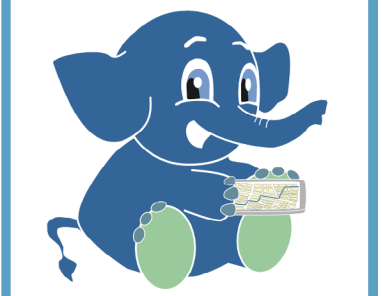
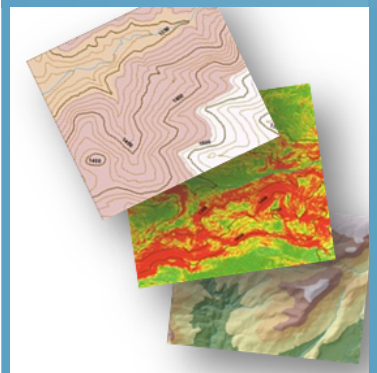
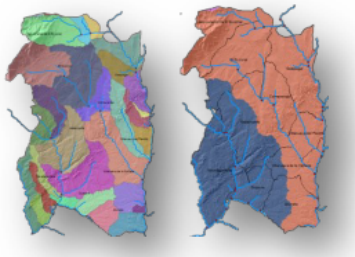
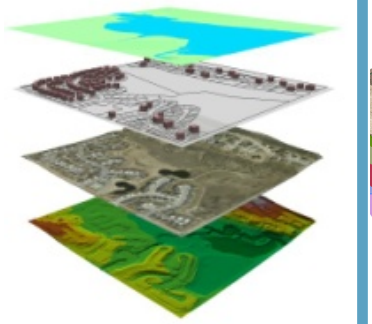
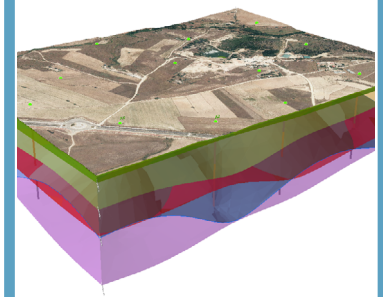
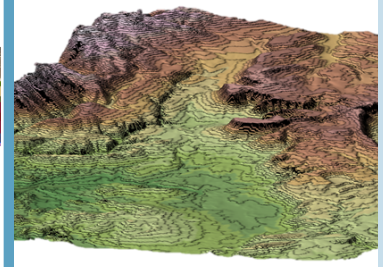










