## General information

| | |
|---|---|
| **Description** | Height for 10% wind damage risk for forests in Nouvelle-Aquitaine incorporated in the QGIS software |
| **Geographical area** | Nouvelle-Aquitaine but can also be completed for whole of France |
| **Group of tree species** | *Pinus pinaster, Quercus spp, Eucalyptus globulus* |
| **Date** | April 2017 |
| **Authors (affiliation)** | Barry Gardiner (EFI), Tommaso Locatelli (Forest Research), Celine Meredieu (INRA) |
| **Contact e-mail** | barry.gardiner@efi.int |
| **Tool type** | Model |
| **Tool format** | Cartography layers (SIG) |
| **Language** | English |
| **Risk management plans to which the tools can be added** | Plan national de gestion de crise tempête pour la filière forêt-bois |
| **Risk management plans link** | https://plurifor.efi.int/wp-content/uploads/WP2/plans/Storm-plan_FR.pdf |
| **This tool is…** | ☒ an improved tool |
| **Original tool of which this one is an improvement** | Hale, S., Nicoll, B., Gardiner, B., (2015) ForestGALES - A wind risk decision support tool for forest management in Britain: User Manual, Version 2.5. Forestry Commission, Edinburgh, UK https://www.forestry.gov.uk/forestgales |

## Topic

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

## Description and analysis

**Summary**
This tool is a set of maps of the height at which forests reach a 10% level of the risk of wind damage for the key forest species incorporated in GIS across Nouvelle-Aquitaine. It incorporates data layers of soil, wind climate, and stand characteristics, together with predictions from the ForêtTempête model to calculate critical heights for stands with and without new edges. Currently the system only has information for *Pinus pinaster, Quercus spp, Eucalyptus globulus.*

**Place in national/regional policy**
At present it is not integrated in regional policy. The purpose was to develop an easy to understand and use mapping system and one that could be easily incorporated within existing forest data exchange systems in Nouvelle-Aquitaine (GIP ATeGERI [Aménagement Du Territoire et Gestion des Risques] and PIGMA [Plateforme d'échange de données en Nouvelle-Aquitaine]).

**Goals and achievements**
This is an extension of ForêtTempête that adds soil, wind climate and forest stand data within a GIS. Currently it only works for maritime pine, oak and Eucalyptus globulus but in fact any species included in the stand-alone version of ForêtTempête could be added.

**Stakeholders involved**
A seminar was given to forest representatives from the regional body responsible for forestry (DRAAF), representatives of forestry owners and managers (CRPF), and representatives responsible for forest health (CAISSE PHYTO FORÊT) to introduce the tool.

**Implementation stage**
Tool is being revised based on feedback from the seminar and further experience. It will then be made available to any interested parties. The plan is to incorporate maps from the tool in the required format to install in PIGMA.

**State of technical knowledge**
The tool represents our best current understanding of caclualting wind risk to forests and is state-of-the-art for forest risk calculation in Nouvelle Aquitaine.

**Regulatory and/or socio-economic contexts**
At present little regulatory context but potentially important socio-economic benefits by helping forest planners to identify areas of the forest most at risk of wind damage and to evaluate the overall level of risk of forests in the region.

## Impacts of the tool

To date very little impact because the tool has not been widely adopted. Efforts will be made to increase the impact by discussing how the maps can be incorporated in PIGMA with GIP ATeGERI.

## Implementation requirements and durability

**Description of the implementation steps**
1. Underlying model development (ForêtTempête)
2. Critical height versus critical wind speeds predictions based on ForêtTempête.
3. Incorportion of model predictions with wind climate and soil maps in QGIS to calculate height at which forests will reach 10% risk of damage.
4. Workshop with key stakeholders
5. Revision of maps to incorporate more species across whole of Nouvelle-Aquitaine, e.g. Douglas fir (in progress)
6. Maps incorporated in PIGMA (not yet completed)
7. Maps shared online (not yet completed)

**Governance**
- EFI PFF will be responsible for continued development, improvement and availability
- EFI PFF will be responsible for incorporation of maps in PIGMA

**Regulatory framework**
The tool is advisory only to assist regional planners andforest owners concerned with risk to forests in Nouvelle-Aquitaine. 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 collaborative work between EFI PFF and GIP ATeGERI. This work should be carried out in the summer of 2018. In addition some form of short description of the maps and how they have been created in French is required.

