

Cross-Institute Programme for Sustainable Soil Function

SoilCIP

Newsletter for February 2007

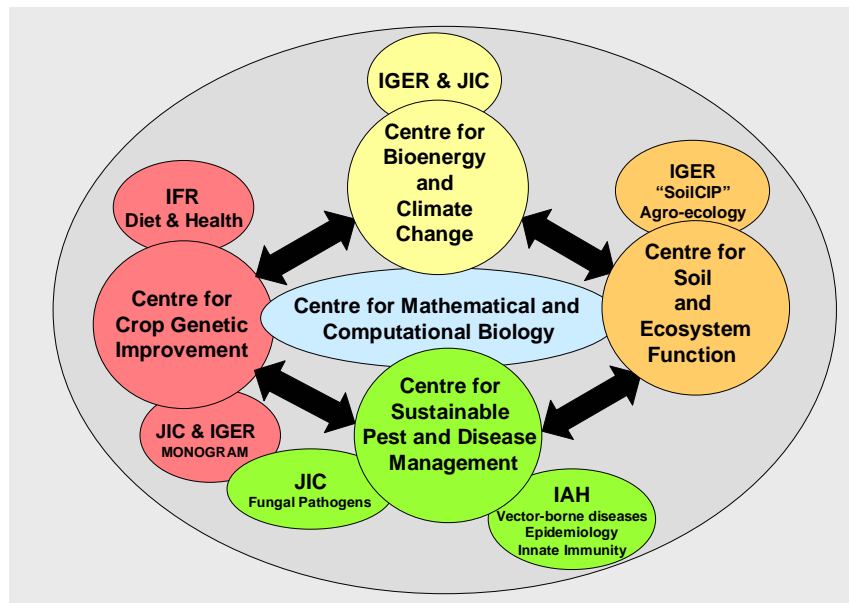


New institute structures

As I'm sure you know, BBSRC Council has announced its preferences for future institute structures. Its view is that North Wyke should be run as part of Rothamsted, " but with protection of its scientific remit and UK-wide collaborations, especially with IGER ". Details can be seen at:

http://www.bbsrc.ac.uk/news/articles/07_inst_gov.html

At the same time, Rothamsted is moving towards a new research structure, a summary diagram of current plans is below.



I discussed both these issues with the North Wyke SoilCIP team on my recent visit; Les Firbank will be discussing them with the Rothamsted Board next week. It is likely that two teams, one for science and one for administrative matters, will be put together from Rothamsted and North Wyke to take the changes forward. As part of the ongoing discussions, several senior Rothamsted staff are planning to visit North Wyke with me on 19th April, when I'll be there for David Powlson's Stapledon Lecture.

New SoilCIP members

Dr Lesley Ogilvie joined the SoilCIP team on 1st February to work on a three-year BBSRC project entitled 'Long-term Impacts of Heavy Metals on Soil Microbial Diversity, Numbers and Function', (grant no. D002990/1). Lesley's experience is as a molecular ecologist, most recently using metagenomics to investigate bacterial genes involved in the nitrogen cycle. She will be working with Steve McGrath, Penny Hirsch, Fangjie Zhao and Ian Clark. Work will focus on three contrasting bacterial groups which have important functions in soils and determine the relationships between their population size, diversity and functions, and environmental exposure. A range of molecular (q-PCR, 16S rRNA, DGGE, specific functional gene primers, BrdU incorporation for native population analyses) and conventional techniques will be used to quantify the numbers, diversity and function of these groups across gradients of chronic Zn and Cu exposure, derived from unique field experiments, including soils from the National Sewage Sludge Trials. Chemical measurements of soils and soil solutions and the latest speciation modelling methods will be employed to determine the environmental exposure associated with any microbiological changes.

New grants

Murray Lark is part of a consortium led by the Macaulay institute that has won a contract for the 'Design and operation of a UK soil monitoring scheme' (project SC060073; managed by the Environment Agency on behalf of the UK Soil Indicators Consortium). This is a one-year project in which Murray will lead the spatial modelling of available data and the quantitative assessment of alternative soil monitoring strategies. Murray writes "If we can find a good robust strategy we will be well-placed for future bids to draft SOPs and protocols, and to implement a monitoring scheme. "

Details of the Soil Indicators Consortium can be found at:

<http://www.defra.gov.uk/Environment/land/soil/research/indicators/consortium/index.htm>

Doctoral Training Grant (DTG)

David Hatch and I interviewed some excellent DTG candidates on 19th February and an offer has been made to Felicity Crotty to take up a studentship with Phil Murray, Chris Clegg, Saran Sohi, with Rod Blackshaw at Plymouth, to study 'Elucidating the relative importance of bacterial and fungal feeding channels in soil food webs under differing land managements', starting in April. We had several other good candidates but all interested in the same project - well done Phil, Chris and Saran for coming up with such a popular project! We are exploring with one of the other candidates whether they would be interested in taking up a different project for the second studentship available this year.

