

CIEE / ICEE

Canadian Institute of Ecology and Evolution /
Institut canadien d'écologie et d'évolution

NEWSLETTER

Issue 7 - December 2015



CIEE's Working Group in action: The "Understanding recent biodiversity change across spatial and temporal scales" working group met at McGill's Gault Nature Reserve (left picture) and at the UBC Biodiversity Research Centre (right), on May and June 2015.

IN THIS ISSUE:

- 1. Working Group meetings and activities.**
- 2. Workshop on "Biological Stoichiometry".**
- 3. New products from Working Groups and Synthesis Consortium**
- 4. Upcoming CIEE activities.**
- 5. Membership Drive.**

***Canadian Institute of Ecology and Evolution:
Accelerating scientific progress through programs that
synthesize current knowledge and develop future leaders.***

Peter Leavitt, Director

Greetings from the CIEE! As the year ends, we would like to share with you a number of exciting activities that took place during the last few months, including workshops, meetings and new products from our ongoing Thematic Programs. In addition, we want to update you on the recent call for proposals for new Thematic Working Groups - we had a remarkable response and received a record of 17 competitive applications from across the country! Finally, we take this opportunity to extend special thanks to the members of the CIEE's Scientific Advisory Group for their remarkable work in the reviewing process.

We anticipate that 2016 will see continued strong growth of CIEE and its activities. One of our central priorities will be to build on the successes of the Thematic Working Groups, outreach and training activities to increase our Institutional membership. As you may know, the CIEE achieves its mission principally through funding from, and co-operation among, a consortium of Canadian institutions. As a result, the more members we have, the more activities we can support! If you recognize the importance of having a national centre for advancing eco-evolutionary synthesis in Canada, please contact us via our dedicated email: ciee-icee@uregina.ca.

On behalf of the members of the CIEE Management Board, and all the CIEE community, we hope you have a holiday filled with peace, joy, and meaning. We look forward to our work together in 2016!

1. Working Group Meetings and Activities

The Working Group “*Understanding recent biodiversity change across spatial and temporal scales*”, led by Mary O'Connor and Andrew Gonzalez, is developing new theories of how diversity varies in space and time, and is conducting new analyses of existing diversity/abundance databases in light of these theoretical expectations. This group includes researchers from five Canadian Universities (UBC, McGill, Alberta, Sherbrooke, Dalhousie), and other five institutions from US, UK, and Germany.

The main goal of this project is to resolve controversy over mechanisms underlying broad spatial and temporal patterns in biodiversity by improving data and methods for detecting and attributing biodiversity change. Some of the questions that this project is addressing are: How has biodiversity changed at local spatial scales? How are local trends related to regional and global biodiversity trends? How can local biodiversity trends be reliably detected and compared? What are the implications for conservation? Thus, this group is considering not only the causes and magnitude of biodiversity change, but also its consequences for management and decision-making.



CIEE's working group "Understanding recent biodiversity change across spatial and temporal scales". From left to right: Jarrett Byrnes (UMass Boston, US), Patrick Thompson (McGill), Jillian Dunic (UMass Boston, US), Isla Myers-Smith (St. Andrews, UK), Forest Isbell (U. of Minnesota, US), Mark Vellend (Sherbrooke), Andy Gonzalez (McGill), Maria Dornelas (St. Andrews, UK), Robin Elahi (UBC), Mary O'Connor (UBC), and Sarah Supp (U. Wisconsin-Madison, US). Other participants in this working group are: Jon Chase (iDiv, Germany), Nicole Knight (UBC), Coreen Forbes (UBC), Fangliang He (U. of Alberta), Diane Srivastava (UBC), Grace Murphy (Dalhousie Univ.) and Brian McGill (U. of Maine, US).

The group met twice in 2015. The first meeting took place at the UBC Biodiversity Research Centre in Vancouver, BC, on May 4-8, 2015. The main goal of this inaugural meeting was to resolve differences in interpretation through analysis of scale and metrics. The meeting began with an innovative public symposium in which each participant presented their goals for the working group in a 5-minute 'lightening' talk. This 1-h symposium attracted 50 people, and the working group received many stimulating questions and suggestions. During the subsequent 4-day meeting, the group's participants worked collaboratively to a) derive predictions for how drivers change diversity estimates using RAD theory, b) perform the simulation analysis, c) compare the effectiveness of common diversity metrics (effect sizes, log response ratios, mixed effects models), and d) produce recommendations and guidelines for the detection and attribution of diversity change using species richness time-series.

