

Impacts of Land Use on Forest Ecosystems in Indiana

Graduate Student:
Bogdan Chivoiu, Ph.D.

Goals:
To understand how land-use change affects forests in a fragmented landscape through an integration between a landscape disturbance and succession model and a land transformation model.

Statement of Problem:

The major anthropogenic disturbance in north-central Indiana is land-use change and is mostly driven by urban sprawl. Little is known about how urbanization affects forests in the region. Better understanding the impacts of land use change on forest structure and composition is important for the sustainable management of the forests in north-central Indiana.

Current Activities:

Finishing up dissertation writing.

Carbon Sequestrations among Different Forests

Graduate Student:
Zhiwei Zhang, Master

Goals:
To provide guidance on forest management for maximizing carbon sequestration by applying effective silviculture measures in different forest ecosystems in north-central region of the US.

Statement of Problem:

Carbon credit has become an economically and environmentally important option for forest landowners. Maximizing carbon sequestration through forest management is important for maximizing carbon credit. Carbon-oriented forest management requires different considerations from the conventional timber-oriented forest management.

Current Activities:

Data analysis with a forest carbon accounting model ForCAM.

Applying Object-Oriented & Context-Sensitive Algorithms

Graduate Student:
Xiaoxiao Li, Ph.D.

Goals:
To accomplish consistent LULC mapping methodology with high-resolution remote sensing data for different applications of LULC maps in north-central Indiana.

Statement of Problem:

Definiens eCognition is powerful but sophisticated image analysis software system. The classification process with Definiens involves automatic, semi-automatic, and manual steps. The overall classification procedures and parameters vary with data and LULC types. Systematic experiments are required to find out the optimum procedures and parameters.

Current Activities:

Preliminary experiments of classifications with Definiens.

Integrating LIDAR with Optical Remote Sensing Data

Graduate Student:
Yue Wu, Master/Ph.D.

Goals:
To extract information about forest structures and types through intelligent integrations between LIDAR and optical remote sensing data.

Statement of Problem:

LIDAR and optical remote sensing data have different advantages. LIDAR sensor is a "structure" detector whereas optical sensor is a "type" detector. Both sensor systems generate numerous data metrics. It is important to optimize metrics combinations, identify spatial variations in metrics among different forest types, and extract information about forest characteristics.

Current Activities:

Data acquisition is under going.