

## **HELI PELTOLA, Curriculum Vitae (CV)**

### **Personal details and date of CV**

Surname: Peltola (former: Sorsa)

First Names: Heli Maarit

Researcher identifier (ORCID): <https://orcid.org/0000-0003-1384-9153>

Home page: <https://uefconnect.uef.fi/en/person/heli.peltola/>

Date of CV: 7 December 2021

### **Degrees**

Degree of Ph.D. (Agr. and For.) 17.5.1995; Degree of Lic. (Agr. and For.) 22.2.1991; Degree of B.Sc. (Agr. and For.) 1.7.1988, University of Joensuu (UJOE), Finland

Title of Docent 21.5.2002, Silvicultural Sciences, University of Joensuu, Finland

### **Current employment**

1.2.2013- (permanent position), Professor in Silvicultural Sciences, University of Eastern Finland (UEF since 2010, after merging of Universities of Joensuu and Kuopio), Finland

### **Previous work experience**

UJOE/UEF: 1.9.2012-31.1.2013 Acting Professor in silvicultural sciences; 1.8.2006-30.8.2012 Senior researcher in silvicultural sciences; 15.8.2004-31.7.2006 Acting Professor in silvicultural sciences; 1.8.2002-14.8.2004 100% and 1.2.-31.7.2002 80% Senior researcher in silvicultural sciences (1.2.-31.7.2002, 20% Administrative Co-ordinator, CoE of AF), 1.1.2000-31.1.2002 Senior researcher / Administrative Co-ordinator (CoE of AF); 1.8.1995-31.12.1999 Post doc / Researcher.

Academy of Finland (AF): 1.8.1992-31.7.1995 Junior fellow and 1.5.1990-31.7.1992 Research assistant (excl. 9.10.1991-5.9.1992 motherhood leave).

### **Research funding and (major) grants**

**2018-2022** Academy project (OPTIMAM, Direct and value-based trade-offs for ecosystem goods and services in multi-objective management of boreal forests under changing climate), Academy of Finland (AF) 499 896 €, PI.

**2015-2021** SRC Consortium project (FORBIO, Sustainable, climate-neutral and resource-efficient forest-based bioeconomy), Strategic Research Council of AF 6,098 M€, Consortium (& UEF/For.) PI (1,452 M€). Other partners: UEF/Dept. of Chem., Finnish Meteorological Institute, Natural Resources Institute Finland, European Forest Institute, and Finnish Environment Institute.

**2013-2016** Joined Finnish Chinese Forest Research Call – project (EXTREME, Sensitivity of carbon sequestration and biomass production to the foreseen climate change, climatic variability and weather extremes: comparative analyses on desert and boreal forest ecosystems), AF 536 752 €, Consortium PI. Other partner: Beijing Forestry University, China (NSFC funding).

**2012-2016** Academy consortium project (ADAPT, Adaptation of forest management to climate change: uncertainties, impacts and risks to forests and forestry in Finland). AF 881 126 €, Consortium PI (490 486 €), other partner: Finnish Meteorological Institute.

**2008-2010** Academy project (Impacts of temporal and spatial variability of critical weather events and forest management on the risk of wind and snow induced damage in forest stands), AF 296 580 €, PI.

**2003-2005** Finnish-Swedish Basic Research, Wood Material Science Research Programme (AF, FORMAS and MMM), PI of Sub-project (Influence of environmental factors, forest structure and silvicultural practices on Scots pine, Norway spruce and birch properties), AF 172 840 €. Consortium PI Tuula Nuutinen, Finnish Forest Research Institute (FFRI), other partner organisation Skogforsk.

**1998-2001** Wood Wisdom Research Programme, PI of Sub-project (Effects of silvicultural management on the physical and chemical properties of wood), AF 152 000 €. Consortium PI Pekka Saranpää, FFRI.

### **Research supervision and leadership experience**

*Supervision of Post Docs (8):* Veli-Pekka Ikonen (6/2012-12/2013), Ane Zubizarreta Gerendiain (1/2013-11/2016), Jinnan Gong (11/2013-4/2016); Xia Zhou (6-12/2016), Tendry Randriamanana (9-12/2016 & 3-6/2017), Katri Nissinen (2018-2020), Ranjith Gopalakrishnan (1/2018-5/2021), Olalla Díaz-Yáñez (10/2018-6/2020).

*Principal supervisor for doctoral dissertations (22):* Eino Levkoev 2019, Laith AlRahahleh and Mikko Tikkinen 2018, Ben Wang & Xin Jia 2017, Piritta Torssonen, Inka Pippuri & Terhi Vilén 2015, Hilppa Gregow, Yohama Puentes Rodriques & Antti J. Lukkarinen 2013, Jaume Gort-Oromi 2010, Ane Zubizarreta Gerendiain 2009, Veli-Pekka Ikonen 2008, Jordi Garcia-Gonzalo 2007, Elemer Briceño-Elizondo & Hongheng Zeng 2006, Antti Kilpeläinen, Leena Kärkkäinen & Juho Matala 2005, Ari Talkkari 2001, Marja-Leena Päätaalo 2000.

*Co-supervisor for doctoral dissertations (5):* Norul Sobuj 2021, Johanna Routa & Zhenming Ge 2011, Liisa Huttunen 2009, Mart-Jan Schelhaas 2008. *Ongoing supervision of PhD students:* Laura Pikkarainen, Olli Muhonen, Timo Salminen.

