





Who Owns Terrestrial Carbon? The Brave New World of Valuing and Trading Carbon

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”...in addition, compact development preserves open space, forests and other carbon sinks that remove greenhouse gases from the atmosphere” (from March 2013 SF Bay Area SB 375 draft plan)

A simple  and not so simple  way to think about forests and climate change

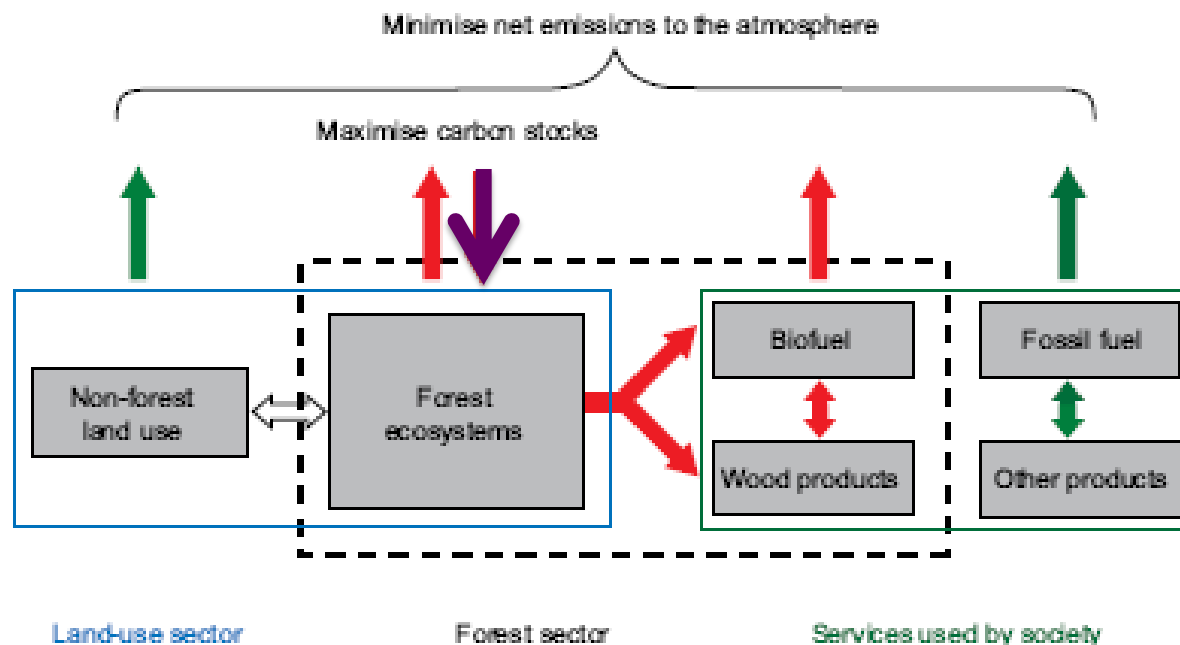


Figure 9.3: Forest sector mitigation strategies need to be assessed with regard to their impacts on carbon storage in forest ecosystems on sustainable harvest rates and on net GHG emissions across all sectors.

An aerial photograph of a forest landscape. The image shows a mix of dense green coniferous trees and large, irregularly shaped clear-cut areas where the trees have been removed, leaving a brownish-grey ground. A network of dirt roads or paths crisscrosses the terrain, separating the different sections of the forest. The overall scene depicts a managed forest with significant areas of recent logging and replanting.

Blodgett Research Forest by design is not adding more 'carbon on the stump', because we make money selling renewable products

“(c) The scoping plan proposes to maintain the current 5 MMTCO₂ annual sequestration rate through 2020 by implementing "sustainable management practices," which include potential changes to existing forest practices and land use regulations.” (PRC 4512/ AB 1504)

So, is the Center for Forestry a 'climate criminal'?

Some of UCANR's clients sell products from lands that planners see as continuous carbon offsets for other emissions

- 12 million acres of private forests
- 10 million acres of private grasslands
- 10 million acres of irrigated crop land
 - 3 million acres of tree crops and vines
- 5 million acres of private shrublands
- 4 million acres of private woodlands



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They know CO₂ was ‘removed’ by plant , they are just guessing that it is continuing to ‘remove’ CO₂ at measureable rates.

So, if an owner reduces carbon stocks, have they damaged a public trust resource? Will they be fined?

