ED32B-07
Satellite Level 3 & 4 Data Subsetting at NASA GES DISC

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Data Levels

- EOSDIS Data Processing Level specifications
- Level 3: Variables mapped on uniform space-time grid scales, usually with some completeness and consistency.
- Level 4: Model output or results from analyses of lower-level data (e.g., variables derived from multiple measurements).

What is Subsetting

- Subsetting refers to trimming a file's contents to user specifications
- Common subsettable file contents
  - Data variables
  - Spatial coverage
  - Temporal coverage/time steps
  - Additional dimensions (pressure / vertical levels, quality, clouds percentage, layers, etc.)

Need For Subsetting

- Subsetting allows users to prune unwanted variables, spatial area, time slices, dimensions, etc.
  - Provides clarity & efficiency in file layout & contents
- Original L3/L4 data file sizes often large
  - GES DISC: MERRA 2 files can get up to 14GB in size
  - Difficult to download entire file (need for multiple files, bandwidth, connection stability, resources usage, etc).
  - Subsetting to user's specifications can greatly reduce file size

Beyond Subsetting: Need For Regridding, & File Conversion

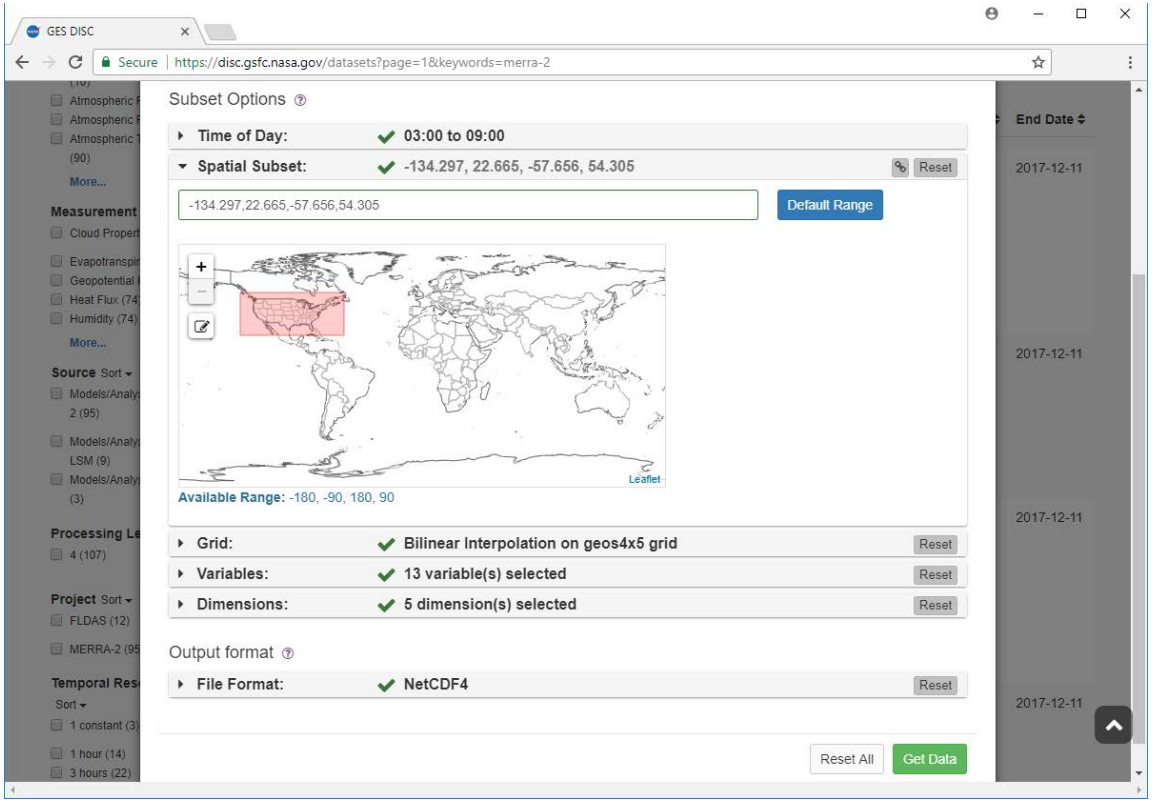
- Level 3 & 4 data Lat/Lon grid parameters are not standard across data products
  - Resolution & Alignment
  - Makes data comparison difficult
- Level 3 & 4 data products often in different data formats
  - NetCDF, HDF-EOS, HDF, GRIB, etc.
  - Complicates analysis efforts by requiring extra tools or specialized code