*Supervision of 87 completed M.Sc. theses* (also many M.Sc. students under supervision).

*Other leadership experience:* Leader of FOBI (Forests and Bioeconomy) UEF Research Community 2020-2030, also BORFOR (Forests, Global Change and Bioeconomy) UEF Research area 2015-2020; Leader of WP3 Smart decision support (Co-PI of UEF/For. team) of AF flagship UNITE (2020-2024, flagship director Jyrki Kangas, UEF).

### **Awards and honours**

The decoration Knight First Class of the Order of the White Rose of Finland by the President of the Republic of Finland Sauli Niinistö in 2020; Carola and Carl-Olof Ternryd's award by the Linnaeus Academy's Research Foundation in 2020; Cajander Bronze Medal by the Finnish Society of Forest Science in 2014. Member of the Finnish Academy of Science and Letters, since 2018; Good teacher of the year -award by the University of Joensuu in 2005.

### **Scientific and societal impact**

*Memberships:* Research Council for Biosciences Health and the Environment (BTY), AF, 1.1.2019-31.12.2021, Finnish Climate Change Panel, 13.8.2020-31.12.2023, Steering group (2014-2020) and Executive committee (2021-) for the updating of forest management guidelines for practical forestry (led by TAPIO, <https://tapio.fi/>). Internationally highly recognised expertise in process-based forest ecosystem and risk modelling and their applications (also pioneer in mechanistic wind damage risk modelling in 1990's), and in sustainable multifunctional management and use of upland boreal forests. Participated over 30 national/international research projects. Large number of publications and workshop/seminar presentations (also many interviews for articles, radio and TV programmes). Google Scholar H-index 52, Web of Science (WoS) H-index 40, > 600 times WoS article citings in 2020.

### **The 10 most important scientific articles (in alphabetical order) related to this proposal**

- ALRahahleh, L., Kilpeläinen, A., Ikonen, V.-P., Strandman, H., Venäläinen, A., Peltola, H. 2018. Effects of CMIP5 projections on volume growth, carbon stock and timber yield in managed Scots pine, Norway spruce and silver birch stands under Southern and Northern boreal conditions. *Forests* 9, article id. 208.
- Díaz-Yáñez, O., Pukkala, T., Packalen, P., Lexer, M. J., Peltola, H. 2021. Multi-objective forestry increases the production of ecosystem services. *Forestry: An International Journal of Forest Research* 94(3):386–394.
- Díaz-Yáñez, O., Pukkala, T., Packalen, P., Peltola, H. 2020. Multifunctional comparison of different management strategies in boreal forests. *Forestry: An International Journal of Forest Research* 93(1): 84-95.
- Ge, Z-M., Kellomäki, S., Zhou, X, Wang, K-Y., Peltola, H. 2011. Evaluation of carbon exchange in a boreal coniferous stand over a 10-year period: an integrated analysis based on ecosystem model simulations and eddy covariance measurements. *Agricultural and Forest Meteorology* 151(2):191-203.
- Heinonen, T., Pukkala, T., Asikainen, A., Peltola, H. 2018. Scenario analyses on the effects of fertilization, improved regeneration material, and ditch network maintenance on timber production of Finnish forests. *European Journal of Forest Research* 137:93–107.
- Heinonen, T., Pukkala, T., Kellomäki, S., Strandman, H., Asikainen, A., Venäläinen, A., Peltola, H. 2018. Effects of forest management and harvesting intensity on the timber supply from Finnish forests in a changing climate. *Can. J. For. Res.* 48:1-11.
- Heinonen, T., Pukkala, T., Mehtätalo, L., Asikainen, A., Kangas J., Peltola, H. 2017. Scenario analyses on the effects of harvesting intensity on development of forest resources, timber supply, carbon balance and biodiversity of Finnish forestry. *Forest Policy and Economics* 80: 80-98.
- Kellomäki, S., Peltola, H., Nuutinen, T., Korhonen, K. T., Strandman, H. 2008. Sensitivity of managed boreal forests in Finland to climate change, with implications for adaptive management. *Philosophical Transactions of the Royal Society B: Biological Sciences* 363(1501):2341-2351.
- Kellomäki, S., Väisänen, H., Kirschbaum, M.U.F., Kirsikka-Aho, S., Peltola, H. 2021. Effects of different management options of Norway spruce on radiative forcing through changes in carbon stock and albedo. *Forestry: An International Journal of Forest Research* 94(4):588–597.
- Venäläinen A., Lehtonen I., Laapas M., Ruosteenoja K., Tikkanen O-P., Viiri H., Ikonen, V-P., Peltola H. 2020. Climate change induces multiple risks to boreal forests and forestry in Finland: a literature review. *Global Change Biology* 26: 4178-4196.

