

Climate Data Store – data and API

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Copernicus is the **European Programme** for the establishment of a European capacity for Earth Observation



Atmosphere Monitoring;



Marine Environment Monitoring;



Land Monitoring;



Climate Change;



Emergency Management;

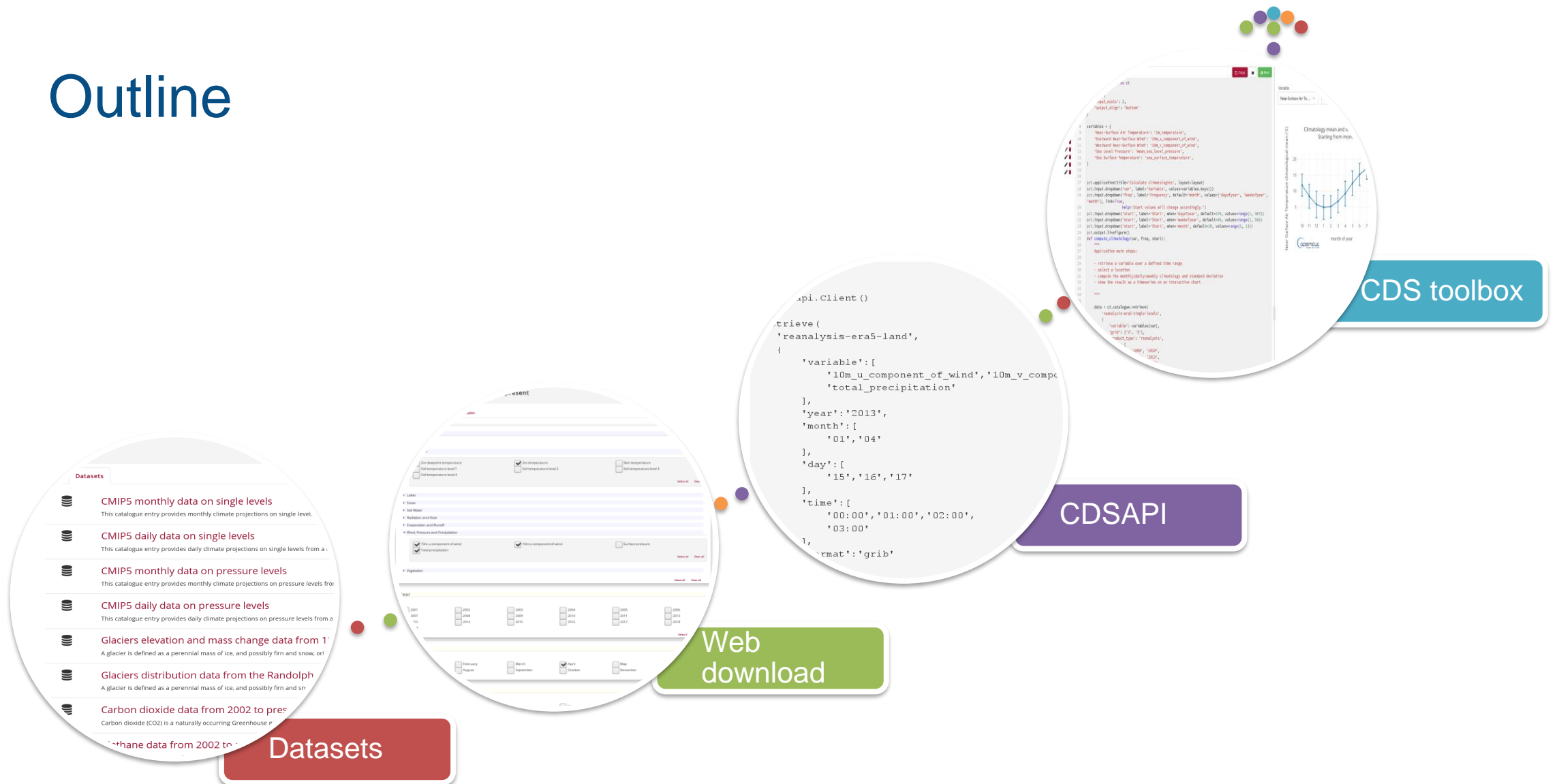


Security.



