

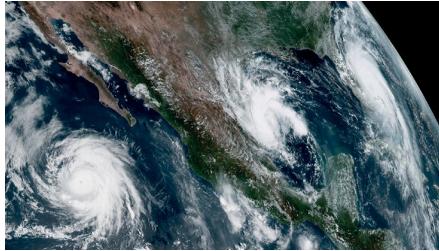
Save the data

Cuts at US government agencies are disrupting monitoring critical to tracking Earth system changes and natural hazards. Data gaps threaten geoscience progress and the safety of society.

The Atlantic hurricane season, which begins this month and is forecasted to be more active than normal, has exposed very real potential consequences of recent staffing and budget cuts to the US National Oceanic and Atmospheric Administration (NOAA)¹. With the National Weather Service struggling to staff round the clock operations and perform basic maintenance, hurricane monitoring efforts central to forecasting and disaster preparedness are at risk.

Monitoring of the atmosphere and ocean is essential for accurate forecasts to keep people safe from these storms, as well as to develop strategies to cope with extreme weather events. As climate change increasingly exacerbates extreme weather, it is vital that the ability to monitor – and archive – these events is not reliant on the political winds of the moment.

The cuts to NOAA affect much more than hurricane forecasting, with repercussions beyond the USA itself. Reduced atmospheric and oceanic observations, from remote sensing to weather balloons, could lead to spatial and temporal gaps that affect weather forecasting more generally. A range of data products related to marine and coastal science, climate science, and earthquakes is being decommissioned². Cuts threaten the Integrated Ocean Observing System that is used for not only science, but harbour navigation by ships, algal bloom detection by commercial anglers, and tsunami preparedness³. NOAA will also no longer track the costs of weather disasters like floods, heatwaves, and wild-fires⁴ – data critical for effective rebuilding and an insurance industry adjusting to shifting climate risks. Meanwhile, cutbacks to maintenance of a pair of polar-orbiting weather satellites important for accurate weather forecasts and early storm warnings increase the risk of a technical failure that could blind the country to an extreme storm⁵.



NOAA satellite photo of hurricanes from September 2019.

Earth monitoring has been affected at other US government science agencies as well. The lack of funds from the National Science Foundation (NSF) for infrastructure maintenance threatens US Antarctic research – particularly the viability of its research stations⁶ – with implications for international research projects. Furthermore, proposed cuts to NASA may affect more than space exploration: the NASA Earth Science Division operates more than 20 satellites in orbit and supports a broad range of Earth observations. Understaffing and funding restrictions could also affect the monitoring of other natural hazards including earthquakes, volcanic eruptions, and solar storms that require regular instrument maintenance and round-the-clock staffing at observatories⁷.

The USA has long led the way and been a reliable source for state-of-the-art Earth observational data. It has also set high standards for archiving these data and making them publicly available for scientists around the world. But recent reports of scientific resources disappearing from US federal agency websites are undermining trust in these datasets: many climate-related government pages have been taken down. NOAA is not only discontinuing many of its data products related to Earth monitoring but making these historic data sources unavailable².

The uncertainty facing US-funded science is a wake-up call to the international research community of the pitfalls of overdependence on any single country. Fortunately, global geoscience is not reliant on the USA for monitoring environmental change. The European Union's Copernicus programme supports satellite and ground-based data

collection. China has also built a comprehensive Earth observation system⁸. In fact, countries across the world support satellites and other monitoring programmes. Should the USA no longer lead the way, there is an opportunity for other nations to step up, though abruptly ramping up resources and expertise will be no small feat given the size of historic US investments and a challenging economic climate.

Ultimately, what happens to the data may be the key issue: how datasets are archived and safeguarded for future generations will affect scientists' ability to understand extreme weather and environmental change and society's ability to respond to those events and adapt to those changes. Individual scientists and those working with the [Public Environmental Data Project](#) are scrambling to download and safeguard US government-held environmental data. But it shouldn't be left up to grassroots efforts to protect critical data archives; enduring and accessible storage of data in internationally supported repositories is needed. In Europe, the Earth science data repository PANGAEA has been working with NOAA to back up databases to ensure they remain publicly available⁹.

Geoscientists rely on data to tackle the world's challenges. Earth monitoring efforts and preservation of these records need to be protected from politics. For both scientists and society, scientific knowledge is power.

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