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PIER's Efforts in Terrestrial Carbon Sequestration Research

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Public Interest Energy Research (PIER) Program
California Energy Commission

PIER Research Plan

- The Energy Commission started working on climate change in 1988 (AB 4420)
- PIER was created in the late 1990s and started working in earnest on climate change in 2001
- PIER adopted its long-term research plan in 2003. Updated in 2008
- Executive Order # S-20-06, October 18, 2006 mandates biennial science reports on the effects of climate change on CA
- First CAT report was released in March 2006
- Draft 2008 Assessment report released on April 1st, 2009

California Climate Change Center

- Virtual research center designed to implement the PIER plan
- Funding ~ $6 million/year
- Scripps Institution of Oceanography is the main core research group (Dr. Dan Cayan) but most of the major research institutions in California are involved.
- Areas of work:
  - Regional climate monitoring, analysis, and modeling
  - GHG Inventory Methods
  - Options to reduce GHG emissions
  - Impacts and adaptation studies

Options to Reduce GHG Emmissions

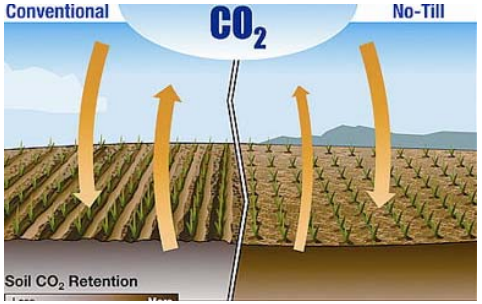
- It's a PIER priority to thoroughly characterize the costs and benefits of potential GHG reduction actions to better inform the state's GHG reduction actions.

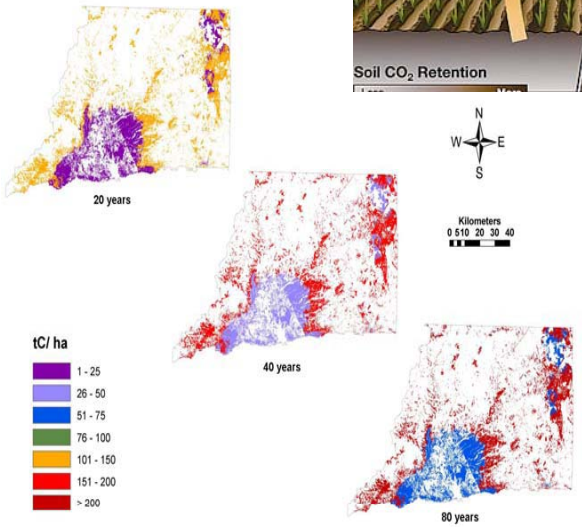
- Controlling GHG emissions:
  - Increasing energy efficiency in all economic sectors
  - Reducing fossil fuel consumption

- Examine C mitigation through C sequestartion and storage
  - Geologic carbon sequestration
  - Increase in aboveground biomass
  - Increase in soil carbon stores

Funded Terrestrial C Sequestration Studies

- **Changes in agricultural practices that could increase carbon sequestration and mitigate GHG emission.**
  - Farming practices could reduce greenhouse gas emissions by about 0.5 to 3 Mg CO_2 eq ha^{-1} yr^{-1}.
  - Variation due to type of farming practice used.
  - Potential increased in the following order: low nitrogen fertilizer input, reduced tillage, manure application, and winter cover cropping.
- **Terrestrial carbon sequestration potentials in Shasta County**
  - Afforestation of Shasta County rangelands could result in the sequestration of about 17.7 million tons of carbon after 20 years at a cost of less than $20/t C
- **Carbon sequestration on Delta islands**
  - Pilot-scale research by the U.S. Geological Survey on Twitchell Island in the Sacramento Delta
  - Results show that wetlands grown under specific conditions appear to be a viable means of long-term carbon sequestration





Future Terrestrial C Sequestration Studies

(Funds will likely be allocated in July 2009)

- **A full GHG accounting of soils ammended with biochar**
  - Biochar is produced when the residues from crops, forestry, and animal wastes are burned.
  - It can be used to restore soil fertility, while storing C for centuries.
  - In order to fully account for sequestration potential, it is necessary to determine nitrous oxide and methane emissions from CA soils amended with biochar
- **The potential of rangelands to sequester C through the management of cattle**
  - The proper management of rangelands offers opportunities mitigate CO_2 emissions through sequestration in the soil and vegetation.
  - It is important to determine the best management schemes for the diverse types of rangelands in CA.

6th Annual Climate Change Conference

http://www.climatechange.ca.gov/events/research.html

SEPTEMBER 9th – 11th, 2009

Location: Sacramento Convention Center

- Presentations are tailored to share technical information in an easy-to-understand manner with policy makers, program managers, climate change researchers, news media, and the general public.
- Intended to facilitate cross-disciplinary discussions and provide a forum for individuals interested in regional climate change issues and ongoing research in California.

Contacts and Further Information

For PIER reports please go to:

http://www.climatechange.ca.gov/documents/pier_gcc_reports.html

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