

Little Pictures about our climate

Visualisierung von Klimadaten

30.09.2023

image sources can be found in meeting notes



& ubilabs

Little Pictures about our climate

Moin SCICAR

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Moin SCICAR

Was haben die mit uns vor?

- #1 Wo stehen Klima-Grafiken heute?
- #2 Was wollte das Little Pictures Projekt?
- #3 Wie kommt man eigentlich an Klimadaten heran?
- #4 Hands-On: Wir basteln uns ein Little Picture
- #5 Und nun: Wie es weitergeht...



Wo stehen wir mit Klima-Grafiken heute?

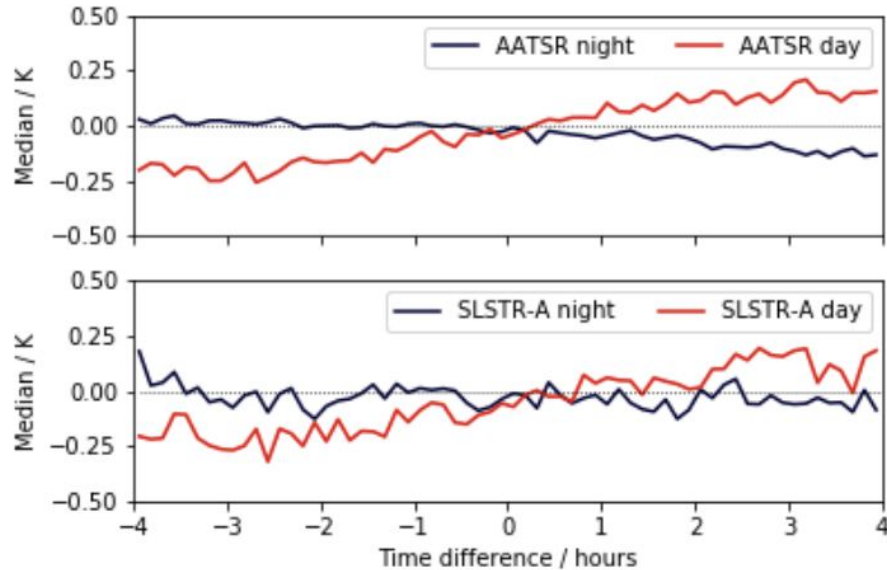
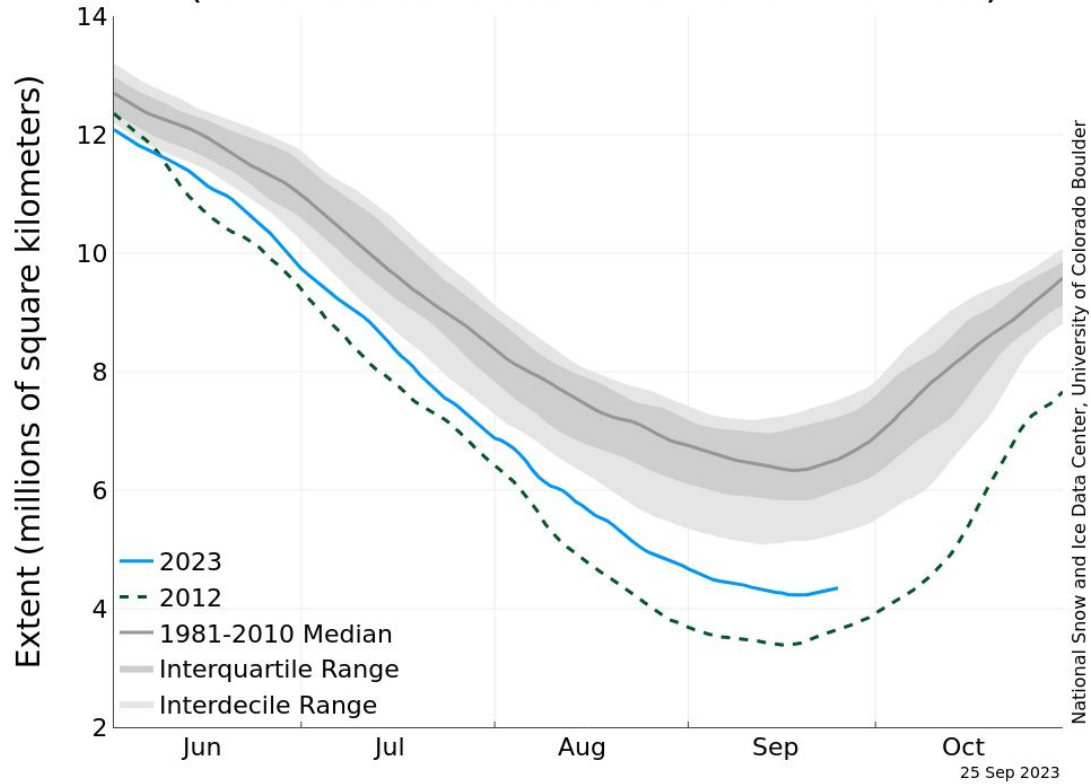
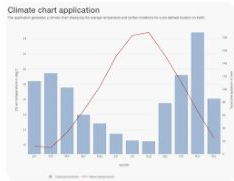


Figure 1. Comparison of (upper) advanced along-track scanning radiometer (AATSR) and (lower) sea and land surface temperature radiometer (SLSTR) dual-view skin sea surface temperature (SST) retrievals with matched in situ radiometer measurements. Median satellite-radiometer SST difference is plotted against satellite-radiometer time difference. The data are binned in time difference intervals of 7.5 min. The noisier appearance of the SLSTR-A curves is due to a lower accumulation of matches during SLSTR-A's shorter lifetime to date.

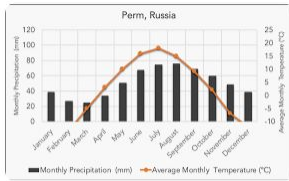
Arctic Sea Ice Extent (Area of ocean with at least 15% sea ice)



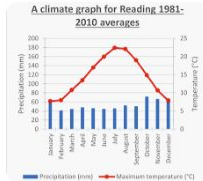
Current State of Climate Graphics



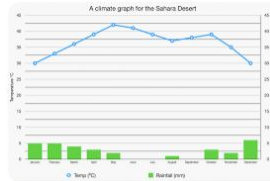
Climate Data Store
climate graph application ...



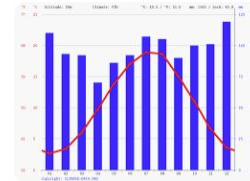
NASA Earth Observatory
Temperature and Precipitation Graphs



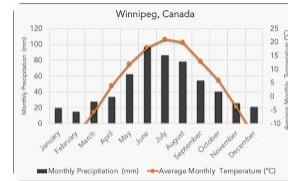
MetLink.org
Climate Graph Practice ...



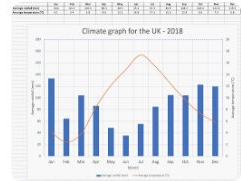
Internet Geography
What are climate graphs? - Internet ...



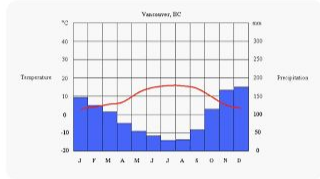
Climate-Data.org
Germany Climate: Average Tempera...



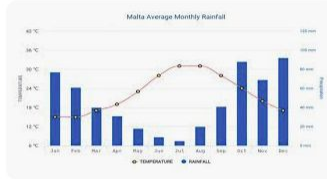
NASA Earth Observatory
Temperature and Precipitation Graphs



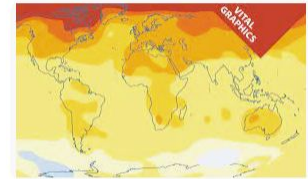
Internet Geography
Excel Climate Graph Template - I...



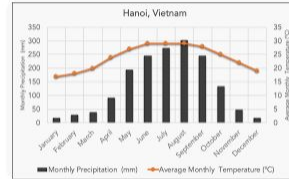
Open School BC
What is a climate graph?



Teleskola
Interpreting and Drawing Climate Graphs ...



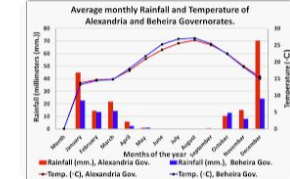
GRID-Arendal
Vital Climate Graphics | GRID-Arendal



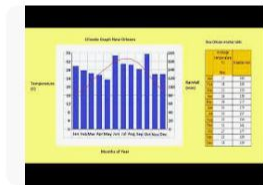
NASA Earth Observatory
Temperature and Precipitation Graphs



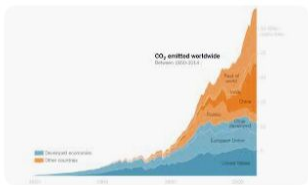
climatecharts.net
ClimateCharts



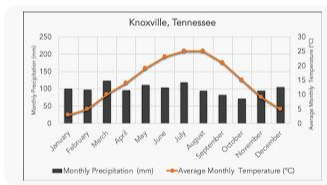
R² ResearchGate
A Climate Graph representing the ...



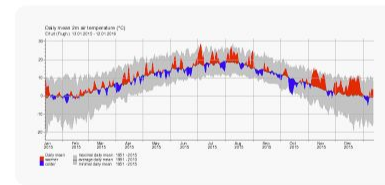
YouTube
How to make a Climate Graph - YouTube



The New York Times
Teach About Climate Change With These ...



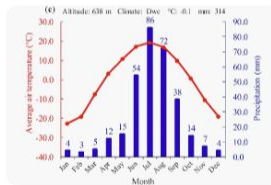
NASA Earth Observatory
Temperature and Precipitation Graphs



Deutscher Wetterdienst
Explanatory notes on the climate graphs



NR-Feldmann
Climate Graphs Interactive ...



