



# American Carbon Registry and California Air Resources Board US Forests Compliance Offset Protocol: Review of updates to common practice values

Barbara Bamberger, Forestry Lead Staff, ARB  
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October 14, 2014

## **Introduction to ACR and ACR's Role in California's Cap & Trade Program**

Jessica Orrego, ACR

## **Summary of QM update and Regulatory Process**

Barbara Bamberger, ARB

## **USFS Forest Inventory and Analysis**

Olaf Kuegler, Statistician, FIA

## **Update of common Practice Values**

Barbara Bamberger, ARB

## **Q & A**

Stewart McMorrow, ACR

## Asking questions

- Either during presentation or Q&A period at end
- Type questions into **'Chat'** box near bottom of your webinar pane or click hand icon to ask in person. Please include your name and organization.
- We will direct questions to the appropriate person during the Q&A period at the end
- We will try to answer all questions and will make our best effort to respond to any questions not addressed during the call via email

## Webinar will be recorded

- Both the presentation and a link to the recording will be sent to all registered webinar participants



# Introduction to ACR and ACR's Role in California's Cap & Trade Program



# Winrock International Institute for Agricultural Development

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*Non-profit organization that works in the U.S. and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources*

- Formed in 1985 from three Rockefeller family organizations
- Dedicated to economic development and sound resource management in the U.S. and around the world
- Climate change and its impacts on the poor are a central concern
- Supports market mechanisms as a means to improve the environment and alleviate poverty





# American Carbon Registry

- **First U.S. private voluntary GHG registry**, founded 1996
  - Over 40 million tons of emissions reductions issued
  - Joined Winrock International in 2007
- **Registry roles:**
  - Develop and approve carbon offset accounting standards & methodologies / protocols
  - Oversee independent verification by accredited entities
  - Review and register GHG emissions reduction projects, including issuance of serialized offsets
  - Transparently track transactions and retirements
- **ARB-approved** in December 2012 as Offset Project Registry (OPR) and Early Action Offset Program (EAOP) for the California cap and trade market
  - Supports ARB's implementation of the Cap-and-Trade Offset Program from ACR's Sacramento office



- Compliance offset projects must register with an ARB-approved OPR; early action offset projects must register with an ARB-approved Early Action Offset Program (EAOP).
- The OPR will oversee the project listing, verification, registration and issuance of Registry Offset Credits developed using ARB-approved compliance offset protocols.
- Once approved by ARB, issued Registry Offset Credits can be cancelled on the OPR and re-issued as ARB Offset Credits on the CITSS

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- Technical expertise in forestry and forest protocol = quick and accurate answers, customer service oriented
  - Long track record of project review, verification oversight and credit issuance
  - Competitive fee structure including no issuance fees
  - Open channel of communication with ARB to address questions and provide consistent interpretations
  - **Seven** ACR staff have received ARB Forest Protocol accreditation
  - Able to draw on Winrock forest carbon, clean energy and agriculture experts for additional technical input



## **Jessica Orrego**

- *12 years of experience developing forest carbon offset projects, and related forestry consulting*

## **Stewart McMorrow**

- *California RPF, former ARB lead verifier, 15 years experience in forestry management.*

## **Kyle Hemes**

- *Experience in REDD project development, expertise in ACR registry process and ARB regulation, ROC reviews*

Account opening:	\$500
Annual account fee:	\$500
Project listing fee:	\$750/ compliance offset project

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Offset issuance fee:	Free
Offset activation fee:	\$0.15/offset*
Offset cancellation fee:	\$0.03/offset*
Offset transfer fee:	\$0.02/offset

***\* Total of \$0.18/offset for issuance, activation and cancellation when ARB requests cancellation of ROCs or EAOCs***

# **Update and Overview Compliance Offset Protocol U.S. Forest Projects**

Regulatory Process &  
Update of Common Practice Values

American Carbon Registry Webinar

October 14, 2014

# Compliance Offset Protocol U.S. Forest Projects - Rulemaking Process

- September 2014 Rulemaking Package (Quantification Methodology)
  - 45-day public comment period began August 1, 2014
  - Board Hearing on September 18, 2014
    - Approved for adoption with modifications:
      - Common Practice update delayed until December rulemaking package
    - Revised protocol in 15-day public comment period
  - Documents may be found here:  
<http://www.arb.ca.gov/regact/2014/capandtrade14/capandtrade14.htm>.
  - Anticipated effective date 1/1/2015

# Compliance Offset Protocol U.S. Forest Projects – Rulemaking Process

- December 2014 Rulemaking Package
  - Add regions of Alaska
  - Update Common Practice values and High/Low site classification
- 45-Day Public Comment period begins October 31, 2014
- Board Hearing on December 18 & 19, 2014
- Second Board Hearing in 2015
- ARB Cap and Trade List Serve sign up:  
[http://www.arb.ca.gov/listserv/listserv\\_ind.php?listname=capandtrade](http://www.arb.ca.gov/listserv/listserv_ind.php?listname=capandtrade)