Their second meeting took place at the McGill's Gault Nature Reserve in Mont Saint Hilaire, QC, on June 1-4, 2015. This time, the group focused on analysis and synthesis of data from an

enhanced database of more than 1,200 diversity time-series using the innovative R code and developed during the first meeting. The group also substantially advanced the associated manuscript to develop a generalized framework for detecting and attributing biodiversity change. A third and final meeting will be held in Leipzig, Germany, on February 22-26, 2016 (more details below).

The broad remit and international flavor of this Thematic group reflects the joint collaboration, in-kind donations, and financial from four centres for advanced research. Participating centres included the Synthesis Centre for Biodiversity Sciences of Germany (sDiv) and the Canadian Institute of Ecology and Evolution (CIEE), as well as the UBC Biodiversity Research Centre and the Quebec Centre for Biodiversity Science.

2. Workshop on “Biological Stoichiometry”.

CIEE sponsored a workshop on “Biological Stoichiometry and Trait-Based Ecology”, which took place at Trent University on 25 June of 2015, in conjunction with the “Conference on Biological Stoichiometry 2015”.

The workshop, led by Dr. Cédric Meunier (Alfred Wegener Institute, Germany) and Dr. Elena Litchman (Michigan State University, USA), fostered collaborations between scientists of different fields (freshwater, marine, and terrestrial ecologists) to explore promising connections between ecological stoichiometry and trait-based ecology. The event was very successful with 64 academics and graduate students from 45 universities and institutions around the world, including the Canadian institutions of U. Victoria, U. Alberta, Trent U. and Memorial U.

The workshop was structured to have; 1) introductory presentations by Dr. Meunier and Dr. Litchman, 2) break out group sessions of small groups to discuss selected topics such as applications or challenges to their study systems, 3) group intermixing to explore commonalities and differences in discussion, and 4) general discussion involving the entire audience. The main discussed topics were: How to identify stoichiometric traits and their function in different groups of organisms? What are the trades-offs between stoichiometric and other traits? How do they affect community structure and diversity? What are emerging topics for stoichiometric trait-based ecology? The workshop ended with a call for interested participants in an ensuing synthesis or capstone activity that may yield a publishable manuscript and new collaborative projects.

The CIEE grant was used by the Chair of the Conference, Dr. Paul Frost (Trent University), to cover travel costs for the leaders of the workshop.



Sixty-four academics and graduate students from 45 universities and institutions around the world participated in the CIEE's sponsored Workshop in Stoichiometry held in Peterborough, Ontario, on 25 June, 2015. Photo credit: Hamza Khattak.

3. New products from Working Groups and Synthesis Consortium

3.1. The "Terra incognita of community ecology" working group, headed by Timothée Poisot, Dominique Gravel (both Université du Québec à Rimouski) and Daniel Stouffer (University of Canterbury, New Zealand) has recently published the paper:

- Poisot, T., Gravel, D., Leroux, S., Wood, S., Fortin, M-J., Baiser, B., Cirtwill, A.R., Araujo, M., and Stouffer, D. 2015. Synthetic datasets and community tools for the rapid testing of ecological hypotheses. bioRxiv doi: <http://dx.doi.org/10.1101/021402>

It is important to remark that this productive working group already produced two other publications (mentioned in our previous newsletter):

- Poisot T, Stouffer DB, Gravel D. 2014. Beyond species: why ecological interaction networks vary through space and time. *Oikos*. Di 10.1111/oik.01719,
- Poisot TE, Baiser B, Dunne JA, Kéfi S, Massol F, et al. 2014. Mangal - making complex ecological network analysis simpler. bioRxiv. <http://dx.doi.org/10.1101/002634>

3.2. The "Forecasting groundfish biodiversity change in the Newfoundland shelf" working group, led by Patrick Thompson, Eric Pedersen and others, presented their results in two Congresses:

- Pedersen EJ, Thompson PL, Gonzalez A, Guichard F, Fortin MJ, Pepin P, Ball A, Gouhier TC, Link H, Moritz C, Nenzen H, Stanley R, and Taranu Z. Anatomy of the collapse and

onset of recovery in the North Atlantic groundfish community. 100th ESA Annual Meeting. Baltimore, Maryland, 9-14 August, 2015.

