

## MINUTES/FUNDARGERÐ

FORHOT – 1st formal project meeting

6. of February 2012

### Attending:

Ásrún Elmarsdóttir (Icel. Inst. Nat. Hist. / NÍ)  
Bjarni Diðrik Sigurðsson (Agric. Univ. Icel. / Lbhí),  
Edda Sigurdís Oddsdóttir (Icel. For. Res. / Móg.)  
Helena Marta Stefánsdóttir (Agric. Univ. Icel. / Lbhí)  
Úlfur Óskarsson (Agric. Univ. Icel. / Lbhí)  
Brynhildur Bjarnadóttir (Icel. For. Res. / Móg.)  
Kesara Anamthawat-Jónsson (Univ. Icel. / HÍ).

### Excused:

Ólafur Arnalds (Agric. Univ. Icel. / Lbhí)

10:05 Opening, BDS and HMS were accepted as meeting moderator as secretary, respectively.

### 1. Background and overview.

Bjarni gave a short overview talk on former research on effects of elevated temperature (climate change) on forest ecosystem functioning in Iceland.

The ForHot project idea was initiated by BDS and ESO in connection to the Kick-off meeting of the Nordic NordForsk funded project “**FSC-Sink**; *Forest Soil C-sink Nordic Network*” in Copenhagen on 26<sup>th</sup> of Oct. 2010 (and the idea was sent out by e-mail to all Icelandic participants except KA-J on 27<sup>th</sup> of Oct. 2010; but before that BDS, HMS and ÚÓ had had some informal talks about the possibility of using the site for ecological research.

Soon after this EOS and BDS found a tentative name for the project:

EN: **FORHOT** (*Natural soil warming in a Sitka spruce forest in Iceland*)

IS: **JARÐHITASKÓGURINN** (*Áhrif náttúrulega hækkaðs jarðvegshita undir sitkagreniskógi að Reykjum í Ölfusi*)

The first formal introduction of the project idea to scientists outside the Icelandic group was given at an international conference entitled “*Nutrient constraints on the net carbon balance*” that took place in Iceland during 14-17 June 2011. It was organized by the ESF-funded project, “**CLIMMANI**; *Climate Change - Manipulation experiments in terrestrial ecosystems*”.

Because of the above background the ForHot-project is already formally linked to those two projects (**FSC-Sink** and **CLIMMANI**). It is FSC-Sink funds that have been used to pay for the infrastructure that is already at place at the study site and we have so far got two exchange grants for foreign PhD students doing research at the ForHot sites funded through CLIMMANI. The ForHot project (idea) has then been further introduced at various meetings and workshops, both in Iceland and abroad.

## Where are we today?

The practical work within the project that has already started or which is likely to start in 2012 can be divided into 11 work packages.

