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Phragmites Mapping with Synthetic Aperture Radar

The aggressive wetland vegetation known as *Phragmites australis* has become an invasive species in the Great Lakes region, largely due to changing climate conditions that expose large areas of fertile ground around wetlands (Croley, 1990; Kling et al, 2003). With vast areas at risk of invasion by this non-native, thick, tall grassland species, native flora and fauna face significantly reduced habitats. In addition, human recreational use of the Great Lakes coastline areas are affected by *Phragmites* invasion with restricted shoreline views.

The objectives of this work investigate the use of polarimetric RADARSAT-2 Synthetic Aperture Radar (SAR) data to map the extent of *Phragmites* over a study area in the Georgian Bay National Park, Ontario. This data is used for polarimetric analyses and to simulate compact polarimetry data in preparation for the RADARSAT Constellation Mission (RCM). Methods make use of the Freeman-Durden decomposition to identify areas dominated by double-bounce scattering, a technique well known for identifying areas of flooded vegetation. However, a focus on temporal change detection analysis is used to discriminate *Phragmites* from other wetland vegetation, in particular cattails and bulrush.

This presentation will give a brief background on the *Phragmites* invasion followed by processing methodology and information extraction procedures. Results will be discussed with respect to polarimetry and compact polarimetry for monitoring *Phragmites*.