UNIVERSITY of WASHINGTON

OGH

Observatory for Gridded Hydrometeorology Python library

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Timeline

- 20 min – presentation on OGH
- 30 min – small group activity
- 30 min – large group discussion

Start tutorial

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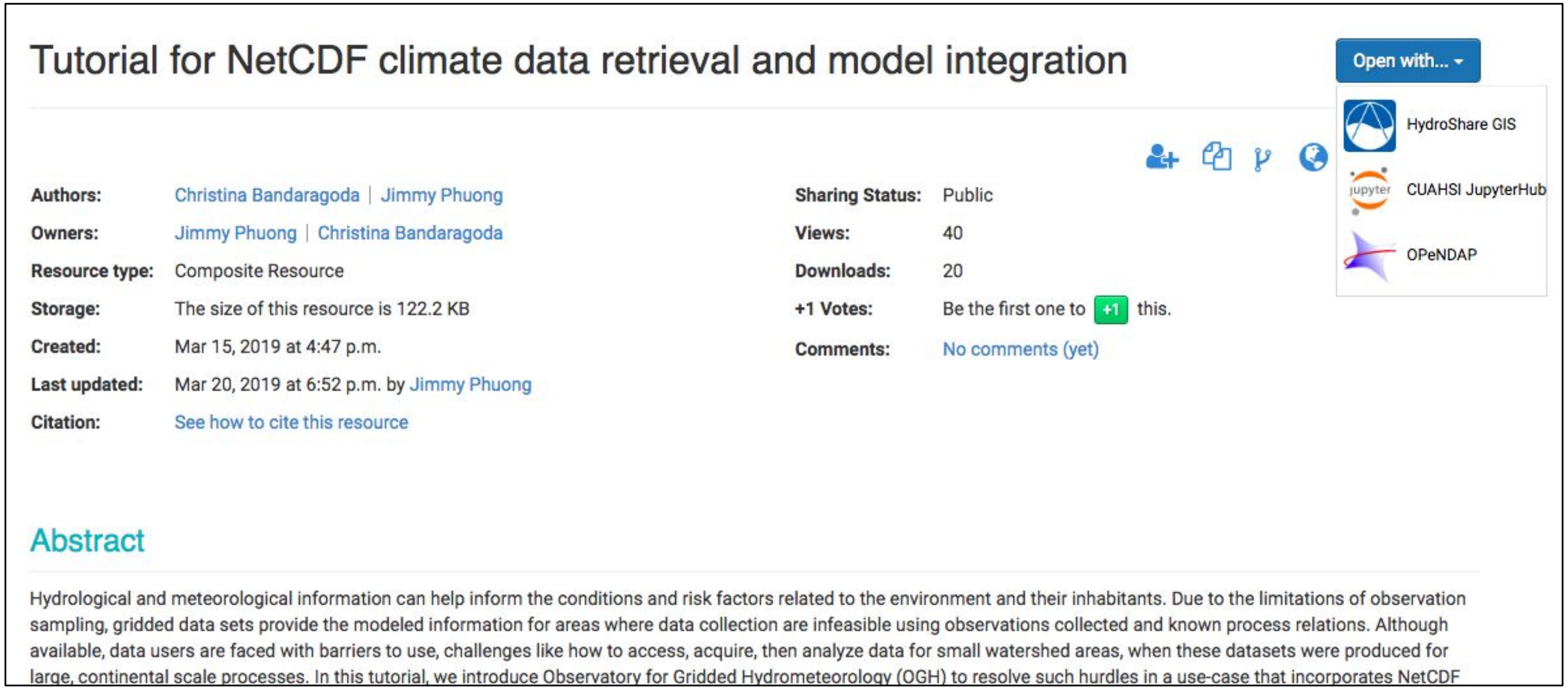
Tutorial: https://bit.ly/2JsmTMJ

Click **'Open with'**

Choose **'CUAHSI Jupyterhub'**



OGH functionalities

- Automate access to data repositories
- Visualize gridded data on a map
- Analyze large volumes of gridded data
  - Basic spatial-temporal statistics
  - Exceedance probabilities
- Integrate data with earth surface models
  - Landlab vegetation model case-study

