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Forest Protocol Updates

May 29, 2020

The Reserve's Forest Protocol Timeline

- 2003 - development work began
- 2005 – Version 1.0 adopted
- 2007 – Version 2.1 had the first verified projects
- 2009 – Version 3.0 introduced new project types, permanence requirements, etc.
 - Shift from conservation-based forest management to improved forest management, avoided conversion, and reforestation
- 2011 – CA Air Resources Board introduced the first compliance offset protocol (COP), based on version 3.2
- 2012 – Version 3.3 adopted (incorporated Alaska, among other changes)
- 2015 – CA Air Resources Board adopts current version of their COP
- **2017 – Version 4.0 adopted**
- **2019 – Version 5.0 adopted**
- **2020 – introduced a new Reforestation methodology**

Priority Areas for Improvement with COP

Project
development costs

Verification costs

Making the protocol
more accessible to
smaller landowners

Rigidity of guidance
and methods

Accessibility of
information to all
stakeholders

Changes Intended to Reduce Project Development Costs

- New Default Baseline Methodology for IFM projects
 - Allows for projects to avoid extensive baseline modeling in certain cases
- Publication of a standardized inventory methodology (SIM) and Climate Action Reserve Inventory Tool (CARIT)
 - SIM is optional, but reduces the need for project developers to craft a new methodology, and comes “pre-approved” by the Reserve
 - CARIT contains approved biomass equations and comes pre-verified

Changes Intended to Reduce Verification Costs

- SIM and CARIT come pre-approved – verifiers just need to ensure they were implemented correctly
- More time available to verify project after an unintentional/unavoidable reversal and addition of “computational reversals”
 - In recognition that there may be ongoing mortality – verification within a year may not capture this, so we increased this to 2 years
 - Computational reversals are still compensated for like an intentional/avoidable reversal, but with a relaxed verification timeline
- Sequential sampling changes
 - Provided separate stopping rules for height and diameter
 - Provided more detailed guidance for determining in/out trees and allowing some flexibility for not including in-growth in certain cases
 - Recently disturbed plots may be excluded from sampling for 1 RP (up to 5% of plots)

Changes Intended to Reach Smaller Landowners

- Aggregation guidance
 - Allowing multiple projects to be managed jointly, with different Target Sampling Errors and confidence deductions
 - Has been included in the Reserve's program since v3.0
- Reduced verification frequency for small projects, and projects not seeking CRTs
 - Comparable to ARB's approach that allows a less frequent verification schedule for smaller livestock, rice, and MMC projects under a certain credit threshold
- Project development cost-reduction from optional use of default baseline, SIM and CARIT

Streamline Problem Areas

- Get rid of high and low site class distinction for Common Practice
- Even aged management variable retention
 - No post-harvest retention still limited to 40 acres, but would allow for larger stands to be harvested based on post-harvest retention
- Public lands baseline methodology
 - “Historical trendline” option in the protocol isn’t feasible
 - Our protocol has a methodology that utilizes COLE (Carbon Online Estimator), but that has some reliability concerns

Additional Considerations

- Incorporation of Hawaii as an eligible area
 - Lack of available growth and yield model remains a challenge
- Publicized critiques of the program's approach to leakage will likely prove challenging the next time the protocol undergoes revisions
- Revisit buffer pool contributions – wildfire/insect/disease should all have opportunity for reduced contribution through treatment/fuels management
- LMU requirement in protocol is vague and doesn't accomplish what it set out to do
 - We've switched to a watershed approach
- Reserve's Climate Forward Reforestation Methodology
 - Allows conservative ex-ante crediting of reforestation projects, to make this project type financially viable.

Accessibility of Guidance

- FAQs published infrequently
 - While this is a programmatic issue, it seems to have the greatest impact on forest projects
- ARB has continued to develop guidance in key areas: determination of site class, choosing to disallow trees 1-5 in. DBH, changing the buffer pool contribution for Alaska Native Corporations, etc.
- OPOs/APDs are disadvantaged/unable to learn this guidance if they don't have many projects in the system, or if they don't ask the right questions
 - ARB has prevented OPRs from publishing the guidance independently, and the guidance changes frequently which makes it difficult to track
 - Publishing the agendas from OPR calls (or returning to more frequent publication of FAQs) could help remedy this

Questions?

