



**FUTMON**  
forest monitoring for the future

## Forest Monitoring and Science

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*IUFRO Research Group 7.01 Impacts of Air  
Pollution and Climate Change on Forest  
Ecosystems*



a Life+ co-financed project for  
the "Further Development and  
Implementation of an EU-level  
Forest Monitoring System".



The project coordination centre  
is situated at the Institute for  
World Forestry, Hamburg,  
Germany.

## IUFRO – International Union of Forest Research Organisations

- the **global network** for forest science cooperation
- the **only world-wide** international organization devoted to forest research
- more than **15,000 scientists** in almost **700 Member Organizations** in more than 110 countries

### IUFRO RG 7.01

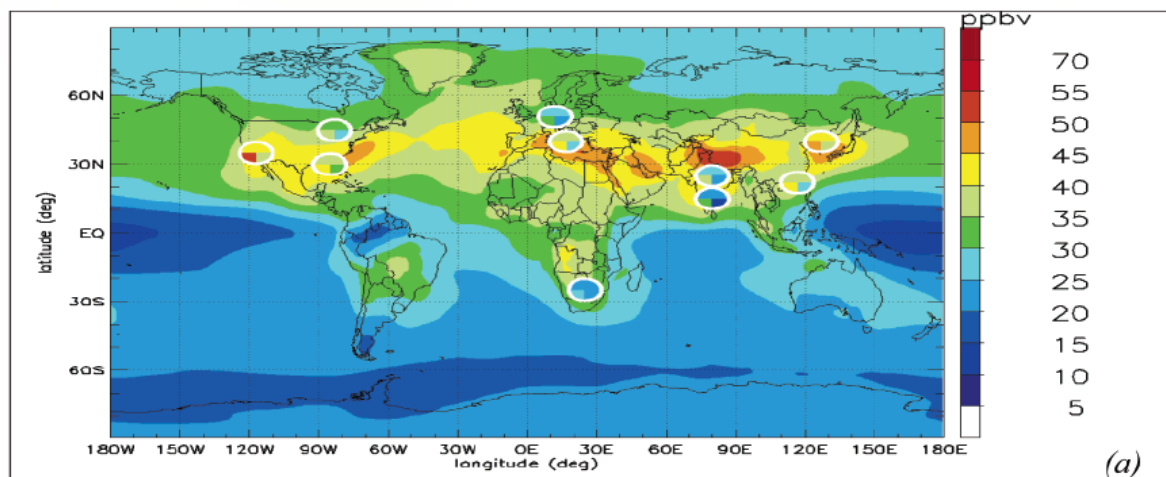
- Mission : to promote international cooperation, to encourage an interactive process between scientists, policy makers and representatives of local to regional governments and institutions, in order to share scientific knowledge and harmonize effective strategies aimed to reduce the risk for forests related to air pollution and climate change



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## Global change emergencies