When vineyards expand, they replace some other vegetation



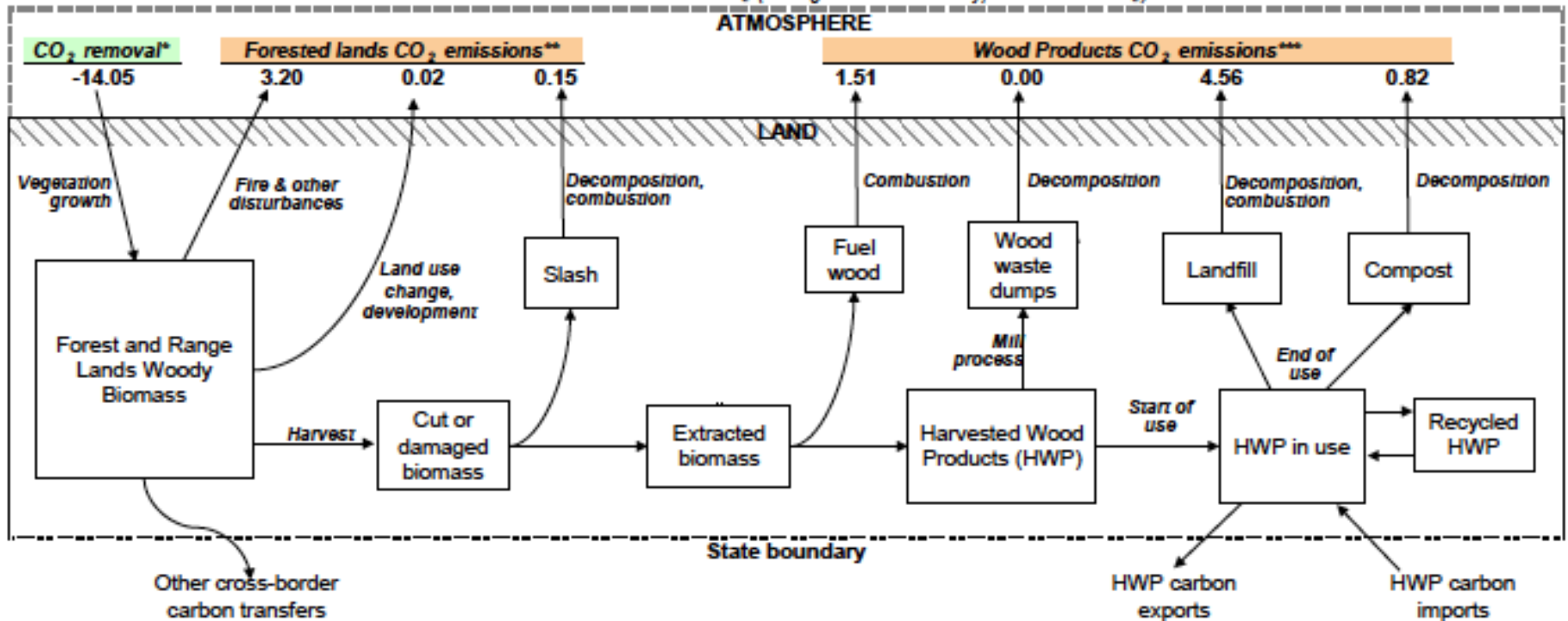
- In 2011, the Napa County Farm Bureau tried to understand the county's SB 375 terrestrial carbon math
- The math was totally indecipherable
- But the county proposed an 85% fine on the carbon loss if vines replace woodlands
- But new new big box retail outlets only had a 15% fine

California: Let 100 Flowers Bloom regarding how to do carbon offset accounting

- Climate Action Registry (2001 – 2010) - voluntary
- Climate Smart (2007 CPUC approval) – a failure
- **AB 32 Global Warming Solutions Act (2006)**
- Climate Action Plan (2008) – sectoral targets
- SB 375, regional transportation and land use (2008)
- Follow-up legislation specifically guides departments to meet their sector's target
- CARB is now certifying out of state forest offsets to meet the demand and keep price stable

ARB's forest sector box diagram chose just the 'forest ecosystem' box of the full IPCC diagram

2009 Net CO₂ Flux = Sinks + Emissions = -14.05 + 10.25 = -3.80
 Values for 2009 in million tonnes of CO₂ (Biodegradable carbon only, no fossil fuel CO₂)

