NOAA National Environmental Satellite, Data, and Information Service (NESDIS) + NOAA Open Data Dissemination (NODD) + Microsoft Office Hours
November 29, 2023 | 12-1:15 PM EDT

TO: NESDIS NODD Microsoft Office Hours Participants

DATE: 29 NOVEMBER 2023 | 12-1:15 PM EDT

FROM: Steve Superczynski, Jeff Key, Peter Romanov, Yinghui Liu, Xuanji Wang (NOAA National Environmental Satellite, Data, and Information Service), Cindy Elsenheimer (NOAA National Weather Service), Adrienne Simonson, Jenny Dissen & Kate Szura (NOAA Open Data Dissemination Engagement and Communication)

SUBJECT: Responses to Questions from GOES-R Office Hours

Dear Colleagues,

Thank you again for your tremendous contribution during the NESDIS NODD Microsoft Office Hours. Your data related questions and comments raised during the discussion were heard and noted by NOAA.

This document provides brief responses to questions that were identified during the registration and that were raised during the discussion. Names and attributions of individuals and their affiliation have not been documented, unless it is a NOAA speaker.

We recognize the importance of continued engagement and collaboration, and invite ongoing comments via our emails.

Thank you,
Steve, Jeff, Peter, Yinghui, Xuanji (National Environmental Satellite, Data, and Information Service)
Cindy (National Weather Service)
Adrienne Simonson, Jenny, Kate (NODD Engagement and Communication)

<u>Contents for the Summary Notes</u>

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1. General Agenda of the Webinar

OUTLINE FOR THE DISCUSSION

12:00 - 12:05   Brief Introductions by NESDIS GOES-R, NODD, and Microsoft
12:05 - 12:25   Geostationary Operational Environmental Satellites—R Series - Cryosphere Data
                Overview
12:25 - 12:45   Introduction to Microsoft Planetary Computer and Brief Demo via Azure
12:45 - 1:10   Open Discussion (Please use "Raise Hand" or the chat to raise questions)
1:10 - 1:15   Summary Comments/Closing Remarks/Next Steps

2. Questions and Responses

The questions below were identified as part of the registration process and during the Office
Hours discussion. Responses are provided in brief where the NOAA team felt information was
available.

QUESTIONS RAISED FROM REGISTRATION FORM

QUESTION FROM REGISTRATION	RESPONSE
Topics: sea ice thickness and concentration, snow thickness	Thank you for submitting topics of interest. This Office Hours covered all three of these suggested topics.
Accuracy of product suite. Is snow albedo available? What is the source reflectance data and can we access that?	A surface albedo product is available, though it is not a product of the Cryosphere Team. Surface reflectance for the ABI bands is also available. These and other products are available from NOAA's Comprehensive Large Array-data Stewardship System (CLASS).
What is a Cryosphere in simple terms?	The cryosphere collectively describes elements of the earth system containing water in its frozen state and includes: solid precipitation, snow cover, sea ice, lake and river ice, glaciers, ice caps, ice sheets, ice shelves, permafrost, and seasonally frozen ground. The cryosphere is global, ~100 countries.
Identify Contrails to Reduce Global Warming	Thank you for submitting a topic of interest. The scope of this Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness.

Data availability in the cloud, data gaps	GOES-R products and related satellite data are made available through NOAA Open Data Dissemination (NODD) cloud partners. To explore available products, please view our list of datasets on noaa.gov/nodd/datasets.
AI/ML opportunities	Our teams would be happy to point to resources. Please reach out with any particular questions to nodd@noaa.gov if there is interest in a specific area. Resources to explore overall are NOAA Center for Artificial Intelligence (NCAI) and Pangeo Machine Learning Working Group.
Better understand satellite imagery usage	Thank you for submitting a topic of interest. This Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness. Imagery usage was covered as well. Please see questions and responses posed during the discussion below and the video recording available at noaa.gov/nodd.
Monitoring Methane Emissions	Thank you for submitting a topic of interest. The scope of this Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness.
What is the geostationary satellite visible in the eastern sky from northeast PA?	Geostationary satellites will not be visible with the naked eye. However, when located in PA, the GOES-R satellite nearest is GOES-16, located at 75.2 W
Currently on Goes-R satellites and EMWIN/HRIT broadcast systems	Thank you for submitting a topic of interest. This Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness. If you would like additional information on GOES products available over EMWIN/HRIT please visit the NOAASIS site.
NWS - Numerical Prediction model process	Thank you for submitting a topic of interest. This Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness.
Remote Sensing	Thank you for submitting a topic of interest. This Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness.

Multispectral technique	Thank you for submitting a topic of interest. This Office Hours focused on GOES-R Cryosphere products, particularly snow cover, ice concentration and extent, and ice age and thickness.