### Tropospheric ozone



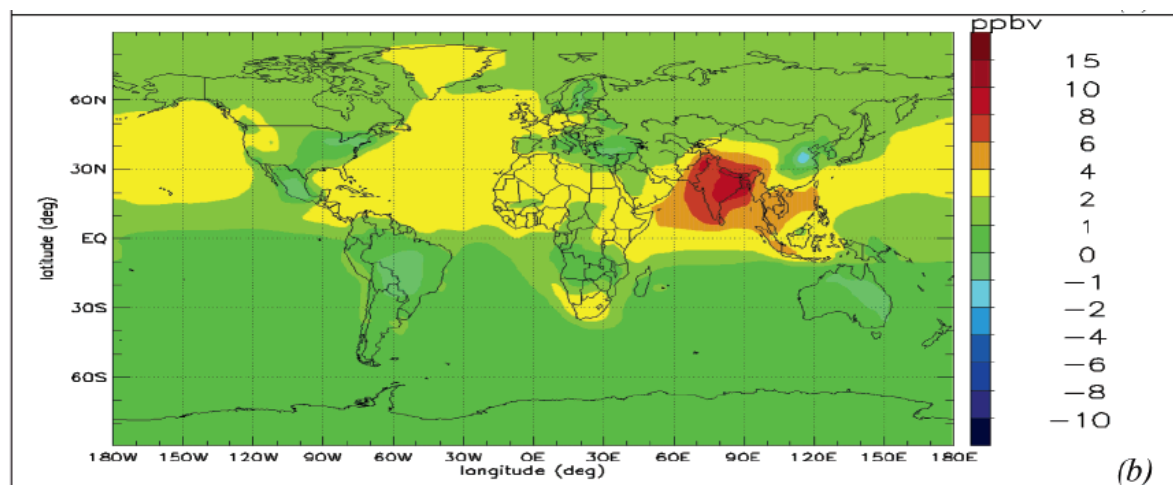
### Annual mean (ppb) 2000

Europe  $36.6 \pm 4.2$

United states  $38.7 \pm 4.9$

South East Asia  $31.5 \pm 4.4$

Southern Africa  $34.8 \pm 5.0$



### Increase (ppb) CLE2030

Europe  $+1.8 \pm 1.5$

United states  $+1.3 \pm 2.4$

South East Asia  $+3.8 \pm 0.7$

Southern Africa  $+1.4 \pm 3.9$



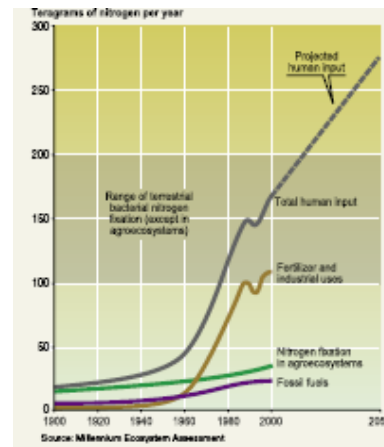
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# Global change emergencies

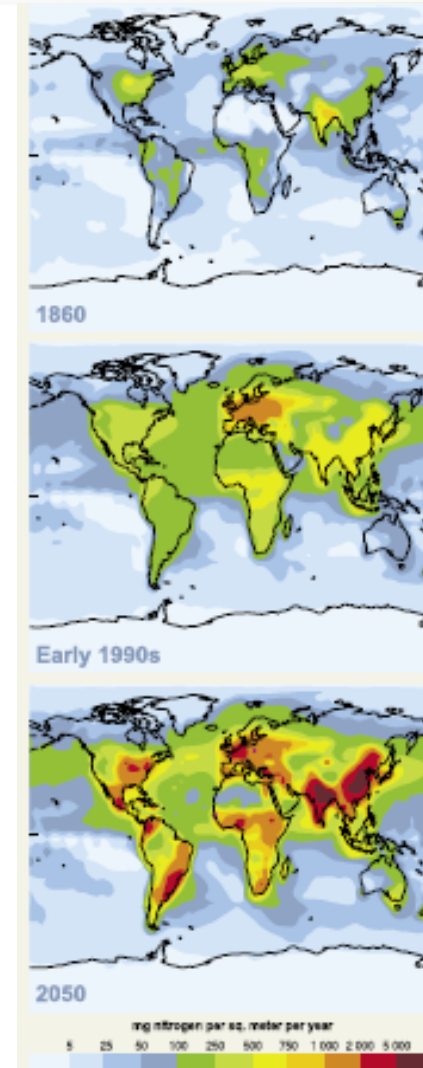
## Nitrogen deposition



Global trend in the creation of reactive Nitrogen (Nr) on Earth by human activities



