Satellite climatology atlas for Europe and Latvia

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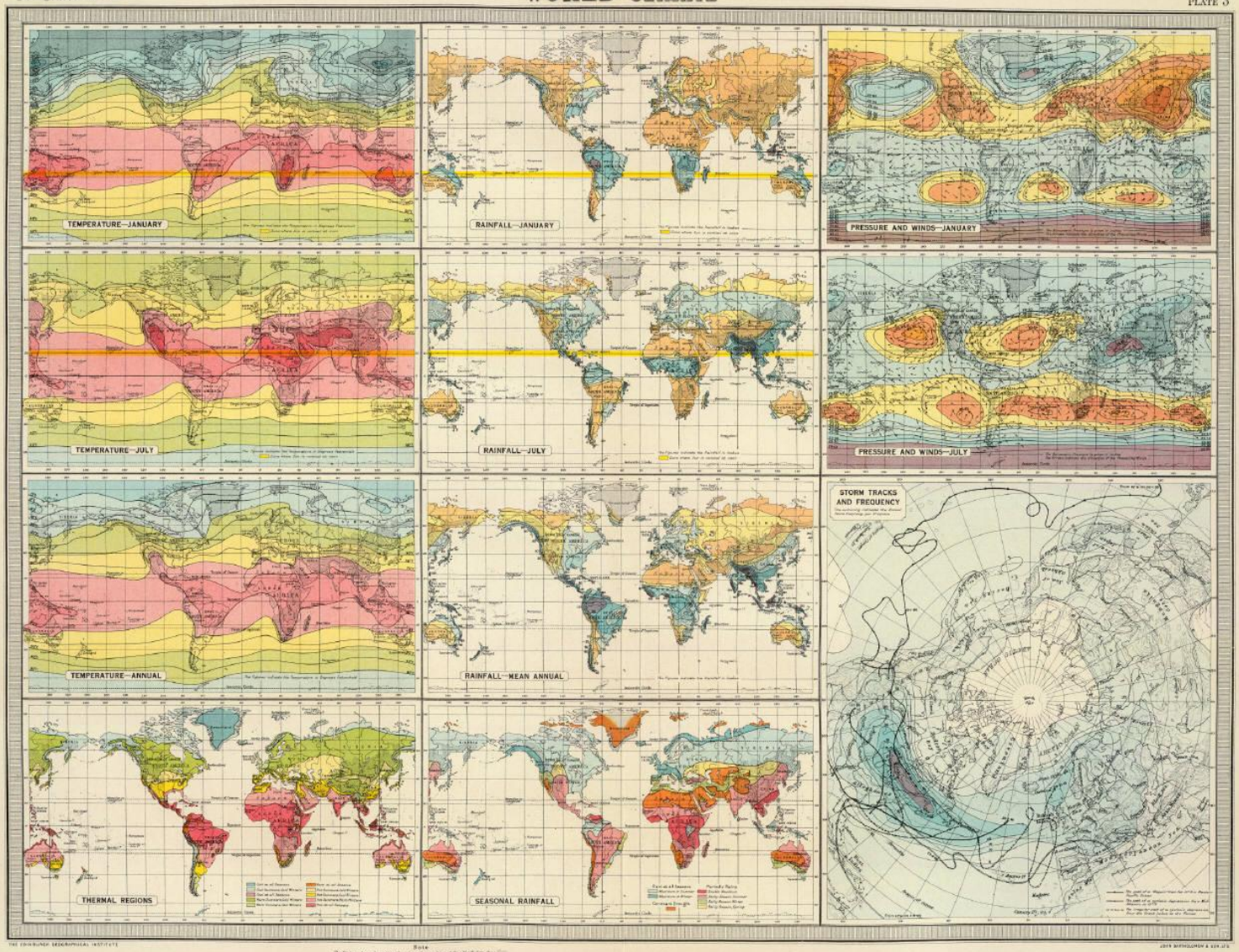