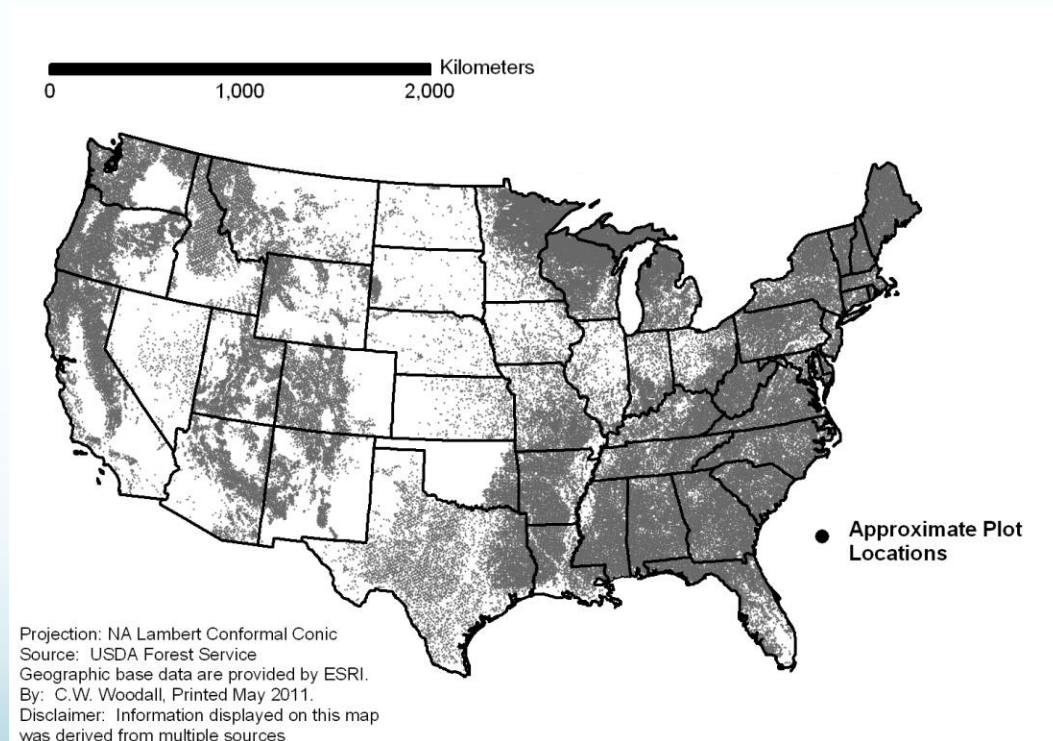
# Which Protocol Version to Use?

- Projects Listed Prior to January 1, 2015
  - May continue to use October 2011 protocol
  - May elect to use the January 2015 protocol
- Projects Listed On/After January 1, 2015
  - Must use January 2015 protocol
- Future protocol updates
  - Existing projects may continue to use the protocol they are currently using
  - Existing projects may elect to use the latest protocol
  - New projects must always use the latest protocol

# Key Updates

**Anticipated Effective Date: 1/1/15**

- Standardized adjustment factors for density and structural loss in the standing dead tree carbon pool



# Key Updates

**Anticipated Effective Date: 1/1/15**

- Calculating adjustment factors for density & structural loss in the standing dead tree carbon pool
  - Applicable to all states except CA-OR-WA
  - Calculate the biomass in standing dead trees
    - central stem and bark and deduct missing or rotten portions
  - Apply density reduction factor
  - Apply bark and bole structural loss adjustment
    - results in an adjustment factor
  - Apply adjustment factor to each component using the CRM Method
  - Multiply remaining tree component estimates
    - top and limbs, stump, and belowground biomass by the component SLA by decay class per tree (Harmon 2011)
  - Multiply component estimates by .5 to convert to C
    - results in C, which must be converted to CO<sub>2</sub>e
- For CA-OR-WA use Harmon (2011)



