

MINUTES

FutureArctic/FORHOT – 12th formal project meeting

Hannesarholt, Reykjavik + on-line

and from a workshop entitled *“Joint Ecosystem Assessment on the Effects of Natural Soil Warming and N-input Manipulation on Subarctic Grasslands and Forests”* 10-14 Oct, 2022

Attending: Altogether 33 ForHot and Future Arctic participants attended the meeting in situ and 20 were taking part on-line. Total = **53 participants**.



Figure 1. Snapshot from the FutureArctic/ForHot excursion on Oct 11

Agenda of the ForHot/FutureArctic business meeting

1. ForHot member overview now (2022)
2. Main ongoing (funded) activities/projects
3. New activities/projects endorsed at this meeting
4. Funding news
5. Published papers
6. Publication plans Oct 2022-Oct 2023
7. Other issues
8. Mini-conference program and a link to pdfs of the talks
9. Attendance lists



Figure 2. Snapshot from the FutureArctic/ForHot project meeting in Hannesarholt, Reykjavik.

1. ForHot member overview now (2022)

The list of active participants of the ForHot project. Researchers active now in 2022 are in **bold/green**. Students who are still active in 2022 are in **bold/blue**; others who are still linked to the project but not very active in 2021-2022 are in **bold/red**:

<p>Agric. Univ. of Iceland</p> <ol style="list-style-type: none"> 1. Prof. Bjarni D. Sigurdsson (coord.) 2. Páll Sigurðsson (Ph.D. student 2016-) 3. Ruth Tchana (Ph.D. student 2020-) 4. Narfi Hjartarson (BSc student 2020-) <p>Icelandic Forest Research – Mogilsa</p> <ol style="list-style-type: none"> 5. Dr. Edda S. Oddsdóttir <p>Svarmi ehf.</p> <ol style="list-style-type: none"> 6. M.Sc. Tryggvi Stefánsson 7. Amir Hamedpour (Ph.D. student 2020-) <p>Soil Conservation Service</p> <ol style="list-style-type: none"> 8. Dr. Bryndis Marteinsdóttir <p>Univ. of Antwerp - Belgium</p> <ol style="list-style-type: none"> 9. Prof. Ivan Janssens 10. Prof. Erik Verbruggen 11. Dr. Joke Van den Berge 12. Dr. Eric Struyf 13. Johan de Gruyter (PhD student 2017-2021) 14. Coline Le Noir de Carlan (PhD student 2020...) 15. Prof. Steven Latré 16. Priyesh Puluckul (PhD student 2020...) 17. Vaidehi Narsingh (PhD student 2020...) 18. Bart Bussmann (PhD student 2020...) <p>ILVO - Belgium</p> <ol style="list-style-type: none"> 19. Dr. Peter Lootens 20. Dr. Caroline De Tender 21. Dr. Greet Ruyschaert 22. Dr. Niel Verbrugghe 23. Joanna Pranga (PhD student 2020...) <p>IMEC - Belgium</p> <ol style="list-style-type: none"> 24. Prof. Maarten Weyn 25. Dr. Yorick De Bock 26. Dr. Johan Bergs <p>Thünen Institute - Germany</p> <ol style="list-style-type: none"> 27. Dr. Christopher Poeplau <p>Univ. Greifswald, Germany</p> <ol style="list-style-type: none"> 28. Prof. Tim Ulrich 29. Dr. Mathilde Dahl (Post-doc) <p>ETH Zürich, Switzerland</p> <ol style="list-style-type: none"> 30. Dr. Tom Walker <p>CzechGlobe, Czech Republic</p> <ol style="list-style-type: none"> 31. Dr. Karel Klem 32. Dr. Otmar Urban <p>Univ. S. Bohemia, Czech Republic</p> <ol style="list-style-type: none"> 33. Dr. Anne Daebeler <p>Cardinal Stefan Wyszyński Univ., Poland</p> <ol style="list-style-type: none"> 32. Dr. Krassimira Ilieva-Makulec 	<p>EMU, Estonia</p> <ol style="list-style-type: none"> 60. Prof. Ülo Niinemets 61. Dr. Kristiina Mark 62. Upasana Sharma (PhD stud. 2021...) 