



Universidade Federal de Santa Catarina
Centro de Ciências Biológicas
Departamento de Ecologia e Zoologia
Programa de Pós-Graduação em Ecologia



Code: ECO410047

Course: **ECHOing sustainability-** Global and local stressors impacts in Marine biodiversity

Credits: 04

Total: 60h

Professors: Dr. Jason Hall-Spencer e Paulo Horta

Semester/Year: 2020/01

Period: 13to24/1

Hours: 09:00 to12:00 and 14:00 to18:00.

Number of students: 10

Room: To be confirmed (NIMFA/BOT II)

Pre-requisite: Basic statistic

Purpose

This course is designed for students with special interest in marine biology. Its purpose is to increase the understanding of dynamic of biological systems, from population to the ecosystem level, considering impacts of climate change and potential interaction with local stressors as pollution. Through experiments and field characterization, we intend to construct with student analytical tools to evaluate impact of global change on marine life. Providing students opportunities to work together, they will ask questions and do field/lab work to answer many of their own questions.

Syllabus: The course will address in lab and field different aspects related to climate change and its interactions with local stressors. During the two weeks we will seek to innovate in the approach to circumscribing problems as well as presenting possible solutions to their mitigation and / or providing adaptation alternatives for vulnerable communities.

The syllabus:

- Climate changes,
- Global stressors,
- Local Stressors,
- Ocean acidification,
- Marine pollution,
- Nature-based Solutions
- Presentation of seminars and discussion of observed predicted scenarios

Ementa: A disciplina irá abordar em laboratório e em campo diferentes aspectos relacionados com as mudanças no clima e suas interações com estressores locais. Durante as duas semanas buscaremos inovar na abordagem de circunscrever os problemas assim como apresentar possíveis soluções para sua mitigação e/ou fornecendo alternativas de adaptação para comunidades vulneráveis.

O conteúdo programáticos:

- Mudanças climáticas,
- Estressores globais,
- Estressores Locais,
- Acidificação dos oceanos,
- Poluição,
- Soluções inspiradas no funcionamento da natureza
- Apresentação de seminários e discussão de dos cenários observados e previstos

Methodology: Theoretical lectures, field visits and characterization, sampling, experiment design and evaluation, short talks and theoretical discussions.

Assessment of students' performance: Frequency in lectures, participation and involvement in practical activities, presentation of a final project based on original data.

Written - One written report per group of student is required on a selected species experimental evaluation of global/local climate change impact. Such a project will include at least 10 pages of formal edited writing, and will conform to the style used in the journal *Global Change Biology* (i.e., Introduction, Methods, Results, Discussion, and Conclusions).

Power Point presentation – Each student will be required to give a 15-min, 15-slide, Power Point presentation to the class considering a manuscript analysis. The final presentation of each group will be followed by a classroom discussion.

Program and Schedule

- 13/01 – General introduction to climate change, concepts, seminar distribution
- 14/01 – Experimental design, species selection and theoretical discussions
- 15/01 - Field trip and ground truth evaluation
- 16/01 - Field trip, ground truth evaluation and experiment monitoring
- 17/01 – Seminar presentation and theoretical discussion
- 18/01- Field trip, ground truth evaluation and experiment monitoring
- 19/01- Field trip, ground truth evaluation and experiment monitoring
- 20/01 – Experiment finalization e data analysis
- 21/01 – Data analysis e theoretical discussion
- 22/01 – Reading and writing period
- 23/01 – Reading and writing period
- 24/01 – Seminar presentation

References

<https://www.ipcc.ch/report/sixth-assessment-report-cycle/>

ALTIERI, Andrew H.; GEDAN, Keryn B. Climate change and dead zones. *Global change biology*, v. 21, n. 4, p. 1395-1406, 2015.

BROWN, Christopher J. et al. Interactions between global and local stressors of ecosystems determine management effectiveness in cumulative impact mapping. ***Diversity and distributions***, v. 20, n. 5, p. 538-546, 2014.

CHANGE, IPCC Climate et al. Mitigation of climate change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, v. 1454, 2014.

CELIS-PLÁ, Paula SM et al. Macroalgal responses to ocean acidification depend on nutrient and light levels. *Frontiers in Marine Science*, v. 2, p. 26, 2015.

EDENHOFER, Ottmar (Ed.). **Climate change 2014: mitigation of climate change**. Cambridge University Press, 2015.

KABISCH, Nadja et al. Nature-based solutions to climate change mitigation and adaptation in urban areas: perspectives on indicators, knowledge gaps, barriers, and opportunities for action. ***Ecology and Society***, v. 21, n. 2, 2016.

O'NEILL, Brian C. et al. IPCC reasons for concern regarding climate change risks. ***Nature Climate Change***, v. 7, n. 1, p. 28-37, 2017.

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URRY, John. Climate change and society. In: *Why the social sciences matter*. Palgrave Macmillan, London, 2015. p. 45-59.

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WERNBERG, Thomas et al. Impacts of climate change in a global hotspot for temperate marine biodiversity and ocean warming. **Journal of experimental marine biology and ecology**, v. 400, n. 1-2, p. 7-16, 2011.

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