World - climate. The Edinburgh Geographical Institute, John Bartholomew & Son, Ltd. "The Times" atlas. (London: The Times, 1922)

Satellite climatology atlas for Europe and Latvia

For climatologists, young scientists and general public who

- need information on Europe's climatology
- are just *maybe* thinking about starting with satellite data
- need inspiration for the further work

Objectives

- To provide general information on the climatic characteristics of meteorological parameters over Europe and Latvia
- To provide information on satellite data suitable for climatological studies, their strengths and weaknesses
- To provide instructions for creating a satellite climatology atlas and beginning to work with satellite datasets in general

Data used

Parameter	Dataset	Variable	Period
Cloudiness	CLARA-A1	Monthly mean cloud fractional cover (CFC)	1982-2009
Cloud Phase	CLARA-A1	- Monthly mean fraction of liquid water clouds (CPH) - Monthly mean cloud ice water path (IWP) - Monthly mean cloud liquid water path (LWP)	1982-2009
Cloud Top Parameters	CLARA-A1	Monthly mean cloud top parameters (CTO) - Cloud top height - Cloud top pressure - Cloud top temperature	1982-2009
Cloud Optical Thickness	CLARA-A1	Monthly mean cloud optical thickness (COT) - All clouds - Ice clouds - Liquid clouds	1982-2009
Solar Radiation	MVIRI dataset	- Monthly mean solar surface irradiance (SIS) - Monthly mean direct radiance at surface (SID)	1990-2005
Daylight	Daylight dataset	Daylight intensity (DAL)	1990-2005
Surface Albedo	CLARA-A1	Surface albedo (SAL)	1982-2009

Data source: **CM SAF** – Satellite Application Facility on Climate Monitoring
http://www.cmsaf.eu/

To show the advantages of satellite data for climate studies

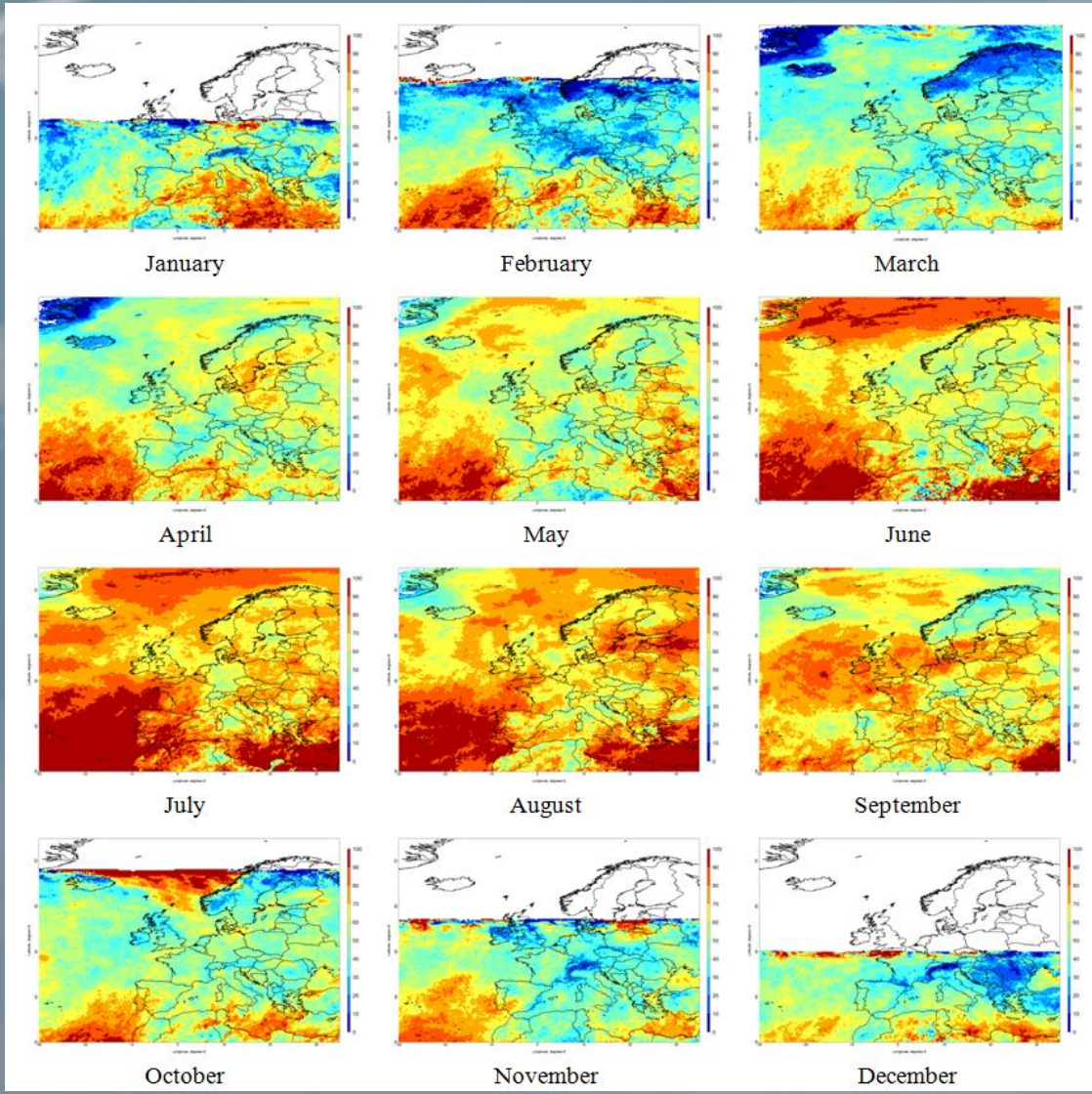
- Coverage, spatial and temporal resolution → GEO vs. LEO
- Information on parameters that can not be measured by the surface observation stations
- *Almost* 30-year period

