

# Damaging effects of ozone: key questions

Ozone pollution damages:



Health



before



after

Textiles  
and rubber



Plants and  
ecosystems

**Gina Mills, CEH Bangor**  
**[gmi@ceh.ac.uk](mailto:gmi@ceh.ac.uk)**

# Ozone: health effects

Ozone is a **respiratory irritant** responsible for:



Children and the elderly are especially vulnerable

- 21 000 premature deaths on and after days with high ozone levels annually due to ozone in Europe (25 countries)<sup>1</sup>
- August 2003 heat wave – 1500 deaths in France due to ozone alone<sup>1</sup>
- 57 million lost work days per annum due to ozone-related respiratory illness<sup>2</sup>

There is no evidence of a threshold for short-term and long-term health effects – effects found at very low concentrations e.g below 35 ppb (SOMO35)<sup>2</sup>

# Ozone: health effects

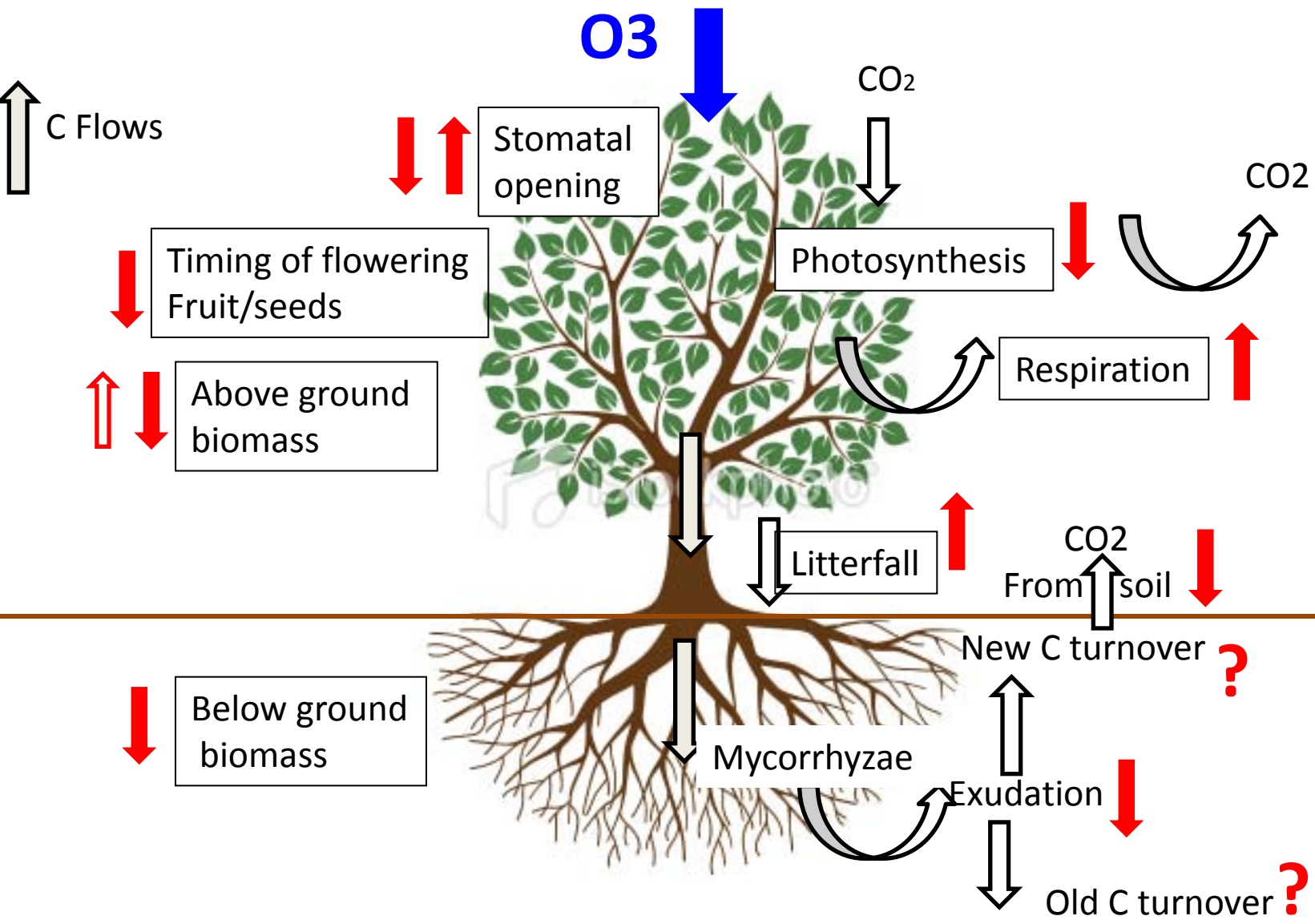


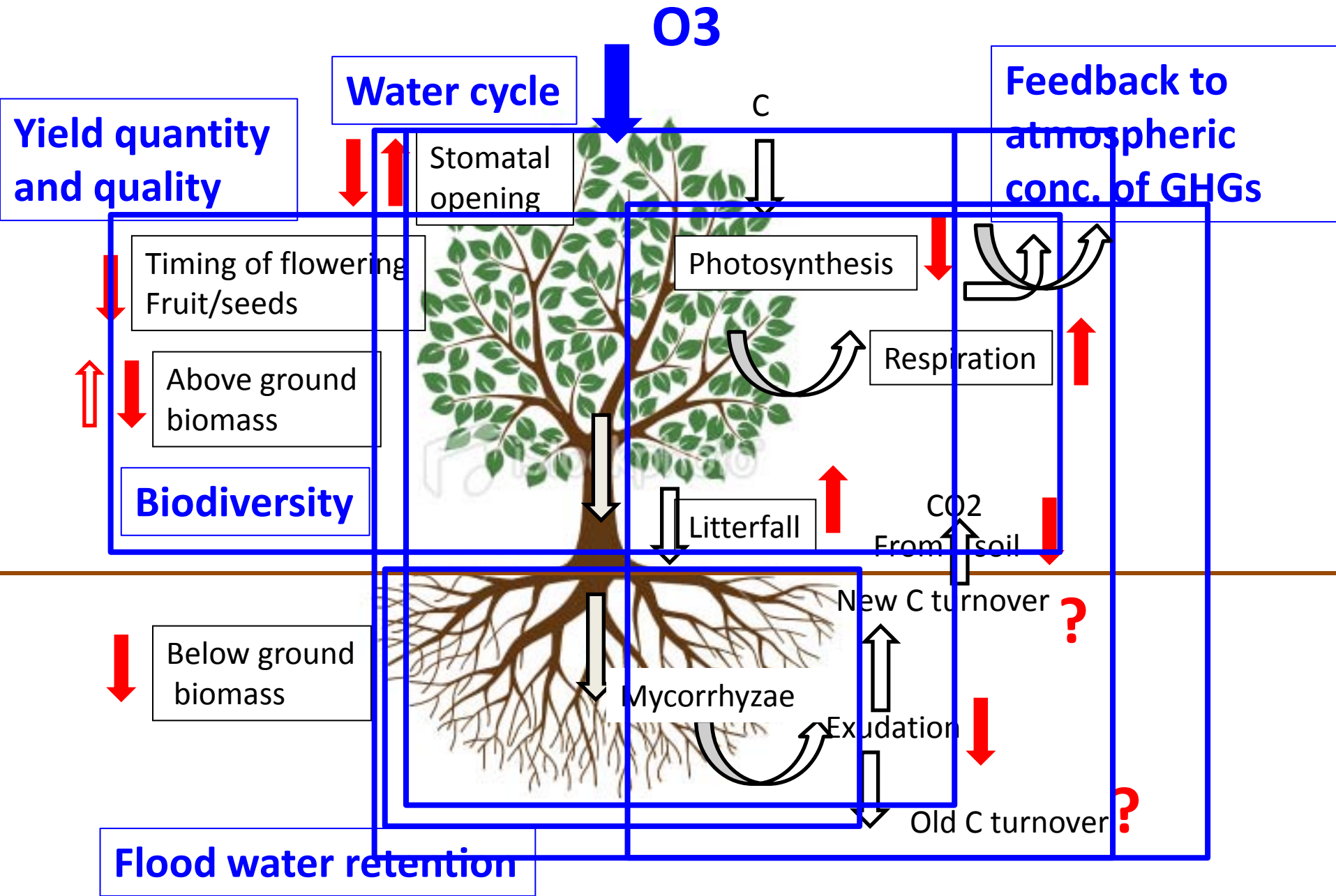
Children and the elderly are especially vulnerable

## Questions

- What are long-term consequences of chronic exposure to low ozone?
- Which metrics best capture ozone effects?
- What are the combined effects of ozone, particulates, heat stress etc.?
- By how much does vegetation affect ozone concentration and thus health effects?

