

# Scaling Issues & Challenges: An Overview

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# *Challenges Outlined in 2003 Report*

- ❖ American public is interested in sustainability at multiple scales—local, community, regional, national
- ❖ Only a few indicators in the 2003 report had data on sub-national trends
- ❖ Only the timber-related indicators in Criterion 2 were sufficiently complete, current, and reliable to provide both regional or statewide summaries



# *Opportunities Identified in 2003 Report*

- ❖ Develop databases and indicator analyses to better understand and report on local conditions
- ❖ Develop ability to “scale up” regional information to understand national trends and “scale down” national information to sub-national levels
- ❖ Display information on local and regional “hot-spots”



# *Progress Being Made on Opportunities Identified*

- ❖ Develop databases and indicator analyses to better understand and report on local conditions
  - ❖ Building a State-level database for selected indicators to promote use at sub-national scale
- ❖ Develop ability to “scale up” regional information to understand national trends and “scale down” national information to sub-national levels
  - ❖ Considering ways to use maps to display information collected or generated by models to allow interpretations at sub-national spatial scales
- ❖ Display information on local and regional “hot-spots”
  - ❖ Pursuing this approach for selected indicators



# *More Challenges*

- ❖ Some national indicators may not make sense at sub-national levels
  - ❖ Value and volume of exports and imports of wood products (6.1.f)
  - ❖ Area and percent of forests in protected areas by forest ecosystem type, and by age class or successional stage (1.1.b)
- ❖ Information from models or displayed in maps may not match local conditions
  - ❖ Regional estimates mask local variability
  - ❖ Choropleth, isarithmic, or dasymetric maps
- ❖ Remotely sensed data and geospatial analytical tools are creating new challenges
  - ❖ Classifying and interpreting pixelated maps

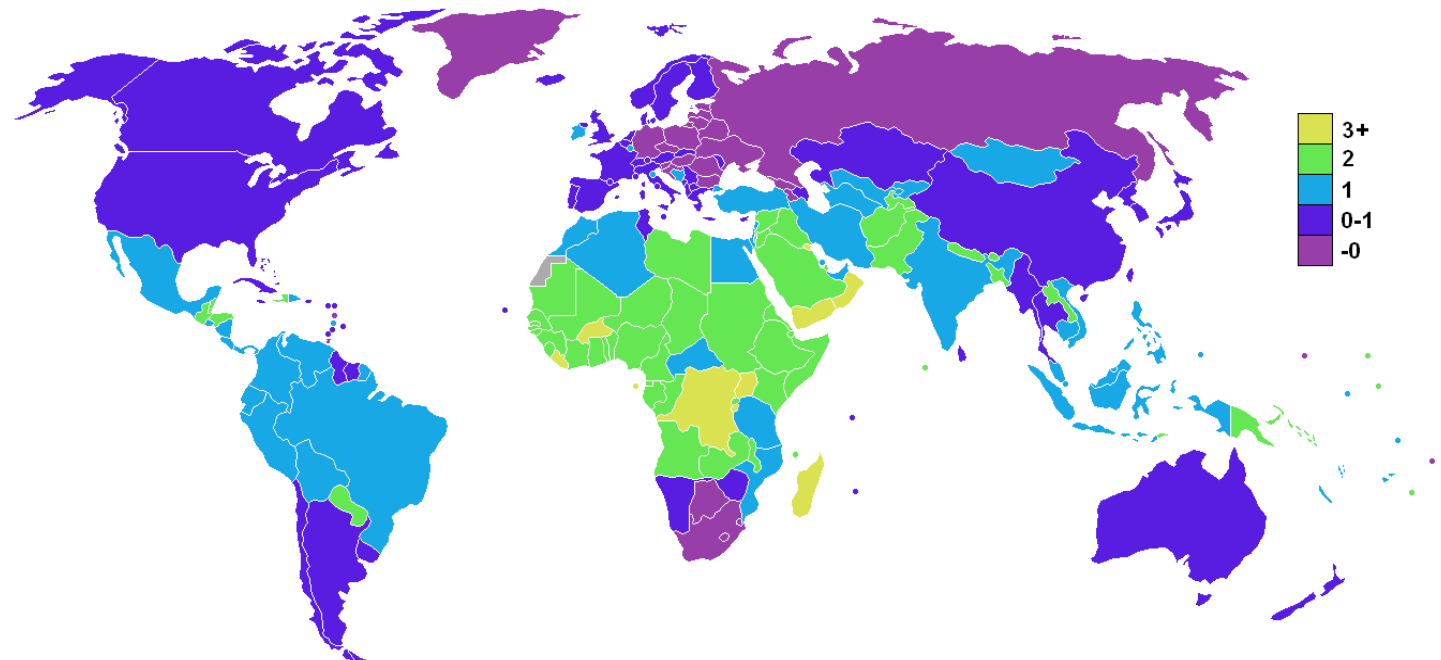


# *Displaying Information in Maps*

- ❖ Choropleth maps use pre-defined boundaries
- ❖ Isarithmic maps let the data define the borders
- ❖ Dasymetric maps are often a helpful compromise
  
