

# Z8100 GLOBÁLNÍ MAPOVÁNÍ 10

Future Earth | ESA CCI – klimatická data

**Ondřej Kvarda**

# Future Earth

- Síť vědců, projektů, výzkumných asociací, výzkumníků a inovátorů.
- Snaha o globální udržitelnost.
- Systémový přístup – hlubší poznání procesů na Zemi a lidské dynamiky.
- Návrhy na opatření (policies) a strategie pro udržitelný rozvoj.
- Znalosti potřebné pro dodržení UN 17 SDGs.

# Future Earth

## – 19 globálních projektů:

- AIMES – ANALYSIS, INTEGRATION & MODELLING OF THE EARTH SYSTEM
- BIODISCOVERY
- ESG – EARTH SYSTEM GOVERNANCE
- EVOLVES
- FUTURE EARTH COASTS
- **GCP – GLOBAL CARBON PROJECT**
- GLP – GLOBAL LAND PROGRAMME
- **GMBA – GLOBAL MOUNTAIN BIODIVERSITY ASSESSMENT**
- **IGAC – INTERNATIONAL GLOBAL ATMOSPHERIC CHEMISTRY**
- IHOPE – INTEGRATED HISTORY AND FUTURE OF PEOPLE ON EARTH
- ILEAPS – INTEGRATED LAND ECOSYSTEM-ATMOSPHERE PROCESSES STUDY
- **IMBER – INTEGRATED MARINE BIOSPHERE RESEARCH**
- IRG – INTEGRATED RISK GOVERNANCE PROJECT
- MAIRS-FE – MONSOON ASIA INTEGRATED RESEARCH FOR SUSTAINABILITY
- ONEHEALTH
- **PAGES – PAST GLOBAL CHANGES**
- PECS – PROGRAMME ON ECOSYSTEM CHANGE AND SOCIETY
- SOLAS – SURFACE OCEAN-LOWER ATMOSPHERE STUDY
- WATER FUTURE — SUSTAINABLE WATER FUTURE PROGRAMME

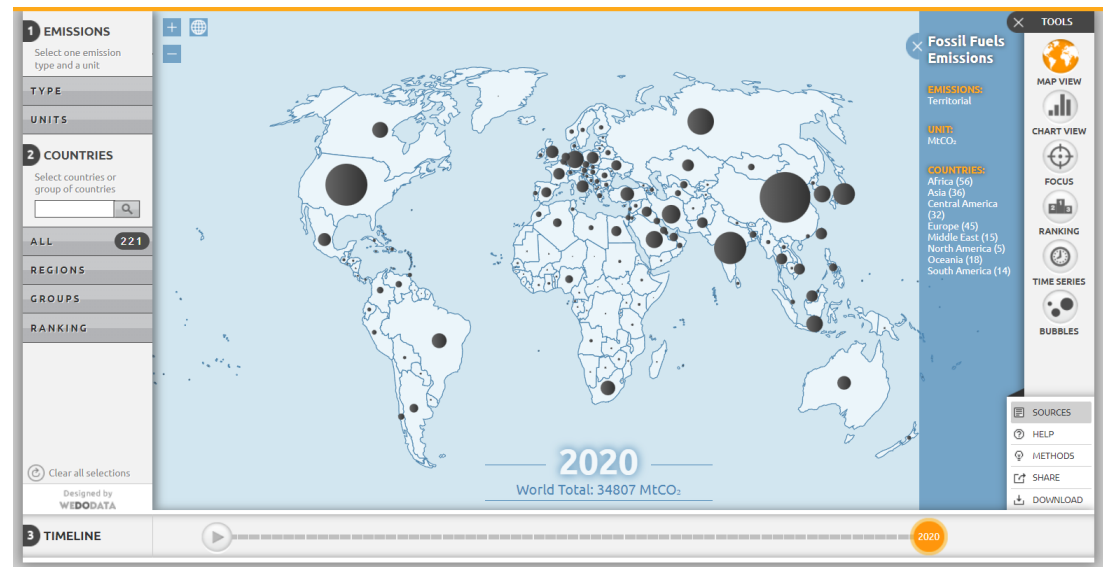
# GCP



- Globla Carbon Project
- Monitoring a měření objemu skleníkových plynů v atmosféře.
- Globální bilance oxidu uhličitého, metanu a oxidu dusného (objemy a producenti).

