

Biogenic Fluxes: Module Update

Garry Hayman and James Weber

Covers the exchange of trace gases between the land surface and atmosphere

- Emission (or release) to the atmosphere from the land surface
- Deposition (or uptake) to the land surface from the atmosphere

Specific topics

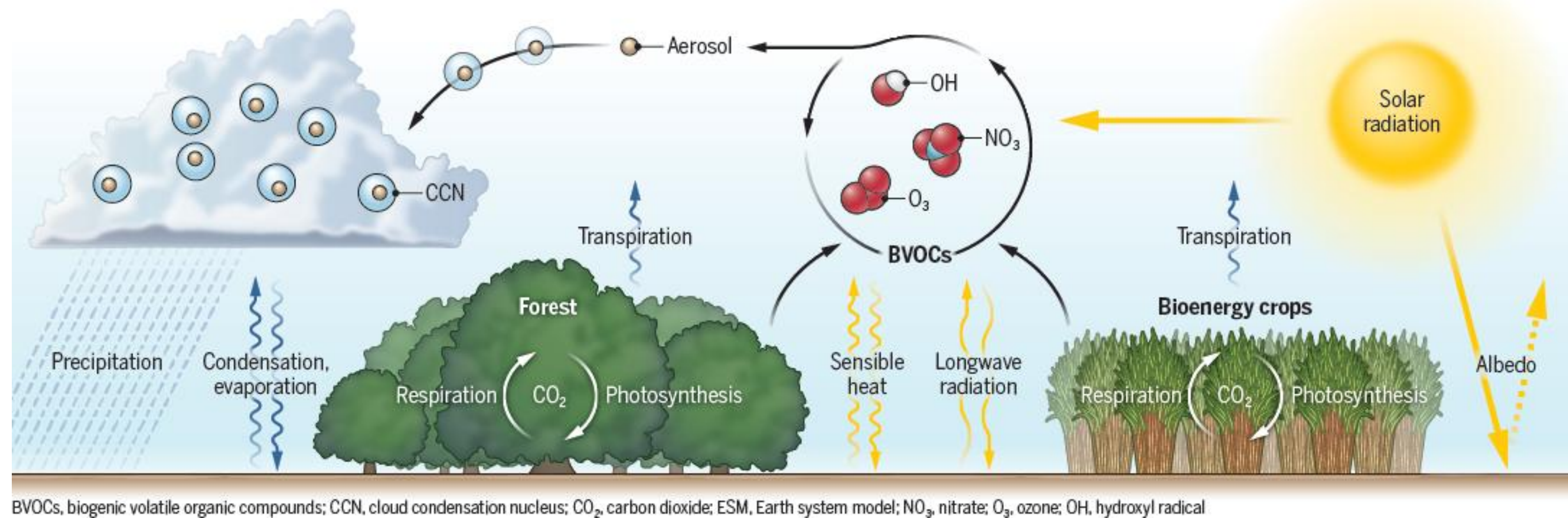
- **Emissions of biogenic VOCs (isoprene, terpenes, acetone, methanol)**
- **Atmospheric deposition**
- *Vegetation O_3 damage (with vegetation module)*
- *Emissions of CH_4 from wetlands (also hydrology and soil biogeochemistry modules)*
- *Emissions of trace atmospheric species from biomass burning (with fire module)*

Activities

- **BVOCs, vegetation O₃ damage:** NERC funding application “SEQUESTERS: Simulating, Exploring and Quantifying the Effects of Tree planting on the Earth System” (J Weber PI with G Hayman, R Oliver, P Harris)

How forests and bioenergy crops affect the Earth system

There are many coupled land and atmospheric processes, such as albedo, photosynthesis, and the release of BVOCs by vegetation, that have been included in recent ESMs. ESMs are used to investigate the effects of forests and bioenergy crops on the surface climate and carbon cycle. Although forestation increases CO₂ uptake, this can be partially offset by attendant changes in albedo and atmospheric composition.



