CMIP6 CLIMATE DATA AND MODELS OVERVIEW

- *Understanding Climate Models, Scenarios, and Projections*
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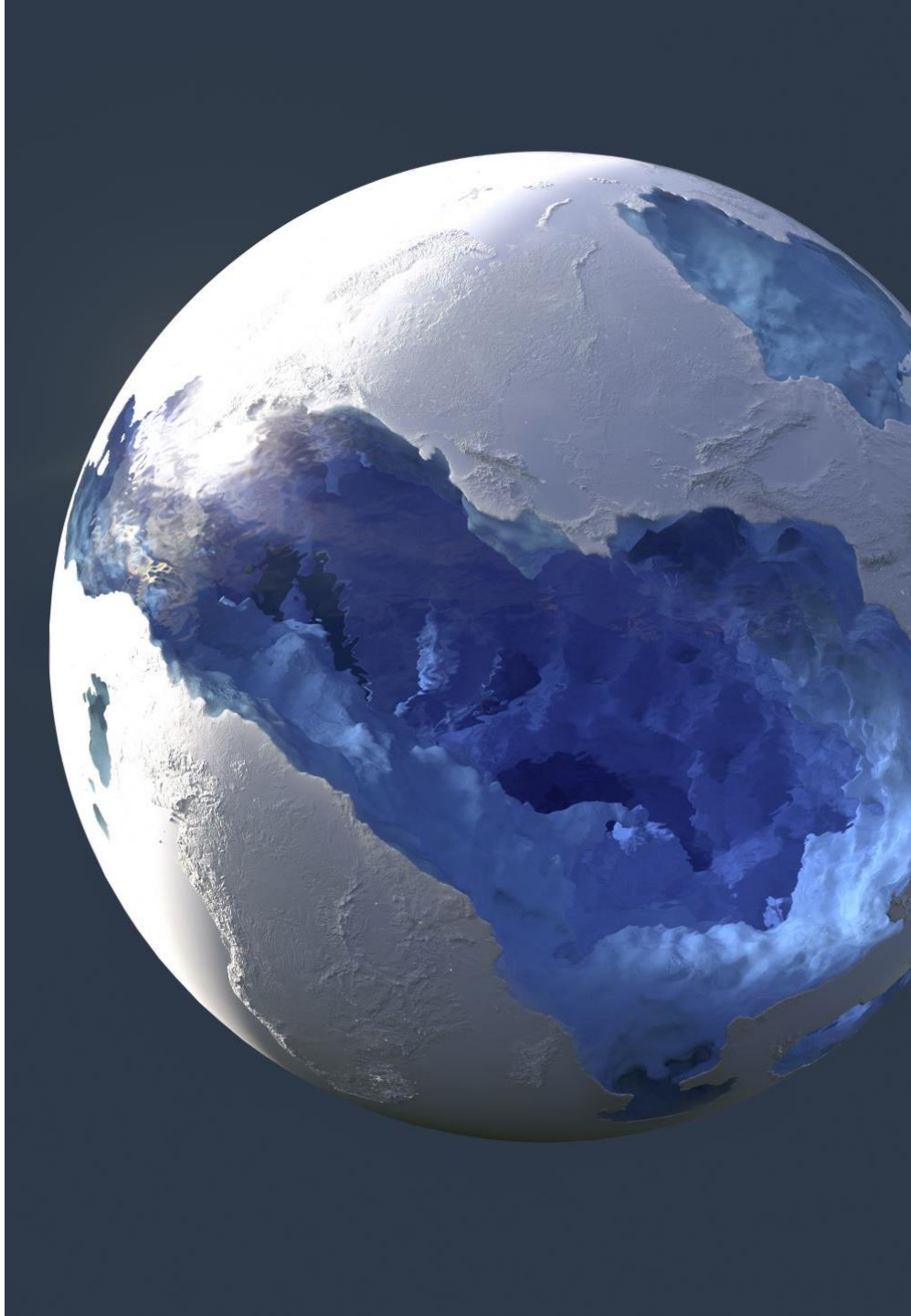
CMIP6 OVERVIEW

- CMIP6 involves around 100 distinct models from 49 different groups globally.
- Provides improved exploration of future emission scenarios, socio-economic pathways, and Earth system interactions.
- Despite delays, CMIP6 data provides key insights into climate sensitivity and future warming projections.



