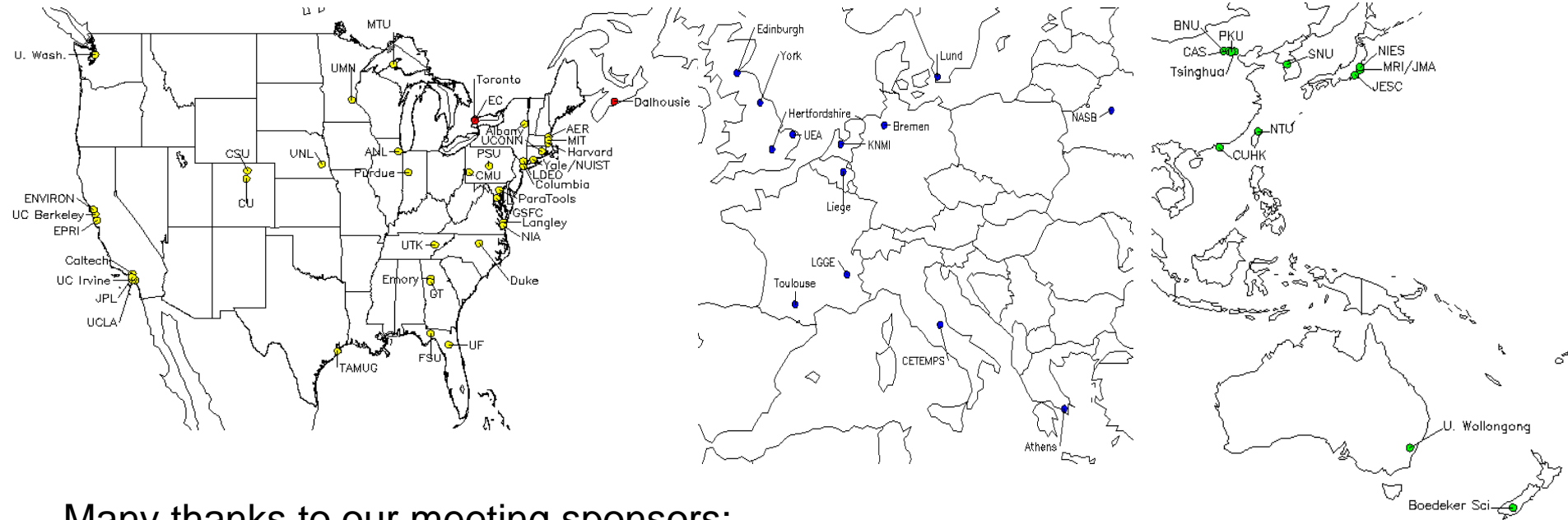


Welcome to the 7th International GEOS-Chem Meeting!

The GEOS-Chem user community: 70 institutions, 18 countries



Many thanks to our meeting sponsors:



Meeting Objectives

Exchange information at frontier of knowledge of atmospheric composition

- IGC7 is first and foremost a scientific meeting

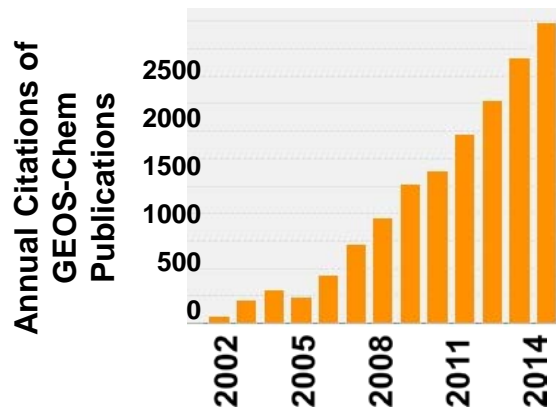
Promote interactions both within and outside GEOS-Chem community

Sustain functioning of the GEOS-Chem community

- Model clinics
- Working Group meetings, share your vision!
- Business meeting: leadership/communications, long-term vision

