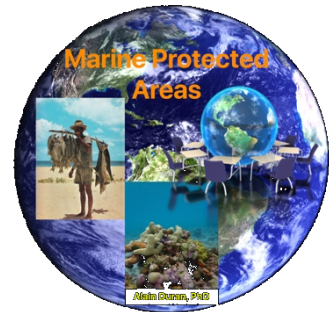


**MARINE RESERVES PCB 4467-C
ADVANCED MARINE RESERVES PCB 5418-C**

Online live (COIL)

A Global Learning Course



Instructor

Dr. Alain Duran (FIU)

Dr. Ileana Ortegon-Aznar (UADY)

Office hours: _____; contact via **email at alduran@fiu.edu** to schedule a meeting.

Semester: _____

Successful completion of General Biology I and II is a prerequisite.

Required textbook:

Marine Protected Areas: tools for sustaining ocean ecosystems. National Research Council, National Academy Press. Washington D.C. 2001. 272 p. ISBN: 0-309-07286-7.

Provided by the instructor. (Here on NRC-MPA)

Salm, R. V., J. R. Clark, and E. Siirila. 2000. Marine and coastal protected areas. A guide for planners and managers. Third Edition. IUCN. Washington D.C. xxi: 371 p. **Provided by the instructor. (Here on IUCN-MCPA)**

Examples of complementary books (*several other marine biology books can be used as a complementary information source*)

Castro, P. and M. Huber. (7th-9th editions). Marine Biology. McGraw-Hill Publishing Company. ISBN 978-0073524207.

Speight, M. and P. Henderson. 2010. Marine Ecology. Concepts and applications. Wiley-Blackwell. 276 p. ISBN 978-1-4051-2699-1 (hardcover) or ISBN 978-1-4443-3545-3 (pbk).

Introduction

Coastal zones, particularly the Caribbean region, are well-known for their beautiful beaches and complex ecosystems. The highly rapid tourist development, accompanied by high population

growth, has modified the human and biological communities' structure, causing significant adverse environmental impacts on our marine resources. Coastal problems are also affected by local, regional, and global stressors that need to be incorporated into any analysis. Therefore, managing these resources has become a need and a challenge. The goal of establishing Marine Protected Areas (MPA) is to protect the fisheries, ecosystems, and the biodiversity of highly affected or threatened areas or species and benefit the dependent human communities and their cultural values. Knowledge of social concepts such as co-management, respect for native cultures, and property rights; biological concepts, such as connectivity, food web size and networks, the demography of threatened species, and monitoring are essential for the design and management of a successful MPA. These activities are complex, and only well-trained people with global awareness and perspective will handle the different challenges of the design, establishment, and management of an MPA.

Course description

The course employs active learning strategies to increase students' global awareness, global perspective, and global engagement attitude. Global perspectives will be achieved through lectures and different learning strategies that will provide information on biological and sociological concepts and methods for designing and managing marine protected areas around the globe.

Class Objectives (CO)

By the end of the semester, the students will be able to:

- CLO1. Describe direct and indirect human stressors impacting marine biodiversity
- CLO2. Discuss the value of biodiversity and relate bio-social-eco aspects of sustainability
- CLO3. Explain the most important global oceanographic processes governing the distribution and functioning of marine environments
- CLO4. Describe the biological composition and the interactions with physical factors of common marine ecosystems found within MPAs
- CLO5. Illustrate how oceanographic and ecological processes influence MPA functioning
- CLO6. Evaluate the level of public environmental awareness/understanding
- CLO7. Relate the impact of fisheries marine ecosystem and the need for MPAs
- CLO8. Describe the benefits, approaches, and challenges of integrated coastal zone management
- CLO9. Explain the principles and justification for creating and designing MPAs as an effective conservation approach to marine resources
- CLO10: Recognize the social, cultural, and economic complexity of different approaches in conservation biology
- CLO11: Describe the need for community engagement and a multi-cultural education program in conservation biology
- CLO12: Critically analyze MPA management taking into biological, social, political, cultural, and economic aspects

Provide students with a global perspective by analyzing multiple marine protected areas around the globe. Particular emphasis will be on South Florida and the Caribbean worldwide.