Sarah Wescott

- Senior Forest Program Manager
- swescott@climateactionreserve.org

Jon Remucal

- Senior Forest Policy Manager
- jremucal@climateactionreserve.org

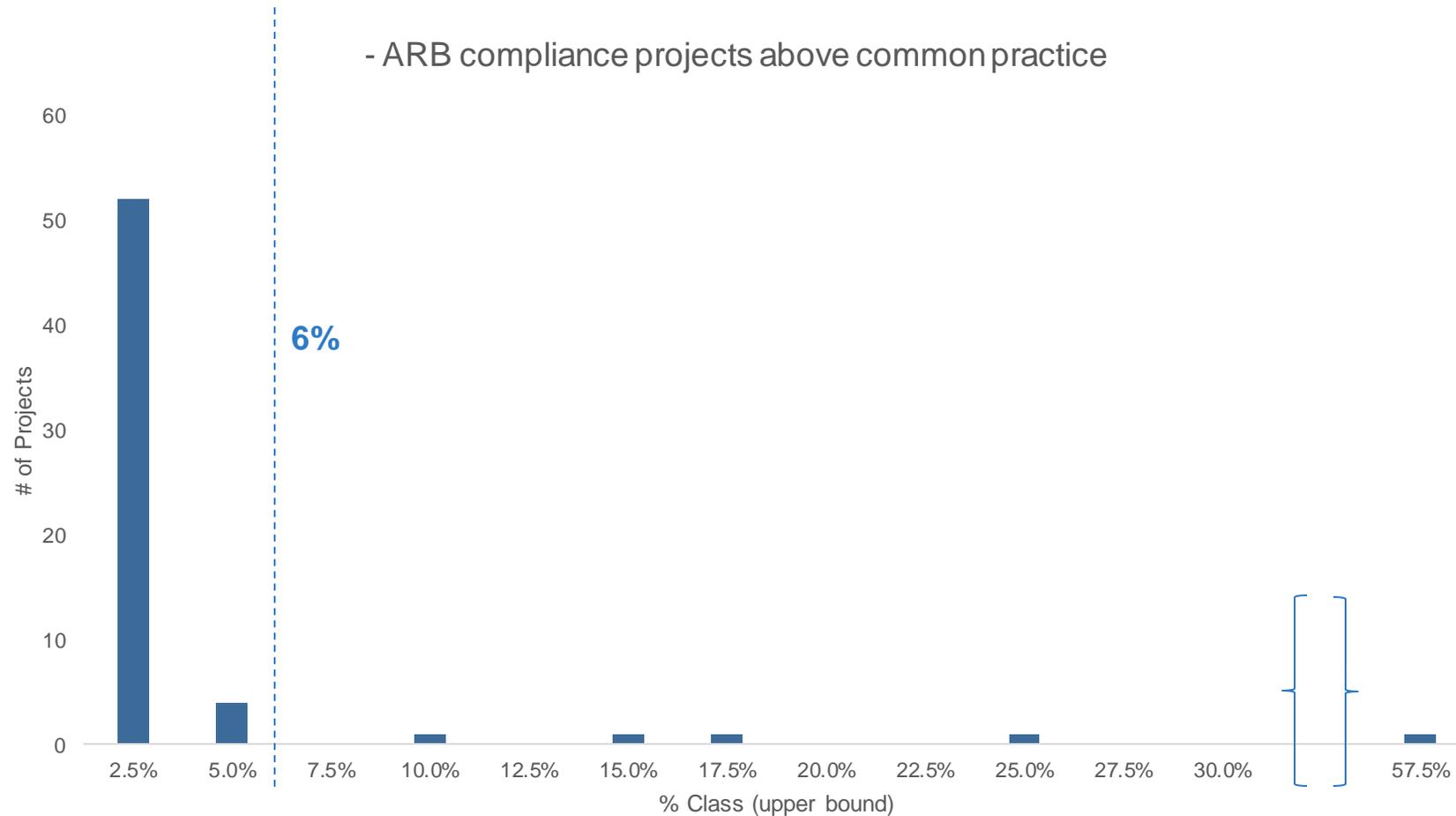
New IFM Baseline Methodology

- Created a methodology that would eliminate the cost of modeling for eligible IFM projects
 - Instead of the traditional methodology, where projects have to model a 100-year baseline with legal and financial constraints, we are providing a conservative default option (see next bullet)
- Projects must pass a screening test to show they could easily reach common practice values (i.e., our existing performance standard metric of “business as usual”)
 - If so, then the default approach conservatively increases common practice by 6%, and allows them to use that as the baseline
 - Assumptions were developed based on an analysis of current projects in ARB’s compliance program, which showed that most projects were able to model to within 2.5% of common practice with very few outliers

New IFM Baseline Methodology

Baseline Aboveground Live Carbon in excess of Common Practice as % of Common Practice

- ARB compliance projects above common practice



New IFM Baseline Methodology

- New steps are:
 - Determine eligibility to use the standardized approach
 - Cannot have deeded encumbrances preventing timber management, and must pass a screening test
 - Establish initial baseline (either Common Practice or initial carbon stocks)
 - Initial baseline is increased by 6% to conservatively account for legal and financial constraints
 - Harvest volume and carbon delivered to mill is estimated based on trends we've observed in existing carbon projects
 - Below ground carbon is estimated in the baseline in proportion to the initial inventory
- All projects still have the option to model the baseline

Smaller project verifications

- All Forest Projects receiving under 4,000 CRTs/year
- Changes the site visit frequency from every 6 years to every 12 years
- 4,000 CRTs are on average; site visit is triggered if 48,000 unverified CRTs have accumulated

Project entering a monitoring phase

- Any Forest Project not seeking CRTs by the time a site visit is required
- In such cases, they will need to have previously submitted monitoring reports verified as a desk review
