Owning the Externality: Why Forests Should be Put Under the Carbon Cap

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A Half-baked Polemic

Half-Baked:

- Informal Insufficiently thought out; ill-conceived: a half-baked scheme.
- Informal Exhibiting a lack of good judgment or common sense: a half-baked visionary

Polemic:

- "controversial argument or discussion," from Gk. polemikos "warlike, belligerent," from polemos "war." Meaning "one who writes in opposition to another.“

- And Tentative to boot (but a good thought exercise)

What am I proposing?

- CO Emissions from LULUCF placed under national carbon cap and liable to credit trading
- Landowners (fed, state, local, private) receive credits for sequestration, must purchase credits for emissions
  - Not that net national sequestration should be used to meet national targets (Kyoto or other)
  - This is in contrast to selling offset credits from outside the cap

Why am I giving this presentation?

- A lot of loose economic thinking at the highest levels around carbon sequestration (offset) credits
  - Looking for easy, painless solutions
  - Chasing the benefits without owning up to the costs
  - Overlooking full general equilibrium

The mother of all externalities

Need to think big

- Meaningful reductions in CO_2 mean major transformations for our society, including LULUCF

Economic mechanisms need to be strong enough to motivate real change, and…

They must account for the full externality (or at least most of it)

Overall, financial costs will far exceed financial benefits though some sectors (e.g. forestry) may gain

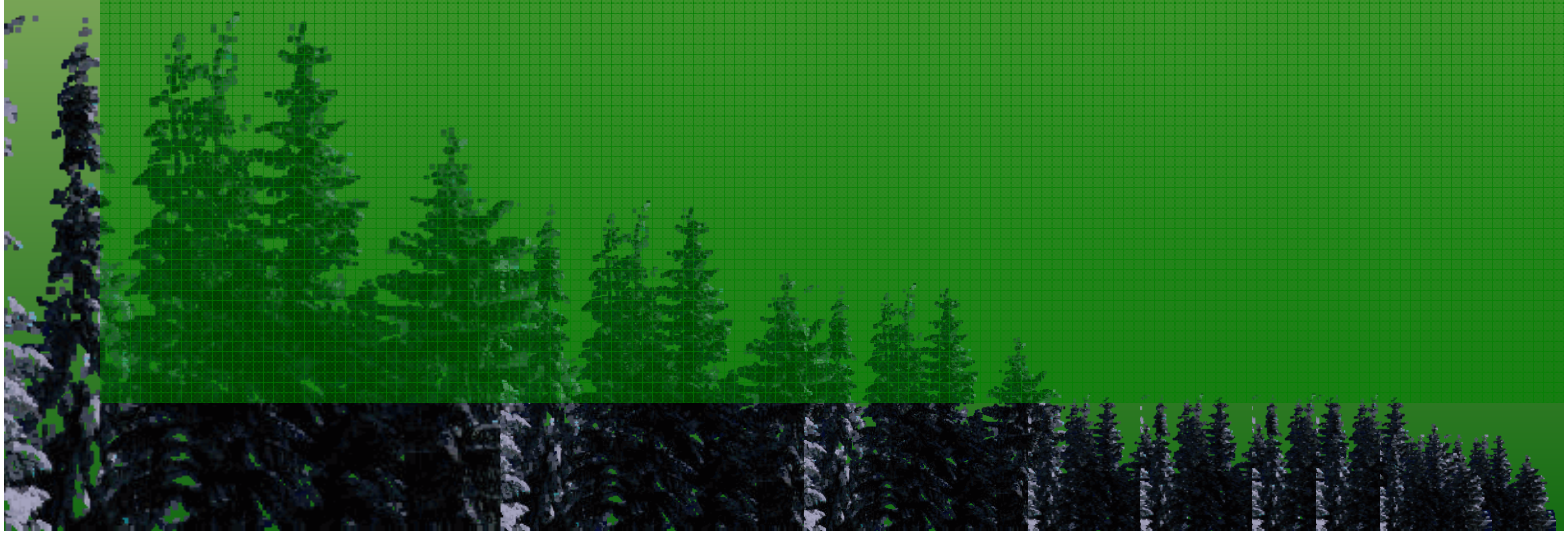
Markets not self-regulating

(Even under regulatory cap)

