When working with climate change data, researchers have access to a variety of data sources, each with its own strengths and limitations. Here are some key sources of climate change data:

**1. Satellite Observations**

* **NASA’s Earth Observing System (EOS)**: Includes missions like Terra, Aqua, and Suomi NPP, which provide data on atmospheric composition, temperature, and land surface changes.
* **European Space Agency (ESA) Climate Change Initiative**: Offers datasets from missions like the Sentinel series and others focusing on various climate variables.
* **NOAA’s National Environmental Satellite, Data, and Information Service (NESDIS)**: Provides satellite data on weather, climate, and environmental monitoring.

**2. Ground-Based Observations**

* **National Weather Service (NWS)**: In the U.S., provides local climate data, weather observations, and historical weather records.
* **Meteorological Agencies**: National agencies (e.g., the UK Met Office, the Japan Meteorological Agency) offer climate data specific to their regions.
* **Global Historical Climatology Network (GHCN)**: Maintained by NOAA, provides historical weather and climate data from weather stations around the world.

**3. Climate Models and Projections**

* **Coupled Model Intercomparison Project (CMIP)**: Provides data from various climate models used to simulate future climate scenarios.
* **IPCC Data Distribution Centre**: Offers model outputs and climate projections used in the Intergovernmental Panel on Climate Change (IPCC) reports.
* **National Center for Atmospheric Research (NCAR)**: Provides model outputs and data sets for climate and weather research.

**4. Reanalysis Datasets**

* **European Centre for Medium-Range Weather Forecasts (ECMWF) Reanalysis**: Includes data such as temperature, precipitation, and atmospheric variables from historical reanalyses.
* **NASA’s Modern-Era Retrospective analysis for Research and Applications (MERRA)**: Offers reanalysis data for atmospheric and surface conditions.
* **NOAA’s Climate Prediction Center (CPC) Reanalysis**: Provides global reanalysis data for climate research.

**5. Paleoclimate Data**

* **National Centers for Environmental Information (NCEI)**: Offers paleoclimatic data such as ice cores, tree rings, and sediment records.
* **PAGES (Past Global Changes)**: Provides reconstructions of past climate changes based on various proxy data sources.

**6. Climate Data Portals**

* **Climate Data Initiative**: A U.S. government portal offering access to a wide range of climate-related data.
* **Copernicus Climate Change Service (C3S)**: Provides climate data and information for Europe and the world, including climate projections and historical data.
* **WorldClim**: Offers high-resolution climate data, including historical and future climate projections.

**7. Institutional Databases and Repositories**

* **World Meteorological Organization (WMO)**: Provides access to a variety of global climate data and standards.
* **International Climate Assessment and Dataset (ICAD)**: Offers datasets related to climate impacts and adaptation.
* **Global Carbon Project**: Provides data on carbon fluxes and emissions related to climate change.

**8. Local and Regional Climate Networks**

* **Regional Climate Centers**: Offer localized climate data and information specific to particular regions (e.g., the Southeast Regional Climate Center in the U.S.).
* **Local Universities and Research Institutions**: Often have region-specific climate data and research projects.

**9. Citizen Science and Crowdsourced Data**

* **Weather Underground**: Provides crowdsourced weather data from personal weather stations.
* **CoCoRaHS (Community Collaborative Rain, Hail & Snow Network)**: Offers precipitation data collected by volunteers.

**10. Data Repositories and Libraries**

* **Data.gov**: A U.S. government platform that includes climate and environmental data among other datasets.
* **Zenodo**: An open-access repository that includes climate-related datasets from various research projects.

These sources provide a range of data types and scales, from global satellite observations to local ground-based measurements, enabling researchers to analyze and understand climate change from multiple perspectives.