

# WG 2:

## Interactions between climate change, air pollution and ecosystems

C. Akselsson, L. Emberson, J.W. Erisman, M. Engardt, D. Fowler,  
M. Hallquist, H. Harmens, S. Hellsten, L. Högbom, H. Hultberg,  
P.E. Karlsson, J. Klingberg, J. Langner, L. Lundin, E. Mbaogu, F.  
Moldan, T. Morrissey, **J. Munthe**, H.S. Møller, G. Pihl Karlsson, H.  
Pleijel, S. Reis, **T. Spranger**, M. Ulstein

# Main topics

1. General: links between air pollution and climate change via ecosystem effects and feedbacks
2. Ozone effects and CC
3. Nitrogen effects and CC
4. Other CC feedbacks

# Presentations

- *M. Enghardt*: Climate change effects on air pollution
- *H. Harmens and J. Klingberg*: Ozone effects and climate / C feedbacks
- *S. Reis and F. Moldan*: C / N / climate interactions
- *C. Akseleson*: ...and biodiversity

# Ozone

- Strong indirect radiative forcing via ozone / CO<sub>2</sub> interaction with plants
- Flux modelling can capture these feedbacks
  - largest fluxes/effects in Central Europe
  - fluxes may decrease in the future
- Ozone reduction benefits AP and CC abatement

# Nitrogen

- Strong N effects on net GHG budgets incl C sequestration
- Strong time delayed but persistent N effect on biodiversity
- Various feedback mechanisms, effects not additive
- Ammonia N reduction high priority

# General conclusions and recommendations

- Biological feedbacks especially via N and ozone are essential for global CC models
- Need for
  - large-scale, long-term multi-component field studies
  - uncertainties and robustness analysis of more integrated models
  - formalisation of science, monitoring and policy interaction on CC / AP effects