Achievements of ICP Vegetation* in 2014 & plans for the future

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ECE/EB.AIR/WG.1/2014/3, 8, 13

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33rd Session WGE, 17 – 19 Sept. 2014, Geneva

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27th ICP Vegetation TFM, Paris

- 28 – 30 January 2014, Paris. Hosted by the French Environment and Energy Management Agency (ADEME), in collaboration with AgroParisTech, INRA, Muséum national d'Histoire naturelle (MNHN) and Université Paris-Est Creteil (UPEC)

- 84 experts from 22 countries attended the meeting

- 28 January: one-day ozone critical levels workshop to review current status and make recommendations for amendments to Chapter 3 of the Modelling and Mapping Manual: 'Mapping critical levels for vegetation'. Discussion and recommendation finalised during TFM.

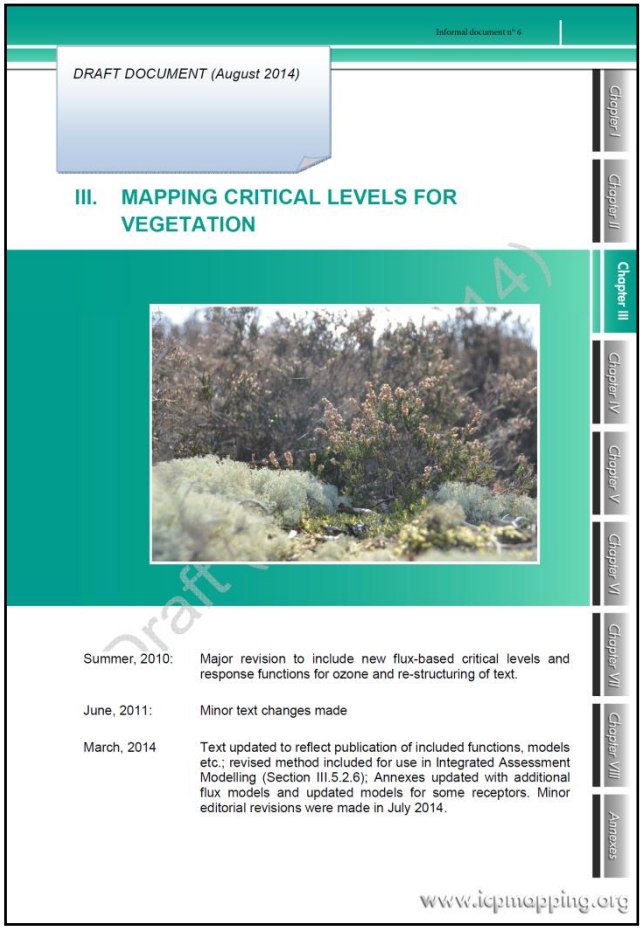
Revisions text Chapter 3 *(1.1.18)*

- ❑ **No changes to the existing critical levels**

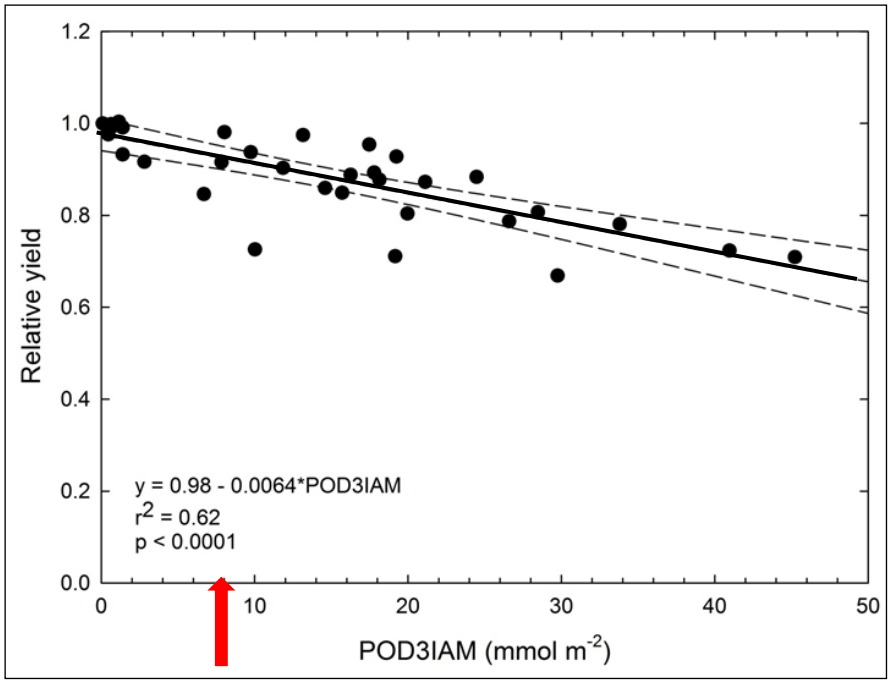
- ❑ **Annexes:**
  - Parameterisation ozone flux model for grapevine, maize, soybean, sunflower, poplar
  - Revised parameterisation wheat Mediterranean
  - References to published flux models for local scale application

- ❑ **Text related to integrated assessment modelling (Section III.5.2.6) updated:**
  - ○ New terminology for the simplified generic ozone flux – **$POD_Y IAM$** will replace $POD_Y gen$

    (POD_Y = Phytotoxic Ozone Dose above a flux threshold of Y nmol m^{-2} s^{-1})



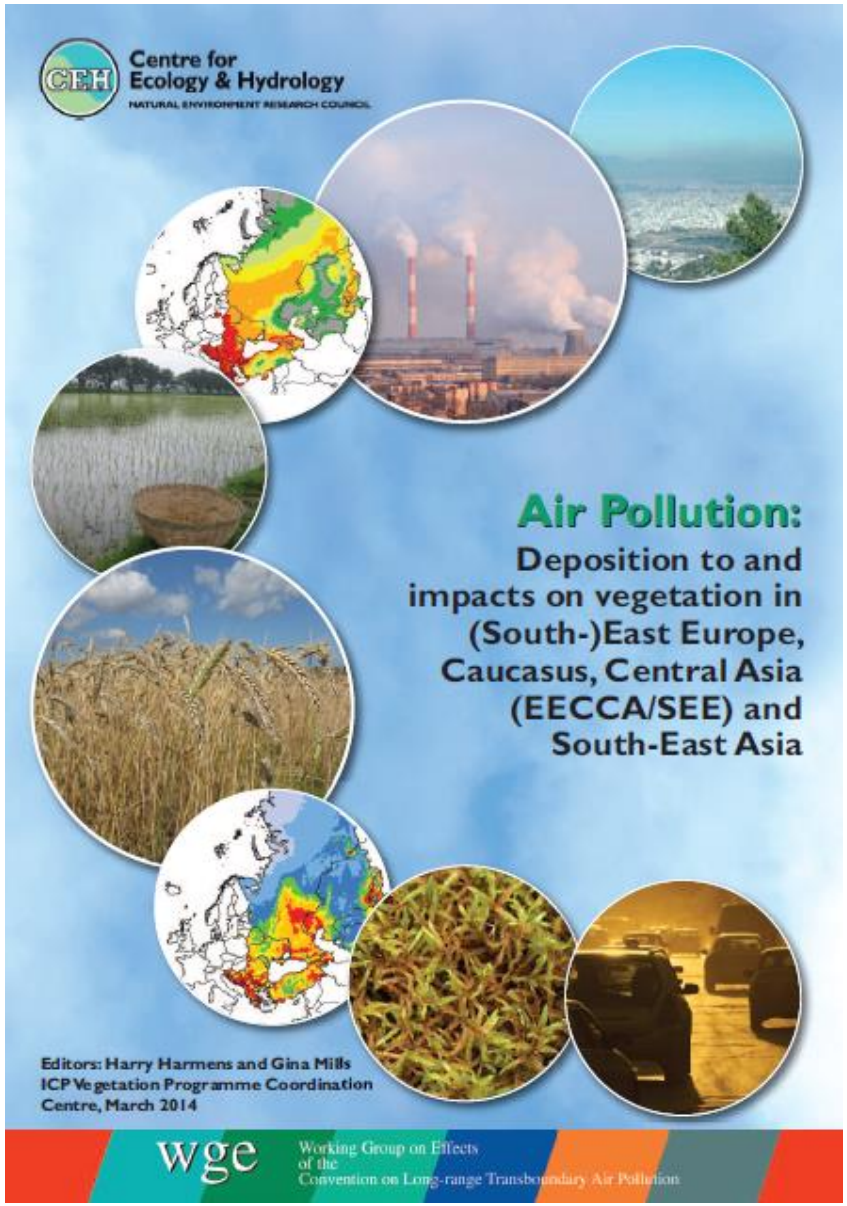
Ozone flux-effect relationship for IAM *(1.1.18)*



