

## Environmental hazards

### NERC science saves lives and money

Environmental hazards such as extreme temperatures, floods and volcanic eruptions can threaten human life, infrastructure and wildlife. These events are unavoidable, but better scientific understanding can help minimise their harmful effects. NERC scientists provide information that lets government and business manage these risks more effectively. This has improved health outcomes and increased private-sector activity while reducing costs for the UK government, companies and individuals. That's the conclusion of a 2015 NERC-commissioned analysis by Deloitte.

#### Investment

Between 2007 and 2012, NERC investment in research on environmental hazards has averaged £12.8m per year.

#### Impact

Deloitte's analysis shows that NERC investment has produced enormous benefits. NERC research:

#### SEASONAL WEATHER EXTREMES

**NERC research improves forecasts, minimising deaths, economic disruption and public spending.**

NERC scientists developed high-speed wind forecasts that are more accurate and can predict further into the future. The Met Office included these warnings in the National Severe Weather Warning Service from 2011. It estimates these warnings **save 23 lives a year, valued at £41m**; reduce construction industry costs (£43m); provide efficiency savings to the emergency services (£51m); improve aircraft routing (£120m); reduce in-flight delays (£5m); and save 352,000 tonnes of CO<sub>2</sub> by cutting fuel use.

Enables weather warnings that save

**23** lives and **£260m** a year

Saved airlines up to **£290m** a day after Grimsvötn eruption

#### FLOODING

**NERC research enables earlier flood warnings and improves prediction, protecting lives and reducing flood damage by up to 10%, saving £76m+ pa.**

Early flood warnings increased from two to five days in advance due to a new model developed by NERC's Centre for Ecology & Hydrology (CEH) in combination with high-resolution weather forecasts. The Met Office estimates that such warnings can avoid 6-10% of flood damage. Based on Environment Agency flood damage estimates, this could cut annual costs by £76m-£127m.

#### VOLCANIC ERUPTIONS

**NERC science helped minimise disruption of aviation by volcanic ash during the 2010/11 Icelandic eruptions, saving airlines up to £290m a day and reducing passenger delays.**

NERC research was essential in the flexible staged lifting of the flight ban after the 2010 Eyjafjallajökull eruption, avoiding unnecessary disruption that was costing the global airline industry up to £300m a day in lost revenues. Improved risk assessment practices cut the number of flight cancellations after the 2011 Grimsvötn eruption by 98% - 900 disrupted flights around Grimsvötn versus 42,600 around Eyjafjallajökull. This saved the global airline industry up to **£290m a day**.

#### NATURAL RESOURCES

**NERC scientists help understand risks to animal populations and protect sensitive environments without inhibiting economic activity.**

Modelling cod populations in the North Sea showed that the 'closed area' policy the EU implemented in 2001 to slow their decline was ineffective. This led to a new recovery plan, which generated increased fishing quotas worth £8.6m pa to the UK.

Reduces flood damage by up to **10%** or **£127m** a year

