

NOVUS NEWSLETTER

APRIL 2015, ISSUE 5



The Novus RCN

*Ecosystems and
Disturbance from Tens
to Millions of Years*

NOVUS SCIENTIST EXCHANGE PROGRAM (SEP)

This spring, Novus launched the scientist exchange program (SEP), providing travel awards to promote new collaborations, enhance research skills, and provide professional development for early- and mid-career scientists via travel to a host institution to facilitate the project. Awardees are:

Dr. Heather Alexander, hosted by Dr. Jill Johnstone for the project “Cajander larch seed germinatin in response to fire-driven variations in soil conditions.”

Dr. Brian Buma, hosted by Dr. Becca Barnes for the project “Bioavailability of soil carbon in a complex, multiple disturbance environment.”

John Calder will be hosted by Dr. Jonathan Thompson for the project “Modeling subalpine forest responses to fire and climate change through the Medieval Climate Anomaly”

Dr. Ryan Kelly, hosted by Dr. Tatiana Loboda for the project “Constraining boreal forest fire-vegetation feedbacks with satellite imagery”

Arjan Meddens, hosted by Dr. Bryan Shuman for the project “Combining remotely sensed and pollen data to evaluate past bark beetle outbreaks.”

Dr. Fernanda Santos, hosted by Dr. Rudolph Jaffé for the project “Export of pyrogenic carbon from Michigan temperate forest soils.”

Volodymyr Trotsiuk, hosted by Dr. Neil Pederson for the project “Unifying tree-ring methods for reconstructing disturbance dynamics.”

Dr. Emanuele Ziaco, hosted by Dr. Ingo Heinrich for the project “Application of confocal laser scanner microscopy to the study of anatomical features and hydraulic adjustment of conifer species.”

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SEP Site Visit: Modeling subalpine forest responses to fire and climate change through the MCA

The first of the SEP site visits to be completed was between PhD candidate [John Calder](#) (University of Wyoming) and [Dr. Jonathan Thompson](#) (Harvard University). Their project planned to reconstruct factors affecting fire intensity in subalpine regions of northern Colorado, focusing on feedbacks of vegetation type and climate. In addition to reconstructing the paleoecology of this region, this work may also inform future fire disturbance predictions by better understanding potential vegetation feedback limitations on future fire-climate scenarios. During the SEP visit, Calder and Dr. Thompson parameterized

the LANDIS-II model and developed the simulation experiments for their analysis using the Dynamic Fire and Fuels (DFF) extension to LANDIS-II. Currently, the team is still working to test assumptions of LANDIS-II and the DFF extension, to ensure this model adequately represents fire regimes in this system. When asked about their overall satisfaction with being involved in the SEP, Dr. Thompson responded “Very satisfied. It was a great opportunity that could not have happened without the support from Novus.” Calder responded “The exchange went great. It’s great to start working with other scientists at this early stage of my career.”



Cedar Bog Lake, photo from Wikipedia

Novus Workshop III, Summer 2016

Plans are currently in development for the third Novus Workshop, which will be held in summer 2016 at Minneapolis, MN, USA. During this workshop, we hope to conduct a joint-field research project in the same region where Raymond Lindeman completed the first ecosystem-level energy budget in 1942 (see full paper [here](#)). The site is the [Cedar Creek Ecosystem Science Reserve](#) and [Long-Term Ecological Research](#) (LTER) station. Details of the workshop will be shared via the [Novus blog](#) as they become available.



SEP Site Visit: Export of pyrogenic carbon from Michigan temperate forest soils

The second of the SEP site visits to be completed was between Dr. Fernanda Santos (Michigan State University) and Dr. Rudolf Jaffé (Florida International University).

The project focused on quantifying the amount of dissolved pyrogenic carbon (DPC) exported from the Great Lakes forest ecosystem using the benzene polycarboxylic acid (BPCA) method in order to address questions relating to post-disturbance ecosystem carbon flux. The team completed all the proposed goals of methodological training on the BPCA method, and DPC data collection on temperate forest soil and is now looking to publish the data on their own and/or incorporate this work into a larger grant proposal for additional funding.

Neither member of the team directly interacted with Novus prior to their involvement with the SEP. Dr. Jaffé considered the SEP to be a “very positive experience” and stated “it was a pleasure working with [Dr. Santos] and we are looking forward to further research collaborations with her.” Dr. Santos was excited for the chance to link her current terrestrial work with the aquatic expertise of Dr. Jaffé and also described her experience with the SEP as “very positive.”



Biodiversity, Conservation, and Environmental Change

Novus member [Dr. Lindsey Gillson](#) (University of Cape Town) recently published a new book titled [Biodiversity, Conservation, and Environmental Change: Using paleoecology to manage dynamic landscapes in the Anthropocene](#).

