

Overview of CCSP Goal 2:
Climate Forcing – Research & Decision Support

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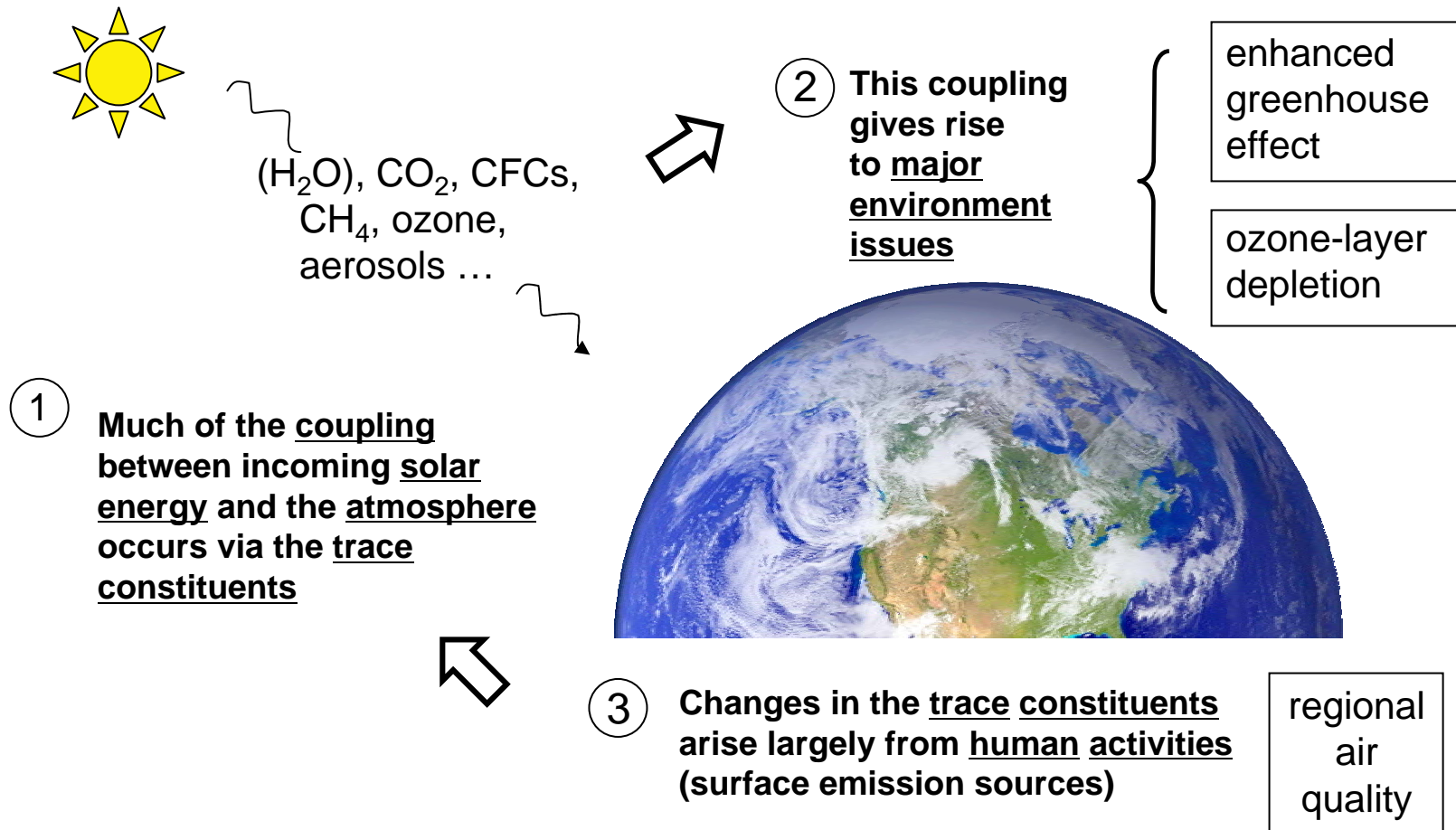
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Goal 2: “Improve quantification of the forces that bring about changes in the Earth’s climate and related systems.”

Today’s overview...

- **Where “Climate Forcing” fits in**
 - > Trace atmospheric constituents
 - > Relation to issues
- **A snapshot: CCSP Goal 2 research**
 - > Key questions
 - > Tasks
 - > Payoffs
- **Decision-support assessments**
 - > As key information products
 - > Those related to CCSP Goal 2
- **These products and this workshop**
 - > Helping us shape the information-user context

A. Where Atmospheric Composition and Climate Forcing Fit In



Bottom line: Understanding atmospheric composition is a key first step in:

- characterizing the human influence, within the context of natural changes.
- constructing scenarios/predictions for consideration as options for changing climate forcing.
- identifying “win-win” choices in addressing multiple issues: air quality and climate.



GOAL 2

Improve quantification of the forces bringing about changes in the Earth's climate and related systems.

TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS

SIGNIFICANCE

COMPLETION

Updating scenarios of greenhouse gas emissions and concentrations, in collaboration with the CCTP. Review of integrated scenario development and application.

Sound, comprehensive emissions scenarios are essential for comparative analysis of how climate may change in the future, as well as for analyses of mitigation and adaptation options.

within 2 years

North American carbon budget and implications for the global carbon cycle.

The buildup of CO₂ and methane in the atmosphere and the fraction of carbon being taken up by North America's ecosystems and coastal oceans are key factors in estimating future climate change.

within 2 years

Aerosol properties and their impacts on climate.

There is a high level of uncertainty about how climate may be affected by different types of aerosols, both warming and cooling, and thus how climate change might be affected by their control.

2-4 years

Trends in emissions of ozone-depleting substances, ozone layer recovery, and implications for ultraviolet radiation exposure and climate change.

This information is key to ensuring that international agreements to phase out production of ozone-depleting substances are having the expected outcome (recovery of the protective ozone layer).

2-4 years

B. CCSP Goal 2 Research: The Questions, Tasks, and Payoffs

Key Questions

Atmospheric Composition Tasks

Payoffs

- | | | |
|---------------------------|---|---|
| • <u>What's changing?</u> | Monitoring of composition's variability and trends: satellites and global sites. | Testing the skill of emissions "hindcast" |
| • <u>Why?</u> | Characterizing chemical and meteorological processes with lab and field experiments. | Input needed for modelsmithing |
| • <u>Future changes?</u> | Evaluating and improving predictions: observations \longleftrightarrow simulations. | Testing the skill of the prediction |

- > *Since 2002, considerable focused research.*
- > *Numerous advances in policy-relevant understanding.*
- > *The National Research Council has recently produced an overview.*

• Who cares & Why?

Our focus here today!

Assessments: Relating the sought-after understanding in user-friendly terms to those who must manage.

"News you can use"

C. Climate Forcing: The Decision-Support Assessments

- **U.S. CCSP Products**
 - > 2.1 Emission Scenarios
 - > 2.2 North American Carbon Budget
 - > 2.3 Aerosol Impacts
 - > 2.4 Trends in Ozone Depleting Substances
- **Intergovernmental Panel on Climate Change - IPCC** (International)
 - > IPCC Fourth Assessment Report on Climate Change (2007)
 - > IPCC Report on Carbon Capture and Sequestration
 - > Future IPCC Emission Scenarios (for 5th IPCC report)
- **U.N. Montreal Protocol on the Ozone Layer** (International)
 - > Scientific, Environmental, and Technology/Economic Panels and their Assessments (2006)

What these are:

- Authoritative state-of-understanding assessments
- Reviewed professional information
- “One-stop shopping” on an issue

What these are not:

- Policy recommendations or policy prescriptions
- Research planning documents
- The voice of one sector, group, etc.

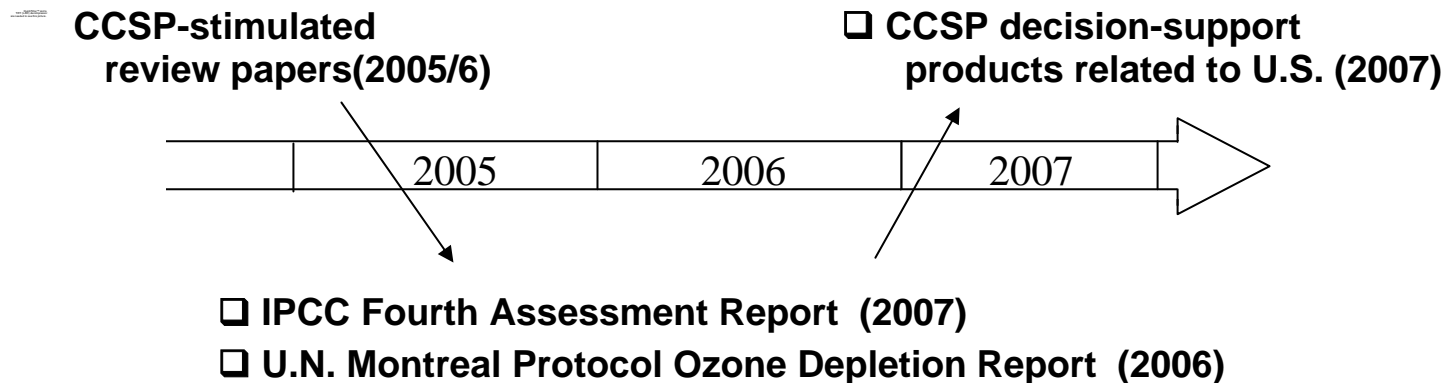
D. The Assessment Products: The Important Role of This Workshop

- **The relation: International and national information products**

Several modes of constructive interface:

- > 2.1 Some experts are in common
- > 2.2 CCSP product often can be viewed as input to international endeavor
- > 2.3 International product often can serve as the science basis for CCSP to focus on national issues.

- **Two examples**



- **This workshop**

 *We seek your comment and input to the types of decision support information upon which we could focus.*