

# Impacts of Land-use Change on Snow, Soil Frost, and Soil Erosion in the Great Lakes Region

AGRY 598G Remote Sensing Seminar

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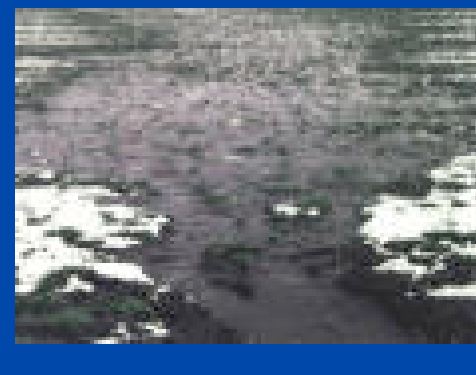
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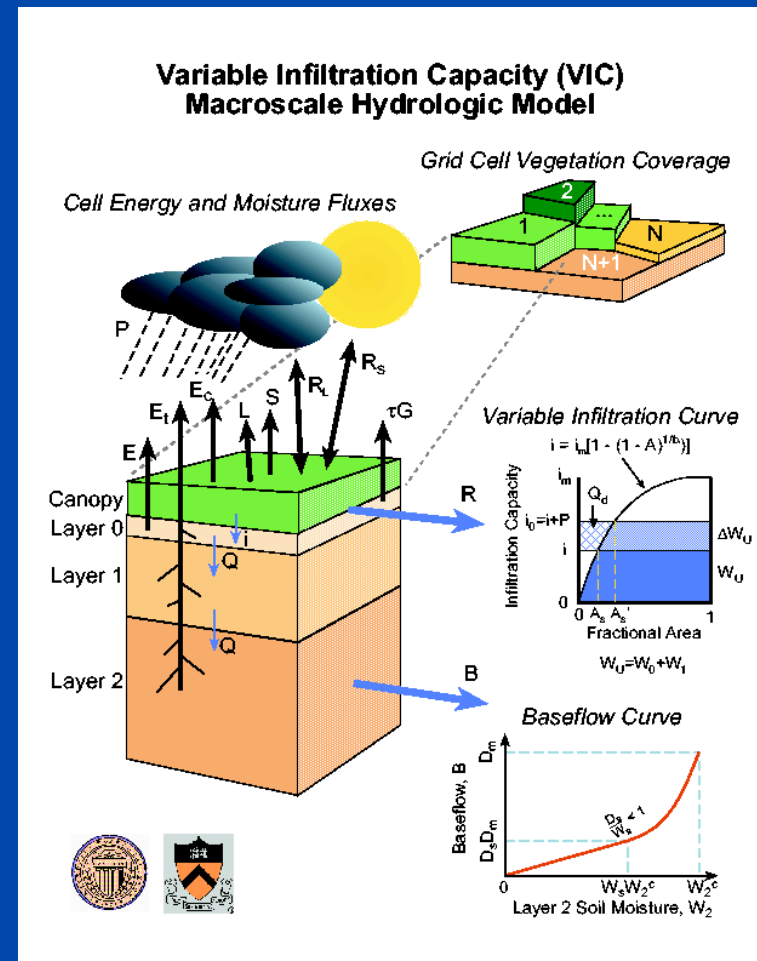
# Problem Statement

- Soil erosion is a long-term problem in natural resources management.
- Frozen soil plays a major part in spring melt runoff and erosion.
- Land-use and land cover have a major impact on the accumulation, distribution and melting of snow and development of soil frost.