Estimated total Nr deposition from the atmosphere



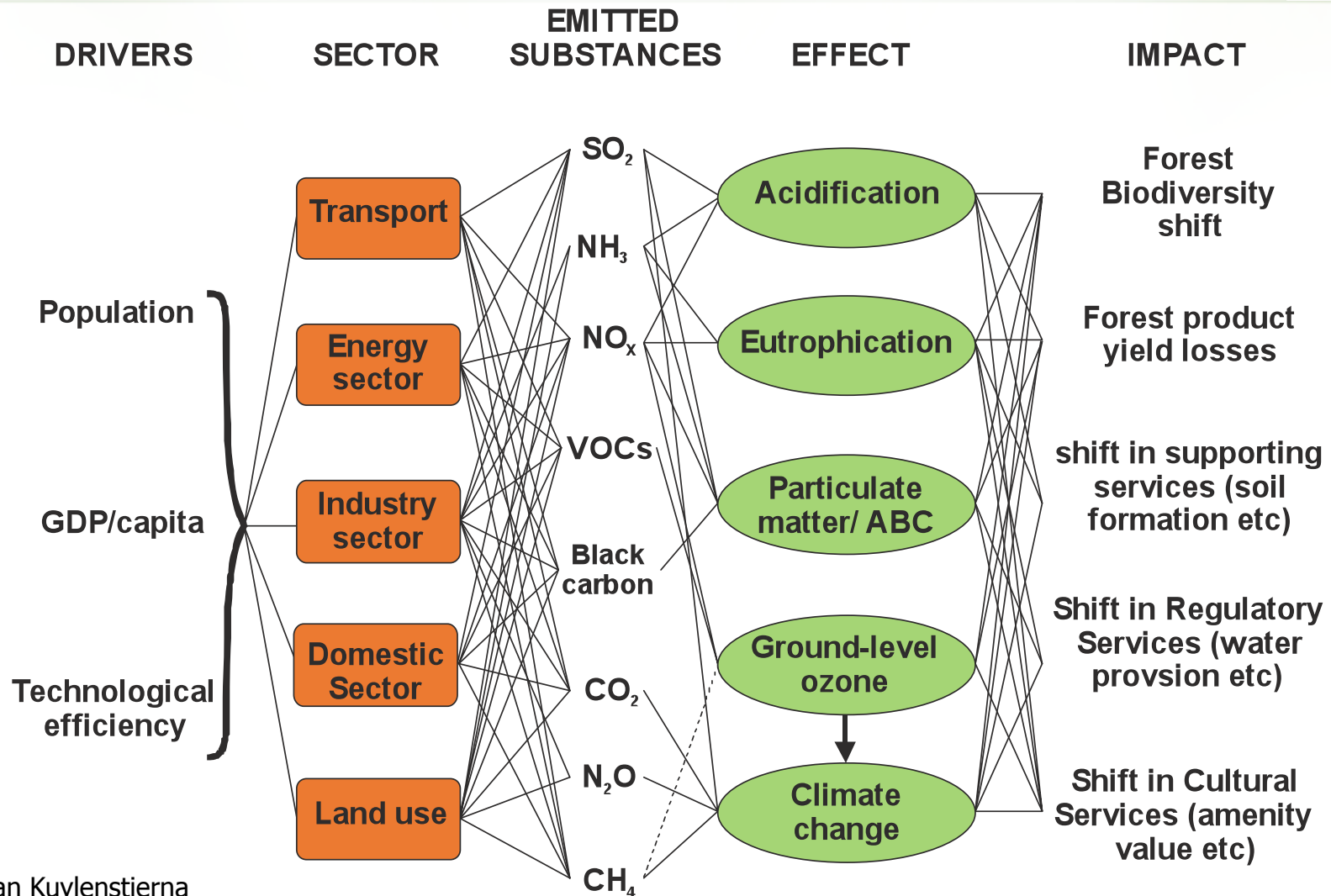




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# How to untangle the interlinkages?

