

# Carbon & Forestry Jobs



# Some Carbon Industry Project Categories

## Emission Reduction

- Methane Gas Capture
- Energy Efficiency
- Renewable Energy

## Sequestration/Storage

- Forestry: Improved Forest Management, Afforestation/Reforestation, Avoided Conversion

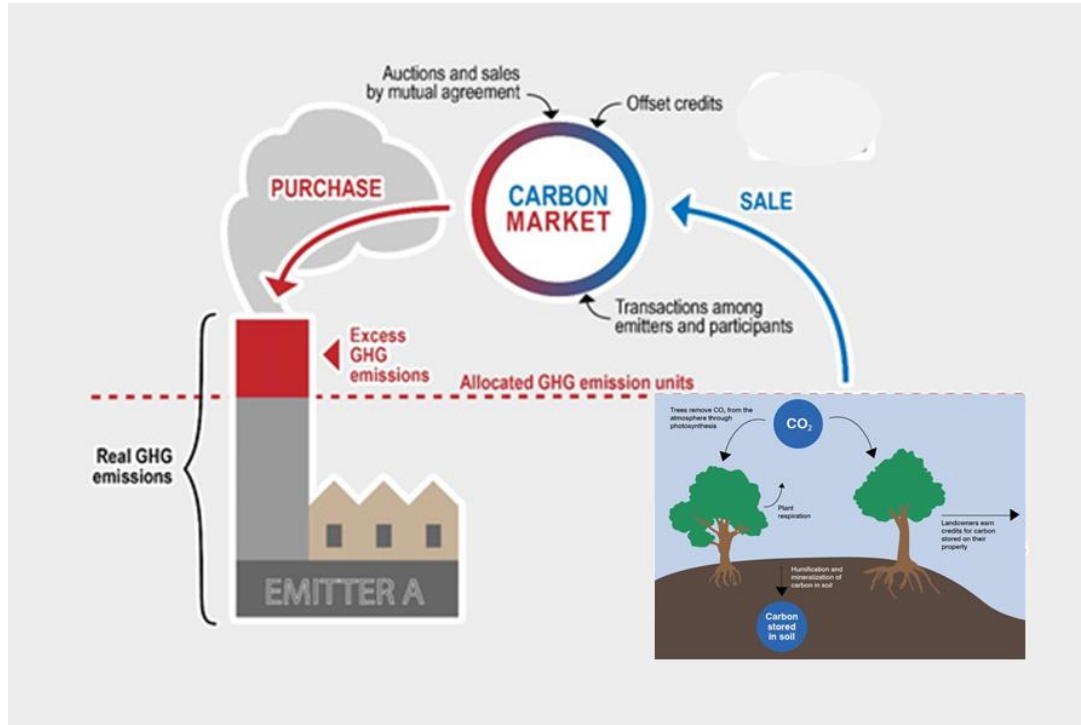




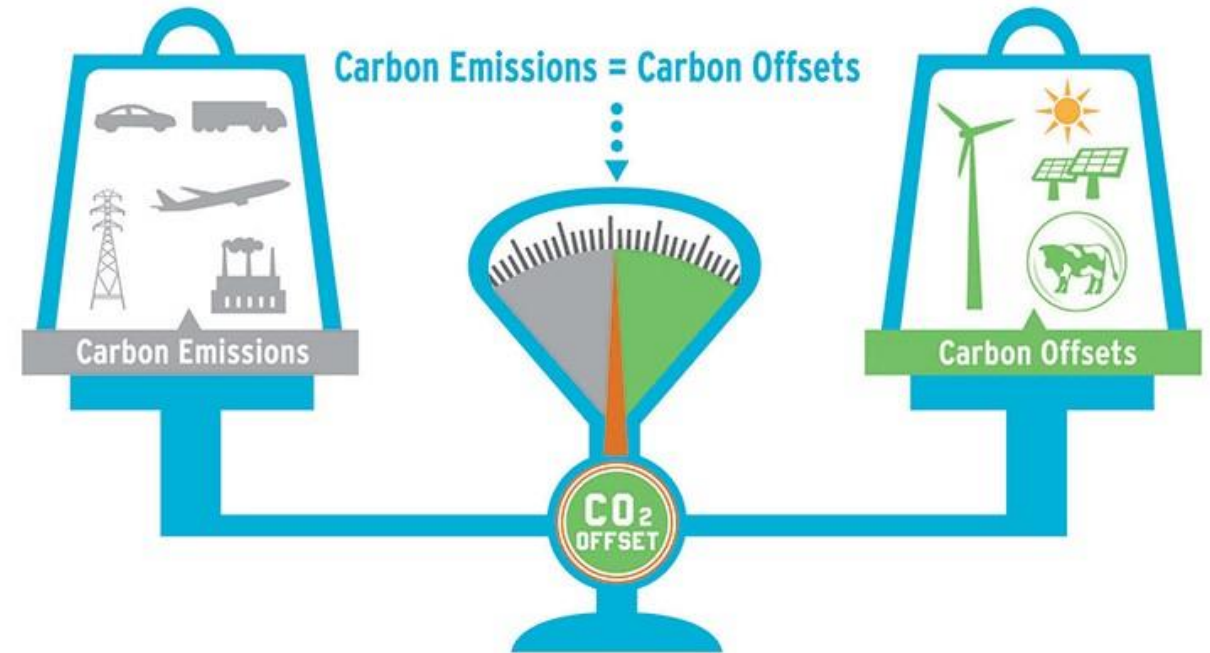
- A *Carbon Offset* - a reduction in GHG emissions or an increase in carbon storage that is used to compensate for emissions that occur elsewhere.
- A *Carbon Offset Credit* is a certified, transferrable instrument which represents an emission reduction of one metric tonne of CO<sub>2</sub>, (MtCO<sub>2</sub>e) or an equivalent amount of other GHGs.
- Aka: Carbon Offset Credit, CER (Carbon Emission Reduction), ERT ( Emission Reduction Tonne), ERU (Emission Reduction Unit)



