



# Global and Climate Change Program

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# Global and Climate Change Program

- **Global Carbon Cycle:** Identify the size, variability and potential future changes to reservoirs and fluxes of carbon.
- **Land Use/Land Cover Change:** Identify the processes that determine the temporal and spatial distribution of land cover and land use at multiple scales.
- **Ecosystems Dynamics:** Identify options society may have to ensure that desirable ecosystem goods and services are sustained in the context of uncertainties in climate.
- **Global Water Cycle:** Identify trends in the intensity of the water cycle and determine the impacts and feedbacks of these changes in agricultural lands and forests.
- **Human Contributions and Responses:** Identify how human activities interact to drive changes in the climate system, land use, and related agricultural systems.

# CSREES Global and Climate Change Program: Critical Dependencies



## USDA

- Forest & soil inventories
- Agricultural & forest managemt.
- Carbon sequestration



## NOAA

- Meteorological observations
- Ocean surface temperature and land cover observations
- Atm. CO<sub>2</sub> flask/tall tower network
- Weather models (NCEP)
- Air-Sea CO<sub>2</sub> exchange studies
- Integrated carbon modeling
- Ship-based ocean CO<sub>2</sub> surveys



## DOE

- Fossil fuel emissions
- AmeriFlux
- FACE and other CO<sub>2</sub> expts.
- Carbon databases (CDIAC)
- Carbon modeling
- Carbon sequestration



## USGS

- Landsat data & data products
- Topography & land cover maps
- Stream gauge network



## NASA

- Remote sensing: satellite time series (Landsat, SeaWiFS and EOS); expt. airborne sensors
- Remote sensing research
- Field campaigns--SAFARI, LBA
- Ocean, land, atmosphere and coupled carbon-climate modeling;
- Data sets & DISS



## NSF

- Fundamental Earth science research
- Ocean field campaigns
- Process studies
- NCAR, NCEAS, LTER

# Global and Climate Change Program

## FY 2007-2008

- 2007 Joint RFA with NASA (Carbon Management)
- 2008 Joint RFA with EPA (Climate Change, Land Use, Invasive Species)
- Maximum \$200,000 per year for up to three years; Maximum request \$600,000
- CSREES independently or co-shares funds with federal partners

# Global and Climate Change Program

Funding Year	2007 Carbon Management	2008 Climate change/Land Use/Invasive Species
# of proposals	74 (15)	46
# of proposals awarded	22 (4)	9 (3)
Success rate (%)	<b>30%(27%)</b>	20%
Average award size	<b>\$400,000</b>	<b>\$550,000</b>
Average award duration	3 years	3 years

# Global and Climate Change Program

## 2009-2010 Collaborations

- Enhancing ecosystem services from agricultural lands: management, quantification and developing decision support tools.  
(Joint with EPA)
- Regional studies that provide decision support tools for sustainable adaptive responses and carbon mitigation in agricultural lands and forests.  
(Joint with NASA)

# Managed Ecosystem Structure

- Research and Integrated
  - Higher education
- Farm to watershed levels
- Multi-disciplinary and multi-institutional
- Multi-functional systems approach



# Managed Ecosystems Program Statistics

<b>Funding Year</b>	<b>2005 \$4.7</b>	<b>2006 \$3.6M</b>	<b>2007 \$4M</b>	<b>2008 \$4.8 M</b>
<b># of proposals</b>	<b>110</b>	<b>73</b>	<b>69</b>	<b>79</b>
<b># of proposals awarded</b>	<b>11</b>	<b>17</b>	<b>13</b>	<b>18</b>
<b>% success</b>	<b>10</b>	<b>23</b>	<b>18</b>	<b>23</b>
<b>Average award size (standard)</b>	<b>428,000</b>	<b>334,034</b>	<b>382,694</b>	



# Managed Ecosystems

## *Problems addressed*

- How to protect and enhance the natural resource base and environment
- How to enhance economic opportunities by increasing productivity and ecosystem services
- How to improve quality of life through improved environmental quality.



# Managed Ecosystems

## *Long Term Goals*

Develop predictive, *multifunctional* agroecosystem management methods that will concurrently:

1. Optimize resource use efficiency
2. Increasing product quality and
3. Environmental quality

Develop indicators for land resource use assessment – market valuation



# Managed Ecosystems - *Approaches*

1. Basic biogeochemical functional level – how does the system work?
2. Multi-functional management level – How to couple production and ecosystem functions?
3. Quantify system outputs – Is the agricultural production and environmental conditions improving due to management changes?



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