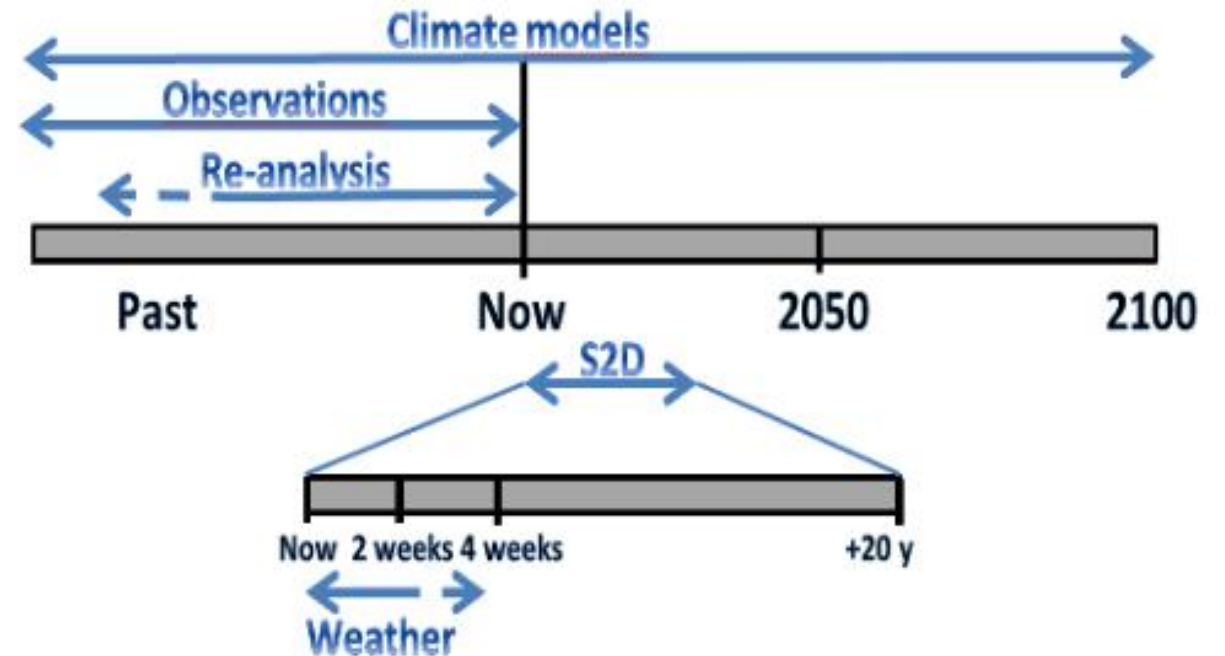
- The European Commission has entrusted ECMWF with the implementation of the **Copernicus Climate Change Service – C3S**
- **Climate Data Store** - **past**, **present** and **future** climate datasets available through a unified web interface
- The CDS contains:
 - **observations**,
 - global and regional climate **reanalyses**,
 - global and regional **climate projections** and **seasonal forecasts**
- The CDS **toolbox** to **develop applications** to make use of the content of the CDS

Outline

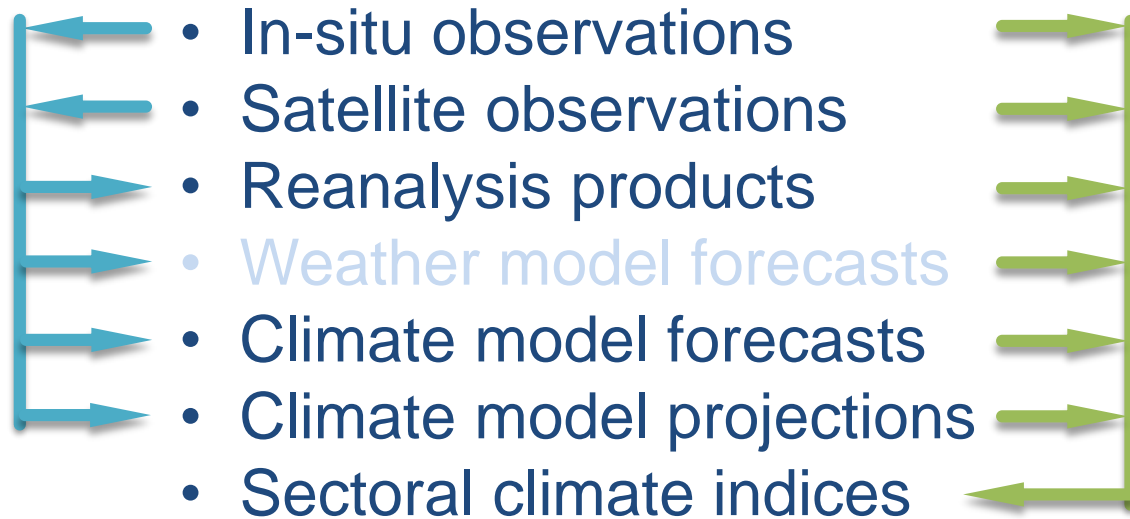


Sources

- In-situ observations
- Satellite observations
- Reanalysis products
- Weather model forecasts
- Climate model forecasts
- Climate model projections

