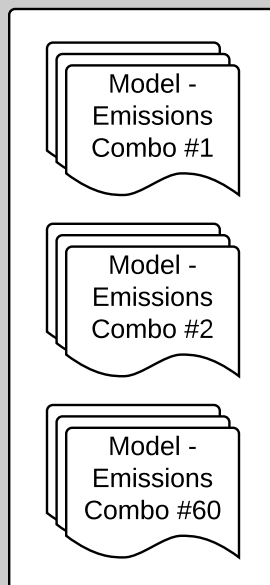


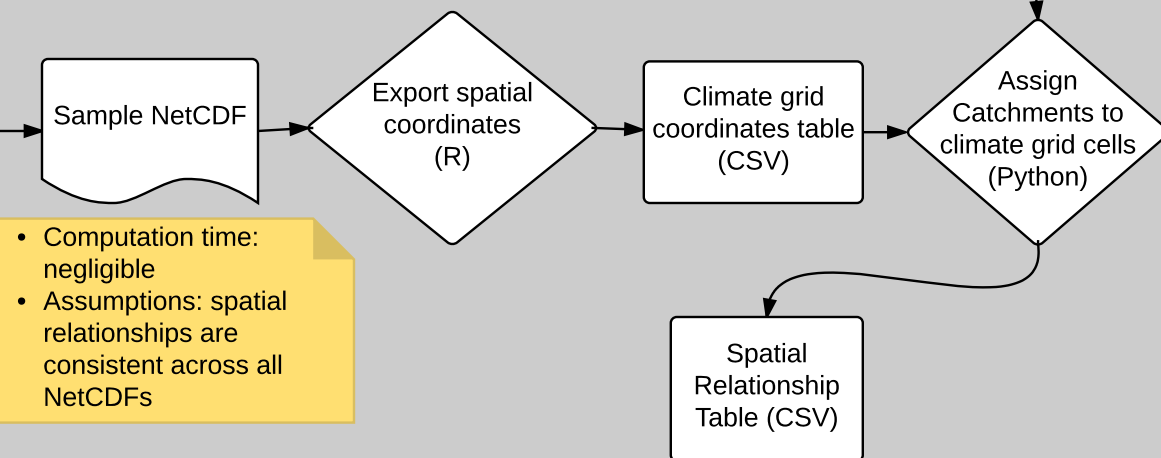
NetCDF Library

- 60 model - emissions scenario combinations
- 150 years
- 3 variables
- ~450 NetCDFs per model/scenario
- ~ 27,000 total NetCDFs



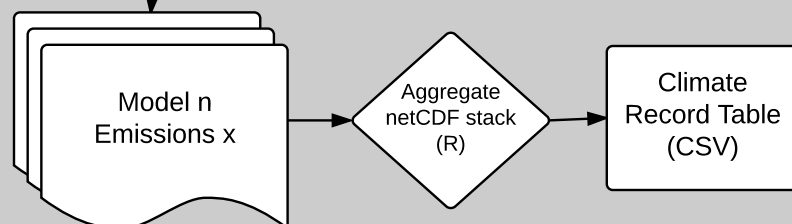
Determine Spatial Relationships

A single NetCDF file is used to access spatial coordinates of the grid cells. These grid cells are overlaid with the catchment centroids to produce a table identifying which grid cell is associated with each FEATUREID.



- Computation time: negligible
- Assumptions: spatial relationships are consistent across all NetCDFs

Store Climate Data



Individual NetCDF files are grouped by model/scenario. This step aggregates 450 1-year/1-variable files into 1 full-record CSV which may then be uploaded as a table to the database. The grid cells are reduced to only those intersecting the catchments.

- Computation Time: 25 minutes for 55 years (historical)
- Estimated Computation Time: 80 hours

Database Upload

The spatial relationship table is uploaded to the database with 4 columns (cellid, lat, lon, featureid) and ~450K rows (1 for each featureid).

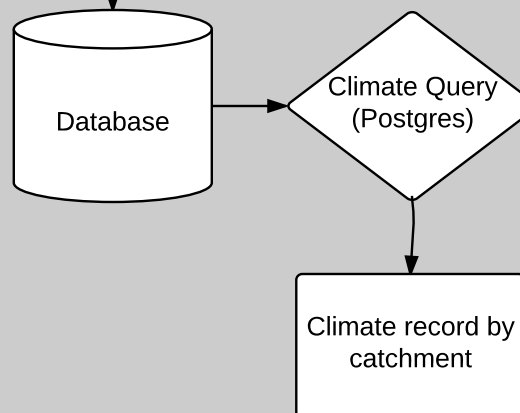
- Server upload time: negligible
- Database upload time: negligible

The climate record tables are uploaded as individual tables (1 for each model/scenario) with 5 columns (cellid, date, pr, tasmax, tasmin).

- Server upload time: **3 hrs per CSV**
- Database upload time: 5-6 minutes per CSV
- Storage Space: ~300 GB total



Query Climate Data



- Query time: ~ 30 s for 1000 featureids in one model over 55 years
- Query time will slow some with full record