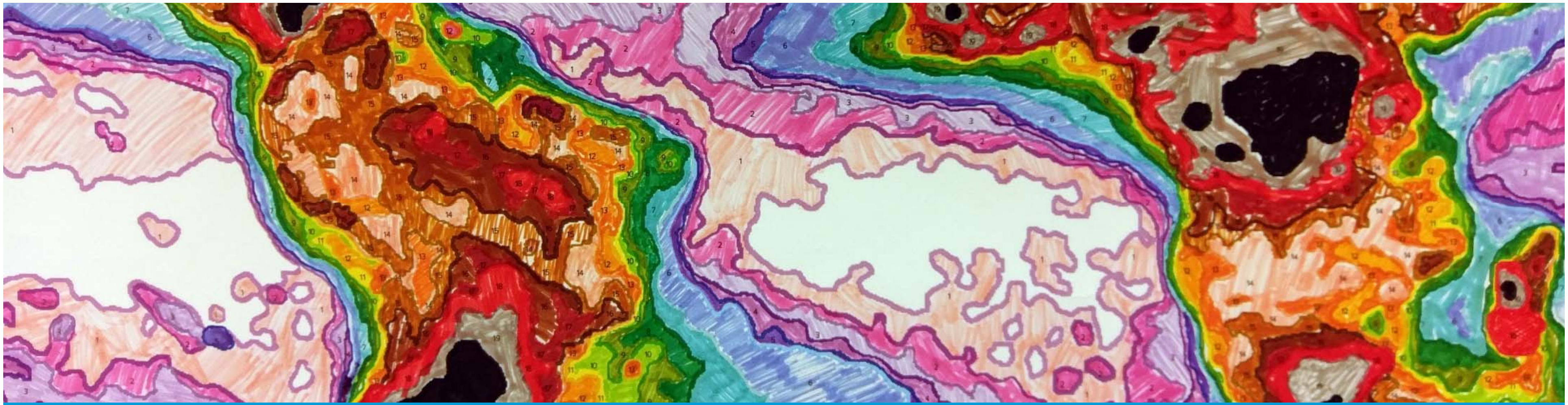


GHRC Outreach

Leigh Sinclair

User Services

Introduction

- GHRC focuses on a series of science and outreach efforts to accomplish the following:
  - Make GHRC data and critical resources more discoverable for users
  - Enable unfamiliar users to become more informed on GHRC data, instruments, and science focus areas
  - Increase the usability of GHRC data to address user needs
- Ways we work towards these efforts:
  - Micro Articles
  - Data Recipes
  - Mastheads
  - Webinars
  - Website changes or improvements
  - Attend conferences

FY2019 Micro Articles

GHRC

Instrument: Cloud Radar System (CRS)

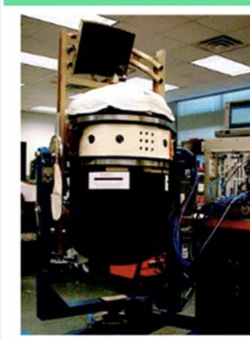
INSTRUMENT

Active Remote Sensing → Polarimetric Radar → Cloud Radar System (CRS)

INSTRUMENT PLATFORM

Airborne

NASA ER-2 High-Altitude Research Aircraft



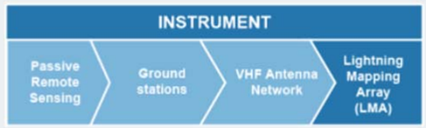
Description

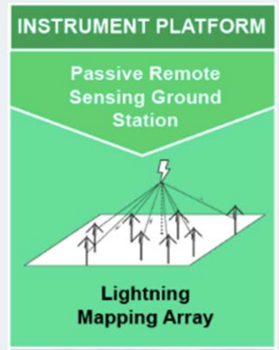
The Cloud Radar System (CRS) is a 94 GHz, W-band polarimetric Doppler radar designed to operate aboard the NASA ER-2 high-altitude research aircraft or as a ground-based radar. Its very high frequency and short 3 mm wavelength make it very sensitive; perfect for cirrus cloud studies in particular as it has the ability to collect more detailed cloud and precipitation observations than traditional weather radars. Since CRS was specifically tailored to operate from the NASA ER-2 aircraft, the instrument is compact, does not require pilot operation, and can capture measurements useful for the validation of satellite estimates. The CRS is housed inside the tailcone of either ER-2 superpod, located in the mid-sections of the aircraft wings. Because the ER-2 flies at a 20 km altitude, within the lower stratosphere, CRS in located in close proximity with its targets, decreasing measurement effects that would occur at a larger distance. It can detect clouds and precipitation from flight level down to the surface. When CRS is operating airborne, its downward pointing beam takes profiles of radar reflectivity and Doppler velocity. Its polarimetric capabilities enable it to measure the horizontal and vertical dimensions of cloud and precipitation particles, revealing cloud microphysical properties and processes. The CRS can also effectively detect the intense signal returned by the ocean's surface, making the ocean an ideal target for calibrating the instrument. The specialized capabilities of CRS make it very useful for observing cloud microphysics and dynamics. Observations by CRS and other instruments mounted on the ER-2 aircraft also provide important insight into cloud radiative properties impacting Earth's global energy budget.

FY2019 Micro Articles

GHRC

Instrument: Lightning Mapping Array (LMA)





Description

A Lightning Mapping Array (LMA) is a network of antennas, GPS receivers, and processing systems that detect total lightning. This includes both lightning that occurs within the clouds (CC) and lightning that reaches the ground (CG); although typically not the actual point at which the flash comes to ground. The system is able to determine the location and time of lightning discharge based on the time it takes the very high frequency (VHF) signal radiated by the discharge to arrive at the various antenna stations.* The LMA VHF antennas detect the signal within a locally unused VHF telecommunications band. These antenna stations are typically placed 15 to 20 km apart over a region 60 to 80 km in diameter. Around 7 to 20 LMA antennas surround a central station that calculates the time and location of the lightning source. LMA antennas are typically placed at remote locations with minimal signal interference where they can effectively detect the lightning VHF signals.The antennas are equipped with a GPS receiver for time synchronization and wirelessly connected to the central station, permitting real-time data processing and display. Each antenna is adjusted to only capture events with a signal magnitude above a certain threshold, indicating lightning activity. When a signal is detected, the antenna station transmits the time at which it received the signal back to the central station. The LMA processing system then calculates the time, latitude, longitude, and altitude of the lightning source using the known distances between each antenna and the difference in the signal time-of-arrival at each of the VHF antennas. These antennas can detect hundreds of sources per lightning flash over a domain extending around 200 km from the central point of the antenna network. The system detects

FY2019 Micro Articles

Instrument: Cloud Physics LiDAR (CPL)

INSTRUMENT

Active Remote Sensing → Light Detection And Ranging (LiDAR) → Cloud Physics LiDAR (CPL)

INSTRUMENT PLATFORM

Airborne

NASA ER-2 High-Altitude Research Aircraft

Description

The Cloud Physics LiDAR (CPL) is a multi-wavelength backscatter Light Detection And Ranging (LiDAR) instrument used for aerosol and cirrus cloud studies. The CPL uses laser technology to detect, locate, and identify aerosol and cloud particles by measuring the backscatter coefficient for a volume of targets, retrieving information about their location and composition. Similar to radar and sonar technology, LiDAR transmits pulses of electromagnetic radiation, or light in this case, towards a target. When the radiation contacts the target, some of the light energy is absorbed and scattered while some is reflected back, or backscattered, towards the instrument's receiver. The time that it takes this reflected energy to return to the receiver indicates the target's distance from the instrument (i.e., its location), and the characteristics of the returned signal give information regarding the target's properties. The CPL uses three operating wavelengths: 1,064 nm, 532 nm, and 355 nm. These relatively short wavelengths give CPL the ability to detect the minute particles that make up aerosols and cirrus clouds. Its laser pulse has a high repetition frequency and is low energy, allowing CPL to use photon-counting detection; a technique for providing a more accurate target location by counting the number of photons returned in the backscattered signal. CPL's high-resolution measurements of aerosol and cirrus cloud properties can be applied to various operational and research areas including air quality monitoring and climate studies.

