Hello MSSANZers – this is your not-quite-Friday digest!

There are a number of announcements – headlines just below and more detail at the end of this message or attached.

Best regards and apologies for lateness! Val

- Conference session announcement - Integrated Assessment Modelling for Environmental Systems, https://www.ifac2020.org/call/open-invited-tracks/#oi72 (more information below)
- Several positions at ANU – see attached, closing on November 19th
  - Fenner School of Environment & Society, Fellow - Hydrological modelling
  - Climate Change Institute, Research Fellow - Environmental science or social sciences
  - Research School of Earth Science, Research Fellow/Fellow - Space geodesy analyst
  - Research School of Earth Science, Research Fellow/Fellow - Data assimilation analyst
  - College of Engineering and Computer Science, Research Fellow/Fellow - 3A Institute
  - Crawford School, Research Fellow/Fellow - Socio-Economics Thematic water research
- From Chaoshui Xu a 3-year postdoctoral position at Adelaide University with a major mining industry partner to deliver new methods for automating variography (https://careers.adelaide.edu.au/cw/en/job/503196/grant-funded-researcher-a-or-b-school-of-civil-environmental-and-mining-engineering)
- At Perdue University Post-Doctoral Research Associate in the Economics of Land and Water Use closing on 30 November (see below)
- Two PostDoc/ Researcher positions on "Inventories of C and N environmental N losses (e.g. GHG emissions, leaching) for managed and natural ecosystems at national to global scales" and "Biogeochemical and distributed hydrological model development and coupling" at the Karlsruhe Institute of Technology – see both below

Integrated Assessment Modelling for Environmental Systems

Which is a central topic for this community and I guess it will raise the interest of many of you.

Detailed information is available at https://www.ifac2020.org/call/open-invited-tracks/#oi72

Integrated Assessment Modelling (IAM) aims at supporting environmental managers by appraising holistic policies. It is a participative and iterative process in which scientists from different disciplines, policymakers and other stakeholders work together to merge knowledge from multiple domains (engineering, chemistry, physics, social and life sciences, economics, ...) into a single framework, generating structured information useful for policymaking. For this reason, IAM represents a route inversion with respect to a more traditional approach of science, which largely progressed by isolating and studying single domains. IAM integrates models, databases, and tools to assess and, consequently, control the behaviours and the interconnections among environmental, economic, and social systems. Interlinked models of such complex systems are a fertile source of questions for researchers working in the fields of dynamical systems and control theory. Some of these questions are classical, such as: what to measure and how to implement decisions in a chain of dynamical models; but others are very peculiar to IAM: What is the correct level of integration to effectively support decision-making? How can we integrate different sub-models into a whole that is transparent to the users, while preserving their testability and in a way that generates the necessary user confidence? Should we preferably work with a scenario approach or with a receding

horizon control? How can we effectively convey the notion of model uncertainty to the users? The open session aims at addressing some of these challenging questions. It will serve as an international forum for interaction among scientists who are interested in defining, testing, and promoting models and methods to support policies for climate change, water resources management, air quality, agriculture, and any other activity that has an impact on human life or the environment itself.

Post-Doctoral Research Associate in the Economics of Land and Water Use

Department of Agricultural Economics, Purdue University
West Lafayette, Indiana USA

NATURE OF POSITION: Multi-scale Economic Modeling of Long Run Sustainability

DATE AVAILABLE: The start date for this full-time appointment January 1, 2020. This will be an annual appointment, renewable for up to three years.

PRINCIPAL DUTIES: This position is part of Purdue's initiative in Global to Local Analysis of Systems Sustainability (GLASS) and this individual will report directly to the PI: Thomas Hertel. It will involve working with an inter-disciplinary team of researchers seeking to understand the local environmental stresses emerging as a consequence of global change, as well as the consequences of local responses to these stressors. The focus is on land and water resources used in agriculture. The economic modeling undertaken by this individual will be spatially explicit and seeks to characterize economic and biophysical relationships at the level of individual grid cells, all nested within a global economic model. Current research in this group is focused on land cover change, water scarcity, nitrate leaching, food security, agricultural productivity, climate change, and international trade. The selected applicant will be expected to publish, as well as play a leading role in research projects, and contribute to competitive grant proposals. This person will be housed in the Department of Agricultural Economics but will be involved in collaborative relationships with colleagues in the Departments of Agronomy, Agricultural and Biological Engineering, Earth and Atmospheric Sciences, Economics and Political Science, among others. There also will be opportunities to collaborate with faculty and staff in the following Centers:

- Global Trade Analysis Project
- Purdue Climate Change Research Center
- Center for the Environment

QUALIFICATIONS: The successful applicant will hold a Ph.D. in agricultural, resource or environmental economics. S/he should have research experience in computational partial or general equilibrium modeling. Prior experience handling spatially explicit data is desirable.

SALARY: Commensurate with training and experience.

APPLICATION: Applications and references may be initiated by writing to or emailing:

Holly McIntire (hcmcinti@purdue.edu)
Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University
403 W. State St., West Lafayette, Indiana 47907-2056

A complete application includes:

- cover letter describing the applicant's research interests and experience
- resume
- names, email addresses, and phone numbers of at least three references who can evaluate the applicant's qualifications for this position

The **Karlsruhe Institute of Technology (KIT)** and its I**nstitute of Meteorology and Climate Research / Atmospheric Environmental Research (KIT/IMK-IFU)** at Campus Alpin in **Garmisch-Partenkirchen**, **Germany**, invites applications for:

Full time PostDoc/ Researcher position:

"Biogeochemical and distributed hydrological model development and coupling"

The division of "Bio-Geo-Chemical Cycles" at Karlsruhe Institute of Technology (KIT) IMK-IFU in Garmisch-Partenkirchen is looking for a qualified, creative and motivated postdoc/researcher with profound programming skills and experience in the development and coupling of biogeochemical and/or distributed hydrological models.

Potential fields of work are:

- description and technical implementation (C/C++) of biogeochemical processes such as microbial (de-)nitrification, NH_3 volatilization and architectural plant fine root development into the ecosystem model framework LandscapeDNDC (http://ldndc.imk-ifu.kit.edu)
- coupling LandscapeDNDC to the distributed hydrological model CMF (https://philippkraft.github.io/cmf) in order to describe the influence of lateral transport of dissolved nutrients on C and N turnover at catchment scale

General research questions are related to the investigation of C and N transformation processes and biosphere/hydrosphere/atmosphere exchange of environmental important C and N compounds (N_2O/ NH_3/ CO_2/ CH_4/ NO_3^-/ DOC/ DON) for managed and natural ecosystems at local to catchment scales. The successful candidate is strongly encouraged to bring in and pursue own research ideas that are related to the above or other existing or upcoming projects within the research group.

Your Profile

- University degree in geosciences, physics, computer science or related fields
- Experience in biogeochemical and/or hydrologic modeling
- Advanced skills in programming with C/C++
- Experience in high-performance computing
- English language proficiency and proven ability to write scientific publications
- Strong communication and teamwork skills

We offer

- International, interdisciplinary and friendly working environment
- Large international network
- Attractive research campus at the foot of Germany's highest mountain
- The gross salary will be equivalent to the public service TV-L13, initially for the duration of three years

Applications

Applications should be sent by email to Prof Dr. Klaus Butterbach-Bahl (klaus.butterbach-bahl[at]kit.edu) and/or PD Dr. Ralf Kiese (ralf.kiese[at]kit.edu) and should include a detailed CV, including personal contact information and three references as well as a two-page research

statement addressing your specific interest, motivation and qualifications for the position. Specifically, the following points should be addressed

- What skill and abilities would you bring to the team?
- What skills and abilities would you hope to gain from working on this position? What is your specific research interest regarding agriculture and climate change?

We are looking to fill the position by the end of the year but the application will remain open until a suitable candidate has been found.