Identify model development priorities for the next two years

- A major charge for the Working Group meetings



IGC7 Agenda

Monday, May 4

Model Overview

GEOS-Chem Working Group Introductions

Aerosol Chemistry and Microphysics

Photochemistry

Clinics (Beginners, Intermediate/Adv, Adjoint, Parallel & ESM)

Poster Session A (6:00 onward)

↑
Interspersed
Scientific
Presentations
&
Users Meeting
↓

Tuesday, May 5

Chemistry-Climate

Carbonaceous Aerosols

Nitrogen Cycle (posters & intros)

Carbon Cycle & Organics

Working Group Meetings (discussion, development needs)

(Carbon + Assimilation + Adjoint, Chemistry-Climate)

(Oxidants & Chemistry, Nested, Transport)

Poster Session B (6:00 onward)

Wednesday, May 6

Mercury and POPs

Regional and Global Air Quality

Sources and Sinks

Working Group Meetings (discussion, development needs)

(Aerosols, Hg&POPs, Emissions & Surface Uptake)

Poster Session C (6:00 onward)

Thursday, May 7

Tropospheric Ozone (oral)

Nitrogen Cycle (oral)

Awards for Poster Introductions

GEOS-Chem Business Meeting (decide priorities, vision)

Interspersed
Scientific
Presentations
&
Users Meeting



Some Logistics

Oral Presentations

Max 7 minutes

Remaining 3 minutes for Q&A + changeover

Posters

Oral introductions: max 30 seconds

Posters must be taken down before morning

Uploading Talks (Thanks to Matt Yannetti)

<http://www.fas.harvard.edu/~geoschem>

Username: GCMeeting

Password: GCUser

Directions on submission page

Presentations must be submitted **before** the break before your session

Poster Introductions must be submitted **the day before** your session

If you don't have web access, bring a thumb-drive to a member of the A/V team (Alex Turner, Jessica Kunke, and Rachel Silvern) in the front of the room at the **beginning** of the break

Share your ideas! Expect feedback forms on Thursday.

Live video cast organized by Alex Turner, Jessica Kunke, and Rachel Silvern

GEOS-Chem Chemical Transport Model

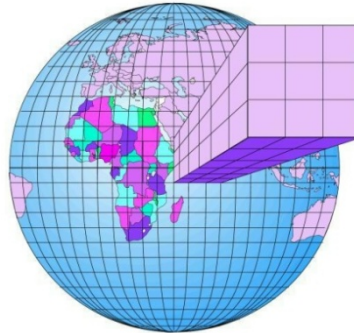
Input data

- NASA GEOS meteorological fields
- other

Model solves 3-D chemical continuity equations
on global or nested Eulerian grid

Modules

- emissions
- transport
- chemistry
- aerosols
- deposition
- sub-surface



Model adjoint

Applications

- chemical processes, transport, budgets
- inverse analyses
- radiative forcing
- air quality
- biogeochemistry
- ...

Model capabilities:

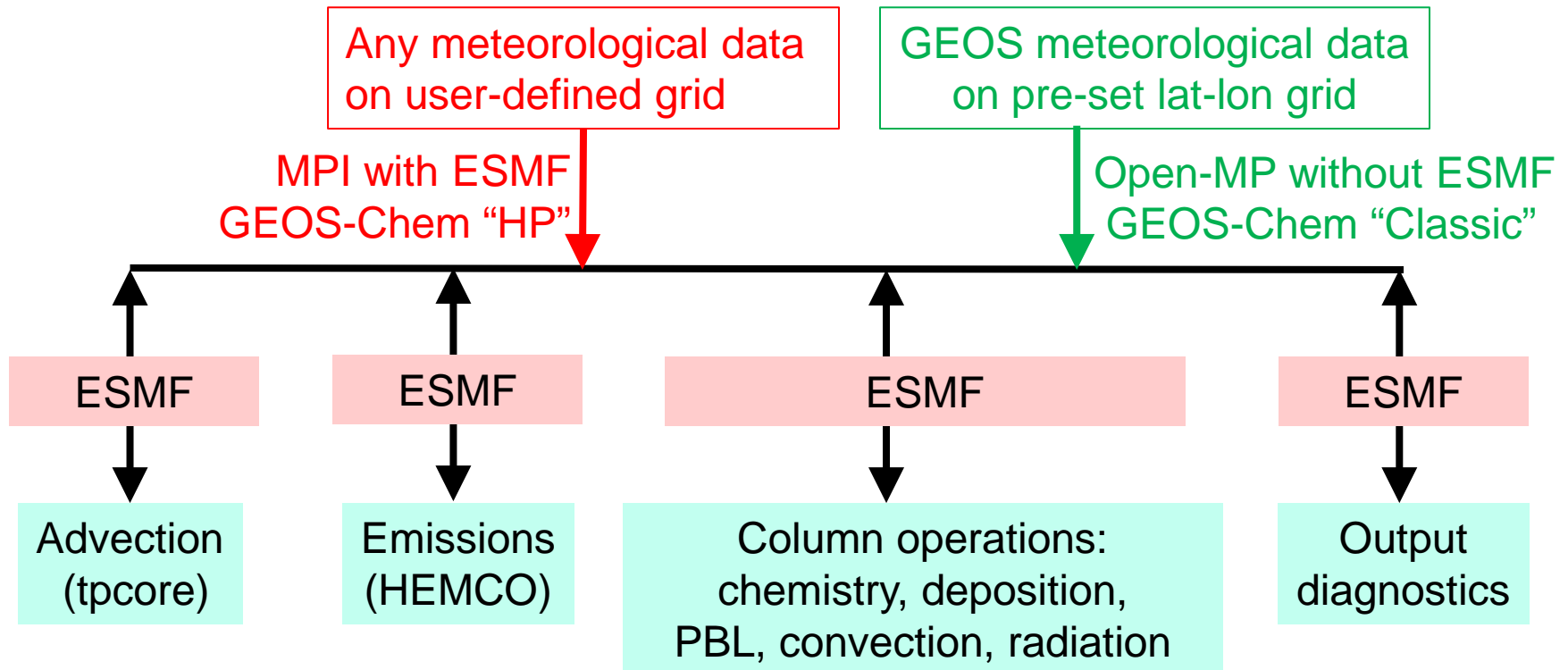
- Tropospheric and stratospheric chemistry, aerosol microphysics, CO₂, methane, mercury, various tracers
- 1980-present GEOS meteorological data, past and future climates (GCMs)
- Horizontal resolution: 0.25°x0.3125° (native), 1/2°x2/3°, 2°x2.5°, 4°x5°, other grids
- Flexible implementation of new emission inventories (HEMCO)

GEOS-Chem is now grid-independent & ESMF-compatible

It operates on individual columns (1-D) with coordinates specified at runtime

This enables:

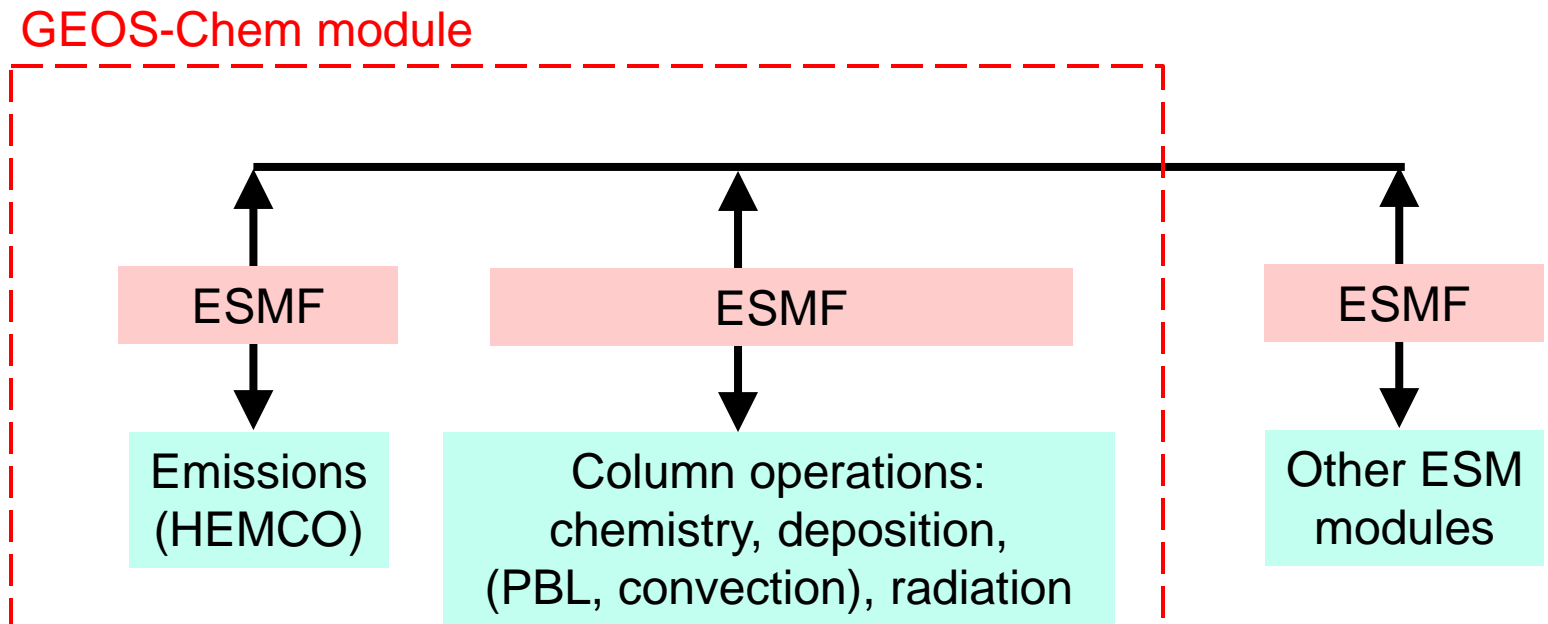
- Massively parallel simulations using distributed memory architecture (MPI)
- Running GEOS-Chem on any grid for which meteorological data are available
- Using GEOS-Chem as chemical module in Earth System Models



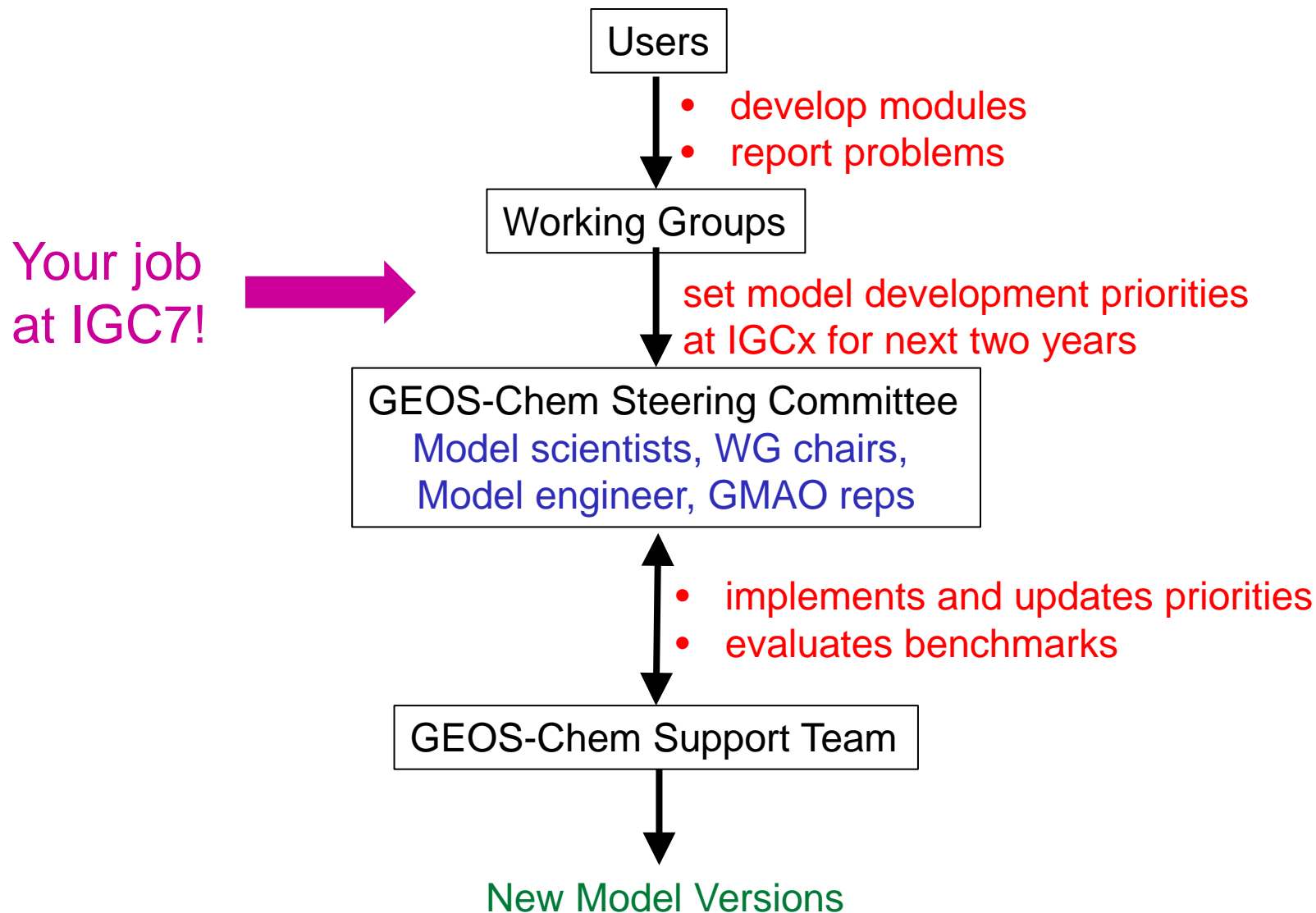
Exact same code is used for GEOS-Chem HP and GEOS-Chem Classic

