Exploring NASA GES DISC Data with Interoperable Services

Peisheng Zhao\(^1\), Wenli Yang\(^1,2\), Mahabal Hegde\(^1,3\), Jennifer C Wei\(^1,3\), Steven Kempler\(^1\), Long Pham\(^1\), William Teng\(^1,3\), Andrey Savtchenko\(^1,3\)

\(^1\)NASA Goddard Earth Science Data and Information Services Center (GES DISC); \(^2\)George Mason University; \(^3\)ADNET System Inc.

**Open-standard and Interoperable Services**
- Improve data discoverability, accessibility, and usability with metadata, catalogue and portal standards
- Achieve data, information and knowledge sharing across applications with standardized interfaces and protocols
- Open Geospatial Consortium (OGC) Data Services and Specifications
  - Web Coverage Service (WCS) -- data
  - Web Map Service (WMS) -- pictures of data
  - Web Map Tile Service (WMTS) -- pictures of data tiles
  - Styled Layer Descriptors (SLD) -- rendered styles

**AIRS Near-Real Time Data**
The Atmospheric Infrared Sounder (AIRS) Near-Real Time (NRT) data provide information on the global and regional atmospheric state, with very low temporal latency, to support climate research and improve weather forecasting.

With the support of OGC WCS and WMS, the AIRS NRT visualization portal provides near real time (refreshed every 30-minute), and recent 10 days images and data of false color radiance, air quality, temperature, and humidity parameters.

![AIRS Near-Real Time Data Portal](http://disc.sci.gsfc.nasa.gov/nrt/data-holdings/airs-nrt-products/MapViewer)

**L2 Data Quality Service and Visualization**
The OGC WCS/WMS for Level 2 data provides swath data, including OMI, MODIS and MISR, to broad user communities in an interoperable way.
- Accurate pixel footprint mapping
- Multiple on-the-fly coordinate transformations
- Dynamic resolution specification
- Flexible spatial and temporal subsetting/stitching
- Various combinations QA screening
- Multiple data formats: HDF4/5-EOS, CF-NetCDF3/4, geoTiff, and PNG

The NASA L2 Data Quality Visualization (DQViz) Portal enables users to browse, QA-screen, and download customized data.

![L2 Data Quality Visualization (DQViz) Portal](http://giovanni.gsfc.nasa.gov/giovanni)

**Interoperable Giovanni**
Geospatial Interactive Online Visualization and Analysis Interface (GIOVANNI) enables users to explore a wide variety of remotely sensed Earth science datasets through interactive mapping, together with various algorithms including spatiotemporal average and correlation.

![Giovanni](http://giovanni.gsfc.nasa.gov/giovanni)

The OGC WMS interface is implemented in Giovanni to support the Big Earth Data Initiative (BEDI). This machine-to-machine interface makes Giovanni interoperable at the system level, e.g., enabling GIBS to import the Giovanni analysis results with a simple WMS request:

```
```

The data, algorithms, visualization and workflows in Giovanni are shared across applications and systems.

![Interoperable Giovanni](http://giovanni.gsfc.nasa.gov/giovanni)

**AIRS NRT Data Portal**
The Atmospheric Infrared Sounder (AIRS) Near-Real Time (NRT) data provide information on the global and regional atmospheric state, with very low temporal latency, to support climate research and improve weather forecasting.

With the support of OGC WCS and WMS, the AIRS NRT visualization portal provides near real time (refreshed every 30-minute), and recent 10 days images and data of false color radiance, air quality, temperature, and humidity parameters.

![AIRS NRT Data Portal](http://disc.sci.gsfc.nasa.gov/nrt/data-holdings/airs-nrt-products/MapViewer)