Introducing L34RS

- L34RS (Level 3 & 4 Regridding Subsetter)
- On the fly service to subset and regrid Level 3 & 4 data with file conversion capabilities
- Presently supports MERRA 2, MERRA, GLDAS, NLDAS, NCA-LDAS, FLDAS products

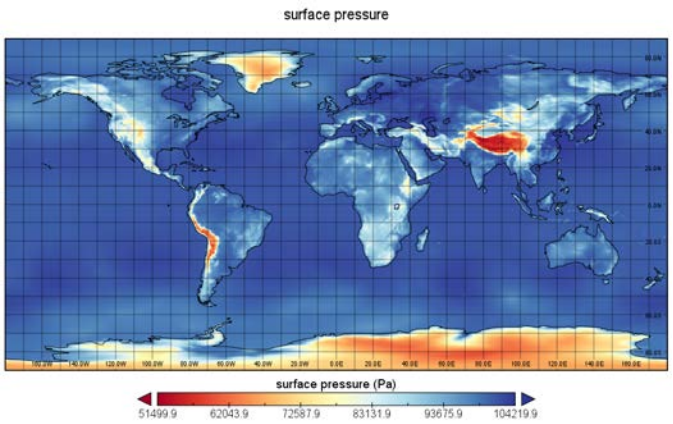
L34RS Interface

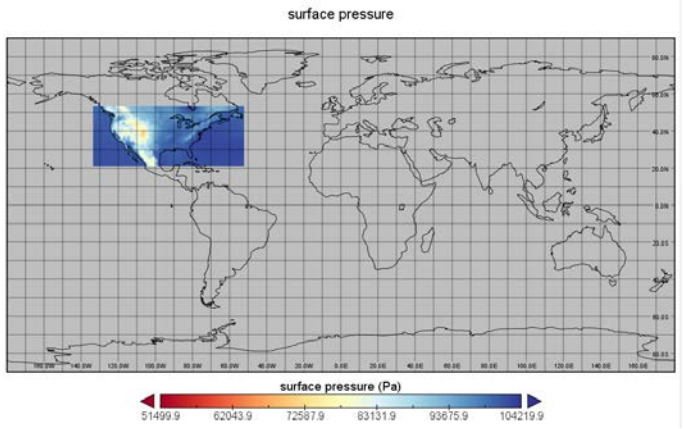
- https://disc.gsfc.nasa.gov/datasets?page=1&keywords=merra-2



L34RS – Subsetting

- Spatial
  - Latitude & Longitude box
  - Point



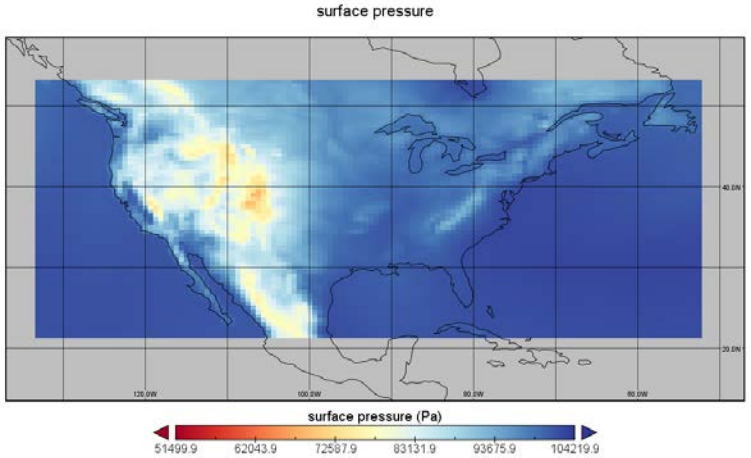


L34RS – Subsetting (cont'd)

