The Autonomous Systems University Strategic research Group (USRG) at the University of Southampton pulls together a wide range of research via an interdisciplinary network which includes students as well as researchers and also embraces external members from other organisations. The membership of the group reflects not just our expertise in sensors and platforms technology and applications but also aspects of Autonomous Systems research that fall within the realm of behaviour, policy, economics, ethics and the law.

Aims

The Autonomous Systems USRG offers innovative research which responds to global challenges to develop solutions for, or understanding of, issues in different sectors such as energy and climate change. Most of our projects have industrial beneficiaries and our researchers and students focus on real world problems.

We train the scientists and technological experts who will inherit the global challenges we face and we keep the notion of 'future leaders' in mind so that we can offer students the kind of experience, via interdisciplinary projects and industry competitions, that will equip them for these roles whether they go on to become researchers or join industry.

Benefits

– Through engaging with us, whether you are a funding agency, a business or an NGO, you get the benefit of our world leading multidisciplinary academic expertise and our combined knowledge base.

– We have state of the art facilities which are available for hire, including our state-of-the-art mobile command, control and communications vehicles equipped to support unmanned systems field operations, *Osprey* and *Gannet*, our wind tunnels, a 138m towing tank for maritime and water borne applications and the equipment and expertise of our colleagues at NOC.

Outcomes

– Commitment to delivering a multidisciplinary approach to respond to the needs of industry.

– Innovative research with obvious relevance to industrial requirements.

– The flexibility to deliver teams of experts and deploy them in the field to test requirements for industry.

Contact

The Autonomous Systems group invites industry collaborators to engage with us.

www.southampton.ac.uk/autonomous-systems
Twitter @AutonomousSyst2 | Email as-usrg@southampton.ac.uk