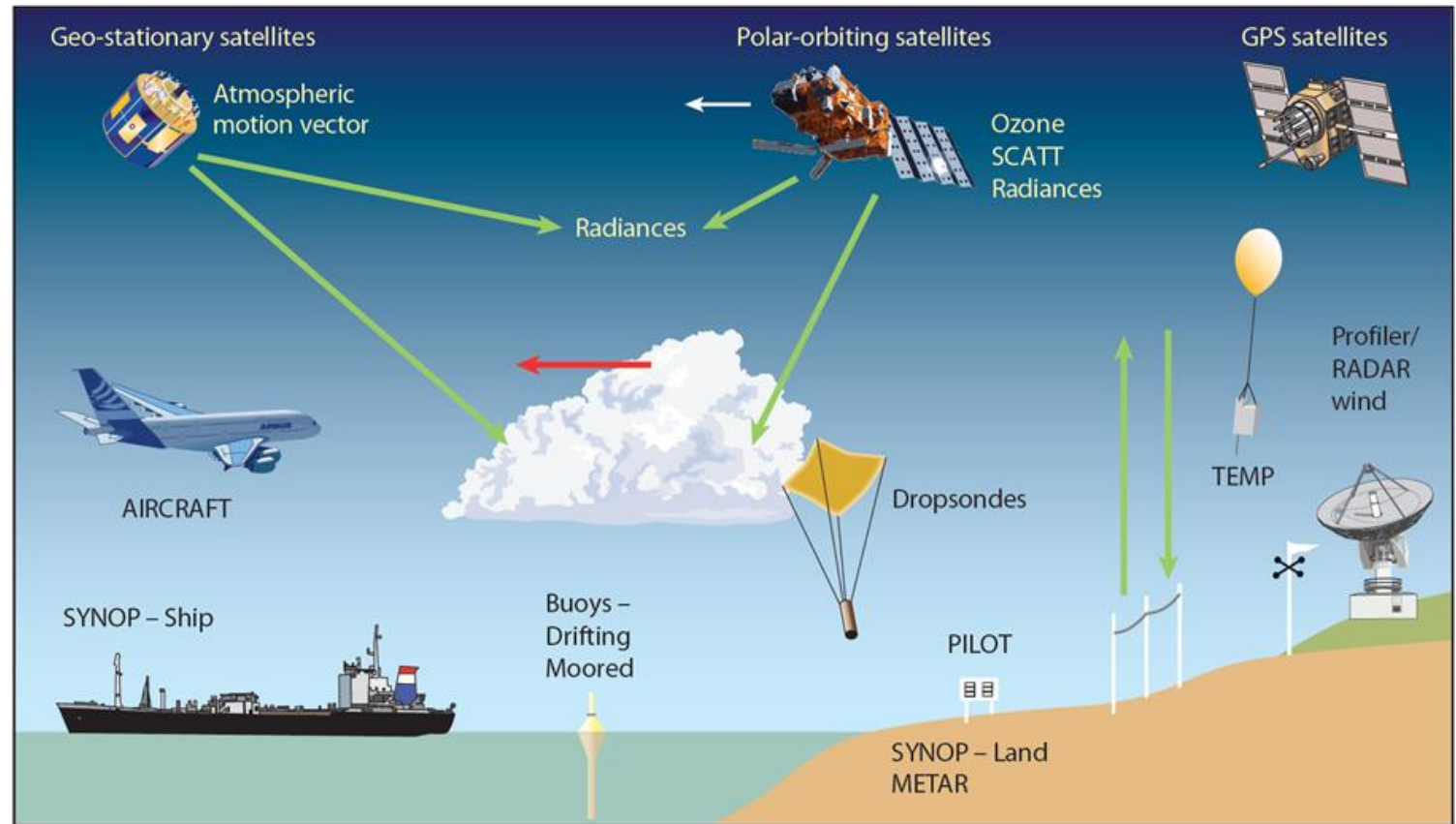


Sources



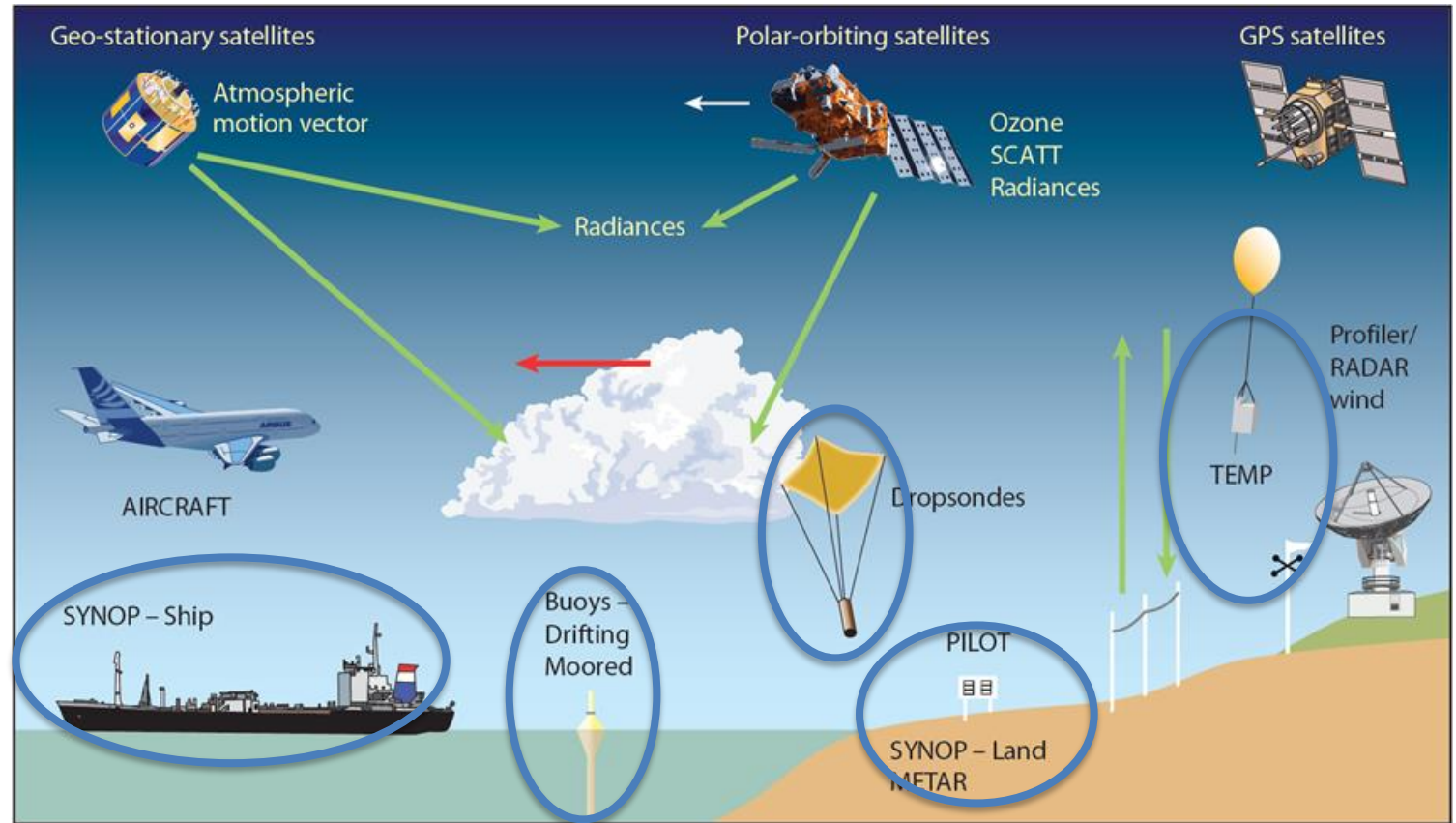
Sources

- In-situ observations (1850s → now)
- Satellite observations (1970s → now)