- New POD_3IAM – effect relationship for use in integrated assessment modelling at European scale only (for effects of ozone on wheat, 90 d exposure period)
- Critical level: 8 mmol m^{-2} (representing 5% yield decline)

- For use in scenario analysis and optimisation runs within GAINS to provide indication of potential effects on wheat yield under non-limiting water availability
- Two parameterisations flux model: 1) Northern & Central Europe, 2) Mediterranean areas (as defined in the M&M Manual)

EECCA/SEE & South-East Asia report *(1.1.10(b)/17(c))*



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)

Minor text amendments doc. 13

Report will be translated into Russian too

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New Smart phone App *(1.1.17(a))*

Recording incidences of leaf ozone injury

Smart-phone App linked to ICP Vegetation web site

Location on interactive map

Purpose:

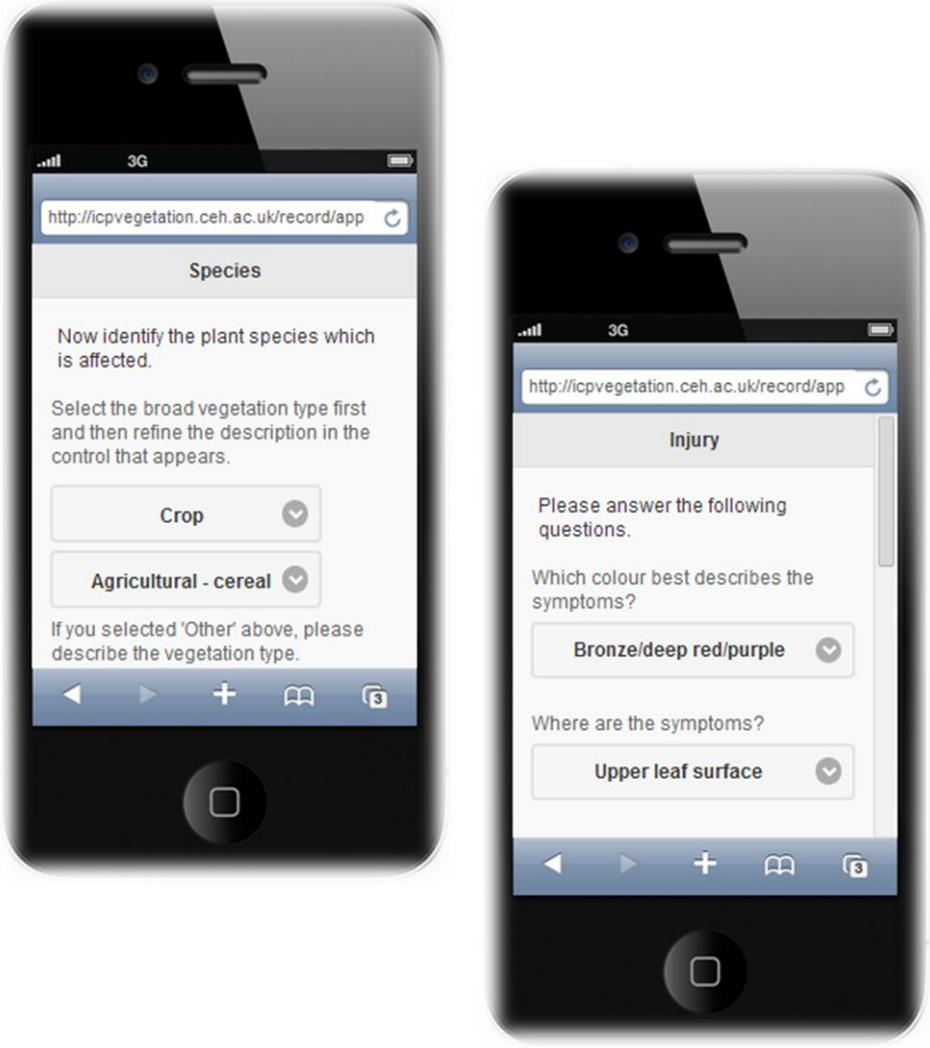
(1) Quantify extent of damage in changing profile

