Forest MMRV in a Partnership for Climate-Smart Commodities
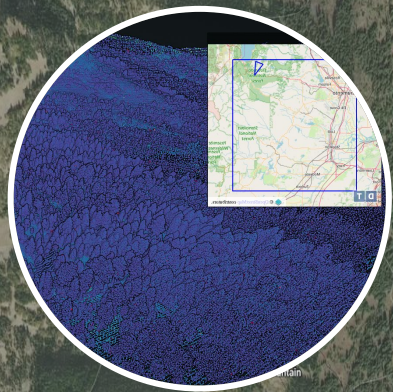
David Diaz

June 20, 2024

Vibrant Planet:
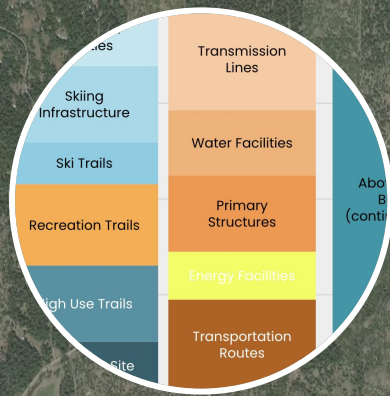A common operating picture
for climate resilience

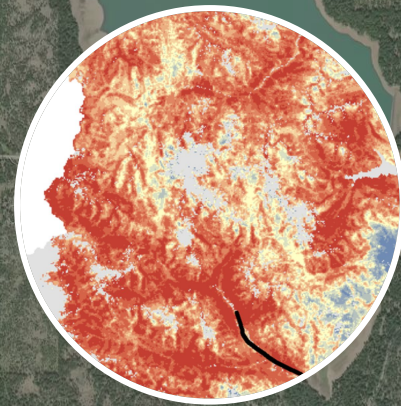# Providing actionable data and decision support systems to facilitate forest resilience and risk management.

3D foundational vegetation base level

Synthetic canopy height modeling

Complex socio-ecological quantification

Leading hazard risk visualization

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Climate Smart Commodities

Partnerships for Climate-Smart Commodities

USDA will support the production and marketing of climate-smart commodities through a set of pilot projects that provide voluntary incentives through partners to producers and land owners.

$3.1 billion announced for 141 projects taking place through 2027.

Building Markets and Investing in America's Climate-Smart Farmers, Ranchers & Forest Owners to Strengthen U.S. Rural and Agricultural Communities

Fiscal Year (FY) 2022
Partnerships for Climate-Smart Commodities
National Funding Opportunity (NFO)

No. USDA-NRCS-COMM-22-NOFO0001139

USDA United States Department of Agriculture

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Building the Climate-Smart Wood Economy

Partnership for Climate-Smart Commodities Grant Team

SUSTAINABLE NORTHWEST

NORTHWEST NATURAL RESOURCE GROUP

CLIMATE SMART WOOD GROUP

Ecotrust

Vibrant Planet Data Commons

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PIERCE CONSERVATION DISTRICT
Over 70 Years of Conservation

TROUT MOUNTAIN FORESTRY

WASHINGTON CONSERVATION ACTION
Protecting People & Nature as One

Projects must...

Building Markets and Investing in America's Climate-Smart Farmers, Ranchers & Forest Owners to Strengthen U.S. Rural and Agricultural Communities

Fiscal Year (FY) 2022
Partnerships for Climate-Smart Commodities
National Funding Opportunity (NFO)