FY2019 Micro Articles

GOES-R Post Launch Test (PLT) Field Campaign

The GOES-R PLT field campaign was a collaborative mission to validate the Advanced Baseline Imager (ABI) and Geostationary Lightning Mapper (GLM) instruments aboard the GOES-R, now GOES-16, satellite. GOES-R is part of NOAA's geostationary satellite fleet, Geostationary Operational Environmental Satellites - R series, and provides continual observations of primarily North and South America and the Atlantic. The GOES-R PLT campaign lasted roughly 9 weeks from March 21, 2017 to May 17, 2017, with 105.1 mission flight hours. The goal of the campaign was to provide a collection of coincident airborne, satellite, ground based, and near surface measurements of surface weather phenomena to test, validate, and improve the accuracy of GOES-R ABI and GLM measurements. The campaign was comprised of two phases: the first centered on the U.S. west coast, providing tests primarily for the ABI instrument, and the second focused on the central and eastern U.S. with tests primarily for the GLM instrument. Airborne measurements were taken using NASA's ER-2 aircraft, equipped with spectrometer, radar, lidar, radiometer, and other atmospheric observation instruments to assist with ABI and GLM validation. The target phenomena for validation observations included land and ocean surfaces, active wildfires, and thunderstorms. This campaign provided a blueprint for the operation of future GOES validation projects.

SPATIAL COVERAGE

[N: 43.573, W: -124.625, E: -72.202, S: 26.449] degrees

TIME RANGE

March 21, 2017 - May 17, 2017

PHENOMENA STUDIED

- Weather Phenomena
- Wildfires
- Land Environment
- Ocean Environment

Scientific Objectives

The primary objectives of GOES-R PLT field campaign included:

- Provide high altitude validation of spectral radiance measurements for all ABI spectral bands
- Provide surface and atmospheric geophysical measurements for validation products

FY2019 Micro Articles

Atmospheric Rivers

Atmospheric Phenomenon

WHAT IS AN ATMOSPHERIC RIVER?

The term atmospheric river is used to indicate narrow, elongated corridors of concentrated moisture transport associated with extratropical cyclones. Atmospheric rivers are the largest transport mechanisms of freshwater on Earth. This moisture transport occurs under particular combinations of wind, temperature, and pressure conditions. Atmospheric rivers are typically located within the low-level jet, an area of strong winds in the lower levels of the atmosphere, ahead of the cold front in an extratropical cyclone. Based on satellite observations, an atmospheric river is greater than ~2,000 km (1,245 miles) long, less than 1,000 km (620 miles) wide, and averages 3 km (1.8 miles) in depth. A study by Ralph et al. (2013) found that typical atmospheric river conditions last around 20 hours over an area on the coastline. Strong landfalling atmospheric rivers interact with topography and can deposit significant amounts of precipitation in relatively short periods of time leading to flooding and mudslides. Atmospheric rivers also can have beneficial impacts by contributing to increases in snowpack, such as in the western United States. An example of an atmospheric river is provided in the image to the right from 14 February 2019. This atmospheric river extends from Hawaii to California as highlighted by the dashed oval. The observations are from one day of observations from the Special Sensor Microwave Imager / Sounder (SSMIS) on the Defense Meteorological Satellite Program (DMSP) satellites DMSP-16 and -17 as well as from the Advanced Microwave Scanning Radiometer 2 (AMSR2) on the Global Change Observation Mission - Water (GCOM-W1).

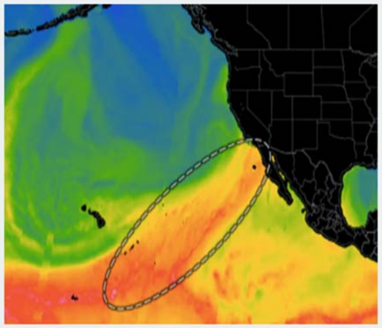


Image Source: NASA Worldview

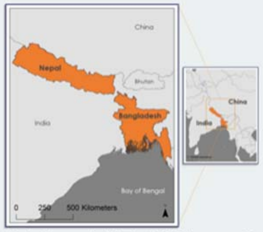
How do atmospheric rivers occur?

Atmospheric rivers are a part of the larger system of extratropical cyclones that transport heat and moisture from the tropics toward the poles. There are many factors that contribute to the formation of atmospheric rivers. Conditions usually include high humidity levels, strong low level winds, and a moist neutral atmospheric profile, which allows for extensive precipitation production when air is lifted

FY2019 Micro Articles

NASA DEVELOP's Hindu-Kush Himalayan Disasters

Description



Intense thunderstorms and an increase in population throughout the Hindu-Kush Himalayan (HKH) region have resulted in an upsurge of lightning-related deaths. Partnering with the NASA Global Hydrology Resource Center Distributed Active Archive Center (GHRC DAAC), NASA SERVIR Science Coordination Office, Bangladesh Meteorological Department (BMD), Nepal Department of Hydrology and Meteorology (DHM), and the International Centre for Integrated Mountain Development, this study investigated the lightning risks in the HKH region and the correlation between precipitation and lightning. Lightning flash point data collected by the Lightning Imaging Sensor (LIS) onboard both the Tropical Rainfall Measuring Mission (TRMM) satellite and the International Space Station (ISS) from January 2001 to December 2017 were plotted to determine the locations where the highest concentrations of lightning strikes occurred. Data from the United Nations Office for Disaster Reduction (UNISDR) Global Assessment Report for 2015 (GAR15), Oak Ridge National Laboratory (ORNL) Landscan 2016 global population dataset, and NASA's Shuttle Radar Topography Mission (SRTM) were used to assess the factors that contribute to a population's vulnerability to lightning activity. Additionally, the team used the TRMM Precipitation Radar (PR) data to identify areas with the highest precipitation rates over Bangladesh and Nepal. A Lightning Risk Map (LRM), created to highlight lightning-prone areas and regions with vulnerable populations, showed that communities in western Nepal and northern Bangladesh are at an increased risk for lightning related injury. A Precipitation and Lightning Correlation was calculated to verify whether areas experiencing heavier precipitation also experienced higher lightning totals. These end products will assist the BMD and the DHM to increase hazard awareness and issue earlier warning times to reduce lightning casualties.

Science Area

EARTH SCIENCE > ATMOSPHERE > ATMOSPHERIC ELECTRICITY > LIGHTNING

EARTH SCIENCE > ATMOSPHERE > PRECIPITATION

Science Objectives

- Aid project partners in emergency management
- Identify areas vulnerable to frequent lightning activity

FY2019 Micro Articles

GHRC

Integrated Precipitation and Hydrology Experiment (IPHEx) Field Campaign

The Integrate Precipitation and Hydrology Experiment (IPHEx) was a NASA field campaign that took place in the summer of 2014 to support the Global Precipitation Measurement (GPM) Ground Validation (GV) project. The study area for the field campaign was in the Southern Appalachians of North Carolina in the Southeastern United States. The goal of the field campaign was to gain further understanding of how mountainous areas influence and interact with summertime precipitation before, during, and after rainfall occurs. This includes how rain runoff behaves in mountainous regions. To accomplish this goal, radars, weather stations, and other precipitation measuring instruments were set up throughout the mountainous region and out into the Piedmont and Coastal Plain regions. Simultaneous data were collected using instruments on scientific research aircraft and satellites. This was the first GPM GV field campaign after the launch of the GPM Core Satellite and therefore, results from IPHEx played an important role in improving algorithms used to retrieve rainfall data from space.

Scientific Objectives

The primary objectives of IPHEx field campaign included:

- The development, evaluation, and improvement of remote-sensing precipitation algorithms in support of the Global Precipitation Measurement Mission (GPM)
- The evaluation of Quantitative Precipitation Estimation (QPE) products for hydrologic forecasting and water resource applications in the Upper Tennessee, Catawba-Santee, Yadkin-Pee Dee and Savannah river basins
- To characterize warm season orographic precipitation regimes and the relationship between precipitation regimes and hydrologic processes in regions of complex terrain

SPATIAL COVERAGE
[N: 38.0, W:-86.0, E: -75.0, S:32.0] degrees

TIME RANGE
May 5, 2014 - July 15, 2014

PHENOMENA STUDIED

Precipitation

Micro Article Metrics

Most viewed Micro Article

1,169

Lightning

Atmospheric Phenomenon

WHAT IS LIGHTNING?