## 1. Personal details and date of CV

**Surname:** Palviainen, **First names:** Marjo Maarit, **ORCID:** 0000-0001-9963-4748, **Date:** 7.12.2021

## 2. Degrees

13.12.2012 Title of docent (Forest Soil Science), University of Helsinki, Finland

14.12.2005 Ph.D (Forest Sciences), University of Eastern Finland (Joensuu), Finland

02.10.2001 M.Sc. (Biology), University of Eastern Finland (Joensuu), Department of Biology, Finland

## 3. Current employment

University lecturer, 1.4.2021–, University of Helsinki, Dept. of Forest Sciences, permanent position

## 4. Previous work experience

1.9.2019–31.3.2021 University researcher, University of Helsinki, Dept. of Forest Sciences

1.9.2018–31.8.2019 University teacher, University of Helsinki, Dept. of Forest Sciences

1.1.2016–31.8.2018 University researcher, University of Helsinki, Dept. of Forest Sciences

1.1.2007–31.12.2015 Post doctoral researcher, University of Helsinki, Dept. of Forest Sciences

1.3.2006–16.4.2006 Researcher, University of Eastern Finland (Joensuu), Faculty of Forestry

1.1.2006–28.2.2006 Senior researcher, Finnish Forest Research Institute

1.1.2003–31.12.2005 Researcher, University of Eastern Finland (Joensuu), Faculty of Forestry

1.6.2002–31.12.2002 Researcher, Finnish Forest Research Institute

1.1.2002–31.5.2002 Researcher, University of Eastern Finland (Joensuu), Faculty of Forestry

1.10.2001–31.12.2001 Researcher, Finnish Forest Research Institute

1.7.2001–31.7.2001 Research assistant, Finnish Forest Research Institute

1.1.2001–31.1.2001 Research assistant, Finnish Forest Research Institute

29.5.2000–28.10.2000 Research assistant, Finnish Forest Research Institute

**5. Career breaks:** Maternity leaves 15.8.2007–22.6.2008 and 2.3.2011–1.5.2012

## 6. Research funding and grants

1.9.2018–31.5.2021 Marjatta and Eino Kolli Foundation: "Biochar, circular economy and the reduction of environmental impacts of forestry", 93 053 €, PI: Marjo Palviainen.

13.1.2020–31.8.2022 Maa- ja vesitekniikan tuki Foundation: "Biochar – novel water protection tool in acid sulphate soils", 50 000 €, PI: Marjo Palviainen.

1.5.2019–31.8.2022 Academy of Finland, Water JPI WaterWorks2017 ERA-NET Cofund: "Reducing the effects of forest management to inland waters (REFORMWATER)", 1.1 million €, Consortium Leader: Jukka Pumpanen, Project leader in University of Helsinki: Marjo Palviainen.

1.9.2019–31.8.2023 Academy of Finland: "Cascading carbon flow in managed forested catchments (CASCAS)", 539 951 €, Consortium leader: Jukka Pumpanen, Project leader in the University of Helsinki: Marjo Palviainen

1.9.2019–31.8.2023 Academy of Finland: "Methane and soil - tree networks: Adding dimensions to greenhouse-gas studies", 600 000 € (member of applicant team), Consortium leader: Ari Laurén

1.1.2015–31.12.2017 The Foundation for Research of Natural Resources in Finland: "Biochar as a tool for improving soil quality" 147 500 €, member of applicant team, PI: Jukka Pumpanen.

1.1.2013–31.12.2015 Nessling Foundation: "Longevity of soil changes and long-term ecosystem recovery from chemical and physical load" 102 000 €, member of applicant team, PI: Heljä-Sisko Helmisaari.

1.1.2007–31.12.2009 University of Helsinki funded post doc project: "The effects of logging residues and stump harvesting on nitrogen dynamics, ground vegetation and seedling growth." PI: Marjo Palviainen

1.1.2007–31.12.2009 Kone Foundation: "The effect of climate change and forest management on the amount and quality of runoff from forested catchments", 78 000 €, Main applicant: Marjo Palviainen.

## 7. Research output

56 articles in peer-reviewed international scientific journals, Google scholar: h-index 23, 1861 citations

## 8. Research supervision and leadership experience

**PhD theses (8):** *Lilli Kaarakka* (28.9.2018) co-supervisor, *Mari Lappalainen* (23.11.2018) co-supervisor, *Iñaki Urzainki* 1.4.2018– co-supervisor, *Taija Saarela* 1.9.2018– co-supervisor, *Elham Kakaei Lafdani* 1.8.2019– co-supervisor, *Saleh Ahmadinia* 7.2.2020– co-supervisor, *Niko Kinnunen* 25.5.2020– co-supervisor, *Satu Määttänen* 25.1.2021– co-supervisor. **MSc theses (7):** *Anup Mishra* (2018), *Christine Ribeiro Moreira de Assumpção* (2017), *Mikael Marjanen* (2015), *Erno Launonen* (2015), *Jan Majuri* (2009), *Heidi Lindblom* (2009), *Irene Ruokolainen* (on-going).

**Leadership experience in research groups or projects:** Project leader in 5 research projects

## 9. Teaching merits

Teacher in several courses at the University of Helsinki (University lecturer)

Pedagogical training: 2017 University pedagogy course: Teaching and Learning in Higher Education. (5 ECT), University of Helsinki.

## 10. Awards and honours

Award for Excellent PhD thesis, University of Eastern Finland Foundation (2006)

## 11. Other key academic merits

–*Member of evaluation panel of funding applications:* FORMAS (Sweden), the Research Council of Norway, 2021.

–*Member of editorial board:* *Frontiers in Forests and Global Change* 11/2018–, *Biochar* 11/2018–.

