



# Agriculture's Role in the New Carbon Economy

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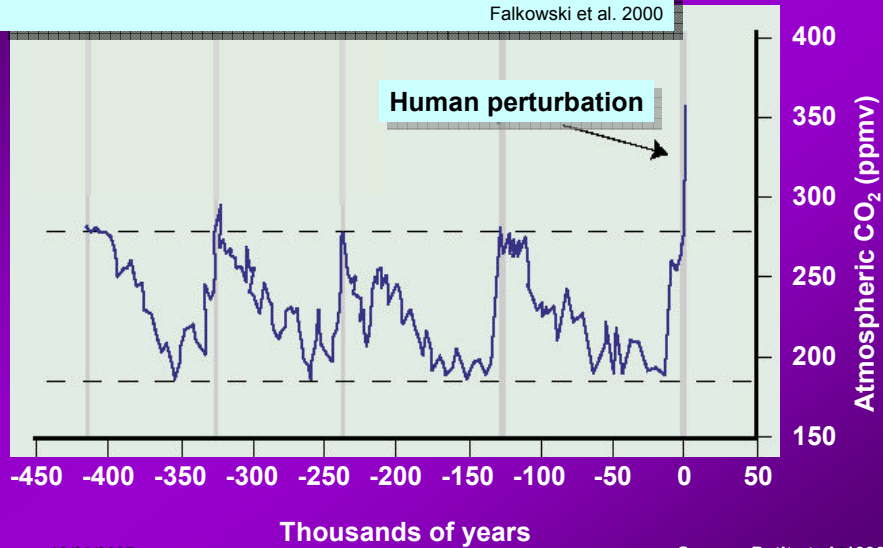


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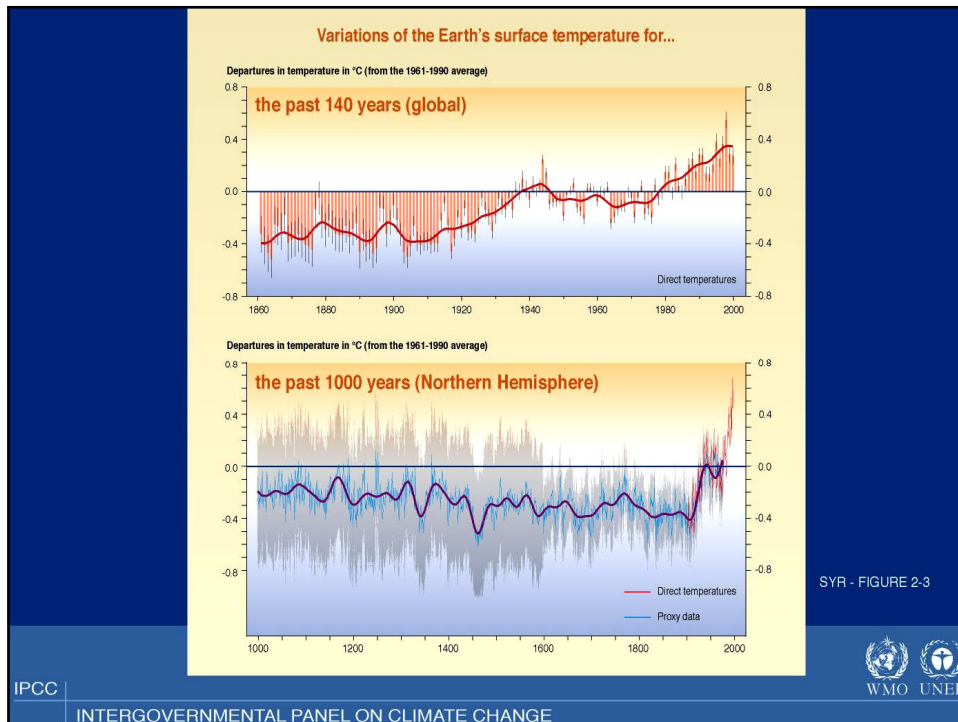
We have left the domain that defined the Earth system for the 420,000 years before the Industrial Revolution

