

**Application of the species distribution models for  
the delineation of seed transfer zones/models in CE**

**(A.T1.4)**

**Documentation handbook  
(D.T1.4.4)**

# SusSelect User's Manual

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## Introduction

The SUSTREE project brings together experts on forest provenance research and breeding from eight institutions and six countries of Central Europe. Objective of the transnational collaboration is to identify endangered forest genetic diversity and to discuss cross-boundary seed transfer. The goal is to ensure the utilization of the best genetic material fit for climate change in the forests of the region.

Within SUSTREE, a harmonized provenance trial dataset evaluating the adaptive performance of more than 10,000 populations of 7 major European tree species was compiled in order to develop Universal response function (URF) models. The URF models integrate both climatic and genetic factors in predicting phenotypic variation in functional traits and allow us to evaluate not only single populations growing under specific climate conditions but the overall phenotypic space expressed throughout a wide climatic spectrum. Thus, the URFs can be used to identify either the best seed provenances for a specific site climate or the best planting site for a specific seed provenance. These URFs were used as delineation models of 7 major tree species of Europe (*Picea abies*, *Abies alba*, *Pinus sylvestris*, *Larix decidua*, *Fagus sylvatica*, *Quercus petraea* and *Quercus robur*) to predict the location of optimum seed sources or planting materials suitable for a given combination of the planting site and according to the different climate scenarios. The output from these delineation models was depicted as spatially explicit maps of best seed sources under the current climate (1961-90) and two climate change scenarios (RCP 4.5 and RCP 8.5). These maps were also integrated into a decision support tool SusSelect smartphone App (Output OT3.2).

SusSelect is the desktop and mobile mapping application of the SUSTREE Interreg project. It displays the current and future vulnerability of these 7 European tree species and suggests locations for seedling selection.

## Requirements

Windows platform:

- Operating system: Windows Vista, 7, 8, 10
- CPU: minimum 1GHz
- Display: minimum 800x600
- RAM: minimum 1GB
- HDD: 200MB

Android platform:

- Operating system: Android 4 and above
- CPU: minimum 1GHz
- Display: minimum 800x480
- RAM: minimum 512MB
- HDD: 200MB

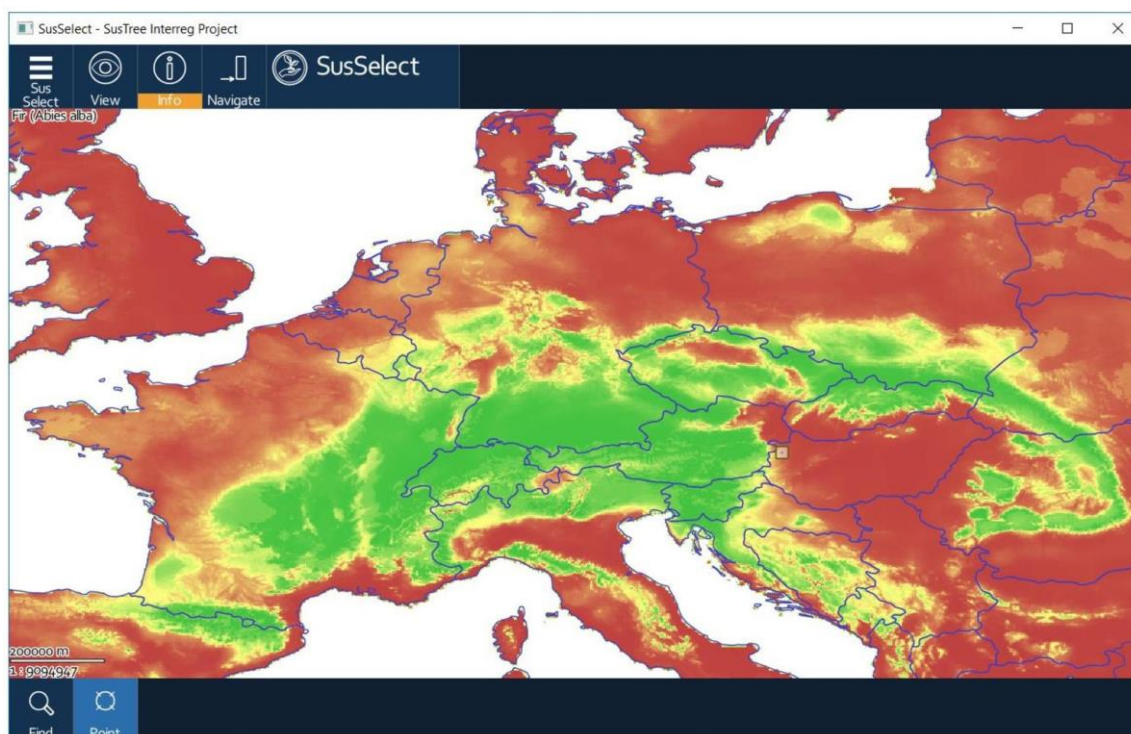
## Features

The application has the following features:

- Can operate offline and online on two platforms: Windows and Android
- Can display distribution and certainty maps for 7 species, for the present and the future, it can display 28 maps altogether
- Can display and zoom to the current GNSS or Geolocation of the user
- Can display the skyplot with the available GNSS above the horizon
- Basic tools: Zoom in/out/all, Pan, Find, Information query, Navigate
- Can list the nearest seed origins based on the project results
- Can find geographical features by entering a search pattern
- Colour coded display of the present/future vulnerability maps for 7 species
- Colour coded display of the present/future certainty maps for 7 species
- Online background map display: OSM or Bing Maps Satellite
- Localization support for 11 languages (Bosnian, Bulgarian, English, French, German, Hungarian, Latvian, Polish, Portuguese, Serbian, Turkish)

## Start-up screen

The start-up screen of the application displays the map of the last state or a country map at first. The top line of the app above the map contains the menu and the toolsets and the bottom line below the map include the tools of the currently selected toolset. The most left icon of the toolset opens and closes the app menu. The most right icon brings the user to the project webpage.



## Gestures

The map can be zoomed by two fingers (touch screen) or the mouse wheel (on Windows). The map can be dragged by a single finger or by dragging the mouse. A position can be selected by a single touch or click. This gesture opens the vulnerability panel where the present and futures vulnerability of the seven species appears on a percentage scale.

## Tools

The View toolset contains tools to zoom in, zoom out the map or zoom to the full extent. The default tool is the map pan:



The Info toolset includes the Find tool to search geographic locations by entering their names, and the position selection tool:

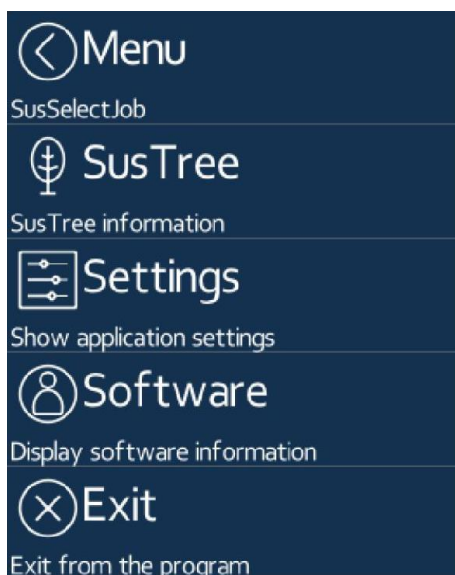


The Navigation toolset displays the current GNSS receiver status if available and the Target selection tool. The status button opens the Skyplot panel with detailed information about the GNSS receiver. The Target button can designate a target for navigation by clicking the same position twice.



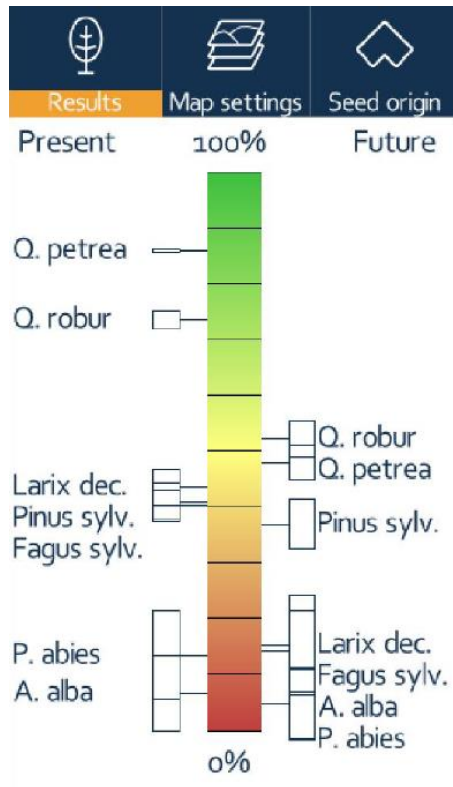
## Menu

The menu contains the SusTree information panel, the Settings and information about the software, and the Exit button.



