



EULife+ MONIMET (LIFE12 ENV/FI/000409)

FINAL STAKEHOLDER WORKSHOP

MONIMET seminar will be held on November 2, 2017, at 09:00 – 16:00 and CLIMATE seminar will be held on November 2, 2017, at 09:15 – 11:30, in Helsinki, Finland (*Finnish Meteorological Institute, Erik Palmenin Aukio 1*).

REGISTRATION: By October 26, from the workshop webpage.

WEBPAGE: <http://monimet.fmi.fi?page=Workshop2>

The workshop will also be broadcasted online in the workshop webpage.

AGENDA: EU Life + MONIMET project Final Seminar on Climate Change Indicators and Vulnerability of Boreal zone ecosystems and a Climate modeling seminar: Dealing with uncertainties

November 2, 2017

9:00 Welcome & Introduction *Tuula Aalto and Ali Nadir Arslan*

9:15 – 11:30 Chair: Ali Nadir Arslan (FMI)

Claire Treat (UEF): “The relative role of non-growing season methane fluxes in wetlands and uplands ecosystems across temperate, boreal and tundra biomes”

MONIMET: Novel measurements and analysis tools – snow and vegetation phenology observations from leaves to regions

Mikko Peltoniemi (LUKE): “Use of cameras to track phenology of trees, experiences from Monimet project.”

Kristin Böttcher (SYKE): “Satellite observations of vegetation phenology and snow”

Terhikki Manninen (FMI): “Darkening of seasonal snow in Finland”

Boris Tûpek (LUKE): “Webcam observations of forest canopy and understory in connection to soil respiration”

Cemal Melih Tanis (FMI): “Automatic digital image processing system for multiple camera networks - FMIPROT”

11:30 – 12:15

Lunch break

12:15 – 14:00 Chair: Kristin Böttcher (SYKE)

Tero Mielonen (UEF): “How to take uncertainties into account when quantifying relationships between different quantities?”

MONIMET: Modeling climate change indicators and their uncertainties. Vulnerabilities.

Tuula Aalto (FMI): *'Soil-vegetation-atmosphere models for estimating climate change effects on boreal ecosystems'*

Tiina Markkanen (FMI): *“Extracting ecosystem climate change indicators from century long simulations”*

Annikki Mäkelä (UHeI): *“Assessment of uncertainty of climate change indicators ”*

14:00

Coffee break

14:15 – 15:00 Chair: Victoria Sinclair (UHeI)

Ari Leskinen (UEF): "Recent activities at the UEF Aerosol physics, chemistry, and toxicology research unit ILMARI"

15:00 - 16:00 Chair: Mikko Peltoniemi (LUKE)

MONIMET: Vulnerability assessments and new Climateguide.fi contents

Katri Rankinen (SYKE): *“Vulnerability assessment of nitrates in drinking water in near future”*

Maria Holmberg (SYKE): *“Boreal forest ecosystem services under climate change”*

Tiina Markkanen (FMI): *“A brief view on the MONIMET variables in Climateguide.fi”*

16:00 – 18:00

Posters

17:00 – 19:00

Buffet

18:00 – 22:00

Sauna and beverages

November 3, 2017

Dealing with uncertainties in climate modeling

Chair: Tuula Aalto (FMI)

9:15

Aki Tsuruta (FMI): “Uncertainty estimates in inverse models”

9:35

Petri Räisänen (FMI): “Accounting for internal climate variability in the analysis of climate model results”

9:55

Heikki Järvinen (UHeI): “Sources of uncertainties in weather, climate, and air quality forecasts”

5 minute break

10:20

Pirkka Ollinaho (FMI): “Model uncertainty – lessons learned from weather and seasonal timescale predictions”

10:40

Narasinha Shurpali (UEF): “Dealing with uncertainty in ecosystem models”

11:00

Clémence Rose (UHeI): will give a talk on uncertainties in modeling monoterpene emissions – title to be announced later

11:20 – 11:30

Discussion and closing remarks

Contact: Ali Nadir Arslan (ali.nadir.arslan@fmi.fi)

<http://monimet.fmi.fi>

INTRODUCTION

The increased temperature in the boreal region has extended the growing season. Especially the spring recovery of photosynthesis has the potential to start earlier, which increases the net uptake of CO₂. In the autumn, on the other hand, higher temperatures increase soil respiration (CO₂ emission). This has been shown to be significant during the warm late autumns, when low light levels cannot anymore maintain high photosynthesis levels. During the summer, the changing climate may increase the carbon uptake due to enhanced gross primary production (GPP). However, net uptake may also be reduced as a result of increased respiration or if excess heat and droughts reduce GPP. The drier and warmer conditions are also suggested to increase the frequency of forest fires. In addition to meteorological factors, carbon sinks are enhanced by the direct influence of higher CO₂ levels (CO₂ fertilization) and increasing nitrogen availability (atmospheric deposition and mineralization in the soil).

MONITORING & MODELING TECHNIQUES

In MONIMET project, flux measurements by Eddy Covariance (EC) technique at six Finnish forest sites with the longest time series spanning over 15 years are used. In order to study the influence of climate change, these results are up-scaled in time and space. For this, modelling techniques are implemented at various scales (process models, land surface/biosphere models, global transport models), as well as the inversion technique based on tall-tower measurements of background concentrations. The use of web cameras are also investigated in upscaling and monitoring ecosystem processes. Image colour information provides a useful and cost-efficient way to monitor leaf onset and snow cover from broad areas, and they can be used as proxies and indicators of spring timing, for example. In addition, ecosystem behaviour can be monitored with earth observation satellites, which provide global data on various environmental variables.

Moreover, in MONIMET, an extensive network of web-cam phenological observation sites in Finland is implemented. The data is used to assess the indicators produced with the models. Finally, the models are run with climate scenario data, and consequently the impact of the climate change on land surface can be observed in terms of climate change indicators.

RESULTS WE AIM TO ACHIEVE

The main results of the project are to estimate vulnerability of boreal forest ecosystems to climate change impacts in the future, and to assess uncertainties due to measurements, climate models and ecosystem models. Results we aim to achieve can be listed as below

- 1. A harmonized webcam network for monitoring the seasonal cycle in boreal ecosystem carbon exchange**
- 2. Demonstration of the mapping of climate indicators in boreal forest zone**
- 3. Demonstration of vulnerability assessment for Finnish municipalities to climate change effects in boreal forest**
- 4. Calibrated soil-vegetation-atmosphere model parametrisations for the boreal zone**
- 5. Estimates of the uncertainty of the results**