63. José Ángel Morales Sánchez (PhD stud. 2021...) <p>Copenhagen Univ. - Denmark</p> <ol style="list-style-type: none"> 64. Prof. Per Gundersen 65. Dr. Klaus S. Larsen 66. Linsey Avila (PhD student 2020...) <p>Aarhus Univ. - Denmark</p> <ol style="list-style-type: none"> 67. Prof. Martin Holmstrup <p>DMR - Denmark</p> <ol style="list-style-type: none"> 68. Poul Larsen 69. Samer Nasser (PhD student 2022...) <p>Univ. of Tromsø</p> <ol style="list-style-type: none"> 70. Dr. Alexander Tveit 71. Dr. Andrea Söllinger (Post-doc 2019...) 72. Laureen Sarah Ahlers (MSc 2022...) <p>Univ. of Vienna - Austria</p> <ol style="list-style-type: none"> 73. Prof. Andreas Richter 74. Dr. Christina Kaiser 75. Lucia Fuchslueger (Post-doc 2020...) 76. Joana da Silva (PhD student 2018...) 77. Dennis Metze (PhD student 2020...) 78. Moritz Mohrlök (MSc student 2019...) 79. Prof. Ulrike Felt 80. Virginia Vargolska (PhD student 2020...) 81. Philipp Guendler (M.Sc. student 2018-2019) 82. Prof. Michael Wagner 83. Dr. Petra Pjevac 84. Dr. Craig Herbold 85. Dr. Andrew Giguere (post-doc 2019...) <p>Univ. of Innsbruck - Austria</p> <ol style="list-style-type: none"> 86. Prof. Michael Bahn 87. Dr. Johannes Ingris 88. Kathiravan M. Meeran (PhD student 2018...) 89. Fabrizio Protti (PhD student 2020...) <p>VSI - Austria</p> <ol style="list-style-type: none"> 90. Dr. Liaqat Seehra <p>BOKU - Austria</p> <ol style="list-style-type: none"> 91. Prof. Boris Rewald 92. Dr. Gernot Bodner 93. Pavel Baykalov (PhD student 2020...) <p>Universitat Autònoma de Barcelona (UAB), Spain</p> <ol style="list-style-type: none"> 94. Prof. Josep Peñuelas 95. Dr. Jordi Sardans 96. Dr. Olga Margalef
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<p>Vrije Univerity, Amsterdam, NL</p> <p>33. Ass. prof. James T. Weedon</p> <p>34. Ruud Rijkers (PhD student 2018-...)</p> <p>Univ. Eastern Finland</p> <p>35. Prof. Marja Maljanen</p> <p>36. Prof. Christina Biasi</p> <p>37. Katri Ylä-Soininmäki (MSc student 2022...)</p> <p>LSCE, Inst. Pierre Simon Laplace, France</p> <p>38. Dr. Rose Abramoff</p> <p>Berkeley Lab - USA</p> <ul style="list-style-type: none"> • Dr. Margaret S. Torn • Dr. Jennifer Soong (Post-doc 2018-2020) • Colette Brown (PhD student 2021-...) <p>Lund University</p> <p>49. Prof. Håkan Wallander</p> <p>50. Prof. Erland Bååth</p> <p>51. Dr. Per Bengtson</p> <p>Umeå Univ., Sweden</p> <p>52. Dr. Niki Leblans (Post-doc 2018...)</p> <p>Örebro Univ., Sweden</p> <p>53. Prof. Alf Ekblad</p> <p>Univ. of Tartu, Estonia</p> <p>54. Prof. Ivika Ostonen</p> <p>55. Prof. Jaak Truu</p> <p>56. Ass.Prof. Marika Truu</p> <p>57. Ass.Prof. Martin Maddison</p> <p>58. Biplabi Bhattacharai (PhD student 2019...)</p> <p>59. Arun Kumar Devarajan (PhD student 2020...)</p>	<p>97. Dr. Iolanda Filella</p> <p>98. Dr. Albert Gargallo (post-doc 2016...)</p> <p>99. Dr. Sara Marañón Jiménez</p> <p>100. Dr. Guille Peguero (Post-doc 2018...)</p> <p>101. Argus Pesqueda (PhD student 2020...)</p> <p>102. Miquel Ferrin (PhD student 2021...)</p> <p>In total active in 2022: at least 83 brains</p> <p>51 researchers, 7 postdocs and 25 PhD students</p> <p>and 5 MSc/BSc students</p> <p>30 universities/institutes</p> <p>16 countries</p> <p>If you find that some name is missing (e.g. for MSc student or a college) then please let Bjarni know and send him the missing name and the e-mail address of that person.</p>
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2. Main ongoing activities/projects at the ForHot infrastructure

