

STUDY GUIDE

Innovative Methods to Assess the Distribution of Marine Ecosystems

Originally developed in the context of Creative Commons education materials created by the TRASMARES ERASMUS+ project (2019-1-ES01-KA203-065536, "Specialized training on applied tools for sustainable marine ecosystems"), coordinated by the University of Cantabria (UC).

Organised by

University of Cantabria (UC)

1. IDENTIFYING DATA.		
• Course Name.	Innovative methods to assess the distribution of marine ecosystems.	
• Coordinating University.	University of Cantabria (UC)	
• Partner Universities Involved.	-	
• Course Field(s).	Sustainability	
• Related Study Programme.	Transdisciplinary course, open to students from any study programme.	
• ISCED Code.	051101. Biology 053201. Marine sciences 071201. Environmental engineering 073202. Civil engineering	
• SDG.	SDG 04. Quality education SDG 13. Climate action SDG 14. Life below water	
• Study Level.	MECU 7 (Master or 240 ECTS Degree)	
• EUNICE Key Competencies	Problem solving	Moderately
	Teamworking	NOT AT ALL
	Communication	NOT AT ALL
	Self-management	Strongly
	Cognitive flexibility	NOT AT ALL
	Digital competence	Strongly
	Technical competence	Strongly
	Global intercultural competence	NOT AT ALL

• Number of ECTS credits allocated.	2 ECTS.
• Mode of Delivery.	Online self-study.
• Language of Instruction.	English, with subtitles in Spanish, Italian and Portuguese
• Course Dates.	03.10.2025 – 19.12.2025 (October 3 rd , 2025 – December 19 th , 2025).
• Precise Schedule of the Lectures.	The course can be attended from the beginning of October until the mid of December 2025 at any time. Course materials and assessment forms are fully online and can be checked at any point. Lectures are asynchronous and can be reviewed at any time.

• Key Words.	Coastal ecosystems, structural and functional diversities, ecosystem services, zonation profiles, distribution of species, modelling.
• Catchy Phrase.	The sustainability of coastal ecosystems requires a basic understanding of their distribution, processes and functions.

• Prerequisites and co-requisites.	No previous requirements established.
• Number of EUNICE students that can attend the Course.	Unlimited.
• Course inscription procedure(s).	Course inscription through the EUNICE MOOC platform available here. The course is free of charge.

2. CONTACT DETAILS.

• Department.	Environmental Hydraulics Institute (IHCantabria).
• Name of Lecturer.	Prof. José A Juanes (Coordinator) Dr. Elvira Ramos (Director)
• E-mail.	juanesj@unican.es ramose@unican.es
• Other Lecturers.	<p>Academic staff from UC-IHCantabria in charge of this course:</p> <ul style="list-style-type: none"> • Prof. Araceli Puente • Dr. Bárbara Ondiviela • Dr. Camino Fernández • Dr. Cristina Galván • Dr. Inés Mazarrasa • Dr. María Recio • Dr. Samuel Sainz <p>International advisors from TRASMARES project:</p> <ul style="list-style-type: none"> • Prof. Laura Airoidi (University of Padova) • Dr. Joao Neto (University of Coimbra) <p>External contributors of CC materials from the TRASMARES project:</p> <ul style="list-style-type: none"> • Dr. Joanne Wong (freelance environmental consultant) • Prof. Federica Constantini (University of Bologna) • Prof. Sonia Silvestri (University of Bologna) • Prof. Eva Turicchia (University of Bologna) • Prof. Massimo Ponti (University of Bologna)

- Dr. José M. Álvarez (University of Oviedo)
- Dr. Felipe Fernández (freelance IT consultant)

3. COURSE CONTENT.

Teaching materials of this MOOC were co-created, under creative commons licence, in the TRASMARES project “Specialized training on applied tools for sustainable marine ecosystems”, funded by the EU ERASMUS+ programme (2019-1-ES01-KA203-065536, 2019-22) and developed through the collaboration of academics and researchers from the Institute of Environmental Hydraulics of the University of Cantabria, coordinator of the project, the University of Bologna and the University of Coimbra.

The course reviews the main characteristics of the different coastal ecosystems, explaining the concept of diversity and the different approaches to characterise the different species, as well as their spatial and temporal distribution. It also introduces the ecosystem services paradigm; clarifies the concepts of their functions, services and benefits; and shows the different ways to classify and quantify them. In addition, students can learn the direct and indirect approaches to characterising the distribution of ecosystems. In this way, students acquire a broad understanding of the most innovative methodologies and tools available for determining the distribution and functions of coastal ecosystems.

4. LEARNING OUTCOMES.

- Students will know the main structural and functional characteristics of coastal ecosystems.
- Students will discover how to characterise and evaluate the most important coastal ecosystem services.
- Students will learn different traditional and innovative techniques to quantify the current and potential distribution of communities and species.

5. OBJECTIVES.

This course aims at learning the most representative coastal ecosystems, their characteristics, functions and services, and the approaches currently used to analyse their distribution.

6. COURSE ORGANISATION.

UNITS

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| 1. | Introduction to marine ecosystems. |
| 2. | Marine ecosystems characterization. |
| 3. | Functions, services and benefits of marine ecosystems. |

4.	Direct approaches to characterise the distribution of ecosystems.
5.	Indirect approaches to characterise the distribution of ecosystems.
LEARNING RESOURCES AND TOOLS.	
The learning resources and assessment tools of the course are available at the EUNICE Moodle platform.	
PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.	
<p>Students will have access to video materials, written course contents, and automatic online evaluation tests in EUNICE Moodle online environment. Students can review the materials and do the assessments at their own pace during the period of course delivery since. The course is asynchronous and can be reviewed at any time. Students' activity in EUNICE Moodle is expected to consist of the following:</p> <ul style="list-style-type: none"> • Watching the video materials available on the course site. • Reading and familiarisation with the text materials available on the course site. • Taking the evaluation tests that measure students' knowledge and skills in content areas. <p>The course is completed by independently working and by taking the exams which consists of multiple-choice questions covering the course topics. The course is graded "passed" or "failed".</p> <p>As an additional optional activity, each sub-topic will have a forum for students to share their questions, discussions or doubts. It will be moderated by the UC-EUNICE Office, with input from professors when necessary. All students are free to participate and post their queries.</p>	

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

To complete the course, you must:

- View the materials in each Module, going through all Sub-Topics.
- Correctly answer at least 50% of each of the Automatic Online Assessments.
- Complete the post-survey of the course. This will take approximately 3 minutes. We need the data to issue your Certificate (free of charge) and for justification purposes.

Upon fulfillment of the course completion criteria, you will be able to download the Course Certificate directly from EUNICE Moodle platform.

OBSERVATIONS.

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

Specific lectures, videos, and tools are provided by the professor.