



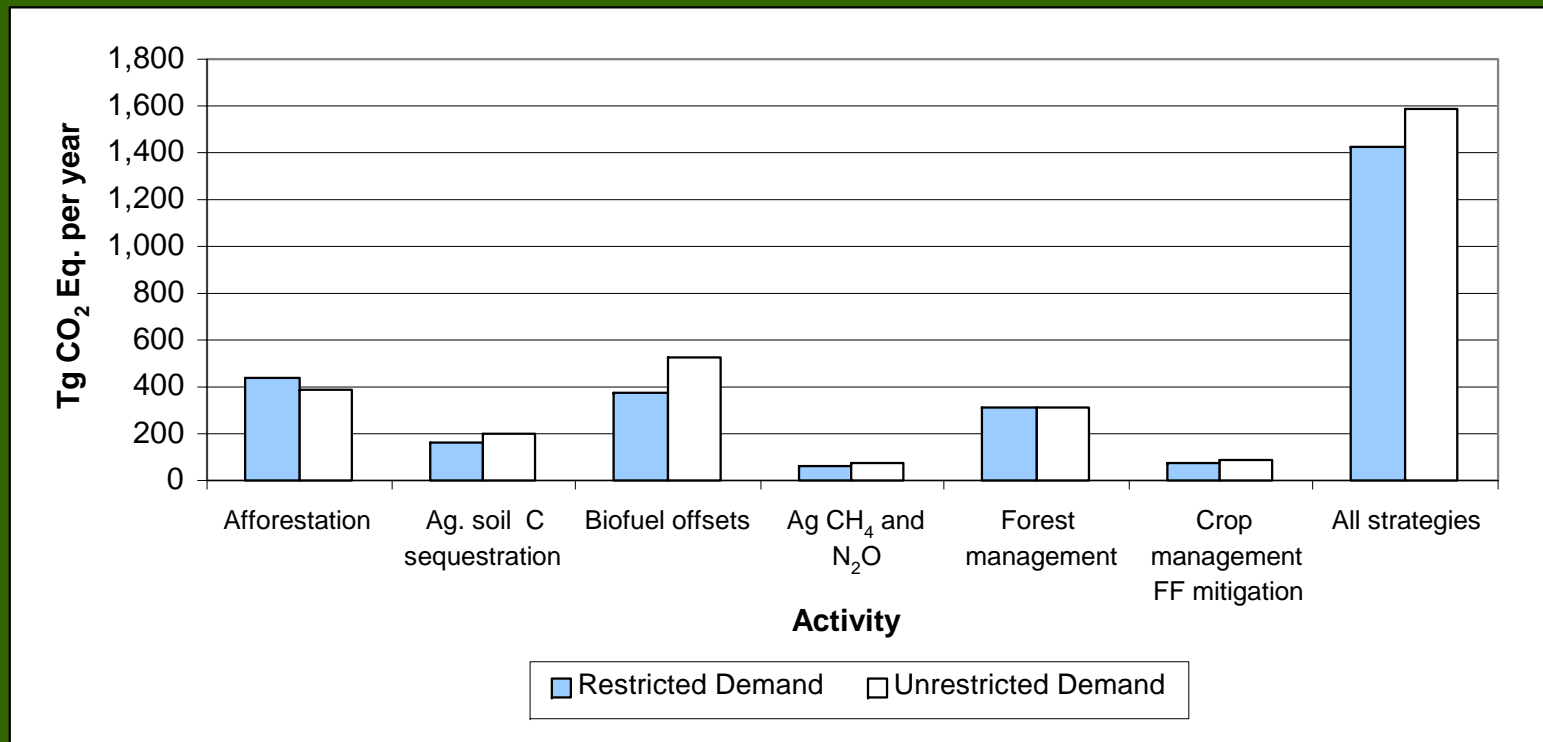
# Practical Considerations in Developing a Role for Forests in Addressing Climate Change



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# Forest and agriculture could offset 10-25% of total U.S. GHG emissions