- **ForHot-Forest** 2016-2018... (Bjarni D. Sigurdsson/ AUI)
- **Seasonal (GN) Experiment** 2017-18 (Andi Richter / Univ. Vienna)
- **TNT** 2018-2021 (Michael Bahn/Ivan Janssens)
- **FutureArctic** 2019-2023 (Ivan Janssens et al.)
- **DFG-Postdoc** 2020-2026 (Mathilde Borg) *Quantitative molecular assessment of the soil biota in high-latitude grasslands impacted by long-term warming*
- **ForHot Estonia** 2019-2026 (Ivika Ostonen / Tartu Univ.).
- **Finding NiMO** 2021-2024 (Anne Dalebeler / Univ. South Bohemia) *Illuminating the interactions between nitrification and methane oxidation and the ensuing ecological impacts*
- **NAT-LAB-14C** 2021-2024 (Christina Biasi / Univ. Eastern Finland) *Using volcanic-geothermal fields as natural laboratories to investigate transfer of 14C in soils and into terrestrial food webs*
- **Socrates** 2023-2026 (Sara Marañon / CREAF, Barcelona)

3. New ForHot activities/projects endorsed at this meeting

- **Sara Marañon - CREAF, Barcelona.** Socrates – transplant study. Will start in spring 2023
- **Christina Kaiser – Univ. Vienna.** SomSOM – Self-organisation of microbial soil organic matter turnover: a) aggregate study, b) incubation study
- **Margaret Torn – Berkley, CA, USA** – Data sharing and synthesis among all the 9 whole-soil warming experiments that are found globally.
- **Margaret Torn – Berkley, CA, USA** – *Belowground Biogeochemistry SFA* collaboration on Fluorescence Sensing (SIF) of warming-induces changes in foliar N and linking that to satellite remote sensing at ForHot.
 - a. Issues of scales for satellite data, but we are still interested to do ground-based measurements to compare with Berkley's grassland experiment.
 - b. Might be interesting to do these SIF measurements on the NT-nitrogen addition plots at ForHot.
 - c. Would be possible to establish few lager cool and warmed plots at ForHot.

4. Funding news

- Andi and Erik V plan to submit a grant proposal to FWO/Austria to co-fund the new Transplant experiment
- Alex and Andrea are going to re-submit a grant proposal to add to Mathilde's new seasonal experiment. More microcosm studies + pure cell-culture studies...
- Bjarni plans to submit a grant proposal to Icel. Res. Council in June 2023 to co-fund the Transplant experiment.

5. Published papers

Papers already out (in chronological order):

