

Copernicus Climate Change Service

Climate Change







The C3S mission

To support European adaptation and mitigation policies by:

- Providing consistent and authoritative information about climate (past, present, future)
- Building on existing capabilities and infrastructures (nationally, in Europe and worldwide)
- Stimulating the market for climate services in Europe



FC





Achievements since the signature of the Delegation Agreement

Celebrating C3S transitioning from a concept to an operational Service^{*}

Video 1

*: C3S second General Assembly, Berlin, 24-28 September 2018





The C3S mission

Change

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Providing consistent and authoritative information about climate (past, present, future)

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Stimulating the market for climate services in Europe



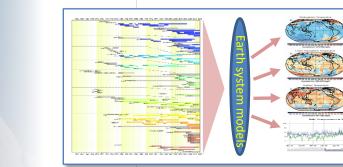


opernicus



Access to past, present and future climate information

Climate Change



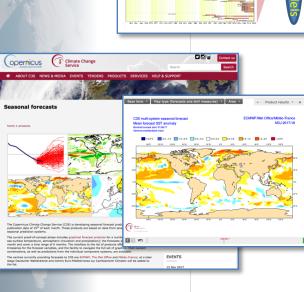
Observations and climate reanalyses

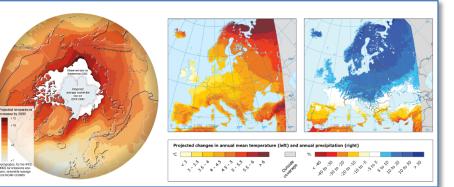
Seasonal forecast data and products

Climate model simulations

Sectoral climate impact indicators

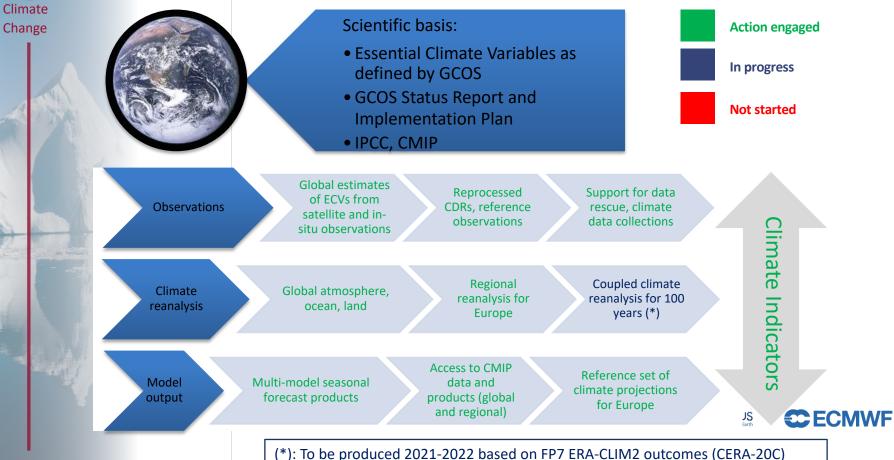








Climate Data Store content (November 2018)





C3S mission The

Change

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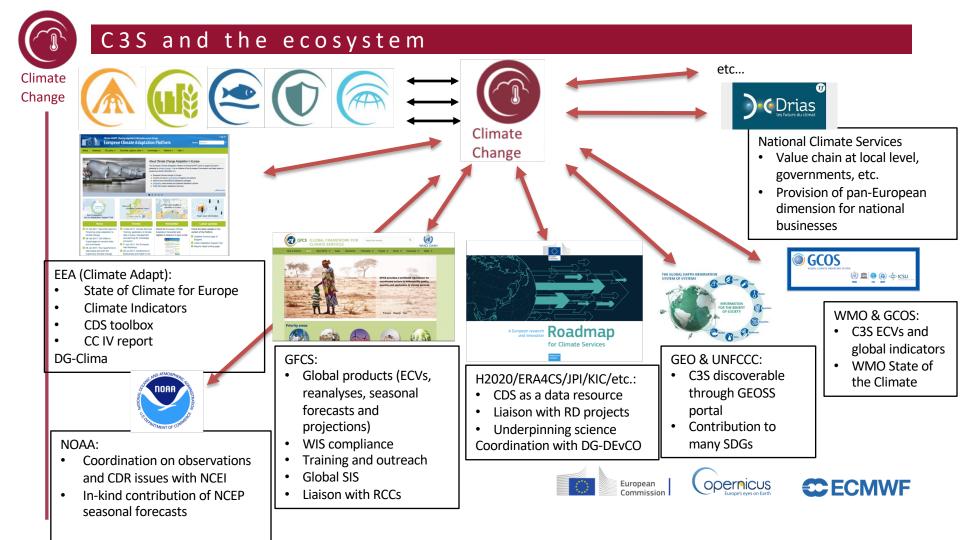
Entities contributing to C3S

Change

C3S: a truly European effort

249 different entities from 29 EU and ECMWF Member States, International Organisations and third countries







Climate Data Store Content







What C3S offers to its users

- Access to climate data
- Tools needed to use the data
- Information on sectoral impacts
- Quality assurance
- User support and training
- Climate change assessments ۰
- Outreach and communication