- At \$15/ton CO<sub>2</sub>, agriculture and forestry actions could eliminate 10% of US GHG emissions
- At \$30/ton CO<sub>2</sub>, agriculture and forestry actions could eliminate 25% of US GHG emissions

(Source: EPA, 2005)

# Financing large-scale land-based greenhouse gas mitigation

While cost-effective, aggregate expenditures of large scale mitigation could be daunting:

- 600 million Tons CO<sub>2</sub> @\$15/ton ~ \$9 billion/yr
- 1,400 million tons CO<sub>2</sub> @ @30/ton ~\$42 billion /yr

## Options:

- Regulation
- Incentives: through existing programs or new program
- Providing offsets to private markets (cap and trade)
- Hybrids

# Offsets Market “Lingo”

Issue 1: **Permanence** -- Will the carbon stay out of the atmosphere?

– Potential solutions:

- **Assign liability, continuous reporting,**
  - temporary credits, renting credits,
  - Discounting
- Verifying the existence of carbon stocks is easier over time
    - Cumulative aggregation of carbon is easier to detect than year-to-year fluctuations

# Offsets Market “Lingo”

Issue 2: **Additionality** – Would the action happen anyway?

– Potential solutions:

- Limit entry (categorical exclusions)
  - Exclude forests (EU)
  - Exclude deforestation (CDM)
  - Exclude forest management (several US registries)
- Comparison lands (Duke Protocol)
- Document justification,
  - Reporting requirements (CCAR)
  - Barrier tests
- Discount credits,
  - Proportional additionality
- **Accept it (adjust national goals)**

# Offsets Market “Lingo”

Issue 3: **Leakage** – Will the emissions move elsewhere?

– Potential solutions:

- Discount credits,
- Exclude activities,
- Reporting requirements -- document that changes did not occur elsewhere,
- **Accept it (adjust national goals)**

# Offsets Market “Lingo”

Issue 4: **Uncertainty** –What if our estimates are wrong?

– Potential solutions:

- Exclude categories or pools;
- Discount credits using an uncertainty factor,
  - One-tailed tests
- **Accept it (recognize that uncertainty does not imply bias – laws of large numbers apply)**

# Offsets Market “Lingo”

Issue 5: **Baselines** –What are we measuring benefits against?

Options:

Historic


- **Base year/period carbon stocks;**
- Base year/period carbon fluxes;

Expectations

- Projections of business-as-usual;
- Projections of expected improvements;
- Projections of expected average business practice.

# Comparison Lands

## Additionality and Baseline tests

Land 

Comparison Land 

Carbon Payment \$\$\$

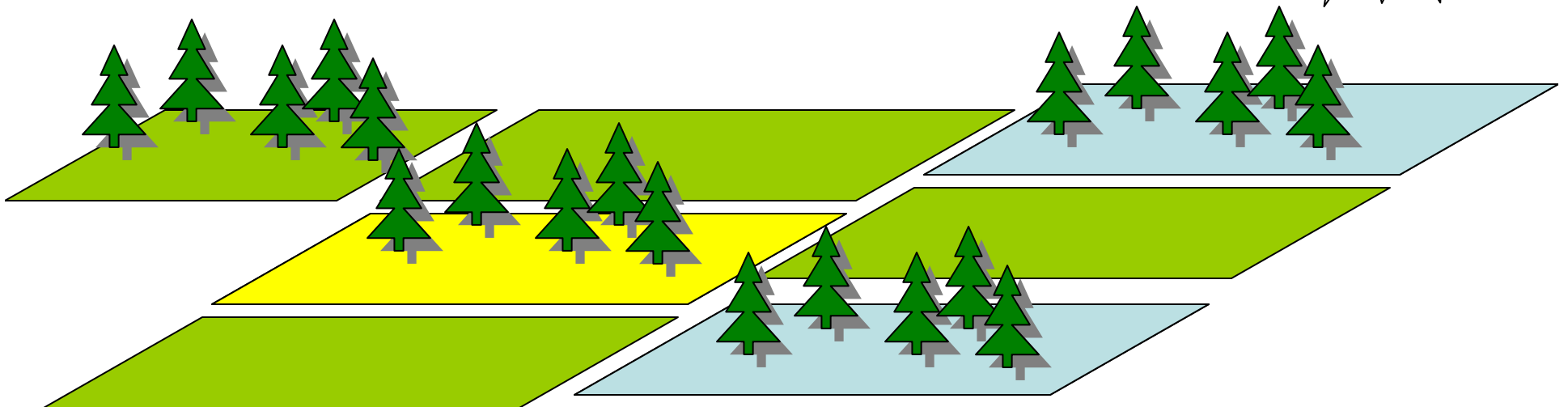
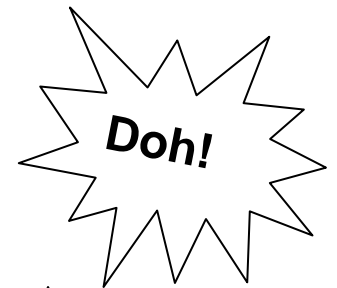


