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Creating a Comprehensive Map of the US and Canadian Coastal Great Lakes Wetlands and Stressors

Mapping is underway to produce an international contemporary baseline map of wetland type, extent and adjacent land use of the coastlines of the Great Lakes. Long-term monitoring of coastal Great Lakes wetlands currently uses science-based indicators (SOLEC or GLEI) which rely on old, incomplete and static landscape-scale data. This older static data negatively impacts our ability to monitor and detect effects from significant wetland stressors such as urban development, pollutants and invasive plant species. A consistent and contemporary bi-national baseline map is needed in order to monitor change in coastal ecosystems of the Great Lakes. Due to the complexity of wetland ecosystems it is highly beneficial to include a fusion of sensors for mapping. Synthetic Aperture Radar (SAR) represents a unique tool that is sensitive to flood condition as well as structure and biomass. Optical sensors fused with SAR are complementary in the classification and monitoring of wetland ecosystems. Previous research has demonstrated the unique capability of ALOS PALSAR L-band data for detecting and mapping invasive *Phragmites australis*. The international wetlands map is being produced using a fusion of multi-season PALSAR and Landsat data capable of detecting and delineating large stands of problematic plant species, *Phragmites australis*, as well as *Typha spp*. The maps are produced with a Random Forests classifier using training data derived from field work and air photo interpretation. A randomly selected subset of training data is reserved for validation to evaluate map accuracy. The basinwide maps will provide the first ever international Great Lakes coastal land-use land-cover map suitable for coastal wetland assessment and management.