



GHRC Overview and Highlights

Dr. Manil Maskey, DAAC Manager (MSFC ST11)

Dr. Geoffrey Stano, DAAC Scientist



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GHRC User Working Group 2020

Overall Organization



HQ ESDS Program

HQ Earth Science Data Systems (ESDS) Program

About the ESDS Program

ESDS Policies

Data and Information Policy

Data Processing Levels

Data Rights & Related Issues

Open Source Policy

New Missions

Data Management Plan Guidance

New Missions Requirements

Program Components

Continuous Evolution

Program Review Findings and Recommendations

More Resources

About the ESDS Program

The Earth Science Data Systems (ESDS) Program is responsible for:

- Actively managing NASA's Earth science data as a national asset
- Developing data system capabilities optimized to support rigorous science investigations and unique needs of multiple science disciplines
- Processing instrument data to create Earth System Data Records (ESDRs)
- Upholding NASA's policy of free, full, and open sharing of all data, tools, and ancillary information for all users
- Engaging members of the Earth science community in the evolution of data systems

Alignment with NASA Strategic Plan

Mission Statement

Program Charter

Continuous Evolution

Collaborations

HQ: <https://earthdata.nasa.gov/earth-science-data-systems-program/about-the-esds-program>

ESDIS Project

The Earth Science Data and Information System (ESDIS) Project is a part of the Earth Science Projects Division under the Flight Projects Directorate at the Goddard Space Flight Center (GSFC).

The ESDIS Project manages the science systems of the Earth Observing System Data and Information System (EOSDIS). EOSDIS provides science data to a wide community of users for NASA's Science Mission Directorate.

The ESDIS Project is responsible for:

- Processing, archiving, and distributing Earth science satellite data (land, ocean, atmosphere, cryosphere, human dimensions, and calibrated radiance and solar radiance data products)
- Providing tools to facilitate the processing, archiving, and distribution of Earth science data
- Collecting metrics and user satisfaction data to learn how to continue improving services provided to users
- Ensuring scientists and the public have access to data to enable the study of Earth from space to advance Earth system science to meet the challenges of climate and environmental change.
- Promoting the interdisciplinary use of EOSDIS data, including data products, data services, and data handling tools to a broad range of existing and potential user communities.

For information on various components within EOSDIS, visit the Science System Description page.

