

## Horizon Scan 2019

1	Change in the Capacity of Antarctic Benthos to Store Carbon as Climate Changes
2	Extensive Release of Mercury by Thawing Permafrost
3	Ecological Effects of Options for Reducing Plastic Pollution
4	Effects of Shinorine Sunscreens on Corals and Other Marine Species
5	A New Irrigation Canal in Northwest China Supplied by Water from the Qinghai-Tibet Plateau
6	Modification of Weather in the Tibetan Plateau by Cloud Seeding
7	Salt-Tolerant Strains of Rice
8	US Government Decision not to Regulate Gene-Edited Plants
9	Effect on Insects of Transgenic Oilseed Crops that Produce Omega-3 Fatty Acids
10	Harnessing Plant Microbiomes for Agricultural Production and Ecosystem Restoration
11	Expansion of Plantations and Infrastructure into Indo-Malay Islands
12	Development of Fisheries in the Mesopelagic Zone
13	Industrial Microbial Feed Production
14	Innovative Insurance Products to Share Costs and Benefits of Protecting Natural Assets
15	Effects of Noncompliance with the Montreal Protocol on Global Environmental Governance

## Horizon Scan 2018

1	Thiamine Deficiency as a Possible Driver of Wildlife Population Declines
2	Geographic Expansion of Chronic Wasting Disease
3	Breaks in the Dormancy of Pathogenic Bacteria and Viruses in Thawing Permafrost
4	RNA-Based, Gene-Silencing Pesticides
5	Genetic Control of Mammal Populations
6	Use of Lasers in Commercial Deep Water Fishing
7	Use of Metal–Organic Frameworks (MOFs) for Harvesting Atmospheric Water
8	Aquaporins Engineered to Increase Plant Salt Tolerance
9	Effect of Culturomics on Conservation Science, Policy, and Action
10	Changes in the Global Iron Cycle
11	Underestimation of Soil Carbon Emissions
12	Rapid Climatic Changes on the Qinghai–Tibet Plateau
13	International Collaborations to Encourage Marine Protected Area Expansion in the High Seas
14	Belt and Road Initiative in China
15	Potential Effects on Wildlife of Increases in Electromagnetic Radiation

## Horizon Scan 2017

1	Manipulating coral symbionts to avoid mass coral bleaching
2	Robots to target invasive marine species
3	Electronic noses to combat illegal wildlife trade and improve biosecurity
4	Bumblebee invasions in new regions
5	Extensive use of bacteria and fungi to manage agricultural pests
6	Managed bees as vectors
7	Sand becomes a scarce resource
8	Effects of border fences on wild animals
9	Effects of changing waste management on animal movements and populations
10	Increasing wind speeds at the sea surface
11	Development of floating wind farms
12	Creating fuel from bionic leaves
13	Lithium-air batteries
14	Reverse photosynthesis for biofuel production
15	Mineralising anthropogenic carbon dioxide

## Horizon Scan 2016

1	Artificial superintelligence
2	Changing costs of energy storage and consumption models
3	Ecological civilization policies in China
4	Electric pulse trawling
5	Osmotic power
6	Managed bees as vectors
7	Unregulated fishing in the Central Arctic Ocean threaten expanding fish stocks
8	Increasing extent of construction of artificial oceanic islands
9	Increasing aquatic concentrations of testosterone
10	Effects of engineered nanoparticles on terrestrial ecosystems
11	Satellite access to shipborne automatic identification systems
12	Passive acoustic monitoring to prevent illegal activity
13	Synthetic body parts of endangered animals
14	Artificial glaciers to regulate irrigation
15	Invasive species as reservoirs of genetic diversity

## Horizon Scan 2015

1	Compounds that disrupt the capacity of insects to sense airborne compounds
2	Bioplastics from waste
3	Algae as a replacement for palm oil
4	Adoption of electric vehicles
5	Legalisation of recreational drugs
6	Underground gasification of coal
7	Pharmaceutical-induced loss of aquatic biofilm
8	Sustainable intensification of high-yielding agriculture
9	Increases in coral disease in the Indo-Pacific
10	Effects on krill of marked decline in Antarctic sea ice
11	Novel coastal ecosystems associated with ice retreat
12	Increasing the legal status of non-human species
13	Impact investing
14	Reproducibility in environmental science
15	Investor-state dispute settlements in free trade negotiations

