Data Access, Visualization, Analysis and Usage of Terrestrial Hydrological Data From NASA’s Hydrology Data and Information Services Center (HDISC)

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AGU 2009 Annual Conference, San Francisco CA, December 14-18, 2009

North America (NLDAS) and Global Land Data Assimilation System (GLDAS) and water and energy cycle research (http://disc.gsfc.nasa.gov/hydrology).

Hydrology Data and Information Services Center (HDISC)

The Hydrology DISC currently supports the North America and Global Land Data Assimilation System (NLDAS and GLDAS) data products generated by GSFC’s Hydrological Sciences Branch. HDISC has the capability to support more hydrology data products and provide more advanced data access and visualization tools. The goal is to develop HDISC as a data and services portal that supports weather and climate forecast, and water and energy cycle research (http://disc.gsfc.nasa.gov/hydrology).

North America (NLDAS) and Global Land Data Assimilation System (GLDAS)

NLDAS and GLDAS systems integrate data from multiple space-based Earth observing systems using advanced land surface modeling and assimilation techniques. These products support weather and climate forecast experiments, water resources applications, and water and energy cycle research.

<table>
<thead>
<tr>
<th>NLDAS</th>
<th>GLDAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Water and energy budget data, forcing data</td>
</tr>
<tr>
<td>Spatial extent</td>
<td>Conterminous U.S., parts of southern Canada and northern Mexico All land north of 60 degree south</td>
</tr>
<tr>
<td>Spatial resolution</td>
<td>1/8 degree 1 degree and 0.25 degree</td>
</tr>
<tr>
<td>Time period</td>
<td>Jan 1, 1979 to present for NLDAS-2 Oct 1, 1996 to Dec 31, 2007 for NLDAS-1 Jan 1, 1979 to present for the 1.0° data Feb 24, 2000 to present for the 0.25° data</td>
</tr>
<tr>
<td>Temporal resolution</td>
<td>Hourly and monthly 3-hourly and monthly</td>
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<tr>
<td>Forcing</td>
<td>Multiple data sets derived from satellite measurements, radar estimation, precipitation gauges, and atmospheric analyses Multiple data sets derived from satellite measurements and atmospheric analyses</td>
</tr>
<tr>
<td>Land surface models</td>
<td>Mosaic, Noah, SAC and VIC CLM, Mosaic, Noah, VIC</td>
</tr>
<tr>
<td>Output format</td>
<td>GRidded Binary (GRIB)</td>
</tr>
<tr>
<td>Elevation definition</td>
<td>GTOPO 30</td>
</tr>
<tr>
<td>Vegetation definition</td>
<td>University of Maryland, 1 km</td>
</tr>
</tbody>
</table>

- Parameters for GLDAS (L), NLDAS-2 Forcing (M) and NLDAS-2 Mosaic output (R)

Access HDISC Data

- Anonymous http and ftp data downloading
- Mirador - that provides discovery of, and access to, a Google-like search and download tool based on keywords

Online Visualization and Analysis (Giovanni)

Giovanni is a simple and intuitive way to visualize, analyze, and access Earth science remote sensing data online.

GrADS Data Server (GDS)

GDS provides submitting and analysis services across the internet. GDS supports any operation that can be expressed in a single GRADS expression.

On-The-Fly Spatial and Parameter Subset

- A. User selects data sets of interest
- B. User selects OTF subset options: spatial and/or parameter

On-The-Fly Conversion to netCDF

- A. Convert-to-netCDF service available for GLDAS data sets
- B. Run conversion and download netCDF files

Drought Monitoring With NLDAS Data

The NLDAS-2 data are used in various combinations in a post-processor to generate different drought indices. The three main types of droughts to be investigated are:

- Meteorological (primarily from precipitation deficit)
- Hydrological (primarily from streamflow/runoff deficit)
- Agricultural (primarily from soil moisture deficit)

The different drought indices and output from the separate LSMs will be evaluated against historical and current drought observations.

Further Development

- Support additional NLDAS products and monthly products.
- Advanced Giovanni services for GLDAS and NLDAS products.
- Support GLDAS new processing with improved forcing dataset.