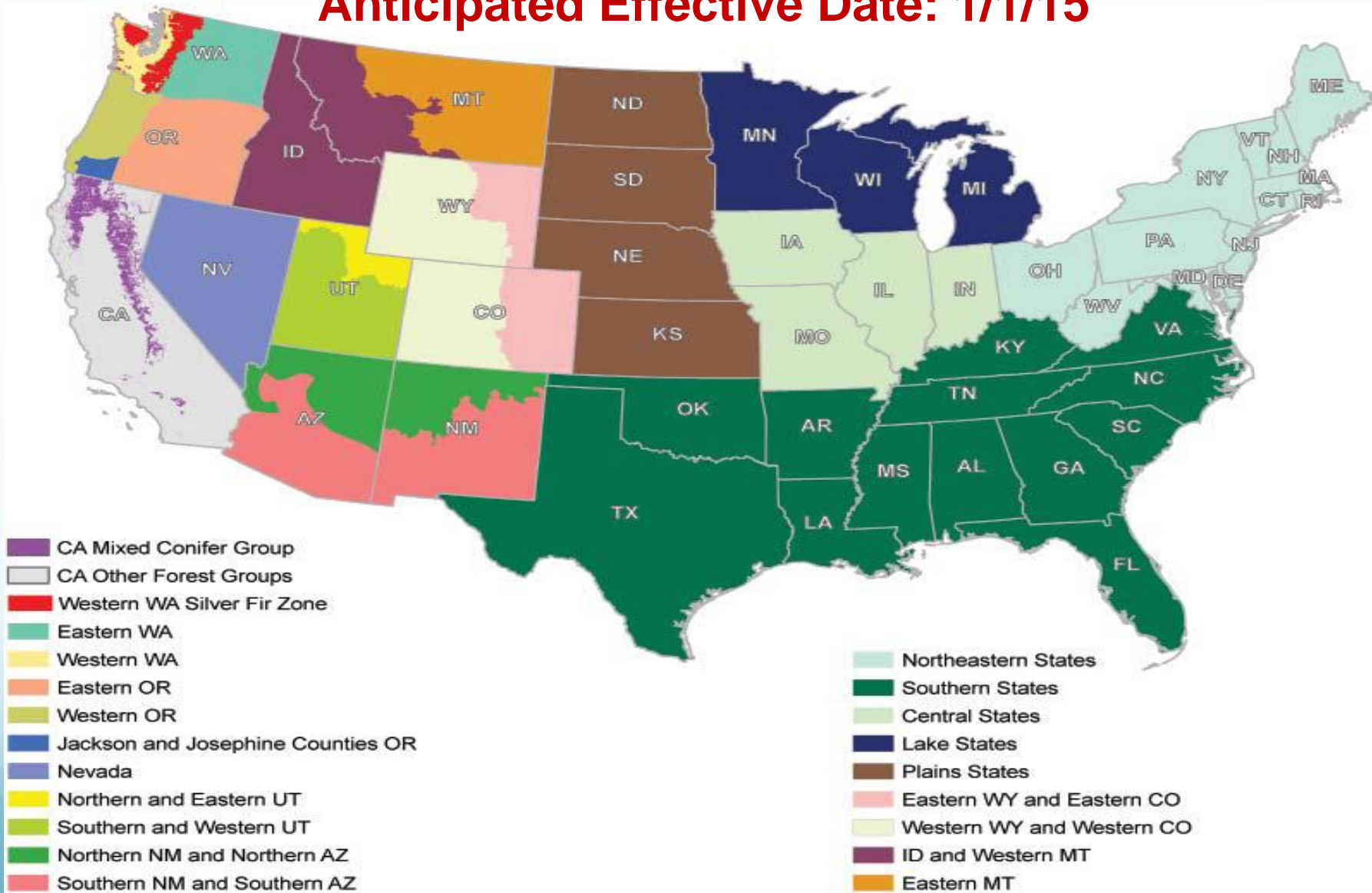
# Key Updates

**Anticipated Effective Date: 1/1/15**

- Volume and Biomass Equations for 45 states
  - Woodall, et al (2011) *Methods and Equations for Estimating Aboveground Volume, Biomass and Carbon for Trees in the U.S. Forest Inventory*, 2010
  - OPO/APDs will still use the Component Ratio Method for estimating biomass
- Volume and Biomass Equations for CA-OR-WA
  - Updated regional volume models and biomass equations

# Key Updates

Anticipated Effective Date: 1/1/15



# Key Updates

## December Protocol Revisions

- Proposed Common Practice Value Updates
  - Delayed from the Quantification Methodology updates heard at September Board Hearing
  - Incorporated into the December rulemaking package

# Common Practice

## December Protocol Revisions

- Adopted by Board as part of the original Cap-and-Trade Regulation on October 20, 2011
- Based on 2002-2006 data
- Board directed staff to periodically review protocols and update to the latest science and data

# Common Practice

## December Protocol Revisions

- Steps for updating Common Practice
  - Reviewed existing data
  - Reviewed new data
- New Data Reflects:
  - Growth, harvest, fire, and any other disturbance or conversion
- Update Includes:
  - standing live trees (only)
  - private lands
  - data 2002-2012
- 5-year, 7-year or 10-year rolling average annual estimates, depending on region

# USFS Forest Inventory and Analysis

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Statistician

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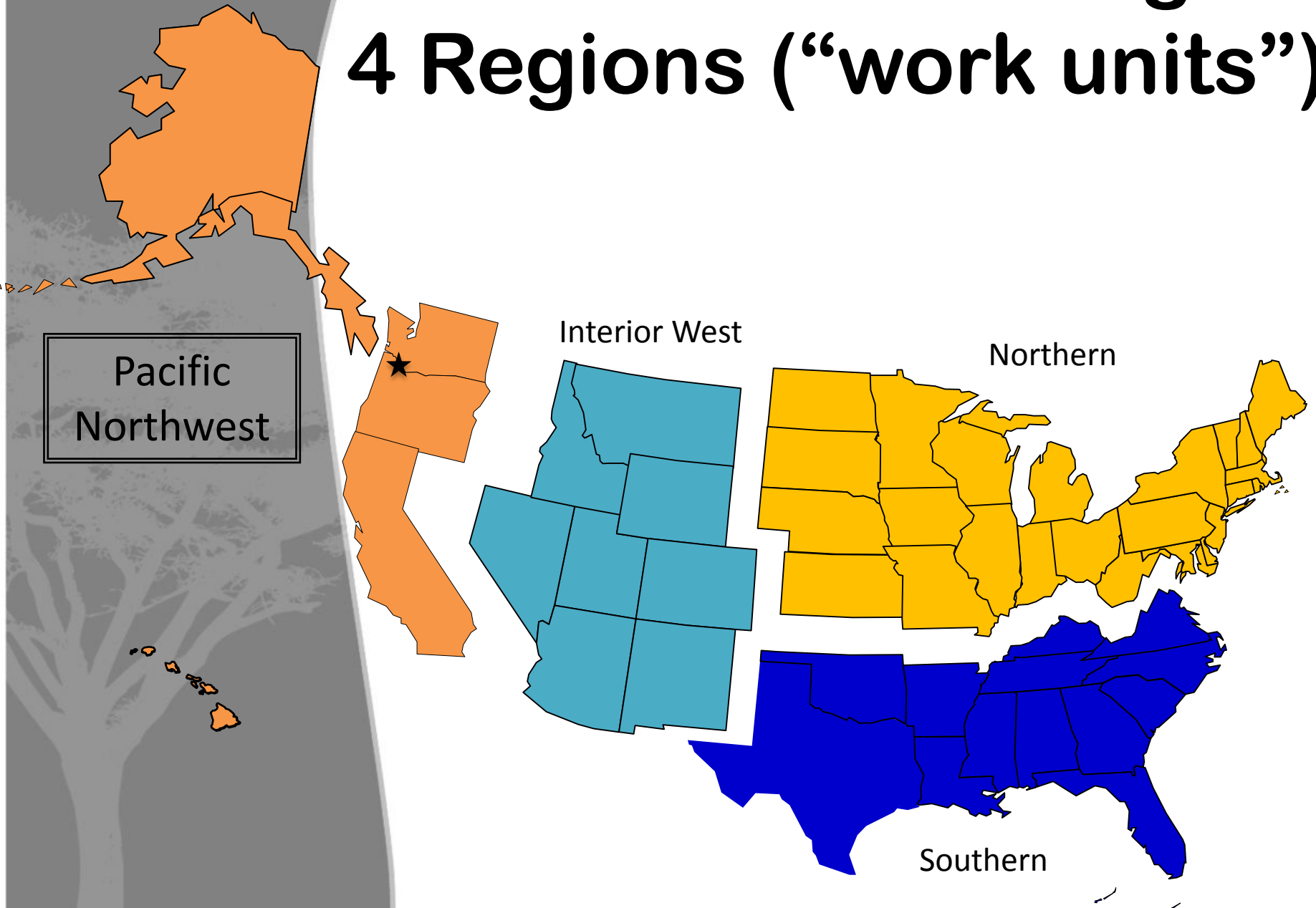
# What is FIA?