– *Board member of Bachelor's Programme in Forest Sciences at the University of Helsinki* 1/2021–

–*Referee:* Plant and Soil, Forest Ecology and Management, Ecol. Res., Scand. J. For. Res., Biogeosciences, Boreal Environment Research, J. For. Res., Mitigation and Adaptation Strategies for Global Change, Can. J. For. Res., Inland Waters, Forestry, Pedosphere, PLOS One, Agricultural and Forest Meteorology, Global Change Biology Bioenergy, Forest Ecosystems, Biochar

–*Member of scientific advisory board:* "Forest fertilization using nutrient-enriched biochar for climate change mitigation" 2020–2023 funded by Norwegian Research Council and "Self-heating in drying and quality management of wood chip piles" 2020–2022, funded by European Regional Development Fund.

–*Member in doctoral dissertation committee:* Caroline Björnerås (2020), Lund University, Sweden.

–*Pre-examiner of PhD thesis:* Mihails Čugunovs (2018), University of Eastern Finland.

–*Invited speaker:* The First International Conference on Biochar Research and Application, Shenyang, China 9/2019; Agri-Hydrological model and precision water management, Beijing, China 10/2018; Toward Sustainable Forest Management, 11/2017, Kyushu, Japan; BIOGEOMON 9th International Symposium on Ecosystem Behavior, 8/2017, Litomyšl, Czech Republic.

–*Member of organizing committee of scientific meeting:* Biomass harvesting for energy – latest scientific knowledge on the ecological impacts in Nordic forests. 4/2017, Helsinki.

## 12. Scientific and societal impact

–Forestry Development Centre TAPIO. Member of a working group "Recommendations for energy wood harvesting" (2010).

– The Finnish Society of Forest Science, Vice-chair 1/2021–, *Board member:* Forest Biology Club 1/2007–12/2017, Forest Management Club, 4/2019–12/2020, Womens' Science Foundation (2016–2019)

–Interviews in the following newspapers: Metsälehti 4/2020, Keskipohjanmaa 5/2009, Metsälehti 8/2007, Suomalainen Maaseutu. Maaseudun Tulevaisuus 3/2007.

### 10 most important publications:

1. Palviainen M., Peltomaa E., Laurén A., Kinnunen N., Ojala A., Berninger F., Zhu X., Pumpanen J. 2022. Water quality and the biodegradability of dissolved organic carbon in drained boreal peatland under different forest harvesting intensities. *Science of the Total Environment* 806: 150919 <https://doi.org/10.1016/j.scitotenv.2021.150919>.
2. Aaltonen H., Tuukkanen T., Palviainen M., Laurén A., Tattari S., Piirainen S., Mattsson T., Ojala A., Launiainen S., Finér L. 2021. Controls of organic carbon and nutrient export from unmanaged and managed boreal forested catchments. *Water* 13, 2363. <https://doi.org/10.3390/w13172363>.
3. Palviainen M., Laurén A., Pumpanen J., Bergeron Y., Bond-Lamberty B., Larjavaara M., Kashian D.M., Köster K., Prokushkin A., Chen H.Y.H., Seedre M., Wardle D.A., Gundale M.J., Nilsson M.-C., Wang C., Berninger F. 2020. Decadal-scale recovery of carbon stocks after wildfires throughout the boreal forests. *Global Biogeochemical Cycles* 34, e2020GB006612. <https://doi.org/10.1029/2020GB006612>.
4. Palviainen M., Aaltonen H., Laurén A., Köster K., Berninger F., Ojala A., Pumpanen J. 2020. Biochar amendment increases tree growth in nutrient-poor, young Scots pine stands in Finland. *Forest Ecology and Management* 474, 118362. <https://doi.org/10.1016/j.foreco.2020.118362>
5. Palviainen M., Berninger F., Bruckman V.J., Köster K., Ribeiro Moreira de Assumpção C., Aaltonen H., Makita N., Mishra A., Kulmala L., Adamczyk B., Zhou X., Heinonsalo J., Köster E., Pumpanen J. 2018. Effects of biochar on carbon and nitrogen fluxes in boreal forest soil. *Plant and Soil* 425: 71–85.
6. Palviainen M., Laurén A., Launiainen S., Piirainen S. 2016. Predicting the export and concentrations of organic carbon, nitrogen and phosphorus in boreal lakes by catchment characteristics and land use: a practical approach. *AMBIO* 45: 933–945.
7. Palviainen M., Finér L., Laurén A., Launiainen S., Piirainen S., Mattsson T., Starr M. 2014. Nitrogen, phosphorus, carbon and suspended solids loads from forest clear-cutting and site preparation: long-term paired catchment studies from Eastern Finland. *AMBIO* 43 (2): 218–233.
8. Palviainen M., Finér L. 2012. Estimation of nutrient removals in stem-only and whole-tree harvesting of Scots pine, Norway spruce, and birch stands with generalized nutrient equations. *European Journal of Forest Research* 131: 945–964.
9. Palviainen M., Finér L., Mannerkoski H., Piirainen S., Starr M. 2005. Changes in the above- and below-ground biomass and nutrient pools of ground vegetation after clear-cutting of a mixed boreal forest. *Plant and Soil* 275: 157–167.
10. Palviainen M., Finér L., Kurka A.-M., Mannerkoski H., Piirainen S., Starr M. 2004. Decomposition and nutrient release from logging residues after clear-cutting of mixed boreal forest. *Plant and Soil* 263: 53–67.

