Climate Extremes: Heatwaves, Changes in Ice, Drought, Floods

Drought monitoring with Copernicus Emergency Service European Drought Observatory Data

Valentin Rakovsky, Agence France-Presse (AFP)

The role of data in journalism

WRAP

Last 8 years warmest on record globally: EU climate monitor

Published Tuesday, January 10, 2023 1:17 PM • Updated at 1:50 PM

AFP • Marlowe HOOD • Paris (FRA)

Associated topics

climate

science

2022

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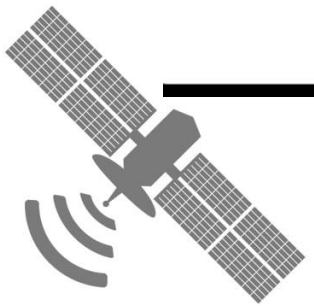
The last eight years were the warmest on record even with the cooling influence of a La Nina weather pattern since 2020, the European Union's climate monitoring service said Tuesday.

Average temperatures across 2022 -- which saw a cascade of unprecedented natural disasters made more likely and deadly by climate change -- make it the fifth warmest year since records began in the 19th century, according to the Copernicus Climate Change Service.

Pakistan and northern India were scorched by a two-month spring heatwave with sustained temperatures well above 40 degrees Celsius (104 degrees Fahrenheit), followed in Pakistan by flooding that covered a third of the country, affected 33 million people, and caused some $30 billion in damage and economic losses.

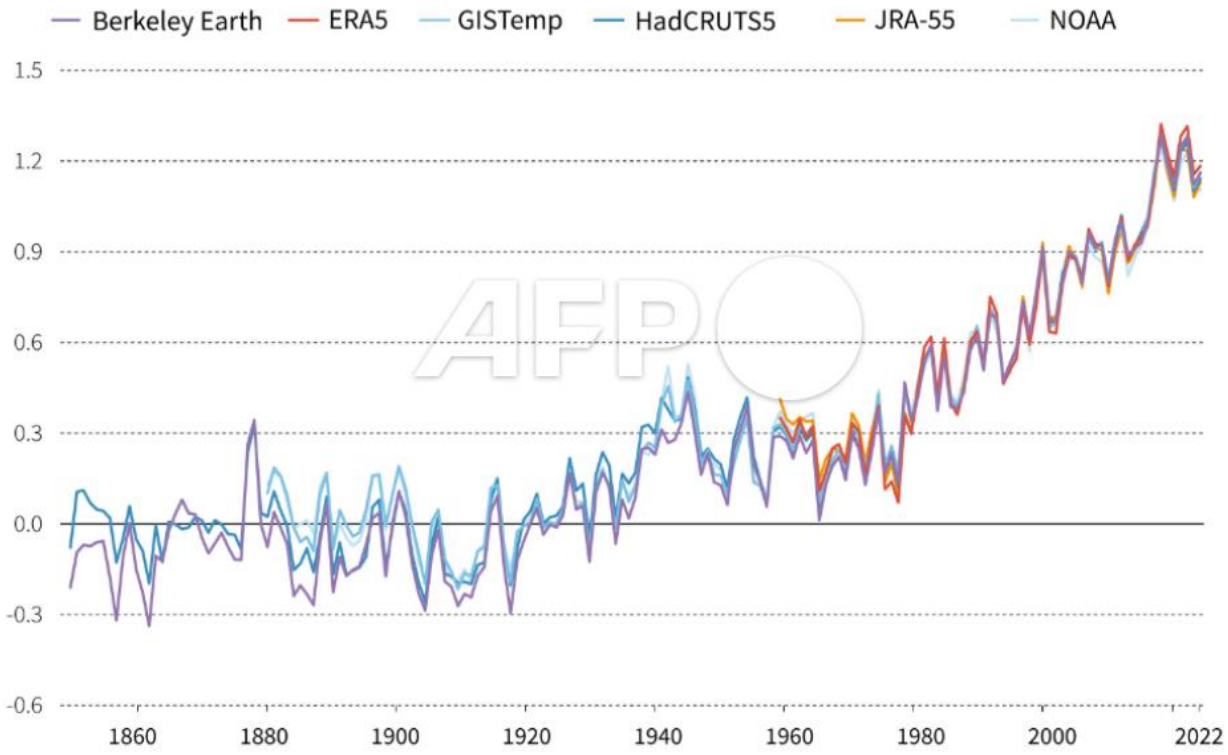
France, Britain, Spain and Italy set new average temperature records for 2022, with Europe as a whole enduring its second hottest year ever, Copernicus said in an annual report.

Heatwaves across the continent were compounded by severe drought conditions.



Last 8 years to 2022 warmest ever recorded

Difference between average temperature compared to the pre-industrial levels (1850-1900), in °C



