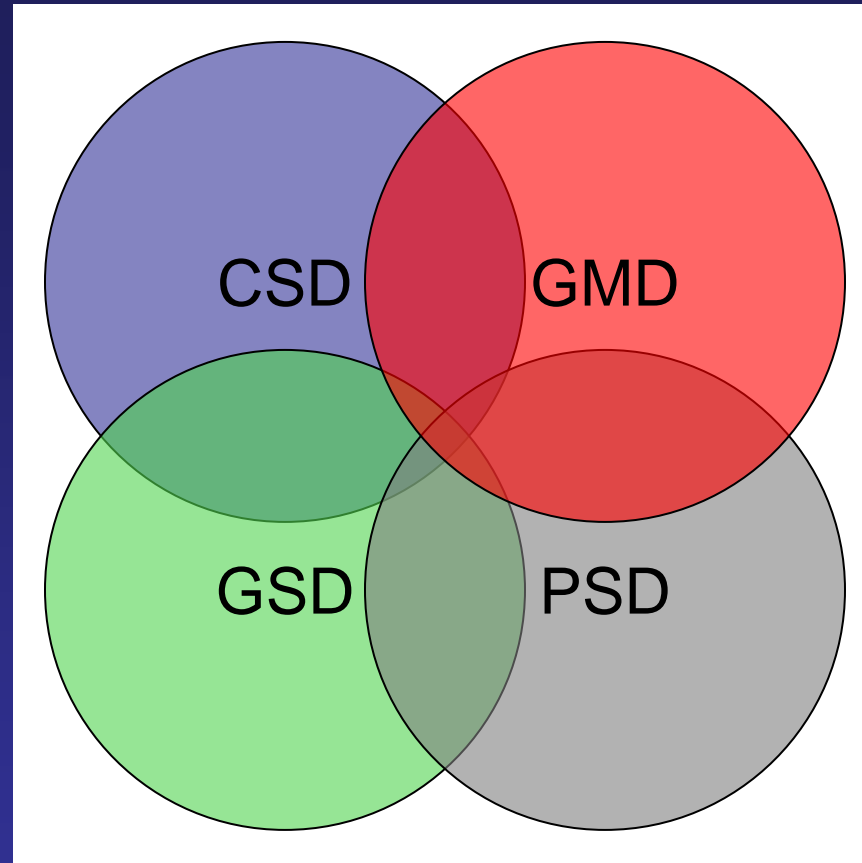


Wrap-Up and Future Outlook

- Field intensives
- Laboratory studies
- Modeling

- Model development
- Forecasting



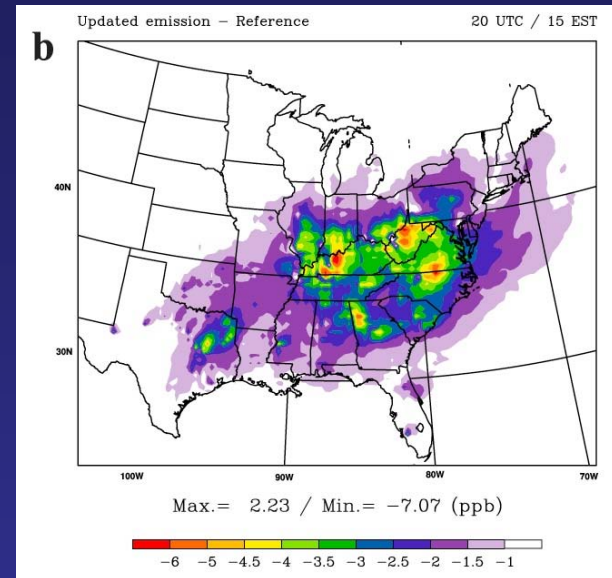
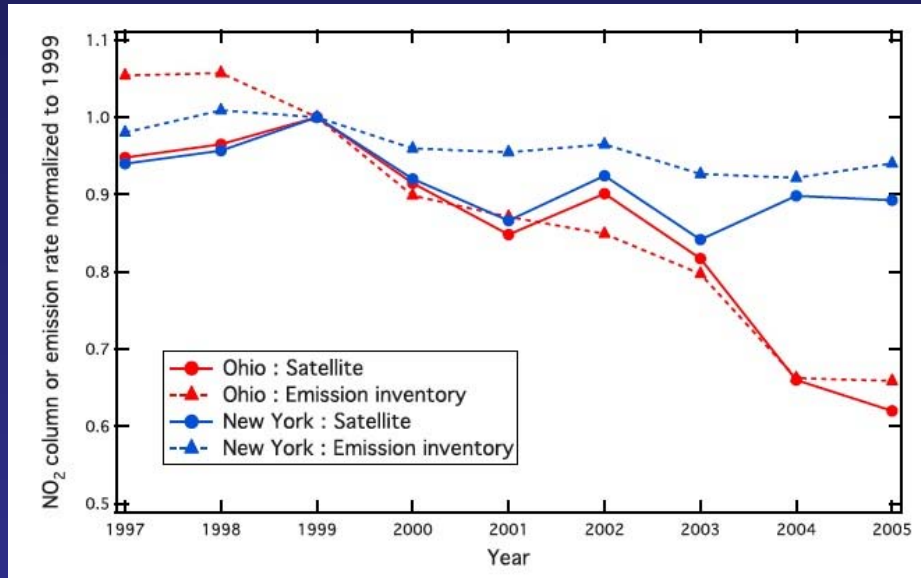
- Monitoring
- Ozone sondes

- Meteorology
- Forecast validation

Ozone and air quality are a research theme in all 4 divisions of ESRL

Ozone in the United States

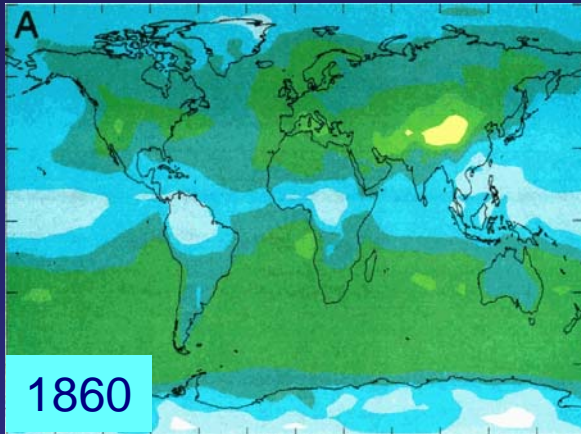
- Progress has been made (example: NO_x from power plants):



- Maintaining or improving ozone remains a struggle
- Lower ozone standard will push many counties into non-attainment
- Solid science is needed for cost-effective decisions