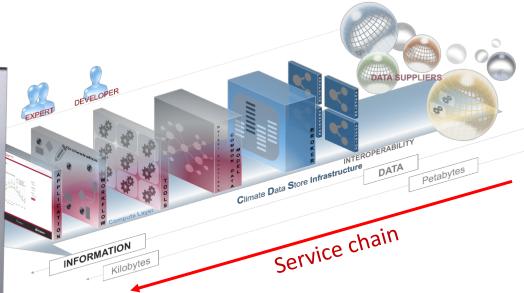
A one-stop Climate Data Store





CDS toolbox, workflows and applications

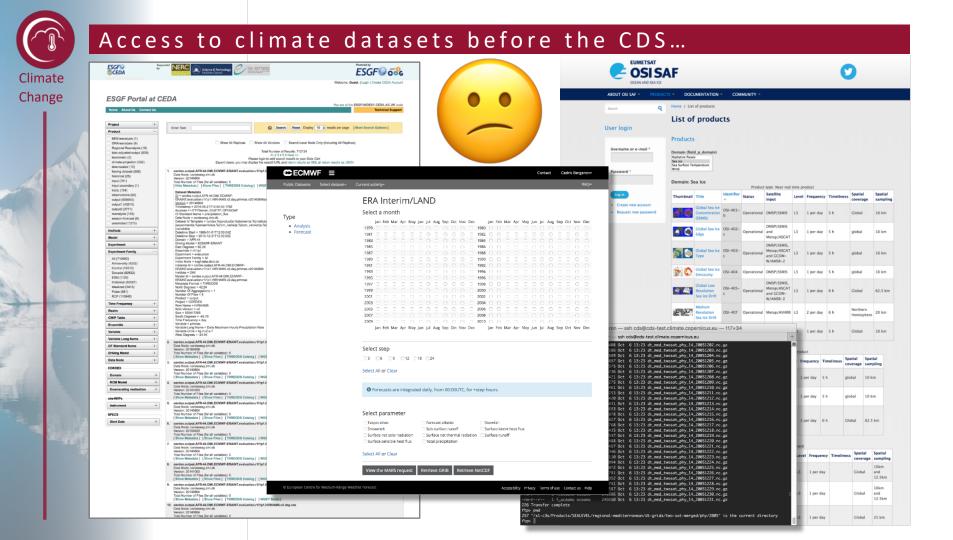




Quality assured information and tools for users: scientists, consultants, decision makers.









Catalogue of climate datasets

	CECM	Cognoreguer
Search Datasets Toolbox Help &	support	
rch results		
h dataset		
n dataset Q	All Datas	es
incy		Glaciers elevation and mass change data from 1894 to 2014 from the Fluctuation of Glaciers Database Aglacier is defined as a perential mass of ice, and possibly firm and snow, originating on the land surface from the recrystalization of snow or other forms of solid precipitation and showing eviden
	(4)	Glaciers extent data from 1995 to 2015 from the Randolph Glacier Inventory Aglicier's defined as a perennal mass of ice, and possibly firm and snow, originating on the land surface from the recrystalization of snow or other forms of solid precipitation and showing eviden
onal forecasts	(6) (2)	Methane data from 2002 to present derived from satellite sensors Methane (CH4) is the second most significant greenhouse gases that has increased in concentration in the amosphere directly due to human activities, from the vewpoint of the radiative forcing of cli
	(3) (4)	Sea surface temperature daily gridded data from 1991 to 2010 produced by ESA-CCI This dataset provides daily values for sea surface temperature and sea ice fraction over a regular grid with no missing values in space or in time. The initial statelite data from the Along Track Scan
l (biosphere)	(4) (1) (2)	Water quality indicators for European rivers This datase contains modelled dua for phosphorous and nitrogen concentrations and loads. The data comes from the Swedish Meteorological and Hydrological Institute E-HYPE model at catchment level L.
	(2)	Water quantity indicators for Europe This dataset contains modelled data for water runoff and wenness, river flow, snow water equivalent, soil water content and other water related quantities for the European region. These variables wer
oral coverage	0)))	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
	0)))	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
	0)))	CMIPS 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
	0)))	Seasonal forecast monthly statistics on single levels from 2017 to present Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, et a result of predictable changes in some of the slow-varying components of the s
	0)))	Seasonal forecast monthly statistics on pressure levels from 2017 to present Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s
	0)))	Seasonal forecast daily data on pressure levels from 2017 to present Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s
		ERAS hourly data on pressure levels from 2000 to present ERAS is the fifty generation ECMWF atmospheric reanalysis of the global climate. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset
		Seasonal forecast daily data on single levels from 2017 to present Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s



CECMWF

OPERPICUS Europe's eyes on Earth



ECV products from Earth observations

Overview Download data Documentation Sea ice monthly and daily gridded data from 1978 to present This dataset provides daily values for sea ice concentration. sea ice edge and sea ice type and monthly values for se thickness. These four variables are important markers for climate change studies since sea ice greatly influences the Download data Overview Documentation surface albedo and aa exchanges of energy, moisture and carbon. The sea-ice distribution, including polynyas and margins, also has an important infl on marine ecosystems. Changes in the distribution of sea ice affect these ecosystems and a number of activities such as shippingistic and tourist This is a ne Variable operations At least one selection must be made Sea ice edge, sea ice concentration and sea ice type were Home Search Datasets Applications Your requests Toolbox Help & support computed from satellite passive microwave brightness Sea ice edge Sea ice type Sea ice concentration temperatures from the series of SMMR, SSM/I and SSMIS Sea ice thickness Search results sensors. Sea ice thickness were computed from Ku-Band radar altimeter measurements collectring the Envistat and CryoSat-2 Select all satellite missions. Ice thicknesses from Envisat satellite (October 2002 to October 2010) have less coverage and higherstainty than thicknesses from CrvoSat-2 (November 2010 - March 2015), however the combined dataset provides a valuable unique observational recor Datasets Year ice variability At least one selection must be made Sort by From 1978 up to April 2015 the data records provided by this dataset have sufficient length, consisten Showing 1-11 of 11 results for Satellite observations continuity to dete climate variability and change. From April 2015 onwards, satellite data were processed up Relevancy 1978 1979 1980 same algorithms and processing ronment but consistency and continuity have not been extensively verified. 1981 1982 1983 Title 9 Glaciers elevation and ma More details about the product are given in the Documentation section. 1984 1985 1986 from the Fluctuation of Gl 1987 1988 1989 DATA DESCRIPTION ✤ Product type 1992 1995 Climate projections 1998 Coming soon: (2) Reanalysis 2001 (11) Satellite observations 2004 data from 1995 to 2015 from the Randolp 2007 (6) Seasonal forecasts 2010 Sectoral climate indices (2) 2013 2016 Variable domain Quality upgrades for several ECV datasets Select all Atmosphere (composition) (3) Land (biosphere) (1) Data products for additional ECVs (22 ECVs) Land (cryosphere) (2) (5) Ocean (physics) March Spatial coverage lune (8) Global (1) Northern hemisphere **CECMWF** opernicus European (1) This dataset provides daily values for sea surface temperature and sea ice fraction over a regular grid with no Southern hemisphere Commission missing values in space or in time. The initial satellite data from the Along Track Scan..