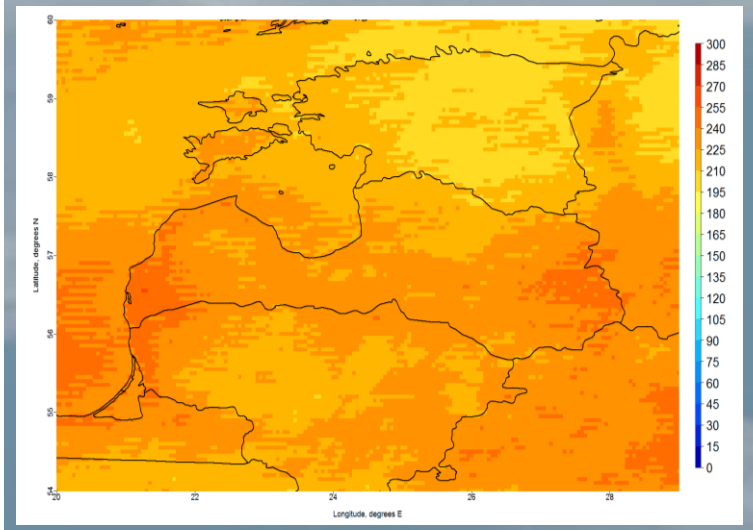
To discuss the things to pay special attention to

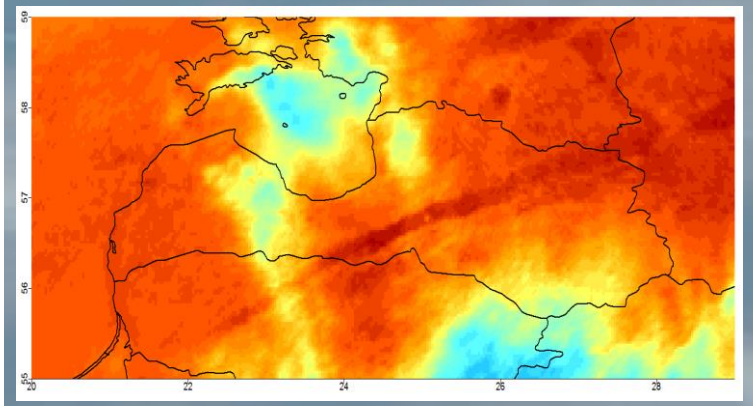
- Not measuring the exact parameter – result depends on the retrieval method
- Retrieval methods, limitations for the use of data
- Known errors and imperfections in the datasets:
  - ✓ Missing scan-lines
  - ✓ Effect of snow cover
  - ✓ Effect of SZA thresholds
  - ✓ Unnatural features in the data (line over Latvia)