Nr	NAMES		SUB-PROJECT
<i>INFRASTRUCTURE AND ECOSYSTEM STRUCTURE</i>			
<i>Basic infrastructure</i>			
I	Bjarni D. Sigurðsson	Lbhí	Mapping and monitoring of soil temperatures, air temp., soil water content. Building of infrastructure as walking bridges, etc.
	Edda S. Oddsdóttir	Móg.	
	Helena M. Stefánsdóttir	Lbhí	
	Úlfur Óskarsson	Lbhí	
<i>Tree growth</i>			
II	Armando Lenz*	UB	Aboveground tree growth. AL is a PhD student and did his work on aboveground diameter and height tree growth and TNC status along the soil T transect in October 2011 (2005-2011 responses), (publ. expected in 2012/3). CK is his supervisor. BDS and BB are then planning to continue meas. of the forest growth.
	Christian Körner	UB	
	Brynhildur Bjarnadóttir	Móg.	
	Bjarni D. Sigurðsson	Lbhí	
<i>Vegetation composition</i>			
III	Elín Guðmundsdóttir*	Lbhí	Changes in ground vegetation structure (community) as soil becomes warmer + compare what happens in forest understory to treeless heathlands outside as they become warmer. EG is a M.Sc. student at Lbhí and ÚÓ and ÁE are her supervisors. Time: 2011-2013.
	Úlfur Óskarsson	Lbhí	
	Ásrún Elmarsdóttir	NÍ	
<i>Soil characteristics</i>			
IV	Ólafur Arnalds	Lbhí	Changes in soil morphology and composition as it becomes warmer.
	Helena M. Stefánsdóttir		
<i>PLANT/SOIL INTERACTION</i>			
V	<i>C-N-P cycle in plants and soil</i>		Changes in the ecosystem C, N and P cycle as soil temperature increases in the forest and in the heathlands outside. NL is a PhD student and IJ and BDS are her supervisors. Time: 2012-2015 (all fieldwork in Iceland). The final PhD project plan is still under construction.
	Niki Leblans*	UA	
	Ivan Janssens	UA	
	Bjarni D. Sigurðsson	Lbhí	
<i>Litter decomposition</i>			
VI	Edda S. Oddsdóttir	Móg	Litter-bag study measuring litter decomposition. A pilot project was started in October 2011 – plan to increase this in 2013.
	Helena M. Stefánsdóttir	Lbhí	
<i>CO<sub>2</sub> fluxes from soil</i>			
VII	Bjarni D. Sigurðsson	Lbhí	Continuous measurements of soil respiration and GPP/NEE of ground vegetation along the soil temperature gradient. 12 automated flux systems from ADC. Start in spring 2012.
	Helena M. Stefánsdóttir		
<i>SOIL ECOLOGY</i>			
<i>Microbial community structure</i>			
VIII	James T. Weedon*	VU	Measurements of soil microbial community structure along the soil temperature gradient using DNA/RNA extracts. JTW is a PhD student and PvB is his supervisor. This work will take place in April 2012 (publ. in 2012/2013).
	Peter van Bodegom,	VU Móg	
	Edda S. Oddsdóttir	Lbhí	
	Úlfur Óskarsson		
<i>Microbial and fungal production</i>			
IX	Erland Bååth	Lund	Measurements of the growth of soil microbial and fungal decomposers and community shifts along the soil temperature gradient. Use of mesh bags, DNA/RNA analysis and PLFA patterns. Time: Spring to autumn 2012 (publ in 2013).
	Edda S. Oddsdóttir	Móg	
	Úlfur Óskarsson	Lbhí	
	Hákan Wallander	Lund	
<i>Nitrification by NH<sub>4</sub>-ox archaea</i>			
X	Anne Daebeler	NIOO-KNAW	AD is a PhD student who has been doing her studies the past 3 years in a nearby grassland/heathland area which has experienced a long-term soil heating (not just 3 years like ForHot). She will repeat her measurements of archae existence and NH <sub>4</sub> oxidation (in lab).
<i>Ectomycorrhizal community</i>			
XI	Ella Thoen*	UO	Measurements of ectomycorrhizal community and quantity on Sitka spruce along the temperature gradient. ET was a graduate student and ESO and KA-J her supervisors. She already did her thesis in autumn 2011, but ESO/UO plans to continue this work. Time: 2012.
	Edda S. Oddsdóttir	Móg	
	Úlfur Óskarsson	Lbhí	
	Kesara Anamthawat-Jónsson	HÍ	

\* These are graduate or post-graduate students. Lbhí = Agric.Univ.Icel, Móg. = Icel.For.Res., UB = Univ. Basel, Switcher land, NÍ = Icel. Inst. Nat. Hist., UA = Univ. Antwerp, Belgium, VU = Vrije Univ., Netherlands, UO = Univ Oslo, Norway, HÍ = Univ. Iceland. Lund = Lund Univ., Sweden, NIOO-KNAW = Netherlands Inst. Ecol.

**The initial concept: The concept has been to try to attract various research groups to join the “ForHot consortium”, with the idea that we could build “a long-term” ecological experiment at Reykir, where different sub-projects all contribute to gaining a better understanding of how (Icelandic) ecosystems, their structure and function, are affected by temperature fluctuations (or future climate change).**

## **2. A formal launch of the Icelandic ForHot project**

Even if we have been preparing and starting the ForHot project since October 2010, we had never formally launched it. Now it was therefore high-time to do this. After a general discussion about our vision and ideas for the optimal formal structure of the project the following was decided:

An Icelandic steering group was formed with one representative from all Icelandic institutes/universities presently active within ForHot + a project coordinator. They are:

1. Bjarni D. Sigurdsson (coordinator) - Landbúnaðarháskóli Íslands/ Agric. Univ. Icel
2. Úlfur Óskarsson - Landbúnaðarháskóli Íslands/ Agric. Univ. Icel
3. Edda Sigurdís Oddsdóttir - Skógrækt ríkisins / Icel. For. Res.
4. Kesara Anamthawat-Jónsson - Háskóli Íslands / Univ. of Iceland
5. Ásrún Elmarsdóttir - Náttúrufræðistofnun / Icel. Inst. Nat. Hist.