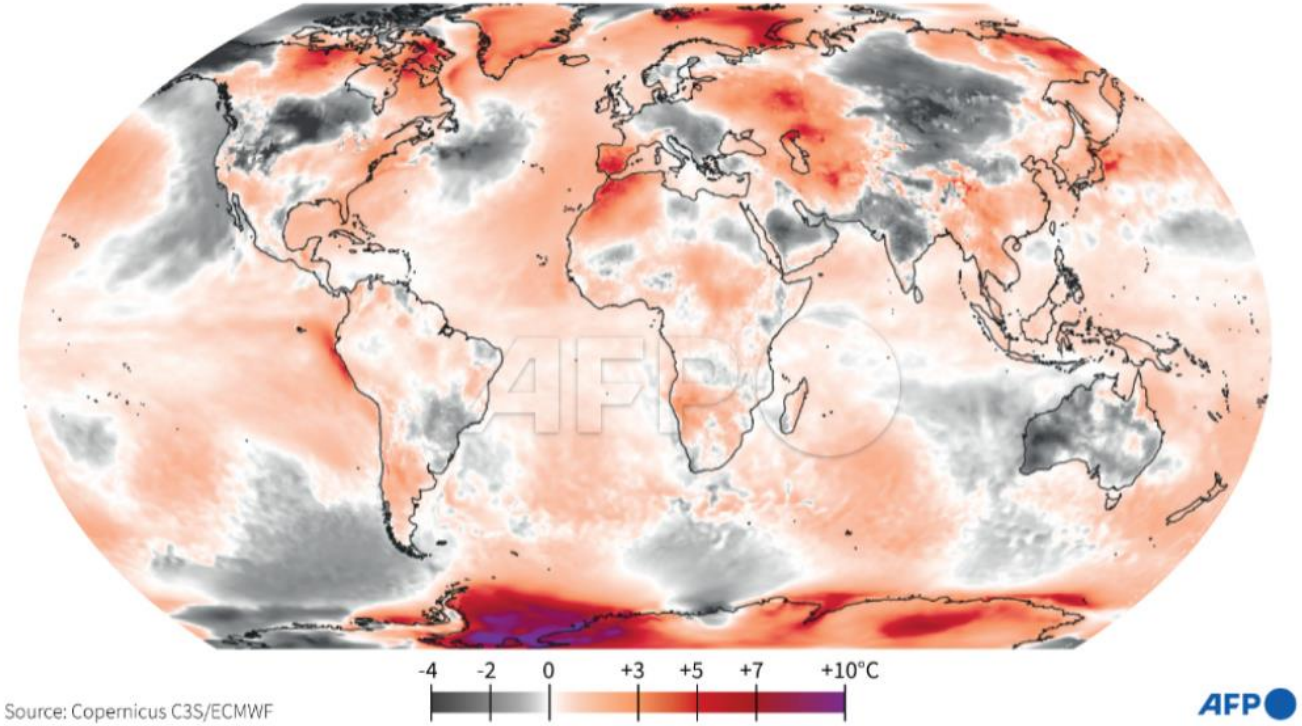
Sources: Copernicus C3S, ECMWF

AFP

Using Copernicus data

Temperature anomalies in April

Variation compared to the average temperatures in March from 1981 to 2010, in °C

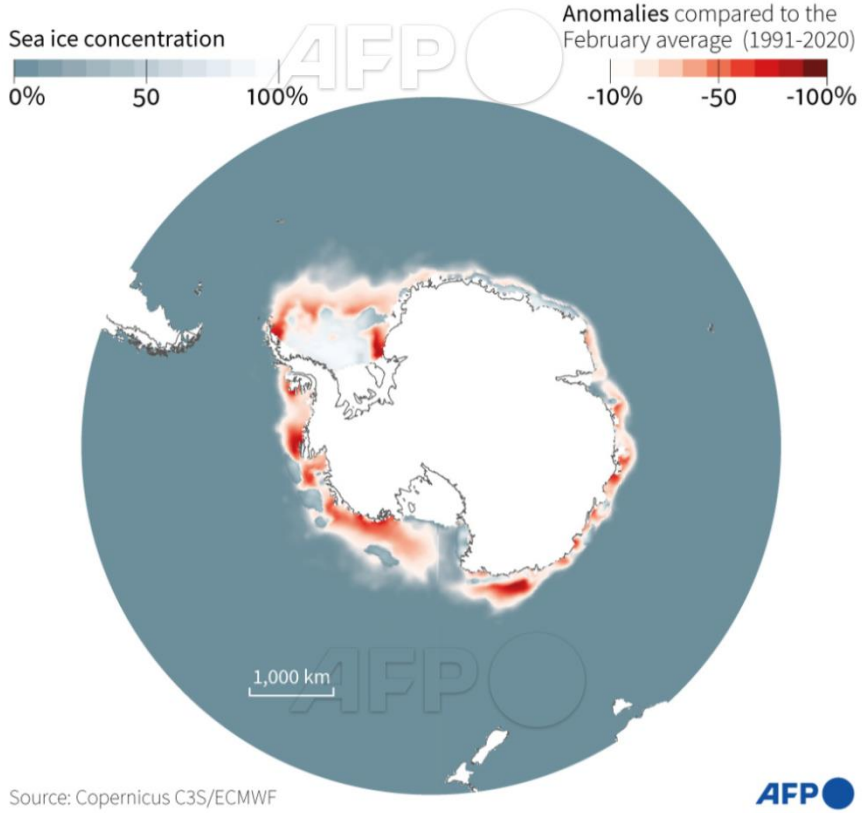


Source: Copernicus C3S/ECMWF

AFP

Melting of the Antarctic sea ice

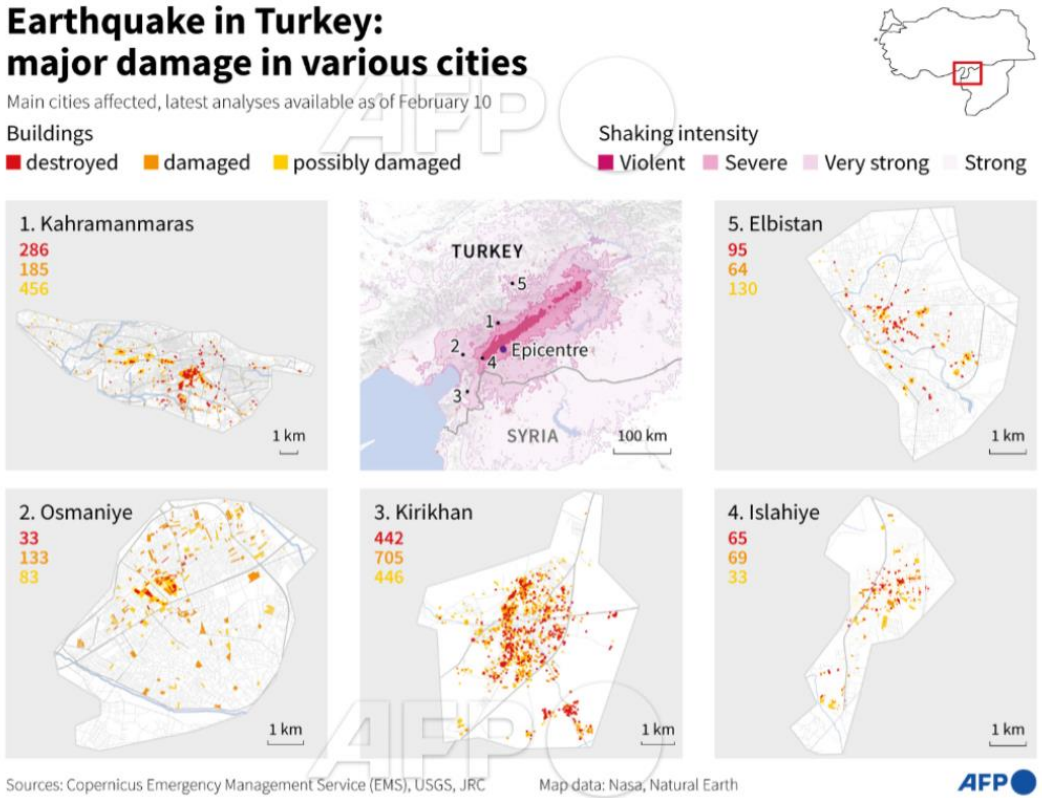
The ice extent in February 2023 was the lowest ever recorded for the month of February, breaking the 2017 record