Use of ‘reliable’ information only:

- For COT, CPH, IWP, LWP, SAL only data from March till September were used
- For SIS, DAL the first years (up to 1990) of the datasets were not included
- The original MVIRI dataset for SIS was not used

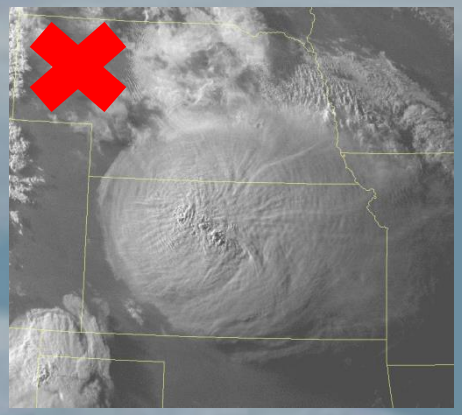






Climate Datasets and High Impact Weather

- Reprocessed homogenised data series
- Temporal and spatial resolution



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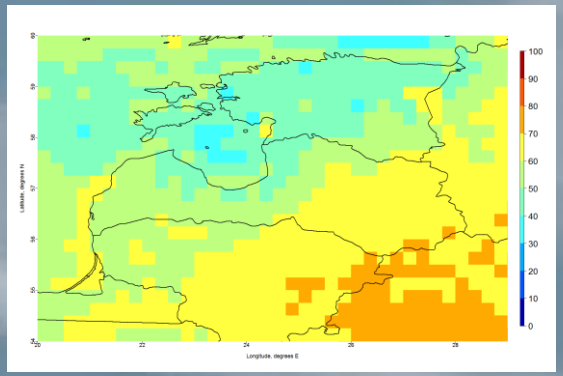
- Lose some of the detail
- Can not see individual events as good

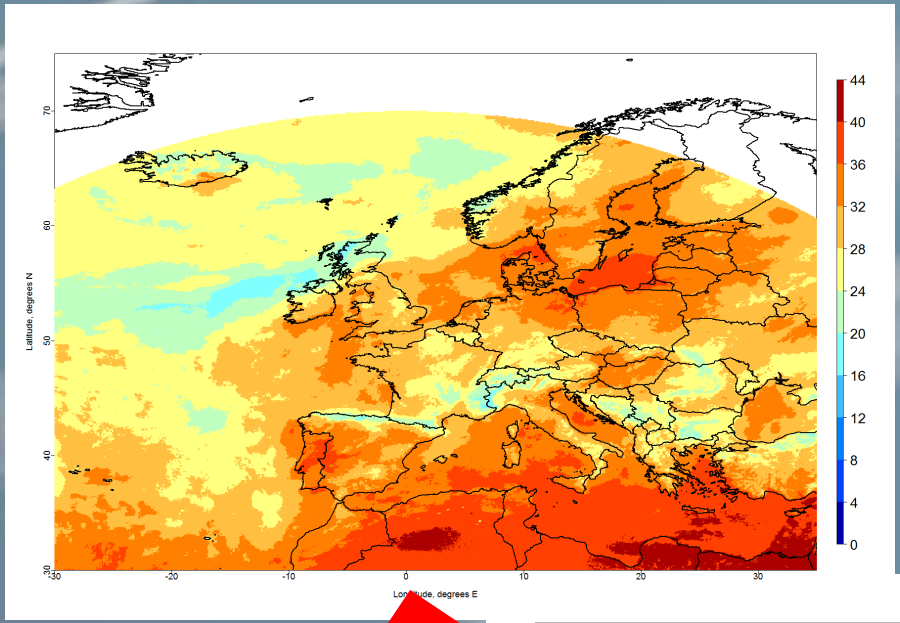
BUT

- Continuous events – droughts, heat waves, cold waves
- Can assess the climatology of High Impact Weather events

