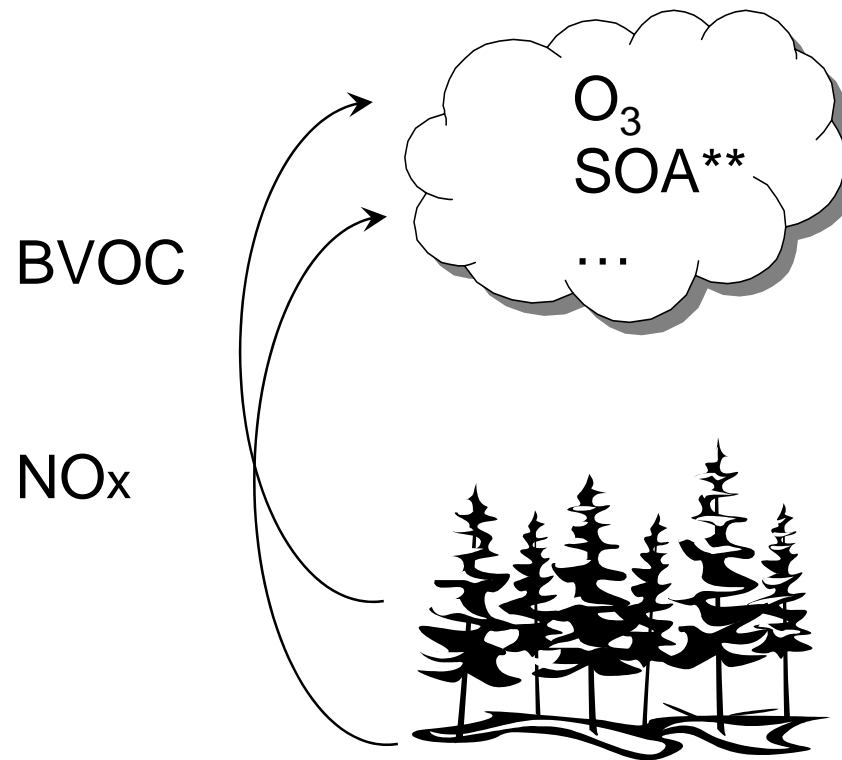


A general system to calculate air chemistry processes within biosphere canopies

18.04.2008

Edwin Haas – Rüdiger Grote – Renate Forkel – Rainer Gasche

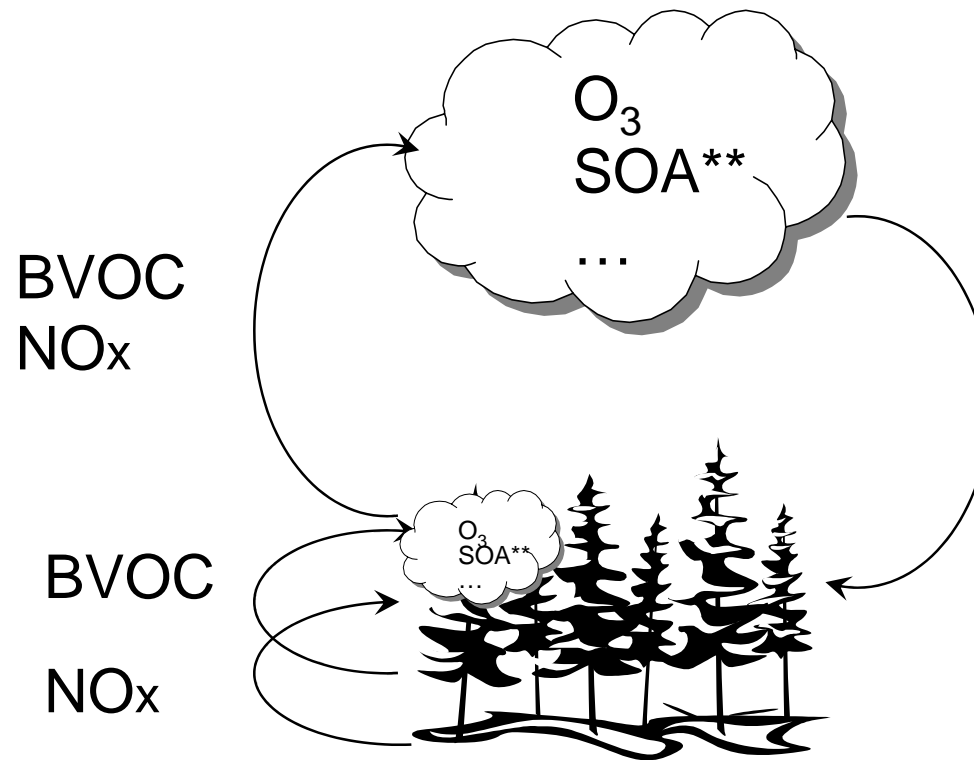
Regional air chemistry modeling requires estimates of BVOC* and reactive N emission from the Biosphere...