Sea ice monthly and daily gridded data from 1978 to present

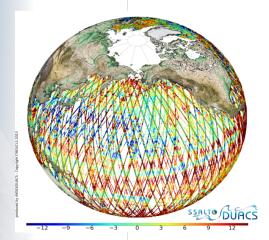
Temporal coverage
 Past

💷 🗧 Sea ice monthly and daily gridded data from 1978 to present



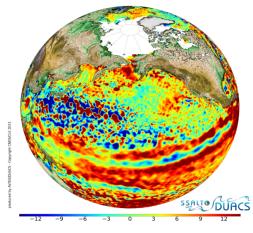
From satellite tracks to long-term global coverage

Change

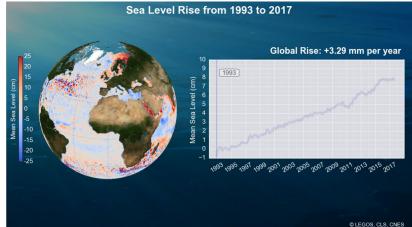


From satellite **along-track** measurements...

> ... to sea level gridded maps...



... to derive Ocean Monitoring Indicators

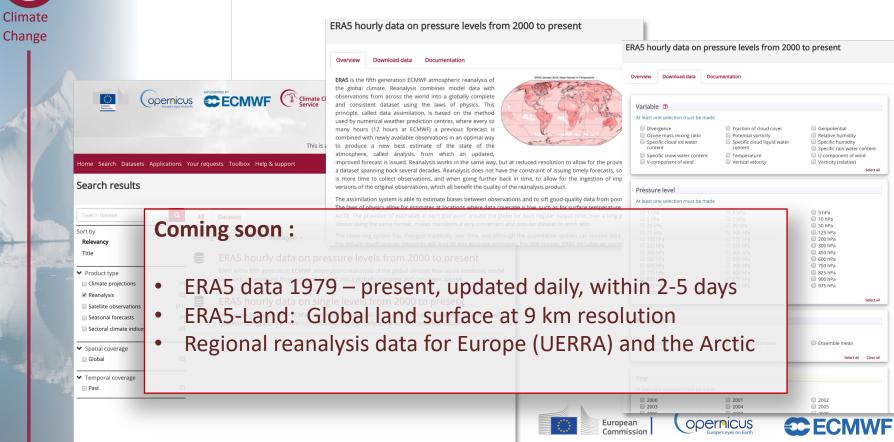








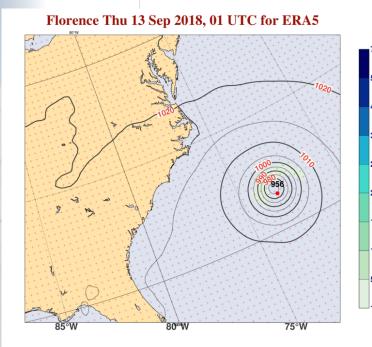
Climate reanalysis

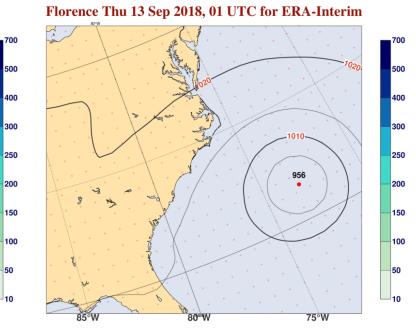




Going from ERA-Interim to ERA5

Change









Multi-system seasonal forecasts

Change

		result of predictable changes in some of the slow-varying components of the system. For example, ocean temperatures	Decomment	thly statistics on single le	evels from 2017 to pres
me Search Datasets Ap earch results	splications Your requests Toolbox Help & support	typically vary slowly, on timescales of weeks or months; as the ocean has an impact on the overlaying atmosphere, the variability of its properties (e.g. temperature) can modify both local and remote atmospheric conditions. Such modifications of the 'usual' atmospheric conditions. Such modifications and atmospheric conditions are the essence of all long-range (e.g. seasonal) forecasts. This is different from a weather forecast, which gives a lot more precise detail - both in time and space - of the evolution of the state of the atmosphere over a few days inti the chaotic nature of the atmosphere limits the possibility to predict precise changes and the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict precise changes at the state of the atmosphere limits the possibility to predict preci	at local scales. This is c	je	Météo France Select all
arch dataset	All Datasets Showing 1-6 of 6 results for Seasonal for	reasons long-range forecasts of atmospheric conditions have large uncertainties. To q range forecasts use ensembles, and meaningful forecast products reflect a distribution Given the complex, non-linear interactions between the individual components of the long-range forecasting are climate models which include as many of the key compone typically, such models include representations of the atmosphere, ocean and land surf, with data describing the state of the system at the starting point of the forecast, and	At least one selection must be main ace. These models are ace. The	de 10m v-component of wind 2m dewpoint temperature Evaporation	 10m wind gust since previous post-processing 2m temperature Maximum 2m temperature in
e oduct type Climate projections teanalysis iatellite observations ieasonal forecasts	Coming soon second forecast			 Minimum 2m temperature in the last 24 hours Sea surface temperature Snow depth Surface latent heat flux Surface solar radiation downwards Top thermal radiation 	the last 24 hours North-south surface stress rate of accumulation Sea-ice cover Snowfall Surface sensible heat flux Surface thermal radiation downwards Total cloud cover
ectoral climate indices		tional forecast providers			Select all
aatial coverage Slobal emporal coverage Future Past		ication information for a	Il forecast produ	cts	
	Seasonal forecast d	daily data on single levels from 2017 to	European		

Seasonal forecast monthly statistics on single levels from 2017 to present

Seasonal forecasts provide a long-range outlook of changes in the Earth system over periods of a few weeks or months, as a result of predictable changes in some of the slow-varying components of the s...