1. **JOURNAL PAPER:** O'Gorman et al. (2014) Climate change and geothermal ecosystems: natural laboratories, sentinel systems, and future refugia. *Global Change Biology*, 20(11):3291-3299.
2. **JOURNAL PAPER:** Bjarni D. Sigurdsson et al. (2016). Geothermal ecosystems as natural climate change experiments: the ForHot research site in Iceland as a case study. *Icelandic Agricultural Sciences* 29:53-71.
3. **JOURNAL PAPER:** Christopher Poeplau et al. (2017). Sensitivity of soil carbon fractions and their specific stabilisation mechanisms to extreme soil warming in a subarctic grassland. *Global Change Biology* 23: 1316-1327.
4. **JOURNAL PAPER:** Niki Leblans et al. (2017). Phenological responses of Icelandic subarctic grasslands to short-term and long-term natural soil warming. *Global Change Biology* 23(11), 4932-4945.
5. **JOURNAL PAPER:** Marja Maljanen et al. (2017). The emissions of N₂O and CH₄ from natural soil temperature gradients in a volcanic area in southwest Iceland. *Soil Biology and Biochemistry* 109: 70-80.
6. **JOURNAL PAPER:** Albert Gargallo-Garriga. (2017). Impact of soil warming on the plant metabolome of Icelandic grasslands. *Metabolites* 7(3) 44
7. **JOURNAL PAPER:** Martin Holmstrup et al. (2018). Resilience in functional diversity of Collembola subjected to long-term warming. *Functional Ecology* 32(5): 1304-1316
8. **JOURNAL PAPER:** Dajana Radujkovic et al. (2018). Prolonged exposure does not increase soil microbial community response to warming along geothermal gradients. *FEMS Microbiology Ecology* 94(2): fix174.
9. **JOURNAL PAPER:** Marja Maljanen et al. (2018). The potential effect of elevated soil temperatures on the production of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), nitric oxide (NO) and nitrous acid (HONO) from volcanic soils in southern Iceland. *Icelandic Agricultural Sciences* 31, 11-22
10. **JOURNAL PAPER:** Tom W. N. Walker et al. (2018). Microbial temperature sensitivity and biomass change explain soil carbon loss with warming. *Nature Climate Change* 8: 885-889.

11. **JOURNAL PAPER:** Christopher Poeplau et al. (2019). Changes in the Rock-Eval signature of soil organic carbon upon extreme soil warming and chemical oxidation - A comparison. *Geoderma* 337 (2019): 181-190.
12. **JOURNAL PAPER:** Sara Vicca et al. (2018). Using research networks to create the comprehensive datasets needed to assess nutrient availability as a key determinant of terrestrial carbon cycling. *Environmental Research Letters* 13(12): 125006.
13. **JOURNAL PAPER:** Marañón-Jiménez S. et al. (2018). Geothermally warmed soils reveal persistent increases in the respiratory costs of soil microbes contributing to substantial C losses. *Biogeochemistry* 138: 245–260.
14. **JOURNAL PAPER:** Kaarin Parts et al. (2019) Acclimation of fine root systems to soil warming: comparison of an experimental setup and a natural soil temperature gradient. *Ecosystems* 22(3): 457-472.
15. **JOURNAL PAPER:** Nicholas Rosenstock et al. (2019). Carbon sequestration and community composition of ectomycorrhizal fungi across a geothermal warming gradient in an Icelandic spruce forest. *Fungal Ecology* 40: 32-42.
16. **JOURNAL PAPER:** Sara Marañón-Jiménez, et al. (2019). Coupled carbon and nitrogen losses in response to seven years of chronic warming in subarctic soils. *Soil Biology and Biochemistry* 134: 152-161.
17. **JOURNAL PAPER:** Cindy De Jonge, et al. (2019) Lipid biomarker temperature proxy responds to abrupt shift in the bacterial community composition in geothermally heated soils. *Organic Geochemistry*, 137, 103897. doi:<https://doi.org/10.1016/j.orggeochem.2019.07.006>
18. **JOURNAL PAPER:** Tom W. N. Walker, et al. (2020). A systemic decadal-scale overreaction to soil warming in a grassland ecosystem. *Nature Ecology and Evolution* 4: 101-108
19. **JOURNAL PAPER:** Dmitry Kutcherov, et al. (2020). Temperature responses in a subarctic springtail from two geothermally warmed habitats. *Pedobiologia - Journal of Soil Ecology* 78: 150606. <https://doi.org/10.1016/j.pedobi.2019.150606>
20. **JOURNAL PAPER:** Johan De Gruyter, et al. (2020) Patterns of local, intercontinental and inter-seasonal variation of soil bacterial and eukaryotic microbial communities. *FEMS Microbiology Ecology* 96, fiae018.
21. **JOURNAL PAPER:** Jing Zhang et al. (2020). The influence of soil warming on organic carbon sequestration of arbuscular mycorrhizal fungi in a sub-Arctic grassland. *Soil Biology and Biochemistry* 147(August 2020): 107826
22. **JOURNAL PAPER:** Christopher Poeplau et al. (2020). Strong warming of a subarctic Andosol depleted soil carbon and aggregation under forest and grassland cover. *Soil* 6, 115–129. <https://doi.org/10.5194/soil-6-115-2020>
23. **JOURNAL PAPER:** Marja Maljanen et al. (2020). Stable isotope method reveals the role of abiotic source of carbon dioxide efflux from geothermally warmed soil in Southern Iceland. *Icelandic Agricultural Sciences* 33, 41-56, doi.org/10.16886/IAS.2020.05
24. **JOURNAL PAPER:** Joana Séneca et al. (2021). Warming leads to an up regulation of genes involved in the degradation of organic nitrogen substrates in subarctic grasslands. *ISME Communications* 1(1): 69. <https://doi.org/10.1038/s43705-021-00073-5>

