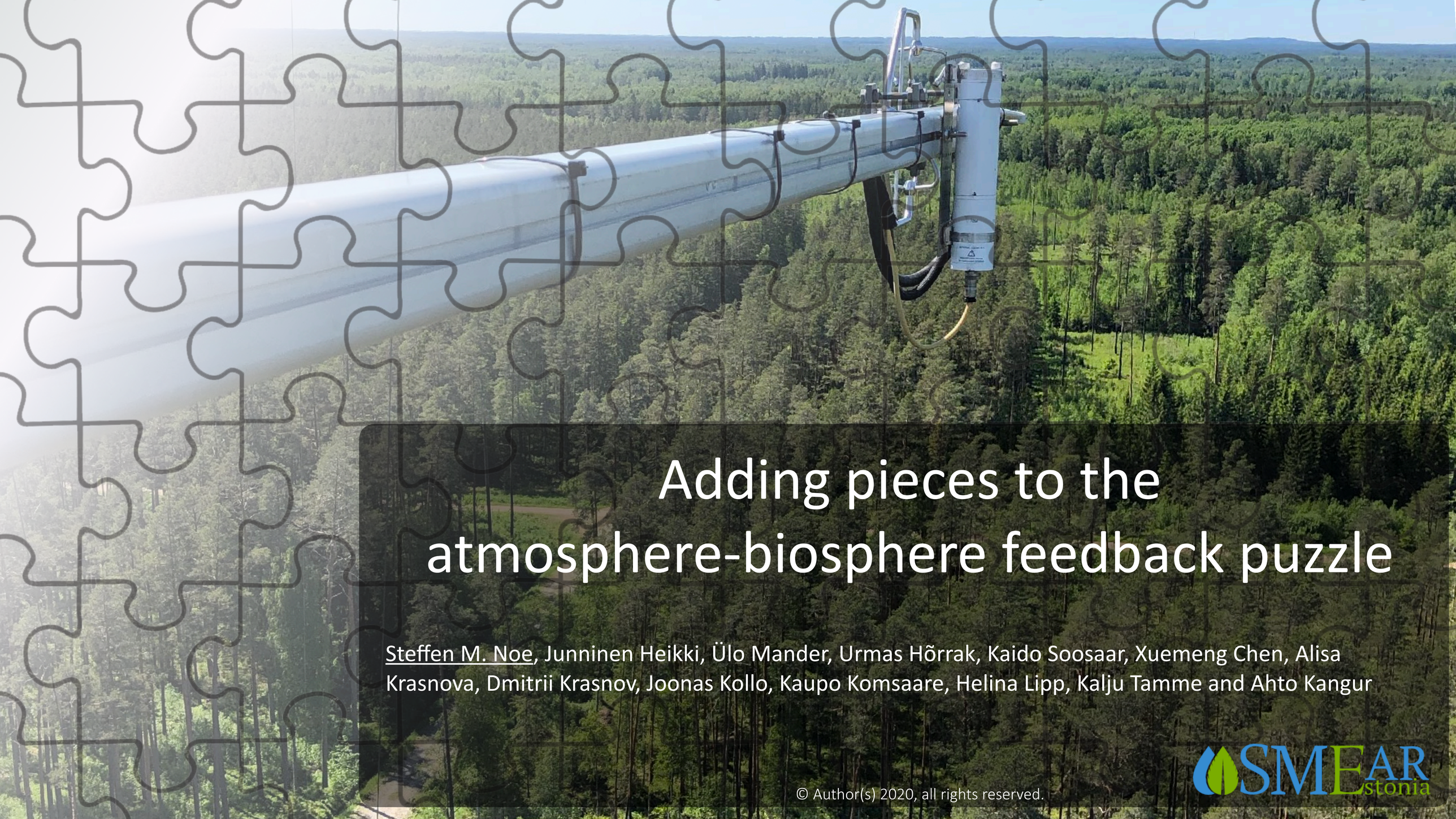
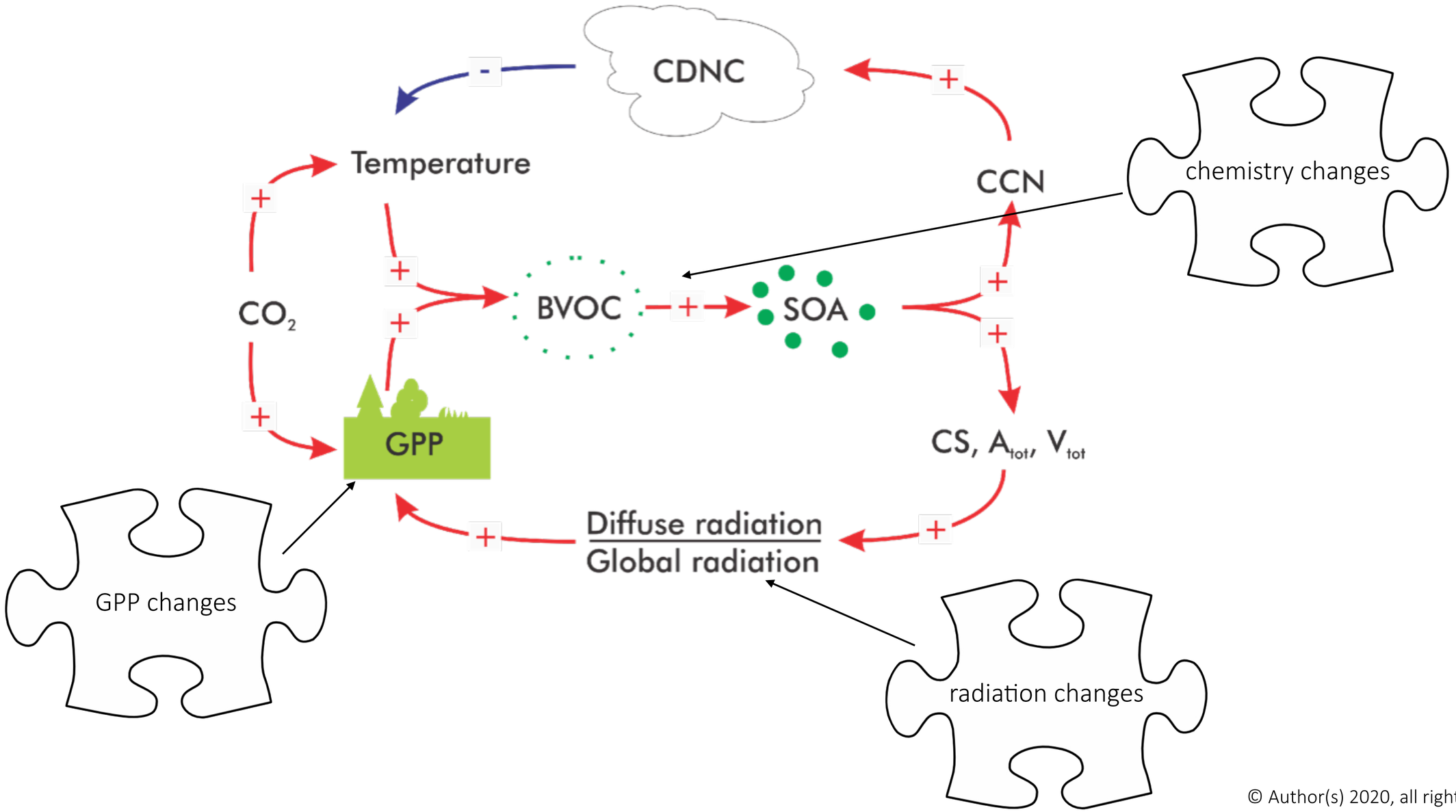