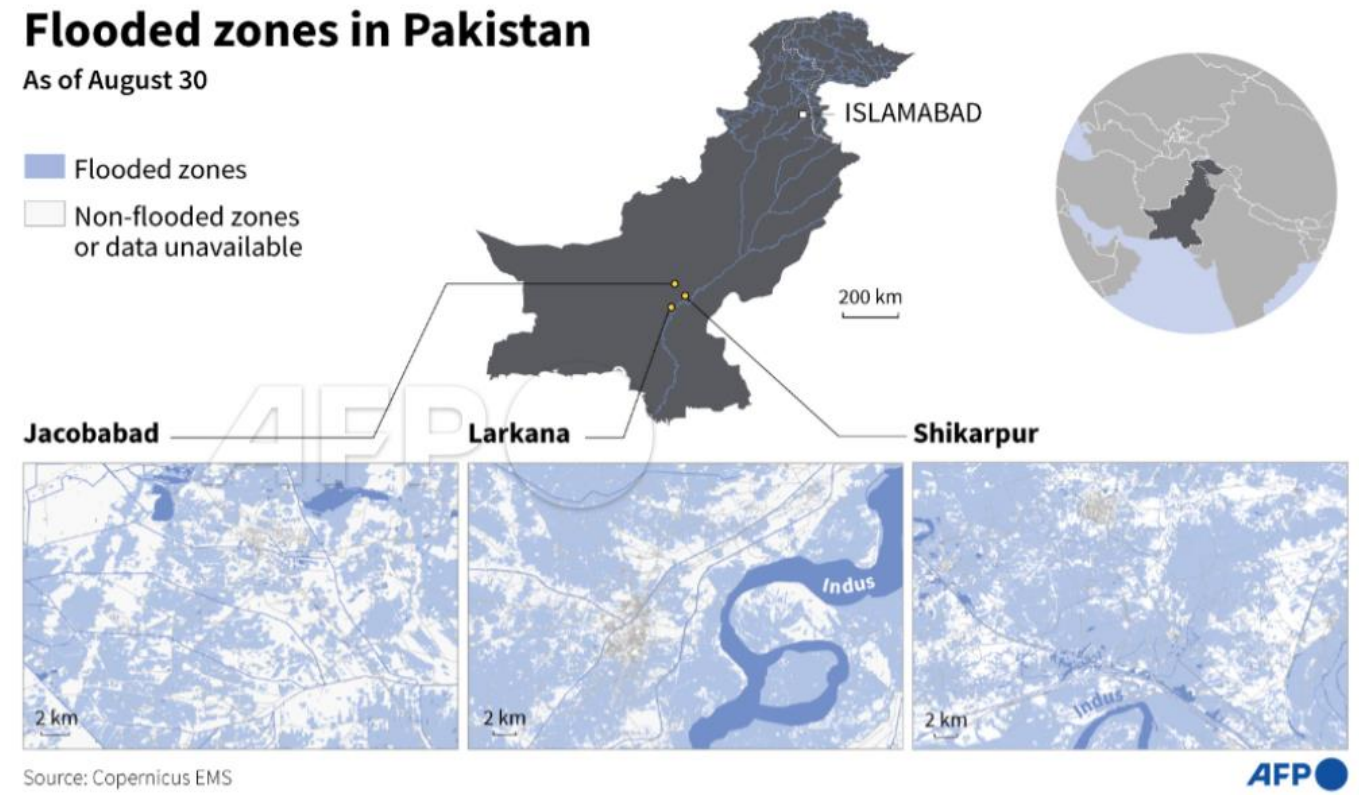


Source: Copernicus C3S/ECMWF

AFP

Our use of Copernicus data

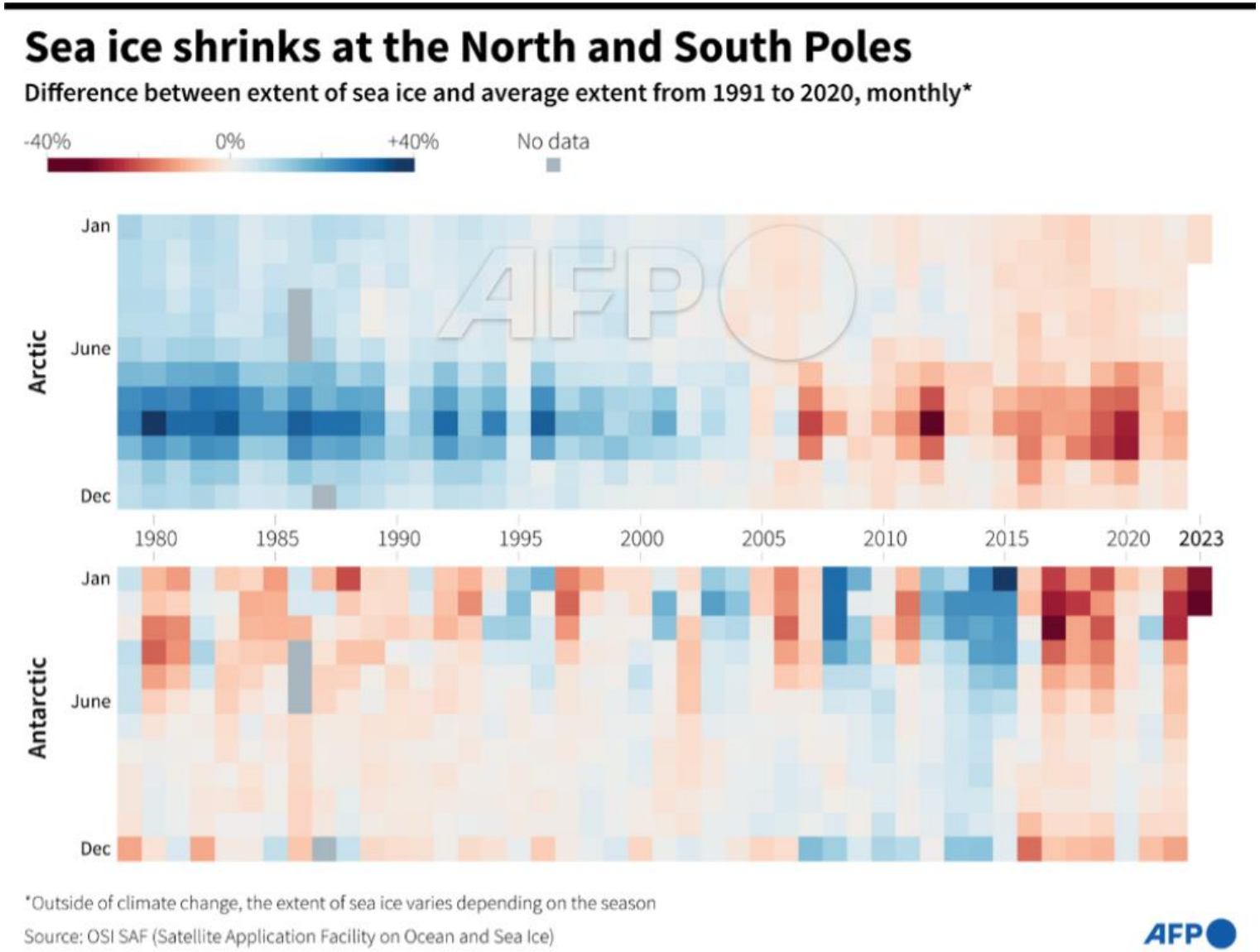




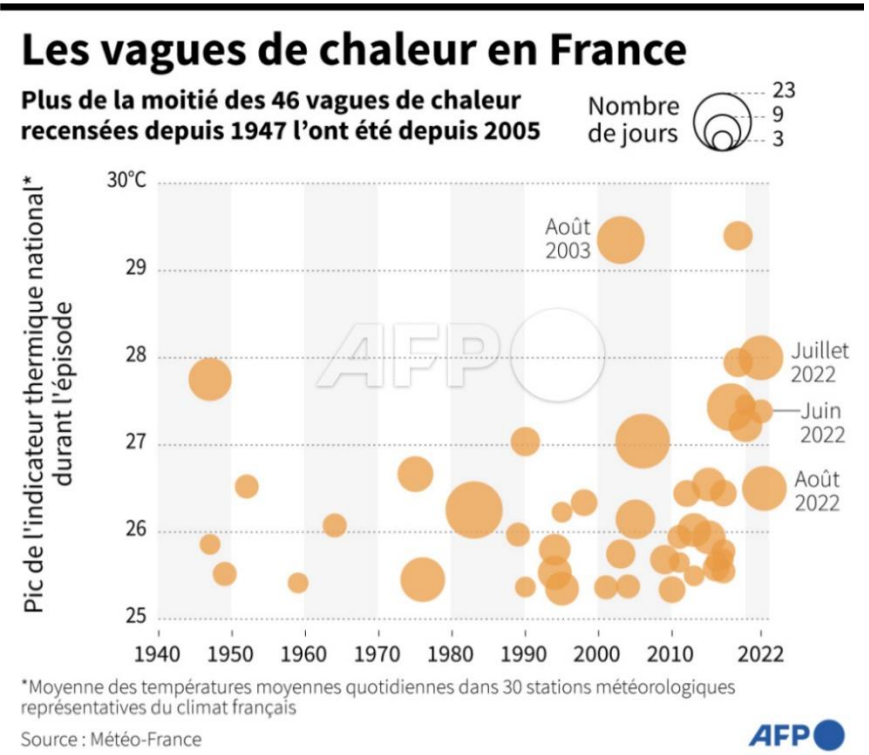
Copernicus Earth Observation Data Visualisation Workshop Series

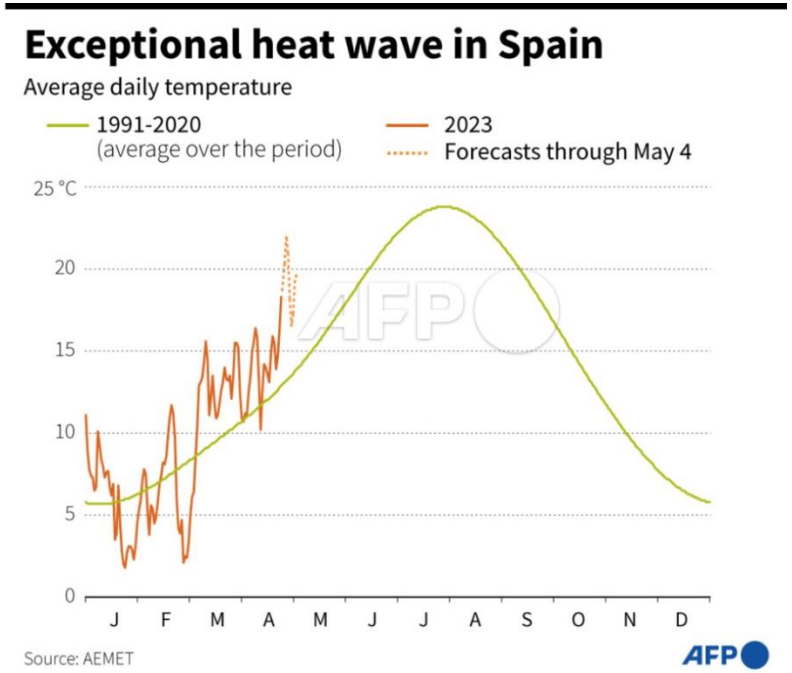
Climate Extremes: Heatwaves, Changes in Ice, Drought, Floods

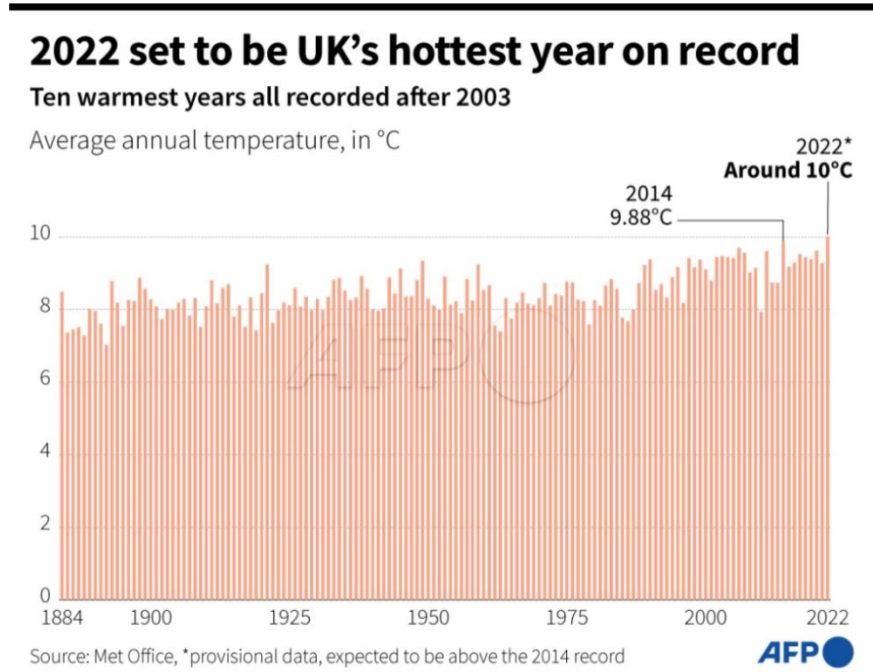
Not just maps ! We like comprehensive raw data, like chronologic ones