(2) Validate risk maps

Available at: http://icpvegetation.ceh.ac.uk

Smart phone App. set up

- Registration
- Level of experience
- Permission to use data
- Date and location
- Broad vegetation type & species (crops, trees, grassland, heathland, wetland & coastal)
- Upload photos of damage
- Symptoms of ozone injury
- Evidence of other injury
- Weather
- Ozone pollution (if known)

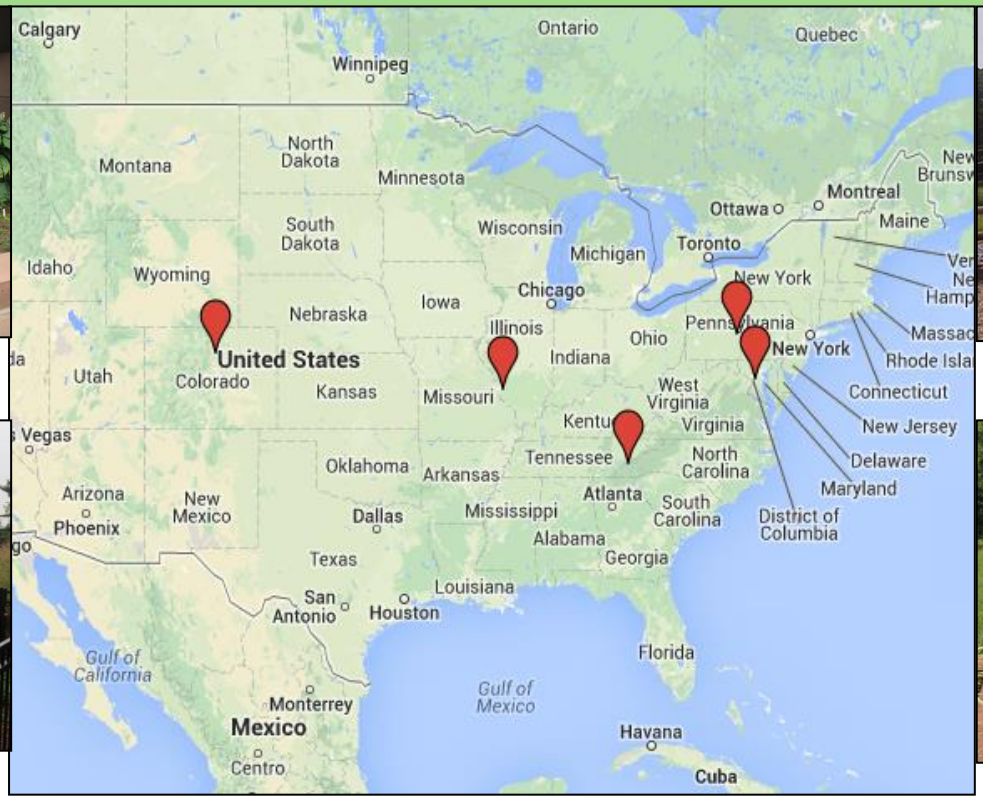


USA Ozone Bio-indicator Gardens

Boulder, Colorado

St. Louis University

Great Smoky Mountains NP



Penn State University

NASA Goddard Research Station, Maryland

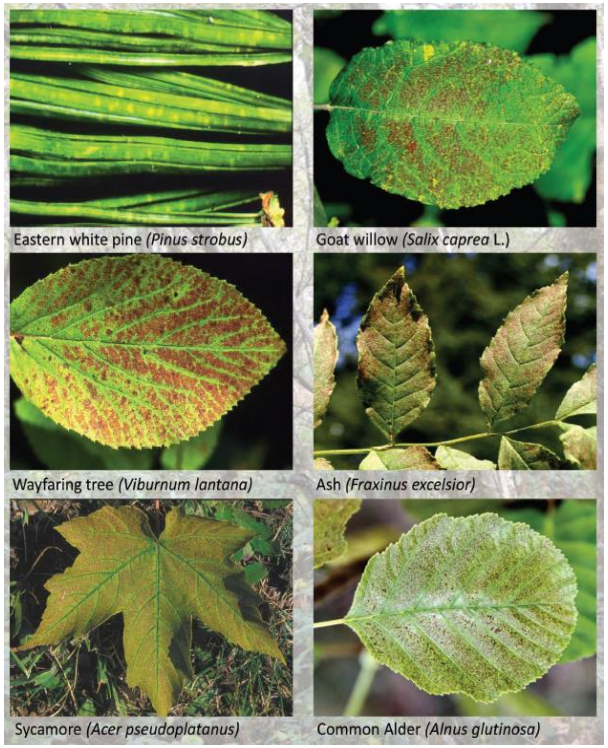
- Species include:
  - Snap bean
  - Cutleaf coneflower
  - Common or Tall milkweed