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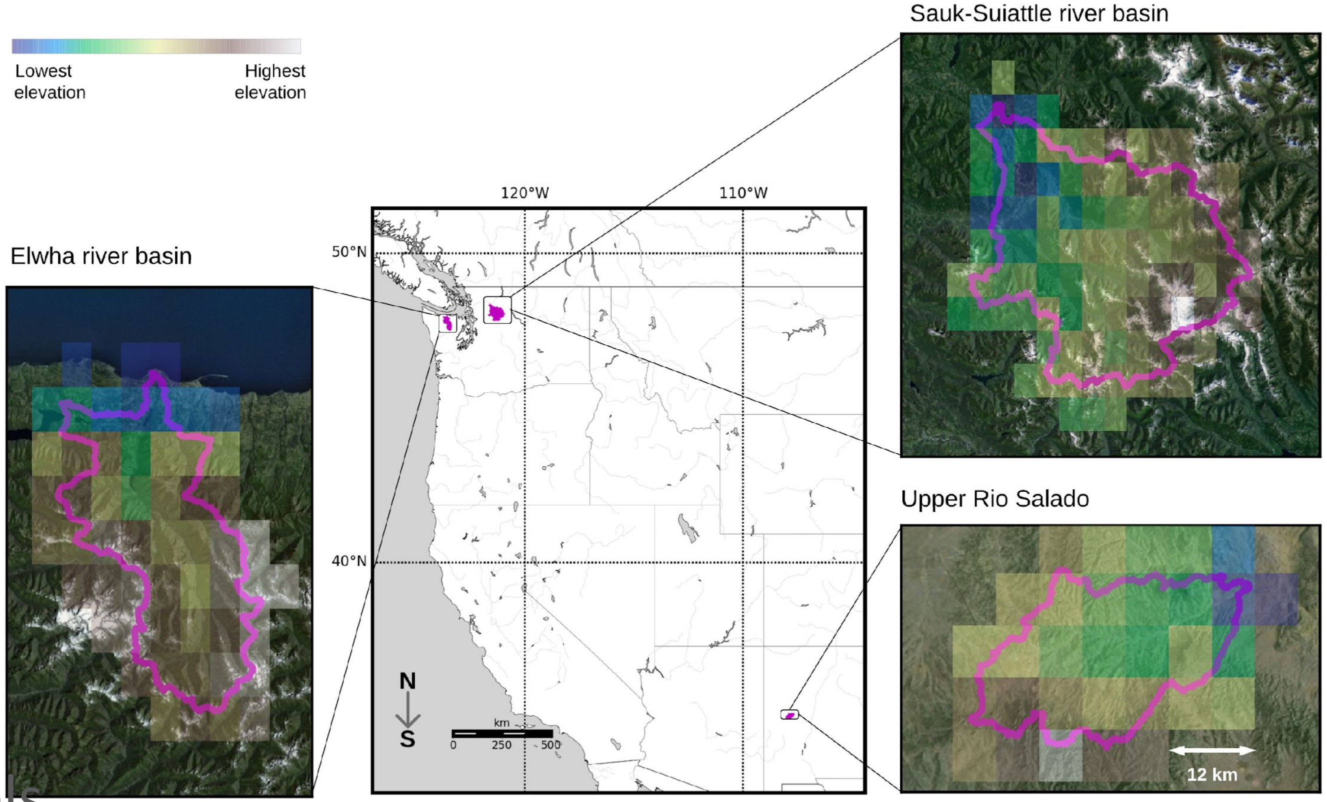
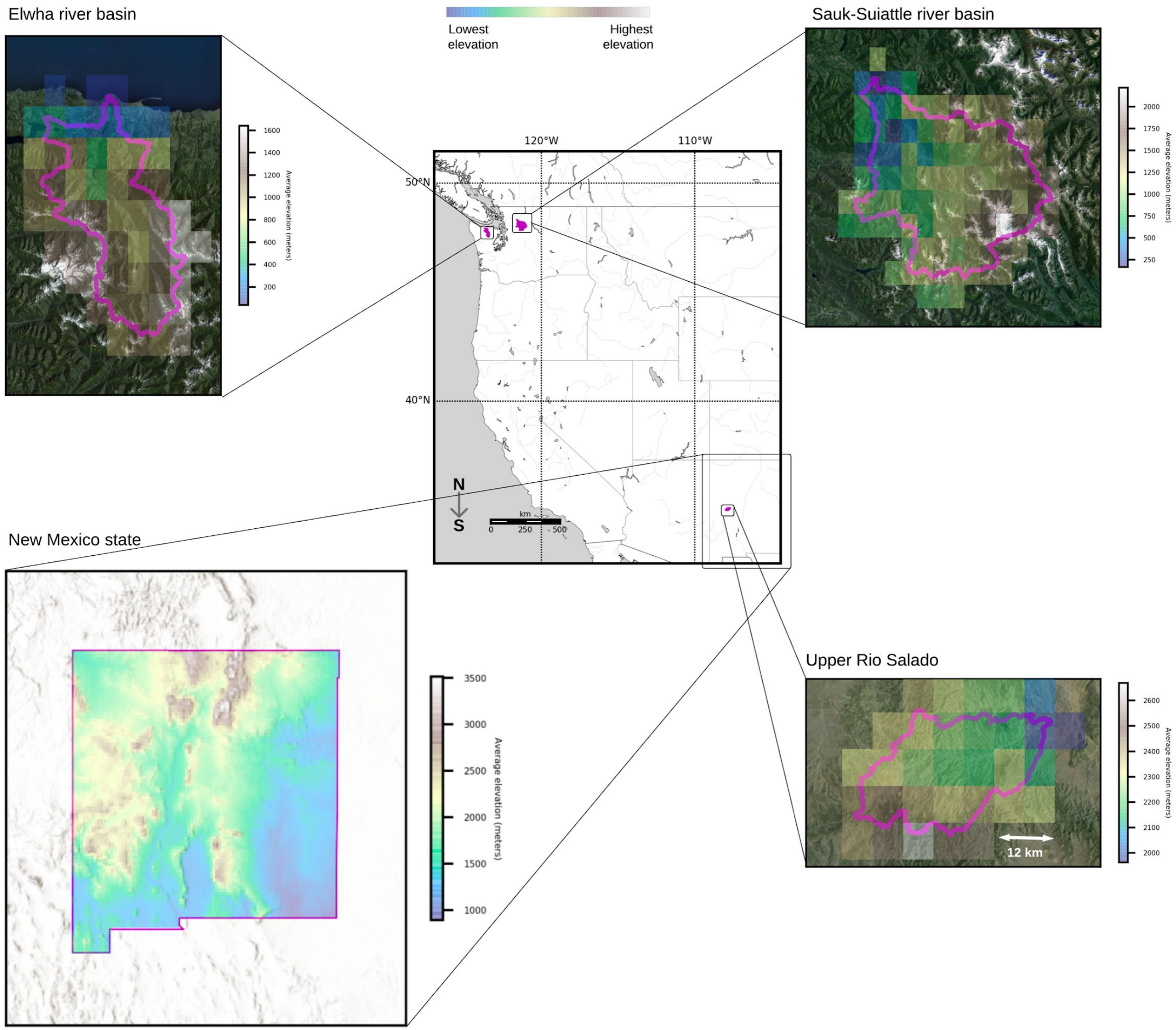