- Thompson PL, Pedersen EJ, Gonzalez A, Guichard F, Fortin MJ, Pepin P, Ball A, Gouhier TC, Link H, Moritz C, Nenzen H, Stanley R, and Taranu Z. 'Anatomy of the collapse and onset of recovery in the North Atlantic groundfish community'. 10th CSEE Annual Meeting. Saskatoon, SK, 21-25 May 2015.

In addition, during the last month the group advanced on a manuscript, intended to be submitted to PNAS, with a working title of “*Signatures of the collapse and incipient recovery of an overexploited marine ecosystem*”.

3.3. The “Canada’s phylogenetic diversity in a changing world” working group, headed by Dr. Jana Vamosi and Dr. Jeremy Kerr, presented some of their results in two works at the 10th CSEE Annual Meeting in Saskatoon, on 21-25 May 2015:

- Lewthwaite J, Mooers AO, Kerr JT. 'Dynamic Patterns of Phylogenetic Endemism in British Columbia’s Butterflies over the Past Century', and
- Vamosi, J. ‘Conservatism in diet specialization in changing environments’ at the Symposium ‘Using species interactions to predict the response of communities under environmental changes’

In addition, the working group has recently submitted a manuscript to Global Change Biology entitled, “*Climate Debt for Western Canadian butterflies is significant and moderated only by range size*”. The authors include Jayme Lewthwaite, Amy Angert, Steven Kembel, Simon Goring, Jonathan Davies, Arne Moers, Felix Sperling, Steven Vamosi, Jana Vamosi, and Jeremy Kerr.

3.4. The working group “Understanding recent biodiversity change across spatial and temporal scales”, headed by Mary O’Connor and Andrew Gonzalez, advanced their manuscript, “*A framework for detecting and attributing biodiversity change in the Anthropocene*”, with the intention of being submitted shortly to Ecology Letters as an Ideas and Perspectives paper.

Another important product from this working group is a database of biodiversity time series, the BioTIME database: <http://synergy.st-andrews.ac.uk/biotime/biotime-database/>. This database is intended to be accessed by anyone, with appropriate permissions by data owners. The group also invite other contributors to share their biodiversity data, giving credit as co-authors in prospective publications. The working group has its own website (<http://schangewg.weebly.com/>) with a link to the biodiversity time series site.

3.5. The CIEE is an active member of “**The International Synthesis Consortium**” (ISC, <http://synthesis-consortium.org/>), a global network of thirteen Synthesis Centres in Ecology, Evolution and Environment from North America, Europe, China and Australia. Our participation

in the ISC is consistent with the CIEE aspiration of being a national leader and point to a growing influence as an international synthesis centre.

As a member of the ISC, the CIEE was present at the International Scientific Conference “Our Common Future Under Climate Change”, held in Paris, France, on 7-10 July 2015, through a joint presentation of entitled: “Synthesis centers: An essential tool in our complex, data-rich future”. The authors of this presentation were A. Specht, J. Baron, M. Winter, P. Bishop, J. Boyd, A. Campbell, F. Davis, D. Hawthorne, C. Jonsson, J. Kramer, T. Meagher, M. Palmer, C. Salomon, D. Steinaker and T. Vision.

4. Upcoming activities

4.1. Working Group Meetings

4.1.1. Several CIEE working groups have planned new meetings and activities for coming months. The thematic working group “Adaptation versus maladaptation in response to environmental change”, headed by Andrew Hendry, Rowan Barrett, Alison Derry and Gregor Fussmann, will meet twice (December 2015 and August 2016) at the McGill's Gault Nature Reserve in Mont St Hilaire, Quebec.

