Benefits of Intensifying the FIA Sample, Or...
What we’ll cover:
• Temporal acceleration
• Spatial intensification
• Targeted sampling
Temporal acceleration: Comparison of 5 year cycle vs. 7 year cycle or 10 year cycle

In year 1, the permanent plots are measured, and every 6th year, the same plot is re-measured. In year 2-5, the same occurs with the plots in those cells.

In year 1, the permanent plots are measured, and every 11th year, the same plot is re-measured. In year 12-20, the same occurs with the plots in those cells.
Temporal acceleration*

- Rapid re-measurement
  - Information comes quicker about change variables
    - Afforestation/deforestation
    - Growth
    - Removals
    - Mortality
  - ‘Normal’ intensity for landscape variables (1:6,000 acres)

Temporal acceleration makes sense in more homogenous forested environments where change information is most important

* Maine
  Minnesota
  New Jersey
  The south except LA
  Several NFS regions
**Spatial intensification**: in the top graphic, there is a base intensity defined by a standard grid spacing. In the bottom graphic, there is a 4X intensification – in this example, the inventory is still completed in 5 years, but there are more plots (a larger value of $n$).

This is the equation for confidence interval – the mean ($\bar{X}$) +/- the $t$ value associated with a given confidence level (e.g., ~1.96 for a 95% confidence interval) * the sample standard deviation ($s$) divided by the square root of sample size ($n$). If $n$ is larger, the confidence interval is smaller and data users are more confident in the estimate.
Spatial intensification*

• Greater number of plots per unit area
  • Information has a finer spatial resolution
    • Greater area detail at regional, multi-county or county level, depending on the variable(s)
    • Greater species/forest type detail
  • ‘Normal’ time scale for change variables (7 or 10 year cycle)

Spatial intensification makes sense in more heterogenous forested environments where area (think wood basket analyses), species composition (think rare species) and forest type variability information is most important

* Minnesota
New Jersey
Wisconsin
Several NFS regions
Spatial intensification – example from Wisconsin CFI Data

• We looked at mortality (# of trees)
• P2 versus P3 plots (basically 3X versus 1X)
• Sampling error for P2 4.0%, P3 6.4%
• 41 species showed mortality on P2
• 32 species showed mortality on P3
Spatial intensification – example from Wisconsin CFI Data

Sugar maple SE: P2 15.7%  P3 26.8%

Northern White-cedar SE: P2 33.5%  P3 71.4%
Targeted sampling*

- Intensifying measurements for a specific variable of interest
  - Regeneration
  - Insects/disease
  - Fuel loading
  - Etc.

- Intensifying measurements in specific areas (CFI)

Makes sense when there is a specific issue or area of interest that merits further study

* Indiana
  Pennsylvania
  Texas
  Wisconsin
  Several NFS regions
Summary

• All of these methods have benefits
• Intensification is not cheap
• If you choose to intensify, target the method to the benefit you are looking for
• Intensification doesn’t significantly increase the accuracy of some estimates at some scales
• If all else fails...
Give ‘em more cowbell!

Any questions?