**NOAA National Environmental Satellite, Data, and Information Service (NESDIS) + NOAA Open Data Dissemination (NODD) + Google Office Hours**

**April 18, 2024 | 12-1:15 PM EDT**

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TO: NESDIS NODD Google Office Hours Participants

DATE: 18 APRIL 2024 | 12-1:15 PM EDT

FROM: Lihang Zhou, Satya Kalluri (NOAA National Environmental Satellite, Data, and Information Service), Adrienne Simonson, Jenny Dissen & Kate Szura (NOAA Open Data Dissemination Engagement and Communication), Mya Sears (North Carolina Institute for Climate Studies)

SUBJECT: Responses to Questions from LEO JPSS Office Hours

Dear Colleagues,

Thank you again for your tremendous contribution during the NESDIS NODD Google 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,

Lihang Zhou (NOAA National Environmental Satellite, Data, and Information Service)
Adrienne Simonson, Jenny Dissen, Kate Szura (NOAA Open Data Dissemination)
Mya Sears (North Carolina Institute for Climate Studies)

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# Contents for the Summary Notes

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## 1. General Agenda of the Webinar

**OUTLINE FOR THE DISCUSSION**

12:00 - 12:09 Brief Introductions by NESDIS LEO, NODD, and Google
12:09- 12:10 NODD Overview
12:10 - 12:25 NOAA LEO Joint Polar Satellite System (JPSS) Presentation (Data Access)
12:25 - 12:45 LEO JPSS Access via Google (Training and Demo) and Use Cases
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 & TOPICS OF INTEREST RAISED FROM REGISTRATION FORM*

| QUESTION FROM REGISTRATION | RESPONSE |
|---|---|
| Where/how can I find this dataset on Google? | NOAA’s LEO JPSS data is hosted on Google via NOAA Open Data Dissemination (NODD) and can be accessed through Google Marketplace. The Google Marketplace JPSS landing page contains details about the data and links to the buckets containing data from each of the active JPSS satellites. |
| Tips for accessing near-real-time datasets of interest to the disaster response community | There are many near real-time datasets which are offered by NOAA and via NODD cloud partners. Users can access and use a variety of tools and platforms by NOAA, NASA, and the USGS.<br><br>Depending on the dataset or climate impact of interest, users can subscribe to relevant alert systems and data feeds as those offered by NOAA's National Weather Service alerts or NASA's Earthdata Near Real-Time (NRT) data.<br><br>LEO JPSS provides data and information into NWS models such as HRRR.<br><br>Near real-time satellite imagery from platforms like NOAA's GOES and NASA's MODIS provides crucial information on weather patterns, storm development, and wildfire monitoring.<br><br>Other examples include:<br><br>- heat.gov |

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| | - USGS's Hazards Data Distribution System (HDDS) enables users to visualize and analyze real-time data on disasters like wildfires, earthquakes, and floods.<br>- NOAA NCEI has API services provided by several datasets, making it easier for integration into custom applications and decision support systems for disaster response operations. |
| Interagency (DOC and others) partnerships and data sharing successes and challenges | Given the broad nature of this question, and to be able to answer within the context of JPSS Office Hours, we invite further engagement and ask the participant to please email the NODD team with a specific question at **nodd@noaa.gov.** |
| Rainfall accumulation data | For precipitation data derived from SNPP, NOAA-20, NOAA-21, one can find information for rainfall on the MIRS website and on the SnowfallRate website for snowfall. CMORPH2 graphics can be accessed from this NOAA National Centers for Environmental Prediction webpage.<br><br>The data can be accessed from NOAA CLASS or from NODD via Google Cloud here. |
| Training opportunities? | NOAA has several resources and references for training:<br><br>The LEO JPSS website offers several guides and documents to support users. This NODD Office Hours also walks through a Gitlab repository (**JPSS_notebook_geolocate.ipynb**) which provides an introduction to accessing JPSS via Google Cloud. It is set up so that users can expand on the outlined processes.<br><br>There will be additional Office Hours focused on LEO JPSS in collaboration with other cloud partners. Please visit the NODD website for more information. |
| Precipitation Estimates | For precipitation data derived from SNPP, NOAA-20, NOAA-21, one can find information for rainfall on the MIRS website and on the SnowfallRate website for snowfall. CMORPH2 graphics can be accessed from this NOAA National Centers for Environmental Prediction webpage.<br><br>The data can be accessed from NOAA CLASS or from NODD via Google Cloud here. |