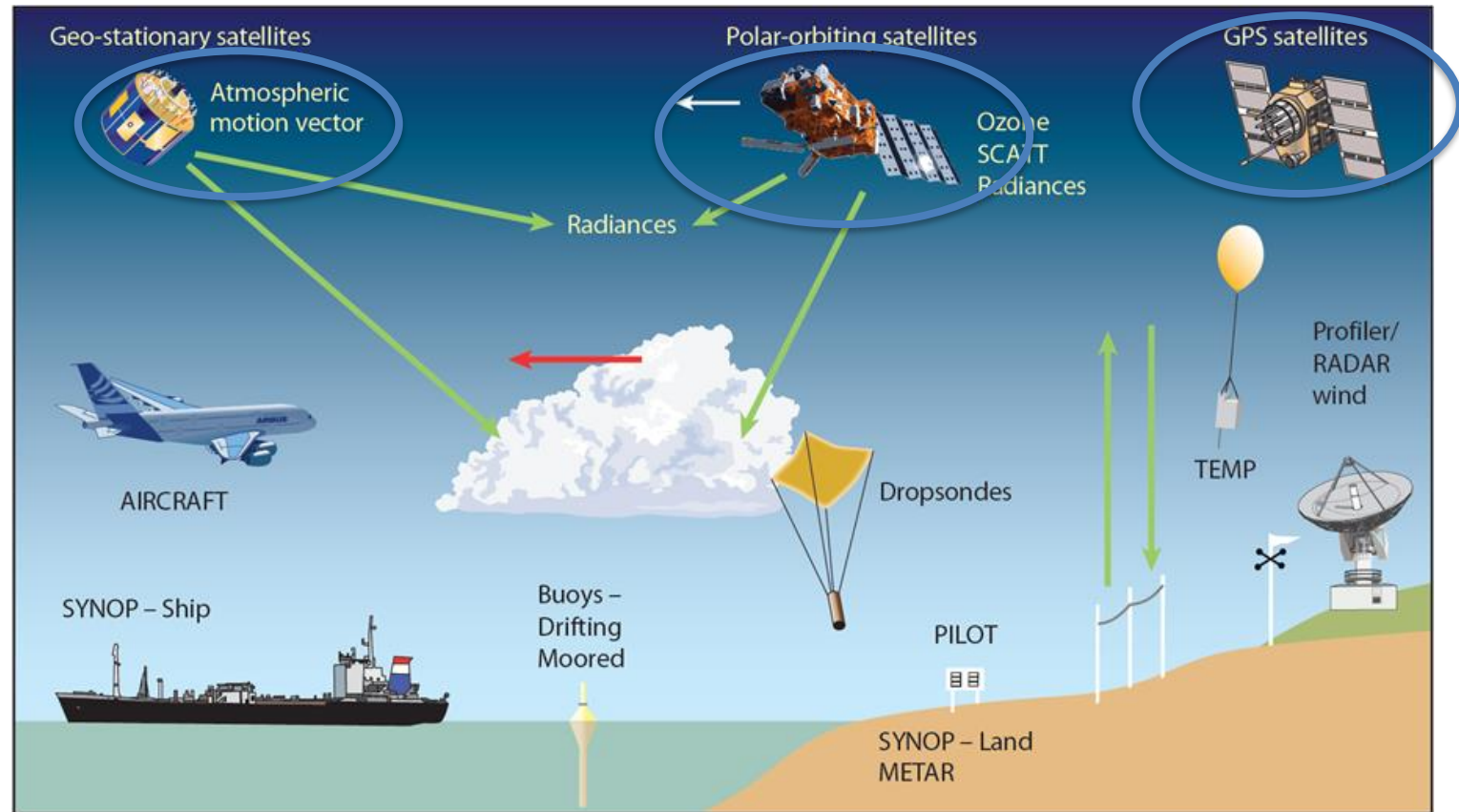
Sources

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(1850s → now)
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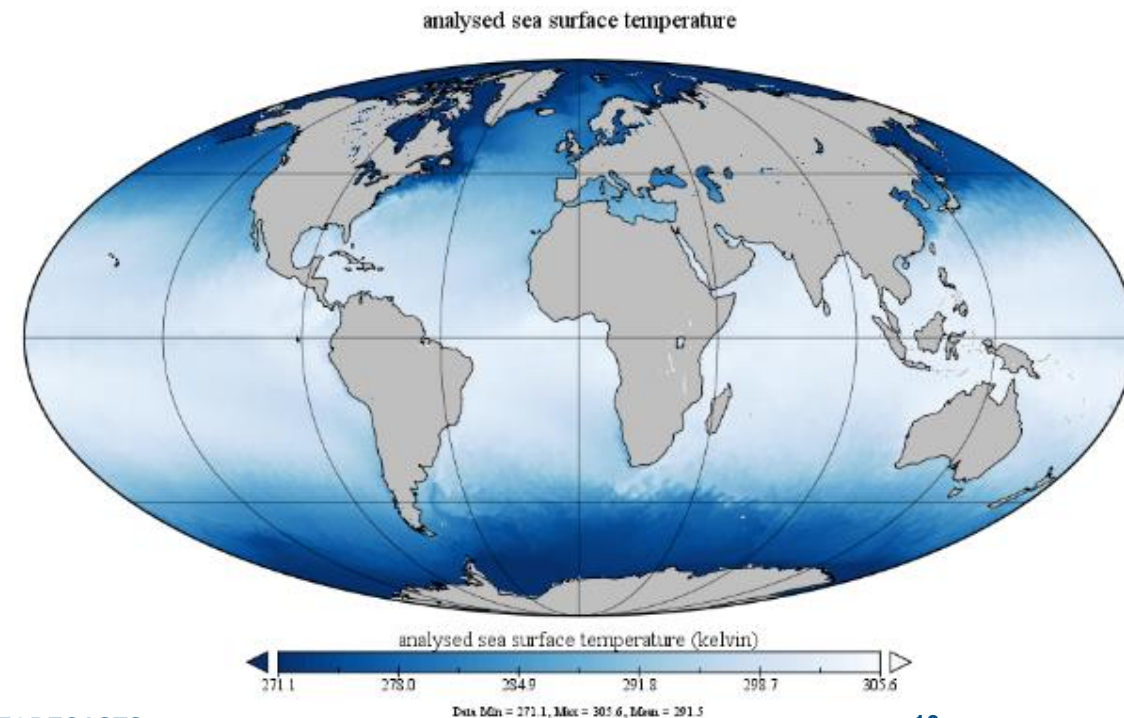
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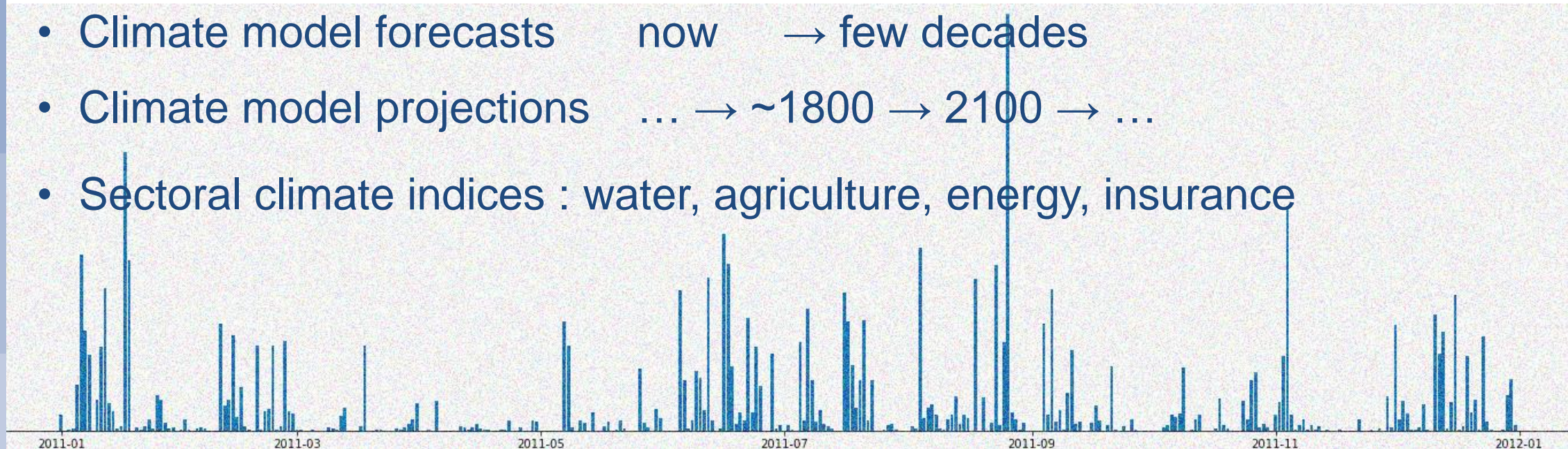
Sources

- Gridded products Essential Climate Variables (ECVs)
 - Observations from global climate data archives
