December 17, 2019

Dear Associate Editor/Editor,

We are submitting the manuscript entitled “**Crop-Type Classification for Long-Term Modeling: An Integrated Remote Sensing and Machine Learning Approach”** to be considered for publication in the *Remote Sensing* journal*.*

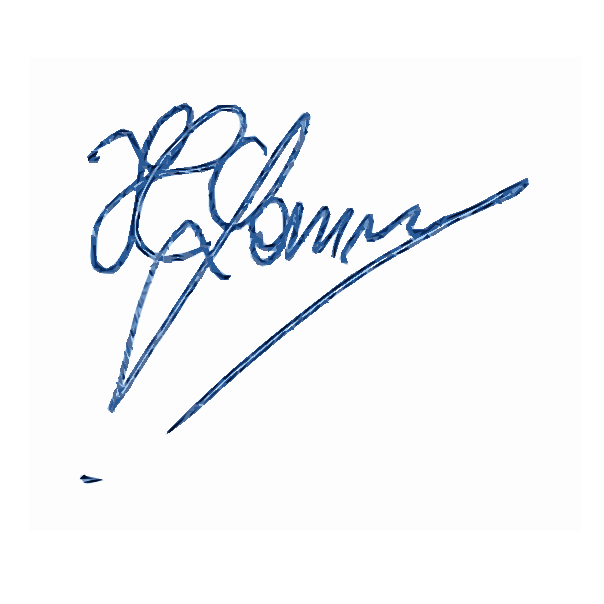
Long-term hydrological/climatological studies are designed to quantitatively evaluate the impact of farming practices to the spatial-temporal production and transportation of non-point source pollutants (sediment, nutrient, and pesticide) and the impact of climate on agricultural output. These studies rely on long-term crop-type information to estimate typical farming management practices. In the U.S.A, crop-type spatial information is available starting in the year 2000. Therefore, this study sought to develop crop-type spatial information from times series of remotely sensed spectral indices of historic years when USDA-generated CDLs are not available.

The manuscript describes novel methodology for data pre-processing, conversion from pixel-scale to object-scale, phenological curves development based on filtering and function fitting, and development of multi-temporal crop-type classification based on random-forest classifier.

Findings of this study support the development of crop-type geospatial datasets for years when CDLs are not available (in US) or in locations in which such information is not produced. Specifically for hydrological studies, the information generated from these methods support the development of long-term watershed-scale conservation strategies by enhanced characterization of crop-type and quantification of crop conversion trends.

This paper (or closely related research) has not been published or accepted for publication. No other papers using the same data set have been published.

We appreciate the opportunity to publish our work in the *Remote Sensing* journal.

Sincerely,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Henrique Momm

Associate Professor

Department of Geosciences

Middle Tennessee State University

[henrique.momm@mtsu.edu](mailto:henrique.momm@mtsu.edu) and 615-904-8378