No. USDA-NRCS-COMM-22-NOFO0001139

USDA United States Department of Agriculture

➔ Pilot implementation of climate-smart practices on a large-scale

➔ Include meaningful involvement of small or historically underserved producers

➔ Produce quantification, monitoring, reporting, and verification plans

➔ Develop markets and promote climate-smart commodities generated

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GHG Accounting Paradigms

Offset Paradigm, v1.0

Example Project Scenario
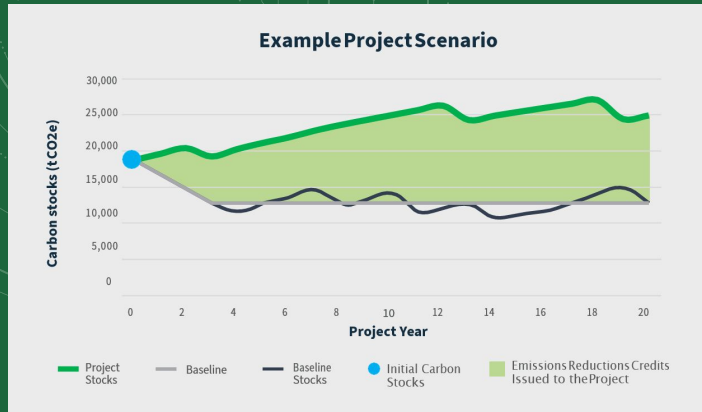
→ Motivated to enable transactions of market instruments related to GHG impacts (e.g., carbon offset credits)

→ Initially for project scopes, more recently at jurisdictional scopes.

→ Impact accounting relies upon forward simulation of a counterfactual scenario ("baseline") that cannot be observed.

→ Fundamental source of recent forest carbon offset criticism.
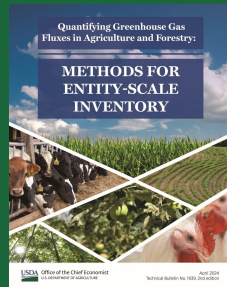
Consequential Accounting
Offset Paradigm, v2.0

Verified Carbon Standard

VCS Methodology

VM0045

IMPROVED FOREST MANAGEMENT
USING DYNAMIC MATCHED BASELINES
FROM NATIONAL FOREST INVENTORIES

Version 1.1
12 March 2024
Sectoral Scope 14

→ Abandons forward-simulated baselines in favor of a monitoring-based approach known as "synthetic controls"

→ Employed for longer time for jurisdictional REDD+, now arriving for IFM projects.

→ Being employed by 1-2 out of 3 multistate Climate Smart Commodities projects involving timber (AFF/TNC and NEFF?)

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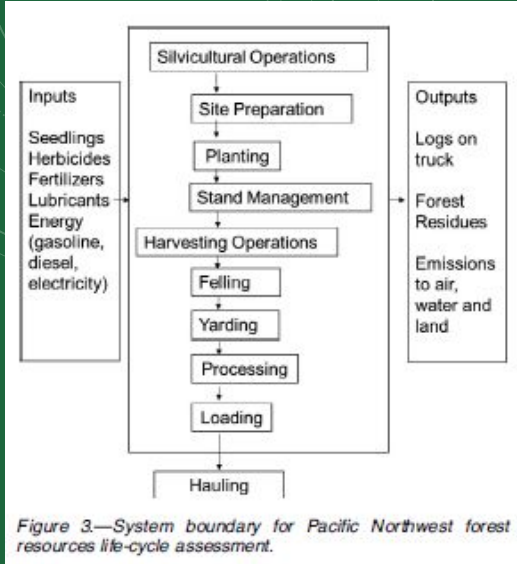# Shift to focus on embodied carbon

Embodied Carbon
Manufacture, transport and installation of construction materials

Operational Carbon
Building energy consumption

Skanska

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Attributional LCA, v1.0

*Figure 3.—System boundary for Pacific Northwest forest resources life-cycle assessment.*

Oneil and Puettmann (2017). "A Life-Cycle Assessment of Forest Resources of the Pacific Northwest, USA." Forest Products Journal 67(5-6): 316-330.

Average inputs and outputs from industrial forest practices evaluated at regional extents for PNW, SE, and Canada.

Does not track or report observed forest carbon stock changes at local or regional scales.

Used to generate Environmental Product Declarations that provide "cradle-to-gate" impact estimates per unit of product.