Climate projections from CMIP5

mate			CMIP5 daily data on pro	essure levels						
ange			Overview Download data D	ocumentation						
			This catalogue entry provides daily pressure levels from a large number time periods computed in the frame Coupled Model Intercomparison f Historical experiment. Information complete CMIPS dataset can be four section. The term "pressure levels" is us	r models, members and work of fith phase of the project (CMIP5) for the on how to access the ad in the Documentation	Extent Hod	MIP5 daily data on pres	sure levels			
			variables were computed at multiple		Eastward Wind (r) 5-1)					
		This is a new service your feedba	differ in number and location amo The term "experiments" refers to the			Overview Download data Docu	imentation			
	Home Search Datasets App	lications Your requests Toolbox Help & support	CMIP5 simulations:	e lour main categories of						
	Search results			(Pi-control) with prescribed, non-evol- d to be before the industrial period;	lving concentrations of	Variable 🔞				
	Searchinesaits		Historical experiments which cove	r the period where climate observatio	ons do exist;	At least one selection must be made				
	Search dataset	Q All Datasets		e Atmospheric Model Intercomparison of during the all period of the experim reedbacks in the climate system;		Temperature	U-component of wind	Geopotential height Select all		
1748	Sort by Relevancy	Showing 1-4 of 4 results for Climate projections ×	 Ensemble of climatic projection ex 6.0 and 8.5. 	periments following the Representativ	ve Concentration Pathv	Model 🕐				
28.01	Title		Typically, the same experiment was			At least one selection must be made				
-		CMIP5 daily data on pressure levels	was repeatedly done using slightly or related. Each member of that ensemi	blifferent conditions producing in that ble is named after a triad of integers as		inmcm4 (INM, Russia)	ACCESS1-0 (BoM-CSIRO,	bcc-csm1-1 (BCC, China)		
	✓ Product type	This catalogue entry provides daily climate projections on pressure le members and time periods computed in the framework of fifth phas				CMCC-CM (CMCC, Italy)	Australia) CMCC-CMS (CMCC. Italy)	bcc-csm1-1-m (BCC, China) CNRM-CM5 (CNRM-CERFACS,		
	 Climate projections Reanalysis 	(4)				GFDL-CM3 (NOAA, USA) HadGEM2-CC (UK Met Office,	GFDL-ESM2G (NOAA, USA)	France) GFDL-ESM2M (NOAA, USA) FISL-CM5A-LR (IPSL, France)		
	Satellite observations	(1) CMIP5 daily data on single levels				UK) IPSL-CM5B-LR (IPSL, France)	UK) UK) OPI-ESM-LR (MPI, Germany)	IPSL-CM5A-MR (IPSL, France) MPI-ESM-MR (MPI, Germany)		
	Seasonal forecasts	(6) This catalogue entry provides daily climate projections on single level models, members and time periods computed in the framework of fi				NorESM1-M (NCC, Norway)	MPI-ESM-LR (MPI, Germany)	,		
	Sectoral climate indices	(2)						Select all		
	✓ Variable domain	CMIP5 monthly data on pressure levels				Ensemble member 🔞				
	Atmosphere (surface)	(4) This catalogue entry provides monthly climate projections on pressu								
a series	Atmosphere (upper air)	(4) experiments, models, members and time periods computed in the fr	amework of fifth phase of the Cou			✓ r1i1p1	🔲 r2i1p1	🔲 r3i1p1		
	✓ Spatial coverage	CMIP5 monthly data on single levels				🔲 r4i1p1		r6i1p1 Select all Clear all		
	🔲 Global	(4) This catalogue entry provides monthly climate projections on single I	0							
	✓ Temporal coverage	experiments, models, members and time periods computed in the fr				Period (?)				
	Future	(4)				At least one selection must be made				
	🔲 Past	(4)				18600101-18641231	18610101-18651231	18650101-18691231		
	Present	(4)			European			ECMWF		
					Commissio	Europe's eye	es on Earth			



Evaluation and Quality Control (EQC)

A suitable EQC framework has been developed for guality assurance of CDS datasets

Key feature: Quality Assurance R

Sea ice monthly and daily gridded data from 197

Documentatio

Overview Download data

DATA DESCRIPTION Horizontal coverage

Quality

Sea ice thickness and type: northern hemisphere (Lambert EASE2 projection).

This dataset provides daily values for sea ice concentration, sea ice edge and sea ice type and monthly values for se thickness. These four variables are important markers for climate change studies since sea ice greatly influences the surface albedo and aa exchanges of energy, moisture and carbon. The sea-ice distribution, including polynyas and margins, also has an important infl on marine ecosystems. Changes in the distribution of sea ice affect these ecosystems and a number of activities such as shippingistic and tourist operations.

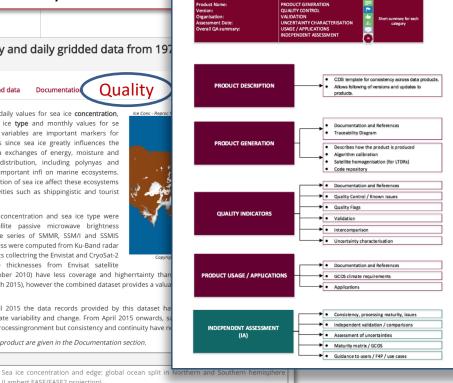
Sea ice edge, sea ice concentration and sea ice type were computed from satellite passive microwave brightness temperatures from the series of SMMR, SSM/I and SSMIS sensors. Sea ice thickness were computed from Ku-Band radar altimeter measurements collectring the Envistat and CryoSat-2 satellite missions. Ice thicknesses from Envisat satellite

(October 2002 to October 2010) have less coverage and higherrtainty than (November 2010 - March 2015), however the combined dataset provides a valua ice variability.

From 1978 up to April 2015 the data records provided by this dataset ha continuity to dete climate variability and change. From April 2015 onwards, s same algorithms and processingronment but consistency and continuity have needed.

(Lambert EASE/EASE2 projection)

More details about the product are given in the Documentation section.