# California Cap and Trade Market



# Voluntary Market



California's Compliance Offset Program



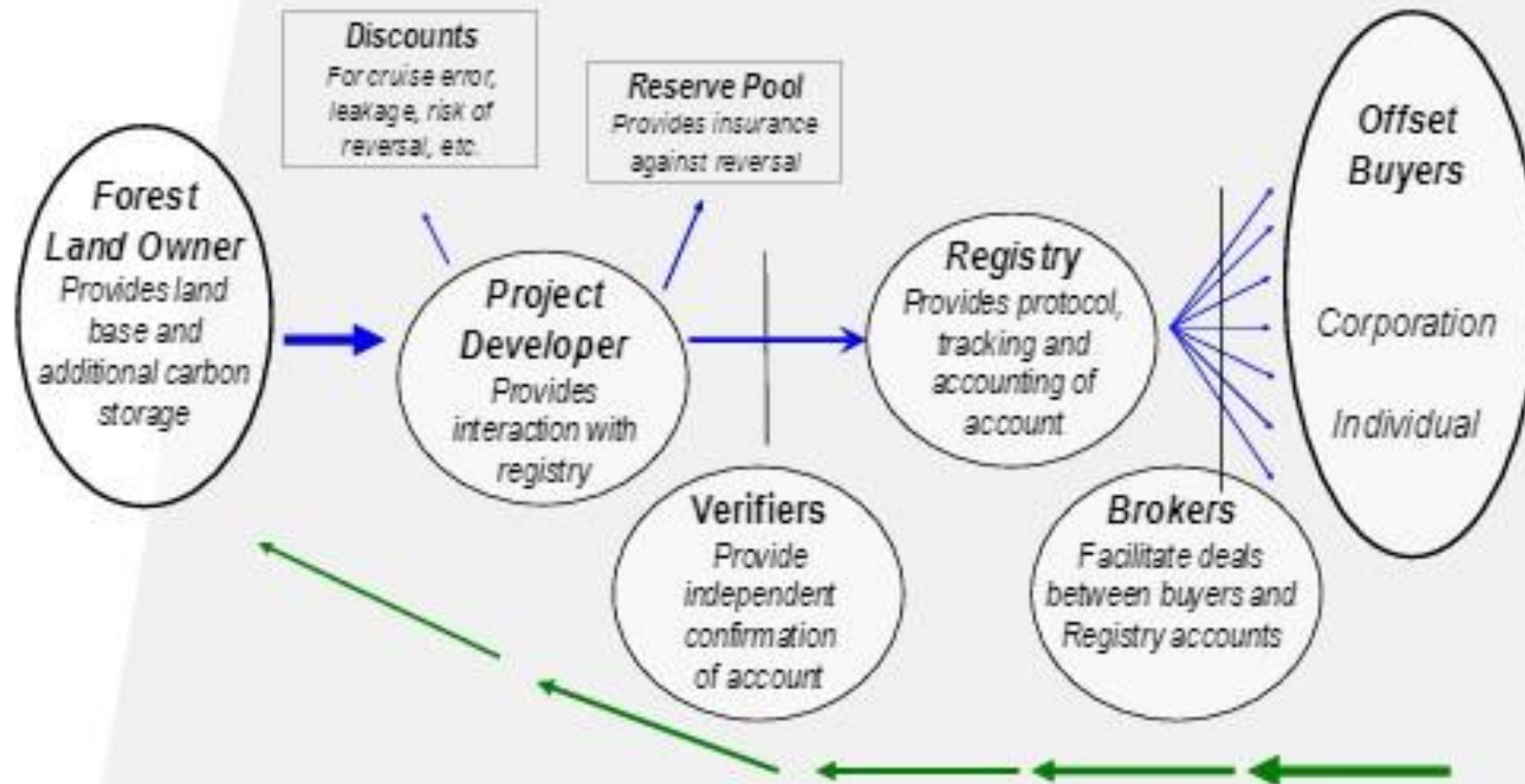
CLIMATE  
ACTION  
RESERVE



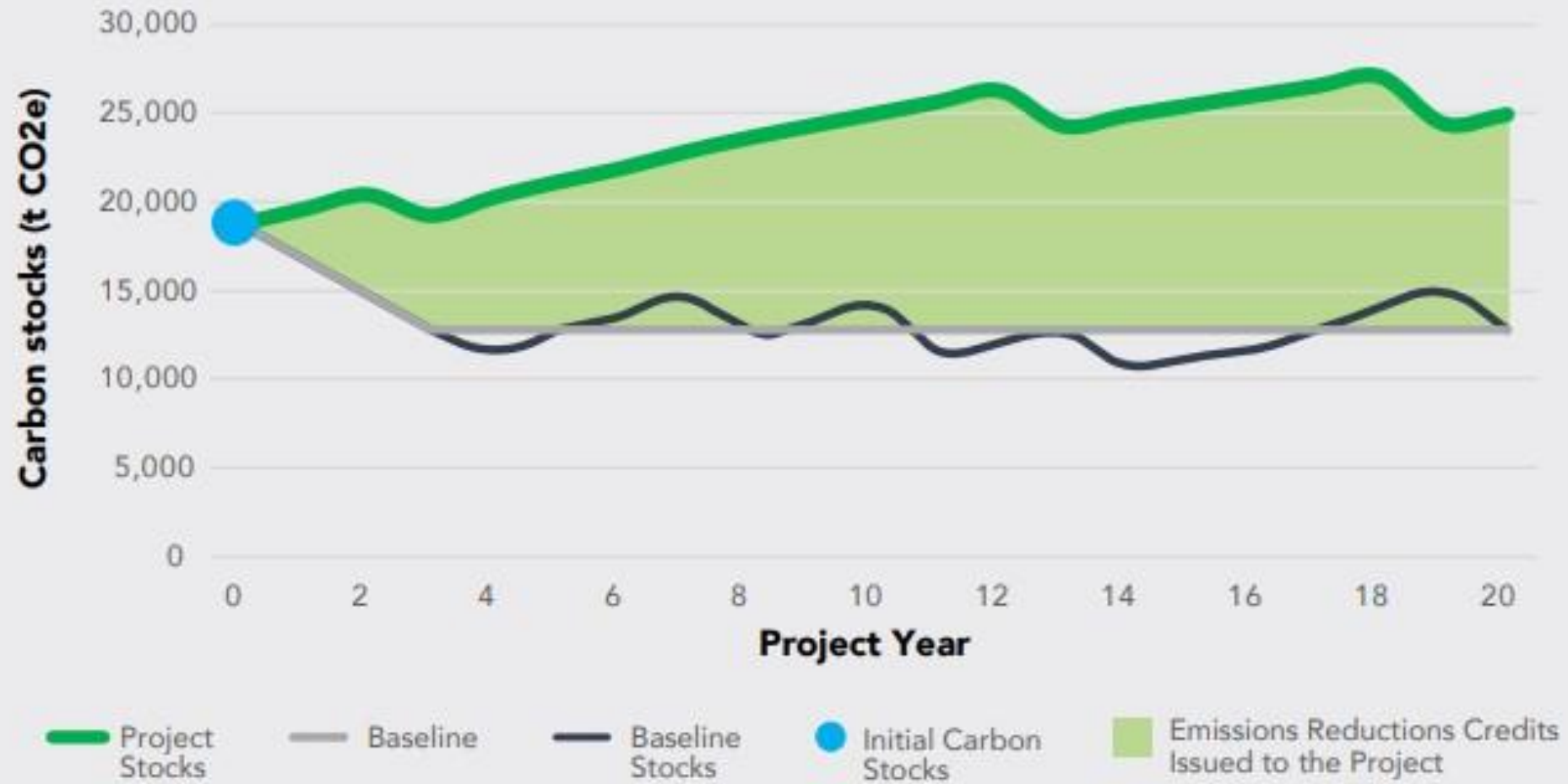
Verified Carbon  
Standard



# FOLLOWING CARBON AND MONEY THROUGH AN OFFSET MARKET



## Example Project Scenario





# Where are the Jobs

- Project Development
- Forest Inventory
- Validation and Verification
