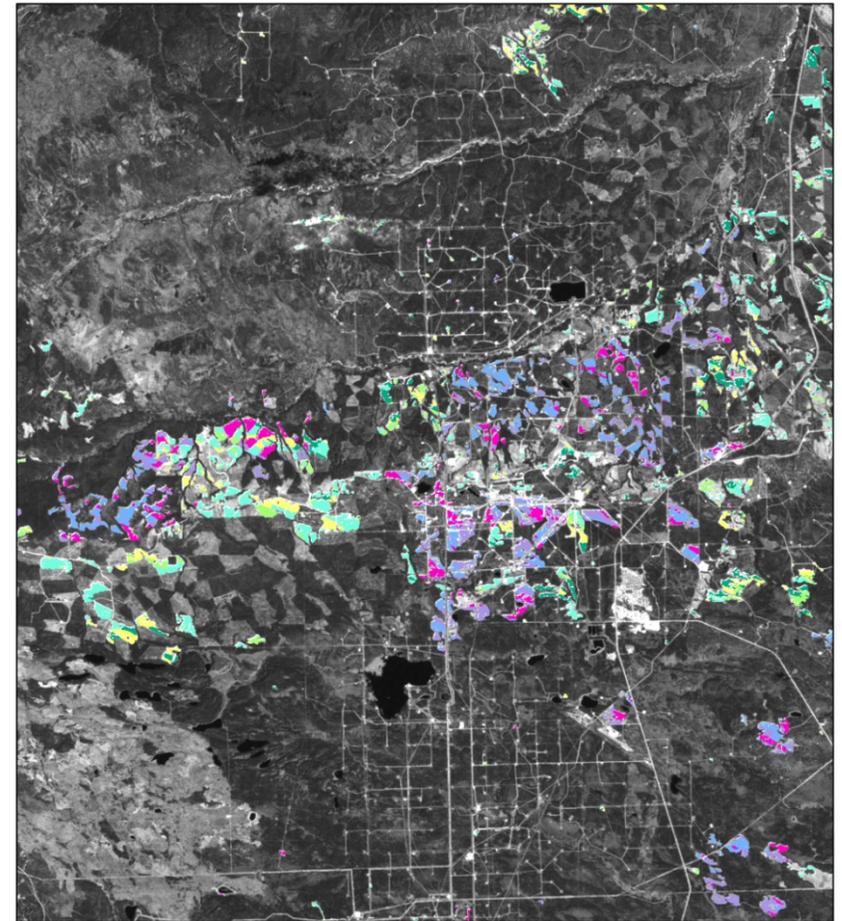
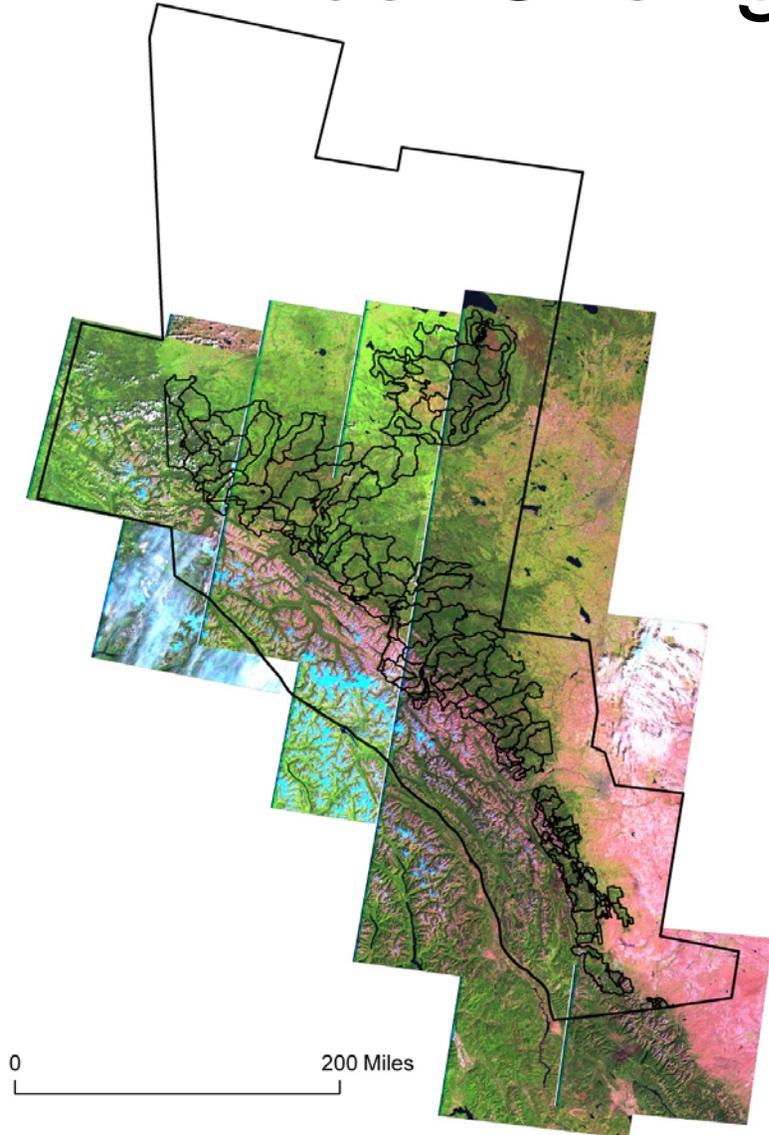