## CURRICULUM VITAE 07.12.2021

### 1. Personal details

**Surname:** Launiainen **First names:** Jomi Jouko Samuli  
**Gender:** Male, **Date of Birth:** 10.11.1978, **Nationality:** Finnish  
**ORCID:** <https://orcid.org/0000-0001-6611-6573>  
**WoS Researcher ID:** AAS-9180-2021

### 2. Education and degrees completed

01.05.2014 Title of Docent (Forest Meteorology and Hydrology), University of Eastern Finland, Finland  
 07.01.2011 Ph.D. (Meteorology), University of Helsinki, Finland  
 24.02.2006 M.Sc. (Meteorology), University of Helsinki, Finland  
 01.01.2021- Specialist vocational qualification in leadership and business management (ongoing), Luksia, Finland

### 3. Current position

01.09.2021– Principal Scientist, Natural Resources Institute Finland (LUKE)

### 4. Previous work experience

01.01.2016– 31.8.2021 Academy Research Fellow, LUKE  
 01.01.2015 – 31.08.2016 Senior researcher, LUKE  
 01.08.2010 – 31.12.2014 Senior researcher, Finnish Forest Research Institute  
 01.04.2006 – 30.06.2010 Doctoral student, University of Helsinki, Department of Physics  
 01.01.2004 – 28.02.2006 Research assistant, University of Helsinki, Department of Physics  
 15.5.2002 - 15.09.2002 Research assistant, Finnish Marine Research Institute

### 6. Personal Research funding and grants

#### *Research grants as the main applicant*

- 1.9.2016-31.8.2021 Academy of Finland Academy Research Fellow (296116): Climate impacts of boreal bryophytes – from functional traits to global models (CLIMOSS), Academy of Finland (296116), 434 485€
- 1.9.2016-31.8.2019 Academy of Finland (307192), Academy Research Fellow research costs, 274 642€
- 1.9.2019-31.8.2021 Academy of Finland (327180), Academy Research Fellow research costs, 199 943€
- 1.4.2021-31.12.2022 LUKE strategic funding, Hydrology of Tropical Peatlands (HYDROPE) 180 000€
- Academy of Finland, Mobility grant Fin-Jpn joint seminar on the effects of climate change on ecosystem services 2019, 2 700€
- 01.01.2008-30.6.2010 Academy of Finland Centre Excellence program, Finnish Doctoral School full-time PhD-funding

#### *Grants as consortium member*

- 01.01.2020-31.12.2023 FORMAS, Sweden: Innovative modelling approaches for the identification of boreal forest management strategies under a changing climate (ForClimStress) to Giulia Vico,(SLU, Sweden), 542 000€

#### *Significant role as co-applicant in funded proposals*

- 9/2021-8/2024 Academy of Finland: Novel intra-molecular isotopic approach to infer past climate and plant responses from tree-ring archives (MoleO, no. 343059) to Katja Rinne-Garmston, LUKE 500 000€. Role: ecological modeling
- 2016-2017 Academy of Finland Advanced computational methodologies on open big data for forest terrain trafficability monitoring and forecasting (FOTETRAF) to Leena Finér (Luke) 297 632€. Role: Design of hydrological modeling
- 2010-2013 Finnish Bioeconomy cluster FIBIC, Value through Intensive and Efficient Fibre Supply (EFFIBRE); PI Jari Hynynen, 320 000€

### 7. Leadership and supervision experience

#### *Post-doc supervision*

- Aura Salmivaara, 3/2016-4/2020 (now Researcher at Luke); forest machine trafficability and spatial analysis

- Antti-Jussi Kieloaho, 5/2017 – 5/2019 (now Senior Specialist at Luke), ecohydrological and physiological modeling and programming
- Mingfu Guan, 6/2017-6/2018 (Luke, currently Ass. Prof. at University of HongKong); spatial hydrological modeling
- Kersti Leppä, 12/2017-8/2020 (now Academy Post-Doctoral Fellow at Luke); ecohydrology of drained peatland forests; ecosystem modeling
- Pavel Alekseychik, 9/2018-, drone-based thermal and multispectral imaging for micrometeorological and ecological research

#### *Ongoing PhD -supervision*

- Toprak Aslan, 2/2019-, Biophysical and biogeochemical impacts of boreal forest thinning. University of Helsinki, Finland
- Jari-Pekka Nousu, 8/2020-, Modeling spatiotemporal hydrology at high-latitudes, University of Oulu, Finland

#### *Project leadership*

- Leader of Luke's Ecosystem Modeling Lab and Academy Research Fellow Project (2016-)
- sub-project PI TRAM & ForClimStress
- Coordinator of Luke's Eddy-Covariance and greenhouse gas infrastructure development (2021-)

### **8. Teaching experience and pedagogical competence**

#### *Pedagogical training*

- University pedagogics (10ETC, University of Helsinki, 2009)

#### *Lectured courses*

- Forest-Atmosphere Interactions (2008, also a web-course), University of Helsinki, Department of Physics
- Forest Soil Hydrology 2013, University of Eastern Finland, School of Forest Science

#### *Assistant / guest lecturer*

- Forest-Atmosphere Interactions (2006); Boundary-layer physics I (2006, 2009); Boundary-layer physics II (2007); Principles in Environmental Physics I (2009); Impacts of silviculture on greenhouse gas emissions and biogeochemical cycles (2010)