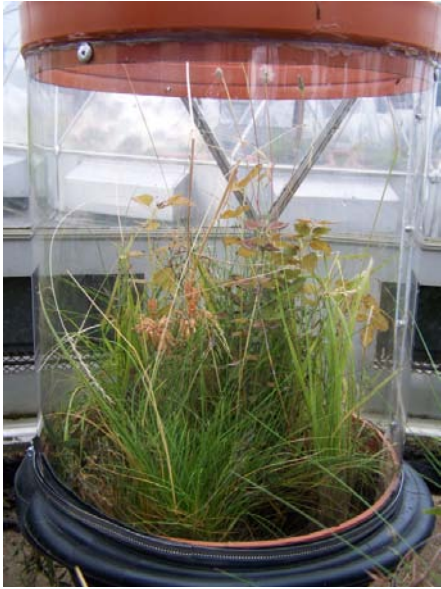
# O3 effects on ecosystem services





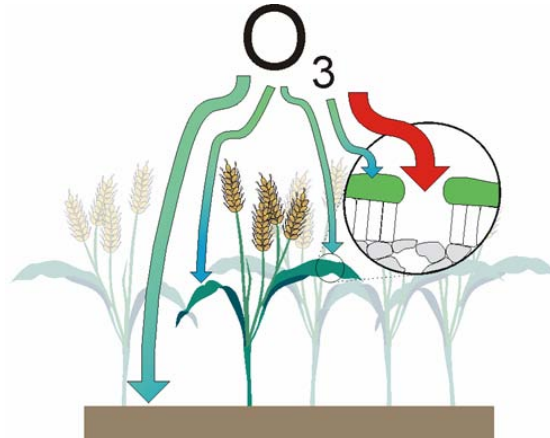


# Key questions – bridging the gaps



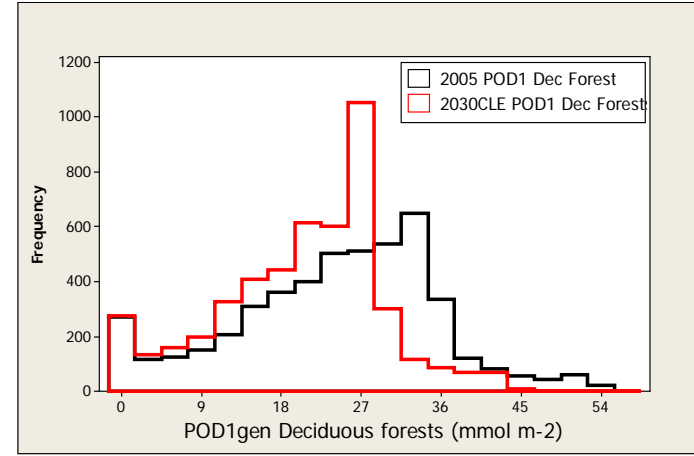
## Experiments

Mechanisms  
Species balance  
Pollutant interactions  
BVOCs



## Models

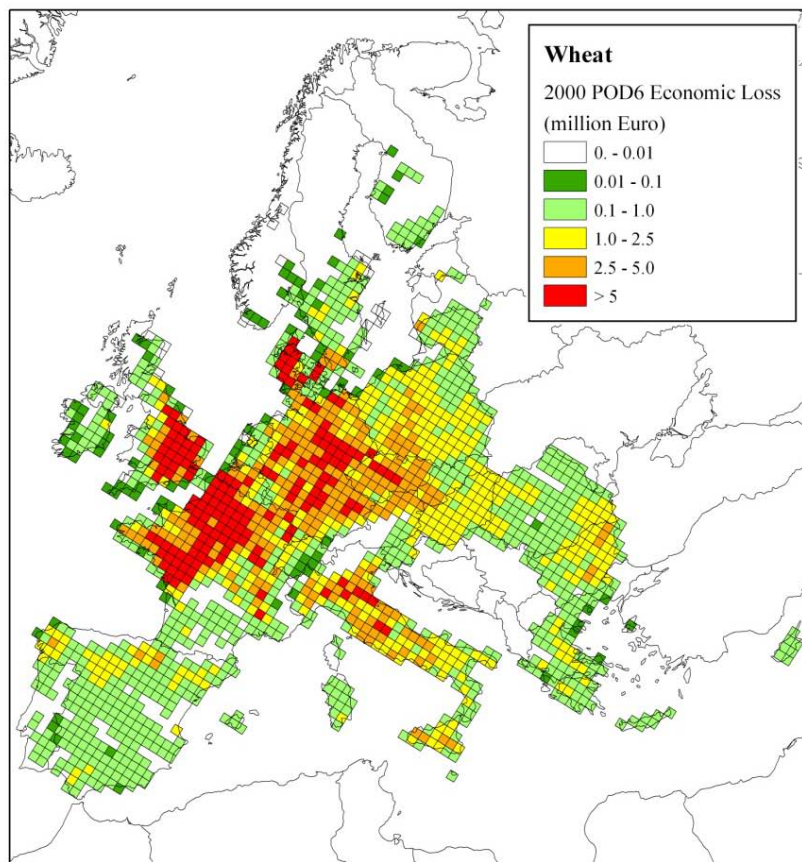
Atmospheric chemistry  
EMEP4UK  
DO3SE  
Land-atmosphere  
DGMVs