QUESTIONS / DISCUSSION FROM THE OFFICE HOURS

QUESTION FROM DISCUSSION	RESPONSE
When a satellite is in standby mode, is it collecting data? If not, why not?	The instruments on satellites in standby mode do not collect scientific data, just station-keeping information to monitor health and safety of the instrument.
Is there a product that provides snow thickness for snow on top of Arctic sea ice? We have used the NOAA RDEFT4 data set in the past. Is this part of the GOES-R dataset?	We don't have one – remote sensing of snow thickness/depth on ice is "holy grail" because of its widespread impacts. There are some methods using passive microwave dating over first year ice, and there is new work combining elevations of sea ice with laser and altimeters, but we don't have this product. Snow and ice products are also available for VIIRS on the JPSS satellites (NOAA-20 and -21), and will be generated from the METimage instrument on the future Metop-Second Generation satellites. Some of the products are also available in a climate data record based on AVHRR data starting in 1982.
Is there real-time support available from either NESDIS or NODD when trying to access or use GOES-R data, or is it via email/forums only?	Support for users via NOAA based resources for GOES-R is available through the following options: - GOES-R users email: spsd.userservices@noaa.gov - ESPC Operations via email or phone: ESPCOperations@noaa.gov or 301-817-3880 - NOAA NCEI: https://www.ncei.noaa.gov/contact (select satellite) - NODD team via email: nodd@noaa.gov ESPC operations is a 24/7 support that can be used at any time, NODD is more 8-5 support. ESPC does not cover cloud access issues – reach out to NODD with cloud questions. For real-time data/product, you could try NOAA/NESDIS PDA (Production Distribution and Access). Your request can be made via email to PDA_DHS@noaa.gov

Is the snow/ice product available via EMWIN?	The Cryosphere products are not currently available in the EMWIN data stream.
I have tried to use the GOES-R data using the microsoft API to get it in the form of useful map-tiles layers, but the data cannot be accessed in near real time, what is the delay time to get as webmap?	Right now the latency for GOES-R is on the order of ~12-24 hours or so. We have work in progress that'll get the latency down to ~minutes (NODD gets the data to Azure in about 1-2 minutes, then we can generate the COGs pretty quickly, and the STAC item creation will take ~seconds).
Resources for notebooks shared by Tom Augspurger from Microsoft.	- Snow / Ice: https://github.com/microsoft/AIforEarthDataSets/blob/main/data/goes-ice.ipynb - Hurricane Florence example: https://planetarycomputer.microsoft.com/docs/tutorials/hurricane-florence-animation/
Thanks Tom, that was very helpful! Just to be clear, the cloud data needs to be accessed from an instance in the same region as the blob storage? Also, what does the auth look like on the STAC API?	Users don't need to access the data from the same region (or even Azure, period). The STAC API is public. Some of our datasets do require a token to access the data, which can be gathered anonymously. More at https://planetarycomputer.microsoft.com/docs/concepts/sas/.
Why Azure and not AWS - just curious	GOES-R data is available on all three cloud service providers. Please go to https://www.noaa.gov/information-technology/open-data-dissemination to explore the available data. This particular presentation focused on Azure access.
I'd like to learn more about challenges with the data that GOES or end users are facing and impacts/changes in culture as we move to the cloud. Where do you see holes in the analysis of the available data? Where should more resources and analysis be targeted?	Understanding user application context is key in terms of what is perceived as gaps and opportunities. NESDIS is doing user engagement to understand how users are using the data products. Having feedback from a broad background of users can benefit the products and allow NESDIS to better understand what gaps are there.

	One data analysis problem that the cryosphere team has is lack of truth/in situ data for validation of their products. This can be a problem for ice motion. Modelers aren't ready to use cryosphere products yet (i.e. ice thickness). We have products that could be used, but aren't ready to be assimilated.
What are the main conferences that are good for connecting to the communities here?	The NODD team will be at the following upcoming conferences: American Geophysical Union (AGU) in December 2023, American Meteorological Society (AMS) in January 2024, and AGU Ocean Sciences in February 2024. We often attend these annually and many teams from across NOAA attend these conferences. We invite you to connect with us and our NOAA colleagues at these events.

3. Office Hours Organizing Team

Name	Title
Cindy Elsenheimer	NWS Partner Engagement Lead
Steve Superczynski	GOES-R User Services Coordinator
Jeff Key	Cryosphere Science Team Lead, NESDIS/STAR
Peter Romanov	Research Scientist at CUNY CREST Institute
Yinghui Liu	GOES-R Cryosphere Team Lead
Xuanji Wang	Cryosphere Scientist and Project Manager at CIMSS
Adrienne Simonson	NODD Director
Patrick Keown	NODD Program Manager
Jenny Dissen	NODD Engagement Lead / NCICS / NC State University
Katelyn Szura	NODD Communications Lead
Jonathan Brannock	NODD Lead Cloud Software Engineer /NC State University
Otis Brown	Director, NC Institute for Climate Studies (NCICS) / NC State University
Tom Augspurger	Geospatial Infrastructure Engineer

4. Poll Results

Poll 1		
Question	**Answer**	**Count**
How do you access GOES-R data today?	On-prem via NOAA	4
	Cloud	8
	Both/Either	2
	3rd Party/Web-based Viewer	3
	None/Other	11

Poll 2		
Question	**Answer**	**Count**
My primary goal for attending today is:	Technical use and access of GOES-R data	6
	To learn about cloud access to date (e.g. NODD Program)	11
	Meet and engage with NOAA staff scientists	4
	Learn about Microsoft Azure access and tools	5

5. Resources / References
- NOAA Open Data Dissemination | NODD Email
- NWS Office of Organizational Excellence | Cindy.Elsenheimer@noaa.GOV
- NOAA Geostationary Operational Environmental Satellites—R Series | spsd.userservices@noaa.gov | GOES-R Algorithm & Product Description | GOES-R Quick Guides | GOES-R Variables & Product Names
- GOES-R Access via Microsoft Azure | Microsoft Planetary Computer

Thank you to our participants for engaging in this discussion!