- Lack of opposing interests between buyers and sellers means little “market discipline” in market where externality is primary product
  - Piecemeal approach with “creative” mechanisms
  - Built in bias to ignore full costs
  - Additionality, leakage, and permanence
- Hence, market mechanisms need scrutiny and careful design

Overview

- A
  - b



Forest Carbon in the US

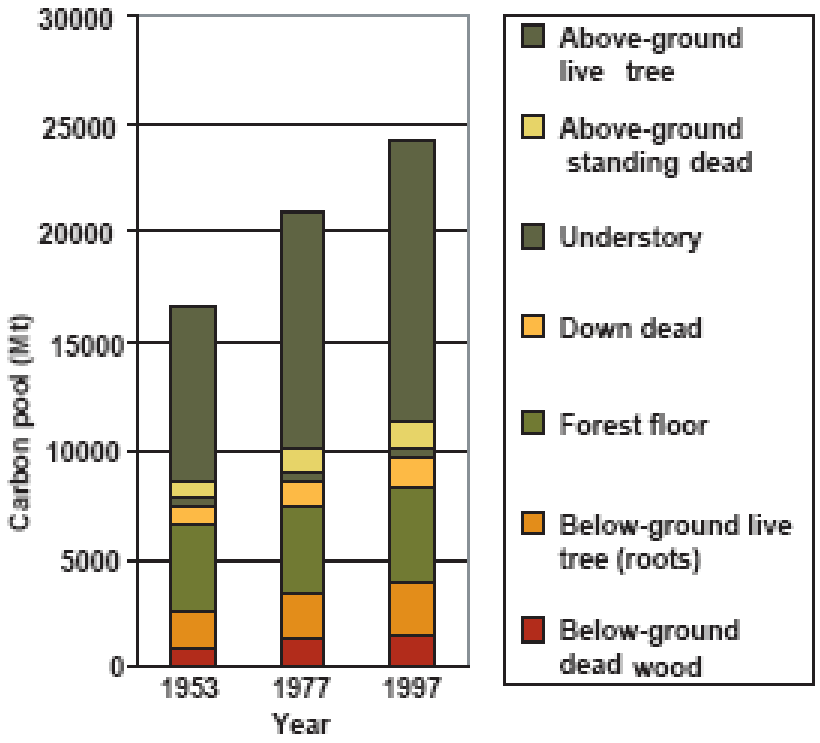


Figure 26-1. Carbon pools (Mt) of coterminous U.S. forest land.

Heath et al. 2004

National Report on Sustainable Forests

Forest Carbon in the US

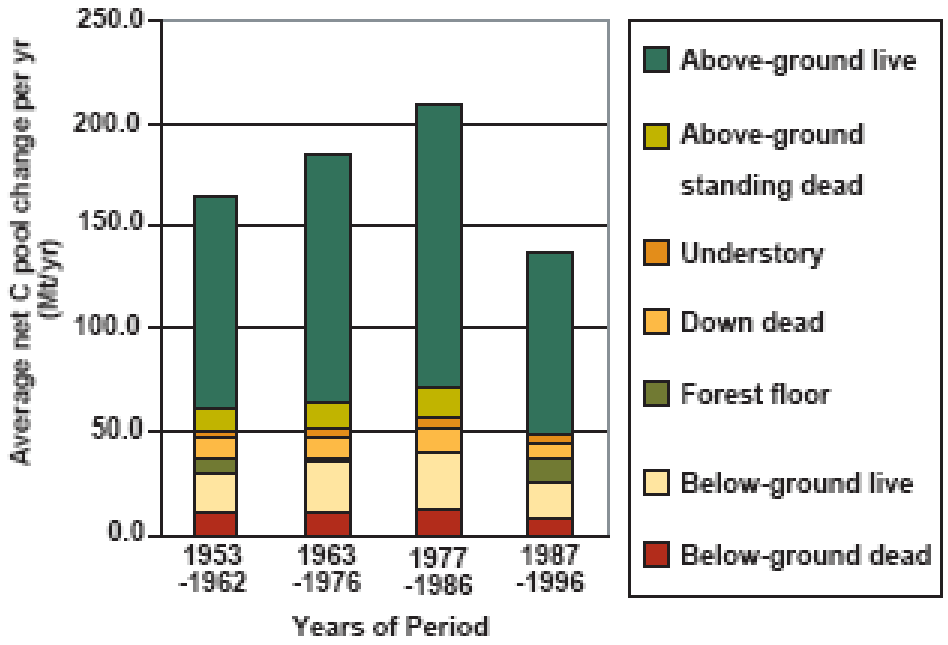


Figure 27-1. Average annual net forest carbon change (Mt/yr), 1953–1996.