The **Karlsruhe Institute of Technology (KIT)** and its I**nstitute of Meteorology and Climate Research / Atmospheric Environmental Research (KIT/IMK-IFU)** at Campus Alpin in **Garmisch-Partenkirchen**, **Germany**, invites applications for:

Full time PostDoc/ Researcher position:

"Inventories of C and N environmental N losses (e.g. GHG emissions, leaching) for managed and natural ecosystems at national to global scales"

The division of "Bio-Geo-Chemical Cycles" at Karlsruhe Institute of Technology (KIT) IMK-IFU in Garmisch-Partenkirchen is looking for a qualified, creative and motivated postdoc/researcher with experience in terrestrial ecosystems modeling and expertise in high-performance computing and data assimilation/visualization. The successful candidate will work in a small team with a research focus on the analysis and modelling of carbon and nitrogen transformations and budgets of arable, grassland and forest ecosystems and its environmental impact. Central questions relate to the calculation of regional and global inventories of biosphere/hydrosphere/atmosphere exchange of environmental important C and N compounds (N_2O/ NH_3/ CO_2/ CH_4/ NO_3^-/ DOC/ DON) for managed and natural land for present day and future climate and landuse/ management conditions. Research aims at the identification of sustainable climate-smart management strategies, thereby using the ecosystem model framework LandscapeDNDC (http://ldndc.imk-ifu.kit.edu). The successful candidate is strongly encouraged to bring in and pursue own research ideas that are related to the above or other existing or upcoming projects within the research group.

Examples of research approaches

- Acquisition and formatting of model driver data for global cropping systems
- Adaptation of the LandscapeDNDC model to high-performance computing facilities
- Calculation of cropland GHG inventories for past, present, and future land use and climate conditions
- Scenario analysis and accompanying uncertainty analysis for optimized climate smart land management practices of global croplands

Your Profile

- University degree in geosciences, physics, computer science or related fields
- Experience in crop/ecosystem modeling, high-performance computing and data assimilation/visualization
- Sound programing skills (C/C++, Fortran, SVN, Git, Python, R, Bash) and ability to work with large datasets

- Experience with spatial analysis and GIS approaches
- English language proficiency and proven ability to write scientific publications
- Strong communication and teamwork skills

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We are looking to fill the position by the end of the year but the application will remain open until a suitable candidate has been found.

The Australian National University (ANU) made a major and on-going investment in water research through its National Institute Grant to establish the Institute for Water Futures (IWF https://fennerschool.anu.edu.au/research/affiliated-research-groups/institute-water-futures-iwf). The IWF brings together researchers in 10 water-related positions from across sciences, social sciences, humanities and public policy within the ANU and has established research partnerships with state and federal water agencies, and other research organisations. The IWF mission is to support sustainable water futures and to identify transformative, innovative and robust strategies to resolve the water challenges of today and tomorrow.

The IWF is seeking to recruit several highly motivated and capable early career water researchers from multiple disciplines and areas of expertise. The successful candidates will be expected to work in collaboration with ANU colleagues, research partners including Bureau of Meteorology, CSIRO, Geoscience Australia, Murray Darling Basin Authority, NSW Department of Industry Queensland Water Modelling Network, Atlas of living Australia and communities to effectively respond to real-world water challenges facing Australia and the Asia and Pacific regions. Working for the IWF, the successful candidates will be actively collaborating with key stakeholders and researchers as part of an inter-disciplinary water research team and will be effectively contributing to the research and teaching program at the IWF.

The Institute for Water futures will be making multiple appointments (Academic level B or C, Salary package: $ 99,809 - $133,202 per annum plus 17% superannuation, mix of fixed term, tenure track and/or continuing positions). Please see the below open opportunities and follow the link (link to ANU job board) to apply.

Applications closing on November 3rd

- Fenner School of Environment & Society, Fellow - Integrated Assessment

Applications closing on November 19th

- Fenner School of Environment & Society, Fellow - Hydrological modelling
- Climate Change Institute, Research Fellow - Environmental science or social sciences
- Research School of Earth Science, Research Fellow/Fellow - Space geodesy analyst
- Research School of Earth Science, Research Fellow/Fellow - Data assimilation analyst
- College of Engineering and Computer Science, Research Fellow/Fellow - 3A Institute
- Crawford School, Research Fellow/Fellow - Socio-Economics Thematic water research

A further position at the Mathematical Sciences Institute (Research Fellow/Fellow - Applied Mathematics) will be advertised in November 2019. Enquiries for this position should be sent to Professor Stephen Roberts, E: stephen.roberts@anu.edu.au