PRODUCT ASSESSMENT STATUS

Quality of data:

•

- assessments
- user guidance
- gaps and limitations

Quality of tools:

- fitness for purpose
- best practices •

Quality of service:

- speed, responsiveness
- system availability, ...









C3S reanalysis data as a business model for an SME in the renewable energy sector

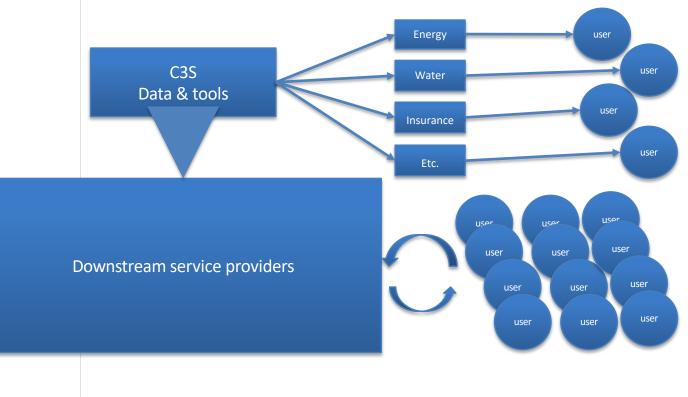
Video 2



Enabler for downstream exploitation

Climate Change

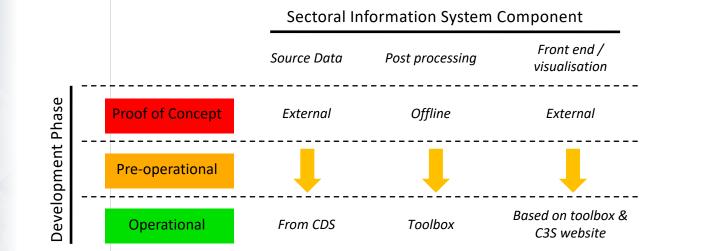
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Sectoral Information System

Climate Change

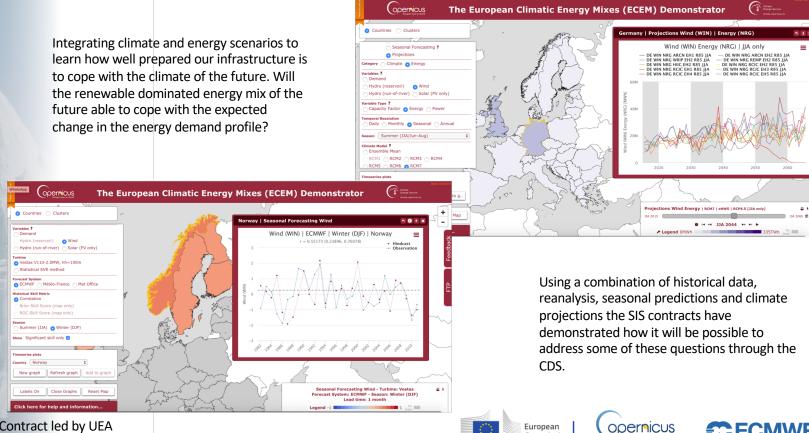






Energy

Change



Contract led by UEA

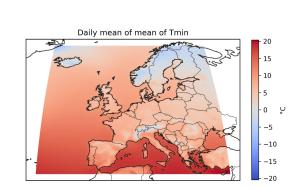


Health exposure demonstrator

C 🛆 🕯 Secure | https://cds.climate.copernicus.eu/apps/355/heat_exposure?sdk_version=2.8.1

Heat_exposure

Climate Change

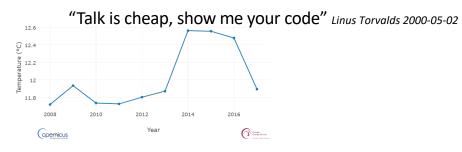


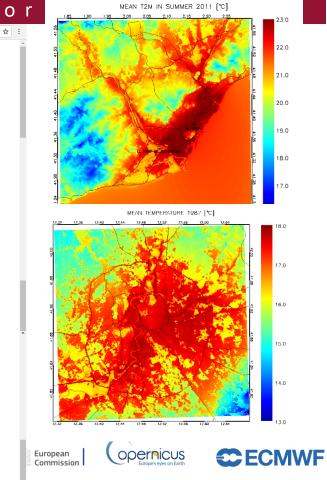
Tmin	~
City	
Rome	~
Statistic	
Mean	~
Period	
Annual	~

Opernicus Europe's eyes on Earth



Timeseries of mean of Tmin for Rome







Indicators, global agriculture contract

Climate Change



Biologically Effective Degree Days, Growing Season Length, Maximum number of consecutive dry days, Maximum number of consecutive frost days (Cold spell), Cold Spell Duration Index

, Maximum number of consecutive summer days (Hot spell), Maximum number of consecutive wet days (Wet spell), Mean of diurnal temperature range, Frost Days, Ice Days, Heavy precipitation days, Very heavy precipitation days, Precipitation sum, Wet Days, Simple Daily Intensity Index (Mean precipitation per wet day), Sumer Days, Mean of daily mean temperature, Mean of daily minimum temperature, Minimum value of the daily minimum temperature, Maximum value of the daily minimum temperature, Tropical nights, Mean of daily maximum temperature, Minimum value of daily maximum temperature, Maximum value of daily maximum temperature, Warm Spell Duration Index, Warm and wet days, AgERA5 wind speed, AgERA5 dewpoint temperature, AgERA5 air temperature, AgERA5 precipitation type, AgERA5 relative humidity, AgERA5 snow, AgERA5 solar radiation, AgERA5 cloud cover, AgERA5 precipitation, AgERA5 vapour pressure, Soybean development stage, Soybean Total aboveground production, Soybean Total weight storage organs (yield), Wheat development stage, Wheat Total above-ground production, Wheat Total weight storage organs (yield),

Rice development stage, Rice Total above-ground production, Rice Total weight storage organs, (yield), Maize development stage, Maize Total above-ground production, Maize Total weight storage organs (yield), evapotranspiration

