GROUP ON EARTH OBSERVATIONS

The value of Earth observation for climate action during and after COVID-19

Webinar “ICTs for climate action and rebuilding greener economies after COVID-19”
ITU Study Group Question 6/2 on ICTs and the Environment
15 July 2020

Impacts and opportunities linked to COVID-19 for the Earth observation community

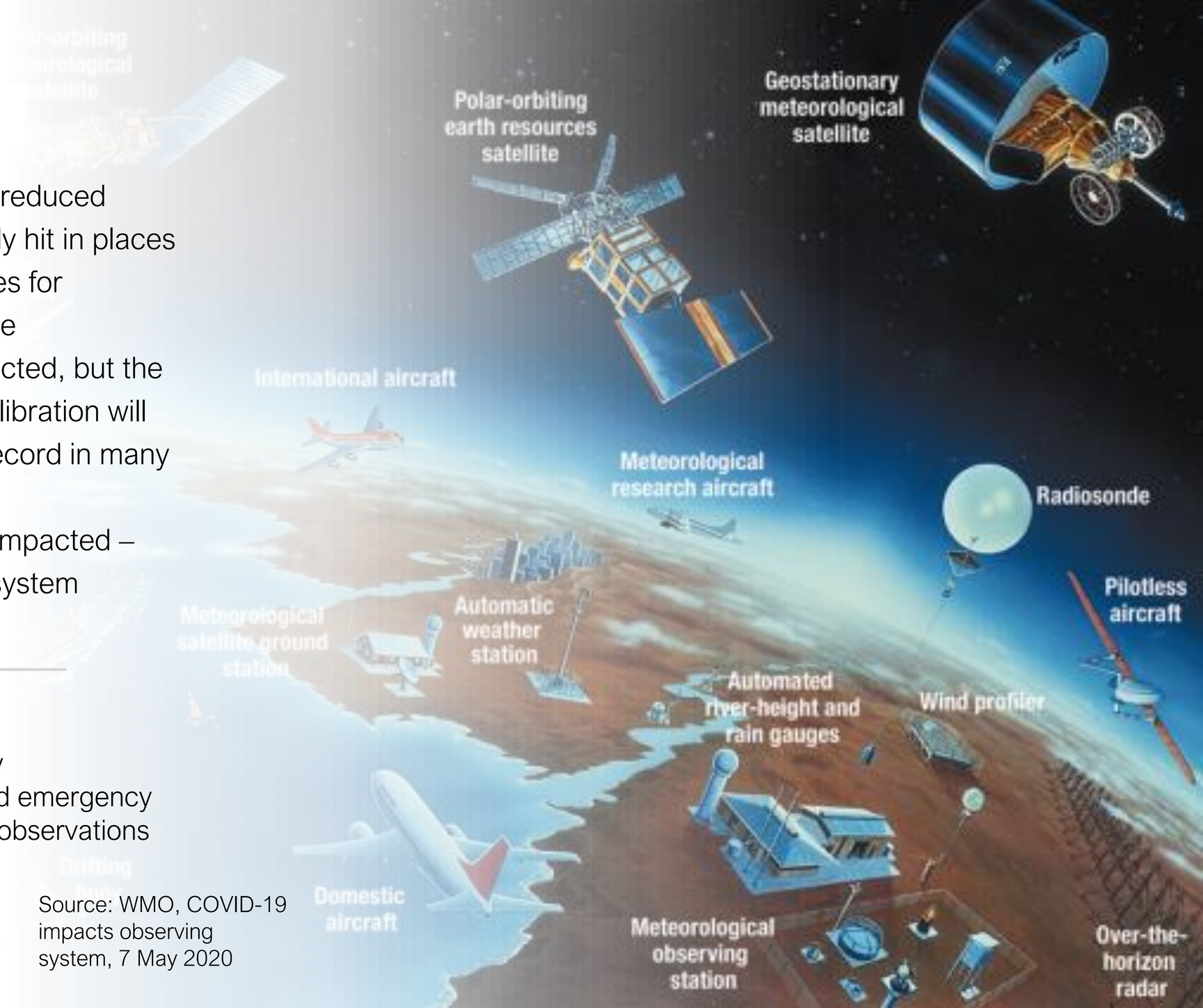
- Impacts on Earth observations: focus on the space industry
- Options and opportunities to enable scientific support for a resilient recovery and for knowledge sharing
- Impacts on GEO planned activities around climate change science and policy, and opportunities for engagement

