

Research and analysis: Optimising the accuracy of radar products with dual polarisation

Rainfall forecast data generated at the Met Office is vital for providing weather and flood warnings, and this project has looked at ways of improving the accuracy and reliability of the radar network as well as fully exploiting and bringing into operation the latest technology.

Radar is particularly important in detecting localised rainfall (often not detected or under-sampled by rain gauge networks), especially where it falls on catchments prone to flash flooding. The upgrade to the UKs dual polarisation radar network in 2016 and the updated data analysis methods from this study means that we can make a step change in the accuracy of rainfall estimates, in particular in very intense precipitation, where radar estimates are most valuable.

Research and analysis: Trialling a new approach to beach replenishment in Poole Bay

The trial tested a new approach to beach replenishment in Poole Bay. The concept was to make use of locally dredged sediment and place it near the shore, allowing the prevailing waves and tidal currents to move material toward and along the beach. A similar approach has been used widely in the Netherlands and more recently in Denmark. The trial was the first of its kind in the UK.

Research and analysis: Understanding the performance of flood forecasting models

Understanding the performance of the flood forecasting models operated in

real-time by the Environment Agency, Natural Resources Wales and the national Flood Forecasting Centre is crucial to the informed use of model outputs for flood guidance across England and Wales. It is also essential to guide future strategic investment in flood incident management.

This report presents the results of the first nationwide analysis of the performance of the various flood forecasting models operated by local centres on the National Flood Forecasting System. The analysis is based on Wales and the English geographical regions that align to the old Environment Agency region names.

Research and analysis: Sediment budget analysis: practitioner guide

The Environment Agency has developed a practitioner's guide on sediment budgets. The guide's main aim is to support flood and coastal erosion risk management practitioners by explaining the need for sediment budget analysis and developing best practice in its application. Use of the guide will provide consistency in the execution and interpretation of sediment budget analysis. It will also help to improve the transparency of decision-making, as the consistent approach will mean stakeholders have greater understanding in the supporting evidence used to calculate a sediment budget.

A sediment budget summarises the balance of inputs and outputs for a defined system (such as an estuary) and time period. This helps determine if a system has an overall surplus (accretion) or deficit (erosion) of material. If the accretion and erosion figures are equal, then the system is considered to be in balance.

SEPA hoping to inspire young people into STEM careers during British Science Week

 16 March 2018

Inspiring young people to follow a career in science, technology, engineering and maths (STEM) is vital to Scotland's environmental regulator.

- Scotland needs young people trained in STEM subjects to tackle

the environmental challenges facing humanity now and in the future.

- SEPA highlights science staff during British Science Week.
- A world-class environment protection agency needs skilled staff inspired and trained in these disciplines.

As British Science Week reaches its end on Sunday (18 March) the Scottish Environment Protection Agency (SEPA) is stressing the importance of STEM skills to ensure that Scotland is prepared to tackle the scale of environmental challenges facing humanity now and in the future.

SEPA is creating a world-class environment protection agency fit for the challenges of tomorrow, and as an organisation dependent on these skill sets, ensuring the future workforce is inspired and trained in these disciplines is essential.

Keen to make sure the wide-range of roles is understood, SEPA has been using social media to highlight just some of the over 400 scientists who work in different areas of the organisation. The intention is to help young people understand what options are open to them.

Recognising that we are over-using our planet's resources – SEPA is acutely aware that the only businesses, societies and nations which will thrive in the 21st Century are those which have developed ways to prosper within our environmental capacity. As environmental issues become more central to health, well-being and sustainable economic growth, environmental information will be more needed to make decisions that achieve all three objectives.

Each year, SEPA specialist teams take tens of thousands of samples from land, water and air and analyse these in the field and in our laboratories to help assess the quality of our environment and levels of compliance by licence holders.

SEPA's sampling figures for 2017 include:

- 27,475 samples collected by our National Monitoring Team, of which specialist sampling may involve mussel collection and identification of non-native species
- Field Chemistry collected 525 samples including particulate monitoring around industrial sites.
- Marine Chemistry & Ecology collected 940 samples which could incorporate boat work and shore surveys of plants found at the coast
- Ecology collected 1650 samples, most of which will involve sampling of the river bed and identification of the animals from it

David Pirie, SEPA Executive Director – Evidence and Flooding, said:

It's an exciting time to be working in a scientific field, with huge global challenges that we need talented people to tackle. We need people who can help to build understanding of the world around us, and to seek out innovative solutions to move Scotland forward.

“Engaging young people helps them see the relevance of science and wider STEM subjects in their lives. Whether that’s the day-to-day impacts or their future study and career opportunities. We’re fortunate in SEPA to have a number of staff who are STEM Ambassadors through the STEMNET programme, giving young people the opportunity to meet people working in these key areas. It also lets our staff showcase the tangible links that STEM disciplines have to almost everything around us. Being able to see the relevance of STEM appears to be a key factor in young people’s enjoyment of science lessons, particularly at secondary level, and it’s certainly something we want to encourage.

“STEMNET is a great initiative and I am delighted to see so many SEPA staff members take up the role of ambassadors. We will continue to support this very important project and build on our capacity to deliver valuable scientific knowledge and expertise well into the future.

“Scientific evidence is essential to SEPA’s work, and we need to ensure we have staff with the right skills. We have scientific staff working in a range of areas, including chemistry, ecology, flood risk, and hydrology. In addition there are staff with STEM backgrounds working across the organisation from data analysis, and policy to communications and senior management”.

Ivvet Modinou, Head of Engagement, British Science Association, said:

Everyone can get involved in science, and British Science Week is the perfect chance for people of all backgrounds, ages and interests to take part in ways that matter to them. Thousands of events happen across the country, but you can also participate from the comfort of your own home, with our fun-filled activity packs and initiatives such as The Plastic Tide – this year’s citizen science partnership. We wish everyone a great Week and we hope it inspires a fascination and engagement with science for years to come”.

Ends