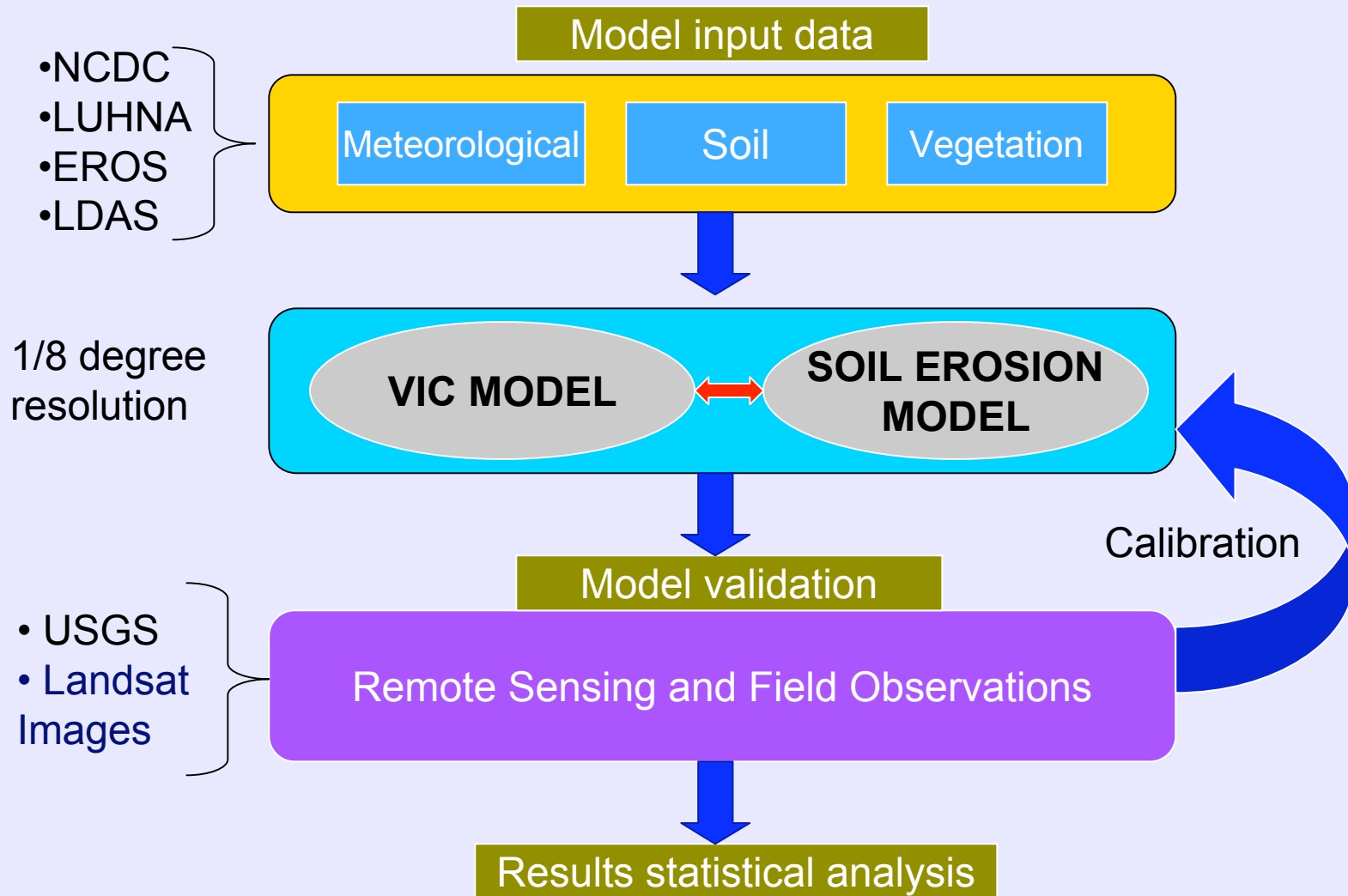


# Research Objectives

- To develop soil erosion model driven by or coupled with the VIC model;
- To simulate historic land-use using the VIC model with frozen soil and snow algorithms;
- To analyze the effects of frozen soil, snow cover, and land-use on erosion; and
- To evaluate how climate change affect soil erosion



# Method and Approach





A satellite image of the Arctic region, showing the Arctic Ocean and surrounding landmasses. The image displays a mix of dark blue water, light brown land, and white snow cover. The text is overlaid on the left side of the image.

