



Copernicus & COVID-19

The EU Earth observation initiatives

Directorate-General for Defense Industry and Space
European Commission

European Centre for Medium-Range Weather Forecasts
(ECMWF)

European Space Agency (ESA)



Space



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www.copernicus.eu





Rapid Action on COVID-19 and EO



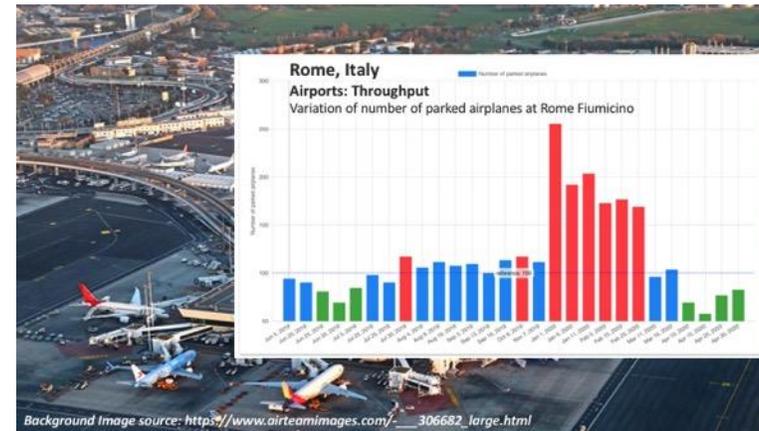
Rapid Action on COVID-19 and EO

Objectives

- Provide public EO info on the state of European society and economy
- Using European EO: Copernicus Sentinels and Third Party Missions
- Leveraging on European companies capabilities and using AI powered latest platforms technology

Focus areas

- **Climate:** greenhouse gas concentrations
- **Environment:** air and water quality evolution
- **Economic** indicators: industry, shipping, construction, trade, traffic
- **Agriculture:** asparagus, red fruits etc.



Achievements

Single source of truth – EO data from Copernicus Sentinels and Third Party Missions
Made in Europe, combining ESA expertise with European industrial skills and EO Platforms leveraging AI4EO
Straightforward to use by non-technical users
Informative for general public and decision makers
Communicates the effects of the lockdown on the environment and the economy, observable from space
Engaging public and community via the EuroDataCube contest