## – Carbon Atlas

(view a dowload –  
.jpg/.xlsx)



# GMBA

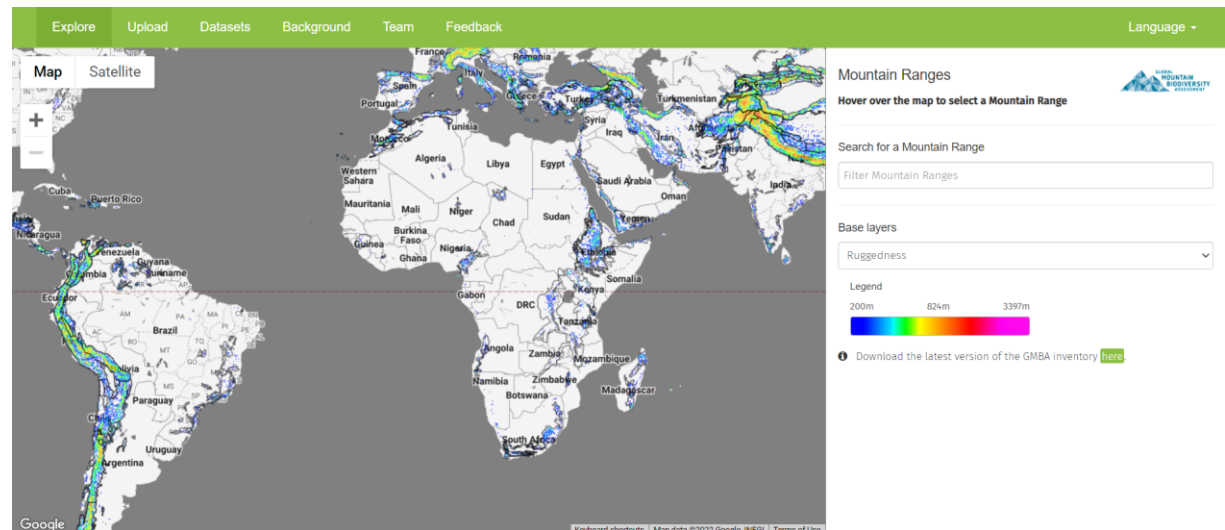


- Global Mountain Biodiversity Assessment
- Platforma pro spolupráci v oblasti **zhodnocení**, **konzervace** a **udržitelného managementu** horské biodiverzity.

- **Mountain Portal**

(**view a download** –  
polygonů pohoří, výskytů  
a pozorování různých  
druhů fauny a flory –  
**datasety**)

- Nutnost přihlášení...



# IGAC



– International Global Atmospheric Chemistry

– Studium chemie atmosféry (emise polutantů, skleníkových plynů), kvality vzduchu a obecně klimatu.

– TOAR (studium troposféry; možnost přistoupit jak k **raw datům**, tak k **web interface** – **satelitní, pozemní, letecká, ozonová a LiDAR data**)

– Nutnost přihlášení...

A screenshot of the TOAR (Tropospheric Ozone Assessment Report) website. The page has a blue header with the IGAC logo and navigation links: About, Activities, Working Groups, Conferences, Publications, Events, and Codes of Conduct in Science. Below the header is a search bar and the tagline "Facilitating atmospheric chemistry research towards a sustainable world". The main content area is divided into two columns. The left column lists "TOAR Phase - I (2014-2019) Completed" and "TOAR Phase - II (2020-2024) In Progress", followed by "Co-Chairs:" and lists Dr. Owen R. Cooper (CIRES University of Colorado/NOAA Chemical Sciences Laboratory, Boulder, CO, USA, owen.r.cooper@noaa.gov) and Dr. Martin G. Schultz (Forschungszentrum Jülich, Germany, m.schultz@fz-juelich.de). The right column contains text about the science effort, organization, achievements, and data tools. The "TOAR data and tools:" section lists: TOAR Data Portal: https://toar-data.org; TOAR surface ozone database web interface: https://join.fz-juelich.de; TOAR surface ozone metrics data compilations and plots: https://doi.org/10.1594/PANGAEA.876108; and a Git repository with python software to access TOAR surface ozone data: https://jugit.fz-juelich.de/m.schultz/toar-public-utilities. Below this is a "Publications" section.

