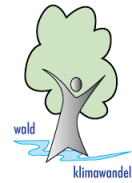




Schweizerische Eidgenossenschaft
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BAFU/WSL Forschungsprogramm Wald und Klimawandel Phase I: 2009 – 2011

Alpine Forest Fire waRning System – ALPFFIRS

Final report

1. Name of responsible leader, title of research project, site of research

Leader: Marco Conedera, WSL Bellinzona
Partners: Sezione Forestale del Canton Ticino (Aron Ghiringhelli)
Dienststelle für Wald und Landschaft Wallis (Philipp Gerold)
Federazione cantonale Ticinese Corpi Pompieri (Daniele Ryser)
Study sites: Cantons of Ticino and Valais

2. Project achievements

WP3

Project purpose, philosophy and results have been continuously presented to different audiences inside and outside the ALPFFIRS consortium and the “Wald-Klima Programm”.

In total about 25 talks, workshops, newsletters, websites, and interviews (radio/TV) have been achieved. From the scientific point of view, only a partial number of the results have been published so far:

- Valese E., Conedera M., Vacik H., Japelj A., Beck A., Cocca G., Cvenkel H., Di Narda N., Ghiringhelli A., Lemessi A., Mangiavillano A., Pelfini F., Pelosini R., Ryser D., Wastl C., 2011: Wildfires in the Alpine region: first results from the ALP FFIRS project. Proceedings of the 5th International Wildland Fire Conference WILDFIRE 2011, 9-13 May 2011 Sun City, South Africa. CD-Rom, 15 p.
- Wastl Clemens, Schunk Christian, Leuchner Michael, Pezzatti Gianni B., Menzel Annette, 2012. Recent climate change: Long-term trends in meteorological forest fire danger in the Alps. Agricultural and Forest Meteorology, 162-163, 1-13.
- Wastl, C.; Schunk, C.; Lüpke, M.; Cocca, G.; Conedera, M.; Valese, E.; Menzel, A., 2013: Large-scale weather types, forest fire danger, and wildfire occurrence in the Alps. Agric. For. Meteorol. 168: 15-25.

Particular attention has been paid to the transfer of the achieved results and products to potential final users. In particular, we passed the information for implementing the Fire Niche approach to Pitsch-Ing.ch AG (owner of the INCENDI system used by the Cantons of VS, GR and SG) and to the Osservatorio Ambientale della Svizzera Italiana (OASI) which is responsible for the implementation of the Fire Niche in Ticino.

WP4

WP4 represented the main WSL contribution to the ALPFFIRS consortium. Our team put most of the effort and innovation in this work package with following achievements:

- We created a web WIKI (<http://wiki.fire.wsl.ch/tiki-index.php>, password protected) with all the information (definition, formula, literature etc.) of up to 20 fire weather indices;
- We developed a tool for automatically calculating the 20 indices of the WIKI according to the standard algorithms (fire calculator v 1.00, programmed in Scala);
- We evaluated different modeling approaches (pure logistic, logistic with pseudo absence; Max Ent Linear, full Max Ent) and different option of input data (meteorological parameters, fire weather indices) for testing the most suitable approach for estimating the fire danger in the Alpine context, where most of the fires are of anthropogenic ignition;
- We developed a combined AUC method (interface approach) for selecting the model that best predict both number of fires and area burnt. The approach was tested for the two study areas TI and VS, developing a model for three different fire seasons: winter anthropogenic; summer anthropogenic, summer natural;
- We proposed an innovative method of fixing the threshold values on the 5-levels fire danger scale according to a multi-criteria approach that considers:
 - Number of events (% of event that occurred in the past when the Fire Weather Index is below the given value);
 - Burnt area (% of area that burnt in the past when the Fire Weather Index is below the given value);
 - Number of days (% of days in the past with a Fire Weather Index below the given value).

Beside the implementation of the system in the two study area (including the calculation of the model for subareas), for the next future we plan publishing the achieved results of the WP4 in international scientific journals.

WP5

Our role in this WP was limited to providing data to ZAMG (Central Institute for Meteorology and Geodynamics of Vienna, responsible for the INCA approach) and to the University of Munich (TUM) for further analysis (see publications cited in WP3: Wastl et al. 2012, 2013).

Unfortunately, in both cases the partners failed to provide an evaluation of the possible future forest fire regimes. Fire weather indices are calculated on the base of daily value, what climatic scenarios do not provide so far. If the Programm is able to provide us climate scenarios on a daily resolution for the meteorological stations in TI and VS, we will be probably able in future to overcome this problem.

WP6

The ALPFFIRS consortium defined an univocal Forest Fire Danger Scale and a minimal common protocol for danger level interpretation for the whole Alpine space. The proposed definition is compatible with the new alarm procedure defined at national level.

From a more operational point of view, thanks to the contribution of Daniele Ryser of the fire brigade federation of Canton Ticino, standard agreements for transnational collaborations in case of transbordering fire events have been prepared between the concerned Swiss cantons and Italian Provinces.

3. Final remarks

Most goals of the project have been successfully achieved. Thanks to the innovative solutions proposed in ALPFIRS we opened new perspective for the fire danger estimation in Alpine conditions.

A second added value of the project is the network we created among professionals and scientist dealing with forest fires in the Alpine regions.

Bellinzona, 31 ottobre 2012

Dr. Marco Conedera
WSL Bellinzona