This working group, co-funded by the CIEE and the Quebec Center for Biodiversity Science (QCBS), is bringing together 27 researchers from 13 Canadian Universities and 4 US Universities. The confirmed participants are: Andrew Hendry (McGill), Rowan Barrett (McGill), Alison Derry (UQAM), Gregor Fussmann (McGill), Steven Brady (Dartmouth College, US), Lauren Chapman (McGill), Erika Crispo (Pace Univ., US), Ian Fleming (Memorial Univ. of Newfoundland), Dylan Fraser (Concordia Univ.), Andrew Gonzalez (McGill), Gareth Hopkins (Utah State University Logan, US), Thomas Lamy (Univ. de Montréal), Jeffrey Lane (Univ. of Saskatchewan), Andrew McAdam (Univ. of Guelph), Antoine Paccard (McGill), Bruce Robertson (Bard College, US), Denis Réale (Univ. du Québec), Mary Rogalski (Yale Univ., US), Gregor Rolshausen (McGill), Andrew Simons (Carleton Univ.), Mark Vellend (Univ. of Sherbrooke), Christopher Eckert (Queen's Univ.), Murray Humphries (McGill), Jeffrey Hutchings (Dalhousie Univ.), Amy Newman (Univ. of Guelph), Patricia Schulte (Univ. of British Columbia), and Stan Boutin (Univ. of Alberta).

The working group will first flesh out a conceptual framework and mathematical models to guide interpretation and prediction of mal-non-adaptation. Second, the group will assemble and curate a freely available online database of evolutionary responses to environmental change. Finally, they will use the database to investigate patterns of mal-non-adaptation in response to environmental change. They will ask whether certain taxa are more or less likely to adapt to particular forms of

environmental change. Communications from this working group will include public presentations, as well as conference papers and publications.

4.1.2. The working group “Understanding recent biodiversity change across spatial and temporal scales”, led by Mary O’Connor and Andrew Gonzalez, will held their third and final meeting on February 22-26, 2016, at the Synthesis Centre for Biodiversity Sciences (sDiv) in Leipzig, Germany. In this last meeting, the group will extend the findings from meetings 1 and 2 outlined above, to the understanding of the implications of diversity change for conservation and ecosystem function.

4.2. Selection of new Thematic Working Groups

We recently issued a Call for Proposals for New Thematic Programs to be staged over the 2016. We had a remarkable response to this Call for Proposals and received a record of seventeen qualified applications from across the entire country. The members of CIEE’s Scientific Advisory Group (SAG) are currently evaluating the proposals, and final funding decisions are expected by the third week of January 2016. We are particularly grateful to past SAG members Mark Lewis (Alberta), Denis Réale (Quebec), Brad Anholt (Victoria) and Sue Bertram (Carleton) for their hard work on behalf of CIEE and its members.

As occurred during the last calls for proposals, CIEE’s finding decisions for new Working Groups will be based on confidential and individual evaluations performed by members of the SAG, including: Mark Cadotte (Univ. of Toronto-Mississauga), Dennis Murray (Trent Univ.), Amy Hurford (Memorial Univ.), Micheline Manseau (Univ. of Manitoba), Ira Tanya Handa (UQAM), Andrew MacDougall (Guelph Univ.), Steve Perlman (Victoria Univ.), Eric Lamb (Univ. of Saskatchewan), Mark Brigham (Univ. of Regina), Edward Bork (Univ. of Alberta), Sean Rogers (Univ. of Calgary), and Michael Russello (UBC). We take this opportunity to again thank our reviewers for their time and commitment.

Each proposal will be receiving five independent reviews. These confidential evaluations will be used by the CIEE Director and Associate Director to make final determinations of the level of funding to be received by each project, as well as provide applicants with formal feedback on the strengths and weaknesses of their proposals. In general, scientific excellence and likelihood of success are the main criteria for evaluation, although consideration will also be made for the degree to which proposals help CIEE demonstrate broader benefits to Canada and fiscal responsibility. Specific criteria for evaluations include: i. Project rationale - scientific significance of the questions, evidence of novel synthesis, evidence of benefit to Canadian environmental and economic well being; ii. Project description - clarity of objectives, outcomes, work plan, meeting schedule; iii. Expertise of applicants and participants; iv. Potential for defined scientific products, including refereed publications, and; v. Budget adequacy and feasibility (complete estimates and coherent justification).

5. Membership Drive

CIEE grows by adding partners from across Canada. Because CIEE achieves its mission principally through funding from, and co-operation among, a consortium of Canadian institutions, it is essential that we have representation from all regions and institutions. Currently, CIEE is financially supported by six Canadian universities (British Columbia, Carleton, McGill, Regina, Toronto, Simon Fraser), and the Canadian Society for Ecology and Evolution (CSEE). In this model, each member institution pays annual membership fees assessed on a sliding scale according to their NSERC Discovery Grant program funding in ecology and evolution. At present, annual membership in CIEE is very reasonable, starting in 2012, universities awarded more than \$5M in support through NSERC Discovery Grants in ecology and evolution pay \$8,000 per year, those receiving \$1-5M pay \$5,000, and all other pay \$2,000 per year. Importantly, all of the funding obtained from sustaining member organizations is used for direct support of CIEE scientific programs, whereas in-kind contributions help maintain staff and synthesis facilities. Our agreement with the University of Regina also allows us to avoid overhead charges to member organizations, thereby focusing our resources on activities (working groups, workshops, etc). As a result, the more members we have, the more activities we can support!