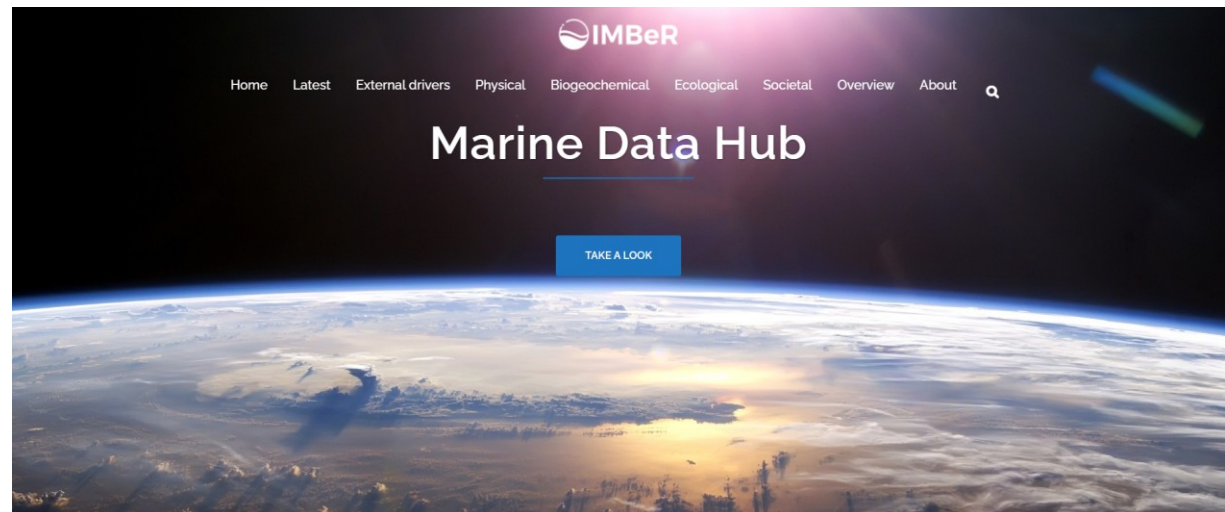
# IMBeR



- Integrated Marine Biosphere Research
- Ocean Sustainability (vliv lidské činnosti na oceány).

- Marine Data Hub

(různé tematiky; celkem málo výstupů; především rastrová a gridová data)



- Past Global Changes
- Studium dávného životního prostředí Země → pochopení a predikce do budoucna (klíma, biochemické cykly, procesy ekosystému, biodiverzita atd.)
- Seznam interních a externích databází

**Data**

- PAGES databases
- External databases
- Data guidelines
- Deposit data

**Latest Magazine**

**PAGES working group databases**

Databases and metadatabases compiled by PAGES Working Groups. We list here only larger data-compilation efforts. Please remember to properly acknowledge all data that you use from others, coming either from models or reconstructions. You may direct any queries or relevant links for inclusion to the [Science Officer](#).

**Databases**

- 2k Network Global Temperature Database (2017): <https://www.ncdc.noaa.gov/paleo-search/study/2171>
- 2k Network Global Temperature Database (2013): <https://www.ncdc.noaa.gov/paleo-search/study/12621>
- 2k Network Global Temperature Field Reconstructions (2019): <https://www.ncdc.noaa.gov/paleo-search/study/26850>
- 2k Network Common Era Surface Temperature Reconstructions (2019): <https://www.ncdc.noaa.gov/paleo-search/study/26872>
- 2k Network Northern Hemisphere Hydroclimate (2016): <https://www.ncdc.noaa.gov/paleo-search/study/19725>
- Antarctica2k Antarctica temperature reconstructions (2017): <https://www.ncdc.noaa.gov/paleo-search/study/22589>
- Arctic 2k Temperature database (2013) update (2014): <https://www.ncdc.noaa.gov/paleo-search/study/16973>
- Australasia2k Low-resolution Australasian palaeoclimate records of the last 2000 years (2017): <https://www.ncdc.noaa.gov/paleo-search/study/21731>
- Australasia2k Instrumental and reconstructed rainfall data for Australia (2017): <https://doi.org/10.4225/49/59e3ee30cddbc>
- Australasia2k Australasia Temperature reconstructions (2016): <https://www.ncdc.noaa.gov/paleo-search/study/12915>
- NorthAmerica2k North American borehole temperature profiles suitable for climate studies (2016):



# ESA – Climate Change Initiative Land Cover



- Globální [land cover](#) s prostorovým rozlišením 300 m.
- Družice [SPOT](#) (panchromatické a multispektrální snímky) a [PROBA-V](#) (vegetace), a senzory [MERIS](#) (oceány a pobřeží; spektrometr) a [AVHRR](#) (povrchová teplota).
- [Land Cover Map](#) (1992 – 2020); [Plant Functional Map Type Map](#) (% holé půdy); [MERIS Surface Reflectance](#); [Water Bodies](#) (150 m); User Tool
- [Mapový portál](#) (možnost stažení dat – po „přihlášení“)
- (Alternativa: [Copernicus Global Land Cover](#) 100 m)

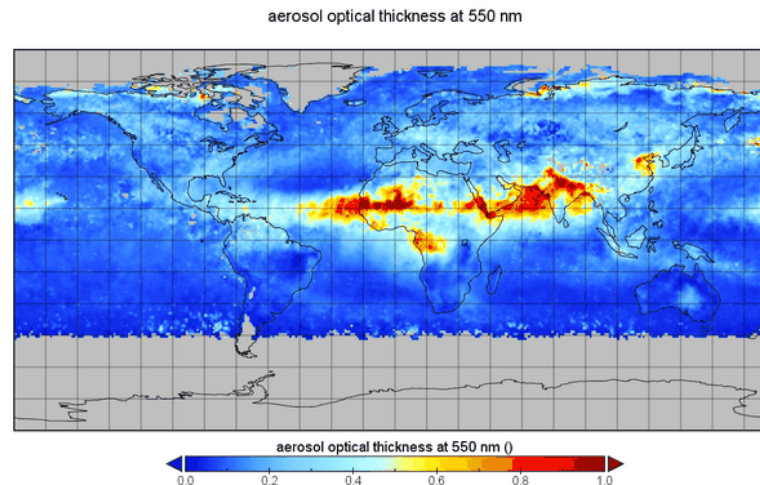
# ESA – Climate Change Initiative Aerosol



– Vlastnosti, složení a množství aerosolů v atmosféře.