http://science-edu.larc.nasa.gov/ozonegarden/pdf/Bio-guide-final-3_15_11.pdf

Ozone leaf injury brochure *(1.1.17(a))*

Available in English and Russian

Trees



Crops

In collaboration with ICP Forests Expert Panel on Ambient Air Quality

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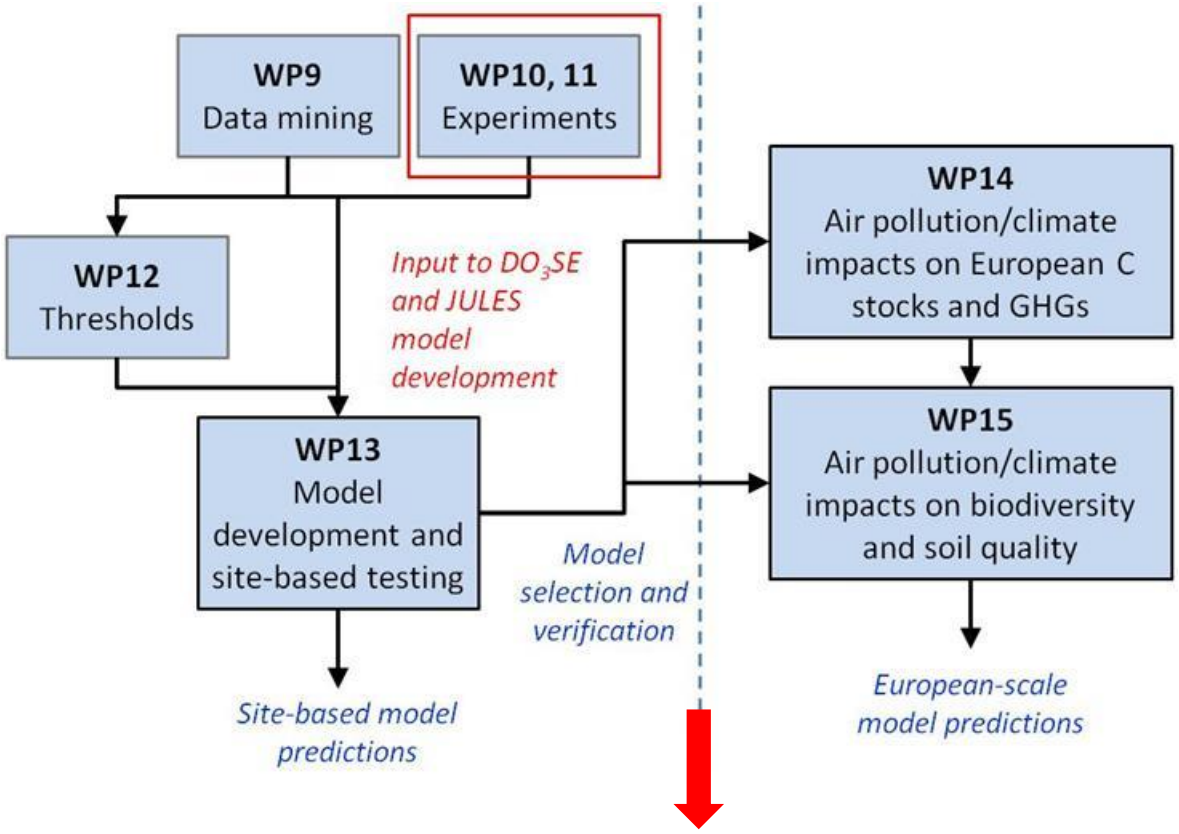
éclaire

Effects of climate change on air pollution impacts and response strategies for European ecosystems

SEVENTH FRAMEWORK PROGRAMME

(1.1.17(b))