* Biogenic volatile organic carbon (e.g. isoprene)

** Secondary organic aerosols

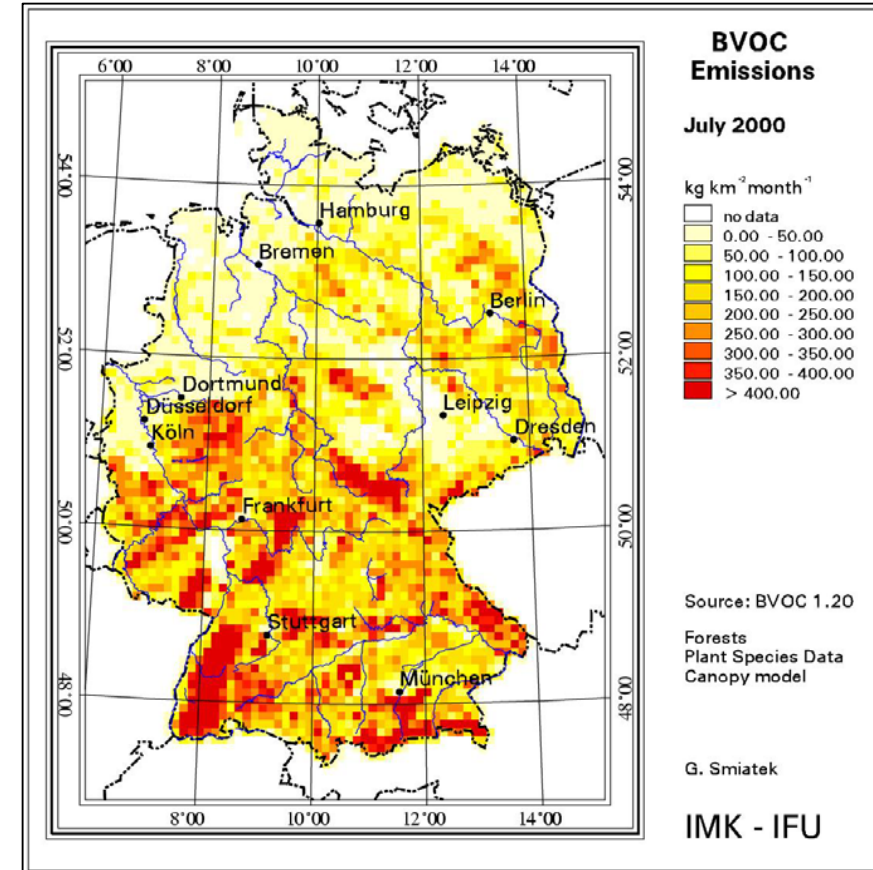
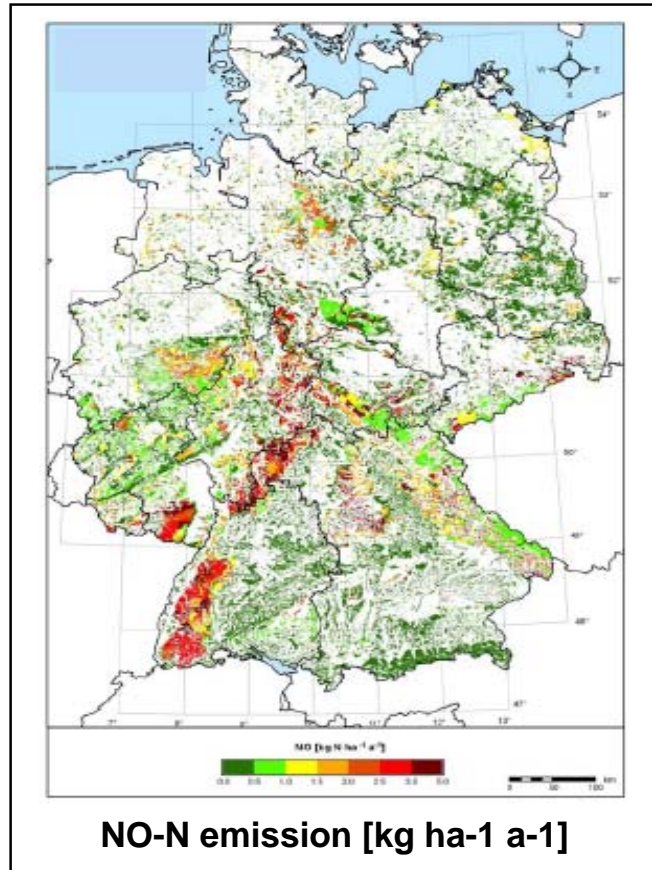
...but current approaches usually neglect chemical reactions within the canopy!



