

# **“Forest Carbon Inventory for the Small Landowner”**

**Steve Fairweather**

**Mason, Bruce & Girard, Inc.**

**Portland, Oregon**

**Timber Measurements Society**

**April 8<sup>th</sup>, 2010**

- **Woodlands Carbon Company**
  - **Family forests**
  - **Chicago Climate Exchange (CCX)**
  - **Concerned consulting foresters**
- **“Guidelines for Developing Baseline Forest Inventories to Meet the Requirements of the Chicago Climate Exchange”, Northwest Woodlands, Summer 2009.**

## Rules of the Chicago Climate Exchange -

- 1. The estimated inventory must have a 90% confidence interval that is no larger than +/- 10%.
- 2. The inventory must be capable of being grown with the FVS growth model.
- 3. The inventory systems and procedures must be capable of passing an inspection by CCX-approved verifiers.

# Rules of the Chicago Climate Exchange -

- 1. The estimated inventory must have a 90% confidence interval that is no larger than +/- 10%.
- “At last! Finally, some *standards*.”

Sampling Method:		Full measure all plots				
Confidence Level:		90%		t= 1.7		
		Allowable Error (% of Mean)				
CV		25%	20%	15%	10%	5%
30%		4	7	12	26	104
45%		9	15	26	59	234
50%		12	18	32	72	289
55%		14	22	39	87	350
60%		17	26	46	104	416
65%		20	31	54	122	488
70%		23	35	63	142	566
75%		26	41	72	163	650

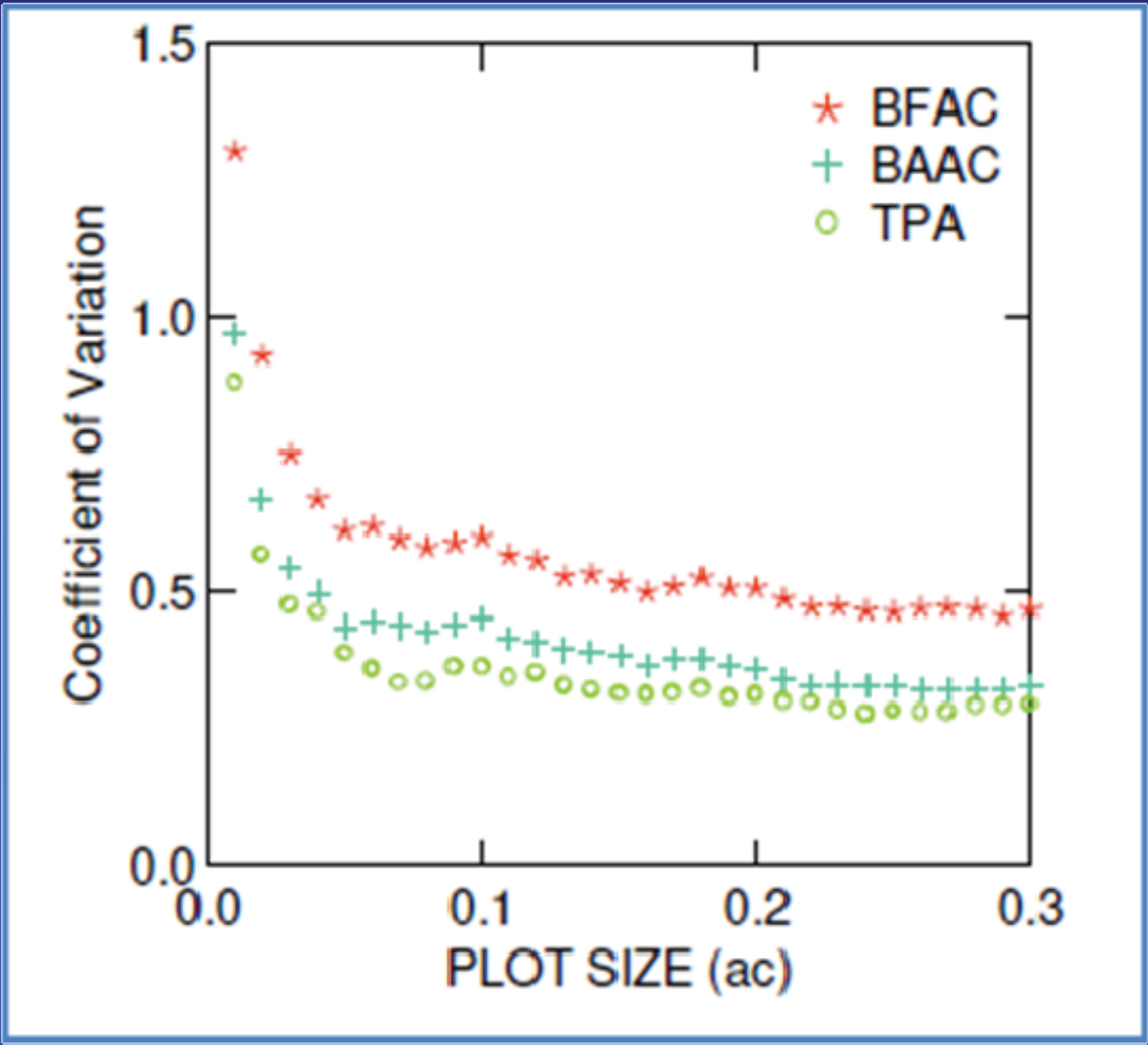
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  - Stratification – one of our most powerful tools for reducing the variability

