

## Minicourse: Ecosystem Service Provision and Evaluation

**Delivery: hybrid (in person/online) lessons, and in person field sessions**

### Programme:

Date	Topic	Staff
23 <sup>rd</sup> November 2022 9:00am – 11:00am	Introduction to module and background information (2 hours) Sala de Reunião – 3 <sup>o</sup> andar do Condomínio de Empreendedorismo e Inovação, Campus do Pici	Raymond Ward
24 <sup>th</sup> November 2022 9:00am – 17:00pm	Field session Rio Coco (from Labomar base*). Rio Coco trails, history, background, current state and ecosystem services provided for the city (4 hours). Rio Coco Sabiaguaba (dunes and mangroves, 4 hours). Ecosystem assessment of the local area (carbon and pollutants). (Total 8 hours)	Raymond Ward
25 <sup>th</sup> November 2022 9:00am – 17:00pm	Field session Rio Pacoti (from Labomar base*). Move along upriver background to the site, historical land use and recent changes. Comparison with adjacent ecosystems, how can we put a value on nature? (4 hours). Head back to coast to look at an ecosystem assessment of the beach coastal zone. How does this compare with the mangroves or the dunes from a natural ecosystem perspective, level of degradation/alteration and the value it provides to local communities. (Total 8 hours)	Raymond Ward
26 <sup>th</sup> November 2022 9:00am – 11:00am	Online class. How can we calculate the economic value of the ecosystem services provided by the ecosystems visited? What are the obvious and what are the hidden values? (2 hours)	Raymond Ward

**\*Note: The shuttle leaves from Labomar UFC.**

**Timetabling support administration** CEA/EIDEIA

**Teaching Staff:** Dr Raymond Ward (RW),

**Minicourse co-ordinator:** Dr Raymond Ward [r.d.ward@brighton.ac.uk](mailto:r.d.ward@brighton.ac.uk).

This course is available for final year undergraduate, MSc, PhD and above from the fields of natural and social sciences and engineering with an interest in ecosystem service provision in coastal environments.

## Aims and Learning Outcomes

<b>Module Content</b>
This is a field module extending over two working days (including fieldwork, data analysis and discussion) in Fortaleza, with additional time for class study at campus do Pici. The module provides an opportunity to undertake a period of intensive study and science based skills training in a field environments. An element of guided study and training will be combined with work in small groups. Students will be trained in a range of field observation, data-recording and survey methods applicable to environmental assessments. The development of critical evaluation of literature will constitute an important part of the learning process.
<b>Module Aims</b>
<ul style="list-style-type: none"><li>• To provide students an opportunity to understand and investigate different physical and environmental systems in tropical environments;</li><li>• To provide training in a range of science-based field skills;</li><li>• To provide skills in the assessment of ecosystem services</li></ul>
<b>Module Learning Outcomes</b>
At the successful completion of the module, students will be able to: <ol style="list-style-type: none"><li>1. demonstrate an advanced understanding of different physical and environmental systems in tropical environments;</li><li>2. collect and record environmental data and apply appropriate analytical techniques within a research context;</li><li>3. demonstrate a critical approach to environmental data, recognising potential sources of bias and error;</li><li>4. research a theme, appropriate to the field course location, and evaluate the value of the ecosystem service researched</li></ol>

## Minimum Requirements

Students must meet at least 16 hours of attendance.

## Assessment Information

Chmura, G. Anisfield, S., Cahoon, D. and Lynch, J. (2003) Global carbon sequestration in tidal, saline wetland soils. *Global Biogeochemical Cycles* 17: 1-11.

Clifford, N.J., French, S. and Valentine, G. (eds.) (2010) *Key Methods in Geography* (2nd Edn) (Sage: London)

Howard, J., Hoyt, S., Isensee, K., Pidgeon, E. and Telszewski. (2014). *Coastal Blue Carbon*. Blue Carbon Initiative, Australia.

Jones, A., Duck, R., Reed, R. and Weyers, J. (2000): *Practical Skills in Environmental Science*. (Prentice-Hall: Harlow).

Parsons, T. and Knight, P.G. (2005): *How To Do Your Dissertation in Geography and Related Disciplines* (2/e). (Routledge: London). Available as an eBook.

Spalding, M. (2011) *World Atlas of Mangroves*. Cambridge University Press, UK.

Ward, R.D., Friess, D., Day, R. and MacKenzie, R. (2016). Impacts of climate change on mangrove ecosystems: a region by region overview. *Ecosystem Health and Sustainability* 2(4): 1-25.

Ward, R.D. (2020). Carbon sequestration and storage in Norwegian Arctic coastal wetlands: Impacts of climate change. *Science of the Total Environment*. 748: 141343.

## **Food & Water**

Make sure you bring food and water for the field days. We will try to find a suitable place to purchase food on the day.

### **Bring the following:**

- Notepad / Writing equipment (pencil preferred for the field)
- Water bottle (absolutely essential)
- High protection sunblock/sun cream (absolutely essential)
- Mosquito repellent (absolutely essential)
- Any essential personal medication
- Appropriate clothing
- Sunhat (absolutely essential)
- Appropriate footwear; - ideally something that will protect you from the sun and anything that may cut your feet, plus which you don't mind getting dirty (e.g. mangrove muds and sandstone platforms).