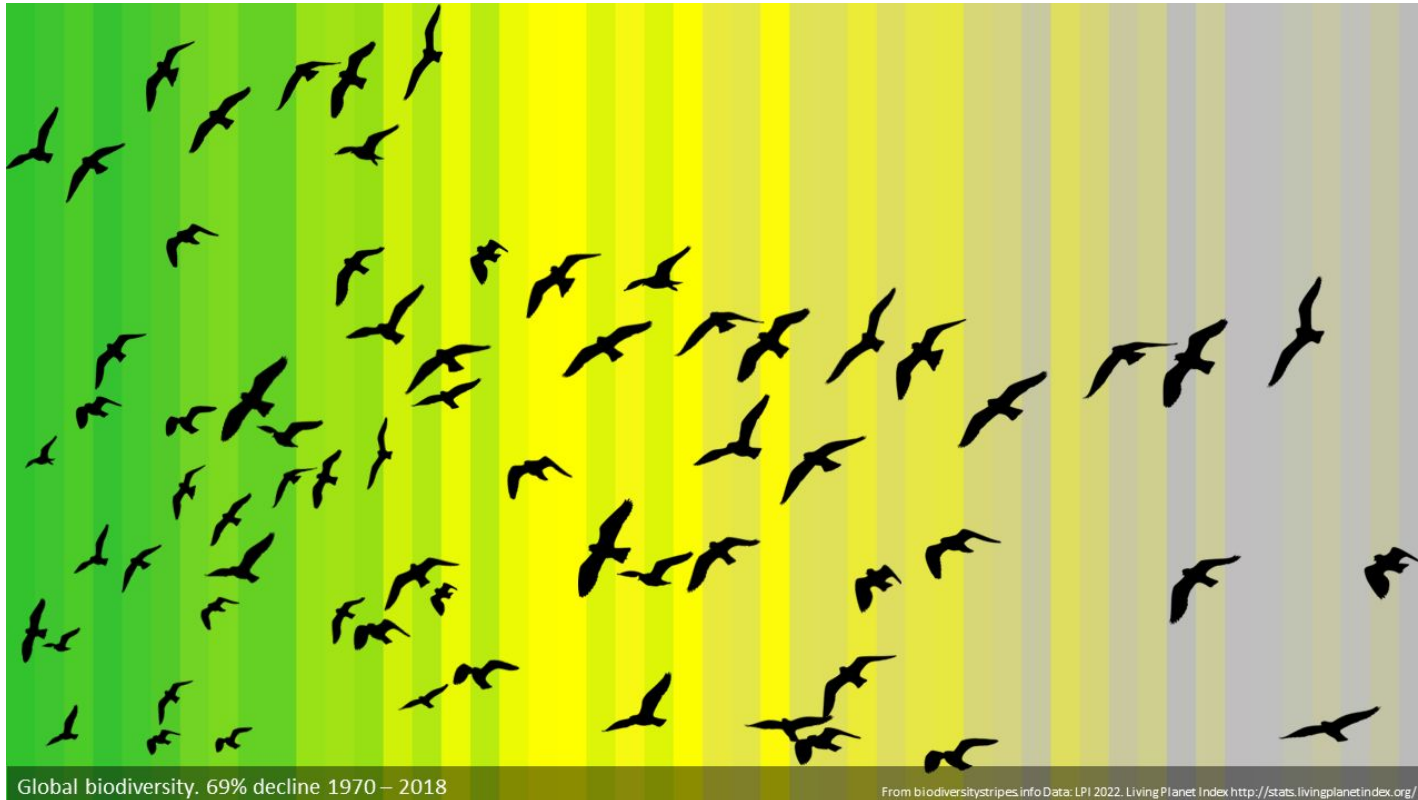
R² ResearchGate
climatic zones in Mongolia ...

Current State of Climate Graphics

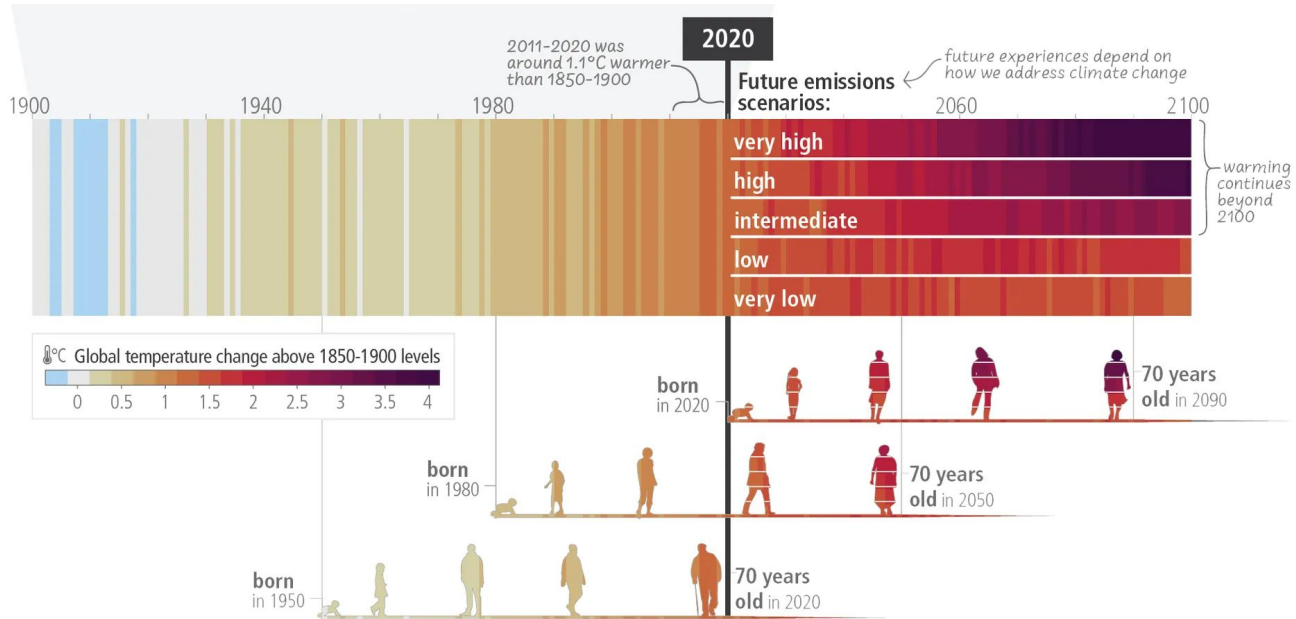
Ok, es gibt natürlich Ausnahmen...



Spin-Offs für Biodiversität, Bodenfeuchte etc.



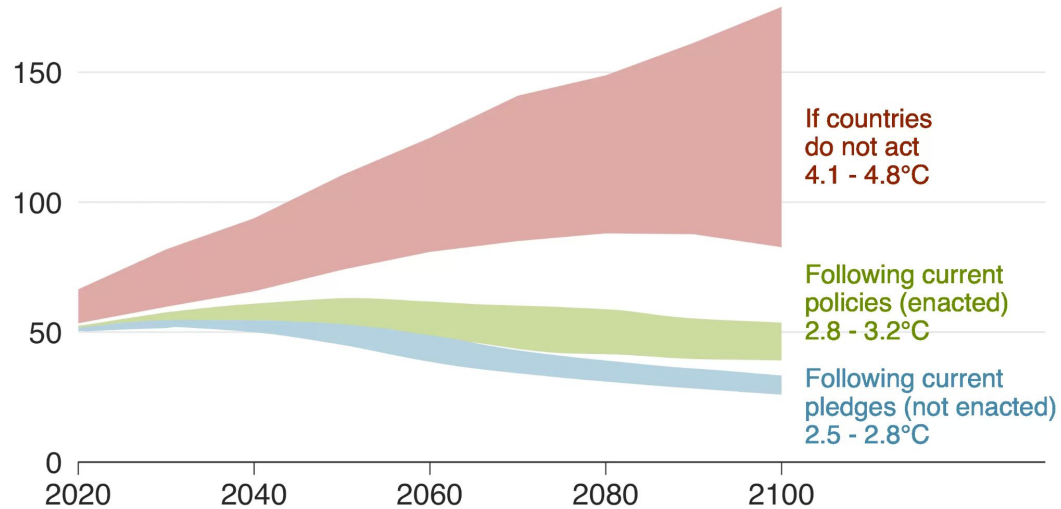
Inzwischen full circle wieder zurück im IPCC Report



Klima-Charts in den Medien

How much worse will the problem get?

Emissions* and expected warming by 2100



*Emissions are in Gigatonnes of CO2 equivalent

Source: Climate Action Tracker

BBC

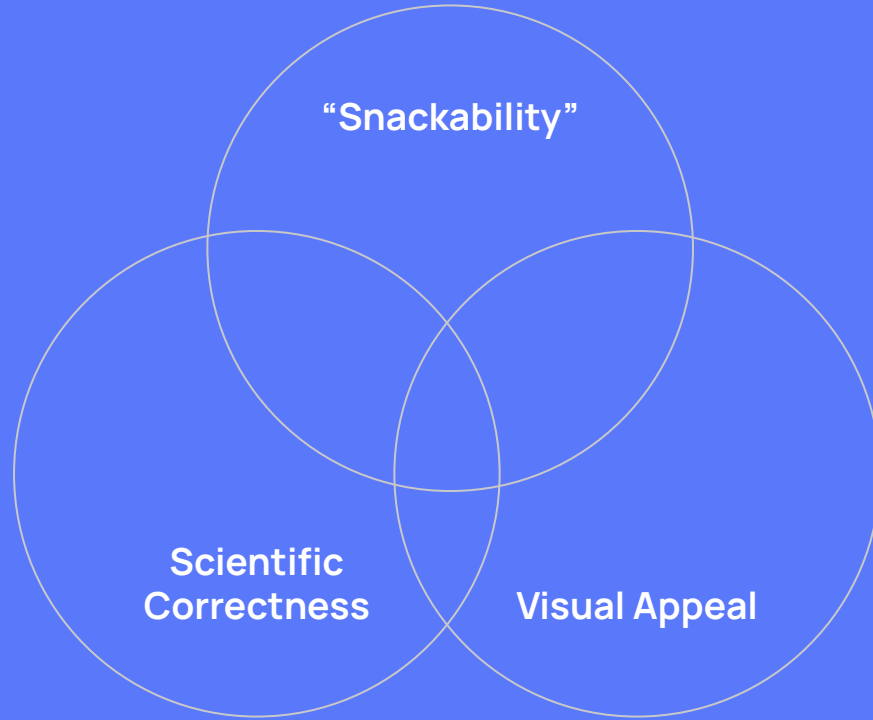
Was wollte das Little Pictures Projekt?



Wie können wir
neue Zielgruppen
erreichen?