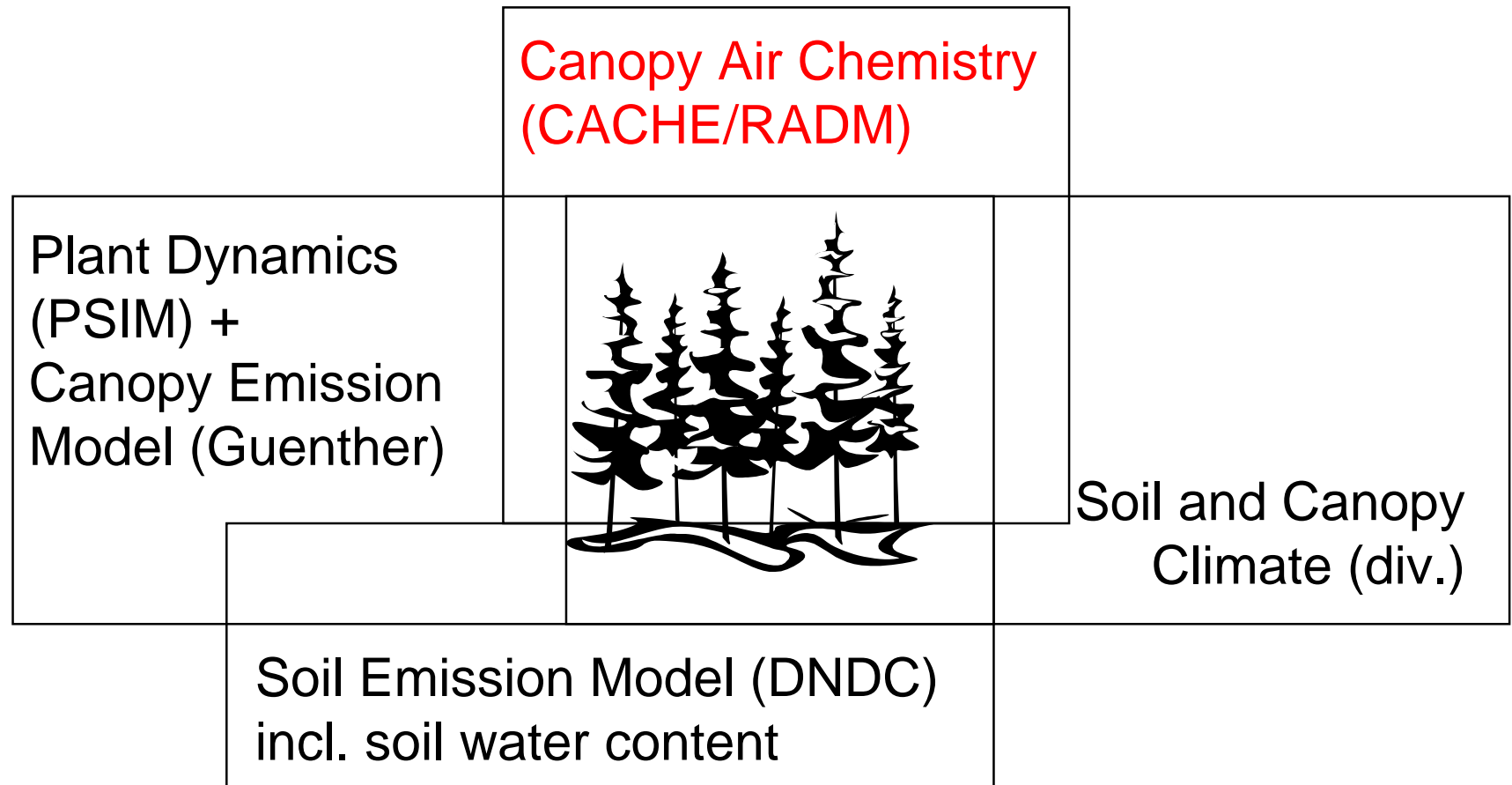
* Biogenic volatile organic carbon (e.g. isoprene)

** Secondary organic aerosols

So what do emission maps really mean?