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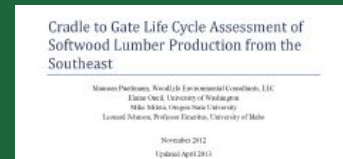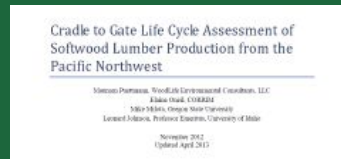
Environmental Product Declarations
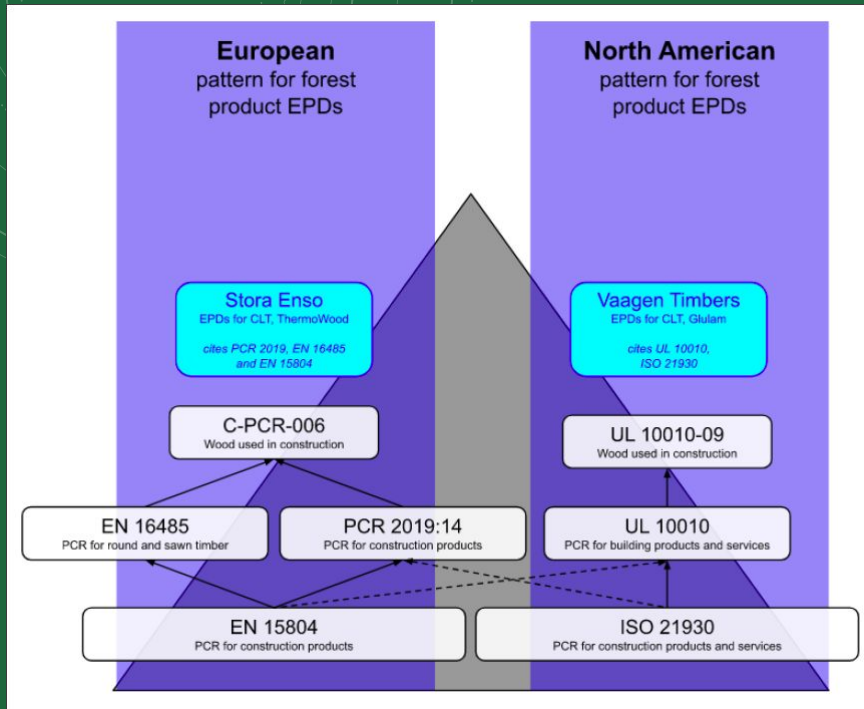
Hierarchy of standards governing application of LCA for product specific declarations which report "cradle-to-gate" impact estimates per unit of product.
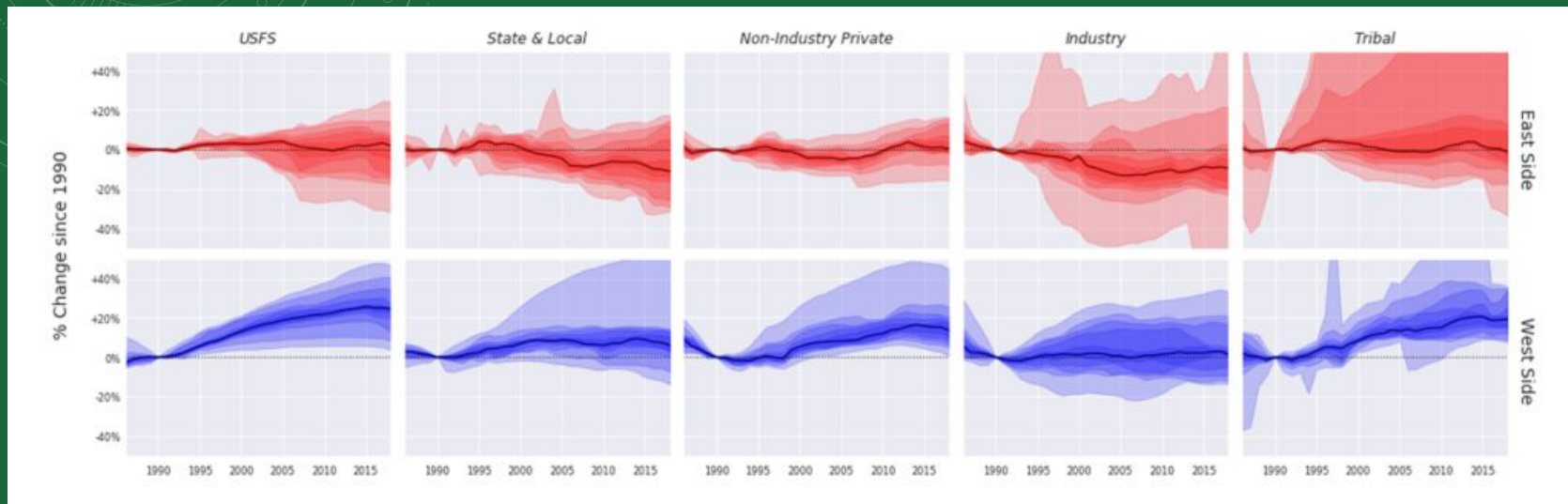
Two poorly integrated sets of standards operating in North America vs. Europe.