Impacts on Earth observations

- Aircraft observations have drastically reduced
- Manual surface observations are badly hit in places that already have insufficient resources for observations and hence little resilience
- Automatic observations are less impacted, but the effects of lack of maintenance and calibration will accumulate and impact the climate record in many locations
- Satellite observations have not been impacted – showing the benefits of a composite system

This will lead to:

- Degradation of climate monitoring
- Degradation of weather forecasts globally
- Significant impacts on local forecasts, and emergency warning systems in the countries lacking observations



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WORLD METEOROLOGICAL ORGANIZATION

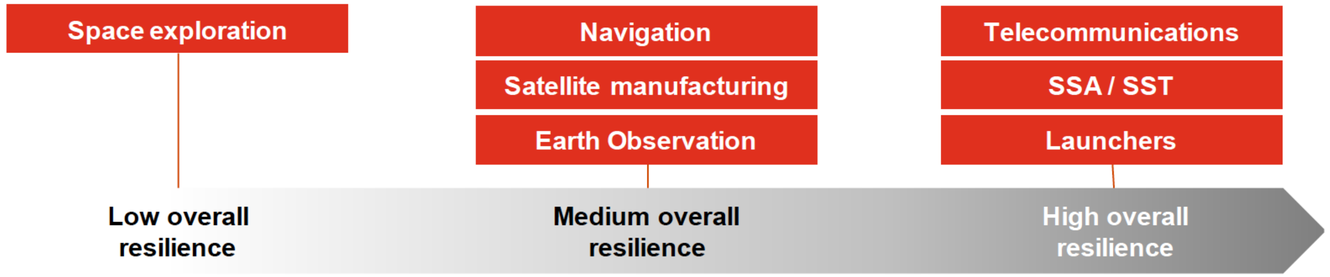
Source: WMO, COVID-19 impacts observing system, 7 May 2020

Impacts on Earth observations: the space industry

- While other Earth observations are negatively affected by COVID-19, space-based measurements on climate, environment and society continued, largely without interruption (source: CEOS/CGMS).

- Only positive impact of COVID-19 on space industry value chain is on Earth observation: very strong increase in demand especially for Big Data Analytics services, both from commercial players and public entities.

- Growing interest for innovative imagery-based applications expressed through open rapid responses procurement opportunities from space agencies, such as ESA or NASA, but also from non-space organizations.



	Driver	Impact Level negative <-> positive
Earth Observation	Demand	○ ○ ● ● ○
	Supply	○ ○ ● ○ ○
	Private investment	● ● ● ○ ○
	Public policy	○ ● ● ○ ○

