Modelling the distribution of biodiversity and climate change

Course Overview

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Scope

Address the **interactions** and potential **impacts of global climate changes on marine biodiversity**.

Strong **component on biodiversity and climate data acquisition, management and visualisation, as well as on species distribution modelling** using state of the art correlative approaches.

Sessions 1-8

S01. Course overview

S02. Biological and environmental data for macroecology

S03. Ecological niches and geographic distributions

S04. Climate oscillations and distributional shifts of marine biodiversity

S05. Principles of Ecological Niche Modelling

S06. Potential applications of Ecological Niche Modelling

S07. Model fitting and transferability in space and time

Evaluation

Individual research study

Each student needs to prepare an **individual** report (**research study**) **addressing the interactions OR impact of global climate changes** on marine biodiversity. This can be:

. identifying the main environmental drivers shaping distributions;

. predicting present distributional ranges;

. projecting future range shifts;

. predicting marine invasion processes, etc.

Formulate a relevant research ecological question

>> what will be the consequences of future climate to *Zostera noltii*?

Formulate an hypothesis, based on the general theories presented in the lectures or from literature

>> increasing emissions of greenhouse gases will produce more severe range shifts to *Zostera noltii*.

Build a conceptual model to address the question in their system

>> model the ecological niche of *Zostera noltii* and predict its distribution for the present and for future climate conditions; compare ranges.

Read literature in a systematic way to assess the evidence for the different components of their models and hypothesis, and formulate conclusions and recommendations.

Evaluation

[Dec. 16] Speed Talks : 5 + 5 min (25% grade)

[Jan. 09] Individual research study as a markdown report (75% grade)

**** Final grade = (Talk x 0.25) + (Research x 0.75)**

Classes

Theory [up to 30m] >> Break >> Hands-on >> Break >> Hands-on

Resources

https://github.com/jorgeassis/courseMarAfrica/

Sessions (PPTs), Data, Scrips, challengeSolutions and codeRecipes

Relevant questions

[book a meeting] jmassis@ualg.pt