

***Forestry and Agriculture Greenhouse Gas Modeling
Forum, Workshop #4:***

***Modeling Ag-Forest Offsets and Biofuels in
U.S. and Canadian Regional and National
Mitigation***

**March 6-8, 2007 – Shepherdstown, West Virginia
National Conservation Training Center**

WELCOME !! RELAX – YOU MADE IT --

Ken Andrasko

**Climate Economics Branch, Climate Change Division
Office of Air and Radiation, U.S. EPA**

Brief History of the 21st Century: Modeling Forums, Coffee, Great People

Cooperators:

- **US EPA, Climate Change Div.**
 - **USDA - Forest Service**
 - **USDA Office of Global Change**
 - **Agriculture and Agri-Food Canada**
 - **RTI International**
 - **Nicholas Institute for Environmental Policy Solutions**
- 1st Forum 2001: model scenario comparisons
 - 2nd: 2002
 - 3rd 2004: Modeling to Support Policy. Farm Foundation summary.
 - 4th: 2007: Biofuels & deforestation
 - 5th Forum?: 2008 ?? Impacts and Adaptation??
 - 6th Forum?: 2009?? For/ag in Global and climate economic modeling?

People Make Things Happen

- **Nicholas Institute for Environmental Policy Solutions:** **Brian Murray**
- **Agriculture and Agri-Food Canada:** **Bob MacGregor**
- **USDA-Forest Service:** **Ralph Alig**
- **USDA Office of Global Change:** **Jan Lewandrowski**
- **RTI International:** **Linda Cooper**
- **EPA:** **Jules Siedenburg, Ken Andrasko**

AWARDS CEREMONY

Easy Rider Award for Transcontinental Travel

Cool Hand Luke Award for Brevity, But Insight

Rock of Gibraltar Award: Steadiness Under Fire

Modeling Forum #4 Goals

- Identify policy community's needs and priorities for assistance from modelers to improve understanding of the benefits, costs, and co-effects of mitigation options
- Assess feasibility of large-scale deployment of biofuels in U.S. and Canada
- Assess potential for reducing deforestation in tropics and North America as climate mitigation option.

Outreach:

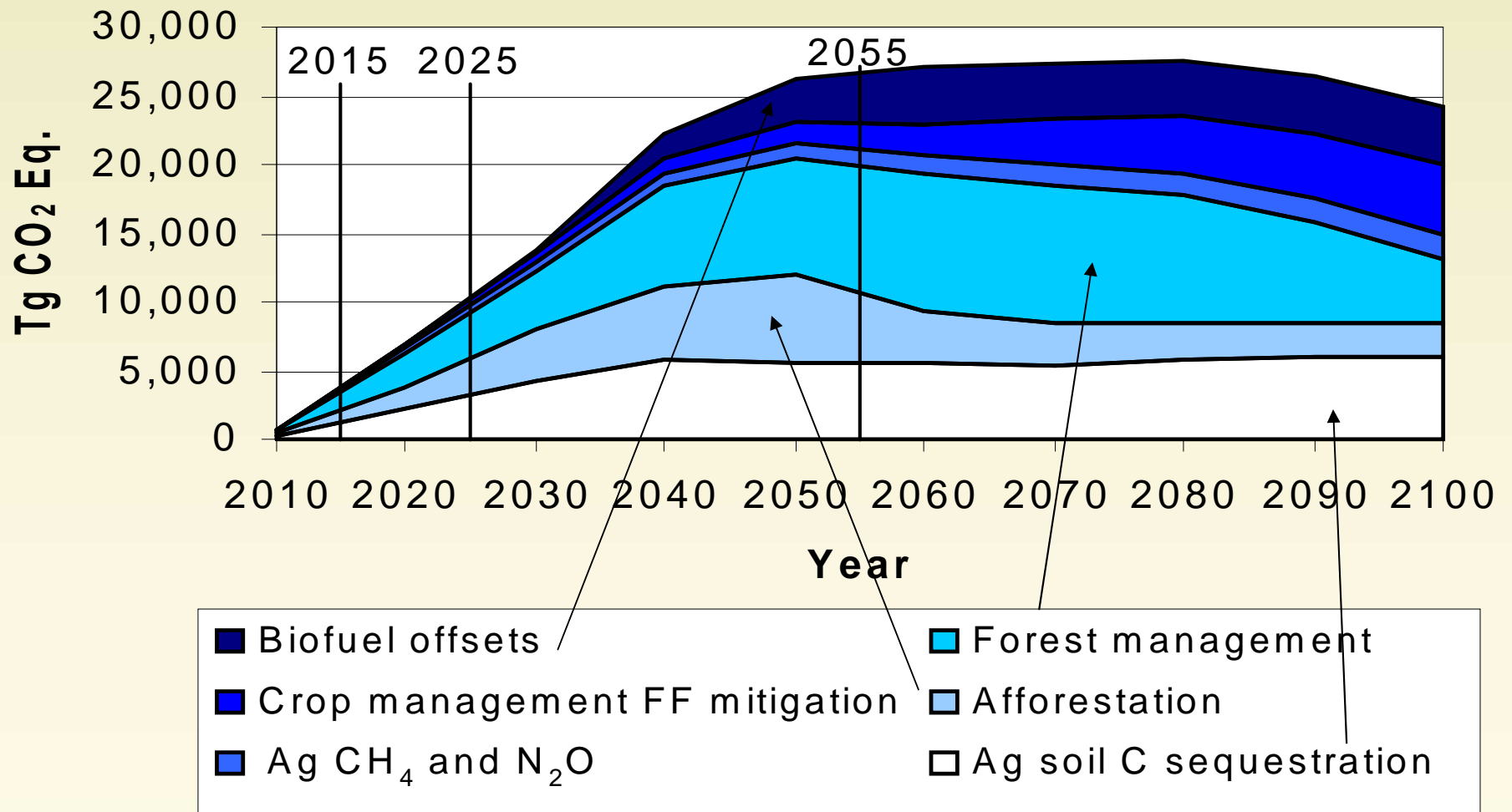
- Brief policymaker summary of each topic & longer summary
- Possible day-long summary event in D.C.?
- Other ideas ?



Potential GHG mitigation from forestry & agriculture: How Much? Where? Co-Effects? How Would it Work?

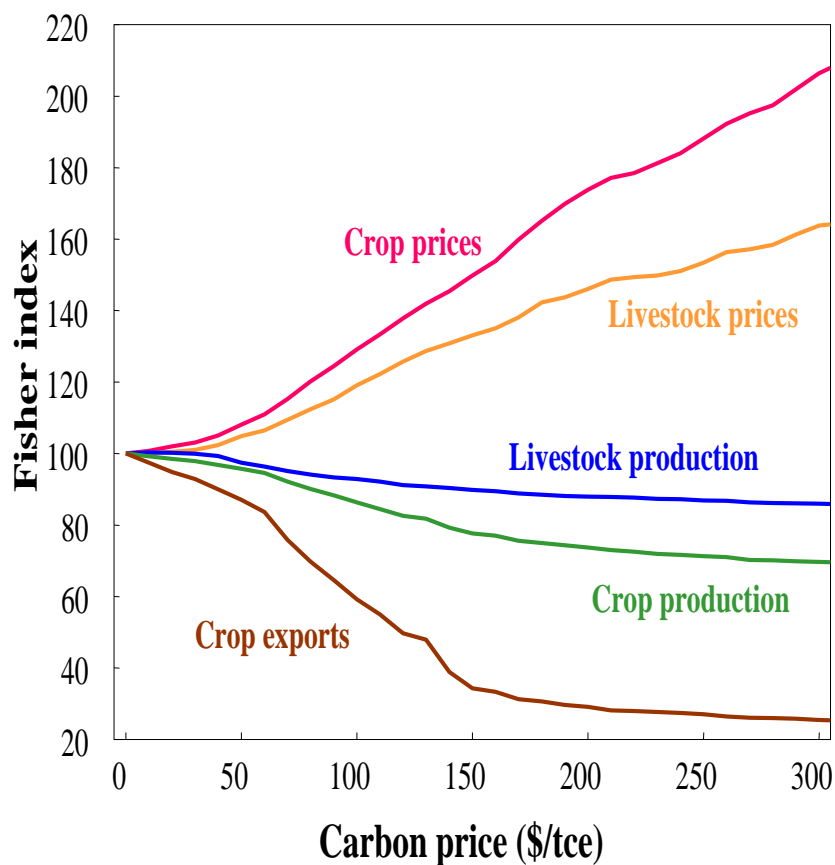
Eg, EPA 2005 report: *GHG Mitigation Potential in US Forestry and Agriculture*

