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To tackle wildfires, researchers in Europe team up with frontline forces

The EU is seeking to limit growing threats from blazes through the use of satellites, artificial intelligence and unmanned aerial vehicles.

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Picture the following scene on the French island of Corsica: a local fire service uses a special surveillance camera to detect smoke in the area, quickly declare the outbreak of a blaze and mobilise a targeted response.

No, the action in the Biguglia municipality on Corsica's northeastern coast wasn't one of the many wildfire emergencies in Europe in 2023. Rather, it was a demonstration in October 2022 under an EU-funded research project to help regions in Europe counter threats from wildfires.

Teaming up

The Biguglia exercise used a smoke bomb to simulate the start of a fire and an extensive data network to trigger the rapid-reaction steps. It involved a service that has 1 300 firefighters who protect a population in this part of Corsica – the Mediterranean's fourth-biggest island – that grows to around 400 000 in summer.

'This first demonstration on Corsica was very positive,' said Michael Pelissier, a firefighter who participated in the test.

As part of the EU project, called SAFERS, a similar firefighting exercise took place in the Piedmont region of Italy in February 2023 and two more trials are planned in Greece and Spain toward the end of this year.

'After the next two demonstrations, we would like to push the management system forward in Europe and also beyond,' said Claudio Rossi, who coordinates the project and is a senior researcher at an Italian research and innovation centre called the Links Foundation in the city of Turin.

With the help of EU funding, Europe's research community is joining forces with firefighters to prevent fires from spreading or from happening at all. SAFERS is one of several EU projects to combine resources and know-how for tackling wildfires on the continent.

Satellite support

The focus of SAFERS is primarily on the use of satellites and artificial intelligence, or AI, to provide information that could help save lives and contain environmental damage.

'The orchestrated utilisation of AI-powered solutions can increase resilience to forest fires,' Rossi said.

Running for three and a half years through March 2024, the project features weather and hazard maps, fire-detection techniques, input from the general public and other tools to help local authorities prepare for any wildfire emergencies.

The ultimate goal is to build on the demonstrations in France, Greece, Italy and Spain and develop a comprehensive wildfire-control system for use around Europe.

By combining satellite images and other data, the system is intended to give first responders, decision-makers and ordinary people a clearer view of what's happening and to facilitate the best responses.

Earth-observation data from the EU's Copernicus programme is the primary source of information. This would be combined with data collected from smoke detectors, mobile applications, social media and forecast models.

Present threat

A stark reminder that wildfires pose a growing threat in Europe came from news images in July 2023 of tourists fleeing flames on the Greek island of Rhodes and blazes spreading near the Sicilian city of Palermo.

A month later, attention turned to Spain and Portugal where blazes destroyed more than 16 300 hectares of land and forced the evacuation of villages and tourist accommodations.

The Biguglia municipality on Corsica was chosen as a SAFERS demonstration site in part because of a major fire there in 2017.

'These last years we have noticed that, notably because of global warming, the summer season has a tendency to expand,' said Pelissier, the firefighter. 'So we are increasingly threatened by forest fires.'

The EU, which recently doubled its firefighting fleet of aircraft, has deployed more than 10 planes, 500 firefighters and 100 vehicles to help control and quell wildfires in Greece alone during the summer of 2023.

Over the past two months, the EU has also mobilised such support for Cyprus and – outside Europe – Tunisia. The moves were closely coordinated with national authorities.

Hotspot training

Another EU-funded project – TREEADS – plans to feature drones, high-altitude balloons and satellites in a Europe-wide protection system.

‘We can’t only invest in fire trucks, helicopters or planes – we need to train our communities before the fires happen,’ said Kemal Sarp Arsava, who coordinates the project.

Arsava is a senior research scientist at Norway-based RISE Fire Research, which specialises in fire safety.

TREEADS aims to establish a comprehensive fire-management platform covering all three stages of wildfires – before, during and after a blaze breaks out.

Arsava is a native of Turkey who has also worked and studied in the US.

While in the US in late 2019, he was reminded of the international dimension of the wildfires threat by noticing the effect of Australia’s major outbreak of bushfires at the time.

Based then in the state of New Hampshire, Arsava said the blazes caused a slight haze in North America while primarily hurting air quality in South America.

‘The smoke from all of the wildfires in Australia basically crossed the Pacific Ocean and even changed the colour of the sky in America,’ he said.

Drones and balloons

TREEADS began in December 2021 and is due to run until end-May 2025.

The initiative brings together research institutes and companies from 14 European countries and Taiwan.

Besides Norway and Taiwan, the participants are from Austria, Belgium, Bulgaria, Cyprus, Denmark, France, Germany, Greece, Italy, Lithuania, Romania, Spain and Sweden.

The team of researchers is developing new technologies that’ll be tested in eight countries represented in the project.

One plan is to use drones and high-altitude balloons to detect blazes early, collect data for fire crews and even aid their actions by dropping fire-suppressant materials.

A four-layer approach is foreseen: low-altitude drones to locate fire hotspots; mid-altitude drones to drop fire suppressants; high-altitude balloons to provide a broader view; and satellites for the whole picture.

The trials are due to start early next year.

The project is also testing a virtual-reality headset to train firefighters who aren’t typically assigned to dealing with wildfires. That means teaching city firefighters to deal with blazes in different terrains should the need arise.

In total, more than 26 technologies including for fire protection and suppression will be enhanced, developed and verified in TREEADS.

‘These new technologies will make it easier to fight wildfires in the future,’ said Arsava.

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More info

- TREEADS
- SAFERS
- EU-funded forest fire research and innovation