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Supplement of

The effect of meteorological conditions and atmospheric composition in the occurrence and development of new particle formation (NPF) events in Europe

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16 **Table S1:** Correlation matrices of the meteorological and atmospheric variables. Correlations $r < -$
 17 0.50 or $r > 0.50$ are in bold.

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UKRU	SR	RH	T	WS	P	SO ₂	NOx	O ₃	OC	SO ₄ ²⁻	CS
SR	1.00	-0.70	0.55	0.12	0.13	0.05	-0.12	0.45	0.07	0.05	0.00
RH	-0.70	1.00	-0.55	-0.29	-0.10	-0.10	0.20	-0.59	0.01	-0.04	0.01
T	0.55	-0.55	1.00	0.12	0.09	-0.01	-0.26	0.37	0.15	0.11	-0.03
WS	0.12	-0.29	0.12	1.00	-0.42	0.04	-0.19	0.41	-0.29	-0.12	-0.32
P	0.13	-0.10	0.09	-0.42	1.00	-0.07	0.03	-0.09	0.13	0.15	0.23
SO ₂	0.05	-0.10	-0.01	0.04	-0.07	1.00	0.05	0.06	0.03	0.37	0.31
NOx	-0.12	0.20	-0.26	-0.19	0.03	0.05	1.00	-0.58	0.48	0.16	0.54
O ₃	0.45	-0.59	0.37	0.41	-0.09	0.06	-0.58	1.00	-0.30	-0.07	-0.34
OC	0.07	0.01	0.15	-0.29	0.13	0.03	0.48	-0.30	1.00	0.37	0.59
SO ₄ ²⁻	0.05	-0.04	0.11	-0.12	0.15	0.37	0.16	-0.07	0.37	1.00	0.44
CS	0.00	0.01	-0.03	-0.32	0.23	0.31	0.54	-0.34	0.59	0.44	1.00

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UKUB	SR	RH	T	WS	P	SO ₂	NOx	O ₃	OC	SO ₄ ²⁻	CS
SR	1.00	-0.70	0.53	0.22	0.07	0.08	-0.15	0.47	0.01	0.02	-0.14
RH	-0.70	1.00	-0.56	-0.22	-0.19	-0.08	0.20	-0.66	-0.10	-0.01	0.08
T	0.53	-0.56	1.00	0.21	-0.05	-0.05	-0.38	0.52	-0.12	0.01	-0.18
WS	0.22	-0.22	0.21	1.00	-0.33	-0.16	-0.44	0.41	-0.43	-0.25	-0.50
P	0.07	-0.19	-0.05	-0.33	1.00	0.18	0.22	-0.06	0.31	0.25	0.26
SO ₂	0.08	-0.08	-0.05	-0.16	0.18	1.00	0.44	-0.16	0.29	0.40	0.39
NOx	-0.15	0.20	-0.38	-0.44	0.22	0.44	1.00	-0.56	0.57	0.29	0.79
O ₃	0.47	-0.66	0.52	0.41	-0.06	-0.16	-0.56	1.00	-0.14	-0.14	-0.40
OC	0.01	-0.10	-0.12	-0.43	0.31	0.29	0.57	-0.14	1.00	0.46	0.63
SO ₄ ²⁻	0.02	-0.01	0.01	-0.25	0.25	0.40	0.29	-0.14	0.46	1.00	0.36
CS	-0.14	0.08	-0.18	-0.50	0.26	0.39	0.79	-0.40	0.63	0.36	1.00

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UKRO	SR	RH	T	WS	P	SO ₂	NOx	O ₃	OC	SO ₄ ²⁻	CS
SR	1.00	-0.68	0.51	0.11	0.15	0.14	0.17	0.16	-0.03	0.03	0.06
RH	-0.68	1.00	-0.49	-0.14	-0.24	0.01	-0.01	-0.35	0.09	-0.01	0.06
T	0.51	-0.49	1.00	0.16	0.21	0.18	0.15	-0.02	0.02	0.01	0.15
WS	0.11	-0.14	0.16	1.00	-0.34	0.17	0.17	0.08	-0.16	-0.19	-0.05
P	0.15	-0.24	0.21	-0.34	1.00	-0.10	-0.05	0.04	0.15	0.08	0.01
SO ₂	0.14	0.01	0.18	0.17	-0.10	1.00	0.91	-0.65	0.36	-0.13	0.72
NOx	0.17	-0.01	0.15	0.17	-0.05	0.91	1.00	-0.63	0.34	-0.04	0.81
O ₃	0.16	-0.35	-0.02	0.08	0.04	-0.65	-0.63	1.00	-0.43	0.02	-0.64
OC	-0.03	0.09	0.02	-0.16	0.15	0.36	0.34	-0.43	1.00	0.24	0.47
SO ₄ ²⁻	0.03	-0.01	0.01	-0.19	0.08	-0.13	-0.04	0.02	0.24	1.00	0.18
CS	0.06	0.06	0.15	-0.05	0.01	0.72	0.81	-0.64	0.47	0.18	1.00

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DENRU	SR	RH	T	WS	SO ₂	NOx	O ₃	OC	SO ₄ ²⁻	CS
SR	1.00	-0.56	0.44	0.07	-0.05	-0.12	0.43	-0.04	-0.09	0.05
RH	-0.56	1.00	-0.39	0.02	0.02	0.17	-0.54	0.01	0.18	-0.08
T	0.44	-0.39	1.00	-0.18	-0.09	-0.19	0.37	-0.13	-0.06	0.22
WS	0.07	0.02	-0.18	1.00	0.02	-0.28	0.22	-0.09	0.02	-0.32
SO ₂	-0.05	0.02	-0.09	0.02	1.00	0.18	-0.06	0.48	0.51	0.34
NOx	-0.12	0.17	-0.19	-0.28	0.18	1.00	-0.58	0.34	0.22	0.54
O ₃	0.43	-0.54	0.37	0.22	-0.06	-0.58	1.00	-0.17	-0.18	-0.17
OC	-0.04	0.01	-0.13	-0.09	0.48	0.34	-0.17	1.00	0.65	0.58
SO ₄ ²⁻	-0.09	0.18	-0.06	0.02	0.51	0.22	-0.18	0.65	1.00	0.41
CS	0.05	-0.08	0.22	-0.32	0.34	0.54	-0.17	0.58	0.41	1.00

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DENUB	SR	RH	T	WS	NOx	O ₃	CS
SR	1.00	-0.55	0.45	0.06	-0.02	0.39	0.04
RH	-0.55	1.00	-0.40	-0.02	0.15	-0.58	-0.04
T	0.45	-0.40	1.00	-0.13	-0.11	0.40	0.18
WS	0.06	-0.02	-0.13	1.00	-0.37	0.26	-0.35
NOx	-0.02	0.15	-0.11	-0.37	1.00	-0.59	0.55
O ₃	0.39	-0.58	0.40	0.26	-0.59	1.00	-0.23
CS	0.04	-0.04	0.18	-0.35	0.55	-0.23	1.00

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DENRO	SR	RH	T	WS	SO ₂	NO _x	O ₃	OC	CS
SR	1.00	-0.55	0.30	0.21	0.37	0.29	0.41	0.00	0.26
RH	-0.55	1.00	-0.45	-0.09	-0.26	-0.17	-0.42	-0.20	-0.29
T	0.30	-0.45	1.00	0.04	0.22	0.12	0.25	0.39	0.41
WS	0.21	-0.09	0.04	1.00	-0.16	-0.12	0.53	-0.19	-0.12
SO ₂	0.37	-0.26	0.22	-0.16	1.00	0.80	0.01	0.31	0.62
NO _x	0.29	-0.17	0.12	-0.12	0.80	1.00	-0.02	0.20	0.67
O ₃	0.41	-0.42	0.25	0.53	0.01	-0.02	1.00	-0.01	0.05
OC	0.00	-0.20	0.39	-0.19	0.31	0.20	-0.01	1.00	0.36
CS	0.26	-0.29	0.41	-0.12	0.62	0.67	0.05	0.36	1.00

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GERRU	SR	RH	T	WS	P	OC	SO ₄ ²⁻	CS
SR	1.00	-0.70	0.55	0.20	0.13	-0.07	-0.07	0.02
RH	-0.70	1.00	-0.61	-0.31	-0.12	0.08	0.10	-0.01
T	0.55	-0.61	1.00	0.01	0.11	-0.34	-0.29	-0.11
WS	0.20	-0.31	0.01	1.00	-0.24	-0.14	-0.09	-0.35
P	0.13	-0.12	0.11	-0.24	1.00	0.11	0.13	0.23
OC	-0.07	0.08	-0.34	-0.14	0.11	1.00	0.83	0.65
SO ₄ ²⁻	-0.07	0.10	-0.29	-0.09	0.13	0.83	1.00	0.52
CS	0.02	-0.01	-0.11	-0.35	0.23	0.65	0.52	1.00

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GERUB	SR	RH	T	WS	P	CS
SR	1.00	-0.72	0.55	0.25	0.16	-0.06
RH	-0.72	1.00	-0.61	-0.32	-0.17	0.10
T	0.55	-0.61	1.00	0.05	0.11	-0.20
WS	0.25	-0.32	0.05	1.00	-0.21	-0.31
P	0.16	-0.17	0.11	-0.21	1.00	0.21
CS	-0.06	0.10	-0.20	-0.31	0.21	1.00

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GERRO	SR	RH	T	WS	P	CS
SR	1.00	-0.65	0.50	0.19	0.14	0.05
RH	-0.65	1.00	-0.72	-0.14	-0.16	0.03
T	0.50	-0.72	1.00	-0.03	0.16	-0.14
WS	0.19	-0.14	-0.03	1.00	-0.15	-0.34
P	0.14	-0.16	0.16	-0.15	1.00	0.19
CS	0.05	0.03	-0.14	-0.34	0.19	1.00

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FINRU	SR	RH	T	WS	P	SO ₂	NOx	O ₃	OM	SO ₄ ²⁻	CS
SR	1.00	-0.67	0.50	0.11	0.11	0.00	-0.24	0.30	-0.05	-0.14	0.09
RH	-0.67	1.00	-0.56	-0.21	-0.27	-0.12	0.31	-0.55	0.00	0.17	-0.20
T	0.50	-0.56	1.00	0.01	0.03	-0.20	-0.28	-0.14	0.27	-0.20	0.28
WS	0.11	-0.21	0.01	1.00	0.17	0.11	0.13	0.35	-0.20	-0.20	-0.07
P	0.11	-0.27	0.03	0.17	1.00	0.00	-0.08	-0.08	0.34	0.12	0.19
SO ₂	0.00	-0.12	-0.20	0.11	0.00	1.00	0.18	0.09	NA	NA	0.21
NOx	-0.24	0.31	-0.28	0.13	-0.08	0.18	1.00	-0.24	NA	NA	0.12
O ₃	0.30	-0.55	-0.14	0.35	-0.08	0.09	-0.24	1.00	NA	NA	0.02
OM	-0.05	0.00	0.27	-0.20	0.34	NA	NA	NA	1.00	0.43	0.61
SO ₄ ²⁻	-0.14	0.17	-0.20	-0.20	0.12	NA	NA	NA	0.43	1.00	0.18
CS	0.09	-0.20	0.28	-0.07	0.19	0.21	0.12	0.02	0.61	0.18	1.00

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FINUB	SR	RH	T	WS	P	CS
SR	1.00	-0.54	0.45	0.05	0.09	0.00
RH	-0.54	1.00	-0.35	0.04	-0.23	-0.01
T	0.45	-0.35	1.00	-0.02	-0.01	0.00
WS	0.05	0.04	-0.02	1.00	-0.26	0.00
P	0.09	-0.23	-0.01	-0.26	1.00	0.00
CS	0.00	-0.01	0.00	0.00	0.00	1.00

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FINRO	SR	RH	T	WS	P	NO _x	O ₃	CS
SR	1.00	-0.58	0.47	0.03	0.08	0.05	0.20	0.09
RH	-0.58	1.00	-0.29	-0.05	-0.24	0.02	-0.34	0.01
T	0.47	-0.29	1.00	-0.07	-0.02	-0.08	0.18	0.05
WS	0.03	-0.05	-0.07	1.00	-0.25	-0.29	0.41	-0.32
P	0.08	-0.24	-0.02	-0.25	1.00	0.10	-0.09	0.13
NO _x	0.05	0.02	-0.08	-0.29	0.10	1.00	-0.61	0.75
O ₃	0.20	-0.34	0.18	0.41	-0.09	-0.61	1.00	-0.51
CS	0.09	0.01	0.05	-0.32	0.13	0.75	-0.51	1.00

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SPARU	SR	RH	T	WS	P	SO ₂	NO ₂	O ₃	CS
SR	1.00	-0.45	0.50	0.38	0.09	0.10	-0.02	0.34	0.34
RH	-0.45	1.00	-0.29	-0.20	-0.24	-0.08	0.05	-0.48	-0.06
T	0.50	-0.29	1.00	0.16	0.24	0.07	-0.05	0.54	0.47
WS	0.38	-0.20	0.16	1.00	-0.16	0.13	-0.02	0.25	0.10
P	0.09	-0.24	0.24	-0.16	1.00	-0.15	0.12	0.09	0.14
SO ₂	0.10	-0.08	0.07	0.13	-0.15	1.00	0.14	0.19	0.25
NO ₂	-0.02	0.05	-0.05	-0.02	0.12	0.14	1.00	-0.02	0.42
O ₃	0.34	-0.48	0.54	0.25	0.09	0.19	-0.02	1.00	0.44
CS	0.34	-0.06	0.47	0.10	0.14	0.25	0.42	0.44	1.00

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SPAUB	SR	RH	T	WS	P	SO ₂	NO ₂	O ₃	CS
SR	1.00	-0.43	0.44	0.18	0.03	0.25	-0.09	0.32	0.00
RH	-0.43	1.00	-0.04	-0.23	-0.16	-0.12	0.10	-0.23	0.16
T	0.44	-0.04	1.00	-0.14	0.11	0.35	-0.07	0.38	0.11
WS	0.18	-0.23	-0.14	1.00	-0.26	-0.08	-0.34	0.32	-0.43
P	0.03	-0.16	0.11	-0.26	1.00	0.13	0.15	-0.10	0.10
SO ₂	0.25	-0.12	0.35	-0.08	0.13	1.00	0.20	0.13	0.16
NO ₂	-0.09	0.10	-0.07	-0.34	0.15	0.20	1.00	-0.66	0.59
O ₃	0.32	-0.23	0.38	0.32	-0.10	0.13	-0.66	1.00	-0.35
CS	0.00	0.16	0.11	-0.43	0.10	0.16	0.59	-0.35	1.00

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GRERU	SR	RH	T	WS	P	NO ₂	O ₃	OC	CS
SR	1.00	-0.30	0.33	0.02	-0.11	0.36	0.19	0.09	0.18
RH	-0.30	1.00	-0.25	-0.27	0.20	-0.20	-0.12	-0.06	0.08
T	0.33	-0.25	1.00	0.00	-0.53	0.02	0.54	0.35	0.46
WS	0.02	-0.27	0.00	1.00	-0.21	-0.03	0.15	0.14	0.11
P	-0.11	0.20	-0.53	-0.21	1.00	-0.10	-0.35	-0.24	-0.09
NO ₂	0.36	-0.20	0.02	-0.03	-0.10	1.00	0.00	0.01	-0.02
O ₃	0.19	-0.12	0.54	0.15	-0.35	0.00	1.00	0.50	0.62
OC	0.09	-0.06	0.35	0.14	-0.24	0.01	0.50	1.00	0.47
CS	0.18	0.08	0.46	0.11	-0.09	-0.02	0.62	0.47	1.00

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GREUB	SR	RH	T	WS	P	CS
SR	1.00	-0.55	0.48	0.47	-0.15	0.04
RH	-0.55	1.00	-0.67	-0.30	0.18	-0.07
T	0.48	-0.67	1.00	0.20	-0.51	-0.06
WS	0.47	-0.30	0.20	1.00	-0.15	-0.21
P	-0.15	0.18	-0.51	-0.15	1.00	0.16
CS	0.04	-0.07	-0.06	-0.21	0.16	1.00

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38 **Table S2:** Gradients and R^2 for the relationship between VOCs and NPF event variables.

UKRU	a_N	R^2	a_{GR}	R^2	a_J	R^2
benzene	-3.37E-01	0.88	1.24E+00	0.16	-5.99E-03	0.07
ethane	-5.42E-02	0.88	-4.79E-01	0.26	-4.61E-03	0.77
ethene	-1.65E-01	0.83	2.64E+00	0.60	-1.70E-02	0.57
ethylbenzene	-7.01E-01	0.79	6.78E+00	0.41	-5.77E-02	0.63
iso.butane	-2.06E-01	0.75	1.41E+00	0.70	-5.62E-03	0.11
iso.octane	-5.23E-01	0.45	1.09E+01	0.80	9.32E-03	0.11
iso.pentane	-1.96E-01	0.74	2.36E+00	0.58	2.36E-02	0.72
m.p.xylene	-2.92E-01	0.86	3.21E+00	0.68	-1.98E-02	0.35
n.butane	-1.67E-01	0.79	1.04E+00	0.44	1.43E-02	0.11
n.heptane	-9.63E-01	0.80	1.36E+01	0.73	-1.46E-02	0.13
n.hexane	-1.21E+00	0.84	6.82E+00	0.67	1.33E-02	0.11
n.pentane	-3.71E-01	0.67	3.49E+00	0.64	-8.97E-03	0.06
o.xylene	-5.34E-01	0.71	8.59E+00	0.86	-1.81E-02	0.42
propane	-7.77E-02	0.76	1.97E-01	0.24	-4.28E-03	0.49
propene	-1.50E-01	0.67	-4.01E-01	0.02	6.20E-03	0.08
toluene	-1.48E-01	0.79	1.88E+00	0.81	-9.26E-03	0.43
1.2.4.trimethylbenzene	-4.36E-01	0.46	5.38E+00	0.29	-4.78E-02	0.68
1.3.butadiene	-1.17E+00	0.40	-1.68E+01	0.71	-7.55E-02	0.66
1.butene	-9.39E-02	0.03	-4.77E+00	0.25	-1.99E-02	0.07
2.methylpentane	-7.66E-01	0.77	8.49E+00	0.57	4.56E-02	0.64

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FINRU	a_N	R²	a_{GR}	R²	a_J	R²
Acetaldehyde	-1.04E-01	0.05	-2.16E+00	0.69	1.23E-02	0.07
Aceticacid	1.19E-01	0.13	5.88E+00	0.77	3.33E-02	0.21
Acetolnitrite	-1.02E+00	0.13	1.33E+01	0.59	6.62E-02	0.18
Acetone	-4.63E-02	0.08	3.38E+00	0.74	5.85E-03	0.19
Benzene	-4.46E-01	0.11	-2.02E+01	0.83	-4.13E-02	0.02
Ethanol	4.04E-02	0.06	1.31E+00	0.10	4.77E-03	0.10
Isoprene	-3.17E+00	0.51	1.59E+01	0.87	-1.50E+00	0.31
MEK	6.45E-01	0.34	-8.03E+00	0.36	2.95E-02	0.03
Methacrolein.MVK	-5.15E+00	0.45	3.75E+01	0.66	2.92E-02	0.02
Methanol	1.68E-02	0.05	1.48E+00	0.75	3.48E-03	0.12
Monoterpenes	-1.17E-01	0.38	2.84E+00	0.56	1.11E-03	0.00
Toluene	-4.25E+00	0.59	2.88E+01	0.80	-5.55E-02	0.13

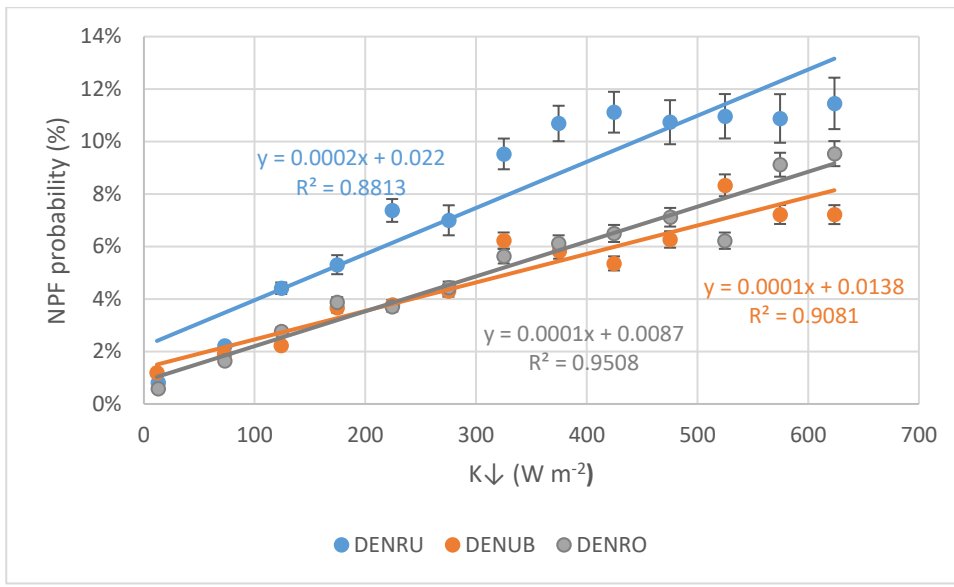
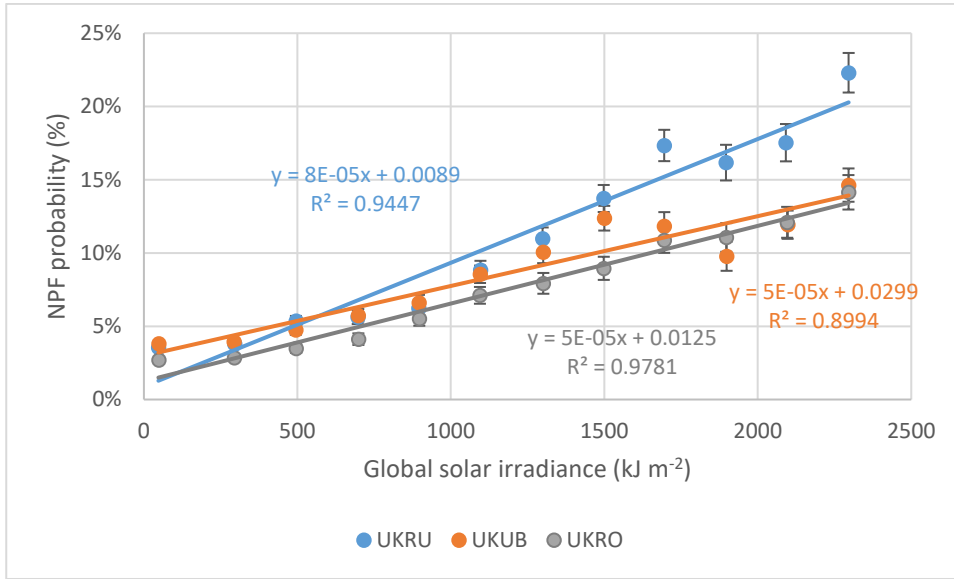
41

42

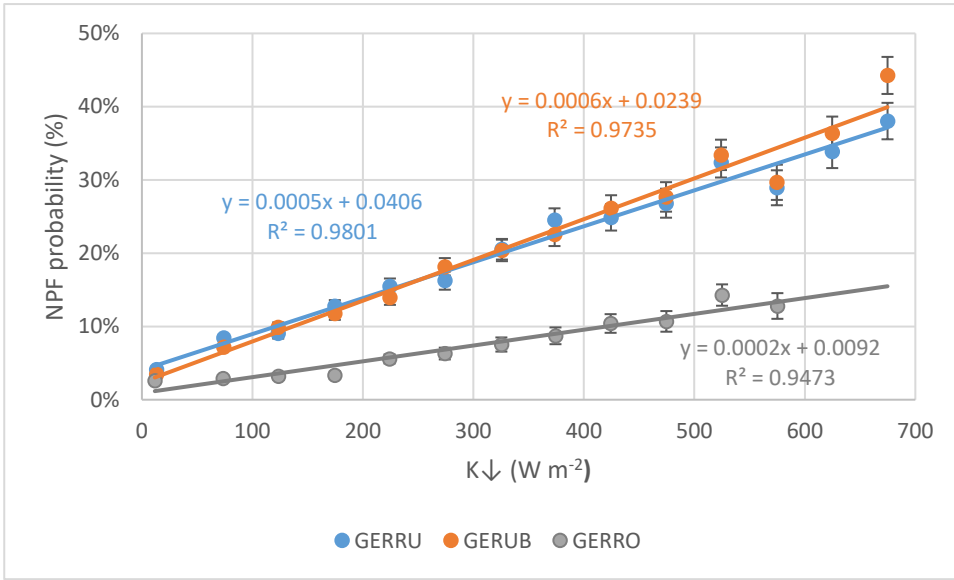
UKRO	a _N	R ²	a _{GR}	R ²	a _J	R ²
benzene	-1.03E-01	0.68	1.36E+00	0.80	4.42E-02	0.78
cis.2.butene	-1.93E-01	0.59	8.33E-01	0.02	1.70E-01	0.48
ethane	-2.45E-02	0.53	2.99E-02	0.06	2.28E-03	0.14
ethene	-4.59E-02	0.69	5.74E-01	0.83	2.50E-02	0.97
ethylbenzene	-7.13E-02	0.87	1.22E+00	0.77	3.59E-02	0.41
ethyne	-8.43E-02	0.74	1.23E+00	0.75	4.22E-02	0.64
iso.butane	-4.70E-02	0.55	6.07E-01	0.78	1.79E-02	0.92
iso.octane	-7.53E-02	0.80	2.14E+00	0.78	7.35E-02	0.67
iso.pentane	-1.10E-02	0.70	2.64E-01	0.72	1.00E-02	0.82
isoprene	-2.75E-02	0.07	4.34E-01	0.01	2.24E-03	0.00
m.p.xylene	-1.99E-02	0.91	3.81E-01	0.56	1.47E-02	0.64
n.butane	-2.17E-02	0.61	2.58E-01	0.78	4.07E-03	0.17
n.heptane	-1.53E-01	0.75	2.51E+00	0.80	1.15E-01	0.82
n.hexane	-1.10E-01	0.63	2.86E+00	0.75	8.28E-02	0.74
n.octane	-2.64E-01	0.55	7.06E+00	0.72	2.73E-01	0.98
n.pentane	-5.44E-02	0.53	1.03E+00	0.80	2.99E-02	0.86
o.xylene	-4.69E-02	0.88	9.58E-01	0.65	4.37E-02	0.86
propane	-3.16E-02	0.68	1.95E-01	0.32	1.01E-02	0.90
propene	-6.69E-02	0.87	1.15E+00	0.85	3.55E-02	0.78
toluene	-1.22E-02	0.84	2.76E-01	0.74	1.15E-02	0.85
trans.2.butene	-2.63E-01	0.72	3.16E+00	0.35	1.41E-01	0.60
trans.2.pentene	-1.67E-01	0.73	2.69E+00	0.31	1.16E-01	0.52
1.2.3.trimethylbenzene	-1.45E-01	0.78	3.31E+00	0.66	1.28E-01	0.81
1.2.4.trimethylbenzene	-4.89E-02	0.85	7.64E-01	0.43	3.26E-02	0.46
1.3.5.trimethylbenzene	-8.62E-02	0.77	1.56E+00	0.67	6.65E-02	0.64
1.3.butadiene	-1.78E-01	0.81	2.99E+00	0.44	9.04E-02	0.26
1.butene	-2.18E-01	0.38	2.51E+00	0.25	1.24E-01	0.64
1.pentene	-2.43E-01	0.52	6.92E+00	0.37	3.00E-01	0.82
2.methylpentane	-3.73E-02	0.68	8.57E-01	0.67	2.83E-02	0.80

44 **Figure S1:** Relationship of solar radiation with NPF variables.