Adding pieces to the atmosphere-biosphere feedback puzzle

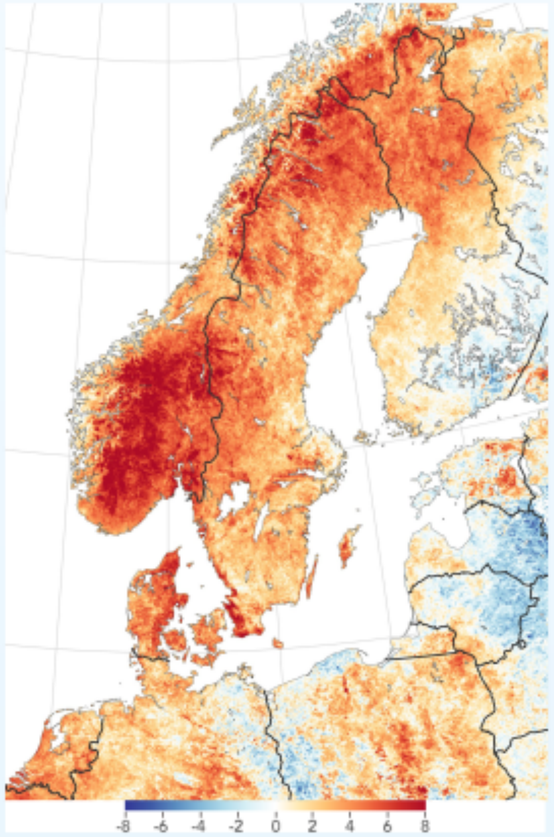
Steffen M. Noe, Junninen Heikki, Ülo Mander, Urmas Hõrrak, Kaido Soosaar, Xuemeng Chen, Alisa Krasnova, Dmitrii Krasnov, Joonas Kollo, Kaupo Komsaare, Helina Lipp, Kalju Tamme and Ahto Kangur

Putting pieces to the atmosphere-biosphere feedback loop

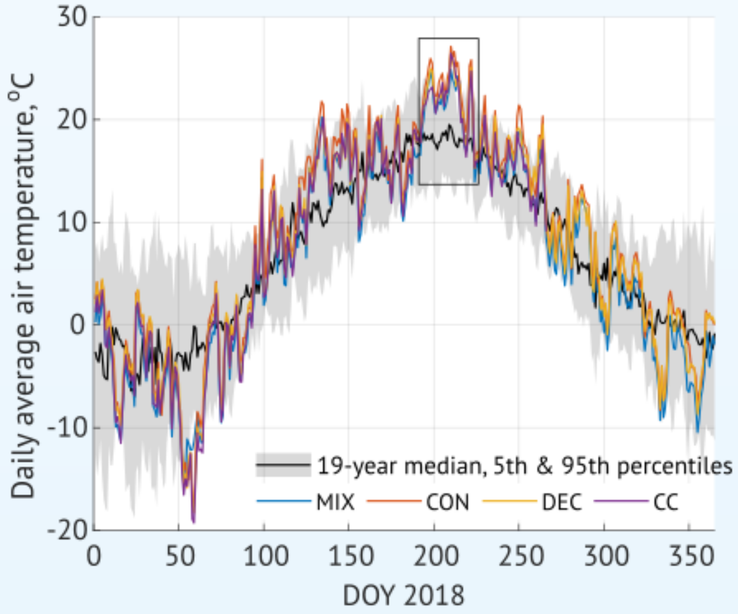


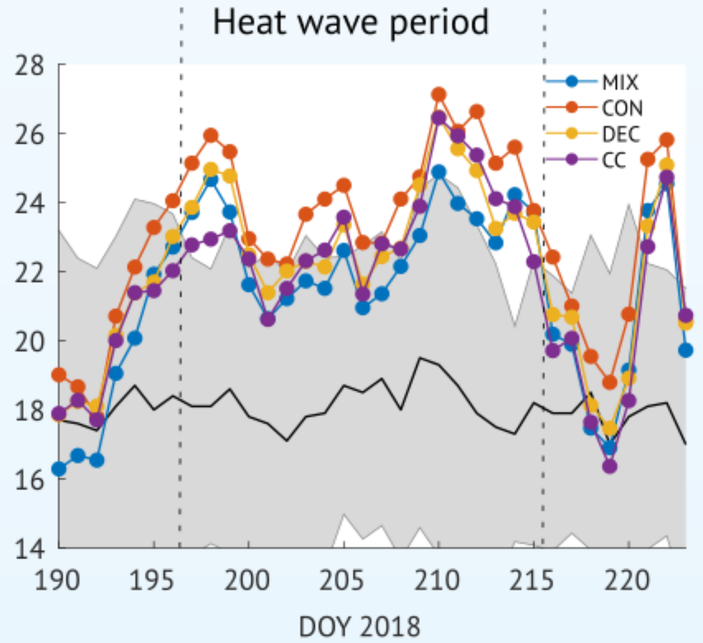
What can we say about the forest as carbon sink using SMEAR Estonia data

2018 heat wave led to about 5-6°C warmer July at SMEAR Estonia



Land surface temperature anomaly in July 2018 compared to 2000-2015 mean.
Picture by NASA Earth Observatory



