

# Discovery of Patterns in Global Earth Science Data Using Data Mining

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The climate and earth sciences have recently undergone a rapid transformation from a data-poor to a data-rich environment. In particular, climate and ecosystem related observations from remote sensors on satellites, as well as outputs of climate or earth system models from large-scale computational platforms, provide terabytes of temporal, spatial and spatio-temporal data. These massive and information-rich datasets offer huge potential for understanding and predicting the behavior of the Earth's ecosystem and for advancing the science of climate change.

However, mining patterns from Earth Science data is a difficult task due to the spatio-temporal nature of the data. This talk will discuss various challenges involved in analyzing the data, and present some of our work on the design of algorithms for finding spatio-temporal patterns from such data and their applications in discovering interesting relationships among ecological variables from various parts of the Earth. A special focus will be on techniques for land cover change detection (and their use in assessing the impact on carbon cycle) and finding teleconnections between ocean and land variables.