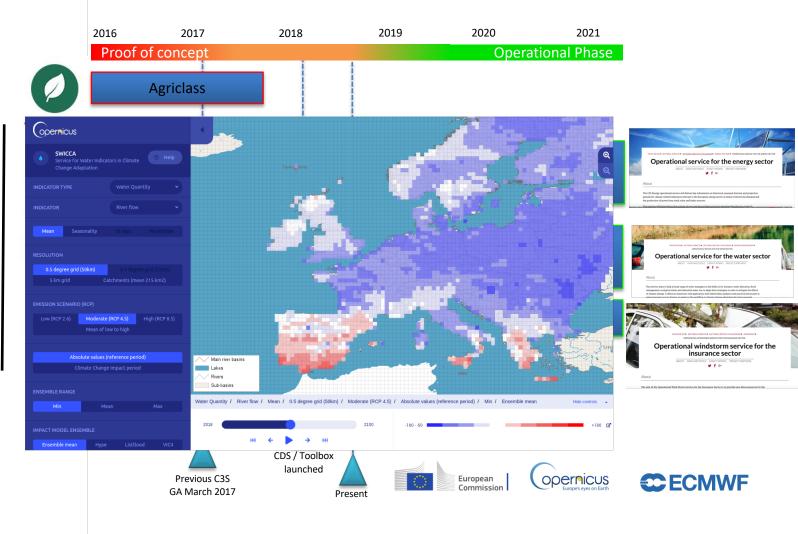


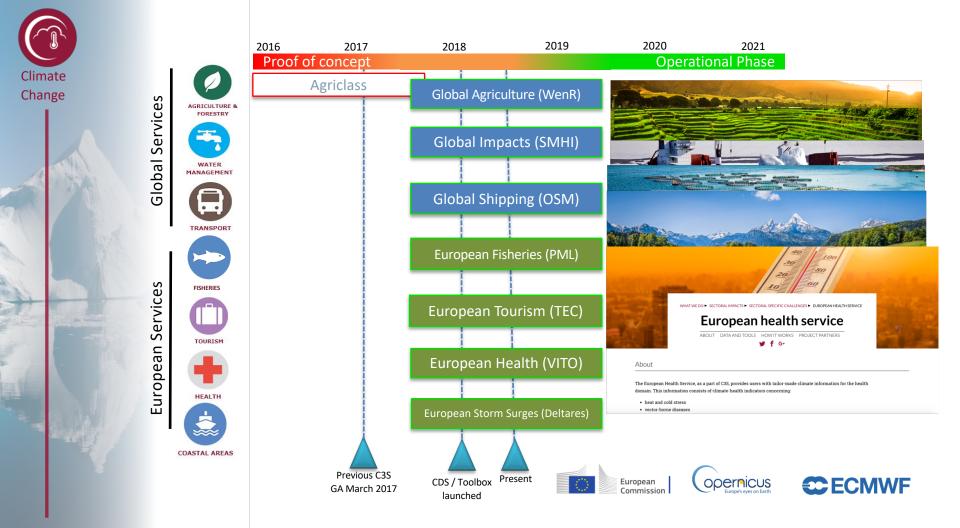




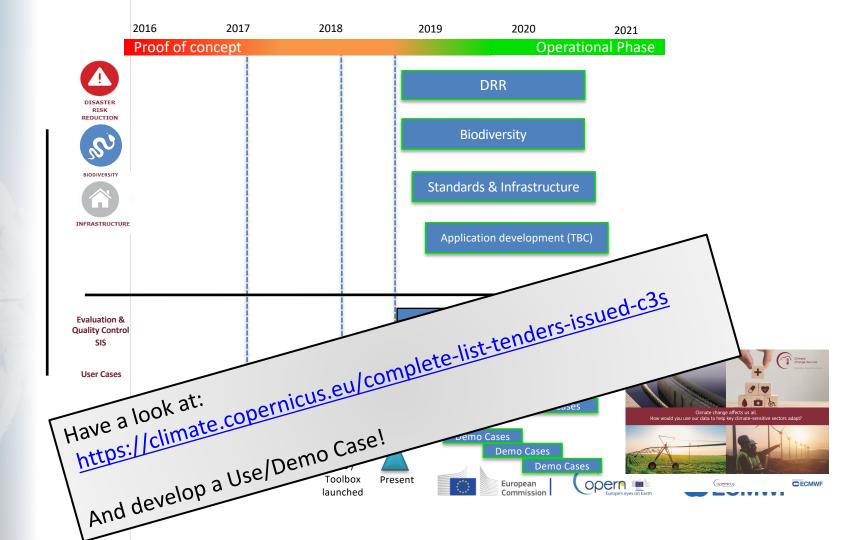


POC to Operations



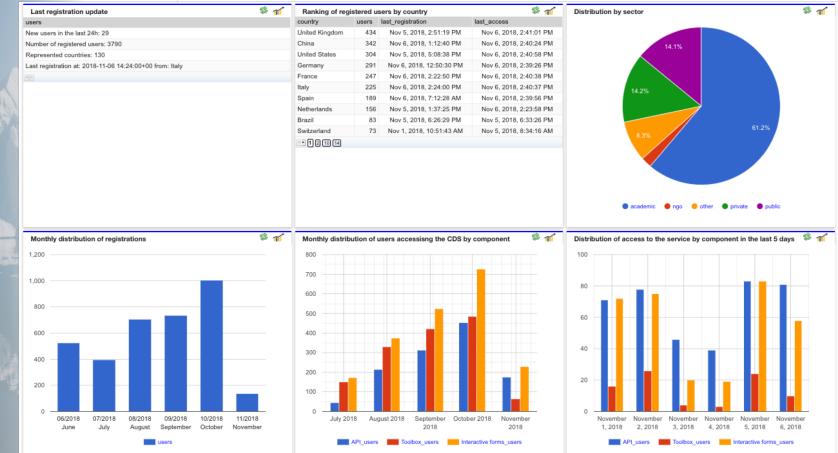








CDS user uptake (dashboard)

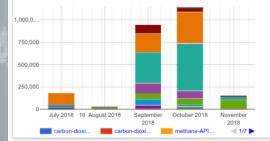




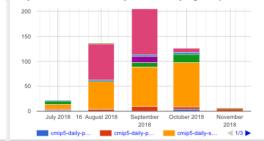
CDS data access (dashboard)

