By applying our science and expertise, we help the aviation industry understand and reduce the impacts of weather.

Our specialist knowledge is critical to a range of aviation customers – from large international commercial airlines and air traffic control service providers, to offshore helicopters and private pilots.

We are one of only two World Area Forecast Centres (WAFC) providing high-level weather information for the entire globe. Our advice, research and guidance also support the Civil Aviation Authority (CAA) and National Air Traffic services (NATs).

Every day, all over the globe, millions of people trust us to keep air passengers safe.
Complex cocktail

The Eyjafjallajökull volcano in Iceland erupted explosively in 2010 emitting a complex cocktail of ash and gases into the atmosphere.

The resulting ash plume was blown into UK and European airspace causing disruption to aviation, leaving tens of thousands of passengers stranded and causing considerable costs to the airline industry and the global economy.

The Met Office London Volcanic Ash Advisory Centre (VAAC) is responsible for monitoring and forecasting the movement and dispersion of volcanic ash originating from volcanoes in the north-eastern Atlantic.

Volcanic eruptions are extremely complex to model and are influenced by many factors. Our experts use the Met Office’s Numerical Atmospheric-dispersion Modelling Environment (NAME) to model a range of atmospheric dispersion events, including volcanic eruptions.

Observations are vital to be able to validate and add value to the model forecasts. We make use of a variety of observation sources including laser cloud-based recorders, lidars, satellite imagery, balloon-borne ash sensing instruments, and aircraft instruments. The Met Office Civil Contingency Aircraft (MOCCA), which went into operational service early in 2012, provides a dedicated, fully instrumented airborne volcanic ash response capability.

We are working to improve our atmospheric dispersion forecasts and develop volcanic ash observing systems to enhance the detection of volcanic ash. Many of our activities are in collaboration with international organisations. These include the World Meteorological Organization, the International Union of Geodesy and Geophysics, the Volcanic Ash Scientific Advisory Group, the International Civil Aviation Organization and the International Airways Volcanic Watch Operations Group.

Space weather

Although the Sun is over 90 million miles away from Earth, life on this planet simply couldn’t exist without it. The Sun is in constant flux and the impact of solar activity is more apparent as people become more reliant on technology.

Solar flares, coronal mass ejections (CMEs) and the solar wind affect our technology and systems such as satellites, GPS, power grids and radio communications. Solar flares can cause high-frequency radio and GPS to perform erratically and extreme CMEs can put power grids at risk. Therefore, space weather forecasts are of crucial importance to the Armed Forces, electricity industry, satellite operators and the aviation industry.

We’re working to develop space weather capability and share valuable knowledge and expand the UK’s space weather forecasting capabilities with a range of partners in the US. We have a formal collaboration agreement with the National Oceanic and Atmospheric Administration (NOAA), and we are also working with the National Aeronautics and Space Administration (NASA) and the Air Force Weather Agency (AFWA).

In the UK, we’re working closely with the Science and Technology Facilities Council (STFC) and the British Geological Survey (BGS). As we develop an operational Space Weather Prediction Centre, we’re also working with different industry sectors to make them aware of their potential vulnerability to space weather. If they’re already aware of the potential dangers, we’re working together to help mitigate the risks.

As operational space weather prediction experts and as a partner of the International Space Innovation Centre (ISIC), we are able to understand the needs of industries that are affected by space weather. This enables us to tailor services to meet specific industry requirements and help ISIC support and facilitate innovation in the space sector.

Safety

Weather is one of the greatest hazards to aviation so we provide guidance to maintain safety across the entire aviation industry.

Internationally renowned for our meticulous standards of weather forecasts, data and research, our services are vital for safety-critical decision-making – both during planning and while in the air.

Efficiency

Our tailored weather solutions, designed for airlines, airports and air traffic control centres, lead to:

• savings in time and money;
• increased airfield capacity through better mitigation of weather effects;
• improved route planning;
• streamlined fuel costs;
• reduced delays;
• cost-effective and timely runway and taxi maintenance;
• better planning of staffing requirements;
• increased passenger satisfaction.