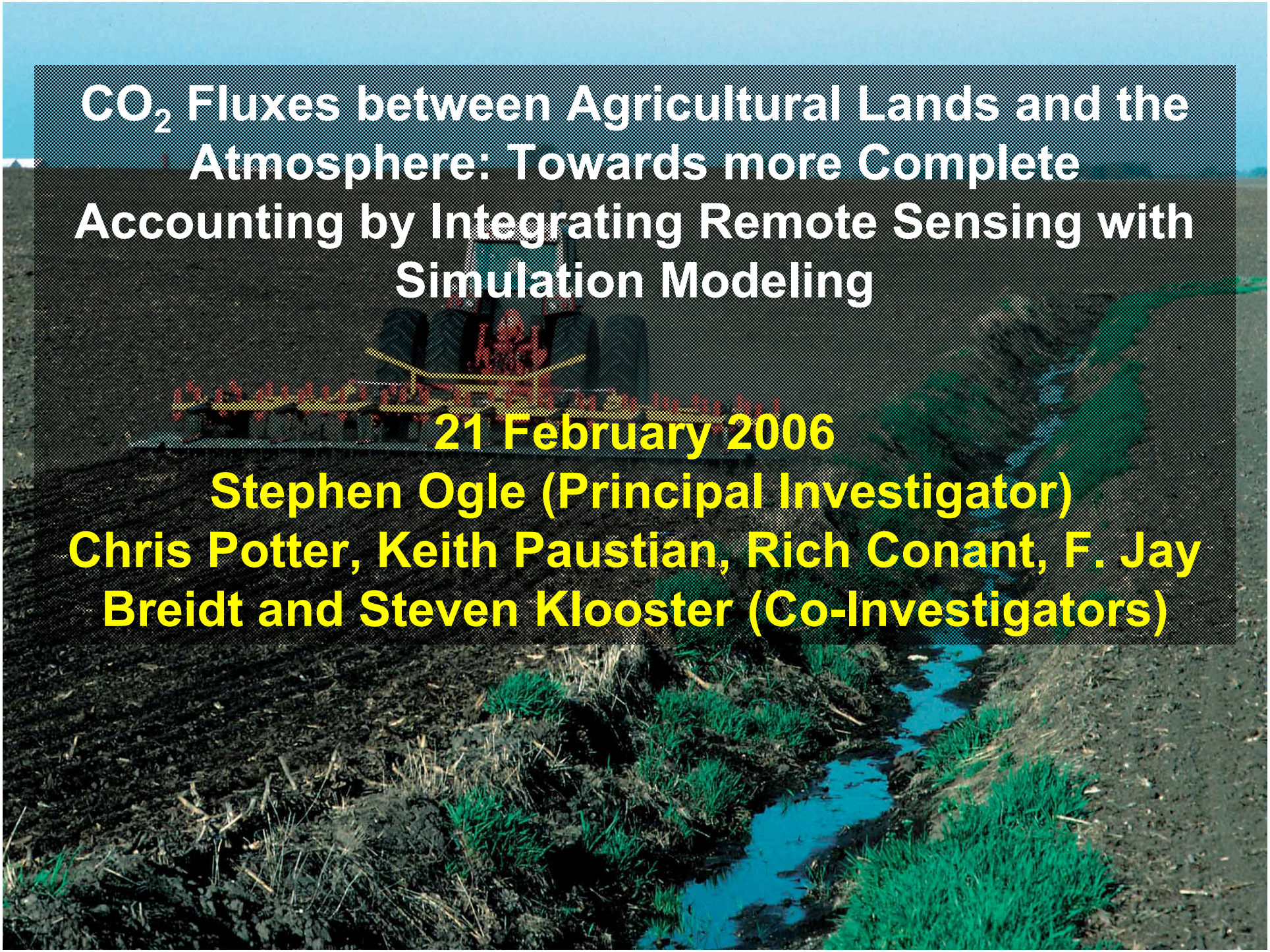
