

Integrating Weather and Climate with GIS Technology Part 1: Desktop and Online Applications

Short Course Organizer: Dan Pisut

AMS Conference on Environmental Information Processing Technologies

Time	Topic	Instructor
8:00 AM	Exercise 1: Adding Data to a GIS	Dan Pisut
8:15 AM	Exercise 2: Create Multidimensional Layers	Dan Pisut
8:30 AM	Exercise 3: Plot timeseries using temporal profile	Kevin Butler
9:00 AM	Exercise 4: Using Geoprocessing Tools	Kevin Butler
10:00 AM	Coffee Break	
10:15 AM	Exercise 5: Analysis with Raster Function Chains	Kevin Butler
10:30 AM	Exercise 6: Adding Demographic Data	Dan Pisut
10:45 AM	Exercise 7: Spatial Analysis using Machine Learning	Kevin Butler
11:30 AM	Exercise 8: Publishing Data Online	Dan Pisut
12:00 PM	Course End	

Exercise 1: Adding Data to a GIS

Objective: Learn the basic steps to add simple geotif, shapefile, or web-hosted data services into a GIS project. We'll also cover the basics of symbolizing the layers with stretched color ramps and classifications.

Exercise 2: Create Multidimensional Layers

Objective: Learn how to add complex spatio-temporal data with multiple variables into a GIS project. We'll focus on the most common formats such as NetCDF, HDF, and GRIB files from model, analysis, and satellite data sources.

Exercise 3: Make a time series and plot using temporal profile

Objective: Visualization using temporal profile for multidimensional mosaic dataset. We'll take analysis to the next level by incorporating time by building the multidimensional files from Exercise 2 into a mosaic that has multiple variables in space and time. These layers can be animated or graphed.

Exercise 4: Analyze data using Geoprocessing Tools

Objective: Perform time series analysis using the Cell Statistics and Summary Statistics geoprocessing tools in Spatial Analyst. We'll also delve into more complex spatial analysis, such as calculating anomalies on the fly, using SpaceTime Cube trends, and Empirical Bayesian Kriging Regression.

Exercise 5: Analyze Multidimensional Data using Raster Function Chain

Objective: Applying a series of Raster Functions and saving it as a Raster Function Chain and Raster Function Template (RFT) for sharing or future use as a processing workflow.

Exercise 6: Adding Demographic Data

Objective: Learn how to enrich raster and polygon data (e.g., warning area, flood zone) with affected population and statistics from the Census Bureau.

Exercise 7: Spatial Analysis using Machine Learning

Objective: Use built-in machine learning analysis tools to develop a novel climate analysis or model areas of vulnerability

Exercise 8: Publishing Data Online

Objective: Use built-in tools to quickly publish results to the cloud as analytical layers or tiled map images online with a group or the public. Build these layers into quickly deployed web applications that require no HTML or JavaScript development.