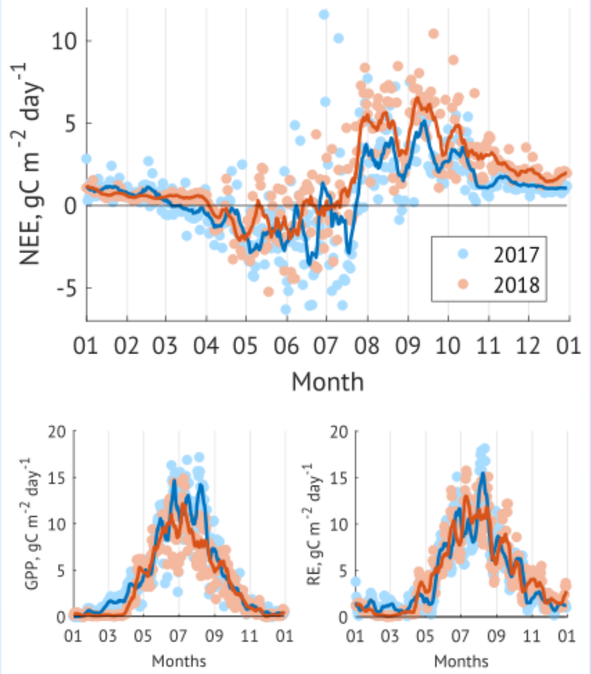


MIX = Järvselja SMEAR Estonia (mixed forest),
CON = Soontaga (old Pine forest)
DEC = Järvselja/Agali (Alder stand on a river bank)
CC = Clear cut in Tenso

Forest flux changes due to the heat wave

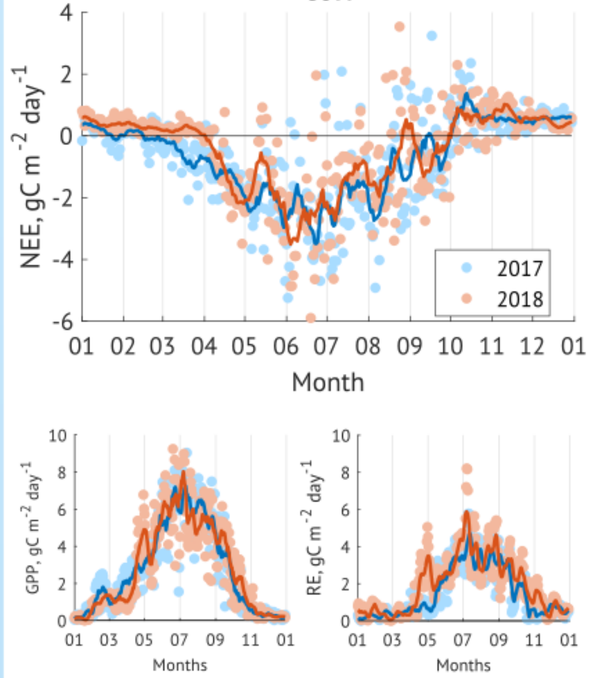
The managed mixed forest in Järvselja changed to a source!
The old Pine forest in Soontaga remained a sink!

MIX



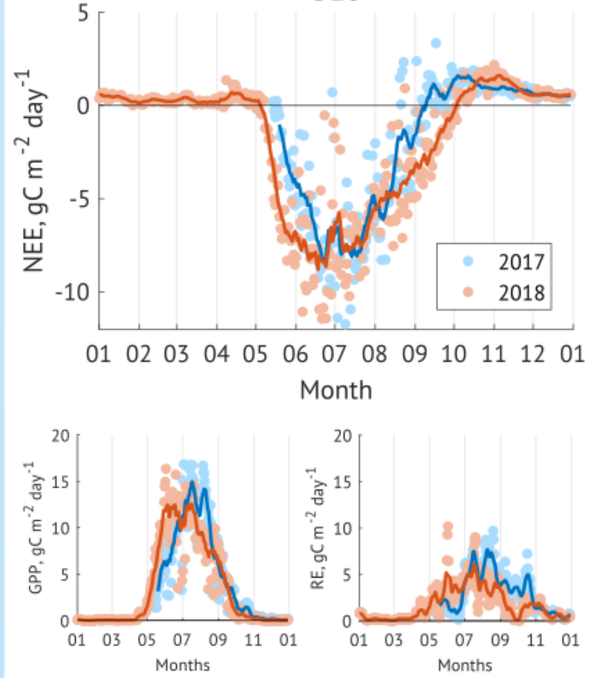
gC m^{-2}	Full year			Vegetation period		
	NEE	|GPP|	Reco	NEE	|GPP|	Reco
2017	252	1615	1579	-22	1317	1119
2018	565	1352	1614	151	1122	1122

CON



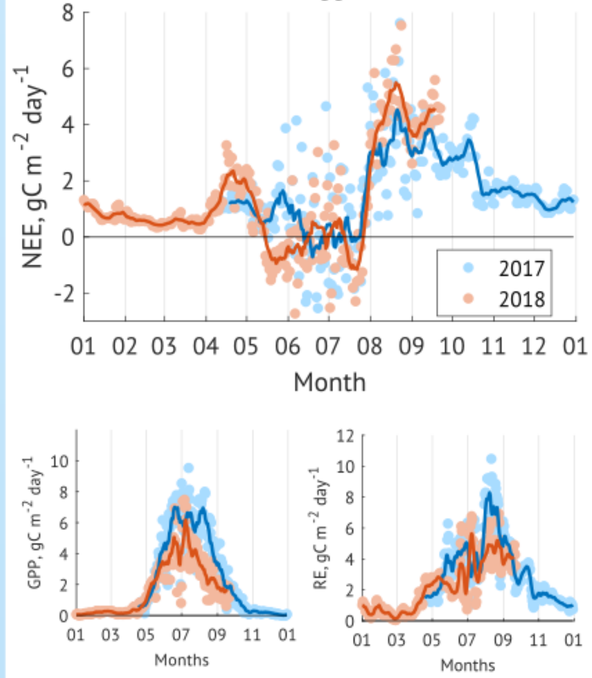
gC m^{-2}	Full year			Vegetation period		
	NEE	|GPP|	Reco	NEE	|GPP|	Reco
2017	-257	1007	553	-283	766	391
2018	-178	1026	699	-240	776	483

DEC



gC m^{-2}	Full year			Vegetation period		
	NEE	|GPP|	Reco	NEE	|GPP|	Reco
2017	-	-	-	-561	1083	461
2018	-652	1286	632	-722	1138	446

CC



gC m^{-2}	Full year			Vegetation period		
	NEE	|GPP|	Reco	NEE	|GPP|	Reco
2017	-	-	-	195	635	607
2018	-	-	-	202	435	485

