ICP Vegetation, March 2014

With contributions from:

- **CCE** (critical loads data & maps)
- **EMEP/MSC-West** (ozone flux and concentration)
- **EMEP/MSC-East** (HM and POPs data and maps)
- **SEI-York** (South-East Asia)

Report will be translated into Russian too
Air pollution deposition and impacts on vegetation in EECCA and SEE:
- Nitrogen
- Ozone
- Heavy metals
- POPs

Concentrations and effects of air pollutants on vegetation in South-East Asia:
- Ozone
- Nitrogen
- Atmospheric aerosols
- Heavy metals

Country reports:
SEE:
- Albania
- Croatia
- FYR Macedonia
- Greece
- Romania
- Serbia
- Slovenia

EECCA:
- Russian Federation

Other:
- Egypt

EMEP/WGE, 17 Sept 2014, Geneva
EMEP monitoring stations

- Lack of stations in SEE and EECCA region
- Also true for effects monitoring
N Cload exceedance generally higher in Western & Central Europe

Improvements generally lower in EECCA countries

EMEP/WGE, 17 Sept 2014, Geneva
Risk of ozone damage to forests

South-East Europe at highest risk

* Flux-based: assumes no water limitation
## Asia: Losses in wheat yield due to ozone

<table>
<thead>
<tr>
<th>Country</th>
<th>90 d AOT40 (European)</th>
<th>75 d AOT40 (Asian)</th>
<th>POD$_6$ (European)</th>
<th>POD$_{12}$ (Asian)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>6.4</td>
<td>7.2</td>
<td>14.9</td>
<td>10.3</td>
</tr>
<tr>
<td>India</td>
<td>8.2</td>
<td>8.9</td>
<td>22.3</td>
<td>9.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Relative wheat production loss 2000 (%)</th>
<th>Increase wheat production loss 2000-2020 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>8.4</td>
<td>8.1</td>
</tr>
<tr>
<td>India</td>
<td>7.1</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Tang et al. (2013) Global Change Biology 19, 2739–2752
HM: Modelled deposition and CLoad exceedance
B[a]P and PCDD depositions higher in SEE than EECCA, highest levels of HCB deposition in large part of EECCA and SEE region.

However, deposition of HCB has dropped by more than 87% since 1990.

Relatively small decline B[a]P and PCDD in EECCA countries since 1990 compared to the rest of Europe.
Conclusions and recommendations

- Lack of monitoring data on deposition of air pollutants to and impacts on vegetation particularly in EECCA and South-East Asia
- More measurement data needed to validate model outputs regarding air concentrations, deposition and impacts on vegetation
- Slower progress implementation air pollution abatement policies in EECCA and South-East Asia compared to rest of Europe

Thank you for your attention!

EMEP/WGE, 17 Sept 2014, Geneva