- Decline in canopy cover of more than 5% triggers a site visit
- Canopy cover now required to be submitted in project documents

Improved Flexibility for Avoided Conversion Projects

- New flexibility has been added to the commencement date for Avoided Conversion projects
 - Where recordation of a conservation easement is used to signal the project start date, multiple conservation easements may be used to cover a single Project Area.
 - Where transfer of the Project Area to public ownership is used to signal the project start date, multiple transfers may be used to cover a single Project Area.
- The project must have one fee owner (for conservation easements), or must be transferred to a single public entity
- All easements must be recorded within the span of 12 months; all transfers must take place within the span of 12 months
- The whole project area must have the same alternative non-forest land use, must use the default rate of conversion, and must apply the same Conversion Risk Adjustment Factor

Climate Action Reserve Inventory Tool (CARIT)



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- CARIT is a Microsoft Access-based inventory management tool developed to lower costs
 - Developed with funding support from a Conservation Innovation Grant provided by the USDA NRCS
- Allows foresters and others with technical knowledge to manage their carbon inventories in-house
 - The tool is verified, and doesn't require the expertise of a professional project developer, which helps projects save \$

CARIT Dashboard

Climate Action Reserve Inventory Tool About CARIT

Project: North Coast Example
Description: CARIT Project

| Strata | Plot Years | Plot #s |
|--------------------|------------|---------|
| High C - Redwood | 2018 | 4 |
| Medium C - Oak | | 5 |
| Medium C - Redwood | | 8 |
| | | 9 |
| | | 10 |
| | | 15 |
| | | 17 |
| | | 40 |

Selecting a different stratum resets plot year selection
Delete key deletes the selected stratum

Click plot # to select/deselect

Calculate CO2

Grow Trees

Project Management

- New Project
- Import from Tables
- Delete Project
- Exp->xls
- Exp->tbl

View and Edit Data

- Strata
- Plots
- Trees

Year and Plot Management

- Delete Year
- New Year
- Copy Plot(s)
- Reassign Plot(s)