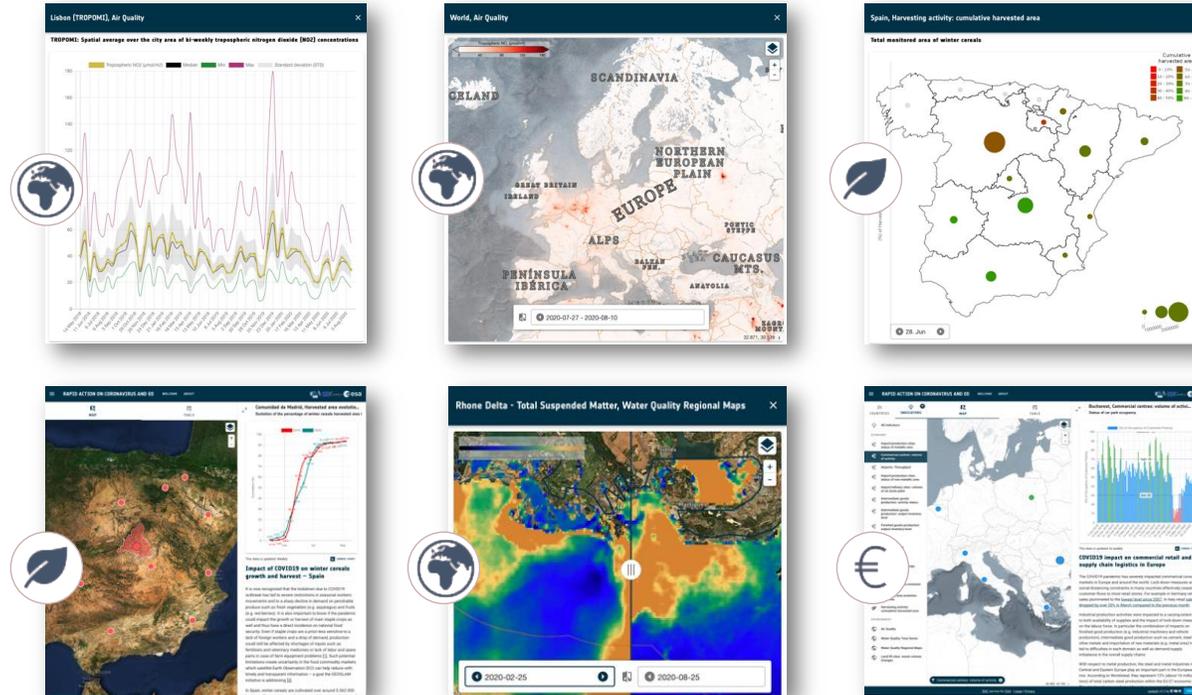


Achievements

Showcases real examples of the pandemic's effects in 200+ representative Areas of Interest across the EU* through 129 Indicators* such as air and water quality, agricultural production, travel, manufacturing or trade.

*as of 01/09/2020

From idea to launch in 2 months



race.esa.int

Next Steps

New Data

Dashboard will be expanded with new data throughout the economic reboot

Increased Coverage

Coverage of additional Member States, provision of new indicators, and transfer to operations, building on success

International Cooperation

The Dashboard is coordinated with international cooperation efforts



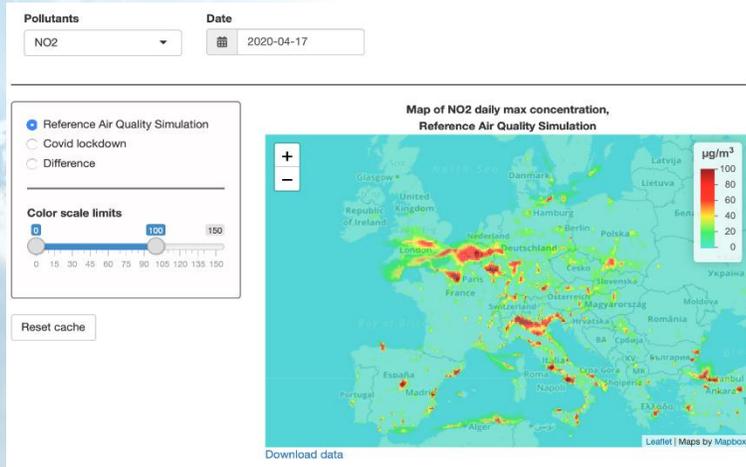
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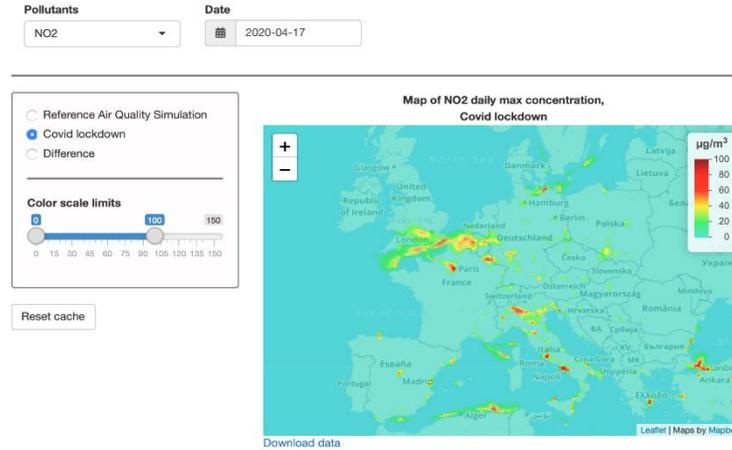
COPERNICUS ATMOSPHERE MONITORING SERVICE

- Dedicated EU Space webpage with initiatives launched by the Commission and its partners and members of the ecosystem is live : www.euspace-programme.eu/coronavirus
- Continued strong interest from international media/press

