Saskatchewan Prairie Conservation Action Plan

Native Prairie Appreciation Week

Speaker Series

Mapping Native and Tame in the Mixed Grassland Ecoregion using Machine Learning and Big Remote Sensing Data

Speaker: Nasem Badreldin, SK Ministry of Environment

Wednesday June 17th, 2020 at 3:00 pm CST

This presentation is a FREE webinar.

To register:

https://attendee.gotowebinar.com/register/8237041244813214219

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Title: Mapping Native and Tame in the Mixed Grassland Ecoregion using Machine Learning and Big Remote Sensing Data

Speaker: Nasem Badreldin, Beatriz Prieto*, and Ryan Fisher

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Description: Native grasslands are one of the most vital habitats for sustaining ecosystem health in the Prairie as well as a hotspot for biodiversity, and so grassland mapping has become an urgent necessity for better environmental conservation planning. Our case study was the Mixed Grassland Ecoregion of Saskatchewan, covering an area of 8.6 million hectares. Our goal was to identify stands of pure native grassland (>75% cover), pure tame grassland stands (>75% cover) and stands of mixed native and tame using remotely sensed products from optical and synthetic aperture radar (SAR) sources, and digital terrain derivatives. Random Forest (RF) was used in the classification process and incorporated information from 75 satellite-based indices and terrain derivatives and a total of 2500 reference training points. Linear discriminant analysis and principal component analysis were used to reduce the 75 variables into a manageable number of variables and to enhance the overall classification accuracy to about 90.2% for the native, tamed, and mixed grasslands. The results show that 33.9% of the Mixed Grassland Ecoregion in Saskatchewan is covered with >75% of native grass, 2.3% is pure tame,

and 4% is mixed grass. The cropland areas cover 52.2% of this Ecoregion, tress cover 0.7%, and shrubs cover 1.5%; 5.5% of the case study is covered with water. This novel analytical framework will support our endeavor to add more ecoregions in the future and provide reliable information.

Speaker: Dr. Nasem Badreldin is a landscape modeling scientist. He received his Doctorate in Geography from Ghent University (UGent) in Belgium (December 2013), and his M.Sc. in Physical Land Resources from the Faculty of Bioscience Engineering in UGent (September 2008). He worked as a Postdoctoral Fellow at the Center for Earth Observation Sciences (CEOS) in Dept. of Earth and Atmospheric Sciences at the University of Alberta, and at the Dept. of soil science in the University of Manitoba and University of Guelph. He is a professional in land cover mapping using machine learning algorithms, big remote sensing data, and advanced spatial statistics. He is now working for the Ministry of Environment in the Fish, Wildlife & Lands Branch at the Government of Saskatchewan as a GIS analyst.