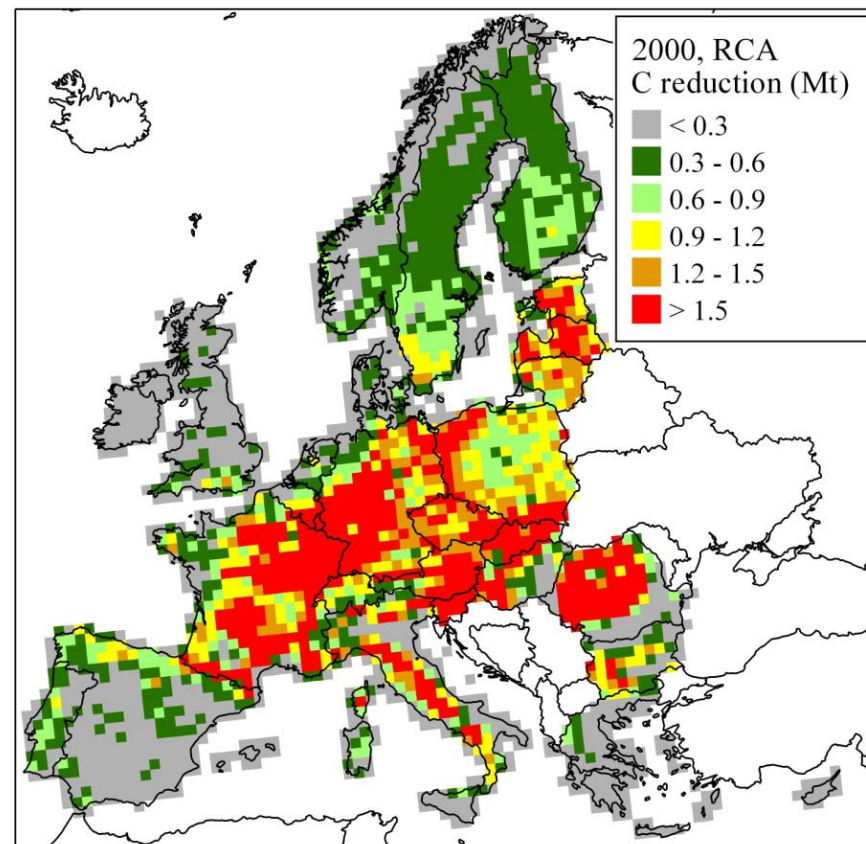
## Simulations

Scenarios  
Spatial analysis  
Economic valuations

# Key questions – informing policy



Crop yield e.g. Wheat in 2000



C sequestration in trees, 2000

Research by CEH, SEI-York and EMEP  
<http://icpvegetation.ceh.ac.uk>

# Bridging the gaps – instruments to impact assessments

## To be developed:

ICP Vegetation

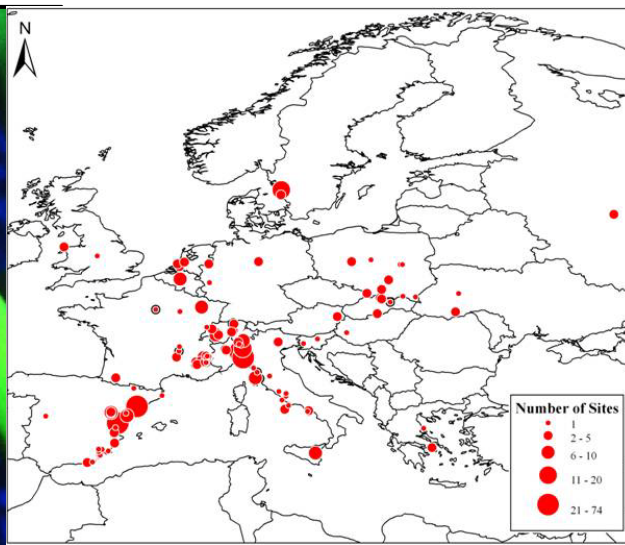
Web-page and iPhone App for recording incidences of visible ozone injury

**Aim:** track effects of ozone episodes across Europe (and outreach) **Citizen science activity**

Measuring aerosols on a smartphone, The Netherlands

iSPEX.nl

**Can this be achieved for ozone?**



meet fijnstof met je smartphone