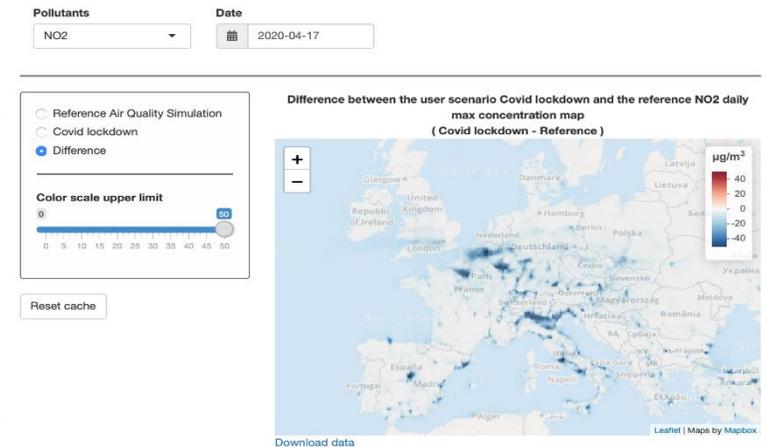
Recent addition: daily “COVID-19 emissions” scenario runs + advanced “Air Control toolbox”



What would be today’s forecast of NO2 (PM10, PM2.5) under normal circumstances?



What would be today’s forecast of NO2 (PM10, PM2.5) with emissions changed because of COVID-19 related measures?



What is the difference between the two?

Crude hypotheses at this stage: -60% for road traffic, -30% for industrial, +20% for residential, and no change for agricultural activities or maritime shipping as well as for natural sources. Powered by Ineris (France).

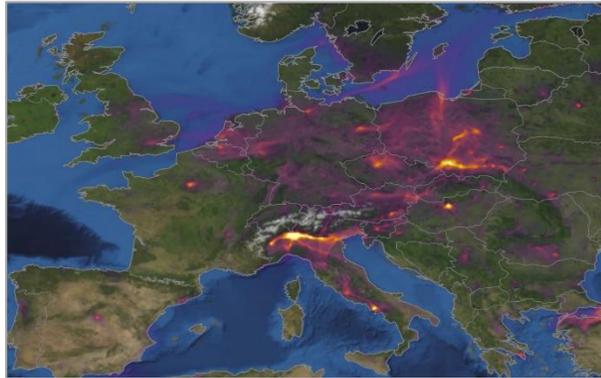


Atmosphere
Monitoring

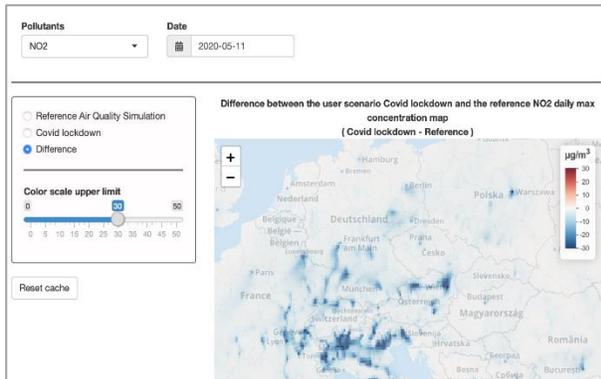
CAMS IN ACTION : CAMS COVID-19 MINISITE

<https://atmosphere.copernicus.eu/european-air-quality-information-support-covid-19-crisis>

Maps and animations of the latest situation in Europe.

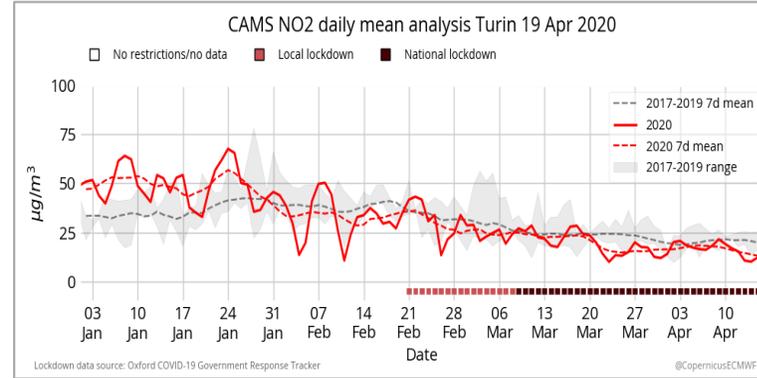


Forecast model estimate of reduction in air pollution is expected on a daily basis accounting for weather effects.