- **Deposition:** Poster presentation atmospheric deposition (G Hayman) at UKCA meeting, July

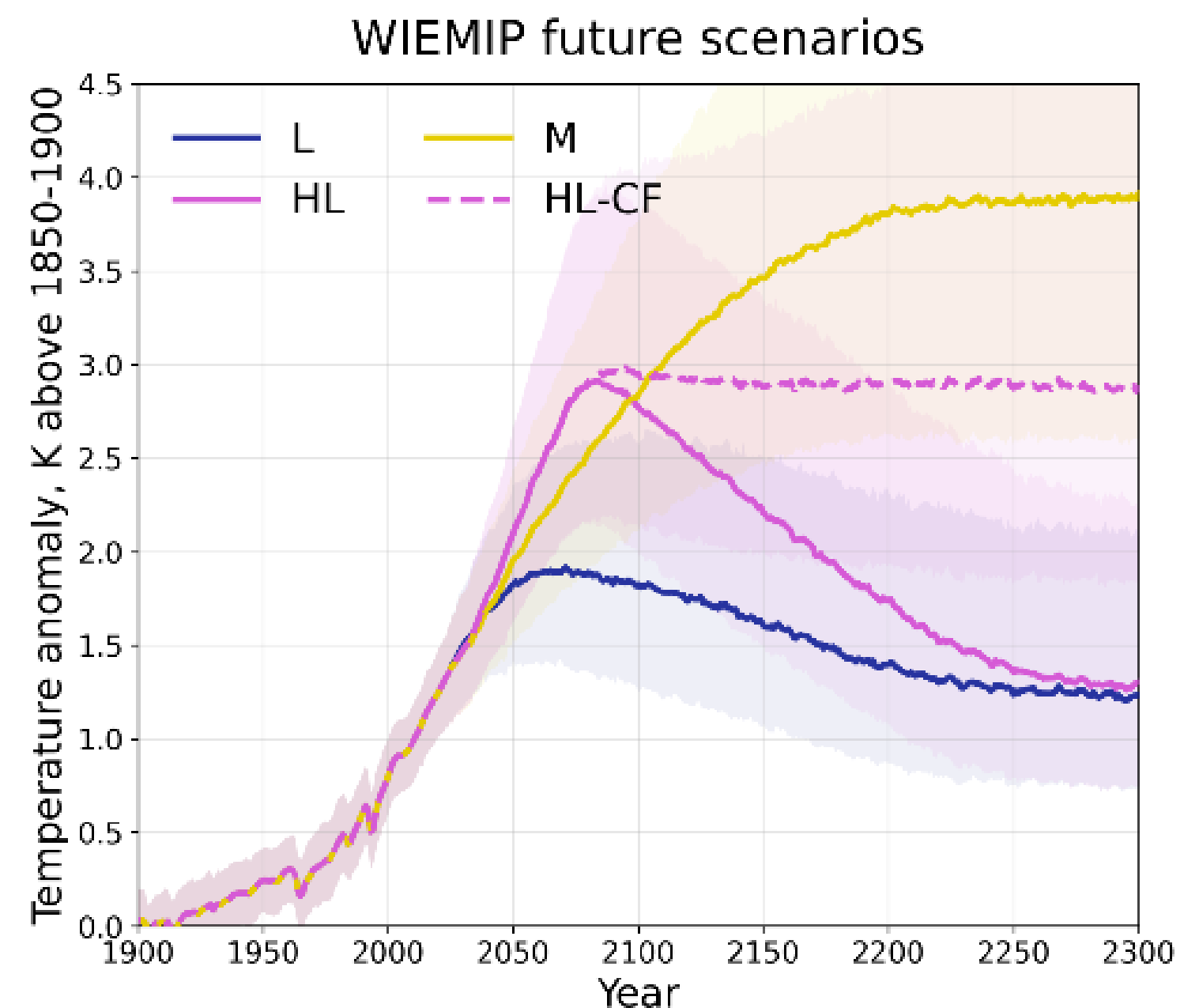
WIE-MIP: BVOCs Working Group

- Garry Hayman (UKCEH)

Warming-induced Emission Model Intercomparison Project (WIE-MIP)

See presentation by Juliette Bernard on Wednesday

- Little information in the literature on the response of BVOCs to temperature overshoot
- Output from 7 land surface models, including JULES-WIEMIP
- JULES WIEMIP configuration uses UKESM2 BVOC emission factors
- Emulator approach to simulate atmospheric processes (trace gases and aerosols) to get BVOC climate feedback
- Links to AerCHEM-MIP2 activity (James Weber and others)
- Publication planned for input into the IPCC AR7





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