Report on the outcomes of a Short-Term Scientific Mission[1]

Action number: CA22164

Grantee name: Michele Salis

Details of the STSM

Title: **Improving real-time wildfire analysis skills by learning from a fire-management oriented approach**

Start and end date: **19/07/2024 to 28/07/2024**

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

(max. 500 words)

During his STSM, the grantee was hosted by ISA (University of Lisbon) and integrated into the Autoridade Nacional de Emergência e Proteção Civil (ANEPC) at the National Control Room of Lisbon (Portugal), in close collaboration and under the scientific coordination of Akli Benali from ISA.

On July 20, the grantee was introduced to ANEPC and the NAD-AIR (Núcleo de Apoio à Decisão - Análise de Incêndios Rurais) of the Civil Protection Special Force, as well as to the experts and responsibles involved in wildfire management and civil protection activities at the National level.

The grantee started having access to the use of the dedicated NAD-AIR platform (FEB Monitorização), which incorporates webGIS, weather and fire datasets, as well as to the main procedures and methods routinely carried out in the Control Room for wildfire analysis and monitoring purposes.

The grantee familiarized with the procedures adopted by the NAD-AIR group for wildfire danger and potential behavior analyses, valid for the incoming 3 days, and daily revised (if necessary) considering the updated information of the weather models. These strategic evaluations were conducted considering weather and FWI forecasts from IPMA (Instituto Português do Mar e da Atmosfera).

In the next days, several supporting technological tools useful to monitor and analyze potential wildfire spread and behavior, as well as to support wildfire management and suppression, were also presented

[1] This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

to the grantee by Akli Benali and the ANEPC experts. These tools included websites, online WebGIS platforms, and online systems to monitor and download satellite images, observed/predicted weather data, and other significant information for wildfire monitoring and management purposes. Moreover, the grantee learned how to activate the Copernicus Emergency Management Service (CEMS) to support environmental monitoring or analyses.

The grantee was then involved in the mapping of two wildfire events: the Serpa wildfire (about 126 ha), occurred on July 18, and the Alcabideche-Cascais wildfire (about 85 ha), which spread on July 21. Considering the amount of data, videos, and pictures from the aerial and terrestrial forces available in the FEB Monitorização platform, the grantee analyzed in more details the Alcabideche-Cascais wildfire.

The analysis started with the identification and mapping of the main spatio-temporal wildfire progressions, which allowed to calculate observed rate of spread, maximum spread length, area burned, occurrence of spot fires, and other metrics for each time step. Then, the grantee collected several environmental data, namely weather conditions of the day of the fire, vegetation, and topography, as well as information on wildfire suppression efforts. These data were useful to interpret, in the most reasonable way, the observed wildfire spread and behavior and identify the critical points of the case study. The main aspects of this analysis were shared with the colleague Valentina Bacciu, and a detailed report with the analysis of the Alcabideche-Cascais wildfire was released at the end of the STSM.

During the STSM, the grantee also participated to some internal meetings at ANEPC, as for instance the general briefing on July 23, where all National Institutions involved in wildfire and civil protection issues provided an update about the general conditions, main facts, and risks at the National level.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

During his STSM, the grantee achieved all planned goals and expected outcomes. The main results obtained during his STSM are summarized in the next lines:

1) The grantee learned the basic methods adopted by ANEPC for monitoring wildfire and environmental data, for both past fires and real-time events, as well as for predicting potential wildfire danger and behavior in future days. In this sense, even if the grantee works in a research team and has no operative roles in Sardinian Institutions devoted to wildfire management, the grantee had several insights and ideas to potentially improve the current wildfire monitoring and forecast procedures in Sardinia.

2) The grantee monitored and analyzed wildfire spread and behavior for the wildfire events occurring in Portugal during the STSM. The challenges of managing wildfire propagation in complex fuel conditions (e.g. high presence of Pinus and Eucalyptus forests with heavy fuel load understory) in Portugal, even in relatively “mild” summer days, were evident.

3) The grantee investigated spatio-temporal wildfire spread and behavior, as well as the main wildfire drivers, for a significant wildfire occurred in Alcabideche-Cascais on July 21. For this purpose, he used the methods adopted at NAD-AIR, which presents several common points but also some differences with respect to the approach adopted by the grantee (and other colleagues in Sardinia) to analyze past wildfires in Sardinia. This was another relevant outcome of his STSM.

4) The grantee was and is in contact with a number of Sardinian Institutions involved in wildfire management. The outcomes and lessons learned from this STSM will be shared in dedicated meetings with Sardinian experts at the end of this fire season, which was so far quite challenging for the island due to several converging factors. The idea is to work to present an innovative project that can pave the way for the adoption of renewed procedures for wildfire monitoring and forecast at the regional level as well

as in or neighboring Countries/Regions with which we are in close contact, considering the involvement of the grantee and his Research Institution in other EU and National Projects (e.g.: FirEUrisk; Fire-Adapt; CRITERIA) and other research and third mission initiatives.