Sourcing issues on climate coverage







Copernicus Earth Observation Data Visualisation Workshop Series

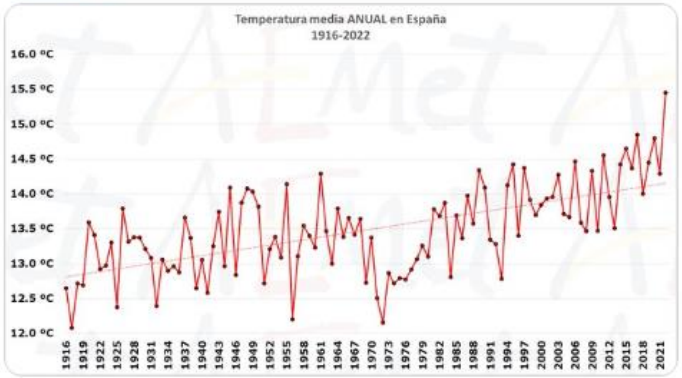
Climate Extremes: Heatwaves, Changes in Ice, Drought, Floods

Sourcing issues on climate coverage

AEMET
@AEMET_Esp

2022 ha sido el año más cálido en España desde, al menos, 1916, con diferencia respecto a los inmediatos seguidores (2017 y 2020).
Es la 1ª vez que la temperatura media anual supera 15 ºC. Hasta 2011, no se había llegado nunca a 14,5 ºC. Desde entonces, ha sucedido cinco veces.

Translate Tweet



7:03 AM · Jan 2, 2023 · 865.1K Views

1,161 Retweets 172 Quotes 1,585 Likes 57 Bookmarks

DWD
@DWD_presse

Jetzt final: Mit einer Jahresmitteltemperatur von 10,5 Grad Celsius sind 2018 und 2022 die beiden wärmsten Jahre in #Deutschland seit Messbeginn 1881. Da Rekorde klimatologisch unbedeutend sind, nutzt der DWD die zweite Nachkommastelle nicht zur weiteren Differenzierung./kis

Translate Tweet

Parameter *Parameter*	Jahr *Year*	Wert *Value*
Minimum [°C]	1940	6,6
Maximum [°C]	2022, 2018	10,5
30-jähriger Mittelwert [°C]	1991-2020 1981-2010 1971-2000 1961-1990	9,3 8,9 8,6 8,2
aktueller Wert [°C]	2022	10,5
Abweichung vom Referenzzeitraum [K]	1991-2020 1981-2010 1971-2000 1961-1990	1,2 1,7 2,0 2,3
linearer Trend [K]	1881-2022	1,7

3:52 PM · Jan 3, 2023 · 9,886 Views

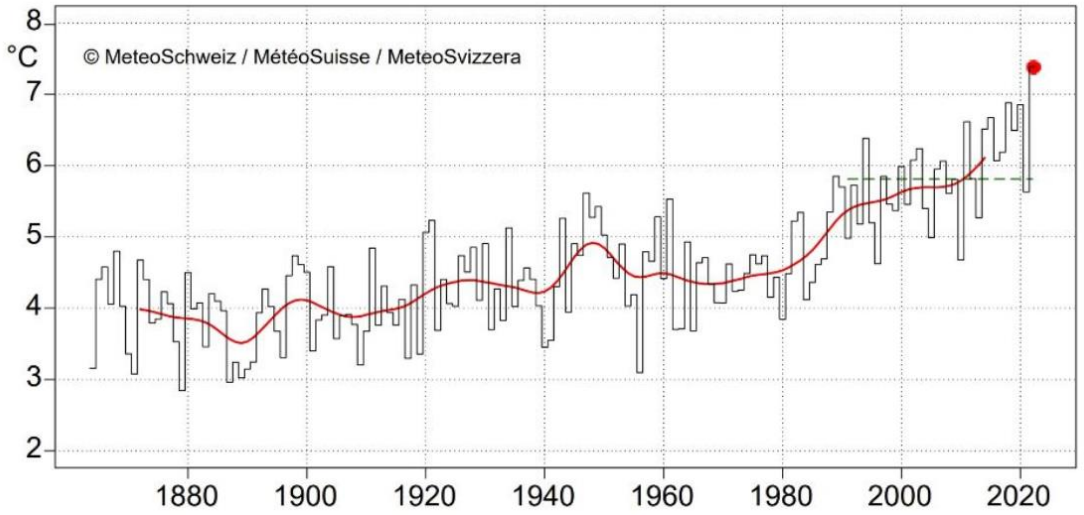
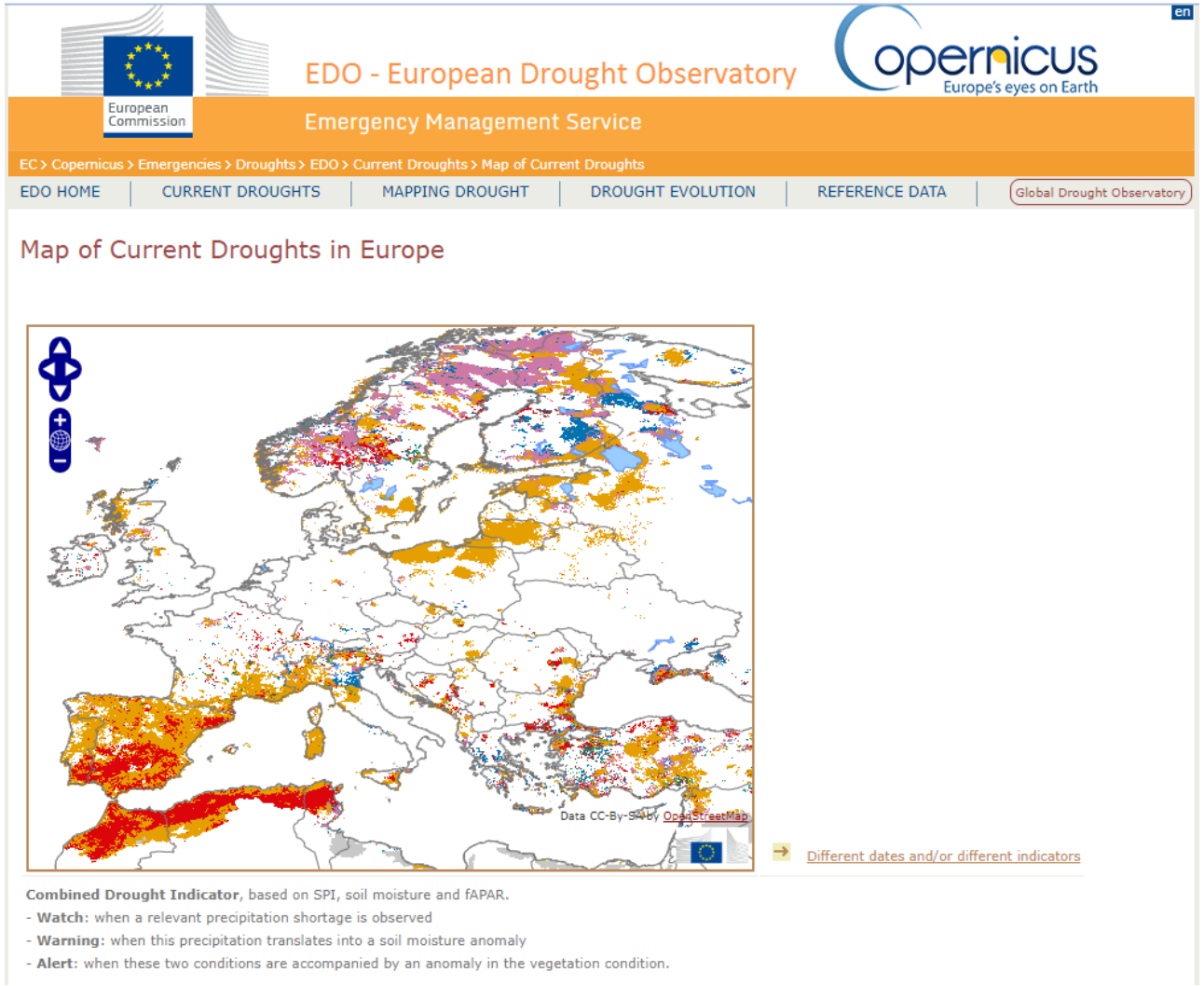


