



Working Forest Carbon Credits:

How It Works in Texas

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Texas Forest Service





Forest Carbon Markets & Registries

- California Climate Action Registry
- ***Chicago Climate Exchange (CCX)***
- DOE
- Georgia Carbon Sequestration Registry
- NYMEX
- RGGI
- Over-the-Counter Transactions





Three CCX Offset Forestry Protocols

- Afforestation Protocol
- Managed Forests Protocol
- Long Lived Wood Products Protocol





Market Participants

- CCX
- Landowners
- Aggregators
- Associate Aggregators
- Verifiers





Managed Forests - Eligibility

- Evidence of sustainable forest management
 - SFI, FSC, **Tree Farm**
- 15-year commitment of sustainable management
- Sustainable Forest Management Plan
- All projects subject to review/approval by CCX





How Do I Sign Up?

- Contact appropriate organization
 - CCX – only projects > 10,000 MT CO₂e
 - Aggregator / Associate aggregator / consultant
- Calculate annual net change in carbon stocks
 - Establish baseline
 - Direct measurement / Modeling to determine credits
- Agree to terms of contract, sign
- Prepare supporting documentation
- Verification
- Maintain forest land / records



Establishing Carbon Baseline

- Baseline = carbon stocks on Dec. 31 of prior year
 - May be able to back grow to 2003
- Forest Inventory must be conducted
 - 10% AE for 90% confidence interval
- Results input into approved G&Y model
 - SiMS – Best for Southern pine plantations
 - FVS – all other stands
- Model predicts net annual change (**growth**) in carbon stocks





Managed Forest Contract

- Must be signed
- Minimum of 15 years
- Aggregators have sample contracts on web
 - Terms and Conditions
 - Fees
 - Payments
- Enrollment worksheet
 - Tract / stand details





Terms and Conditions

- **Catastrophic Loss**
 - 20% of credits placed in Reserve pool to mitigate for catastrophic losses. Released after contract is completed.
- **Acquisition / Disposition of Forest Land**
 - Credits adjusted annually to account for changes in forest ownership
- **Harvesting**
 - Must account for all losses in carbon stocks





Supporting Documentation

- Aerial photograph / map
- Legal description of property
- Evidence of Forest Certification
- Legal evidence of property ownership
- Evidence to maintain forest carbon stocks for 15 years
- Forest Management Plan
- Forest inventory results





Verification

- All projects subject to verification by independent, third-party CCX-approved verifier
- Texas Forest Service is a CCX approved verifier
- Verification ensures that project protocols are properly followed and that the appropriate volumes of carbon dioxide are being recorded
- Offset projects subject to an initial verification and subsequent annual verifications





Verification – Managed Forests

- Legal ownership – property deeds, appraisal district records
- Forest certification – approval letter, certificate, website
- Existence of forests – aerial photographs, field check, planting / seedling receipts
- 15 yr signed contract, letter of intent to maintain enrolled land – documentation included in contract file
- Number of acres – GIS / GPS, Land Survey
- Species – field ID, planting receipts





Methods of Verification

- Type of forestland (plantation) – field check, planting receipts
- Land Acquisitions/dispositions, damages from pests, fire noted
 - documentation included in contract file
- Carbon quantification method per CCX rules
 - **audit forest inventory plot data, G&Y model**
 - reference worksheet (s) to CCX rulebook
- Net annual change in carbon per CCX rules
 - calculate annual change in carbon
- Signed contract with aggregator in file





Maintain Forest Land / Records

- Maintain forest land
 - Land acquisition / disposition
- Keep detailed records regarding enrolled land
 - Catastrophic losses (wildfire, insect/disease, severe weather, etc.)
 - Harvesting (volume / product classes)
 - Land acquisition / disposition
- Submit annual reporting forms to aggregator / CCX
 - Annual attestation





Anticipated Fees

- Aggregator – 10%
- Associate aggregator – 10%
- Verification – \$.15/credit
- CCX Transaction fees - \$.20/credit
- Reserve – 20% of credits held back





Anticipated Returns

- Amount of Credits Dependent on
 - Species
 - Geographic Location / Site Index
 - Management Intensity
 - Standing Volume
- Market Conditions
- \$10-20 / acre annually





An Example of Potential Additional Return from CCX Managed Forest Offset Programs





Assumptions

- 100 acre loblolly pine plantation
- Previously cutover
- Site Index (Base 25) = 60
- Chemical Site Preparation / Hand Plant
- Trees per acre @ planting = 620
- Rotation age = 31 years (2 CCX contracts)
- No catastrophic losses will occur





