



Scientists are skipping trips meant to maintain sensors for the Ocean Observatories Initiative.

forecasting weather over the oceans, as well as for keeping longer-term records of ocean health and climate change, says Emma Heslop, a programme specialist in ocean observations at the Intergovernmental Oceanographic Commission in Paris. Her group is still trying to assess the extent of the damage that the pandemic is doing to the ocean-observing community as a whole, but researchers are already feeling some effects. Over the past two months, they've seen steadily declining numbers of shipboard observations – amounting, since the beginning of February, to a 15% loss of stations reporting data. And although the community is working hard to figure out other ways to collect important data, the situation is likely to worsen as the pandemic stretches on. “The longer the restrictions are in place,” Parks says, “the longer it will take for our operations to recover.”

Commercial flights provide invaluable weather data, too – measuring temperature, pressure and wind speeds. The meteorological data provided by the US aircraft fleet had decreased to half its normal levels as of 31 March, according to the US National Oceanic and Atmospheric Administration (NOAA).

Maintenance woes

Satellites and weather balloons can fill in some gaps, but certain aircraft data are irreplaceable. “It’s certainly the case that with the virtual loss of worldwide aviation, there is a gap in some of the records,” says Grahame Madge, a spokesperson for the UK Met Office in Exeter.

The Met Office estimates that the loss of aircraft observations will increase their forecast

error by 1–2%, but notes that, in areas where flights are typically more abundant, scientists’ forecast accuracy might suffer even more. The Met Office maintains more than 250 UK weather stations that provide continuous or daily feeds of autonomously collected atmospheric and weather data. For now, those systems are functioning just fine, but if an instrument goes down, Madge says, it will be difficult to get staff out to fix the problem.

Many of the world’s atmospheric-monitoring data are collected with little to no human intervention, and such projects should be able to keep running. The Advanced Global Atmospheric Gases Experiment, for example, measures ozone-depleting compounds, greenhouse gases and other trace components in the atmosphere at 13 remote sites around the globe. Many of their systems are autonomous: the stations are each staffed by one or two people who perform routine maintenance to keep the instruments running. Ray Weiss, an atmospheric chemist at Scripps who leads the project, says that two instruments have broken down so far, but the loss of a single instrument or even a whole site for a few weeks is unlikely to jeopardize the network’s monitoring capabilities. Arlyn Andrews, who runs NOAA’s greenhouse-gas-monitoring programme, says that impacts on that network have been “relatively minor”, and less than 5% of the NOAA sites have lost data so far.

Unless the situation gets a whole lot worse, Weiss anticipates that the programme will escape relatively unscathed. “We’re limping through, is the bottom line.”

Q&A



Charlie Swanton

Cancer-evolution researcher Charlie Swanton at the Francis Crick Institute in London has led the conversion of some labs into a coronavirus testing facilities. Swanton, also a consultant oncologist at the University College London Hospitals (UCLH), spoke to *Nature* about the effort.

How did this start?

Scientists didn’t want to sit at home and read reports about increases in deaths. We reached out to the UCLH and they said there was an unmet need for staff and patient testing. So researchers set up a working group to convert laboratories here into a rapid real-time polymerase chain reaction (RT-PCR) screening facility. Five large laboratories here have now been repurposed. Everybody wanted to help.

What does it take to retool a cancer lab into a diagnostic testing facility?

You need the right people, laboratory infrastructure and reagents. We have here BSL-3 (biosafety-level-3) facilities and BSL-3 trained staff, 10–15 RT-PCR machines, environments to extract RNA from viral samples, and space. We repurposed a lot of the software tools that we use to track patients’ cancer and blood samples to help us track COVID-19 tests.

We get swabs couriered from the UCLH every day: they’re taken up in an isolated coronavirus-specific lift and barcoded; the virus is inactivated, the PCR test done and the results reported back via a messaging app to medical staff. We are currently doing hundreds of tests per day, and hope to get up to 500–1,000 tests per day.

How have researchers adapted?

This is a new way of working for many of our scientists and staff. Much of this diagnostic work is repetitive and quite boring, but the stakes are high. It’s been extraordinary to see the selflessness of scientists here to help in the bigger effort of getting medics back to the front line.

Interview by Noah Baker

This interview has been edited for length and clarity.