Stratum	Acres	Weight ( $w_h$ )	Plots	Volume/ acre	90% CI
Old Doug-fir	30	.40	17	6,200	+/- 11%
Young Doug-fir	25	.33	14	2,300	+/- 22%
Hardwoods	20	.27	12	3,900	+/- 24%
Total	75	1.00	43	4,292	+/- 9.3%

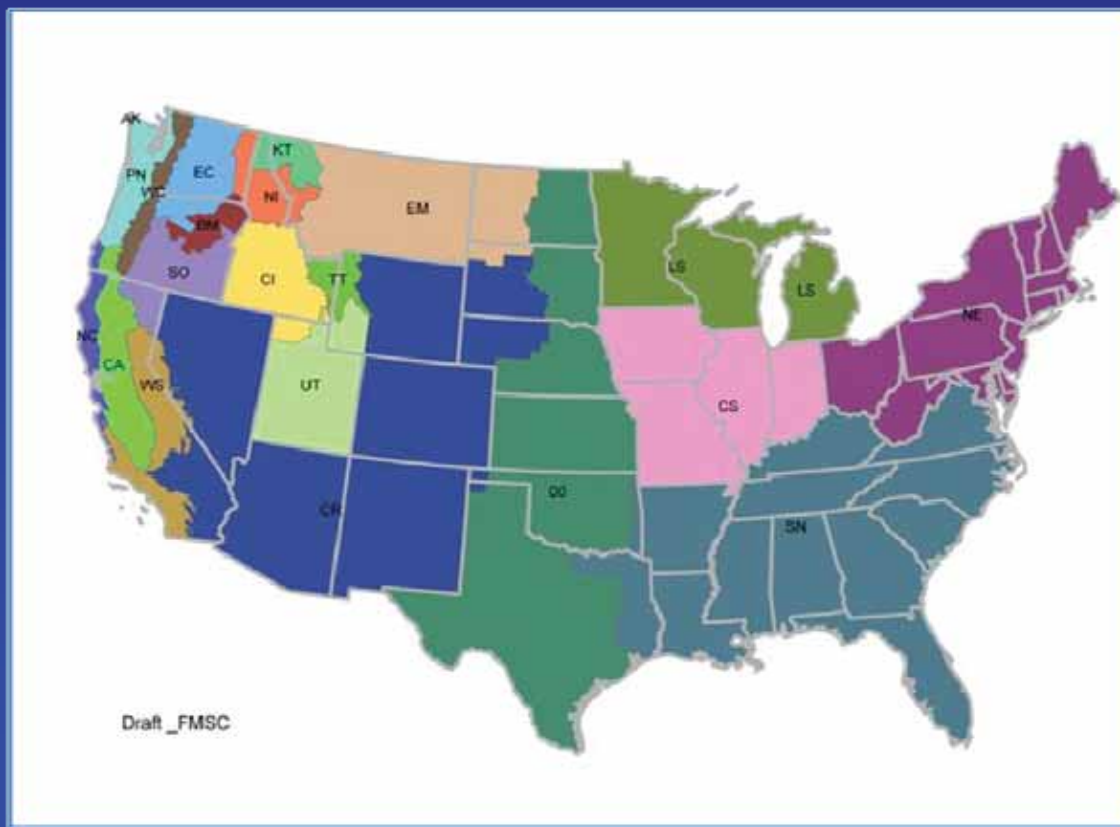
## Rules of the Chicago Climate Exchange -

- 1. The estimated inventory must have a 90% confidence interval that is no larger than +/- 10%.
  - Stratification – one of our most powerful tools for reducing the variability
  - Consider “plot size” – small plots tend to introduce more variability than large plots



# Rules of the Chicago Climate Exchange -

- 2. The inventory must be capable of being grown with the FVS growth model.



## “CARBCALC”

Calculates above-ground and below-ground carbon tons per acre, in living vegetation.



## Rules of the Chicago Climate Exchange -

- 2. The inventory must be capable of being grown with the FVS growth model.
  - FVS requires a tree list for each stand.
    - Ideally plot number, tree number, species, dbh, total height; can work with stand table
    - “Inventory summaries” won’t work.
  - FVS requires a site index for each stand.

## Rules of the Chicago Climate Exchange -

- 3. The inventory systems and procedures must be capable of passing an inspection by CCX-approved verifiers.
  - *What will the verifiers look for?*
    - Documented systems and procedures for data collection, data management, and reporting;
    - QA/QC measures, such as check cruising;
    - Correct arithmetic and calculation of statistics;
    - Rigorous/documentated annual update procedures;
    - A spatial (GIS) stands layer that is in sync with the tabular data for the stands.

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