



# Reducing Greenhouse Gases through Agriculture & Forestry

## The American Experience

Presentation to  
Australian Grains Industry Conference  
Melbourne, VIC  
July 2008















- New Entity for carbon credit aggregation owned by Iowa Farm Bureau Federation
- First licensed aggregator on the Chicago Climate Exchange (2003)
- Aggregation Specialists – Building a nation-wide network of contract facilitators in every state.
- 3.4 Million Carbon Credits in First 6 Months
- “Country Elevator of Carbon Credits”



- General Farm Organization
- Part of the American Farm Bureau Federation
- 155,000 member families
- Political Representation
- Member Services

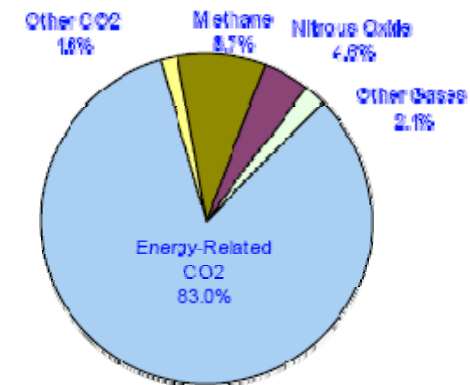




# The U.S. Carbon Market

- Voluntary National Market
  - Chicago Climate Exchange
    - Carbon Dioxide (CO<sub>2</sub>)
    - Methane (CH<sub>4</sub>)
    - Nitrous Oxide (N<sub>2</sub>O)
    - Sulfur Hexafluoride (SF<sub>6</sub>)
    - Perfluorocarbons (PFCs)
    - Hydrofluorocarbons (HFCs)

Predominant Sources of 2003 U.S. Greenhouse Gas Emissions



Source: EIA, Emissions of GHG gases in the United States 2003

# The Chicago Climate Exchange®

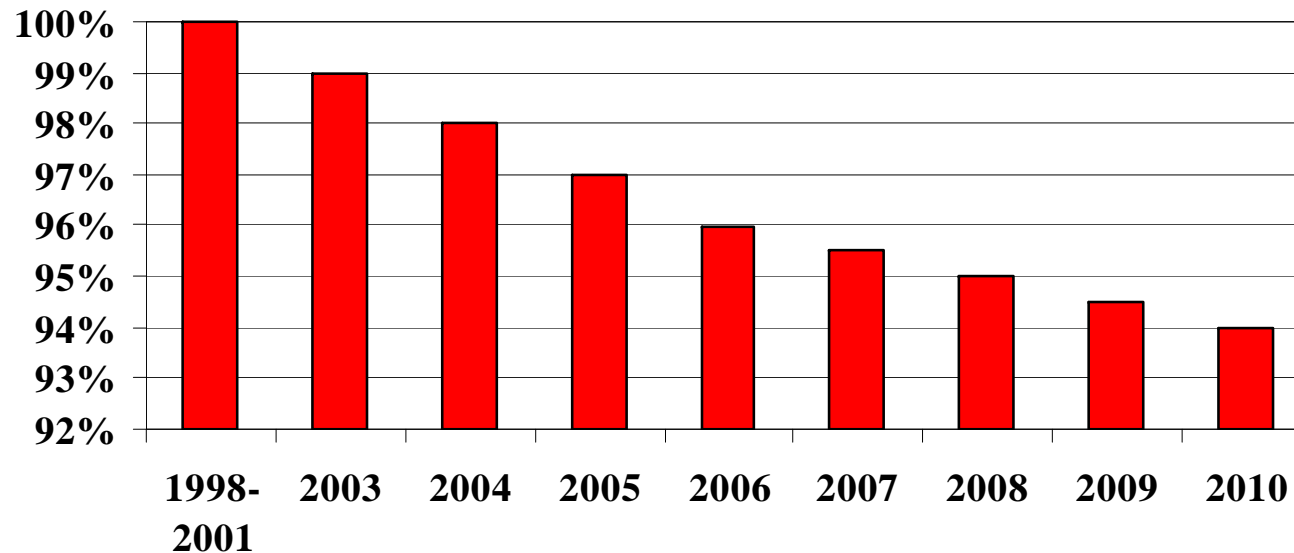


- The Chicago Climate Exchange® (CCX®) is a greenhouse gas (GHG) emission reduction and trading pilot program for emission sources and offset projects in the United States and for offset projects undertaken in Brazil and other countries. CCX® is a self-regulatory, rules-based exchange designed and governed by CCX® Members.
- These members made a voluntary, legally binding commitment to reduce their emissions of greenhouse gases by four percent below the average of their 1998-2001 baseline by 2006 and a six percent reduction by 2010.

# CCX Reduction Timetable

- 2003-2006: Reduce emissions to 1%, 2%, 3%, 4% below 1998-2001 baseline
- 2006 – 2010: Reduce emissions to 6% below 98-01 baseline

**CCX Emission Reduction Schedule**

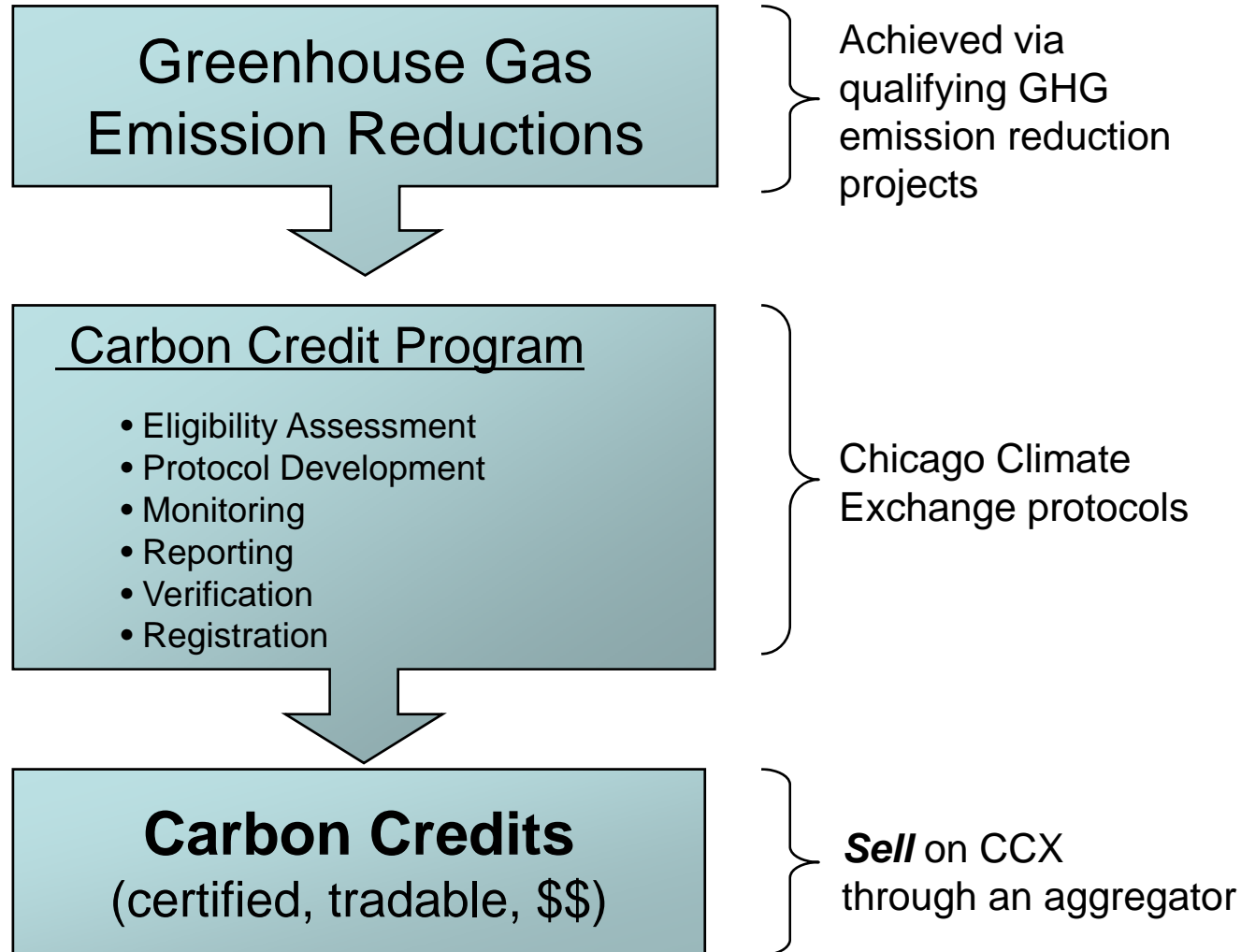


# Meeting CCX Reductions

- Allowances (x% less than baseline)
- Own reductions
- Industry credits from excess reductions
- Offsets (no more than 50% of reduction requirement)

