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ABSTRACT TITLE: A high performance data platform for terrestrial ecosystem modeling

ABSTRACT: Significant progresses have been made on key components of terrestrial ecosystem sciences, i.e., experiment, observation, and model. However, the multidisciplinary integration has been generally left behind. This poster presents some of our current efforts towards a high performance data platform to advance integrated ecosystem sciences. Based on two-tier software architecture, this data platform, which leverages high performance computing capability and adopts the fundamental of Geographic Information System (GIS) design, is to provide interactive ecosystem manipulation capability for direct measurement-model connection, realistic landscape representation, and large scale phenomena diagnostic analysis for decision making. Specifically, three cases have been presented; they are 1) CLM functional unit testing on photosynthesis; 2) landscape categorization based on temporal-spatial datasets analysis and clustering; as well as 3) a global CLM offline simulation diagnostic analysis on HPC platform. Innovative computational methods using the ORNL Leadership Computing Facility (OLCF) will also be discussed to address technical challenges associated with those exemplary scenarios and several future efforts.