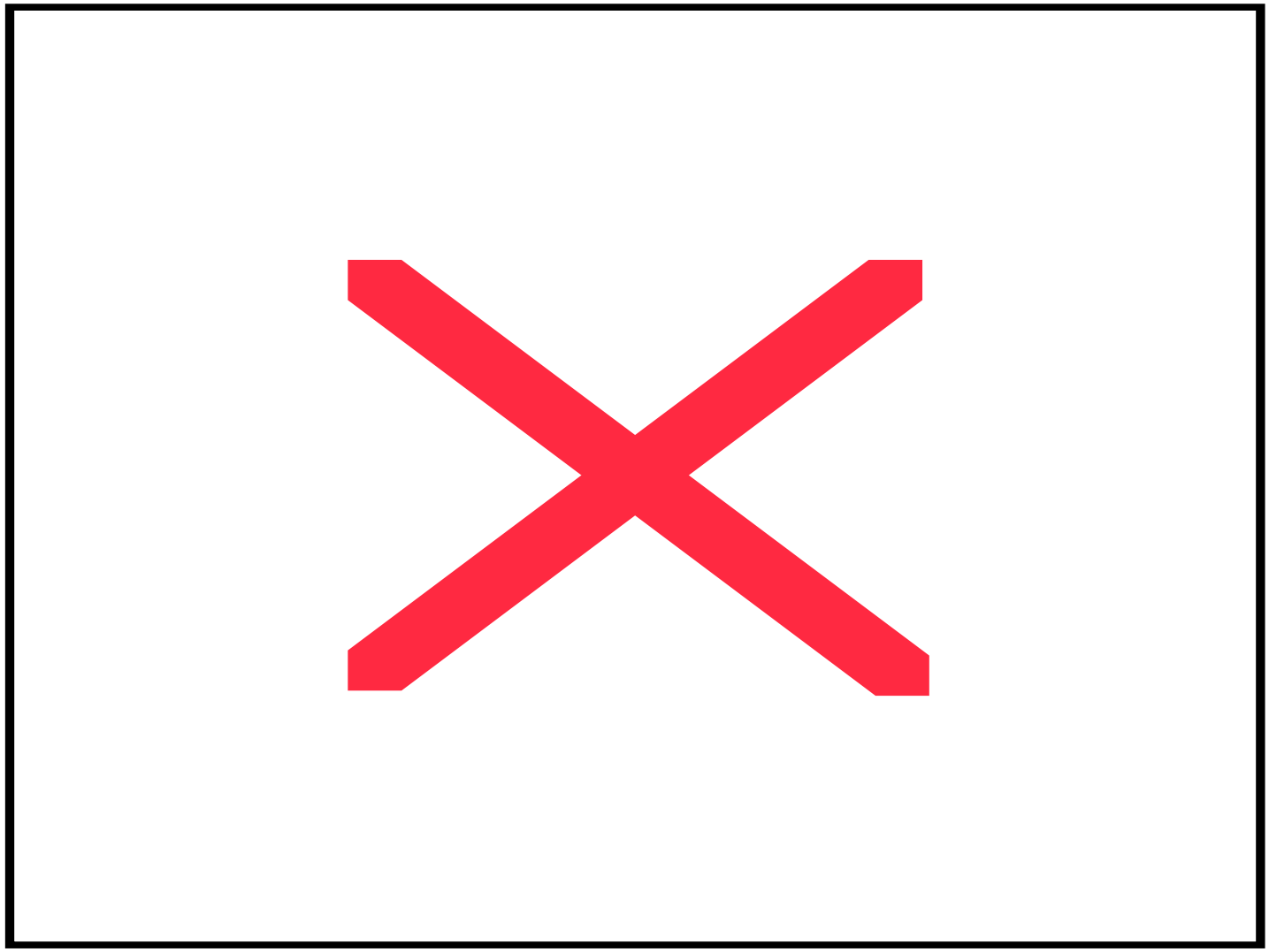