NERC CASE PhD studentship PM Haygarth and RE Brazier (Exeter Geography)

Phil Haygarth and Richard Brazier have won a NERC CASE studentship, one of 36 selected from 123 applications. The studentship is entitled: 'Multi-scale predictions of

soil erosion and water quality from intensively managed grasslands' The main aim of the project will be to develop a predictive tool, using a multi-disciplinary approach, which draws on laboratory, field data collection and numerical modelling techniques. Key objectives will be:

- 1) To build upon existing empirical understanding of the entrainment/mobilisation of sediments and nutrients from grassland environments.
- 2) To facilitate ongoing collection of datasets describing hydrology, sediment and nutrient dynamics at a range of scales within grassland catchments.
- 3) To incorporate existing knowledge from the literature and that gained through (1) into a parsimonious model of grassland hydrology, sediment, colloid and nutrient dynamics.
- 4) To apply and evaluate the model at a range of scales within an uncertainty framework using existing time series of data describing grassland sediment, colloid and nutrient dynamics.
- 5) To make predictions of the impact of different land management practices and climate change scenarios on the water quality of grassland environments.

Cross-Institute visits and links

University of Reading: Steve Robinson (biogeochemistry of wetland and upland soils), Chris Collins (pollutant fate, transport and remediation of soils), Liz Shaw (biodegradation and impacts of organic pollutants on soil microbes, the rhizosphere), Anne Verhoef (soil physics - heat, water vapour and CO₂ fluxes), Mark Hodson (environmental geochemistry and mineralogy of soil) and Andrew Parker (contaminated sediments and clay mineralogy) from the Department of Soil Science at Reading visited Rothamsted on 7th February to discuss common interests and future collaboration with Rothamsted SoilCIP members. Follow-up meetings are now being arranged.

Oxford Centre for Industrial and Applied Mathematics (OCIAM): On 2nd February, Phil Haygarth, Nigel Bird, Kit Macleod, Murray Lark and Helen Ougham, IGER Aberystwyth, took part in a joint BBSRC – Oxford Centre for Industrial and Applied Mathematics (OCIAM) workshop at Oxford. The aim of the workshop was to present examples of biological and biogeochemical problems that are being researched at IGER and Rothamsted and to identify key mathematical 'problems' that might lead to collaboration. Some interesting questions that arose during the discussion were:

1. Moving from systems biology to the biology of systems – dealing with heterogeneity. How are they related?
2. Can we breed a plant and determine the outward effects of plants on the environment?
3. Can we determine the pore space structure in soil and assess how this controls the microbial activity?
4. The challenges of soil structure – how to we mathematically capture that?
5. How can we best combine process models with statistical prediction?
6. How can we tailor process models to applications at different spatial scales?
7. Can we use process knowledge to infer spatial statistics?

The group agreed to collaborate and to continue to discuss opportunities, generally around the soil-plant-root-pore-scale area. Recognising that it was a 'first' time get

together for some of the BBSRC representatives, it was felt that the next step was for this grouping to meet by video conference to take a common idea forward, with the aim to draft a page or so of description of a mathematical problem. This could form the basis for some added-value collaboration, leading to a paper output as a group and a means to apply for some additional funding. A follow up meeting on a BBSRC site, probably North Wyke, will develop these ideas.

The OCIAM is at: <http://www.maths.ox.ac.uk/ociam/>

BBSRC Vacation Bursaries

Rothamsted and IGER have been awarded one Vacation Bursary each. Details are at:

http://bbsrc.mondosearch.com/cgi-bin/MsmGo.exe?grab_id=0&EXTRA_ARG=IMAGE3.X%3D10%00%26IMAGE3.Y%3D5&host_id=42&page_id=646&query=vacation%20bursaries&hiword=VACATIONS%20VACATE%20VACATED%20BURSARY%20bursaries%20vacation%20

(This must be the longest newsletter weblink yet!) The website describes the Vacation Bursaries scheme as "...a freestanding scheme that is designed to give promising undergraduates an opportunity to experience first-hand a period of time during the summer vacation in a research laboratory in a UK university or a BBSRC-sponsored research institute, to encourage them to consider a career in scientific research. " Please let me know if you decide to apply.

NERC Research Strategy

NERC has announced a consultation on its research strategy. Details are at:

<http://www.nerc.ac.uk/about/consult/strategy/>

Rothamsted will be submitting some comments but we could make a separate SoilCIP submission, encouraging work on soils and links with CEH. Please let me have your views on this and any comments on the Strategy.

CIP websites

I've agreed with Tina Barsby, manager of MONOGRAM, and Elke Anzinger, who is helping Tina to set up the MONOGRAM website, that they will use the same textured background for MONOGRAM as for SoilCIP but in a different colour, so that the CIP websites have a similar appearance.

Keith Goulding, 28th February 2007