Falkowski et al. 2000



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Source: Petit et al. 1999



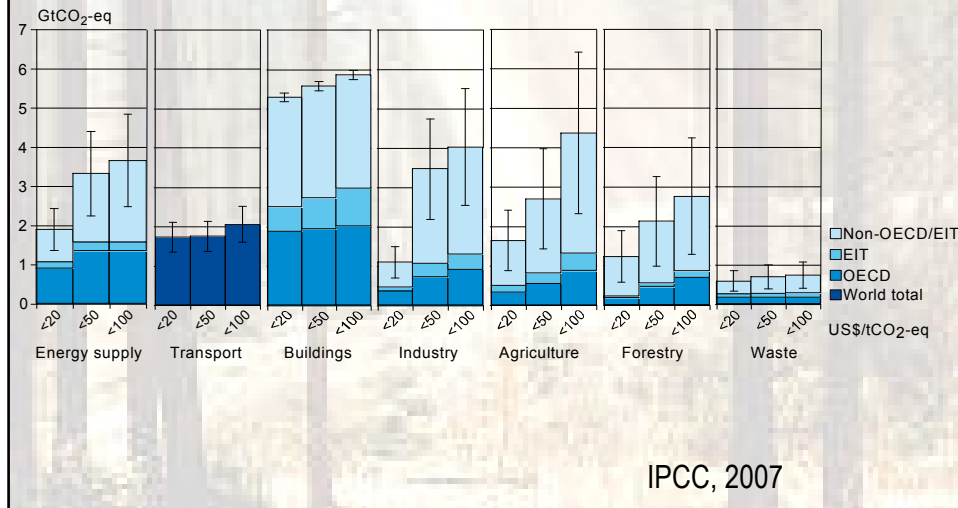
## UNFCCC Bali Dec 2007

- Enhanced national/international action on mitigation of climate change
- Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions

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## Global economic mitigation potential for different sectors at different carbon prices



## Agriculture

- A large proportion of the mitigation potential of agriculture (excluding bioenergy) arises from soil C sequestration, which has strong synergies with sustainable agriculture and generally reduces vulnerability to climate change.
- Agricultural practices collectively can make a significant contribution at low cost
  - By increasing soil carbon sinks,
  - By reducing GHG emissions,
  - By contributing biomass feedstocks for energy use

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IPCC Fourth Assessment Report, Working Group III

## Biofuel Production Concerns

- *Changes in land use, and potential conversion of conservation lands to biomass production.*
- Impact on soil carbon
- *Changes in water needs, availability, and water quality impacts.*
- *Competition for grains and oilseeds and impacts on food and feed availability and prices.*
- *Lifecycle analyses and GHG/C accounting for biofuels production.*
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- *Assessing co-benefits of biofuel production, such as soil quality, reduced erosion from marginal crop lands, and enhanced wildlife benefits.*

## Progress in Measuring and Monitoring

- Nitrous oxide monitoring in agriculture – Cesar Izaurralde, Pacific NW National Lab
- COMET and scaling up issues – Rich Conant, Colorado State University
- Comparison of C measuring techniques – Cesar Izaurralde, Pacific NW National Lab
- VERIS technology for measuring carbon – Eric Lund, VERIS Technologies
- Carbon trading programs for agriculture – Nathan Clark, Chicago Climate Exchange
- **Cap-and-Trade: Is Federal Legislation Coming?” – Debbie Reed, DRD Associates, Arlington, VA**

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## Biofuels and the Global Carbon Balance

- Resource assessment needs, sustainability issues, and life-cycle standards associated with biofuels development – Richard Nelson, KSU
- Modeling the impact of cellulosic ethanol production on soil carbon – Scott Staggenborg, KSU
- California's Global Warming Solutions Act: How Does It Impact Agriculture? – Cynthia Cory, California Farm Bureau
- Environmental impact of climate change on Kansas – Johannes Feddema, Univ. of Kansas

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## Agriculture's Challenge: Mitigating and Adapting to Climate Change

- Economics of ethanol industry adopting cellulosic technology – Mike Woolverton, KSU
- Soil carbon sequestration in Brazil –Telmo Amado, Universidade Federal de Santa Maria, Brazil
- IPCC Report and the Nobel Peace Prize – Chuck Rice, KSU

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