Source: PwC, Resilience of the Space Sector to the COVID-19 crisis, April 2020

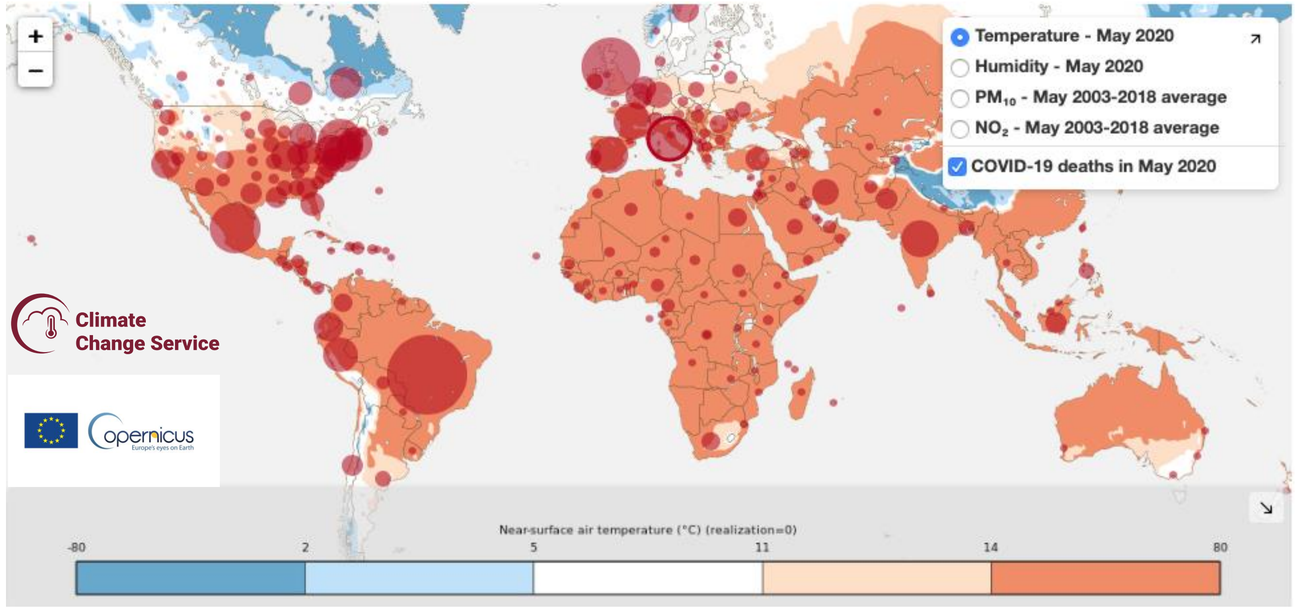
Options and opportunities to enable scientific support for a resilient recovery and for knowledge sharing

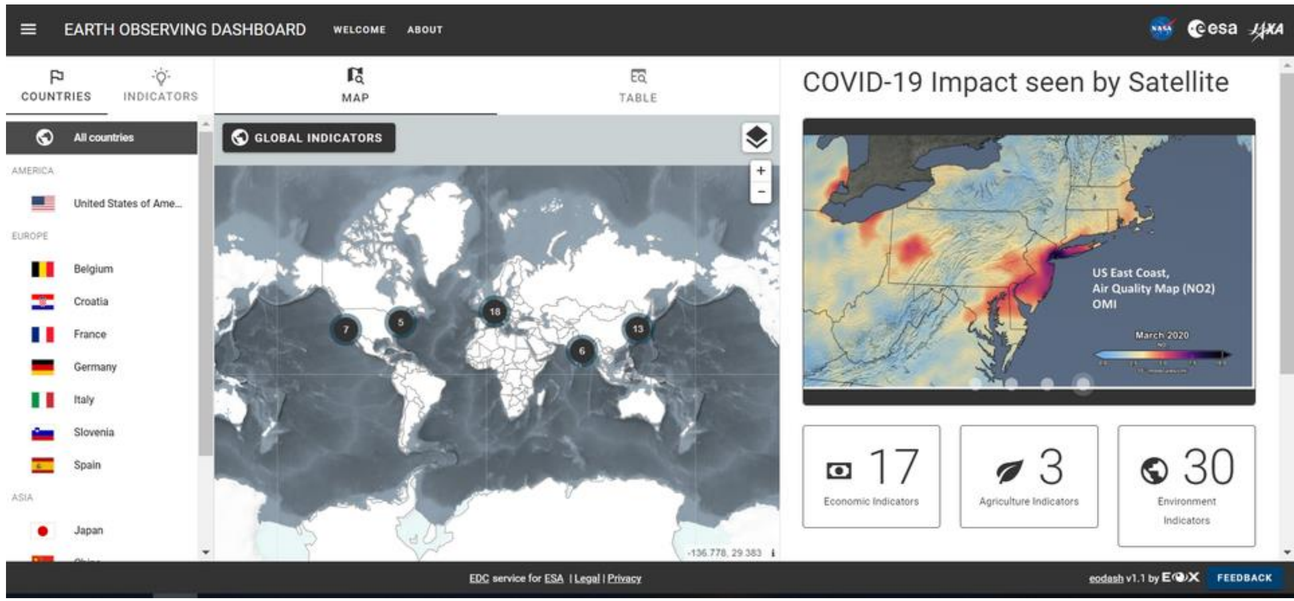
Global, space-based observations are being monitored and analyzed as global tracers of changes in economic activity during the slowdown and initial recovery.

