

COST Action FP1403 **INNEXT** Non-native tree species for European forests – Experiences, Risks and Opportunities

TRAINING SCHOOL

MODELLING LANDSCAPE INVASION BY NON-NATIVE TREES: CHALLENGES AND APPLICATIONS

25-29 September 2017 – Porto, Portugal

Sponsored by : COST Action FP1403 – NNEXT (<http://nnext.boku.ac.at/>) & BioDiv Doctoral Programme - CIBIO/InBIO

General topic

Modelling non-native trees distribution

Skills that will be provided

- Invasion ecology;
- Different modelling techniques, namely: Bayesian modelling, Habitat Suitability modelling, Agent based modelling, Stochastic dynamic modelling, Multivariate modelling;
- Introduction to R software and statistical programming;
- Spatial analyses of ecological and environmental data;
- Species mapping using Unmanned Aerial Vehicles.

Target participants

The intended audience for this course are students or researchers at early stage of their career. They should be interested in forest ecology and species distribution modelling and are expected to have limited experience with programming and statistics. This course is also interesting for those with a strong background in modelling who want to broaden their horizon in modelling tools.

Location

CIBIO/InBIO - Research Centre in Biodiversity and Genetic Resources - Campus Agrário de Vairão, Universidade do Porto, 4485-601 Vairão, Portugal - Tlf. +351-252660411.

25th September | “Invasive Opening”

8:30-9:30 | Registration

9:45-10:00 | Welcome message (CIBIO board)

10:00-11:00 | OPEN LECTURE – Expansions by non-native tree species: patterns, processes, and impacts (by João Honrado)

11:00-11:30 | *Coffee-Break*

11:30-12:30 | LECTURE – Theory, concepts, assumptions and principles of biodiversity models (by Joana Vicente)

12:30–14:00 | *Lunch*

14:00–14:45 | LECTURE – Down on earth and up in the sky – applications of satellite and UAV very-high resolution imagery for tree invasion mapping and surveying (by João Gonçalves & Renato Henriques)

14:45–16:15 | PRACTICALS (PART I) – Aerophotogrammetry using UAV’s for remote sensing of plant invaded sites - field session (by Renato Henriques & João Gonçalves)

16:15–16:45 | *Coffee-Break*

16:45–18:15 | PRACTICALS (PART II) – Aerophotogrammetry using UAV’s for remote sensing of plant invaded sites - room session (by Renato Henriques & João Gonçalves)

18:15 – 19:15 | 5 min poster presentation by the participants (PART I)

19:15 | Welcome “Porto de Honra” and “Aperitivo”

26th September | “Models – Vol. I”

9:00–9:45 | LECTURE - Habitat Distribution Models (by Antoine Guisan)

9:45–10:30 | LECTURE – Individual- and Agent Based Models (by Andreas Huth)

10:30–11:00h | *Coffee-Break*

11:00–11:45 | LECTURE – Bayesian Models (by David Conesa)

11:45–12:30 | LECTURE – The Stochastic Dynamic Methodology (StDM) - Towards spatially dynamic tools for local conservation and forest planning (by João Alexandre Cabral & Mário Santos)

12:30 – 14:00 | *Lunch*

14:00–17:00 | PRACTICALS – HDMs – Introduction into spatial modelling of ecological niches of alien invader trees (by Antoine Guisan)

17:00 – 17:30 | *Coffee-Break*

17:30 – 19:00 | 5 min poster presentation by the participants (PART II)

19:30 | Training school official dinner at Vila do Conde

Grant

The financial support is an individual grant of up to 600€ for each trainee. It does not necessarily cover all expenses related to attending the training school. The exact amount will be decided based on the number of participants and expected travel costs.

27th September | “Models – Vol. II”

9:00–10:30 | PRACTICALS (PART I) – ABMs/IBMs models - Identification of dispersal paths of alien tree species and assessing the effect of management methods (by Andreas Huth)

10:30–11:00h | *Coffee-Break*

11:00–12:30 | PRACTICALS (PART II) – ABMs/IBMs models - Identification of dispersal paths of alien tree species and assessing the effect of management methods (by Andreas Huth)

12:30 –14:00 | *Lunch*

14:00-15:30| PRACTICALS (PART I) - Bayesian modelling – unravelling the best places for non-native tree species occurrence (by David Conesa)

15:30–16:00 | *Coffee-Break*

16:00-17:30 | PRACTICALS (PART II) - Bayesian modelling – unravelling the best places for non-native tree species occurrence (by David Conesa)

Eligible trainees

1. Trainees from NNEXT member countries and near neighbour countries;
2. Trainees from approved European Research and Technological Development (RTD) Organisations.

(More information on training school rules: <http://www.cost.eu/download/COSTVademecum>)

28th September | “Models – Vol. III”

9:00-10:30 | PRACTICALS (PART I) – The Stochastic Dynamic Methodology (StDM) - StDM fundamentals and description in practice (by João Alexandre Cabral, Mário Santos, and Rita Bastos)

10:30-11:00h | *Coffee-Break*

11:00-12:30 | PRACTICALS (PART II) – The Stochastic Dynamic Methodology (StDM) - Demonstrative StDM modelling applications on the scope of alien tree distribution (by João Alexandre Cabral, Mário Santos, and Rita Bastos)

12:30 – 14:00 | *Lunch*

14:00-14:45 | LECTURE – Multivariate statistics in R (by Ana Sofia Vaz)

14:45-16:00 | PRACTICALS (PART I) – Applying multivariate models in tree invasion ecology (by Ana Sofia Vaz & Joana Vicente)

16:00 – 16:30 | *Coffee Break*

16:30-18:00 | PRACTICALS (PART II) – Applying multivariate models in tree invasion ecology (by Ana Sofia Vaz & Joana Vicente)

Application process

To apply, send (I) Curriculum vitae and (II) Motivation letter (including current position and research interests) to NNEXT Chair Elisabeth Pötzelsberger (nnext@boku.ac.at) and Joana Vicente (jsvicente@fc.up.pt). Applications need to be submitted by **15th June 2017**. Applicants will be informed about the application result by 1st July 2017 and will be required to confirm their participation by 5th July 2017.

29th September “Outside the Models”

9:00-10:30 | Fieldwork at CIBIO campus - the most widespread non-native tree species and invasion patterns in *Eucalyptus globulus* stands

10:30-11:00h | *Coffee-Break*

11:00-12:30 | Hands on (Part I) - Modelling an alien tree species distribution using several modelling techniques

12:30 – 14:00 | *Lunch*

14:00-16:00 | Hands on (Part II) - Modelling an alien tree species distribution using several modelling techniques | one technique per group of participants

16:00 – 16:30 | *Coffee Break*

16:30-17:00 | Brainstorming – Is there a need to collect and synthesise information about the use of modelling techniques to study non-native tree species? Key words to perform the revision, which ones are the better?

17:00-17:30 | Training school evaluation and closing session

Specific requirements

Participants should preferably use their own laptops for the course. Participants are required to install R and NETLOGO on their laptops prior to the course. The necessary instructions to perform these tasks will be sent by email one week prior to the start of the course. All participants must bring a poster, related to their research, to be presented on the second day.