WHY IS CMIP6 IMPORTANT?

- CMIP6 enables policymakers, researchers, and scientists to assess climate risks.
- It provides models and scenarios that are critical for planning in sectors like agriculture, water resources, and infrastructure development.
- It helps in predicting regional changes in climate, extreme events, and long-term trends.

THE NEW SOCIOECONOMIC PATHWAYS (SSPS)

- CMIP6 uses **Shared Socioeconomic Pathways (SSPs)** to drive climate models, reflecting various future emission and policy scenarios.
- The SSPs replace CMIP5's **Representative Concentration Pathways (RCPs)**.
- **SSP1-1.9** to **SSP5-8.5** represent a range from aggressive emission cuts to high-emission, no-policy scenarios.

CMIP6 SCENARIO OVERVIEW

- **SSP1-1.9**: Aims to limit warming to below 1.5°C by 2100, in line with the Paris Agreement goals.
- **SSP1-2.6**: Targets a radiative forcing of 2.6 W/m² by 2100, similar to RCP2.6.
- **SSP2-4.5**: A middle-of-the-road scenario, similar to RCP4.5, assuming moderate emission reductions.
- **SSP3-7.0**: A no-policy baseline scenario, presenting mid-range emission outcomes.
- **SSP5-8.5**: A high-emission, fossil-fuel-intensive future without climate policies, similar to RCP8.5.

COMPARING SCENARIOS – WHAT DO THEY MEAN?

- **SSP1-2.6** and **SSP1-1.9**: Project limited warming through rapid emission reductions.
- **SSP2-4.5**: Projects moderate warming, balancing economic growth with climate policies.
- **SSP3-7.0**: Represents a mid-level, no-climate-policy future, leading to substantial warming.
- **SSP5-8.5**: Worst-case scenario with significant long-term warming (4°C or more by 2100).