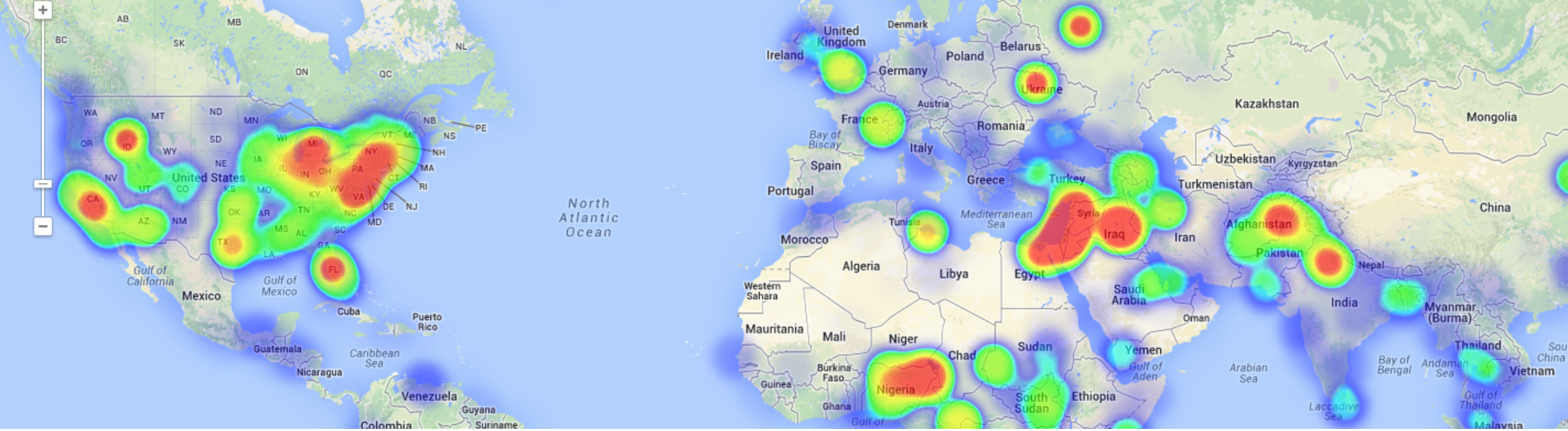


QGIS AND GRASS APPLIED TO ENVIRONMENTAL MANAGEMENT

ONLINE TRAINING

TYC GIS Training

GIS Course.com



COURSE

The objective of this course is to initiate the student in the management of QGIS, for the preparation of studies related to environmental management.

The student will acquire the necessaries skills in the manipulation of QGIS tools that are recommended in environmental studies and analysis (EIA, environmental papers, fauna studies, etc.). The student will be trained in the development of quality thematic cartography, multi-criteria spatial analysis with applicability in environmental management and in alternative analysis.

GOALS

- Highlight the importance and utility of a Geographic Information System (GIS), its integration and applicability in environmental management.
- General overview about the basic skills needed in QGIS and GRASS GIS. Essential concepts used by a GIS system in environmental management projects elaboration.
- Learn about GIS key tools in an appropriate and professional way, usage of vector and raster data information, develop high quality cartography products, elaborate complex spatial analysis.
- Find about all possible difficulties which you may encounter in the execution of environmental GIS projects, and their solutions through practical exercises.
- Gain experience in data preparation, layout development, map creation and high quality products delivery.

Skills acquired by the student during our course: management of field sampling spatial databases, fauna density maps, erosion studies, hydrological studies, environmental sensitivity maps.

INSTRUCTORS

Santiago Pardini Herranz

With a Bachelor's Degree in Environmental Sciences from University of Almeria and a Master in Engineering and Environmental Management from Spain's School for Industrial Organization (EOI), Santiago is a GIS/Remote Sensing expert/consultant and managing director at TYC GIS Integrated Solutions.
With different courses graduated in GIS/Remote Sensing/CAD and BIM technologies, and more than 7 years of experience in practical applications of these knowledges in environmental consultancy, spatial planning, geomarketing, civil engineering or agricultural sciences, Santiago is a knowledgeable and experienced professional in GIS training and business activities.

Alfonso Noriega Díaz

With a Bachelor's Degree in Environmental Sciences and a Master in Safety, Hygiene and Ergonomics from University of Almeria, Alfonso has an extensive experience in GIS/CAD and topography training programs.

His expertise extends also on private sector as he worked as a co-director in final career projects and PRL Technician during the construction of "Helios Campos de San Juan I y II

Beatriz Ramos López

Beatriz holds a Bachelor Degree in Biology at University of Sevilla, a Master in Geographic Information Systems and another one in Geographic Information Technologies, both of them at the University of Alcala. She has experience in the execution of Web GIS related projects, in the usage of open source software products and in the development of cartographic viewers.

METHOLOGY

Enrolled students in this online course will have access to our virtual e-learning platform (which is available 24 hours), where they will find the content of the course, practical exercises, forum discussion and additional content. One of the advantages of this online platform, is that students can benefit of real time support and assistance offered by the instructor (2 hours per week), whom they can contact via direct messages, regarding course related issues, at any moment. They can also contact the instructor via email.

TYC GIS Training

STUDENTS PROFILES

The course is aimed at students and professionals in Engineering, Architecture, Biology, Geography, Geology and Environmental Sciences who are interested in the application of Geographic Information Systems in their present or future professional activities..

Important: The course does not require prior knowledge of QGIS.

