

Integrating Tundra Structure, Function and Change – 19th ITEX Meeting 25-27 April 2018, Stirling, Scotland, UK



Location: University of Stirling (Scotland, UK); Stirling Court Hotel and the Cottrell Building

Main scientific themes:

- *Rates of Change and Whole-Ecosystem Processes;*
- *Plant Functional Traits / "functional diversity change";*
- *Tundra Data Synthesis (e.g. including up-scaling);*
- *Microbial Ecology (including Plant-Soil Interactions);*
- *ITEX Protocol Development.*

Science Steering Committee:

- *Anne Bjorkman (Team Scotland)*
- *Bob Hollister (ITEX Co-Chair)*
- *Kari Klanderud (ITEX Co-Chair)*
- *Isla Myers-Smith (Team Scotland)*
- *Tom Parker (Team Scotland and Local Host)*
- *Philip Wookey (Local Host: philip.wookey1@stir.ac.uk)*

Tuesday 24th April 2018

Informal local walk (departing Stirling ~ 10 a.m.)

18:30 hrs **Pre-Registration/pub gathering @ 'The City Walls'**
 Back Walk, Stirling, FK8 2QA; citywalls-stirling.co.uk
<https://goo.gl/maps/YU8UcfZ3Q8L2>

Wednesday 25th April 2018

Location: University of Stirling, Stirling Court Hotel (<https://goo.gl/maps/k4RJxqmC7cq>),
 Hermitage Iona Room

8:30 **Registration**

Presentations:

09:00 – 09:15 **Welcome!**

09:15 – 10:30 **Plenary Session I – Rates of Change and Whole-Ecosystem Processes**

Chair: Ellen Dorrepaal Co-chair: Greg Henry

Gaius (Gus) R. Shaver – *“Forty years of change in composition and structure of monitored and manipulated Alaskan tundra ecosystems”*

Ingibjörg (Inga Svala) S. Jónsdóttir – *“Simulated climate warming: The unexpected resilience of island tundra plant communities”*

Kari Klanderud – *“Transplants, OTCs and gradient studies: different approaches ask different questions in climate change effects studies”*

Christian Rixen – *“Hearing the grass grow: Vegetation records at automatic climate stations”*

Elisabeth J. Cooper – *“Snow manipulation on Svalbard since 2006- what have we learnt?”*

10:30 – 11:00 **Break**

11:00 – 12:30 **Plenary Session II – Rates of Change and Whole-Ecosystem Processes [Cont.]**

Chair: Isla Myers-Smith Co-Chair: Sandra Angers-Blondin

Gergana N. Daskalova – *“Eighteen years of ecological monitoring reveals multiple lines of evidence for tundra vegetation change”*

Jacob A. Harris – *“Changes in Vegetation Cover Across the Landscape Over Time at Atqasuk and Utqiagvik, Alaska”*

Signe Lett – *“Mosses mediate climate-change effects on tree seedlings at the alpine treeline”*

Jørn Olav Løkken – *“Disentangling alpine vegetation response to warming and herbivory”*

Jeremy May – *“Effects of warming on growth rates and remotely-sensed normalized difference vegetation index (NDVI) values across eight ITEX sites in northern Alaska”*

	Johan Olofsson – <i>“Effect of herbivores on species richness in a changing climate”</i>
12:30 – 14:00	Lunch (and poster preview)
14:00 – 15:30	Plenary Session III - Plant Functional Traits / "functional diversity change" Chair: Anne Bjorkman Co-Chair: Zoe Panchen Per Mølgaard – <i>“Climate change brings the greedy moth Eurois occulta to Disko”</i> Robert G. Björk – <i>“Implications of evergreen shrub advancement: The need for a more comprehensive view of Arctic shrubification”</i> Sonja Wipf – <i>“Faster, taller, more – patterns and drivers of change in arctic and high-alpine plant communities”</i> Anne D. Bjorkman – <i>“Species and functional diversity change over three decades of tundra monitoring”</i> Ellen Dorrepaal – <i>“Winter climate-change effects on tundra bryophytes”</i> Ned Fetcher – <i>“Ecotypic variation in Eriophorum vaginatum: physiology and genetics”</i>
15:30 – 16:00	Afternoon Tea
16:00 – 16:45	Plenary Session III - Plant Functional Traits / "functional diversity change" [Cont.] Chair: Kari Klanderud Co-Chair: Signe Lett Katlyn Betway – <i>“Exploring Plant Traits as Predictors of Changes in Vegetation Cover”</i> Haydn J.D. Thomas – <i>“Tundra vegetation change has no net impact on tundra litter decomposition rates”</i> Francesca Jaroszynska – <i>“Plant functional groups regulate ecosystem properties in semi-natural alpine grasslands”</i>
17:00 – 17:15	Plenary Introduction and Planning of Parallel Sessions & Workshops
17:15 – 17:30	Poster overviews