- Soil Offsets
  - No-till
  - New Grass
  - Rangeland
- Forestry
  - New Plantings
  - Enhanced Working Forest
- Ag Methane
- Industrial Fuel Switching
- Biofuels
- Landfill Methane

# Carbon Credit Program

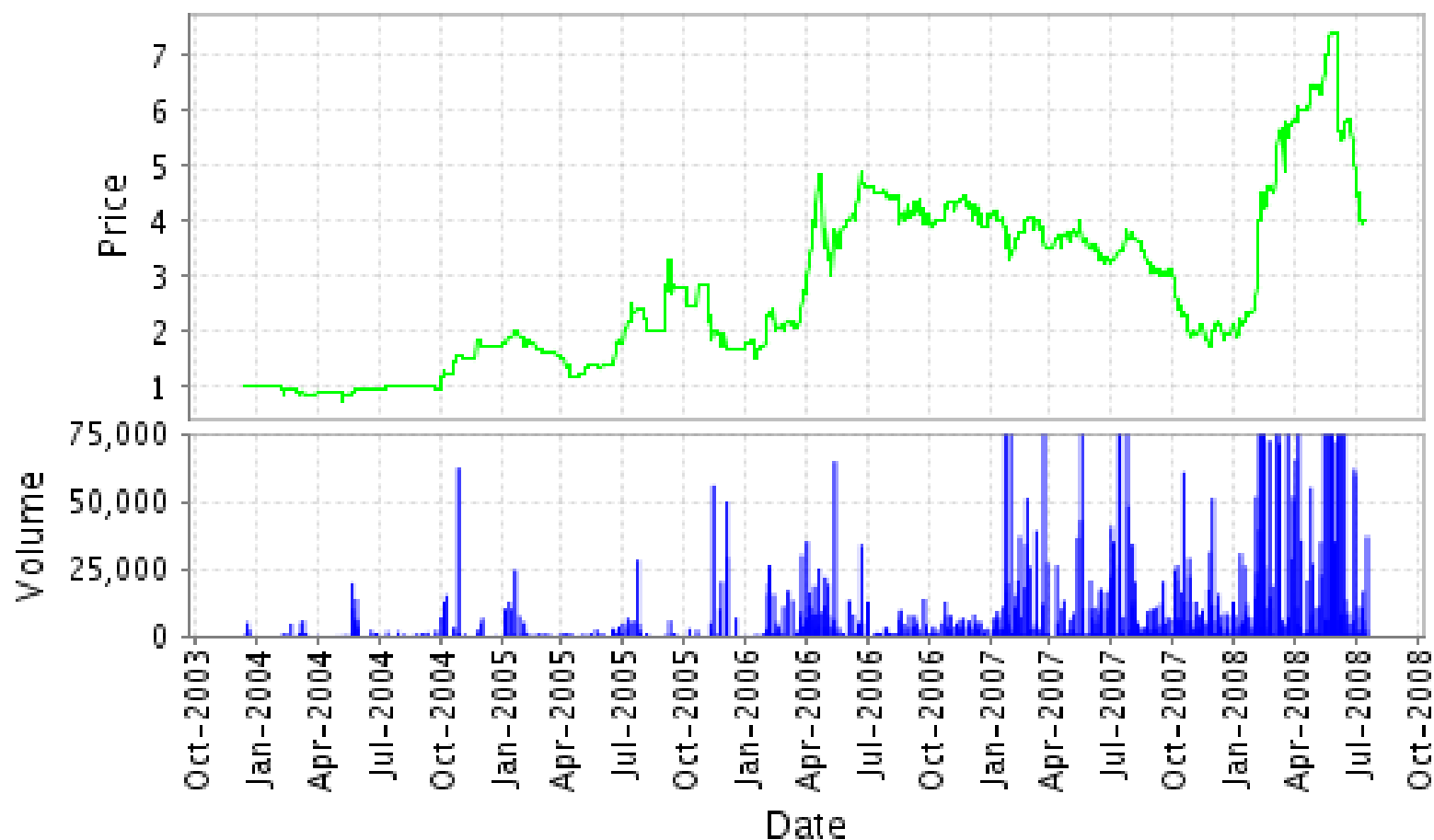


# Progress to date

- Protocols developed & implemented
  - No-till
  - Grasslands
  - Rangeland management
  - Afforestation
  - Managed forests
  - Ag Methane from Livestock facilities
  - Biomass substitution
- Producers Enrolled; projects verified; credits traded; producers paid

# Carbon Offset Prices

## CCX Carbon Financial Instrument (CFI) Contracts Daily Report



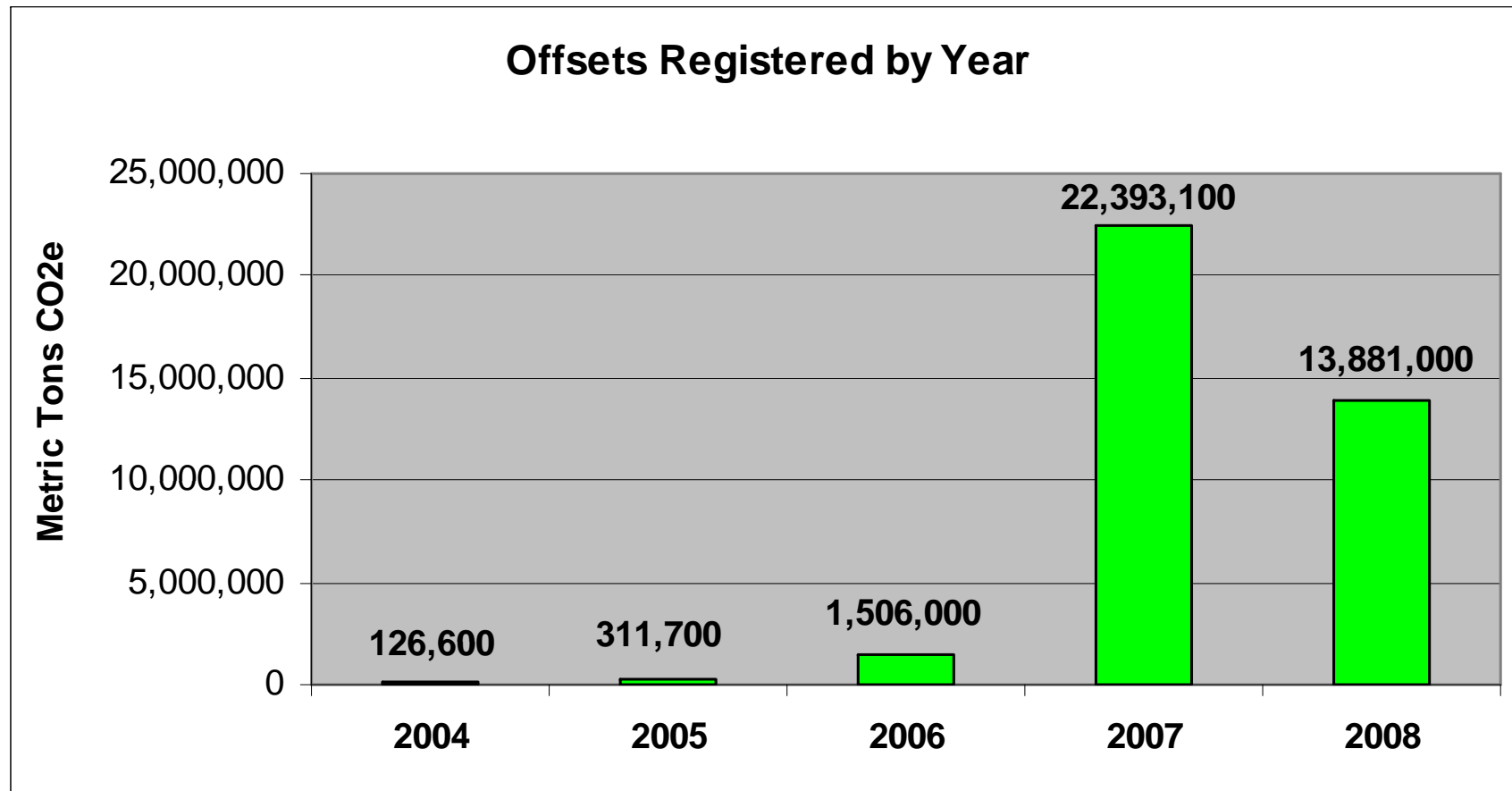
# Primary Factors Affecting Carbon Prices