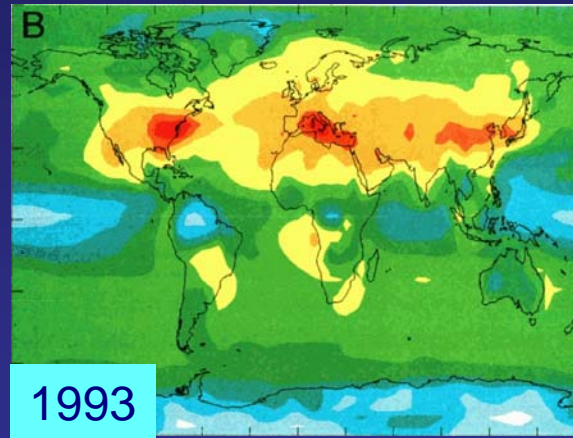
Ozone in a Developing World

Effects on surface ozone of increasing anthropogenic emissions

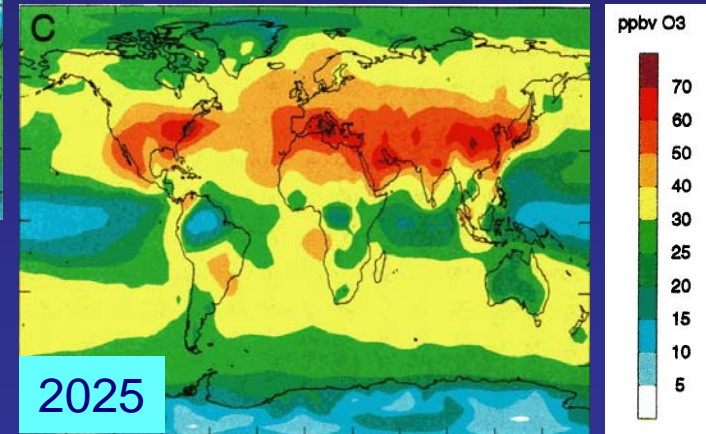


1860

Lelieveld and Dentener
[JGR 2000]



1993

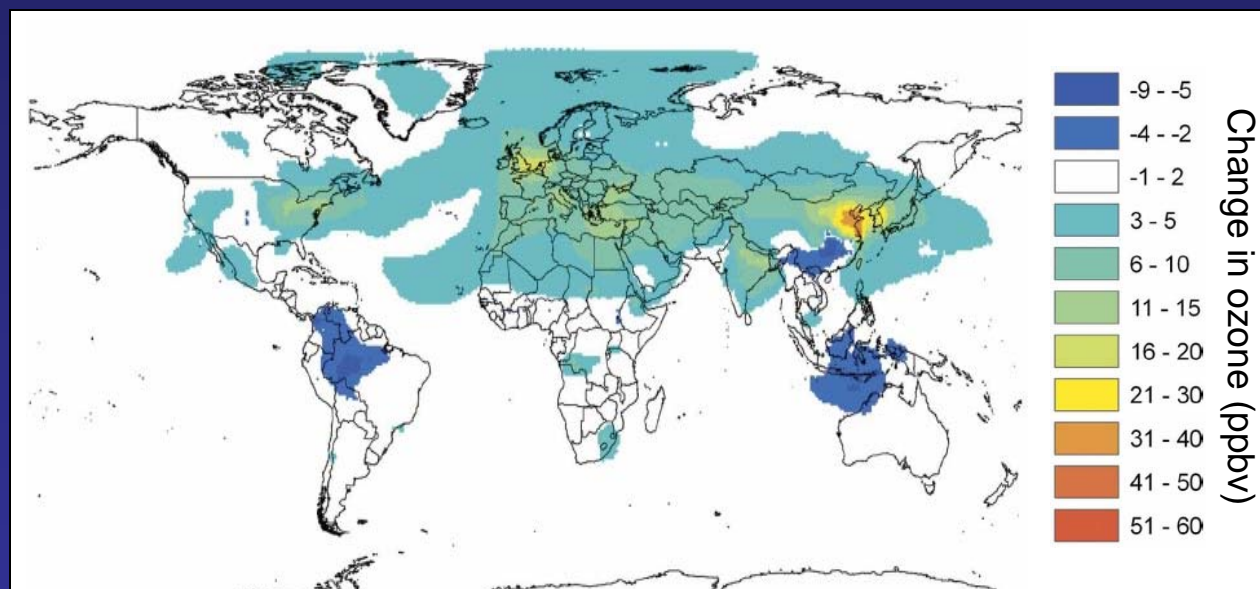
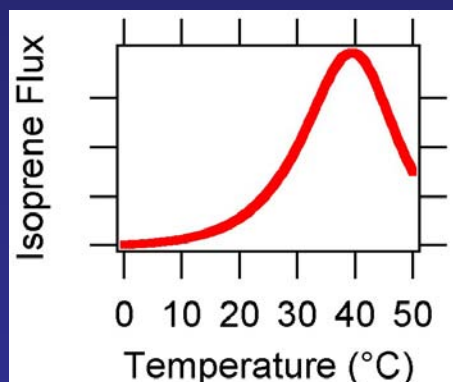