Global Learning Outcomes

1. Through the study of Marine Protected Areas, you will be able to demonstrate knowledge of the interrelatedness of social concepts such as co-management, respect for native cultures, and property rights; and biological concepts, such as diversity, fisheries, connectivity, food webs, and coral reef networks at local, and global scales.
2. Through the analysis of case studies, you will be able to develop an in-depth analysis of a Marine Protected Area. Each study will describe an MPA and evaluate the status of the selected MPA. You will analyze how active the management of the selected MPA is; you will detect gaps and strengths of that particular Marine Protected Area and if it is worth the MPA label.
3. In lab sessions, you will create conceptual maps that will increase your understanding and awareness of the marine environment's functioning and threats. You will be able to engage and propose a solution by participating in a town hall meeting to solve real problems faced by Marine reserves. You will be able to demonstrate your willingness to engage in local problem-solving solving and interact with different cultural sectors.

This course has lecture (50%) and laboratory (50%) sections, which are complementary; thus, performance is equally important.

Lecture section

Through lectures, guest speakers, and readings, the students will get acquainted with the biological, economic, and social aspects of MPAs'. Integrative analysis of domestic and international (from different countries and cultures) MPAs will provide the student with opportunities to understand the diversity of issues involved in MPAs while reasoning the importance of a global approach as they get exposed to distinct stakeholders' perspectives.

Two midterm exams (20% each) will make up 40% of the lecture portion. Questions for quizzes and exams can take any format (from multiple choice to short answer questions).

Laboratory section

The lab section is an interactive (question-answer/discussion, and in-depth analyses of scientific research) via ZOOM, and all students must "attend" (connect). A video camera is not mandatory, but it is highly recommended to promote a dynamic interaction during the class.

Lab sections are designed to complement the material covered in lectures with actual examples and provide the students with the opportunity to conduct independent (small) research projects. You are expected to complete weekly tasks, read and discuss scientific papers and actively participate in lab exercises such as simulated townhall meetings, design, and create monitoring programs of MPAs. Please, check the schedule at the end of the syllabus and make sure you do not have conflicts that prevent you from participating in these activities. Each lab's evaluation will be partially dependent on the corresponding quiz (10%), which is based on the readings. 15% of the lab grade is based on in-class lab activities, 15% lab assignments, and the other 20% is gained by completing the final project. Notice, there is not making up for any of the lab evaluations. Thus, fail to turn in your work on time or missed the lab will result in grade 0.

Class grading break up the table

Evaluation	Percentage	Description
Partial Exam 1	20	Exam with multiple-choice and short answer questions evaluation of all the material (readings and lectures) covered up to week 6)
Partial Exam 2	20	Exam with multiple-choice and short answer questions evaluation of all the material (readings and lectures) covered up from week 7 to week 14)
Quizzes	10	Weekly quizzes from week 2 to week 11 (n=10). Quizzes are multiple-choice and short answer questions evaluating the materials covered in the PREVIOUS lecture and lab (including readings, lab discussion, and assignments) and the CURRENT week reading. For example, quiz 2 will evaluate the material covered in lectures 1a and 1b, lab 1, and the reading for lab 2 discussion. Remember that lectures and lab are complementary.
In-class lab activities	15	
Lab assignments	15	<ol style="list-style-type: none"> 1. Explore local MPAs (Ind. submission, 2%) 2. Interview (Ind. Submission, 2%) 3. Elaborate biological conceptual map (team submission, 1%) 4. Video analysis (team submission, 1%) 5. Global footprint calculations (team submission, 3%) 6. Elaborate user consequence map (Team submission 1%) 7. Stakeholder list (Team submission, 2%) 8. Zonation exercise (Team submission, 2%) 9. Monitoring exercise (Team submission, 2%) 10. Townhall meeting II (Team submission, 4%)
Final project	20	Written document (10%) Oral presentation (10%)

GRADING SCALE

- You will be evaluated based on lecture and lab activities.
- Grade scale: A: 90-100%, B: 80-89%, C: 70-79 D: 60-69%, F:<60%.