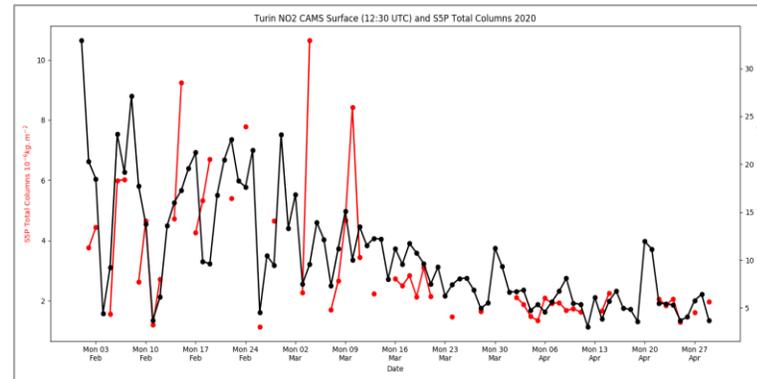


CAMS currently contributes to a number of epidemiological studies trying to evaluate the links between air pollution and COVID-19 (effects of long- and short-term exposure; fine particulate matter as a potential vector in air for the virus?...)

Air pollution across Europe compared to 2017-2019 and as a function of lockdown measures.



How consistent are surface and satellite measurements?



CAMS regional air quality forecasts: Météo-France, Ineris (FR)
CAMS COVID-19 scenario forecasts: Ineris (FR)
CAMS website: ECMWF



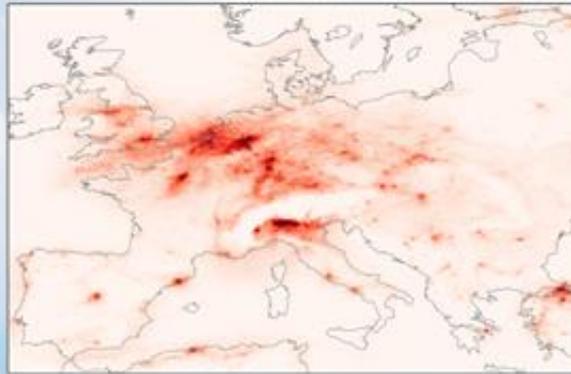


Atmosphere Monitoring

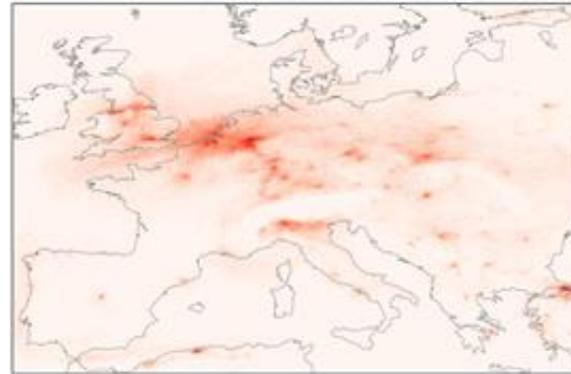
CAMS IN ACTION : SENTINEL-5P, AIR QUALITY FROM SPACE

