

Climatology Calculation Support in the GeoCAT Ecosystem

Part of the Pivot to Python

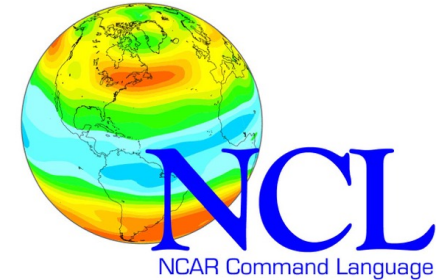
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July 27, 2021

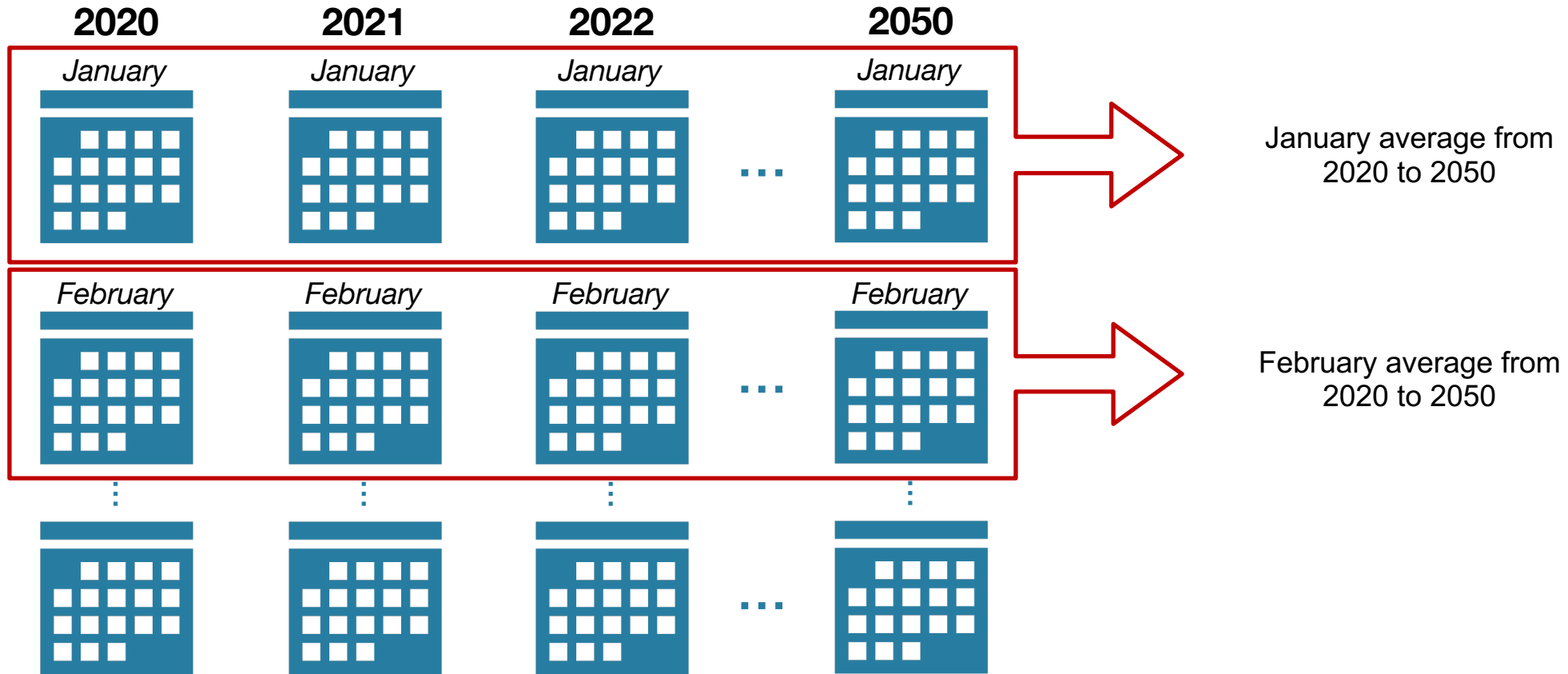


NCL functionality needs to be added to the GeoCAT ecosystem

- Visualization
 - Example gallery (GeoCAT-examples)
 - Wrapper classes (GeoCAT-viz)
- Computation (GeoCAT-comp)
 - Working with different kinds of model data (i.e. CAM-SE)
 - Interpolation of data
 - Handling data on non-rectangular mesh grids
 - Calculating climatological averages

