

Serving NASA GES DISC Multi-spatiotemporal Earth Science Data to the *GIS* community



2018AGU
IN53D-0638

Jennifer.C.Wei@nasa.gov
http://disc.gsfc.nasa.gov

NASA/Goddard Earth Sciences Data and Information Services Center (GES DISC)

Jennifer Wei¹, Wenli Yang^{1,2}, Peisheng Zhao^{1,2}, Mike Beron³, Long Pham¹, and David Meyer¹

¹NASA Goddard Space Flight Center, ²George Mason University, ³ADNET Systems Inc.

Introduction

NASA Earth Science (ES) data is essential to a wide range of GIS research and applications. However, for many GIS users, searching, accessing, using and analyzing NASA ES data can be of a great challenge - ranging from the sheer data volumes, types of science parameters, and to the complexity of data encoding formats.

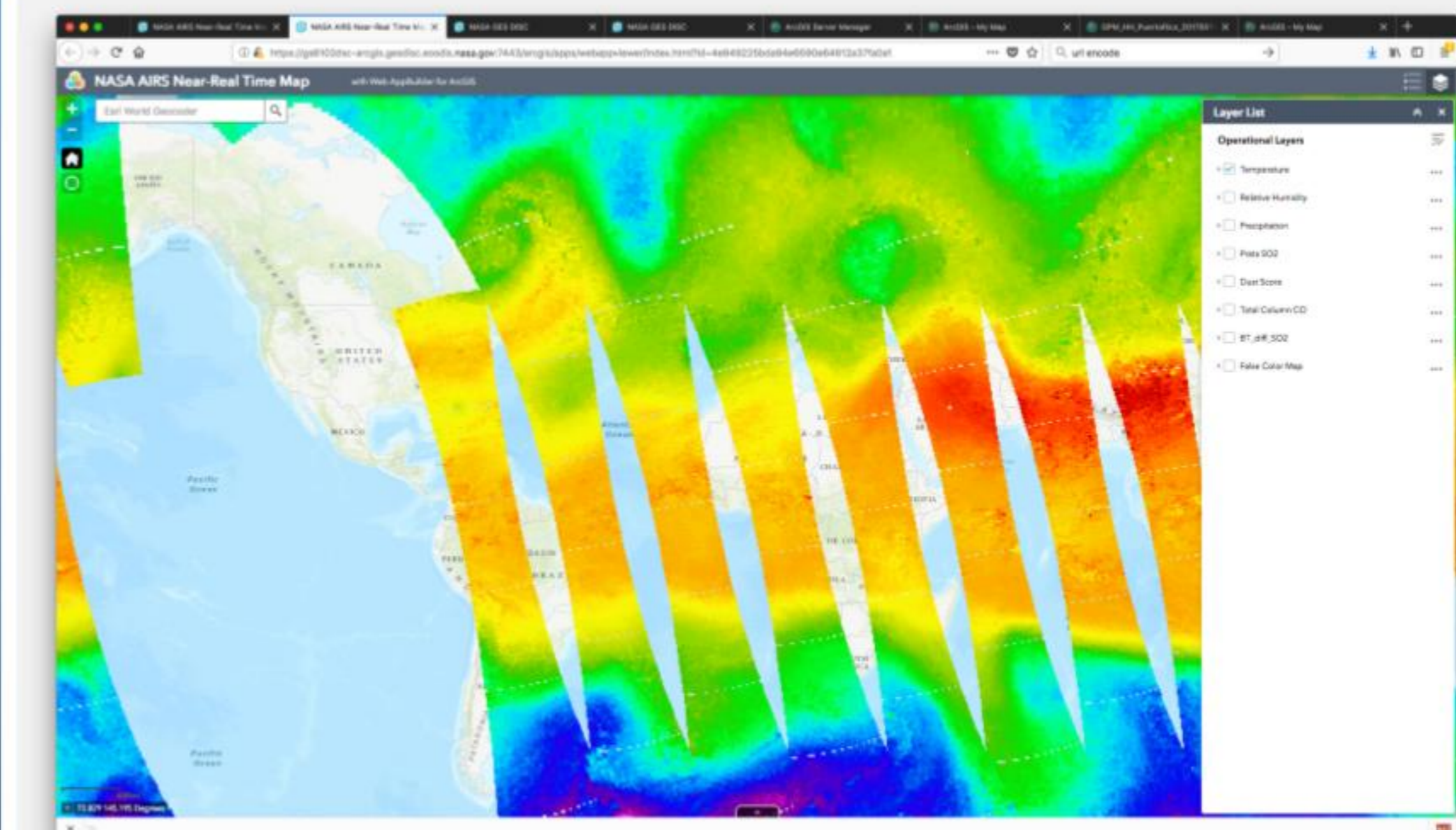
As one of the twelve NASA Science Mission Directorate (SMD) Data Centers, Goddard Earth Sciences (GES) Data and Information Services Center (DISC) archives and distributes petabytes of ES parameters covering atmosphere, land, and ocean fields. Most data are multidimensional and multi-spatiotemporal in nature and are encoded in different science data formats (e.g. HDF, HDF-EOS, netCDF, GRIB, binary), which usually contain multiple variables and different metadata information. By far, GES DISC has been developing a number of services and online tools to help GIS users to easily explore our data products. In this presentation, we will describe our ArcGIS-based data accessing and visualization services and portals, which allow users directly exploring the multi-spatiotemporal ES data in ArcGIS clients without having to pre-download/import the data. The ArcGIS services are also compliant with the Open Geospatial Consortium (OGC) Web Coverage Service (WCS) and Web Map Service (WMS) protocols and can be accessed by any other WCS/WMS clients to get customized GES DISC EO data on-the-fly from such services.