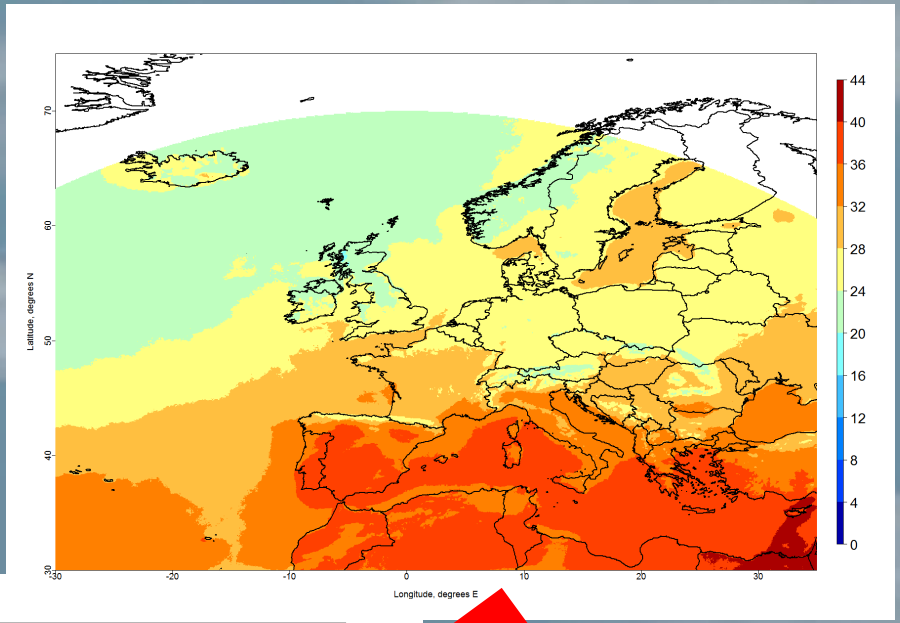


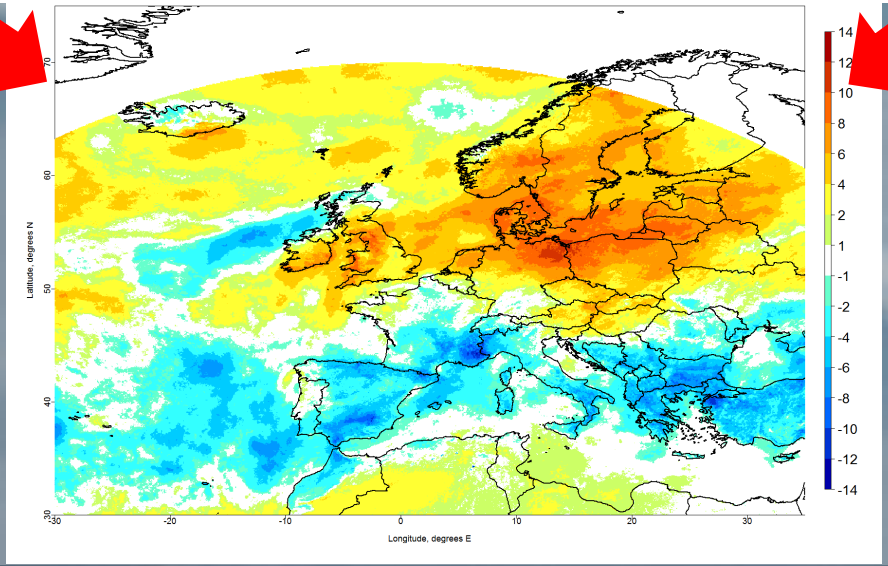
Anomalies – Daylight Intensity

June 1992



Multi-year mean for June



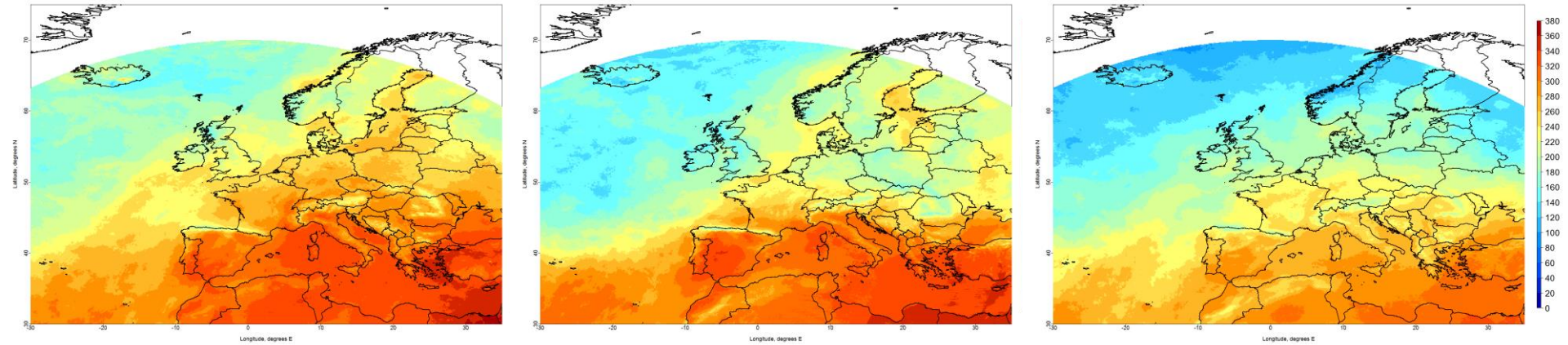


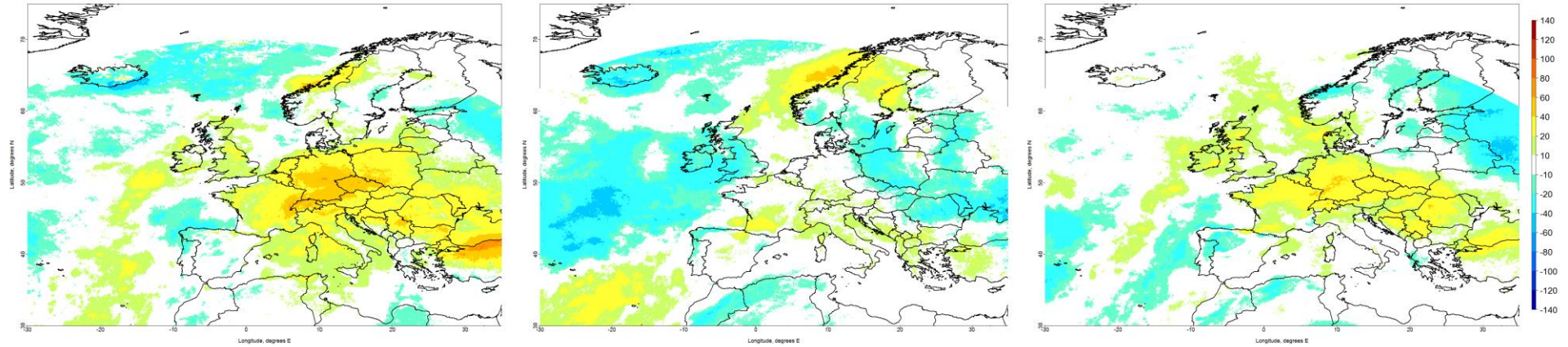
Anomaly June 1992

Analyse Extreme Events - Heat Wave 2003

