the ice pack, avoiding areas of thicker and higher concentrations sea ice. The timeliness of the DNB images provided an essential tool for this vessel assist.

(left) Experts at the NWS Sea Ice Program were able to use GINA satellite imagery to help a lost crab boat get out of sea ice.