NO₂ Total Column

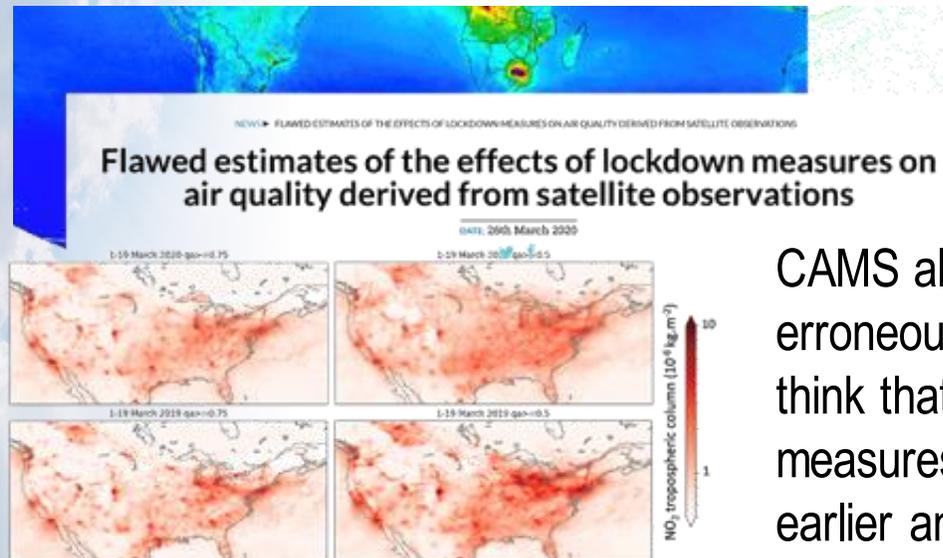
Mid-March to mid-April 2019



Mid-March to mid-April 2020



S-5P is the 1st satellite to provide credible measurements of air quality.



CAMS also showed that erroneous use of S-5P data led to think that effect of restriction measures on US air quality were earlier and stronger than in reality.

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Science & Environment

Coronavirus: Lockdown prompts clear fall in UK air pollution

By Jonathan Amos
Science correspondent

© 31 March 2020

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S-5P NO₂ total column provision: ESA, KNMI (NL)
S-5P NO₂ total column processing: ECMWF