Recovery missed exams policy

Given the hybrid Format, students have the week in its entirety to complete the assignments. Thus, no make-up will be allowed except for well-justified cases that missed the exam. In that case, make-up exams will be taken orally. Notice that the lab encompasses several Team activities and weekly discussions. **YOU ARE RESPONSIBLE FOR COORDINATING WITH YOUR PEERS AND WORKING IN A TEAM.**

**PLEASE BE RESPECTFUL WITH YOURSELF, YOUR PROFESSOR,
AND YOUR PEERS**

Instructor Communication: All instructor communication and announcements will be via email and the course's CANVAS section. Only students' FIU email addresses will be used. If students do not use their FIU email account, use the easy-to-set-up automatic mail forwarding option to the email account you regularly use.

Students must maintain an active FIU email account and observe the "News" web page. All emails from students must contain "PCB 4467C, or PCB 5418C" or "MPA course," or "Marine Reserves course" in the subject line; student emails without proper subject line and the student's **name** will **not** be answered! Emails returned due to "over quota" email accounts will not be re-sent.

Sexual harassment policy: FIU is committed to eliminating sexual harassment. Per the FIU Faculty Senate guidelines, this syllabus warns that any misconduct will be reported.

Academic misconduct: FIU is committed to not tolerating any academic misconduct by students. Per the FIU Faculty Senate guidelines, this syllabus warns that any academic misconduct, particularly cheating in exams, will be reported and penalized.

**ALWAYS STAY INFORMED!
FOR MORE INFORMATION AND UPDATES, CHECK OUT THE COURSE CANVAS
SITE**

Marine Protected Areas. Fall 2020 Schedule (Lecture + Laboratory)				
Date	Module	Topic	Lecture activity	Lab activity
August				
Jan 9 – Jan 15	1	Introduction to conservation biology and the need for marine protected areas. MPA class introduction and the global learning approach	Lecture 1 (video-lecture 1) Readings <ul style="list-style-type: none"> • NRC-MPA textbook: chapters 1 and 2 (pages 10-30) • Scientific article: Rebuilding marine life (Duarte et al. 2020) 	In-class activities (Jan 13) <ul style="list-style-type: none"> • Get to know each other. • Introduction to the lab, including the final project • Form groups select region/ecosystem to work. To be submitted (Ind.) <ul style="list-style-type: none"> • What is your relationship with the ocean? (video)

Jan 16 – Jan 22	2	Value of Biodiversity, nature conservation, and associated philosophical and ethical issues	<p>Lecture 2 (video-lecture 2)</p> <p>Readings</p> <ul style="list-style-type: none"> IUCN-MCPA textbook: part 1 (pages 13-35) Scientific article: Scientific results to support the sustainable use and conservation of marine life 	<p>Module 2. Quiz 1</p> <p>In-class activities (Jan 20)</p> <ul style="list-style-type: none"> Discussions of both papers <p>To be submitted (Ind.)</p> <ul style="list-style-type: none"> How much do we know about our local MPAs? Interview assignment (excel)
Jan 23 – Jan 29	3	The marine environment	<p>Lecture 3 (video-lecture 3)</p> <p>Readings</p> <ul style="list-style-type: none"> NRC-MPA textbook: Chapter 5 (pages 71-96) Scientific article: The central importance of ecological spatial connectivity to effective coastal marine protected areas and to meeting the challenges of climate change in the marine environment (Carr et al. 2017) 	<p>Module 3. Quiz 2</p> <p>In-class activities (Jan 27)</p> <ul style="list-style-type: none"> Discussion of interview assignment and assigned readings <p>To be submitted (Team)</p> <ul style="list-style-type: none"> Global footprint estimation? (Excel)
Jan 30 – Feb 5	4	Structure and function of marine ecosystems. (Estuaries, Mangroves, Rocky Shores, and Beaches)	<p>Lecture 4 (video-lecture 4)</p> <p>Readings</p> <ul style="list-style-type: none"> Marine and Coastal Protected Areas (IUCN) Part II. Protected areas for lagoons and estuaries (pages 185-197), Protected Areas for Beaches (pages 231-238). Case examples: Negombo Lagoon (CZM-MPA page 255) and Boca Grande Key (page 253) Protected Areas for Beaches (pages 231-238), Scientific article: The value of estuarine and coastal ecosystem services (Barbier et al. 2011) 	<p>Module 4. Quiz 3</p> <p>In-class activities (Feb 3)</p> <ul style="list-style-type: none"> Discussion of Global Footprint results and assigned readings <p>To be submitted (Team)</p> <ul style="list-style-type: none"> Estimate of local boat density? (Excel)