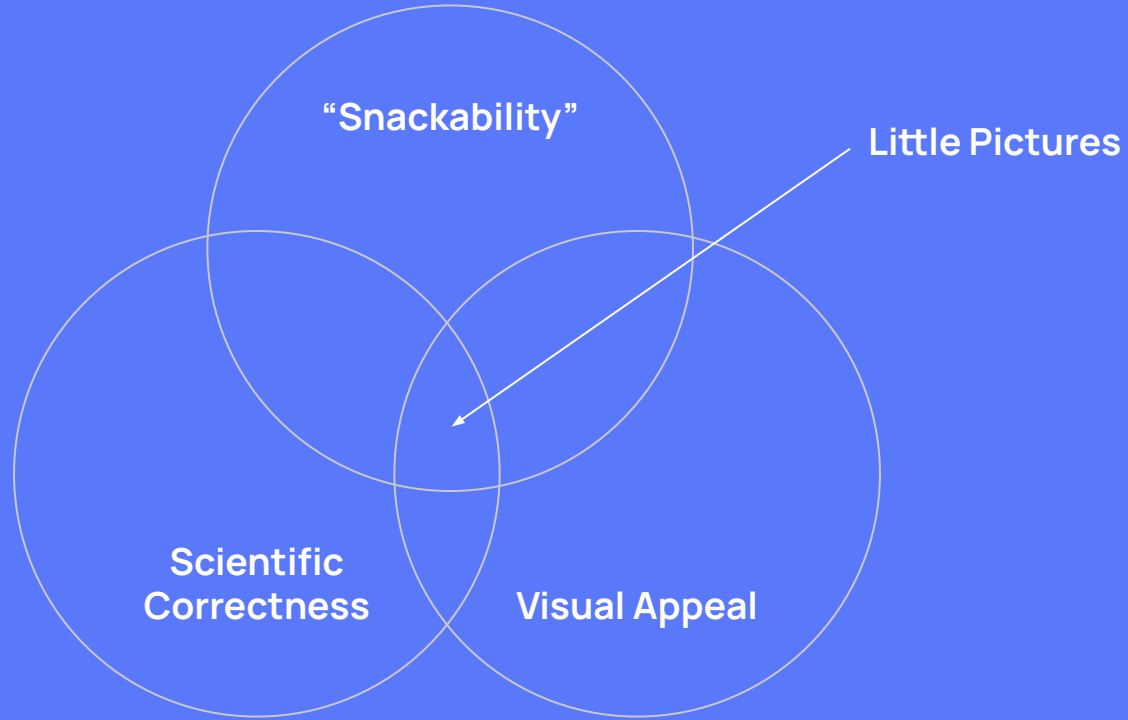




"Snackability"

**Scientific
Correctness**

Visual Appeal



A Little Picture must be:

Data-driven

Design-first

Self-contained

Rapidly-buildable

Rapidly-deployable

Climate Change DataViz Process

Communicating Climate Risk: Insights from the IPCC Information Design Team - Nightingale
 Nightingale et al. (2017) discuss the importance of clear communication in climate science, particularly in the context of communicating climate risk to the public. They highlight the need for data-driven approaches to quantify climate impacts and the role of visualization in making complex data accessible and actionable.

Our Approach | Climate Impact Lab
 Leveraging a first-of-its-kind, evidence-based, data-driven approach to quantify climate impacts, historical climate and socioeconomic data from around the world to look toward the relationship between climate and society.

not a CLIP but similar approaches

Climate Change Memes

MOVE TO FLORIDA THEY SAID
 A meme featuring a person in a boat, likely a reference to the movie 'The Boatman Boy'.

WHAT IF I TOLD YOU
 A meme featuring a person looking at a graph, likely a reference to the movie 'The Matrix'.

CLIMATE CHANGE DOESN'T JUST EFFECT THE POLAR BEARS
 A meme featuring a polar bear, likely a reference to the movie 'The Ice Age'.

ONE DOES NOT SIMPLY
 A meme featuring a man from Star Wars, likely a reference to the movie 'The Force Awakens'.

DOES CLIMATE
 A meme featuring a Shiba Inu dog, likely a reference to the meme 'Doge'.

Not data-driven and might be too simple

Climate Change Art

DACA 2022
 A graphic design featuring a blue and orange color scheme with the text 'DACA 2022' and a stylized figure.

A photograph of a person holding a globe, likely representing climate change or environmental impact.

possible, but has to be digital

Climate Games

Play Games
 A section featuring a 'CLIMATE CHANGE' game, a 'State of the World as Usual' report, and a 'CATAN' game board.

CLIMATE CHANGE
 A game board featuring a 'CLIMATE CHANGE' theme, likely related to the board game 'Catan'.

State of the World as Usual
 A report titled 'State of the World as Usual' by the World Resources Institute, discussing global development and environmental challenges.

CATAN
 A board game titled 'CATAN' by Catan Studio, featuring a 'CLIMATE CHANGE' theme.

possible, data-oriented strategy topic

Climate DataViz (static/animated)

A circular chart showing data distribution.

A bar chart showing data distribution.

A line graph showing data trends.

A mug with a climate change graphic, likely representing a sustainable product.

fits CLIP Definition

Climate DataViz (interactive)

A grid of small charts and graphs, each with a title and description, likely representing interactive data visualization.

fits CLIP Definition

Climate DataViz (Video)

Two play button icons, indicating video content.

ESA Climate Office

Home > Open Data Portal

Evidence | Explore | Educate | ESA & Climate

Climate Data Dashboard

of the ESA Climate Change Initiative

→ Climate Data Search interface

for the ESA Climate Change Initiative

- Aerosol
- Cloud
- Greenhouse Gases
- Ozone
- Ocean Colour
- Sea Ice
- Sea Level
- Sea State
- Sea Surface Salinity
- Sea Surface Temperature
- Water Vapour
- Antarctic Ice Sheet
- Above-Ground Biomass
- Fire
- Glaciers
- Greenland Ice Sheet
- Lakes
- Land Cover
- Land Surface Temperature
- Permafrost
- Snow



treva Labs

Your idea for a little picture.

Topic or Title

Just a few words so we get the idea.

Sea ice area visualization

Description

Need a few more lines to elaborate?
Feel free to write them here!

We are loosing millions km² of sea ice. These are big numbers, difficult to relate to. How to visualize?

Maybe this is more for an interactive app than a little picture.

Sketch

Can be a quick sketch, the Mona Lisa, or anything in between



Different ideas =

- Highlight areas (countries?) whose area correspond to ice loss.
- Game? let the user guess what country is the closest?

Datasets you would like to use?

If you have a certain dataset in mind.

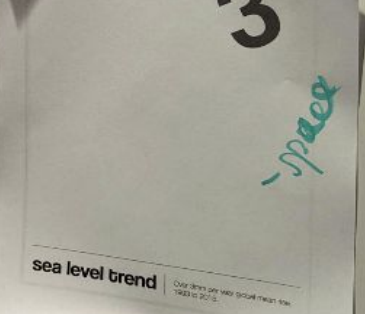
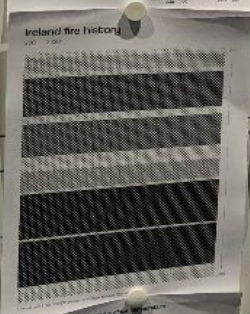
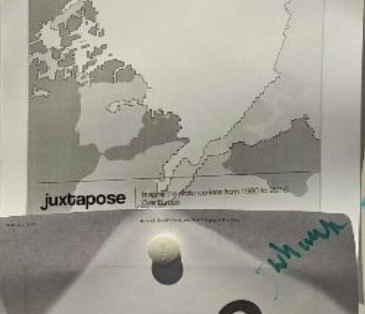
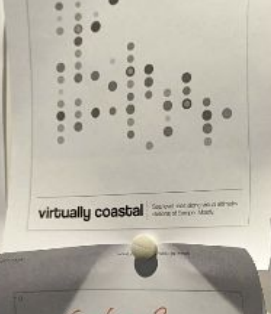
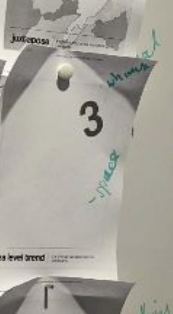
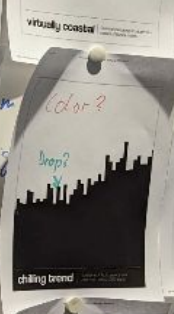
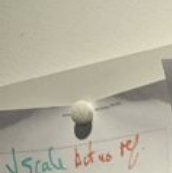
EUMETSAT and ESA CCI Sea Ice data

Mind telling us who you are?

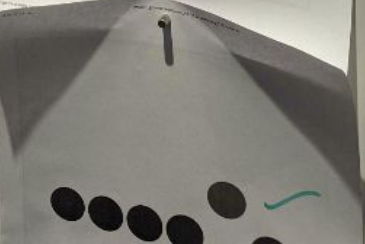
So we can reach back to you.

thomas.lavergne@met.no

name



60.2°/74.9°/00.8°
59.4°/74.8°/00.5°
58.3°/74.1°/00.3°
57.0°/74.1°/00.2°
55.2°/72.6°/018.0°
54.3°/72.3°/11°
53.2°/72.4°/08.8°
52.0°/71.8°/08.3°
50.8°/71.0°/07.8°
49.8°/70.1°/119.1°
48.2°/716.3°/06.9°
48.1°/717.1°/06.8°
47.5°/718.1°/13.9°
46.8°/716.0°/712.5°
45.8°/705.3°/12.8°
44.7°/703.3°/11.3°
43.7°/702.3°/11.3°
42.5°/701.3°/11.3°
41.5°/700.3°/11.3°
40.5°/700.3°/11.3°
39.5°/700.3°/11.3°
38.5°/700.3°/11.3°
37.5°/700.3°/11.3°
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3.5°/700.3°/11.3°
2.5°/700.3°/11.3°
1.5°/700.3°/11.3°
0.5°/700.3°/11.3°



an eye on ice loss

virtually coastal

juxtapose

an eye on ice loss

virtually coastal

juxtapose

melting points

fire fingerprint

chilling trend

sea level trend

Ireland fire history

all connected

climate connections

growth from loss

fire fingerprint

chilling trend

sea level trend

arctic proportions

rising seas

all connected

Scale better M?

Color?

Drop?

3

Color?

Drop?