ArcGIS Image Service for GES DISC Data

A Snapshot of Deployed ArcGIS Image Services

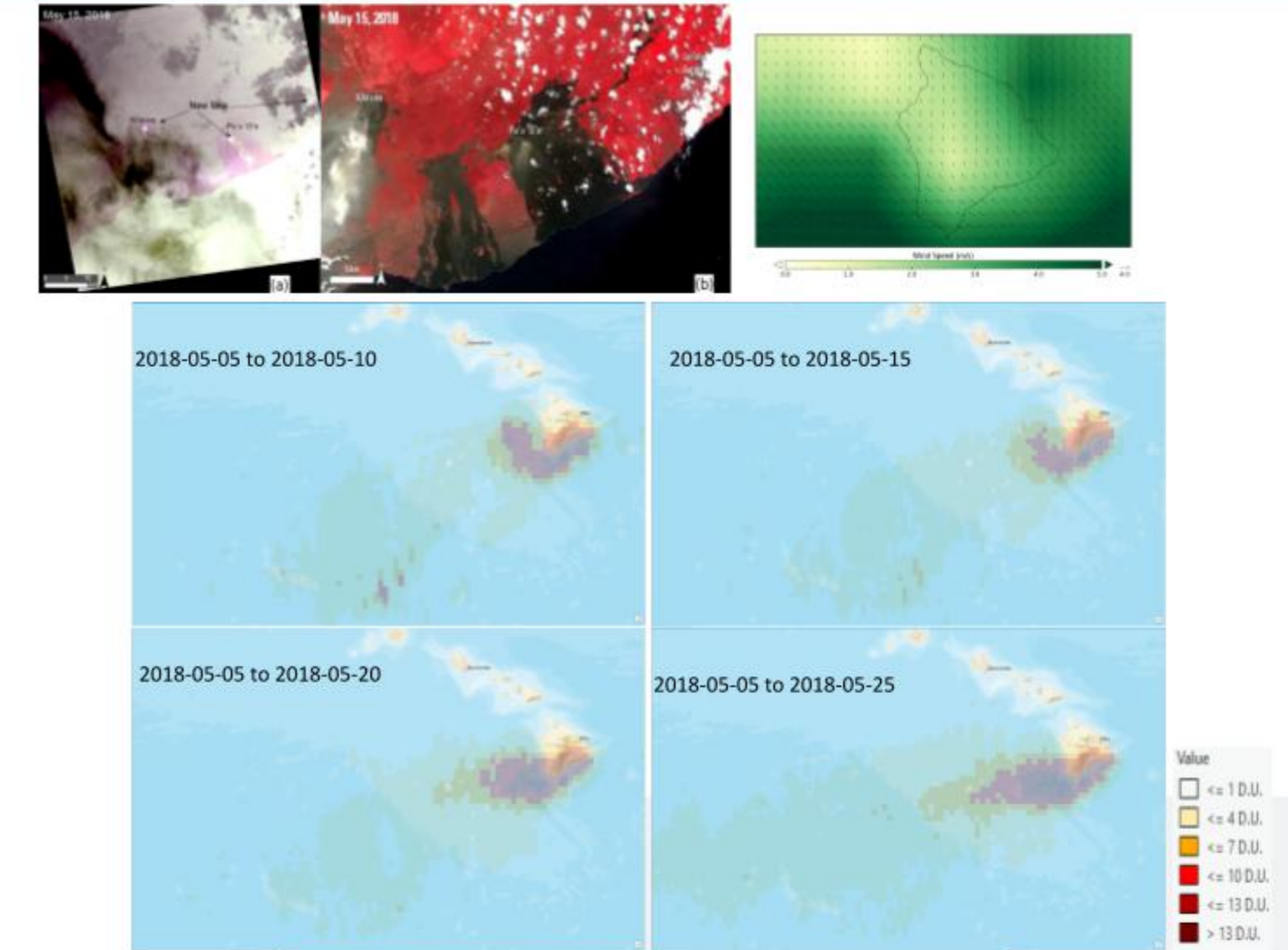
<https://gs6102project.ndc.nasa.gov/arcgis/services/GPMMonthlyPrecipitation/ImageServer/WMServer?request=GetCapabilities&service=WMS>