- Demand Side
  - Political dynamics
  - World economic growth
  - Growth in voluntary market participation
  - Higher natural gas prices
- Supply Side
  - Less allowances (CCX)
  - More offset opportunities

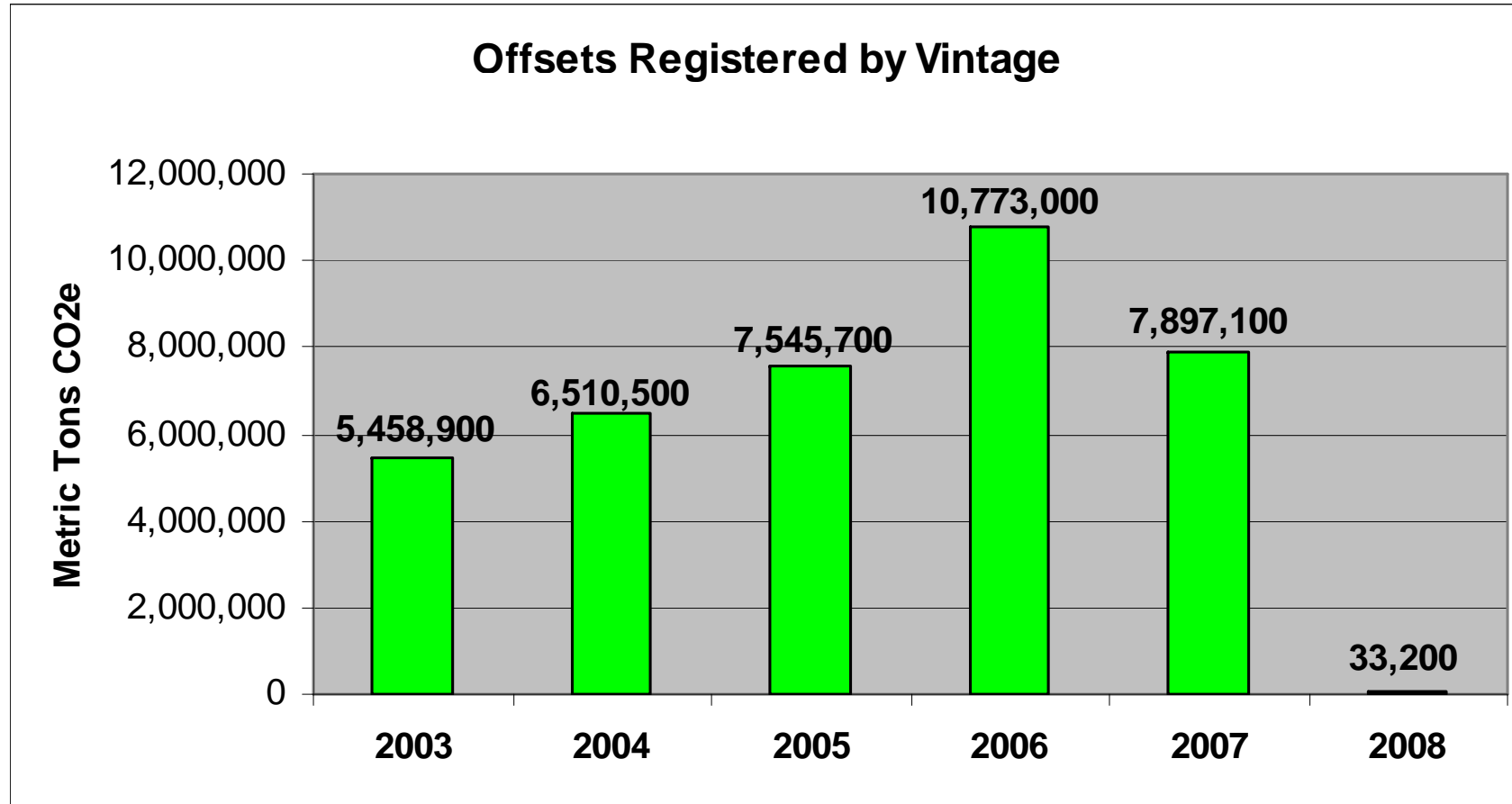


# CCX Offsets Issued by Year

(Offsets registered through June 2007)

