

New Earth observation strategy to keep pace with our changing world

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Fueled largely by climate change, our planet is being subjected to environmental changes that are having an unprecedented global impact

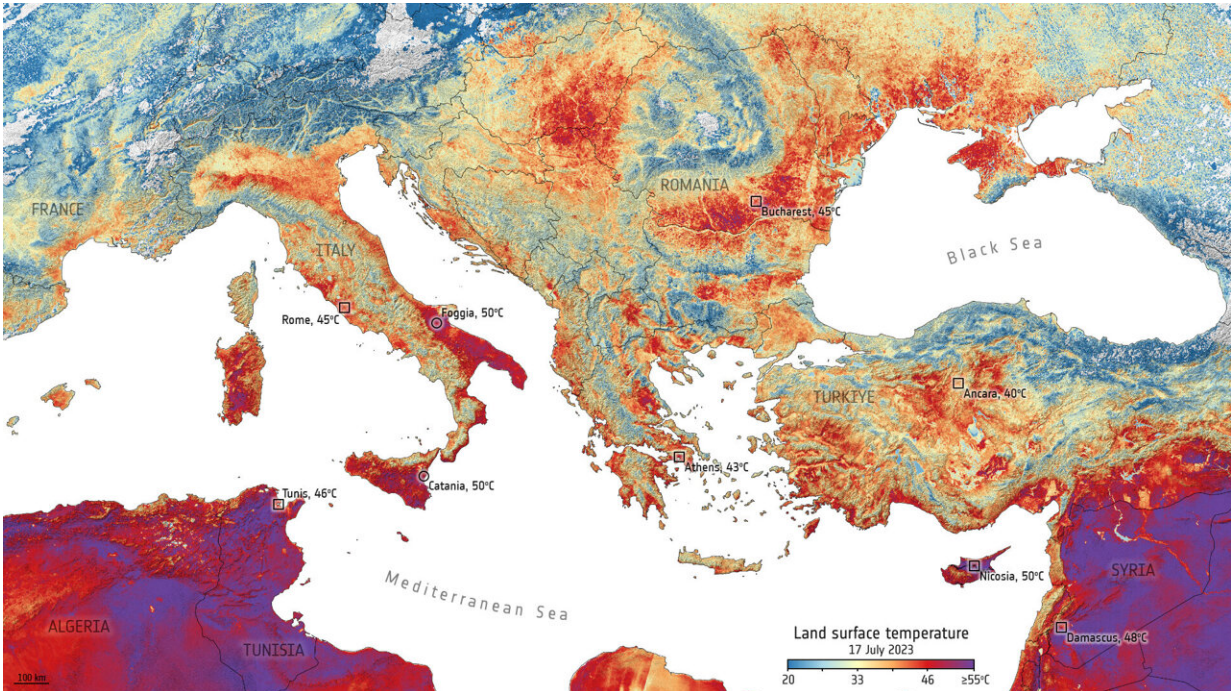
on humans, animals and plants. Shockingly, in certain locations these changes are occurring at a rate never before witnessed.

To keep pace with the challenges we face, ESA is embarking on a new Earth observation science strategy—and has reached out to the [scientific community](#) at this early stage in the process to help guide the Agency's scientific agenda for the coming years.

More than ever, Earth observation-based science forms a critical part of our efforts to understand and address the many complex challenges facing our world.

From climate change to [natural disasters](#), to food and water security, data from satellites orbiting above and the resulting scientific knowledge provide valuable insights into these [global issues](#) and help make informed decisions about how these challenges can be best addressed.

At the same time, observing Earth from space has become a dynamic and fast-developing sector. It is critical to build on the latest advances in technology, [data analytics](#) and modeling to develop a comprehensive and integrated approach to Earth observation, while ensuring that the underlying science questions remain relevant.



This image uses data from the Copernicus Sentinel-3 mission’s radiometer instrument and shows the land surface temperature in the morning of 17 July 2023 during a heatwave. It is worth noting the difference between air temperature and land-surface temperature. Air temperature, given in our daily weather forecasts, is a measure of how hot the air is above the ground. Land-surface temperature instead is a measure of how hot the actual surface feels to the touch. This map shows the temperature of the land’s surface which is hotter than the temperature of the air. As climate change takes grip, heatwaves such as this are likely to be more frequent and more severe, with far-reaching consequences. Credit: contains modified Copernicus Sentinel data (2023), processed by ESA, CC BY-SA 3.0 IGO, CC BY-SA 3.0 IGO

Paving the way for the new Earth Observation Science Strategy, ESA taken the first two steps; firstly launching a Science Strategy Foundation Study, which has resulted in a [comprehensive set of Earth science questions](#), and an early [open consultation](#) with the scientific community.

ESA's Malcolm Davidson said, "Our current strategy was issued in 2015 and identified key challenges that limit our understanding in specific areas such as oceans, ice, land and atmosphere. Our [satellite missions](#), particularly our [Earth Explorer research missions](#), have responded to these challenges and been extremely successful in delivering information to improve our understanding of our planet in these areas—and new missions in the pipeline are set to advance our knowledge even further.

"Nevertheless, Earth observation is evolving and has changed dramatically since 2015. We are seeing, for instance, how quickly our planet is being altered by the climate and the needs of a growing global population.

"Advances in Earth system science, in [remote sensing](#), in-situ observations, and digital information technology are also opening the door to new and unprecedented opportunities for advancing science, which ESA needs to grasp."

The new science strategy will respond these challenges by focusing more on our understanding the Earth as a system.

ESA's Mark Drinkwater added, "Like the human body, our Earth is made up of diverse parts that interact in complex ways. Better insight into how our planet works, how it will evolve in the future and how it responds to issues such as [climate change](#) is key to understanding these interactions through the use of observations from space.

"This is complicated science. In order for us to have a solid roadmap in place by mid-2024 we first launched a comprehensive international study as a way for scientists to help us identify key science questions. These questions express future science priorities and their role in addressing important gaps in our knowledge of the Earth system, as well as societal benefits linked to addressing these science drivers."

A workshop was therefore held recently, giving the scientific community the opportunity to put their ideas and needs forward.

Simonetta Cheli, ESA's Director of Earth Observation Programs, said, "Our science strategy will be a bold and ambitious scientific vision for the future.

"It will outline the research objectives, priorities, and approaches for scientific activities within our Earth Observation Programs. It will identify the key scientific questions to address associated challenges and opportunities, as well as embrace opportunities such as digital innovation, open science, commercial space, national programs and policy directives.

"We recognize this is very complex and interconnected, and requires a multidisciplinary and collaborative approach, but we want our projects to continue to push the boundaries of our understanding of the Earth system.

"I'd like to thank everyone who has contributed to these important initial steps. This will help us to formulate a roadmap for implementing our programs over the next several years to a decade."

The next step will be for ESA to start preparing the Earth Observation Science Strategy, building on results from the workshop and the foundation study activity, in consultation with the Advisory Committee on Earth Observation.

A draft strategy document is anticipated to be ready in spring 2024 when, by popular demand, a second consultation is planned with the science community to review the document.

The goal is to finalize the strategy by mid-2024 and to proceed with its

implementation.

Provided by European Space Agency

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