# Using the eBee drone for a rapid forest fire damage assessment

Learn how Lithuanian GIS company Hnit-Baltic used an eBee drone to map fire damage on Lithuania's protected Curonian Spit

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Neringa municipality in westernmost Lithuania sits on the Curonian Spit, a uniquely beautiful UNESCO-recognised landscape that is a popular destination for local and foreign tourists.

On April 26th, 2014 a fire decimated a 118 hectare (219 acre) area of the site, comprised mainly of Pinus mugo (mountain pine) forest.
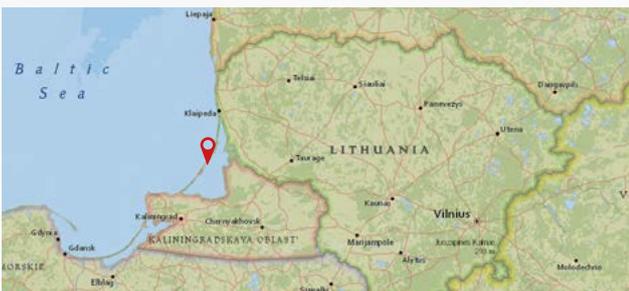
Rapid response

When Simonas Guogis of Hnit-Baltic heard about the fire, he immediately contacted the Neringa National Park Directorate, an existing GIS client, to find out how his company might help.

The Directorate's response? "They needed post-fire data collecting as quickly as possible," says Guogis. "We proposed flying an eBee drone over the site as we knew we could optimise its flight time to cover the area in a single flight. As soon as the Directorate's team heard how quickly they could expect the data, the project was approved."

Hnit-Baltic was contracted to supply an accurate orthomosaic of the site, which the Directorate's team would use to calculate the exact area affected and the total vegetation loss. This map also needed to be hosted online so that GIS professionals inside various agencies could access this data for their work.

"Our job was to provide accurate maps, in other words actionable data, to the different government and environmental organisations involved; not just Neringa's National Park team but also the State Forestry Agency, The Environmental Protection Agency and the Fire Rescue Department," says Guogis.

The project confirmed, Guogis packed his drone and laptop - for flight planning and image processing - and set off from the Lithuanian capital of Vilnius, arriving on-site on April 27th, the day after the flames had been extinguished.

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Dual sensor approach

In addition to his eBee drone, Guogis carried with him two camera payloads capable of collecting different spectral data: one RGB camera and a near infra-red version.

The RGB images would be used to determine the area affected and for loss calculation. The NIR would provide another level of detail, helping Hnit-Baltic's clients to better differentiate between living and burnt trees, and helping them identify the trees at the edges of the site where the species are more mixed.

When planning the eBee's flights in eMotion, Guogis specified a desired ground sampling distance of 20 cm (7.9 in) per pixel. "This resolution provided the accuracy needed, while keeping the drone's flight time down so that we could map the whole area with just one flight," he explains. The total area mapped was just over 200 hectares (494 acres), since this was before the exact scope of the damage – an area of 118 hectares (219 acres) – was known.

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Guogis then flew two flights of 22 minutes each to collect the required RGB and NIR images, before using Postflight Terra 3D software to process the 132 images acquired. He then generated the RGB and NIR orthomosaics immediately on-site. From flight planning to maps took three hours in total.

That same day, Guogis had an on-site meeting with the agencies involved to explain the project and preview the data, using Postflight Terra to perform a quick calculation of the area affected. He also uploaded the orthomosaics onto ArcGIS.com so that these could be shared within and across agency teams, and with the wider public. **(View these maps.)**

"Using drones for this kind of post-event mapping is becoming more and more popular," Guogis says. "Although the goal of this project was to provide the orthomosaics, it also ended up being about showing these agencies what kind of accuracy and speed they could achieve with a drone. The eBee is such a simple system to use, any agency or organisation could easily use it to collect this kind of data themselves."

Putting the data to work

With the full data set to hand, the agencies used these orthomosaics to identify which exact parcels of forest had been damaged, with their staff comparing Hnit-Baltic's maps to their existing GIS vegetation databases.

The agencies then began a host of individual projects, including for example the generation of a full fire report and fire protection schemes by the Fire Rescue Department, and reconstruction and replanting modeling projects by the State Forestry Agency.

The RGB orthomosaic generated from images acquired during one eBee flight.
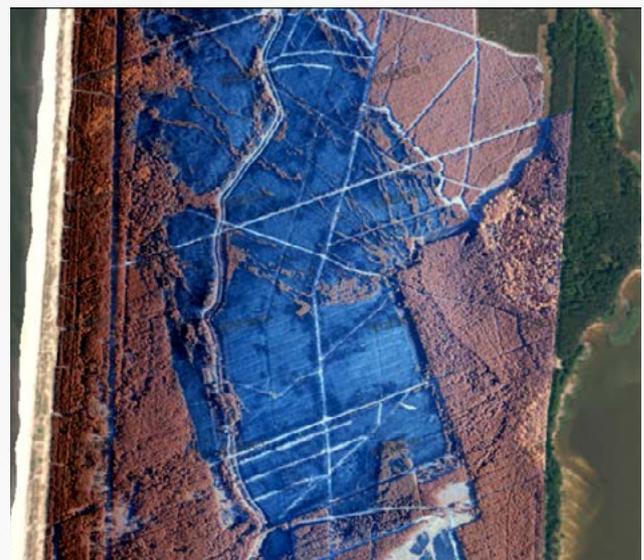
The NIR version of the orthomosaic; red represents live vegetation, blue represents dead.

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About Hnit-Baltic

Founded in 1993, Hnit-Baltic (**www.hnit-baltic.lt/en**) is a leader in GIS software development and implementation in Lithuania and beyond. The company also supplies GIS/GPS technologies such as senseFly drones and spatially enabled IT solutions to public and private clients.

"We use solutions like the eBee and ArcGIS to help clients with a wide range of projects," says Guogis, "from territory and infrastructure planning, homeland security and defence, through to cartography, land management, telecommunications, and transport and utilities planning."

Discover eBee:
Learn more at www.sensefly.com/drones/ebee.html

Get the newsletter:
Register for our regular email update at www.sensefly.com

2 flights
(1 RBG, 1 NIR)

22 min
per flight

650 m
flight altitude
(as per take-off point)

Wind speed:
8-10 m/s

Linear landing

66
images per flight

75/75
image overlap (%)

20 cm/pixel
GSD

3 h
data delivery

2
orthomosaics

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