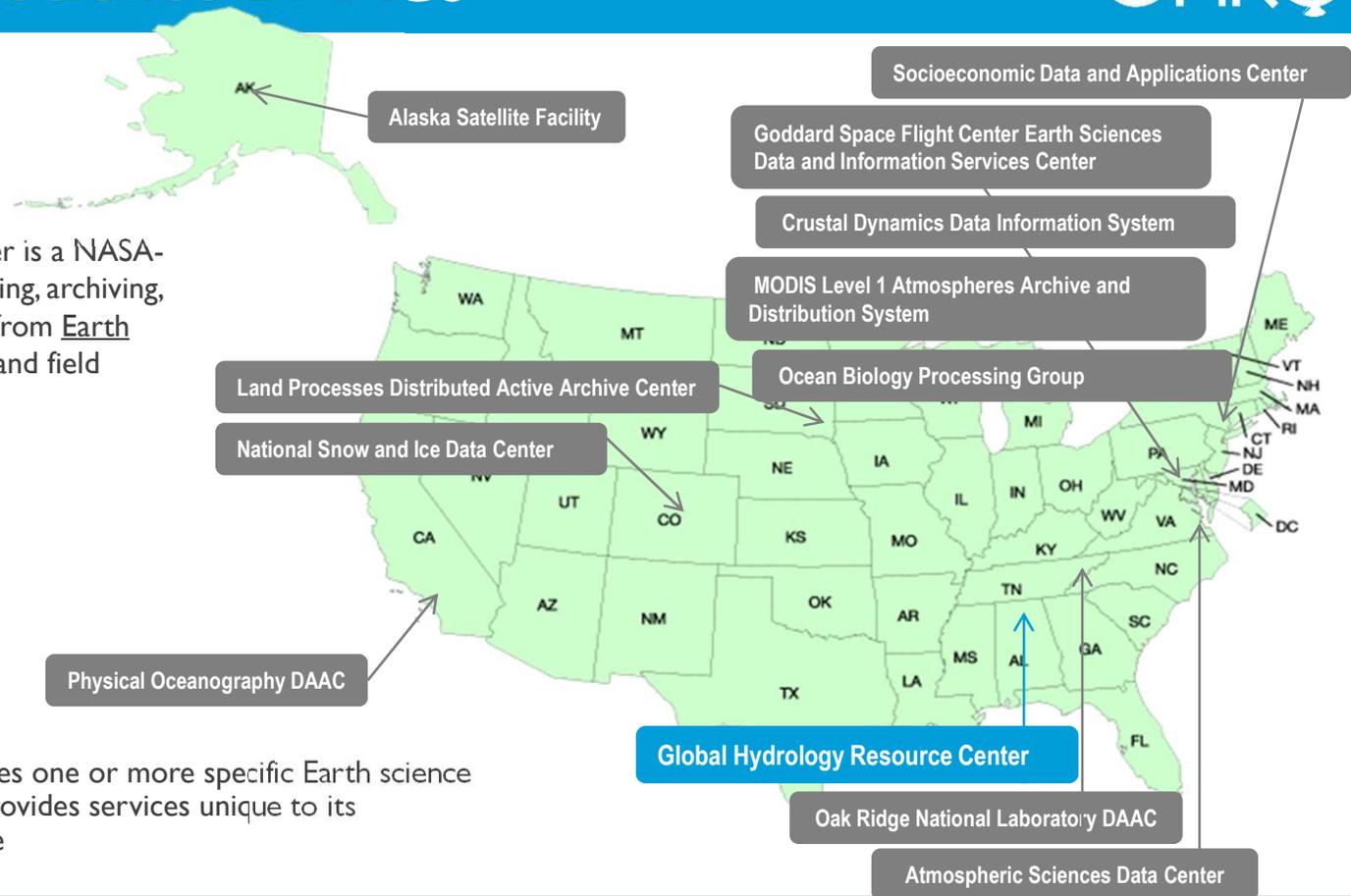
The ESDIS Project Supports		
Science System Elements	Distributed Active Archive Centers (DAACs)	12
	Science Investigator-led Processing Systems (SIPs)	15

GSFC: <https://earthdata.nasa.gov/about/esdis-project>

NASA's Earth Science DAACs



A Distributed Active Archive Center is a NASA-funded entity charged with processing, archiving, documenting and distributing data from Earth Observing System (EOS) satellites and field measurement programs



Each DAAC serves one or more specific Earth science disciplines and provides services unique to its particular science

A circular icon with a blue outer ring and a white center containing the text 'ESDS VISION'.

ESDS VISION

Accelerate scientific advancement for societal benefit through innovative Earth science data stewardship and technology development.

A circular icon with a green outer ring and a white center containing the text 'GHRC MISSION'.

GHRC MISSION

To provide a comprehensive active archive of data and knowledge augmentation services with a focus on *hazardous weather, its governing dynamical and physical processes, and associated applications.*

Focus on *lightning, tropical cyclones, and storm-induced hazards* through integrated collections of satellite, airborne, and in-situ data sets.

Goal 1: Set the standard for efficient production and stewardship of science-quality data

Goal 2: Advance open science data systems for the next generation of missions, data sources, and user needs

