

Annual report for CARs

Submit the report before March 1st to: sns@slu.se
 The report should not exceed 1500 words (including words in the template).

1. CAR title:	Centre of Advanced Research on Environmental Services from Nordic Forest Ecosystems (CAR-ES)
2. Reporting year:	2017

3. Project coordinator:	Raija Laiho
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Activities during the reporting year:

4. Description of the activities during the reporting year:

CAR-ES activities were based on active national research and dissemination, including training of forestry professionals. Varying consortia of CAR-ES members were also active in several international projects including EU COST actions. CAR-ES has proven integral for forming consortia with a strong Nordic-Baltic perspective, and benefits for the region. The progress of all research is reported in the network meetings, where joint interests are identified and coordinated efforts are initiated. The meetings are thus integral for CAR-ES, even though much of the coordinated work in general takes place via e-mail and Skype meetings. We managed to arrange only one specific network meeting in 2017, but the conclusion and plan was to have minimum two in the following years. Main activities in the topic areas covered by CAR-ES included:

C sequestration: collaboration was mostly channelled through SNS-120 project on greenhouse gas emissions from organic forest soils, which is a spin-off of CAR-ES (reported separately). Latvia implemented the EU Life project Sustainable and responsible management and re-use of degraded peatlands in Latvia, contributing to the topic and providing data for future syntheses. Silava, NIBIO and University of Copenhagen participated in ERA-GAS project Improving national forest inventory-based carbon stock change estimates for greenhouse gas inventories (INVENT) together with Swedish University of Agricultural Sciences. One proposal for EU Life Climate Change Mitigation, participation in another.

Functional biodiversity: A specific workshop in Tartu. Mapping of the state-of-the-art in the Nordic-Baltic region based on a questionnaire was started, to support review and project proposal planned for 2018.

Water quality: Review evaluating policies for surface water protection zones in the different countries was published (Ring et al. 2017). Much of the collaboration was channelled through the Interreg project WAMBAF, which is a spin-off of CAR-ES (<https://www.skogsstyrelsen.se/en/wambaf/>).

Soil quality: Evaluation for harmonizing and standardizing methods for soil texture analysis, results presented as poster, manuscript on preparation.

Silvicultural operations: research on forest management on sensitive organic soils got funded in Finland (SOMPA), and was included in a joint proposal for EU Life Climate Change Mitigation.

Intensified harvesting: collaboration was mostly channelled through SNS-NKJ 03 Effects of bioenergy production from forests and agriculture on ecosystem services in Nordic and Baltic landscapes, which is a spin-off of CAR-ES.

Land-use change involving forests: national-level research that will be basis for future synthesis was done in Denmark, Latvia, Lithuania and Iceland.

Climate change: collaboration was mostly channelled through ES-1308 COST ClimMani, where a number of

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participants have worked together. Joint research project on the effects of warming on ecosystem processes (ForHot) got funded in Iceland, where all participants are involved and that has so far produced four scientific articles where SNS/CAR-ES is acknowledged for support. This activity also led to one H2020 ITN/ETN application in January 2018.

Place and date for the activities:

5. Activity	Place (country) for the activity	Duration (date)
CAR-ES network meeting	Tartu, Estonia	29.-30.6.2017
SNS-NKJ 03 Effects of bioenergy production from forests and agriculture on ecosystem services in Nordic and Baltic landscapes	Denmark, Finland, Iceland, Latvia, Lithuania, Norway, Sweden, coordinated by NIBIO (Norway; Nicholas Clarke)	1.1.-31.12.2017 (final meeting was moved to 2018 to take place with the bioenergy governance conference to be arranged in April 2018)
Planning of bioenergy governance conference to be arranged in Copenhagen in April 2018, co-organized by CAR-ES, SNS-NKJ 03 and IAEA Bioenergy	Denmark, internet meetings, coordinated by University of Copenhagen (Denmark; Inge Stupak)	29.5.-31.12.2017
SNS-120 project	Denmark, Estonia, Finland, Iceland, Latvia, Norway, Sweden, e-mail meetings, coordinated by Luke (Finland; Raija Laiho)	1.1.-31.12.2017
Interreg WAMBAF project	Sweden, Finland, Latvia, Lithuania, Poland, coordinated by Swedish Forest Agency	1.1.-31.12.2017
Proposal for EU Life + on GHG emissions from organic forest soils	Latvia, Estonia, Finland, Lithuania, e-mail meetings and internet services, coordinated by Silava (Latvia; Andis Lazdins)	1.5.-6.9.2017