Assumptions

Thinning and Final Harvest

Year	Intensity
16	30%
23	30%
31	100%



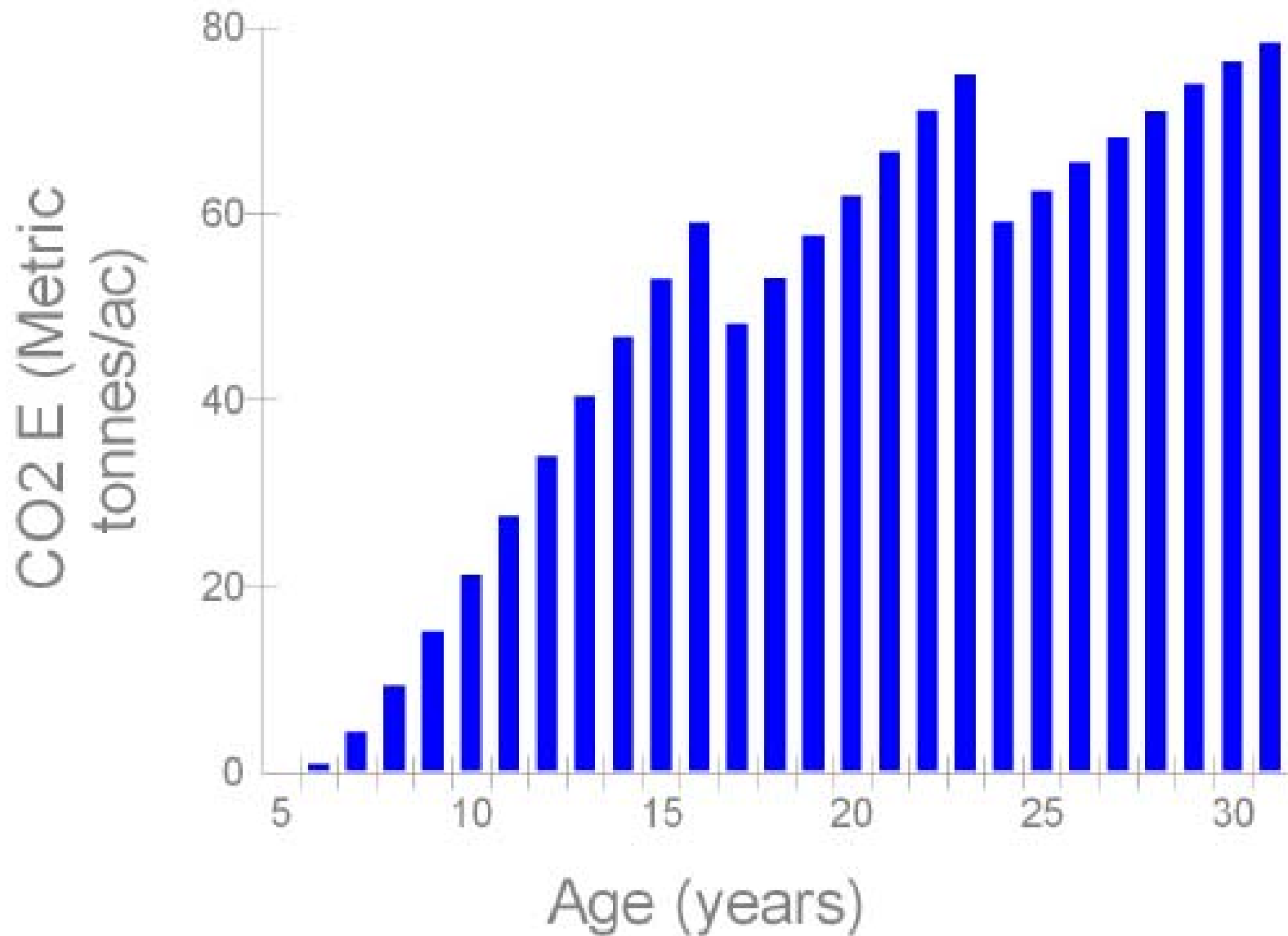


Model Results

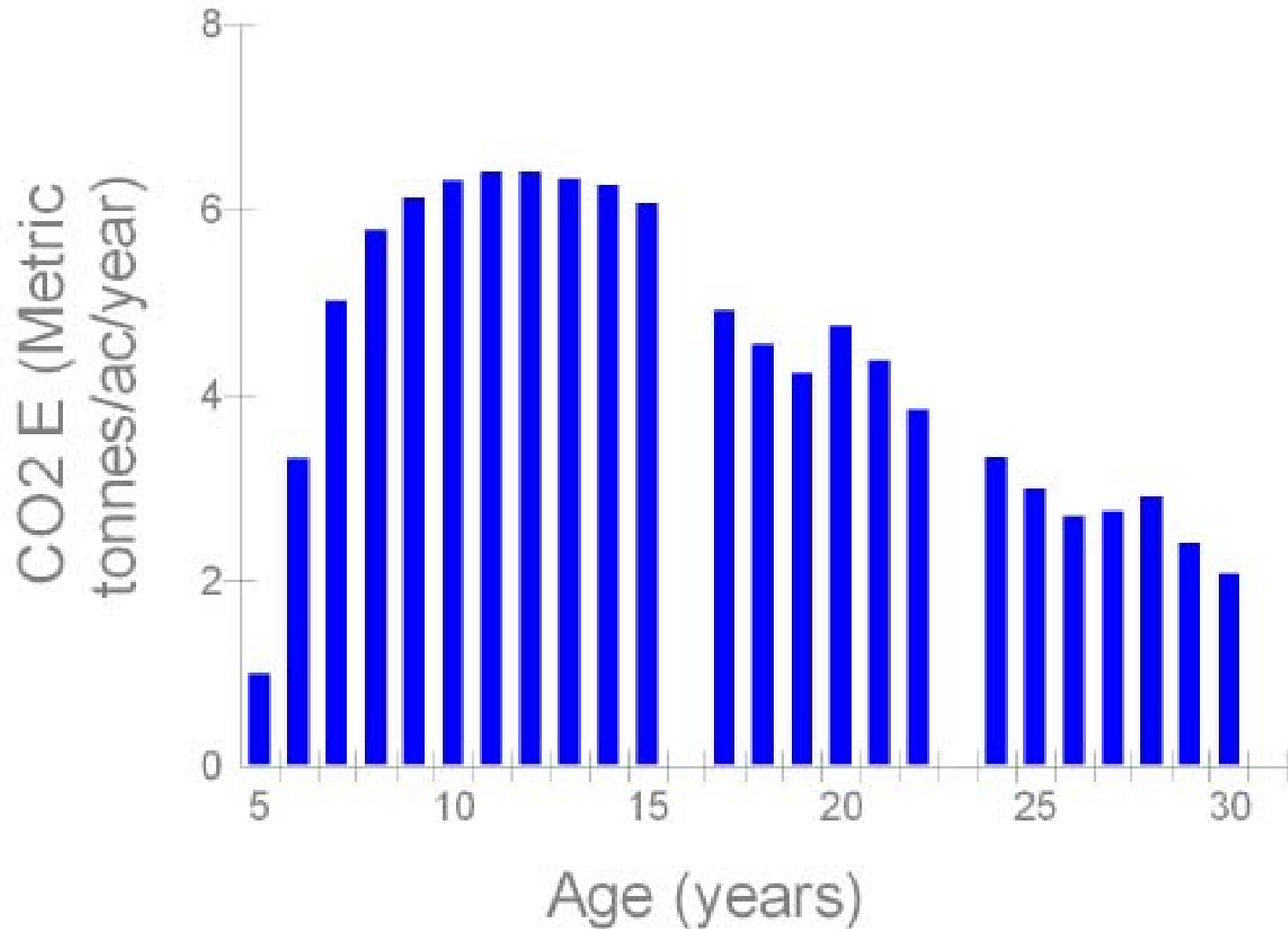
- Reports Carbon as short tons, MT, and CAI
- Carbon seq. begins at age 5
- CAI (growth) @ age 7-15 = 5-6 MT / ac / yr
- CAI declines around mid rotation
- Accounts for Carbon reductions from thinning



CO2 Equivalent



CAI CO2 Equivalent





Carbon Returns

- 1st CCX contract yields 3.9 MT / ac / yr
 - Aggregation = 0.8 MT / ac / yr
 - Verification and trading fee = \$.35 / MT
 - Net return @ \$4.35 / MT = **\$12.40 / acre / yr**

- 2nd CCX contract yields 1.3 MT / ac / yr
 - Aggregation = .3 MT / ac / yr
 - Verification and trading fee = \$.35 / MT
 - Return @ \$4.35 / MT = \$4 / acre / yr
 - LLWP (22.9 MT) @ \$4.35 / MT = \$91.60 / ac
 - Net return = **\$10.10 / ac / yr**

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