Informing the next generation of climate policy

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Panel: What is the Meaning of Policy Failure on Climate Change?
Climate Change 2011: When Policymakers Fail
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EAPS

What is the meaning of “policy failure”?

- Existing policies to address greenhouse gases in many jurisdictions
- Collective actions and decisions determine the state of the environment
- Role for policy-relevant science to inform these decisions
  - Identify the consequences of human action or inaction
  - Expand the menu of possible interventions

Three observations about science for atmospheric management

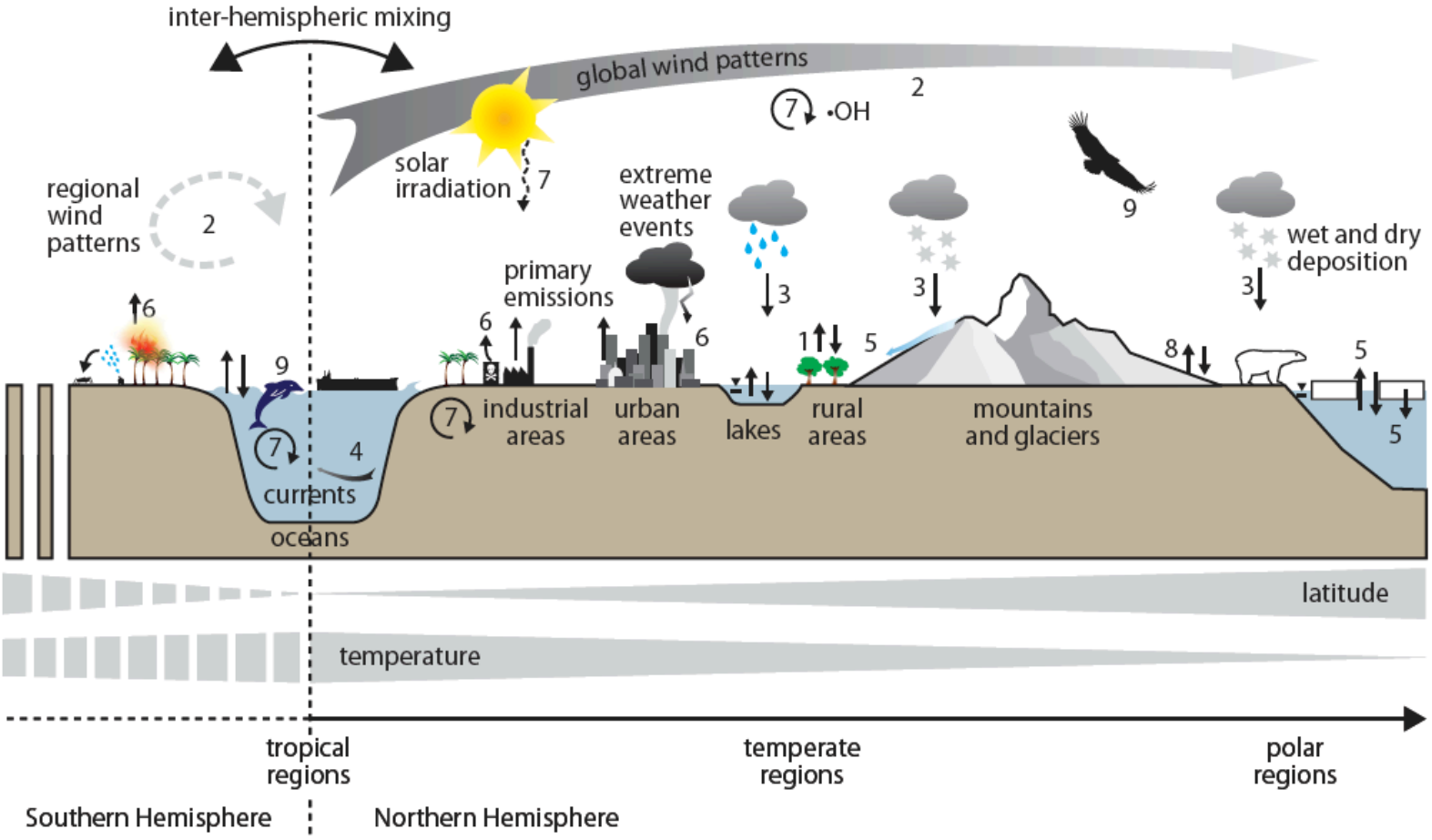
1) Climate has changed and will change in the future: this affects a broad range of policy choices
2) Scientists need to improve knowledge for mitigation "outside the box": not just about CO_2 anymore
3) Effective policies require understanding the atmosphere as a complex system involving humans