CO_2 Fluxes between Agricultural Lands and the Atmosphere: Towards more Complete Accounting by Integrating Remote Sensing with Simulation Modeling

21 February 2006

Stephen Ogle (Principal Investigator)
Chris Potter, Keith Paustian, Rich Conant, F. Jay Breidt and Steven Klooster (Co-Investigators)

Model: CASA-Century

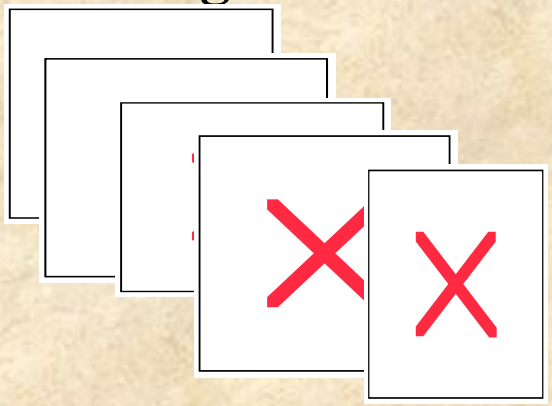


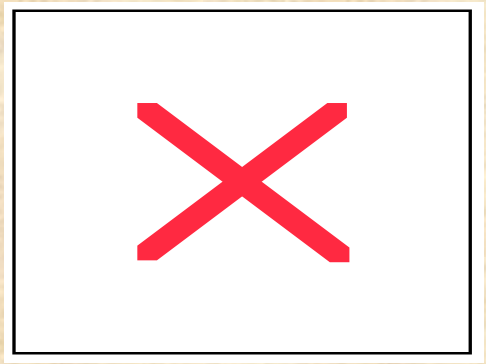
Model Testing and Verification

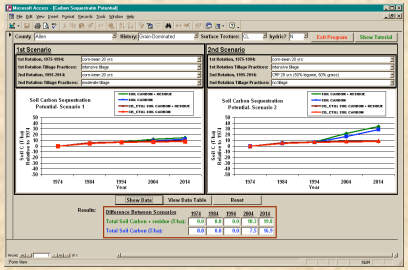
- Compare results with measurements
  - Long Term Agricultural Experiments
  - Ameriflux Sites
  - ARS Flux Sites
  - Other Experiments
- Improve model structure and parameterization to the extent possible

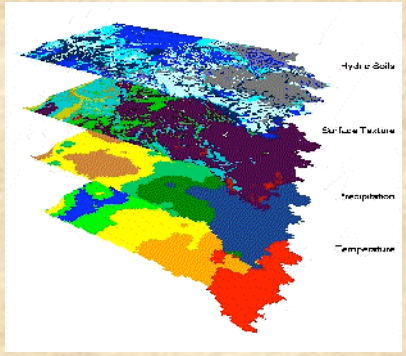
Modeling Framework for Regional Simulations