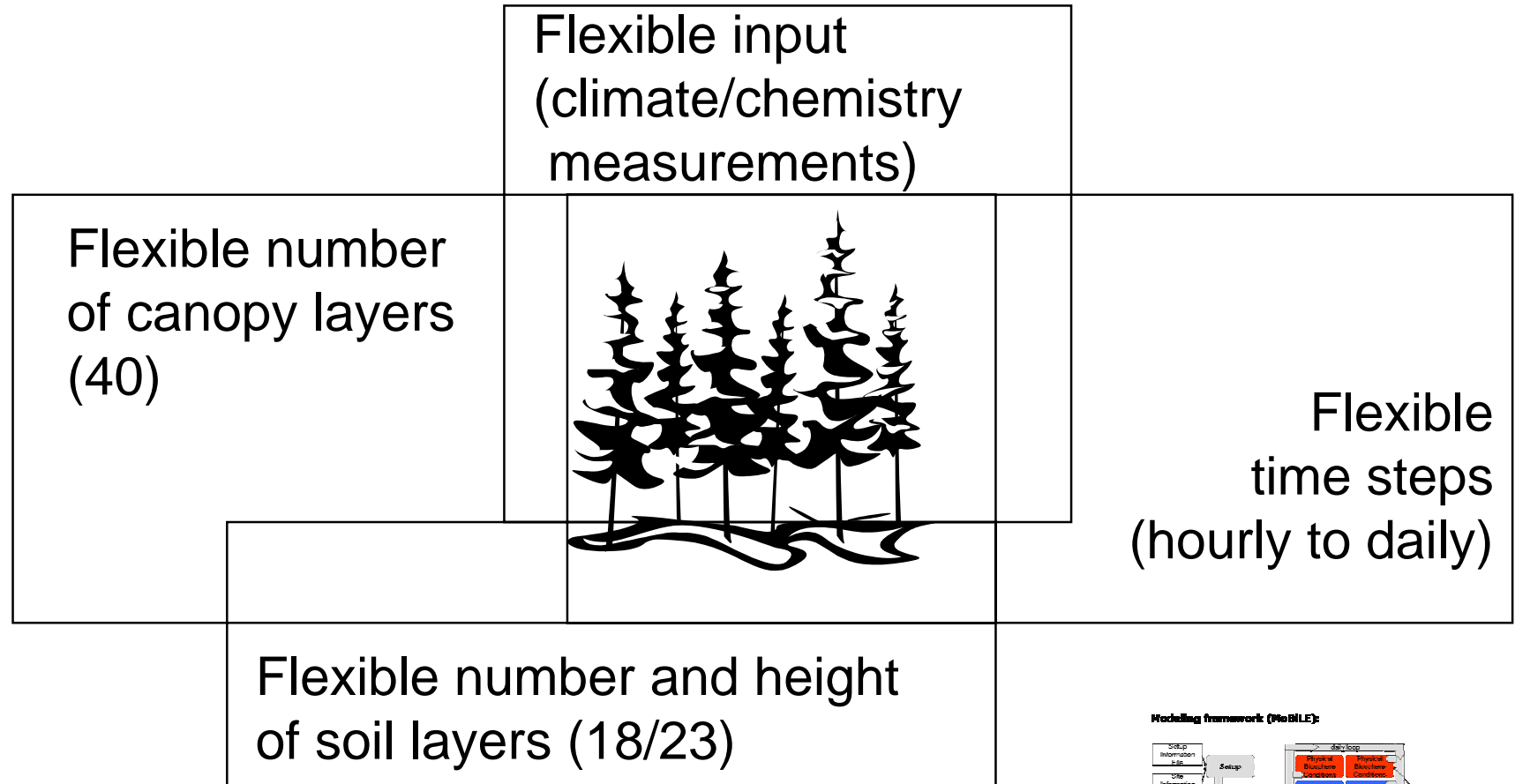


Model Selection

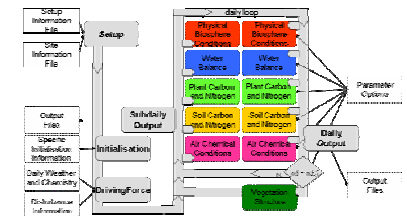


Forke et al. 2006 (NewPhyto)
Stockwell et al. 1992 (GRC)
Went et al. 1980 (GRC)

