Seasonal land cover and annual land use mapping for fire modeling

Peng Gong, Han Liu, and Yuqi Bai
(penggong@tsinghua.edu.cn)

Fire modeling needs timely fuel information. Land cover and land use data are often used for fuel type mapping. Existing large scale mapping efforts do not provide frequent land cover information, due partly to the lack of frequent raw data, and partly to the huge computational cost. In this presentation, we will report our latest land cover and land use mapping efforts toward mapping global land cover at seasonal steps while mapping land use at annual intervals. We report a data-cube approach applied to over 20-year Landsat and Terra and Aqua data (2000-2019) that made it convenient to experiment with various land cover and land use mapping procedures.

With a data cube, time series analysis can be easily done that allows not only fuel type mapping but also fire event detection. We report the use of multiple season land cover samples collected in a specific year at the global scale to map seasonal land cover. We also report the use of historical land use for annual land use mapping. In addition, we report burnt area detection results from the using selected data from historical burnt area maps in training machine learning algorithms based on the data cube. Land cover and land use data are cross-walked to fuel type data. This approach provide more accurate fuel type data for fire emission estimation and fire behavior modeling.