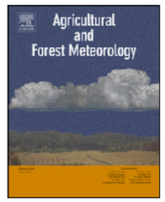
Forest heterogeneity impacts on carbon exchange

Agricultural and Forest Meteorology 275 (2019) 11–23

Contents lists available at ScienceDirect

Agricultural and Forest Meteorology

journal homepage: www.elsevier.com/locate/agrformet



Carbon exchange in a hemiboreal mixed forest in relation to tree species composition

Alisa Krasnova[a,c], Mai Kukumägi[b], Ülo Mander[c], Raili Torga[c], Dmitrii Krasnov[a], Steffen M. Noe[a], Ivika Ostonen[c], Ülle Püttsepp[a], Helen Killian[a], Veiko Uri[d], Krista Lõhmus[b], Jaak Sõber[b], Kaido Soosaar[c,*]

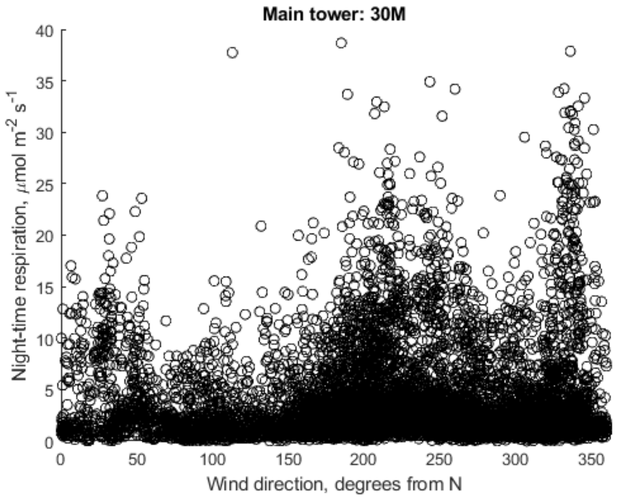
Plant Soil
https://doi.org/10.1007/s11104-019-04129-3

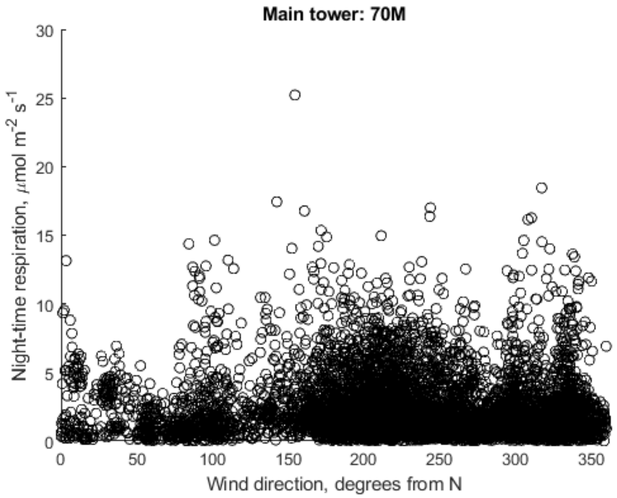
REGULAR ARTICLE

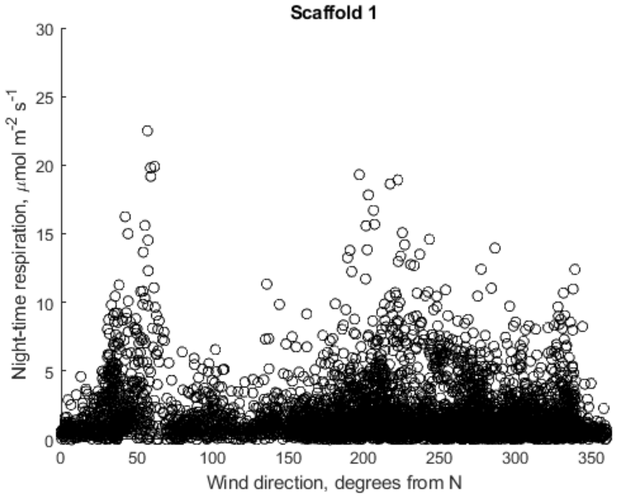
Stand type affects fluxes of volatile organic compounds from the forest floor in hemiboreal and boreal climates

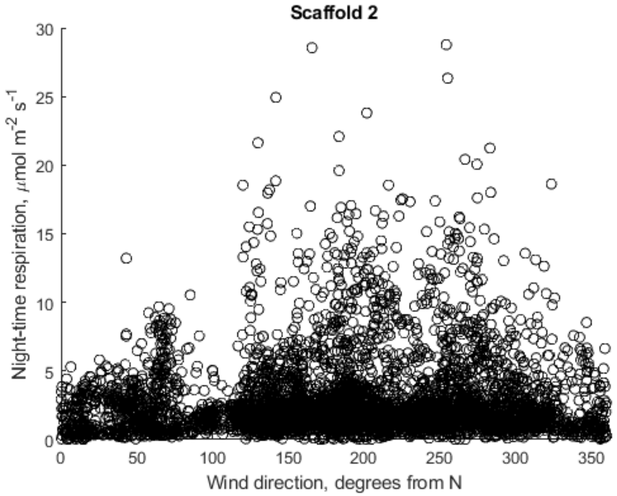
Mari Mäki · D. Krasnov · H. Hellén · S. M. Noe · J. Bäck

Forest heterogeneity lead to respiration hotspots









Measurements in the roughness sublayer at 30m and at the scaffolding towers (also 30m) show higher variability in night-time respiration than the 70m EC system which is located in the constant flux layer.

What can we say about forest atmosphere feedback using SMEAR Estonia data

Linking in-situ GPP to remote sensed Solar induced fluorescence

A strong relationship between Solar-induced chlorophyll fluorescence (SIF) was found with a strong correlation for mid day and on daily timescales.