**Financial requirements**
Low level of financial requirement for installation because themaps have been created and additional maps will be created by EFI PFF. However, for a fully effective implementation it will be necessary to incorporate the maps in PIGMA.

**Technical requirements**
Maps can be viewed in the free-software QGIS (https://qgis.org/en/site/)

**Priorities identified for successful implementation of the tool (political, technical, human, financial…)**
The priorities are making the maps available within the PIGMA data sharing platform available in Nouvelle-Aquitaine adding all other key species for the region and other levels of risk (e.g. 1%, 20%). In addition further workshops dedicated to using and interpreting the maps need to be organised for different potential end-users in Aquitaine (DRAAF, ONF, CRPF, CAISSE PHYTO FORÊT, Insurance Companies, provate forest owners, etc.)

**Challenges or risk factors (legal, financial, safety…) expected during the implementation and solutions proposed**
The main challenge is to incorporate the maps in the decision making process. For a rare (but important) hazard like storms it is difficult to ensure that such rare events are taken into account. The role of government and regional bodies (e.g. DRAAF) and forestry associations (e.g. CRPF) in promoting the use of the maps is very important.

**Additional and non-formal experiences to help the implementation of good practice**
This maps can be used as stand alone, within GIS or as part of PIGMA. Little experience is required in assessing the maps. The main challenge is to ensure end-users understand the origins of the maps and their limitations (guidance note required).

## SWOT analysis

| Strengths | Weaknesses |
|---|---|
| • Scientifically based and tested tool for evaluating storm risk<br>• Easy to integrate into map based management systems or any GIS | • Model is not yet integrated in the current management systems used in the region<br>• Currently only incorporates *Pinus pinaster, Quercus spp, Eucalyptus globulus* and other species need to be incorporated.<br>• At present only calculates 10% level of risk. Other levels are required. |
| Opportunities | Threats |

| | |
|---|---|
| • Possible to reduce the financial impact of storms on forestry in Nouvelle-Aquitaine.<br>• Allows foresters to evaluate the impact of different management options including species choice | • Difficulties in persuading people to use the maps because they add complexity to existing decision making. |

## Lessons learnt

| |
|---|
| **Evaluation process, if exists (internal or external)**<br>Verbal feedback from participants at the first seminar demonstrating the maps. Ongoing evaluation by developer to improve maps with more species and levels of risk (1%, 20%) |
| **Assessment of results (quantitative and qualitative) and comparison with main goals**<br>Tool meets the original goals but needs updating with new species and levels of risk. |
| **Negative aspects identified**<br>Short Guidance Notes in French are required. |
| **Unexpected consequences (short- / mid- / long-term) and corrective measures implemented**<br>None so far |

## Access to complete tool

| | |
|---|---|
| **Files** | Crit_Ht_EG_Edge.tif; Crit_Ht_EG_No_Edge.tif; Crit_Ht_MP_Edge.tif; Crit_Ht_MP_No_Edge.tif; Crit_Ht_OK_Edge.tif; Crit_Ht_OK_No_Edge.tif |
| **Web links** | https://www.dropbox.com/s/fry8ba6tu3sakd2/Crit_Ht_EG_Edge.tif?dl=0<br>https://www.dropbox.com/s/rcta1527wijf348/Crit_Ht_EG_No_Edge.tif?dl=0<br>https://www.dropbox.com/s/14pt5t4epzcr86y/Crit_Ht_MP_Edge.tif?dl=0<br>https://www.dropbox.com/s/6kjke6tdmayp9bv/Crit_Ht_MP_No_Edge.tif?dl=0<br>https://www.dropbox.com/s/u1ypms9cvph7axf/Crit_Ht_OK_Edge.tif?dl=0<br>https://www.dropbox.com/s/qko7eurzrgnjh1o/Crit_Ht_OK_No_Edge.tif?dl=0 |

Interreg Sudoe
EUROPEAN UNION

Transnational plans for the management of forest risks
PLURIFOR
European Regional Development Fund