Tree planting

Carbon Payment \$\$\$




Tree planting



# Transaction costs and “additionality”

Farmer 1 

Farmer 2 

Farmer 3 

Farmer 4 

**Carbon Payment**

0 \$ \$ \$

**Extensive Reporting Requirements**

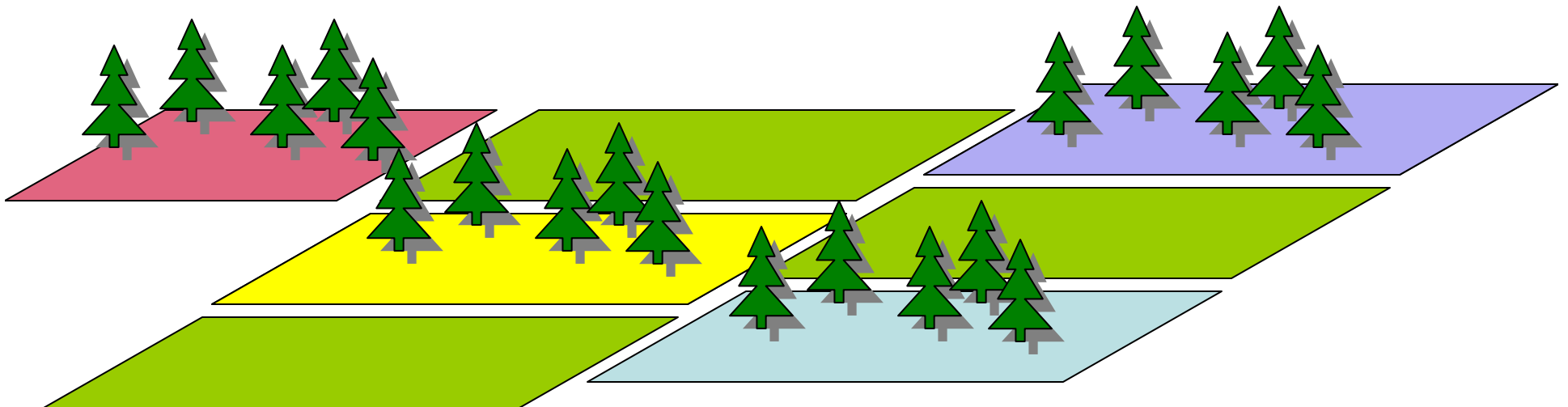
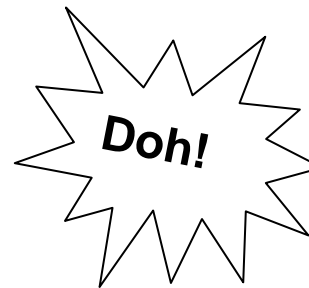
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**Uncertainty Discount**

