Lecture outline

Geographic Information Systems (GIS), with its ability to handle geospatial and temporal data in a single environment, provides the basic structure essential for modeling various physical processes. GIS can be used in various ways to support modeling:

- Store and Manage data.
- Parameter extraction: flow lengths, watershed areas, slopes, etc.
- Visualization: two and three-dimensional visualization of model outputs (example, floodplain mapping).
- Data analysis: Watershed delineation, network tracing, etc.
- Interface for models – GIS can be used as an interface for running simulation models.

We will discuss the following topics in this lecture:

- Introduction to GIS and data representation
- Geodatabase design and data models
- Raster and Vector analysis in GIS
- 3D representation and visualization in GIS
- GIS and modeling techniques
- GIS and modeling examples
  - Hydrologic and hydraulic modeling
  - Fish habitat modeling
  - Water quality modeling

Reading Material