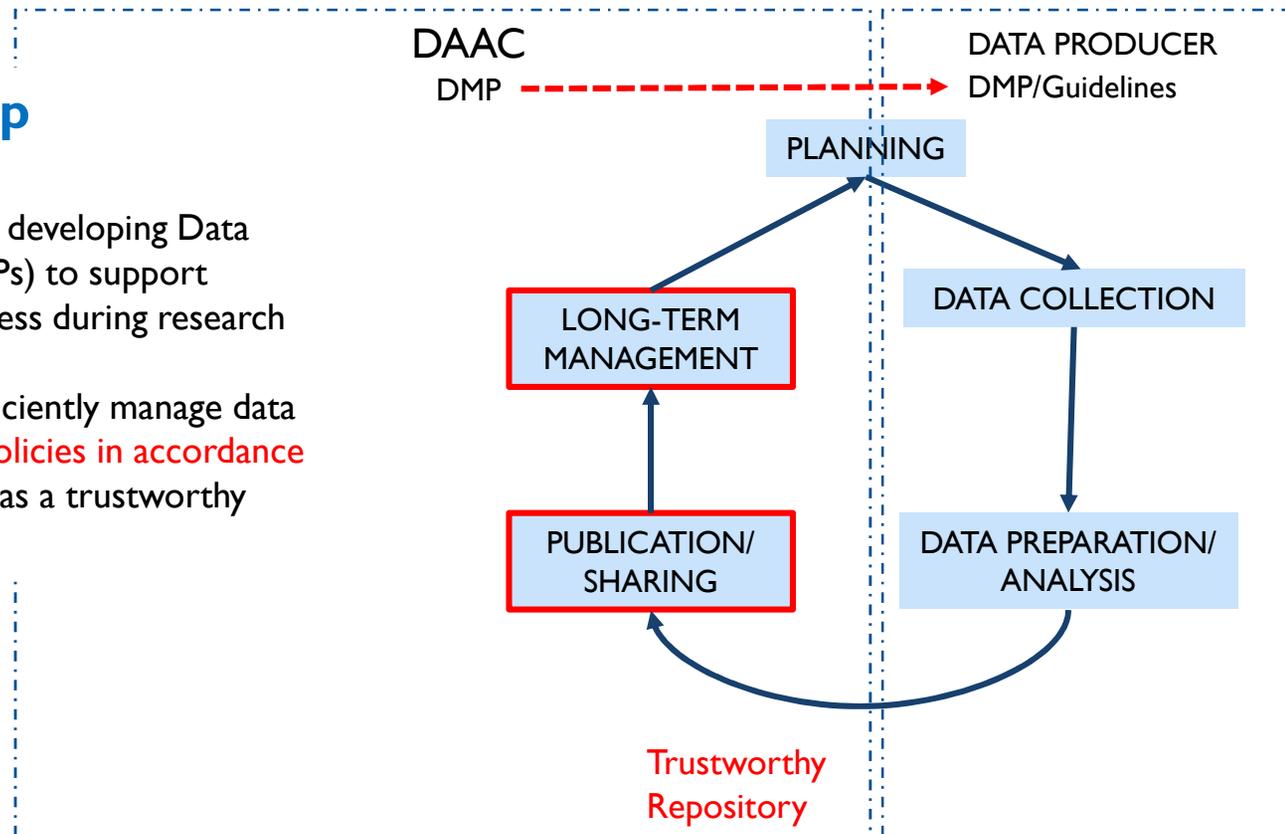
Goal 3: Lead research and development of technology for management and analysis of complex Earth science data

Goal 4: Leverage the diversity of global Earth science communities to advance open science