Simulation Setup



Modelling framework (MOBILE):





Waldstein
Spruce (27m)
2002
• climate, BVOC



Höglwald
Spruce (41m)
1995
• NO, O₃



3. Evaluation

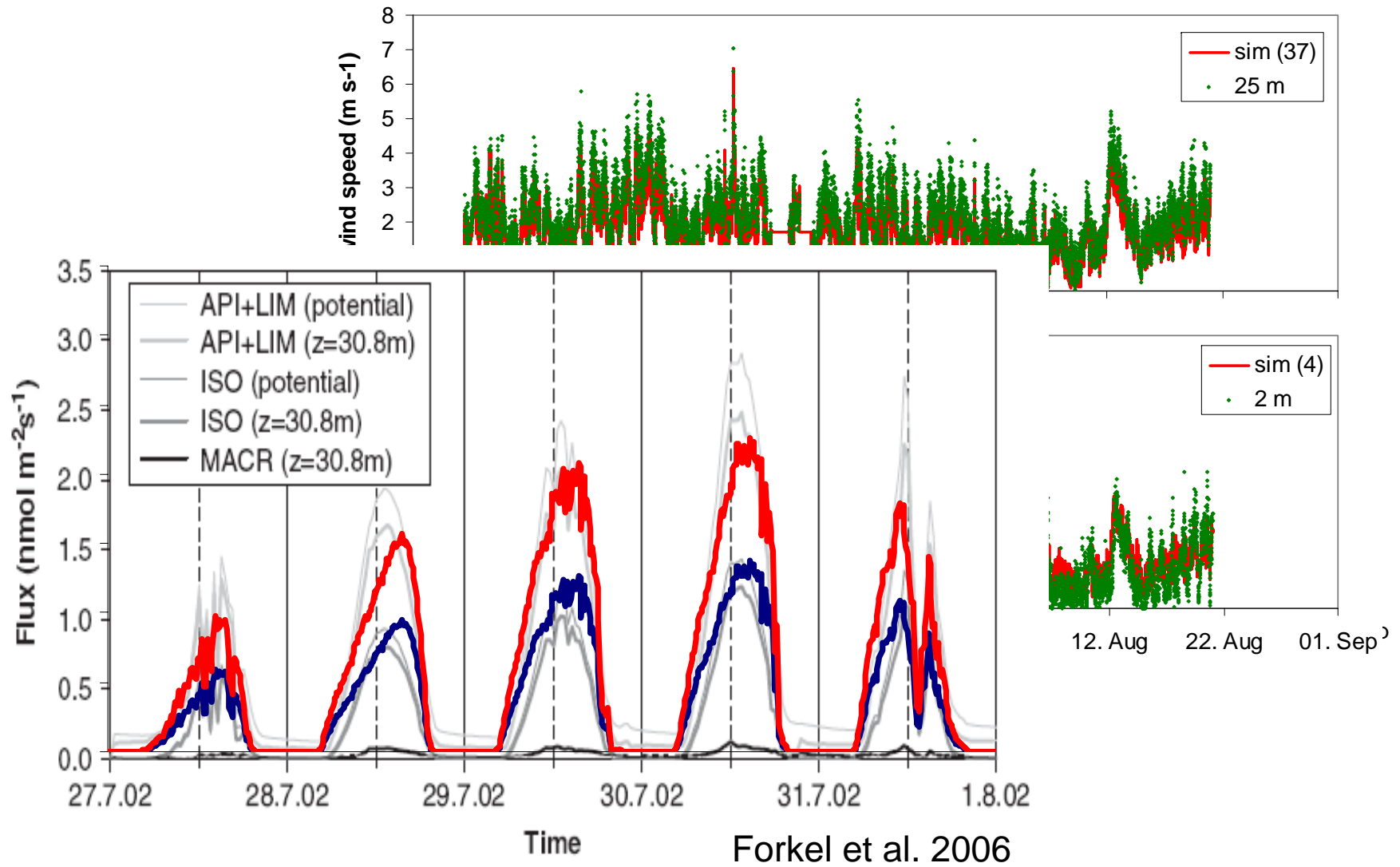
Waldstein



Boundary Conditions:

3 months

- air temperature
- wind speed
- BVOC emission



3. Evaluation

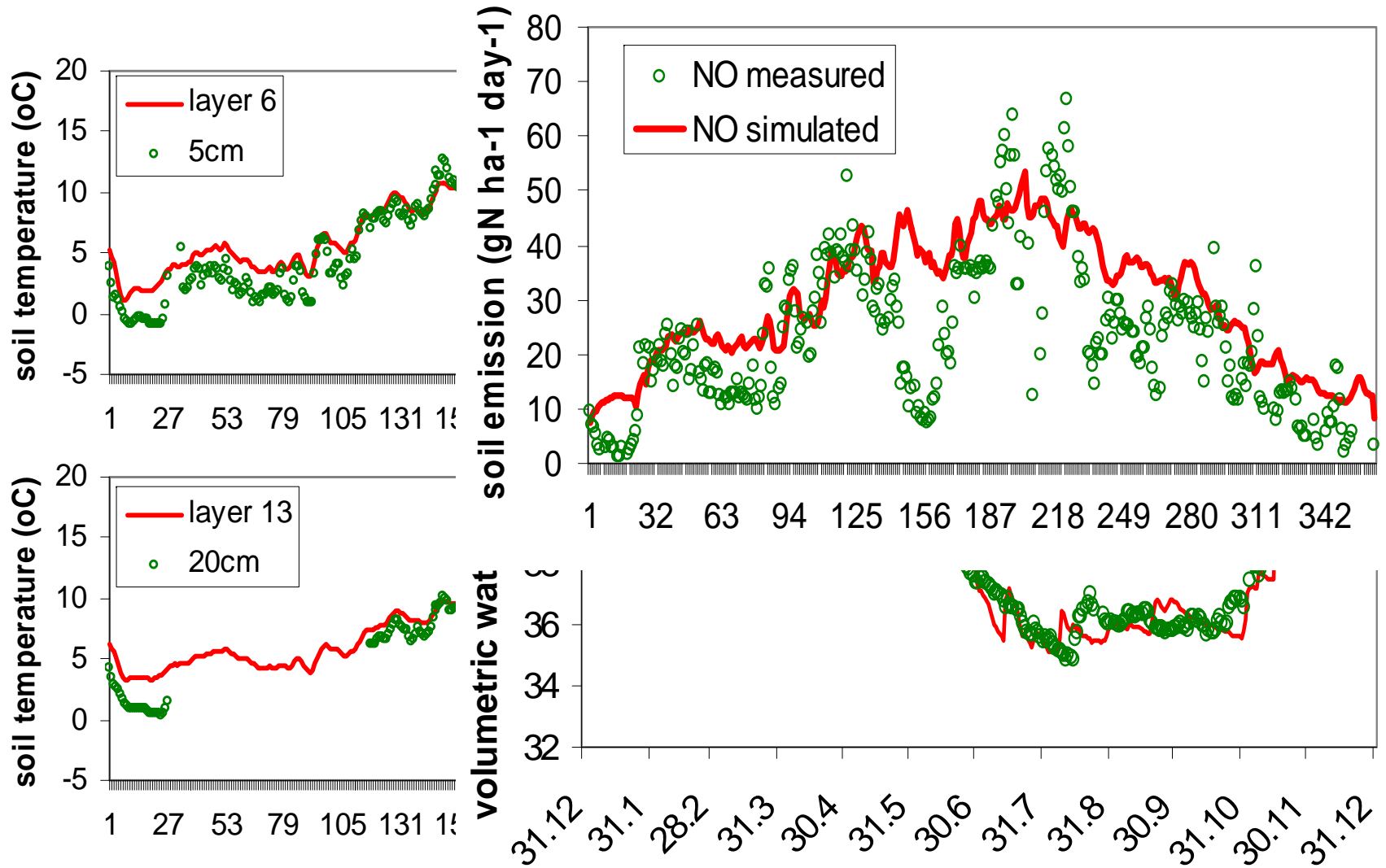
Höglwald



Boundary Conditions:

>1year

- soil temperature
- soil water
- NO emission



4. Simulation results

Höglwald

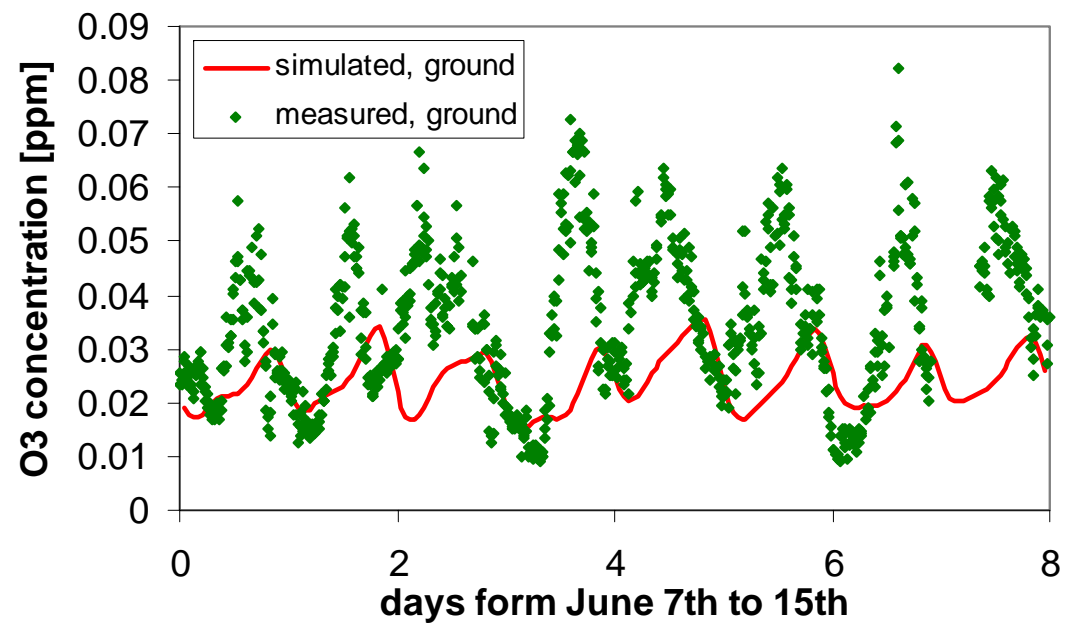
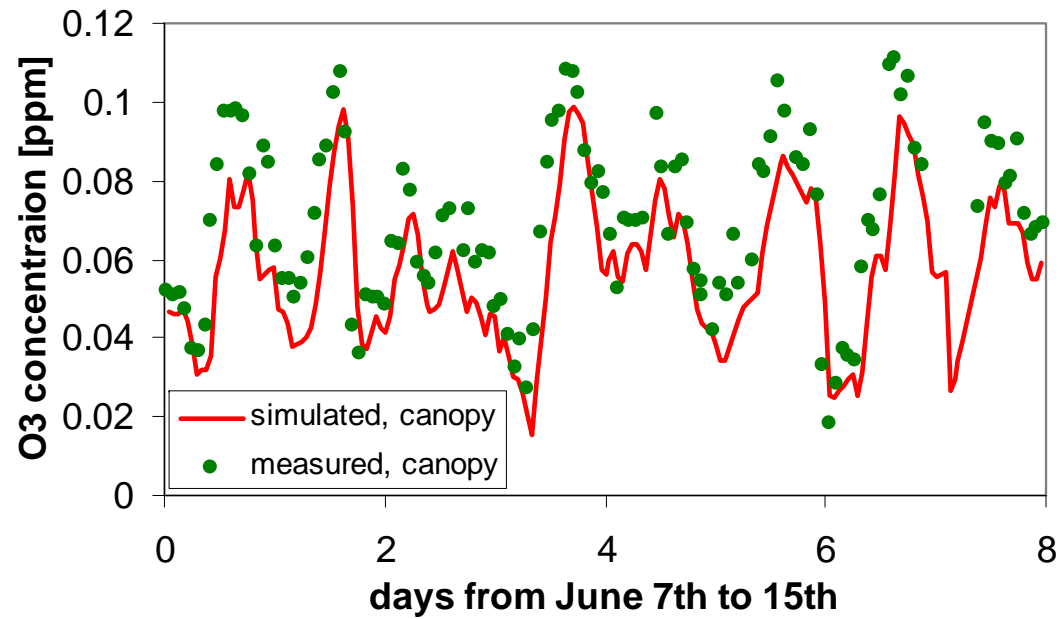


Air Chemistry:

Total: 1 month

Selected: 8 days

- O_3
- (NO_x)