- ❖ But the display technique still doesn't cure the problem of generalizing the local variability within an area or the standard errors in estimates from classification models
  
- ❖ Pixel maps present some unique opportunities we are just beginning to explore



# *Choropleth Maps*

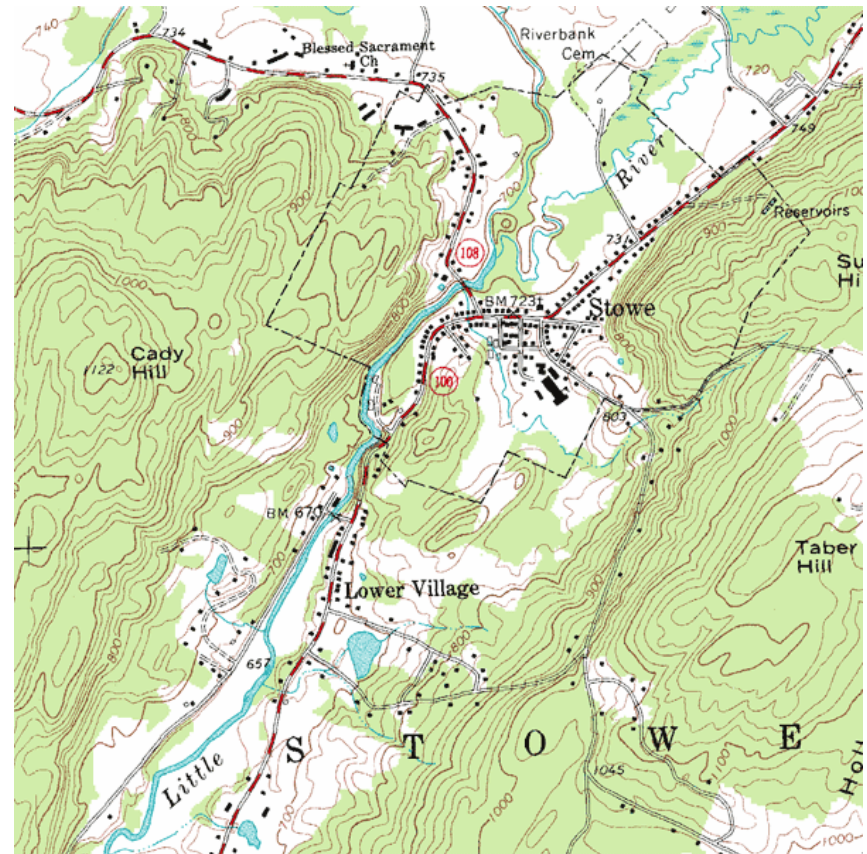


- ❖ Boundaries pre-determined & independent of variation in data
- ❖ Easy to construct; potential for misinterpretation



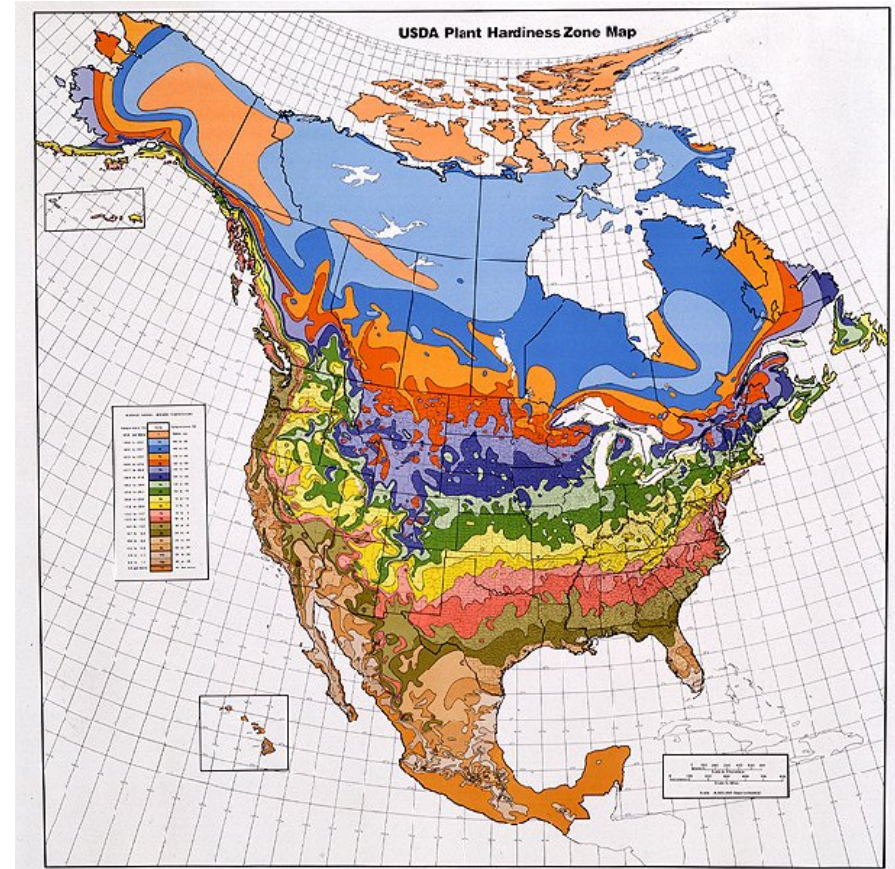
# *Isarithmic or Isopleth Maps*

- ❖ An isarithm is a function of two variables, displayed as a line connecting points of equal value
- ❖ The gradient is perpendicular to the isolines



