Carbon Management in Natural Resources and Agriculture

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Forests offset 11-16% of U.S. GHG emissions
Agriculture is a net GHG source

U.S. EPA 2005
ABATEMENT POTENTIAL BY SECTOR – 2030
Opportunities less than $50/ton CO$_2$e

Source: McKinsey analysis

Creyts et al. 2007
Opportunities for Forestry and Agricultural Mitigation of Atmospheric CO$_2$ - Florida

Mulkey et al. 2008
UF Carbon Science Expertise

- Natural resource and agricultural management
- Plant sciences
- Ecology
- Biogeochemistry
- Remote sensing
- Engineering
- Economics
- Policy
- Social sciences
Carbon Resources Science Center Mission

• Bring UF carbon science experts together to work synergistically on common problems
• Leverage new sources of research funding
• Serve as an objective, well-regarded source of rigorous information on carbon resources science for stakeholders
Focus Areas

- Develop optimum forest management regimes for sequestering carbon;
- Discover technologies for decreasing carbon emissions from agricultural production systems;
- Advance agricultural and forest management systems to produce carbon-neutral biofuels to substitute for fossil fuels;
- Create efficient methodologies for cost effective implementation of cap-and-trade systems;
- Conduct life-cycle analyses with full-cost accounting of alternative policies, incentives and management regimes; and
- Address critical shortage of US scientists through graduate education.
Example Projects
Forest Carbon Management

- Forestry is one of few industries that is a net C sink
- Improved management can increase rates of sequestration
- Model development is underway to support C management in slash, loblolly, and longleaf pine
- Include life cycle C emissions associated with management, transportation, and decay of forest products
Example Projects TerraC Information System

- Terrestrial C pool is third largest after ocean and fossil fuels
- Research on terrestrial C pools and fluxes are diverse and scattered across multiple disciplines and spatial and temporal scales
- There is a need for integration and synthesis of existing terrestrial C pool and flux data
Objectives

• Address obstacles to synthesis and integration of terrestrial C data through development of database infrastructure for the C science community

• Advance terrestrial C science through fusing of carbon & environmental data to assess the potential to sequester C in biomass and below-ground in terrestrial ecosystems
Terrestrial Carbon ("TerraC") Information System

• Will include components to
  – Upload
  – Store
  – Manage
  – Query
  – Analyse
  – Visualize
  – Download
  – C data from diverse terrestrial C science studies
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