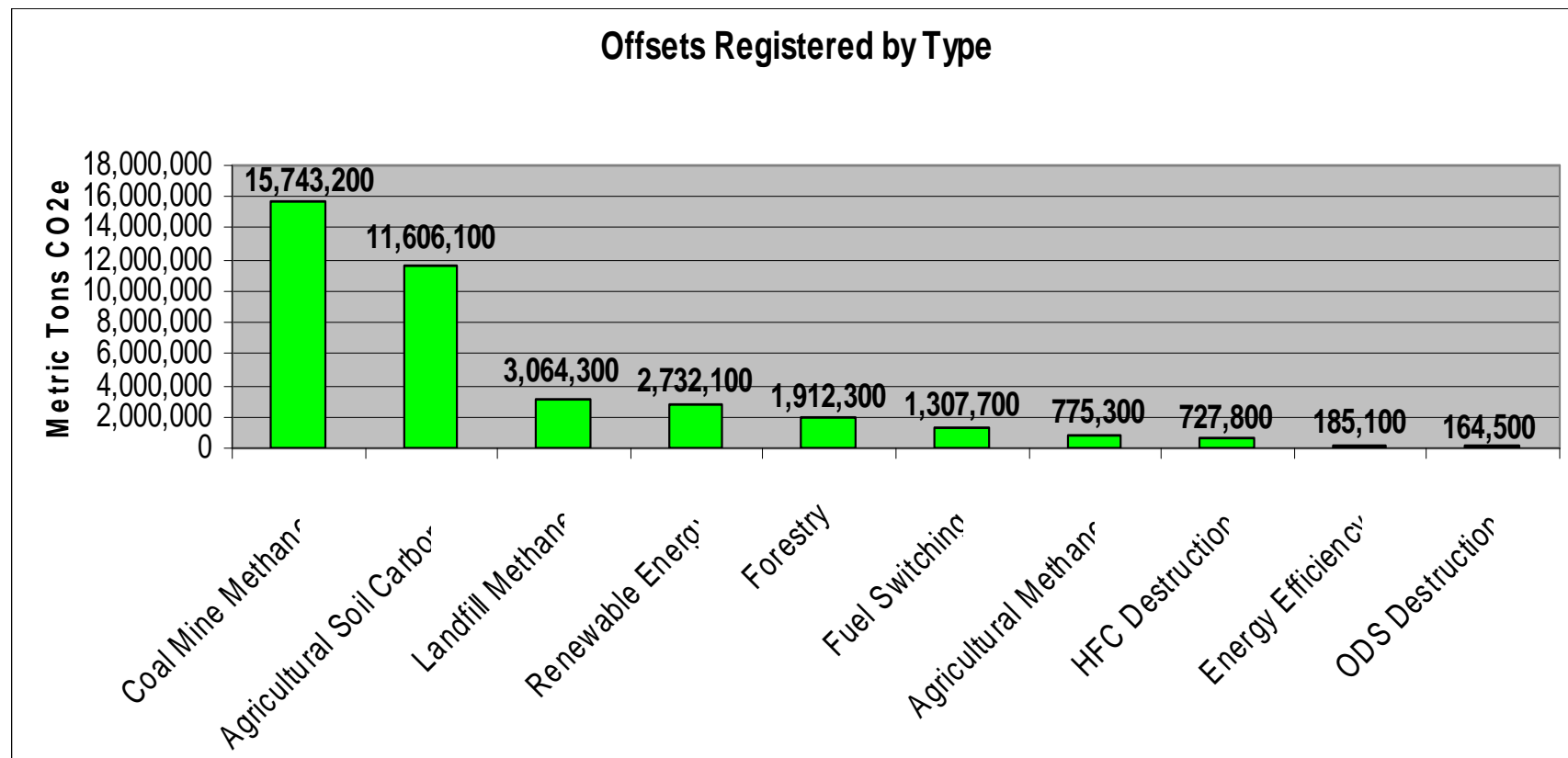


# CCX Offsets Registered by Vintage



# CCX Offset Portfolio by Type

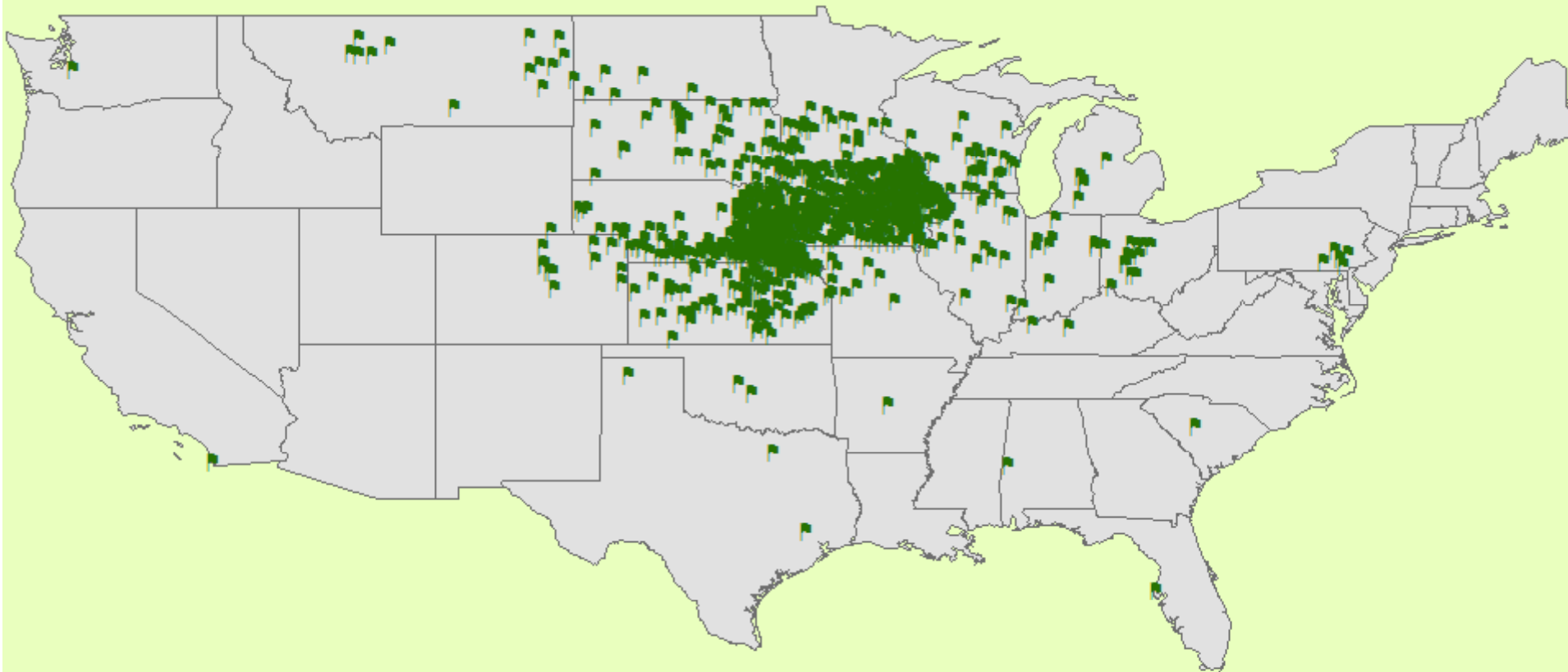
(Projects registered through June 2008)



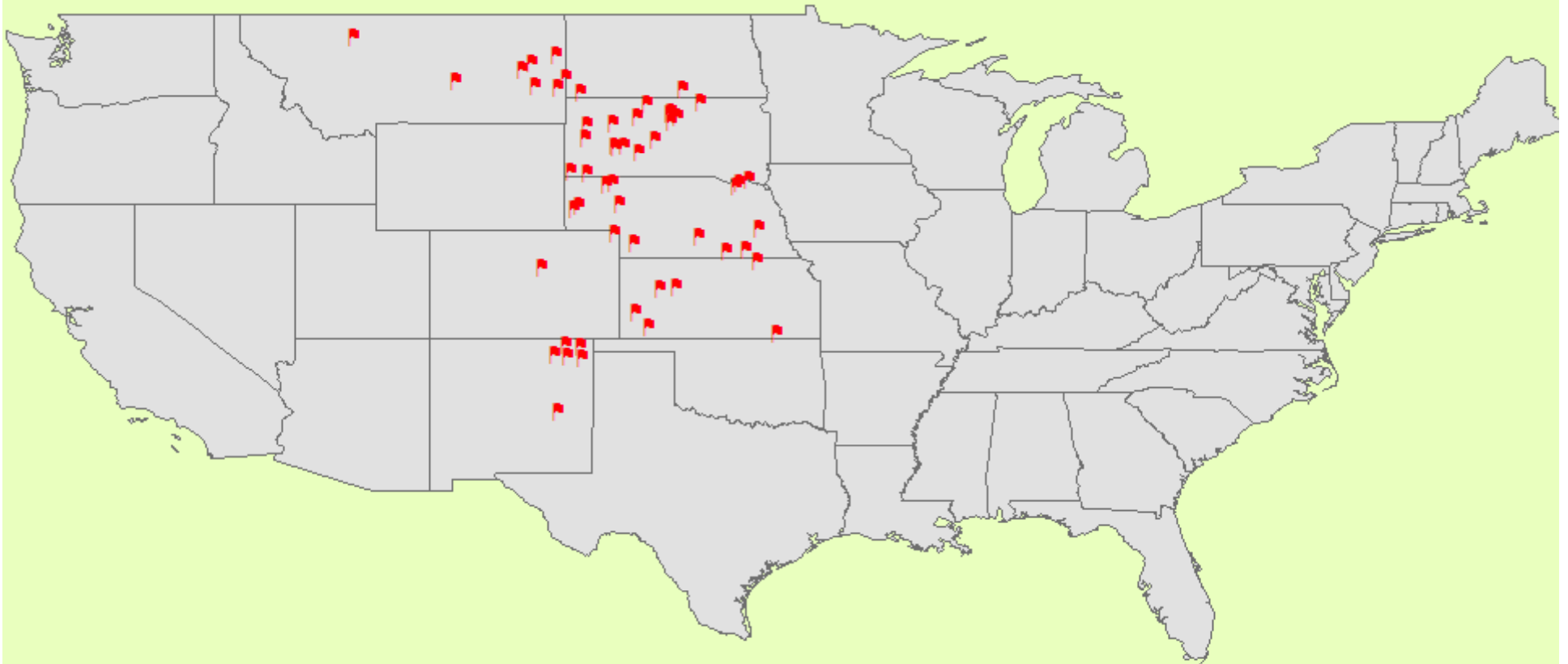
## AgraGate Offsets by Vintage

	Vintage					
Year Issued	2003	2004	2005	2006	2007	2008
2005	133,800	133,800				
2006	17,800	20,600	155,100			
2007	32,800	32,800	254,600	430,500		
2008	137,600	150,200	277,900	498,900	868,000	

