



## **2<sup>nd</sup> COST Action CA15226 - CLIMO Training School**

### ***Multiscale monitoring tools for a smart management of mountain forests***

(San Michele all'Adige, Trento, Italy, 1-3 July, 2019)

#### ***Purpose and objectives***

The main purpose of this training school is to provide trainees with an overview of multiscale monitoring frameworks, highlighting the linkages between forest adaptation and mitigation strategy from tree to landscape. The course will cover selecting key metrics, tree-sampling protocols, lab analysis techniques, introduction to new monitoring tools and installation tutorials, remote sensing scaling, data harmonization and scaling exercise. The training school will also include some general aspects of cybernetic web of experimental structures and Big Data management. The training school will allow engaging participants to develop skills in developing and implementing cyber infrastructure to collect and wirelessly transmit to the Internet a fundamental set of forest and environmental measurements from the sites forming the ESFONET network for Climate Smart Forestry monitoring.

#### ***Trainers***

- Dr. Luca Belelli Marchesini** (FEM, Italy)
- Dr. Michele Dalponte** (FEM, Italy)
- Dr. Lorenzo Frizzera** (FEM, Italy)
- Dr. Rachel Gaulton** (Newcastle University, UK)
- Dr. Damiano Gianelle** (FEM, Italy)
- Prof. John D. Marshall** (SLU, Sweden)
- Dr. Roberto Monsorno** (EURAC, Italy)
- Prof. Melanie Smith** (University of the Highlands and Islands, UK)
- Prof. Mirco Rodegherio** (University of Trento)
- Prof. Roberto Tognetti** (University of Molise, Italy)
- Prof. Riccardo Valentini** (University of Tuscia, Italy)
- Dr. Cristiano Vernesi** (FEM, Italy)
- Dr. Loris Vescovo** (FEM, Italy)
- Dr. Roberto Zampedri** (FEM, Italy)

## *Tentative program*

### **Sunday, 30 June 2019**

Arrival of the participants to San Michele all'Adige

### **Monday, 1 July 2019**

9:00 – 9:30 Training School opening (Damiano Gianelle)

9:30 – 11:00 Moving forward forest tree monitoring – overview (Riccardo Valentini)

11:00 – 11:30 Coffee break

11:30 – 12:30 Setting the scene of monitoring plot establishment - which measurement to make, where to install instruments, how to transmit data (Roberto Zampredi, Lorenzo Frizzera)

12:30 – 14:00 Lunch

14:00 – 16:00 Simulating experimental setup and data collection (*TREE TALKERS* in experimental plots)

16:00 – 17:00 Analysis of data and pattern recognition (*TREE TALKERS* in the lab)

17:00 – 18:00 Plenary discussion on tree monitoring and forest dieback (Roberto Tognetti, Melanie Smith)

### **Tuesday, 2 July 2019**

9:00 – 10:30 An Open hardware and software technology platform suited to develop wireless IoT applications in the field of environmental monitoring - In class introduction and Lab activity (Roberto Monsorno)

10:30 – 11:00 Coffee break

11:00-12:00 An Open hardware and software technology platform suited to develop wireless IoT applications in the field of environmental monitoring in class introduction and Lab activity (Roberto Monsorno)

12:00 – 14:00 Transport to experimental site and Lunch

14:00 – 16:00 Stand-level fluxes. Visit to the Cembra experimental site on N deposition (Mirco Rodegherio). Test in the field of the prototype build in the morning (Roberto Monsorno)

16:00 – 17:00 Return to FEM

17:00 – 18:00 Use of stable isotopes to couple forest carbon and water budgets (John D. Marshall)

20:00 Social dinner

### **Wednesday, 3 July 2019**

9:00 – 9:40 Introduction to remote sensing (Rachel Gaulton)

9:40 – 10:00 Ground-based and near-ground remote sensing of forest structure and dynamics. (Rachel Gaulton)

10:00 – 10:30 Proximal and Remote Sensing of Plant Traits (Loris Vescovo)

10:30 – 11:00 Hyperspectral and Lidar data for forestry applications (Michele Dalponte)

11:00 – 11:30 Coffee break

11:30-12:30 Field instrumentation: TLS, hyperspectral camera, spectroradiometers.

12:30 – 14:00 Lunch

14:00 – 16:00 Practical tutorials (in groups): TLS data (Rachel Gaulton); Spectral data (Michele Dalponte); Lidar data (Michele Dalponte, Loris Vescovo)

16:00 – 17:00 G-BIKE COST Action: tools for assessing and monitoring genetic resilience of mountain forests (Cristiano Vernesi)

17:00-18:00 Final remarks

### **Thursday, 4 July 2019**

Departure of the trainees from San Michele all'Adige