Monthly Mean Solar Surface Irradiance and Anomalies

June **July** **August**



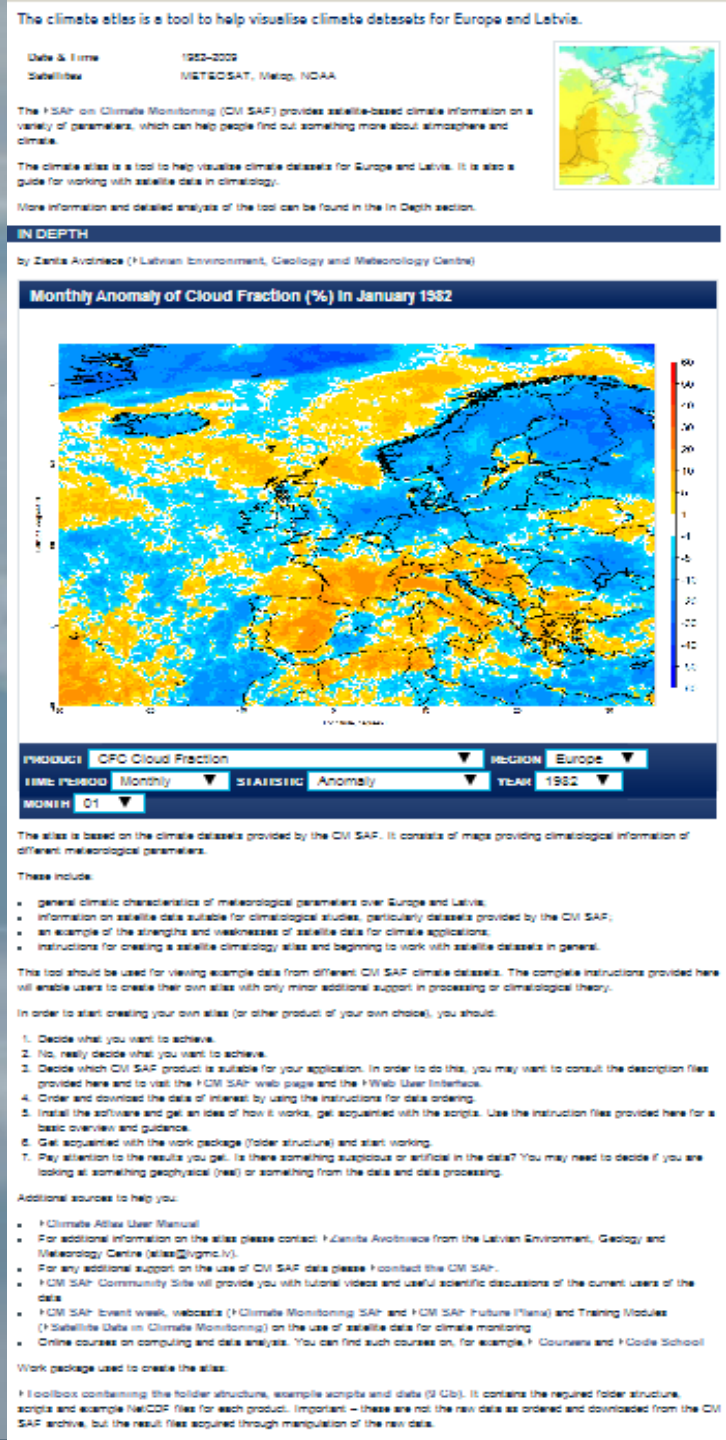


Available at...

- EUMETSAT Image Library
- http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT_2266050.html

+ User Manual
  - Short descriptions of the variables, including the choices made while working with each variable
  - Description of the data sources, ordering, software tools and the use of scripts
  - Example scripts, auxiliary data

Feedback, questions, ideas to atlas@lvgmc.lv



Thank you for your attention!