

How can TRUTHS help with peatland fire monitoring?

How remote sensing from satellites can help

Satellite images have been instrumental in monitoring fire activity over the globe since the 2000s. Due to their ability to monitor remote areas, they have been used to generate global burned area maps that account for the greenhouse gas (GHG) emission contribution from biomass burning. However, over peatlands there are limitations and challenges. Traditional satellite sensors require an intense and significant 'source signal', distinctive from its background, to detect and retrieve the rate of fuel consumption and gas emissions. Over peatlands, this 'source signal' can be very small and dim, requiring a highly accurate and consistent, low uncertainty sensor to be able to detect with confidence.

How TRUTHS will be able to help

TRUTHS, with its enhanced calibration capability, will provide hyperspectral measurements, that could enable the detection with confidence, of these low intensity fires by using specific wavelengths. It will also provide the reference calibration and/or validation to other satellites, thereby improving temporal coverage from harmonisation of different sensors and/or its own measurements to anchor.

What we are doing now

The National Physical Laboratory (NPL) has been conducting research on the detectability of fires over peatlands to understand the limitations and uncertainties of the current operational EO satellites, develop the fiducial reference concept for fire measurements and establish standards for the validation of satellite retrievals. This research will underpin the applicability of TRUTHS for fire research.

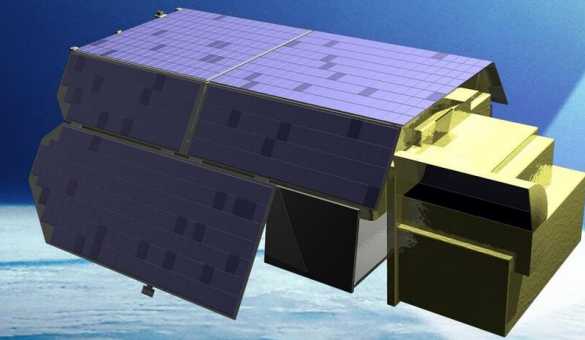


Image credit: Airbus space and Defence UK

The challenge

Peatlands are among the most carbon-rich ecosystems on Earth, they occupy 3% of the global land surface area. They are one of the natural based solutions for carbon sequestration, have a net cooling effect on climate, reduce flood risk and support a rich biodiversity. However, human activities including drainage, burn-management, livestock grazing and the cutting of peat for fuels leads to soil degradation and the release of its large carbon stocks, directly or indirectly, back to the atmosphere.

TRUTHS is a climate focused satellite mission, led by the UK Space Agency (UKSA) in partnership with several European states



Image credit:
<https://www.earth.com/news/restoration-of-peatlands-can-prevent-billions-in-wildfire-damage>

Globally, it is estimated that they emit around 1-2 billion tonnes of CO₂, which is around 2-4% of all human greenhouse gas (GHG) emissions, with a large proportion generated over tropical peatlands of Southeast Asia, where degradation is most acute. These additional emissions further contribute to global warming which indirectly promotes peatland degradation over higher latitudes.

Fire is often used as a tool to clear land for cultivation and is known to produce toxic smog events over Asia. Degraded peatlands are susceptible to burn deep into the soil, releasing more GHGs to the atmosphere, and reinforce climate change.