Feb 6 – Feb 12	5	Structure and function of marine ecosystems II. (Seagrass beds, Coral reefs, and kelp forest)	<p>Lecture 5 (video-lecture 5)</p> <p>Readings</p> <ul style="list-style-type: none"> • Marine and Coastal Protected Areas (IUCN) Part II. Protected areas for coral reefs (pages 161-172), Protected Areas for small islands (pages 209-218). Case examples: Florida Keys: Distant Influence on Coral Reefs (page 2271) and Chumbe Island: Experiences of a private Marine Conservation Project (page 265) • Scientific article: Coral reef management and conservation in light of rapidly evolving ecological paradigms (Mumby and Steneck 2008) 	<p>Module_5. Quiz_4</p> <p>In-class activities (Feb 10)</p> <ul style="list-style-type: none"> • Discussion of Boat density results and assigned readings <p>To be submitted (team)</p> <ul style="list-style-type: none"> • Elaborate biological conceptual map (work)
Feb 13 – Feb 19	6	The open ocean, conventional management of fisheries	<p>Lecture 6 (video-lecture 6)</p> <p>Readings</p> <ul style="list-style-type: none"> • NRC-MPA textbook: Chapter 3 (pages 30-41) • Scientific article: Climate change impacts on the biophysics and economics of world fisheries (Sumaila et al. 2011) 	<p>Module_6. Quiz_5</p> <p>In-class activities (Feb 17)</p> <ul style="list-style-type: none"> • Discussion of biological conceptual map <p>To be submitted (team)</p> <ul style="list-style-type: none"> • Consequence Map. Make a list of all the stakeholders (users) in your MPA and their relationship with the MPA. Include them in your biological conceptual map indicating their effect on MPA resources
Feb 20 – Feb 26	Exam 1			

Feb 27 – Mar 4	NO class (Spring Break)			
Mar 6 – Mar 12	7	Integrated coastal zone management - MPA	<p>Lecture 7 (video-lecture 7)</p> <p>Readings</p> <ul style="list-style-type: none"> • IUCN-MCPA textbook: Part I (pages 37-43) • Scientific article: Challenges and opportunities in promoting integrated coastal zone management in Algeria: demonstration from the Algiers coast (Khelil et al. 2019) <p>Extra reading</p> <ul style="list-style-type: none"> • Overview of ICZM 	<p>Module 7. Quiz 6</p> <p>Virtual Laboratory 7</p> <p>In-class activities (Mar 10)</p> <ul style="list-style-type: none"> • Discussion of consequence map • 1st Townhall meeting To be submitted (team) • A list of all stakeholders involved with your research MPA
Mar 13 – Mar 19	8	Types and design of MPAs	<p>Lecture 8 (video-lecture 8)</p> <p>Readings</p> <ul style="list-style-type: none"> • IUCN-MCPA textbook: Part I (pages 43-62) • NRC-MPA textbook: Chapter 6 (pages 97-125) • Scientific article: Designing MPA networks to address the impacts of Climate Change (McLeod et al. 2009) <p>Extra reading</p> <ul style="list-style-type: none"> • Definitions and classification system for U.S Marine Protected Areas • Guidelines for applying the IUCN protected area management categories to MPA 	<p>Module 8. Quiz 7</p> <p>In-class activities</p> <ul style="list-style-type: none"> • Revision of stakeholder list <p>To be submitted (team)</p> <ul style="list-style-type: none"> • Zonation exercise
Mar 20 – Mar 26	9	Monitoring of MPAs	<p>Lecture 9 (video-lecture 9)</p> <p>Readings</p> <ul style="list-style-type: none"> • NRC-MPA textbook: Chapter 7 (pages 126-144) 	<p>Module 9. Quiz 8</p> <p>In-class activities</p> <ul style="list-style-type: none"> • Discussion of zonation exercise <p>To be submitted (team)</p>