 - Observations from baseline and reference networks
 - Climate monitoring products for Europe



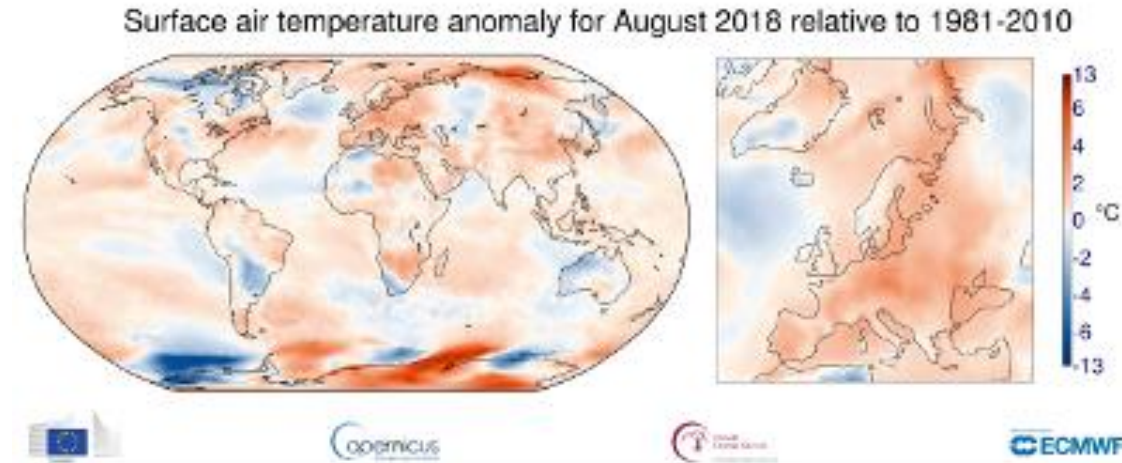
Sources

- Reanalysis products 1950 → now
- Weather model forecasts now → ~14 days future
- Seasonal forecast now → ~12 months
- Climate model forecasts now → few decades
- Climate model projections ... → ~1800 → 2100 → ...
- Sectoral climate indices : water, agriculture, energy, insurance