3

What, what goes for
- low - high

X low, what goes for
- low - high

Whimsical

space

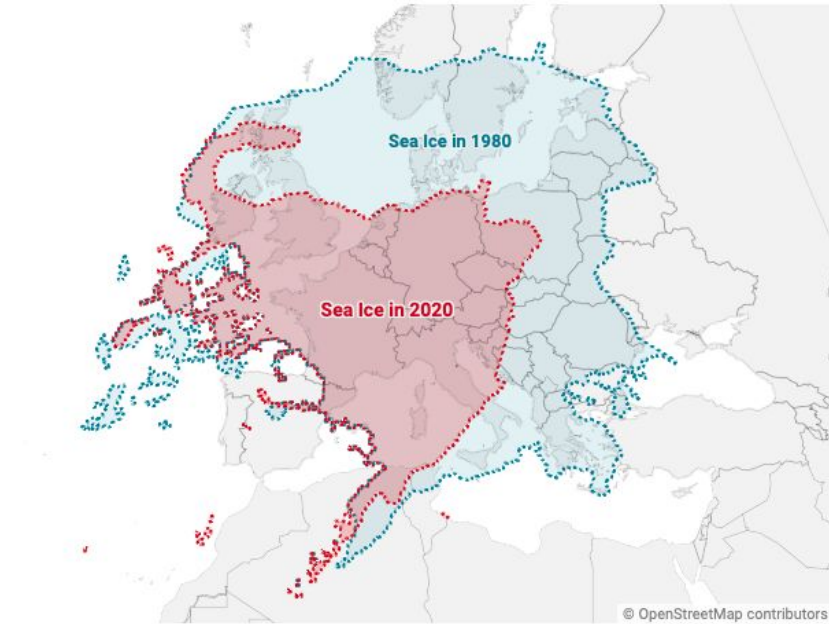
cal

th

the true size of arctic sea ice loss

For a quick size comparison imagine the North Pole was in central Europe.

Between **1980** and **2020** the Arctic ice sheet shrunk about **3.6 million square kilometers**.

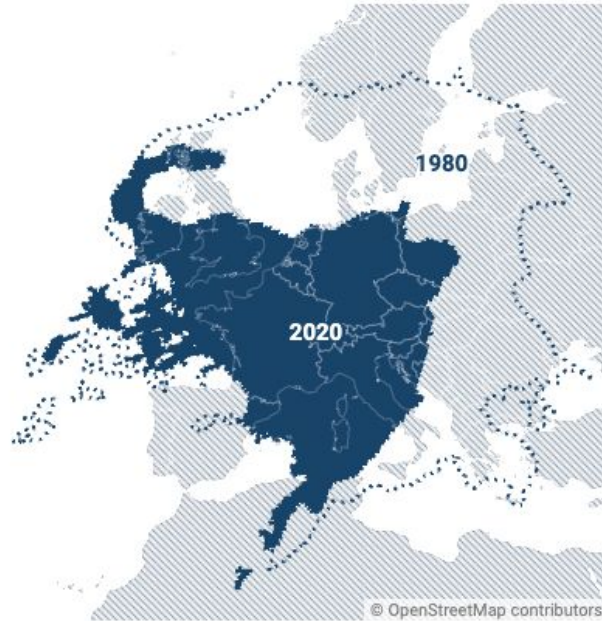


[more info, sources & license](#)

Created with Datawrapper


imagine the north pole in central europe - this is how much sea ice was lost in 40 years

3.6
million square kilometers*



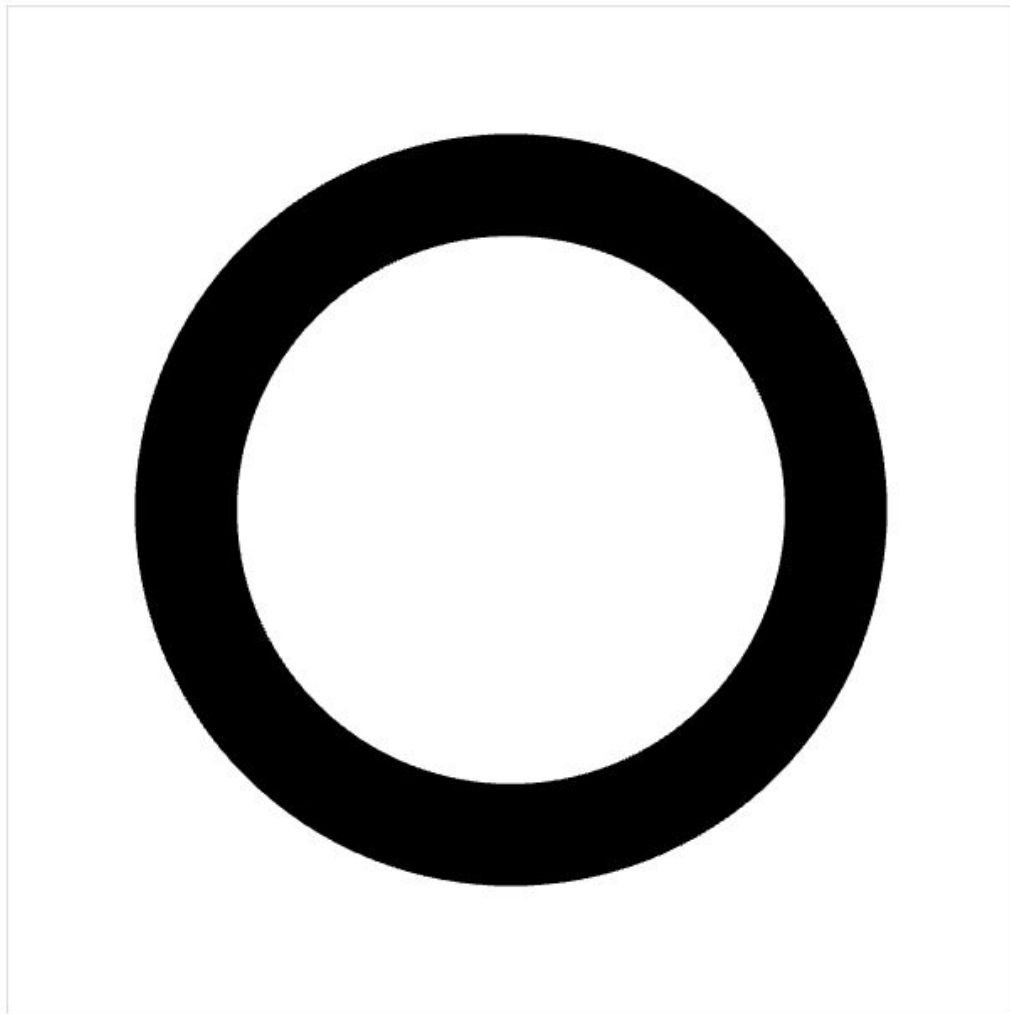
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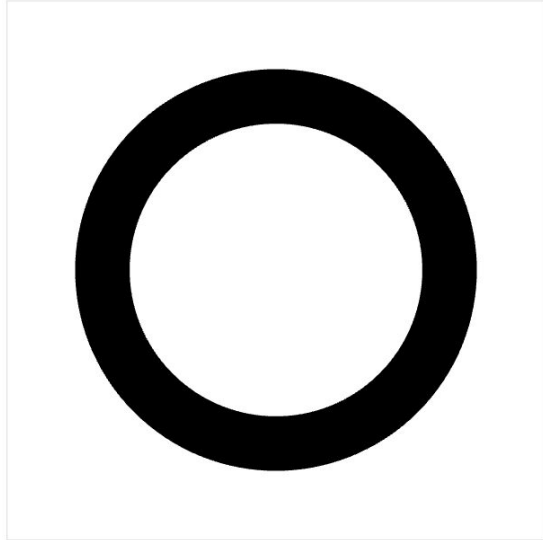
Created with Datawrapper