Land Use and Management Activity





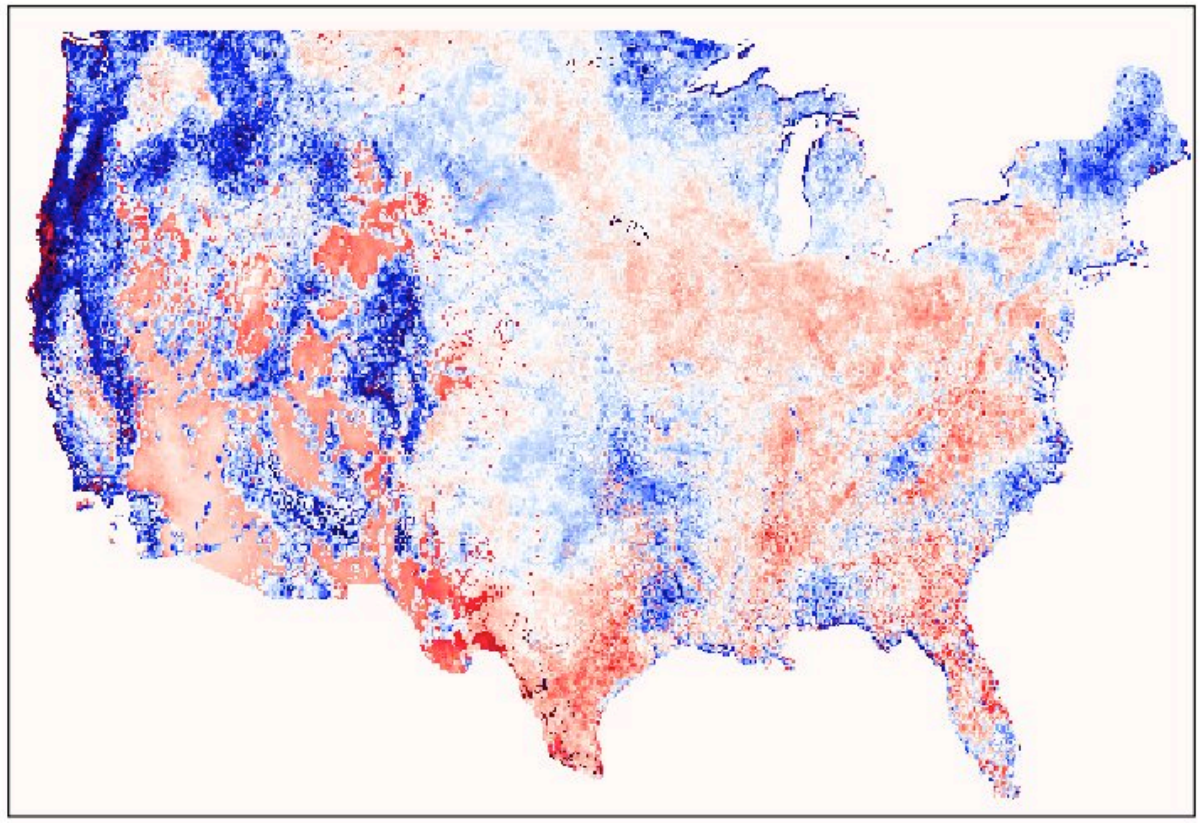




Environmental Conditions:
Soils and Climate

Remote Sensing Data:
MODIS EVI

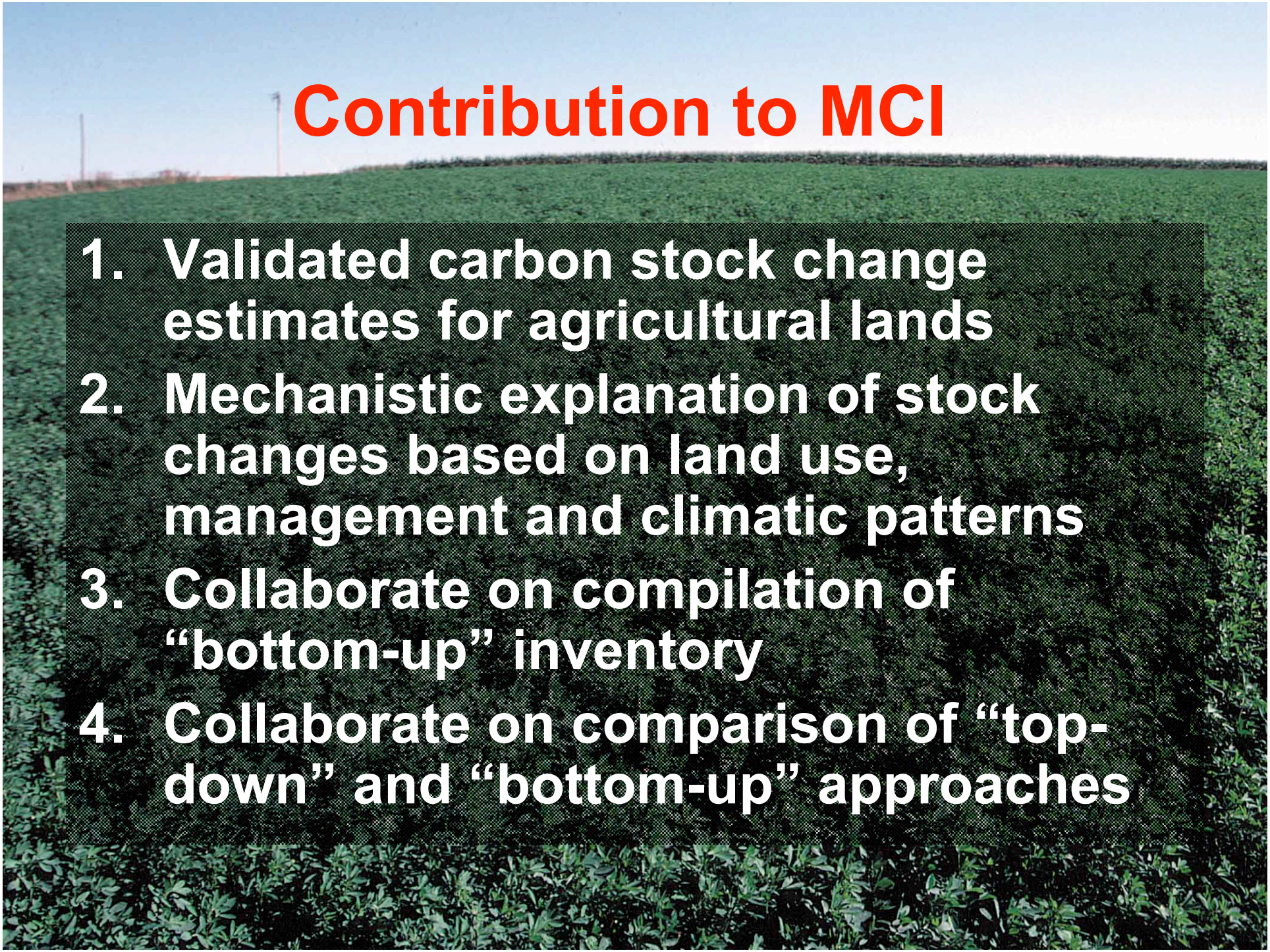
Annual Net Ecosystem Flux of Carbon -- 2004 from MODIS inputs