2025

Increasing emissions, especially in East Asia, are predicted to lead to widespread increases in ozone

Ozone in a Changing Climate

- Meteorology favorable to ozone episodes may change
- Biogenic emissions are temperature dependent: ozone may be expected to change in a warmer climate

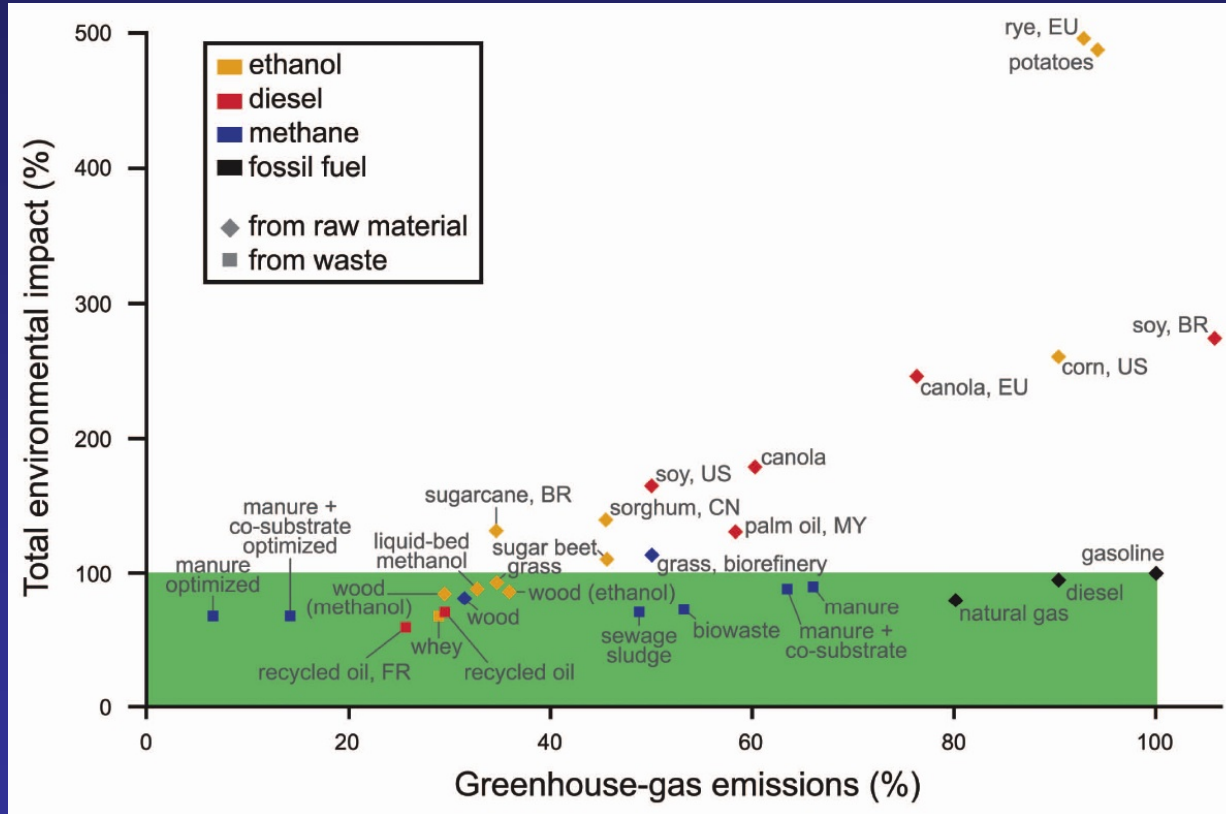


Wiedinmyer et al. [Earth Interact. 2006]

- However, many uncertainties exist including effects of: land-use change, droughts, ozone stress, high CO₂

Ozone in a Changing Climate

- Alternative fuels are developed in response to climate change: what are their environmental impacts?