## Horizon Scan 2014

1	Response of financial markets to unburnable Carbon
2	Extensive land loss in Southeast Asia from subsidence of peatlands
3	Carbon solar cells as an alternative source of renewable energy
4	Rapid geographic expansion of macro-algal cultivation for biofuels
5	Redistribution of global temperature increases among ecosystems
6	High-frequency monitoring of land-cover change
7	Reaccelerated loss of wild rhinoceroses and elephants
8	Increasing scale of eradications of non-native mammals on islands
9	Self-sustaining genetic systems for the control of non-native invasive species
10	Probiotic therapy for amphibians
11	Emerging snake fungal disease
12	Polyisobutylene as a marine hazard
13	Exploitation of Antarctica
14	Expansion of ecosystem red listing

15	Resurrection of extinct species
----	---------------------------------

## Horizon Scan 2013

1	Rapid growth of concentrated solar power
2	Widespread development of thorium-fuelled nuclear power
3	Seabed-located oil drilling and processing
4	Accelerating water cycle
5	Proliferation of hydropower in the Andean Amazon
6	Species loss as a driver of global environmental change
7	Vegetarian aquaculture feed
8	Rapid rise in global demand for coconut water
9	Detecting aquatic species with environmental DNA
10	Use of coral nurseries for reef restoration
11	Forest restoration by micro unmanned aerial vehicles (UAVs)
12	The 3D printing revolution
13	A link between biodiversity, allergy and autoimmune disease
14	The commercial use of antimicrobial peptides
15	Synthetic genetics

## Horizon Scan 2012

1	Warming of the deep sea
2	Mining in the deep ocean
3	Methane venting from beneath the ocean floor
4	Climate-driven colonisations in Antarctic waters
5	Increases in pharmaceutical discharges as human populations age
6	Sterile farming to increase food safety
7	Transferring nitrogen-fixing ability to cereals
8	Increased cultivation of perennial cereals
9	Rapid and low-cost genomic sequencing
10	Electrochemical sea water desalination
11	Rapid development and extensive application of graphene
12	Nuclear batteries
13	Effect of increased cement demand on karst forest and cave ecosystems
14	In-stream hydrokinetic turbines
15	Burning of Arctic tundra

## Horizon Scan 2011

1	Environmental consequences of increasing milk consumption in Asia
2	New greenhouse gases
3	Increases in productivity of polar oceans driven by loss of sea ice
4	Biological impacts of perfluorinated compounds
5	Expansion in mining for lithium used in rechargeable batteries
6	Genetic techniques to eradicate mosquitoes
7	Nitric acid rain
8	Substantial changes in soil ecology
9	Denial of biodiversity loss
10	Protected area failure
11	Re-emergence of rinderpest
12	Climate governance
13	Transformation of oceans and domestication of marine species

14	Vegetation change facilitated by earthworms in North America
15	Hydraulic fracturing

## Horizon Scan 2010

1	Microplastic pollution
2	Nanosilver in wastewater
3	Synthetic meat
4	Artificial life
5	Stratospheric aerosols
6	Promotion of biochar
7	Mobile-sensing technology
8	Deoxygenation of the oceans
9	Changes in denitrifying bacteria
10	High-latitude volcanism
11	Invasive Indo-Pacific lionfish
12	Trans-Arctic dispersal and colonisation
13	Assisted colonisation
14	Possible impact of REDD on non-forested ecosystems
15	Large-scale international land acquisitions

## Future novel threats and opportunities facing UK

1	Nanotechnologies
2	Invasive potential and possible ecosystem impacts of artificial life and biomimetic robots
3	Unintended consequences of pathogens developed by modern biotechnology methods
4	Direct impact of novel pathogens
5	Impacts of control efforts for novel pathogens
6	Facilitation of non-native invasive species through climate change and 'invasional meltdown'
7	Large-scale restoration for iconic wildlife and habitats
8	Action to facilitate species range change in the face of climate change
9	Frequency of extreme weather events
10	Geo-engineering the planet to mitigate the effects of climate change
11	Implications for biodiversity of the adoption of an ecosystem approach
12	Increased fire risk
13	Increasing demand for biofuel and biomass
14	Step change in demand for food and hence pressure on land for agriculture
15	Ocean acidification
16	Reduction of coldwater continental shelf marine habitats