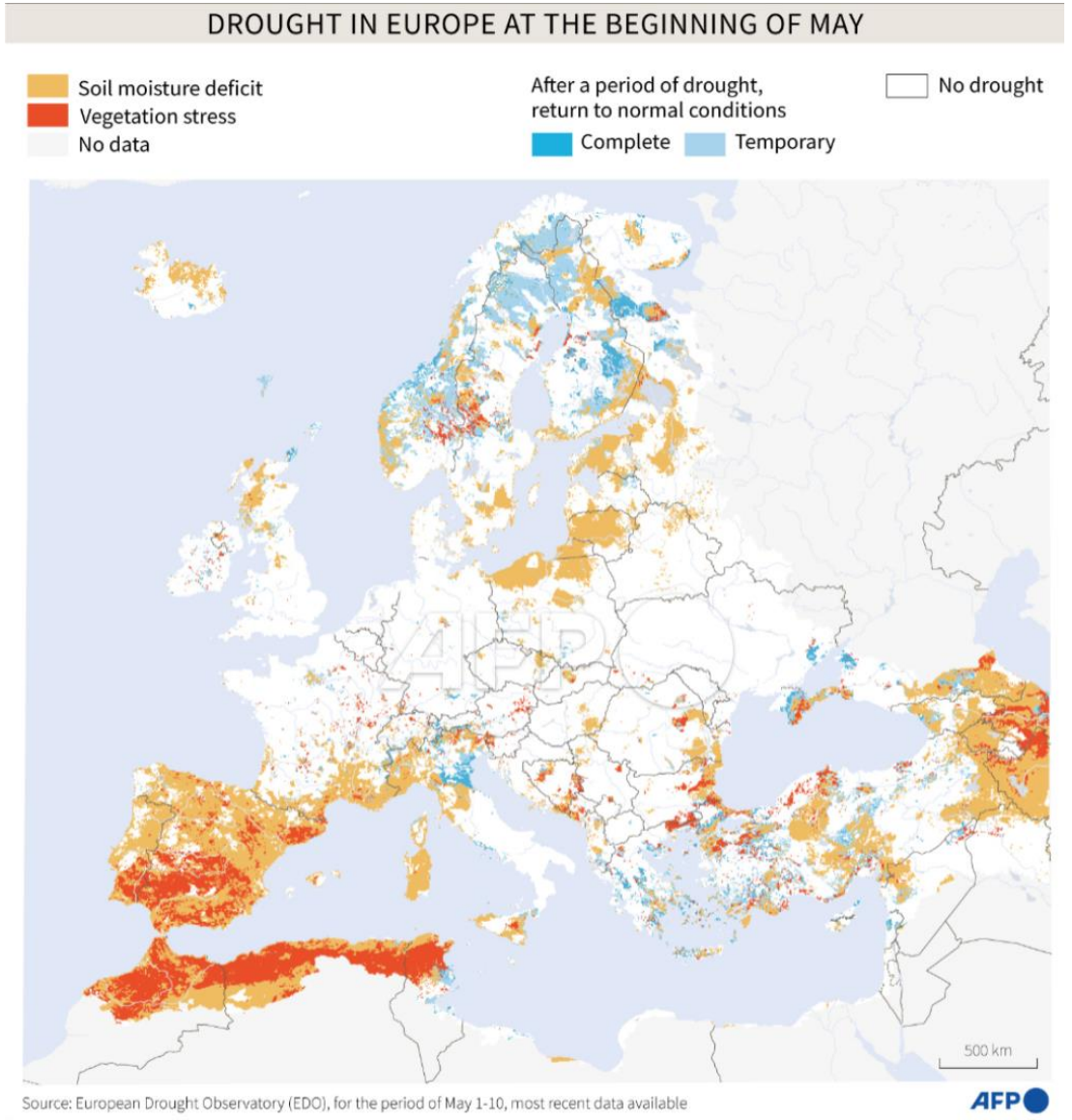
Figure 2. La température moyenne annuelle (de janvier à décembre) en Suisse depuis le début des mesures en 1864. Le point rouge indique l'année 2022 (7,4 °C, état au 21.12.2022). La ligne verte interrompue montre la norme 1991-2020 (5,8 °C), la ligne rouge montre la moyenne glissante sur 20 ans.

Monitoring droughts: the European Drought Observatory



- No drought
- Watch : rainfall deficit
- Warning : soil moisture deficit
- Alert : vegetation stress following rainfall and soil moisture deficit
- Recovery to normal condition
- Temporary soil moisture recovery
- Temporary vegetation recovery

