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Project summary

The Alberta Biodiversity Monitoring Institute's (ABMI's) Human Footprint Inventory (HFI) offers an up-to-date, comprehensive digital representation of 21 categories of surficial human disturbances on the Alberta landscape, including successional features such as forest harvest areas. The status of vegetation regrowth – e.g., regeneration – on the latter is not currently accounted for in the HFI, however. Recent work in the ABMI's Geospatial Centre has focused on leveraging the vast archives of open-access satellite imagery now available without cost, alongside a web-based cloud computing platform to enhance HFI features – in particular, harvest areas – with spectrally-based metrics related to post-harvest regeneration. The objective is to provide a remote sensing-based characterization of regeneration across the province of Alberta that will add value to the HFI in a manner that can support responsible land use and resource management, among other applications. The scientifically-based methodology currently under development builds on previous published research that relies on the long-running Landsat archive of satellite data, per-pixel time series analysis, and trend-fitting. Preliminary results show promise, suggesting the effectiveness of this approach for enhancing information related to the harvest area features in the ABMI's HFI.

Progress to date

Research on best practices and approaches to the provincial-level remote sensing of forest harvest regeneration began in the fall of 2017. This supported subsequent data and spectral metric exploration, assessments of effective, efficient methods for leveraging large Landsat data sets for long-term, Alberta-wide analyses, and development of an operational, methodological workflow. Currently, workflow development is in progress, and once complete will be followed by implementation across all relevant harvest area polygons within the ABMI's HFI.

Management implications

The current ABMI HFI does not distinguish between the successional and more permanent human footprint features contained in its many sub-layers, and therefore cannot currently capture the dynamic nature of the former features and their changing impact on the Alberta landscape that results from regeneration. Attributing HFI features with information on the levels and trends in regeneration on successional features like harvest areas can greatly enhance the value of this data set for land and resource managers, decision- and policy-makers, and for the long-term monitoring of Albertan environments and ecosystems.

Geographic location

This work targets forest harvest areas across the province of Alberta appropriate for the remote sensing-based characterization of regeneration (i.e., harvest occurred during the period of Earth observations, harvest area is large enough for reliable characterization using moderate-resolution imagery, etc.).

Please note: Jennifer is a Research Technician in the ABMI Geospatial Centre, and a collaborator of the BERA Remote Sensing Team.