It was also decided to continue with the same “open-access” policy as previously, so further Icelandic and foreign collaborators will be welcomed into the project if the steering committee and leading participants for work modules don’t feel that the new proposed research overlaps too much with the existing activities.

BDS introduced a draft for a Memorandum of Understanding which all participants in the ForHot consortium will be asked to sign. This MoU gives guidelines on how the practical collaboration is thought and also includes some statements on the participant’s will to share basic data with other participants and offer co-authorship if he/she uses data from other work modules than their own in publications, etc. BDS and the steering group will finalize this draft and then the proposed MoU will be sent to all current participants for comments (in Feb/March 2012).

It was agreed that we should plan for an annual or biannual workshops, where we will try to involve all Icelandic and “foreign” scientists who are involved in ForHot. This should be added to the MoU and we will try to find some external funding for facilitating this.

## **3. General discussion on priorities in new research at the ForHot sites**

We agreed that there are there are some issues that should be put into priority and would benefit all sub-projects:

- a. We need to take air and soil-water samples to exclude the possibility that toxic gases or compounds are interfering with the soil warming (H<sub>2</sub>S, Heavy metals, etc.). This only needs to be done once.
- b. Measurements of fine-root quantity and turnover.
- c. Adding more studies on tree/plant physiology and morphology along the Ts-gradients.

There are already some plans for additional work-packages to be added to the ForHot study; but they are still pending for e.g. that we require further funding to the base-project:

Nr	NAMES		SUB-PROJECT
<i>Tree physiology and dendrometers</i>			
XII	Brynhildur Bjarnadóttir Bjarni D. Sigurðsson	Móg. Lbhí	Measurements diurnal/seasonal diameter growth and of photosynthesis, respiration and transpiration of trees along the Ts gradient. BDS and BB are planning to add these meas. We have already scaffolding waiting to be installed at the site to reach the canopy (ca. 10-15 m tall trees).
<i>Fine root turnover</i>			
XIII	Edda S. Oddsdóttir Lena Finér	Móg Metla	Measurements of fine root growth and turnover along the Ts gradient using ingrowth-bags. ESO is planning to add these meas. in 2012 or 2013 – LM is interested to assist and cooperate...
<i>N2O and NH4 fluxes</i>			
XIV	Marja Maljanen	UEF	Measurements of N2O and CH4 fluxes along the Ts gradient

Metla = The Finnish Forest Research Institute, Joensuu, Finland; UEF = Univ. E-Finland, Kuopio.

#### 4. Next steps of the ForHot's steering group (SG).

- BDS and SG will finalize the MoU draft and send out to all participants.
- The Icelandic participants will send an application to "Tækjasjóður" for funding of more infrastructure at the site. Deadline is March 15.
- The SG will then prepare an application for the base ForHot project to the National Research Council in Iceland (The Icelandic Research Fund). Foreign participants will be asked to formally take part in this application. Deadline June 1.
- Welcome James T Weedon to Iceland this spring :o)

#### 5. Other issues

- Kesara has just set up a new SEM – scanning electro microscope at her lab in Univ. Iceland (Reykjavik). She offers other participants in ForHot to use that, if interested.
  - ⇒ Microbial studies
  - ⇒ Morphological responses of plants (e.g. stomata density, fine-root morphology), etc.
- We already have two products from ForHot:
  - Edda S. Oddsdóttir & Bjarni D. Sigurðsson (2012) Jarðhitaskógurinn – ForHot: Nýtt samstafsverkefni á sviði skógvistfræði [ForHot: A new research project in the field of forest ecology]. Ársskýrsla Skógræktar ríkisins 2011: xxx-xxx. (in Icelandic)
  - Thoen, E. (2011). ECM fungi along a geothermal temperature elevation gradient in a *Picea sitchensis* forest stand in Iceland. An unpublished thesis. University of Iceland, Reykjavik.
    - ⇒ EOS and KA-J will in cooperation with ET try to publish these results in 2012/13.
- Possibilities of establishing a formal ForHOT network
  - Deadlines for sending in a COST-application is March 30<sup>th</sup>.
  - Another possibility would be to use SNS or NordForsk (for the Nordic participants)
- Remember – Undergrad + MS students can still be added to ForHot. Deadline to the Icelandic "Nýsköpunarsjóður námsmanna" is March 8

Meeting ended 12:08