Remote Sensing Grasslands and Savannas: a Perspective from the North

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Abstract
Grasslands and savannas face continual pressure from agricultural conversion and livestock grazing since they occupy lands with high potential for food production. The prairies and savanna-forest transition zone on the Great Plains of North America have experienced these pressures for more than 100 years. In this respect they parallel the 20th century savanna/grassland conversion in Australia, the more recent conversions in the cerrado of Brazil, and the coming wave of conversions in Africa. In the northern plains of the USA, North Dakota (ND) and northern Minnesota (MN) represent this transition from prairies to forest, and contain examples of complete conversion and almost undisturbed wilderness. This seminar explores a range of remote sensing projects focused on global savannas, North American grassland-savanna areas, and regional systems in ND and MN. The projects are focused on retrieval of descriptions of vegetation state using currently and soon to be available multi-spectral sensors (MODIS, VIIRS, Landsat, Sentinel 2) but using hyperspectral imaging to explore potential spectral transforms and surrogacies applicable to the multi-spectral domain. Discussion will include application of BRDF shape indicators to information retrieval in global savannas, disaggregating the tree-grass signals in global savannas, utilizing suites of vegetation indices as indicators of vegetation state in North America, and retrieving cover fractions, biomass and growth rate for rangeland management in the rangelands of southern Alberta.

Bio
Professor Michael Hill has a background in grassland agronomy, but has been working with spatial information and remote sensing of land systems for the past 25 years. He has published widely on agronomy, ecology, biogeography and production of grasslands, and radar, multispectral and hyperspectral remote sensing of grasslands and savannas. His current interests are in application of quantitative information from multi-spectral, hyperspectral and multi-angle imaging to vegetation description, multi-criteria and decision frameworks for coupled human-environment systems, and methods and approaches to application of spatial data for land use management.

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