

GSE Seminar Series

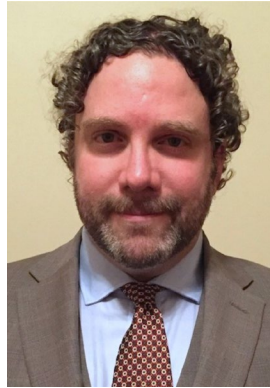
Department of Civil & Environmental Engineering

University of Houston

Wednesday, November 20, 2019

11:30 am - 12:45 pm

Technology Bridge 4, Room 110



Anthony M. Filippi, Ph.D.

Associate Professor

Department of Geography

3147 TAMU

College of Geosciences

Texas A&M University

College Station, TX 77843-3147

High-Dimensional Remote Sensing of Vegetation in the Coastal Zone

Abstract

High-dimensional remote-sensing data (e.g., hyperspectral images, potentially jointly analyzed with LiDAR data, and ancillary geospatial data sets) can enable extraction of detailed vegetation-type information, as well as more accurate vegetation biophysical parameter estimates, relative to low-dimensional/multispectral data sets. As new sensors become operational, however, improved digital image-processing techniques are needed in order to handle the expected increase in hyperspectral and other high-dimensional remote-sensor data volume in a computationally-efficient manner. Traditional statistical techniques are of only limited use when performing high-dimensional data analyses and classification. Thus, other methods must often be utilized when processing high-dimensional data. Furthermore, hyperspectral analysis methods other than those typically employed by the geologic community, which often depend on diagnostic absorption features, may be better suited to address vegetation-mapping applications. In this presentation, recent advances in high-dimensional remote-sensing and geospatial big data classification of vegetation targets in the coastal zone, as well as vegetation biophysical parameter retrieval (e.g., aboveground biomass estimation in coastal floodplain forests) based on high-dimensional data, will be considered. The ability to map vegetation at a high level of specificity would be very useful for various applications, including habitat management and hydrodynamic modeling, and accurate floodplain forest aboveground-biomass retrieval is urgently needed for improved understanding of carbon cycling in such areas.

Biography

Dr. Anthony M. Filippi is an Associate Professor in the Department of Geography, College of Geosciences, at Texas A&M University—College Station. Dr. Filippi earned a Bachelor's degree in Geography from Kansas State University, a Master's degree in Geography from the University of South Carolina, and a PhD in Geography from the University of South Carolina (2003). In the summers of 2005-2008, he served as a Faculty Fellow at Oak Ridge National Laboratory (ORNL). Dr. Filippi has served as an invited Remote Sensing Expert on the Task Force on National Greenhouse Gas Inventories (TFI), Intergovernmental Panel on Climate Change (IPCC). His research interests include remote sensing/environmental and hydrologic optics, geographic information systems (GIS)-based modeling, riverine and coastal studies, vegetation mapping, machine learning/artificial intelligence (AI), and land-cover/land-use change (LCLUC). He primarily teaches courses in remote sensing and GIS/GIS-based spatial analysis and modeling.