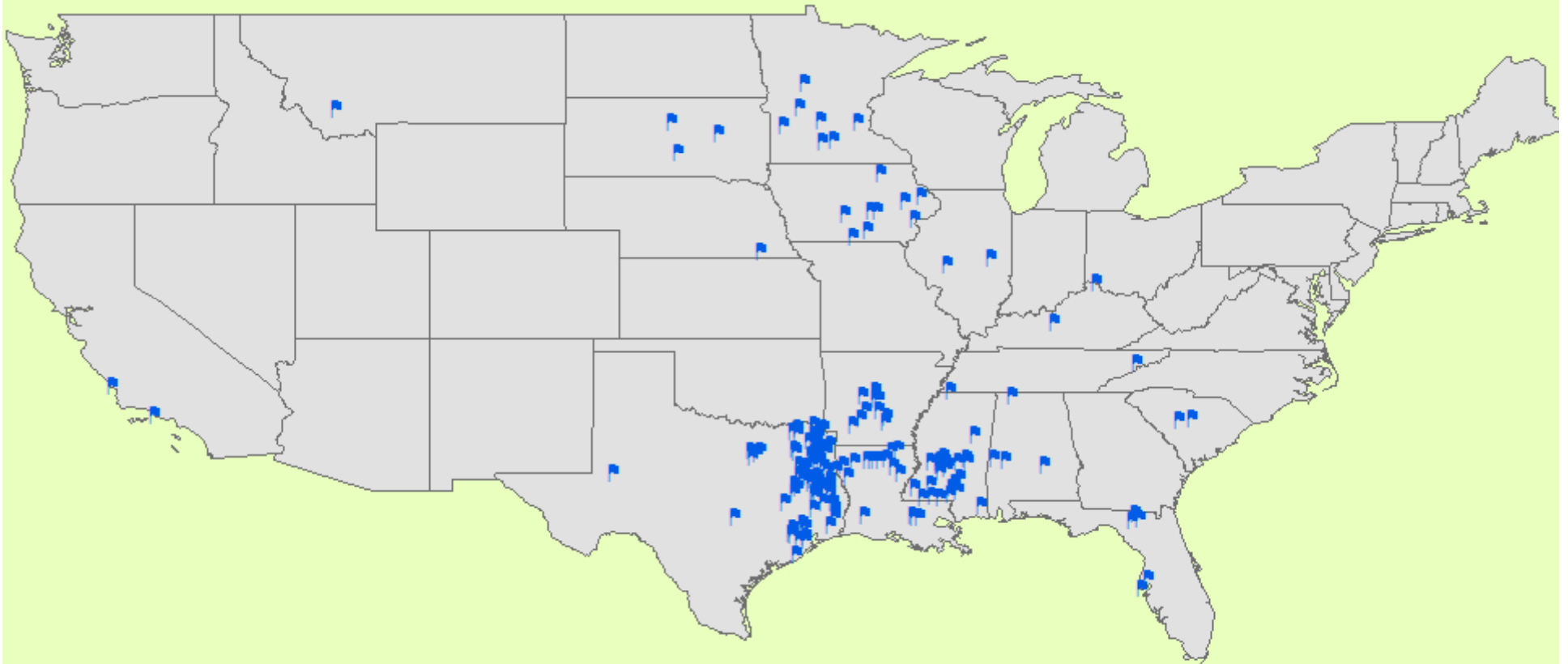
## No-Till - New Grass Contracts



# Rangeland Contracts

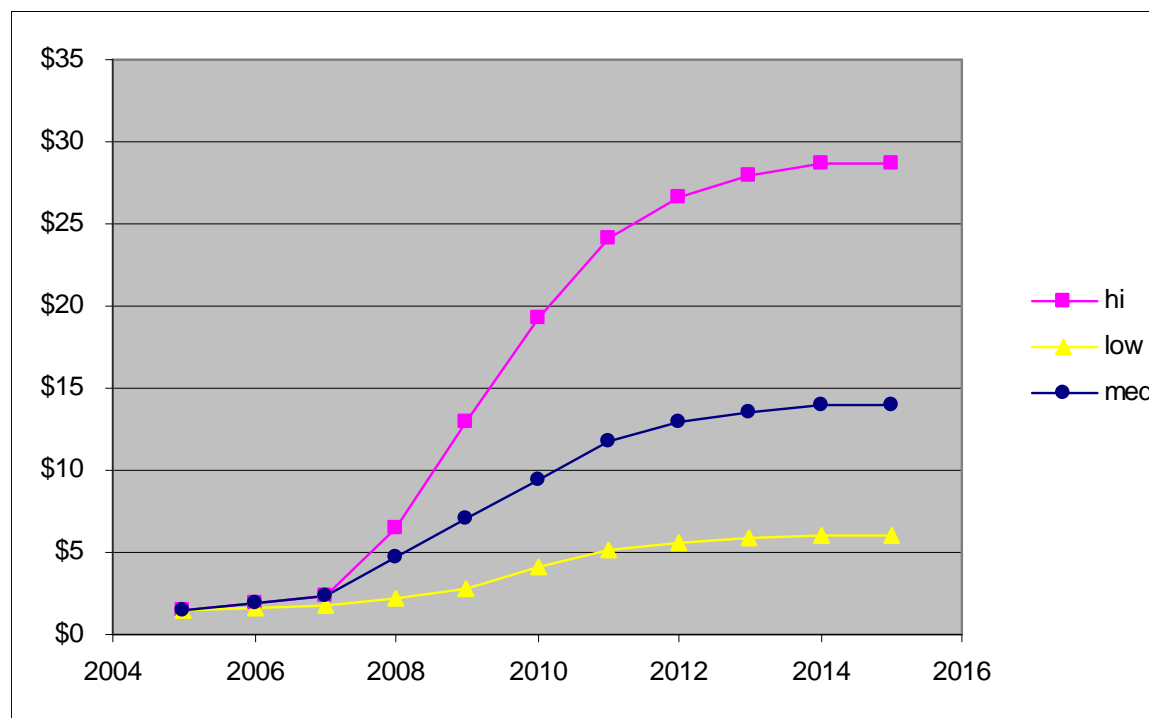


# Forestry Contracts



# Price forecasts for US carbon credits

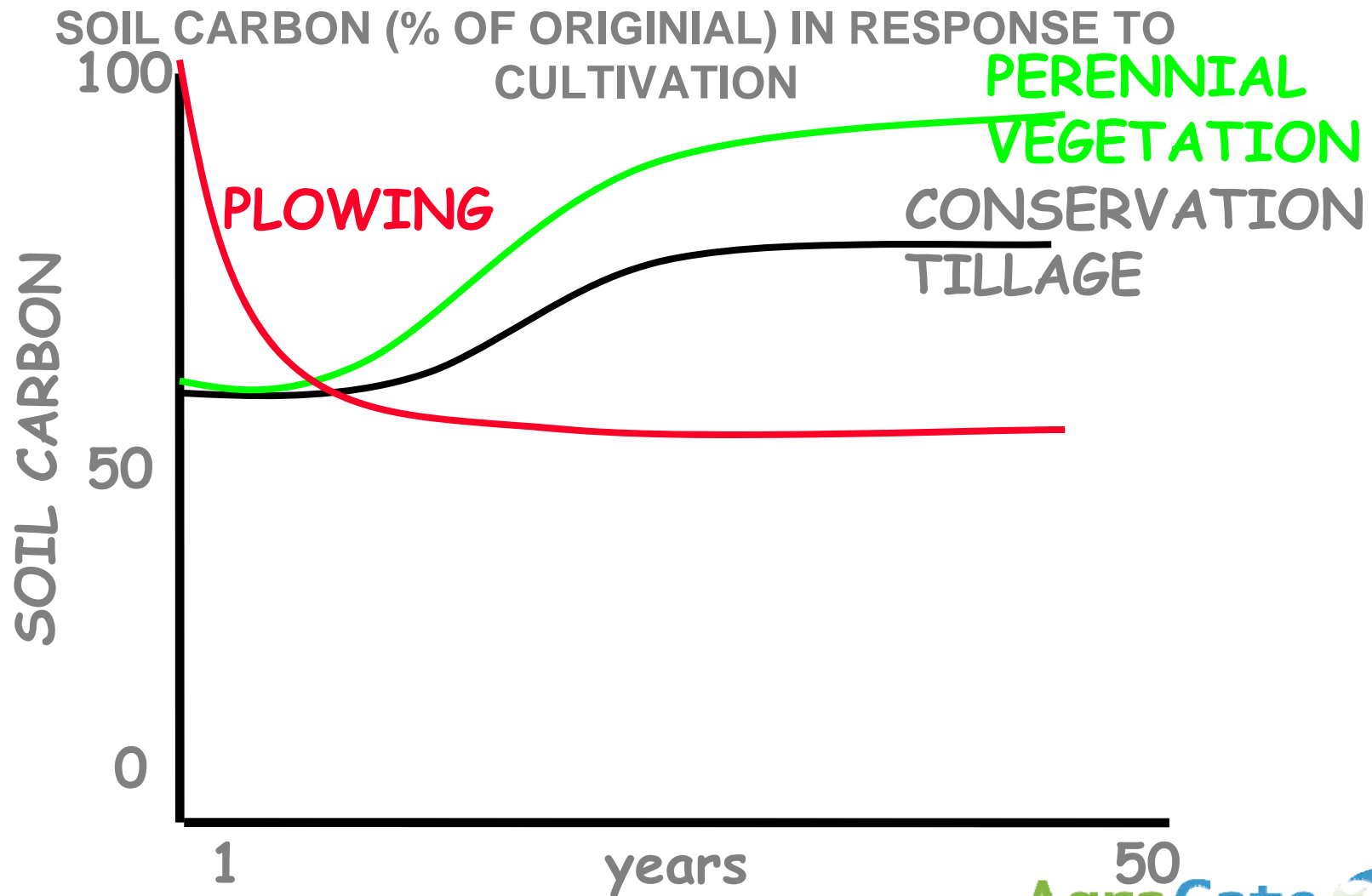
Figure 1. Projected price curves for US carbon credits (\$US per metric ton).



Sources: Carbon Finance, August 2004; EIA/DOE 2004. Analysis of S. 1844, the Clear Skies Act of 2003; S. 843, the Clean Air Planning Act of 2003; and S. 366, the Clean Power Act of 2003. Energy Information Administration, USDOE, SR/OIAF/2004-05, May 2004; EIA/DOE 2005. Impacts of Modeled Recommendations of the National Commission on Energy Policy. Energy Information Administration, USDOE, SR/OIAF/2005-02, April 