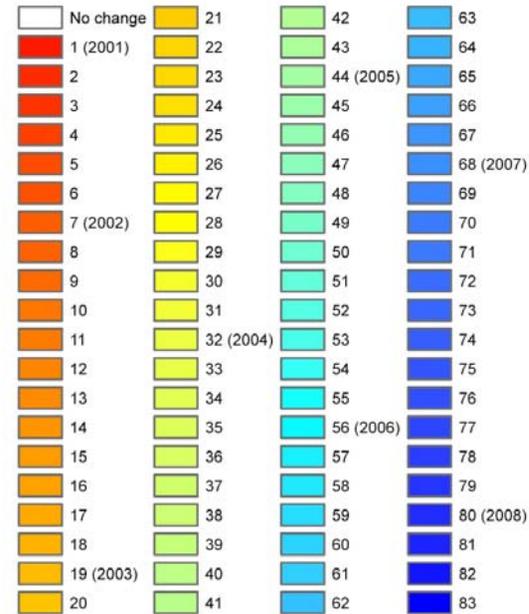
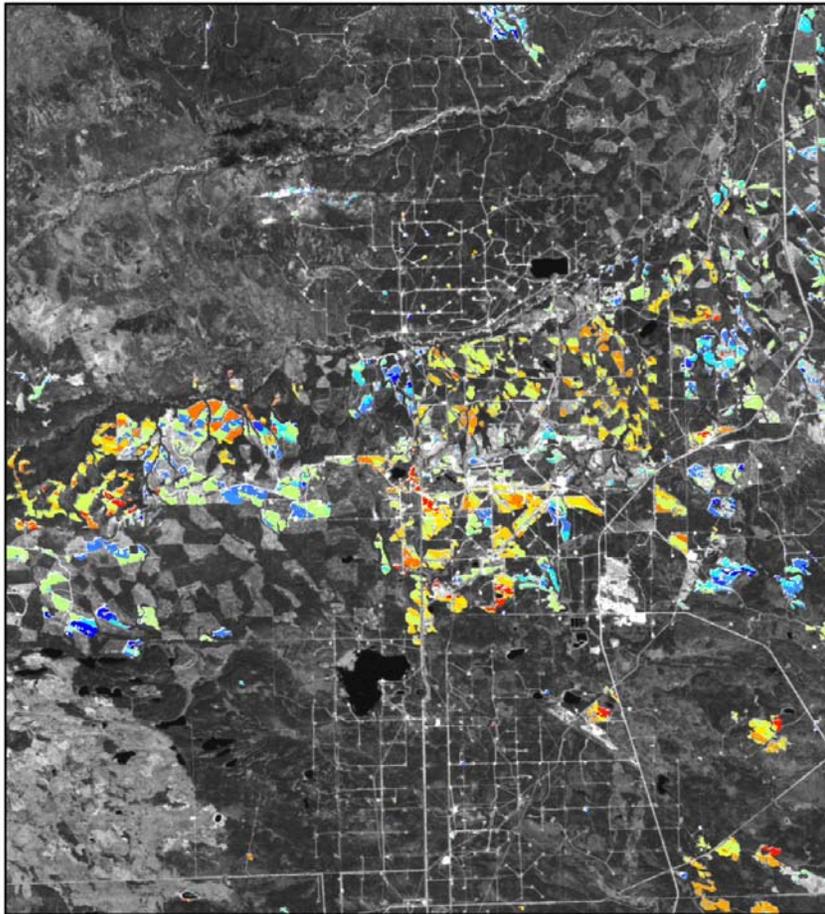
# Synthetic data opportunities and future sensor options linked to information needs