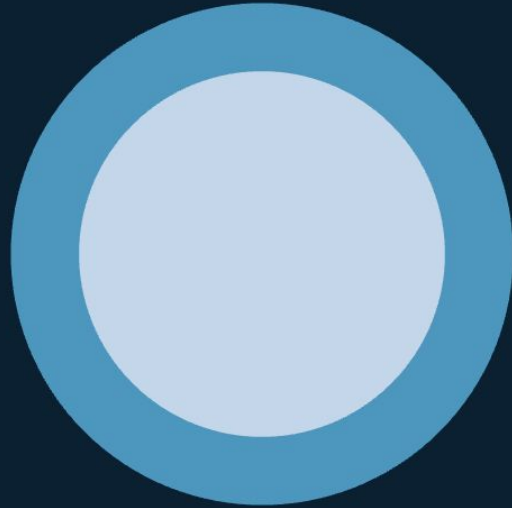
sea ice loss
1980 - 2020





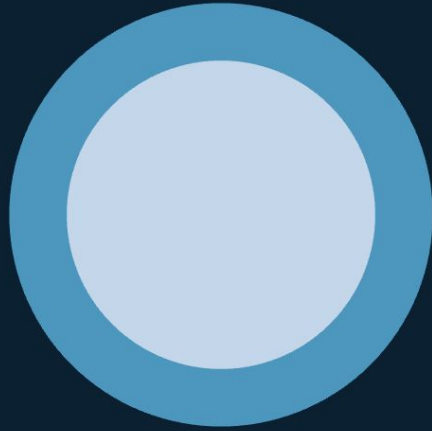






arctic ice loss

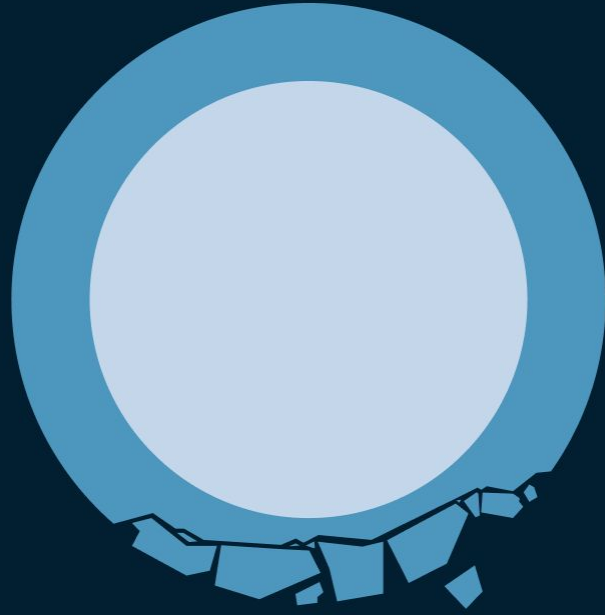
1980 - 2016



arctic ice loss

1980 - 2016





1980
2016

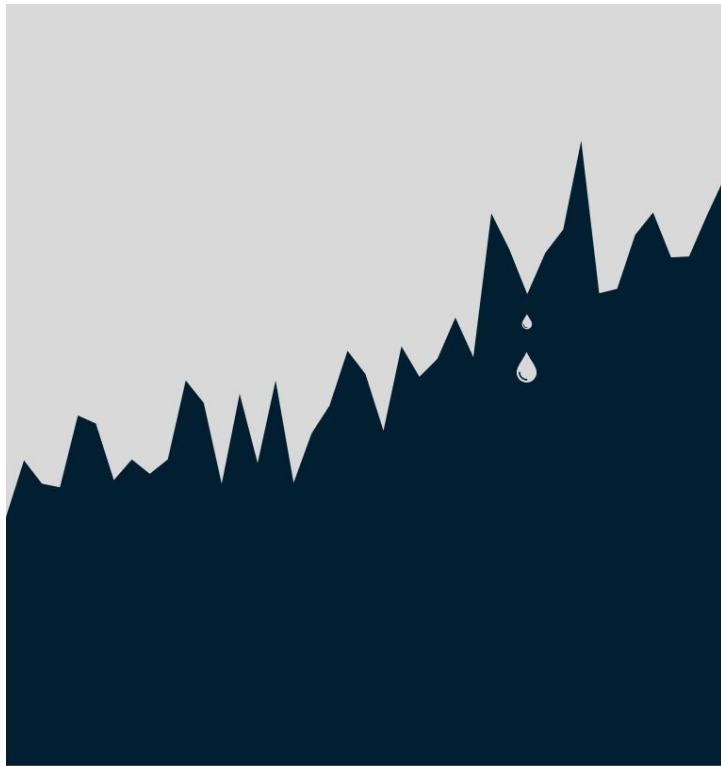
sea ice loss

1980 – 2016

This simple graphic depicting the reduction of Arctic sea ice between 1980 and 2016, highlights the urgency of the Arctic sea ice loss crisis. As our planet's temperature continues to rise due to climate change, the Arctic is losing sea ice.



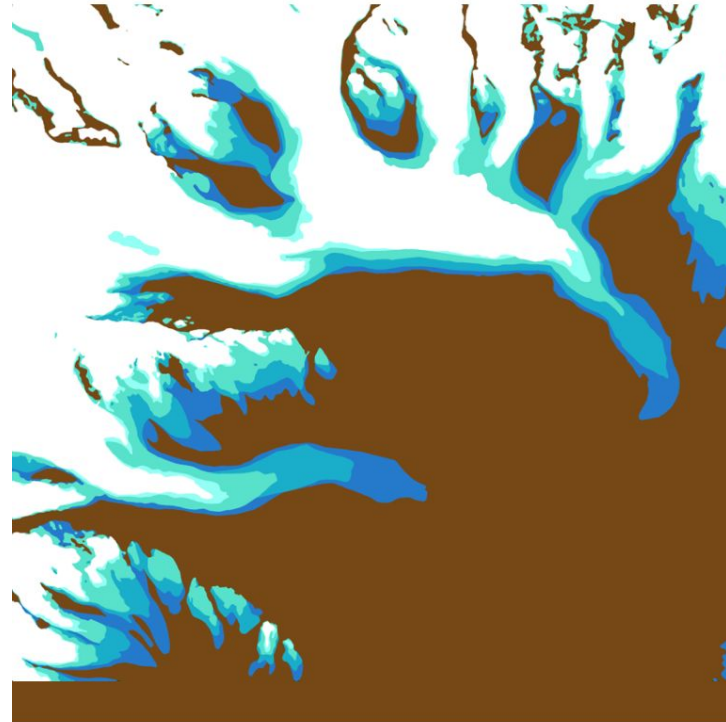
& ubilabs



reduction of arctic ice

1980 – 2016

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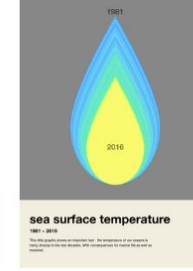
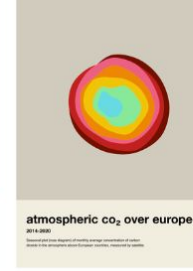
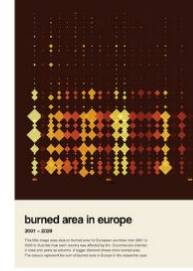
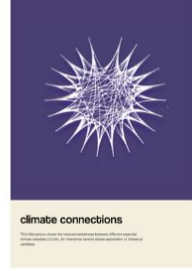
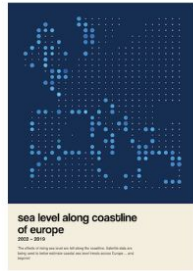
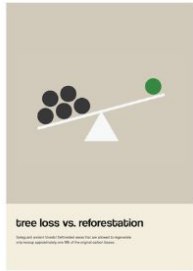
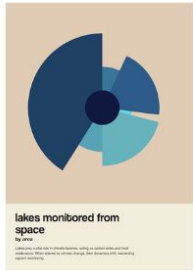
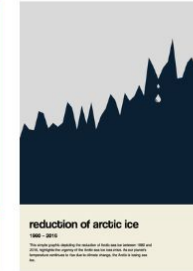
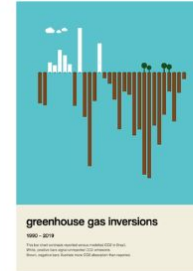
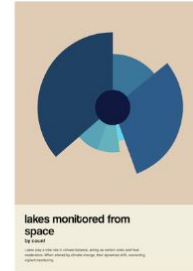
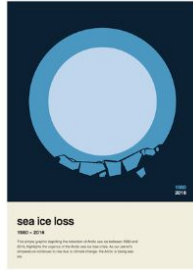
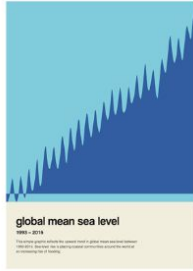
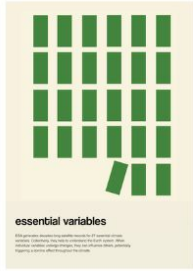


retreating glaciers

1850 – 2016

Glacier outlines around Zermatt in the Swiss Alps, based on historical maps and air photos from 1850, 1931, 1973, 2010 and 2016.





ARCTIC DECLINE

THIS GAME IS BASED ON REAL DATA:

THE LENGTH OF THE ICE
SHEETS MATCHES THE ARCTIC ICE MASS

START GAME

USE ← AND → KEYS
TO MOVE YOUR ICE SHEET

arctic decline game

This little interactive game gives an intuitive insight into the realities of the shrinking sea ice. The size of the paddles corresponds to the arctic sea ice area in the respective level / year.





arctic decline game

This little interactive game gives an intuitive insight into the realities of the shrinking sea ice. The size of the paddles corresponds to the arctic sea ice area in the respective level / year.



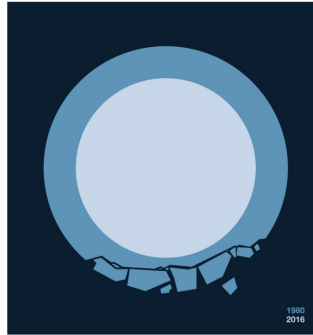
https://littlepictures.github.io/arctic_decline_game/

Python Setup for Little Pictures



python setup
for Little Pictures

The Making Of: Cracked Sea Ice Loss

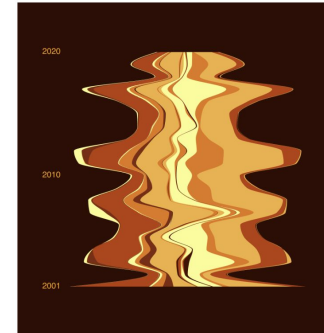


sea ice loss

1980 – 2016

This simple graphic depicting the reduction of Arctic sea ice between 1980 and 2016, highlights the urgency of the Arctic sea ice loss crisis. As our planet's temperature continues to rise due to climate change, the Arctic is losing sea ice.

The Making Of: Fire Streamgraph



burned area in europe

2001 – 2020

This fire streamgraph uses data on burned area for Ireland from 2001 to 2020 to illustrate a data pattern read vertically from top to bottom. The height and shading of each rectangle represents the burned area of that year, as a proportion of the accumulated burned area across all years.





little pictures

Follow

README.md

little pictures - big impact

What is a Little Picture?

A (Climate) Little Picture (CLIP) is a means of communicating climate data in a human readable form.

They are defined as being:

- Data-driven**
 - A picture rendered through frameworks, tools and technologies – such as D3.js, Tableau, ObservableHQ and Datawrapper – for the instant and dynamic visualisation of an underlying climate data layer
- Design-first**
 - A picture built on the principle that its aesthetic design drives its engineering direction. The design language defined and adhered to, draws from principles in industrial design, product design, and cognitive science
- Self-contained**
 - A picture embeddable in, and loosely coupled to, other pictures, stories and systems
- Rapidly-buildable**
 - A picture rapidly creatable from inception of idea to its rendering
- Rapidly-deployable**
 - A picture rapidly deployable to its target environment once built

View as: **Public** ▾
You are viewing the README and pinned repositories as a public user.
You can [pin repositories](#) visible to anyone.
You can [hide the tasks we've suggested](#) on this page and bring them back later.

Discussions
Set up discussions to engage with our community!
[Turn on discussions](#)

- Repositories
- [dataset_preparations](#) Private
 - Jupyter Notebook 0 Updated last week
 - [python_helper_functions](#) Private
 - Python 0 Updated 2 weeks ago
 - [datasets](#)
 - 4 Updated 2 weeks ago
 - [co2_spiral](#)
 - 0 Updated 3 weeks ago
 - [retreating_glaciers](#)
 - Python 0 Updated 3 weeks ago
- View all repositories
- [Create new repository](#) [import](#)

We think you're gonna like it here.

Wie kommt man
eigentlich an
Klima-Daten heran?

What are ESA Data Sources?



“Copernicus is the Earth Observation component of the European Union’s space programme, looking at our planet and its environment for the benefit of Europe’s citizens.”

Sentinel Missions

- 1: SAR Data
- 2: High-Resolution Optical Imaging
- 3: Ocean and Land Monitoring
- 5P: Air Pollution Monitoring

Honorable Mentions:

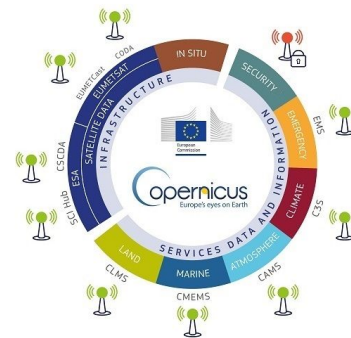
- Envisat (2002 -2012)
- MODIS (since 1999)
- VIIRS (since 2011)
- AVHRR (since 1978)
- Landsat (since 1972)
- ...