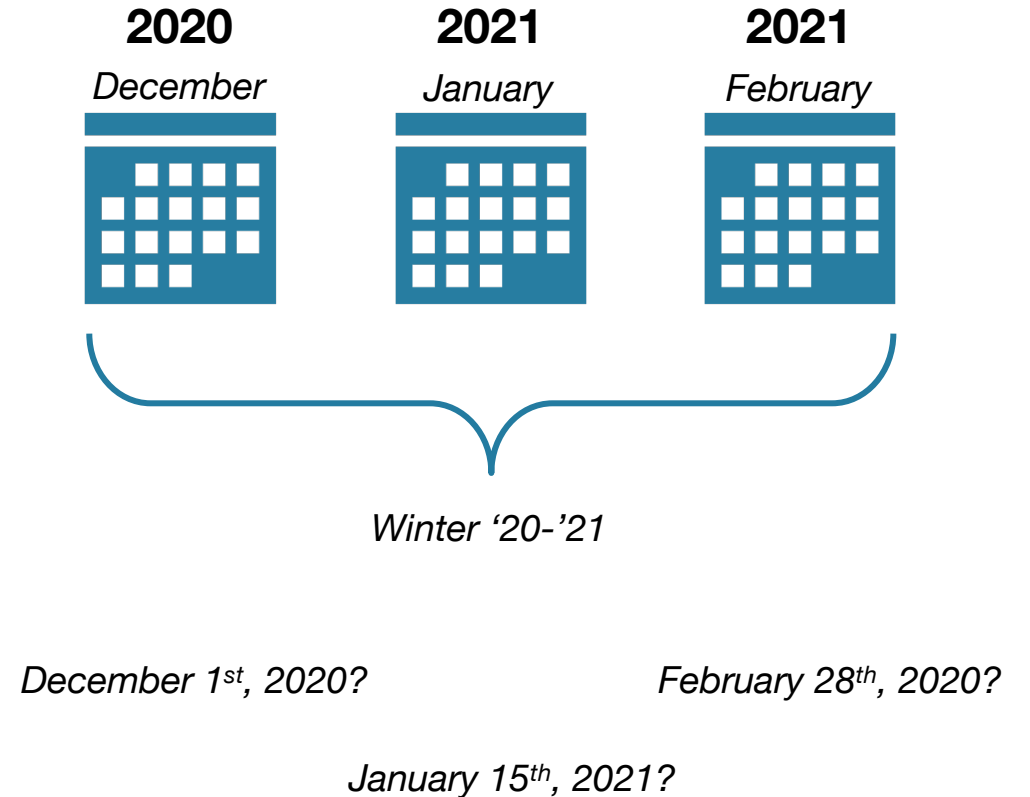


What is a climatological average?



What do users need and want?

- User Stories
 - Asked for input on Zulip
 - Contacted people working on the Earth System Data Science (ESDS) Initiative
- Feedback
 - Different ways to handle the output datetimes
 - Weight monthly data when finding seasonal means



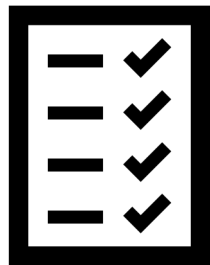
```
def climatology_average(  
    dset: typing.Union[xr.DataArray, xr.Dataset],  
    freq: str,  
    time_dim: str = None) -> typing.Union[xr.DataArray, xr.Dataset]:
```

Calculates long term hourly, daily, monthly, or seasonal averages across all years in the data

- Inputs:
 - The data as an `xarray.DataArray` or `xarray.Dataset`
 - A string representing the frequency of the calculated climatological averages
 - 'hour', 'day', 'month', 'season'
 - The name of the time dimension
 - Optional, will be inferred if not given
- Output:
 - Climatological averages for each period

Jupyter Notebook Demo

What's next?



Implement NCL Functions

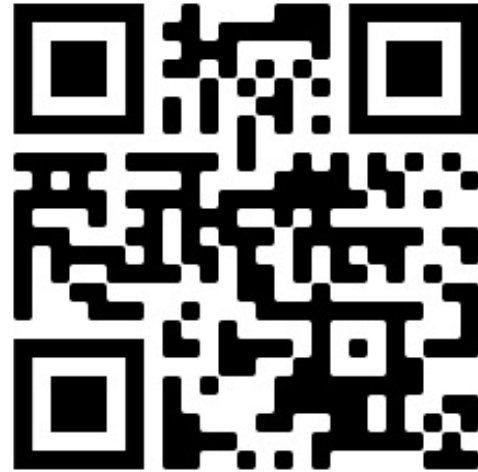


Incorporate User Feedback

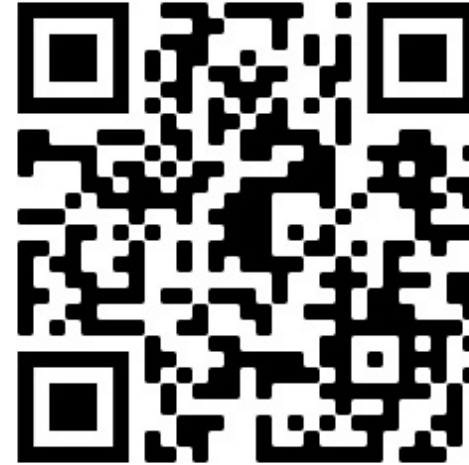


Create New Tools

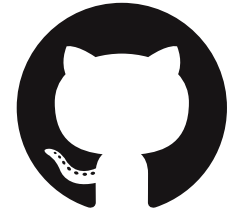
Thank you for listening!



GeoCAT Website
<https://geocat.ucar.edu/>



GeoCAT-comp GitHub
<https://github.com/NCAR/geocat-comp>



Special thanks to my mentors and collaborators this summer:
Alea Kootz, Orhan Eroglu, Max Grover, Anderson Banihirwe, and Deepak Cherian