Validation

- Biomass and Soil C stocks will be measured to evaluate modeled estimates

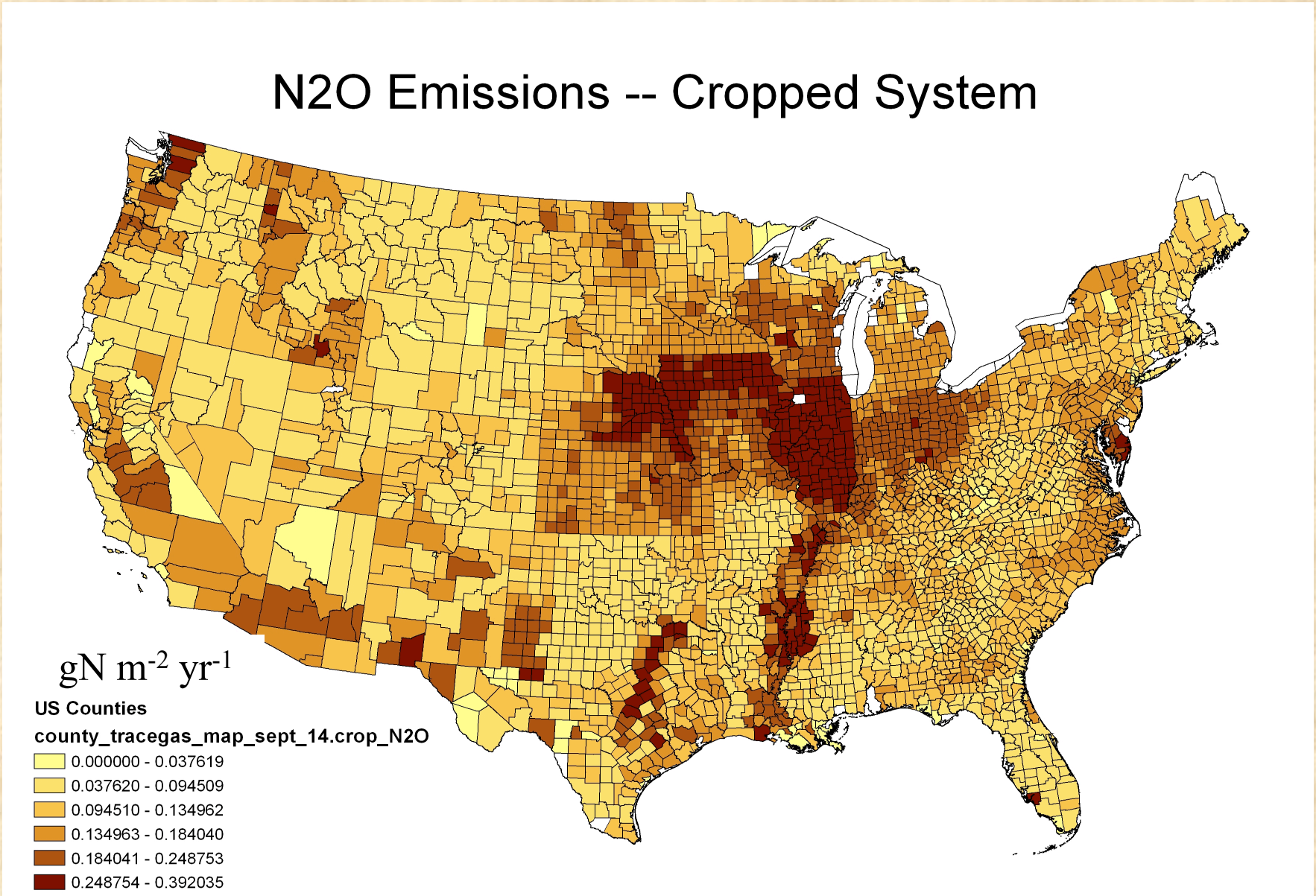
- Soil Quality Monitoring Network
  - Collaborative effort with USDA-NRCS
  - 30-50 sites in MCI Region as a pilot
  - Extended network will be developed in subsequent years



Contribution to MCI

1. Validated carbon stock change estimates for agricultural lands
2. Mechanistic explanation of stock changes based on land use, management and climatic patterns
3. Collaborate on compilation of "bottom-up" inventory
4. Collaborate on comparison of "top-down" and "bottom-up" approaches

Other Modeling Research: Ojima, Del Grosso, and Parton (N_2O and CH_4)



Ojima, Parton and Schimel: Couple DAYCENT modeling with aircraft campaign to compare “top-down” and “bottom-up” estimates