Collaborative Activities for Research and Technology Innovation

Bridging the Temporal Mismatch Between Remotely Sensed Land Use Changes and Field-Based Water Quality/Quantity Observations

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Award: $100,000

Project Length: 12 Months

Syracuse CoE Focus Area: Water Resources

Project Summary

Constructed impervious surfaces (sidewalks, parking lots, roads, rooftops) have been linked to alterations in hydrology, sediment, nutrient, and toxicant loading, and general stream degradation, with attendant loss of ecosystem function and biodiversity.

Currently there is a significant lag time between delivery of mapped impervious surface representations and the hydrological data we are able to capture on the ground.

This temporal disjunction between remotely-sensed and locally-sensed data means that the models relying on this information are inherently flawed.

Subsequently the hypothesis of our work is to evaluate whether an integrated framework of temporally matched remote sensing data and field-based data can improve existing models for water quality assessment.

Our approach will target the development of:

1) Enhanced detection and classification algorithms of impervious surfaces using remotely-sensed imagery; and

2) Watershed impact models designed to take advantage of up-to-date maps of imperviousness.

Our interdisciplinary work will result into a new "Intelligent Environmental Quality System" where our hydrological model will be in the unique position to support intense and rapid landscape/hydrological changes.

Our work will allow researchers and policy makers to derive relevant information faster and therefore inform society about environmental change important to the future sustainability of our societies.

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