45



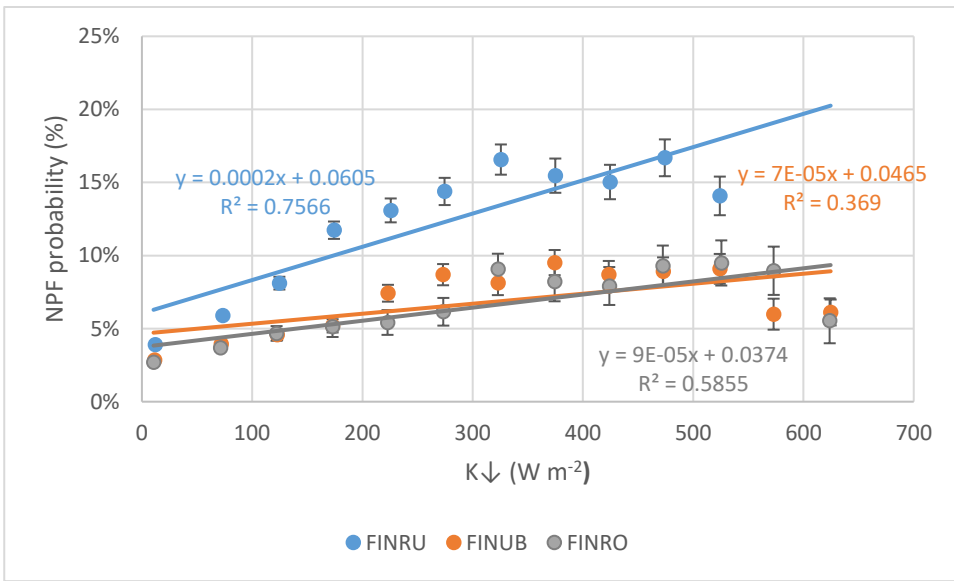
52



53

(c)

54



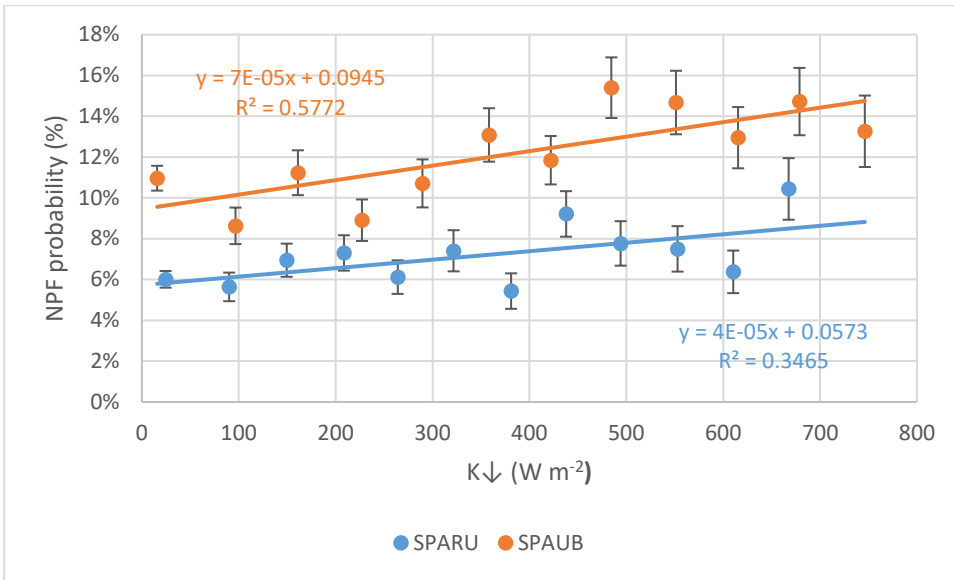
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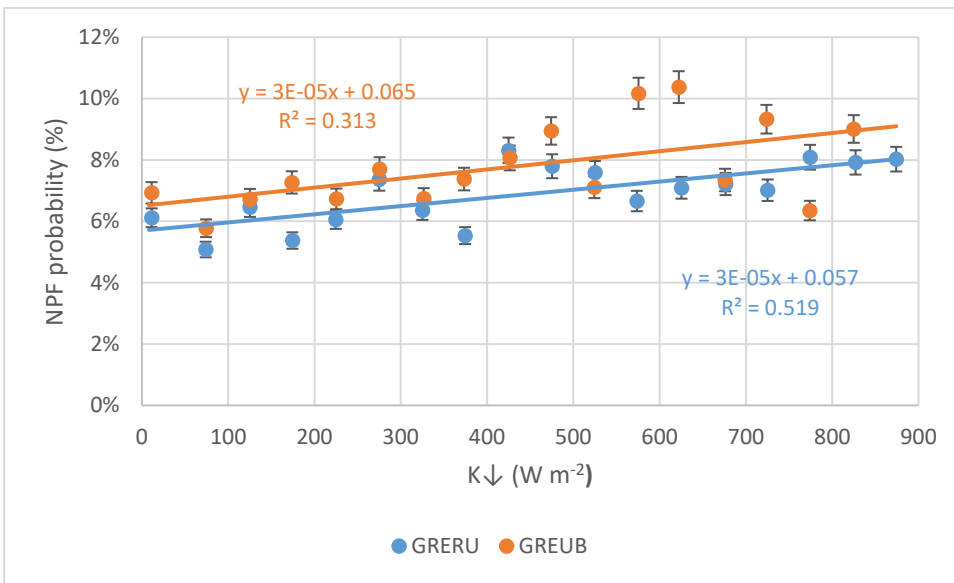
58

(d)



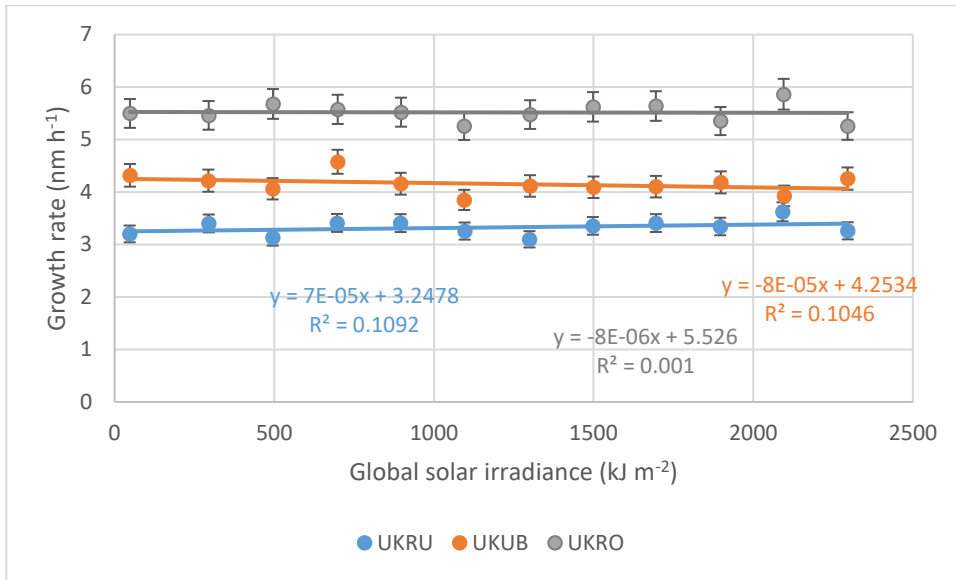
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60

(e)



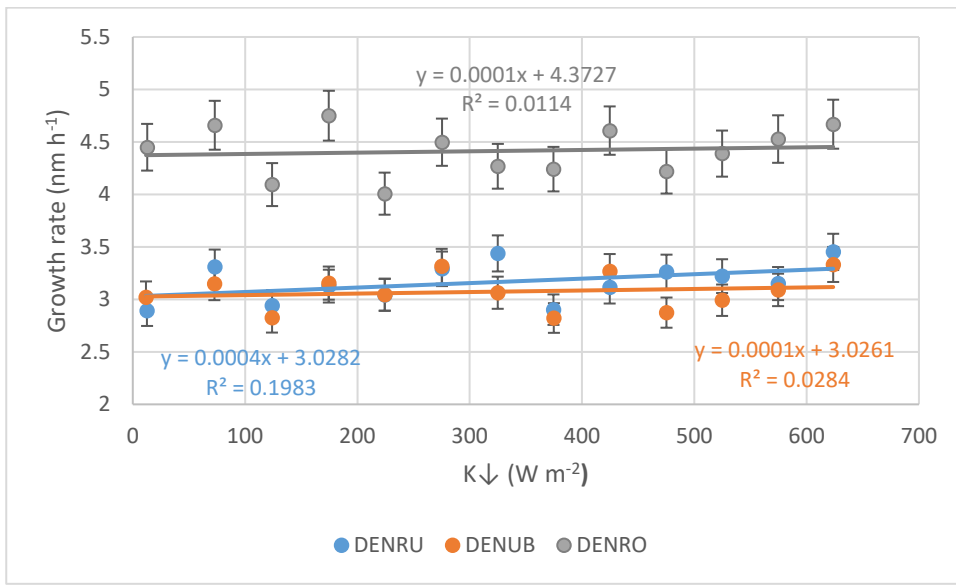
61
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66

(f)



67

68

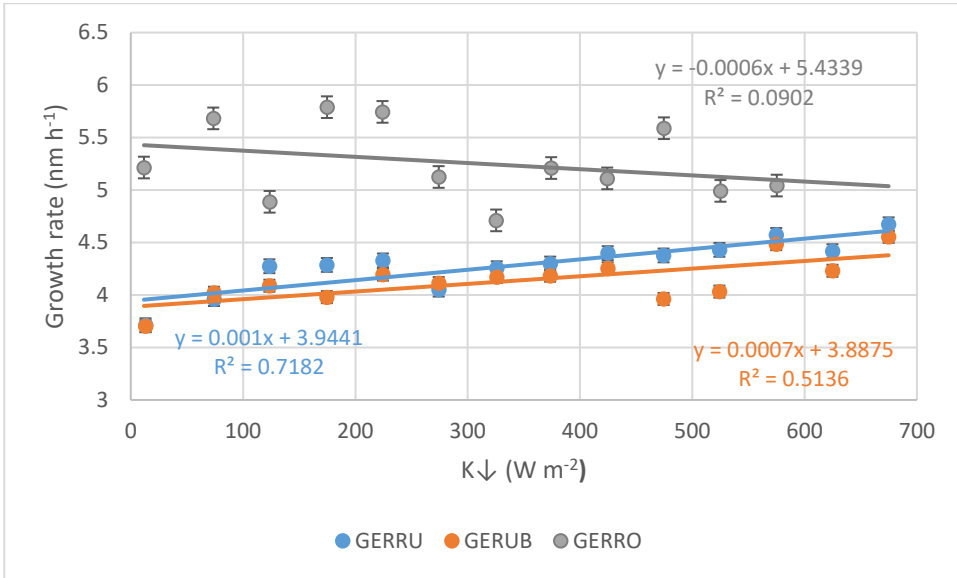


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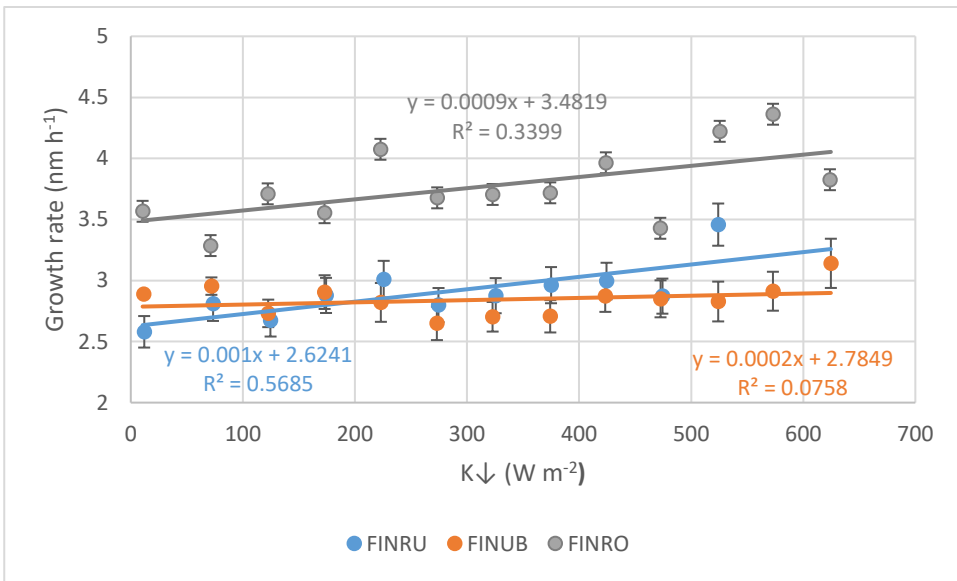
72



73

(i)

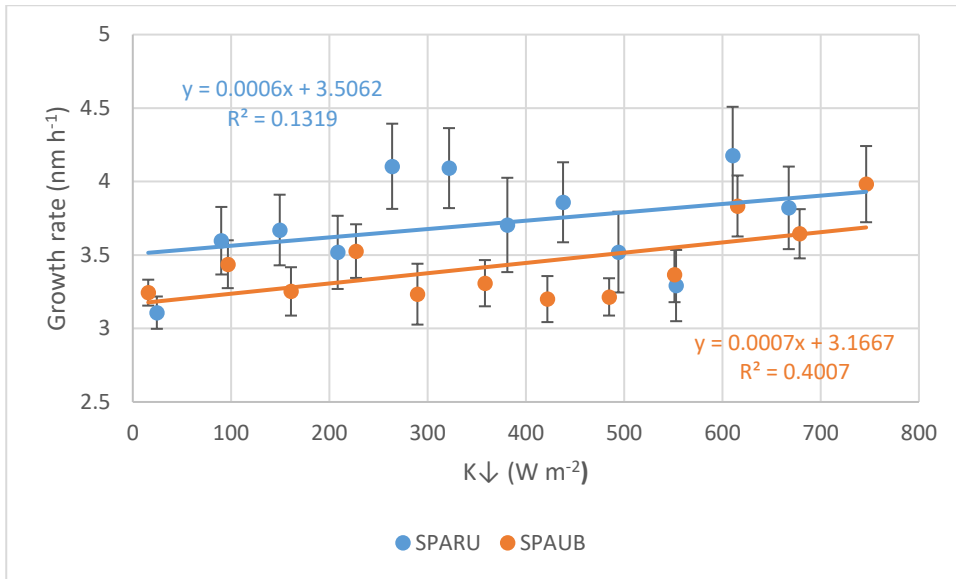
74



75

(j)

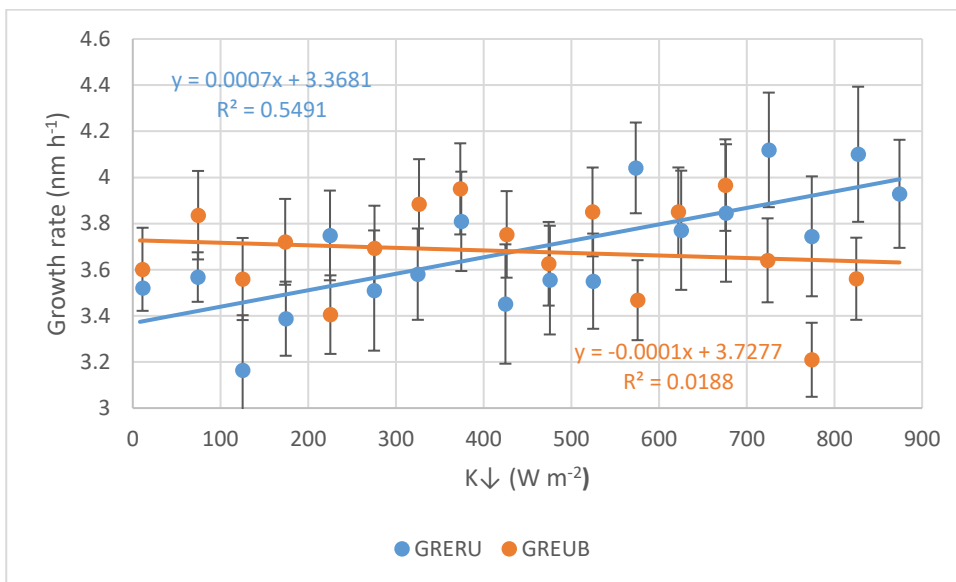
76



77

(k)

78

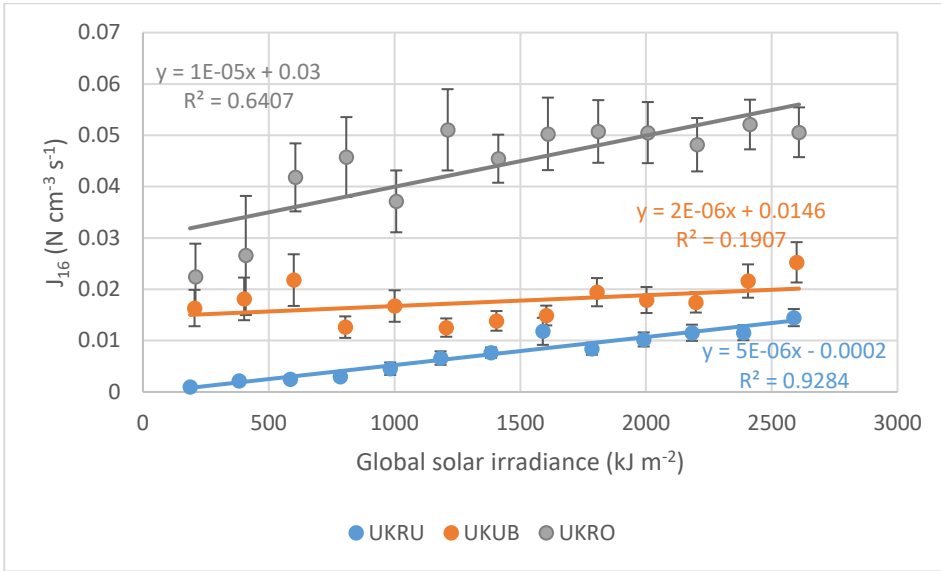


79

(l)

80

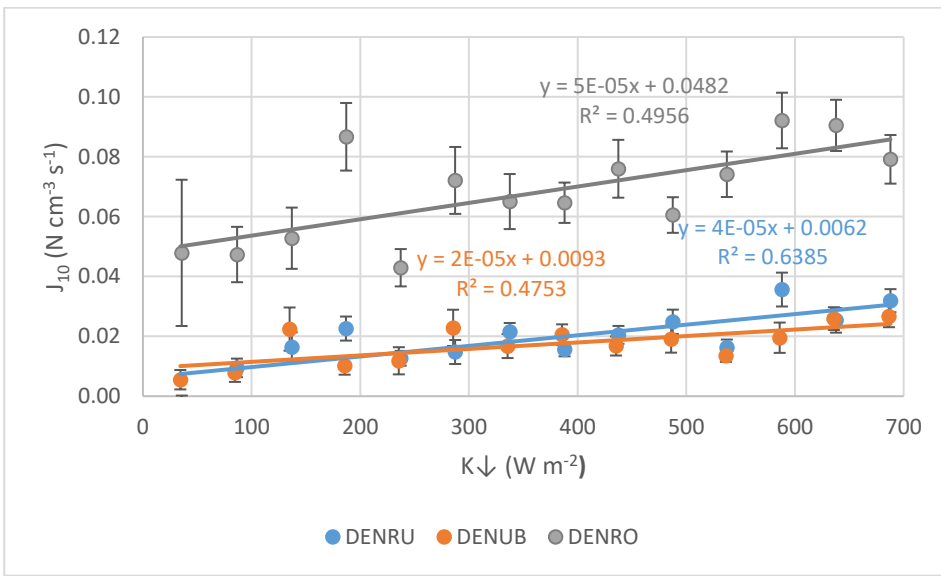
81



82

(m)

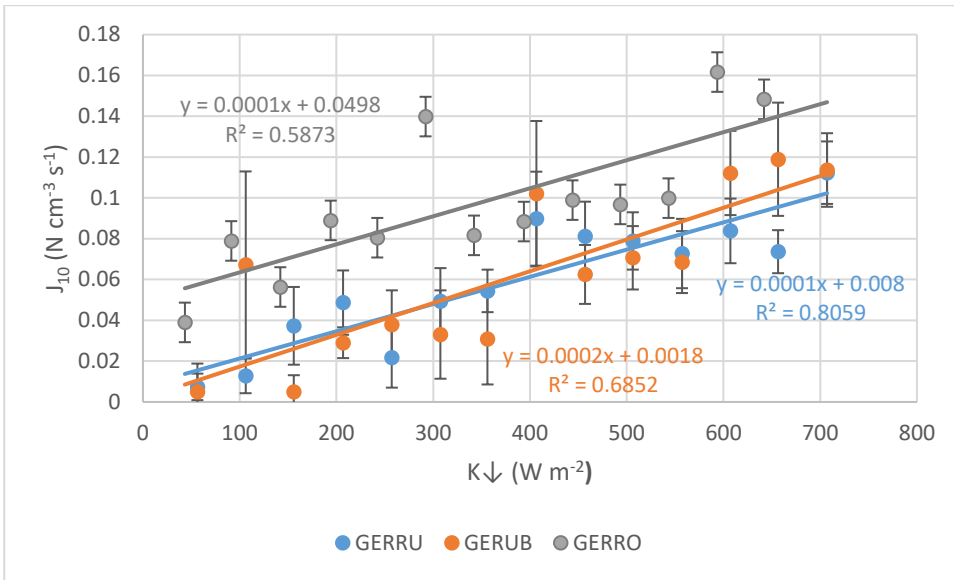
83



84

(n)

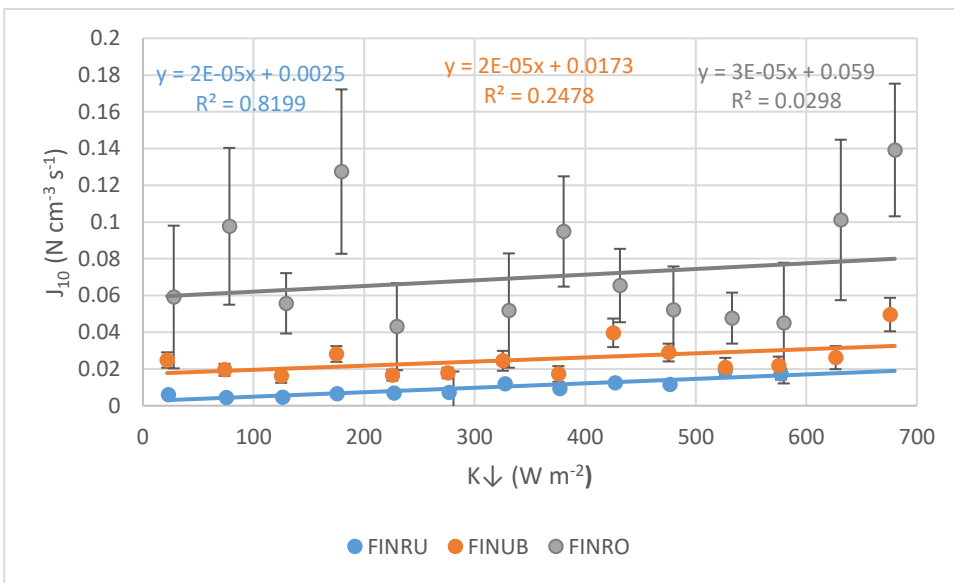
85



86

(o)

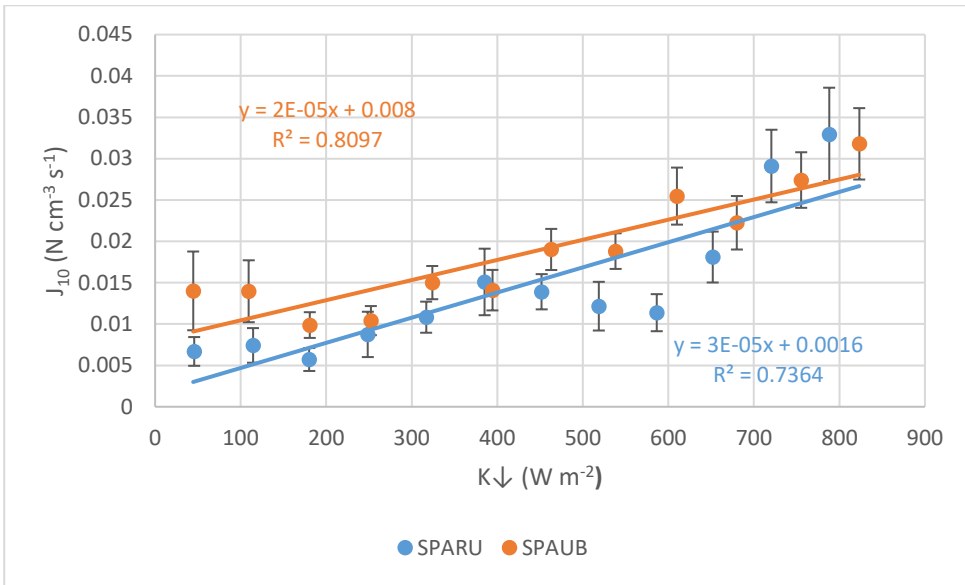
87



88

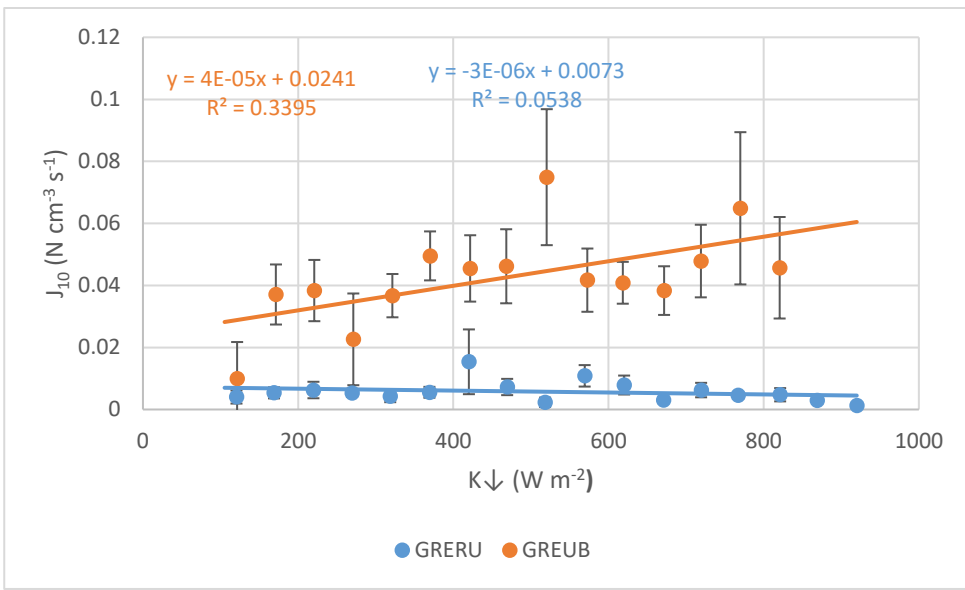
(p)

89



90 (q)

91

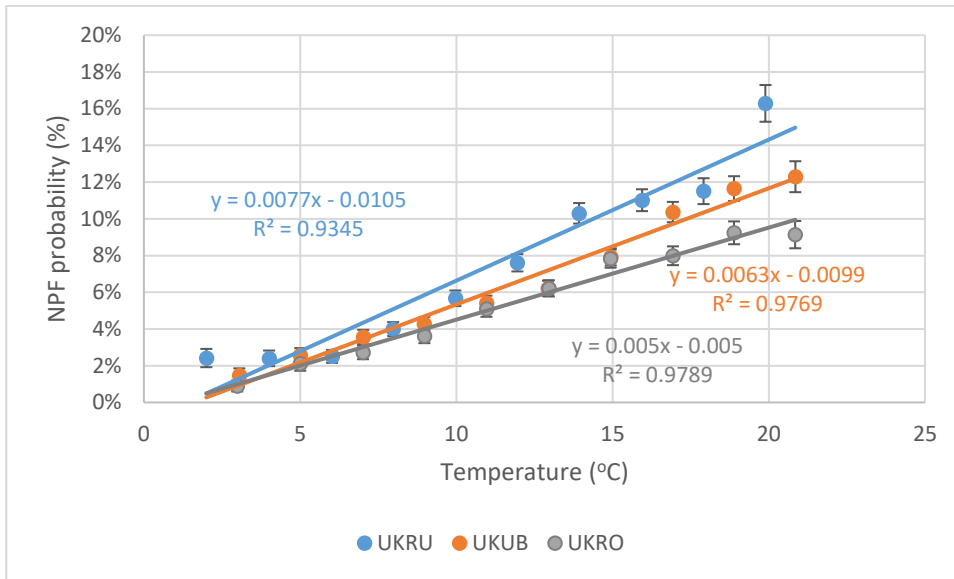


92 (r)

93

94 **Figure S2:** Relationship of temperature with NPF variables.

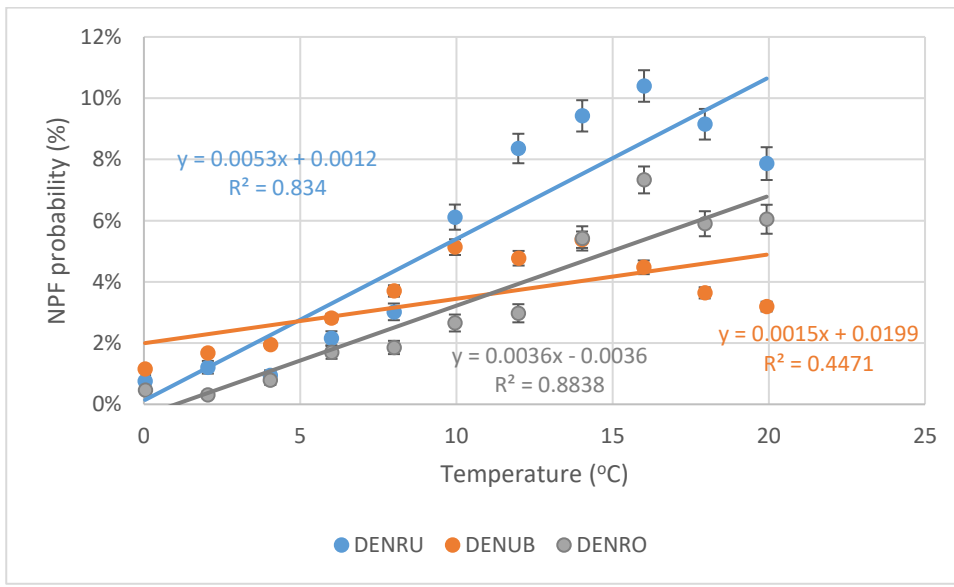
95



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97

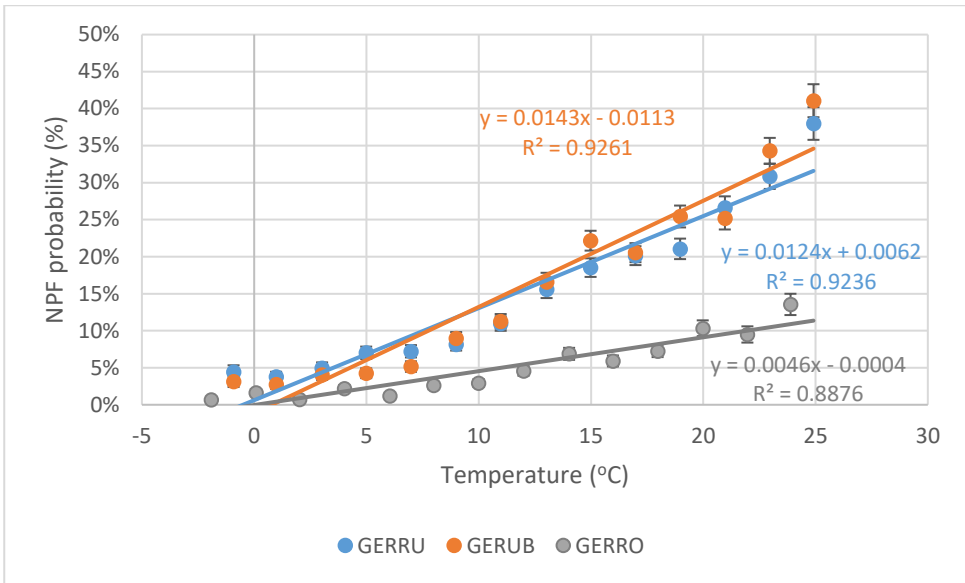
98



99

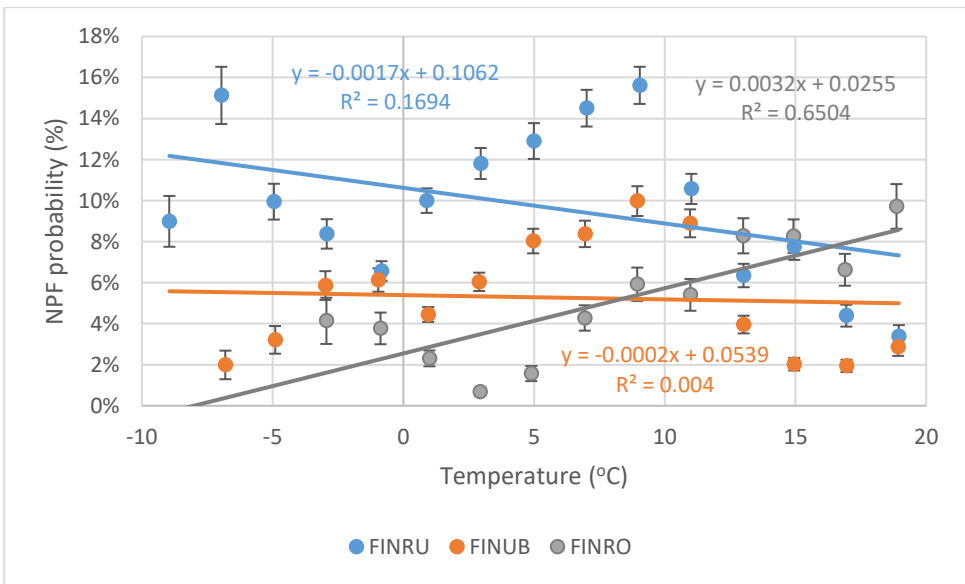
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101



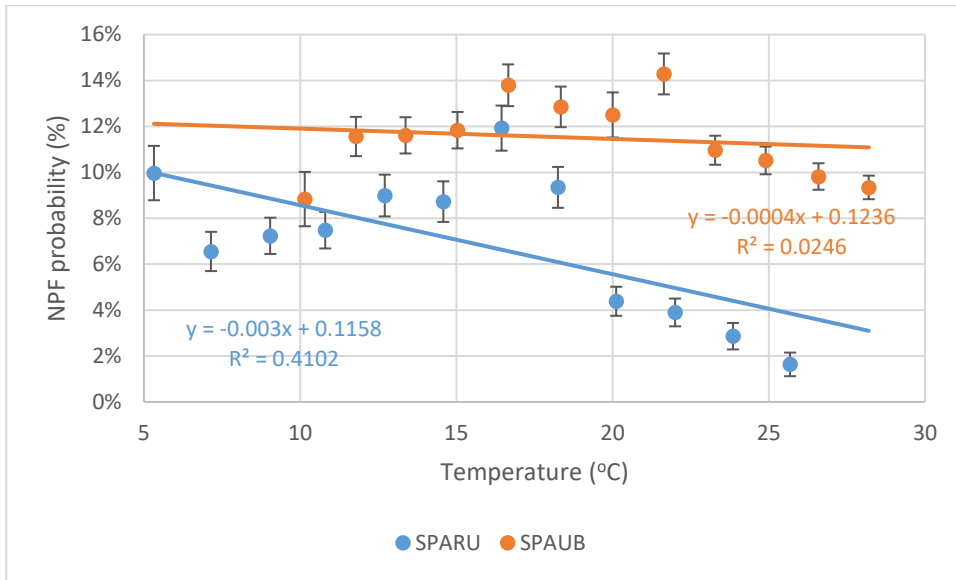
(c)