GEOS-Chem as chemical module for Earth System Models

- GEOS-Chem code consisting of HEMCO emissions and column operations can be interfaced through ESMF to any ESM and this is presently used in the NASA GEOS ESM and DAS [Long et al., GMD 2015]
- External ESM code is then used to simulate atmospheric dynamics and transport, ocean processes, terrestrial processes, etc.
- GEOS-Chem chemical module uses the same code as the stand-alone GEOS-Chem and thus always remains state-of-science and referenced to the latest version



GEOS-Chem scientific development is driven by its users



V9.02: March 2014 - 0.25°x0.3125° capability,...

V10.01: May 2015 - stratospheric chemistry capability, HEMCO, ESMF,...

GEOS-Chem depends critically on its user community

We rely on community ownership and volunteerism – this goes a long way

- You contribute to the model simply by using it!
- Publish your work and be generous with citations, credit to developers
- Report bugs, share model developments
- Keep up with model: new versions, wiki, Working Groups, IGC meetings
- Keep up the spirit – YOU own the model
- Interested in co-chairing a Working Group, serving on Steering Committee?
Talk to me!

Extra slides

Who's who in GEOS-Chem management

Model scientists: D. Jacob, R. Martin (co-), D. Henze (adjoint)

NASA GMAO liaisons: S. Pawson, A. Molod

Working Group Chairs: (outgoing/incoming)

1. Adjoint model & Data Assimilation (K. Bowman, D. Jones)
2. Aerosols (C. Heald, J. Pierce, P. Adams)
3. Carbon cycle (K. Bowman, R. Nassar, D. Jones)
4. Chemistry-climate (H. Liao, S. Wu)
5. Hg and POPs (N. Selin, E. Sunderland, J. Fisher, C. Holmes)
6. Organics (D. Millet, E. Fischer)
7. Oxidants and chemistry (M. Evans, J. Mao, B. Henderson)
8. Nested model (J. Wang, Y. Wang, L. Zhang)
9. Sources and sinks (J. Lin, Q. Zhang)
10. Transport (A. Molod, D. Jones, H. Liu)

At-large Steering Committee members: P. Kasibhatla, J. Pierce

GEOS-Chem Support Team: B. Yantosca (lead), M. Sulprizio, M. Long, C. Keller, E. Lundgren, M. Yannetti, J. Xu, Y. Davila