Heath et al. 2004

National Report on Sustainable Forests

Forest Carbon in the US

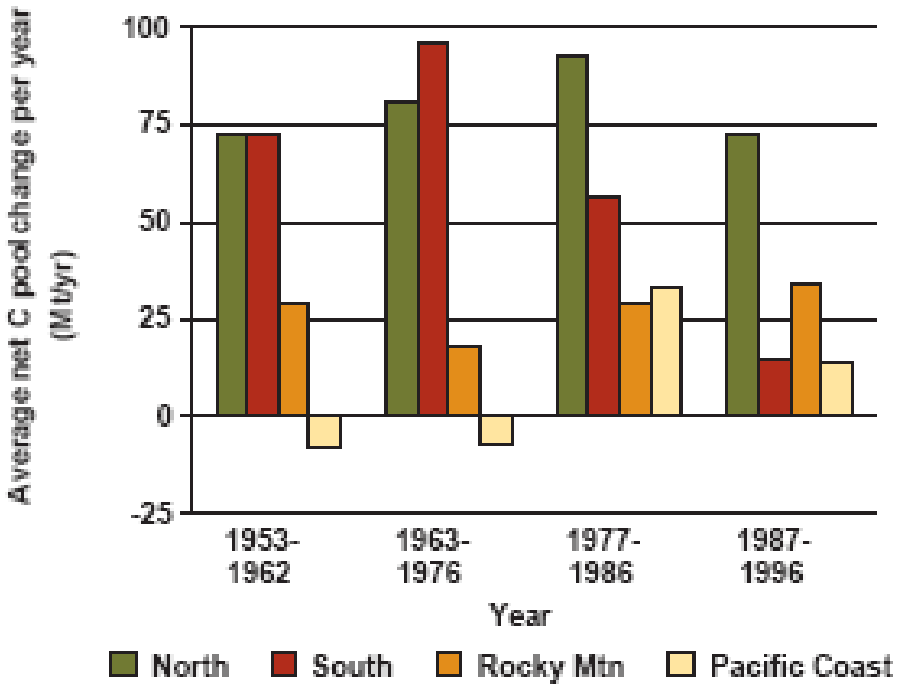


Figure 27-2. Average annual net forest carbon change (Mt/yr) by region.

Heath et al. 2004

National Report on Sustainable Forests

Wood Product Sinks

Year	Change in products in use (1)	Change in products in dumps & landfills (2)	Total change in stock of carbon in product (3)=(1)+(2)	Emitted by burning with energy production (4)	Emitted by decay or burning without energy production (5)	Total emissions from products (6)=(4)+(5)	Total wood carbon consumed (7)=(3)+(6)
1950	13.6	6.3	19.9	37.4	25.5	62.9	82.8
1960	9.0	7.1	16.1	34.6	30.6	65.2	81.3
1970	12.4	9.2	21.6	32.8	35.9	68.7	90.3
1980	11.8	27.9	39.7	48.1	19.2	67.3	107.0
1990	26.0	33.4	59.4	74.4	11.4	85.8	145.2
2000	25.0	32.5	57.5	88.1	14.3	102.4	159.9

Table 28-1. Changes in harvested wood carbon using the carbon stock approach (Mt/yr carbon). Calculations began in 1900.