Lightning is the electrical discharge between positively and negatively charged regions within clouds. The electrical discharge serves as an equalization process between the charged regions, and can travel from cloud-to-cloud, cloud-to-ground, or cloud-to-air. Visually, lightning is comprised of bright flashes of light called strokes. The loud sound of thunder that accompanies lightning is a sonic shock wave produced by the rapid expansion of the air surrounding the lightning channel during the stroke, similar to a sonic boom. Lightning and thunder occur at the same time, however, because light travels faster than the speed of sound, lightning may be observed sooner than thunder is heard.

Image Source: Wikimedia Commons

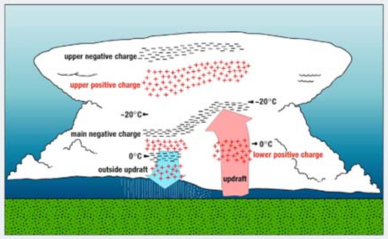


Image Source: NOAA NSSL

Why does lightning occur?

Growing ice particles within a cloud interact with each other through collision, causing the particles to fracture and break apart. It is currently believed that smaller ice particles tend to acquire a positive charge, while the larger particles acquire a more negative charge. Under the influences of thunderstorm updrafts and gravity, these particles separate until the upper portion of the cloud acquires a net positive charge, and the lower portion of the cloud becomes negatively charged. This separation of charge produces electrical potential both within the cloud and between the cloud and ground. Eventually, the electrical resistance in the air between the charged regions breaks down and a flash begins. The resulting lightning strokes are an electrical discharge between the positive and negative regions of a thunderstorm.

456

Lake Effect Snow

Regional Phenomenon

WHAT IS LAKE EFFECT SNOW?

Lake effect snow results from the interaction between cold air passing over warmer lake water generating snow that is deposited in localized regions downwind from the lake. Lake effect snow usually occurs during the late fall and winter months and is capable of producing as much as 2-3 inches of snow an hour with event totals ranging from 60-100 inches. Extreme events are often highly localized, such as the Buffalo, NY event that occurred in November 2014 (NWS, Niziol et al. 1995). This same phenomenon also occurs over other water bodies such as bays and seas where it is called bay effect and sea effect snow.

Data Source: NASA LANCE Terra/MODIS true color image of cloud sheets and snow on the Great Lakes acquired on February 11, 2016

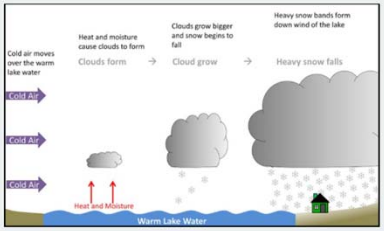


Image Source: NOAA National Weather Service

Why does lake effect snow occur?

When cold, dry air moves across large areas of warmer water, the cold air near the surface warms and begins to take on moisture from the lake. Due to differences between the colder air aloft and warmer air near the surface, instability causes water molecules to rise upwards, condense and eventually form clouds. The water molecules in these clouds freeze and are eventually deposited downwind, on the leeward side of these lakes as snow and other types of winter precipitation. Lake effect snow occurrence and location is mainly dependent on wind (speed and direction) and topography. For instance, wind direction and speed can affect how narrow or wide a snow band is, as well as its length; whereas topography can influence snowfall rate.

Micro Article Metrics

Longest view time

GOES-R Post Launch Test (PLT) Field Campaign

The GOES-R PLT field campaign was a collaborative mission to validate the Advanced Baseline Imager (ABI) and Geostationary Lightning Mapper (GLM) instruments aboard the GOES-R, now GOES-16, satellite. GOES-R is part of NOAA's geostationary satellite fleet, Geostationary Operational Environmental Satellites - R series, and provides continual observations of primarily North and South America and the Atlantic. The GOES-R PLT campaign lasted roughly 9 weeks from March 21, 2017 to May 17, 2017, with 105.1 mission flight hours. The goal of the campaign was to provide a collection of coincident airborne, satellite, ground based, and near surface measurements of surface weather phenomena to test, validate, and improve the accuracy of GOES-R ABI and GLM measurements. The campaign was comprised of two phases: the first centered on the U.S. west coast, providing tests primarily for the ABI instrument, and the second focused on the central and eastern U.S. with tests primarily for the GLM instrument. Airborne measurements were taken using NASA's ER-2 aircraft, equipped with spectrometer, radar, lidar, radiometer, and other atmospheric observation instruments to assist with ABI and GLM validation. The target phenomena for validation observations included land and ocean surfaces, active wildfires, and thunderstorms. This campaign provided a blueprint for the operation of future GOES validation projects.

GOES-R Post Launch Airborne Science Cal/Val Field Campaign (March 21 to May 17, 2017)

SPATIAL COVERAGE
[N: 43.573, W: -124.625, E: -72.202, S: 26.449] degrees

TIME RANGE
March 21, 2017 - May 17, 2017

PHENOMENA STUDIED

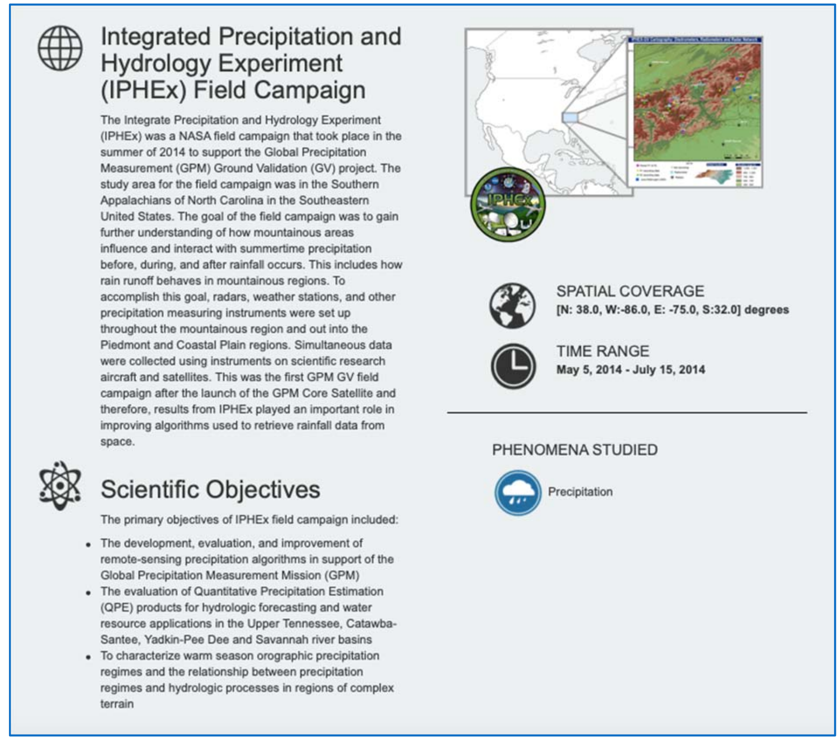
- Weather Phenomena
- Wildfires
- Land Environment
- Ocean Environment

Scientific Objectives

The primary objectives of GOES-R PLT field campaign included:

- Provide high altitude validation of spectral radiance measurements for all ABI spectral bands
- Provide surface and atmospheric geophysical measurements for validation products

3:08



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May 5, 2014 - July 15, 2014

PHENOMENA STUDIED

- Precipitation

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- To characterize warm season orographic precipitation regimes and the relationship between precipitation regimes and hydrologic processes in regions of complex terrain

2:42

Data Recipes

ISS LIS Lightning Flash Location Quickview using Python 3.0 and GIS

Description | How to Use | Dataset Information | Key Parameters

Description

The Lightning Imaging Sensor (LIS) onboard the International Space Station (ISS) retrieves optical lightning measurements over the majority of the Earth. This data recipe guides the user through a Python script that enables visualization of ISS LIS lightning flash locations. It is designed to compile information from a series of user-selected ISS LIS swath data files and generate a gridded heat map plot of lightning flash locations. In addition, a CSV file is generated containing the lightning flash coordinates in a format that can be input into other software. For this data recipe, the CSV file will be used to plot lightning flash locations in ESRI's ArcMap GIS software.