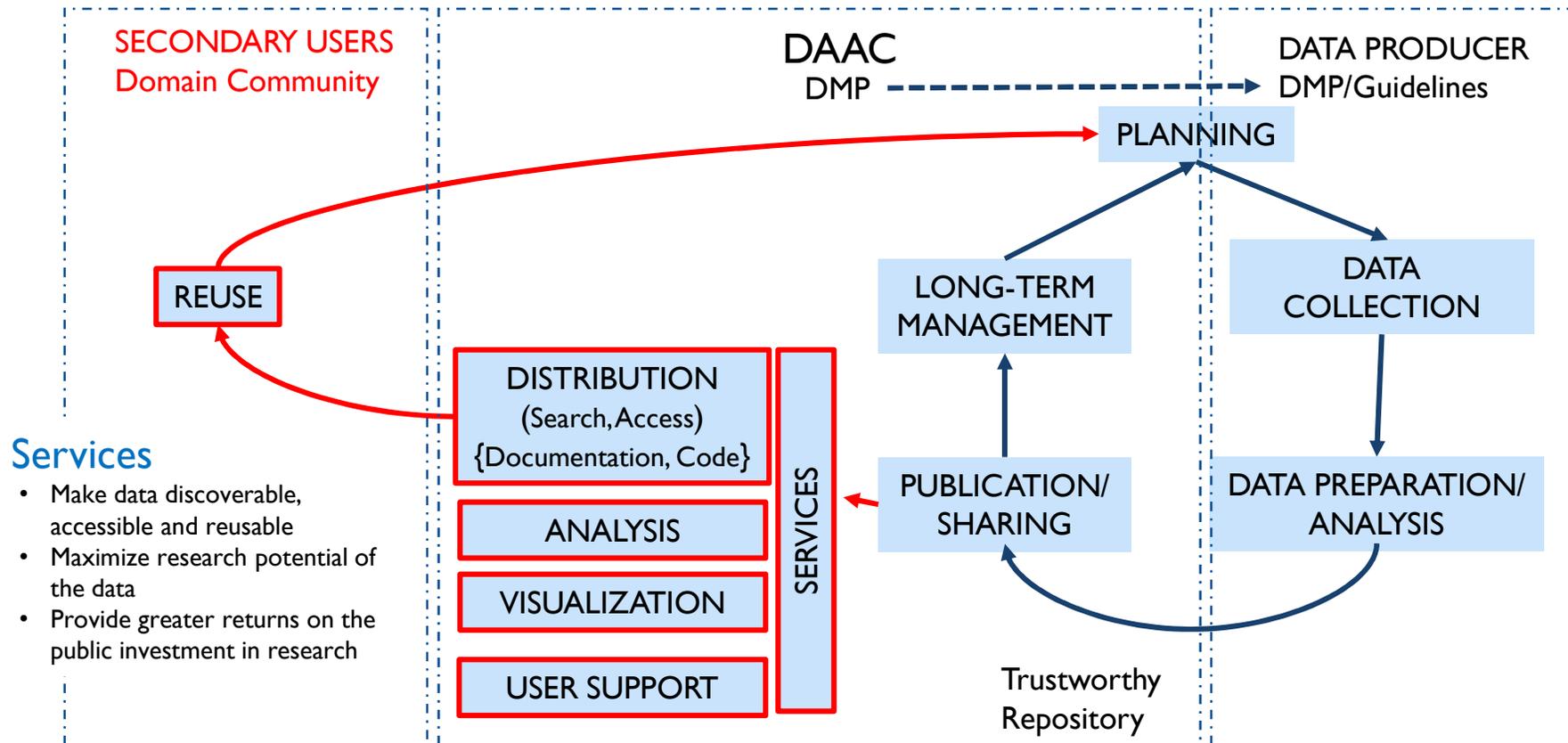


Data Stewardship Responsibility

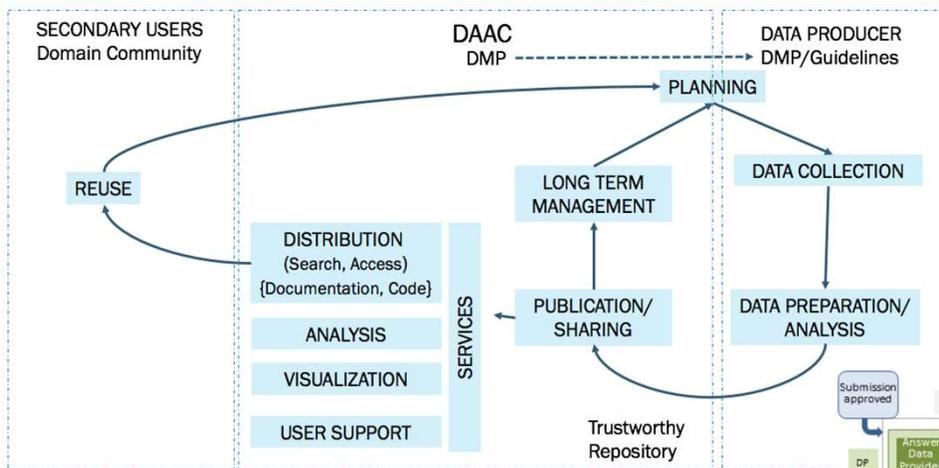
- Assist data producers in developing Data Management Plans (DMPs) to support transparency and openness during research phase
- Use DAAC DMPs to efficiently manage data
- Utilize **workflows and policies in accordance with standards** to serve as a trustworthy repository