- Registries

Inventory development

Inventory field work, auditing (contracted with Forestry firms)

GIS/Remote sensing

Biometrics

Data quantification, modeling, audit (FVS)

Marketing

Business law

Regulatory Compliance



# Guaranteed Work!

Project Development: 8 -10 year contract with Landowner, new projects

Forest Inventory: Every project is inventoried AT LEAST every 10 years, new projects

Validation and Verification: Each project has an annual desk review and a 5 year site visit

Registries: development of new protocols, revising existing standards, monitoring existing projects, new projects

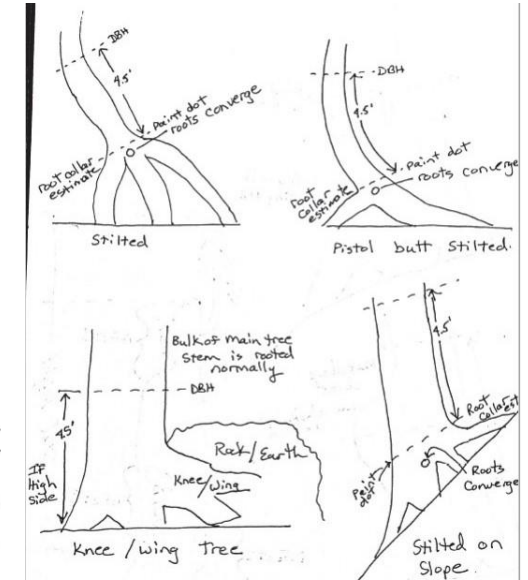
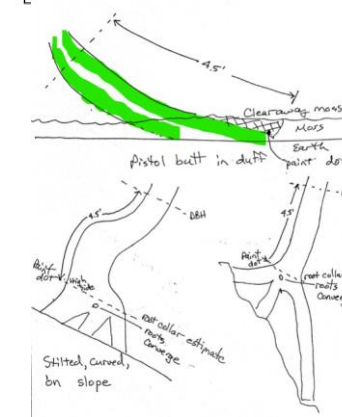
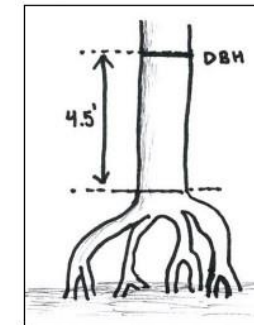
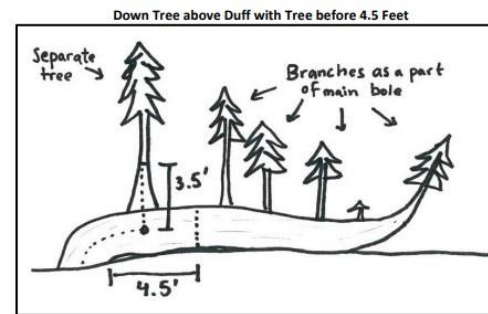
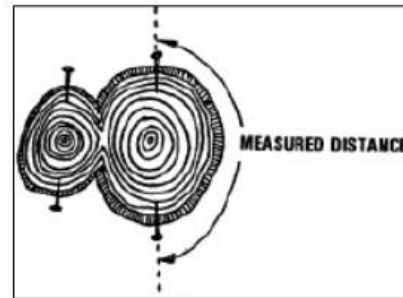