How long it would take?

55 cells (0.06° buffer)

99 cells (0.06° buffer)

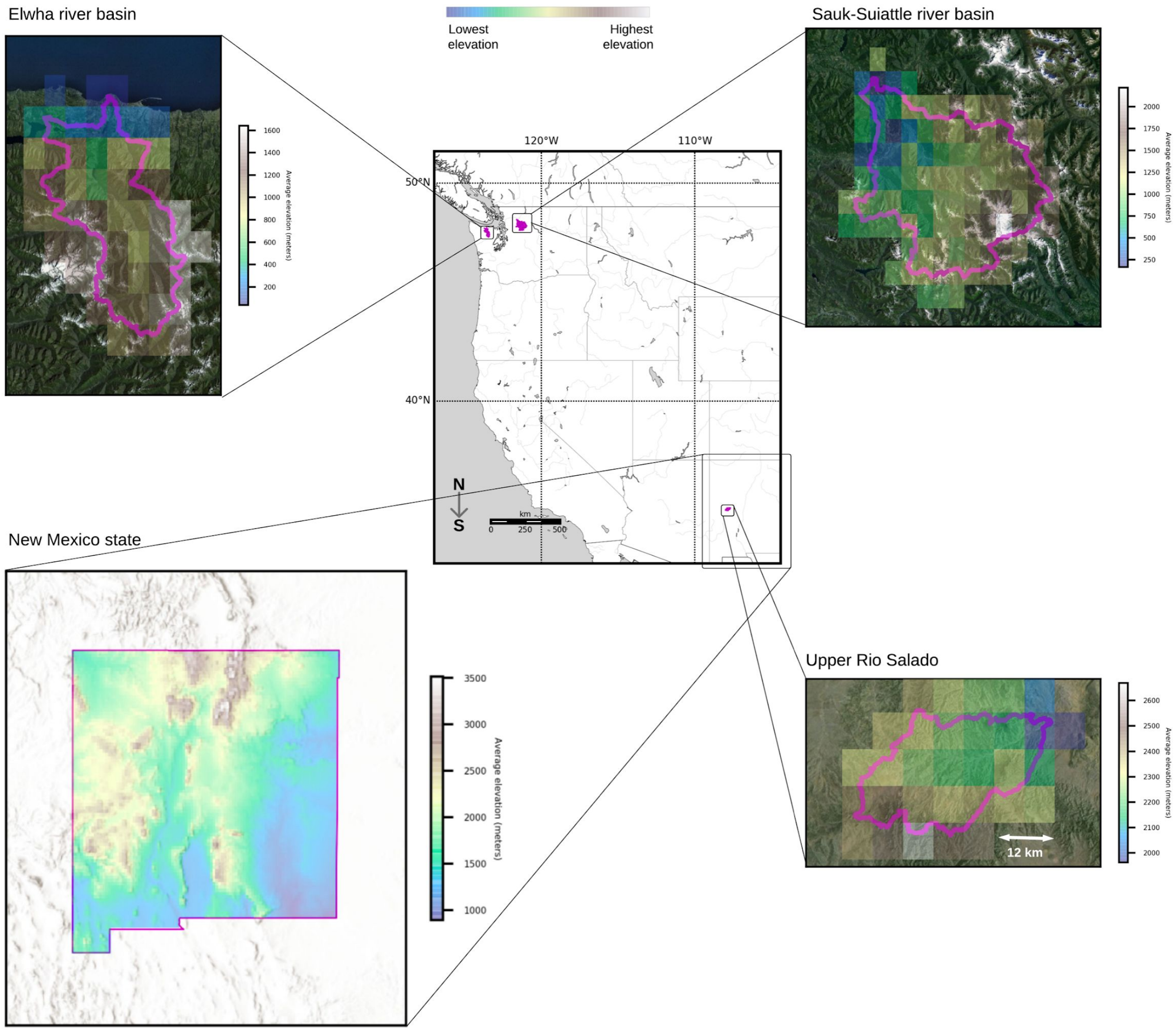


7917 grid cells (0 buffer)

31 cells (0.06° buffer)

