Progress ICP Vegetation* in 2016 and remaining 2016-2017 activities

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(CEH Bangor, UK),
and the participants of the ICP Vegetation

* Supported by Defra (UK), NERC (UK) & UNECE
Field-based evidence of ozone damage on vegetation in Europe coherent with risk of damage as estimated from ozone flux, with damage being widespread.

Epidemiological study Switzerland – reduction annual tree growth: 19.5% and 6.6% for deciduous and coniferous trees respectively (Braun et al., 2014. Environ. Pollut.)
Chapter 4: Impact of ozone on biodiversity, including case studies

http://icpvegetation.ceh.ac.uk

2013

2015

Assessment of the impacts of ozone on biodiversity in terrestrial ecosystems: Literature review and analysis of methods and uncertainties in current risk assessment approaches

Bergmann et al., Thünen-Institut für Biodiversität, Braunschweig

http://www.umweltbundesamt.de/en/publikationen/

2016

Growth of forbs and deciduous trees tend to be more responsive to ozone than grasses and coniferous trees
### Natura 2000 habitats at risk

<table>
<thead>
<tr>
<th>Grassland area in grid cell (%)</th>
<th>POD$_1$ grass (mmol m$^{-2}$)*</th>
<th>&lt;5</th>
<th>5 - 15</th>
<th>15 - 20</th>
<th>20 - 25</th>
<th>25 - 30</th>
<th>&gt;30</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>0.5 – 5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5 - 10</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
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<tr>
<td>&gt;10</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
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</table>

Grassland POD$_1$ (April – September) (Simpson et al., 2012) (0.50° x 0.25°)

E5: Woodland fringes area Natura 2000 sites at risk from ozone (area provided by CCE)
Ozone critical levels workshop (1.2.2, science)

Preparation expert workshops:

- 23 – 25 November, 2015: Critical Levels Methodology Workshops, Sweden*
- 7 – 9 June 2016: Workshop on deriving dose-response functions, Deganwy, UK (with financial support from Switzerland*)
- 7 – 9 November 2016: UNECE Ozone Critical Levels Workshop, Madrid, Spain*:
  - Summary document with response functions and options for critical levels
  - Background document with scientific support for decisions to be made

Deliverables 2017:

- Report on revised ozone risk assessment methods for vegetation
- Revision of Chapter 3 Mapping Manual

* Thank you for contribution in kind!
Since 2014, new Moss Survey Coordination Centre at the Joint Institute for Nuclear Research, Dubna, Russian Federation

<table>
<thead>
<tr>
<th>Rest Europe (17)</th>
<th>Rest Europe</th>
<th>SEE Europe (9)</th>
<th>EECCA (8)</th>
<th>Asia + Africa (6)</th>
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</thead>
<tbody>
<tr>
<td>Austria</td>
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<td>India</td>
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<td>Latvia</td>
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<td>Croatia</td>
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<td>Iceland</td>
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<td>Turkey</td>
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</tbody>
</table>

2018: - Report moss survey 2015/16
- 8\textsuperscript{th} BioMAP workshop in Dubna (Biomonitoring of Air Pollutants, with emphasis on trace elements)
First Asian Air Pollution Workshop, 31 October – 2 November 2015, University of Tokyo. Harry Harmens gave keynote lecture.

- 38 participants: 31 from Asia (China, Japan), 7 from Europe
- Lack of integrated structure for air pollution research in Asia, such as LRTAP Convention, where scientists and policy makers meet
- 2nd workshop: 22 – 23 October, 2016, Beijing, China.

ICP Vegetation contributes to Tropospheric Ozone Assessment Report (TOAR): Global metrics for climate change, human health and crop/ecosystem research’ www.igacproject.org/TOAR

- Gina Mills is lead author for chapter on ozone metrics for vegetation; several other ICP Vegetation participants contribute too

Gina Mills attended TF HTAP Workshop, 17 – 19 February, 2016, Potsdam, Germany: ‘Assessing the impacts of future global air pollution scenarios’
ICP Vegetation participation

Outside UNECE:
- China
- Cuba
- Egypt
- Guatemala
- India
- Japan
- Mongolia
- Pakistan
- South Africa
- South Korea
- Thailand
- Vietnam

Ca. 90 experts from 33 countries

29th ICP Vegetation TFM, Dubna, Russian Federation

ICP Forests EMEP-MSC/East Secretariat

SEE: 8
EECCA: 6
Rest Europe: 11
Rest world: 8
Common activities WGE-EMEP

Contributions to WGE trend report, Scientific Assessment Report 2016

Key messages:

- Large areas in Europe remain at risk of adverse impacts of ozone on vegetation (including crops)
- Global cooperation required to reduce risk of ozone impacts on vegetation in Europe (focus on methane emission abatement)

- Group set up between EMEP/MSC-West and ICP Vegetation to discuss options for regional parameterisation of stomatal ozone flux model incorporated EMEP model, to calculate phytotoxic ozone dose for Mediterranean vegetation (1.1.1.7)
Welcome to ICP Vegetation

The International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops

The ICP Vegetation was established in 1987 under the United Nation Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (LRTAP). The ICP Vegetation is an international research programme investigating the impacts of air pollutants on crops and (semi-)natural vegetation and reports to the Working Group on Effects (WGE). The programme focuses on the following air pollution problems: impacts of ozone pollution on vegetation and the atmospheric deposition of heavy metals and nitrogen to vegetation. In addition, the ICP Vegetation is taking into consideration impacts of pollutant mixtures (e.g. ozone and nitrogen), consequences for biodiversity and the modifying influence of climate change on the impacts of air pollutants on vegetation. The results of studies conducted by the ICP Vegetation are used in assessments of the current, and predictions of the future, state of the environment. Thirty five Parties to the LRTAP Convention participate in the programme. The programme is led by the UK, has its Programme Coordination Centre at the Centre for Ecology and Hydrology - Bangor and is funded by the Department for Environment Food and Rural Affairs (Defra).

News

New reports/brochures:
- Annual report 2012/13 now available
- Ozone pollution: Impacts on ecosystem services and biodiversity
- Heavy metals and nitrogen in mosses: European survey 2010/11
- Benefits of air pollution control for biodiversity and ecosystem services (WGE full report and brochure)

27th ICP Vegetation Task Force Meeting, 28-30 Jan 2014, Paris, France

Thank you!

http://icpvegetation.ceh.ac.uk