To increase our membership, we are seeking CIEE representatives at all Canadian universities to act liaisons to local researchers and administration. Through your institution's membership, you will be able to: 1) foster your and your colleagues access to CIEE's scientific programs along with access by their highly qualified personnel (e.g., your institution's students and PDFs), 2) gain a seat on the management board that sets the mandate and direction of the CIEE, 3) receive priority consideration for CIEE initiatives and funding, and overall 4) play a pivotal role in shaping the future of ecology and evolution research and training in Canada. We you are interesting in joining us as a contributing Member, please do not hesitate to contact us for additional information.

Your input matters

Tell us what you think. We are pleased to receive your questions, comments or concerns about the Canadian Institute of Ecology and Evolution. In particular, please let us know if you have an idea for a new member service or research activity. Thanks!



Email: ciee-icee@uregina.ca, *Twitter:* @CIEEICEE, *Website:* www.ciee-icee.ca

Dr. Peter R. Leavitt, CIEE Director

Dr. Diego F. Steinaker, CIEE Associate Director

Many thanks to our Contributing Members for the continuing support!



THE
UNIVERSITY OF
BRITISH
COLUMBIA



UNIVERSITY OF
TORONTO



McGill
UNIVERSITY



Carleton
UNIVERSITY

University
of Regina



Q

SIMON FRASER UNIVERSITY

Your current CIEE Board Members, Directors and Representatives

Management Board: Mark Forbes (Carleton), Sarah Otto (UBC), Jill Johnstone (Saskatchewan), Donald Jackson (Toronto), Elizabeth Elle (Simon Fraser), Christopher Somers (Regina), and Andrew Hendry (McGill).

Direction: Peter Leavitt, Director (Regina), and Diego Steinaker, Associate Director (Regina)

Scientific Advisory Group: Mark Cadotte (Toronto-Mississauga), Dennis Murray (Trent), Amy Hurford (Memorial), Micheline Manseau (Manitoba), Ira Tanya Handa (UQAM), Andrew MacDougall (Guelph), Steve Perlman (Victoria), Eric Lamb (Saskatchewan), Mark Brigham (Regina), Edward Bork (Alberta), Sean Rogers (Calgary), and Michael Russello (UBC).

College of Representatives: Julia Baum (Victoria), Rolf Vinebrooke and Heather Proctor (Alberta), Leland Jackson (Calgary), Craig Willis (Winnipeg), Nusha Keyghobadi (Western), Patricia Chow-Fraser (McMaster), Miriam Richards (Brock), Hugh MacIsaac (Windsor), Charles Ramcharan (Laurentian), Douglas Morris (Lakehead), Chris Eckert (Queen's), Beatrix Beisner and Yves Prairie (UQAM), Jesse Shapiro (Montréal), David Walsh (Concordia), David Risk (St. Francis Xavier), Dennis Murray (Trent), Paul Snelgrove (Memorial Newfoundland), Elizabeth Elle and Arne Mooers (Simon Fraser), Mark Brigham (Regina), Karl Cottenie (Guelph), Karen Samis (Prince Edward Island), Andrew Simons (Carleton), Shannon McCauley and Marc Johnson (Toronto, Mississauga), Rowan Barrett (McGill), Don Stewart (Acadia), Theresa Burg (Lethbridge), Robin Owen (Mount Royal), Linda Campbell (Saint Mary's), Jill Johnstone (Saskatchewan), Daniel Ruzzante (Dalhousie), Sapna Sharma and Roberto Quinlan (York), Nicolas Lecomte (Moncton), and Stephen Heard (New Brunswick).

If you recognize the importance of having a national centre for synthesis in ecology and evolution, and are interested in acting as the formal CIEE representative to your Institution, please let us know via our dedicated email address ciee-icee@uregina.ca.