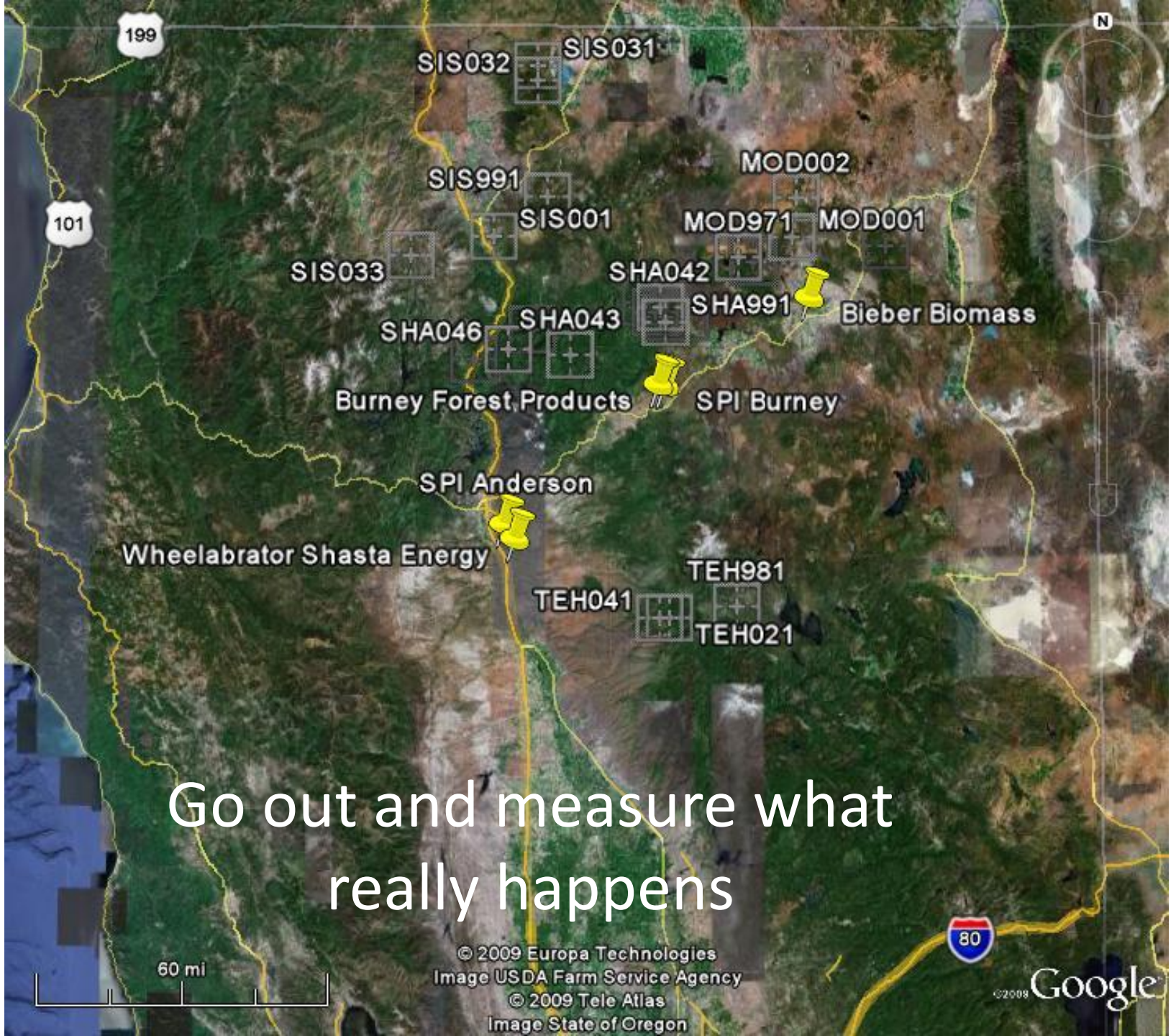


ARB's 2012 forest sector CO₂ emission estimates trend away from benefits

ARB Subsector	2000	2010	2020
Post-fire forest growth	-13	-13	-13
Uncollected dead wood in forest	+5	+5	+5
Wood products thrown away by consumers into regulated landfills	+6	+7	+8
Total	-2	-2	-1

<http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

ARB's forest sector balance is driven by assumptions about the inefficient use of harvested products



Go out and measure what
really happens

Initial Disposition of Harvested Trees

Silvics	Wood Products	Sawmill Energy	Sawmill Waste	Forest chips for energy	Un-collected residues	Total
Partial Cut	6.8	2.3	0.2	23.0	1.6	33.8
Clear Cut	68.1	21.7	0.9	13.7	4.3	108.4
1/2 1/2	74.8	23.9	1.0	36.7	5.9	142.2
Pct of total	52%	17%	1%	26%	4%	100%