6. Project status:

- Does the project develop according to the research plan? Please elaborate:
- Does the project deviate from the research plan? Please elaborate:

A detailed work plan for the first two years was compiled in the kick-off meeting in 2016, and reviewed in network meeting in Uppsala, 21.-22.2.2018. We have been able to follow the plan even surprisingly well; all topics included in it have been started at the very least, and most of them have advanced in the planned schedule or faster. For instance, the major outcomes planned for the 'horizontal activity' (HA; see proposal) C sequestration, for the whole 5-year period (database for organic soils, synthesis & emission factor construction) has progressed so that it will be finished in 2018. Concerning HA Functional biodiversity, the work planned for the first period has progressed well but has taken slightly longer than anticipated in 2016. Concerning HA Water quality, the work has progressed as planned. Concerning HA Soil quality, the work has progressed well but publication has been delayed slightly.

Interdisciplinary workshops have been arranged according to the plan.

Concerning the 'vertical activities' (VA), research for improving management on sensitive (organic) soils has been funded with two major projects in Finland, which will also facilitate collaboration within CAR-ES. A joint workshop with forest operations specialists was postponed to 2018 (already realized in February).

Work on intensified harvesting has progressed as planned. Utilization of the metadatabases is also progressing in 2018, with a planned special workshop session on (wood ash) fertilization and a Tandem proposal. The work on buffer zones resulted in a publication of a review paper (Ring et al. 2017).

Results during the reporting year:

7. List the published outputs during the reporting year (peer-reviewed articles, other publications):

Peer-reviewed articles

CAR-ES synthesis papers

Ring, E, Johansson, J, Sandstrom, C, Bjarnadottir, B, Finer, L, Libiete, Z, Lode, E, Stupak, I, Saetersdal, M. 2017. Mapping policies for surface water protection zones on forest land in the Nordic-Baltic region: Large differences in prescriptiveness and zone width. *Ambio* 46(8): 878-893. DOI: 10.1007/s13280-017-0924-8

Other peer-reviewed articles (examples of work that forms the basis for network activities)

Finér, L., Domisch, T., Dawud, S.M., Raulund-Rasmussen, K., Vesterdal, L., Bouriaud, O., Bruelheide, H., Jaroszewicz, B., Selvi, F., Valladares, F. 2017. Conifer proportion explains fine root biomass more than tree species diversity and site factors in major European forest types. *Forest Ecology and Management* 406: 330-350.

Dawud, M. D., Raulund-Rasmussen, K., Ratcliffe, S., Domisch, T., Finér, L., Joly, François-Xavier, Hattensschwiler, S., Vesterdal, L. 2017 Tree species functional group is a more important driver of soil properties than tree species diversity across major European forest types. *Functional Ecology* 31: 1153-1162.

Maljanen, M., Yli-Moijala, H., Biasi, C., Leblans, N. I. W., De Boeck, H. J., Bjarnadóttir, B., et al. 2017. The emissions of nitrous oxide and methane from natural soil temperature gradients in a volcanic area in southwest Iceland. *Soil Biology and Biochemistry* 109: 70-80.

Rahman, M.M., Bárcena, T.G., Vesterdal, L. 2017. Tree species and time since afforestation drive soil C and N mineralization on former cropland. *Geoderma* 305: 153-161.

Lupikis, A., Bardule, A., Lazdins, A., Stola, J., Butlers, A. 2017. Carbon stock changes in drained arable organic soils in Latvia: results of a pilot study. *Agroonomy Research*, 15(3), 788-798.

Bardule, A., Lupikis, A., Butlers, A., Lazdins, A. 2017. Organic carbon stock in different types of mineral soils in cropland and grassland in Latvia. *Zemdirbyste-Agriculture*, 104(1), 3-8.