Heath et al. 2004

National Report on Sustainable Forests

Forest Carbon in the US

Carbon sequestration in the U.S. forest sector from 1990 to 2010

Peter B. Woodbury *, James E. Smith, Linda S. Heath

Forest Ecology and Management 241 (2007) 14–27

Table 1
Annual net changes in carbon stocks in forest and harvested wood from 1990 to 2010

	Year																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010
Tg C																	
Trees	−97	−83	−80	−65	−81	−99	−127	−109	−84	−75	−79	−78	−78	−78	−78	−78	−78
Down dead wood	−9	−9	−8	−8	−9	−12	−17	−17	−16	−17	−18	−18	−18	−18	−18	−18	−18
Understory	0	1	−2	−2	−2	−2	−1	0	0	1	1	1	1	1	1	1	1
Forest floor	0	0	0	0	0	0	0	−3	−3	−3	−4	−4	−4	−4	−2	−2	−2
Forest soils	−2	−2	−2	−2	−2	−2	−2	−3	−3	−3	−4	−4	−4	−4	−4	−4	−4
Forest sub-total	−108	−94	−93	−78	−95	−115	−148	−133	−106	−98	−104	−103	−103	−103	−101	−101	−100
Wood products	−13	−11	−13	−15	−17	−15	−15	−16	−14	−17	−16	−16	−16	−16	−16	−16	−16
Landfilled wood	−44	−43	−43	−41	−41	−41	−41	−42	−42	−42	−41	−42	−42	−42	−42	−42	−42
Wood sub-total	−57	−54	−55	−56	−57	−55	−57	−58	−56	−59	−57	−58	−58	−58	−58	−58	−58
Total	−165	−148	−149	−133	−153	−171	−204	−191	−163	−156	−162	−161	−161	−161	−159	−159	−159

Overview From IPCC LULUCF

- LU change in tropics net emiter offset by growth in middle and high latitudes (North v. South)

The net terrestrial carbon uptake, that approximately balances the emissions from land-use change in the tropics, results from land-use practices and natural regrowth in middle and high latitudes, the indirect effects of human activities (e.g., atmospheric CO2 fertilization and nutrient deposition), and changing climate (both natural and anthropogenic).

Additionality

Placing LULUCF under cap obviates the need to demonstrate additionality

- Allows for joint production of forest products and carbon sequestration
- (offset credits generally don't because need to prove additionality)

Permanence

Placing LULUCF under cap ostensibly insures permanence in that land holders must commit to credit trading in perpetuity

- Defaults will occur (increasing risk to revenue ratio over time)
- Hence liability stipulations and insurance need to be in place

Leakage

- Big problem for offset credits sold from outside the cap
- LULCUF under the cap eliminates leakage *to the extent* that potential substitutes are also under cap (argument for “global” solution)

Tracking credits

- Precision not that important, lack of systematic bias is.
- A couple options:
  - Expanded Forest Inventory (FIA) Survey (provides multiple benefits)
  - Remote sensing
- Learning by doing and getting better at it over time

Risks

- Growing risk to revenue ratio as stands mature
- Perverse incentives, particularly prior to implementation
- Strategic behavior (gaming the system) in the face of complex rules and endemic externality (market discipline absent)
- Bureaucratic log jam and legal morass

Pros

- A simpler, more “elegant” solution
- Motivates change throughout LULUCF, not just in projects with offset credit potential—greater potential C reductions
- Internalizes the externality, eliminating problems of additionality, permanence and leakage (…if it works)
- Standardization and consolidation of C markets allowing for more fluidity and better transparency

Cons

- Transaction costs
- Lack of institutional capacity
- Equity
- Political opposition
- Change not incremental (revolution vs. evolution)
- Maybe all this expense and effort wont get us much (LULUCF may not be all that liable to change via C market mechanisms)

Options (status quo):

- Philanthropy credits
  - Feel good but marginal impact
- Offset credits sold from outside the cap
  - Incremental and feasible
  - Complexity coupled with additionality, leakage, and permanence issues limit potential contribution and weaken integrity of credits

Options (expanded cap)

- Public land ownerships under the cap
  - Revenue for forestry and integration of C into public land decision making
  - Risk not likely fully internalized given backup from the public purse
- Public lands and Major Private owners
  - Private landowners likely most responsive to economic signals. But LULUCF at urban fringe etc. may not be affected
- Everybody…(!)

Conclusion

- Need to carefully consider implications C trading for forestry. Skepticism is called for.
- Fully taking advantage of LULUCF requires responsibility to emissions as well as taking credit for sequestration (otherwise it will play only a bit part)
- Sound stance for public accounting even if not implemented