### **9. Research outputs**

- 67 peer-reviewed scientific articles, h-index 31, number of citations 2876 (Google Scholar, 07.12.2021)
- APES & pyAPES -ecosystem model open-source code
- SpaFHy, SpaFHy-Peat and NutSpaFHy -distributed hydrological model open-source codes
- KUSTAA -tool for estimating catchment loading

### **10. Other key scientific or academic merits**

- *Pre-examiner of doctoral theses*: Pekka Rantala, 2016 (Univ. Helsinki); Yao Gao, 2016 (Univ. Helsinki); Xin Jia, 2017 (Univ. Eastern Finland); Tom Kokkonen, 2019 (Univ. Helsinki)
- *Associate Editor* in Frontiers of Forests and Climate Change (Section Boreal and Temperate forests)
- *Reviewer* in peer-reviewed journals (2006-2021): Agricultural and Forest Meteorology, Atmospheric Environment, Biogeosciences, Canadian Journal of Forest Research Ecological Modeling, Environmental Modeling and Software, Forest Ecology and Management, Frontiers of Plant Science, Hydrological and Earth System Sciences, Journal of Ecology, Journal of Geophysical Research, Journal of Royal Society Interfaces, Nature Communications, Tellus, series B, Plant and Soil, Scandinavian Journal of Forest Research, Water Resources Research

### **11. Memberships and positions of trust in scientific societies**

- Member of European Geoscientific Union 2017-



### **The 10 most important scientific articles related to this proposal (in chronological order)**

1. Laurén A., Guan M., Salmivaara A., Leinonen A., Palviainen M., Launiainen S. 2021. NutSpaFHy - A Distributed Nutrient Balance Model To Predict Nutrient Export From Managed Boreal Headwater Catchments. *Forests* 2021, 12, 808. <https://doi.org/10.3390/f12060808>
2. Alekseychik, P., Katul, G. Korpela, I. and Launiainen, S.: Eddies in motion: visualizing boundary-layer turbulence above an open boreal peatland using UAS thermal videos. *Atmos. Meas. Tech.*, 14, 3501–3521, 2021; <https://doi.org/10.5194/amt-14-3501-2021>
3. Bhattacharjee J., Marttila H., Launiainen S., Lepistö A., Kløve B. 2021. Combining Landsat image analysis, land-use statistics and land-use-specific export coefficient to predict river water quality after large scale peatland drainage. *Science of the Total Environment*, 779 146419, <https://doi.org/10.1016/j.scitotenv.2021.146419>
4. Leppä, K., Korkiakoski, M., Nieminen, M., Laiho, R., Hotanen, J.-P., Kieloaho, A.-J., Korpela, L., Laurila, T., Lohila, A., Minkkinen, K., Mäkipää, R., Ojanen, P., Pearson, M., Penttilä, T., Tuovinen, J.-P., and Launiainen, S. 2020. Vegetation controls of water and energy balance of a drained peatland forest: responses to alternative harvesting practices. *Agric. For. Meteorol.* <https://doi.org/10.1016/j.agrformet.2020.108198>
5. Leppä, K., Sarkkola, S., Peltoniemi, M., Hökkä, H., Saarinen, M., Lehtonen, A., Laiho, R., Mäkipää, R., Launiainen, S., Nieminen, M. 2020. Selection cuttings as a tool to control water table level in boreal drained peatland forests. *Front. Earth Sci.*, 09 October 2020, <https://doi.org/10.3389/feart.2020.576510>
6. Salmivaara, A., Launiainen S., et al. 2020. Towards dynamic Forest Trafficability Prediction using Open Spatial Data, Hydrological Modelling and Sensor Technology, *Forestry* 2020; 1–13, doi:10.1093/forestry/cpaa010
7. Launiainen S., Guan M., Salmivaara A., and Kieloaho A.-J. 2019. Modeling boreal forest evapotranspiration and water balance at stand and catchment scales: a spatial approach, *Hydrol. Earth Syst. Sci.*, 23, 3457–3480, <https://doi.org/10.5194/hess-23-3457-2019>, 2019.
8. Tupek B., Launiainen S., Peltoniemi M., Sievänen R., Perttunen J., Kulmala L., Penttilä T., Hashimoto S. and Lehtonen A. 2019. Evaluating CENTURY, Yasso07, and Yasso15 soil carbon models against boreal forest soil CO<sub>2</sub> emissions and organic carbon stocks. *European Journal of Soil Science*, 1–12. <https://doi.org/10.1111/ejss.12805>
9. Launiainen, S., Katul, G.G., Kolari, P., and Lauren, A. 2015. Coupling boreal forest CO<sub>2</sub>, H<sub>2</sub>O and energy flows by a vertically structured forest canopy – soil model with separate bryophyte layer, *Ecol. Mod.*, 312, 385–405, doi:10.1016/j.ecolmodel.2015.06.007
10. Launiainen S., Futter M., Ellison D., Clarke N., Finér L., Högbom L., Lauren A. and Ring E. 2013. Is the Water Footprint an appropriate tool for forestry and forest products – the Fennoscandian case. *Ambio*, 10.1007/s13280-013-0380-z, 2013.