- Program created by Forest Service in 1928
- Initially an inventory of marketable timber
  - Permanent field plots established
  - Periodic data collection
    - All plots sampled within 1-3 years, reassessed every 10 years
- Now an annual inventory of *all* forested lands
  - All plots measured on a 5 to 10-year cycle
  - Nationally standardized measurement protocols



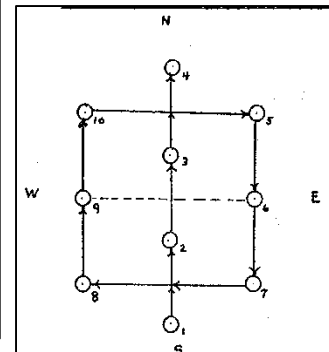
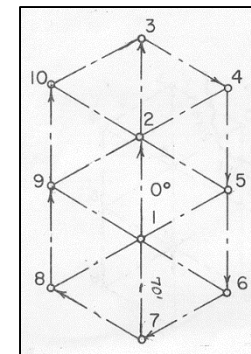
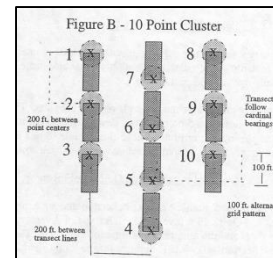
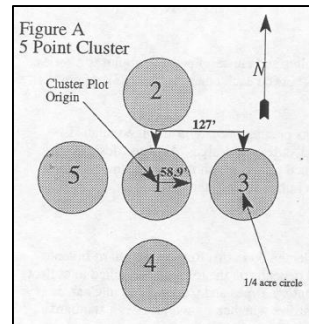
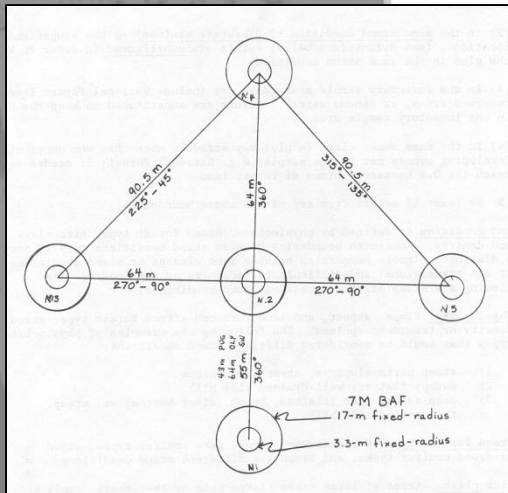
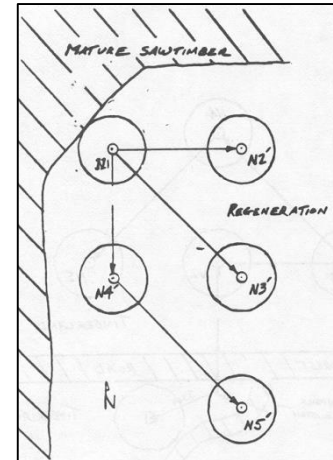
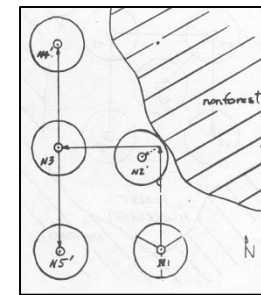
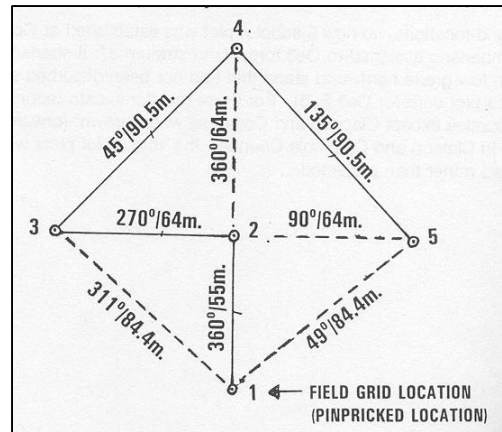
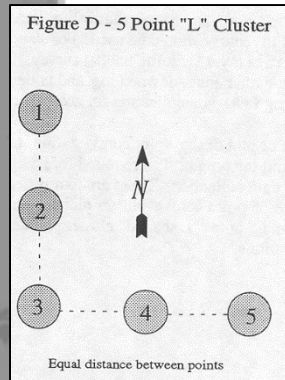
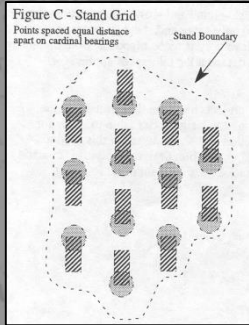
# FIA is a National Program

## 4 Regions (“work units”)





# History



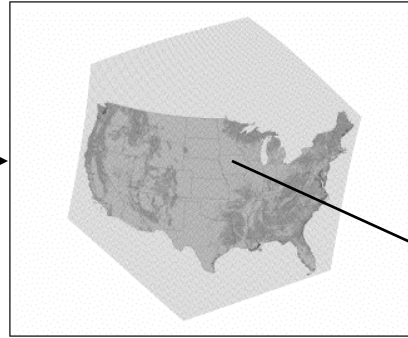
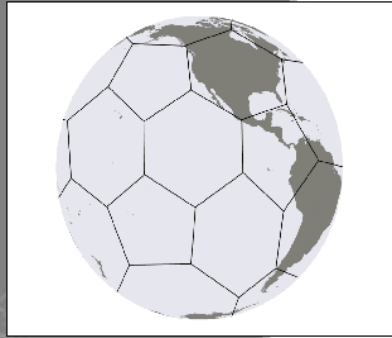
# FIA – National Inventory

- Nationally standardized measurement protocols.
- Set of *core* measurements, done everywhere with the same protocol.
- Set of *core-optional* measurements, done regionally with the same protocol.
- Some regional protocols.
- Neutral data provider.