For space agencies the COVID-19 slowdown and recovery provides an unprecedented opportunity for assessing, refining and improving tools for tracking and quantifying the impacts of these activities on the environment (air pollution, GHG emissions, traffic, shipping, air travel…):

- ESA, NASA and JAXA produced the ‘COVID-19 Earth Observation Dashboard’ to explore environmental and economic indicators https://eodashboard.org

- Copernicus supported investigation of the connections between COVID-19, air quality and climate: Monthly climate explorer for COVID-19 https://cds.climate.copernicus.eu/cdsapp#!/software/app-c3s-monthly-climate-covid-19-explorer?tab=app





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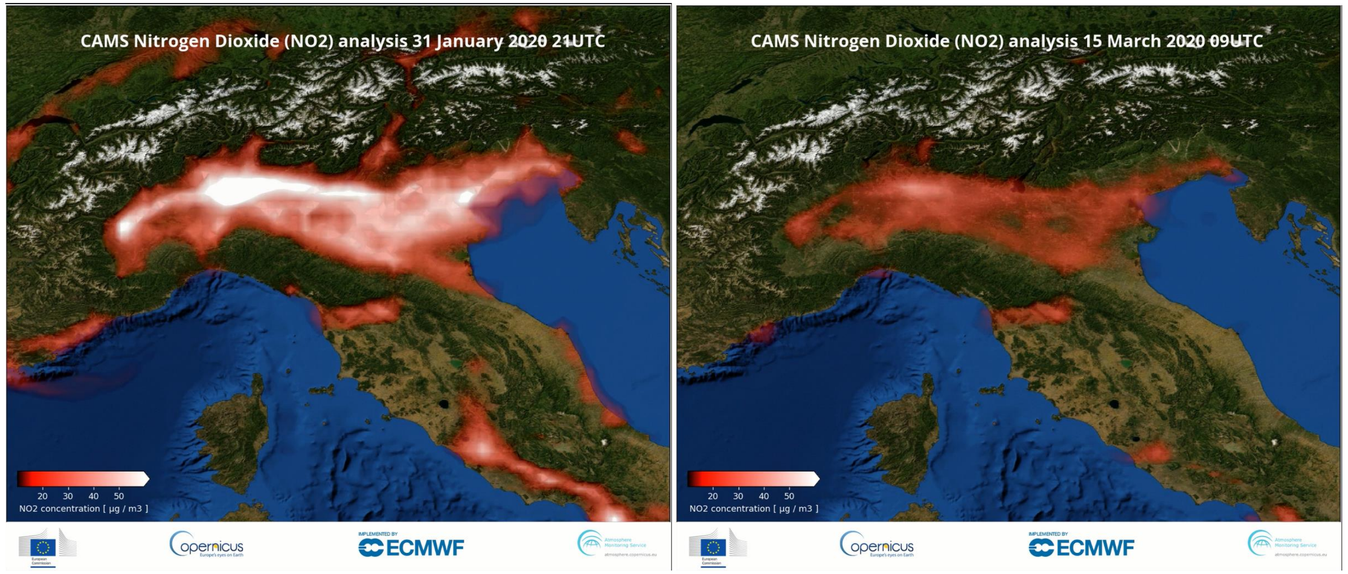