Impacts on forest ecosystem services



By Johan Kuylenstierna

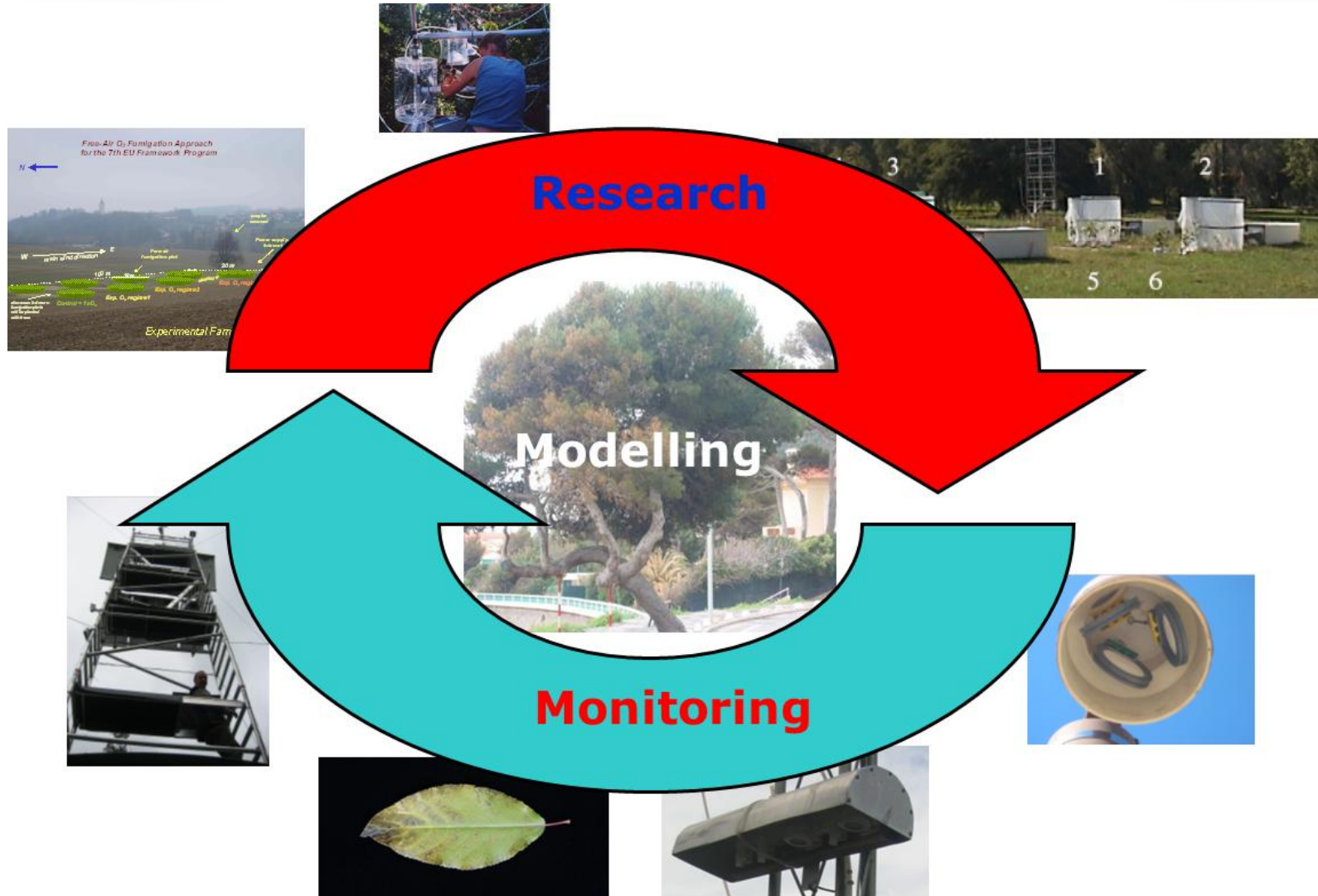




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# Integration among approaches

