

SHORT TERM SCIENTIFIC MISSION (STSM)

Scientific Report

Citizen Science to combat invasive Forest Phytophthora diseases

by Dr Diana Marčiulyrienė

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STSM Title:

Citizen Science to combat invasive forest Phytophthora diseases

STSM start and end date:

13/11/2017 to 03/12/2017

Host

Dr Michelle Cleary,

Host Institution:

Swedish University of Agricultural Sciences (SLU), Alnarp (SE), Sweden -
Faculty of Forest Sciences, Southern Swedish Forest Research Centre

Brief Summary

Purpose of the STSM:

The overall aim of this project was to advance the spatial prediction of invasive forest Phytophthoras by providing the public with inexpensive location-based, time series data of unprecedented quantity and distribution using a Citizen Science platform. In developing this platform, we anticipate being able to target under-sampled habitat within urban areas and along the forest-urban interface at a much greater pace, and over larger geographic distances. A key component of the Citizen Science platform is public education through information dissemination, seminars and training workshops. I believe this project is relevant for, and will help contribute to, WG4 tasks specifically by harnessing the interest of the stakeholders and citizens and involving them in the science through voluntary partnerships that aim at a systematic collection of samples and interactive dissemination of results.

The main results obtained:

1. A website has been created. The site can be found at <http://phytophthora.se/en/> (the website creation is not complete; we are still working to make it as high quality and more interesting to the citizens).
2. A Phytophthora Field Identification Guide (draft) has been created.
3. A related Facebook page has been created and improved to be more attractive to citizens. The Facebook page can be found at <https://www.facebook.com/forestresearch/>.
4. The information brochure is under preparation.

STSM Report

Purpose of the STSM

Over the last 15 years, the prominence of Phytophthora tree pathogens in Northern Europe has increased dramatically. This is believed to reflect a marked increase in the introduction and spread of invasive Phytophthora spp. via imported planting stock. The situation is probably not due to the global trade of plants alone, but also connected to changes in climate conditions over the last 60 years. By destroying the trees' fine roots, these pathogens disturb nutrient and water uptake, thereby reducing the fundamental vitality of trees, leading to instability and premature death of trees. In contrast to most forest diseases that impose a threat to one specific host species (e.g. ash decline), Phytophthora-pathogens are a potential threat against both conifers and broadleaved trees. The invasive behaviour of these pathogens and their ability to adapt to different conditions result in a forest disease problem that has a potential to affect European forestry and forest ecosystems more profoundly than any other forest disease in modern history.

Starting in 2010-2011, extensive Phytophthora-damages were noted on European beech (*Fagus sylvatica*) in urban settings and national parks in southern Sweden. Alarmingly, there are now indications that the disease front for invasive Phytophthora spp. is advancing into natural forests and landscapes. As a consequence, we have in the recent years witnessed a dramatic increase in the number of inquiries from forest managers and other stakeholder representatives, as well as concerned citizens, requesting advice on invasive Phytophthora pathogens and how to manage Phytophthora-damages in amenity trees and forests.

It is a known fact that the more people become aware of a problem like an invasive forest disease in nature, the more likely they are to be able to recognize similar diseased trees and be conscious of decisions that might promote or impede the spread of invasive forest diseases. A Citizen Science initiative related to invasive forest Phytophthora pathogens can provide a novel means to investigate the distribution and diversity of Phytophthora pathogens across a larger landscape level. Different levels of voluntary partnerships are designed to meet the needs and time dedication of different people and can be used to greatly advance research initiatives while allowing a unique opportunity for participants to learn about the scientific process.

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Description of the work carried out during the STSM

Science is our most reliable system of gaining new knowledge and citizen science is the public involvement in inquiry and discovery of new scientific knowledge. Citizen Science contributions have the highest chance of improving and expanding research area. In order to involve citizens in the science through voluntary partnerships, we initiated the development of a Citizen Science Platform as a customizable tool to be used to launch data collection activities (including citizen science contribution) to advance the spatial prediction of invasive forest Phytophthoras.



During this STSM visit, we have created a new platform to make it easy for anyone who wants to collect or share Phytophthora data. The website was developed in the Southern Swedish Forest Research Centre (SSFRC) at the Swedish University of Agricultural Sciences using a free and open-source content management system WordPress. The site can be found at <http://phytophthora.se/en/>. Through this Citizen Science platform, it will create a database for disease distribution in natural settings coming directly from 'volunteers' of the public community. Using the site is free, and it is designed as an easily understandable and fun activity for all people who are interested in science. I would like to emphasize that the website creation is not complete; we are still working to make it as high quality and more interesting to the citizens.

We have created a Phytophthora Field Identification Guide (draft) designed specifically for citizen scientists. The guide provides a step-by-step introduction to the Phytophthora diseases, their identification and sampling methods. This guide has been prepared as a working and training manual for people that are not scientists. Therefore it is meant to be practical and should be seen as an auxiliary tool for people who want to be involved in and contribute to research. It is simply aimed at helping volunteers, students and other interested parties to take the first steps into the world of Phytophthora. It, therefore, focuses on only sampling (specialist volunteer) and identification of main symptoms of Phytophthora (specialist volunteer and volunteer), which are most widespread in Sweden.

We also created a related Facebook page at <https://www.facebook.com/forestresearch/>. This page is freely available and its function is to share information, publish newsletters and develop stakeholder discussions. This is a blog and forum in one place .

During this STSM visit, I also prepared several brochures that were discussed with the team. The final version of the brochure is under preparation.

Description of the main results obtained

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FUTURE COLLABORATIONS (if applicable)

Continued collaboration with the host institution is planned in the future.