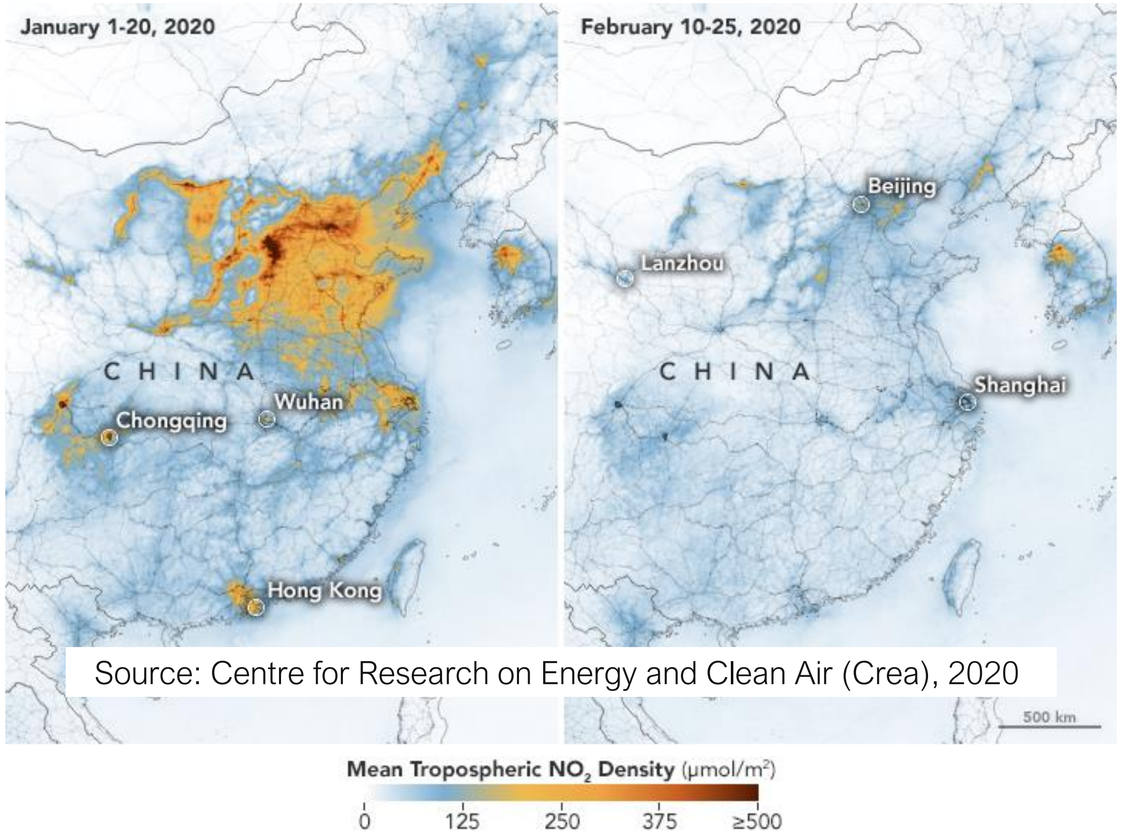
Some results of satellite measurements of COVID-19 impacts on the environment and climate

- Concentration of carbon dioxide (and other long-lived GHG) in the atmosphere will not decrease as a result of lockdown measures.
- The most substantial impact of emission reduction on atmospheric GHG concentrations is visible in urban areas where emission changes can be detected by direct flux measurements.
- Reduction of air pollution from road transport (nitrogen dioxide) is visible but air pollutants do not only change with lower emissions, also with weather conditions (wind speed).
- A coordinated assessment of the potential association of COVID-19 and climate is needed.