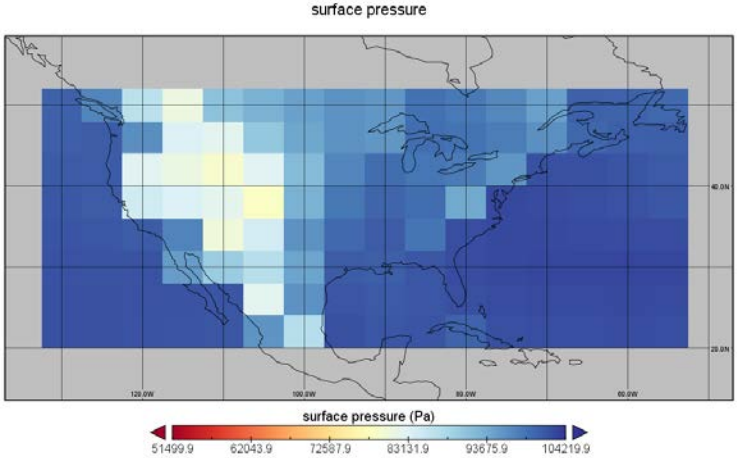
- Variable
- Vertical Level
- Temporal
  - By values (e.g. 02:00 – 04:00)
  - Can also mean over selected values
- Example shown in talk:
  - MERRA 2 file subset from 2.1GB to 1.1MB

L34RS – Regridding

- Regrid to target grid
  - 30 target grid options
  - Several interpolation options



Original resolution (0.5°x0.625°)



Regridded resolution (4°x5°)

L34RS – File Format Conversion

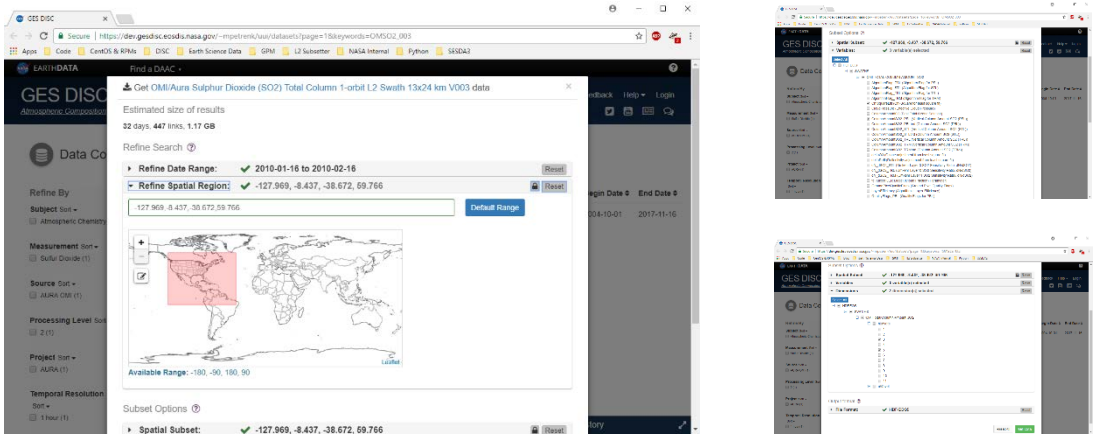
Product Name:	**Original Format:**	**Output Options:**
MERRA	HDF-EOS2	**NetCDF4**, HDF-EOS2
MERRA-2	NetCDF4	**NetCDF4**, HDF-EOS2
GLDAS	GRIB (v1), NetCDF4 (v2)	**NetCDF4** (both), GRIB (v1)
NLDAS	GRIB	**NetCDF4**, GRIB
NCA-LDAS	NetCDF4	**NetCDF4**
FLDAS	NetCDF4	**NetCDF4**

Summary

- Subsetting needed to reduce data deliverables to only what a user needs
- L34RS (Level 3 & 4 Regridding Subsetter)
  - Provides subsetting service for reduced file size
  - Provides regridding and conversion capabilities for ease of analysis and direct data comparison
    - Always offer NetCDF conversion
  - Presently supports MERRA 2, MERRA, GLDAS, NLDAS, NCA-LDAS, FLDAS
  - Work begun on GPM and OMI Products

Addendum: Level 2 Subsetter

- Satellite Level 2 Data Subsetter (L2S)



- Come see my poster (IN41B-0038) tomorrow if interested!

Q & A

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