GES DISC ArcGIS Portal

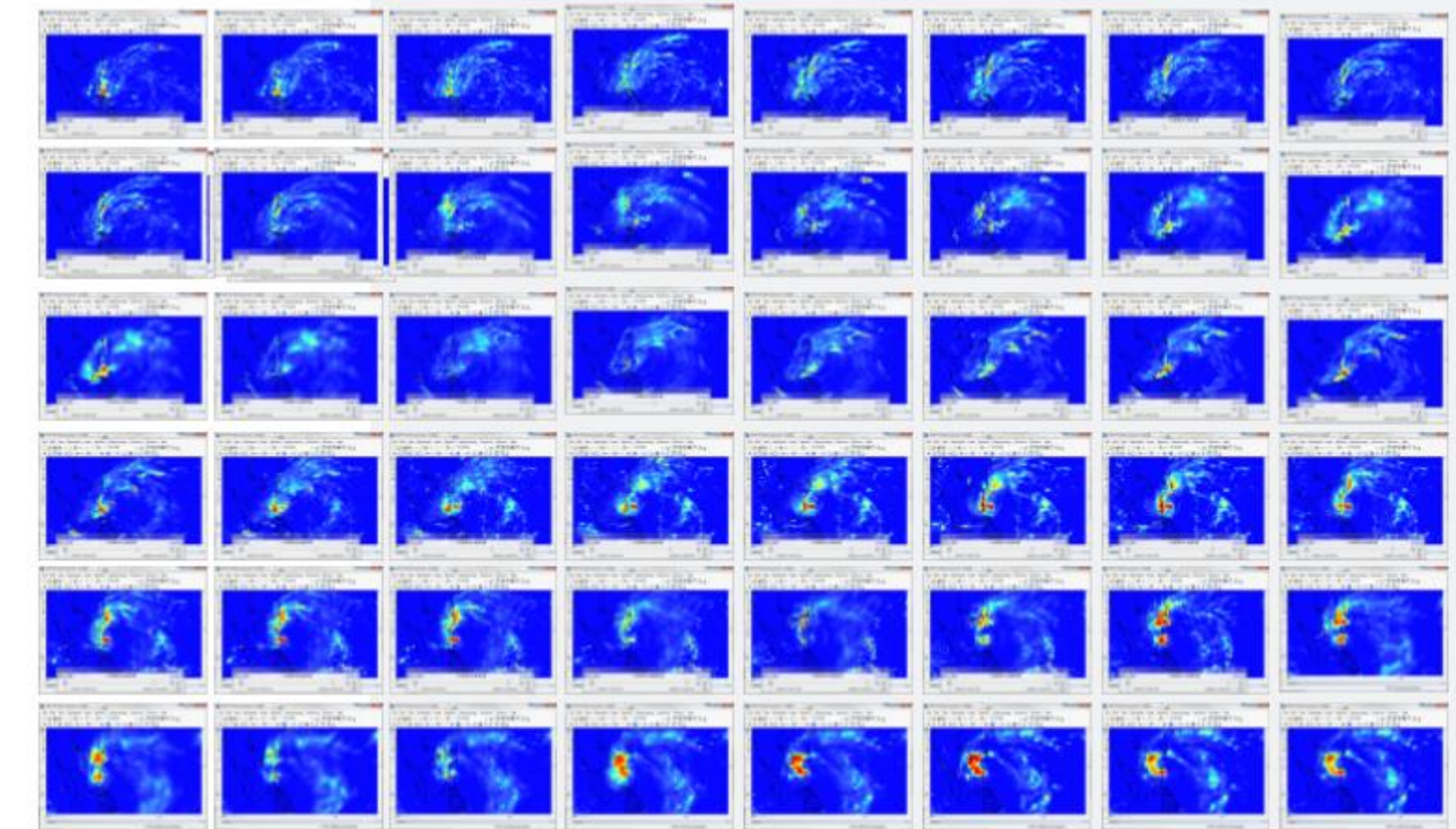


Visualize GES DISC Near Real-time Data in ArcGIS Portal