Reports

- Project CO2
- Strata CO2
- Plot CO2
- Tree CO2
- Confidence Statistics
- Species Diversity

Settings

- Growth
- Data Checks

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USDA
United States Department of Agriculture
Natural Resources Conservation Service

Climate Action Reserve Inventory Tool (CARIT)

- The tool was developed last year, in conjunction with our Standardized Inventory Methodology
 - Over the past year, the tool has been in a “beta” version, being tested by internal staff and external stakeholders
 - It was verified by one of our accredited forest verification bodies, and is compatible with ARB’s protocol
- The tool is free, available by request by emailing reserve@climateactionreserve.org)
 - We will be hosting a CARIT demo webinar on December 10, 2019 – register on our website

Addition of Hawaii Supersection and Assessment Areas

Background

Supersection

- Based on USFS ecosections
- Spatially explicit ecological regions based on similar physical and biological conditions
- If necessary, adjacent ecosections sharing similar environmental, economic, and regulatory conditions are combined

Assessment Area

- Distinct forest community within supersections
- Consist of common regulatory and political boundaries that affect forest management

Common Practice

- Average CO₂/acre for assessment area
- Used to determine project baseline

Since Hawaii's forests have similar species composition, assessment areas can be defined by biophysical settings instead. Most logical basis for spatially defining biophysical settings is the set of moisture zones from Price et al. (2012).

