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Training Course Outline

Training the GIS Professional

Geoprocessing Raster Data using ArcGIS Spatial Analyst 10.x - 2 Days

Overview

This course is designed to introduce ArcGIS 10 users to the basic methods of raster analysis. Whilst, some of the subjects in the course outline may seem complicated a secondary objective is to explain and help users understand raster terminology and to use the raster commands at a basic level.

Who should attend

This course is for those who have experience with the Arc GIS interface at version 10 but need a better understanding of how to analyse raster data.

Goals

- Use a variety of raster analysis tools in the Spatial Analyst Extension
- Set the analysis environment
- Create, manage and display raster data
- Create a Raster data base
- Write Map Algebra expressions
- Model hydrology and use the tools
- Experience raster in 3D

Topics Covered

Managing raster data

Environment setting, masks and cells

Display raster data

Represent Geography as data, pixel display, pyramids, compression and statistics

Map algebra

Algebra components, options, tools and functions
Algebra syntax rules

Surface analysis

Creating a Surface, Functional Surfaces
Terrains and Interpolation tools

Hydrology

Surface Hydrology and ground water

Fuzzy logic

Spatial models, Binary analysis
Suitability modeling: Fuzzy analysis
Fuzzification

Introduction to 3D

Display raster data in 3 dimensions

Prerequisites

To have completed the ArcGIS 1 - Fundamentals of ArcGIS 10.x for Desktop course, or have a competent understanding of ArcGIS at version 10.x

Related Courses

- This course stands as an introduction to raster analysis. However, the results of raster processing can be enhanced through 3D visualisation. Esri UK offer the 'Working with 3D using ArcGIS 10.x' course.

Contact Us

For GIS training enquiries and bookings visit www.esriuk.com/training, email us at training@esriuk.com or call us on 01296 745504

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Topics in detail

Raster Analysis

- What is raster Geoprocessing
- The Analysis environment: Cell size, Extent, Snapping, coordinate systems and Masks
- Raster cell coincidence
- Raster resampling
- Importing Spatial Analysis

Managing Raster Data

- What is raster data?
- How is raster data represented?
- Aligning raster data with other spatial data
- Displaying rasters: Pixel depth
- Organizing rasters into bands
- Improving performance: Raster pyramids
- Displaying raster data: Compression
- Rendering raster datasets using statistics

Working on the cells

- Building Map Algebra expressions
- Map Algebra components
- Data input
- Map Algebra options
- Map Algebra tools (functions)
- Function syntax rules
- Special cell values
- Working with NoData
- CON functions

Moving beyond the cells

- Local functions
- Focal functions
- Zonal functions
- Global functions
- Neighbourhoods
- Regions
- Majority filters
- The “Fitness” tools; Slice, Nibble, Expand, Shrink, Thin

What’s on the Surface?

- Creating a Surface
- Functional Surfaces
- Terrains
- Interpolation tools: IDW, Spline, Trend, Kriging
- Barriers
- The importance of samples
- Topo To Raster
- Contours
- Slope
- Aspect
- Hill shading

Hydrology

- Arc Hydro Data Model and tools
- Surface hydrology tools
- Topographic surfaces
- Topo to Raster
- Identifying and filling sinks
- Flow Direction
- Flow Accumulation
- Creating streams
- Stream to Features
- Defining watersheds and basins
- Snap Pour Points
- Flow Lengths

Groundwater hydrology (Optional)

- Groundwater tool limitations
- Darcy Flow
- Particle Tracking
- Porous Puffs

The Fuzzy Club

- Spatial models
- Suitability modeling: Binary analysis
- Suitability modeling: Fuzzy analysis
- Fuzzification
- Fuzziness vs. probability
- Fuzzy membership
- Hedges
- Fuzzification of categorical data
- Fuzzy overlay analysis

A quick trip through space and time

- Add raster to 3D ArcSceen
- Symbolise Raster in 3D
- Symbolise feature data in 3D over Raster
- Analyse Earthquake data in raster
- Assess building damage
- Analyse aftershock data in space and time

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