Human Readable Inspection

55 cells (0.06° buffer)
15 sec/dataset
download



99 cells (0.06° buffer)
25 sec/ dataset
download

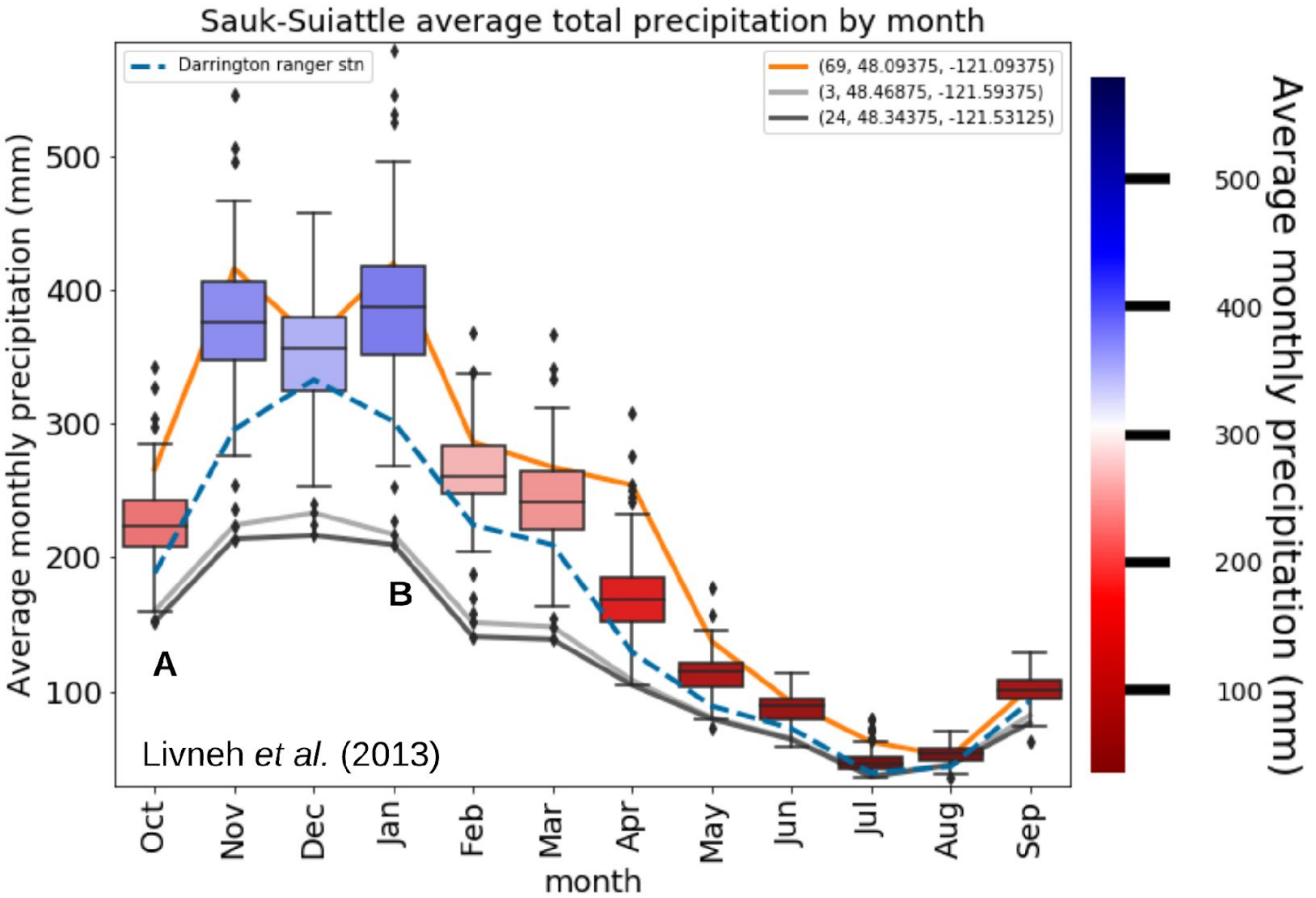
7917 grid cells (0 buffer)
28 min/data set
download

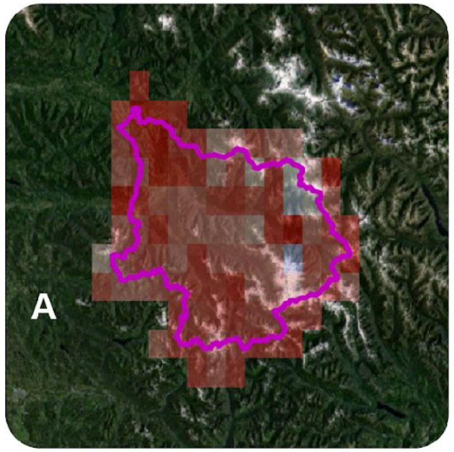
31 cells (0.06° buffer)
13 sec/data set
download