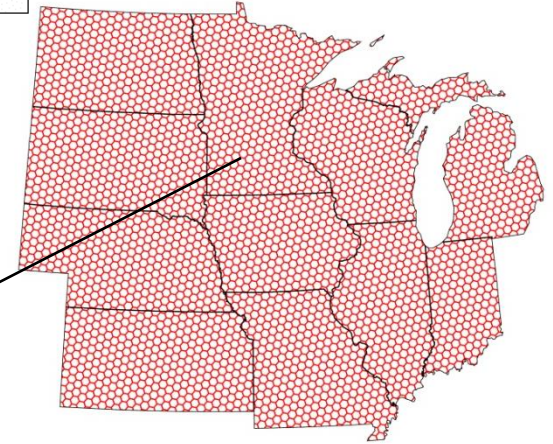
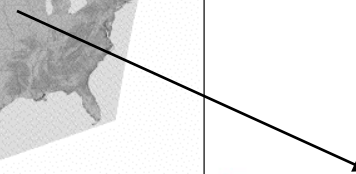
# Data

- Data is publicly available at <http://www.fia.fs.fed.us/tools-data/>.
- Data can be downloaded (FIA DataMart).
- Online estimation tools are also available (FIDO, EVALIDator).

# FIA Inventory Sample Design



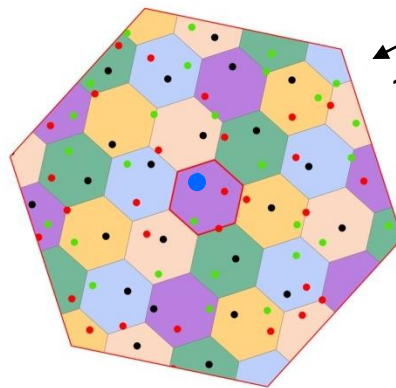
**Country Cell**



**Local Cells**

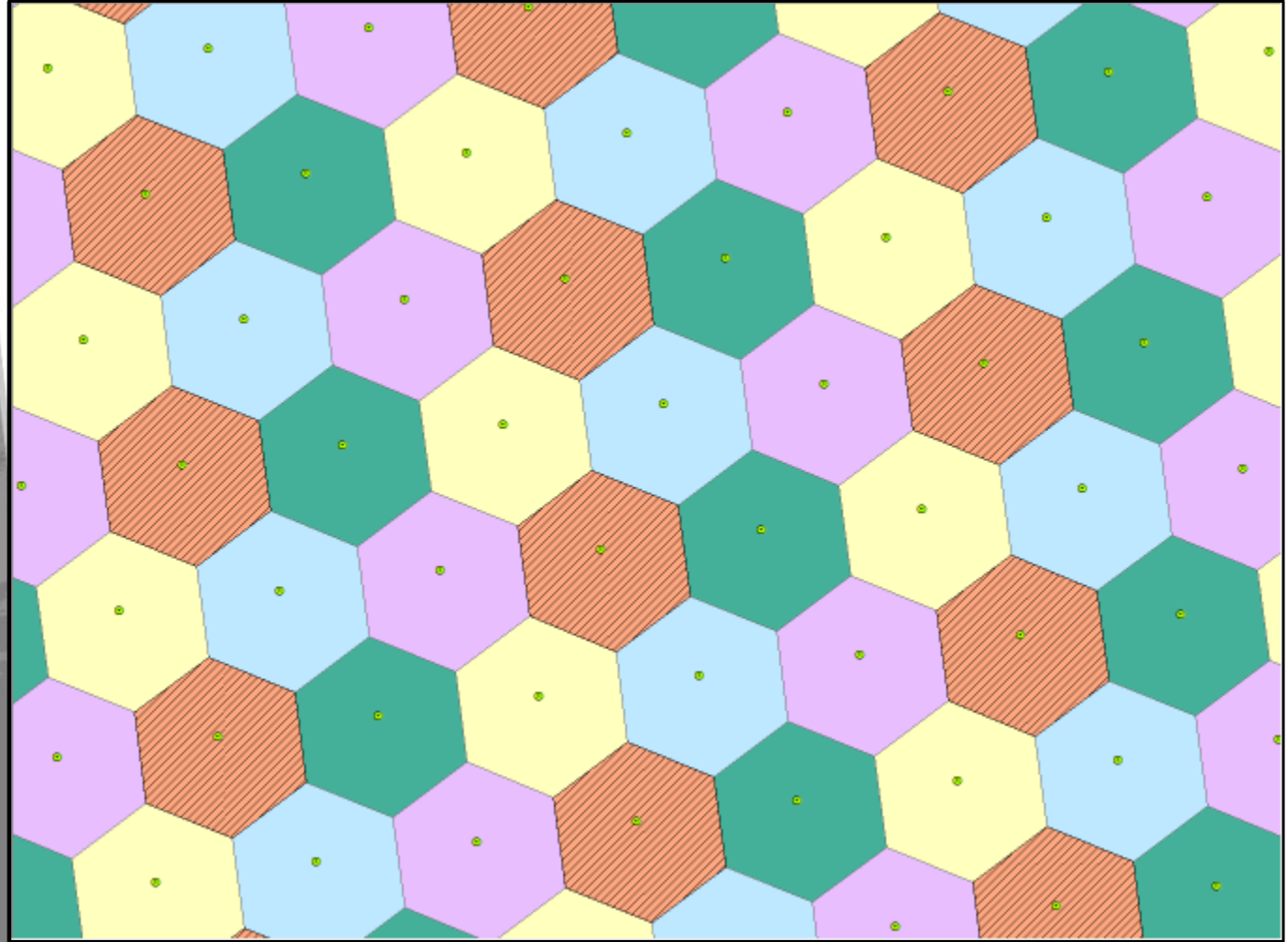
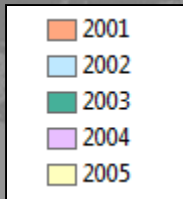
## Phase 2 –the plots

10 panels



- 2004
- 2005
- 2006
- 2007
- 2008

# 5 Year Cycle Example



# FIA Cycle Length

- 1998 Farm Bill mandated five year cycle.
- PNW and Interior West RS are federally *funded* for a 10 year cycle.
- Northern and Southern RS are federally *funded* for a 7 year cycle. Some states pay for a 5 year cycle.
- Due to reduced funding, this may change in the future.