DAAC Role in Supporting Science



Creating a Common Process for Different Data Sources

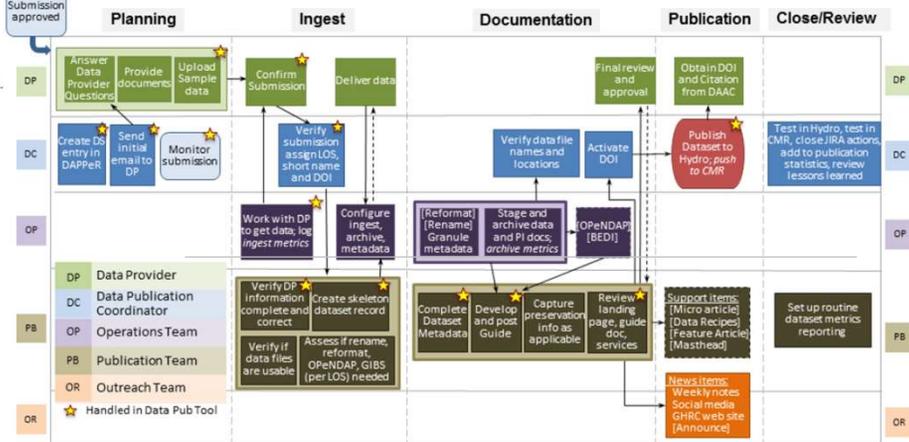


Assigned Satellite Mission (LIS)

Assigned Field Campaign (GPM-GV)

SIPS/MEaSURES Program

Recommendation from the User Community
UWG/ESDIS/HQ Approval



* adapted from ORNL DAAC's Swimlanes

GHRC Organization



Will Ellett Operations



Taylor Wright Facilitator



Geoffrey Stano Outreach & User Services



Leigh Sinclair Data Management



Ajinkya Kulkarni System Architecture & Development



Abdelhak Marouane System Engineering

GHRC UWG Board Members



<i>Discipline</i>	<i>Name</i>	<i>Affiliation</i>	<i>Term end</i>
Lightning	Michael Peterson	Los Alamos National Laboratory	2020
	Timothy Lang	NASA MSFC	2022
	Wiebke Deierling	NCAR	2022
Passive Microwave	Joe Munchak**	NASA GSFC	2021
	Joe Turk	NASA JPL	2021
Hurricane Science	Jason Dunion	Univ. Miami/CIMAS,HRD	2020
	Derrick Herndon	Univ. Wisconsin / CIMSS	2022
Global Precipitation Mission	Ana Barros	Duke University	2020
	Pierre Kirstetter	Univ. of Oklahoma	2020
	Anna Wilson	SCRIPPS / UC San Diego	2022
	Patrick Gatlin	NASA MSFC	2022
Severe Weather	Emily Berndt*	NASA SPoRT	2020
Applications	Eric Anderson	NASA MSFC (SERVIR)	2020
	Dave Jones	StormCenter Communications	2020
	Albert Kettner	University of CO Boulder	2021
	Jordan Bell	NASA MSFC	2022
HQ (ex officio)	Gail Skofronick-Jackson	NASA HQ	
	Kevin Murphy	NASA HQ	
ESDIS (ex officio)	Jeanne Behnke	NASA GSFC	
	Drew Kittel	NASA GSFC	
	Steve Berrick	NASA GSFC	
	Andy Mitchell	ESDIS Project Manager	

2020 Chair, *2020 Co-Chair **Red: 2020 is final year on UWG **Green:** New member in 2020

Operational Improvements

Added new agile facilitator

Developed Internal process and cloud ops documentation

Metadata Improvements

Completed Analysis and Review of CMR Fixes

Web Improvements

Updated Field Campaign landing pages

Completed website cleanup

Tool Improvements

Made Bulk Data Downloader ready for external testers

Migrated Field Campaign Explorer to Earthdata Cloud

Cloud Migration

Started Parallel Operations

Migrated to AWS West

Validated Cloud Datasets

Data Publication

45 total datasets published

Key datasets published:

Lightning – ISS LIS Validation

GPM-GV

IMPACTS Field Campaign

Geostationary Lightning Mapper (GLM) data

Community Engagement

Science Teams

Micro Articles

Data Recipes

Mastheads

Webinar

Conferences/Meetings

IMPACTS mission data support

Journal publications

Cloud Migration

Migrate GHRC website to cloud

Prepare for cloud-only operations

Cross DAAC Collaborations

Earthdata Pub: ORNL, GHRC, NSIDC, GES-DISC

ESDIS activities: Service Architecture, User Needs, Cloud Primer, ORCA Backup

Cloud collaborations: Cloud-located data analysis with GES-DISC

Tools

Field Campaign Explorer

- Make IMPACTS field campaign available through FCX, develop data subsetting functionality
- Work towards making FCX an enterprise cross-DAAC level tool