## Role of Remote Sensing in the Study

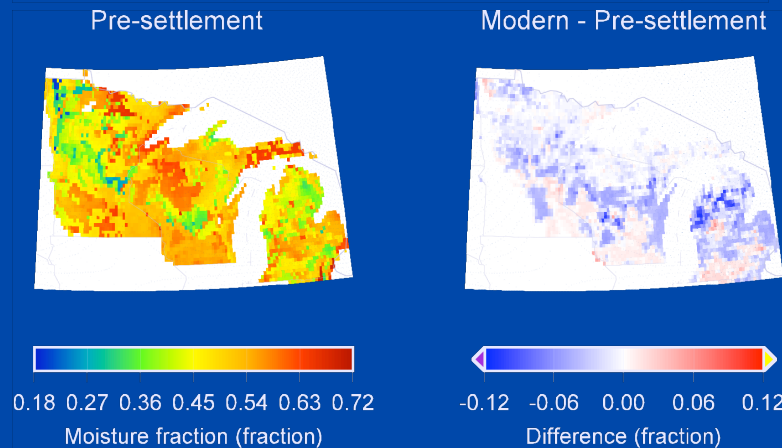
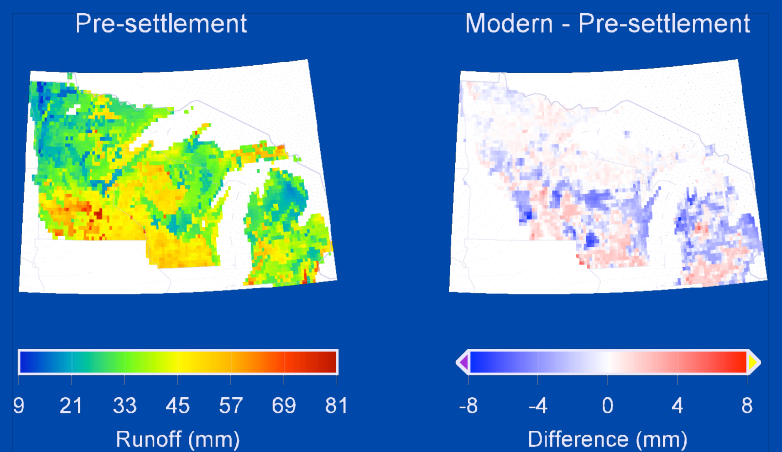
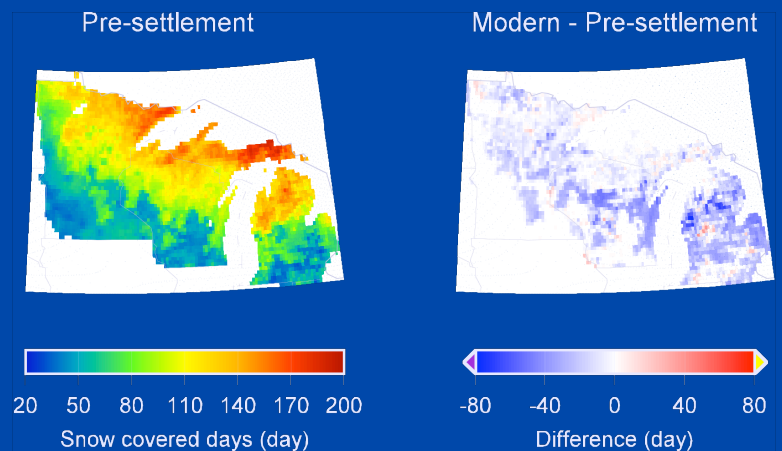
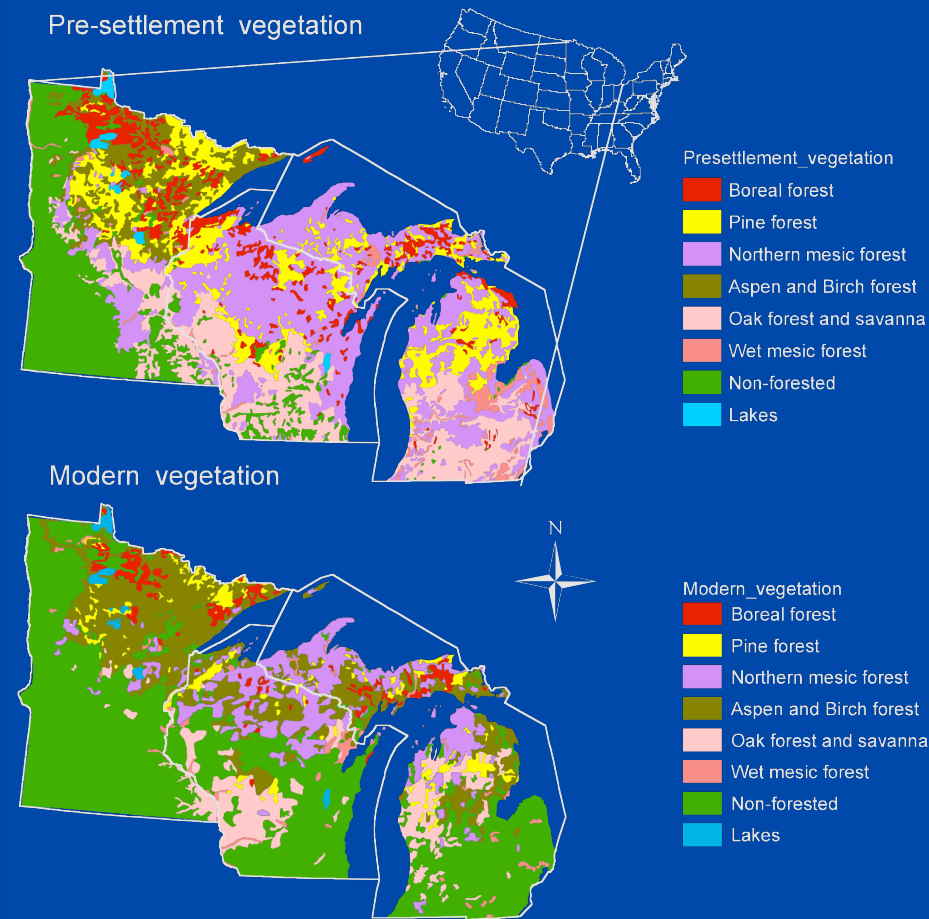
- Landsat TM and MODIS

- 16 days repeated coverage
- finer resolution than model needed

- Landsat data for model validation

- Land-use change
- Snow covered areas and number of days
- Soil moisture





**Some preliminary results from the VIC model**  
**- How land use change affect snow covered days, runoff, soil moisture etc.**

Study still ongoing

Comments and suggestions are welcome

Thank You