Oral and poster presentations (examples)

Callesen, I., Palvianen, M. Kjønaas, O.J., Armolaitis, K., Rasmussen, C. 2017. Soil texture analysis by laser diffraction – standardisation needed. Wageningen Soil Conference: Soil Science in a Changing World. August 27-30. 2017, Wageningen, Netherlands. (poster)

Jauhiainen, J., Alm, J., Bjarnadottir, B., Callesen, I., Christiansen, J.R., Clarke, N., Dalsgaard, L., He, H., Jordan, S., Kasimir, Å., Kazanavičiūtė, V., Klemedtsson, L., Lauren, A., Lazdins, A., Lehtonen, A., Lohila, A., Lupikis, A., Mander, Ü., Minkkinen, K., Ojanen, P., Olsson, M., Óskarsson, H., Sigurdsson, B.D., Soosaar, K., Søgaard, G., Vesterdal, L., Laiho, R. GHG balance in drained organic forest soils – data revisited.

International Workshop Carbon Cycling in Boreal Peatlands and Climate Change II. Set. 25-29, Hyytiälä, Finland. (poster)

8. Other practical outputs during the reporting year (e.g. websites, policy recommendations, conferences, large-scale project applications etc.)

Traceless, a film about forestry and water quality, prepared by Skogsforsk; currently available in Swedish (https://www.youtube.com/watch?v=Vw634g2Gxjo&list=PLQ5tSIRCHKPb4D1HM1_hTFgwW39kd1HEr) and English (<https://www.youtube.com/watch?v=xauLNORS4mo>), soon also in Norwegian.

Project application for EU Life Climate Change Mitigation on GHG emissions from organic forest soils, coordinated by Silava.

7th International Symposium on Physiological Processes in Roots of Woody Plants, June 26-29, Tartu, Estonia, organized by Estonian CAR-ES partners, and participated by many CAR-ES partners.

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9. Economic overview for the reporting year

Received grant from SNS for the reporting year:	Specify currency:
450 000	SEK

Costs. Please report costs **without VAT**.

	SNS funding	External funds	Total
Travel and hotel	108 169 (29%)	3%	5.6%
Meeting costs	6 961 (2%)		0.2%
Communication	6 935 (2%)		0.2%
Consumables	26 236 (7%)	4%	4.1%
Salary	213 654 (58%)	84%	81.2%
(Other costs (specify below))	6 183 (2%)	10%	8.7%
Total SUM	368 137	4 138 374	4 506 511

Transfer of SNS funds to project partners

Sum	Receiver of (partner) and reason for transfer
60 000	University of Copenhagen, Denmark; allocation for networking costs
22 500	University of Tartu, Estonia; allocation for networking costs
60 000	Agricultural University of Iceland; allocation for networking costs
22 500	Latvian State Forest Research Institute (Silava); allocation for networking costs
22 500	Institute of Forestry, Lithuanian Research Centre for Agriculture and Forestry; allocation for networking costs
60 000	Norwegian Institute of Bioeconomy Research (NIBIO); allocation for networking costs
60 000	Skogforsk, Sweden; allocation for networking costs

Comments to the economic overview:

Cost breakdown for external funds was not received from all partners. This breakdown is consequently presented as percentages of total, based on the average of those partners that did report the breakdown. For those partners the percentage values did not differ very much, so I believe that the average percentages reflect the reality quite well.

Altogether, SEK 81 863 was not used of the yearly grant. This was largely because we were 'saving up' funds for another workshop in 2017, which was, however, only realized in early 2018. We will participate in one major conference in 2018 in addition to our two specific workshops, so the saved funds will be put into good use in 2018.

External funds include institutional direct funding to CAR-ES (to a lesser extent) and project funding to CAR-ES topics (to a larger extent), projects managed by CAR-ES core members.

I hereby declare that the above statements are true to the best of my knowledge

Signature of the CAR coordinator, place and date



(Signature)

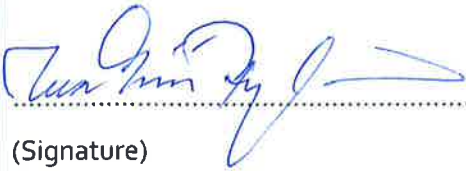
Natural Resources Institute Finland (Luke)

(Institution)

8 / 3 / 2018

(Day / Month / Year)

Signature of head of research institution



(Signature)

Natural Resources Institute Finland (Luke)

(Institution)

8 / 3 / 2018

(Day / Month / Year)

Eeva-Liisa Ryhänen, Vice President (Natural Resources), Natural Resources Institute Finland (Luke)
(Printed name, function)