– Dataseťy


– Copernicus Climate Data Store (1995–2021; GRID)

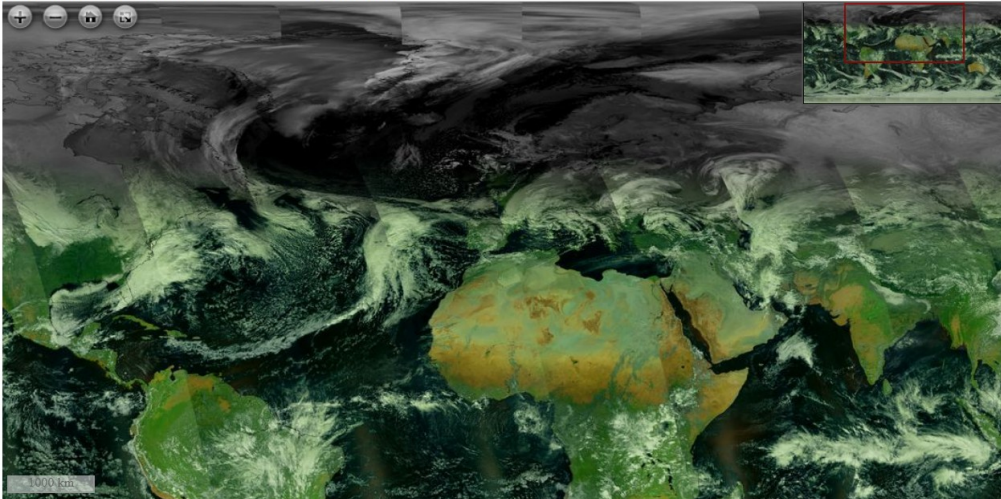


# ESA – Climate Change Initiative Cloud



- Dlouhodobé pozorování vlastností oblačnosti (1982).
- [Mapový portál](#) (view a download dat) (RGB, tlak, teplota, tloušťka atd.)

Select date	Select cloud property *	Lon/Lat	Data value	
Year: 2010 Month: 1 Day: 1	RGB CIP CIT COT CER CTY CPH CWP SWE <sup>#</sup> <sub>TOA</sub> LWF <sup>#</sup> <sub>TOA</sub> SWE <sup>#</sup> <sub>BOA</sub> LWF <sup>#</sup> <sub>BOA</sub> <small>* only a subset is listed</small>	105.10/23.70	647 hPa	
Dataset : AVHRR-PM Date: 2010/01/01 (satellite: NOAA-19)	Data: True colour image <a href="#">download data</a>			



[Generate URL for this view.](#) [https://public.satproj.klima.dwd.de/data/ESA\\_Cloud\\_CCI/Browser/cloudcci\\_L3Ubrowser\\_fw3\\_v1.html?year=1982&month=1&day=1&pr](https://public.satproj.klima.dwd.de/data/ESA_Cloud_CCI/Browser/cloudcci_L3Ubrowser_fw3_v1.html?year=1982&month=1&day=1&pr)

# ESA – Climate Change Initiative Fire



- Processing a detekování **spálených území**. Analýza dopadu požárů na klima.
- Rastr (250–300 m); GRID (0,25°) (sum of burned area, number of fires atd.)

- [Seznam](#) produktů ke stažení.

## Burned Area Products

As part of the Fire\_cci project, several algorithms have been or are being tested in different parts of the world, involving the use of medium to high resolution satellite images, including MERIS, MODIS, Sentinel 1, Sentinel 2, Sentinel-3 and AVHRR data.