25. **JOURNAL PAPER:** Gargallo-Garriga, Albert et al. (2020). Effects of warming on the soil metabolome of Icelandic grasslands. *European Journal of Soil Biology* 105: 103317. <https://doi.org/10.1016/j.ejsobi.2021.103317>
26. **JOURNAL PAPER:** Rijkers, R. et al. (2022). Optimal growth temperature of Arctic soil bacterial communities increases under experimental warming. *Global Change Biology*, 28(20), 6050-6064. <https://doi.org/10.1111/gcb.16342>
27. **JOURNAL PAPER:** Verbrigghe, Niel et al. (2022). Negative priming of soil organic matter following long-term in situ warming of sub-arctic soils. *Geoderma* 410: 115652. <https://doi.org/10.1016/j.geoderma.2021.115652>
28. **JOURNAL PAPER:** Verbrigghe, N. et al. (2022) Long-term warming reduced microbial biomass but increased recent plant-derived C in microbes of a subarctic grassland. *Soil Biology and Biochemistry* 167, 108590. <https://doi.org/10.1016/j.soilbio.2022.108590>.
29. **JOURNAL PAPER:** Verbrigghe, Niel et al. (2022). Soil carbon loss in warmed subarctic grasslands is rapid and restricted to topsoil. *Biogeosciences* 19(14), 3381-3393. <https://doi.org/10.5194/bg-2021-338>
30. **JOURNAL PAPER:** Söllinger, Andrea et al. (2022). Downregulation of the microbial protein biosynthesis machinery in response to weeks, years, and decades of soil warming. *Science Advances* 8(12): eabm320, <https://doi.org/10.1126/sciadv.abm3230>

For more, see www.forhot.is/publications

6. Publication plans 2023



We now have 30 papers that give data from the ForHot infrastructures (see above).

The following papers have been submitted in 2022 or are just to be submitted and should appear soon:

1. **JOURNAL PAPER:** Pavel Baykalov et al. First paper (Root segmenting) (submitted)
2. **JOURNAL PAPER:** Biplabi Bhattarai et al. (2023). Soil warming duration and magnitude affects dynamics of fine-roots and rhizomes and related C and N pools in belowground of subarctic grasslands (resubmit)
3. **JOURNAL PAPER:** Chao Fang et al. Fine-root turnover in GN, GO and NT (in preb.)
4. **JOURNAL PAPER:** Thakur et al. Soil fauna in the Seasonal Experiment in GN (resubmit)

5. **JOURNAL PAPER:** Miquel Ferrín et al. (2023). Responses of soil insect communities to warming are mediated by shifts in microbial carbon and nitrogen in a subarctic grassland = Seasonal experim. (in preb)
6. **JOURNAL PAPER:** Páll Sigurdsson et al. Fine-root turnover in FN (in preb.)
7. **JOURNAL PAPER:** Weedon & Bååth et al. The soil bacteria growth and composition at FN/GN in 2012 (resubmit)
8. **JOURNAL PAPER:** Dahl, Mathilde Borg et al. Long-term warming-induced trophic downgrading in the soil microbial food web (in preb.)
9. **JOURNAL PAPER:** Kathir et al. Effect of soil warming and N availability on the fate of recent carbon in subarctic grassland. (in preb.)