102
103



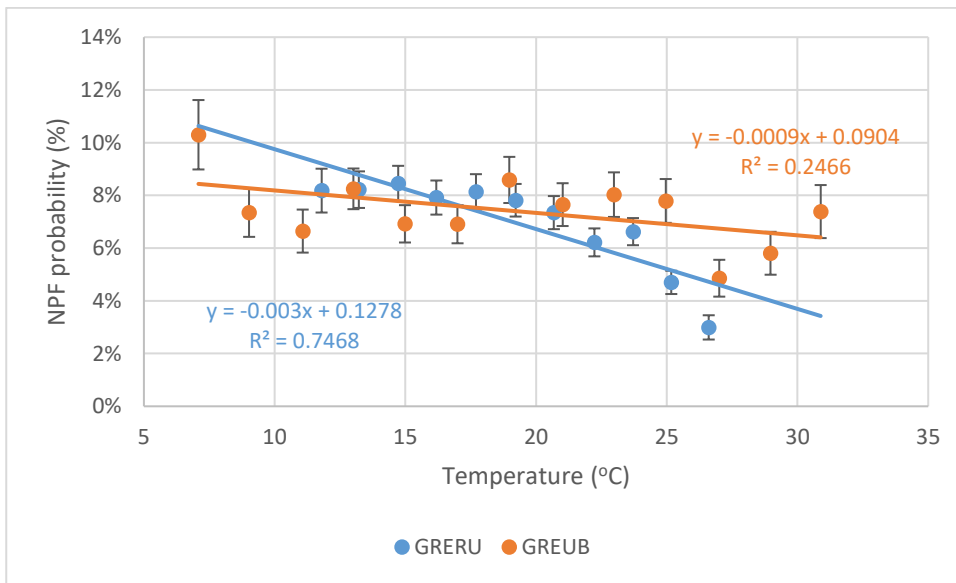
(d)

104
105
106
107
108



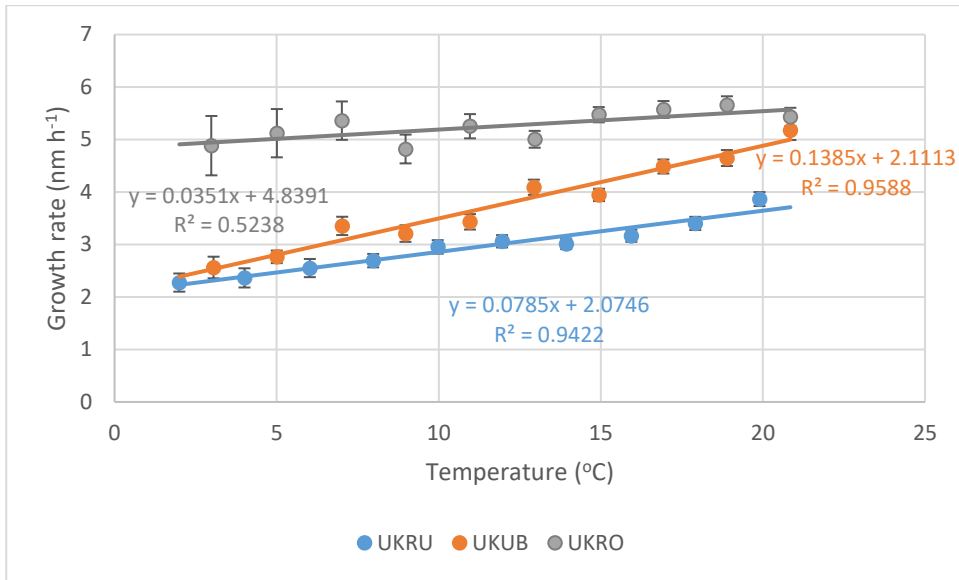
109
110

(e)



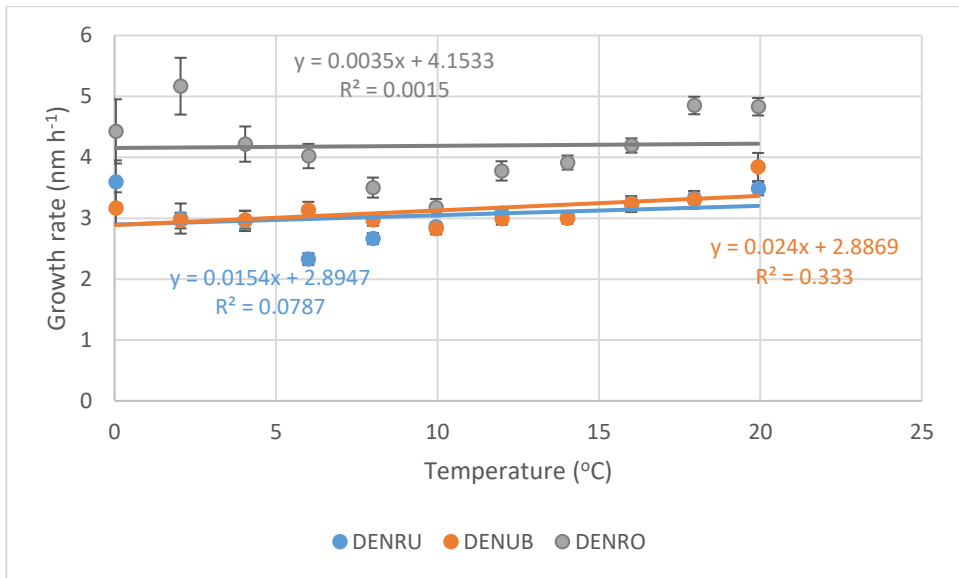
111
112
113
114
115
116

(f)



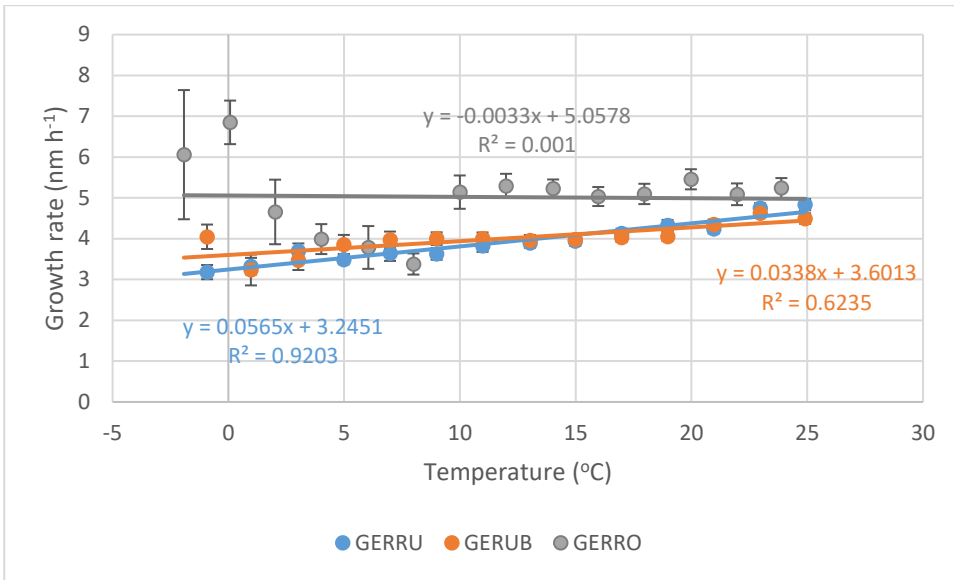
117
118

(g)



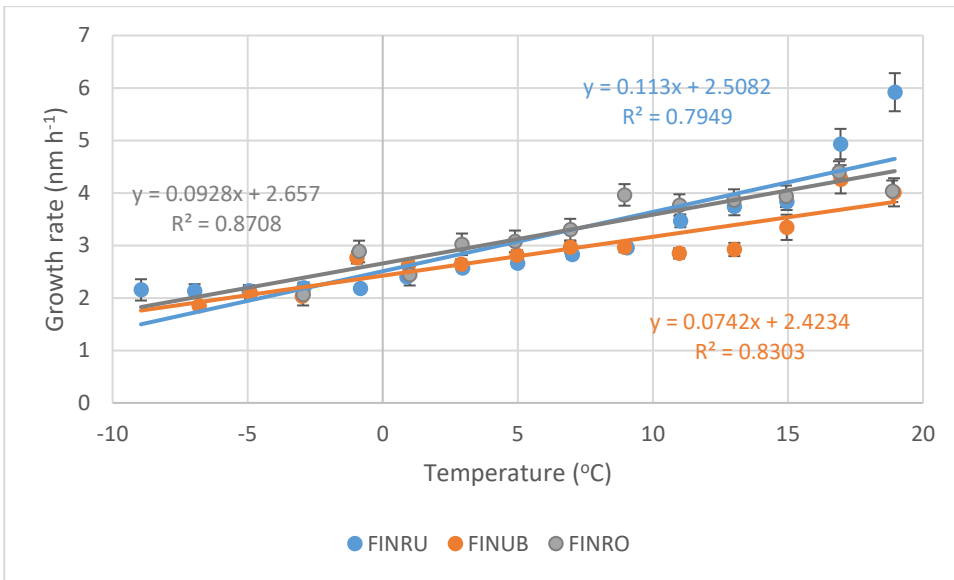
119
120
121
122
123
124

(h)



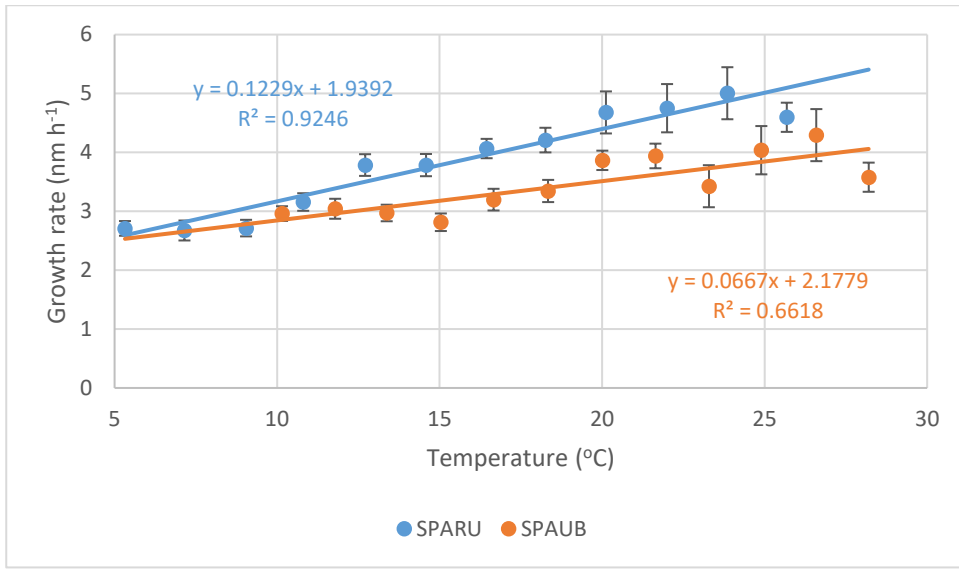
125
126

(i)



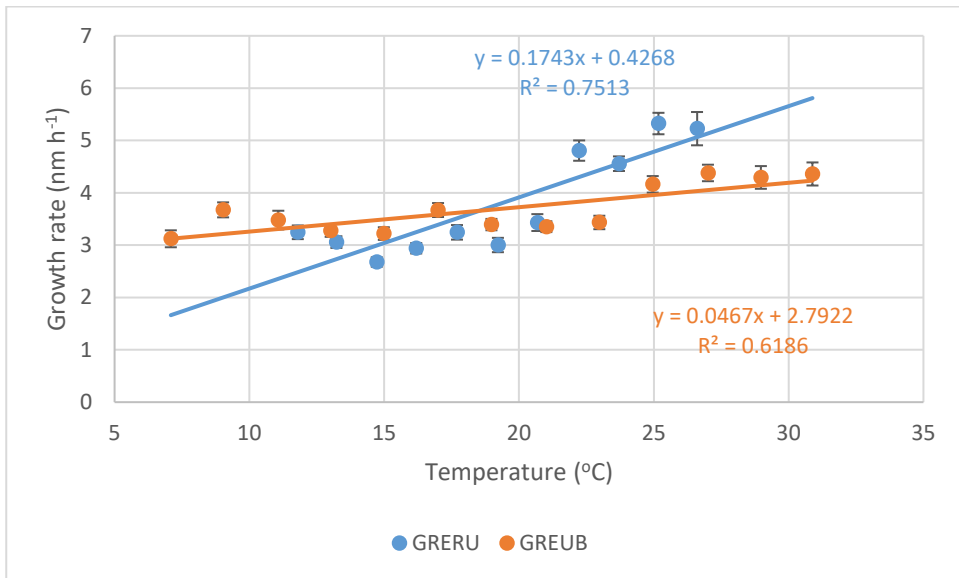
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128
129
130
131
132

(j)



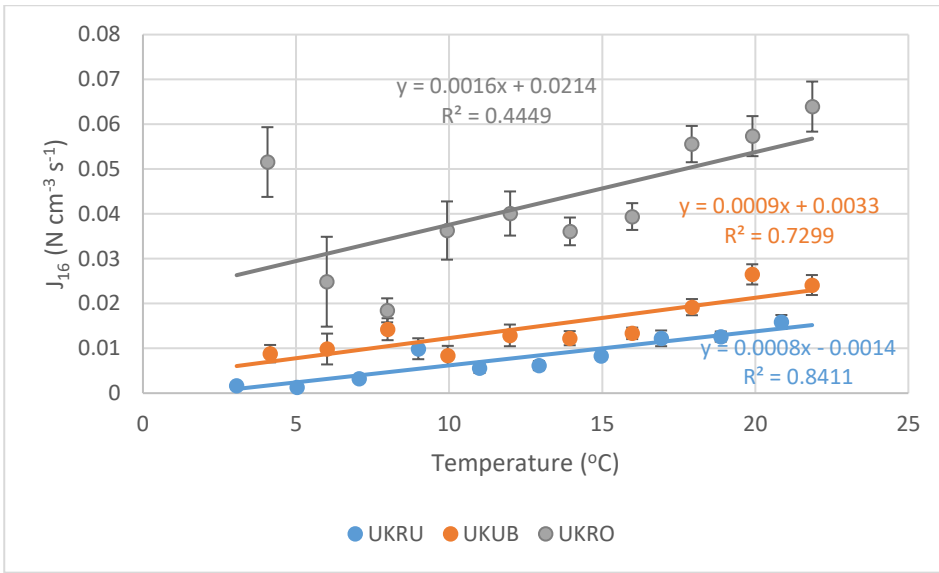
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134

(k)



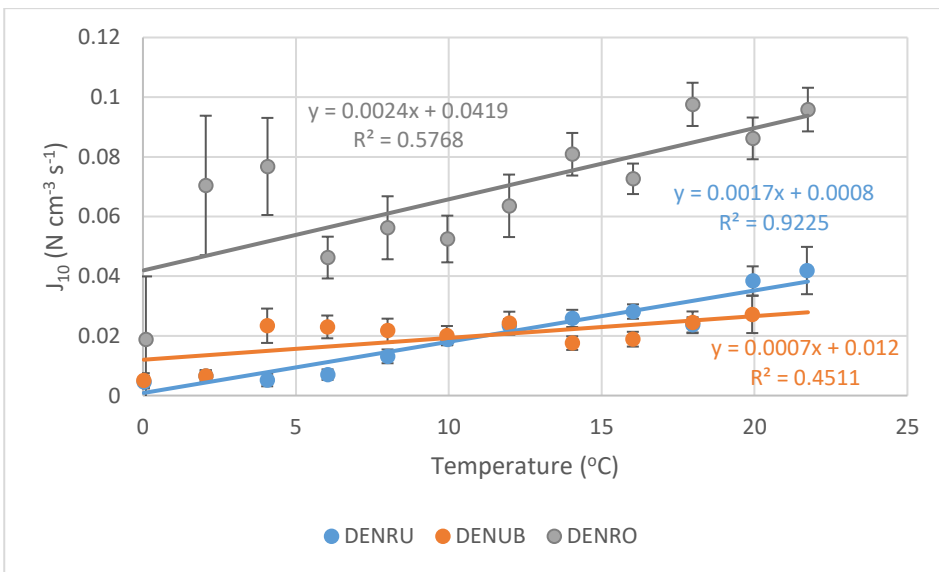
135
136
137

(l)



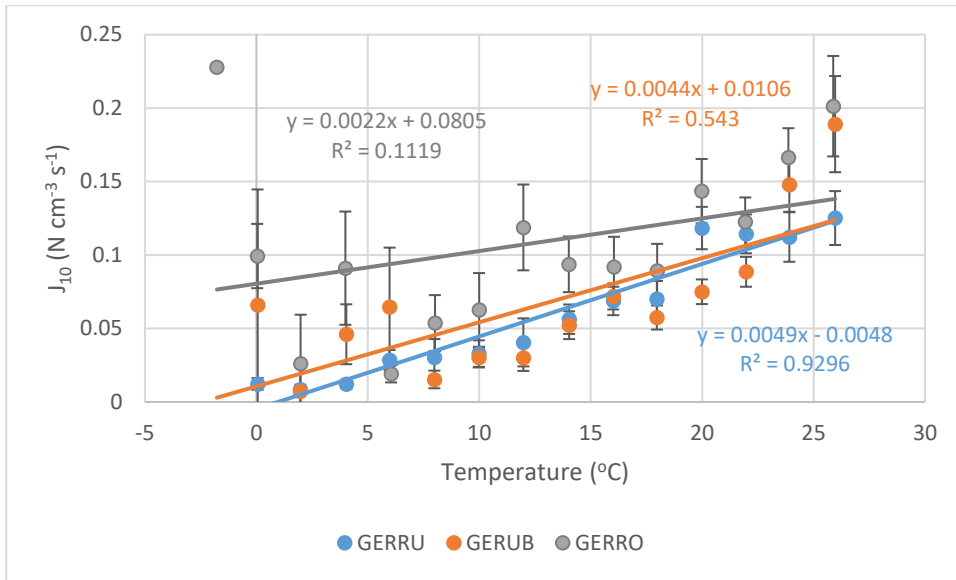
138
139

(m)



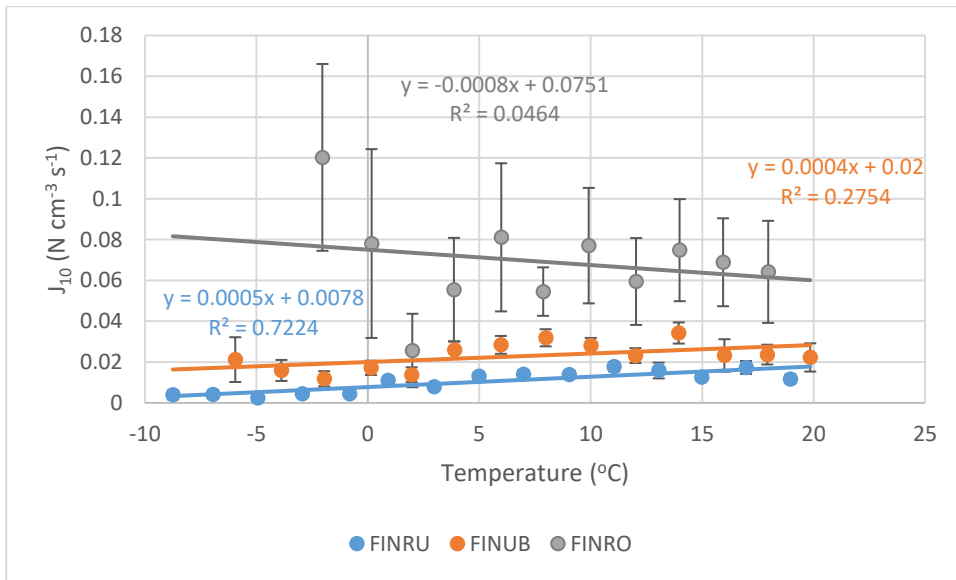
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141

(n)



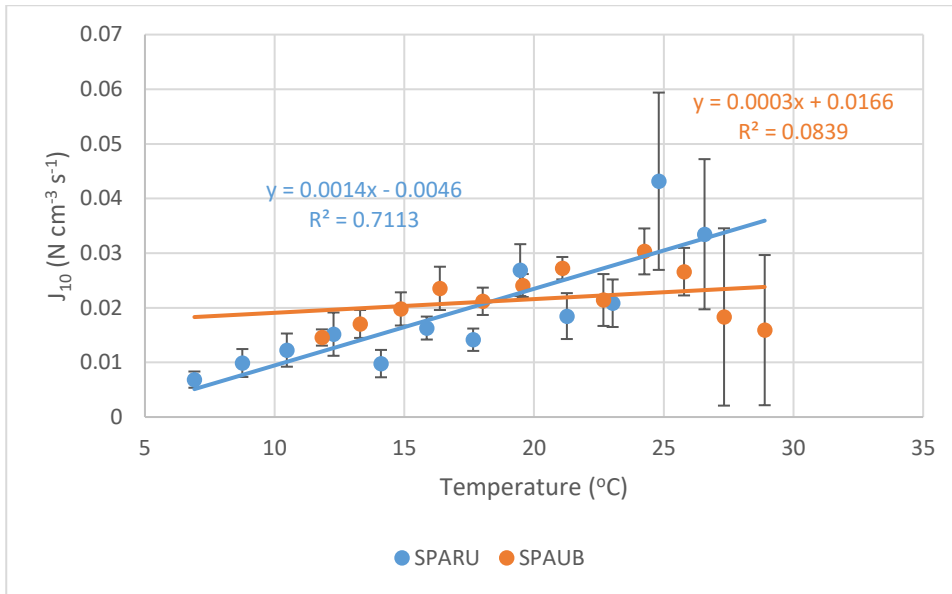
142
143

(o)



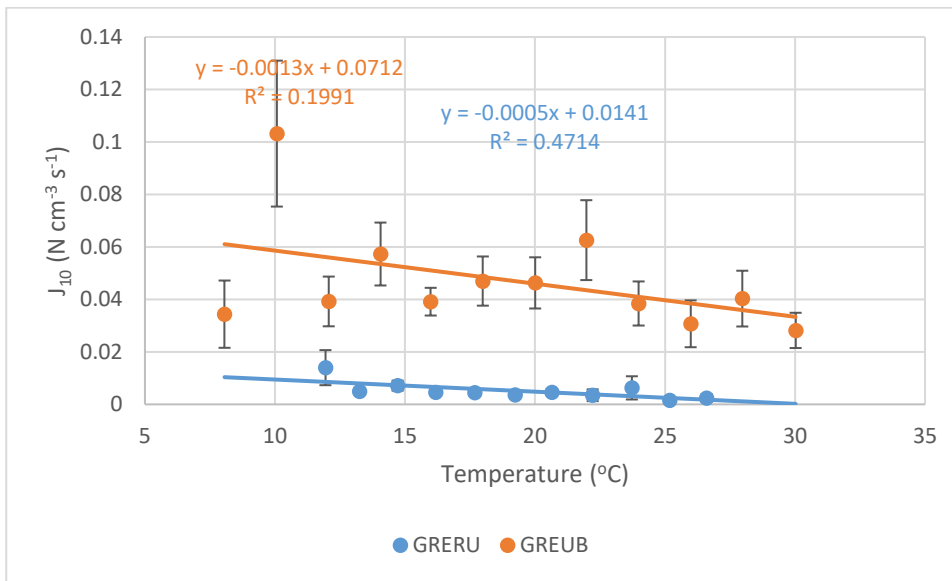
144
145
146

(p)



147
148
149

(q)

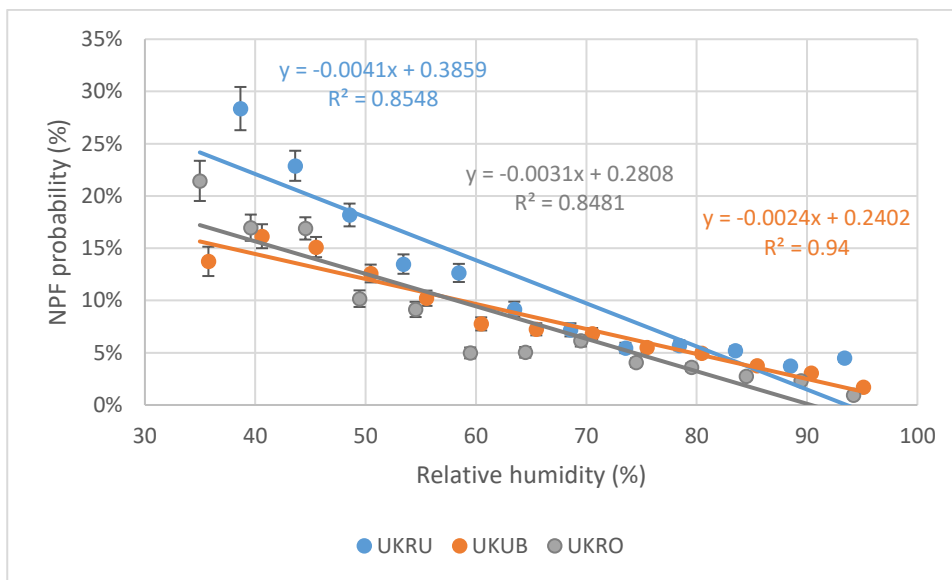


150
151

(r)

152 **Figure S3:** Relationship of relative humidity with NPF variables.

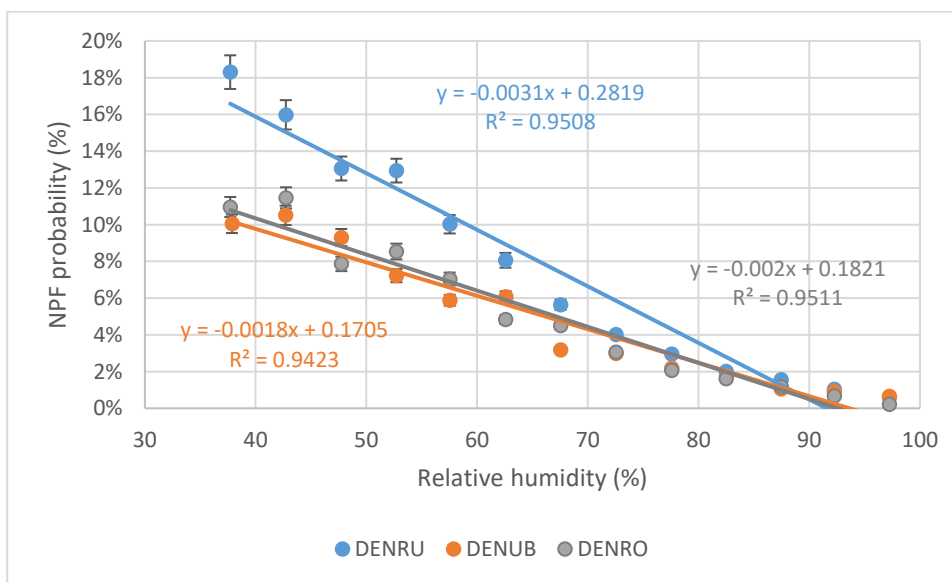
153



154

(a)

155



156

(b)

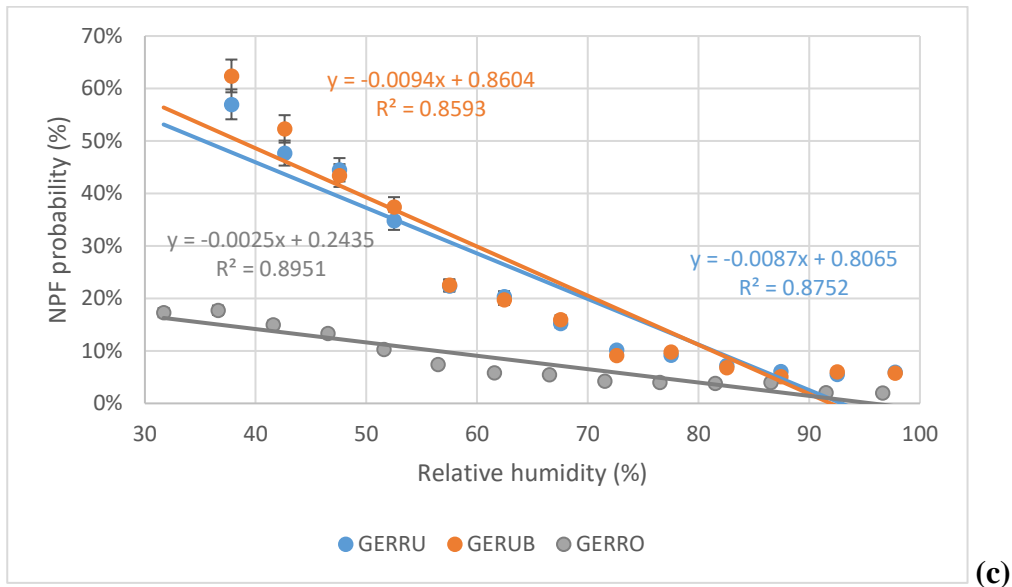
157

158

159

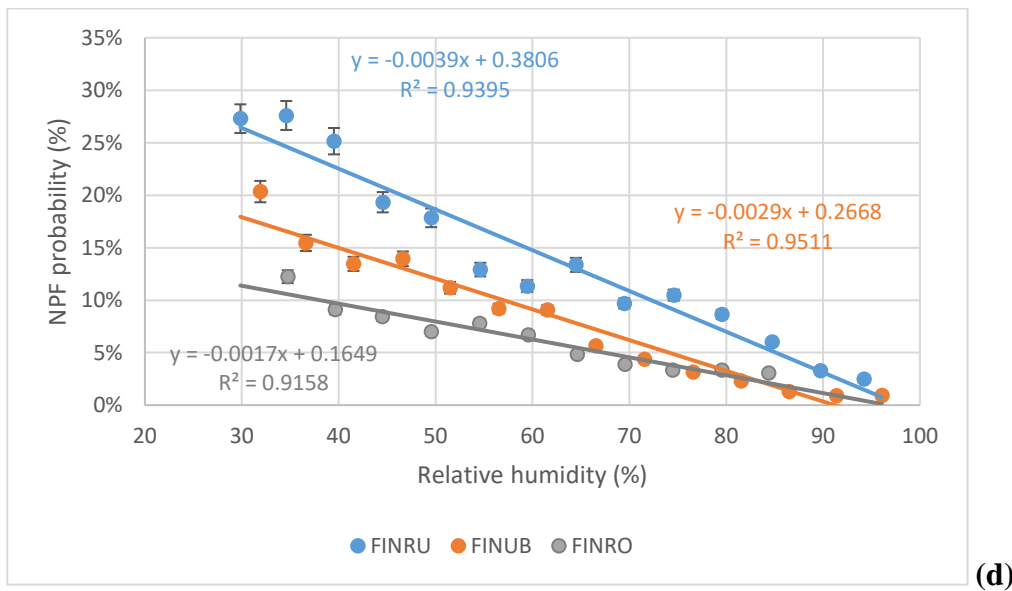
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162