Global Change Biology

PRIMARY RESEARCH ARTICLE

Solar-induced chlorophyll fluorescence is strongly correlated with terrestrial photosynthesis for a wide variety of biomes: First global analysis based on OCO-2 and flux tower observations

Xing Li, Jingfeng Xiao ✉, Binbin He, M. Altaf Arain, Jason Beringer, Ankur R. Desai, Carmen Emmel, David Y. Hollinger, Alisa Krasnova, Ivan Mammarella, Steffen M. Noe, Penélope Serrano Ortiz, A. Camilo Rey-Sanchez, Adrian V. Rocha, Andrej Varlagin ... See fewer authors

First published:07 May 2018 | https://doi.org/10.1111/gcb.14297 | Citations: 48

Global Change Biology

RESPONSE TO EDITOR | Free Access

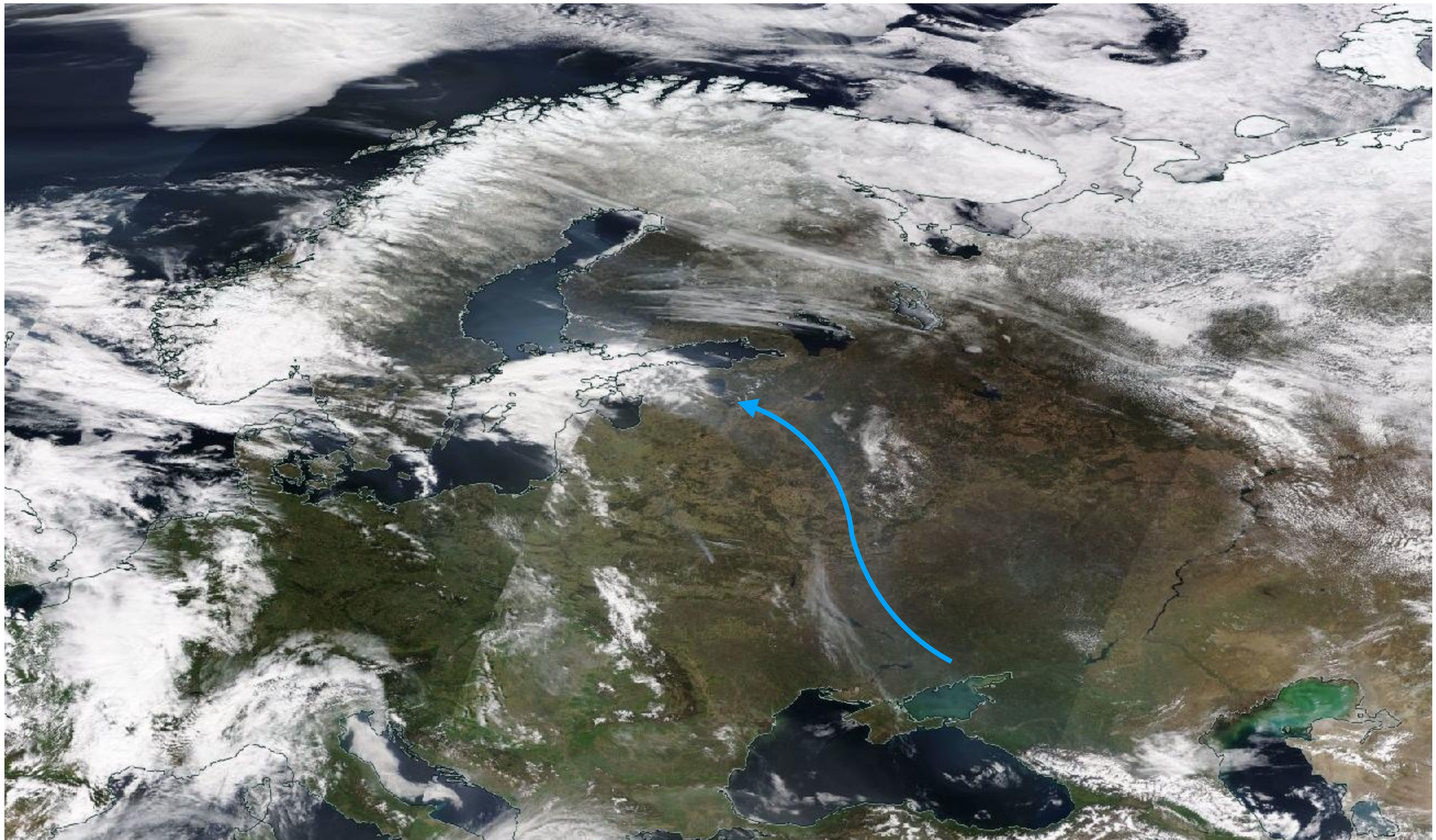
Solar-induced chlorophyll fluorescence exhibits a universal relationship with gross primary productivity across a wide variety of biomes

Jingfeng Xiao ✉, Xing Li, Binbin He, M. Altaf Arain, Jason Beringer, Ankur R. Desai, Carmen Emmel, David Y. Hollinger, Alisa Krasnova, Ivan Mammarella, Steffen M. Noe, Penélope Serrano Ortiz, Camilo Rey-Sanchez, Adrian V. Rocha, Andrej Varlagin ... See fewer authors

First published:05 January 2019 | https://doi.org/10.1111/gcb.14565 | Citations: 3

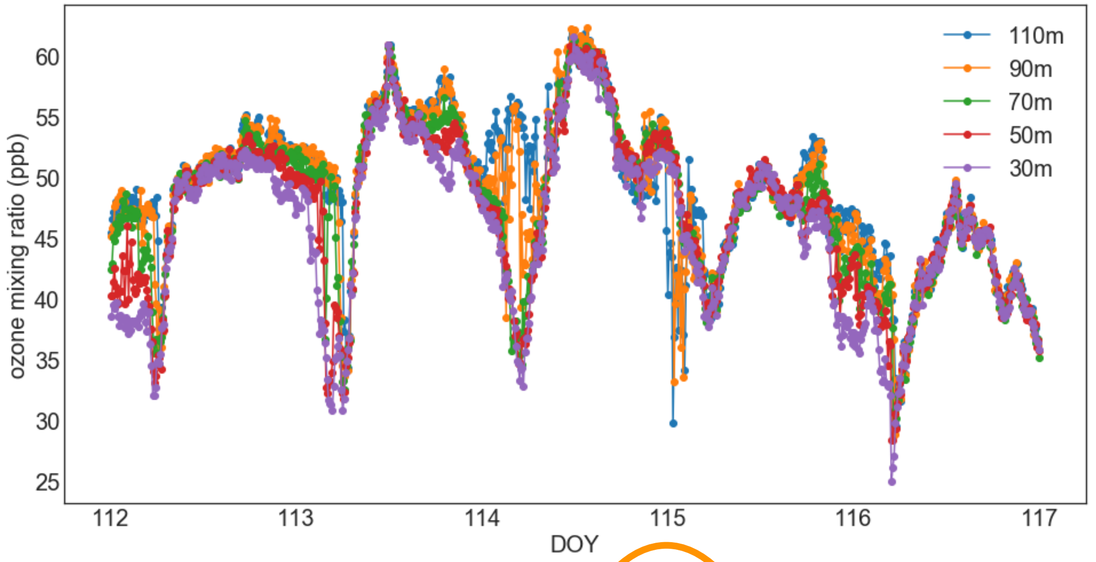
Air pollution from forest fires: large scale change in optical properties

