



# Augmenting FIA with Remotely-sensed Data (Or is it Augmenting Remotely-sensed Data with FIA)?

National Overview of Development and Applications

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# Overview

- **User's Perspective – Dale Hogg**
- **National Perspective:**
  - Where we were.
  - Where we are!
  - Where are we going?
- **Examples of current (or soon to be) products**
  - Characterizing Forest Change - Karen Schleeweis
  - Bridging the GAP between forest estimation and wall-to-wall maps - Tracey Frescino



## Where we were.

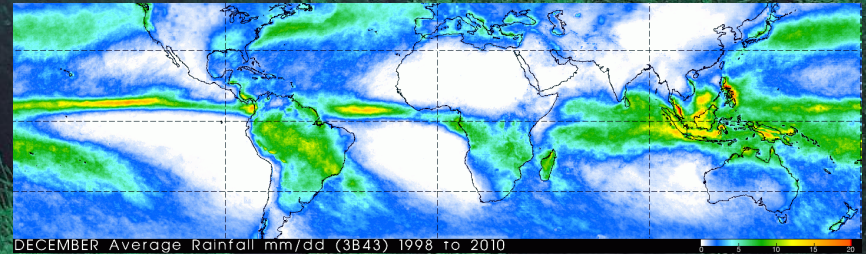
- National Coverage Availability
  - 1972 – ERTS-A (Earth Resources Technology Satellite – now Landsat 1)
  - 1984 – Landsat 5
  - 2003 – NAIP (NHAP pre-cursor)
  - 2008 – USGS Releases archive – FREE!
  - 2013 – Landsat 8
  
- Computing Resources
  - Mainframe/Workstations – Single Nodes
  - Clusters of multiple node/multiprocessor
  
- Experience
  - Other resources vs forest resources –
    - tough nut to crack – what are we actually measuring?
  - Evolution of ideas – end product or ancillary data?





# The Break Through? (aka the killer app)

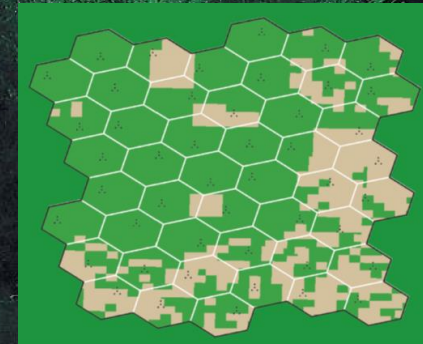
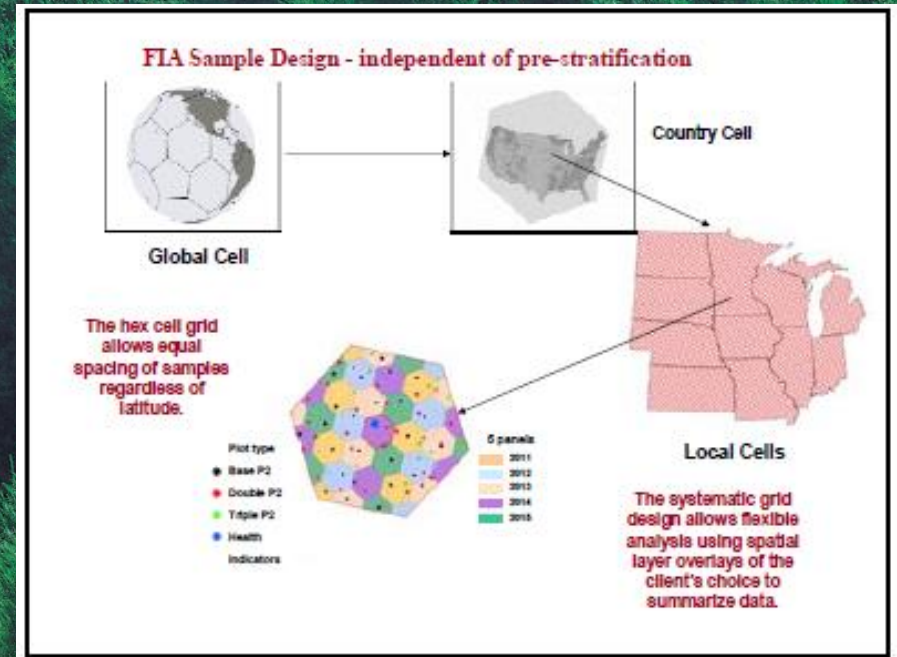
- 1822 single frame photographs
- 1889 kinoscope – “moving” pictures  
– same tech but delivery of rapid succession produced the effect of “movies” (change detection)
- 1972 Landsat 1 single satellite image
- 2008 USGS Archive Release
- 2009 Google Earth Engine – Landsat mega-stacks – Trends (moving)





## Where we are!

- **Pre-field interpretation/Post-Stratification w/classified RS products**
  - 72% PS w/NLCD; 27% PS w/MODIS
- **Land Use and Land Cover Change**
  - manual interpretation of regularly scheduled high-resolution imagery to produce area change estimates
- **Disturbance Mapping**
  - Use of “big data” archives and cluster computing resources
- **Small Area Estimation**
  - Many options possible
  - More flexible options from the “plot in pixel” approaches





## Where we are going?

- **Are We Lost in the Woods?** [Sounds good to me!]
- **BIG OPPORTUNITIES:**
  - Improved computing resources through clustering and data structures that are optimized in the cluster environment
  - Landsat archive collection – now managed as a uniform resource LCMAP
  - USGS 3DEP program – goal of acquiring LIDAR QL-2 wall-to-wall for the L48
  - European Space Agency – offering comparable (and improved) imagery resources – the Sentinel Constellation (@ 10 meter GSD)
  - More frequent and higher resolution NAIP imagery
  - Commercial RS resources – Digital Globe & Planet