# FIA Field Plot Design

**Lichen Plot (optional):**  
(120 ft) Diversity and abundance

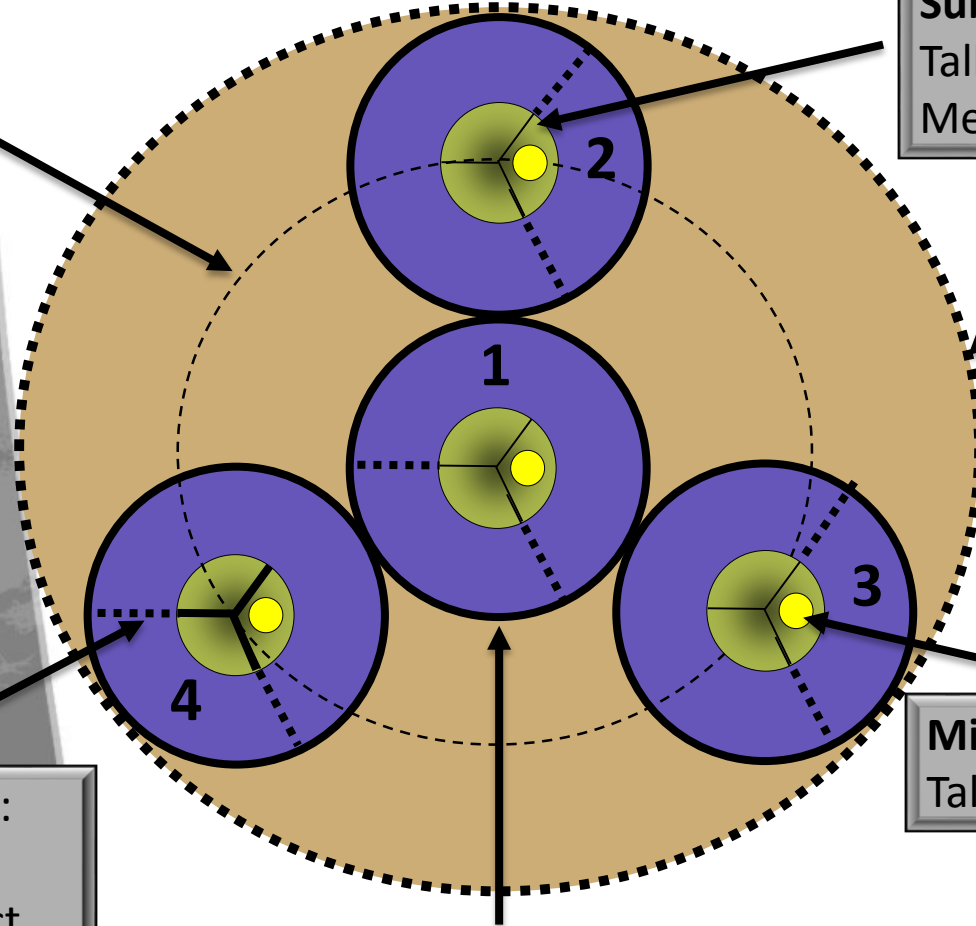
**Subplot (24 ft):**  
Tally all trees  $\geq 5$ " DBH  
Measure understory veg.

**1-hectare plot (optional) (~180 ft):**  
Tally very large trees

**Microplot (6.8 ft):**  
Tally seedlings & saplings

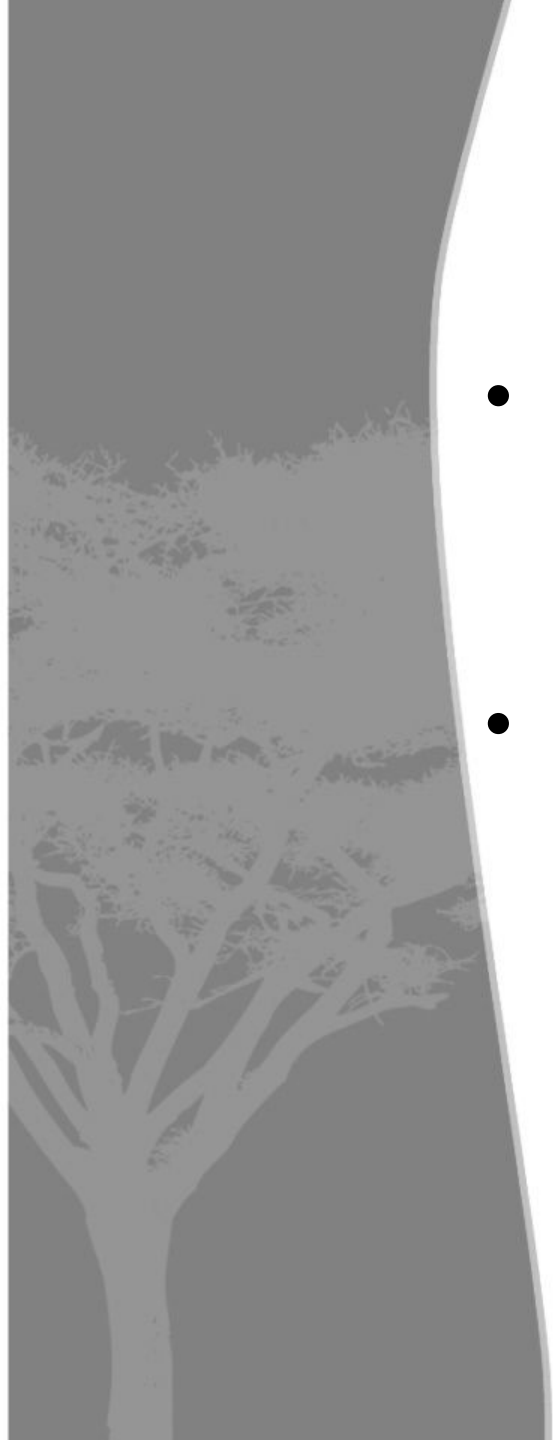
**Transects (optional):**  
Tally coarse & fine woody debris; collect ground cover data