POSTERS**Examining plant traits as drivers of vegetation change in tundra communities**Katlyn R. Betway, Robert D. Hollister**Permafrost thaw – decadal responses to climate change**Mats P. Björkman *and probably more in the final version of the presentation/poster***Effects of climate warming on rate of decomposition in the high and low Arctic**Katrín Björnsdóttir, Isabel C. Barrio, Ingibjörg Svala Jónsdóttir

Using remotely-sensed hyperspectral data to help understand vegetation cover change at Utqiagvik, AK

Hana Christoffersen, Robert Hollister

Maintaining individuality through scaling with equitable transformation: Applications to long-term phenology rates in tundra plants

Cassandra Elphinstone, Greg H.R. Henry

Long-term plant responses to experimental warming and altered snowmelt timing in the Canadian High Arctic

Esther R. Frej, Greg H.R. Henry

Small scale biogeochemical cycling in sub-Arctic mountain birch forests

Nina L. Friggens, Philip A. Wookey, Jens-Arne Subke, Thomas J. Aspray

A retrospective analysis of long-term experimental warming in the Canadian High Arctic using *Cassiope tetragona*

Elise Gallois, Greg Henry

Quantifying vegetation shifts under climate change in extreme biomes

Mariana García Criado, Isla Myers-Smith, Caroline Lehmann

Changes in vegetation cover across the landscape over time at Atqasuk and Utqiagvik, Alaska

Jacob A. Harris, Robert D. Hollister, Timothy F. Botting

Using drones to quantify aboveground carbon in Arctic tussock tundra

Samuel A. Kellerhals, Isla Myers-Smith, Jakob Assmann, Andrew Cunliffe

Monitoring change in species density over time in Arctic Alaska

Kailey Keenan-Whittemore, Jacob A. Harris, Robert D. Hollister

Soil is the new teapot: How tea bags tell us about global carbon cycling

Caleb Krueger, Robert D. Hollister

HERBS ARE HURT – SHRUBS WILL THRIVE in a warmer Arctic climate

Per Mølgaard and Karen Christensen

Peak season CO₂ fluxes in OTC-warmed and control plots in wet and dry tundra at two ITEX sites in northern Alaska, 2000-2017

Paulo C. Olivas, Steven F. Oberbauer, Jeremy May, Craig E. Tweedie, and Robert D. Hollister

High Arctic plant functional type nutrient dynamics under simulated herbivore disturbance and summer warming

Matteo Petit Bon, Hanna Böhner, Kari Anne Bråthen, Virve Tuulia Ravolainen, Ingibjörg Svala Jónsdóttir

Using drones to study plant communities, herbivore driven plant cycles and carbon fluxes

Matthias B. Siewert, Johan Olofsson

Forecasted homogenisation of high-arctic vegetation communities under climate change

Lærke Stewart, Caroline E. Simonsen, Jens-Christian Svenning, Niels Martin Schmidt, Loïc Pellissier

Plant species and elevation shape composition and phylogenetic diversity of root-associated bacterial communities

Ayco J. M. Tack, Jaanis Juhanson, Tomas Roslin, Nerea Abrego, Tea Huotari, Sara Hallin

17:30-18:30

Continuing poster discussions

Thursday 26th April 2018

Location University of Stirling, Cottrell Building, Plenary Room Lecture Theatre A5 (break-out rooms to be advised prior to sessions); Teas/Coffees in 2B85.

Presentations:

- 09:00 – 10:30 **Plenary Session IV – Tundra Data Synthesis**
Chair: Bob Hollister Co-Chair: Friederike Gehrman
Isla Myers-Smith – *“ITEX syntheses: Attribution of ecological change to warming across the tundra biome”*
Janet S. Prevéy – *“The ITEX phenology database: Recent syntheses and future directions”*
Ruud Scharn – *“A note on phylogenetic community structure in the Arctic”*
Craig Tweedie – *“Multi-Scale Analysis of Vegetation Phenological Variability on the North Slope of Alaska”*
Sara Hallin – *“Microbial communities are not linked to vegetation changes induced by long-term warming across the Arctic”*
Alejandro Salazar – *“Consistent responses of soil nitrogen to experimental warming across cold ecosystems: A meta-analysis”*
- 10:30 – 11:00 **Break**
- 11:00 – 12:15 **Plenary – Soil and Rhizosphere Processes and Microbial Community Analysis**
Chair: Sara Hallin Co-Chair: Tom Parker
Mats P. Björkman – *“The sensitivity of carbon in Arctic permafrost soils to climate change”*
Karina E. Clemmensen – *“Arctic tree expansion leads to more efficient N cycling due to changed mycorrhizal functioning”*
Mathilde Jeanbille – *“Co-occurrence networks show response of microbial communities to warming in tundra soils”*
Jaanis Juhanson – *“Different responses of soil microbial communities to long-term experimental warming in northern Sweden”*
Thomas Parker – *“Soil respiration from sub-arctic tree and shrub communities is driven by recent photosynthate”*
- 12:15 – 13:30 **Lunch/walk (foraging on campus)!**
- 13:30 – 14:30 **Plenary – Phenology**
Chair: Janet S. Prevéy Co-Chair: Jakob Assman
Sandra Angers-Blondin – *“Warmer, longer, greener? The role of increased growing season length on shrub growth”*
Jacob Assman – *“Snow-melt and temperature - but not sea-ice - explain variation in tundra spring plant phenology at coastal ITEX sites”*
Friederike Gehrman – *“Differential responses of Arctic plant senescence to snow depth and autumn warming”*