The participants at the 2022 meeting had pledged to submit and publish the following papers (and some were extended for those who did not attend :o) – the deadline for those has now been extended to the 2023 meeting Those on the list below list that will not have submitted their pledged paper, promised that at the next *in situ* meeting (2023) they would bring a bottle of wine and give to another (random) person on the list who had succeeded to keep his/her promise.

UPDATED older promises

10. Kathiravan M. Meeran et al. Pulse-labelling study 2018 in TNT 13C results and fluxes
11. Philipp Guendler et al. Seasonal Experiment I in GN/NT in 2017-2018
12. Andreas Richter et al. Seasonal experiment in GN/NT in 2017-2018
13. Pall Sigurdsson et al. Comparison of three methods to estimate fine-root turnover
14. Pall Sigurdsson et al. Aboveground and belowground phenology in FN
15. Bjarni D. Sigurdsson et al. Tree growth and forest productivity in FN
16. Bjarni D. Sigurdsson et al. C-balance changes in FN during 2013-2018
17. Bjarni D. Sigurdsson et al. Effects of Land Use Change (GN=>FN) synthesis paper
18. Bryndís Marteinsdóttir, Nia Perron, et al. (2017). Plant phenology and fitness at Hengill, GN and GO
19. Per Gundersen et al Leachates in FN 2015-2018
20. Krassimira et al. Nematodes in FN, GN and GO in 2014
21. Niel Verbrügge, Wallander, Poeplau & Richter, Soong et al. Fractionations of GN/GO soil with different methods.
22. Rose Abramoff Testing T-sensitivity functions w. Millennial model
23. Jordi Sardans et al. SEM of GN and GO (pending database updates)
24. Tom Walker, Erik V et al. Synthesis on plant and soil community changes due to warming (pending database updates)

NEW promises in 2022

25. **Matthilde Dahl et al.** Technical internal sequencing standard
26. **Pavel et al.** Segmentation paper II
27. **Pavel et al.** Hyperspectral species identification etc.
28. **Vaidehi et al.** European map of foliar nutrient concentration data
29. **Joanna et al.** Remote sensed species composition
30. **Ruth Phoebe et al.** Plant phenology
31. **Bart & Ruth Phoebe et al.** NDVI 2013-2019
32. **Amir et al.** Vegetation indices 2021-2022
33. **Amir et al.** Remote-sensed grassland biomass
34. **Priyesh et al.** Energy harvesting
35. **Priyesh et al.** InfiniteEN
36. **Coline et al.** Root-core experiment
37. **Dennis et al.** qSIP root-core experiment
38. **Dennis et al.** Austrian warming experiment
39. **Argus et al.** First paper (Metabolomics from the FA core-experiment)
40. **Argus et al.** Second paper (TNT metabolomics)
41. **Biplabi et al.** Sugars in roots
42. **Andrea.** MSc thesis of a student
43. **Andrea et al.** RNA dynamics in GO/GN/FN
44. **Arun et al.** Sequenced root-soil communities
45. **Fabrizio et al.** Soil respiration ^{13}C
46. **Argus et al.** Metabolomics of pulse-labelling experiment
47. **Argus et al.** Metabolomics of root-core experiment
48. **Margret Torn et al.** First synthesis paper
49. **Colette et a.** First chapter in PhD thesis
50. **Sara Mara  n Jim  nez et al.** N-cycle & polymerization from Seasonal Experiment in GN/NT
51. **Sara Mara  n Jim  nez et al.** Seasonal experiment in GN/NT in 2017-2018 synthesis
52. **Ivan Janssens, Niki Leblans, et al.** Effect of short- and long-term soil warming on plant and soil stoichiometry in GN and GO
53. **Ivan Janssens, ESRs et al.** Recent technological/methodological advances in ecological research
54. **Oh Mann** Carbon chicken & N eggs

