

## The wildfire of 17 July 2015, at the Faraklo village, Lakonia, Greece and its suppression

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The fire season of 2015 in Greece was a relatively easy one, with a late start. Until the middle of July no large fires had occurred in the country. However, Friday, July 17, was to be a really exceptional day. The fire danger prediction map issued by the General Secretariat for Civil Protection for that day indicated “high” fire danger for almost all of southern Greece. The rating was mostly due to the meteorological forecast for very strong to extreme north winds.

In the early hours of July 17th, between 3:30 and 3:50 a.m., a wildfire erupted near the village Faraklo in the south-eastern peninsula of Peloponnese, roughly 2.5 km NE of the town of Neapoli. The fire spread through a rough landscape with steep, mostly leeward slopes, ravines and gorges, burning a typical Mediterranean vegetation mosaic of shrubs, clubs of Aleppo pine (*Pinus halepensis*) trees and mainly olive groves. After the head of the fire reached the sea the fire started flanking northwards towards Neapoli, where it claimed the life of a 58 years old Greek-Swiss man who died of a heart attack, and southwards towards the village of Agios Nikolaos.

What made this fire remarkable and worth studying is the unusually erratic, for a wind-driven fire, behaviour which made firefighting very difficult and dangerous. According to “in situ” observations, the direction of the general wind was northeast. During the day, the temperature reached 32°C. The relative humidity was around 30% but dropped below 25% during the crucial noon and afternoon hours, leading to profuse spotting. The local wind field at the fire area reflected the interaction between the topography and the general wind: short periods of strong wind (65 km/h) were followed by sudden extremely strong gusts up to 111 km/h, wind shear, horizontal vortices on the lee side and strong downdrafts at the ridge, close to the heel of the fire. The local wind direction varied between northeast and northwest.

Because of the high windspeed and the leeward slope steepness, episodic (temporary) wind flow separation occurred, ultimately contributing to the occurrence of the Vorticity-driven Lateral Spread (VLS) phenomenon, for some periods of time. In other words, the flanking fire behaviour was affected by the wind vortices and the flanking spread was temporarily driven by them. The propagation of the fire fingers and the flanking fire that were burning on a lee-facing slope, were affected by the interaction between the wind, the terrain and the energy that was released by the fire. It seemed that “there was a continuous competition between the power of the wind and the power of the fire”.

Given the adverse conditions, the ground firefighting forces concentrated on protecting structures with only limited suppression efforts on the fire perimeter as they could not get effective support from the air. The extreme variability of the wind field with wind shears and sudden downdrafts made it very hard for the aerial resources to make effective drops. Most important the conditions caused two documented aerial firefighting incidents (near miss). At 13:05 one Canadair CL-215 was hit by a strong downdraft and the two pilots had to implement a forced landing on shrub vegetation near a cliff. The pilots were not injured but the plane was later burned by the fire. Late in the afternoon, at 18:15, an Erickson S-64 firefighting helicopter, was hit by a sudden and very strong gust and caught in a wind shear, and only avoided a crash due to the successful response of the pilot. The incident was captured on tape and shown in near real time on TV, documenting the extreme difficulty of fighting that fire. The fire finally burned approximately 5,266 hectares of agro-forestry vegetation and several houses.