2005; AEP 2004. An assessment of AEP's actions to mitigate the economic impacts of emissions policies. American Electric Power, August 31 2004



# Soil Carbon Dynamics in Response to Tillage



# Exchange Soil Offsets (XSOs)

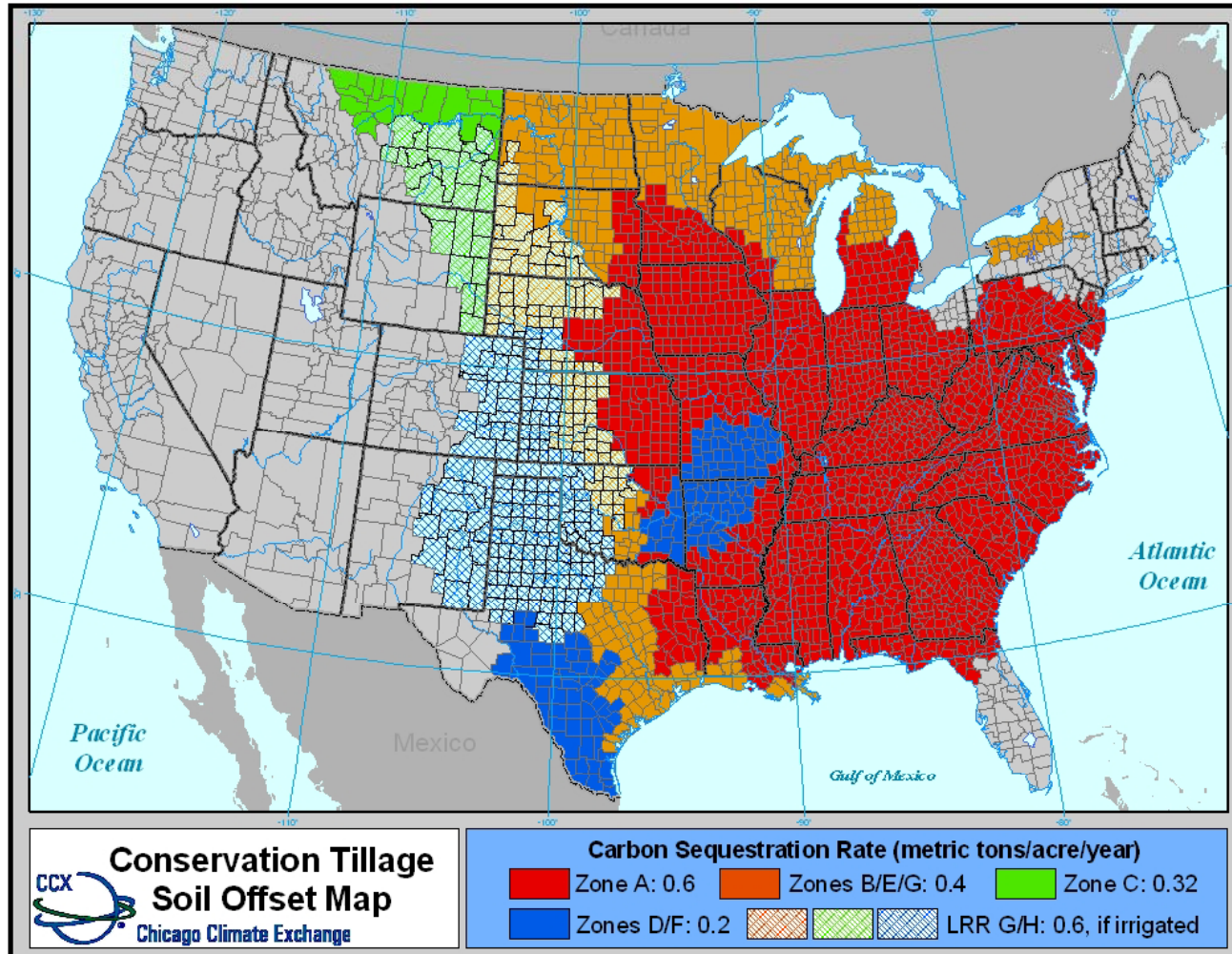
- 5 year contract (2008 – 2012)
  - No-till/Strip-till crop production
  - New Grass establishment
  - Rangeland management
- Annual certification.
- 10% of contracts subject to on-site verification
- 20% reserve held until end of pilot project.
- Contracts are transferable.
- Transfer price will be the price as determined by sale through CCX.
- Payments to applicants are gross revenue less a 10% service fee, Exchange fees, and verification fees.