# *Dasymetric Maps*

- ❖ Becoming more popular in conservation and sustainable development
- ❖ Sets boundaries of zones based on variability in the data
- ❖ Requires ancillary data—costing time and money to collect—to build the classification



# *Pixel Maps*

- ❖ Pixels from remote sensing images are classified using models of site characteristics
- ❖ Geospatial analysis tools exist to aggregate pixels into clusters with similar conditions and obtain estimates of average conditions



# *Contrasting the Map Options*

- ❖ The possibilities for using maps to improve spatial reporting in the 2010 report are:
  - ❖ *Choropleth* maps - some to many maps, depending on the regions pre-selected
  - ❖ *Dasymetric* maps - perhaps a few maps
  - ❖ *Isarithmic* maps - rarely, if at all. Too data intensive.
  - ❖ *Pixel* maps - possibilities are emerging that may bear fruit by 2010
  
- ❖ Our criterion and indicator leads are working hard to assemble the best data and models for the 2010 sustainability report and build some outstanding maps to meet your needs.



❖ Questions?



# *Messages Heard Today ...*

- ❖ Local discussion about Baltimore, Gogebic, and Wallowa Counties
  - ❖ Stream and watershed conditions were key drivers
  - ❖ Forest cover/fragmentation/ownership patterns were critical
  - ❖ Balancing economic health and development with the quality of life (and forests' contributions to QoL)
  - ❖ See the Baltimore County report to help understand county-level information needs



# *Messages Heard Today ...*

- ❖ State-level information needs
  - ❖ Rare habitats and hotspots
  - ❖ Links to water quality
  - ❖ Trends in forest cover change
  - ❖ Fragmentation/ownership/carbon
  - ❖ Urban forest information
  - ❖ Wildlife-forest interactions
  - ❖ Legal & institutional capacity
  - ❖ Open space
  - ❖ Information about bio-energy opportunities



# *Messages Heard Today ...*

- ❖ Regional information needs
  - ❖ Changes in forest land cover
  - ❖ Changes in forest land use
  - ❖ Change matrix between forest, agriculture, and developed uses
  - ❖ Linkages between forests and water, air, and wildlife
  - ❖ Consistency, scalability
  - ❖ Ability to detect real changes
  - ❖ Tailor indicators to regional needs; keep number manageable



# *Common Information ...*

- ❖ Land cover and tracking cover change
- ❖ Land use and tracking land use change
- ❖ Fragmentation and ownership changes (parcelization)
- ❖ Links to water quality; special focus on
  - ❖ Watersheds
  - ❖ Riparian zones
  - ❖ Nutrient movement
- ❖ Influence of wildlife (deer, especially) and other pests to forest health and sustainability
- ❖ Legal frameworks and institutional capacities at multiple spatial scales (county, state, region)



# *Common Issues ...*

- ❖ Obtaining consistent information at multiple scales for multiple jurisdictions
- ❖ Identification of data gaps
- ❖ Implementation and use challenges
  - ❖ Fostering dialogue about meaning
  - ❖ Maintaining dialog and “keeping the issue on the table”
  - ❖ Setting benchmarks and identifying desired future
- ❖ Ways to connect locally-collected information to information at larger/coarser spatial scales
- ❖ How to connect information with local issues and policy to motivate change



# *Questions for Small Groups*

- ❖ What from the presentations and discussion was most surprising to you? Are you in the same canoe?
- ❖ Are the 6 common pieces of information the key ones for sub-national users? Are there others?
  - ❖ Are pixel maps the best way to address each one, or might some other mapping approach be more useful?
- ❖ Are the 5 common issues the key ones? Are there others?
  - ❖ What should the Roundtable and the team preparing the 2010 report do about these issues?
  - ❖ How will you deal with the issues in your domain
  - ❖ How will you share your results & experience with others?



# *Questions for Small Groups*

❖ X



# *What Would Help Criterion Leads Today Regarding Spatial Scale?*

- ❖ For which indicators would it be desirable to report information at the sub-national level in the 2010 report?
- ❖ For indicators of interest at the sub-national level, for which ones would maps not be helpful?
- ❖ For indicators reported at the sub-national spatial scale where maps would be helpful?
  - ❖ For which indicators would choropleth maps be sufficient? Which set of “regions” would be best for what indicators?
  - ❖ For which indicators should we attempt to construct dasymetric maps; draping data over a digital topographic base?
  - ❖ For which indicators is are pixel maps desirable?