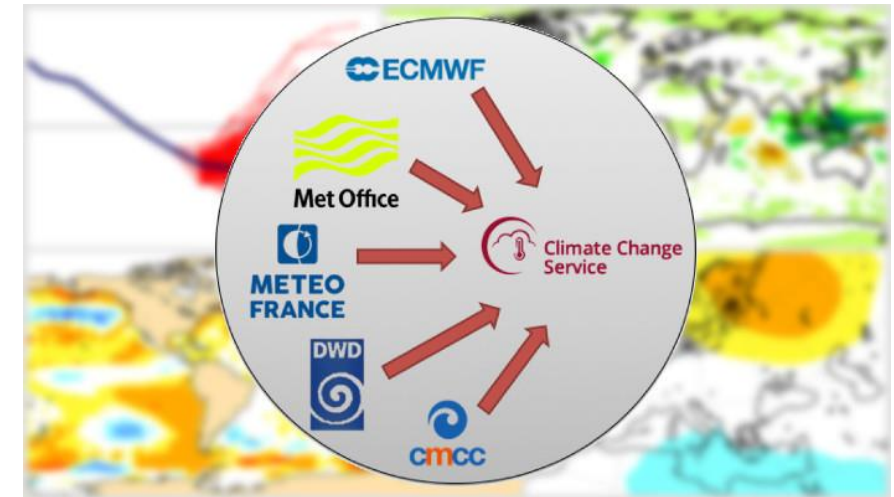
Sources

- Reanalysis products 1950 → now
 - Available observed data assimilated into state-of-art high resolution model
 - Hourly, full global/vertical coverage
 - Reproduced weather time series
 - Good alternative to true observations when these are sparse
 - Pre-calculated monthly-mean averages



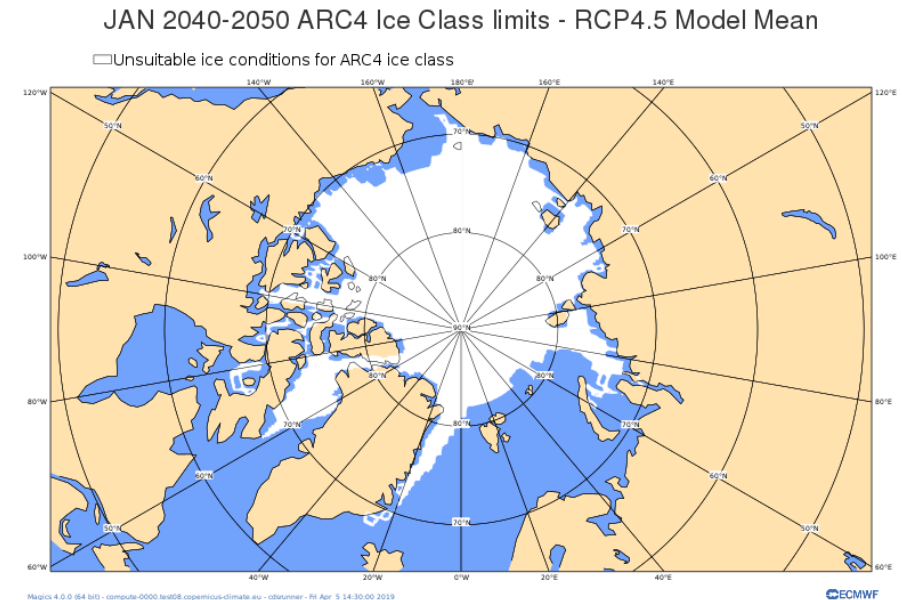
Sources

- Seasonal forecast now → up to ~6-12 months
 - Monthly statistics OK, not *actual* hourly/daily time series
 - Multi-system seasonal forecast service
 - Data includes forecasts created in real-time since 2017