## CURRICULUM VITAE 8.12.2021

**1. Personal details**

Surname: Laurén First names: Annamari (Ari Matt)i, *Orchid ID: 0000-0002-6835-9568*

*Gender: Other, Year of birth: 1968, Nationality: Finnish*

Website: <https://uefconnect.uef.fi/henkilo/ari.lauren/>

**2. Education and degrees completed**

27.01.2007 Title of docent (Forest Soil Science), University of Eastern Finland, Finland

16.12.1999 Ph.D (Forest Sciences), University of Eastern Finland (Joensuu), Finland

03.06.1993 M.Sc., University of Eastern Finland (Joensuu), Faculty of Forestry, Finland

**3. Current position**

01.01.2022 - Professor in process-based modelling forest ecosystems, UEF, School of Forest Science.

01.01.2018–31.12.2021 Associate Professor in process-based modelling of terrestrial ecosystem function, UEF, School of Forest Science.

2018- External researcher in Natural Resources Institute Finland: Plantation forestry

**4. Previous work experience**

Senior Research Scientist, Natural Resources Institute Finland 1.1.2017-31.12.2017

Researcher, Natural Resources Institute Finland (former Finnish Forest Research Institute) 1.5.2001 – 31.12.2017

Leave of absence from Natural Resources Institute Finland during 2012-2013:

Director of Corporate Research Group, Sinarmas Forestry, Indonesia 1.8.2012- 31.7.2013,

Senior Research & Development Specialist, PT Wirakarya Sakti

Senior researcher, University of Oulu, Department of Geosciences: 24.1.2000 – 30.4.2001

Researcher, PhD student, University of Joensuu, Faculty of Forestry, 1.1.1999-31.12.1999

Researcher, PhD student, University of Joensuu, Faculty of Forestry, 6.6.1993-31.12.1996.

**6. Personal research funding and grants**

- 1.9.2021-31.8.2025 Academy of Finland: The Hidden Role of Gases in Trees 296 654€. Project PI in consortium.
- 1.1.2020-31.3.2020 Business Finland, ERDF, Self-heating in drying and quality management of wood chip piles (Haiku), 229 879€
- 1.9.2019-31.08.2023 Academy of Finland: Methane and soil - tree networks: Adding dimensions to greenhouse-gas studies (METNET), Consortium PI, 300 000 €
- 2018 Marjatta and Eino Kolli Foundation, Biochar, circular economy and the reduction of environmental impacts of forestry (2018–2020), 93 053 € (Group funding: Marjo Palviainen, Ari Laurén, Jukka Pumpanen and Taija Saarela). Role: design of mathematical modelling.
- 2017 European Regional Development Fund, Etelä-Savo: Vesiensuojelun laatuloikka/menetelmäkehitys Etelä-Savossa, 243 683 €, main applicant in Luke
- 2017 Euroopan sosiaalirahasto ESR Etelä-Savo: Vesiensuojelun laatuloikka/malleista käytäntöön 100 000 €, main applicant in Luke
- 2014-2018 Private company research funding from different sources 150 000 €, main applicant
- 2008-2011 Academy of Finland: Dissolved organic nitrogen dynamics in boreal ecosystems as influenced by soil food webs, 269 000€, main applicant
- 2001, Academy of Finland, 473000€, co-applicant, PI: Leena Finér, role: design of mathematical modelling.

**7. Leadership and supervision experience**

**Post-doc supervision:** *Petri Kiuru, UEF, Mari Könönen, UEF, Leena Stenberg, Luke, Jani Anttila, Luke, PhD theses: 8 ongoing PhD supervisions:* Olli Muhonen, Niko Kinnunen, Taija Saarela, Antti Leinonen, Saleh Ahmadinia, Elham Kakaei Lafdani. Dmitri Lepilin, Iñaki Urzainqui Aranburu, Luke/UEF, *2 completed supervisions:* Mari Lappalainen, 2018; Timo Korkalainen, 2008.

**Leadership in research:** Leading research work in commercial pulpwood plantation 2012-2013 (Sinarmas group, Indonesia); leading soil and nutrition research in commercial pulpwood plantation 1997-1999.(Finnantara Intiga, Indonesia); leading Academy funded research project 2007-2011.

## 8. Teaching experience

**Teaching experience in University of Eastern Finland:** 2 full courses: Forest Ecosystem Modelling (6 cp), Forest Soil Hydrology (6 cp).

## 9. Experience of organising scientific meetings

- CAR-ES (Centre of Advanced Research in Ecosystem services) meetings 2006 (Hyytiälä), 2008 (Helsinki), 30 participants, CAR-ES conference 2009, Koli, Adapting forest management to maintain environmental services. 50 participants.

## 10. Patents, inventions, awards and honours

- Susi: peatland simulator (simulation software)
- Plantation simulator (simulation software)
- NutSpaFHy – distributed nutrient balance model
- 