The following burned area products are currently available:

- [FireCCI31](#): Based on MERIS data, global at 300m and 0.25 degrees for 2006-2008 (Deprecated)
- [FireCCI41](#): Based on MERIS data, global at 300m and 0.25 degrees for 2005-2011 (Deprecated)
- [FireCCI50](#): Based on MODIS data, global at 250m and 0.25 degrees for 2001-2016 (Superseded)
- [FireCCI51](#): Based on MODIS data, global at 250m and 0.25 degrees for 2001-2020
- [FireCCIS310](#): Based on Sentinel-3 Synergy (SYN) data, global at 300m and 0.25 degrees for 2019
- [FireCCISFD11](#): Based on Sentinel-2 data, for Sub-Saharan Africa at 20m and 0.25 degrees for the year 2016
- [FireCCISFD20](#): Based on Sentinel-2 data, for Sub-Saharan Africa at 20m and 0.25 degrees for the year 2019 (NEW)
- [FireCCILT10](#) (beta product): Based on AVHRR-LTDR data, global at 0.25 degrees for 1982-2017 (Deprecated)
- [FireCCILT11](#): Based on AVHRR-LTDR data, global at 0.05 degrees and 0.25 degrees for 1982-2018
- [FireCCS1SA10](#) (beta product): Based on Sentinel-1 data, for a Large Demonstrator Area in the Amazon at 40m for the year 2017
- [FireCCI special study case Indonesia](#): Based on Sentinel-1 data for El Niño 2015-2016

## Other products are under development in the current Fire\_cci project:

- Test sites in Africa based on Sentinel-1 and a combination of S1 & S2 data for 2019
- Global products based on merged burned area outputs

# ESA – Climate Change Initiative Greenhouse Gases



- Monitoring antropogenního **oxidu uhličitého** a **metanu** v **atmosféře**.
- Přístup k datům přes **CEDA** (Centre for Environmental Analysis).

The screenshot displays the CEDA Archive website interface. At the top, the CEDA Archive logo is on the left, and navigation links for 'Search Catalogue', 'Get Data', 'Help', 'Tools', 'Deposit', and 'News' are in the center. A 'Sign in' button is on the right. Below the header, the page title 'Catalogue Search' is centered. A search bar contains the text 'carbon dioxide' and a 'Search' button. Below the search bar, it indicates '761 Results' and 'Results per page: 20' and 'Sort by: Relevance'. A 'Filter by record type' sidebar on the left lists categories: Datasets (691), Dataset Collections (21), Projects (18), Instruments (21), Platforms (2), and Computations (8). The main content area shows three search results, each with a globe icon, a title, a description, and action buttons like 'Register/Login for access', 'Explore', and 'More Info'. The first result is 'GAUGE: Ecotech Spectronus FTIR greenhouse gas concentrations in Glatton, Cambridgeshire from October 2014 to April 2016'. The second is 'GAUGE: Ecotech Spectronus FTIR greenhouse gas concentrations on a landfill site near Great Blakenham, Suffolk, from 7th August 2014 to 15th August 2014'. The third is 'WCRP CMIP3: CGCM3-1-T63 (Canadian Centre for Climate Modelling & Analysis) data'.

# ESA – Climate Change Initiative Glaciers















– Změny rozlohy, objemu a „rychlosti“ ledovců.

– Glaciers CCI Database -> Randolph Glacial Inventory (globální vymezení ledovců; SHP, CSV, GeoTIFF) – nutnost přihlášení



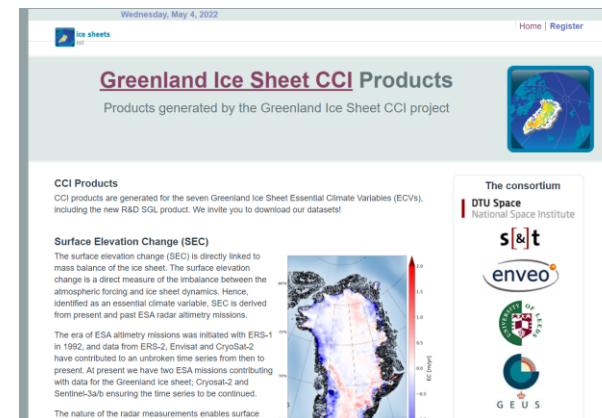
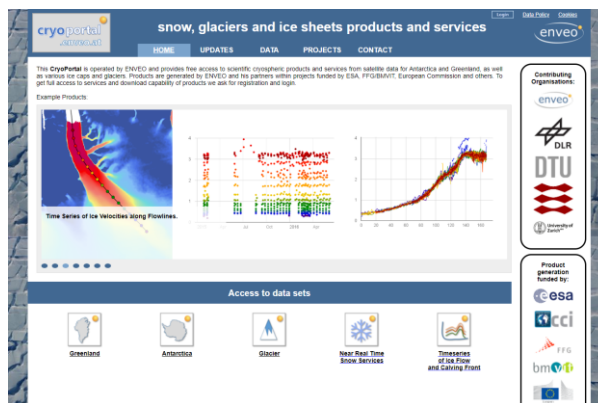
The screenshot shows the Glaciers CCI Database interface. At the top, there is the ENVEO logo and the text "Glaciers CCI Database Operated by ENVEO". Below this, there is a navigation menu with tabs for "Glacier Area", "EC-Altimetry", "EC-DEMDF", and "Ice Velocity". The "Glacier Area" tab is selected. The main content area displays a table with the following columns: Entry ID, Quicklook, Region, Period, Sensor, Release, and a download icon. The table contains the following data:

Entry ID	Quicklook	Region	Period	Sensor	Release	
g_rgi05_002		Greenland	1994-2009	LANDSAT	v170520	
g_rgi05_003		Greenland	1994-2009	LANDSAT	v170525	
g_rgi14_001		Karakoram	1998-2002	LANDSAT	v150505	
g_rgi13_002		Pamirs	1998 – 2009 (2 scenes 2009)	LANDSAT	v151118	
g_rgi17_001		Patagonia (Palena)	1985 – 2000 – 2011	LANDSAT	v151215	
Randolph Glacier Inventory		Global	1999–2010	Multi-sensor optical	RGI 5.0	

# ESA – Climate Change Initiative Ice Sheets



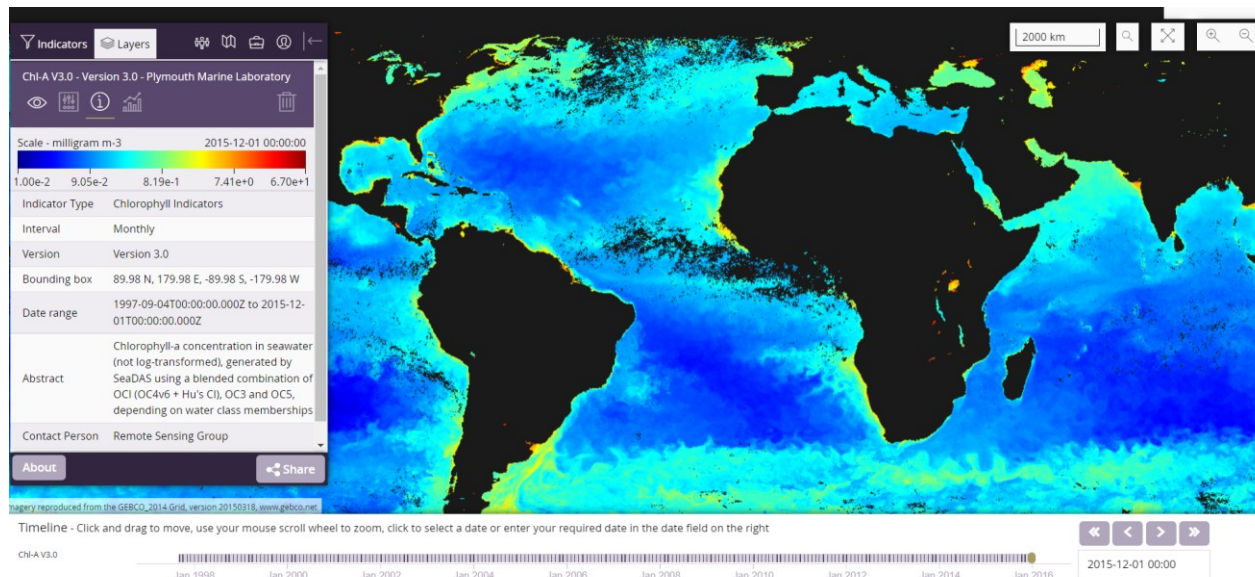
- Monitoring „ledové pokrývky“ v Grónsku a na Antarktidě (rozloha, tloušťka, objem, „rychlost“).
- Vstupy do **modelů** chování ledu na pólech (tvorba, tok vody atd.).
- **Cryoportal** (datasety jak pro Antarktidu, tak pro Grónsko) (většinou GeoTIFF) – nutnost přihlášení
- **Greenland Ice Sheet CCI Products** (výška, rychlost, hmotnost atd.)



# ESA – Climate Change Initiative Ocean Colour



- Optické vlastnosti oceánů (chlorofyl, reflektance, znečištění atd.)
- Composite Browser (pouze view; případně WCS/WMS) (jinak přes [FTP](#) – např. [FileZilla](#))





# ESA – Climate Change Initiative Sea Ice



- Sledování koncentrace, kvality a tloušťky mořského ledu.
- Data výhradně přes [CCI Data Portal](#).

**Climate Data Dashboard**  
of the ESA Climate Change Initiative

## Sea Ice

The ESA CCI Sea Ice project will combine and extend ongoing research to develop improved and validated timeseries of ice concentration and ice thickness for use in climate research. Since sea ice is a sensitive climate indicator with large seasonal and regional variability, the climate research community require long-term and regular observations of the key ice parameters in both Arctic and Antarctic. The project includes representatives from the scientific user community and climate research programmes to validate the ice concentration and ice thickness retrievals provided by the EO science team.

