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Training course material: Application & UAV operation

Work package 2 – WP2

Piloting tools for wildfire prevention and mitigation

Activity 2.1 – A2.1

Pilot activity setup and training

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Training course material: Application & UAV operation

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List of abbreviations and terms

Abbreviation	Definition
API	Application Programming Interface
CSV	Comma-separated values (text file format)
FDI	Fire Danger Index
FWI	Fire Weather Index
GEE	Google Earth Engine
GFS	Global Forecast System
GeoJSON	Format for encoding geographical data structures using JavaScript Object Notation (JSON)
ICT	Information and Communications Technology
NetCDF	NETwork Common Data Form
NBR	Normalised Burn Ratio
SITAC	Standardization of Firefighting Tactical Situation Management
SMTP	Simple Mail Transfer Protocol (Internet standard communication protocol)
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle
URL	Uniform Resource Locator (i.e. web address)
WMS	Web Map Service
WFRPM	WildFire Risk Prevention and Mitigation
API	Application Programming Interface
CSV	Comma-separated values (text file format)

Executive Summary

This document provides comprehensive training materials developed to support end users in effectively using the FRED Application and operating an UAS, as well as using both together for the purposes of fire prevention and mitigation. It aims to facilitate smooth adoption of the system, enhance user competence and ensure consistent understanding of its key functionalities.

The training package includes user guides, step-by-step tutorials that cover all major application modules — from login and navigation to advanced feature use.

Upon completion of the training, users will be able to efficiently navigate and operate the FRED platform, their UAS and connect the UAS with the platform in order to provide for a live stream for a wider audience, leading to improved productivity, reduced support queries and smoother daily operations in prevention, mitigation and firefighting tactical situation management.

1. Introduction

The use of Unmanned Aircraft Systems (UAS) has become a critical asset in environmental monitoring, emergency response, and natural hazard mitigation. Within the FRED project framework, UAS technology plays an essential role in supporting early detection, situational awareness, and strategic planning for wildfire prevention and resilience. To enable effective implementation of pilot activities and operational deployment of the FRED wildfire mitigation platform, a specialized UAS training course has been designed. The training targets representatives of pilot project partners who will be actively involved in testing, evaluating, and applying UAS technology in real-world scenarios defined under project task *D.1.1.2. Pilot case Implementation methodology paper*.

2. Scope of Training

The FRED application training is focused around demonstrating the future users of the application on how to utilize the tool for different purposes related to firefighting. The training provides an overview of the FRED Solution supporting the following functionalities:

- PREVENTION (early warning, hotspot detection, Fire danger index,);
- MITIGATION (UAV supported fire operations, line of fire, search and rescue, post-fire surveillance, SITAC);
- PREDICTION (fire spread models);
- COMMUNICATION;
- SCIENTIFIC (history data collection).

This training material, that was provided to the participants, follows the same structure that was applied at the course: tackling individual functionalities of the application one by one, in a structured and step-by-step manner. The guiding premise was to have the application user-friendly and highly "visual" in quality. All data representation is generally based on the map. Likewise, the training materials are step-by-step instructions on how to use the application, all supported by visuals from the application and related graphic and textual instructions.

The UAS course is structured to build upon this foundational knowledge, aiming to enhance operational and technical capacity in the context of wildfire surveillance and UAS mission execution. It supports capacity building across project partners by fostering shared understanding, compliance readiness, and practical competencies required for safe and effective UAV operations.

Topics Covered by both the application and UAS training are as follows:

Topic 01: General knowledge and introduction to UAS, including flight performance

Topic 02: Refreshment on regulations (EU Regulations 2019/947 & 2019/945)

Topic 03: Operational procedures and limitations (including privacy, data protection, and insurance policies)

Topic 04: "WhatsUP" – UAS market state of the art

Topic 05: General knowledge of LiDAR sensors, mission planning, and results interpretation

Topic 06: General knowledge of thermal imaging sensors and results overview

Topic 07: Login

Topic 08: User management

Topic 09: Map Management

Topic 10: Alerts

Topic 11: Weather data

Topic 12: UAS utilization

Topic 13: Export report

Topic 14: SITAC symbol management

Topic 15: Farsite simulation

Topic 16: FlamMap Simulation

Topic 17: Training mode

Topic 18: History mode.

By equipping participants with advanced insights and practical tools, the course contributes to the broader project objectives of capacity building, operational preparedness, and cross-border coordination in wildfire risk mitigation.

3. Conclusion

Training for the users of the FRED application was held in period 4 of project implementation. The FRED application training was used to introduce the pilot partners with the different segments of the application functionalities, from account management to the utilization of different fire behaviour simulation tools available in the platform. It was well received by the participants, who were also supported by the document *Training course material – FRED application user manual*, as an initial point of user support, before contacting the developer for additional support. The attached *Appendix 1: Training course material – FRED application user manual* is an integral part of this document.

The UAS training delivered as part of the FRED 3rd Consortium Meeting successfully met its objectives of enhancing participants' theoretical understanding and practical competencies in the use of Unmanned Aircraft Systems. The combination of structured content, hands-on demonstrations, and a focus on operational readiness resulted in a measurable increase in perceived knowledge across all key training topics. The training course material, attached *Appendix 2: Training course material – UAS operation* is an integral part of this document.

Both the feedback and assessment surveys confirmed high levels of satisfaction and significant learning gains among participants. Notably, the training was especially effective in strengthening foundational knowledge and building confidence for field deployment, while also identifying areas—such as LiDAR and thermal imaging results interpretation and mission planning—that may benefit from further targeted support.

Overall, the training has laid a strong foundation for the successful implementation of UAS-based pilot activities within the FRED project, ensuring that partners are better equipped to apply advanced UAS technologies in real-world scenarios.

4. Appendices

Appendix 1: Training course material – FRED application user manual

Appendix 2: Training course material – UAS operation