Modelling the distribution of biodiversity and climate change

Course Overview

Jorge Assis, PhD // jmassis@ualg.pt // jorgemfa.medium.com
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Scope

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

Hands-on oriented, with a strong **component on biodiversity and climate data acquisition, management and visualisation, as well as on species distribution modelling** using state of the art mechanistic and correlative approaches.

Goals

Get to know the foundations of **ecological niche theory**;

Develop skills on **macroecology**, **climate data acquisition**, **management** and **visualisation**;

Understand the strengths of niche modelling tools and the develop skills for proper **model transferability across space and time**;

Sessions 1-8

Evaluation

Individual research study

Each student needs to prepare an **individual** report (**research study**) **addressing the interactions OR impact of global climate changes** (past OR future) 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