Total catalogue size: 167.2 GB

Dataset Name	Size	Files
Sea Ice Concentration Climate Data Record from the AMSR-E and AMSR-2 instruments at 25km grid spacing, version 2.1	94.3 GB	10277
Northern hemisphere sea ice thickness from the Env		
Northern hemisphere sea ice thickness from the Cry		
Southern hemisphere sea ice thickness from the Env		
Northern hemisphere sea ice thickness from CryoSat		
Northern hemisphere sea ice thickness from Envisat		
Southern hemisphere sea ice thickness from CryoSat		
Southern hemisphere sea ice thickness from Envisat		

2010

The dataset provides a Climate Data Record of Sea Ice Concentration (SIC) for the polar regions, derived from medium resolution passive microwave satellite data from the Advanced Microwave Scanning Radiometer series (AMSR-E and AMSR-2). It is processed with an algorithm using medium resolution (19 GHz and 37 GHz) imaging channels, and has been gridded at 25km grid spacing. This version of the product is v2.1, which is an extension of the v2.0 Sea\_Ice\_cci data and has identical data until 2015-12-25. This product was generated in the context of the ESA Climate Change Initiative Programme (ESA CCI) by the Sea Ice CCI (Sea\_Ice\_cci) project. The EUMETSAT OSI SAF contributed with access and re-use of part of its processing software and facilities. A SIC CDR at 50 km grid spacing is also available.

Sea Ice Concentration Climate Data Record from the AMSR-E and AMSR-2 instruments at 25km grid spacing, version 2.1  
Click here for data access

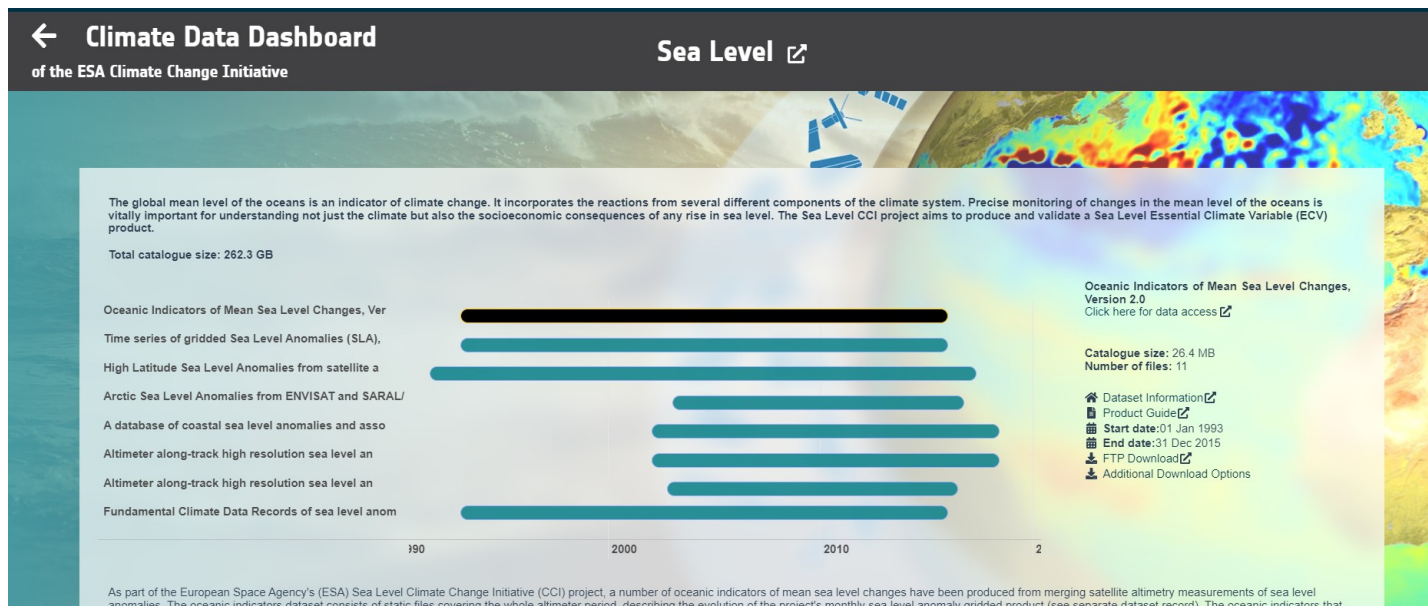
Catalogue size: 94.3 GB  
Number of files: 10277

- Dataset Information
- Product Guide
- Start date: 31 May 2002
- End date: 15 May 2017
- FTP Download
- Additional Download Options

# ESA – Climate Change Initiative Sea Level



- Monitoring hladiny světových oceánů.
- Data výhradně přes [CCI Data Portal](#).