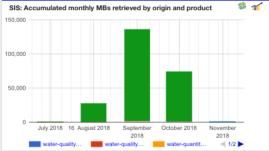
			by product type (User Interfac	e)		S 🐔	Data access	s by product type (API)			S 🐔 🎢
		product_type	last_access	users	requests	retrieved_gbs	product_type	last_access	users	requests	retrieved_gbs
paded from data sources): 727.45 TBs		insitu	Nov 1, 2018, 8:28:47 AM	66	121	17.06	insitu	Nov 6, 2018, 7:57:44 AM	20	220	
(sent to data sources): 1267823		projections	Nov 6, 2018, 10:05:58 AM	119	376	301.06	projections	Nov 5, 2018, 6:00:59 PM	12	287	194.
2796		reanalysis	Nov 6, 2018, 2:48:43 PM	1,130	11,637	159,552.23	reanalysis	Nov 6, 2018, 2:49:51 PM	704	1,186,524	536,160.
in the last 24h: 8449		satellite	Nov 6, 2018, 2:08:17 PM	224	775	2,185.57	satellite	Nov 5, 2018, 3:05:45 AM	21	917	273.
78		seasonal	Nov 6, 2018, 12:30:37 PM	180	886	1,978.69	seasonal	Nov 6, 2018, 2:47:57 PM	69	43,970	13,452.
ast 24h: 7558.43 GBs		sis	Nov 6, 2018, 2:34:28 PM	73	191	241.82	sis	Nov 6, 2018, 12:35:17 PM	6	269	0.
%											
I monthly TBs retrieved by origin and p	product		\$ m s	Seasonal: 10,000 8,000	Accumulat	ed monthly GBs n	etrieved by orig	in and product			\$ 11
				6,000							
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Satellite: Accumulated monthly MBs retrieved by origin and product 🛛 🛸 🎢



Projections: Accumulated monthly GBs retrieved by origin and product 🍄 🎢





CDS out of the starting blocks... (13 November 2018)

Climate Change





C3S for climate monitoring







Monthly climate bulletins

Change

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WHAT WE DO ► CLIMATE BUILLETIN

Climate

Climate bulletins

Through our monthly maps, we present the current condition of the climate using key climate change indicators. We also provide analysis of the maps and guidance on how they are produced.

HIGHLIGHTS OF THE LATEST MONTHLY SUMMARIES MONTHLY CLIMATE UPDATE FEATURED STORY MONTHLY SUMMARIES

Monthly summaries



Surface air temperature

This series of monthly maps and charts, generated from ERA-interim data, covers



reanalysis data, these

provide near real-time



data, covers several

Hydrological variables maps every month. This series of monthly maps and charts, based Based on ERA-interim on ERA-interim



Surface in-situ monitoring for Europe

Monthly and yearly State-of-the-Europeanclimate reports provided

Monthly climate update

15TH OCTOBER 2018

In Europe, it was the warmest September on record. Portugal and western Spain were particularly warm.

Iceland, Ireland and Scotland saw generally cooler than average temperatures.

Japan was hit by two devastating storms, Jebi and Trami following rains, landslides, floods and recordbreaking heat this year.

Strong tropical cyclone Mangkhut caused at least 134 fatalities in the Philippines, Hong Kong and China.





29TH OCTOBER 2018



A stormy September

One of the warmest summers on record has come to an end w September full of storms. Modelling of historic storms can hel prepare for such events. We use two of the recent storms to de the improvements we have made with the release of our new lataset

Read more







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European State of the Climate

Change

WHAT WE DO . EUROPEAN STATE OF THE CLIMATE 2017 European State of the Climate 2017 ABOUT CLIMATE IN 2017 HEADLINE CLIMATE INDICATORS CONTRIBUTORS

About

The European State of the Climate 2017 covers two main themes, the Climate in 2017 and Headline Climate Indicators.

The key findings for each section can be found in the European State of the Climate 2017 Summary. The summary and the sections themselves are aimed at a non-expert audience interested in the climate events of

2 main sections

- Climate in 2017
- Headline climate indicators .