Source: Copernicus Atmosphere Monitoring Service (CAMS), 2020



Source: Centre for Research on Energy and Clean Air (Crea), 2020

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Options and opportunities to enable scientific support for a resilient recovery and for knowledge sharing

Space agencies are soliciting research that targets COVID-19 impacts and recovery efforts, including connections with climate, environmental and socio-economic variables:

- European Commission and European Space Agency (ESA) are offering Copernicus infrastructure and additional resources to monitor COVID-19: Rapid Action Coronavirus Earth (RACE) observation dashboard platform https://www.copernicus.eu/en/events/events/european-commission-esa-press-conference-race-initiative

- NASA's Rapid Response and Novel Research in Earth Science https://www.nasa.gov/feature/goddard/2020/nasa-funds-four-research-projects-on-covid-19-impacts and contributions to the COVID-19 High Performance Computing Consortium; https://www.xsede.org/covid19-hpc-consortium

- NASA, ESA, Canadian Space Agency (CSA), and Japan Aerospace Exploration Agency (JAXA) co-sponsored a COVID-19 Virtual Hackathon on 30-31 May to engage the public to use space-based data to assess impacts and implement recovery efforts: 15,000 participants, winners to be announced in August and invited to work with experts to make real contribution to science https://www.nasa.gov/press-release/nasa-partners-launch-virtual-hackathon-to-develop-covid-19-solutions

Activities underway in the GEO community – a few examples

Huge interest within GEO to bridge dialogue between the Earth and health science communities:

- GEO Community Response to COVID-19: 41 projects from GEO Members and partners from across the GEO Work Programme that are using Earth observation to support response and recovery actions http://www.earthobservations.org/covid19.php
- Since late March 2020, the GEO Health Community of Practice and the Earth Observations for Health (EO4HEALTH) Initiative have coordinated weekly community teleconferences to leverage expertise across sectors and geographies and share EO data, tools, and knowledge to support COVID-19 responses http://www.geohealthcop.org
- GEO Global Agricultural Monitoring Initiative (GEOGLAM) is responding to emerging food emergency as COVID-19 pandemic is predicted to exacerbate existing food crises and drive worsening food insecurity among already vulnerable populations http://www.earthobservations.org/geo_blog_obs.php?id=428
- Esri manages the COVID-19 GIS Hub to get maps, datasets, applications, and more to monitor COVID-19 https://coronavirus-disasterresponse.hub.arcgis.com
- GEO Indigenous COVID-19 Hackathon in May and June, focused on supporting communities to respond to local challenges. In July GEO Indigenous Alliance will present at the United Nations High Level Political Forum (HLPF) on how to benefit from Earth observations http://www.earthobservations.org/geo_blog_obs.php?id=440

Impacts on GEO planned activities around climate change science and policy

- **GEO Climate Change Working Group** launched in April, with 90+ experts: planning virtual WG meetings, workshops/webinars, engagement with UNFCCC and IPCC, and support to countries' climate action through enhanced use of Earth observation.
- **GEO first Virtual Symposium** with over 1,500 registered participants in 14 sessions throughout the week of June 15-19. Session on Earth Observations for COVID-19 Response and Recovery organised by GEO Health Community of Practice, and Session on Engaging UN agencies and IGOs with UNFCCC, GFOI, UNDRR and other partners.
- **GEO Week 2020** including climate action session postponed (tbd)

Climate change and its impacts cut across all areas of GEO's work.

GEO makes available Earth observations in support of effective policy making for climate change adaptation and mitigation, working with partners to enhance global observation systems in order to strengthen resilience and adaptive capacity to climate-related hazards.

How can the international community participate in the upcoming GEO COVID-19 activities related to climate science and action?

- Engage with the **GEO Climate Change Working Group** through the GEO Secretariat for planning of COP26 side-events, dedicated expert workshops, etc

- Join the **GEO Health Community of Practice teleconferences on COVID-19 activities** in July, review materials of past teleconferences and the GEO Virtual Symposium and provide feedback to the experts http://www.geohealthcop.org/covid19-telecons

- Participate in the **WMO/WHO Climatological, Meteorological and Environmental factors in the COVID-19 pandemic: An international virtual symposium on drivers, predictability and actionable information**, 4-6 August 2020 – organised by Department of Science and Innovations-South Africa, WMO, Future Earth, ISC, AGU, GEO Health and partners. Abstract accepted by 10 July https://public.wmo.int/en/events/meetings/covid-19-symposium

Thank You

Communicate and Collaborate with GEO:

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