## Vulnerability scale

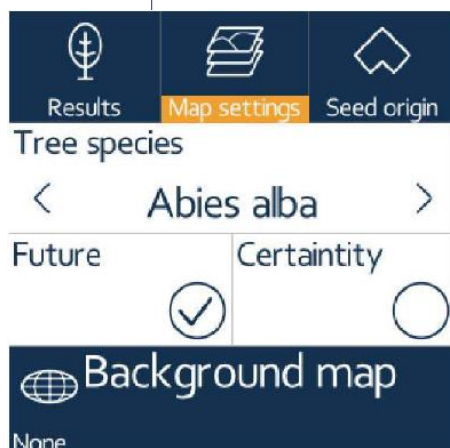
The SusTree information panel comprises three tabs, the Results of the project, the Map settings and the Seed origins for the selected species. The Results panel shows the vulnerability and certainty of the 7 studied tree species. The left side displays the present and the right side the future vulnerability. The size of the rectangles close to the colour scale represents certainty of each species.



## Map settings

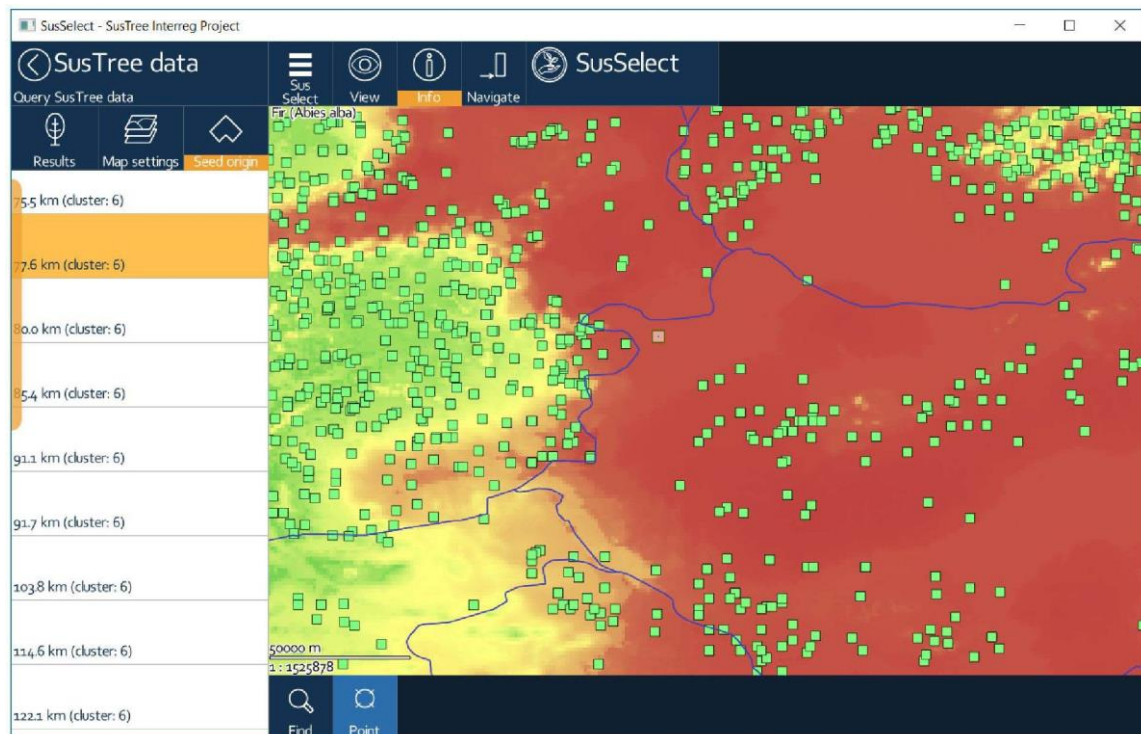
The second Tab of the Information panel is the map settings where the tree species can be selected. After selection the green-yellow-red colour coded vulnerability map appears in the map window. There are two switch buttons under the species selection. The first controls the display the present or the future map set, and the second can switch between the vulnerability and the certainty map set. If both options enabled then the app shows the future certainty map for the selected species.

If the app has online access then one of the following background map can be displayed: Open Street Map or Bing Satellite Map.



## Seed Origin

The third Tab of the Information panellists the seed origins for the selected species and the selected location in ascending order by distance. The map shows the seed origins as points.



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