1) A changed climate has broad impacts for environmental quality

A key example: Air pollution from particulate matter, ozone, and toxics such as persistent organic pollutants (POPs) and Hg

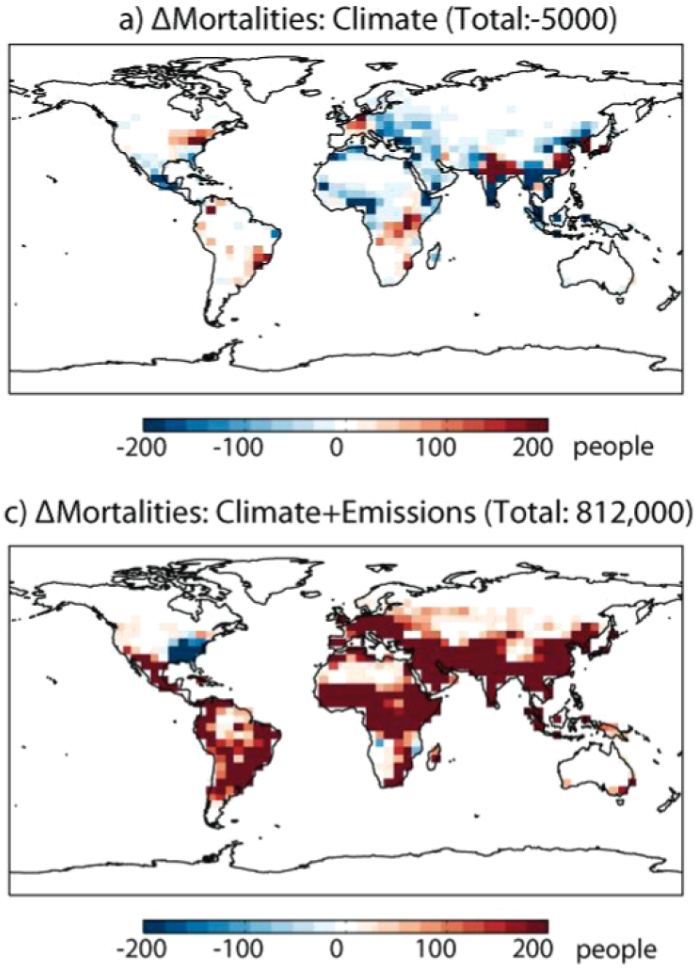
[Photos: UNEP]

1) Impacts of a changing climate: transporting toxics to the Arctic



[*Ref: AMAP, 2011*]

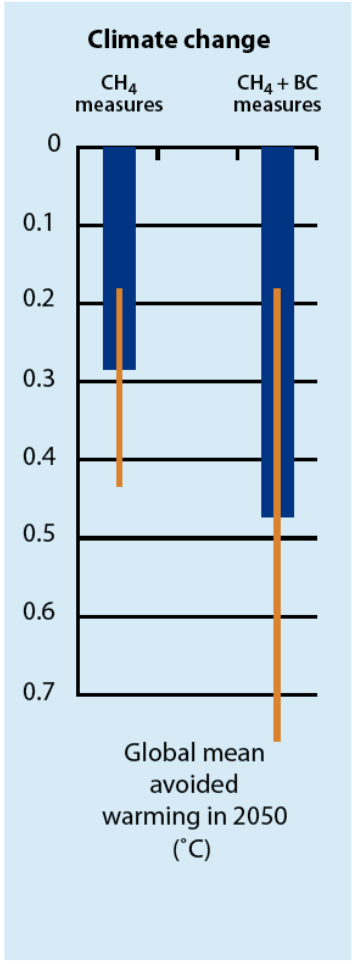
1) Impacts of a changing climate: ozone pollution in the future

