# Introduction to Coastal and Marine GIS

***GeoData in partnership with ABPmer***

## Course Outline

Delivering sustainable development in the marine environment requires a balance to be achieved between resource use and protection of our seas. Spatial data is increasingly important in such decision-making being used for marine planning, conflict management and environmental management.

GeoData's experienced GIS trainers have teamed up with ABPmer GIS Consultants, who specialise in the coastal and marine sector, to create a course that will provide you with the background and skills necessary to utilise these powerful tools and techniques.

The course introduces GIS concepts and techniques using QGIS and is intended for those who have little to no GIS knowledge or who wish to undertake some formalized training in QGIS having been largely self-taught in the past

A project showcase, drawn from ABPmer's portfolio, illustrates how spatial data has been used within GIS to support coastal and marine decision making. The course also considers common problems faced when mapping the coastal and offshore zones (including projections, vertical datums, etc.)

## ANTICIPATED COURSE OUTCOMES / ACHIEVEMENTS

### Aims and objectives

- Provide introductory level GIS knowledge and the fundamental skills to use QGIS
- Focus in on coastal and marine datasets
- Show the many potential applications of GIS within the coastal and marine sectors (through our partners at ABPmer)
- Discuss some of the unique challenges / pitfalls when mapping the coastal and marine zones (e.g. coordinate systems, vertical datums)

### Learning outcomes - by the end of the course, delegates will have a knowledge and understanding of:

- What a GIS is; what spatial data is; raster and vector data models
- The core functionality of QGIS
- Visualising spatial data and producing maps / charts.
- Spatial data management and the use of Geopackages (a type of spatial database)
- Handling tables including selections and queries.
- Creating and editing spatial data.
- Greater appreciation of coastal and marine GIS data and applications.
- Basic geoprocessing

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University of Southampton

ABP mer marine environmental research

GeoData

# Introduction to Coastal and Marine GIS

## Day 1

### 1 - The What the Why the How of GIS

What is GIS?
GIS Tasks
GIS Data Types
Mapping in Layers
Co-ordinate Systems
Coastal & Marine GIS Applications

### 2 – Using QGIS

Open a project
Navigation
Add / Remove data
Identify features tool
Bookmarks
Plugins

**Exercise 2: Getting Started**

### 3 - Visualising Data

Vector symbology
Symbology types
Labelling
Label expressions
Saving symbology

**Exercise 3 – Visualising data**

### 4 – Data Management and Metadata

The QGIS project file
Filters
Project coordinate reference system
Vector storage
The Browser panel
Web layers
Metadata

**Exercise 4: Data Management**

### 5 - Working with Tables

Table types
The Attribute table
Field calculator
Create points from non-spatial table
Working with CSV
Table / Attribute joins

**Exercise 5: Using Tables**

## Day 2

### 6 – Vector processing

Selections
  Interactive
  Attributes
  Spatial
The processing toolbox
Buffer tool
Merge tool
Clip tool

**Exercise 6: Vector processing**

### 7 – Temporal data

Visualising temporal data
Preparing date fields
The temporal controller

**Exercise 7: Temporal data**

### 8 – Creating and Editing Data

Vector storage
Creating new vector data
Modifying vector data
Snapping
Adding attributes
Virtual fields

**Exercise 8: Creating and editing data**

### ABPmer Coastal and Marine GIS Data & Project Showcase

Highlighting the importance of GIS in the context of Marine Spatial Planning. Trainees will explore and interact with important data sources used for Coastal GIS projects.

## Day 3

### 9 – Producing Maps / Charts

What is a Map Layout?
Map Elements
Using Templates
Exporting and printing layouts

**Exercise 9: Creating a map**

### 10 – Raster Processing

Raster data
Raster alignment and resolution
Raster calculator

**Exercise 10: Raster processing**

### 11 – Coordinate Reference Systems

Coordinate Systems
Vertical Datums
Coordinate formats
Reprojecting spatial data

**Exercise 11: Coordinate reference systems**

### ABPmer Coastal / Marine GIS Consultancy Exercises

A more wide-ranging exercise where delegates work with data to solve a typical problem such as planning a new cable route for an offshore windfarm or locating a Salmon protection area

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