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| I am interested in accessing shortwave and longwave solar radiation data | For shortwave radiation data, NOAA NCEI makes available the National Solar Radiation Database (NSRDB), which is also accessible via the https://nsrdb.nrel.gov/. NSRDB is a comprehensive database of solar radiation that provides hourly solar radiation data, including direct normal, global horizontal, and diffuse horizontal irradiance.<br><br>Here is the NCEI link to the SURRAD 1 hour database.<br><br>NOAA provides access to longwave solar radiation data climate data record through the following sources via the OLR Monthly CDR. This data is available via Google (Cloud) and Amazon (Cloud). |
| User' thoughts/perspective on ID'ing swaths to easily locate the satellite lat/long via automated method | This is a great question! As of right now, there is no one simple way to automate this task. The Jupyter Notebook presented in the webinar (the **JPSS_notebook_geolocate.ipynb** notebook in this GitLab repo) uses each file's metadata to determine whether a swath passed over an input lat/lon point, but requires technical methods and a lot of compute power.<br><br>However, there are many discussions across agencies and Cloud Service Providers to find ways to address this issue. We are well aware of the challenges this question poses and hope to come to a solution soon! |
| Scope of data in NODD | There are hundreds of datasets available on the cloud through NODD and the platforms of the Cloud Service Providers (CSPs). NODD datasets are from across NOAA and include near real-time datasets and period of record for select datasets. Data types include satellite, radar, surface observations, model, and forecast data, covering environmental focus areas such as weather, atmospheric, climate, oceanographic, fisheries, and emergency response imagery. A list of datasets available through NODD can be found on our NODD Program Datasets page at noaa.gov/nodd/datasets. |

## *QUESTIONS / DISCUSSION FROM THE OFFICE HOURS*

| QUESTION FROM DISCUSSION | RESPONSE |
|---|---|
| From Lori Brown - NOAA Affiliate from JPSS: I would like to be able to share, on our own JPSS data access | Lihang: Good suggestion Lori, we should have more follow up discussions on it.<br><br>NOAA team will schedule an internal meeting to address the |

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| resource webpage, an accurate table that says which satellites, which timespans, which data products are available from each of the different cloud resources. Is there a way to offer this? Not acceptable to just say to users "go look and see if what you are looking for is there for the dates you want". Is there a way to dynamically update this info as you add new stuff and backprocess things from earlier? | user-friendly nature of data access. Would like to make it easier for the users to find and access the data that's consistent across different NOAA data products. |
| Is the JPSS data in near real-time? | The JPSS data is available in near real-time on the Cloud with minutes or less of latency. |
| Great presentation! Apologies if this was already covered but in the near term (next 6 months) what other data types will be made available on the cloud? | There are plans for a few other datasets as we speak. NODD works with NOAA LOs and cloud service providers to add new datasets. If users are interested in a particular dataset, please email nodd@noaa.gov.<br><br>Ocean color, aerosols, Sea Surface Temperature (SST), smoke, etc. are some upcoming products. Please visit NOAA STAR JPSS to view the product schedule. |
| Great presentations, very helpful. Any guidance on how to 1. identify the best mission with specific data types, and 2. locate and download the specific types of data? For example I am interested in shortwave and longwave downward radiation in the pacific equatorial region. | The GEO mission has a specific set of sensors. The LEO mission (which will be part of NEON) has a variety of different changes.<br><br>For shortwave radiation data, NOAA NCEI makes available the National Solar Radiation Database (NSRDB), which is also accessible via the https://nsrdb.nrel.gov/. NSRDB is a comprehensive database of solar radiation that provides hourly solar radiation data, including direct normal, global horizontal, and diffuse horizontal irradiance.<br><br>Here is the NCEI link to the SURRAD 1 hour database.<br><br>NOAA provides access to longwave solar radiation data climate data record through the following sources via the OLR Monthly CDR. This data is available via Google (Cloud) and Amazon (Cloud).<br><br>Note: not all of these products will be made available in the cloud.<br><br>CrIS sensor available on the NODD for radiation. |
| Has storage in "cloud-friendly" formats been considered for remote access to | From the NOAA side, this conversation occurs frequently and we get a lot of this kind of feedback. Don't yet know what/how |