Neither system meaningfully addresses observable carbon stock changes due to forest land use or land-use change.

Blanket use of "biogenic carbon neutrality".

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Forest Management Matters

Landowners shape forest carbon balance

Benchmarking Washington forest owner types by county against their 1990 carbon stocks.

Getting to work

Monitoring & Reporting Framework

Our work follows from a proof-of-concept study, global and national standards, advice from industry experts, and user-centered design

Exploring the landscape of embodied carbon
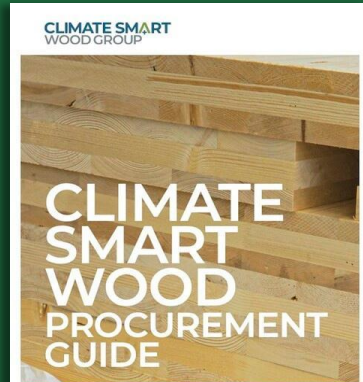
FORESTS & ECOSYSTEM SERVICES

A new look at the relationship between forest land ownership, timber production, and climate in the Pacific Northwest.

We are in the midst of an unprecedented explosion in the volume of data flowing from satellites that now offer imagery of Earth's surface with a tighter focus. The raw imagery alone allows us to quickly see how the Earth changes over time. It's hard not to marvel at how elegantly these images reveal the complexity and beauty of our planet's diverse places and their dynamic nature.

The real power to learn about what's happening on our planet, and particularly to our forests, emerges more clearly when we figure out how to systematically translate the raw data in each of these pixels (including wavelengths of light not visible to the human eye) into information we can readily understand and interpret, such as the amount of canopy cover, abundance of different species, the size or volume of trees, and types of disturbances. For those of us working at the intersection of equity, economy, and the environment, we are just beginning to scratch the surface of a treasure trove of imagery blanketing our planet that reaches back nearly 50 years.

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Top image: The mouth of the Columbia River, as seen from the Sentinel-2 satellite on September 2, 2020.

CLIMATE SMART WOOD GROUP

CLIMATE SMART WOOD PROCUREMENT GUIDE

Options for procuring climate-smart wood

GREENHOUSE GAS PROTOCOL

Land Sector and Removals Guidance
Part 2: Calculation Guidance
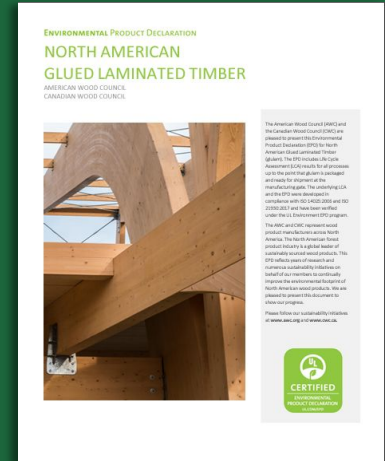
Supplement to the GHG Protocol Corporate Standard and Scope 3 Standard

DRAFT FOR PILOT TESTING AND REVIEW (SEPTEMBER 2022)

WORLD RESOURCES INSTITUTE   wbcsd

ENVIRONMENTAL PRODUCT DECLARATION

NORTH AMERICAN GLUED LAMINATED TIMBER

AMERICAN WOOD COUNCIL
CANADIAN WOOD COUNCIL

CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION

Not Neutral

A basic formula for adding non-zero carbon balance to existing LCAs

1. ## Calculate carbon stock change in the forest

   Account for carbon gains and losses from a specific area over a specific timeframe.

2. ## Calculate timber output

   Total output of industrial roundwood from same area and timeframe.

3. ## Calculate "upstream" embodied carbon

   Divide #1 by #2 to calculate "upstream" embodied carbon for the timber supply area.