# ESA – Climate Change Initiative Sea Surface Temperature



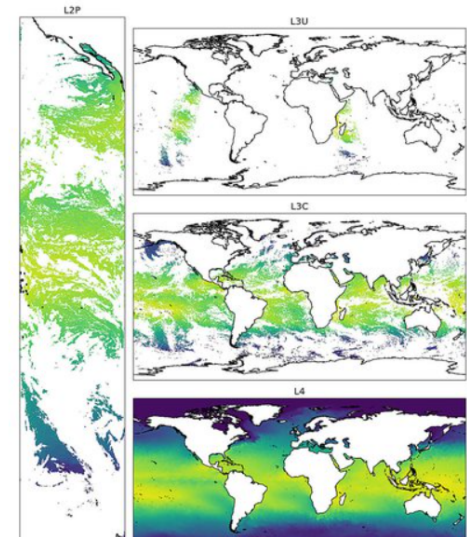
- Měření teploty světových oceánů (od roku 1982). (AVHRR)
- Data v rámci CEDA

The Sea Surface Temperature\_cci project generates three types of data:

1. Most convenient for many general users is our “SST analysis”, which is a global, gridded, gap-free estimate of daily average sea surface temperature at a resolution of ~5 km. For more information and data: [dx.doi.org/10.5285/62c0f97b1eac4e0197a674870afe1ee6](https://dx.doi.org/10.5285/62c0f97b1eac4e0197a674870afe1ee6)
2. Users wanting gridded data, but only where SST was actually observed (no gap-filling) should look at “level 3” data: [dx.doi.org/10.5285/7db4459605da4665b6ab9a7102fb4875](https://dx.doi.org/10.5285/7db4459605da4665b6ab9a7102fb4875) and [dx.doi.org/10.5285/5db2099606b94e63879d841c87e654ae](https://dx.doi.org/10.5285/5db2099606b94e63879d841c87e654ae)
3. Users who need the native, highest resolution information as viewed originally by the satellite should look at: [dx.doi.org/10.5285/373638ed9c434e78b521cbe01ace5ef7](https://dx.doi.org/10.5285/373638ed9c434e78b521cbe01ace5ef7) and [dx.doi.org/10.5285/916b93aaf1474ce793171a33ca4c5026](https://dx.doi.org/10.5285/916b93aaf1474ce793171a33ca4c5026)

The data are available openly for you to use. If you use our data in any report or article, you have just one obligation which is to attribute the data correctly.

As explained on the data pages, to attribute the data correctly, you should quote the correct name for the dataset and version you use, to cite the correct dataset location and our [peer-reviewed article](#) describing the science behind the data.



# ESA – Climate Change Initiative Soil Moisture



- Monitoring **vlhkosti půdy**.
- Aktivní i pasivní **mikrovlnné senzory** (ASCAT-A, ASCAT-B a další).
- Download dat možný po registraci (přes [FTP](#)).

## **ESA CCI SM v06.1 now available!**

Submitted by Tracy Scanlon on Mon, 2021-04-19 17:03

### **Climate Change Initiative**

The new ESA CCI SM version, v06.1 is now available! This is the most accurate ESA CCI SM product so far and provides global data from 1978 to 2020.



Register now to gain access, and take a look at the Frequently Asked Questions and Documentation! **Read more »**

# ESA – Climate Change Initiative CCI Data Portal



- Ke všem zmíněným datovým sadám lze přistoupit také přes [CCI Data Portal](#) (po výběru přesměrování na [CEDA](#), [FTP](#), nebo [alternativní zdroje dat](#)).

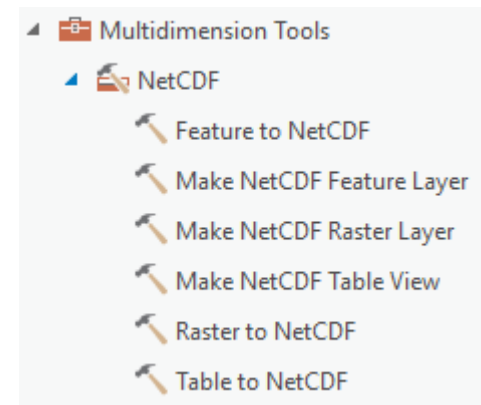


# ESA – Climate Change Initiative



- Data jsou často poskytována ve formátu **.nc (NetCDF)** – formát pro ukládání vědeckých dat (např. klimatických) – seznam softwarů pro manipulaci a případnou konverzi souborů **.nc [ZDE](#)**.

- **ArcGIS Pro** i **QGIS** je umí „načíst“ nativně.



- Některá data jsou však dostupná i v **textové** (.csv, .txt), **rastrové** (GeoTIFF, TIFF), nebo **vektorové** (.shp, .svg) podobě – je jich však celkem málo.

**DOTAZY?**

**Interaktivní osnova**

**Děkuji za pozornost**