Based on

Reanalysis, in-situ, satellite data

With contributions from

- CAMS, CMEMS, EEA and GCOS
- 13 further European research institutions

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Focus Region: Focus Region: Southwest Europe European Arctic During the final months of 2017, some land areas of the north During 2017, the southwest of Europe stood out with Atlantic Arctic experienced monthly temperatures more than 6°C high temperatures, drought and repeated wildfire events. above the 1981-2010 average 2017 was an exceptionally dry and warm year in the Surface air temperatures in the European southwest of Europe sector of the Arctic have been increasing during the 40 years-worth of data analysed here 2017 was the third warmest on record Accusal terroperatures were the biobest or at 1.7°C above average, which is close to the record and soil moisture was the lowest. second warmest year 2012. The warmest year recorded is 2016 with over 2°C above average In particular, spring and summer showed larg positive temperature anomalies. Spring and Despite temperatures at the beginning of summer were among the two warmest on 2017 not being record-breaking, the sea ice record, both at close to 1.7°C above the 1981 area remained much lower than average 2010 average. In large areas the hottest during the first three months of the year summer day was close to or even exceeded January showed the largest negative cifer - the heatwave of 2017 40°C. The annual number of rainy days was anomaly on record. During spring and During summer 2017, southern much below average. Soil moisture reaches summer, the sea ice area was below th Europe was exceptionally warm with multiple heatwaves from Sea ice cover for January 2017 seasonal record lows in spring and autumn. 1981-2010 average, but not exceptionally the month with the year's largest anomaly in the Portugal and Spain to the Balka Peninsula. The drought in south uropean sector of the Arctic. The pink line denotes th so As for temperatures, the end of the year the highest since 2003, when records began. 1981-2010 average sea ice edge for the month showed larger sea ice anomalies. Septembe to December's anomalies are among the three lowest on record. creased the number of wild fire ed to low levels in water reservoir nd reduced agricultural yields. Source: ERA-Interim: Credit: Copenatus Clanat Image: Sea ice in the Arctic Ocean, CES Change Service Implemented by ECMW Climate Indicators Sea ice Sea level ♦Arctic: 2016 maximum and During last 25 year 2012 minimum area lowest Global ocean on record mean sea level increas Antarctic: 2017 of 3.4 mm/war maximum and minimum European regions: area lowest on record mean sea level increase The headline climate indicators show the long-term evolution of by 1 to 2 mm/year in several key climate variables. These can be used to assess the global most coastal areas and regional trends of a changing climate. The arrows show the longcold covering January 199 Arctic sea ice area shows a downward tre term increasing \uparrow or decreasing trends \downarrow of these indicators. to May 2017 that becomes prominent after the year 2000 In the Antarctic, variability rather than trend predominates. Spells of markedly above-Global mean sea level rise amounts to average sea ice area occurred in 2007-2005 3.4 mm/vr during the last 25 years. The Temperature Greenhouse gases and 2013-2015 but Antarctic sea ice area ranslates to a global increase in sea level o initially below average sinc has been substa about eight centimetres. The regional transk ↑ Globe: around 1.1*C increase Current rate of increase in September 2016. during this period can deviate considerably since start of industrial era abundance in air. from the global mean and in the European ◆Europe: around 1.8°C ↑CO,; about 5 PgC/year or Seas, the sea level changes can differ in Glaciers increase since latter half of 2.5 ppm/year the open ocean and in coastal areas due to various geophysical processes. the 19th century ↑CH : about 0.4 PoC/vear Global average ts coverno all or parts more than 20m of observed ↑N.O: about 18 ToN/year loss in ice thickness since stimated net flux data for CO., N.D. CH, covering The aim of the Paris Agreement is to limit Europe: observed loss in ice thickness since en by the Coperature Sentinel-2A satellite (20) global temperature rise to well below 2% 1960s ranges between 2m in southwestern compared to the pre-industrial era and to The estimated net surface flowes into the Scandinavia and 34m in the Alps pursue efforts to limit it to 1.5%. The latest atmosphere of the three preenhouse pase five-year average global temperature is the carbon dioxide (CO ,), methane (CH ,) and angoing observations highest on record, and it shows a warming nitrous oxide (N.O) have been increasing of around 1.1°C since the start of the during recent decades. Anthropogenic emissions of CO, have been partly Glaciers both globally and in Europe have see industrial era compensated by a natural flux (sink) into a strong and continued ice mass loss since around 2000. In the 20th century, the rate of oceans and venetation. It is estimated that Europe represents a vegetation sink for CO mass loss was lower, including some period but the relative magnitude of this sink has of mass gain at regional and decadal scale been decreasing since the 1990s

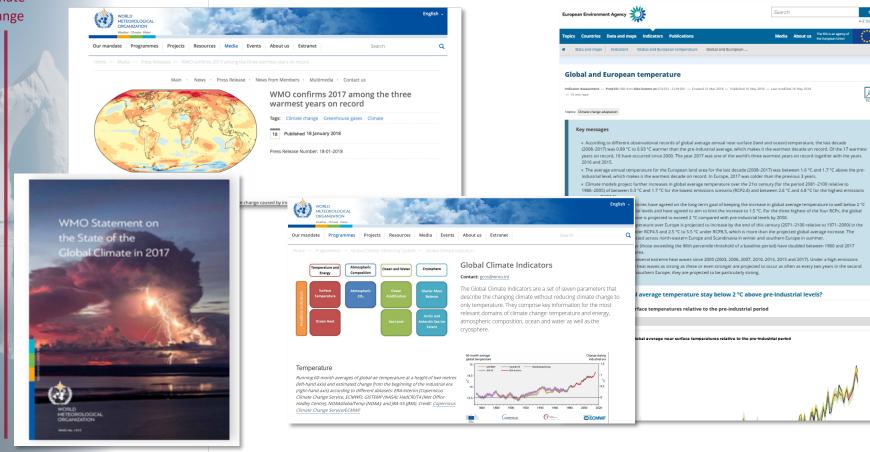
ODCITICOS

Europe's eyes on Earth

Commission



Contributing to EEA, GCOS and the WMO





C3S latest press coverage highlights

Change

TV presenters around Europe continue to use C3S monthly maps latest example was from German national TV broadcaster

ARD where C3S data and maps were shown at prime time evening news.

Reach: 8m

https://www.daserste.de/information /nachrichtenwetter/wetter/videos/rueckblicksommer-2018-100.html

C3S Monthly maps are also regularly featured via social media channels such as Twitter

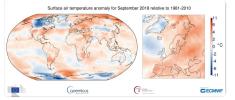


Copernicus ECMWF @ConemicusECMWE

2.17 am - 5 Oct 2018

Follow

##Temperature highlights for September -#Copernicus #C3S. Most of Europe was warmer than average, esp Portugal & Spain. Iceland, Ireland & Scotland generally cooler than average. Globally it was around 0.4°C warmer than the average September. Read more bit.ly/2yq42LM



35 Retweets 36 Likes 🛛 🐭 🌑 🖓 🌑 🗿 🏭 🛶 🇱 🌀





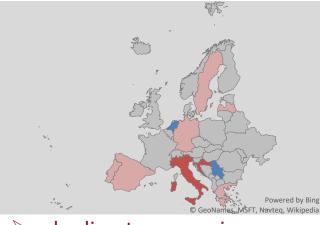


C3S outreach activities

- Change
- Presence at conferences, meetings and fairs
- Press tour
- Hackathon
- User workshops
- C3S user learning services

Train the trainer events

completed (2018)planned (2018)tentative (2019)



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C3S outreach activities

- Change
- Presence at conferences, meetings and fairs
- Press tour
- Hackathon
- User workshops
- C3S user learning services



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C3S outreach activities

Change

- Presence at conferences, meetings and fairs
- Press tour
- Hackathon
- User workshops
- C3S user learning services
- "Ad-hoc" training (TODAY!





completed (2018)
 planned (2018)
 tentative (2019)



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