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What we'll be reporting

Time series of carbon, timber output, and embodied carbon factors from 2000-present, summarized for different owner types and geographic scales:

- Individual forest owners
- Woodsheds for sawmills
- Jurisdictions (county to multi-state)

Additional land use tracking metrics

- Carbon stocking vs. unmanaged reference
- Land use intensity (timber output per area)
- Forest loss and other land-use changes
- Natural disturbance extent and severity
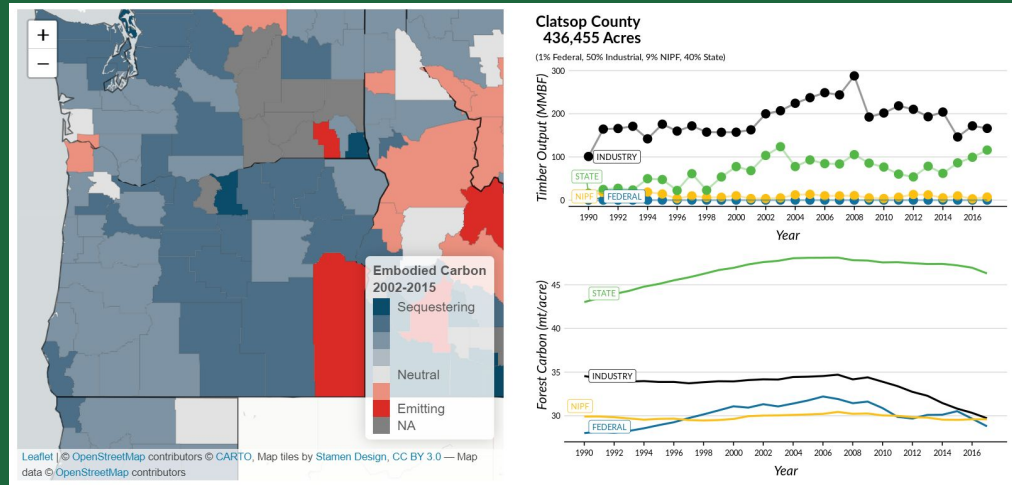
Example of an interactive map and data visualization highlighting carbon stocking and timber output of owner types and regions across the Pacific Northwest. Developed by Ecotrust for Exploring the landscape of embodied carbon.

https://ecotrust.org/mapping-the-northwests-working-forests

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Monitoring & Reporting Platform

1. Develop Methodology
Ecotrust + Vibrant Planet

➔ Define impact assessment methods and reporting framework

➔ Prototype impact assessment with public datasets

2. Hone Data Pipeline
Vibrant Planet + Ecotrust

➔ Develop data pipelines and analytical processes

➔ Bring estimates forest carbon stocking, disturbance, and timber removals up to the present and into the future.

3. Modeling & Inference
Vibrant Planet

➔ Data updated ≤annually and subjected to QA/QC.

➔ Impact estimates modeled to ensure reporting is accurate, consistent, and reproducible.

4. Reporting & Visualization
VP Data Commons + Ecotrust

➔ Impact data translated into a user-centered online reporting system

➔ Web app highlights forest impacts associated with timber production

1. Develop Methodology

2. Prepare Novel Data

3. Data Processing

4. Ingest Data into Tool for Visualization & Reporting

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Forest Modeling & Inference

Generating consistent and actionable forest trends.

1. Start with Small Area Estimation.
Use geospatial data on annual forest biomass, ownership, reserved status, and timber output.

- → Spatial data: CTrees, USFS, PAD-US, sawmill database.

- → Condition RS estimates against annualized FIA (via rFIA) and TPO at county- and survey-unit scales.

- → Package independent benchmarking datasets with plot- and stand-based inventory (no FIA) for evaluating RS-derived layers at stand- and property-scales (e.g., BLM, WA DNR, ODF, FSVeg?) .

2. Progress to State-Space Modeling
Generate time-series of forest growth, mortality, and removals, employing 3-PG Spatial for NPP, infer various disturbance impact factors.

- → Spatial data: HLS, TerraClimate, USFS LCMS, SMAP/OpenET

- → Condition on annualized FIA and TPO at county- and survey-unit scales.

- → Validate on independent plot- and stand-based inventory datasets.

- → Separate natural disturbance fluxes from timber impact reporting following Canadian approach.

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Thank you.

Find me
ddiaz@vibrantplanet.net