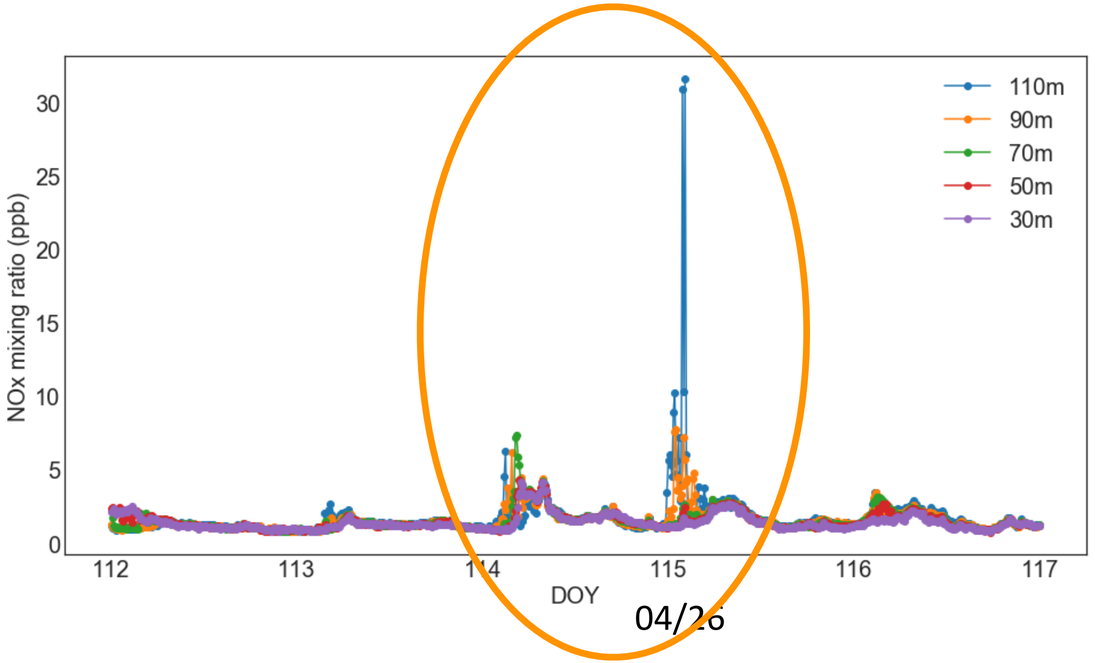
25. April 2019

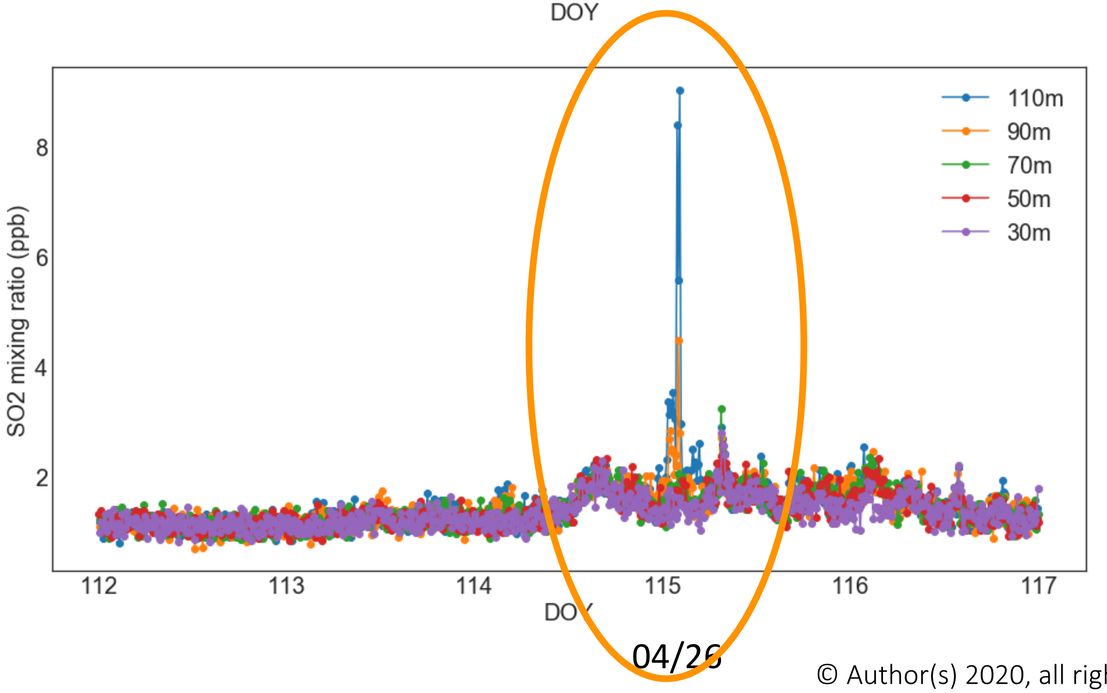


The pollution cloud is passing over SMEAR Estonia

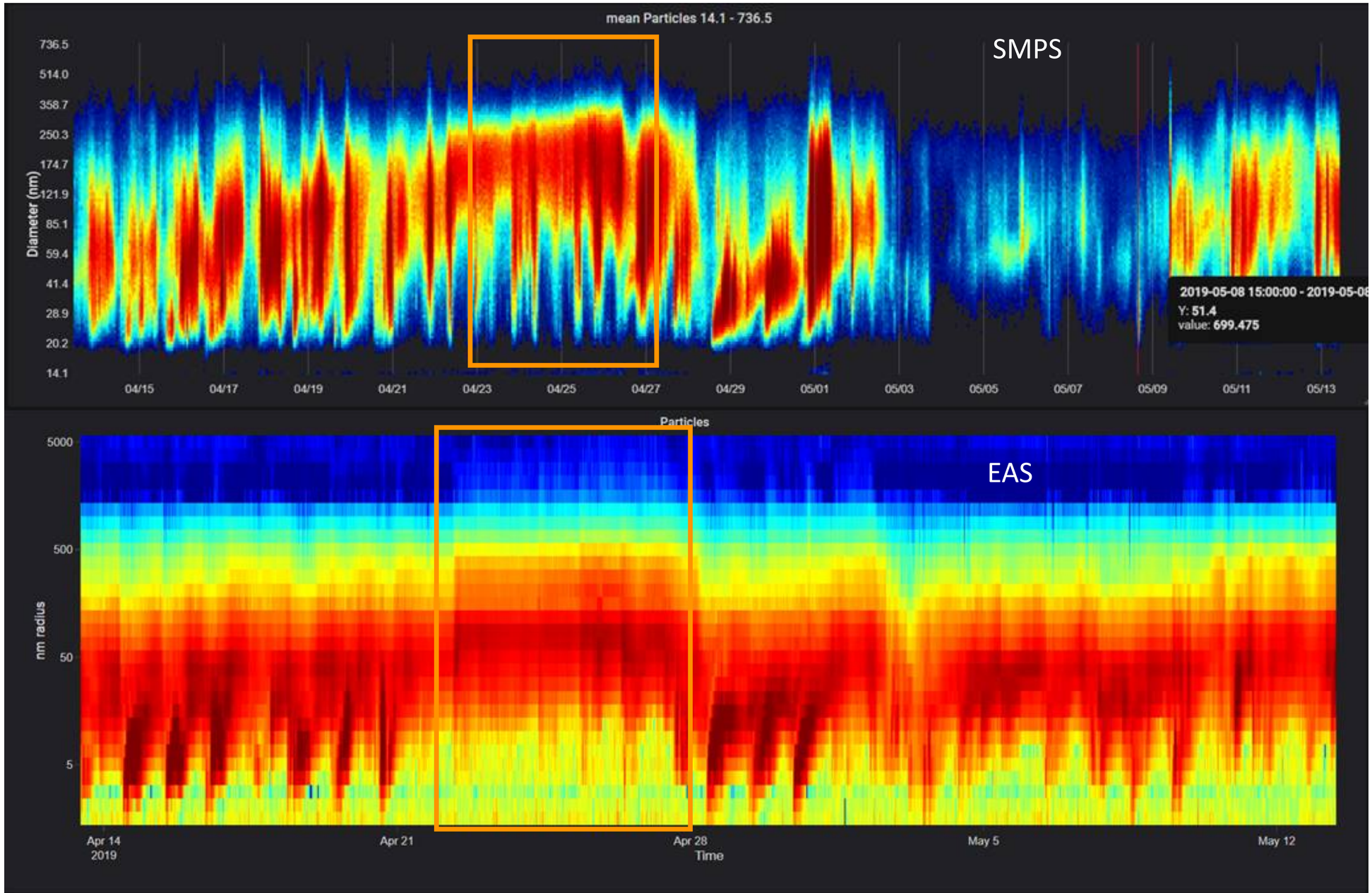
Fire “markers” NOx and SO2 increased substantially during the passage of the ash cloud.







Particle numbers increased during the same time

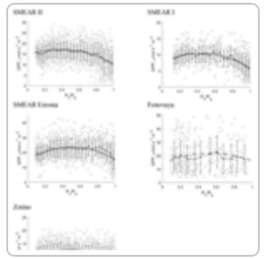


Aerosol effect on the climate feedback system

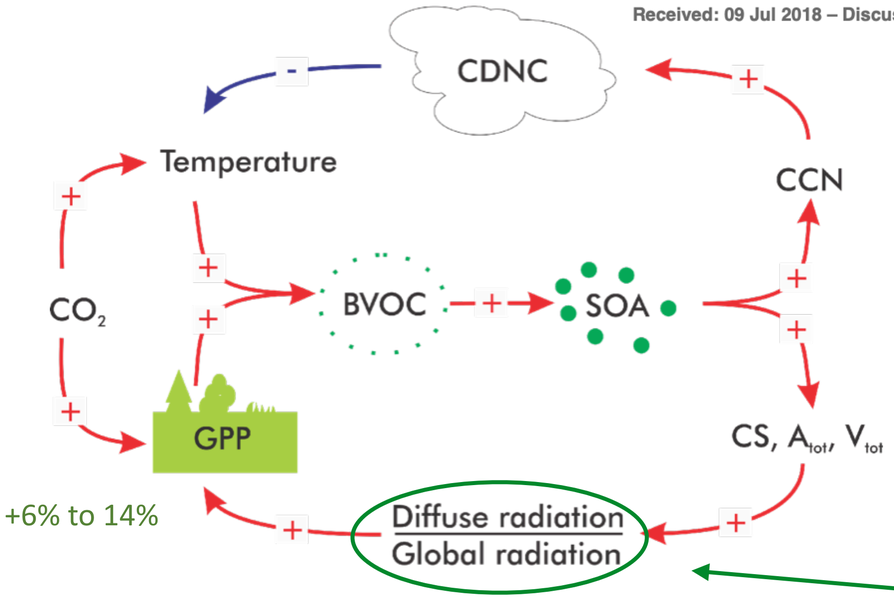
Direct effect of aerosols on solar radiation and gross primary production in boreal and hemiboreal forests

Ekaterina Ezhova[1], Ilona Ylivinkka[1], Joel Kuusk[2], Kaupo Komsaare[3], Marko Vana[3], Alisa Krasnova[4], Steffen Noe[4], Mikhail Arshinov[5], Boris Belan[5], Sung-Bin Park[6], Jošt Valentin Lavrič[6], Martin Heimann[1,6], Tuukka Petäjä[1], Timo Vesala[1,7], Ivan Mammarella[1], Pasi Kolari[1], Jaana Bäck[7], Üllar Rannik[1], Veli-Matti Kerminen[1], and Markku Kulmala[1]

[1]Institute for Atmospheric and Earth System Research/Physics, Faculty of Science, University of Helsinki, P.O. Box 64, 00014 Helsinki, Finland
[2]Tartu Observatory, Faculty of Science and Technology, University of Tartu, Tõravere, Nõo Parish, 61602 Tartu, Estonia
[3]Institute of Physics, Faculty of Science and Technology, University of Tartu, 50411, Tartu, Estonia
[4]Department of Plant Physiology, Institute of Agricultural and Environmental Sciences, Estonian University of Life Sciences, 51006 Tartu, Estonia
[5]V.E. Zuev Institute of Atmospheric Optics of Siberian Branch of the Russian Academy of Sciences, 634055 Tomsk, Russia
[6]Max Planck Institute for Biogeochemistry, 07745 Jena, Germany
[7]Institute for Atmospheric and Earth System Research/Forest Sciences, Faculty of Science, University of Helsinki, P.O. Box 64, 00014 Helsinki, Finland



Received: 09 Jul 2018 – Discussion started: 23 Jul 2018 – Revised: 12 Nov 2018 – Accepted: 22 Nov 2018 – Published: 17 Dec 2018