In bone dry tons/acre

It matters which reports you use

Where	USFS	Pre 2008		USFS	Post 2008	
Utilization	Product	Energy	Waste	Product	Energy	Waste
Harvest	0.60	0.00	0.40	0.70	0.26	0.04
Sawmill	0.67	0.17	0.16	0.75	0.24	0.01
Post-consumer	0.43	0.22	0.35	0.65	0.25	0.10

Forest Management or Forest Conservation
Protocols prefer pre-2008 USFS efficiency estimates
with low efficiencies at harvest, sawmill and post-
consumer stages

Current efficiencies are actually high



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But Forest Management or Forest Conservation Protocols where climate benefits are based on less harvesting prefer old USFS documents that claim low efficiencies at harvest, sawmill and post-consumer stages

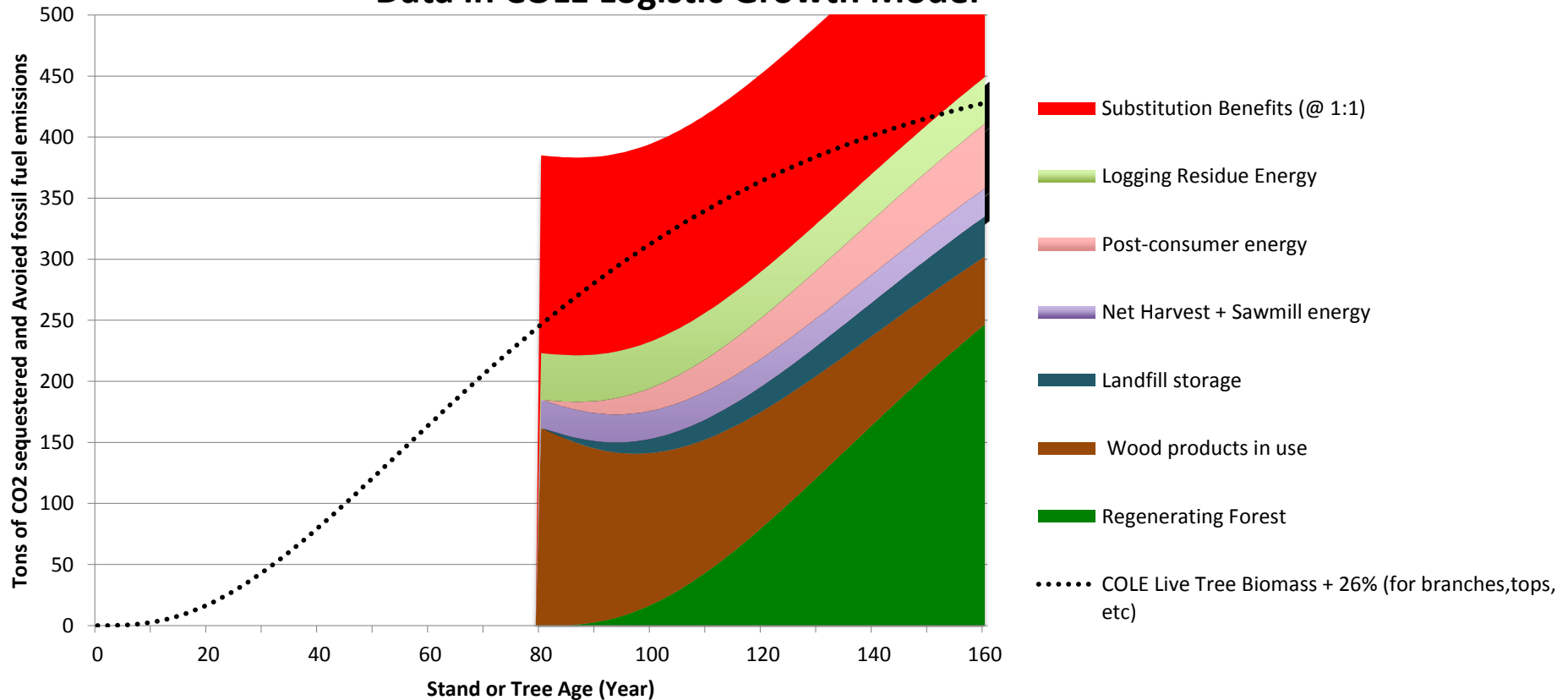
Estimated climate benefits from harvesting 100 tons of carbon from California Forests

