“Managing forests in the 21st century“

BOOK OF ABSTRACTS

Conference at the Potsdam Institute for Climate Impact Research

Telegrafenberg, 14473 Potsdam, Germany

3rd - 5th March 2020

Forest ecosystems, their products and services play an important role in achieving ambitious climate change mitigation objectives at the same time requiring profound adaptation to climate change. Forest management schemes to support climate action have to be developed within their regional context but also have to be aligned with national or EU-level climate, forest and sustainability policies.

The conference on “Managing forests in the 21st century” is the final conference of the FORMASAM, REFORCE and FOREXCLIM research projects. The conference brings together scientific experts on forest management from all over Europe facing very specific management challenges. The aim is to discuss and improve the understanding the role of forests and forest management in the context of climate change. The conference addresses climate change impacts, as well as needs for mitigation and adaptation especially with regard to the following scientific questions:

1. What are the impacts of climate extremes and disturbances?
2. What are the management challenges (and options) for resilient forests?
3. What can we do to increase the contribution of forest management to climate change mitigation?

Conference Organizing Team:

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Speaker: Nikica Ogris, Slovenian Forestry Institute, Ljubljana, Slovenia

„An on-line tool for detecting large-scale disturbances in forests using MODIS satellite time series“

We developed a web application for detecting large-scale disturbances in forests using NDVI time series. The NDVI time series were derived from MODIS time series from 2003 to 2018 for the whole of Europe with a spatial resolution of 500 × 500 m and a time resolution of one month. The on-line tool works as an interactive web map in which the user can make point queries for the analysis of the time series. The results are shown in two graphs: (1) the annual averages of NDVI of the selected raster cell; (2) the monthly averages of NDVI of the selected raster cell. Significant deviations from the overall averages depicts extreme weather events or large-scale disturbances. Additionally, standard deviation and autocorrelation values of vegetation index time series, two time series stability metrics, are shown for the selected point in the table.

The web application is result of the REFORCE project and available at:
https://www.zdravgozd.si/projekti/reforce/

Speaker: Werner Rammer, Technical University of Munich, Germany

„Projecting regeneration failure under future climate and fire regimes for Greater Yellowstone“

Multiple drivers are expected to accelerate environmental change in the 21st century, but the resilience of landscapes to these drivers remains uncertain. We asked if expected changes in climate and fire regimes can lead to widespread regeneration failure of forest types currently dominating the Greater Yellowstone Ecosystem (GYE) in the western USA. We applied SVD (Scaling Vegetation Dynamics), a novel tool based on Deep Learning, to predict regeneration success for the three main forest types for the whole region under varying climate and fire scenarios. The deep neural network at the core of SVD was trained on post-fire regeneration success simulated by a detailed process based forest model (iLand). Dynamic SVD simulations were initiated from the current distribution of forest types in the GYE and driven by spatially explicit fire perimeters derived via statistical projections of climate and fire dynamics. The probability of postfire regeneration success was predicted based on forest type, climate, and the current distance to adult seed trees at a spatial grain of 1 ha. The model predicted regeneration failure between 8% and 21% (depending on fire and climate scenarios) of the total area at the end of the 21st century. Moreover, Douglas-fir and subalpine spruce/fir forests showed regeneration failure on up to 38% of the burned area and were less resilient to fire disturbance than lodgepole pine forests (up to 15%). We conclude that future climate and fire regime may lead to significant loss of forested area in the Greater Yellowstone Ecosystem.