



### General information

<b>Description</b>	Maps of areas of high fire risk in Spanish Basque Country
<b>Geographical area</b>	Northern Spain, with a special focus on Basque Country
<b>Group of tree species</b>	<i>Pinus radiata</i> and other species
<b>Date</b>	March 2018
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<b>Tool type</b>	Model
<b>Tool format</b>	Cartography layers (SIG)
<b>Language</b>	Spanish
<b>Risk management plans to which the tools can be added</b>	Plan de riesgo de incendio del País Vasco
<b>Risk management plans link</b>	<a href="https://plurifor.efi.int/wp-content/uploads/WP2/plans/Fire-risk-plan_1_ES.pdf">https://plurifor.efi.int/wp-content/uploads/WP2/plans/Fire-risk-plan_1_ES.pdf</a>
<b>This tool is...</b>	<input checked="" type="checkbox"/> a new tool
<b>Original tool of which this one is an improvement</b>	FJ Alcasena, M Salis, AA Ager, R Castell, C Vega-García. Assessing wildland fire risk transmission to communities in northern Spain. <i>Forests</i> 2017, 8 (2), 30. <a href="https://www.firelab.org/project/flammap">https://www.firelab.org/project/flammap</a>

### Topic

<b>Risk</b>	Forest fire
<b>Risk component</b>	<input checked="" type="checkbox"/> hazard <input type="checkbox"/> impact <input type="checkbox"/> vulnerability
<b>Risk area</b>	Risk assessment
<b>Risk phase</b>	Prevention
<b>Risk phase (alternative terms)</b>	Preparedness
<b>Level</b>	Regional
<b>Sendai priorities</b>	<input checked="" type="checkbox"/> Priority 1: Understanding disaster risk <input type="checkbox"/> Priority 2: Strengthening disaster risk governance to manage disaster risk <input type="checkbox"/> Priority 3: Investing in disaster risk reduction for resilience <input type="checkbox"/> Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction
<b>Contribution to Sendai targets</b>	<input type="checkbox"/> Reduce global disaster mortality <input type="checkbox"/> Reduce the number of affected people <input checked="" type="checkbox"/> Reduce the direct disaster economic loss <input type="checkbox"/> Reduce disaster damage to critical infrastructure <input type="checkbox"/> Increase the number of national and local disaster risk reduction strategies <input type="checkbox"/> Enhance international cooperation to developing countries <input checked="" type="checkbox"/> Increase availability of and access to multi-hazard early warning systems and disaster risk information and assessment



## Description and analysis

### Summary

Fire simulators are a fundamental element in the management of forest fires. They require wind direction and speed data to adapt the planned fires to reality. Flammap and Farsite are examples of free, new fire simulators developed by USDA (USA) and based on GIS and on high prediction capacity, what makes them powerful tools.

The accuracy and prediction power of these tools depends on good starting data. On the one hand, there are the climatological data at the time of the fire (wind, temperature, humidity). And, on the other hand, there are the physical characteristics of forest and fuel: slope, exposure, scrub, type of trees. The Landscape Maps (LCP files) allow to quantify all those characteristics of forest and fuel in a single file composed of several layers.

This the new LCP file, based on the DTM (Digital Terrain Model) and DSM (Digital Surface Model) of the 2012 flight of the Basque Country, allows to calculate the advance of the fire in different climatological conditions and the risk of damage to forest stands.

Several simulations have been launched for the whole Basque Country in the hypothesis of simultaneous fires with a 250 m-grid and strong winds. In this way, the areas of greatest risk of fire propagation in 2012 can be detected according to the 8 main winds (N, NE, E, SE, S, SW, W and NW).

### Place in national/regional policy

At present it is not integrated in regional policy. The purpose was to develop a simple to use tool that could be easily connected to the current forest maps.

### Goals and achievements

This is a map collection that allows to easily use the fire analysts to study a specific fire in a Basque mountain or to guide the forest policy of a region.

### Stakeholders involved

A workshop will be held in 2019 with forest representatives from all three provinces of Álava, Biscay and Gipuzkoa, representatives of forestry associations and forest owners and managers to introduce the new maps and the fire simulators.

These shapefiles will be easily downloaded in geographical web viewers as GeoEuskadi (<http://www.geo.euskadi.eus>).

### Implementation stage

Maps are available to any interested parties, basically Forest Authorities and forest owners. At this stage there is no immediate plan to incorporate this version of the model directly into official planning systems but to provide a simple and easy use tool to complement the current fire technics, within a commonly used software (GIS, web viewers) to make it as user-friendly as possible.