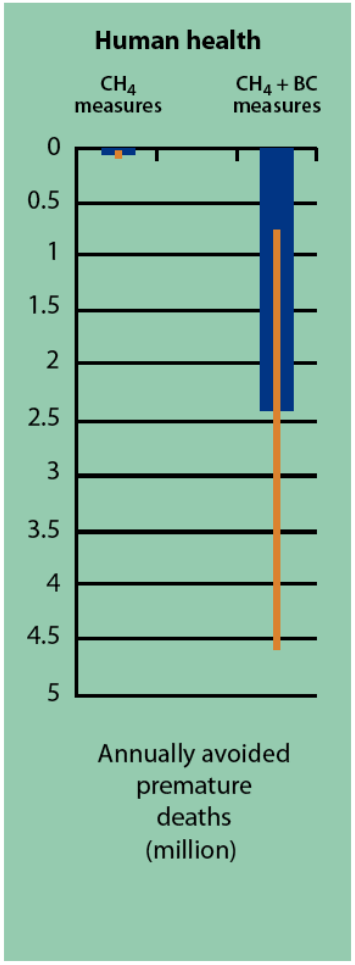


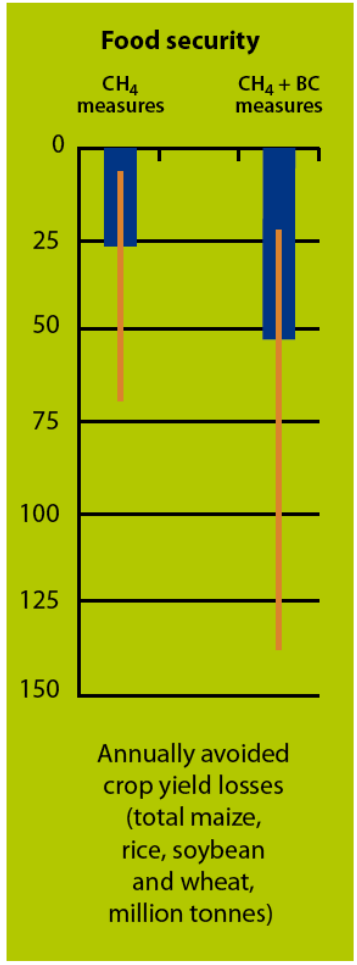
- Under changed climate, surface ozone will increase in some areas, decrease in others (due to temperature, H_20 changes)
- Regulators may have to deal with a "climate penalty" where emissions reductions have less effectiveness
- Research shows that projected emissions trajectory is key determinant of projected air pollution damages

[*Ref: Selin et al., Environmental Research Letters*, 2009]

2) Expanding the Menu of Policy Options

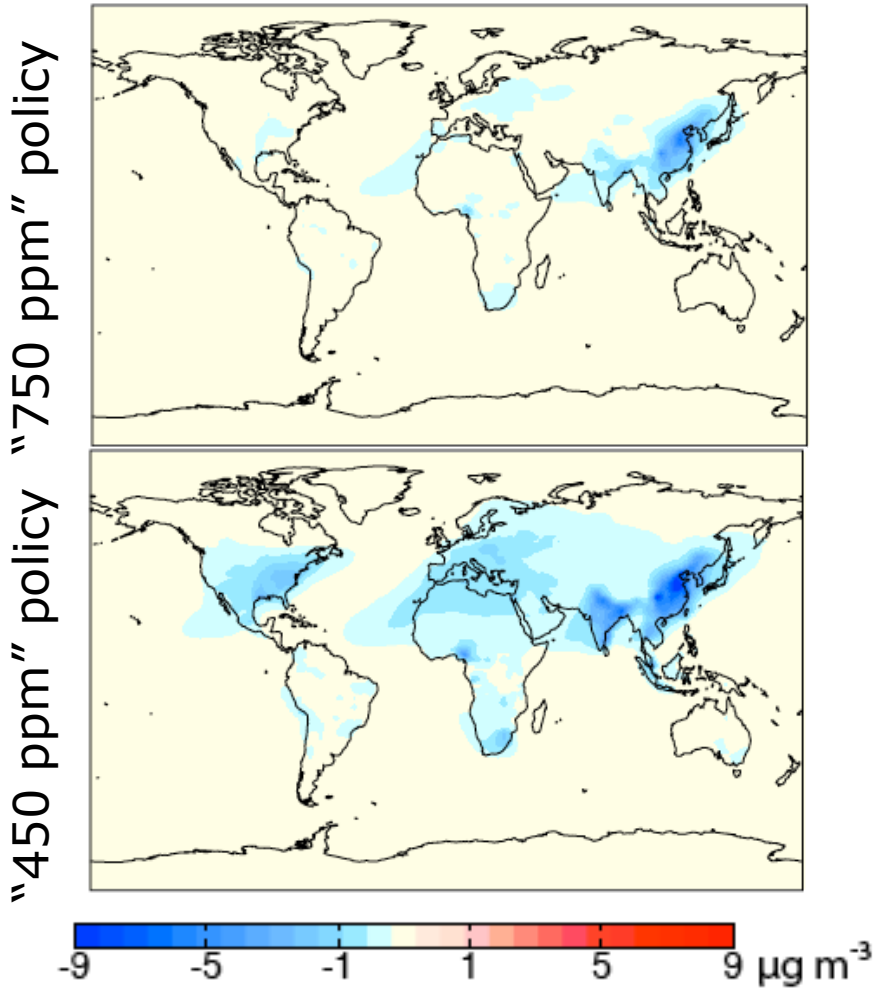






[Ref: UNEP, 2011]

