

Helping the insurance industry thrive, whatever the weather

NERC science enables the UK insurance sector to maintain its status as a global financial powerhouse, contributing significantly to the UK economy

Why it matters

Natural hazards cost thousands of lives and cause destruction and disruption across the globe. Contributing £40 billion and 300,000 jobs to the economy, the UK insurance industry (the biggest in Europe) shields clients at home and abroad from damaging financial and physical impacts. To do this effectively, stay competitive and reinforce their own resilience, insurance and reinsurance firms must secure the best possible understanding of the threats and risks such hazards pose. That means accessing and acting on the best, most up-to-date science – a need made all the more urgent by a changing climate.

What we did

NERC has delivered a wealth of cutting edge science that insurers harness to help them develop the right products and equip themselves to meet current and future challenges. Strong bonds with the industry play a key role in shaping the scope and direction of our work.

For example:

- **Storm clusters:** NERC-funded scientists pinpointed a link between the frequency and intensity of storms over Northern Europe, providing a platform for models that enable more accurate pricing of storm-related risks¹.
- **Tipping points:** NERC support has generated new ways of identifying approaching thresholds which, if exceeded, would lead to irreversible changes in the climate – information crucial to insurers’ ability to manage their risk portfolios effectively².

NERC science also plays a leading role in climate science internationally, benefiting the insurance sector indirectly by:

- Enabling more accurate weather forecasts, which allow insurance clients and society more widely to better prepare for hazards³; and
- Providing increasingly accurate climate projections to inform business decisions and development of the regulatory framework⁴.

Some premium numbers:

£2 billion

saved in insurance payouts by informing the closure of the Thames Barrier

£62–130 million

annual industry losses cut by improved climate models



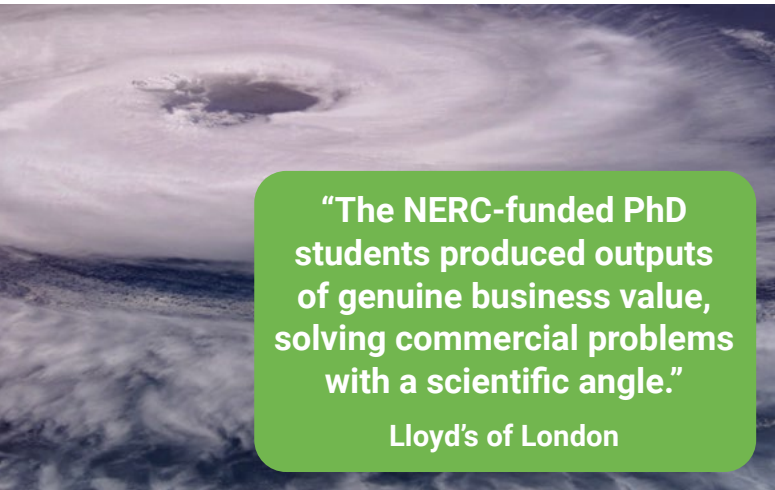
Contributing to the UN Sustainable Development Goals



“We have been working with NERC for decades. Their science allows us to respond more effectively to client needs from corporate to sovereign level.”
Willis Towers Watson