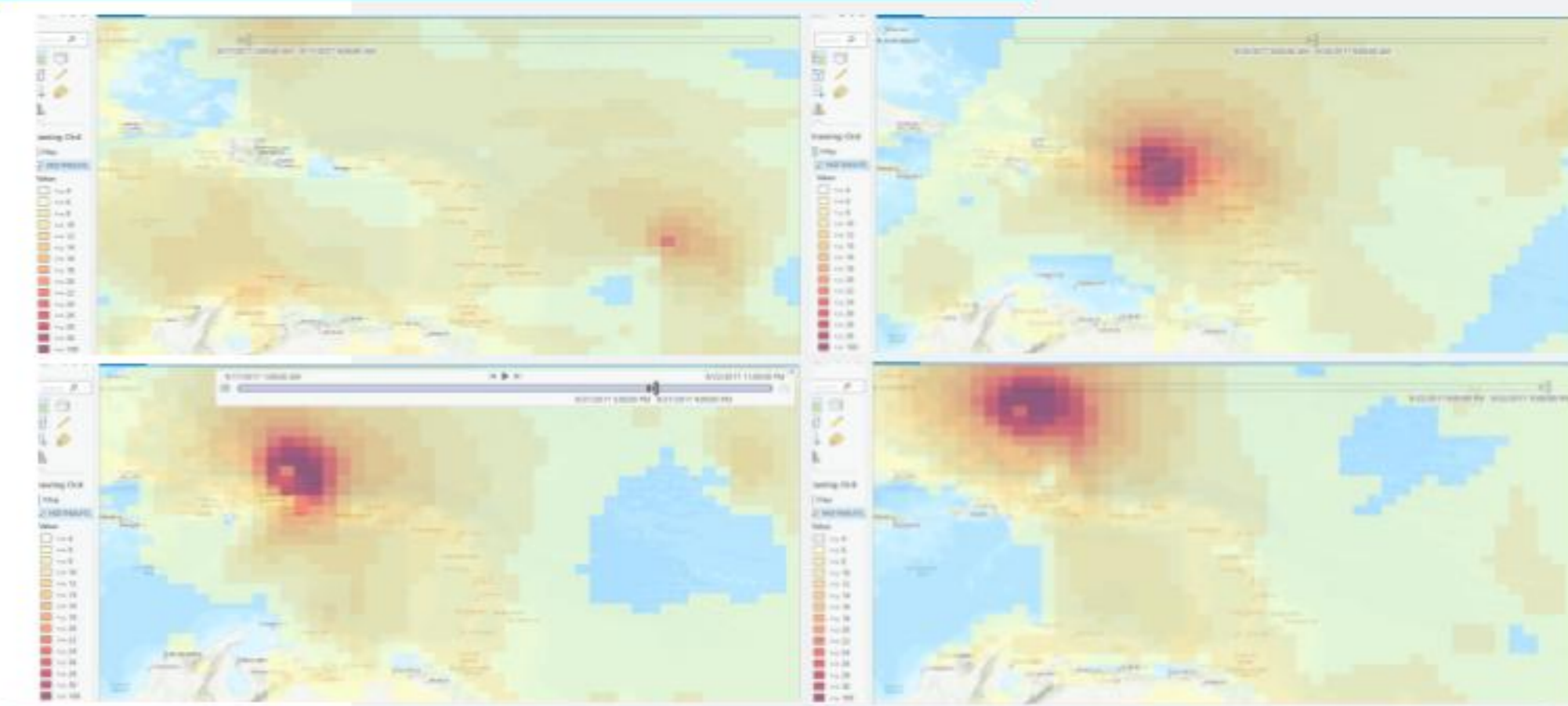
Multi-Disciplinary Data Application with ArcGIS