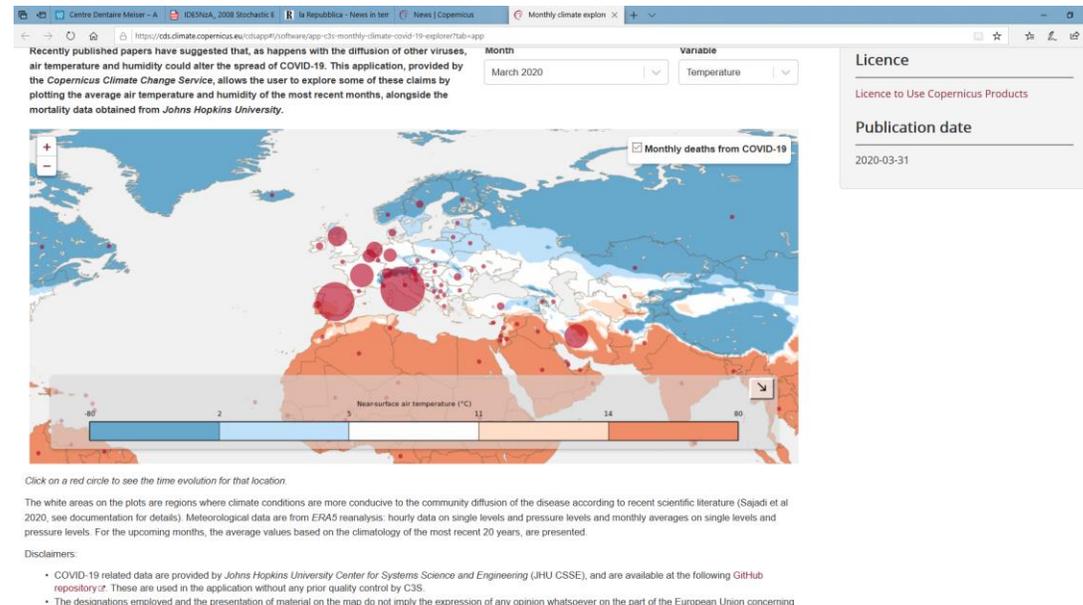
Climate
Change

From the Copernicus Climate Change Service

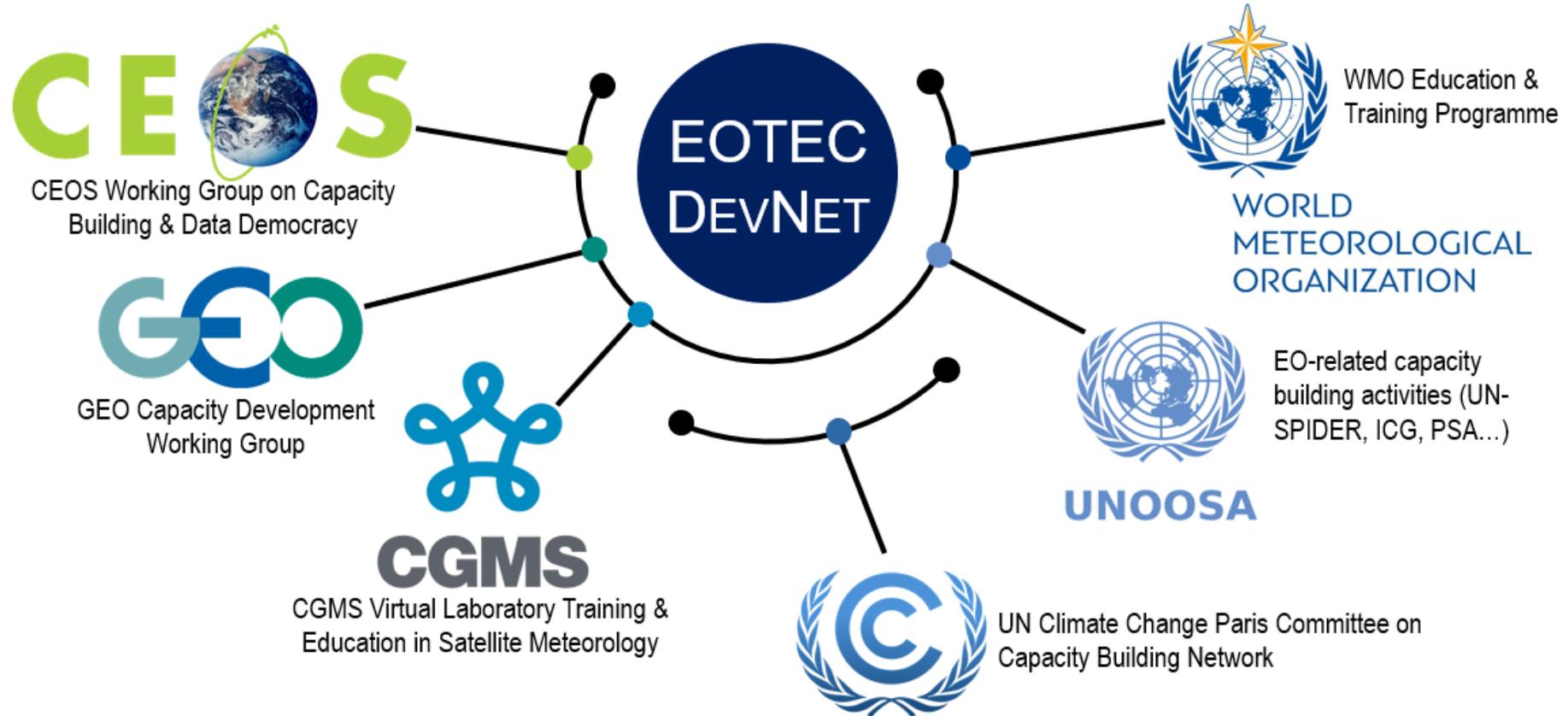
C3S helps health experts explore how temperature and humidity affect virus spread

<https://climate.copernicus.eu/c3s-helps-health-experts-explore-how-temperature-and-humidity-affect-virus-spread>

Recent research suggests that the spread of the new coronavirus (SARS-CoV-2) could be affected by temperature and humidity, so the C3S has worked with environmental software experts [B-Open](#) to develop an [application](#) that maps mortalities against temperature and humidity data. The application allows health authorities and epidemiology centres to explore the claims that temperature and humidity could affect the spread of coronavirus



Earth Observation Training, Education, and Capacity Development Network





Thank you for your
attention

Astrid-Christina.Koch@ec.europa.eu
European Commission
www.copernicus.eu