4. Simulation results

Höglwald

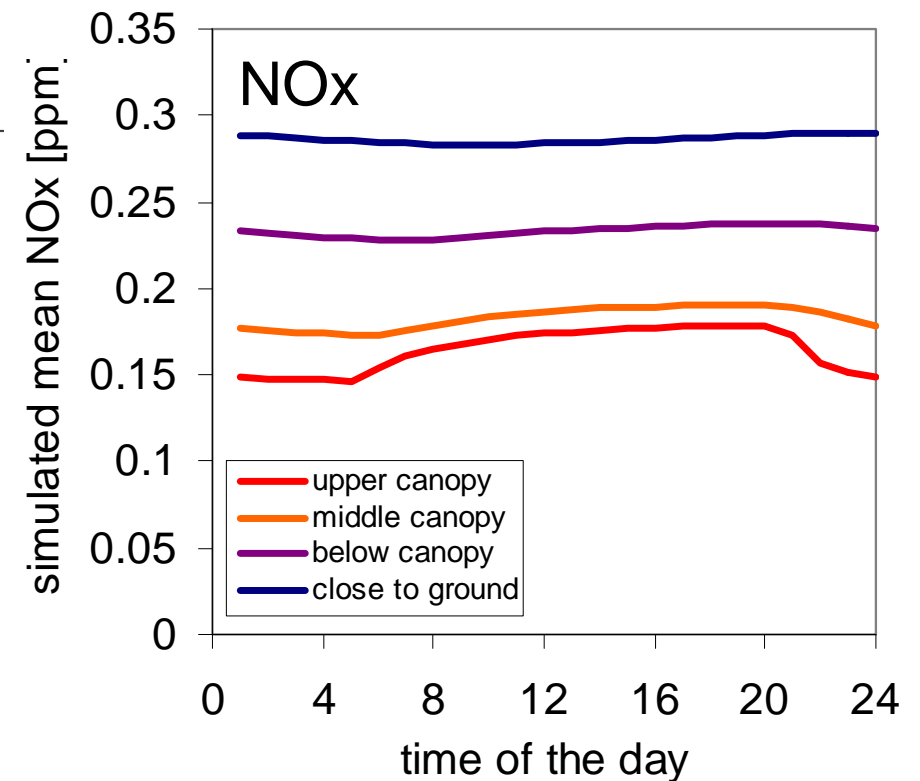
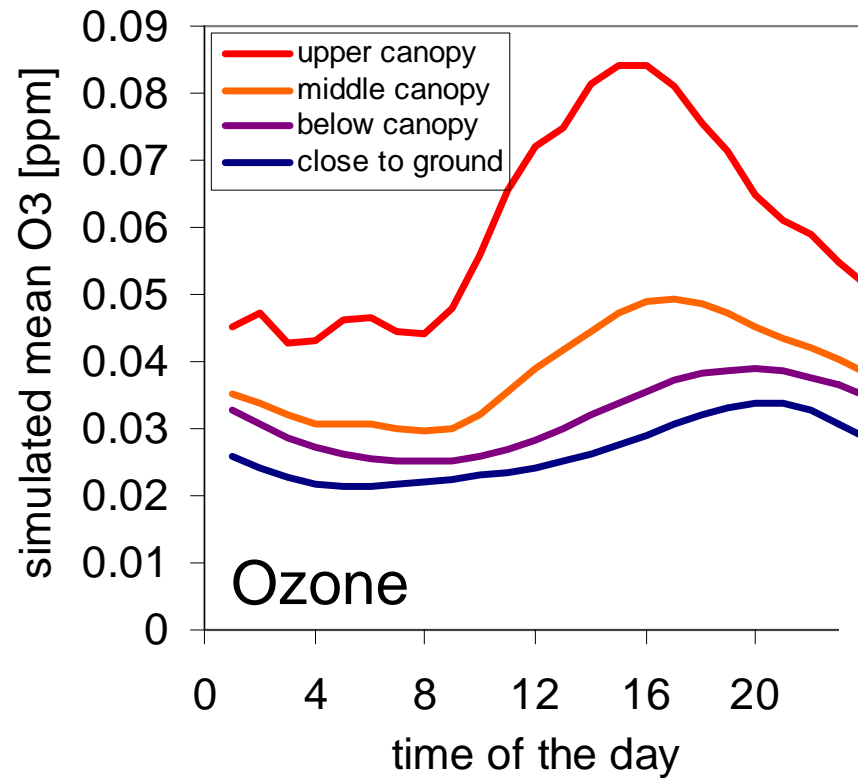


Air Chemistry:

Total: 1 month

Selected: 8 days

- O₃
- (NO_x)



Further Evaluation

Effect on net-emission

Improved emission mapping

Coupling to regional models.

Thank you for your attention!