CMIP6 CLIMATE DATA EXPLORER: OVERVIEW

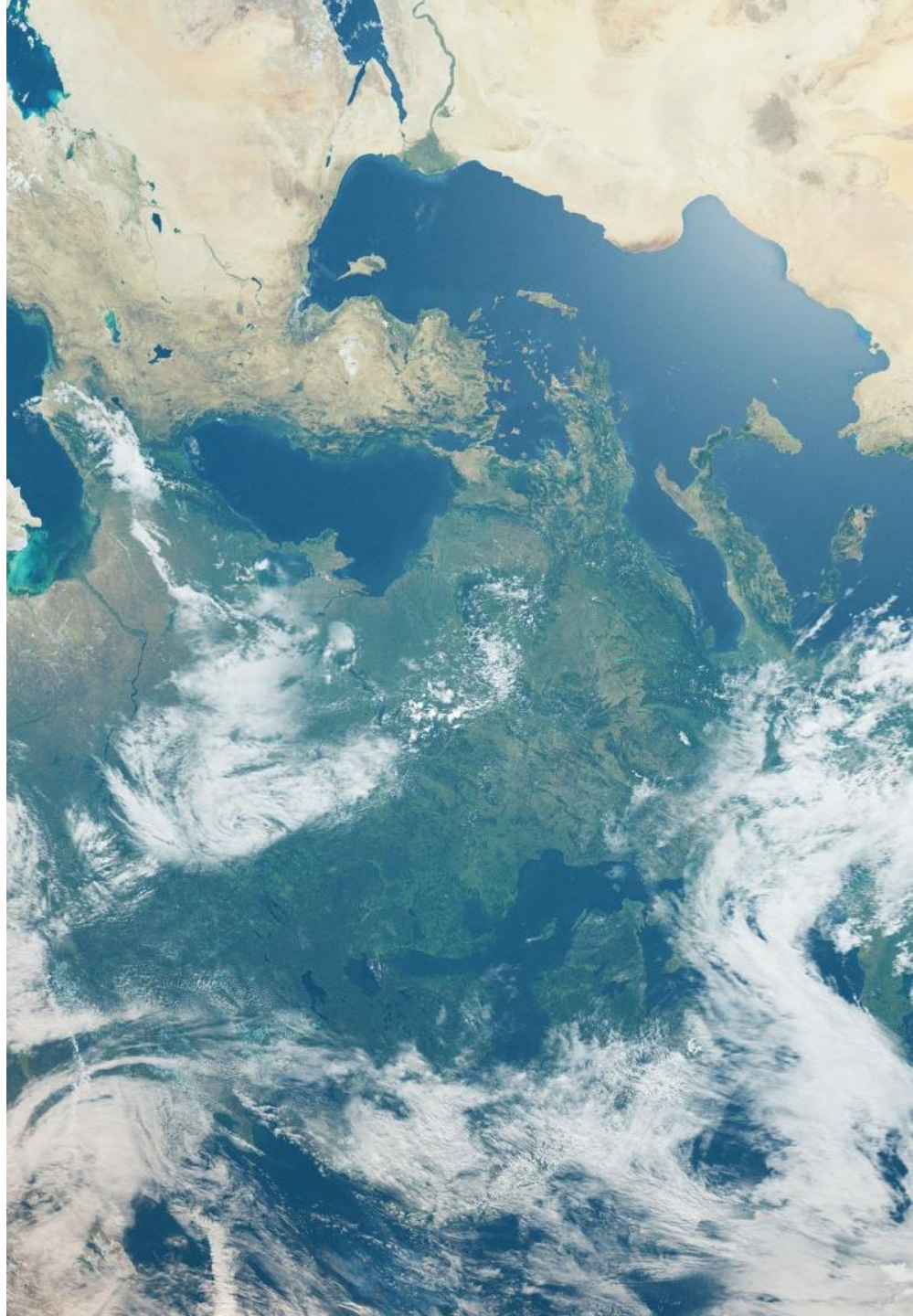
The app allows users to explore temperature and precipitation data using CMIP6 climate models.

Users can generate **time series** for any region by drawing polygons, rectangles, or selecting points on a map.

Interactive layers: Users can select climate models, scenarios, and years for customized analysis.

SUPPORTED CLIMATE MODELS IN THE APP

- **ACCESS-CM2**: A model developed by the Australian Community Climate and Earth-System Simulator.
- **IITM-ESM**: A model developed by the Indian Institute of Tropical Meteorology, focusing on regional climate.
- Note: IITM-ESM does not provide minimum and maximum temperature data, but precipitation data is available.
- Total 20 models are included in APP for visualization



HOW DOES THE APP WORK?

Select Climate Model: Choose from available CMIP6 models (e.g., ACCESS-CM2, IITM-ESM).

Select Scenario: Choose the scenario (e.g., Historical, SSP245, SSP585).

Select Year: Define the time range (e.g., 1950-2100).

Draw Area: Use the map to select the area of interest using a polygon, rectangle, or point selection tool.

Time Series Generation: A chart displays the temperature or precipitation trends for the selected region and time period.

APP FEATURES

Interactive Map: Users can zoom in/out, move the map, and draw custom areas for analysis.

Dynamic Time Series: Temperature and precipitation data is plotted instantly based on user selections.

Multiple Layers: View different climate variables such as minimum temperature, maximum temperature, or precipitation.

DATA SOURCES AND COLLECTION

- **NASA GDDP-CMIP6**: Global dataset used in the app.
  - Includes temperature (tasmin, tasmax) and precipitation (pr) variables.
  - Provides data from 1950 to 2100 under different climate models and scenarios.
- These datasets are part of **NASA EarthData**.

GITHUB REPOSITORY AND ACCESS

LINK TO GITHUB REPOSITORY : HTTPS://GITHUB.COM/PRAJU46/GOOGLE-EARTH-ENGINE-APP-FOR-CMIP6-DATA-EXPLORER.GIT

INSTRUCTIONS FOR CONTRIBUTING TO THE PROJECT, INCLUDING HOW TO FORK, CLONE, AND SUBMIT A PULL REQUEST (AVAILABLE IN README FILE).