The book incorporates broadly relevant case studies integrating environmental history, archaeology, and paleoecology to illustrate the importance of a long-term focus on the success of conservation measures. For example, the text uses historical management practices, disturbance impacts, and land-use change to address current conservation questions such as culling of elephant herds, fire management, and ecosystem rewilding.

The book is suitable for upper-level undergraduate, and graduate-level courses in such topics as conservation ecology, paleoecology, and environmental change, and would also be relevant to land managers and policy makers.

PAGES Workshop: Social-Ecological Dimensions of Forest Bark Beetle Disturbances

Novus Steering Committee member [Dr. Jesse Morris](#) (University of Idaho) and colleagues coordinated a workshop through Past Global Changes ([PAGES](#)) held April 1-3, 2015 in New Mexico. The workshop focused on prioritizing research questions relating to past, current, and future beetle infestations. Major research areas included:

Ecological Science: bark beetle outbreaks are linked to tree mortality, yet it is unclear how (un)precedented current outbreaks are in a historical context. Integration of paleoproxies (lake sediment, tree ring chronologies) may be able to characterize the relative impact of current beetle outbreaks.

Resilience, Adaptive Capacity, and Ecosystem Services: It is currently unclear if and how beetle outbreaks affect air and water quality, property values and ecosystem services such as recreation and ecotourism. Common metrics are needed to assess these impacts across spatial and temporal scales.

Human Behavior: Despite a lack of evidence linking beetle impacts to increased fire hazards, forest management often focuses on reduction of post-beetle fuel loads. Focus is needed on the impact of human perspective on policy and management decisions following beetle outbreaks.

PAGES

PAST GLOBAL CHANGES

Manuscript from Novus Workshop I Submitted

The manuscript describing a subset of ideas from the Novus I workshop at H. J. Andrews has been submitted to *Ecosystems*. Key ideas include assessing the vulnerability of ecosystems to disturbance using a soil N: plant N ratio, the idea of accreting and depleting disturbances, and evaluating long-term effects of disturbance with models and paleoecological data. Details of the submission will be shared via the [Novus blog](#) as they become available.

Full citation: Kranabetter, J. M., K. K. McLauchlan, S. K. Enders, J. M. Fraterrigo, P. E. Higuera, J. L. Morris, E. B. Rastetter, R. Barnes, B. Buma, D. G. Gavin, L.M. Gerhart, L. Gillson, P. Hietz, M. C. Mack, B. McNeil, and S. Perakis. Temporal scaling of biogeochemical response to ecosystem disturbance. In review at *Ecosystems*.

Share Your Ideas for the Novus Blog and Novus Newsletter!

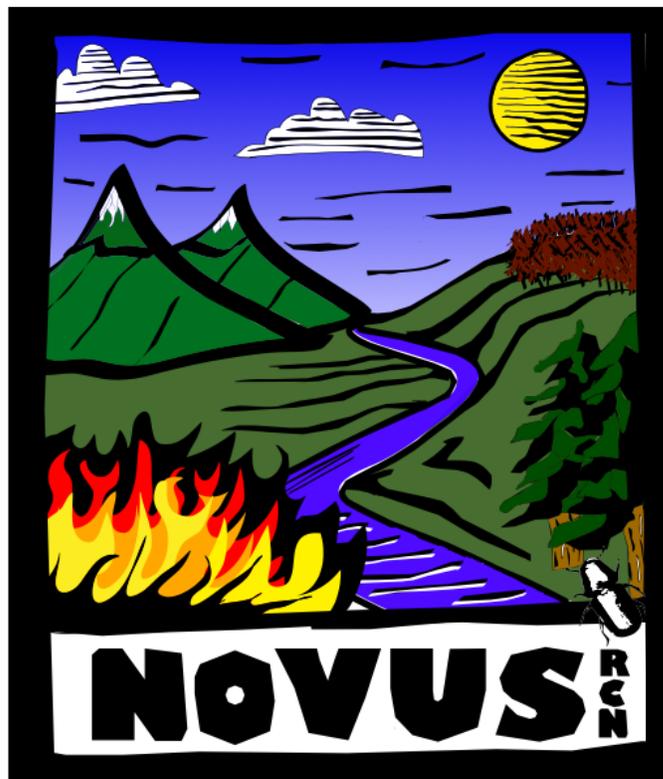
We are always looking for new content for the Novus blog and newsletter. If you have new information to share, please send it to Laci Gerhart-Barley at rockchalk@ksu.edu

Topics for newsletters include:

- Publication highlights
- New projects and grants
- New Novus products or personnel

Topics for blog posts include:

- All newsletter topics
- Job announcements (all levels)
- Funding opportunities (grants, fellowships, stipends)
- Conferences and workshops



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