Hemispheric view of all ISS LIS lightning flash data captured from January 4, 2018

Data Recipe Type

Visualization

Supporting Software Information

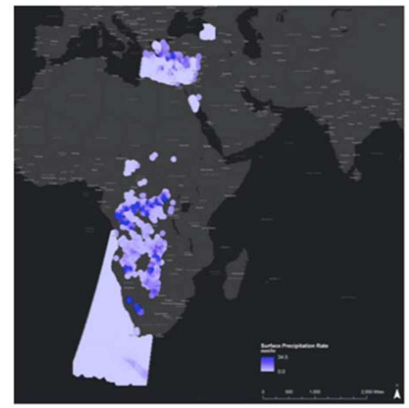
TYPE	ACCESS
Python 3 Script	ArcMap 10.2+

LANCE NRT AMSR2 L2B Global Swath Rain Ocean Data Quickview using Python and GIS

Description | How to Use | Dataset Information | Key Parameters

Description

The LANCE Near Real-Time (NRT) AMSR2 Level 2B Global Swath Rain Ocean Data include surface precipitation, wind speed over ocean, water vapor over ocean, and cloud liquid water over ocean retrieved from measurements of the Advanced Microwave Scanning Radiometer 2 (AMSR2) instrument on the Global Change Observation Mission - Water 1 (GCOM-W1). These rain and ocean products were created using the Goddard Space Flight Center (GSFC) PROFiling algorithm (GPROF) 2010 version 2 by the Land Atmosphere Near real-time Capability for EOS (LANCE) at the AMSR Science Investigator-led Processing System (AMSR SIPS). This Python-based data recipe steps the user through code that compiles information from a series of NRT AMSR2 Swath data files and generates a CSV file containing surface precipitation rates with locations to enable use with other software. For this data recipe, the CSV file will be used to plot surface precipitation rates in ESRI ArcMap.



Surface precipirate rate image created using the LANCE NRT AMSR2 L2B Global Swath Rain Ocean Data in ArcMap 10.2

Data Recipe Type

Data Format Conversion | Data Visualization

Supporting Software Information

TYPE	ACCESS
Python Script	Open Source
ArcMap 10.2+	Restricted, license required

Data Recipe Metrics

Most viewed Micro Article

ISS LIS Lightning Flash Location Quickview using Python 2.7 and GIS

Description | How to Use | Dataset Information | Key Parameters

Description

The Lightning Imaging Sensor (LIS) onboard the International Space Station (ISS) retrieves optical lightning measurements over most of the Earth. This Python-based data recipe steps the user through code that compiles information from a series of ISS LIS datafiles in a directory and generates a gridded heat map plot of lightning flash locations and a CSV file containing the location coordinates. This data recipe enables the visualization of lightning flash locations across several user-selected ISS LIS swath data files, accumulates flashes within a Python plot, and creates a CSV file with locations to enable use with other software. For this data recipe, the CSV file will be used to plot lightning flash locations in ESRI ArcMap.

ISS LIS data capturing lightning from the Jan. 4, 2018 bombogenesis event

Data Recipe Type

Visualization

Supporting Software Information

TYPE	ACCESS
Python 2.7 Script	ArcMap 10.2+

433

328

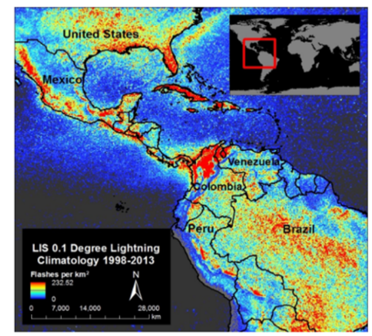
Using ArcGIS to Convert LIS Very High Resolution Gridded Lightning Climatology NetCDF Data to GeoTIFF Format

Description | How to Use | Dataset Information | Key Parameters

Description

The Lightning Imaging Sensor (LIS) aboard the Tropical Rainfall Measuring Mission (TRMM) satellite collected over 17 years of optical lightning observations that were used to generate a Very High Resolution Lightning Climatology dataset available in gridded netCDF format. ArcGIS software does not handle all netCDF data equally due to how the geographic and other information are formatted within datafiles, thus it is best suited for gridded netCDF files. This data recipe provides a step-by-step tutorial on how to bring these gridded netCDF data into ArcMap and create a GeoTIFF file enabling GIS analysis and map making. This data recipe requires a pre-installed version of ArcMap and a downloaded file from the LIS 0.1 Degree Very High Resolution Lightning Climatology Collection available at GHRC.

Image created using LIS 0.1 Degree Very High Resolution Gridded Lightning Full Climatology (VHRFC) dataset in ArcMap 10.2



Data Recipe Type

Data Type Conversion

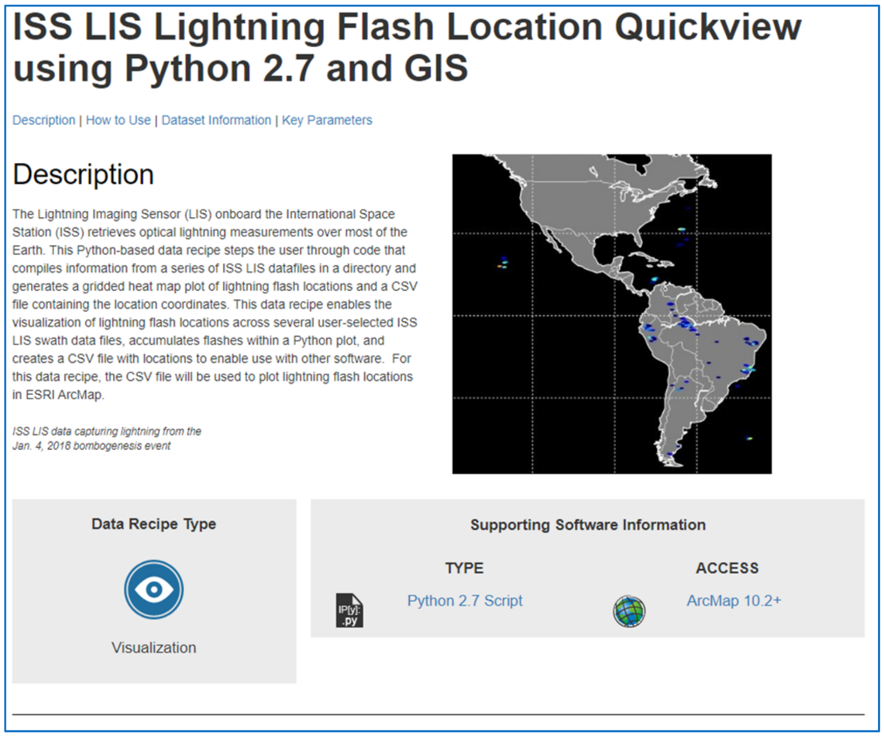
Supporting Software Information

TYPE	ACCESS
ArcMap 10.2+	Restricted, License Required

Data Recipe Metrics

GHRC

Longest view time



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ISS LIS data capturing lightning from the Jan. 4, 2018 bombogenesis event