FIA Plots – Forest Types

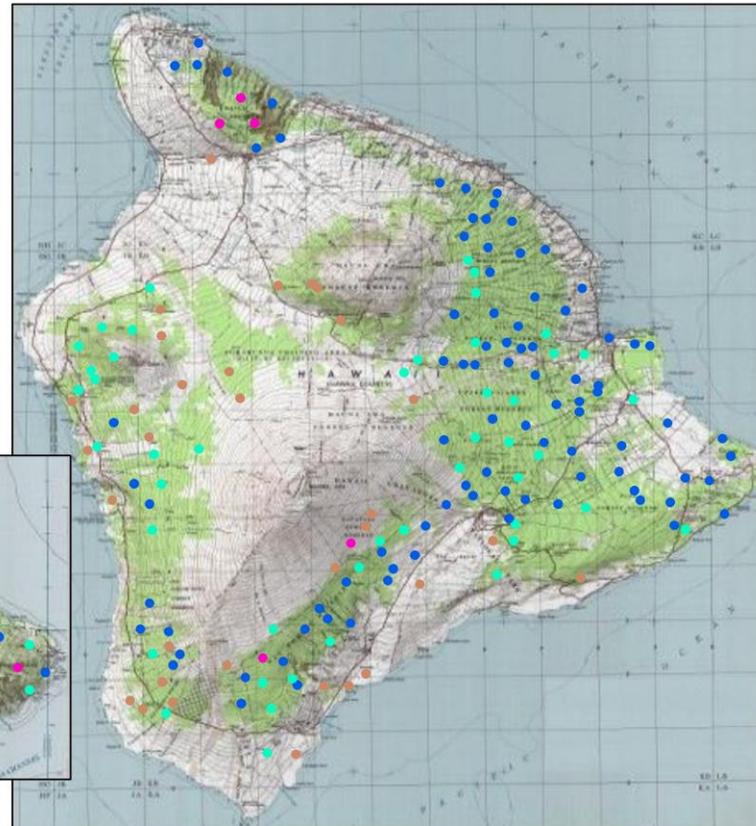


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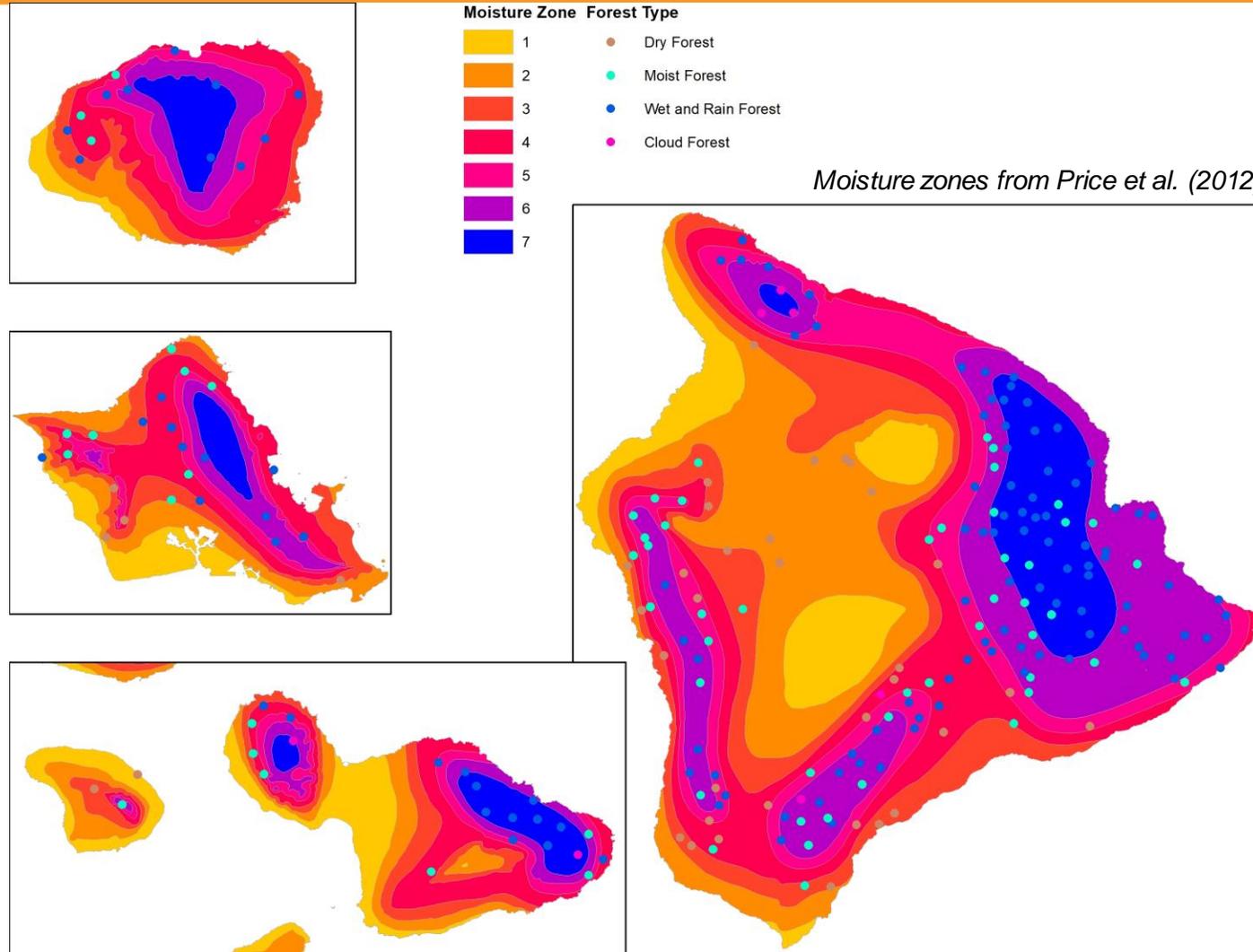
Forest Type