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**Additionality Discount**

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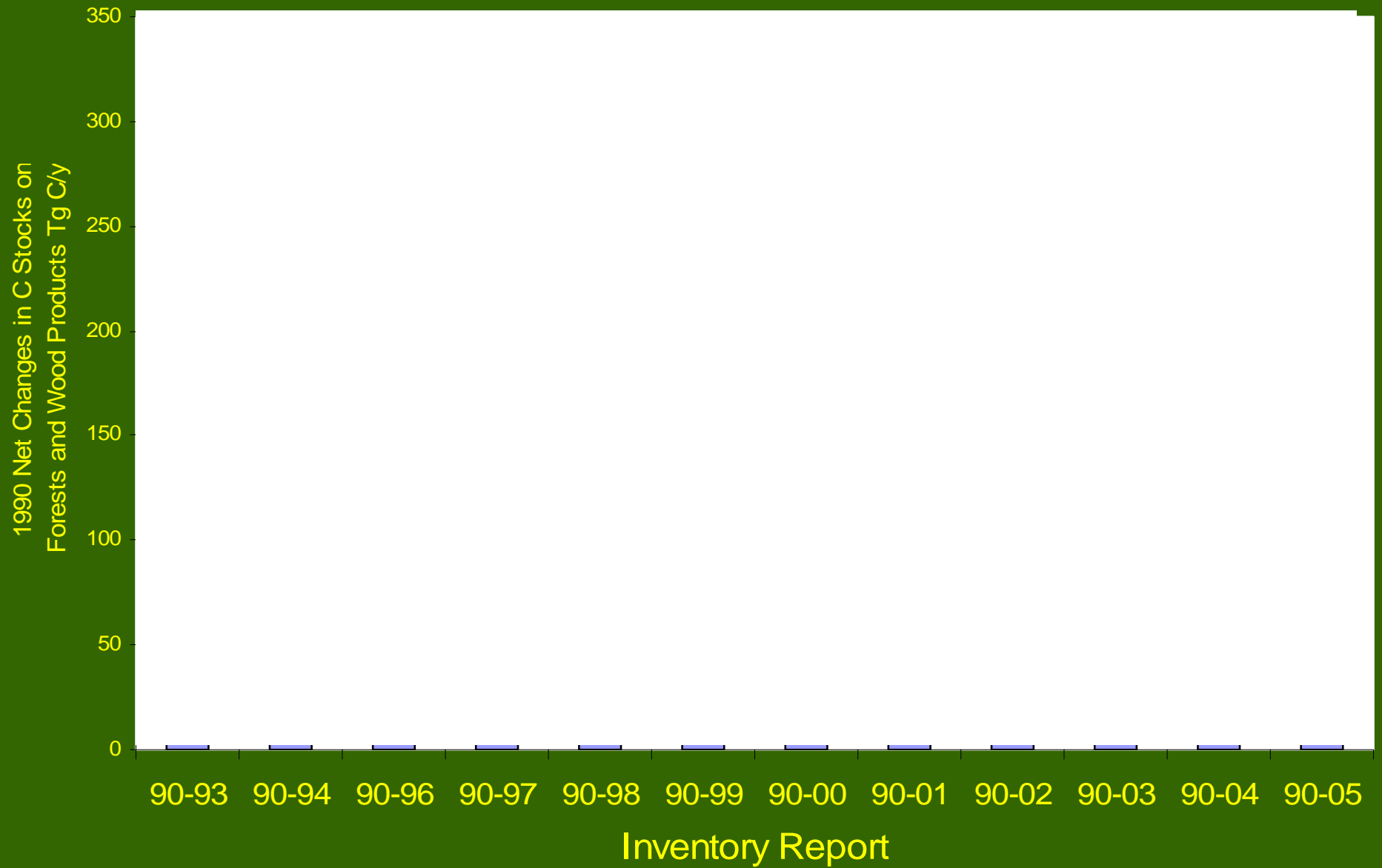


## Variability in emission rates from deforestation will influence year-to-year credit availability



Brazil Amazonia Estimated Deforestation Rate km2 (1989-2006)

# US Carbon Sequestration 1990 Estimate



# Points to Consider

- Offset markets are one of several options for financing terrestrial GHG reduction actions;
- Permanence can be dealt with by assigning liability;
- Additionality and leakage can be addressed at the project-level or in setting national goals;
- Increasing transaction costs and discounting benefits will amplify problems with additionality;
- Deforestation emissions are much more variable than energy emissions;
- Estimation methods will improve over time.