

Permanence & Leakage



Permanence & Leakage

A number of land based practices exhibit issues called permanence and leakage.

Permanence is manifest in two properties

- Gains differ over time and can saturate
- Gains are stored in a volatile form

Leakage is manifest in

- Partial coverage and potential countervailing actions outside coverage area

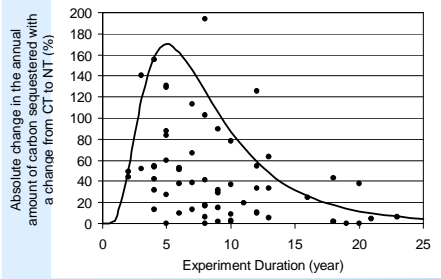
These potentially imply a price or quantity discount



Permanence

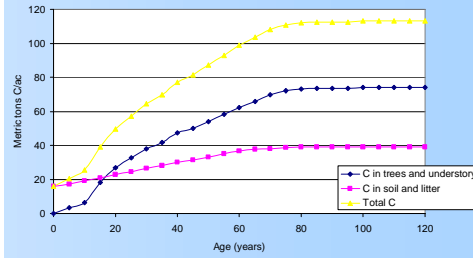
Gains differ over time and can saturate

Ag Soil Carbon Uptake
Gains before year 20



Change in Carbon Sequestered after Change from Conventional Till to No-Till (NT) - West and Post (2002)

Forest Soil Carbon Uptake
Gains before year 80



Carbon Accumulation on an Afforested Southeastern Pine Stand to Saturation - Birdsey (1996)

Practices once undertaken do not continue to produce offsets forever note limits above
- they saturate in a land use

Gains are differential over time note how rates change



Permanence

Gains are stored in a volatile form

Land use can be reversed by decision or external event

Forests can burn or be harvested



No-till or buffer strips can be plowed
releasing filtered items
exposing carbon to oxidization



Permanence

Potentially implies a price discount

If I lease you a house for 30 years saying you could live in it all the time for 10 years, ½ the time for next 10 and a month a year for final 10. Plus I say there is a chance it will be taken by eminent domain at any time.

Would you pay same as for purchase or pure 30 yr lease?

In carbon world compare value of offset gone forever (a ton of methane recovered and combusted versus carbon in a forest that may be released upon harvest or fire in 40 years

Grading standard?



Leakage

We have found in a number of instances where market reactions outside of programs actions can offset gains

- Conservation Reserve Program set asides of environmentally sensitive crop lands increased development of new lands into crop land (Wu)
- PNW forest spotted owl harvest limits stimulated harvest in South and Canada (Murray and Wear)
- US crop price support and supply controls stimulated Brazilian entry into Soybean market
- Texas water conservation subsidies led to more irrigated acreage increasing total water use



Leakage

Partial coverage is often the issue

If a program simulates use of a practice that reduces products flowing into the market share will the slack be taken up elsewhere?

If a practice lowers cost for or raises price to other enterprises will they expand emissions, offsetting gains here i.e. LEAKAGE

If so what do we do about it? *Do we pay on a discounted amount or with a discounted price?*



Our Speakers

- **Mr. Jim Klang** is lead engineer for nutrient pollutant trading, and Total Maximum Daily Load studies in the State of Minnesota where two of the earliest water quality trades took place who will discuss permanence and leakage issues in the water quality arena.
- **Dr. Brian Murray** – until recently at Research Triangle Institute and now at the Nicholas School for the Environment at Duke University who will discuss how permanence and leakage issues influence the value of potentially traded offsets in the GHG arena.