- **How will climate change alter the threat of air pollution on ecosystems**?
- Measurements, models, innovative risk assessment and the economic implications
- **Focus on N and O_3** and their interaction with other pollutants
- 'New' experiments, and existing datasets from current/recent experiments across Europe



Integrated risk assessment and policy tools, including (economic) valuation

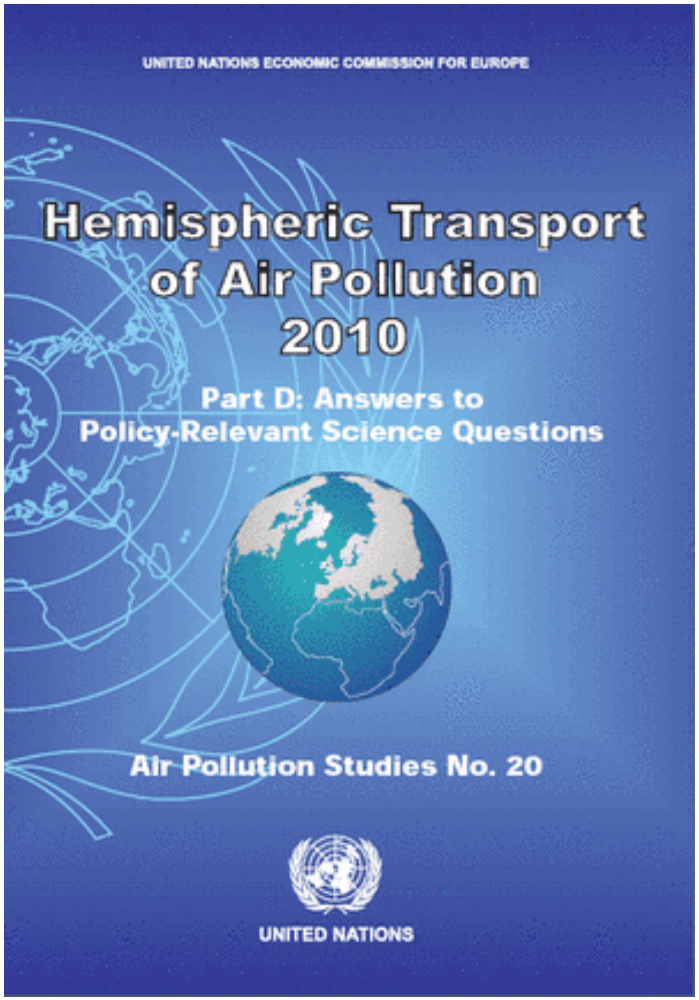
❑ **28 Sept – 2 Oct: Annual ECLAIRE Meeting, Budapest, Hungary**