## 11. Other key scientific or academic merits

- Pre-examiner in Matti Räsänen's doctoral dissertation, Faculty of Science, University of Helsinki, 2020
- Pre-examiner in Jarmo Mäkelä's doctoral dissertation, Faculty of Science, University of Helsinki, 2019
- Pre-examiner in Kaisa Rissanen's doctoral dissertation, Faculty of Agriculture and Forestry, University of Helsinki, 2019
- Member of Independent Peatland Expert working group, Indonesia
- Pre-examiner in Aino Korrensalo's doctoral dissertation, Faculty of Science and Forestry, University of Eastern Finland, 2017
- Pre-examiner in Ben Wang's doctoral dissertation, Faculty of Science and Forestry, University of Eastern Finland, 2017
- Opponent in Heini Postila's doctoral dissertation, Faculty of Civil Engineering, University of Oulu, 2016
- Opponent in Jinnan Gong's doctoral dissertation, Faculty of Science and Forestry, University of Eastern Finland, 2013
- Pre-examination of Syed Alam doctoral thesis, University of Helsinki, VITRI, 2012.
- Opponent in Hanne Laine-Kaulio's doctoral dissertation, Aalto University, 2012.
- Opponent in Zhen-Ming Ge's doctoral dissertation, Faculty of Science and Forestry, University of Eastern Finland, 2011
- Evaluation of Dr Niko Silvan's qualification for docentship, Department of Forest Science, University of Helsinki, 2011
- Evaluation of Dr Teemu Hölttä's qualification for docentship, Department of Forest Science, University of Helsinki, 2010
- Opponent in Kari Mäkitalo's doctoral dissertation, Department of Forest Ecology, University of Helsinki, 2009
- Evaluation of Dr Maria Holmberg's qualification for docentship, Department of Forest Ecology, University of Helsinki, 2008

## 12. Memberships and positions of trust in scientific societies

- Chair of the Finnish Society of Forest Science 2012
- Vice Chair of the Finnish Society of Forest Science 2011
- Board member in the Finnish Society of Forest Science 2010-
- Member in the board of research school VALUE 2009-2012

– Vice member of VITRI Tropical Resources Institute advisory board 20.12.2004-31.3.2007

## 10 Most relevant publications for the work

- (1) Laurén, A., Palviainen, M., Page, S., Evans, C. Urzainki, I., Hökkä, H. 2021. Nutrient balance as a tool for maintaining yield and mitigating environmental impacts of Acacia plantation in drained tropical peatland – description of Plantation Simulator. *Forests* 2021, 12(3), 312; <https://doi.org/10.3390/f12030312>
- (2) Laurén, A., Palviainen, M., Launiainen, S., Leppä, K., Stenberg, L., Urzainki, I., Nieminen, M., Laiho, R., Hökkä, H. 2021. Drainage and stand growth response in peatland forests. Description, testing, and application of mechanistic Peatland simulator SUSI. *Forests* 2021, 12(3), 293; <https://doi.org/10.3390/f12030293>
- (3) Laurén, A., Guan, M., Salmivaara, A., Leinonen, A., Palviainen, M., Launiainen, S. 2021. NutSpaFHy - A Distributed Nutrient Balance Model to Predict Nutrient Export From Managed Boreal Headwater Catchments. *Forests* 12(6), 808; <https://doi.org/10.3390/f12060808>.
- (4) Deshmukh, C.S., Julius, D., Evans, C.D., Nardi, Susanto, A.P., Page, S.E., Gauci, V., Laurén, A., Sabiham, S., Agus, F., Asyhari, A., Kurnianto, S., Suardiwerianto, Y., Desai, A.R. 2020. Impact of forest plantation on methane emissions from tropical peatland, *Global Change Biology*. [Epub ahead of print 20 Feb 2020]. doi: 10.1111/gcb.15019.
- (5) Laurén, A., Lappalainen, M., Kieloaho, A.-J., Karhu, K. Palviainen, M. 2019. Temperature sensitivity patterns of carbon and nitrogen processes in decomposition of boreal organic soils – Quantification in different compounds and molecule sizes based on a multifactorial experiment. *Plos One*. <https://doi.org/10.1371/journal.pone.0223446>
- (6) Palviainen, M, Laurén, A., Launiainen, S. & Piirainen, S. 2016. Predicting the export and concentrations of organic carbon, nitrogen and phosphorus in boreal lakes by catchment characteristics and land use: a practical approach. *Ambio*, 45(8): 933-945.
- (7) Laine-Kaulio, H., Koivusalo, H., Komarov, A.S., Lappalainen, M., Launiainen, S. & Laurén, A. 2014. Extending the ROMUL model to simulate the dynamics of dissolved and sorbed C and N compounds in decomposing boreal mor. *Ecological Modelling* 272: 277-292.
- (8) Laurén, A., Lappalainen, M., Saari, P., Kukkonen, J.V.K, Koivusalo, H., Piirainen, S., Setälä, H., Sarjala, T., Bylund, D., Heinonen, J., Nieminen, M., Palviainen, M., Finér, L. 2012. Nitrogen and carbon dynamics and the role of Enchytraeid worms in decomposition of boreal mor. *Water, Air & Soil Pollution*, DOI 10.1007/s11270-012-1142-4
- (9) Weslien, J. Finér, L., Jónsson, J.A., Koivusalo, H. Laurén, A., Ranius, T. & Sigurdsson, B.D. 2009. Effects of increased forest productivity and warmer climates on carbon sequestration, runoff water quality and accumulation of dead wood in a Boreal landscape: a modeling study. *Scandinavian Journal of Forest Research*, 24:333-347.
- (10) Laurén, A., Finér, L., Koivusalo, H., Kokkonen, T., Karvonen, T., Kellomäki, S., Mannerkoski, H. and Ahtiainen, M. 2005. Water and nitrogen processes along a typical water flowpath and streamwater exports from a forested catchment and changes after clear-cutting: a modelling study. *Hydrology and Earth System Sciences*, 9(6):657-674.