Data Recipe Type

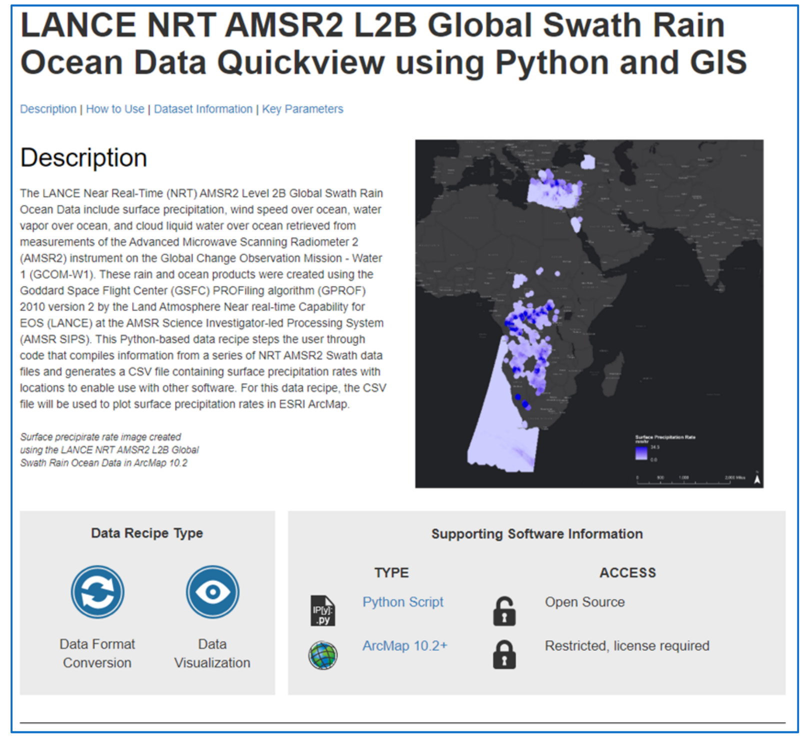
Visualization

Supporting Software Information

TYPE	ACCESS
Python 2.7 Script	ArcMap 10.2+

4:31

3:43



LANCE NRT AMSR2 L2B Global Swath Rain Ocean Data Quickview using Python and GIS

Description | How to Use | Dataset Information | Key Parameters

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Surface precipirate rate image created using the LANCE NRT AMSR2 L2B Global Swath Rain Ocean Data in ArcMap 10.2

Data Recipe Type

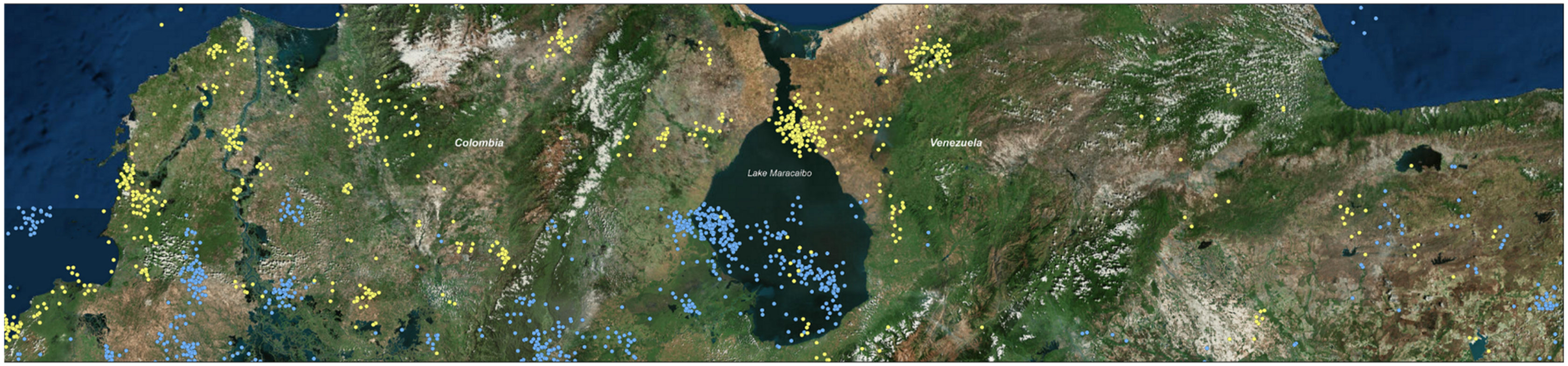
Data Format Conversion

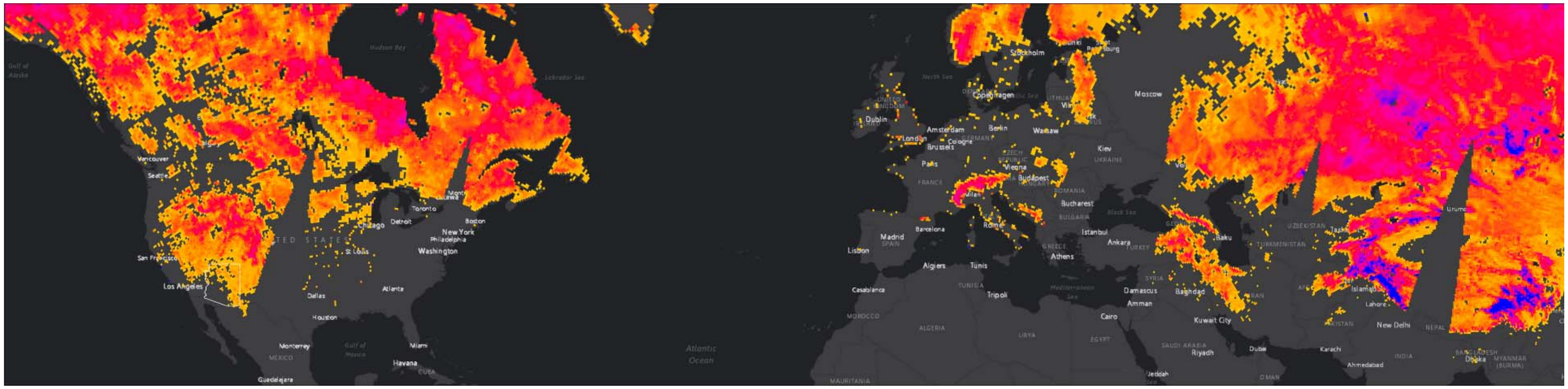
Data Visualization

Supporting Software Information

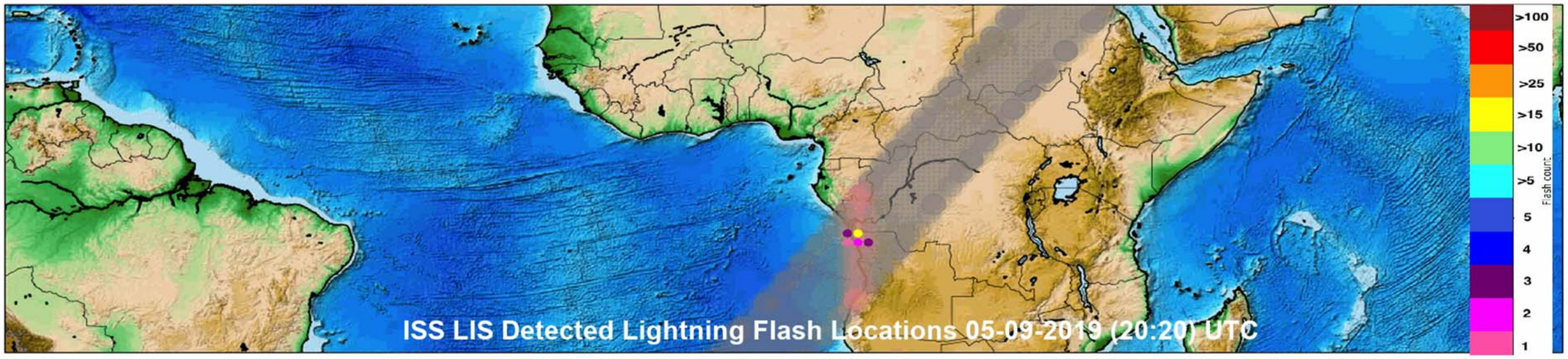
TYPE	ACCESS
Python Script	Open Source
ArcMap 10.2+	Restricted, license required