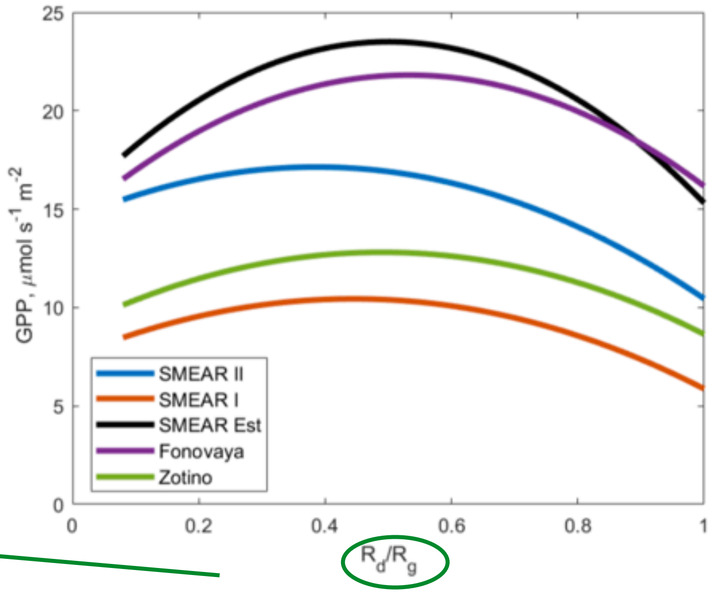
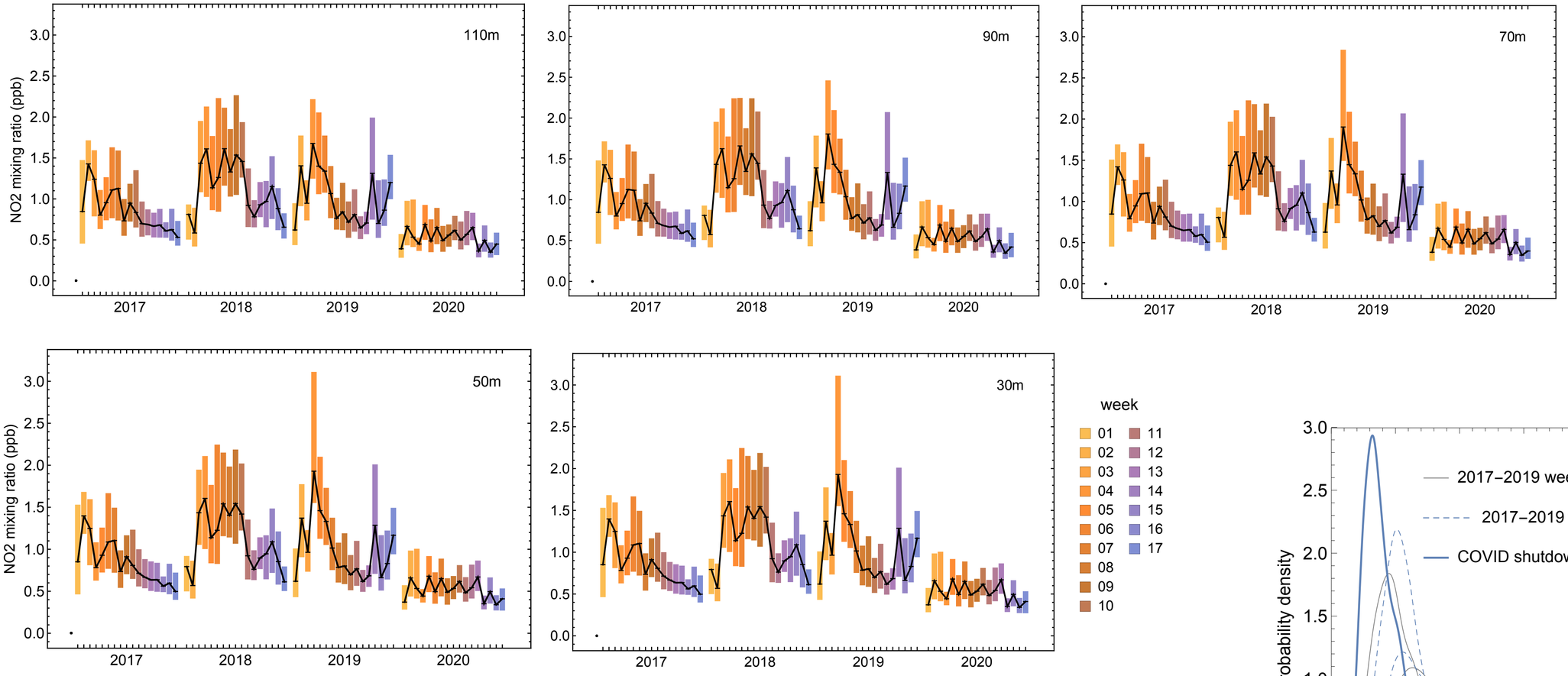
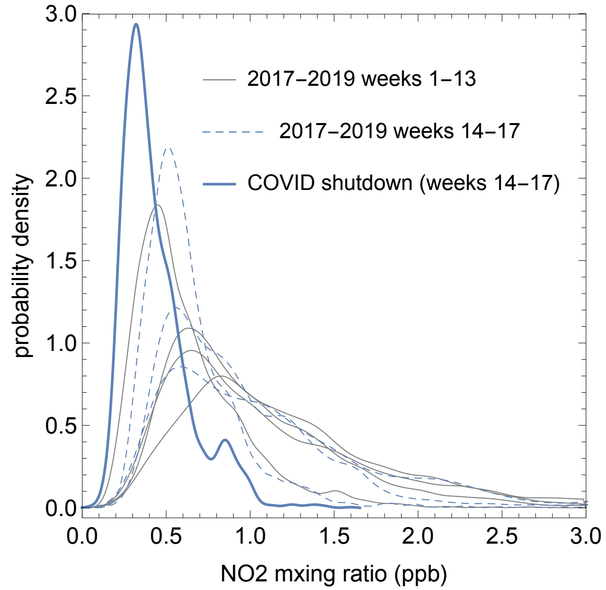


Figure 8. Estimated GPP dependences on R_d/R_g for all the sites (obtained as GPP = LUE · PAR using the coefficients for PAR and LUE dependences on R_d/R_g reported in Table 4).

What can we say about the COVID19 lockdown impact using SMEAR Estonia data

NO2 background during the 2020 shutdown





During the 2020 COVID shutdown SMEAR Estonia shows the lowest background mixing ratios since our measurements started

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ERA-PLANET

ACTRiS

Euroopa Liit
Euroopa
Regionaalarengu Fond

Eesti tuleviku heaks

Thanks for your attention