Outreach to Asia *(1.1.10(c))*

- **'Ozone and Plants' conference, 18 – 21 May, Beijing, China**
  (Chinese Academy of Sciences, IUFRO, ICP Vegetation, TF HTAP)
- 102 experts, 17 countries; China active in research ozone impacts on vegetation
- **Important recommendations:**
  - Communicate to stakeholders – such as crop breeders, farmers and policy makers – the threat of ozone pollution to food security, carbon sequestration and other ecosystem services affecting human wellbeing
  - Collate further field-based evidence for ozone impacts on vegetation and develop critical levels under Asian conditions using Asian species/cultivars
- Follow-up conference in 2017 & **Asian Air Pollution Workshop in 2015**

http://icpvegetation.ceh.ac.uk/publications/documents/ReportOzoneandPlantsConferenceBeijingMay2014.pdf

Further collaboration with HTAP



- ❑ Flux-based ozone impacts on vegetation in next HTAP assessment:
  - ➢ Global maps: potential sensitivities of vegetation using fluxes
  - ➢ Compare with concentration-based methods for crops & forests
  - ➢ What is the robustness of impacts assessment methodology used in Europe or USA for regions such as Asia?
- ❑ Discussing outlines for collaborative papers

Medium-term workplan (1)

Annual activities:

- ❑ Report on supporting evidence ozone impacts on vegetation *(1.1.17(a))*
- ❑ Report on progress with the moss survey 2015/2016 *(1.1.19)*
- ❑ Contributions to common workplan items of the WGE *(1.1.10)*

2015:

- ❑ Report on implications of rising background ozone for vegetation in Europe *(1.1.17(d))* – feed into WGE trends report
- ❑ Report on the interacting effects ozone and N and climatic stresses on vegetation *(1.1.17(b))*

Tentatively for 2016:

- ❑ Report on field-based evidence of ozone impacts on vegetation
- ❑ Report on ozone impacts on biodiversity
- ❑ Ozone critical levels workshop

Medium-term workplan (2)

Tentatively for 2017:

- ❑ Report on revised ozone risk assessments methods
- ❑ Revision of Chapter 3 of the Modelling and Mapping Manual
- ❑ Report of the European moss survey 2015/2016

28th ICP Vegetation Task Force meeting, 3 – 5 February 2015, Rome, Italy

31st ICP Modelling and Mapping Task Force meeting, 25th CCE workshop, 20-23 April 2015, Zagreb, Croatia, with session on ozone and nitrogen interaction impacts on vegetation

Involvement EECCA countries *(1.1.10(b))*

- Translation reports and brochures in Russian
- New Moss Survey Coordination Centre: Joint Institute for Nuclear Research (JINR), Dubna, Russian Federation. **Lead: Marina Frontasyeva**
- Next 'European' moss survey: 2015/2016

For further details: see Annual Report 2013/2014

http://icpvegetation.ceh.ac.uk