- Dry Forest
- Moist Forest
- Wet and Rain Forest
- Cloud Forest

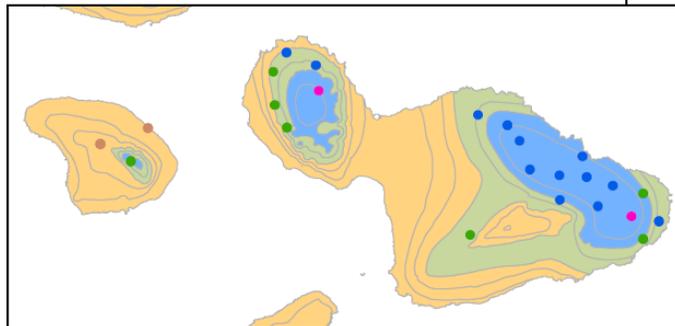
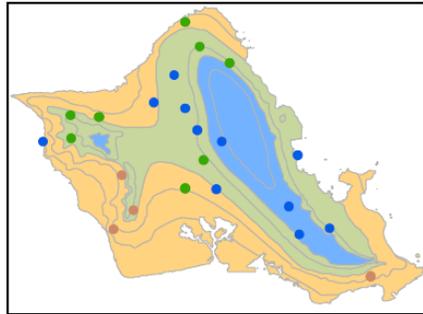
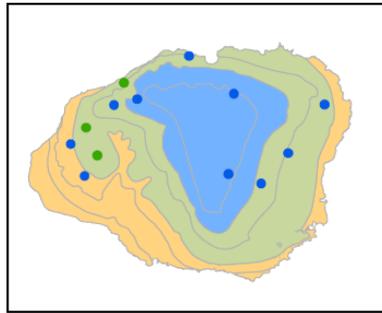


Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

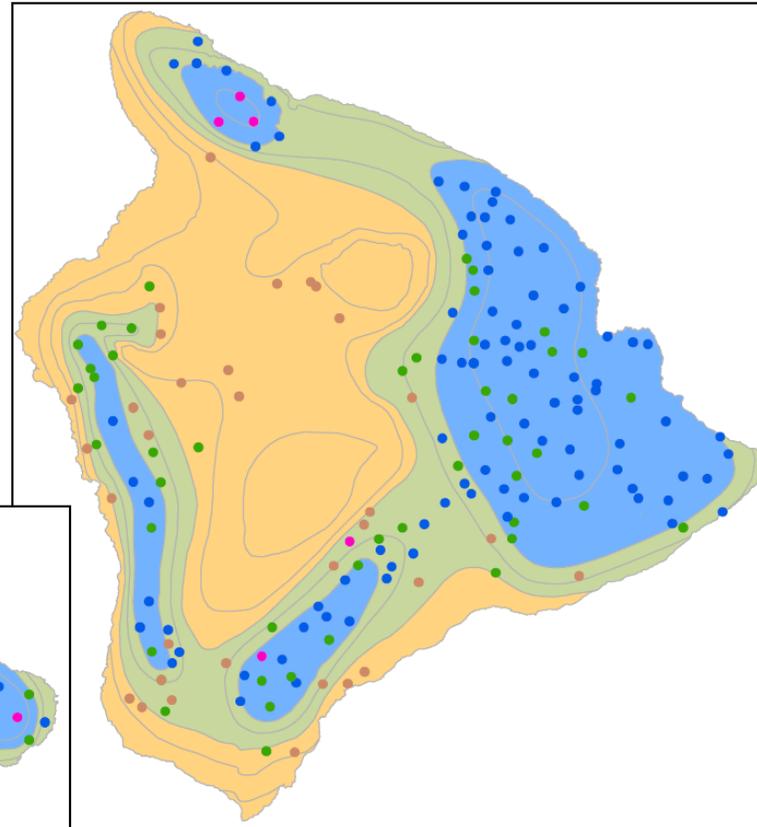
Moisture Zones



Final Assessment Areas



| Assessment Area | CP | SE | # of Plots | Acres |
|--|-----|------|------------|---------|
|  Hawaii Dry | 27 | 5.4 | 16 | 105,791 |
|  Hawaii Mesic | 73 | 8.0 | 37 | 257,989 |
|  Hawaii Wet | 134 | 29.0 | 33 | 216,891 |



Even Aged Management Update

- Previous guidance limited even-aged management to 40 acres
- New rule allows for variable harvest sizes based on the post-harvest retention levels
 - No retention still limited to 40 acres
 - Retention must be demonstrated across the harvest unit (consistent with California Forest Practice Rules)

| <u>Harvest Retention</u> <u>(Square Feet Basal Area/Acre of All</u> <u>Species)</u> | <u>Maximum Size of Harvest Block</u> <u>(Acres)</u> |
|--|--|
| 0 | 40 |
| $\geq 15 < 20$ | 60 |
| $\geq 20 < 25$ | 80 |
| $\geq 25 < 30$ | 120 |
| $\geq 30 < 40$ | 400 |
| $\geq 40 < 50$ | 600 |
| ≥ 50 | Unlimited |