Monitoring droughts: the European Drought Observatory



From a map to a table

```
In [17]: for i in annees :
             for j in mois :
                 for k in jour :
                     date = str(i+j+k)
                     print(date)
                     path = './CDIv3/'+i+'/cdinx_m_euu_'+date+'_t.tif'

                     secheresse_aires_dct = {}
                     secheresse_part_dct = {}
                     secheresse_aires_dct['date']=date
                     secheresse_part_dct['date']=date

                     with rasterio.open(path) as src:
                         meta = src.meta
                         data=src.read(1)
                     shapes_gen=shapes(data, transform=src.transform)
                     features = [{'geometry': shape, 'properties': {'value': value}} for shape, value in shapes_gen]
                     gdf = gpd.GeoDataFrame.from_features(features, crs='EPSG:3035')
                     gdf_raster = gdf.dissolve(by='value').reset_index()

                     secheresse_aires_dct = {}
                     secheresse_part_dct = {}

                     secheresse_aires_dct['date']=date
                     secheresse_part_dct['date']=date

                     for l in liste_des_pays :
                         aires=analyse_pays_aires(l, gdf_raster)
                         part=analyse_pays_part(l, gdf_raster)
                         secheresse_aires_dct.update(aires)
                         secheresse_part_dct.update(part)
                         print(aires)
                         print(part)
                     secheresse_aires_dct_lst.append(secheresse_aires_dct)
                     secheresse_part_dct_lst.append(secheresse_part_dct)
```

```
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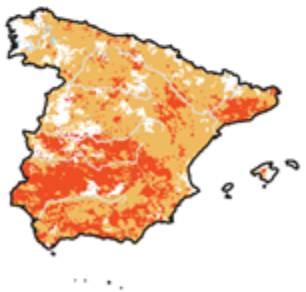
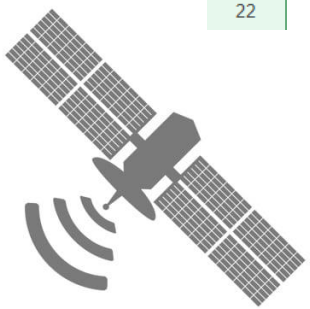


From a map to a table

	A	B	C	D	E	F	G	H	I
