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International Conference on Ozone and Plant Ecosystems

Report by Elisa Carrari, CNR, Italy, and Elena Paoletti, Coordinator of IUFRO Research Group 7.01.00 Impacts of Air Pollution and Climate Change on Forest Ecosystems - https://www.iufro.org/science/divisions/division-7/70000/70100/

Ozone pollution continues to be a serious issue for terrestrial ecosystems and plant health. The conference on 21-25 May 2018 in Sant'Apollonia Auditorium Florence, Italy, allowed experts in the field of interactions between ozone and plant ecosystems to meet and discuss the state-of-the-art and future strategies for decision-makers. In their discussions the 107 participants from 29 countries focused on three main subjects:

- Monitoring, modelling and assessing the risk of ozone damage to plant ecosystems
- How plant ecosystems respond to ozone exposure
- How plant ecosystems affect ozone concentration in the atmosphere

Thanks to the broad participation of experts from different countries and subjects, the conference offered an important opportunity to define the state-of-the-art of the challenging interactions between ozone and plant ecosystems. Even if control measures for ozone are becoming effective, especially in Europe and North America, there is an urgent need to fill research and knowledge gaps and to collaborate for future strategies for decision-makers at global level.

More knowledge is required in the field-based evidence of impacts (monitoring and experimental data and use of epidemiological data) as well as in the understanding of ozone interactions with other stressors related to the changing climate. The flux-based metrics are confirmed to be the most biologically relevant indicators for ozone risk assessments and must be proposed as standards for ecosystem protection. The conference revealed the need to improve the research network and establish a science policy framework, especially, in developing regions.

Among the next goals are the inclusion of ozone impacts in crop and tree growth models, the modelling of future impacts in the context of a changing climate (e.g. drought, elevated CO2) and the elaboration of new epidemiologically-based ozone critical levels for ecosystem protection against ozone, as recommended by EU NECD and LRTAP convention. As a future activity, scientists should work for a better definition of ozone impacts on the complexity of ecosystem services, as well for the investigation of 'management' solutions for crops, forests and semi-natural ecosystems.

In addition, new opportunities in the field are related to studies focusing on the economic-social and environmental evaluation of ozone impacts on crops, terrestrial ecosystems and human health. Ozone experts can also collaborate for greening cities to improve air quality and well-being, defining the most suitable species differentiated for geographical areas. Finally, all participants agreed that the community should work for improving knowledge transfer to stakeholders, in particular policy makers, regarding the ozone and plants issues.

Presenting the ongoing experiments in the FACE facility at CNR (Sesto Fiorentino) during the study tour.
Photo credits: Dr. Barbara Moura and Mr. Lorenzo Bussotti

Website:
https://conference2018.wixsite.com/ozoneandplants

Book of Abstracts (2.4 MB, PDF):
https://www.iufro.org/download/file/28925/6631/70100-et-al-florence18-abstracts_pdf/

The conference was organized by IUFRO Research Group 7.01 Impacts of Air Pollution and Climate Change on Forest Ecosystems, and ICP-Vegetation, and involved IUFRO Working Party (WP) 7.01.02 Genetic, biochemical and physiological processes, WP7.01.05 Modelling and risk assessment, and WP7.01.09 Ground-level ozone.

Host organizations and sponsors were: ARCHES, Regione Toscana, MOTTLES (LIFE15 ENV/IT/000183) and MITIMPACT (ALCOTRA 2017-2020)

The meeting also included a study tour to the Ozone Free Air Controlled Exposure facility (FO3X) in the experimental area of the National Research Council of Sesto Fiorentino (Florence, Italy).