Kilauea Volcanic Eruptions in May 2018



Connect ArcMap to the Half-hourly Imager Server to Track the South India Flood - 2015 Northeast Monsoon



Surface Instantaneous Hourly Wind Speed During Hurricane Maria, Served by Image Server and Viewed from ArcGIS Pro

GES DISC Multidisciplinary and multi-spatiotemporal Data

Remote sensing, *in-situ*, modeling data

- Atmosphere
- Land
- Hydrology
- Ocean

Multi-spatiotemporal data:

- Spatially:
 - Global and continental grids (raster) with spatial resolution up to 4-km
 - Higher resolution swath (feature points) data (e.g., 2.2-km)
- Temporally
 - Near-real-time (NRT) products
 - Half-hourly, hourly, 3-hourly, daily, monthly satellite measurements and modeled products
 - Composite Climatology (yearly, monthly)

Atmospheric Data

Total Ozone Mapping Spectrometer (TOMS)
Upper Atmosphere Research Satellite (UARS)
Solar Radiation and Climate Experiment (SORCE)
Aura: Ozone Monitoring Instrument (OMI),
High Resolution Dynamics Infrared Sounder (HIRDLS),
Microwave Limb Sounder (MLS)
Historical datasets from Nimbus, Tiros, others
SNPP Ozone Mapping & Profiler Suite (OMPS)
Total and Spectral Solar Irradiance Sensor (TSIS)
Sentinel 5P (TROPOMI)
Cloud Absorption Radiometer (CAR)

TIROS Operational Vertical Sounder (TOVS)
Aqua: Atmospheric Infrared Sounder (AIRS)
SNPP/JPSS : Cross-track Infrared Sounder (CrIS)

Atmospheric CO2 Observations from Space (ACOS)
Orbiting Carbon Observatory 2 (OCO-2)
Carbon Monitoring System (CMS)

Modeling

- Modern-Era Retrospective Analysis For Research and Applications (MERRA/2)
- Global Land Data Assimilation System (GLDAS)
- North American Land Data Assimilation System (NLDAS)

Precipitation

- Tropical Rainfall Measuring Mission (TRMM)
- Hydrology Collections
- Global Precipitation Mission (GPM)

MEaSUREs

- MEaSUREs 2006
- MEaSUREs 2012