**Macroplot (optional) (58.9 ft):**  
Large trees or sampling rare events



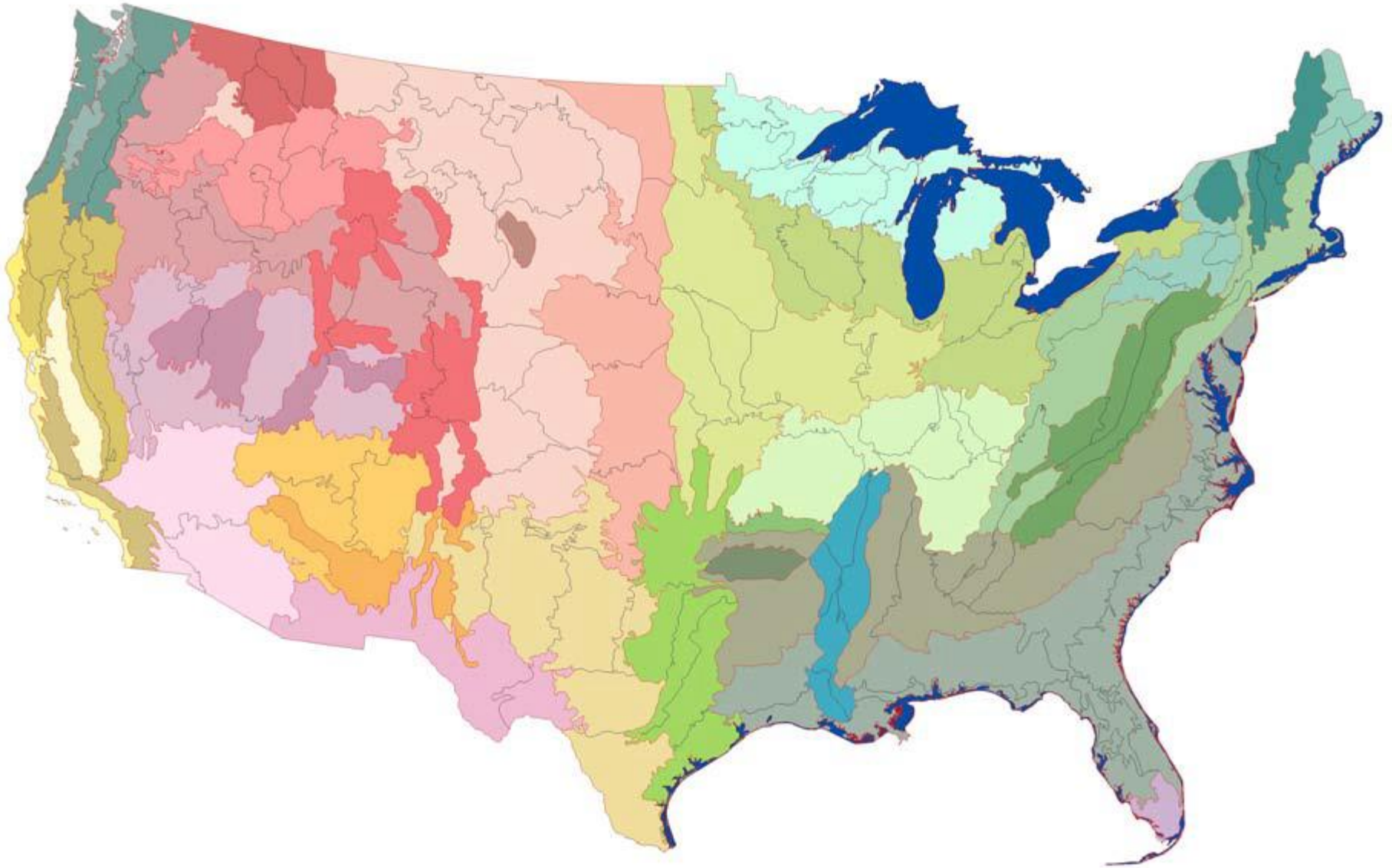
# USFS Ecoregion

- Ecoregions are spatial units that have similar physical and biological components.
- They were developed by the US Forest Service.





# USFS Ecosections



# Supersection

- USFS Ecosections were combined by Climate Action Reserve (CAR) into supersections if they shared similar environmental, economic, and regulatory attributes.
- Supersections were later adopted by ARB.

# Assessment Areas

- CAR combined similar FIA forest types into forest communities
- Forest communities are broken up by high site/low site class within supersections.

# Estimation

- Methods follow USFS GTR SRS-80.
- Design based inference.
- All estimates are based on temporal indifference method (5-10 year averages).
- *Common practice* estimates are ratio of means estimates (per acre).



# Example:

## White Mountains Mixed Hardwoods

This assessment area is comprised of

- mixed hardwoods (FIA forest type 503, 505, 515, 608, 701, 702, 703, 704, 708, 904),
- all site classes,
- within USFS ecosection M211A (*White Mountains*).