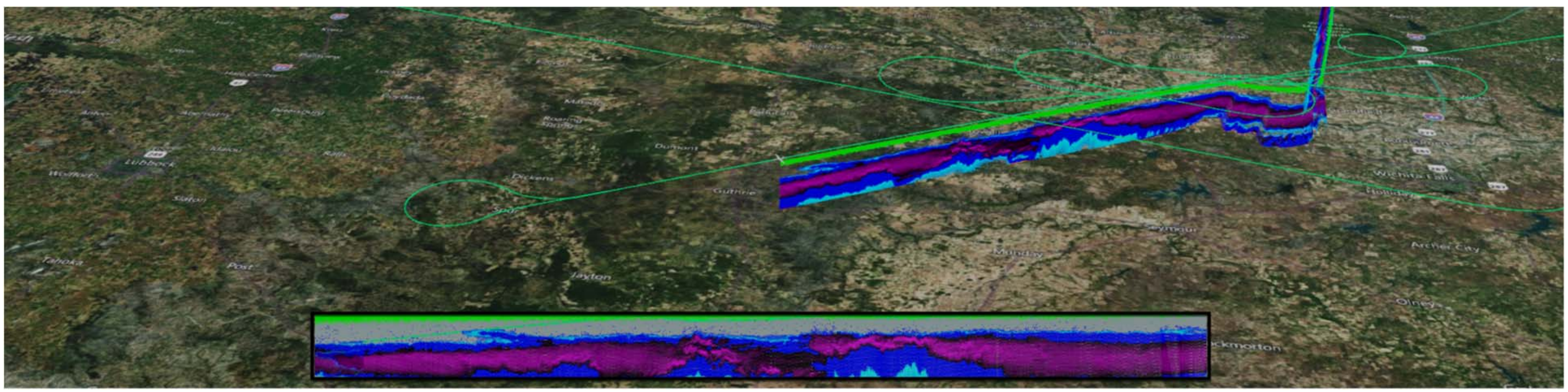
FY2019 Mastheads





FY2019 Mastheads





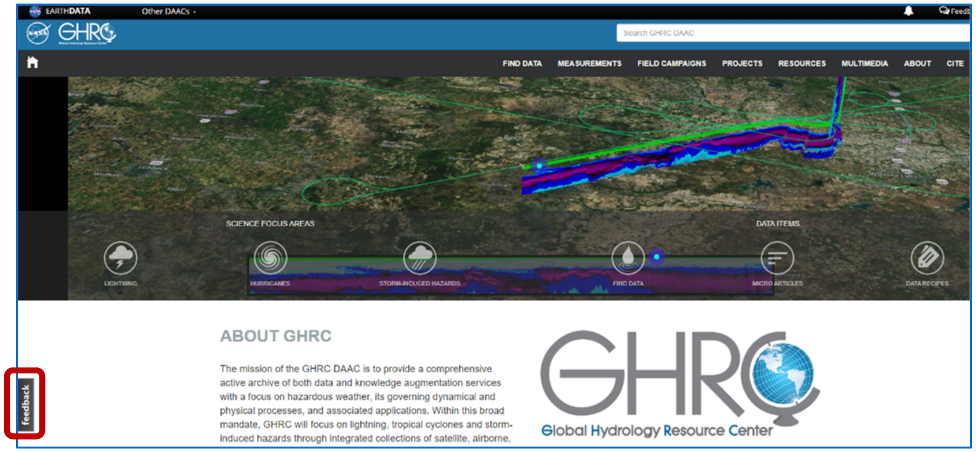
Webinars

- "Discover NASA ISS Lightning and Associated Validation Data from GOES-R" on May 8, 2019
- Provided an introduction to NASA's ISS LIS instrument and data, and showed viewers how to discover and access these datasets at GHRC. Additional topics included a discussion of the importance of lightning observations- for seasonal and long-term trends in lightning activity, applications of ISS data, and highlights from a lightning safety use case in Nepal and Bangladesh. Finally, our speaker provides an overview of the GOES-R Post Launch Test Field campaign validation data and with a focus on how these data might be useful for your research or applications.

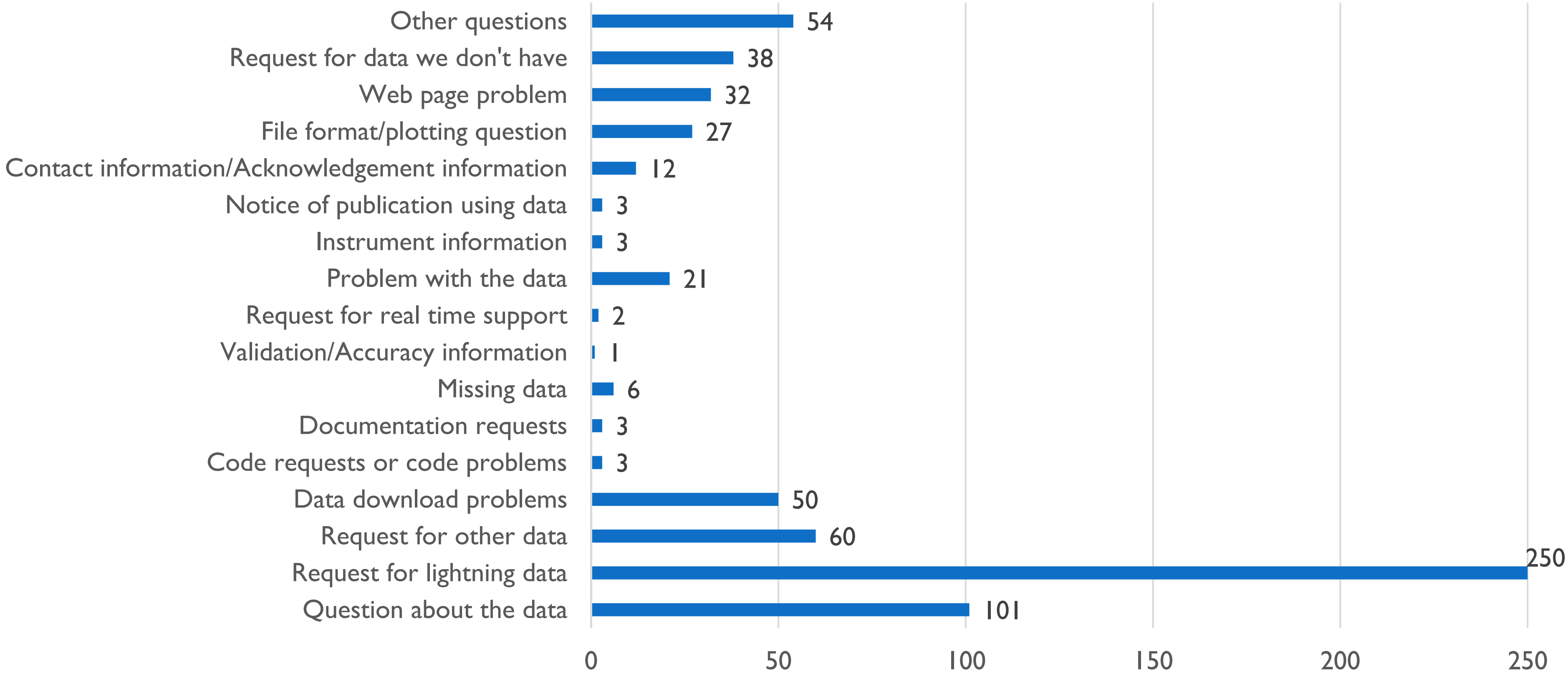
https://www.youtube.com/watch?v=VkmkdLSPwJw

User Feedback

- Find out about issues a user is experiencing through the 'Feedback' button on the GHRC webpage or thru the GHRC User Services email (support-ghrc@earthdata.nasa.gov)
  - Sent to us through Kayako
- Kayako is a customer service ticket portal that helps user services organize issues tickets and properly communicate with users