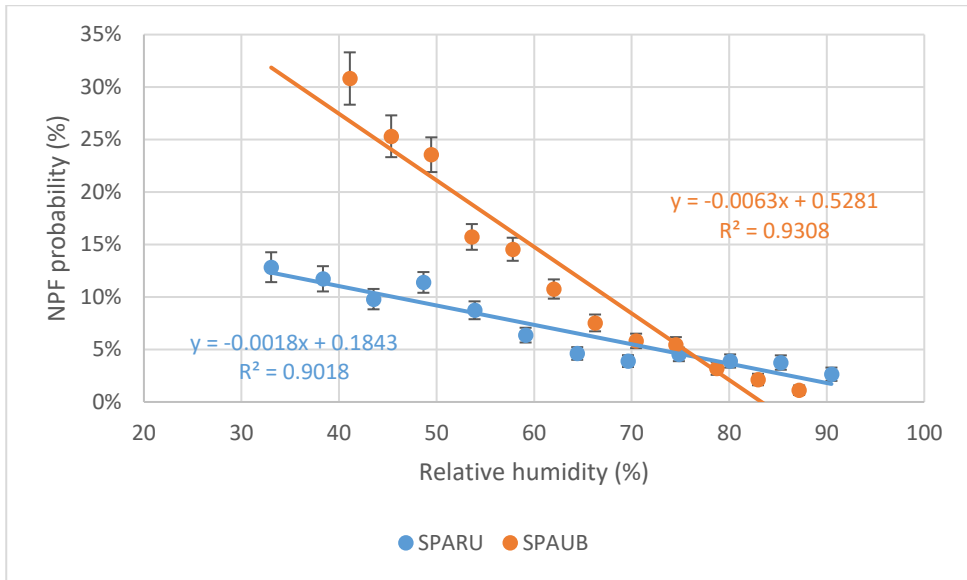
163



164

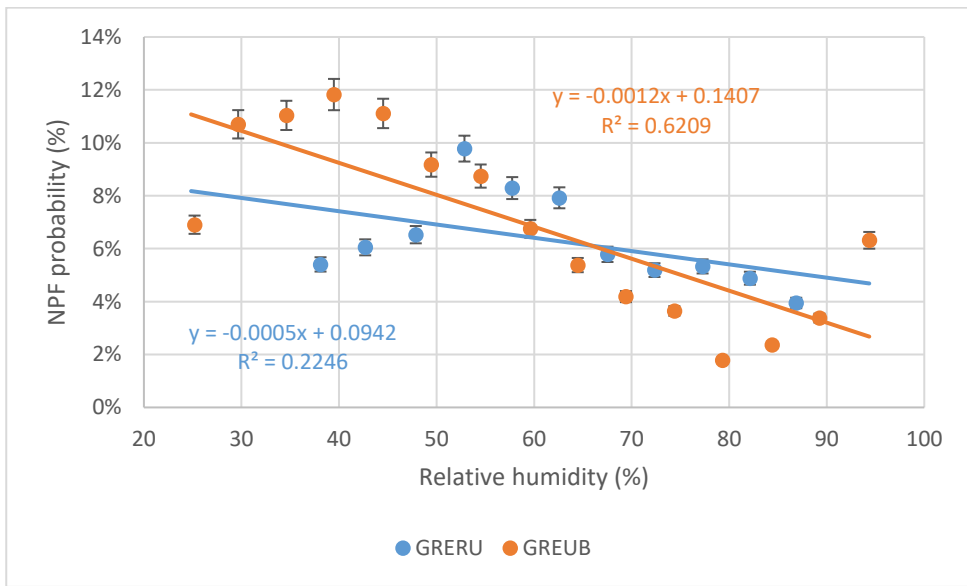
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166



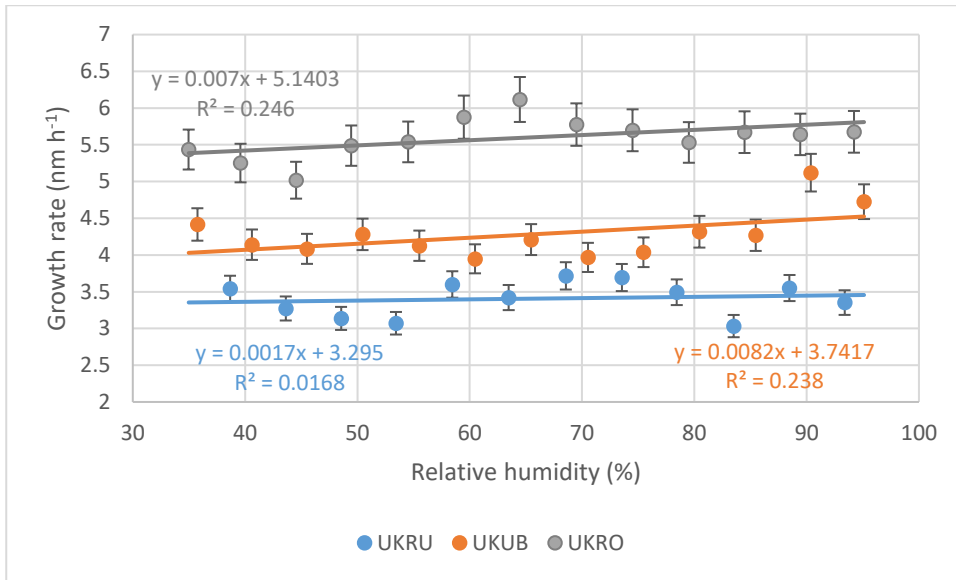
167
168
169

(e)



170
171
172
173

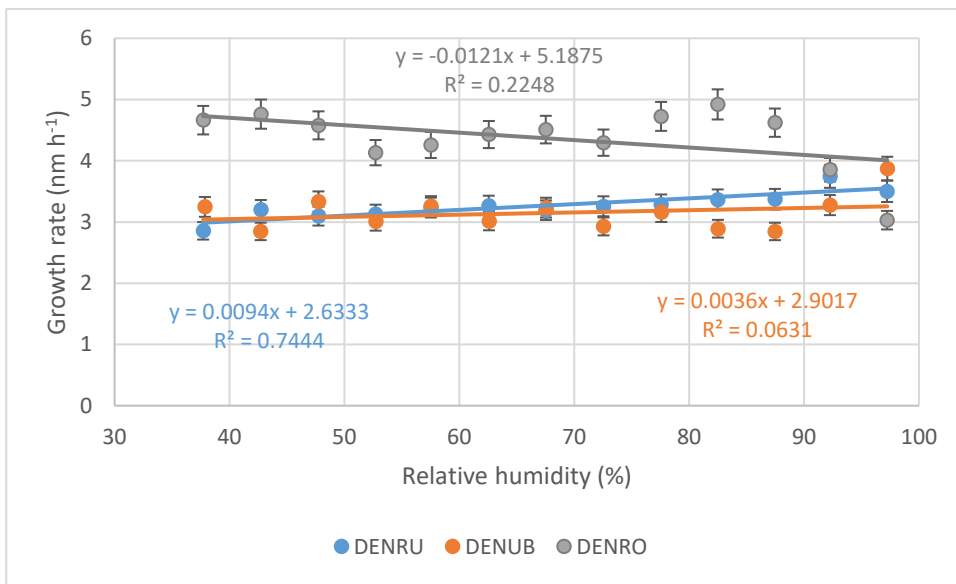
(f)



174

(g)

175



176

(h)

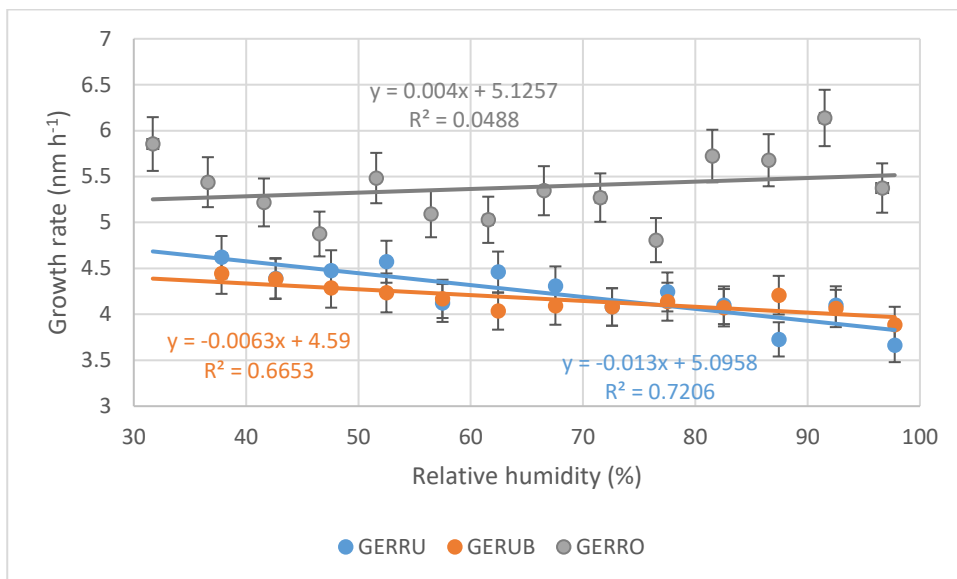
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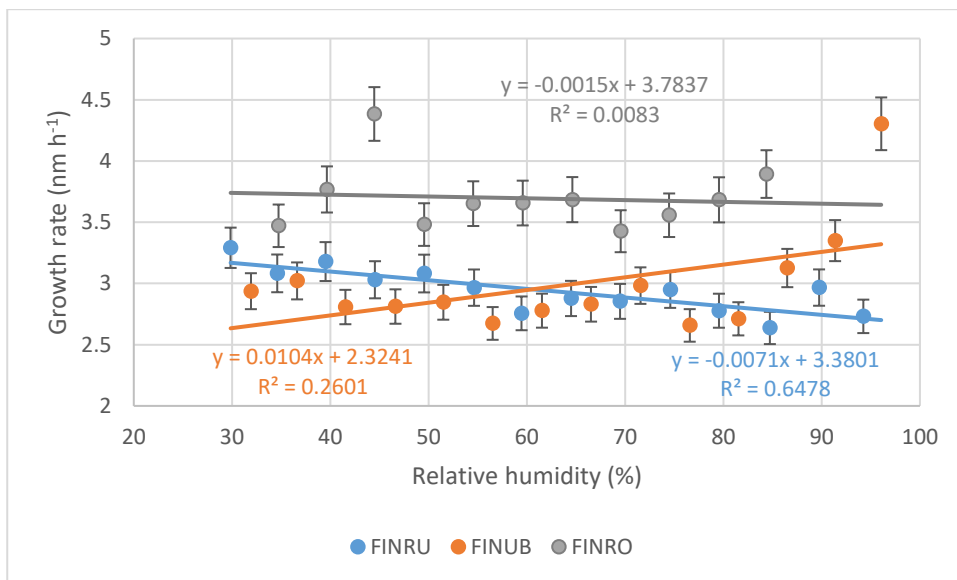
181



182

(i)

183

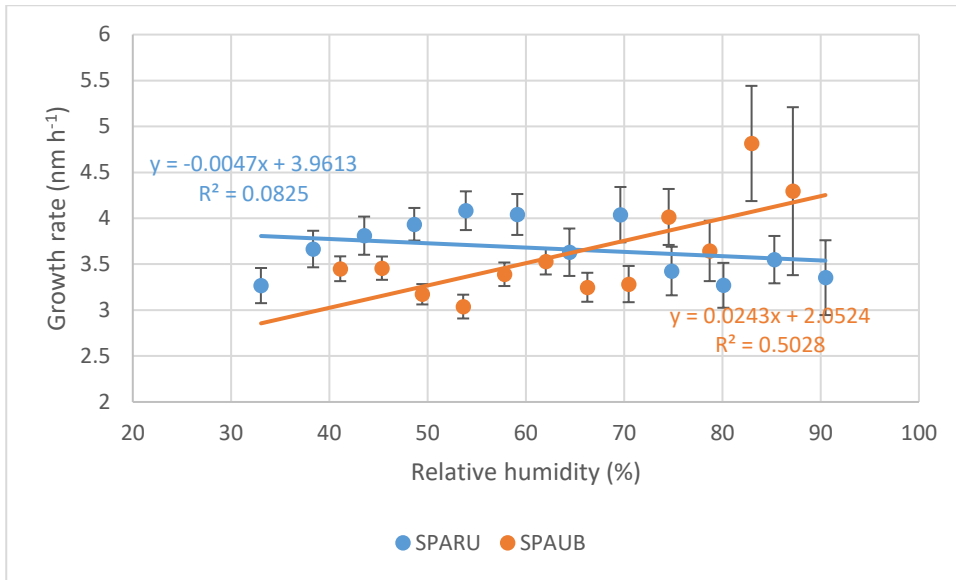


184

(j)

185

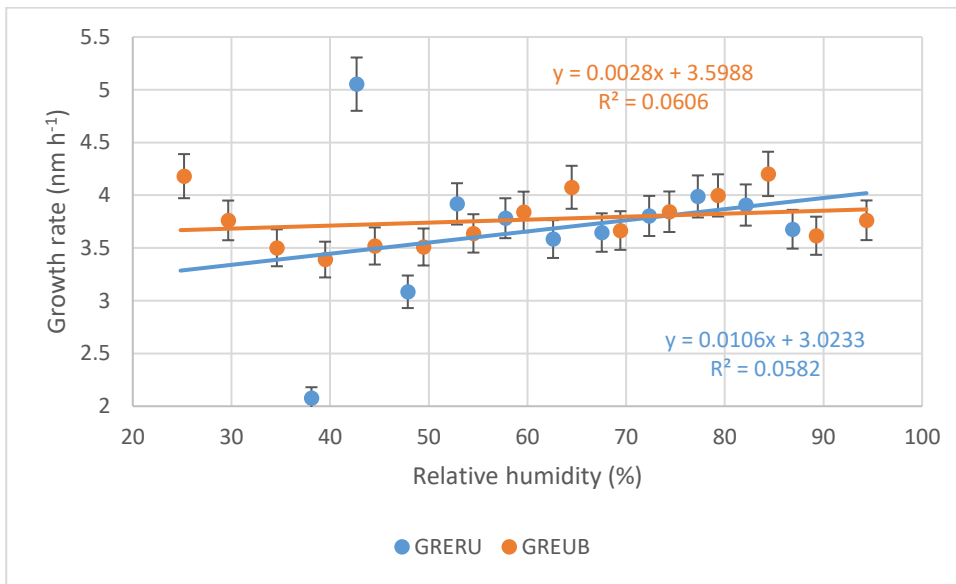
186



187

(k)

188

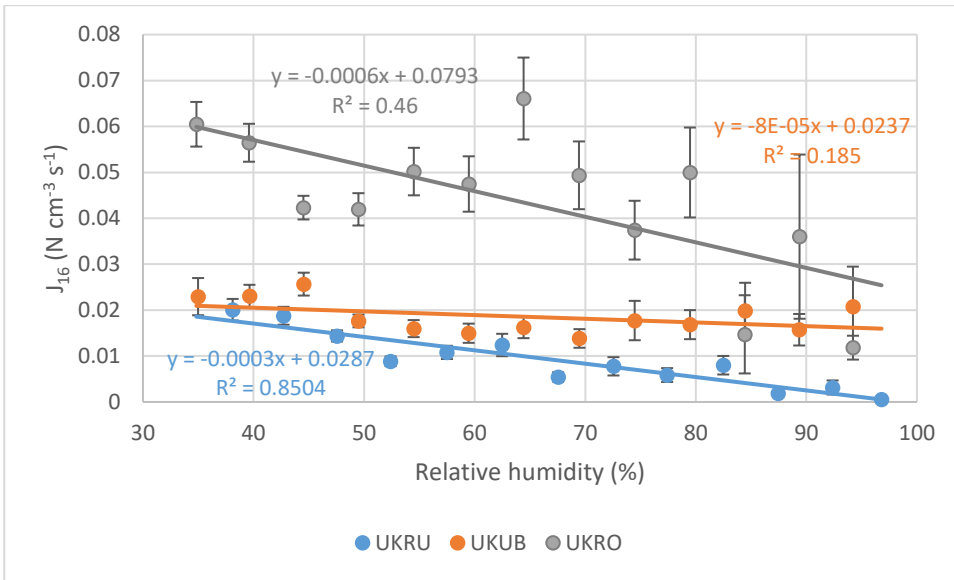


189

(l)

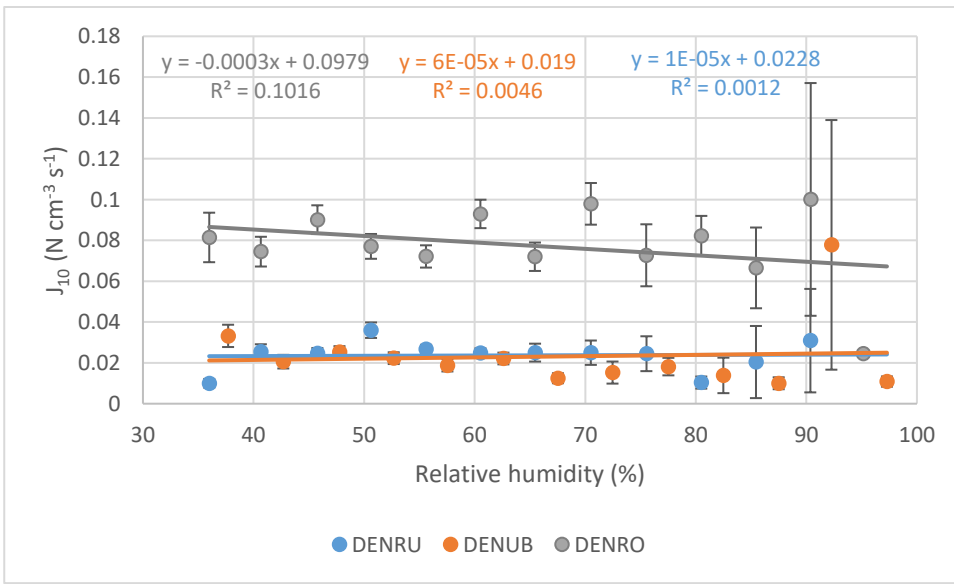
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191



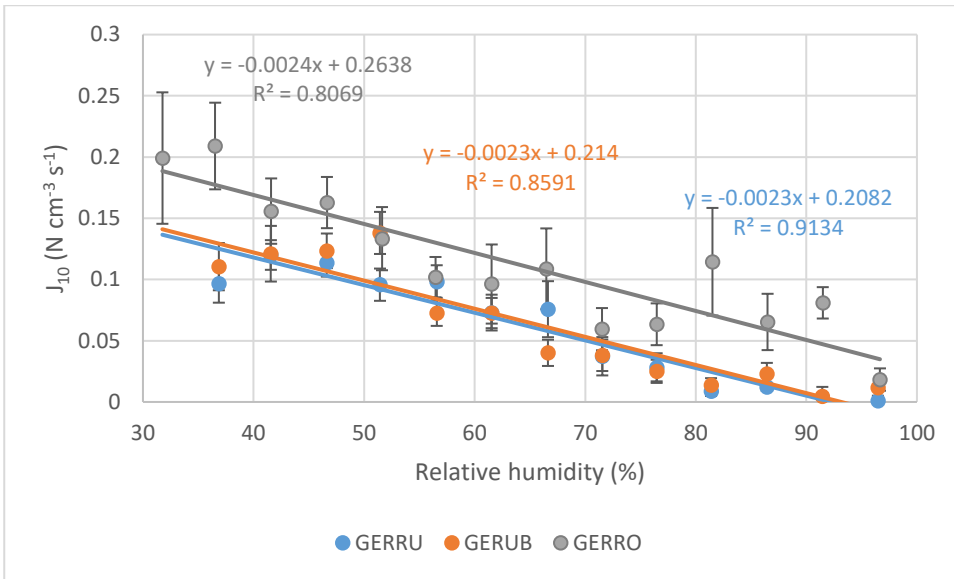
192 (m)

193



194 (n)

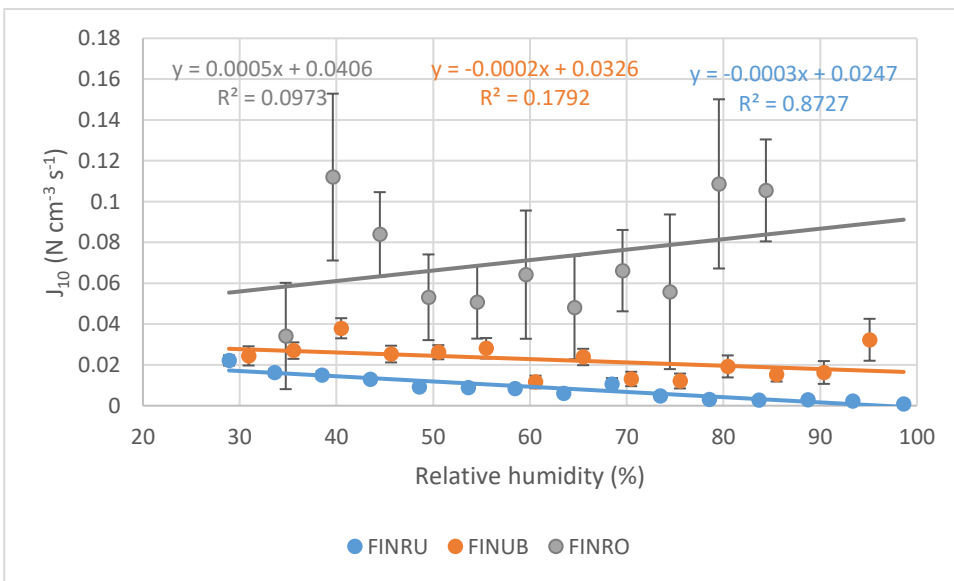
195



196

(o)

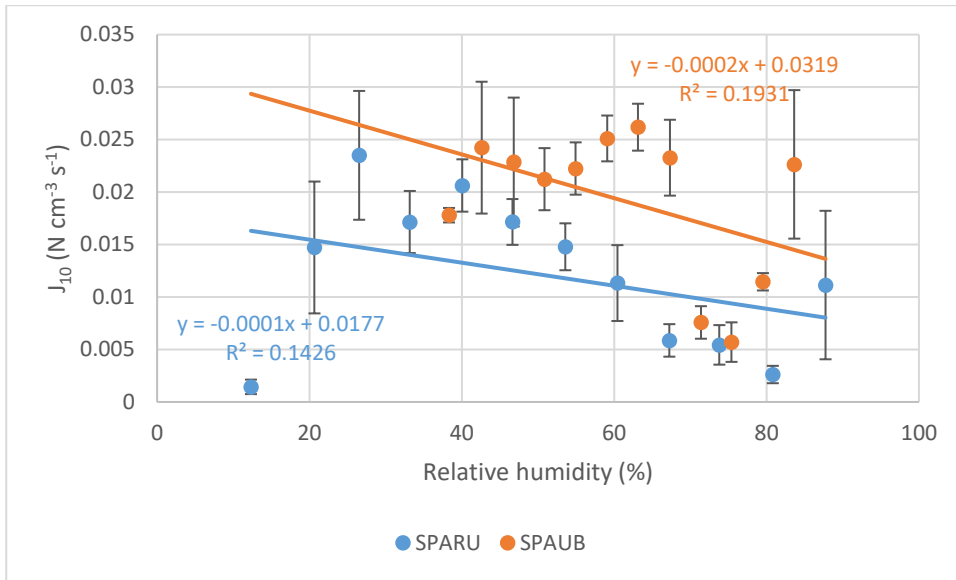
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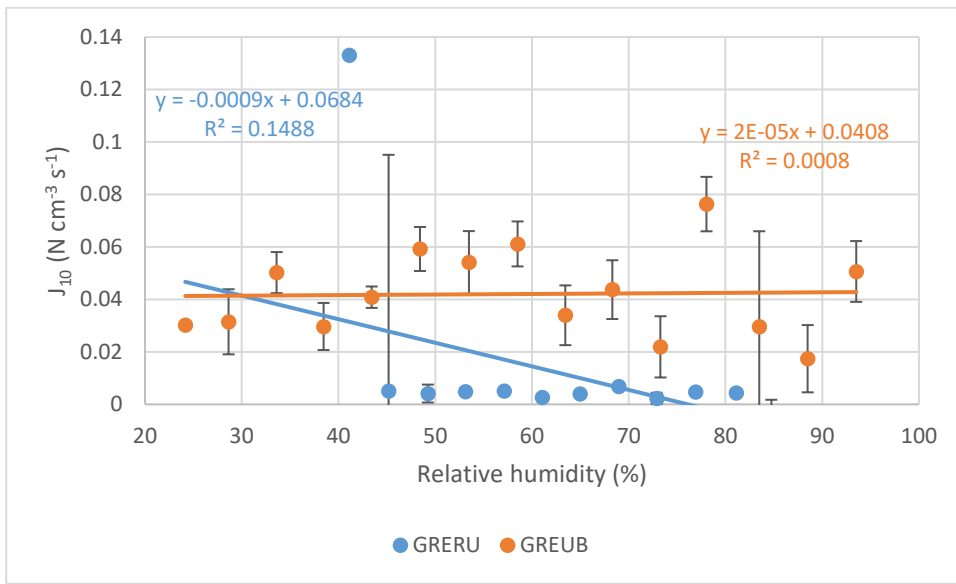
(p)

199



200

201

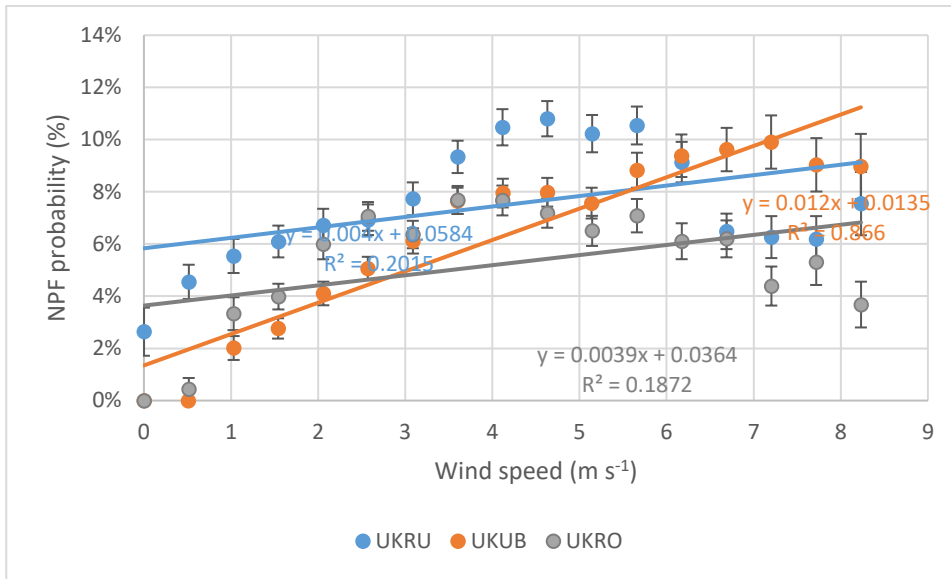


202

203

204 **Figure S4:** Relationship of wind speed with NPF variables.

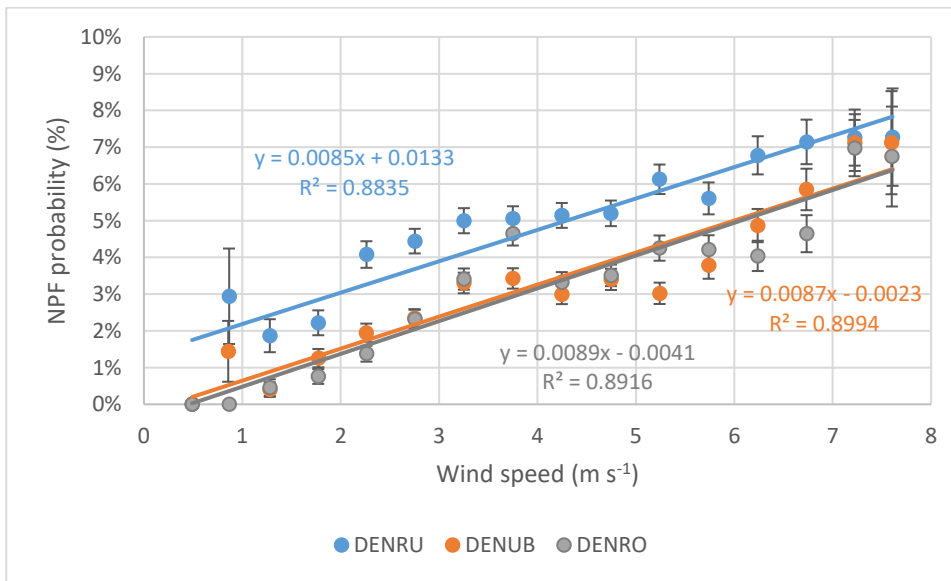
205



206

(a)

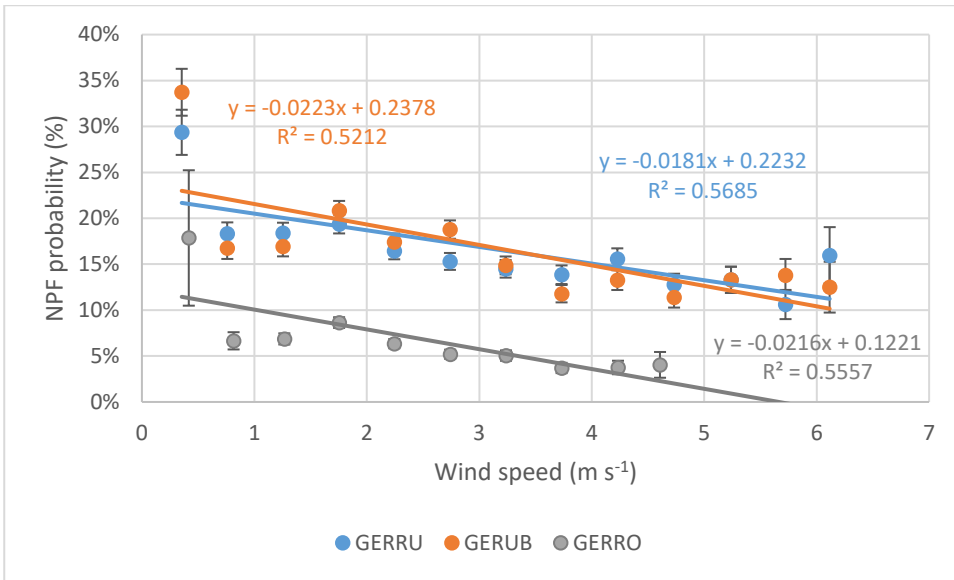
207



208

(b)

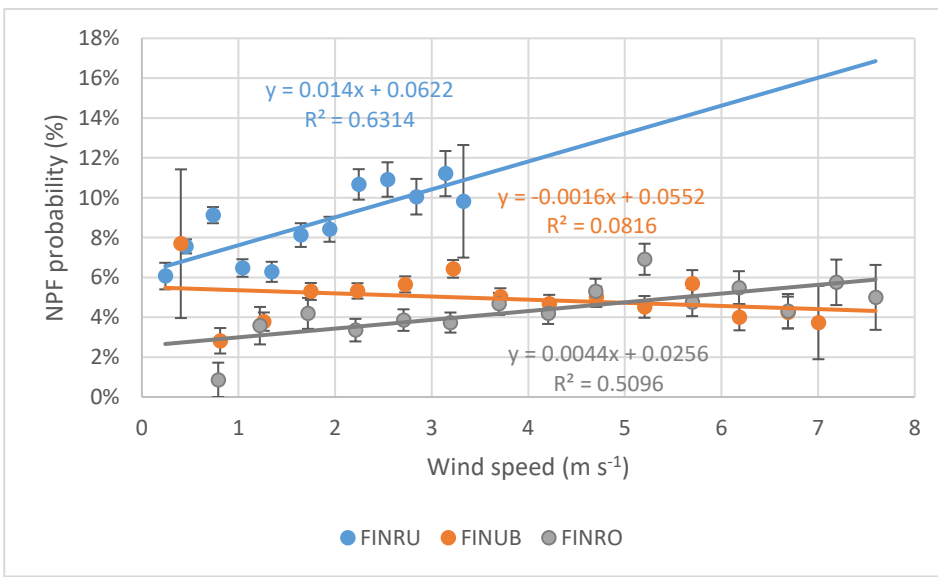
209



210

(c)

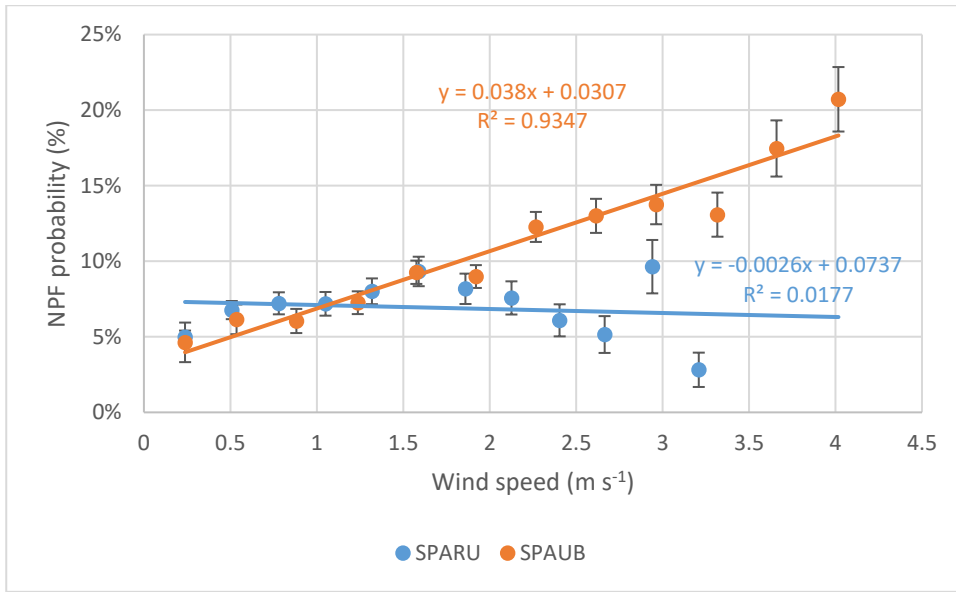
211



212

(d)