1	date	UE27_watch	UE27_warning	UE27_alert	UE27_total_affected	Spain_watch	Spain_warning	Spain_alert	Spain_total_affected
2	20120101	0	24,42	0,09	24,51	0	38,72	0,15	38,87
3	20120111	0	28,3	0,1	28,4	0	46,94	0,18	47,13
4	20120121	0	30,92	0,15	31,07	0	53,27	0,15	53,42
5	20120201	0	33,46	0,43	33,89	0	60,11	0,19	60,3
6	20120211	0	36,26	0,66	36,93	0	65,12	0,44	65,56
7	20120221	0	36,97	1,26	38,23	0	70	1,66	71,66
8	20120301	0	37,9	4,11	42,01	0	73,1	4,7	77,79
9	20120311	0	38,87	7,44	46,31	0	68,01	13,43	81,43
10	20120321	0	43,51	9,88	53,4	0	59,58	19,92	79,5
11	20120401	0	41,84	12,23	54,07	0	52,8	25,37	78,17
12	20120411	0	24,38	20,34	44,72	0	39,5	31,81	71,3
13	20120421	0	15,53	21,52	37,05	0	30,33	40,47	70,79
14	20120501	0	17,89	15,43	33,32	0	18,33	43,43	61,77
15	20120511	0	19,79	10,38	30,17	0	24,83	36,68	61,51
16	20120521	0	22,22	6,25	28,47	0	27,85	23,73	51,58
17	20120601	0	20,73	5,8	26,54	0	33,56	20,62	54,18
18	20120611	0	18,28	3,43	21,71	0	41,31	13,37	54,68
19	20120621	0	22,14	1,67	23,81	0	51,7	6,27	57,98
20	20120701	0	24,28	1,18	25,46	0	57,65	3,15	60,8
21	20120711	0	25,67	1,25	26,91	0	61,83	1,96	63,79
22	20120721	0	23,5	1,53	25,03	0	57,03	0,83	57,85



AMPLIACIÓN

Datos satelitales sobre sequía muestran mejoría en Europa, salvo en España

Published Friday, May 12, 2023 7:48 PM • Updated Saturday, May 13, 2023 3:07 PM

AFP • París (FRA)

Associated topics

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españa
clima
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La sequedad de los suelos en Europa es mucho menos marcada que hace un año, aunque la situación está muy deteriorada en España, revelan los datos satelitales del programa europeo Copernicus analizados el viernes por la AFP.

El indicador se refiere a la sequedad de los suelos, analizables vía satélite, y no al estado de las capas freáticas, que registran niveles históricamente bajos en España y en Francia en este periodo del año.

