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# FIRE-RS SYSTEM - INTEGRATING LAND SENSORS, CUBESAT COMMUNICATIONS, UNMANNED AERIAL VEHICLES AND A SITUATION ASSESSMENT SOFTWARE FOR WILDLAND FIRE CHARACTERIZATION AND MAPPING.

**Abstract**

The Wildland Fire Remote Sensing (FIRE-RS) project, developed within the European Interreg Sudoe Programme, implements an innovative system for prevention, detection and mapping of natural disasters, centred on wildland fires. This objective is achieved through the synergy of four technologies: forest based infrared land sensors for fire in-situ detection, CubeSat spacecraft for early warnings and communications coverage, UAVs for high-accuracy fire mapping and real time data acquisition, and a situation assessment tool for performing efficient risk assessments and coordination strategies, both during and after the wildland fire emergency.

The infrared land sensors are responsible for the early detection and initial analysis of the extension and location of the fire spots. These devices will generate alert messages to be broadcasted to the microsatellite and to the UAVs. The spacecraft (LUME-1) will receive the alert message, and will relay it to the ground facilities, using the on-board SDR communications payload. The Payload Operations Centre is in charge of the live distribution of the alert messages to the Data Distribution and Control Centre, whose main goal is to implement actuation protocols based on the alert messages received from the satellite. It will forward the specific actuation guidelines to the UAVs Control Centres located within the specific emergency zone, where the alert message was originated.

The UAVs will fly over the emergency area to perform a more detailed mapping and characterization of the zone. They will use on-board optic payloads, wind sensors and a SDR communication system to gather detailed data. The data will be integrated within a Situation Assessment software suite, providing centralized access to relevant information for the emergency departments to apply decision-making protocols.