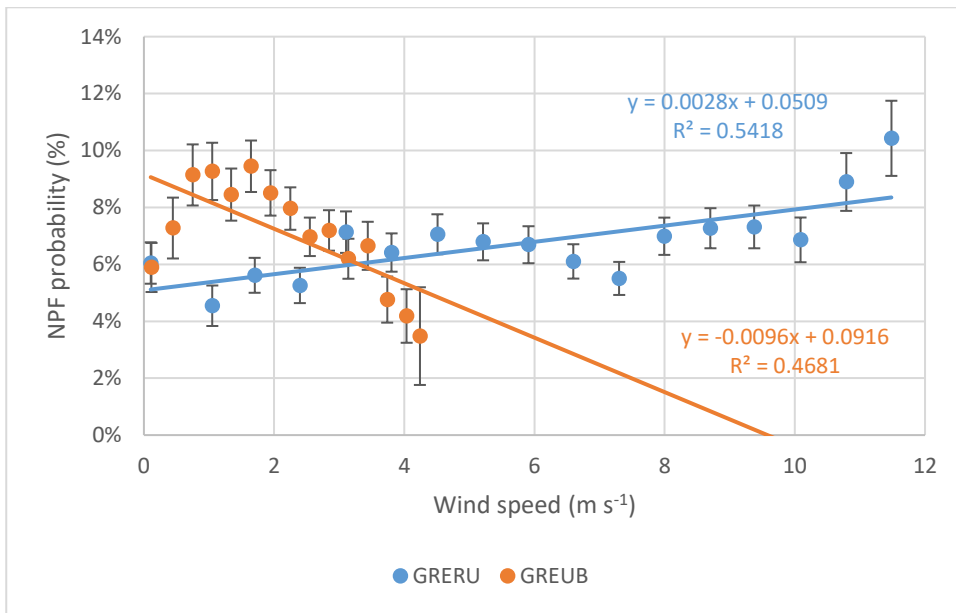
213



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215

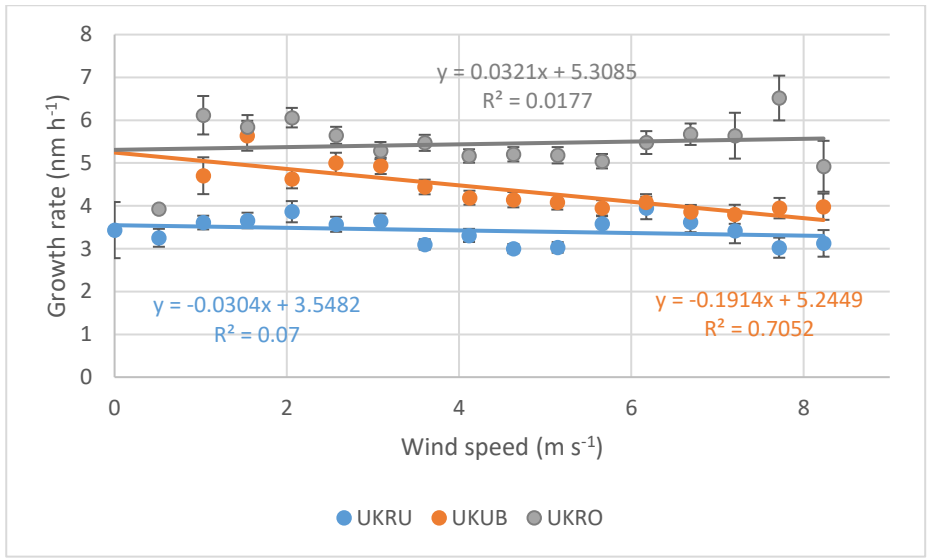
(e)



216

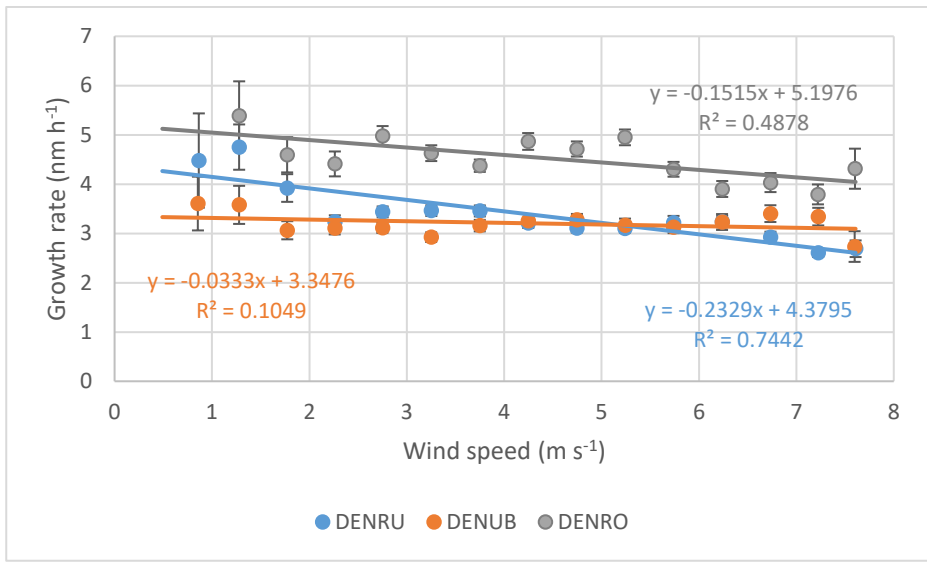
217

(f)



218 (g)

219



220 (h)

221

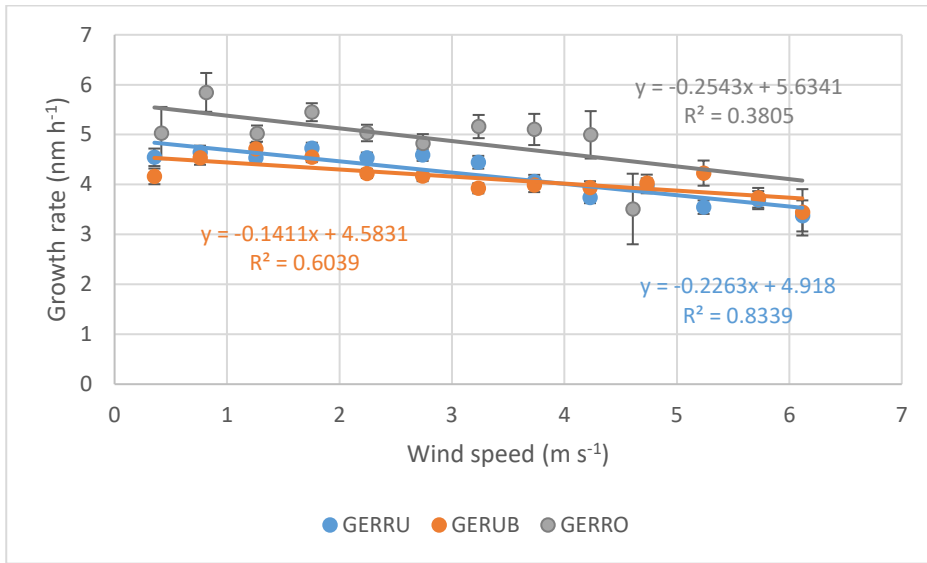
222

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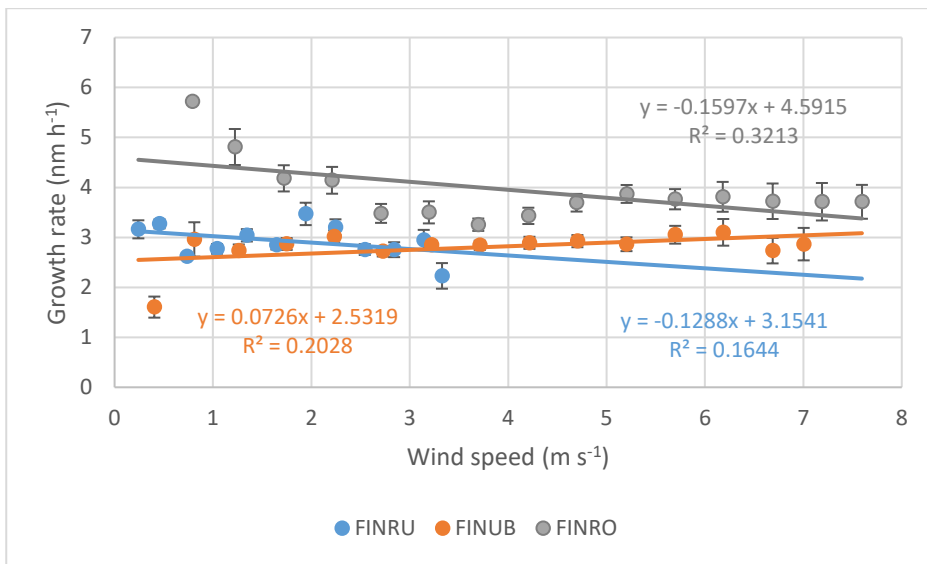
226



227

(i)

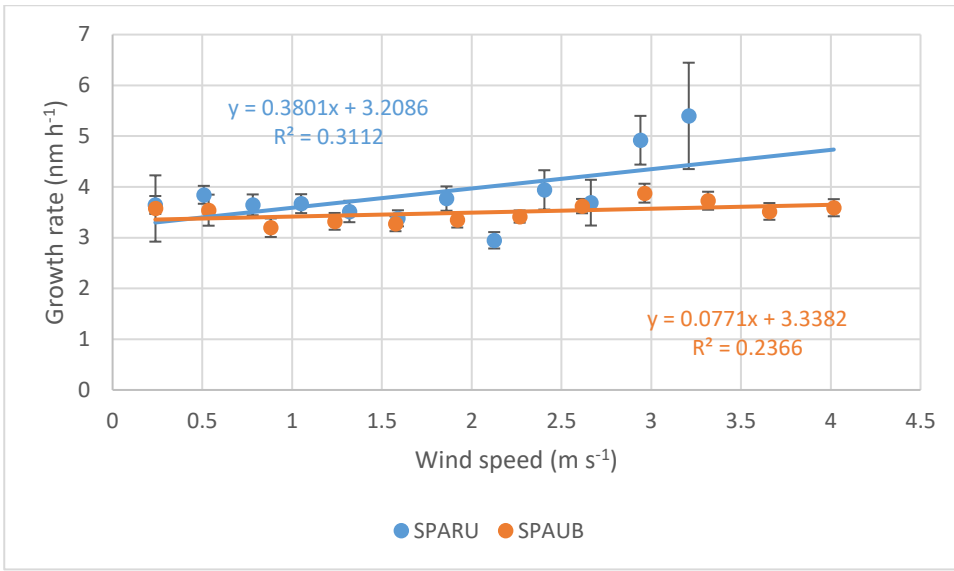
228



229

(j)

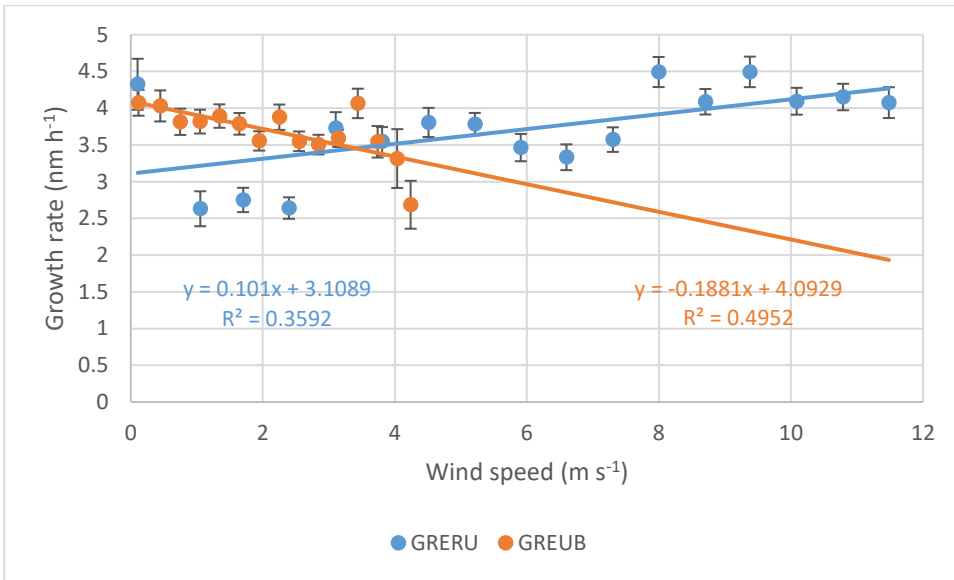
230



231

(k)

232

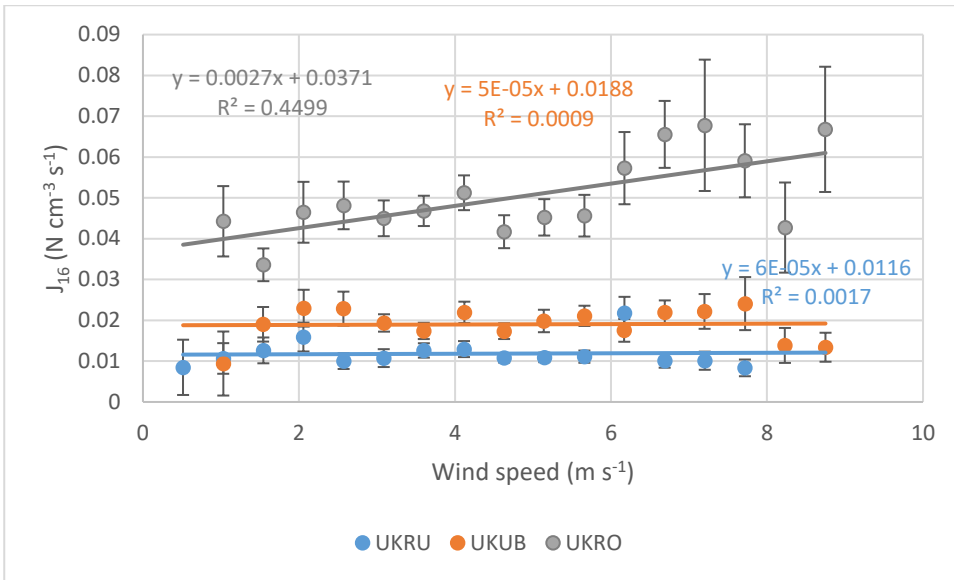


233

(l)

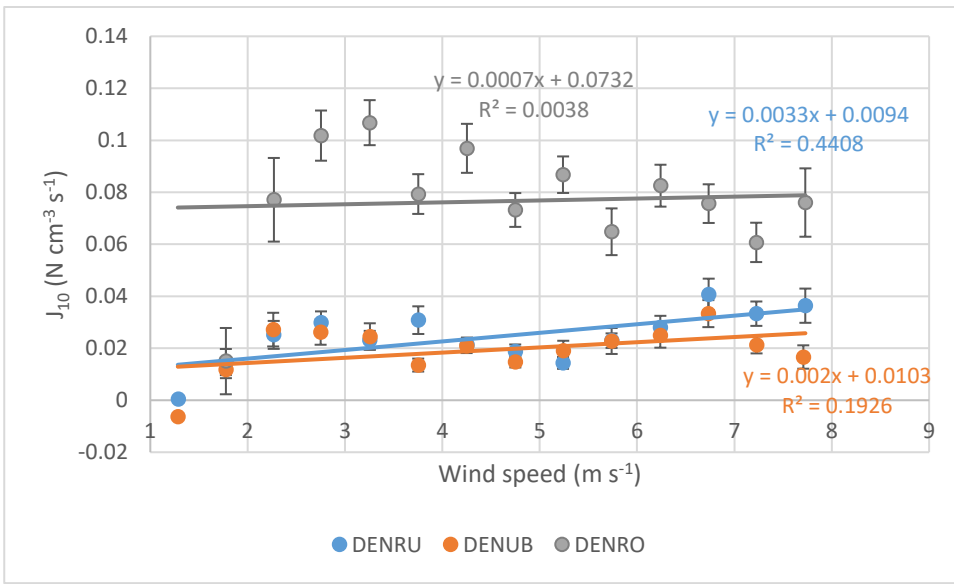
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235



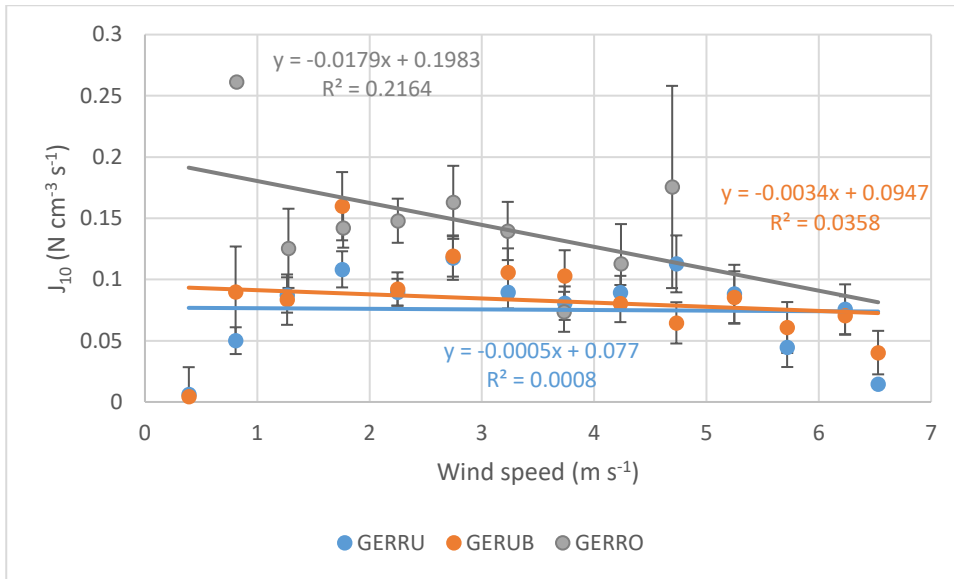
236 (m)

237



238 (n)

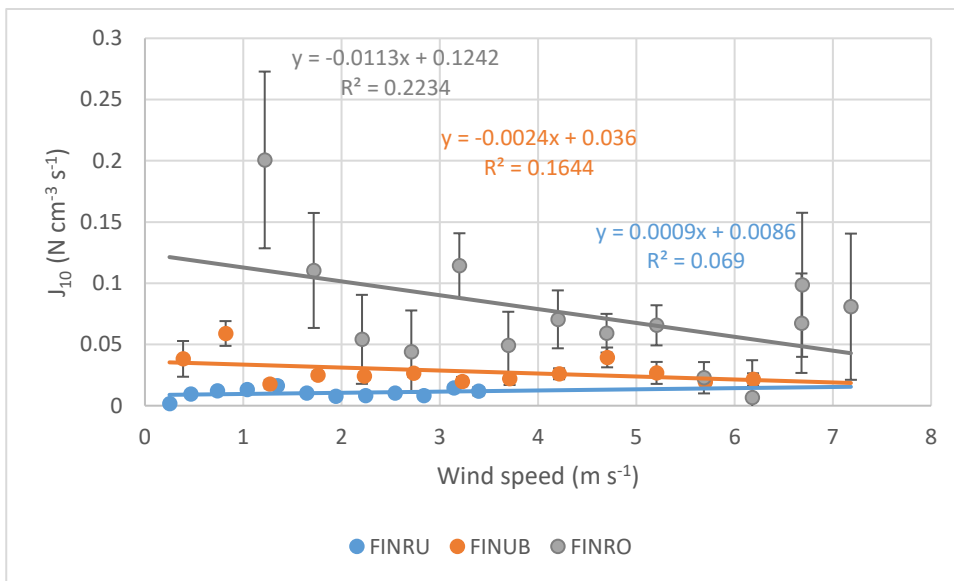
239



240

(o)

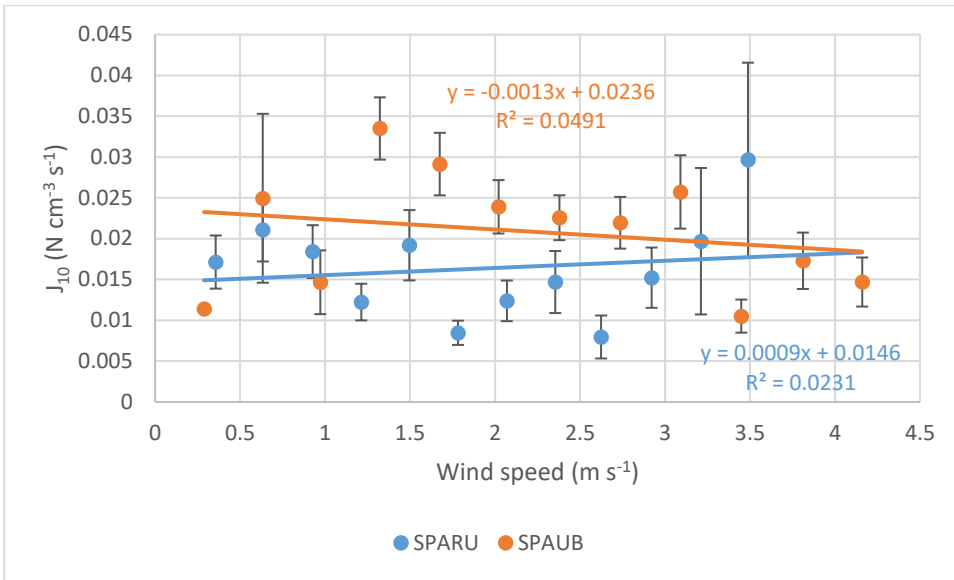
241



242

(p)

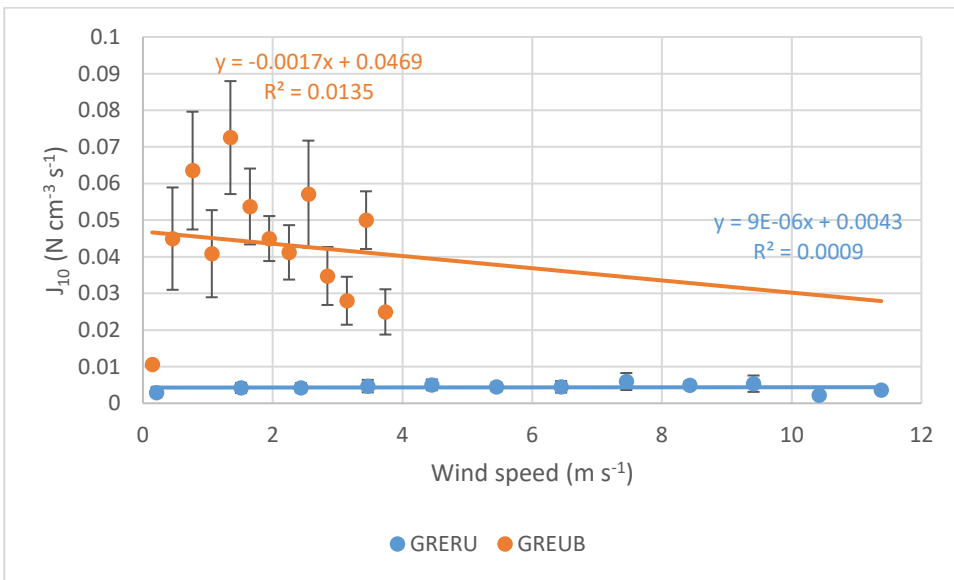
243



244

(q)

245



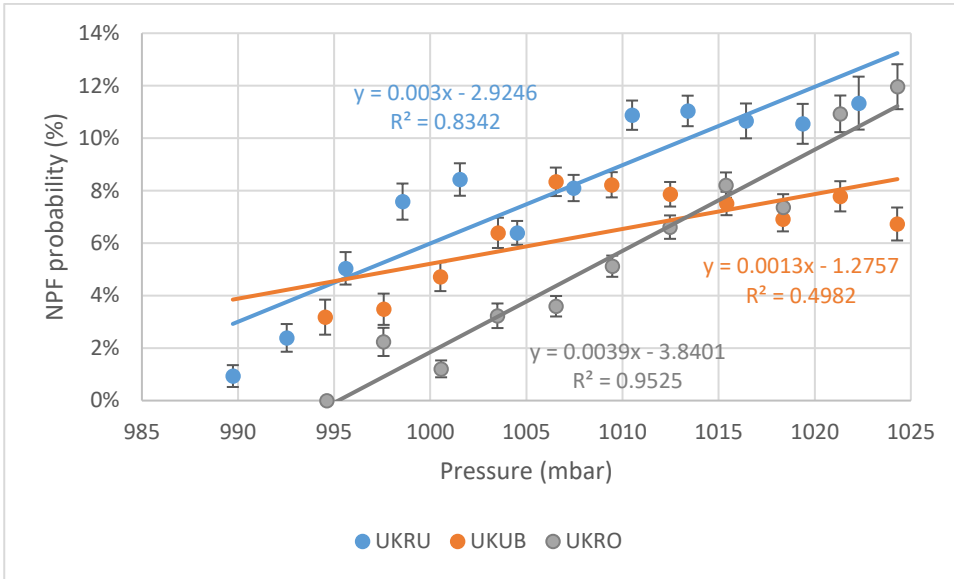
246

(r)

247

248 **Figure S5:** Relationship of atmospheric pressure with NPF variables.

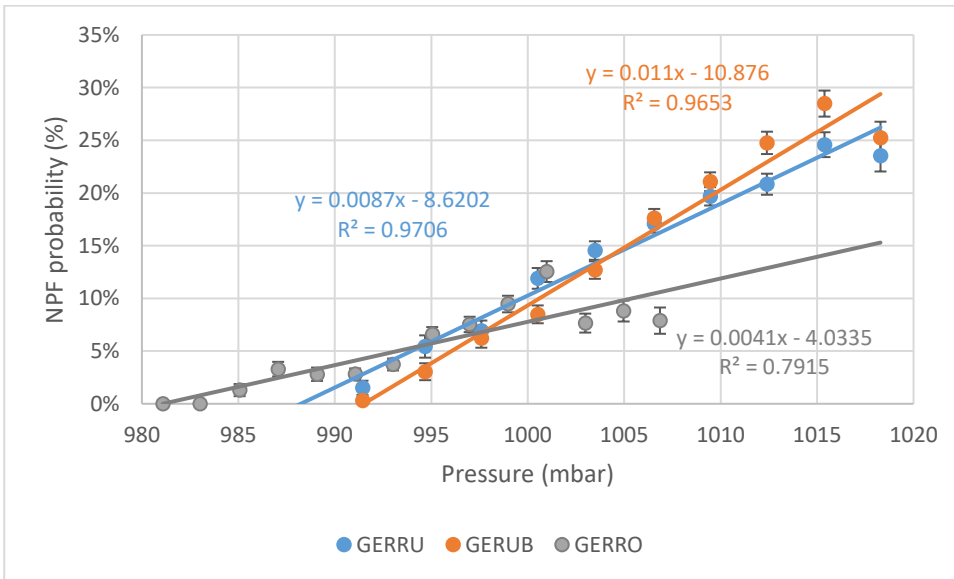
249



250

(a)

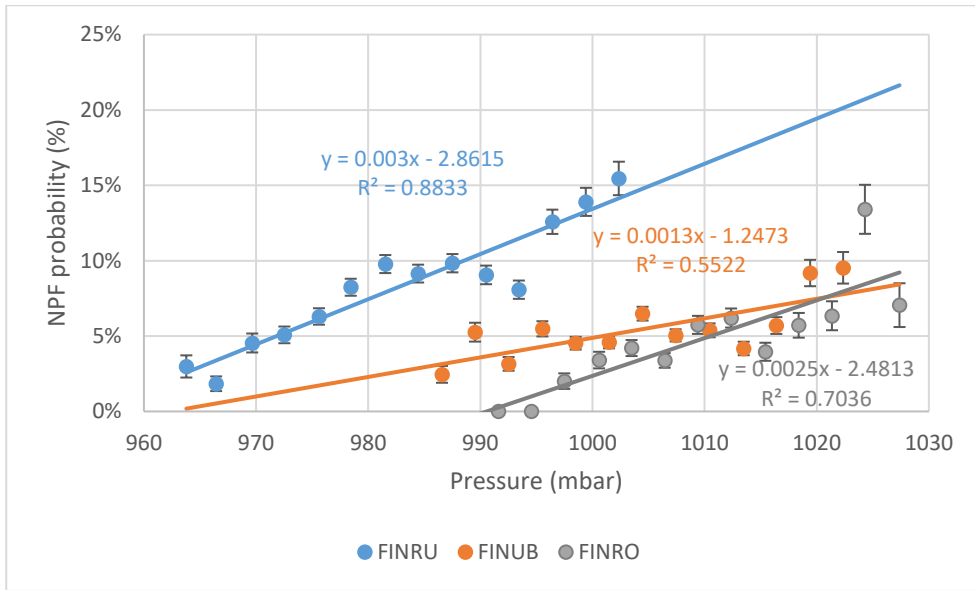
251



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(b)

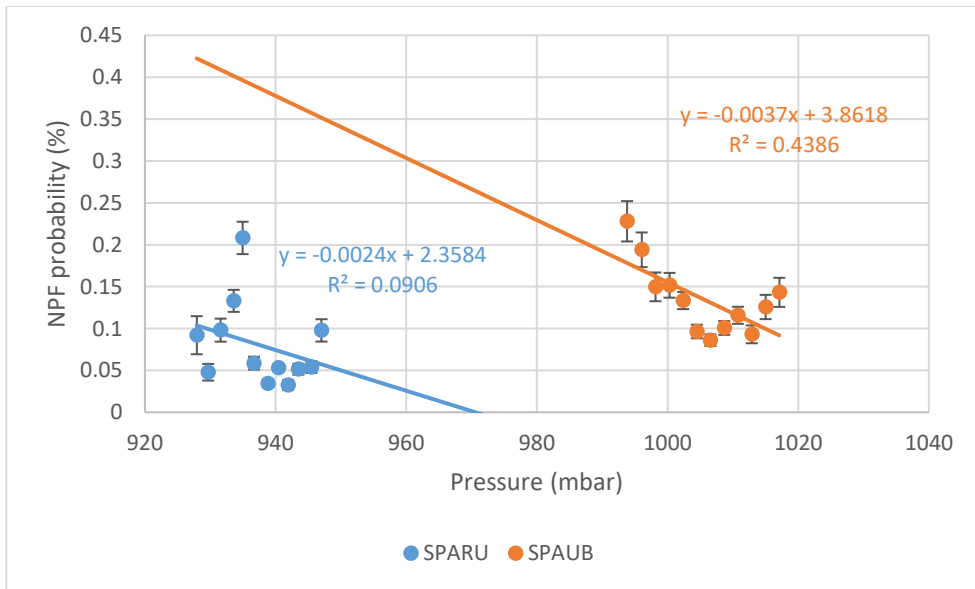
253



254

(c)