# CCX Approach

## **Soil Offsets**-- *Rewarding, rather than punishing early adopters*

- Technical Advisory panel uses long-term university research sites as reference points
  - Average sequestration achieved over time
  - Focus on practices that are not business-as-usual
- Sequestration rates varies based on agricultural climatic zones and production practices
  - Influenced by soil type, rainfall, temperatures, crop biomass intensity, crop rotation.
- Technical panel advises on scientific mean; CCX board sets discount rate
- Conservative credit rate is designed so that agriculture and forestry “over-deliver” sequestered tons versus offsets granted.
- Statistical validity of group participation versus “allusion of accuracy” from individual field or farm measurement.

# Soil Offset Credit Zones



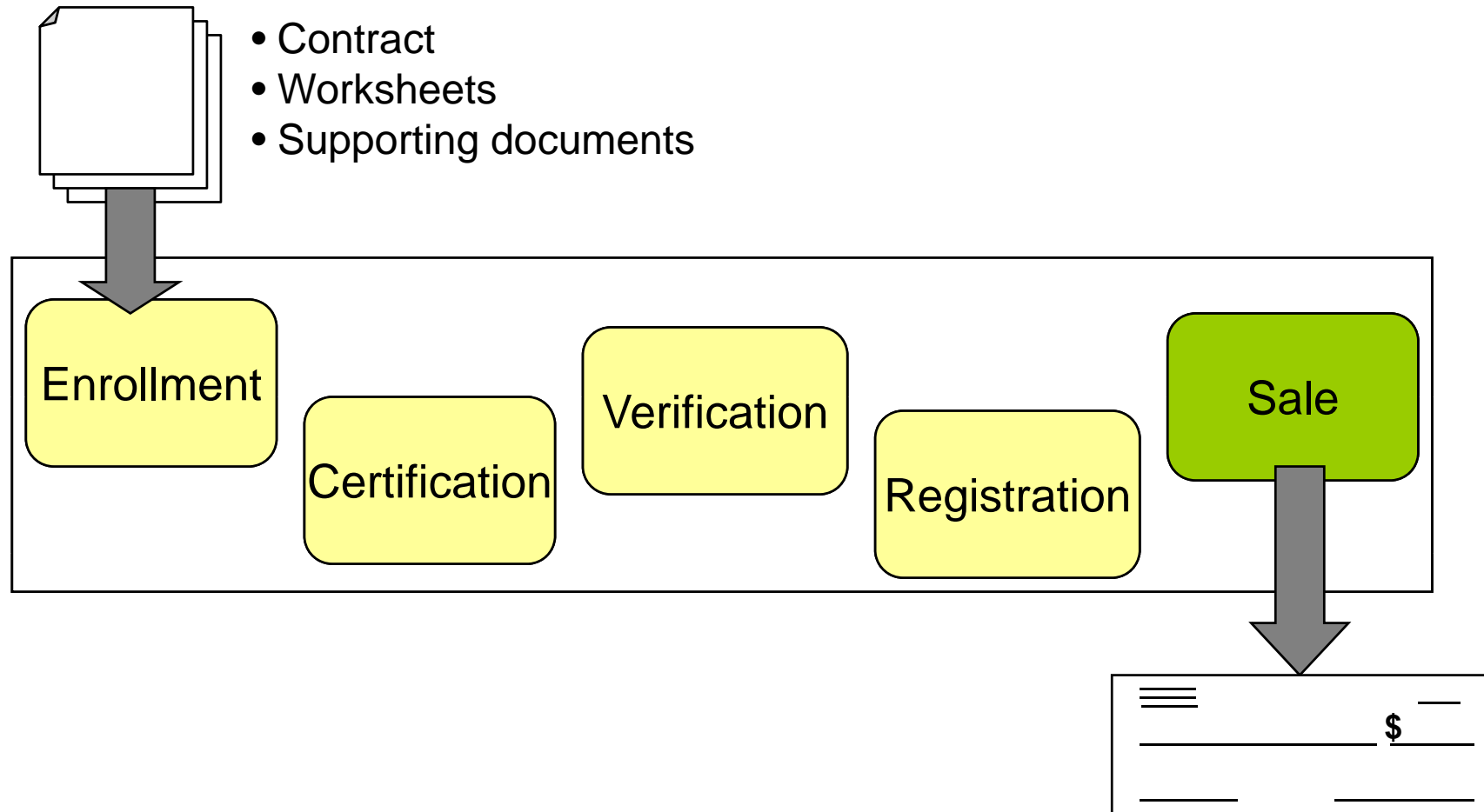
Additional details

- Residue removals
- Haying & grazing
- Fallow
- Field maintenance

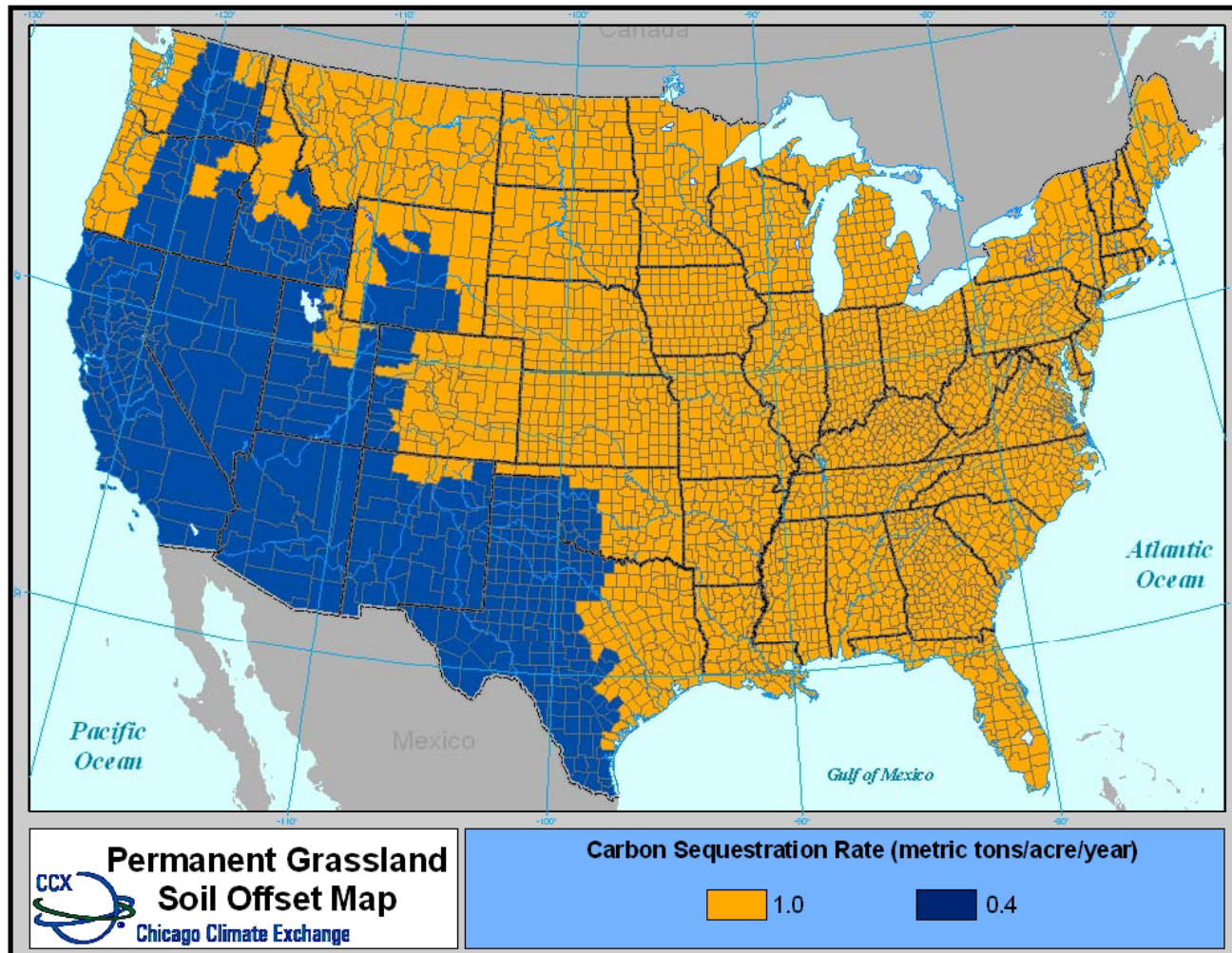
# Tillage Equipment

- Full width inversion –
  - Moldboard plow
  - Chisel plow
  - Field cultivator
  - Tandem disk
  - Offset disk
  - Ridge-till planter
  - Row crop cultivator
- Okay to use
  - No-till/strip-till planter
  - No-till drill
  - Rolling harrow
  - Stock chopper
  - Tools with wide knives
    - Subsoiler/Ripper
    - Anhydrous applicator
    - Manure knife applicator
- **General Guideline:** After the implement has been through the field, there must still be a substantial amount of surface residue present and the soil disturbance must not be full width. If use of the implement would require that a leveling or smoothing activity follow, it would probably result in too much soil disturbance. (2/3rds rule)
- No credits earned during year if residue is removed (i.e. baling corn stocks, chopping silage, burned, etc.) unless a cover crop is planted after the removal.
- 3% variance factor for fixing washouts, ruts, tiling, etc.