IFM Baseline Methodology for Public Lands

- No longer using a comparison for historical inventory trendline to similar landowners
 - Comparisons can't be located!
- New method provides clearer guidance:
 - Baseline determined through use of Forest Service projections of local forest conditions to conservative rotation ages for the assessment area
 - Utilizes a free online tool (COLE – Carbon Online Estimator)
 - CO₂e should be scaled as applicable for any legal constraints, with harvested wood products included

Welcome to COLE 3.0, the next generation Carbon On Line Tool. [Home](#) | [Help](#)

N of recently measured plots meeting Filter Map Query criterion: 139, N displayed: 137

ncasi

COLE 1605(b) report results

Table 1: Carbon Stocks by Age Class for Alabama

| Age Class | Mean volume | Live tree | Dead tree | Under story | Down dead wood | Forest floor | Soil | Total non soil |
|-----------|-------------------------|-----------------------|-----------|-------------|----------------|--------------|-------|----------------|
| years | m ³ /hectare | tonnes carbon/hectare | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 4.24 | 13.63 | 41.99 | 17.87 |
| 5 | 3.42 | 2.81 | 0.01 | 5.9 | 3.32 | 6.92 | 41.99 | 18.96 |
| 10 | 18.1 | 13.39 | 0.06 | 5.71 | 3.26 | 6.12 | 41.99 | 28.54 |
| 15 | 41.33 | 27.9 | 0.16 | 5.15 | 3.7 | 6.76 | 41.99 | 43.68 |
| 20 | 67.72 | 42.26 | 0.32 | 4.81 | 4.3 | 7.61 | 41.99 | 59.29 |
| 25 | 93.32 | 54.47 | 0.51 | 4.6 | 4.85 | 8.4 | 41.99 | 72.83 |
| 30 | 116.05 | 64.04 | 0.72 | 4.47 | 5.3 | 9.07 | 41.99 | 83.6 |
| 35 | 135.14 | 71.18 | 0.95 | 4.38 | 5.04 | 9.63 | 41.99 | 91.78 |
| 40 | 150.62 | 76.36 | 1.18 | 4.32 | 5.89 | 10.1 | 41.99 | 97.85 |
| 50 | 172.38 | 82.61 | 1.61 | 4.26 | 6.17 | 10.85 | 41.99 | 105.51 |
| 60 | 185.25 | 85.65 | 2 | 4.23 | 6.3 | 11.41 | 41.99 | 109.59 |
| 70 | 192.63 | 87.09 | 2.32 | 4.22 | 6.36 | 11.85 | 41.99 | 111.84 |
| 80 | 196.8 | 87.77 | 2.58 | 4.21 | 6.38 | 12.2 | 41.99 | 113.14 |
| 90 | 199.12 | 88.08 | 2.79 | 4.21 | 6.39 | 12.48 | 41.99 | 113.96 |
| 100 | 200.41 | 88.23 | 2.94 | 4.21 | 6.4 | 12.72 | 41.99 | 114.51 |
| a | 202.02 | 88.36 | 3.42 | | | | | |
| b | 0.06 | 0.08 | 0.03 | | | | | |
| se | 99.42 | 43.79 | 3.07 | | | | | |
| n | 139 | | | | | | | |

Rotation length for SE Middle Mixed Forest Western Mid Coastal Plains Loblolly-Shortleaf (short = 30 years)



Sum of standing live and dead carbon = baseline, after converting to per acre and accounting for legal constraints

Removing LMU terminology

- Logical Management Unit previously used to address the concern of “cherry-picking”
 - Not clearly defined and difficult to implement
- New project configuration criteria requires all the forest owner’s landholdings in a 3rd order watershed or greater or the entire ownership – whichever is smaller – be included in the Project Area
 - Clear definition makes this easier to verify