7. Other issues

I. Next FutureArctic/ForHot 2023 annual meeting

- Local host: Ivika Ostonen – Tartu University, Estonia
- Time: 2,3 or 4 weeks of October, 2023 (to be decided)

II. There will (most probably) be EGU session on FutureArctic/ForHot during 23-38 April 2023

- Important that ESRs and others send in abstracts (so the session will be accepted)
- Deadline is usually in mid January

III. The IMEC measurement system at ForHot

Maarten:

- The system will be kept at ForHot for time being.
- Priyesh will optimize its user-friendliness for operation.
- IMEC will make a budget for what it would cost to scale the system up for 50 extra sensors for the Transplant experiment.
- Will develop soil profile Ts measurements on 1 m energy harvesting rods.

IV. Samer's project/system

- Sam will be based at IMEC and continue to work with the DMR system
- Maarten thinks it is good to involve his system in the Transplant Experiment in 2023-2025

V. Svarmi ehf graphical data-system

- Tryggvi offered that ForHot participants can get access to the system through Amir, where graphical data can be stored.

VI. Synthesis workshops for ESRs

- If there will be any budget left after paying for this annual meeting, the rest will be used to invite ESRs to some chosen synthesis/writing workshops that extend between more than two ESRs. We can use the last funding until end of 2023.

9. The 2022 mini-conference on recent findings in Fut.Arc. and ForHot

October 12-14, 2022

Pdfs from all the talks and most workshop sessions are available on a closed dropbox folder. The address is <https://www.dropbox.com/sh/pngw9r1mleammdj/AABbru9DsbM8oZOG0BJmPsjMa?dl=0>

Day 1 – Wednesday 12 th Oct, 2022	
09:00-10:20 GMT (Icelandic time)	Session 1: FutureArctic ESR mini-conference – part I Chair: Josep Peñuelas Talk 01: Ivan Janssens Future Arctic ITN project plan and its status now Talk 02: ESR01 Coline Le Noir de Carlan . Soil microbiome of warmed grasslands Talk 03: ESR04 Dennis Metze . Warming changes who's active in bulk and root-associated microbial communities Talk 04: ESR08 Argus Pesqueda . Core sample metabolomics Talk 05: ESR03 Biplabi Bhattacharai . Soil warming duration and magnitude affects dynamics of fine-roots and rhizomes and related C and N pools, production, turnover and fine-root traits in belowground of subarctic grasslands
10:20-10:40	Break
10:40 – 12:00	Session 2: FutureArctic ESR mini-conference – part II Chair: Joke Van den Berge Talk 06: ESR05 Fabrizio Protti . Soil CO ₂ efflux response to middle-term warming Talk 07: ESR06 Linsey Avila . Carbon exchange in the plant-soil-atmosphere continuum Talk 08: ESR7 Ruth Phoebe Tchana . How does soil warming affect the growth processes of subarctic grasslands? Talk 09: ESR10 Amir Hamedpour . Subarctic grassland analysis from multispectral images Talk 10: ESR02 Joanna Pranga . Visual and multispectral assessment of grasslands
12:00 – 13:00	Lunch
13:00 – 14:45	Session 3: General FutureArctic-ForHot mini-conference – part I Chair: Bjarni D. Sigurdsson Talk 11: Mathilde Borg Dahl . Status of the ForHot project: "Quantitative molecular assessment of the soil biota in high-latitude grasslands impacted by long-term warming" Talk 12: Andrea Söllinger . Down-regulation of the bacterial protein biosynthesis machinery in response to weeks, years, and decades of soil warming On-line talk 13: Christina Kaiser . Do soil microbial ecosystems cross 'tipping points' under warming?" Talk 14: Arun Kumar Devarajan . The effect of short-term and long-term warming on the bulk soil and rhizosphere microbial communities and their potential to perform nitrogen cycling processes
14:45 – 15:05	Break
15:05 – 16:15	Session 4. The transplantation experiment: SOCRATES makes us think Chair: Erik Verbruggen Talk 15: Sara Marañón . Proposal of a joint and "minimal" design for a transplantation experiment in ForHot