Impacts and benefits

- Win-win: industry-leading tools & models boost the sector's growth and protect communities
 - Delivering a step change in flood simulation, the LISFLOOD-FP computer model is serving as a blueprint for competitive pricing of flood reinsurance by improving the accuracy of prediction models⁵.
 - Over 1 million Zambian farmers have insured themselves against drought thanks to daily rainfall estimates provided by TAMSAT⁶, which has helped UK insurance firms expand into the African market and develop products tailored to its needs.
- Bridge-builders: partnerships & networks deliver access to world-class skills
 - A partnership involving NERC's National Centre for Atmospheric Science (NCAS) and the Willis Research Network⁷ played a key role in helping reinsurance brokers estimate potential losses, by developing a state-of-the-art tropical cyclone decision-making tool. It also encouraged Willis Re to translate research into insurance applications estimated to be worth £800,000/year⁸.
 - The NERC-funded PURE⁹ programme established new productive collaborations between scientists and industry practitioners to improve the handling of uncertainties related to natural hazards and wider risks.
- Forward thinking: advanced warnings enable better preparedness and avoids insured losses
 - Improved climate models that aid risk assessment have cut insured losses due to storm damage by £62-£130 million/year, while a new model, developed by the NERC-funded UK Centre for Ecology and Hydrology (CEH), that extends warnings of severe weather from 2 to 5 days ahead could cut the cost of flood damage by £76-£127 million/year¹⁰.
 - Our science protects homes by informing the closure of the Thames Barrier, safeguarding the London flood plain and protecting properties from flooding, saving £2 billion in insurance payouts¹¹.



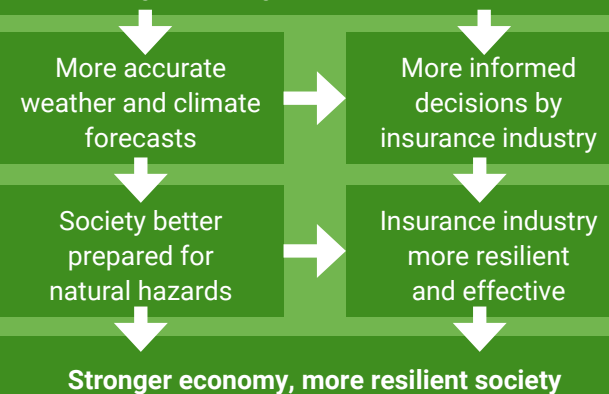
“The NERC-funded PhD students produced outputs of genuine business value, solving commercial problems with a scientific angle.”

Lloyd's of London

Overview of NERC's impact

NERC long-term investment in research, training, innovation and infrastructure delivers:

- New knowledge, models and software
- Trained scientists
- Knowledge exchange



Investing for the future

With a clear focus on tomorrow's as well as today's threats, NERC science strengthens links between environmental science and the insurance sector.

Current initiatives include:

- UK Climate Resilience: a £19 million collaboration led by NERC and the Met Office aiming to deliver interdisciplinary climate risk and adaptation solutions research, as part of the UKRI Strategic Priorities Fund¹²;
- Collaboration with Innovate UK to develop improved data and analytics on environmental change-related hazards, vulnerabilities and risks for the financial services sector; and
- Funding for PhD students and Knowledge Exchange Fellows working closely with the insurance sector¹³.

1. REF (2014). Improved Pricing of European Natural Catastrophe Insurance, <http://tiny.cc/brijfz>
2. REF (2014). Climate Tipping Points, <http://tiny.cc/unijfz>
3. See pages 10-13 of the NERC Impact Report 2017, <http://tiny.cc/3ziyfz>
4. PRA (2015). Impact of climate change on the UK, <http://tiny.cc/0024iz>, & PRA (2019). Enhancing banks and insurers approaches, <http://tiny.cc/1324iz>
5. REF (2014). Flood risk management is strengthened, <http://tiny.cc/2zyujz>
6. Tropical Applications of Meteorology Using Satellite Data and Ground-based Observations, www.tamsat.org.uk
7. Created by reinsurance specialists Willis Towers Watson.
8. Estimate from economic modelling commissioned by NERC, <http://bit.ly/2UMwXnB>
9. PURE (Probability, Uncertainty and Risk in the Environment), <http://tiny.cc/4klyfz>
10. Estimate from NERC Impact Report 2015, <http://tiny.cc/2424iz>
11. ABI (2014). News release, <http://tiny.cc/26yujz>
12. More information <http://tiny.cc/w624iz>
13. Including a partnership between the NERC-funded CENTA2 Doctoral Training Centre and Lloyd's of London