HAS Tools:

Working with ERA5 & Downscaled CMIP6 data

December 2, 2024

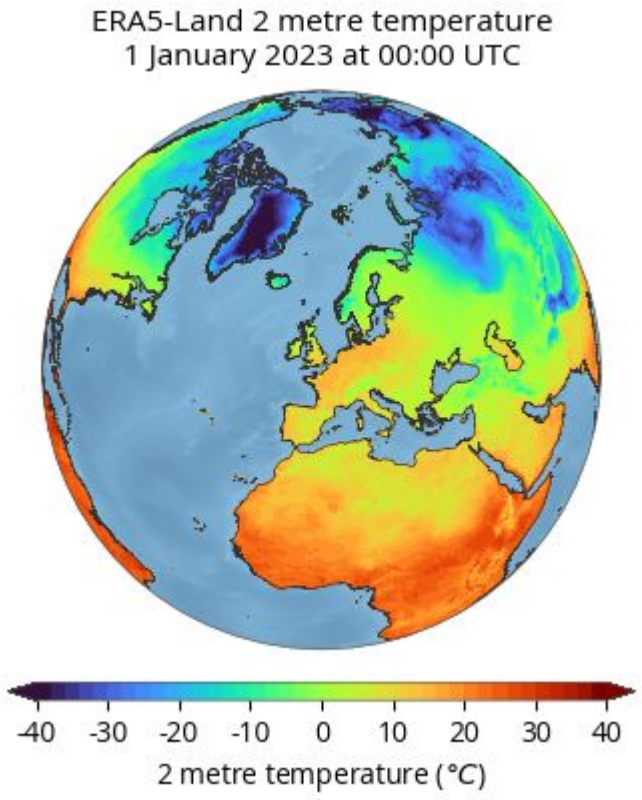
Welcome back!

- Topics this week:
  - Today: Prep/background for final assignment
  - Weds: Generative AI tools
  - Fri: GIS/mapping extra content
- Next Week:
  - Monday: Course reflection/discussion
  - Wednesday: Work time/time off
- Please fill out course evaluations!
- Anything else?

On reanalysis

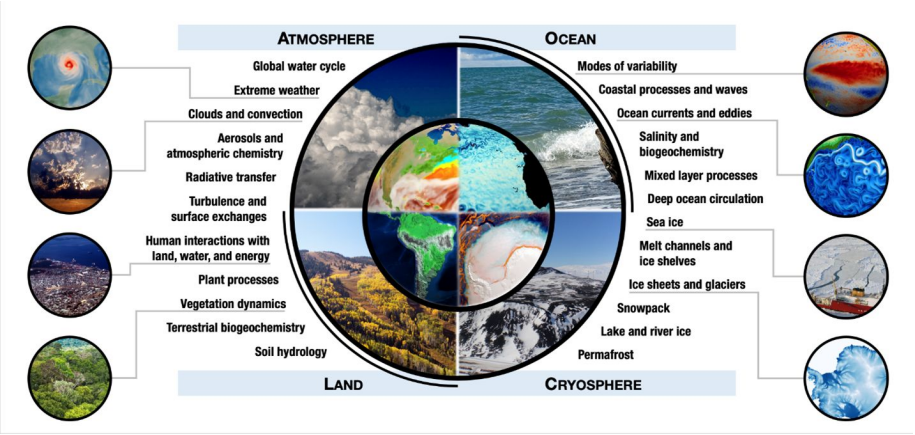
The role of reanalysis:

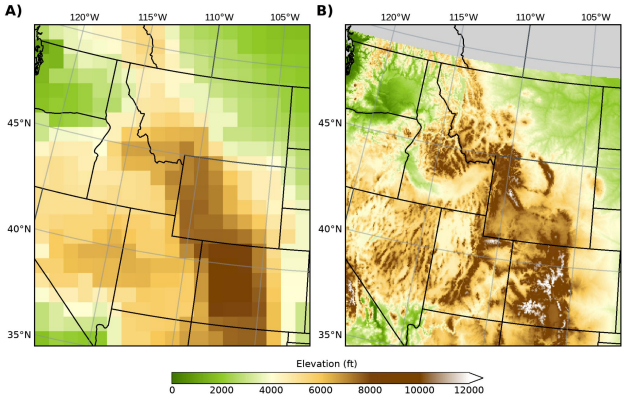
- Learn as much as we possibly can by synthesizing as much data as possible
- Uses model results, historic data, and modern observations
- Produce a spatiotemporally complete view of the Earth System