			<ul style="list-style-type: none"> Scientific article: Adaptive management of the GBR (McCook et al. 2010) 	<ul style="list-style-type: none"> (instruction for second townhall meeting)
Mar 27 – Apr 2	10	Management of MPAs	<p>Lecture 10 (video-lecture 10)</p> <p>Readings</p> <ul style="list-style-type: none"> IUCN-MCPA textbook: Part I (pages 121-129) NRC-MPA textbook: Chapter 4 (pages 43-70) Scientific article: The worldwide costs of marine protected areas. Balmford et al. 2004 <p>Extra reading</p> <ul style="list-style-type: none"> Limits of acceptable change (Stankey et al. 1984) Assessing carrying capacity on coral reefs (Estrada et al. 2004) 	<p>Module_10. Quiz_9</p> <p>In-class activities</p> <ul style="list-style-type: none"> Second townhall meeting <p>To be submitted (team)</p> <ul style="list-style-type: none"> Instructions for the monitoring exercise <p><i>Final project (written documents – Apr 2nd)</i></p>
Apr 3 – Apr 9	11	Community engagement and education	<p>Lecture 11 (video-lecture 11)</p> <p>Readings</p> <ul style="list-style-type: none"> IUCN-MCPA textbook: Part I (pages 65-80) NRC-MPA textbook: Chapter 4 (pages 66-70) Scientific article: Integrating environmental education in marine protected areas management in Colombia (Zorrilla-Pujana and Rossi 2014) 	<p>Module_11. Quiz_10</p> <p>In-class activities</p> <p>Submission of monitoring exercise</p> <p>To be submitted (team)</p> <p><i>Final project (oral presentations) Day 1</i></p>
Apr 10 - Apr 16	12	Historical background and legal framework of MPAs	<p>Lecture 12 (video-lecture 12)</p> <p>Readings</p> <ul style="list-style-type: none"> IUCN-MCPA textbook: Part I (pages 131-157) NRC-MPA textbook: Chapter 8 (pages 145-173) 	<p>In-class activities</p> <p><i>Final project (oral presentations) Day 2</i></p>

			<p>Readings Scientific article: Traditional Marine Conservation Methods in Oceania and their demise. (Johannes 1978)</p> <p>Extra reading</p> <ul style="list-style-type: none"> • Marine Ecology: Reserves do have a key role in fisheries. Callum Roberts • Historical development of fisheries Science and Management (NOAA) 	
Apr 17 – Apr 23	13	Study cases	<p>Lecture/video</p> <ul style="list-style-type: none"> • Gardens of the Queen • California • British Columbia • Hawaii 	<p>In-class activities <i>Final project (oral presentations) Day 2</i></p>
Apr 24 – Apr 29	Exam 2			

The email you received before the beginning of the semester

If you are receiving this email, you have enrolled in my hybrid class of Marine Reserves. So, informally, welcome to the course. As you all know, this 4-credits (Global Learning) class includes weekly lectures and in-person laboratory discussions/work. The lessons and independent assignments can be completed within the week (preferably early in the week); however, for the in-person lab, you must be present. More details about the in-person lab tasks will be provided at the beginning of the semester. Still, in general, we (me included) will discuss your readings, your independent work results, and others.