### State of technical knowledge

Maps complement our best current understanding of calculating fire risk to forests and is state-of-the-art for any forest risk calculation in the Spanish Basque Country.

### Regulatory and/or socio-economic contexts

At present little regulatory context but potentially important socio-economic benefits by helping forest managers and owners to make silvicultural decisions to mitigate the fire risk.

## Impacts of the tool

To date very little impact because the fire simulators has not been widely adopted. Efforts will be made to increase the impact by improving the implementation in GIS or in web viewers and organising further workshops.



### Implementation requirements and durability

#### Description of the implementation steps

1. Underlying model development (free fire simulators)
2. Incorporation of model functions in GIS or in web viewers
3. Workshop with key stakeholders
4. Revision of implementation based on stakeholder feedback (in progress)
5. Model available to download (not yet implemented)

#### Governance

- HAZI will be responsible for continued development, improvement and availability of the LCP file for the whole Basque Country
- HAZI will be responsible for repetition of the process when the 2017 Lidar flight data are available.
- HAZI will be responsible for advice in the replication of these risk maps in other regions with LCP files or Lidar data

#### Regulatory framework

The tool is advisory only to assist forest managers. There is no regulatory framework at present.

#### Human resources requirements

Good collaboration between EFI and the main stakeholder groups will allow long-term implementation beyond the end of the project. For successful implementation it will require further one/two day workshops. In addition some form of short help manual is also required.

#### Financial requirements

Low level of financial requirement for basic installation because the most known fire simulators are freely available and can be added to GIS or to web viewers for anyone with access to these information. However, for a fully effective implementation it will be necessary to make the incorporation more clear, to provide a short help manual.

#### Technical requirements

Can run on any computer, tablet or smartphone with GIS or access to web viewers (online).

#### Priorities identified for successful implementation of the tool (political, technical, human, financial...)

The priorities are promotion of the fire simulators within the forestry sector in other regions, and updating of the model to interface and ease of use. There is also a need for the forest authorities to encourage use of such a tool within the region.

#### Challenges or risk factors (legal, financial, safety...) expected during the implementation and solutions proposed

The main challenge is to change the way that forest managers and owners evaluate risk. For a rare (but important) hazard like fire, it is difficult to persuade people to utilise such tools. In addition the role of forestry associations in promoting the use of maps is very important because of the large number of small-scale private forest owners in the region.

#### Additional and non-formal experiences to help the implementation of good practice

This tool is designed to be used by technicians with any computer, tablet or smartphone and with access to a GIS or to web viewers.



### SWOT analysis

Strengths	Weaknesses
<p>Scientifically based and tested tool for evaluating fire risk and the fire behavior.</p> <p>Familiar to computer users because of experience with GIS or web viewers.</p>	<p>Models is not integrated in the current management systems used in the region.</p> <p>Large volume of information to download when someone works with maps of a whole region.</p> <p>The relief (DTM) in a region does not change in the future, but it is necessary to recalculate the LCP file from new Lidar flights because the characteristics of the vegetation change.</p>
Opportunities	Threats
<p>Possible to reduce the financial impact of fire on forestry in Basque Country.</p> <p>Allows foresters to evaluate the impact of different species choice and scrub management options against fire.</p> <p>Allows to guide the policy and the forestry investments towards the critical zones that can suppose a greater risk of propagation of the fire.</p>	<p>Possible need for confidentiality of these risk maps (to be analyzed by the authorities).</p> <p>Difficulties in persuading technicians to use the tools (risk maps or fire simulators) because of inherent reluctance to add additional work to busy jobs.</p>

### Lessons learnt

<p><b>Evaluation process, if exists (internal or external)</b></p> <p>Verbal feedback from participants at the first wind seminar demonstrating the maps. Ongoing evaluation by developer to improve performance and easy of use of free fire simulators with GIS or web viewers.</p>
<p><b>Assessment of results (quantitative and qualitative) and comparison with main goals</b></p> <p>Free fire simulators meet the original goals but need improvement in order to make it easier to use.</p>
<p><b>Negative aspects identified</b></p> <p>Sensitive information-Possible need for confidentiality</p> <p>Interface within GIS or web viewers needs improvement and a short Help Manual in Spanish is required.</p>
<p><b>Unexpected consequences (short- / mid- / long-term) and corrective measures implemented</b></p> <p>None so far</p>

### Access to complete tool

<b>Files</b>	A set of shapefiles, depending of parameter and of main wind
<b>Web links</b>	<a href="https://plurifor.efi.int/wp-content/uploads/WP4/riesgo-incendio.jpg">https://plurifor.efi.int/wp-content/uploads/WP4/riesgo-incendio.jpg</a>