Entre el 21 y el 30 de abril de 2023, un 27,68% del territorio estudiado por el servicio europeo Copernicus [Europa y las orillas del Mediterráneo] estaba en situación de sequía, indicó el Observatorio Europeo de la Sequía (EDO).

Su expansión es estable respecto a los diez días anteriores (27,52% del 11 al 20 de abril), mostraron los datos.

El EDO también reveló que la situación ha mejorado respecto al mismo periodo de 2022, cuando un 47% de los territorios estudiados registraba sequía.

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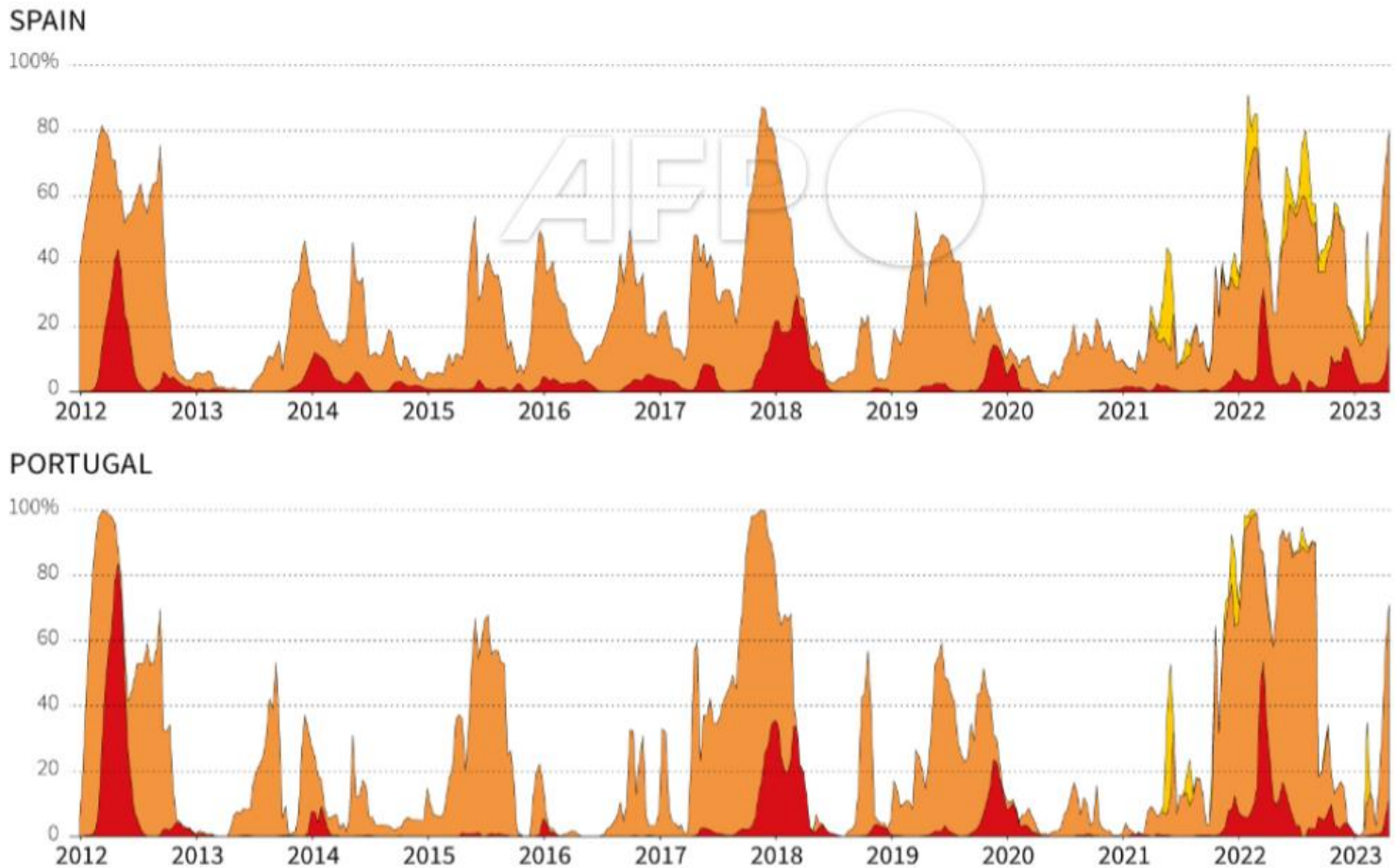
Climate Extremes: Heatwaves, Changes in Ice, Drought, Floods

Drought in the Iberian Peninsula

Percent of affected territory in Spain and Portugal

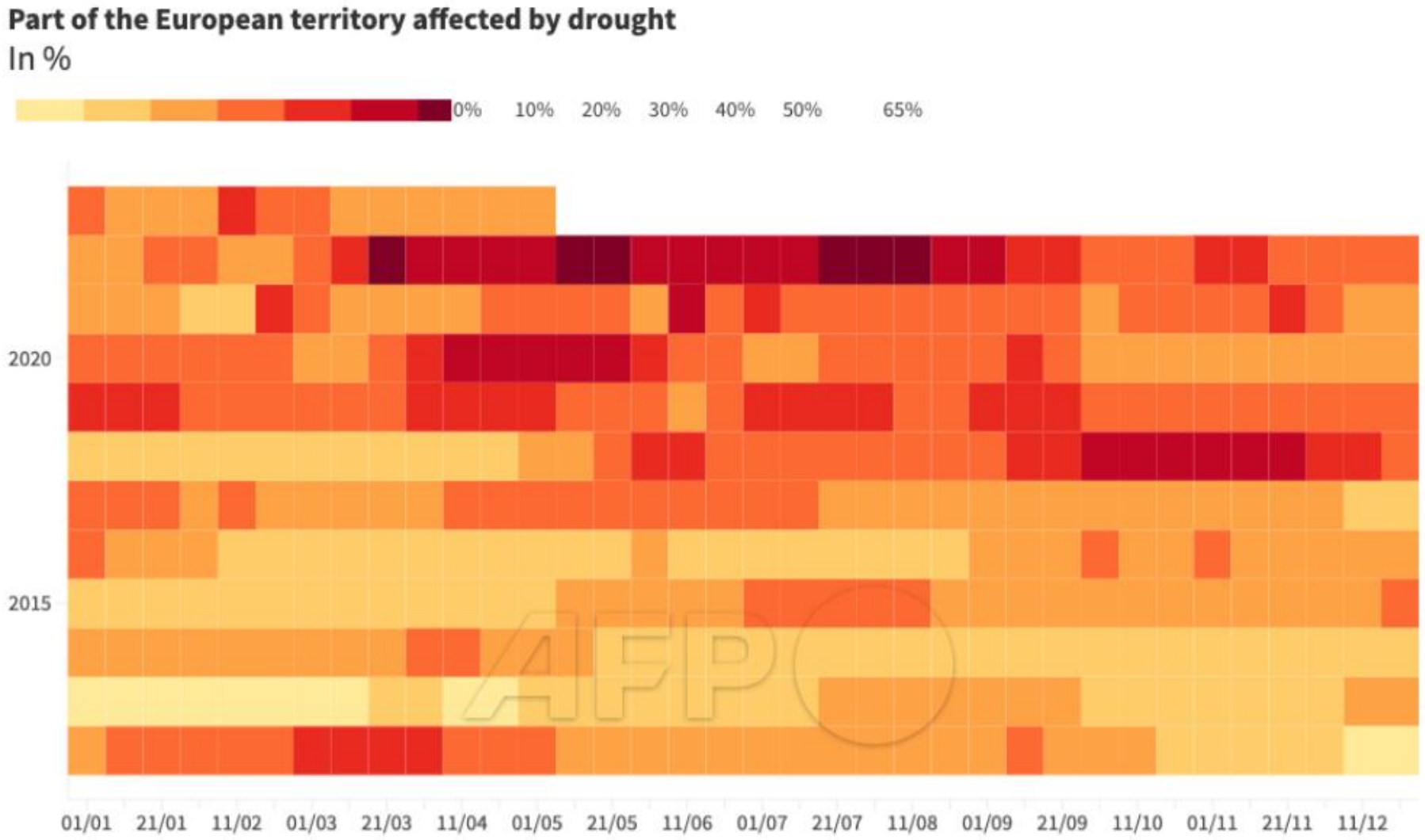
Rainfall deficit (watch)
Soil moisture deficit (warning)
Vegetation stress following rainfall and soil moisture deficit (alert)



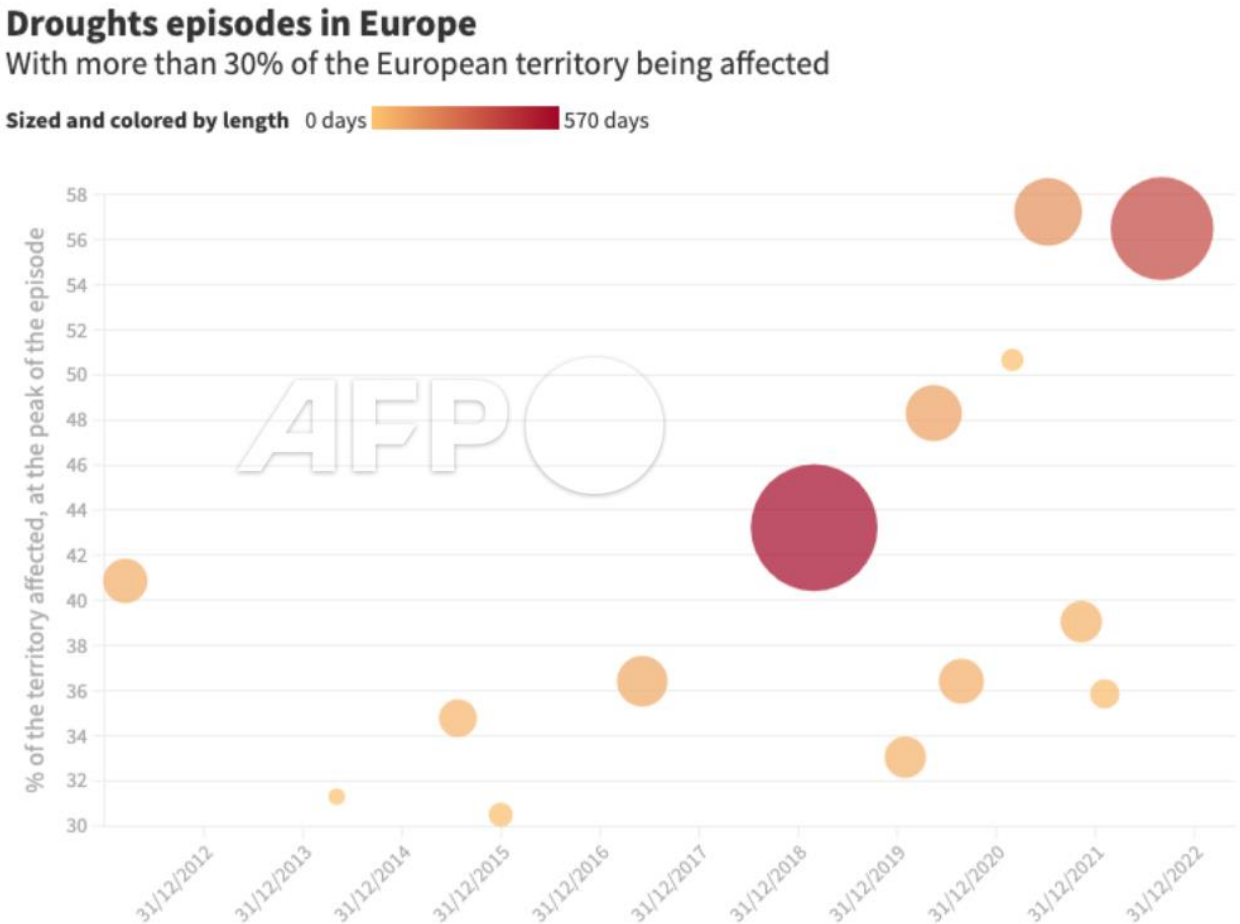
Source: AFP calculations based on data from the European Drought Observatory (EDO), data available from the start of observations in 2012 until April 30, 2023

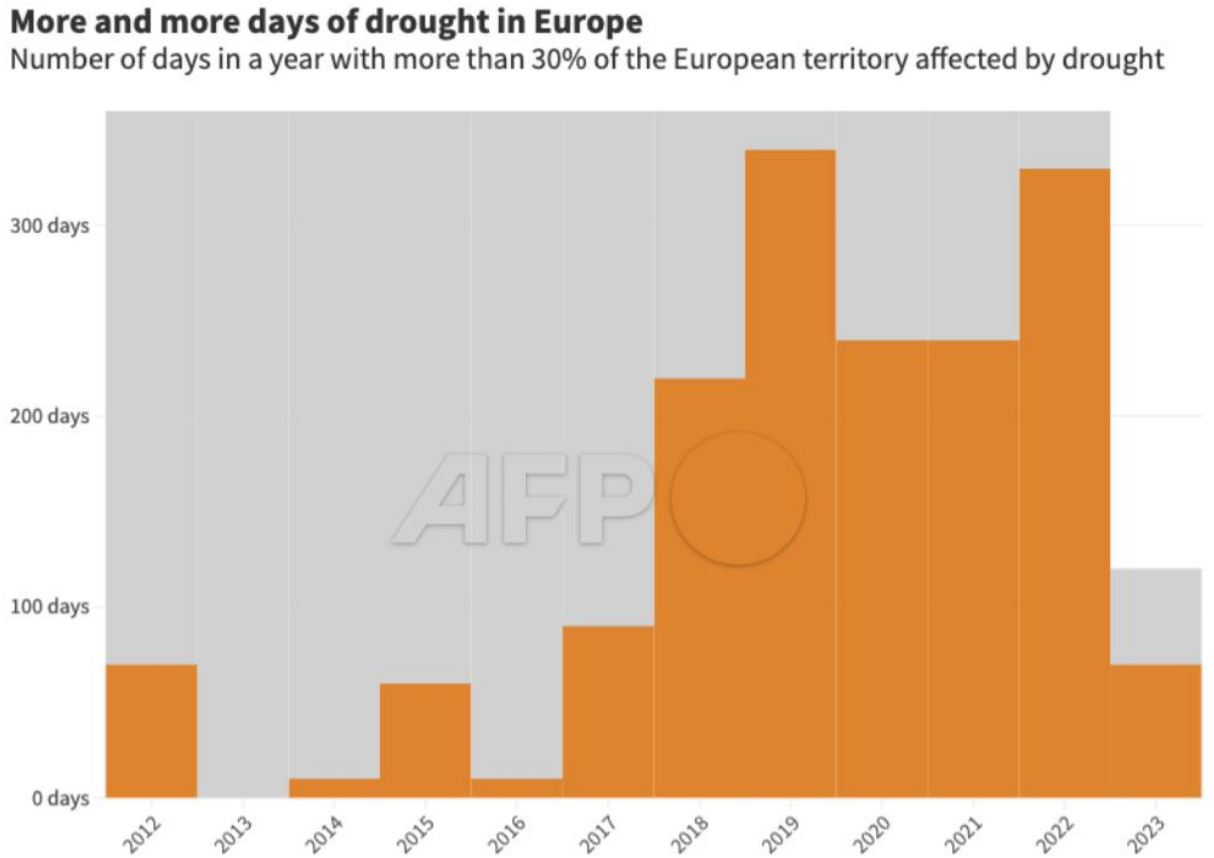
AFP

Database for any visualization



Now, free to try any visualization we want





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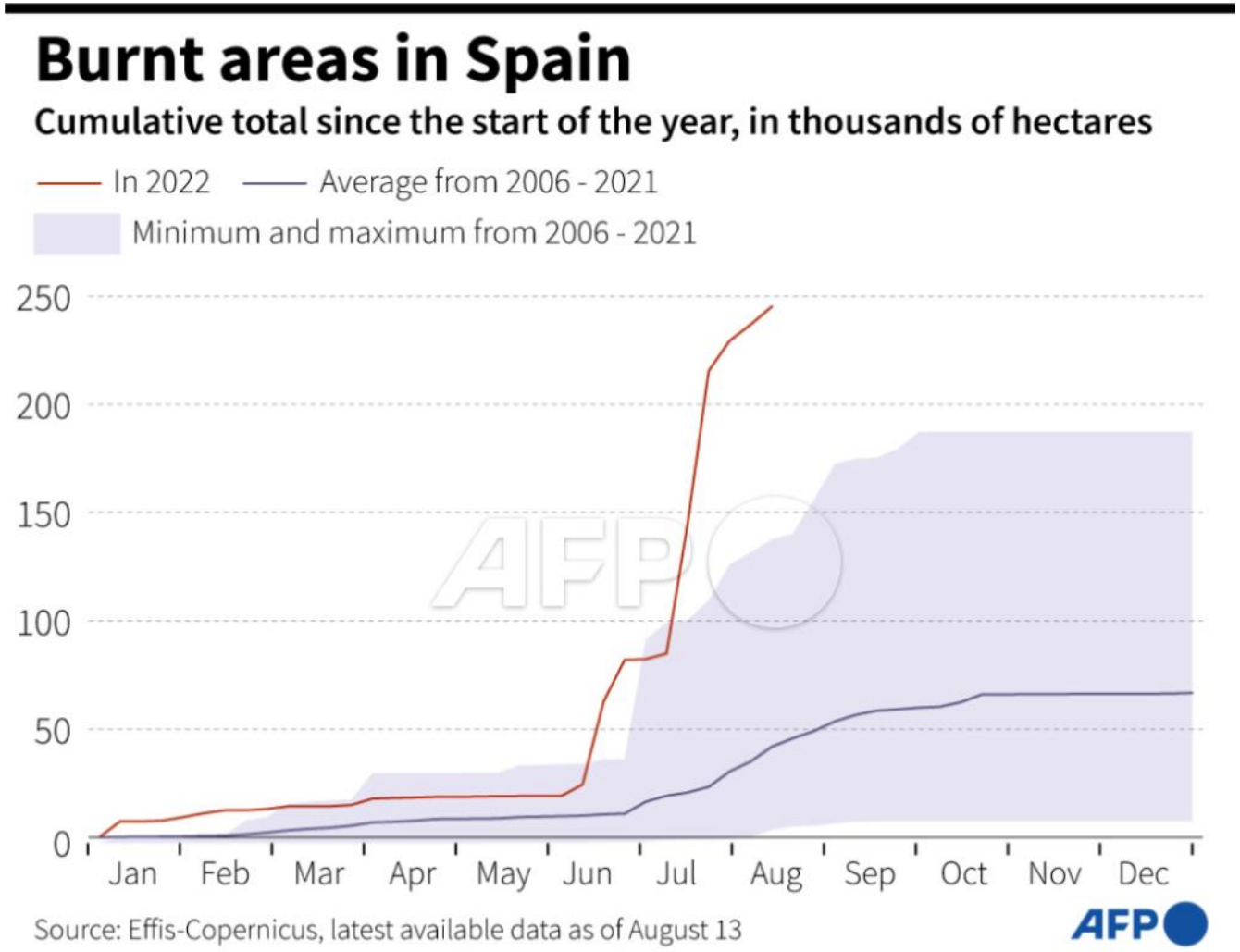
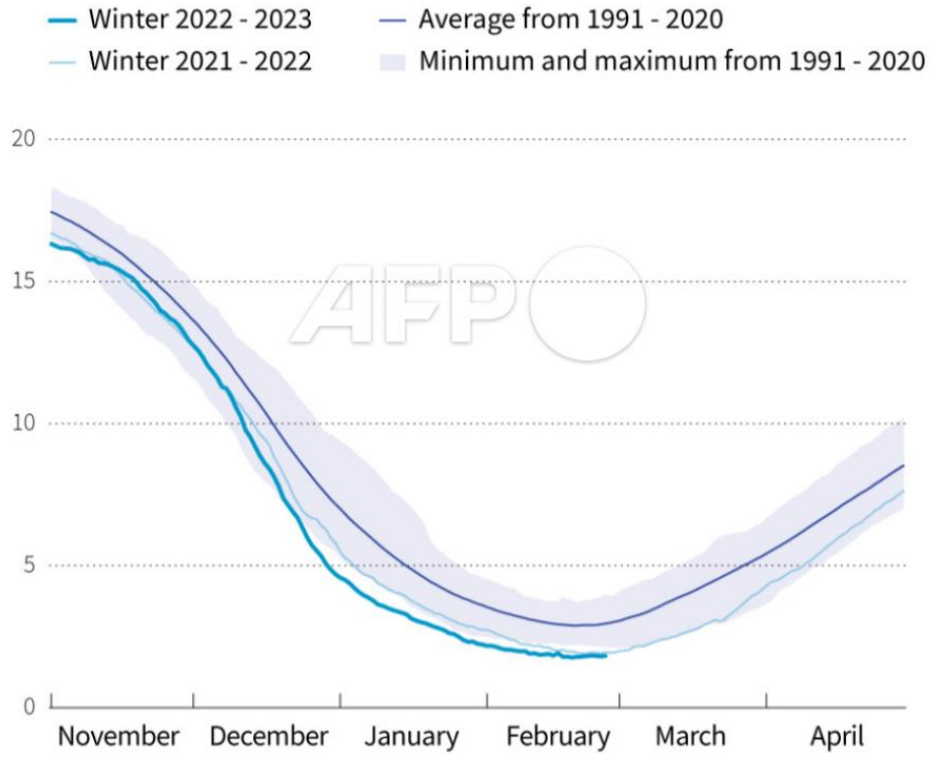
The best for us: maps AND databases



The best for us: maps AND databases

Antarctic sea ice at record low

Extent of sea ice in millions of km²

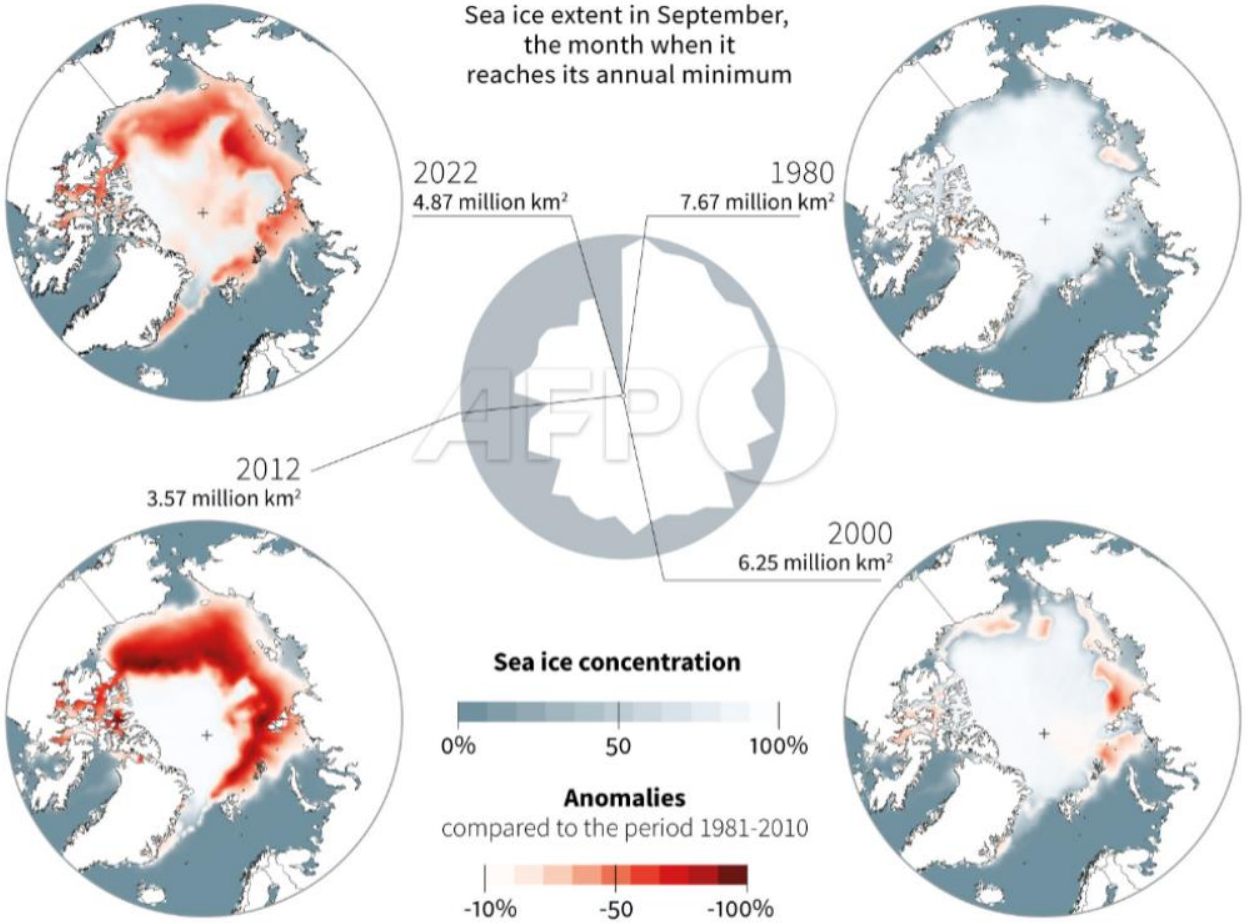


Source: NSIDC

AFP

Loss of Arctic ice

Sea ice extent in September, the month when it reaches its annual minimum



Sources: Copernicus, NOAA

AFP

PROGRAMME OF THE EUROPEAN UNION

Copernicus
Europe's eyes on Earth

WEKEO

IMPLEMENTED BY

EUMETSAT

MERCATOR OCEAN INTERNATIONAL

ECMWF

European Environment Agency