

Monitoring, surveying, modeling and mapping to detect ozone effects on forests in Trentino (Italy) - the ozone EFFORT project

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Ozone phytotoxicity has been widely investigated, with different experimental approaches and considering different response indicators and vegetation types. Nevertheless, with few exceptions, quantitative information on potential and actual effects on forests is scarce in Italy, due to limitations related to ozone data and systematic investigations.

On the basis of reported exceedances of ozone critical levels for vegetation in Trentino (North Italy, 347.000 ha of forests), in 2007 a 5-year study was started aiming to understand the actual levels of ozone in forest and the real impact on forest vegetation.

The project - based on the integration and analysis of measures, models, forest monitoring and inventory data - was planned according to different, complementary steps:

- measurements of ozone concentrations with passive samplers, systematically located on 15-21 forest sites;
- modeling (i) to estimate ozone concentrations and exposure (AOT40) with a 1x1 km resolution and (ii) to estimate the ozone stomatal flux for one test site and over a 15-years period;
- assessment of ozone-specific leaf injury, through investigations on *ad-hoc* introduced bioindicators and on native species;
- evaluation of non-specific effects, based on a correlative study between data on growth and health of forest trees (UN ECE Level I and II forest monitoring sites) and levels of ozone.

Results in terms of ozone concentrations, exposure, uptake, injury on woody species and relationship between ozone, environmental factors and tree health and growth will be presented.