# Forest Inventory

- Fixed radius plots with nested subplots
- In general measurement follow FIA Rules
- No product calls
- Species
- DBH tolerance =  $\pm 0.1 - 0.2$  inches  
Rounding rules vary by project
- Tree Height –Merchantable, total height, actual height, phantom height  
Tolerance varies. Typically 1-6 feet. Verified to  $\pm 10\%$ , generally
- Missing wood – Varying methods including phantom height, Forest Service Biomass Chart, Rule of Thirds
- Dead Tree Decay Class – Forest Service Definitions
- Understory – 1.0" - 4.99". May include a count, dbh and height. Varies by project



The diagram illustrates a circular plot divided into eight sectors by four intersecting dashed lines. A legend at the top right defines the symbols: an open circle for 'Not counted', a grey circle for 'Counted once', and a blue circle for 'Counted twice'. The plot is situated between two irregular lines representing a 'Mapped gap'. Labels include 'Stand 1' on the left, 'Stand 2' on the right, 'Outside' and 'Inside' with arrows indicating directions, and 'Plot' at the center. Within the plot, four blue circles (counted twice) are located in the top, right, bottom-right, and bottom sectors. Four grey circles (counted once) are located in the top-left, top-right, bottom-left, and bottom sectors. Four open circles (not counted) are located in the top-left, top-right, bottom-left, and bottom sectors. The sectors are labeled with letters: 'h' at the top, 'v' at the top-right, 'w' at the bottom-right, and 'x' at the bottom. The 'Mapped gap' is labeled at the bottom right, with 'Inside Stand 1' below it.



| Decay class stage (code) | Limbs and branches          | Top           | % Bark Remaining | Sapwood presence and condition                                | Heartwood condition *  |
|--------------------------|-----------------------------|---------------|------------------|---|--|
| 1                        | All present                 | Pointed       | 100              | Intact; sound, incipient decay, hard, original color          | Sound, hard, original color  |
| 2                        | Few limbs, no fine branches | May be broken | Variable         | Sloughing; advanced decay, fibrous, firm to soft, light brown | Sound at base, incipient decay in outer edge of upper bole, hard, light to reddish brown                   |
| 3                        | Limb stubs only             | Broken        | Variable         | Sloughing; fibrous, soft, light to reddish brown              | Incipient decay at base, advanced decay throughout upper bole, fibrous, hard to firm, reddish brown        |
| 4                        | Few or no stubs             | Broken        | Variable         | Sloughing; cubical, soft, reddish to dark brown               | Advanced decay at base, sloughing from upper bole, fibrous to cubical, soft, dark reddish brown            |
| 5                        | None                        | Broken        | Less than 20     | Gone  | Sloughing, cubical, soft, dark brown, OR fibrous, very soft, dark reddish brown, encased in hardened shell |

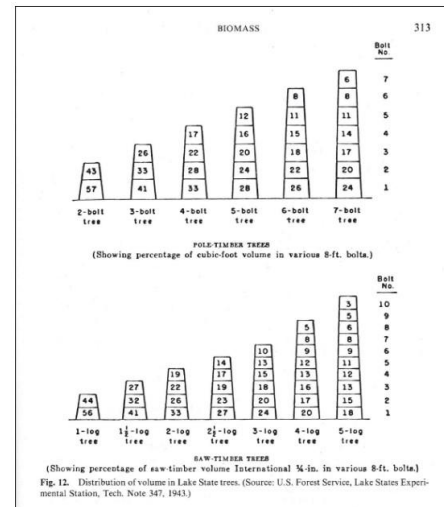


Fig. 12. Distribution of volume in Lake State trees. (Source: U.S. Forest Service, Lake States Experimental Station, Tech. Note 347, 1943.)

**Top Third:**  
50%  
missing

**Middle Third:**  
10%  
missing

**Bottom Third:**  
0%  
missing

**Estimated Original Height**





QUESTIONS?