PROGRAMA

INTRODUCTION IN GEOGRAPHICAL INFORMATIONAL SYSTEMS

Basic concepts and definitions
Capabilities and applications of Geographic Information Systems
Geographic information: vector data models, raster data models and other data models (CAD, TIN, etc.). Main characteristics, advantages and disadvantages of each data model
QGIS graphic interface presentation

ESSENTIAL OPERATIONS WITH VECTOR DATA

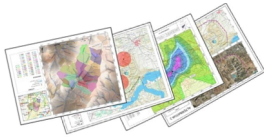
Add layers, edit properties and attribute tables
Add Web Services for Maps and Base Maps (OMS, Google Maps, Bing Maps)
Examine data: Search for data, apply queries and filters
Select by attributes, Select by location, data capture
Symbology layers: single symbol, by categories, by quantities, using graphs

COORDINATE SYSTEMS, PROJECTIONS AND IMAGE GEOREFERENCING

Introduction to Coordinate Systems and Projections
Definition of Coordinate System
Coordinate Systems and Transformations
Image georeferencing, CAD files and layers

VECTOR DATA MODELS. GENERATE AND EDIT VECTOR DATA

Create, edit and work with spatial data
How to create spatial data, edit toolbar, digitization techniques
Obtain new vector layers' form OMS
Convert CAD files to layers
Edit existing layers
Create layers from X, Y coordinates points
Working with attribute table, create and edit data
Attribute table structure
Types of data
Edit table information
Geometric calculations (surface, perimeter, length, etc.)
Table statistics
Table conversion, excel to other formats, reports and graphics generation



VECTOR DATA MODELS. TABLE RELATIONS

Database design
Database connections, combine tables with UNION
Spatial joins, generate new statistics and new data using table and spatial data information

INTRODUCTION IN RELATIONAL DATABASES SYSTEMS

Types of data that can be included in a database
About installing PostgreSQL
Create and manage data using PostGIS

GEOPROCESSING TOOLS AND SPATIAL ANALYSIS USING VECTOR DATA

Vector geoprocessing tools, feature extraction, proximity and overlay analysis
Create sampling grids
Multi-Criteria Analysis, zonal statistics, optimal site location

Practical Exercise 1 (environmental monitoring): Generating sampling grids for the study of population evolution and density.

SPATIAL ANALYSIS USING RASTER DATA

Conversion tools, raster, vector, ASCII, KML
Generate digital models of elevation using vector data, ASCII and TIN files.
Querying and masking raster data for obtaining new information
Merging raster files
Contour, slope, hillshade, aspect and visibility maps

Practical Exercise 2 (landscape): Landscape visibility mapping, viewshed analysis using high precision digital terrain models, define specific views.

ADVANCED SPATIAL ANALYSIS USING RASTER DATA

Reclassify rasters, euclidean distances, boolean operations on layers, raster aggregation and data conversion
Map algebra (Raster calculator), mathematical operations between rasters, cell statistics

**Practical Exercise 3 (geomorphology/erosion): Assessment of soil erosion risk based on variables such as slope, soil type, presence of vegetation, etc.
Data interpolation techniques (IDW, kriging, natural neighbor)**

Guided Exercise 4 (fauna and vegetation): Creating density and distribution maps of vegetation and fauna using interpolation data techniques and data taken from the field or from literature.

HYDROLOGICAL AND MULTICRITERIA ANALYSIS

Hydrological study: drainage networks, flow direction, watershed basins, catchment areas
Practical Exercise 5 (hydrology): Determination of a drainage network in digital elevation models, predominant flow direction and flow accumulation, identification of drainage basins (sub and micro basin delineation).
Performing Multicriteria raster analysis, basic concepts and weights (the most important component of the MCDA model), weighted layers' combination, non-compensatory analysis, least cost path analysis

Practical Exercise 6 (analysis of alternatives): Multicriteria analysis for environmental sensitivity projects and impact studies (select best spatial variables and see the potential environmental impacts, select the option with the least environmental impact).

Practical Exercise 7 (analysis of alternatives 2): Select the best route (corridor) with minimum environmental impact using multicriteria analysis.

INFORMATION SOURCES AND RESOURCES FOUND ON WEB

Download digital maps (IGN), take advantages of WMS cartographic servers.
IDEE (Infrastructura de Datos Espaciales de Espana) Portal for regional, european and international data

MAP PRODUCTS

Layout proprieties
Insert map elements (legend, scale, north arrow, coordinate grid), Excel tables, data frames, images, graphs
Export and print options
Practical Exercise 8 (map creation): Elaboration of quality thematic cartography products focused on environmental impact studies in concordance with INSPIRE Directive.

TYC GIS Training

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