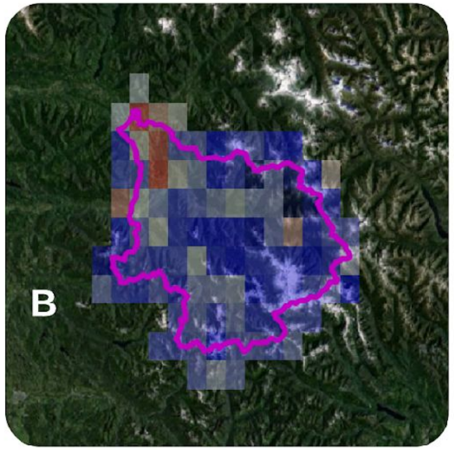
Summarize data availability

	Watersheds		
	Sauk-Suiattle river	Elwha river	Rio Salado
Median Elevation in meters [range] (Number of gridded cells)	1171[164-2216] (n=99)	1020[36-1642] (n=55)	2308[1962-2669] (n=31)
dailymet_bclivneh2013	1171[164-2216] (n=99)	1120[36-1642] (n=55)	0
dailymet_livneh2013	1171[164-2216] (n=99)	1146[174-1642] (n=52)	2308[1962-2669] (n=31)
dailymet_livneh2015	1171[164-2216] (n=99)	1120[36-1642] (n=55)	2308[1962-2669] (n=31)
dailyvic_livneh2013	1171[164-2216] (n=99)	1146[174-1642] (n=52)	2308[1962-2669] (n=31)
dailyvic_livneh2015	1171[164-2216] (n=99)	1120[36-1642](n=55)	2308[1962-2669] (n=31)
dailywrf_salathe2014	1171[164-2216] (n=99)	1142[97-1642] (n=53)	0
dailywrf_bcsalathe2014	1171[164-2216] (n=99)	1142[97-1642] (n=53)	0

Summarize Trends







Examples catalog of gridded data sets

GISS surface temperature analysis	Goddard Institute for Space Studies (GISS/NASA) surface temperature analysis for the globe; globally gridded at a 2x2 resolution.	Catalog
NCEP GODAS ocean analysis	High Resolution Multi-level ocean analysis from NCEP	Catalog
Global Precipitation Climatology Centre (GPCC)	GPCC Global Precipitation Climatology Centre monthly precipitation dataset from 1901-present is calculated from global station data.	Catalog
GPCP V2.3 Precipitation	Global Precipitation Climatology Project monthly precipitation dataset from 1979-present combines observations and satellite precipitation data into 2.5°x2.5° global grids.	Catalog
ICOADS	Global surface marine data from 1800 to near the present summarized in monthly gridded formats (2°x2° boxes, or 1°x1° boxes from 1960 forward), and offering a variety of statistics.	Catalog
Interpolated OLR	Gridded daily and monthly OLR data from NCAR with temporal interpolation. See the related **Uninterpolated OLR** dataset.	Catalog
Kaplan SST	Gridded global SST anomalies from 1856-present derived from UK Met Office SST data which has had sophisticated statistical techniques applied to it to fill in gaps.	Catalog

Minimum Annotation Criteria

Metadata	Metadata descriptions
File location	
1. Dataset	name of the gridded data product
2. Spatial resolution	the distance between gridded cell centroids
3. Web protocol	the data transfer protocol
4. Domain	the web domain
5. Subdomain	the subdomain path
6. Decision steps	the file organization for locating data files
7. Filename structure	the standard components to the filename
8. File format	the file type at download
File structure	
9. Start date	the start date of the time-series
10. End date	the end date of the time-series
11. Temporal resolution	the unit increment for time-steps
12. Delimiter	the column separator within each line of data
13. Variable_list	the list of variables in order of appearance
14. Reference	the sources of metadata
Variable structure	
15. Variable_info	
• desc	the long name of the variable
• dtypes	the expected data type
• units	the unit increment of the data

SMALL GROUP ACTIVITY

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TUTORIAL: https://bit.ly/2JsmTMJ

ROLES

ARCHITECTS are interested in where objects are. Your objective is to draw a visual representation of the workflow with where files are and what functions led to their finished output files.	ACCOUNTANTS are interested in the numerical count of things. Your objective is to figure out how many data objects are inputs and outputs from the OGH functions. Identify what steps have functions that are slow.

GOAL

Get into groups of 4-5. Each participant picks a role with at least one role type per group. Work through the use-case notebook and discuss each step of the 8 steps with your groupmates, while noting observations as your player role to reach your objectives.

EXPECTED OUTCOME

- A drawing of data and workflow
- Numbers for the number of objects involved.

HINT:
SOME FUNCTIONS HAVE MULTIPLE OUTPUTS

Discussion questions

Please answer the following questions on a Post-It canvas

- **Key objects**: What are important data files or object names that you noticed?
- **Fast or slow**: Which steps are relatively slow? Relatively fast?
- **Clarification**: Was there something that your group struggled to figure out?
- **User control**: Did you try changing different parameters in the tutorial?