Conventional Data Access Hubs

The vast majority of data and information delivered by the Copernicus space infrastructure and the Copernicus services is made freely available and accessible to any citizen and any organisation around the world.

Copernicus provides knowledge, but it all starts with data.

<https://www.copernicus.eu/en/access-data/conventional-data-access-hubs>

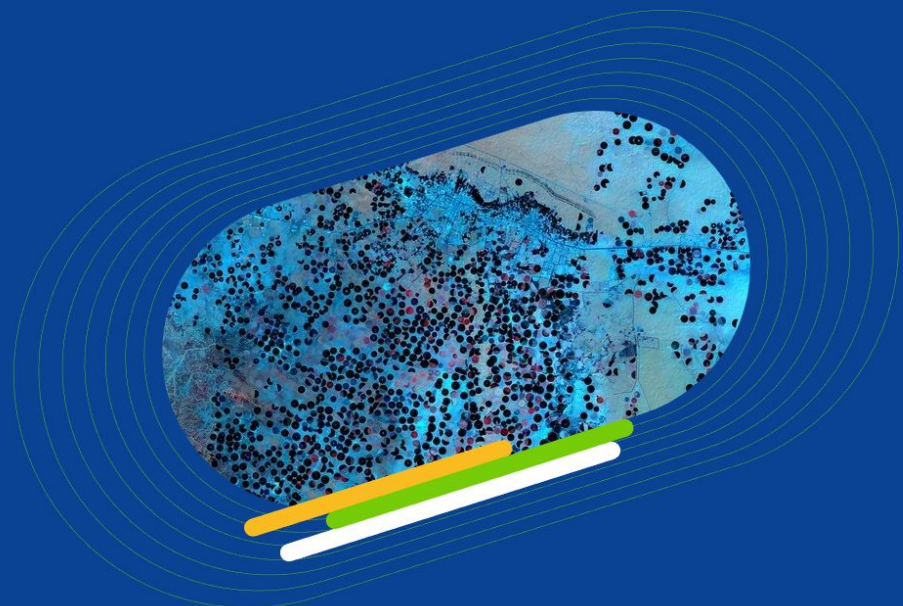


Explore the Copernicus Data Space Ecosystem

Welcome to the Copernicus Data Space Ecosystem, an open ecosystem that provides free instant access to a wide range of data and services from the Copernicus Sentinel missions and more on our planet's land, oceans and atmosphere.

The Copernicus Data Space Ecosystem not only ensures the continuity of the open and free access to Copernicus data but also extends the portfolio for data processing and data access possibilities.

LOGIN 



Discover our services

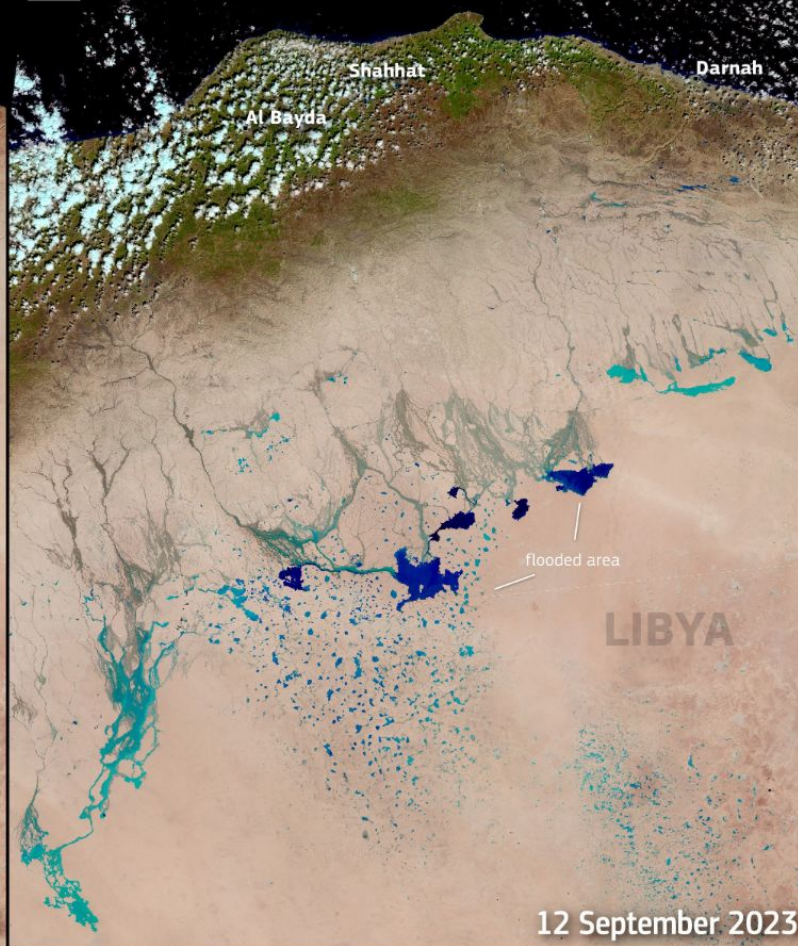


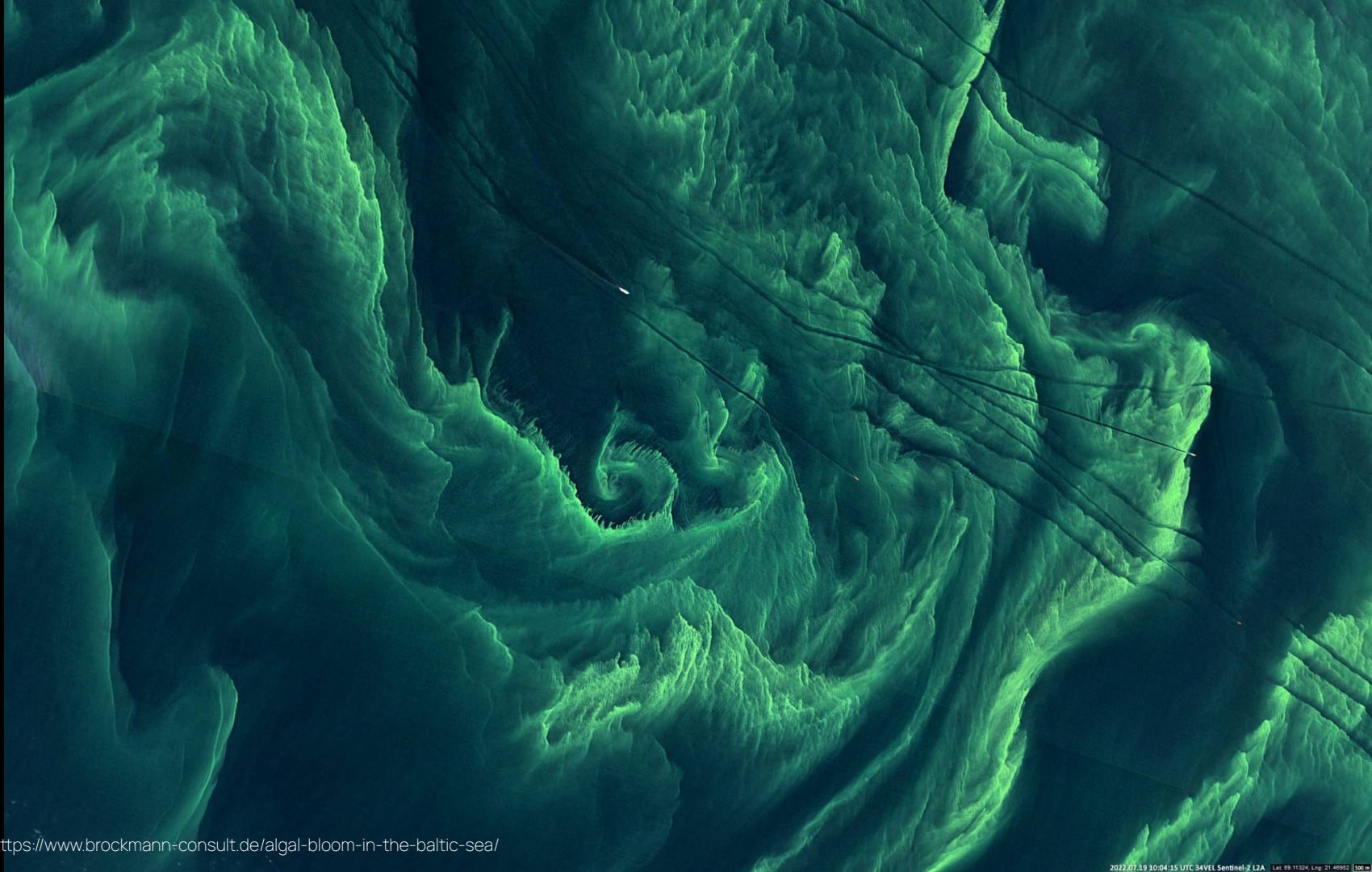
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10 km