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# Current working area (16 p/r) and Annual Change from STAARCH



# 16-Daily change from STAARCH



0 5 Kilometers

# Synthetic imagery as a data option to mitigate a gap in Landsat continuity and / or as a supplemental product

- Goal: annual, global, cloud free imagery, and products
- In the mix of options for policy makers to consider, is there an non-proxy data option?
- Is there a possible role for model based, synthetic imagery?
- In what situations could synthetic imagery and change products fill an outstanding data need?
- Seamless, high temporal resolution, non-scene based, mosaic, products are possible
  - MODIS era

# Synthetic data support

- Gao, F.; Masek, J.; Schwaller, M., and Hall, F. On the Blending of the Landsat and MODIS Surface Reflectance: Predicting Daily Landsat Surface Reflectance. *Transactions on Geoscience and Remote Sensing*. 2006; 44(8):2207-2218.
- Hilker, T.; Wulder, M. A.; Coops, N. C.; Linke, J.; McDermid, G.; Masek, J. G.; Gao, F., and White, J. A New Data Fusion Model for High Spatial- and Temporal-Resolution Mapping of Forest Disturbance Based on Landsat and MODIS. *Remote Sensing of Environment*. 2009; 113:1613-1627.
- Hilker, T.; Wulder, M. A.; Coops, N. C.; Seitz, N.; White, J. C.; Gao, F.; Masek, J. G., and Stenhouse, G. Generation of Dense Time Series Synthetic Landsat Data Through Data Blending with MODIS Using a Spatial and Temporal Adaptive Reflectance Fusion Model. *Remote Sensing of Environment*. 2009; 113:1988-1999.
- Roy, D.P., Ju, J., Lewis, P., Schaaf, C., Gao, F., Hansen, M., Lindquist, E., 2008, Multi-temporal MODIS-Landsat data fusion for relative radiometric normalization, gap filling, and prediction of Landsat data, *Remote Sensing of Environment*, 112:3112-3130.
- Roy, D.P, Ju, J., Kline, K., Scaramuzza, P. L., Kovalsky, V., Hansen, M., Loveland, T.R., Vermote, E., and Zhang, C. (2009). Web-enabled Landsat Data (WELD) preliminary results: Landsat ETM+ composited mosaics of the conterminous United States. *Remote Sensing of Environment*. In press.

# Utility of remotely sensed detection of change: Considerations for sensor development

- Has the scientific and political case been made to ensure support and interest in publically funded medium spatial resolution measures?
  - Trends in sensor development and focus
- Has the link been made between information needs and required measurements?
  - Ability to characterize land cover, land use, and change as enabler
  - Stress general and focused utility of current and expanded capacity
- Have the options for sensor developments to meet land use and land cover change been sufficiently identified and communicated?
  - Including the link of optical imagery to meeting policy, management, and science objectives
- Relates to discussion of future data needs and options for sensor development
  - Sensor and mission features to meet and improve upon ability to meet information needs can be put forward.