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| skip downloading or temporarily storing in memory? | NOAA will approach this due to differences in NOAA offices and data formats, but it's in conversation and feedback will be taken back to the NOAA governance team.<br><br>From Google's side, looking into this right now – building processing scripts to get data into zarr so it can be streamed into xarray. Need to figure out workload and how to process the large workload – hoping to work with NOAA across clouds to make this a standardized approach for everyone. The hope is to get through it this year, but no timeline has been set.<br><br>This isn't specific to JPSS – they'd like to do this for a lot of NOAA data. |
| Will the near real-time data be available through Google Earth Engine? | When this data comes in, its format is not ready to consume in Earth Engine and needs to be converted to different forms. Google processes the data in near-real time, then makes it available to Earth Engine, but it does not enter in near-real time.<br><br>You can access Google Earth Engine through colab using Python workflows. If you don't want to process in colab and want to access what's in Earth Engine, you can use the same language to get visualization done. |
| Do you have the same latency as NOAA CLASS? | JPSS data via NODD is provided near real-time and access to the data is near real-time as well. CLASS contains archived data and thus has some process-based latencies where the data is not delivered near real-time. |
| Has there been any discussion of producing any of the data as map tiles?<br><br>Tile naming conventions? Naming conventions differ across access points. | Some of the VIIRS data is available on Earth Engine already (from SNPP) as map tiles. This is something that Google is looking at for all satellites. At Google, looking into how to provide the most value for their customers and where to allocate resources. NOAA team will work with the Google team to discuss standardization and best practices. |
| If there was a question that was not answered during the Office Hours that you would like additional information on, please reach out:<br><br>• For questions or feedback on access and use via cloud, please reach the NODD team at NODD@NOAA.GOV<br>• For questions or feedback on accessing JPSS via Google Cloud, please reach the Google team at cloud-public-dataset-conferences@google.com | |

## 3. Office Hours Organizing Team

| Name | Title |
|---|---|
| Lihang Zhou | NESDIS LEO Satellite Product Manager |
| Satya Kalluri | Chief Scientist for NOAA NESDIS LEO Program |
| Adrienne Simonson | NODD Director |
| Patrick Keown | NODD Program Manager |
| Jenny Dissen | NODD Engagement Lead / NCICS / NC State University |
| Katelyn Szura | NODD Communications Lead |
| Otis Brown | Director, NC Institute for Climate Studies (NCICS) / NC State University |
| Mya Sears | NCICS Engagement and Data Analyst |
| Tyler Russell | Google Research, Technical Program Manager |
| Antonio Lobato | Google Cloud, Engineering Manager |

## 4. Poll Results

| Poll 1 | | |
|---|---|---|
| **Question** | **Answer** | **Count** |
| How do you access JPSS data today? | On-prem via NOAA | 5 |
| | Cloud | 5 |
| | Both/Either | 2 |
| | 3rd Party/Web-based Viewer | 2 |
| | None/Other | 2 |

| Poll 2 | | |
|---|---|---|
| **Question** | **Answer** | **Count** |
| My primary goal for attending today is: | Technical use and access of JPSS data | 7 |
| | To learn about cloud access to date (e.g. NODD Program) | 9 |
| | Meet and engage with NOAA staff scientists | 1 |
| | Learn about Google Cloud access and tools | 1 |

5. Resources / References
   - NOAA Open Data Dissemination | NODD Email: NODD@NOAA.GOV
   - Gitlab Repository - Joint Polar Satellite System (JPSS) Demo
   - Google Cloud | Google Email: cloud-public-dataset-conferences@google.com
   - JPSS Product Quick Guides
   - Polar Orbit Tracks

*Thank you to our participants for engaging in this discussion!*