



*Providing Training, Advice And
Consultancy On The Use Of Geographic
Information Systems In Ecology*

www.GISinEcology.com

Preliminary Course Timetable And Contents

Day One

09:30 – Welcome And Introduction.

09:40 – 1. Background Session One:

- 1.1 What is GIS and why is it useful in marine biology?.
- 1.2 The structure of GIS projects in ArcGIS software.
- 1.3 An introduction to data layers.
- 1.4 The importance of projections, coordinate systems and datums.
- 1.5 Understanding resolution and scale in GIS projects.

10:40 –Break

11:00 – Background Session Two:

- 2.1 Things to think about before you start your GIS project
- 2.2 An introduction to ArcGIS software

11:30 – Practical Session One: Starting A GIS Project:

- 3.1 Setting the projection, coordinate system and datum for your data frame.
- 3.2: Adding existing data layers to your GIS project.
- 3.3 Adding locational data as a point data layer.
- 3.4 Re-creating survey tracks as line data layers from GPS waypoints.
- 3.5 How to create a new data layer.

12:30 – Lunch.

14:00 – Background Session Three: Collecting Data For Use In A GIS Project:

- 4.1 Data collection for GIS projects.
- 4.2 Using GPS data in a GIS project.
- 4.3 The importance of error checking your data during data input.
- 4.4 Error checking other peoples data.

14:30 – Practical Session Two: Making A Map For A Presentation, Report Or Publication (with break at 15:30):

- 5.1 Setting the extent of your map.
- 5.2 Selecting the right projection.
- 5.3 Making sure that your data layers are displayed correctly.
- 5.4 How to deal with legends
- 5.5 Adding latitude and longitude information around the edges.
- 5.6 Adding a scale bar.
- 5.7 How to ensure that multiple maps of the same area are identical.

17:00 – Close.

Day Two

09:30 – Background Session Four: An Introduction To Working With Raster Data Layers:

- 6.1 What are raster data layers and why are they useful?
- 6.2 Things you need to think about before creating raster data layers.

10:00 – Practical Session Three: Working With Raster Data Layers (with a break at 11:00):

- 7.1 Making a raster data layer of species distribution.
- 7.2 Making a raster data layer of survey effort.
- 7.3 Making a presence-absence raster data layer for a species.
- 7.4 Making a species richness raster data layer.
- 7.5 Making raster data layers of habitat variables (such as water depth, seabed slope, seabed aspect and standard deviation of seabed slope).

12:30 – Lunch.

13:30 – Background Session Five: Using GIS To Investigate Spatial Relationships

- 8.1 What are spatial joins and how can you do them in GIS.

14:00 – Practical Session Four: Investigating Spatial Relationships (with a break at 15:15):

- 9.1 Linking species locational records to habitat variables such as water depth to compare habitat preferences between species.
- 9.2 Linking habitat variables to presence-absence data from a raster data layer.

17:00 – Close.

Day Three

09:30 – Background Session Six: How to Translate Biological Tasks Into The Language Of GIS:

- 10.1 Using flow diagrams to work out what steps you need to do to do a biological task in GIS.
- 10.2 Automating tasks in GIS.
- 10.3 How to find out how to do specific tasks in GIS.
- 10.4 Using Extensions and scripts.
- 10.5 Using non-GIS software to do specific tasks.

10:30 –Break.

10:35 – Practical Session Five: Creating And Using Polygon Grid Data Layers:

- 11.1 Using a polygon grid to calculate abundance per unit survey effort for each grid cell for a study area.
- 11.2 Linking environmental data to a polygon grid data layer.

12:30 – Lunch.

14:00 – Background Session Seven: Extracting Data For Statistical Analysis:

- 12.1 Preparing data for statistical analysis.
- 12.2 Exporting data from a GIS project for use in statistical analysis.

14:00 – Practical Session Six: Exporting Data From Your GIS (with a break at 15:00):

- 13.1 How to export data layers from a GIS project for use in other software
- 13.2 How to add latitude and longitude to a data layer before exporting it so it can be re-plotted in a GIS project at a later date.

16:30 Close.

Day Four

09:30 – Background Session Eight: Planning And Conducting Data Collection For GIS Projects:

- 14.1 Creating a GIS project to help plan your data collection.
- 14.1 Collecting information on point location (such as sampling sites).
- 14.2 Collecting information along survey tracks and transects.
- 14.3 The importance of error-checking your data.

10:00 – Practical Session Seven: Creating A GIS Project From Cetacean Survey Data:

- 15.1 Creating a GIS-compatible spreadsheet or database for your data
- 15.2 Downloading data from a GPS for use in a GIS project
- 15.3 Converting latitude and longitude coordinates into decimal degrees so that they can be plotted in a GIS project.
- 15.4 Checking that your data plot in the correct locations in your GIS.
- 15.5 Re-creating survey tracks as line data layers from GPS waypoints.

12:30 – Lunch

14:00 – Discussion of what has been learnt on the course and question and answer session about using GIS in your own specific projects.

16:30 – End of Course