Scharlemann and Laurance [Science 2008]

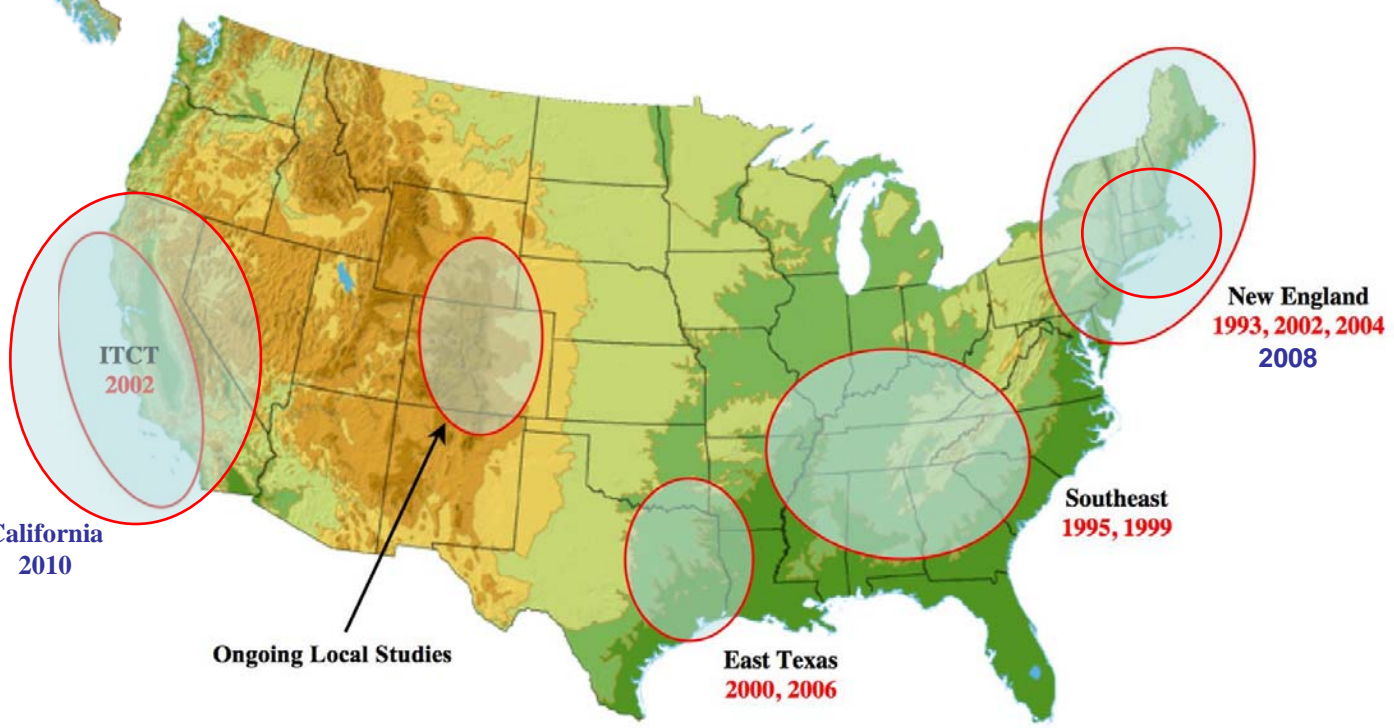
- Scientific basis for assessing the impacts is in its infancy



Regional Air Quality Assessments Future Plans



FY 2008 - Wintertime Aerosol Study
New England, Mountain West, Fairbanks



FY 2010 - California

Thanks For Your Attention!

Jian-Wen Bao, Joost de Gouw,
Georg Grell, Russ Schnell,
Christoph Senff, Jim Wilczak

Questions, Comments?