Kayako Metrics

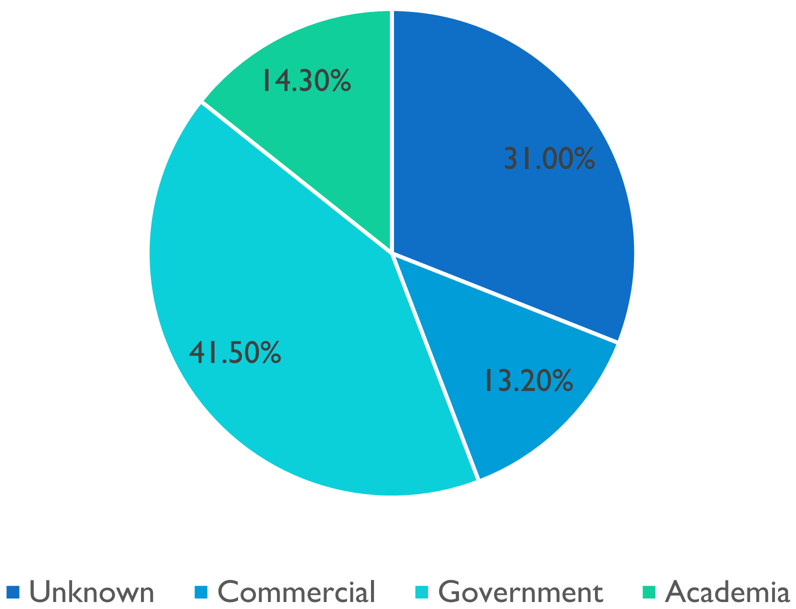


Questions Lead to Action

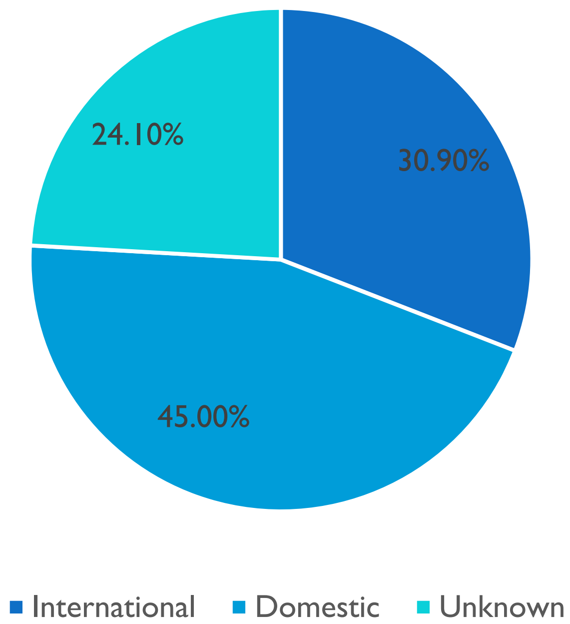
Question Type	Recommended Actions
Question about the data	Make a FAQ
Request for Lightning Data	Guide user to data or contact lightning team
Request for other data for a particular date/time/location	Guide user to data
Data download problems	Make a FAQ, add to HyDRO Help Page
Code requests or code problems	Fix code issue
Documentation requests	Provide documentation, improve user guide, improve web content
Missing data	Alert DMG
Validation/Accuracy information	Provide information, alert DMG if error
Request for real time support	Notify leadership
Problem with the data	Alert DMG, contact PI, fix problem
Instrument information	Provide information, improve user guide, improve web content
Notice of publication using data	Add to publication list
Contact information/Acknowledgement information	Provide information, update content
File format/plotting question	Make a FAQ, create a Data Recipe
Web page problem	Contact web team
Request for data we don't have	Point to alternative
Other questions	Create FAQ if needed