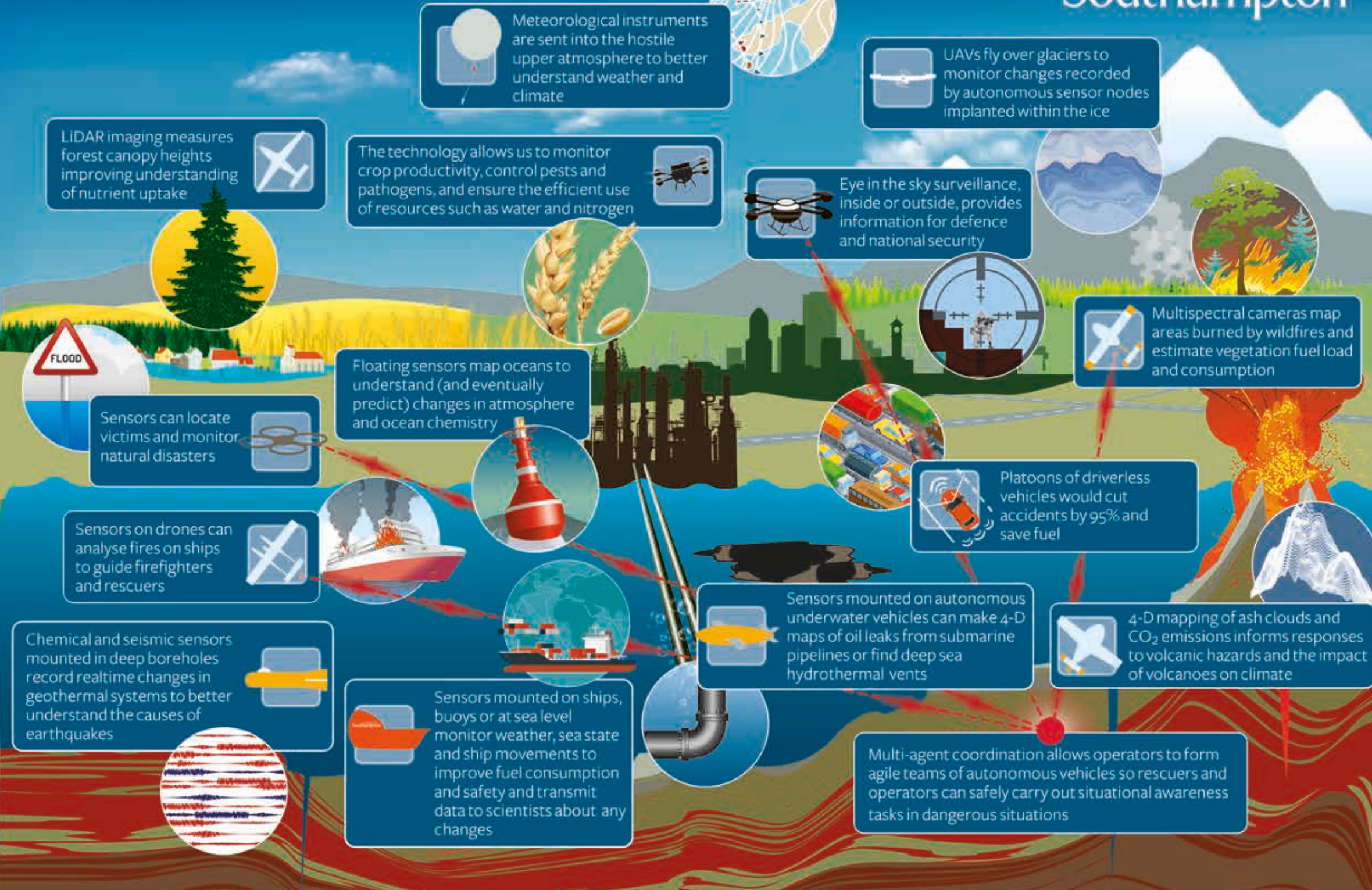Autonomous Systems

UNIVERSITY OF
Southampton

Responding to
global challenges.
Autonomous Systems

Autonomous Systems

Meteorological instruments are sent into the hostile upper atmosphere to better understand weather and climate

UAVs fly over glaciers to monitor changes recorded by autonomous sensor nodes implanted within the ice

LiDAR imaging measures forest canopy heights improving understanding of nutrient uptake

The technology allows us to monitor crop productivity, control pests and pathogens, and ensure the efficient use of resources such as water and nitrogen

Eye in the sky surveillance, inside or outside, provides information for defence and national security

Multispectral cameras map areas burned by wildfires and estimate vegetation fuel load and consumption

Floating sensors map oceans to understand (and eventually predict) changes in atmosphere and ocean chemistry

Sensors can locate victims and monitor natural disasters

Platoons of driverless vehicles would cut accidents by 95% and save fuel

Sensors on drones can analyse fires on ships to guide firefighters and rescuers

Sensors mounted on autonomous underwater vehicles can make 4-D maps of oil leaks from submarine pipelines or find deep sea hydrothermal vents

4-D mapping of ash clouds and CO_2 emissions informs responses to volcanic hazards and the impact of volcanoes on climate

Chemical and seismic sensors mounted in deep boreholes record realtime changes in geothermal systems to better understand the causes of earthquakes

Sensors mounted on ships, buoys or at sea level monitor weather, sea state and ship movements to improve fuel consumption and safety and transmit data to scientists about any changes

Multi-agent coordination allows operators to form agile teams of autonomous vehicles so rescuers and operators can safely carry out situational awareness tasks in dangerous situations

FLOOD

The unique scope of Autonomous Systems research at the University of Southampton

"The NEXUSS Centre for Doctoral Training is an outstanding opportunity to develop a new generation of environmental scientists that is more aware of the vast possibilities that Smart and Autonomous Observation Systems approaches offer, and that can take forward the environmental application of these technologies in decades to come. We are particularly excited by our strong partnerships with industry, government and other SAOS stakeholders, which will allow us to better understand how NEXUSS may develop the highly employable leaders that the UK needs if it is to rise to future environmental challenges"

Professor Alberto Naveira-Garabato
Director of the University of Southampton's NERC and EPSRC funded NEXUSS Centre for Doctoral Training (CDT) in the use of smart and autonomous observation for the environmental sciences