\$15/t CO₂ Eq. Constant Real Price

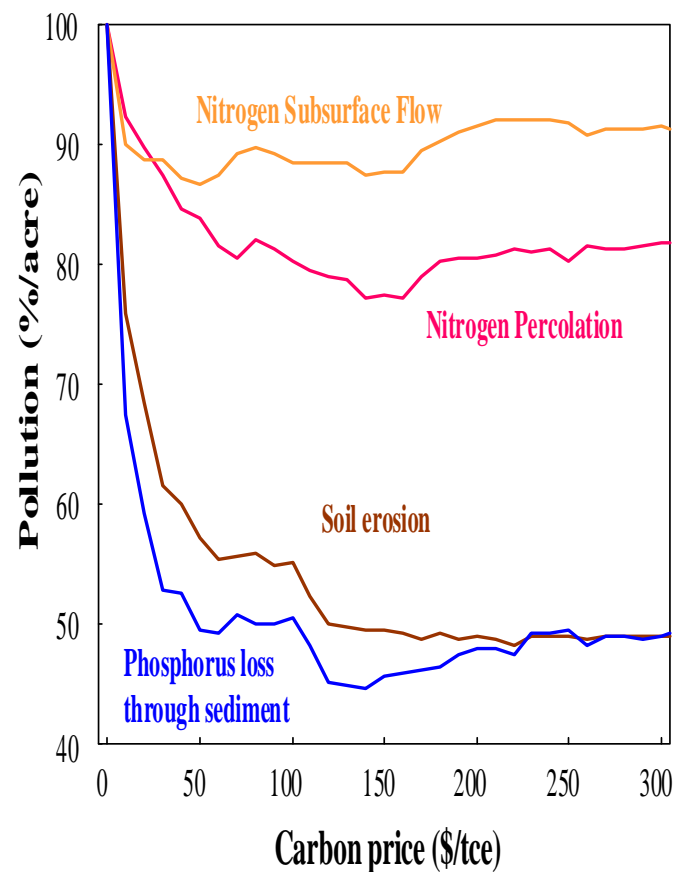


How Do Mitigation Options Affect Markets? The Environment? Each Other? [[Bruce McCarl slides]]

GHG Mitigation and Ag-Markets



Multi-environmental Impacts



Tradeoff between carbon and traditional production: ag prices rise, forest products⁶ fall

