A Practical Introduction to Ecological Modelling
13th-15th July 2016
Life Sciences building (room G08), University of Bristol

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Marine ecosystems and their environment are strongly interdependent. Biological production and the subsequent transformation and transport of organic matter regulate the physical and chemical environment, which in turn feeds back on biological communities and their productivity. Past and future changes in the Earth system therefore need to be understood in terms of these two coupled systems.

This summer school will address key aspects of marine ecosystems and their role in the Earth system. In particular, we will focus on the links between the structure and biogeochemical function of marine microbial communities in the framework of a coupled Earth system and marine ecosystem model. Questions we will investigate include:

- What are the key links between plankton community structure, biogeochemical function and climate?
- How can the holistic system response be constrained by contemporary physiological and biogeochemical data?
- What techniques are available in terms of modelling the key dynamics of marine ecosystems?

The course will be taught by experts in ecology, biological oceanography, and Earth system science, from cellular to global scales. A central objective will be to introduce the current state-of-the-art, and to identify exciting new directions for ongoing research.

Food and refreshments will be provided on all days. There will be a vaguely organised outing to the pub on Wednesday evening for beer/food (is there a difference?). Thursday evening is more ‘free-form’.

The summer school will take place in the Life Sciences Building which is on 24 Tyndall Avenue, BS8 1TQ (see attached maps). There will be a porter at the entrance to let you in. The lectures will take place in G13/G14 and the computer room (which is next door) is G08.
Day 1 (Wednesday 13th July) – Introduction to Earth system modelling

START (9 am)
09:00-12:30 Practical Session – Introduction to the ocean carbon cycle in GEnIE (Andy Ridgwell)
12:30-13:30 LUNCH
13:30-14:15 Lecture – Processes and patterns of oceanic nutrient limitation (Mark Moore)
14:15-15:00 Lecture – The biological carbon pump: magnitude, variability and controls (Steph Henson)
15:00-15:15 COFFEE
15:15-17:00 Practical Session – More fun with GEnIE (Andy Ridgwell)
17:00-17:45 Lecture – Ocean biogeochemistry and the silicon cycle (Kate Hendry)
END (ca. 6 pm) (+ pub meal)

Day 2 (Thursday 14th July) – Ecological modelling

START (9 am)
09:00-09:45 Lecture – Pelagic diversity and biogeography (Pincelli Hull)
09:45-10:30 Lecture – Phytoplankton cell size, metabolism and community structure (Emilio Maranon)
10:30-10:45 COFFEE
10:45-11:30 Lecture – Resource competition theory (Chris Klausmeier)
11:30-12:15 Lecture – Plankton traits and the ecological niche (Elena Litchman)
12:15-13:15 LUNCH
13:15-14:00 Practical Session – Modelling marine ecosystems and the biological pump (Ben Ward)
14:00-18:00 Practical Session – Ecosystems in GEnIE (Ben Ward)
END (ca. 6 pm) (+ pub?)

Day 3 (Friday 15th July) – Project work

START (9 am)
09:00-09:45 Lecture – Past changes in ocean biogeochemistry (Fanny Monteiro)
09:45-16:00 Practical Session – Ecosystems in GEnIE [student projects]
END (ca. 4 pm)
fun (workshop venue)

(Life Sciences building, room G08)

here be dragons
(and trains that don’t run on time)

other transport related dragons

accommodation (Clifton Hill treehouse)