10 km





Source: <https://www.brockmann-consult.de/algal-bloom-in-the-baltic-sea/>



Highlight Optimized Natural Color

2023-02-07 14:52:49 UTC 18HYF Sentinel-2 L2A



Highlight Optimized Natural Color

2023-02-07 14:52:52 UTC 18HYF Sentinel-2 L2A



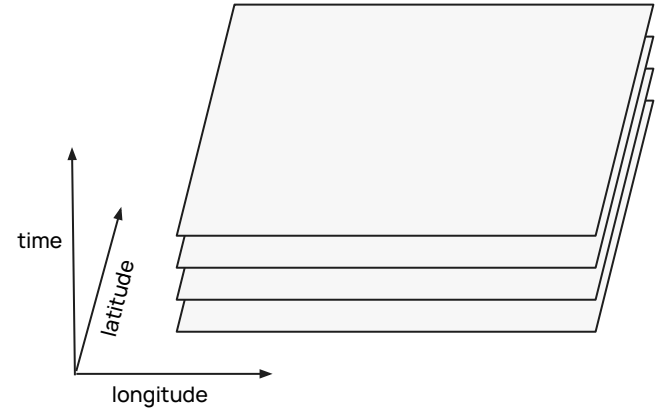
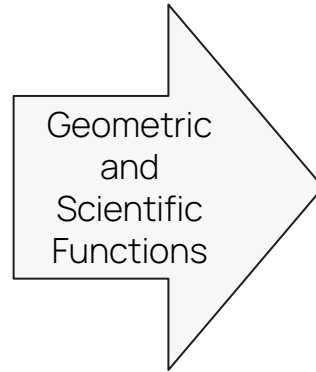
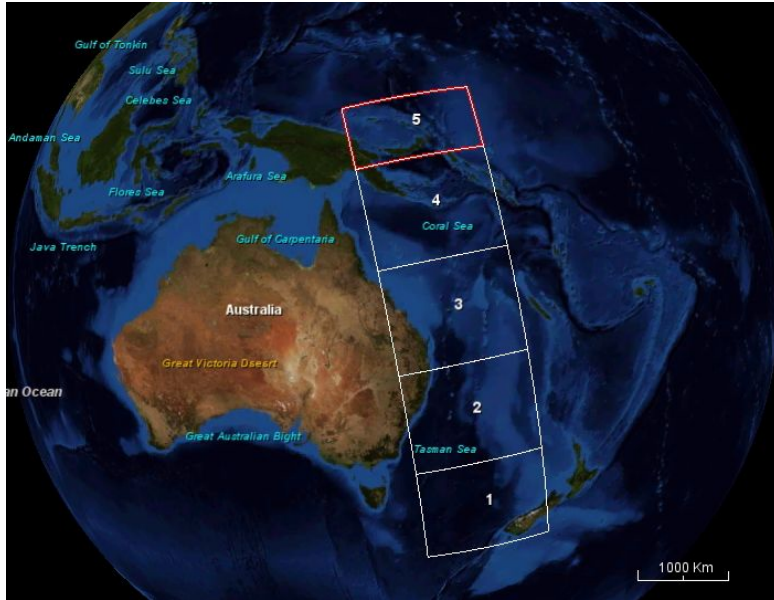
Short wave infrared composite (SWIR), based on bands 12, 8A, 4

ESA Copernicus Sentinel-2



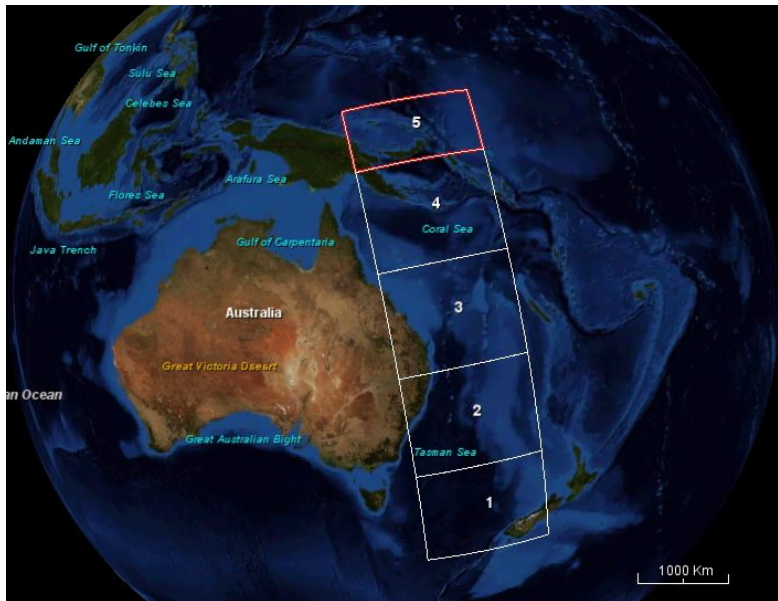
From Satellite Images to Data Cubes

Making Data Analysis-Ready



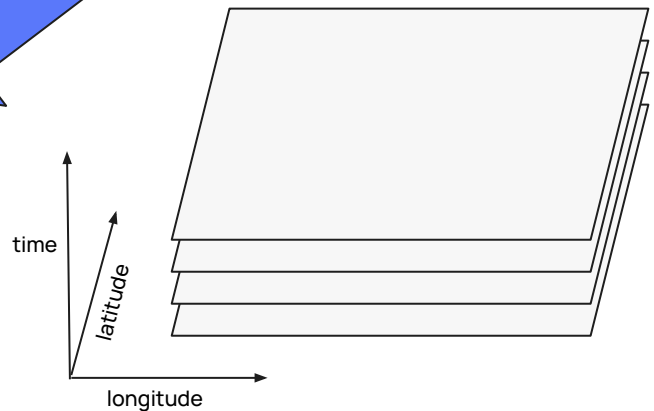
From Satellite Images to Data Cubes

Making Data Analysis-Ready

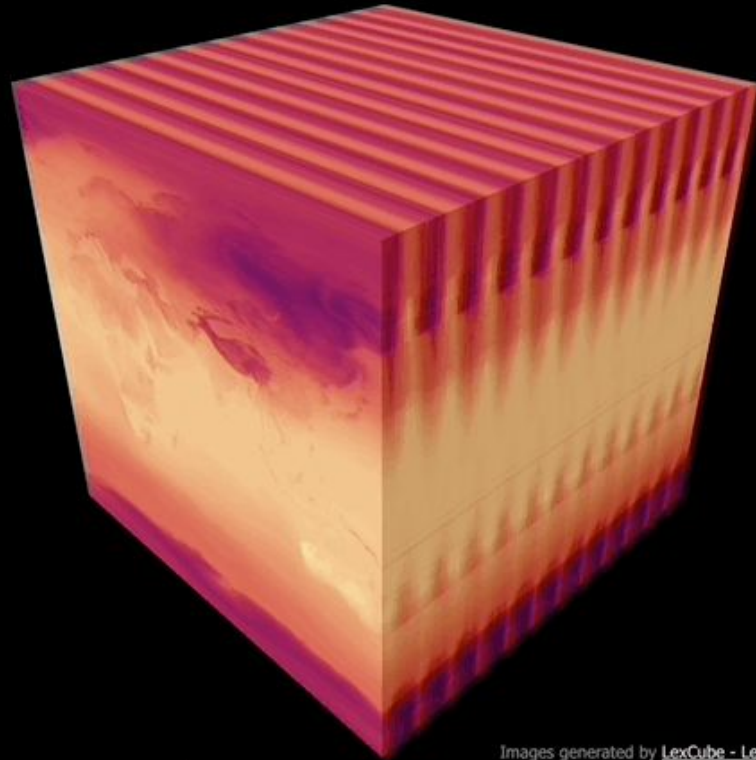


Geometric
and
Scientific
Functions

Here happens Science!



Data Cubes



Images generated by [LexCube - Leipzig Explorer](#)



Climate
Change Service

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[What we do](#)

[Data](#)

[Home](#) / [What we do](#) / The Climate Data Store

The Climate Data Store

The C3S **Climate Data Store (CDS)** is a one-stop shop for information about the climate: past, present and future. It provides easy access to a wide range of climate datasets via a searchable catalogue. An online toolbox is available that allows users to build workflows and applications suited to their needs.

[CONCEPT](#) | [INFRASTRUCTURE](#) | [TOOLBOX](#) | [APPLICATION PROGRAMMING INTERFACE](#)

[USER LEARNING SERVICES](#)



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ESA Climate Office

Home > Open Data Portal

Evidence | Explore | Educate | ESA & Climate

Climate Data Dashboard

of the ESA Climate Change Initiative

→ Climate Data Search interface

for the ESA Climate Change Initiative

- Aerosol
- Cloud
- Greenhouse Gases
- Ozone
- Ocean Colour
- Sea Ice
- Sea Level
- Sea State
- Sea Surface Salinity
- Sea Surface Temperature
- Water Vapour
- Antarctic Ice Sheet
- Above-Ground Biomass
- Fire
- Glaciers
- Greenland Ice Sheet
- Lakes
- Land Cover
- Land Surface Temperature
- Permafrost
- Snow



ESA Climate Office

Startseite > Open Data Portal

Evidenz | Erkunden | Bildung | ESA & Klima

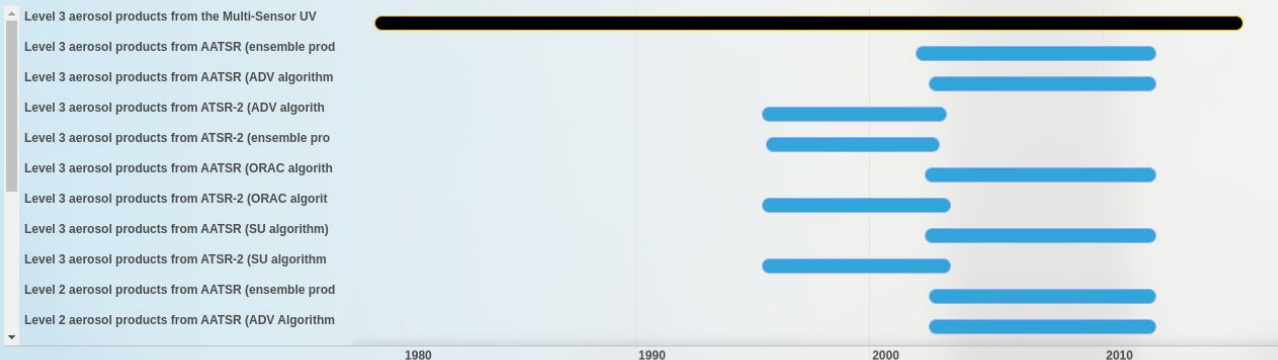
← Climate Data Dashboard

of the ESA Climate Change Initiative

Aerosol [↗](#)

The aerosol_cci project produces a set of global aerosol ECV products from European satellite instruments with substantially different characteristics and information content. Primary products include total column Aerosol Optical Depth (AOD), stratospheric aerosol extinction profiles and further information on aerosol type (fine mode fraction, absorption, mineral dust).

Total catalogue size: 363.5 GB



Level 3 aerosol products from the Multi-Sensor UV Absorbing Aerosol Index (MS UVAI) algorithm, Version 1.7
[Click here for data access](#)

Catalogue size: 8.1 GB
 Number of files: 13079

- [Dataset Information](#)
- [Product Guide](#)
- [Start date: 01 Nov 1978](#)
- [End date: 31 Dec 2015](#)
- [FTP Download](#)
- [Additional Download Options](#)

The ESA Climate Change Initiative Aerosol project has produced a number of global aerosol Essential Climate Variable (ECV) products from a set of European satellite instruments with different characteristics. This dataset comprises Level 3 Absorbing Aerosol Index (AAI) products, using the Multi-Sensor UVAI algorithm, Version 1.7. L3 products are provided as daily and monthly gridded products as well as a monthly climatology. For further details about these data products please see the linked documentation.