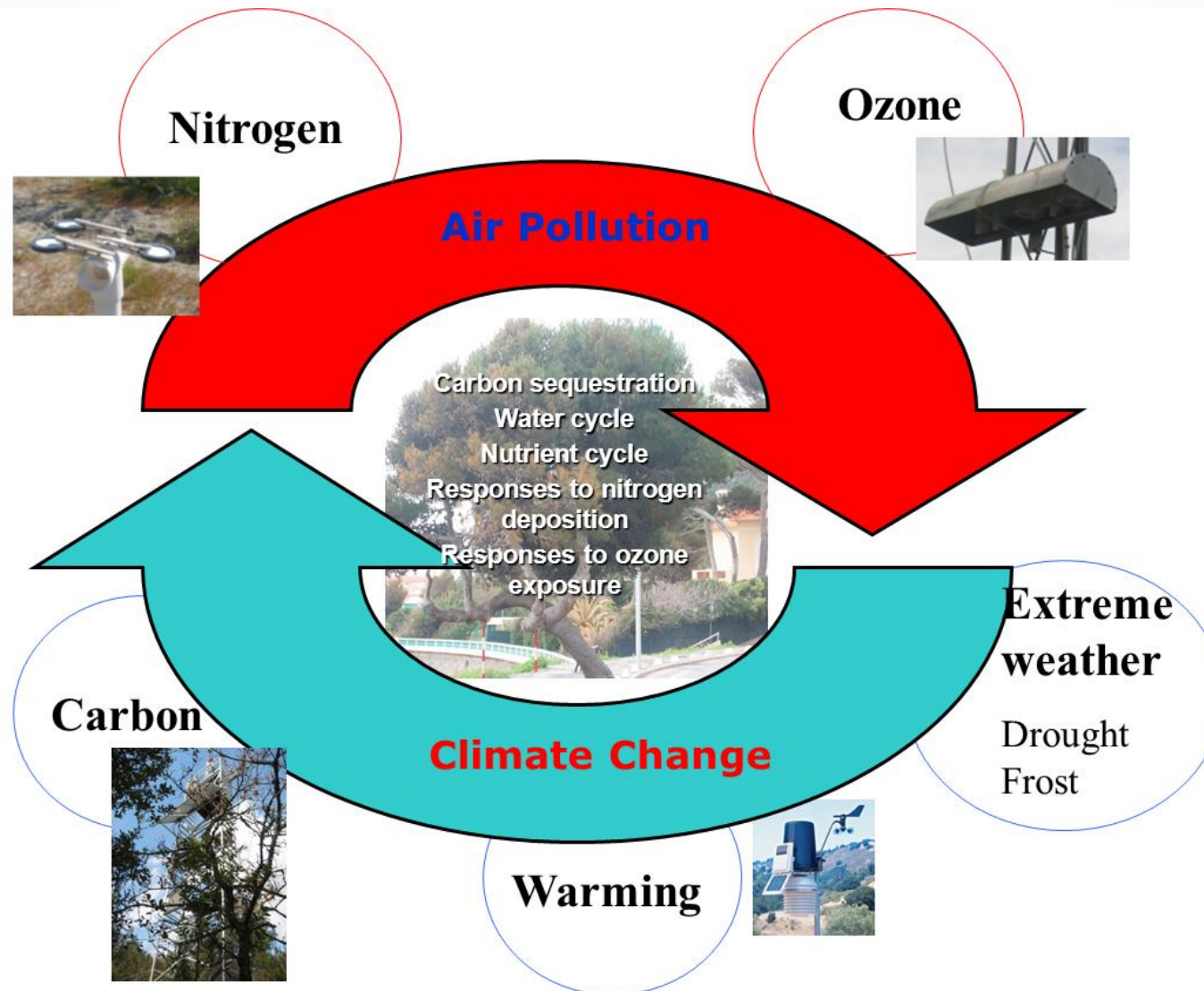
## Research, monitoring and modelling





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## Integration among themes Air pollution and climate change factors





- Reality
- Integration
- Long-term
- Continuity
- Access to data

- Topical issue
- Extraordinary data base
- Mechanistic understanding of the interactions between forests and global change
- Forest protection
- Human health and wellness
- Policy-making and adaptive forest management