Day 2 - Thursday 13 th Oct, 2022	
09:00-10:20 GMT (Icelandic time)	Session 5: FutureArctic ESR mini-conference – part II Chair: Maarten Weyn Talk 16: ESR11 Samer Nasser . Development of an automated sampler for monitoring nutrient flows in the unsaturated soil Talk 17: ESR12 Pavel Baykalov . Semantic segmentation of plant roots from RGB images and hyperspectral data analysis Talk 18: ESR09 Priyesh Puluckul . Powering Internet of Things with the Energy from the Soil Talk 19: ESR14 Bart Bussmann . Investigating mechanisms behind NDVI curves with machine learning Talk 20: ESR13 Vaidehi Narsingh . Prediction of forest foliar concentration using explainable AI techniques
10:30-10:50	Break
10:50 – 12:00	Session 6: Let's study those who study... Chair: Ulrike Felt Talk 21: Ulrike Felt . Challenges of sens(or)ing the environment Talk 22: ESR15 Virginia Vargolska . Challenges of sensing A mini-workshop on Virginia's and Ulrike's research within the FutureArctic project.
12:00 – 13:00	Lunch and a possibility for one sub-group lunch discussion
13:00 – 14:30	Session 7: General FutureArctic-ForHot mini-conference – Part II. Chair: Andrea Söllinger On-line talk 23: Katri Ylä-Soininmäki . Emissions of CO ₂ and CH ₄ and source identification along warming gradients in geothermal areas of Iceland, first results Talk 24: Bjarni D. Sigurdsson . Update on the ForHot activities and a few critical points regarding site environmental parameters Talk 25: Klaus Steenberg Larsen . Changes in GHG exchange in a rewetted wetland in Trysil, Norway Talk 26: Ivika Ostonen . Plants belowground biomass functional distribution in warming soil
14:30 – 15:00	Break
15:00-16:00	Session 8. Data sharing and synthesis among whole-soil warming experiments Chair: Colette Brown Talk 27: Margaret Torn . A brief update on the California soil warming Talk 28: Margaret Torn . Data sharing and synthesis among whole-soil warming experiments experiments
Day 3 - Friday 14 Oct, 2022	
09:00 – 09:45 GMT (IS time)	Session 9. New devices being developed by the non-academic partners. Chair: Poul Larsen Talk 29 Paul Larsen / DMR: Development of an autonomous eDNA robot Talk 30 Tryggvi Stefánsson / Svarmi ehf: DATACT, a platform for companies to measure and report on nature
09:45 – 10:30	Session 10. Finalization of the Future Arctic project Chair: Ivan Janssens What did we promise? ... and how will we get there? Talk 31: Erik Verbruggen The FutureArctic/ForHot Database: next steps

10:30-10:45	Break
10:45-12:00 CET	Session 11. The TNT project: some of its final outcomes Chair: Ivan Janssens On-line talk 32. Michael Bahn. Introduction to TNT On-line talk 33. Kathiravan Meeran. Individual and interactive effects of warming and nitrogen supply on CO2 fluxes and carbon allocation in subarctic grassland On-line talk 34. Niel Verbrigghe. Summary from recent articles and a PhD thesis
12:00 – 13:00	Lunch
13:00-15:30	Session 12. ForHot Business Meeting Talk 35. Bjarni D. Sigurdsson Future collaborative research within the ForHot-Futurure Arctic projects (and outside). A roundtable discussion about all ongoing and future project/publication plans and decisions that need to be reached at this meeting.

10. Attendance lists

People attending the meeting in-situ in Iceland.

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Other un-registered participants:

Name	Name	Name
Jen Li (Guest)	Olga Margalef (Guest)	Sean (Guest)
Laia Merce Bosch de basea Moreno		