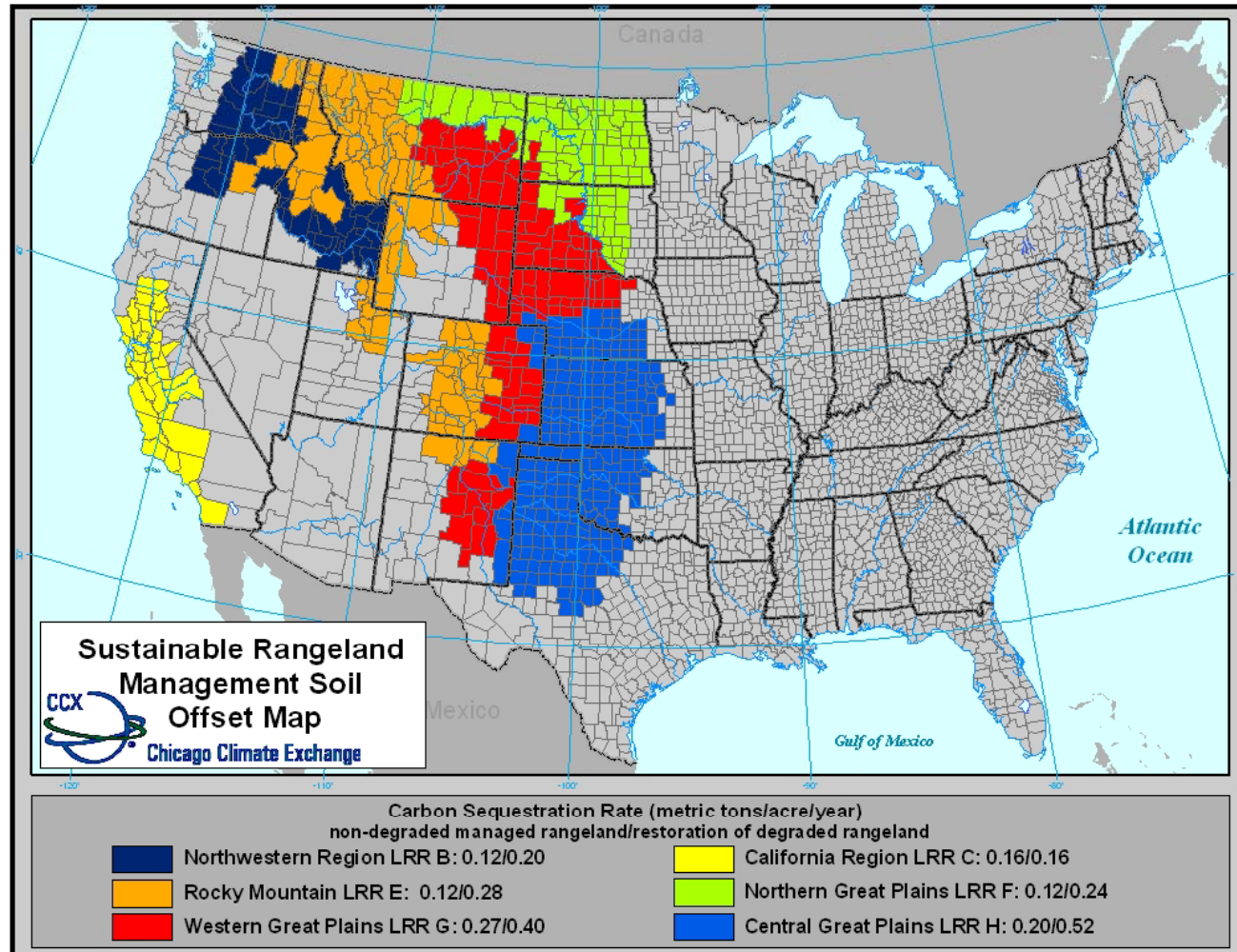
# The Carbon Credit Market Process



# New Grass Plantings



# Rangeland Management





## Other Carbon Credit Opportunities

- Afforestation
- Managed forests
- Long-lived wood products
- Ag methane destruction
- Bio-mass energy
- Bio-fuels
- Wind energy



# Carbon Policy Considerations

- Goals
  - Quality of life
  - Environmental improvement
  - Efficient energy use
- Ag Sector
  - productivity
  - Competitiveness
  - Economic impacts
  - Interactions & unintended consequences

# Agriculture & Climate Change

- Weather cycles versus climate change
- Agricultural protocol design
  - Specific to the country or region
  - Farm or field measurement
    - Illusion of accuracy
- Record keeping and verification

# Key Carbon Policy Issues

- Are the carbon accounting rules as currently written in Kyoto workable for agriculture and forestry?
- How can agriculture and forestry work within a cap and trade market-based regulatory system?.
- Will regulated entities be allowed to use emission offsets as a means of compliance for a significant part of their reduction requirements.
- Will emission offsets that sequester carbon through soil, forestry and other agricultural offsets be recognized as effective in reducing atmospheric carbon and should they be fully recognized in any cap and trade system.

## Offset Program Design Principles

- Offsets must not compromise the integrity of the cap-and-trade program
  - meet to be the standards of real, additional, verifiable, permanent, and enforceable.
- Incorporate statistically valid accounting methodologies and other tools to address permanence, additionality, uncertainty and leakage.
- Utilize best available data and scientific understanding adaptively over time in monitoring, measuring, verification and accounting.
- Be as administratively simple and cost effective as possible without compromising the other design principles.
- Facilitate linkage with other cap-and-trade programs

# Carbon Offset Requirements -- Real

Offsets must represent actual emission reductions and not artifacts of incomplete or inaccurate accounting.

“Leakage” in emissions should be factored into the quantification of emission reductions.

Conservative assumptions should be used where there are uncertainties in quantifying emission reductions or removals.

## Carbon Offset Requirements -- Additional

Eligible emission reductions (or removals) include those not required by law or regulations and that exceed baseline criteria.

The baseline criteria should use standardized criteria (such as performance standards, financial feasibility criteria or project starting dates) that serve to exclude “business as usual” projects from eligibility.

# Carbon Offset Requirements -- Verifiable

Offsets must result from projects or programs whose performance can be readily monitored and verified, and whose effects can be measured with **reasonable** precision and certainty;



# Carbon Offset Requirements -- Permanent

Emission reductions or removals must meet established **duration** criteria.

For emission reductions or removals that can be reversed, (i.e., re-emitted to the atmosphere), adequate safeguards should be established to minimize the risk of reversals, make adequate compensation if a reversal occurs, or take potential reversals into account at time credits are issued.

# Carbon Offset Requirements -- Enforceable

Offsets must be consistent with regulations and administrative rules that define their creation, provide for transparency, meet defined standards of ownership, and avoid double counting.

# Summary

- Carbon Markets are developing
- Agriculture and forestry have a lot to contribute
- Biological systems are not smoke stacks
- Statistical tools are appropriate
- Absolutes are not necessary
- Opportunities and challenges

Thank You