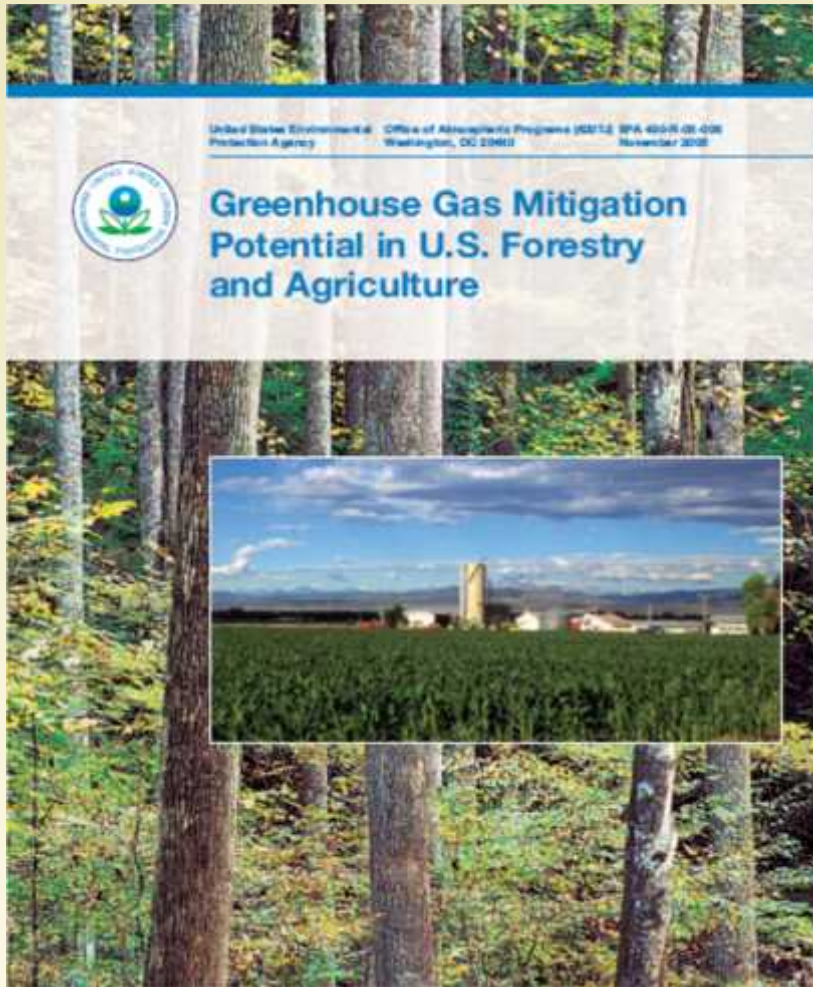
Are We Ready to Identify What Makes Sense, When, and Where??

Eg, EPA 2005 report: *GHG Mitigation Potential in US Forestry and Agriculture*

Mitigation Quantity (Tg CO ₂ Eq./year, annualized, 2010–2100)	GHG Scenario (\$/t CO ₂ Eq.)	Primary Near-Term Strategies (By 2025)	Primary Long-Term Strategies (Beyond 2025)
Low (<300)	\$1–\$5	Agricultural soil carbon sequestration	Forest management
		Forest management	Emissions reduction (CO ₂ and Non-CO ₂) from agricultural activities
Medium (~300–1,400)	\$5–\$30	Afforestation	Forest management
		Forest management	Biofuels
High (1,400+)	\$30+	Afforestation	Biofuels
		Forest management	Fossil fuel CO ₂ and Non- CO ₂ emission reduction options

Table 8-2

More information:



Report Collaborators:

Ken Andrasko & Ben DeAngelo
(EPA),

Brian Murray, RTI, Brent Sohngen
(RTI, Ohio State),

Bruce McCarl (Texas A&M), Darius
Adams (Oregon State), Ralph Alig
(US Forest Service),

Download the entire report:

[Greenhouse Gas Mitigation Potential
in U.S. Forestry and Agriculture](#)

(PDF, 154 pp., 4,929 KB)

www.epa.gov/sequestration

U.S. Greenhouse Inventory:

www.epa.gov/climatechange

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Avoided Deforestation As Mitigation Option ??