Example:  
White Mountains  
Mixed Hardwoods

- Original dates: 2002-2006
- Combined all plots between 2002 and 2006 to estimate total  $CO_2$  and total *acres* within assessment area.
- Divided total  $CO_2$  by total *acres*.  
(*Ratio of means*)

2002-2006

- CO<sub>2</sub>: 5,127,758 tons
- Area: 101,660 acres
- $5,127,758 / 101,660 =$   
50.4 CO<sub>2</sub> tons per acre

# 2008-2012

- CO<sub>2</sub>: 5,015,227 tons
- Area: 102,903 acres
- $5,015,227 / 102,903 =$   
48.7 CO<sub>2</sub> tons per acre





Example:  
White Mountains  
Mixed Hardwoods

- Previous common practice: 50.4
- New common practice: 48.7

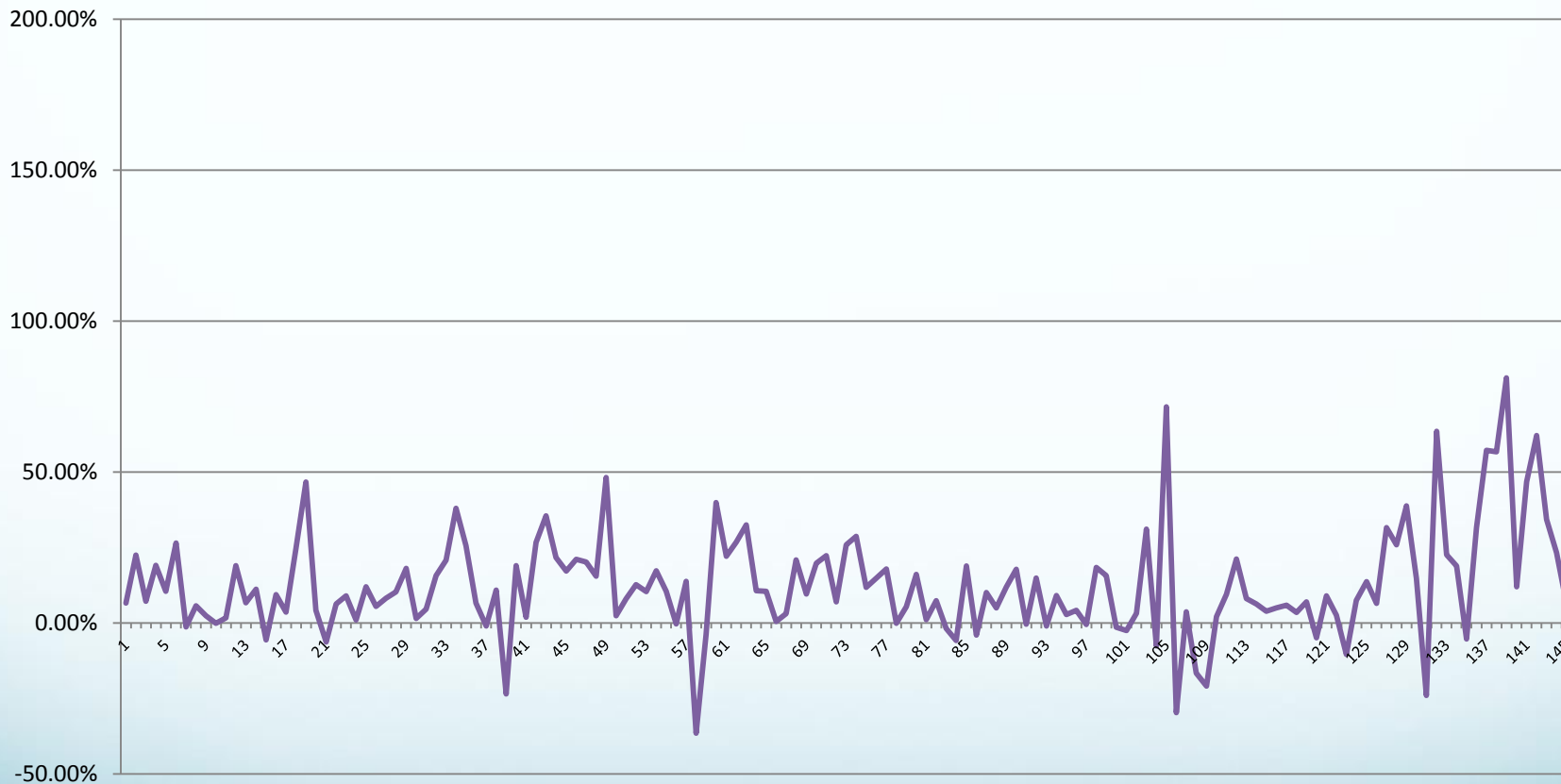
# Original and Updated Site Class Groupings

Site Class	USFS Site Class Groupings	Original	New
High	1-2	1	0
	1-3	11	0
	<b>1-4</b>	<b>69</b>	<b>120</b>
	1-5	63	0
All	1-7	202	235
Low	3-7	1	0
	4-7	22	0
	<b>5-7</b>	<b>68</b>	<b>120</b>
	6-7	64	0

# Change in High Site Class Common Practice Values



# Change in Low Site Class Common Practice Values



# Old and New Values

Supersection	Assessment Area	Site Class	OLD Common Practice	NEW Common Practice	New # Plots
Adirondacks & Green Mountains	Adirondacks & Green Mountains Northeast Conifers	High	90.89	97.98	96
		Low	84.03	89.60	211
	Adirondacks & Green Mountains Northern Hardwood	High	97.82	101.56	106
		Low	83.73	102.60	789
Blue Mountains	Blue Mountain High Elevation Conifer	All	49.54	46.49	<b>26</b>
	Blue Mountain Juniper / Pinyon Woodland	All	11.62	13.38	<b>113</b>
	Blue Mountain Mixed Conifer	High	49.21	64.98	37
		Low	38.22	40.76	169

# Post December Board Hearing Activities

- Public workshops
- Technical workgroups
- Return to Board mid 2015

# Websites

- 15-Day Modifications to the U.S. Forest Protocol are available at:  
<http://www.arb.ca.gov/regact/2014/capandtrade14/capandtrade1415dayattach4.pdf>
- Written comments may be submitted on the 15-Day Modifications by 5 P.M. October 17, 2014 at:  
[http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=capandtrade14&comm\\_period=1](http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=capandtrade14&comm_period=1)



Questions?

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**[ACR@winrock.org](mailto:ACR@winrock.org)**: Will be directed to the ACR Administrator

**Technical forestry questions related to protocol or verification:**

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Thank you!