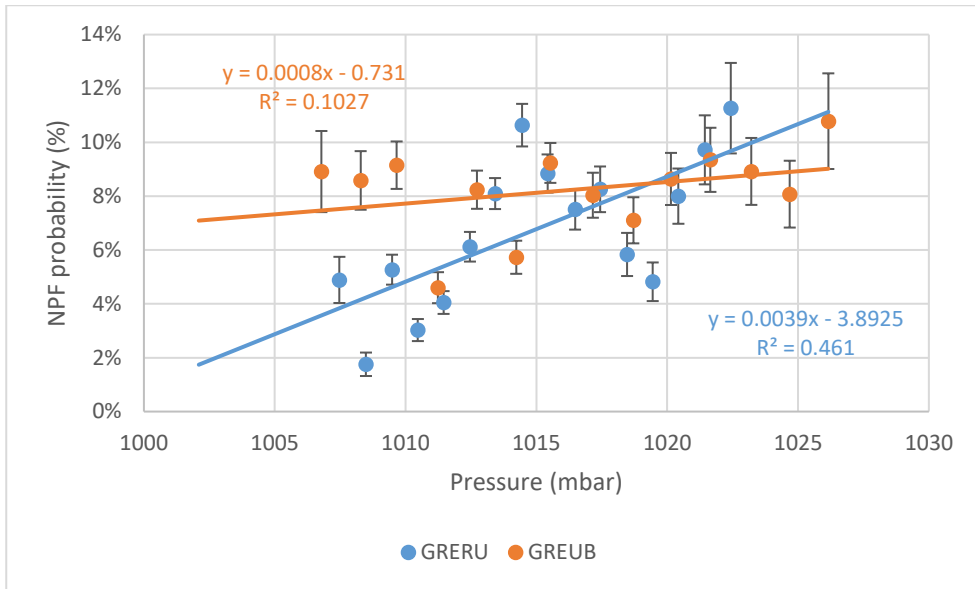
255



256

(d)

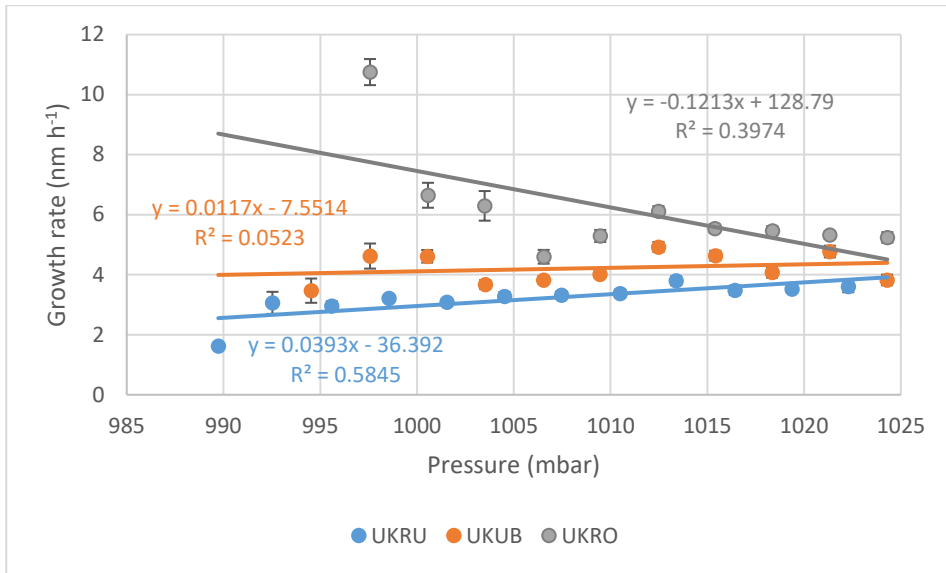
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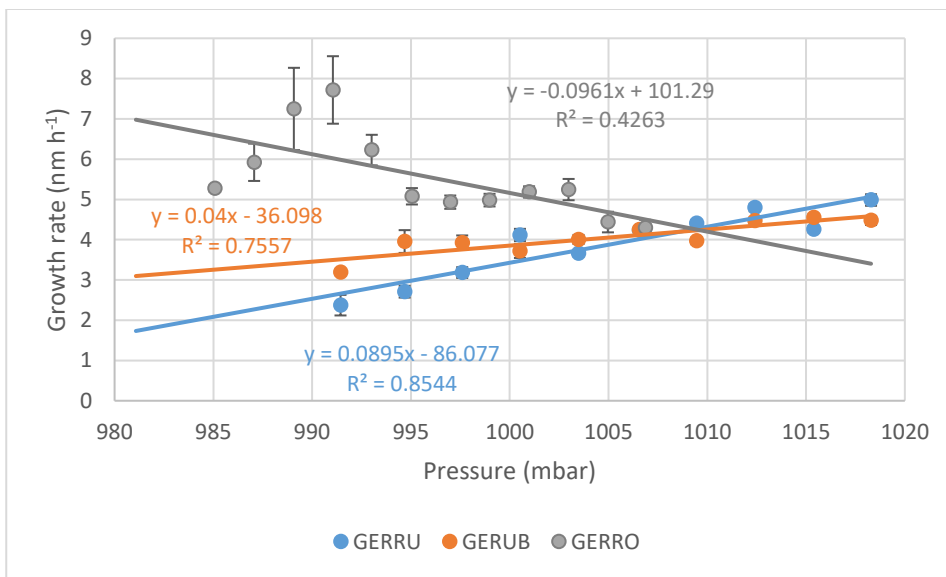
(e)



260

(f)

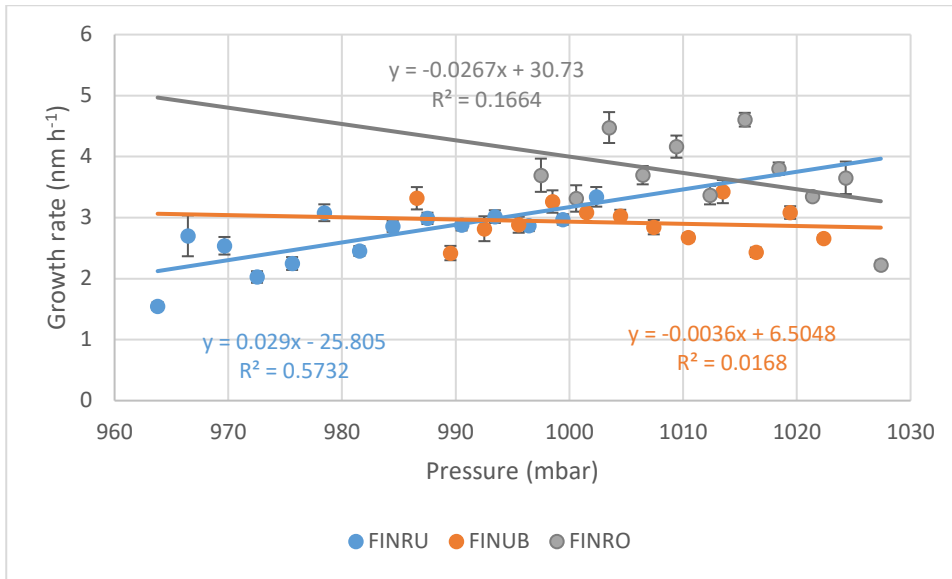
261



262

(g)

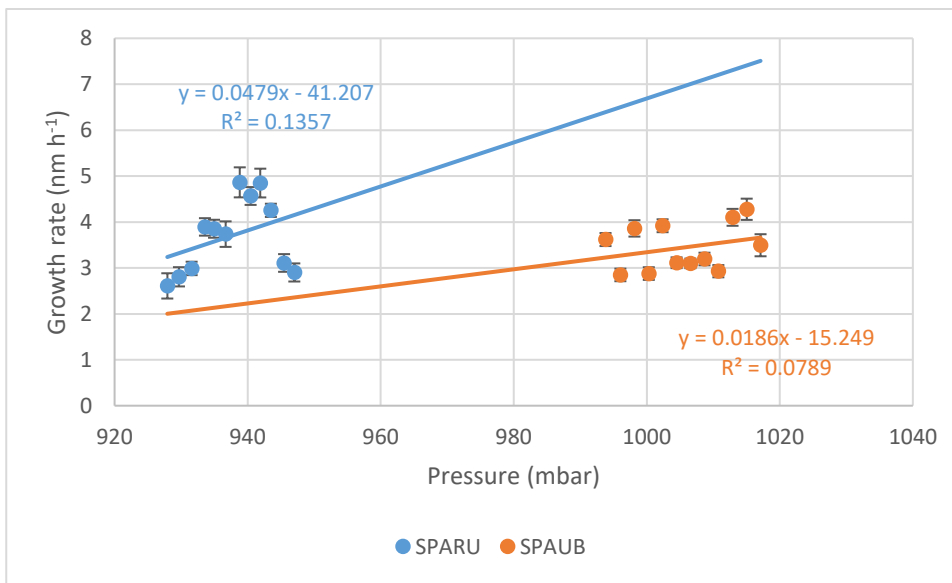
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264

(h)

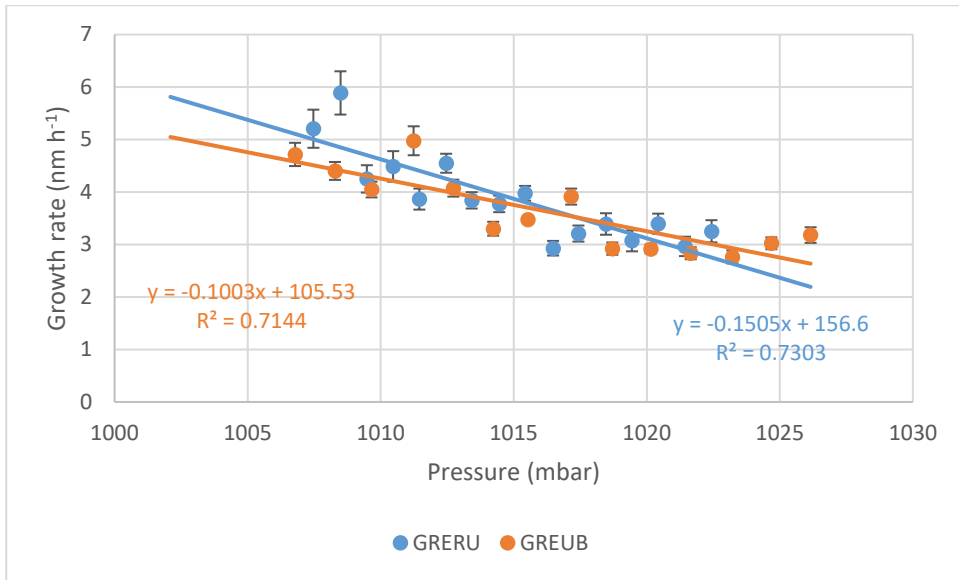
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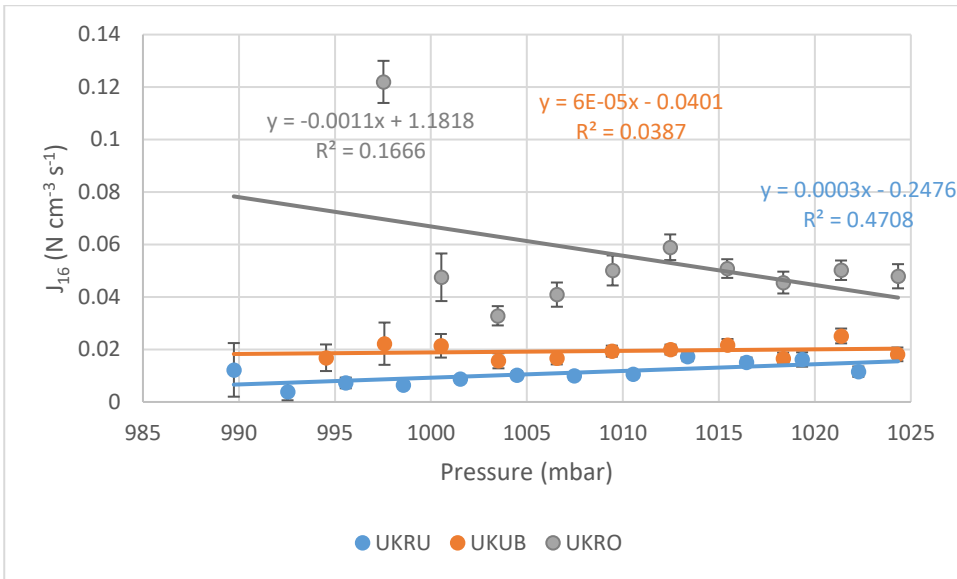


266

(i)

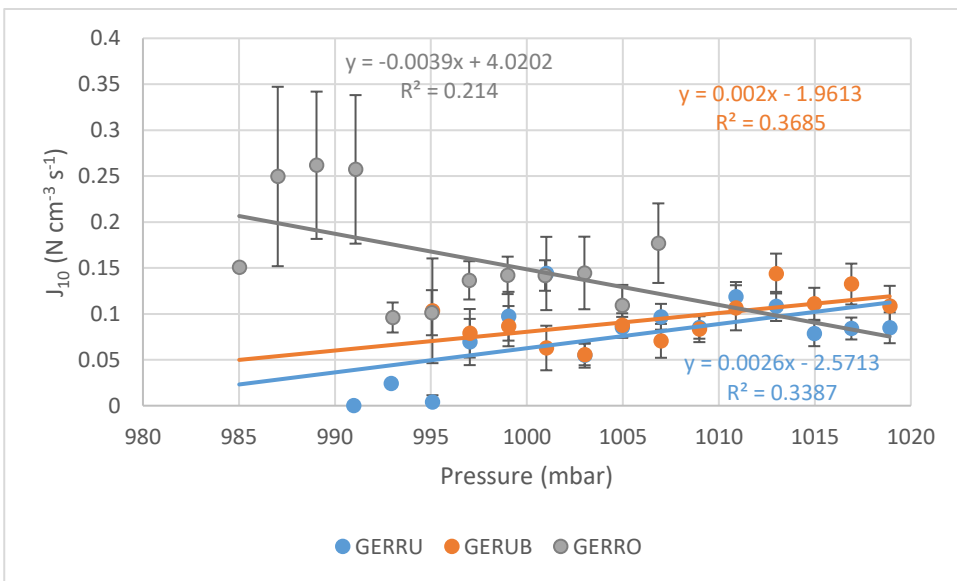
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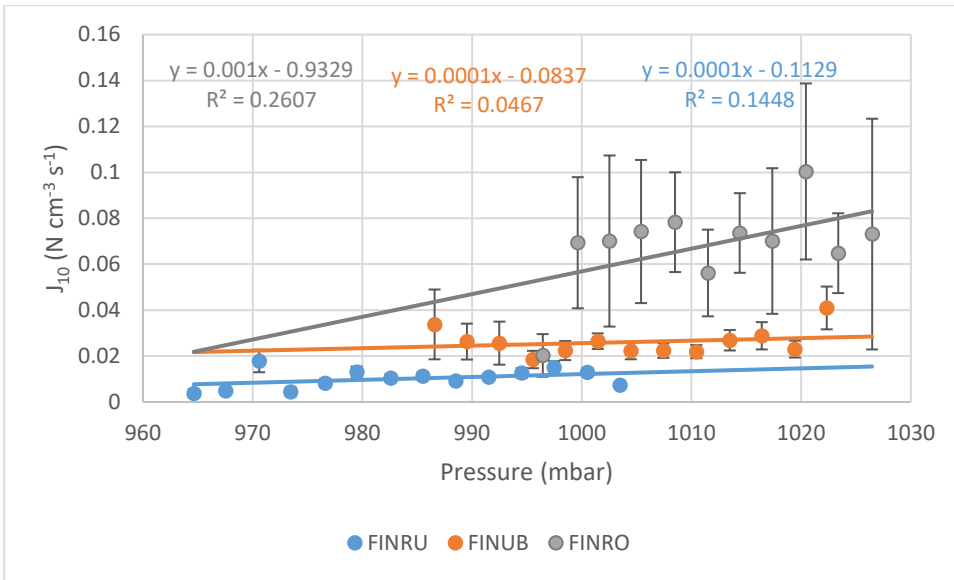
270 (k)

271



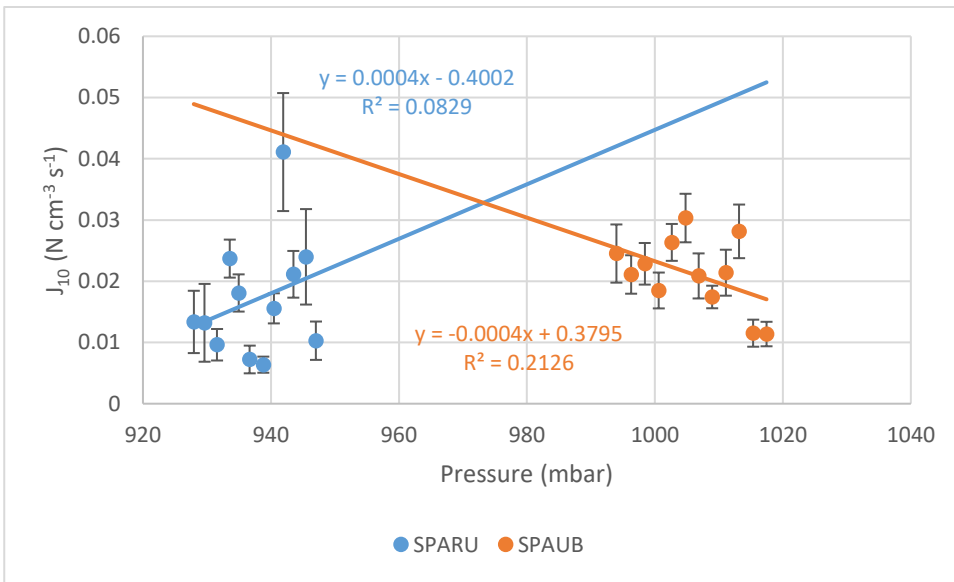
272 (l)

273



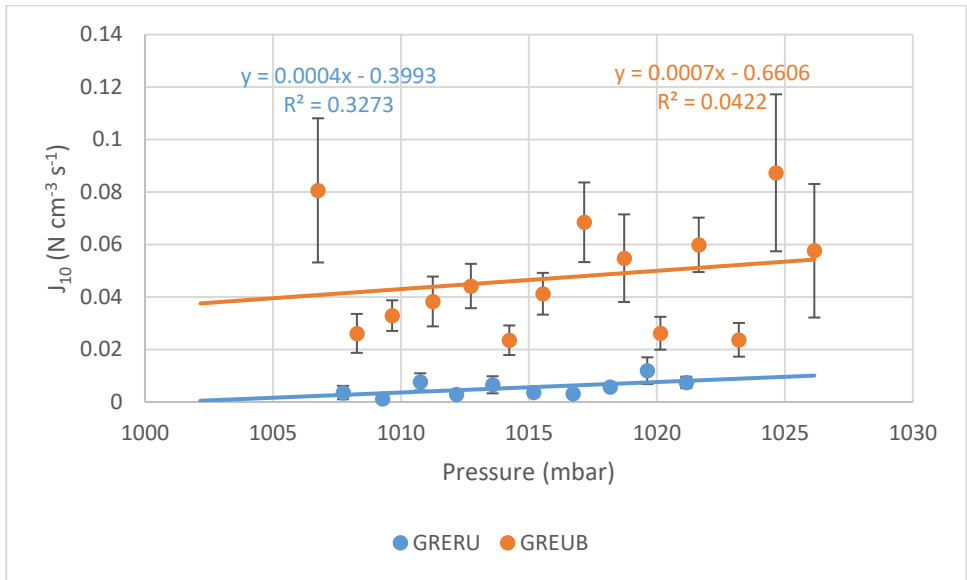
274 (m)

275



276 (n)

277



278

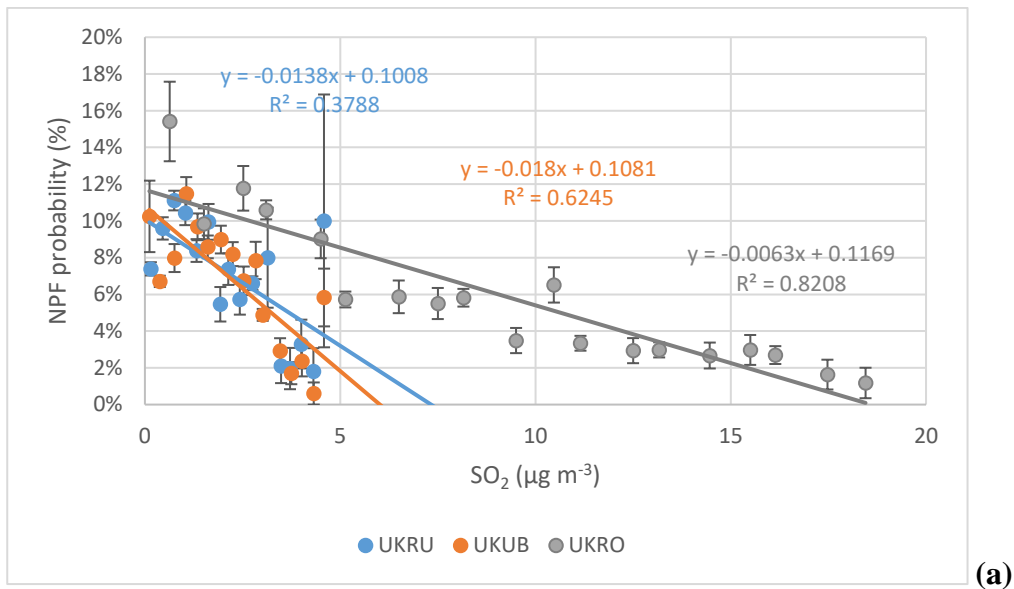
279

280

(o)

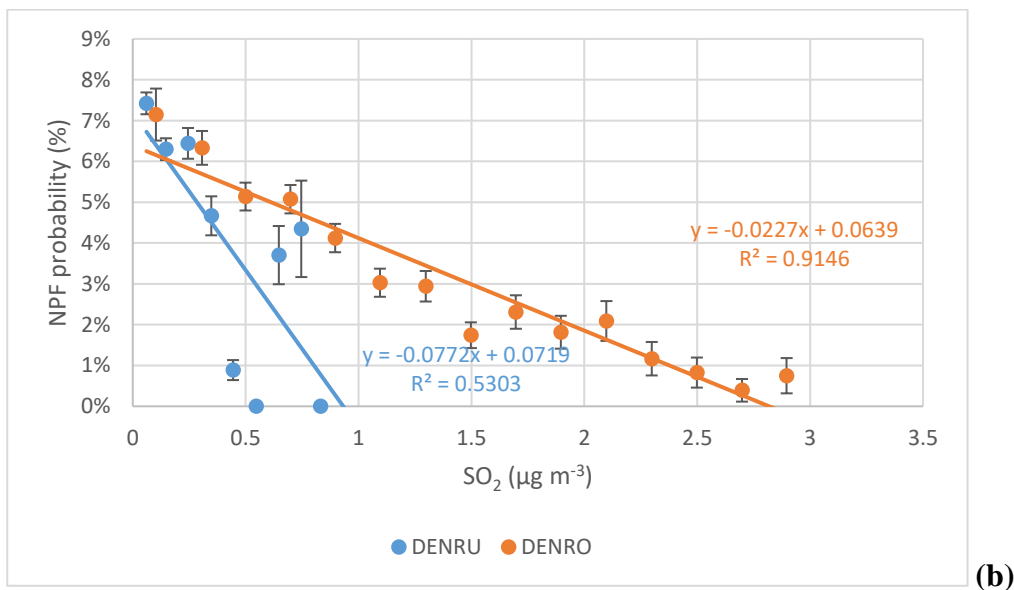
281 **Figure S6:** Relationship of SO₂ concentration with NPF variables.

282



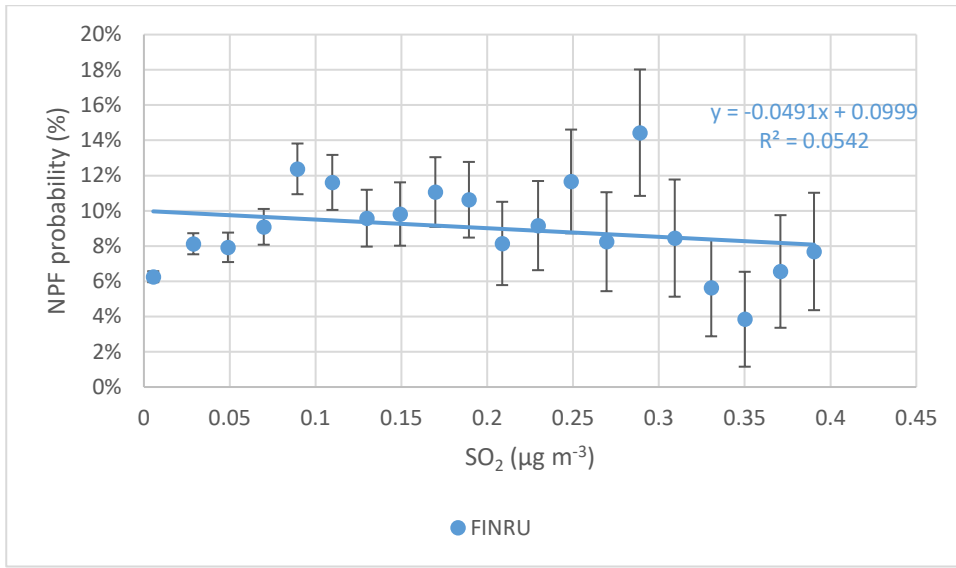
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284



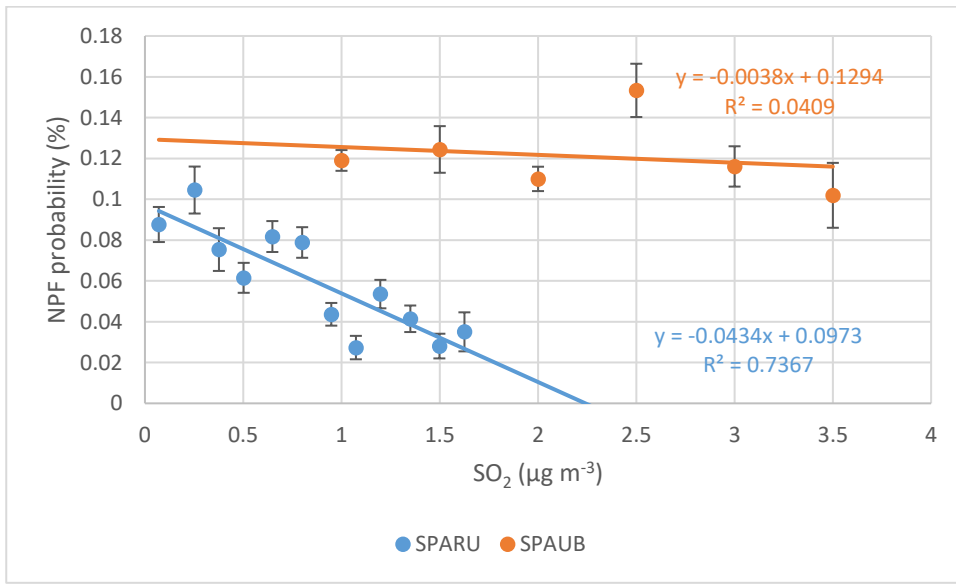
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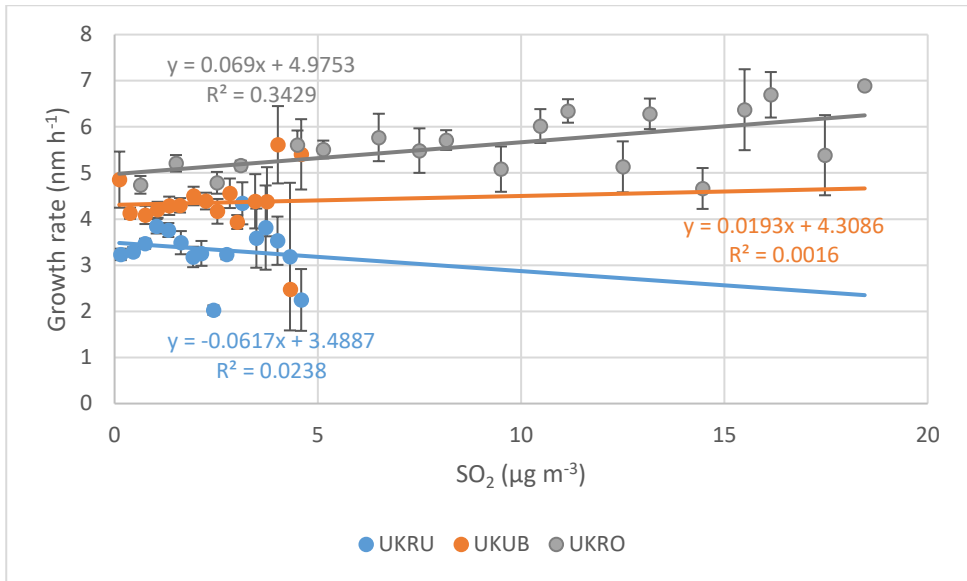
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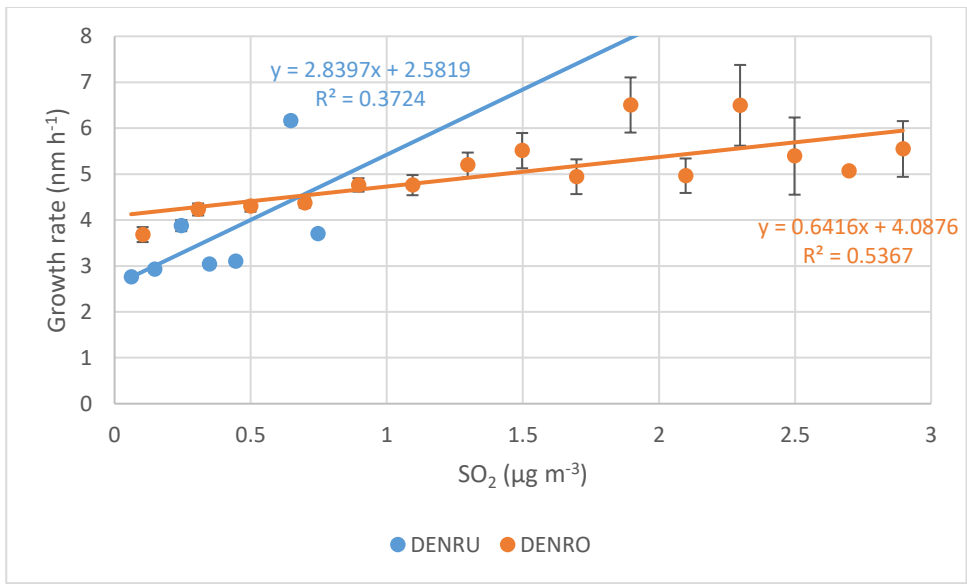
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290



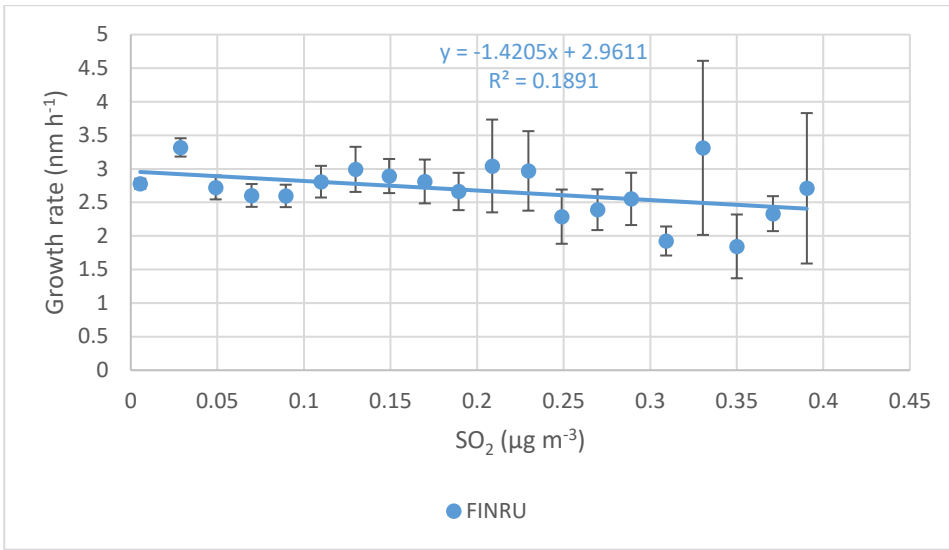
291 (e)

