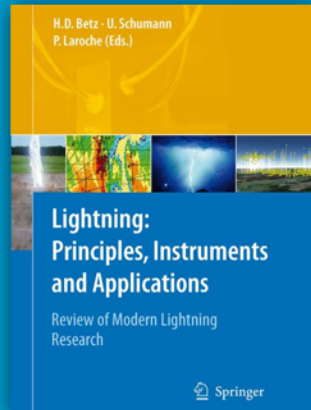
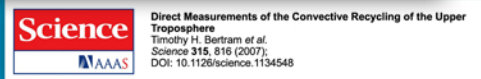
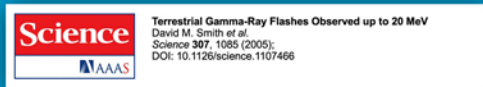


Data Impact beyond Science Teams

- New science areas
- Science applications
- Ancillary data used in many, many publications
- Data used to address specific regional needs all over the world



Data Publication and Citation

- Data Publication at GHRC
 - Data are ingested, cataloged
 - and archived using standards based engineering processes
 - Accessible via NASA data systems
 - Also indexed by Google and other search engines
- Data Citation and DOIs
 - Publication credit for the data producer
 - Traceability for where and how data are used
 - Data DOI in a citation provides a link from the scientific article to dataset information and download page



ghrc.nsstc.nasa.gov



One of NASA's Earth Science Data Centers

A collaboration between
MSFC and the University of Alabama in Huntsville

Mission Statement

To serve as NASA's Earth science **data stewards** for scientific, educational, commercial and governmental communities, with a focus on data for the global hydrologic cycle

Hydrologic Cycle
Severe Weather Interactions
Lightning
Atmospheric Convection

To provide **knowledge augmentation services** encompassing tools, infrastructure, user support, and expertise to our stakeholders



Data Stewardship

ONTOLOGIES
Capture this information to create a knowledge base for our stakeholder communities

CURATION
Work with Science Teams to gather not only data but also all relevant information

INTEROPERABILITY STANDARDS
Ensure that the information is "independently understandable" to all stakeholders without requiring experts



PRESERVATION
Follow documented policies and engineered procedures at every step to insure information preservation against all reasonable contingencies

PROVENANCE
Make the preserved data/information available to all our stakeholder communities with traceability to support authenticity

Serve as NASA's Earth science data stewards for scientific, educational, commercial and governmental communities, with a focus on data for the global hydrologic cycle.

Knowledge Augmentation Services

VERIFICATION/ VALIDATION
Tools to visualize data and support Verification/Validation Science missions

FIELD CAMPAIGN INFRASTRUCTURE
Create specialized portals for managing field campaigns and collecting data

STANDARDS/ BEST PRACTICES
Work with different organizations to develop new standards/best practices

INFUSING CUTTING EDGE INFORMATICS
Research new approaches and technologies and infuse them into operational processes (Provenance research, image retrieval)

DATA DISCOVERY
Develop new tools for data discovery, curation and aggregation, new ways to visualize information

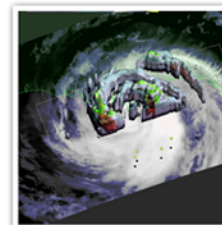


DATA USE
Develop new tools for access, analysis and visualization Investigate and incorporate emerging technologies such as Big Data

Provide knowledge augmentation services encompassing tools, infrastructure, user support, and expertise to our stakeholders.

Lightning Data

- Responsible for the ingest, archive, product generation, reprocessing and distribution of data from the TRMM Lightning Imaging Sensor, plus ancillary lightning data sets utilized by the LIS science team, since January 1998. A second LIS instrument will fly on the SpaceX rocket to the International Space Station in February 2016.
- Ancillary data –
 - National Lightning Detection Network, electric field mill data from the Kennedy Space Center, global infrared data and ground based radar data.
- Precursor satellite instruments -
 - Optical Transient Detector in operation on Microlab-1 from 1995 to 2000.
 - Operational Linescan Sensor on Defense Meteorological satellites from 1973 to 1995.



Internal structure of Hurricane Isaac depicting precipitation intensity and lightning from LIS
Photo courtesy of Owen Kelley

GHRC is recognized as the National Lightning Archive.

Microwave Data

Microwave Dataset Holdings at GHRC



- GHRC and its predecessor programs have been ingesting, processing, archiving and distributing microwave data for over 35 years.
- MSU, AMSU, SSM/I, SSMIS, TMI (satellite); AMPR, HIRAD (airborne)
- This climate sensitive data record extends back to 1978 providing an unbroken inventory of climate information that continues today.

GHRC is also recognized as one of the primary data centers for microwave data.



Field Campaigns

Hurricane Science

Data from successive field campaigns since 1990 are tied together through common procedures, consistent metadata, and discovery and archival systems making it easy to access data from instruments that have been employed across several missions.



GHRC is recognized as one of the main data centers for Hurricane Science data.

Global Precipitation Measurement Mission (GPM) Ground Validation (GV)

Ground and airborne precipitation datasets supporting physical validation of satellite-based precipitation retrieval algorithms.

Hurricane and Severe Storm Sentinel (HS3)

Five-year mission specifically targeted to investigate the processes that underlie hurricane intensity change in the Atlantic Ocean basin, utilizing two unmanned Global Hawks.

GHRC is set up to manage a large number of episodic, heterogeneous datasets and can handle the "long tail" of science data.