Data were processed by the ESA CCI Aerosol project team and supplied to CEDA in the context of the ESA CCI Open Data Portal Project.



Dataset


[View XML](#)

ESA Aerosol Climate Change Initiative (Aerosol_cci): Level 3 aerosol products from the Multi-Sensor UV Absorbing Aerosol Index (MS UVAI) algorithm, Version 1.7

 Open Access

 Download

 See Related Documents

Update Frequency:	Not Planned
Latest Data Update:	2020-06-03
Status:	Completed
Online Status:	ONLINE
Publication State:	Published
Publication Date:	2020-08-27
Download Stats:	last 12 months
Dataset Size:	13.08K Files 8GB

Abstract


The ESA Climate Change Initiative Aerosol project has produced a number of global aerosol Essential Climate Variable (ECV) products from a set of European satellite instruments with different characteristics. This dataset comprises Level 3 Absorbing Aerosol Index (AAI) products, using the Multi-Sensor UVAI algorithm, Version 1.7. L3 products are provided as daily and monthly gridded products as well as a monthly climatology.

For further details about these data products please see the linked documentation.

Citable as: ESA Aerosols CCI project team; de Leeuw, G.; Popp, T. (2020): ESA Aerosol Climate Change Initiative (Aerosol_cci): Level 3 aerosol products from the Multi-Sensor UV Absorbing Aerosol Index (MS UVAI) algorithm, Version 1.7. Centre for Environmental Data Analysis, *date of citation*.
<https://catalogue.ceda.ac.uk/uuid/2e656d3d4016414e8d4bced1863d772e>

Abbreviation: Not defined

Keywords: ESA, CCI

[Related Records](#)
[Details / Docs \(5\)](#)
[Process](#)
[Variables \(7\)](#)
[Tools \(4\)](#)
 Datasets (2)

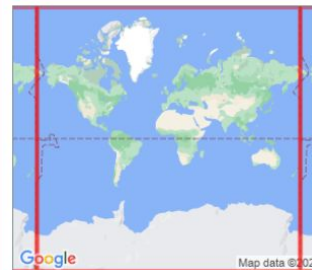
Coverage

Temporal Range

Start time: 1978-11-01T00:00:00

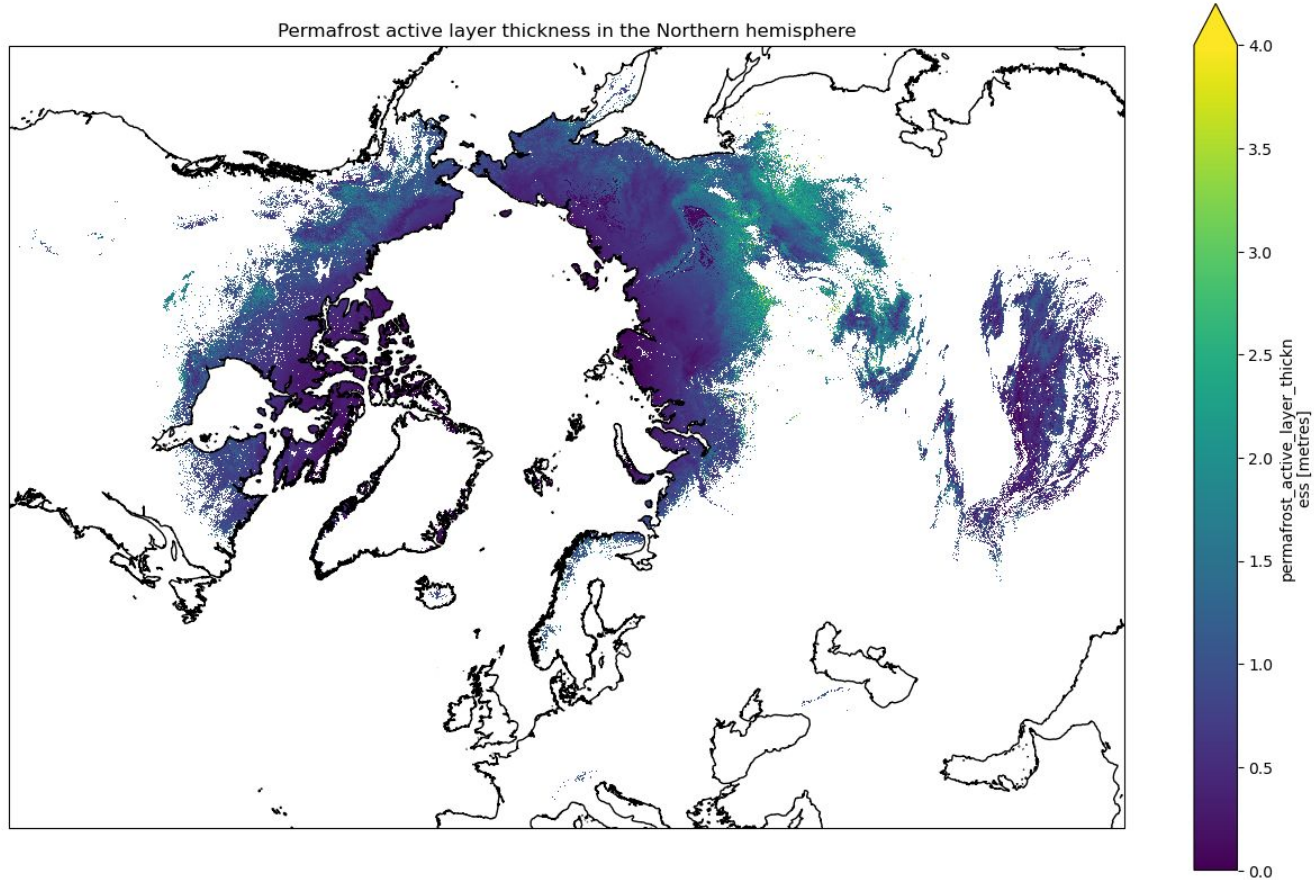
End time: 2015-12-31T23:59:59

Geographic Extent


[Help ?](#)

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Hands-On:
Wir basteln uns
ein Little Picture



Notebooks unter: <https://github.com/littlepictures/scicar23>



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t.ly/4nV3Z

Und nun:
Wie es weitergeht...

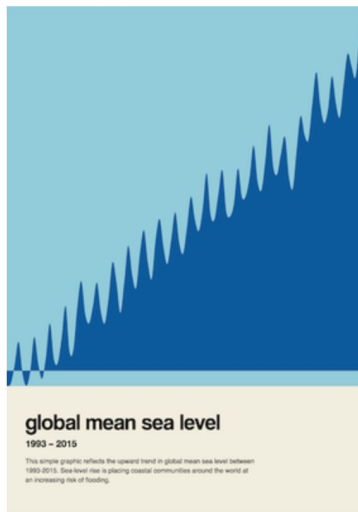
ESA Climate Office

a competition for creative visionaries

help us transform decades of satellite climate data to compelling, impactful "[Little Pictures](#)" that spark awareness and drive action.

submit your own data-driven Little Picture and get the chance to display it at the [UN COP28 climate conference](#). We'll also invite you to an "expenses paid" VIP tour of the [ESA data-visualisation suite](#) at our ESRIN Facility, Frascati, Italy.

ten runners up will get the chance to display your creative data visualisation skills on our [Little Picture gallery](#) (with judges commendations).



little picture: sea level trend



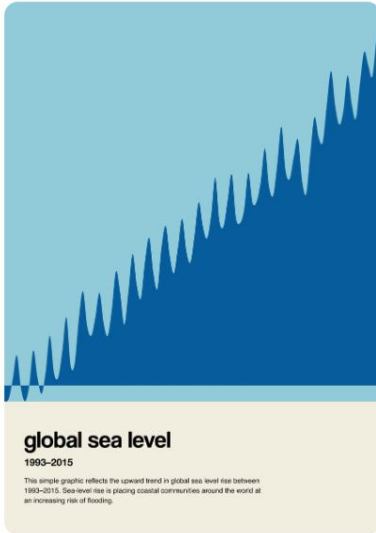
<https://climate.esa.int/en/littlepicturescompetition/>



ESA
@esa

Help make a big difference with a #LittlePicture...

Join our competition for creatives, experts and enthusiasts, and help us transform decades of satellite climate data to compelling, impactful 'Little Pictures' that spark awareness and drive action. Enter here twitter.com/i/web/status/1...



42 Retweets 142 Likes

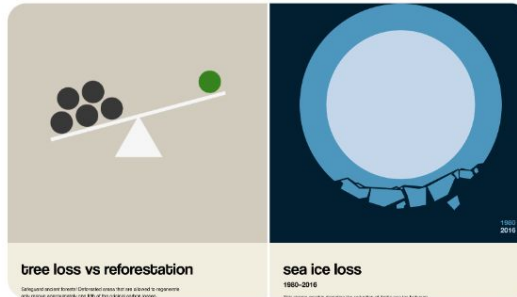


Ed Hawkins
@ed_hawkins

Little Pictures of Climate Competition

Excited to be on the judging panel for an @esaclimate competition to design 'little pictures' which use climate data to communicate an important message in a simple and novel way.

Closing date: 20th November
climate.esa.int/en/littlepictu...



71 Retweets 254 Likes

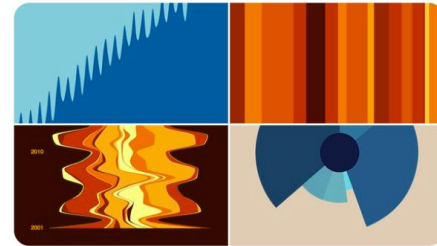


Matthias Stahl
@h_i_g_s_c_h

COMPETITION alert!

Help @esa transform decades of satellite climate data to compelling, impactful »Little Pictures« that spark awareness and drive action!

Submit your own data-driven Little Picture until Nov 4.



35 Retweets 113 Likes



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ESA

The **ESA Climate Change Agency**

ESA is one of the European Space Agency's... (text partially obscured)

ESA Climate Change Agency

ESA is one of the European Space Agency's... (text partially obscured)

climate connections

... (text partially obscured)

reduction of arctic ice

... (text partially obscured)

burned area in europe

... (text partially obscured)

sea level vs. reforestation

... (text partially obscured)

methane gas emissions

... (text partially obscured)

sea ice loss

... (text partially obscured)



Thanks & see you next time!

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