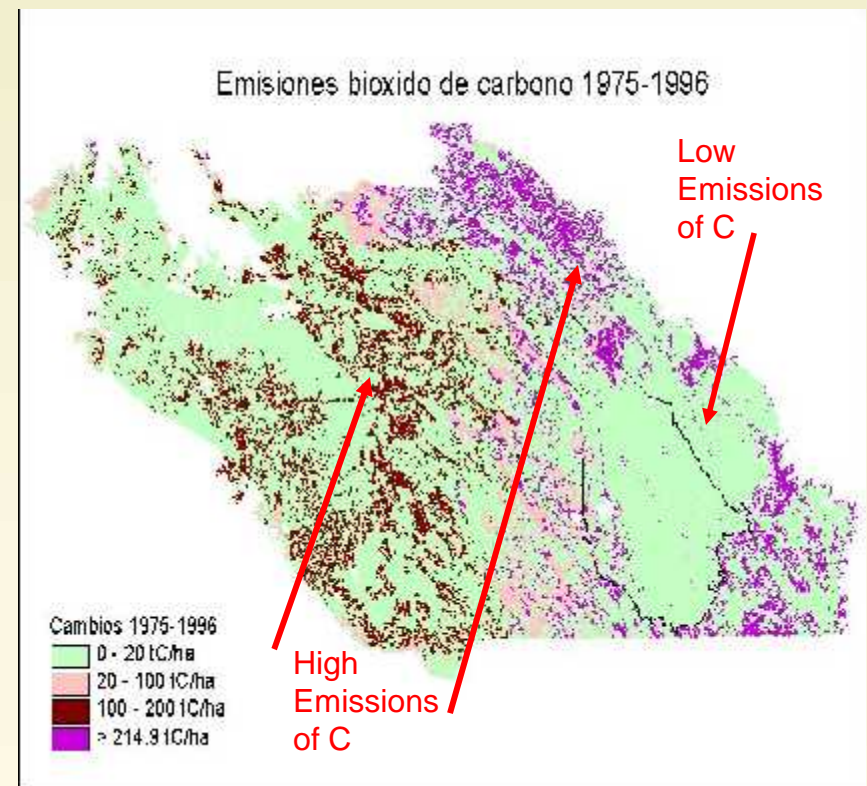
- UNFCCC issue: PNG and Costa Rica
- Policy questions:
 - How would baseline for deforestation be set?
 - Who is willing to pay, how, to whom, for what? How monitor?
 - Context: in UNFCCC Convention? As bilateral or ODA? Within some formal climate policy regime?

- \$10 / tC, 147 million additional ha of forest and 12 billion tC by 2055 (240 million tC / year)
- \$100 / tC virtually eliminates deforestation

[Sohngen et al., 2006; and Sathaye et al, 2006]



North Carolina: new cropland



South India: deforested for crops & plantations

The Gorilla in the Mists: How Do Climate Impacts Affect Mitigation Options ???

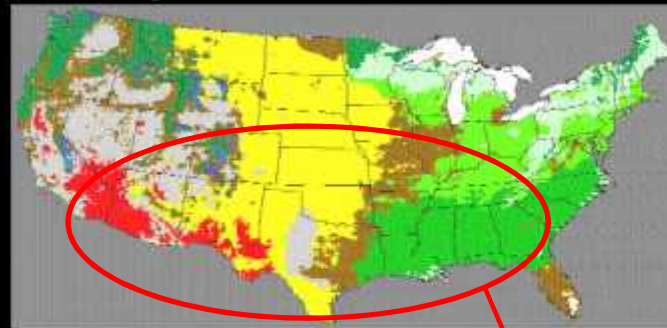
CLIMATE CHANGE IMPACTS ON THE UNITED STATES

Ecosystem Models

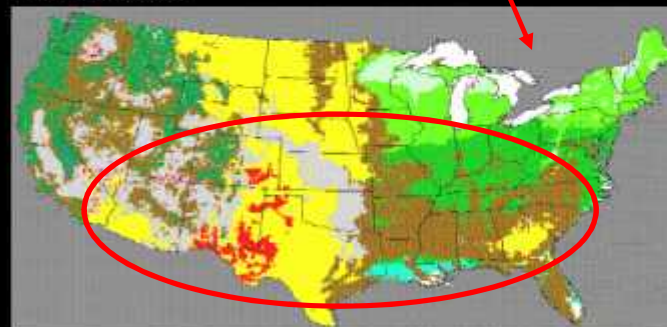
Maps of current and projected potential vegetation distribution for the conterminous US. Potential vegetation means the vegetation that would be there in the absence of human activity. Changes in vegetation distribution by the end of the 21st century are in response to two climate scenarios, the Canadian and the Hadley. Output is from MAPSS (Mapped Atmosphere-Plant-Soil System).

- Tundra
- Taiga / Tundra
- Conifer Forest
- Northeast Mixed Forest
- Temperate Deciduous Forest
- Southeast Mixed Forest
- Tropical Broadleaf Forest
- Savanna / Woodland
- Shrub / Woodland
- Grassland
- Arid Lands

Current Ecosystems



Canadian Model



Hadley Model



Our Task: Share Analyses, Help Them Get Clearly Communicated

“Dude: Redo the monitoring plan ... and don't sell below \$20/ tonne !!”