- Zoe A. Panchen** – *“Are Arctic plant phenological responses to temperature evolutionarily conserved or related to life history traits?”*
- 14:30 – 16:30 **Discussion Session – ‘Out with the old and in with the new’ [emerging and future approaches, but also how to plan for closing down sites]**
- Chair: Esther R. Frei** **Co-Chair: Siri Lie Olsen**
- Jeffrey Kerby** – *“Floating the idea of ITEX drones protocols: From the Yukon Coast to the circum-Arctic”*
- Petr Macek** – *“Nurse effect of cushion plants: Plant interactions in Arctic tundra ecosystems in the face of climate change”*
- Christian Rixen** – *“The local species pool: How much does our measured vegetation change depend on the potential colonizers at our sites?”*
- Siri Lie Olsen** – *“INCLINE: Indirect climate change impacts on alpine plant communities”*
- Esther R. Frei** – *“It’s not the end: How to close down an ITEX site”*
- Greg H. R. Henry** – *“Planning for the inevitable loss of long-term sites: Alexandra Fiord”*
- 16:30 – 17:15 **All [Discussion]** – *“Next steps – Development of protocols for the ITEX Manual?”*
- 18:30 for 19.00 **Conference Dinner and Ceilidh (with Live Folk Music from the Riverside Ceilidh Band)**, Golden Lion Hotel, 8-10 King Street, Stirling FK8 1BD;
<http://www.thegoldenlionstirling.com/>
<https://goo.gl/maps/ogfQhqTQ3tx>
- Award of Poster and Presentation Prizes**

Friday 27th April 2018

Location University of Stirling, Cottrell Building, Plenary Room Lecture Theatre A5 (break-out rooms to be advised prior to sessions); Teas/Coffees in 2B85.

- 09.15 - 10.00 **ITEX network, discussions in plenum** (chairs: **Bob Hollister** and **Kari Klanderud**)
- 10.00 - 12.00 **Parallel Workshops incl. coffee** (available from 10.30)
- 12.00 - 13.00 **Reporting from the workshops** (15 min per group); **next steps [documents arising to be posted on the ITEX website in due course]**
- 13.00 – 14.00 **Close**
- 14.00 – 19.00 **Post meeting activities (suggestions):**
- I. **Exploring Stirling City** (Stirling Castle and Argyll's Lodging; Church of the Holy Rude; Wallace Monument) – under own steam
 - II. **Tullibardine Distillery Visit** (local malt whisky distillery tour – one of the best, and least known, drams available, anywhere!) – taxis can be ordered
 - III. **Loch Lomond and the Trossachs National Park** (a short drive away from Stirling, climb Ben A'an, a 'mountain in miniature' (454 m) with its stunning views, or, for the very fit (bearing in mind the time available), tackle Ben Venue (729 m) on the other side of Loch Katrine) – transport available, but limited to 15
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Saturday and Sunday 28th and 29th April 2018

Day excursions (from Stirling) to sites of potential interest to tundra scientists. Exact itineraries will depend on the weather conditions and the extent of remaining snow cover. Candidate locations include Ben Lawers National Nature Reserve (and surroundings) and the Cairngorms National Park. In late April participants should expect anything from beautiful spring weather (bring sun-cream!) to full blizzard conditions with severe wind-chill; please bring appropriate clothing and footwear (a full briefing will be provided to those who have signed-up for these activities)!



Top left; Coire Leis and Ben Nevis, 22 August 2007 – **Top Right;** Saxifraga oppositifolia, Meall Ghaordaidh, 30 March 2012
Bottom; Coire an Sneachda, Cairngorms, 23 April 2006.