Bulk Download Manager

Data stewardship

Strategic acquisition of data based on portfolio gaps

GHRC User Working Group Mandate



Primary objectives include but are not limited to:

- Suggesting **improvements to enhance overall user experience** including discovery, access, and usability of data
- Suggesting new **research and development ideas** relevant to GHRC to support product/tool prototyping and generation
- Facilitating **communications with the general user community** and interested members of other communities
- Assisting GHRC in **prioritization and pursuit of new data holdings** within the bounds of budget and ESDIS mission constraints
- Provide guidance on strategic initiatives to align with ESDS goals



I. Current Strategic Plan needs to be complemented by a 10-year vision

- Strategic plan in development – Draft set for January 2021

Below are the main objectives for the Strategic Plan and 10-year vision

- Long-term plan for the Field Campaign Explorer (FCX)
 - 3D visualizations in the cloud, particularly with airborne data, are critical future component
 - Ongoing efforts with multiple DAACs on wider use of FCX
 - Further UWG feedback on FCX development vital
- Cross-DAAC collaborations
 - Example: GHRC/Goddard DAAC cloud analysis between GPM Validation Network and IMERG
 - Proof of concept for multi-DAAC cloud collaborations
 - Maintain GHRC's leadership role with cloud development and applications
- Align with NASA's Decadal Survey
 - Aerosol Cloud Convection and Precipitation (A-CCP) mission potential effort
 - Coordinate with UWG on other potential missions GHRC can compete for

I. Current Strategic Plan needs to be complemented by a 10-year vision (continued)

- Align with NASA Earth Venture System (EVS) efforts
 - GHRC awarded the IMPACTS field campaign
 - Success with IMPACTS sets stage for future EVS missions
- Align with newly unveiled ESDS goals
 - Investment in technology – Ongoing GHRC work with FCX
 - Data stewardship
 - World Data System Core Trust Seal
 - Capabilities to support FAIR data principles
 - Opportunity: Cloud data stewardship — This has not been done in the cloud before. Leadership potential for GHRC
 - Impacts and outreach – Sample list upcoming in Outreach presentation and GHRC preparing to improve the capture of these metrics in FY2021

2. Consider a broader GHRC brand to enhance leadership in value-added data services

- UWG recommends changing Hydrology to Hydrometeorology to better encapsulate available data
 - GHRC continues to discuss this topic
- UWG recommends continued support for FCX
 - GHRC has performed the following for FCX this year (align with ESDS technology development):
 - Public release of FCX
 - Open source to build community
 - Collaborations to create coalition of DAACs to broaden use and utility / Investigate use with Harmony
 - Looking ahead: GHRC requests further insight and review from UWG members

2. Consider a broader GHRC brand to enhance leadership in value-added data services (continued)

- UWG recommends additional ties with science teams
 - GHRC fully supports this
 - Ongoing involvement prior to FY2020
 - Lightning Imaging Sensor (LIS) and Geostationary Lightning Mapper (GLM)
 - NASA SPoRT with LIS and graduate students (example of ESDS community impact)
 - Started in FY2020
 - IMPACTS field campaign
 - Department of Defense Space Test Program (STP) – Courtesy invite from UWG member Michael Peterson
 - Potential for several new lightning datasets
 - Looking ahead to FY2021
 - GHRC requests continued support from UWG members to introduce GHRC and science teams

Responses to UWG Suggestions



Below are ongoing GHRC efforts to address each of these suggestions from the 2019 UWG meeting

1. Extend outreach efforts beyond meteorological meetings

- Looking to use jupyter notebooks (per UWG) for micro articles and data recipes
- Develop material for the Field Campaign eXplorer (i.e, use cases, analysis capabilities, etc.)
- Involved in various science team meetings

2. Explore adding advanced, impact-based user metrics to monitor end-to-end user activity

- Investigated Google Analytics for on-prem and added Cloud Metrics provide by Earthdata Cloud
- FY2021 will see improvements to capturing community impact from GHRC
 - Currently: 4 graduate students (2-GHRC, 2-NASA SPoRT), ~10 journals (several prior to DOI creation as GHRC awaited dataset acceptance from ESDIS)
- GHRC is planning to undergo a website refresh
 - Opportunity to address ways to better inter-connect holdings with supporting material
- Have established landing pages for nearly all field campaigns



THANK YOU!
QUESTIONS?