292



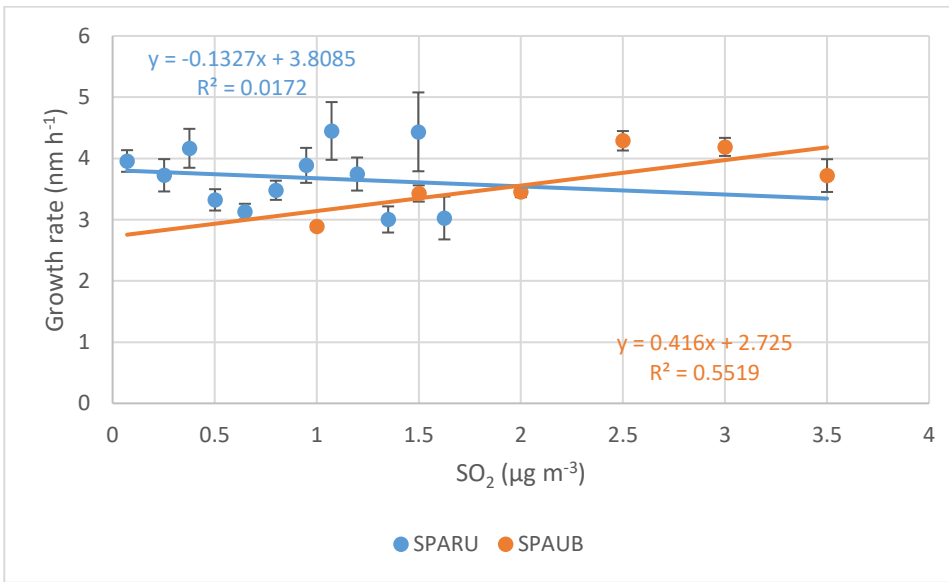
293 (f)

294



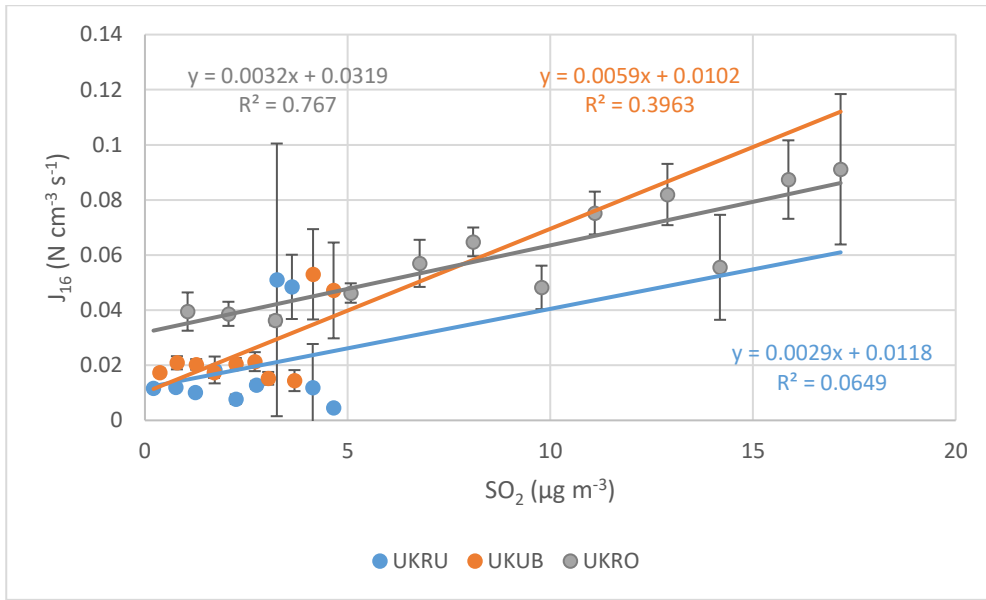
295 (g)

296



297 (h)

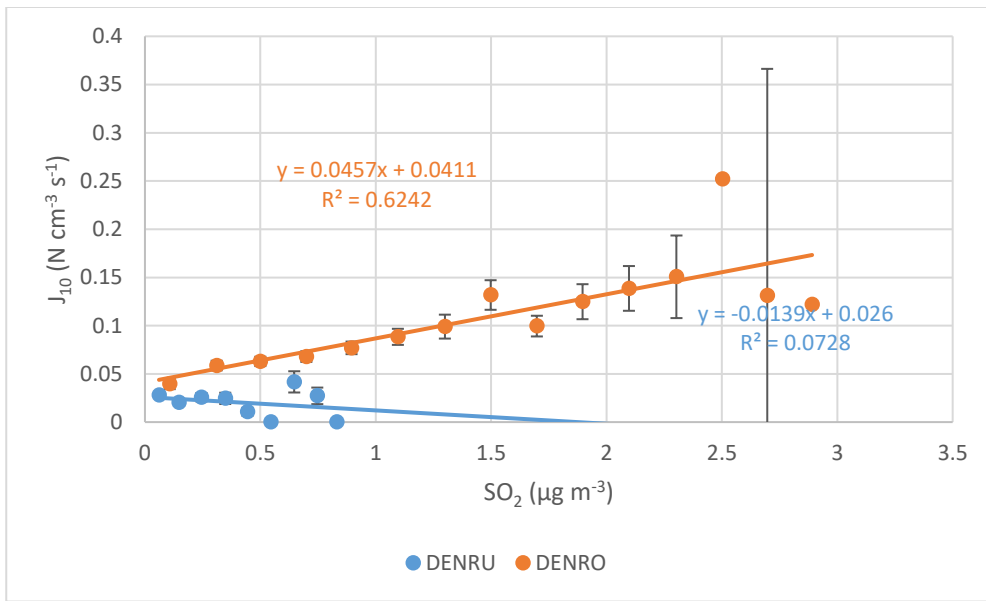
298



299

(i)

300

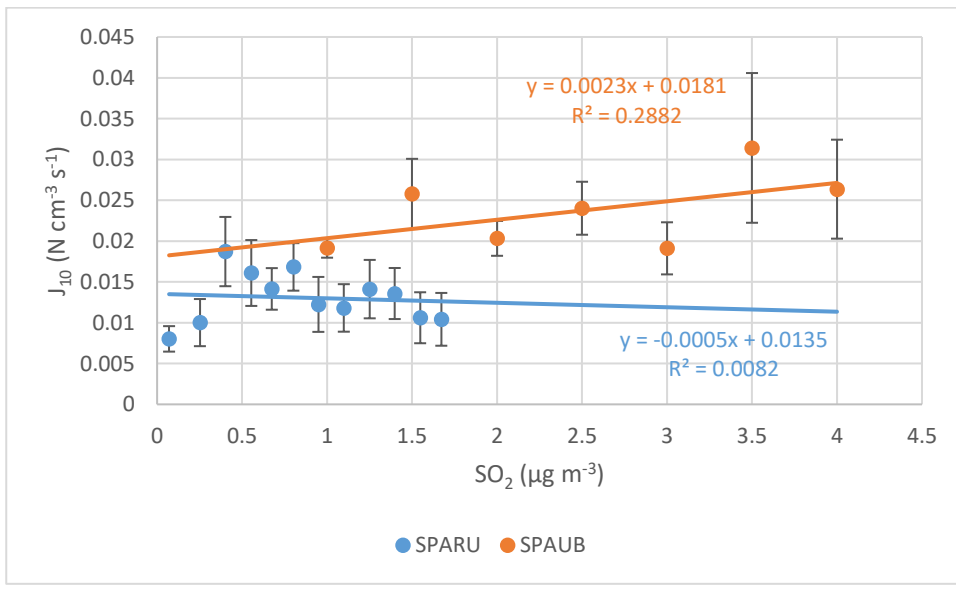
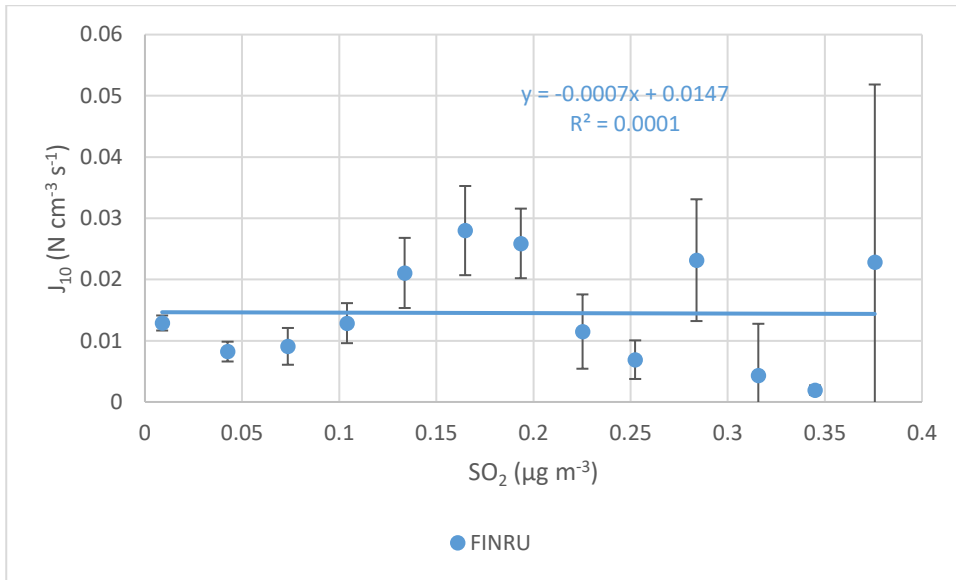


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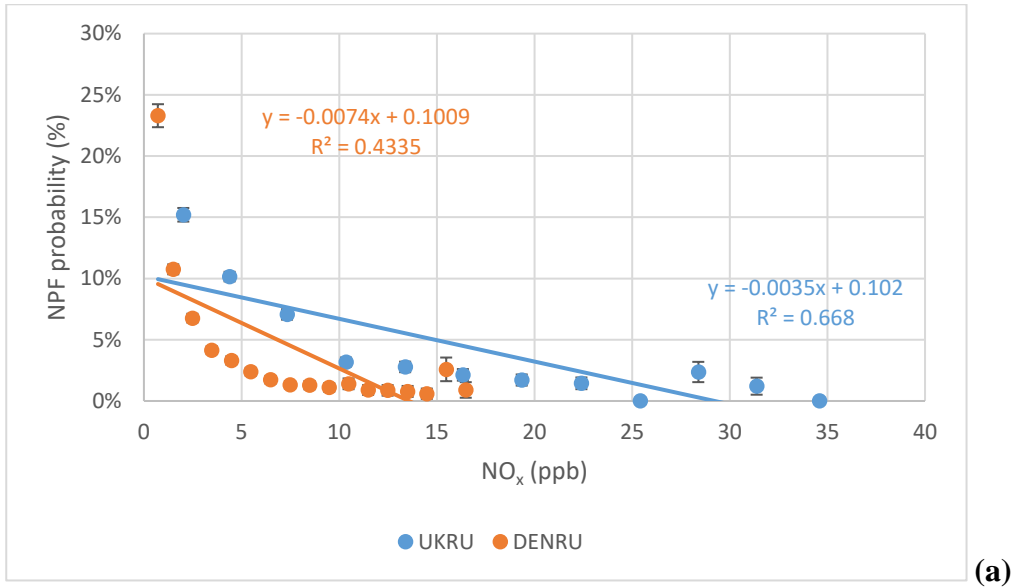
(j)

302

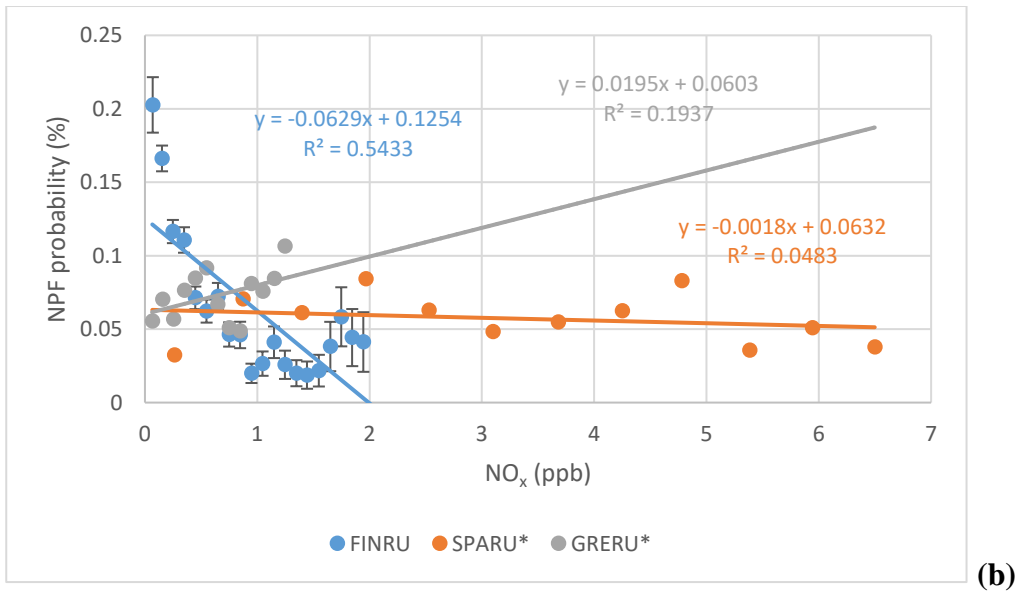
303



310 **Figure S7:** Relationship of NO₂ / NO_x concentration with NPF variables.
 311

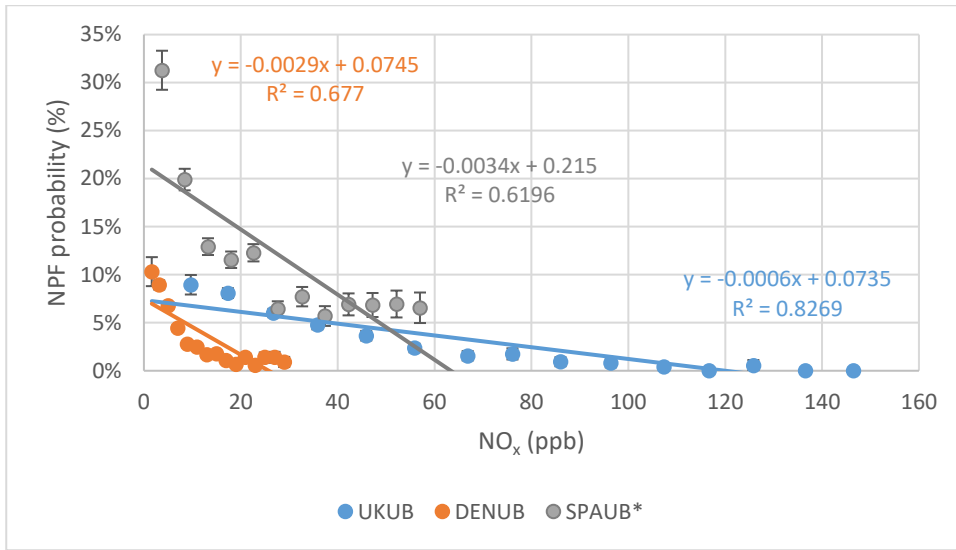


313



315 *NO₂ for SPARU and GRERU

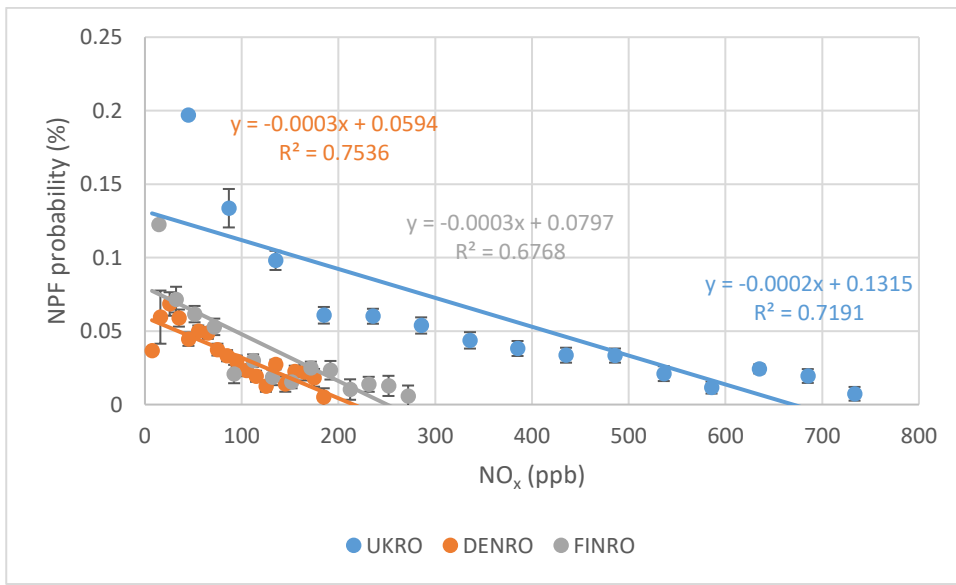
316



317 (c)

318 *NO₂ for SPAUB

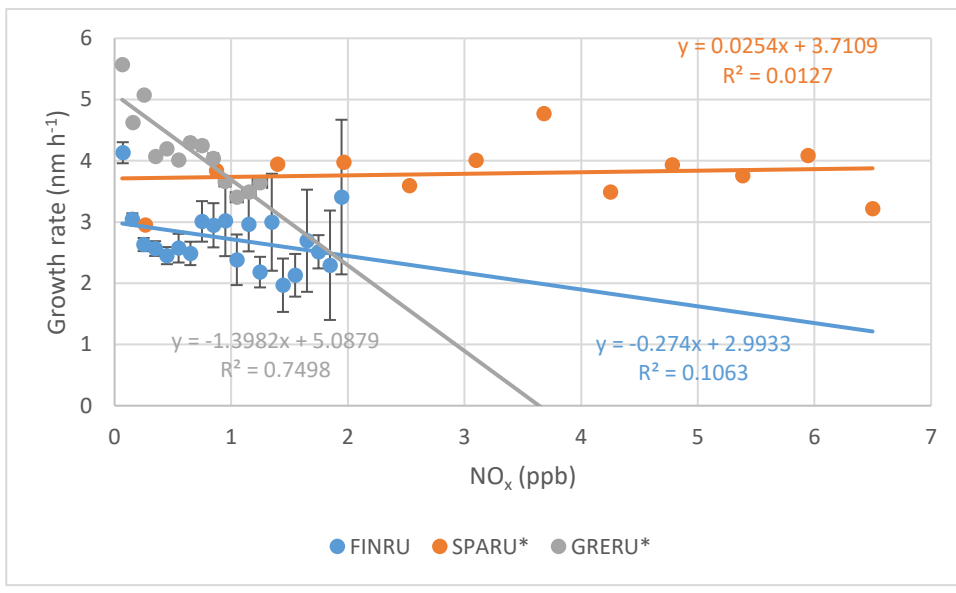
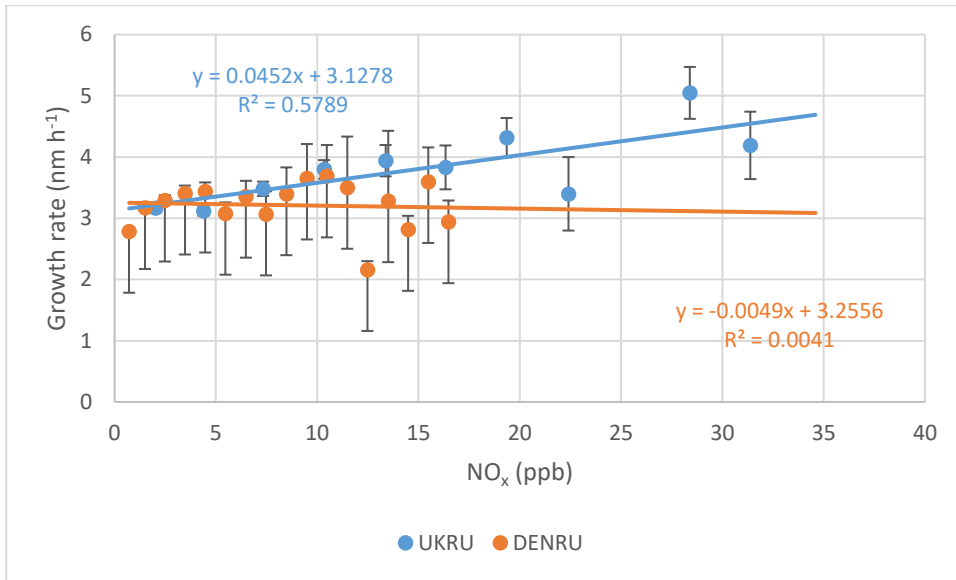
319



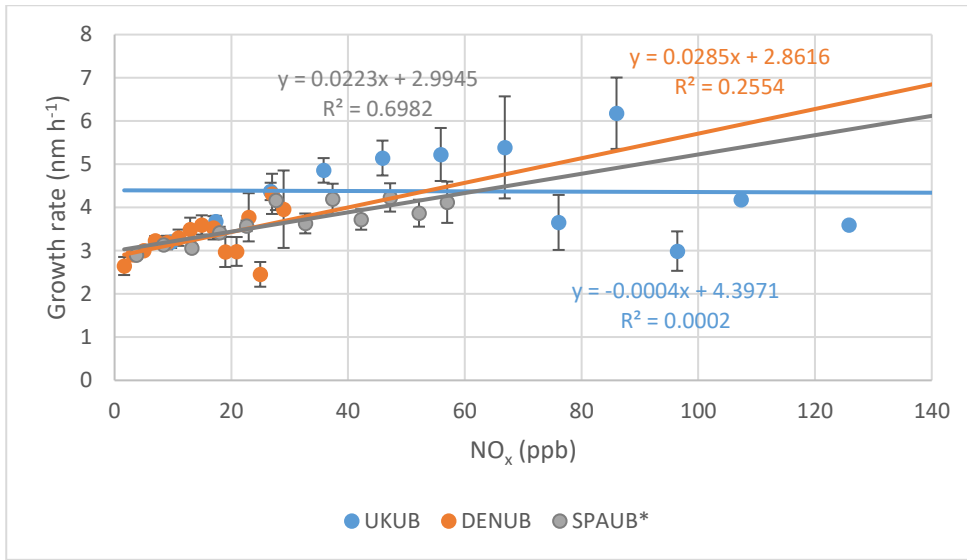
320 (d)

321

322



*NO₂ for SPARU and GRERU

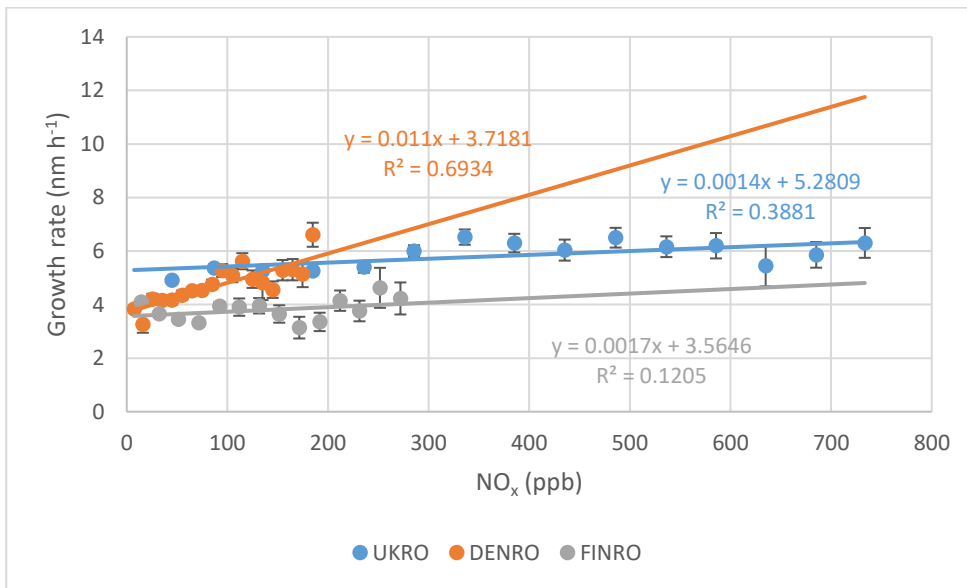


330

(g)

331 *NO₂ for SPAUB

332

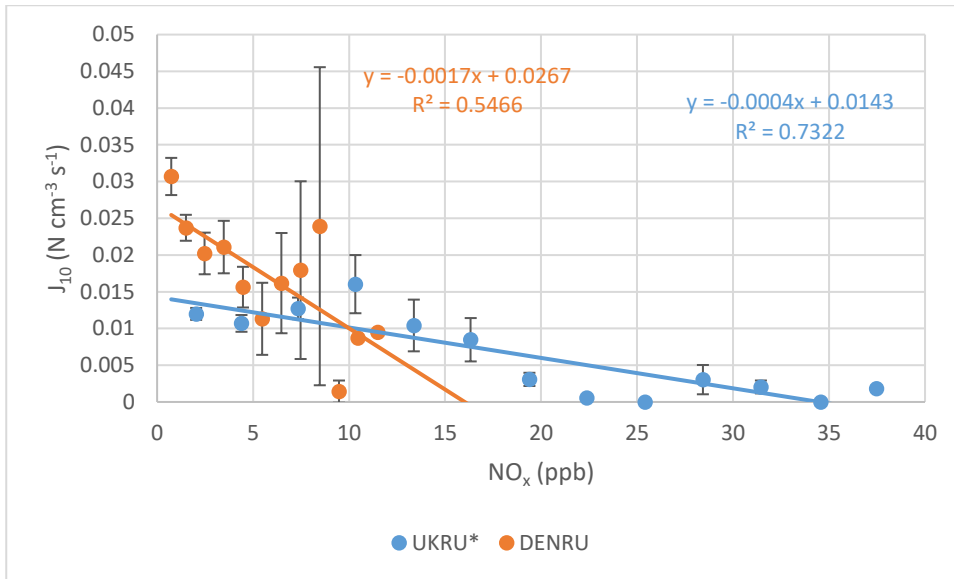


333

(h)

334

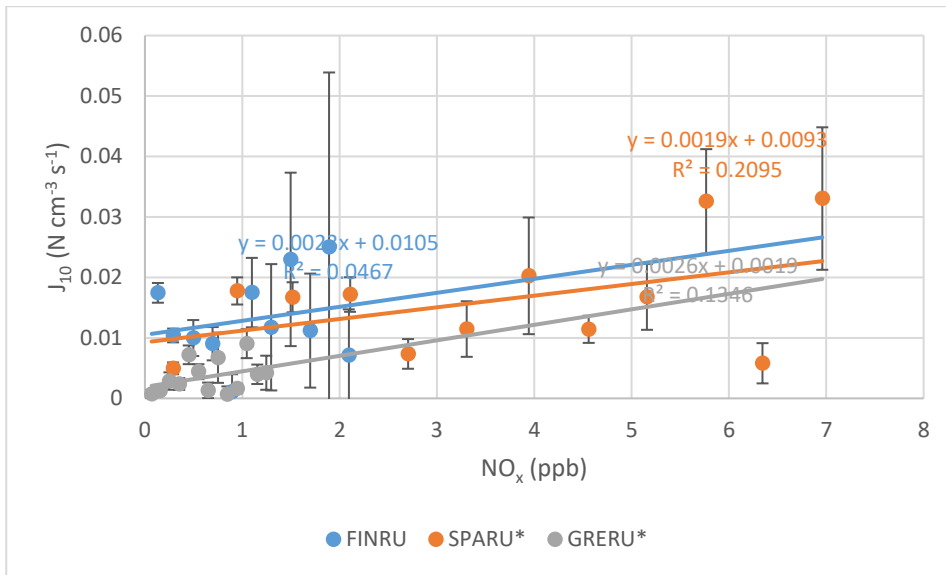
335



336 (i)

337 * J_{16} for UKRU

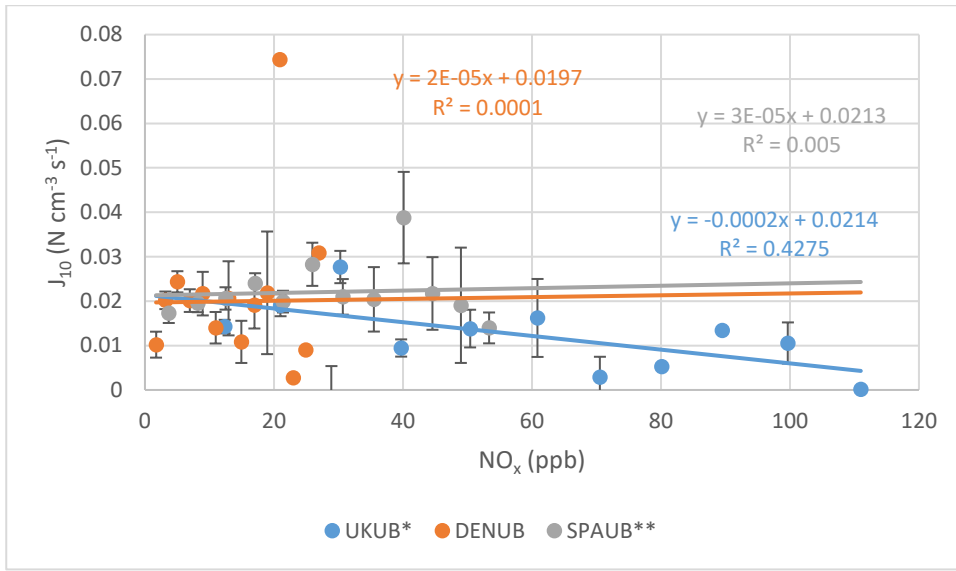
338



339 (j)

340 * NO_2 for SPARU and GRERU

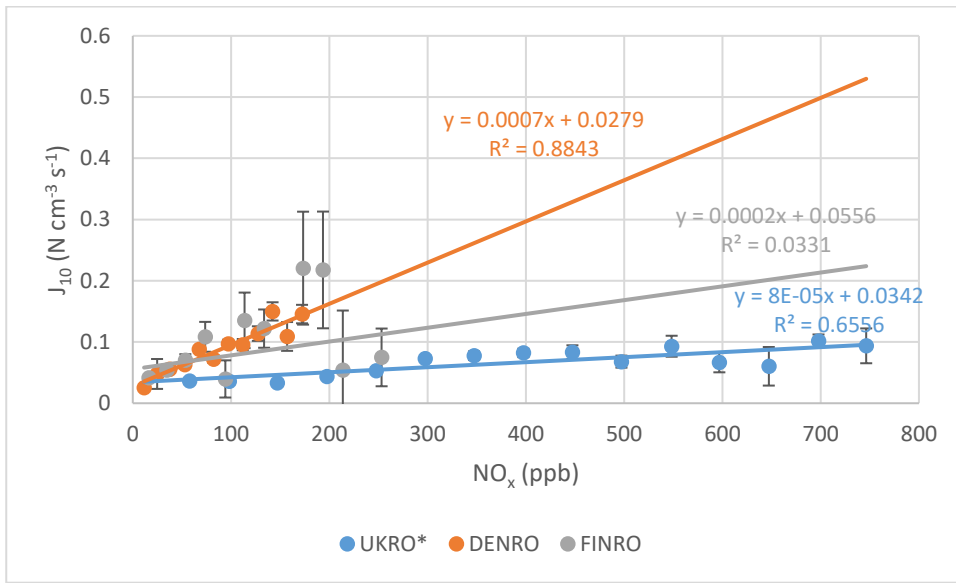
341



342 (k)

343 * J_{16} for UKUB

344 ** NO_2 for SPAUB



345 (l)

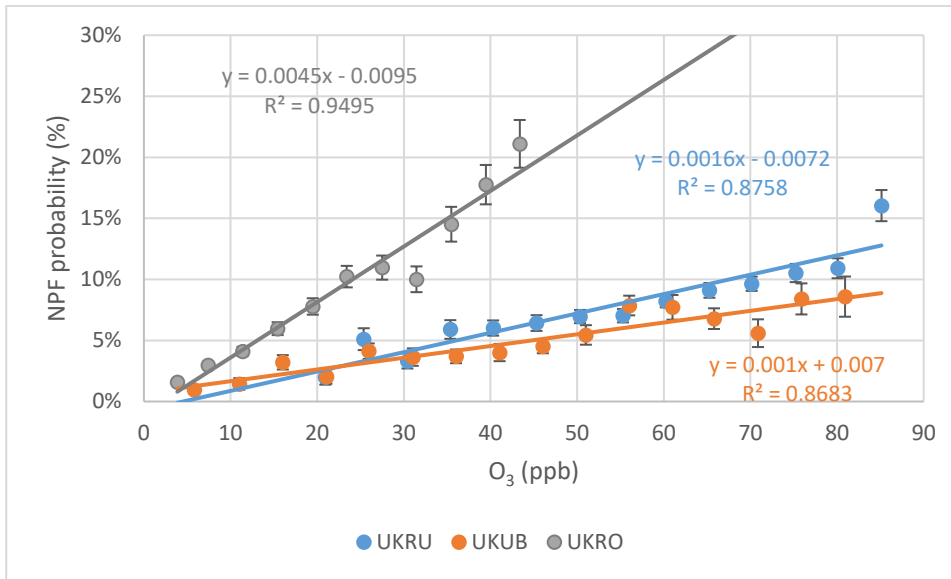
346

347 * J_{16} for UKRO

348

349 **Figure S8:** Relationship of O₃ concentration with NPF variables.