Forest Product-related Climate Benefits	Pre-2008 USFS wood utilization coefficients	Post-2008 USFS wood utilization coefficients
C stored in products	15	27
C stored in landfills	11	7
Energy from logging residues	0	26
Energy from sawmill residues	17	23
Energy from post-consumer residues	7	11
Energy benefits of product substitution	16	30
Total	66	123

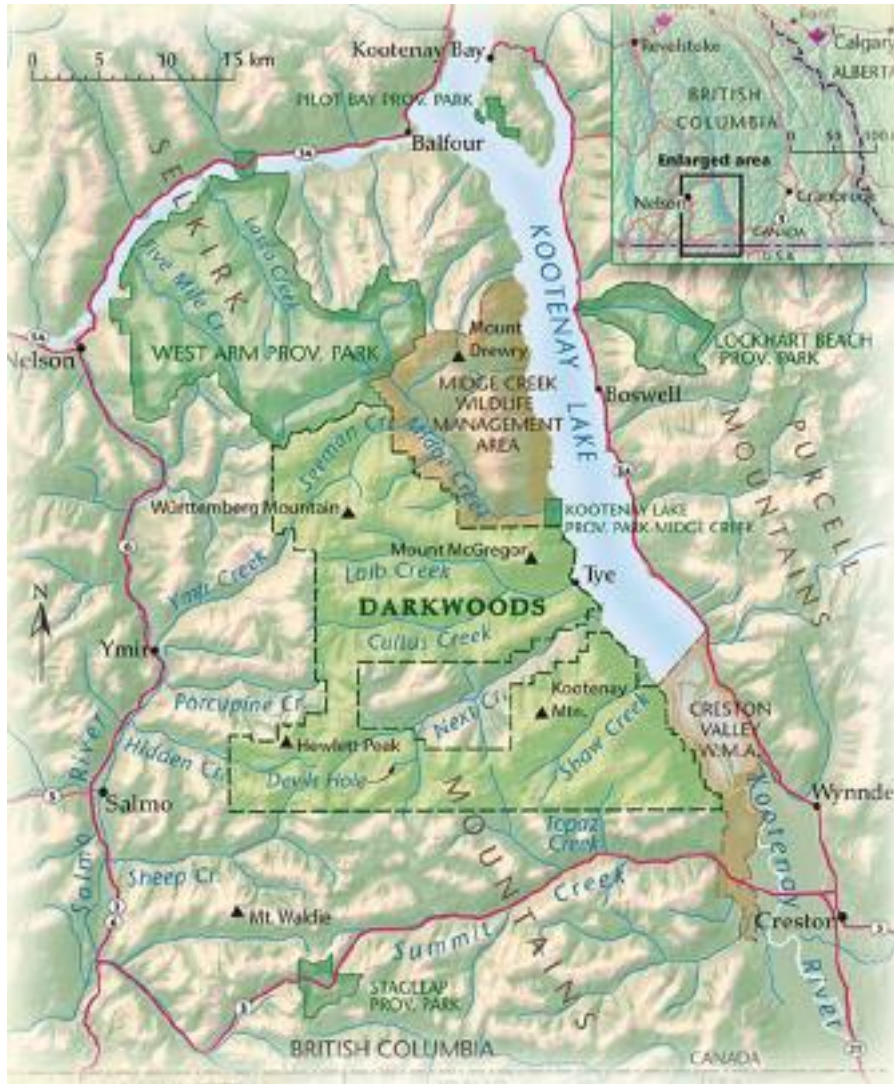
Stewart and Nakamura. 2012 @ UCCE website – ‘forest research and outreach’ under ‘carbon sequestration’ page

California BMPs are efficient when renewables > non-renewables are counted

**Total Carbon Sequestration Benefits of Harvest/Regenerating Forest +
Products vs. Continued Growth of Stand based on FIA Mixed Conifer Plot
Data in COLE Logistic Growth Model**