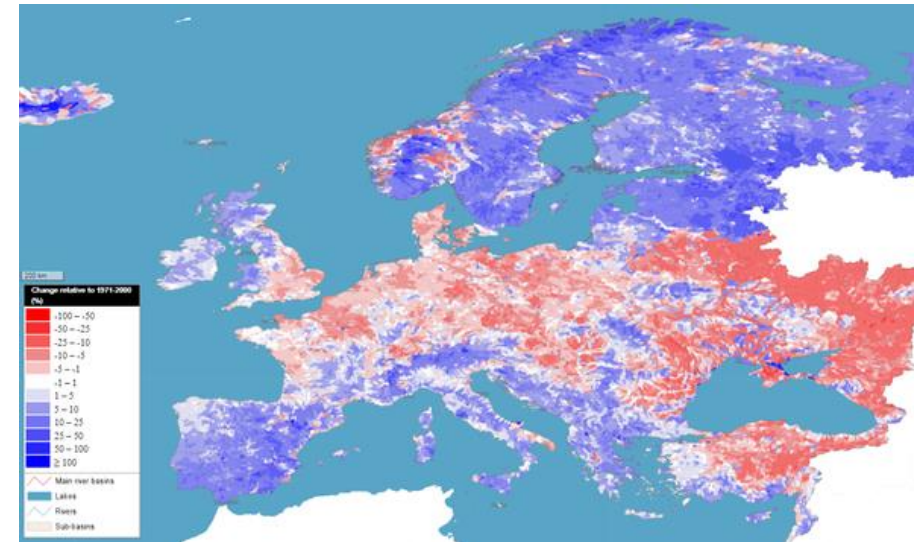
Sources

- Climate change model projections ... → ~1800 → 2100 → ...
 - ‘Non-initialised’ climate models
 - Following prescribed GHG emission scenarios
 - Important to use multiple models and RCPs
 - CMIP5, CORDEX (soon)











Sources

- Sectorial impact models
 - Water, agriculture, energy, insurance
 - E.g. river discharge data, crop development indicators, power potential, etc
 - At the moment only Water quality indicators for Europe is present in CDS



How to find the data? - Be specific

- “I need temperature data” is not good enough
- Time horizon, region/location
- Source → observations or model based
- Variable of interest
- Model / scenario selection

All	Datasets
	CMIP5 monthly data on single levels This catalogue entry provides monthly climate projections on single levels from a large number of experiments, models, members and time periods computed in the framework of fifth phase of the Couple...
	CMIP5 daily data on single levels This catalogue entry provides daily climate projections on single levels from a large number of experiments, models, members and time periods computed in the framework of fifth phase of the Coupled ...
	CMIP5 monthly data on pressure levels This catalogue entry provides monthly climate projections on pressure levels from a large number of experiments, models, members and time periods computed in the framework of fifth phase of the Cou...
	CMIP5 daily data on pressure levels This catalogue entry provides daily climate projections on pressure levels from a large number models, members and time periods computed in the framework of fifth phase of the Coupled Model Intercomp...
	Glaciers elevation and mass change data from 1850 to present from the Fluctuations of Glaciers Database A glacier is defined as a perennial mass of ice, and possibly firn and snow, originating on the land surface from the recrystallization of snow or other forms of solid precipitation and showing eviden...
	Glaciers distribution data from the Randolph Glacier Inventory for year 2000 A glacier is defined as a perennial mass of ice, and possibly firn and snow, originating on the land surface from the recrystallization of snow or other forms of solid precipitation and showing eviden...
	Carbon dioxide data from 2002 to present derived from satellite sensors Carbon dioxide (CO ₂) is a naturally occurring Greenhouse gas, but one whose abundance has been increased substantially above its pre-industrial value of some 280 ppm by human activities, primarily bec...
	Methane data from 2002 to present derived from satellite sensors Methane (CH ₄) is the second most significant greenhouse gases that has increased in concentration in the atmosphere directly due to human activities, from the viewpoint of the radiative forcing of cli

<https://cds.climate.copernicus.eu/>



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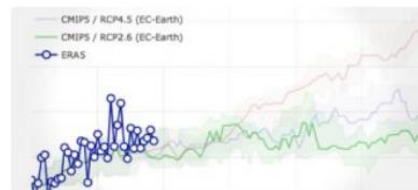
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Welcome to the Climate Data Store

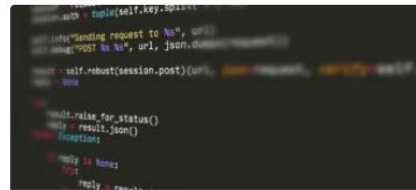
Dive into this wealth of information about the Earth's past, present and future climate.

It is freely available and functions as a one-stop shop to explore climate data. [Register for free](#) to obtain access to the CDS and its Toolbox.

We are constantly improving the services and adding new datasets. For more information, please consult the [catalogue](#), our [FAQ](#) or the [C3S forum](#).

[All](#)[Search](#)

Climate Data Store **Toolbox**



Climate Data Store **API**



Access the **C3S Forum**

Some useful links:

- [Copernicus Knowledge Base](#)
- <https://uls.climate.copernicus.eu/>
- [ERA5 data documentation](#)