Climate projections & downscaling

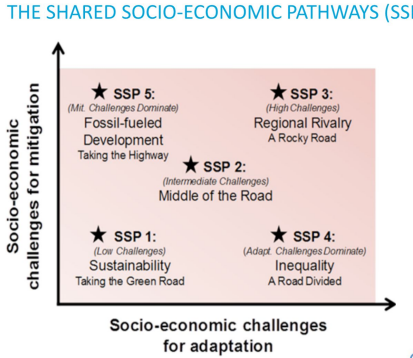
- You have certainly heard of climate projections
- Earth systems models represent the best state of our knowledge
- High process complexity tends to mean low spatial resolution
- To understand regional/local impacts downscaling is done
  - Dynamical vs statistical

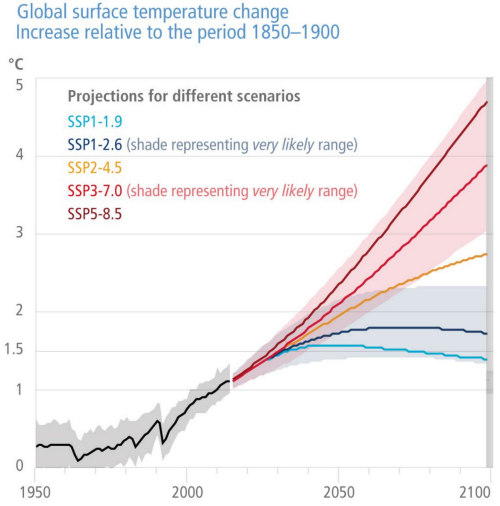




Shared socio-economic pathways

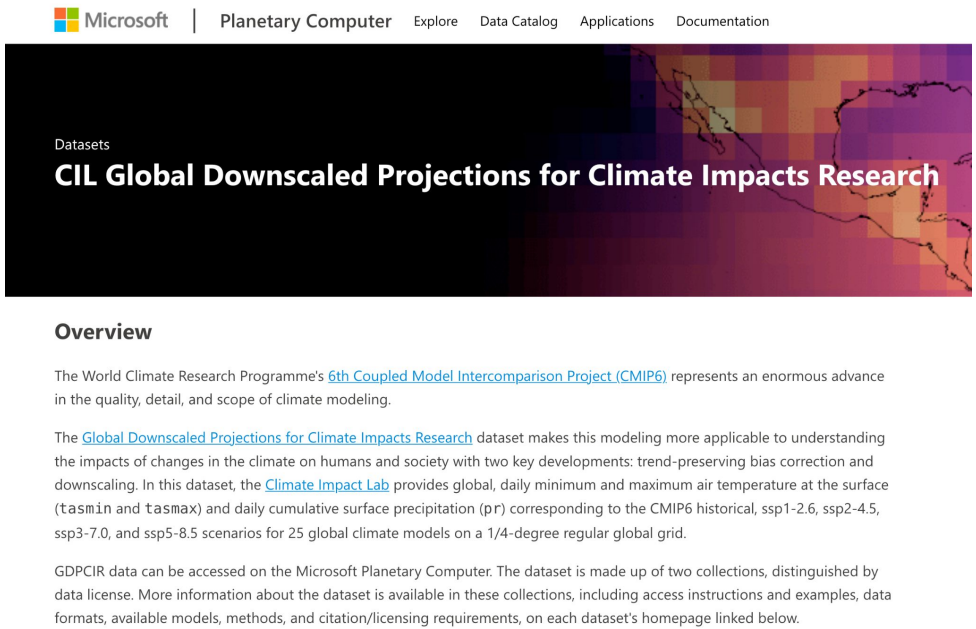
- While we understand and can encode much of the physics/chemistry/etc of the Earth system, humans are harder to model
- SSPs are how we talk about how human actions may change the Earth system
- Mitigation vs adaptation
- We will focus on SSP2-4.5 and SSP5-8.5 for simplicity





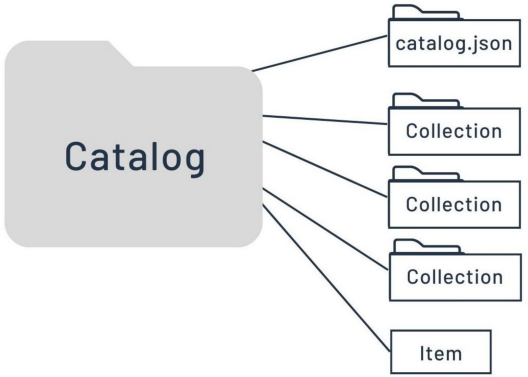
Climate Impacts Lab Downscaled Data

- This is the new dataset we will use for the final assignment
- It contains temperature and precipitation data at 25km scale for:
  - Multiple SSPs
  - Multiple Climate models
- Data is stored on MS Planetary Computer and accessed via a STAC catalog



SpatioTemporal Asset Catalog

- Aims to provide a unified language to talk about geospatial data
- Makes large datasets/collections of datasets:
  - Searchable
  - Queryable
- Three main building blocks:
  - item, catalog, collection

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jump to codespaces for tutorial