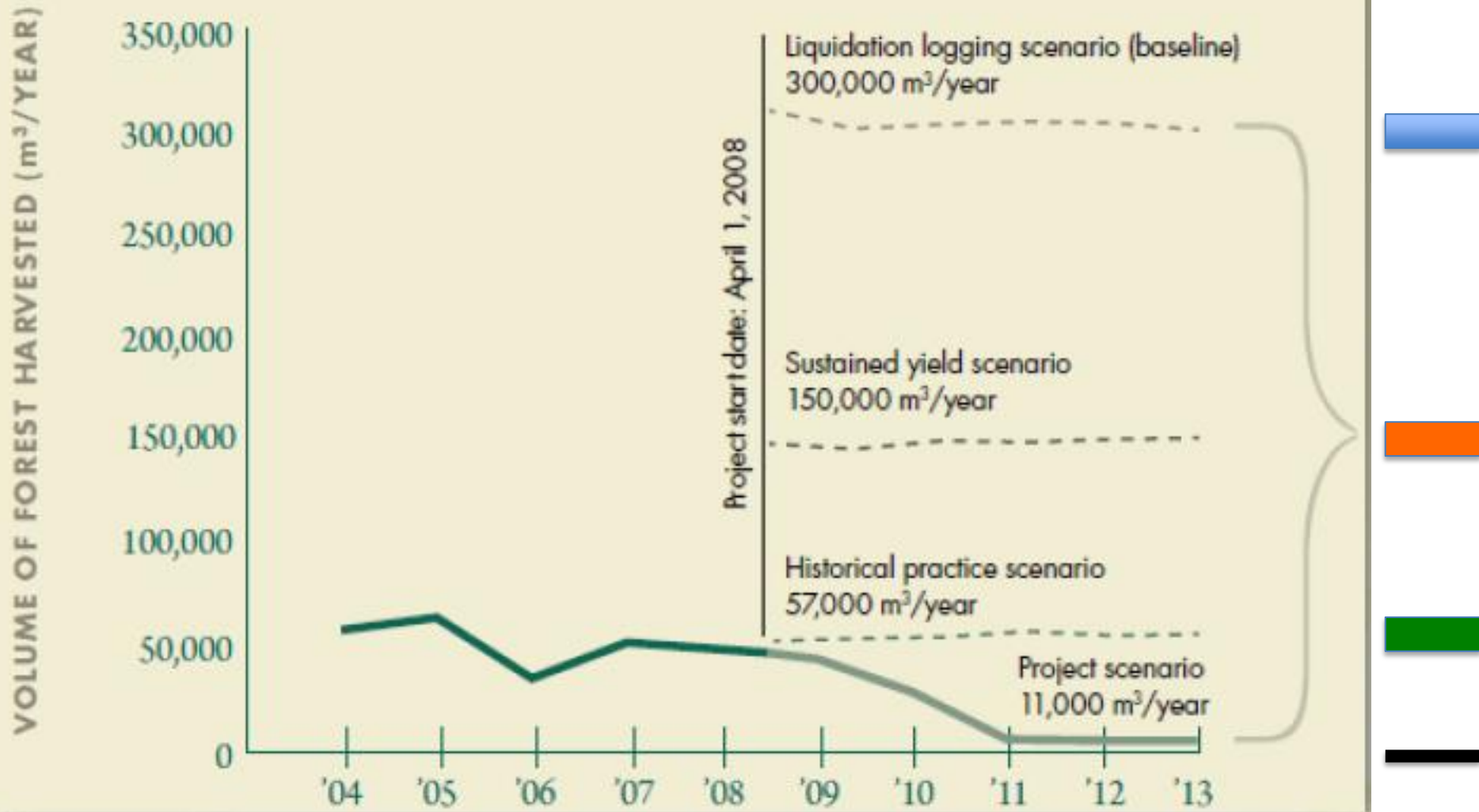


Darkwoods: A model for creating forest offsets ?



- Google 'Darkwoods' or check www.bcauditor.com
- 133,00 acres next to Kootenay Lake, 4 Provincial Parks, 2 Wildlife Management Areas
- Bought by TNC Canada in 2008 from Duke Carl Herzog von Wurtemberg
- \$100 million TNC, \$25 million Federal Govt grant
- Pacific Carbon Trust (a BC govt entity) buys a ton at \$6, sells at \$25 to school and hospital districts
- In 2011, started selling ~\$ 4 million carbon credits annually to captive schools and hospitals

How Many Carbon Credits Do You Think This Project Was Awarded?



Conclusion: Valuing and Trading Carbon

- Cap and Trade requires offsets for the same political reason that the Tax Code has tax credits – **political lubrication**
- Higher level regulators need to get Cap and Trade through the early political stages via Offsets
- Mid level regulators need to meet the new ‘targets’ for the single sectors that they regulate
- Carbon-holding landowners may have an asset or a liability depending on how the regulators count stuff
- UCANR expertise will be pulled into this mess