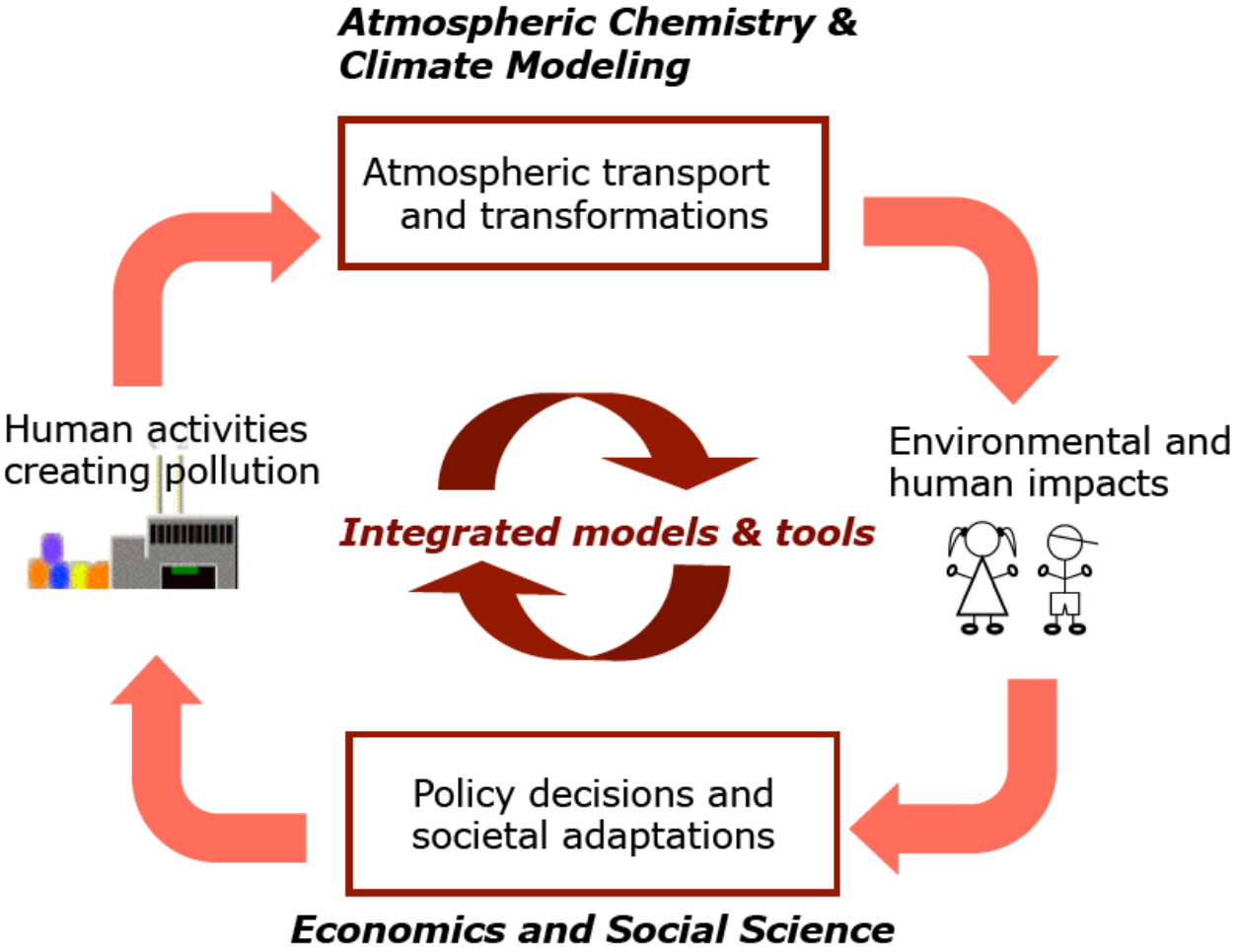
2) “Win-win” solutions?: co-benefits of climate policy for air pollution



- Climate policies can also reduce particulate matter exposure
- Quantified benefits small relative to cost of climate policies
- North-South issues in cost, benefit distribution

[*Ref: Selin et al., submitted to ES&T*]

3) Understanding the coupled system: Including human responses



[*Ref: Selin, submitted to ES&T*]

How to educate the next generation of scientists to inform policy?

- Few opportunities for formal training in policy during scientific education

- Developed new interactive tool to help educate scientists and students about how science is used in global politics: The Mercury Game http://mit.edu/mercurygame
- Freely available with registration

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