User Characterization

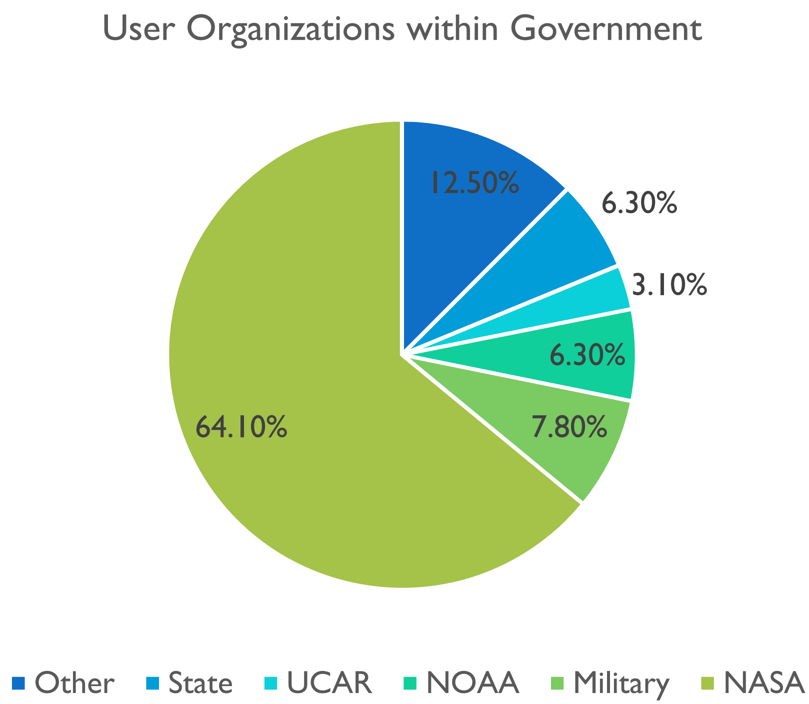
User Organizations

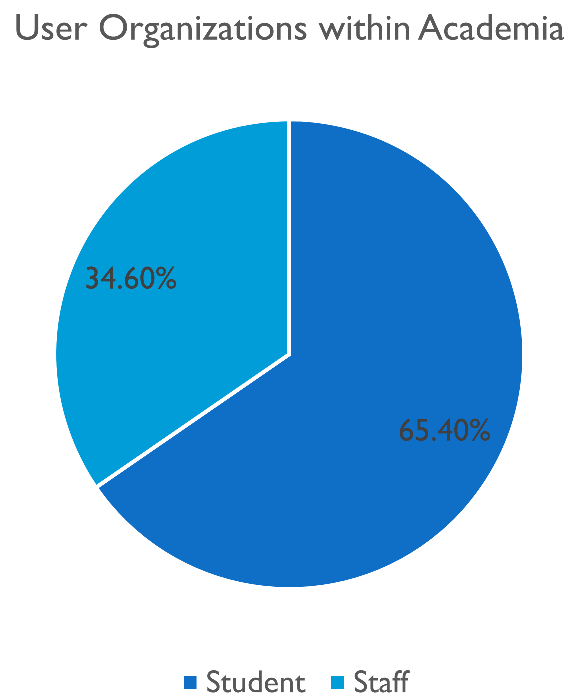


International or Domestic Users



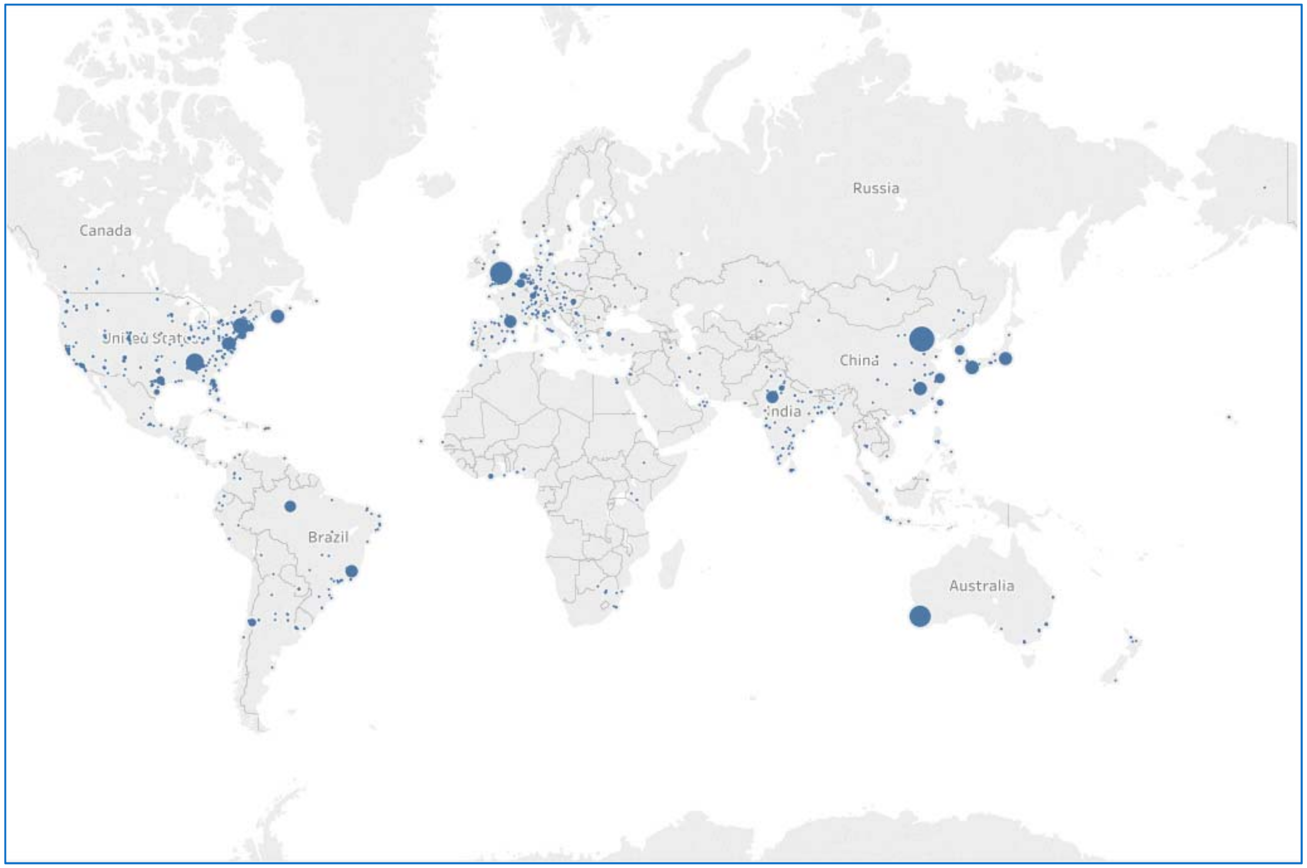
User Characterization





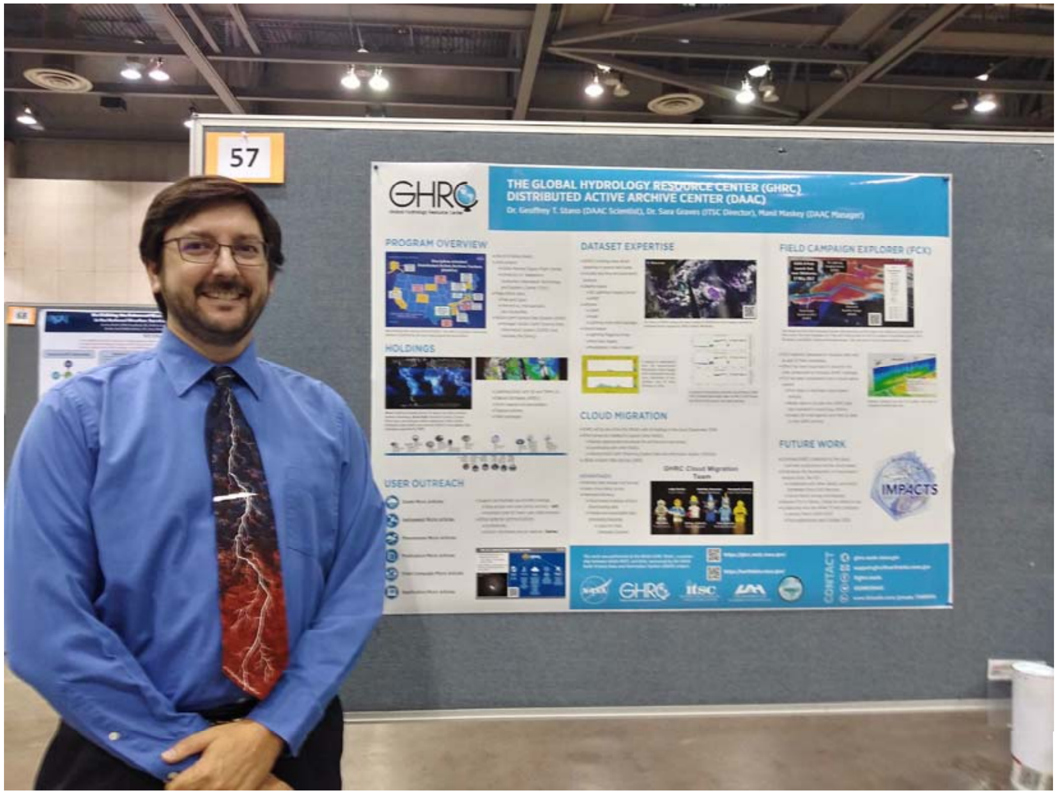
Earthdata User Log Metrics

- FY19:
  - 7,341
- All time
  - 15,502



Attended Conferences/Meetings

- GLM Science Team Meeting
- National Weather Association (NWA)
- AGU
- AMS
- ESIP
- LP DAAC/ORNL UWG
- SEDAC UWG



FY2020 Planned Activities

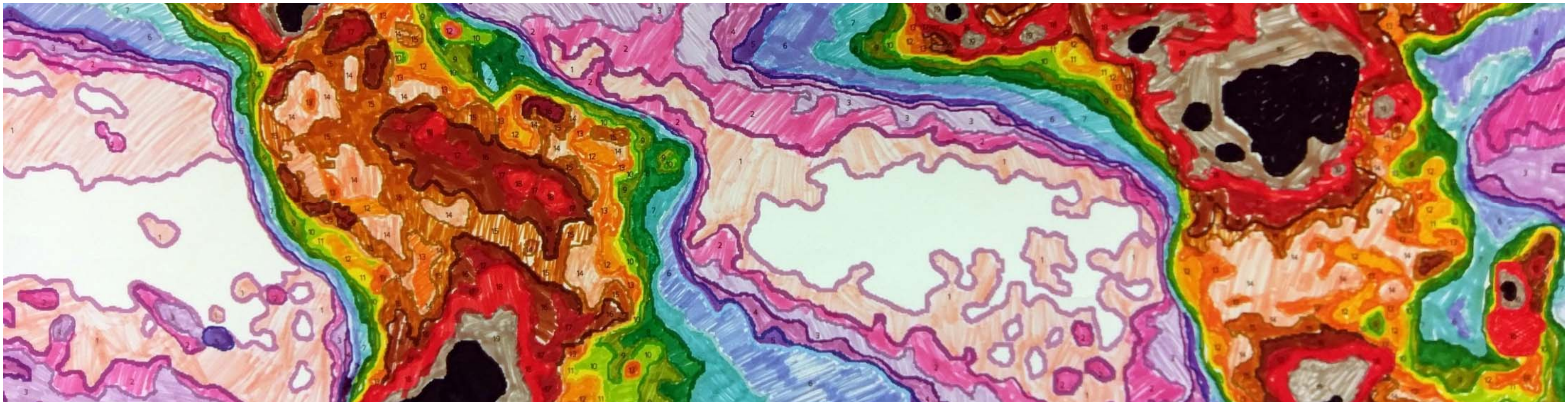
- Planned Conferences/Meetings
  - AGU
  - AMS
  - GLM Science Meeting
  - UN TIM Meeting
  - IMPACT Science Team Meeting
  - ESIP
  - ESDSWG
- Create more Data Recipes and Micro Articles
- Improve web content/consistency
- Create more mastheads
- NASA Webinar
- **Suggestions on topics to cover?**

AGU Talks and Sessions

- December 10th
  - Poster - "Near Real-Time Distribution of Land, Atmosphere Near real-time Capability for EOS (LANCE) ISS LIS Lightning Data available at the Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC)"
  - Oral - "Operating a Cloud-Native Distributed Active Archive Center (DAAC)"
- December 11th
  - Poster - "A New, Cloud Native Visualization Tool for Earth Science Data at the Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC): Field Campaign Explorer and Others"

AMS Talks and Sessions

- January 13th
  - Oral - “Near Real-Time Distribution of LANCE ISS LIS Lightning Data available at the Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC)”
- January 16th
  - Oral - “Operating a Cloud-Native Distributed Active Archive Center (DAAC)”



THANK YOU!

QUESTIONS?