

## 2-Day: Water Resources Applications for Beginner

### Overview

This course covers fundamental GIS concepts as it applies to water resources applications. Upon completion an attendee will know how to query a GIS database, manipulate tabular data, edit spatial and attribute data, and present data clearly and efficiently using maps and charts in the context of water and watershed.

Participants will learn how to use ArcGIS including: ArcMap™, ArcCatalog™, and ArcToolbox™ and explore how these applications work together to provide a complete GIS solution.

This 2-day course is for those who are new to ArcGIS and new to GIS in general. This course will introduce basics of GIS for water related applications on Day 1, followed by hands-on experience working with water related data on Day 2 (including DEMs, water quality, soils, landuse/landcover data).

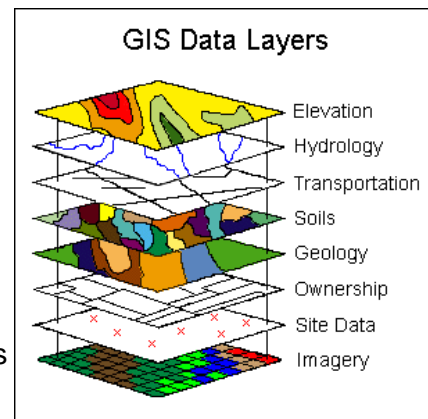
### Prerequisites and Recommendations

Participants should know how to use MS windows software. This course provides the fundamental ArcGIS knowledge and experience needed to enroll in Intermediate and Advanced GIS applications for Water Resources workshops

### Module I: Introduction to GIS

#### Learning Objectives

- What is GIS?
- Map vs. GIS
- Major Components of a GIS
- Introduction to Data Collection
- Introduction to GIS Data Types and Resolution
- Introduction to Projection and Datum
- Introduction to Spatial Analysis
- Introduction to Map Design and Communication Processes



### Module II: Getting Started with ArcGIS

#### Learning Objectives

- Introduction to ArcGIS Software

Case Study: Find sites (point data) that are within certain distance of a linear feature

### Module III: Map Making and Display

#### Learning Objectives

- Introduction to Map Projection, Datum & Coordinate Systems
- Working with GPS data

Case Study: Working with Datum and Projection with Watershed Boundaries

Case Study: Working with GPS data of weather stations

#### **Module IV: Data Integration**

##### Learning Objectives

- Remote Sensing Application and Integration
- Digitizing

Case Study: Simple Image Classification using Raster Calculator

Case Study: Advanced Image classification and Water Budget Analysis

Case Study: Extracting vector data from imageries

#### **Module V: Analyzing Spatial Data**

##### Learning Objectives

- Foundation of Query
- Foundation of Geoprocessing

Case Study: Querying the vector data

Case Study: Application of Geoprocessing tools to watershed analysis

Case Study: Working with buffer for Riparian zones

#### **Module VI: Working with Raster Data**

##### Learning Objectives

- Suitability Analysis
- Edge Effect Analysis
- Change Detection Analysis
- Summarizing Raster Data

Case Study: Working with Raster Data and Map Algebra

Case Study: Find a Potential Reservoir

Case Study: Working with Elevation data

#### **Module VII: Comprehensive Application of GIS**

##### Learning Objectives

- Introduction to water related modeling
- Integration of soils, landuse and slope data

Case Study: GIS application of Revised Universal Soil Loss Equation

Case Study: Water Quality and Data Integration