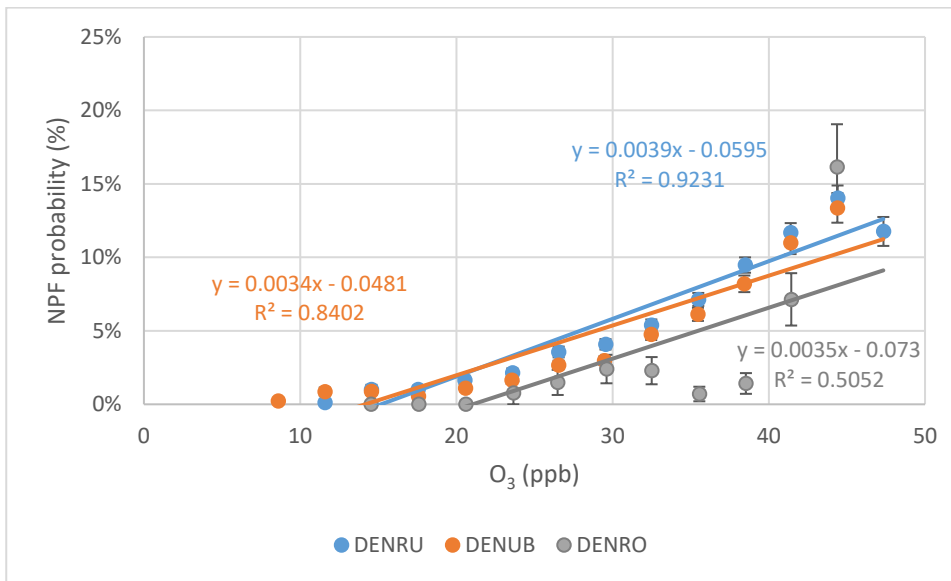
350



351

(a)

352



353

(b)

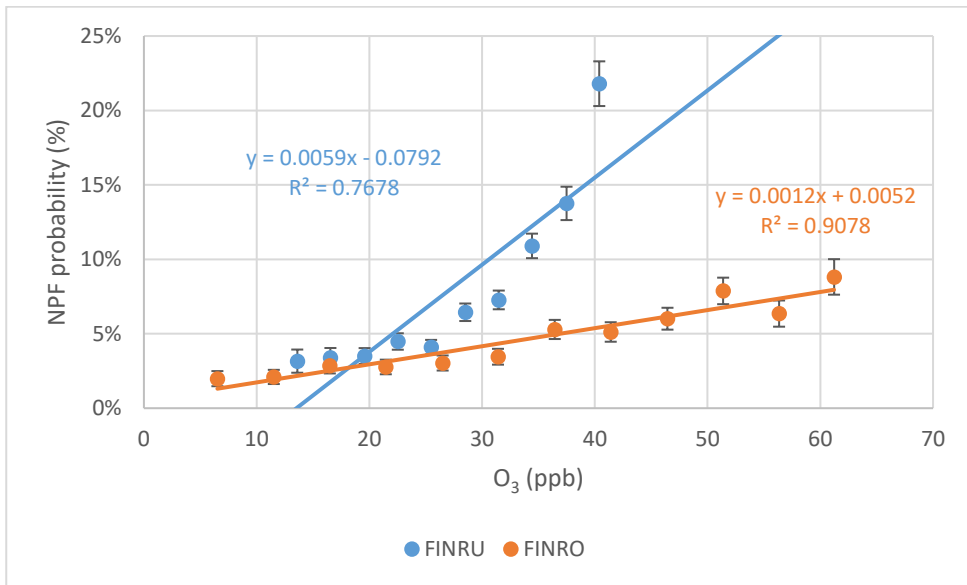
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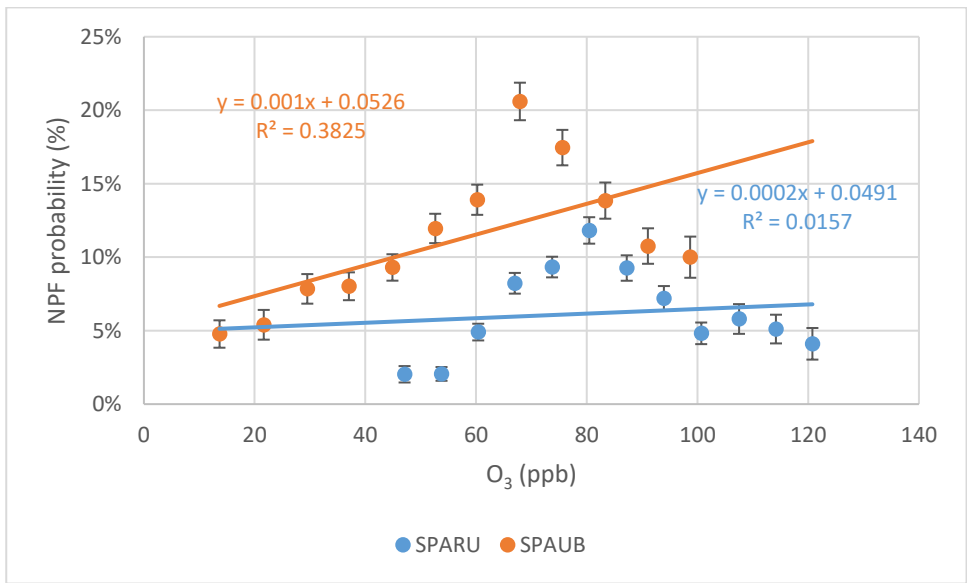
358



359

(c)

360



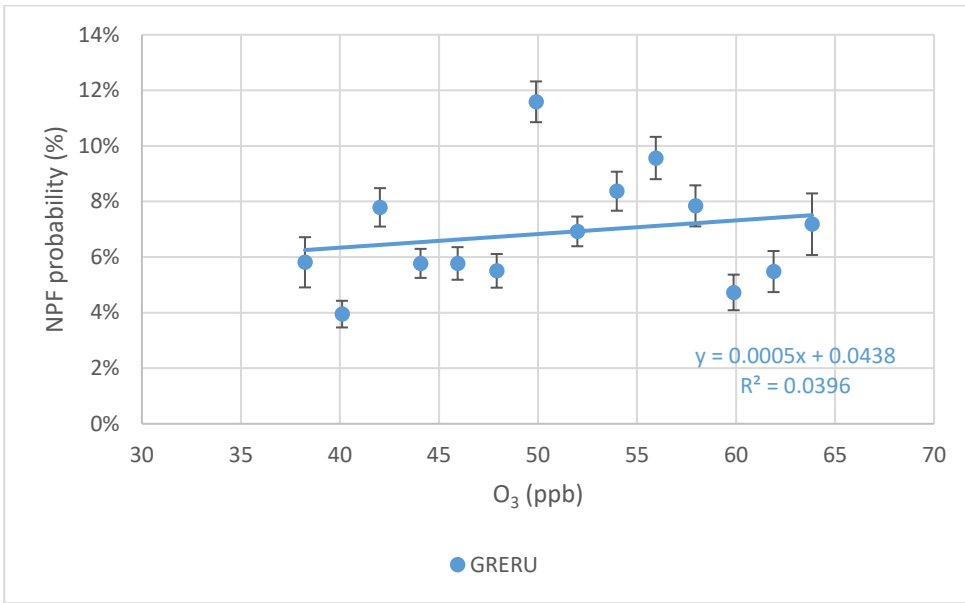
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(d)

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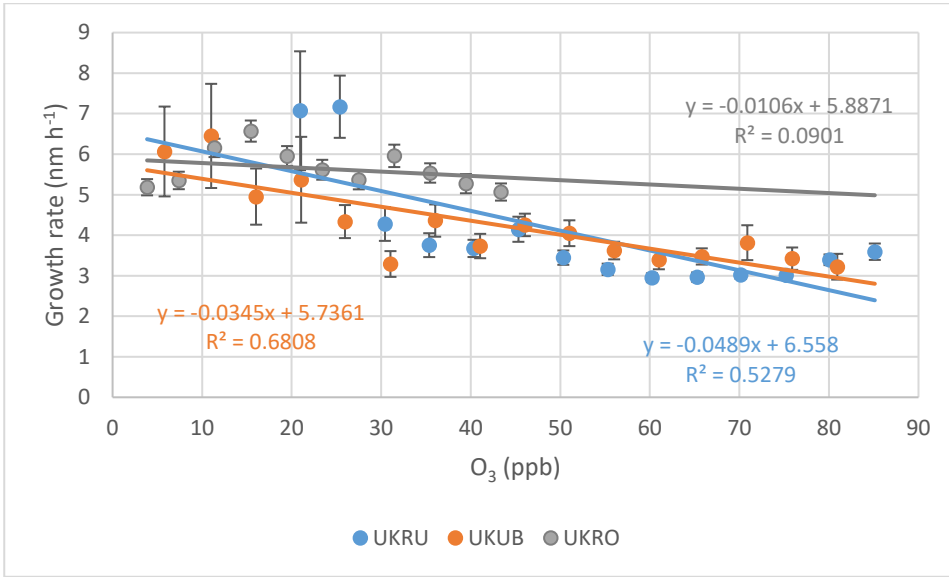


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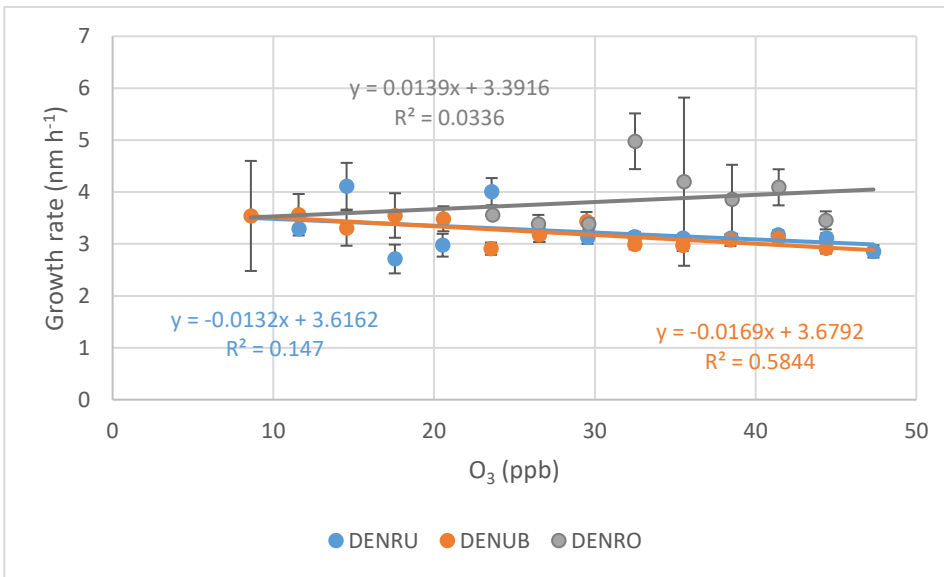
(e)



368

(f)

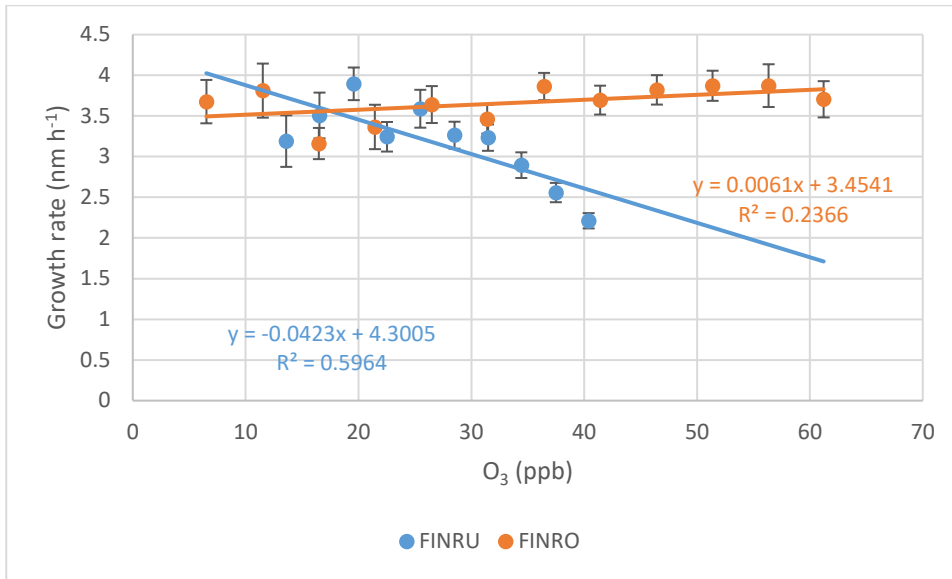
369



370

(g)

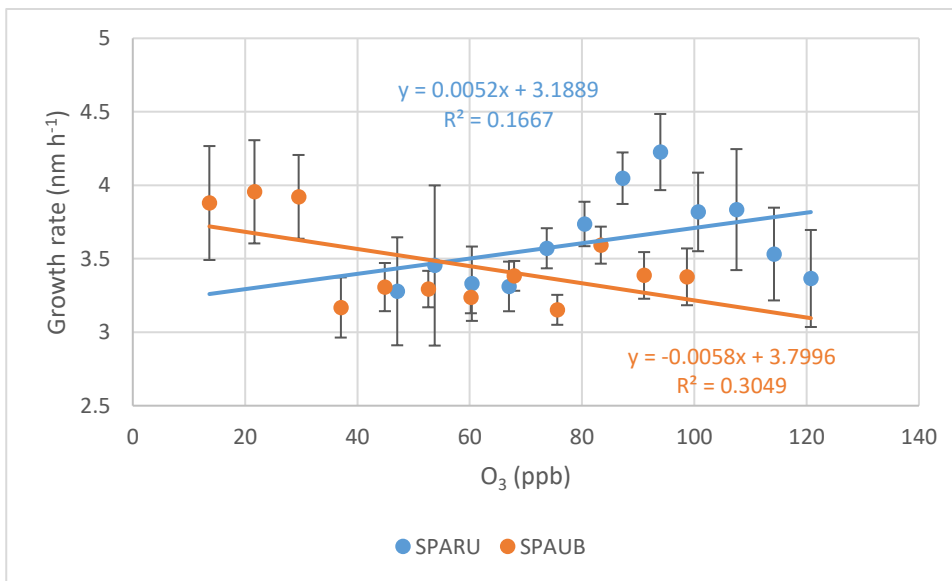
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372

(h)

373



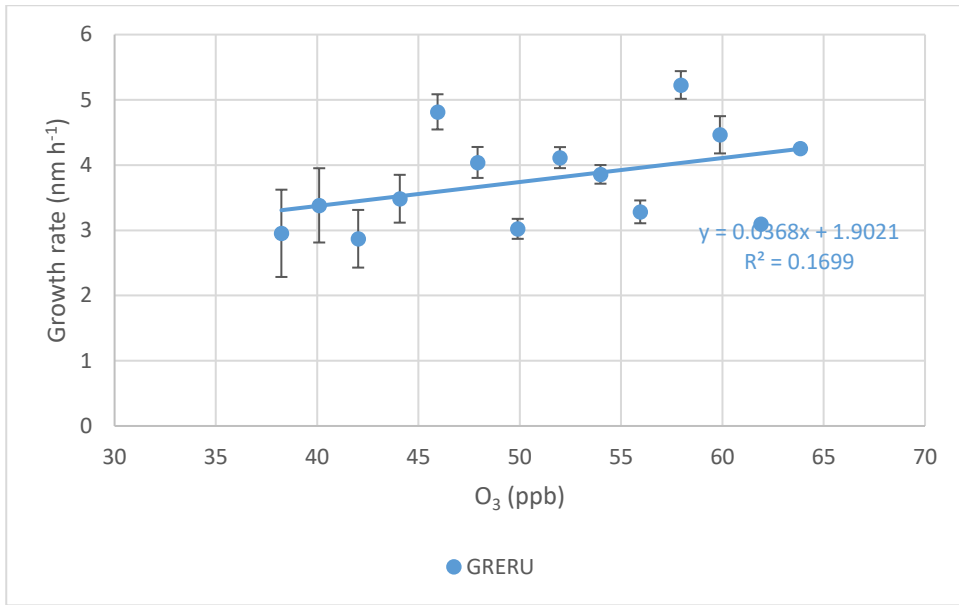
374

(i)

375

376

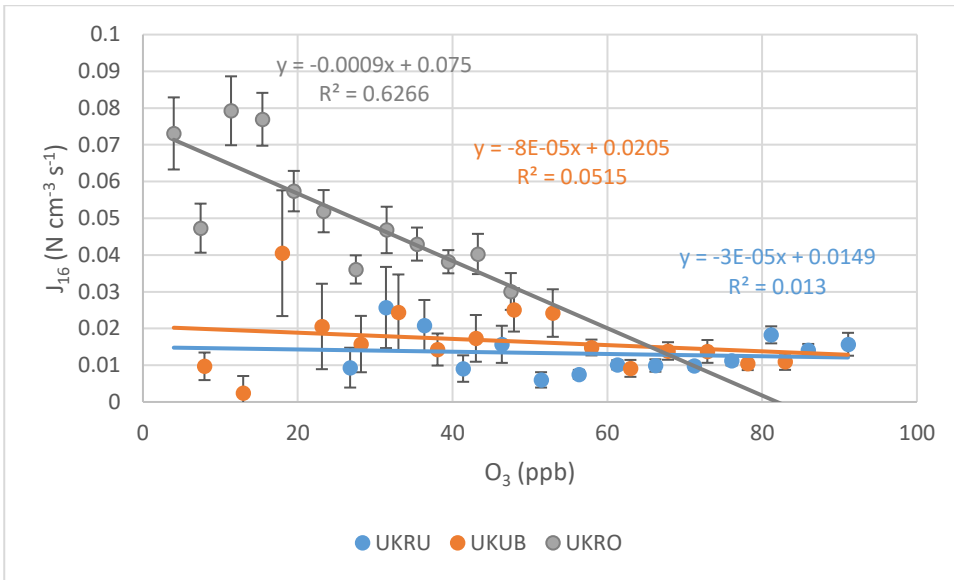
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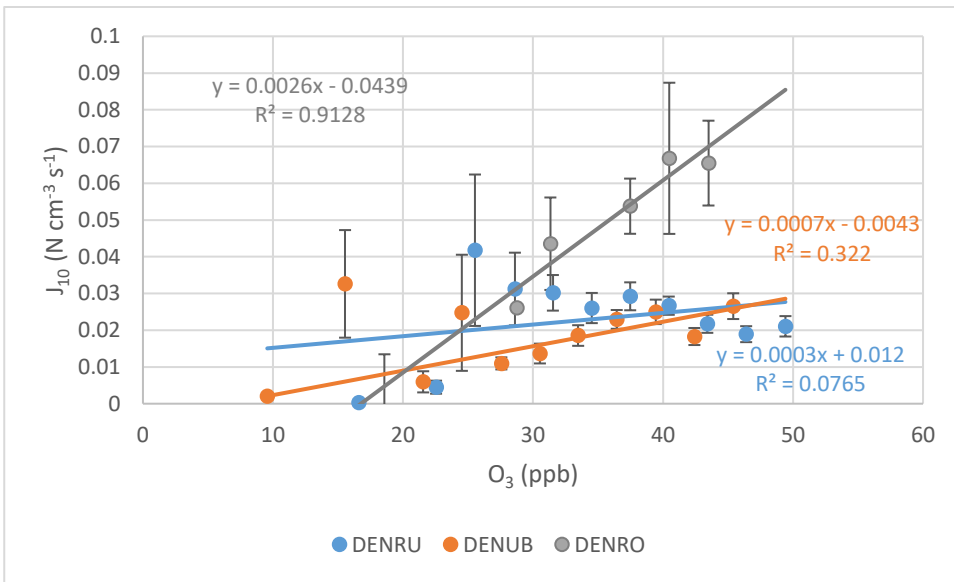
(j)



380

(k)

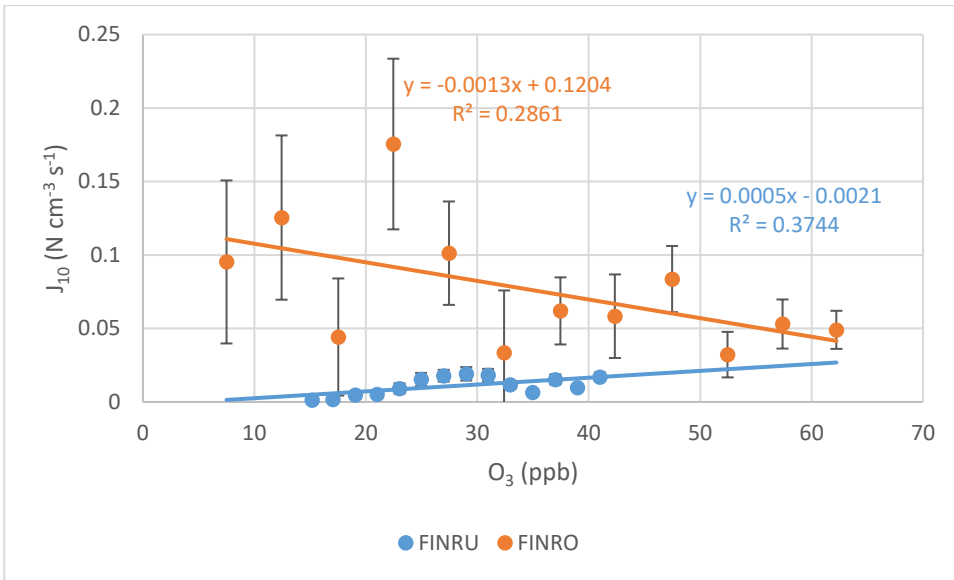
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382

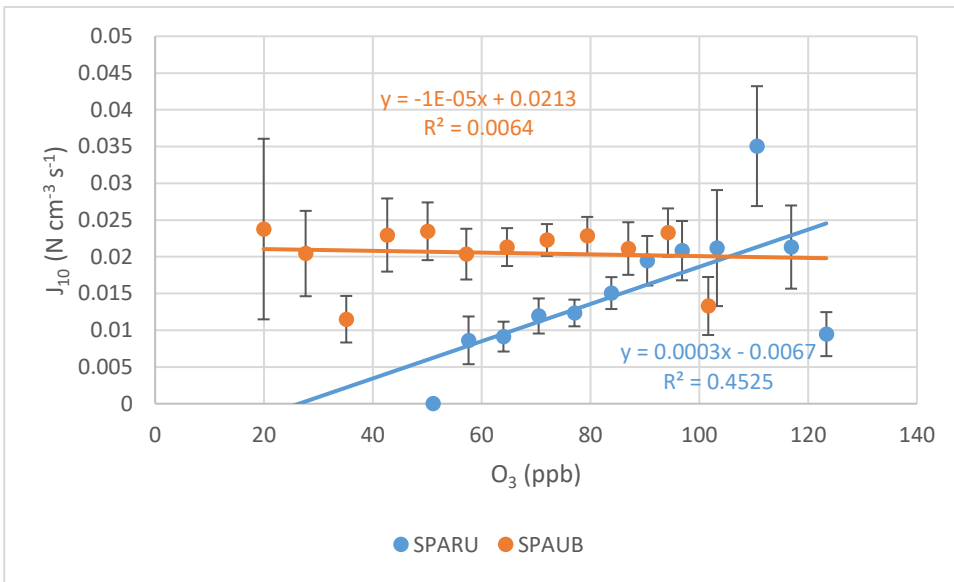
(l)

383



384 (m)

385

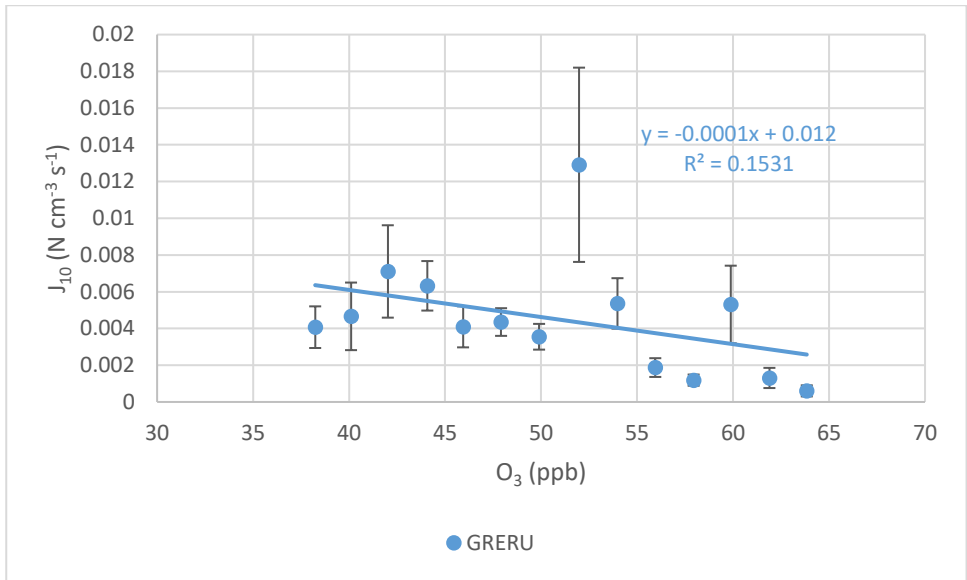


386 (n)

387

388

389



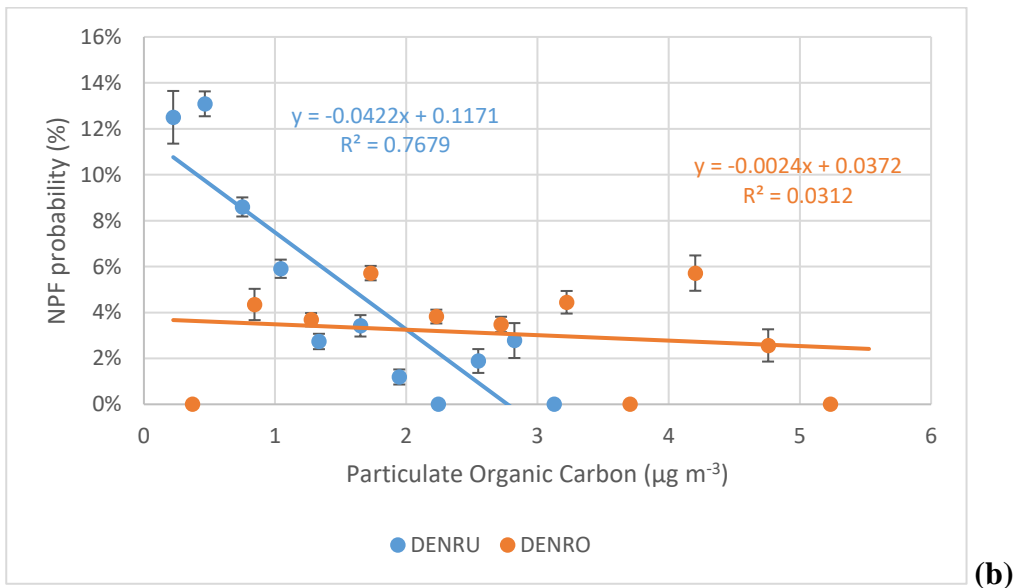
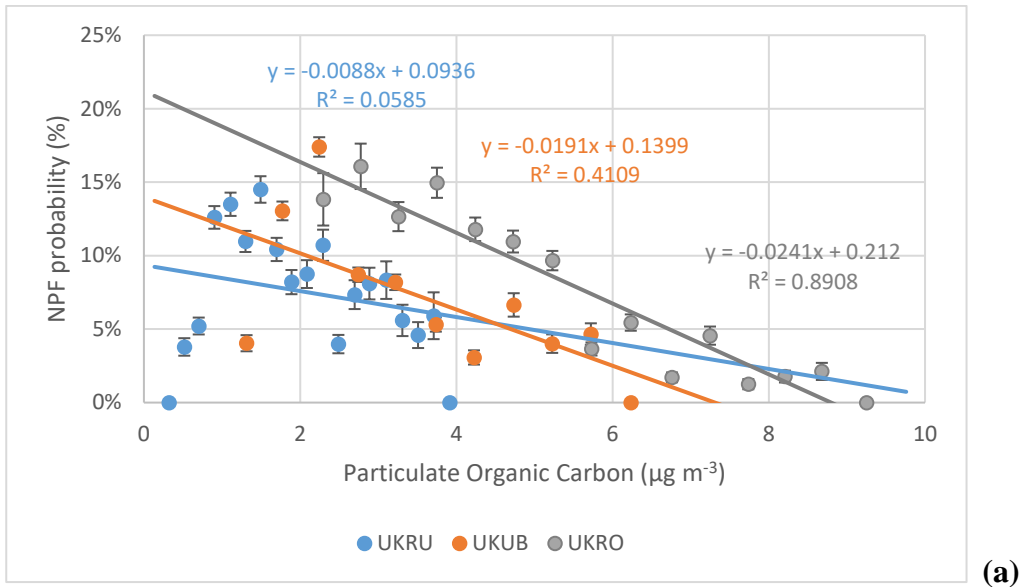
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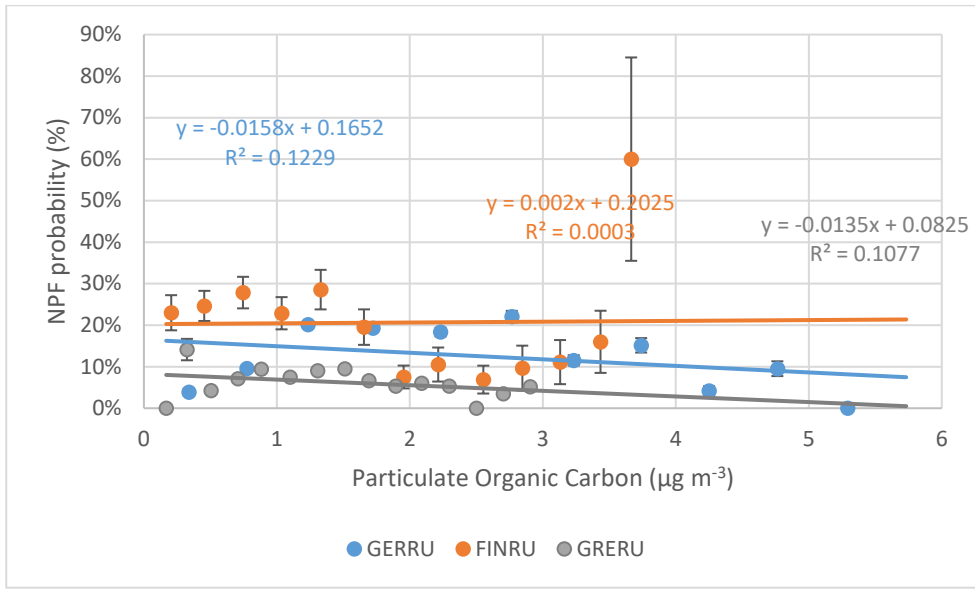
391

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393

394 **Figure S9:** Relationship of particulate organic carbon concentration with NPF variables.
395

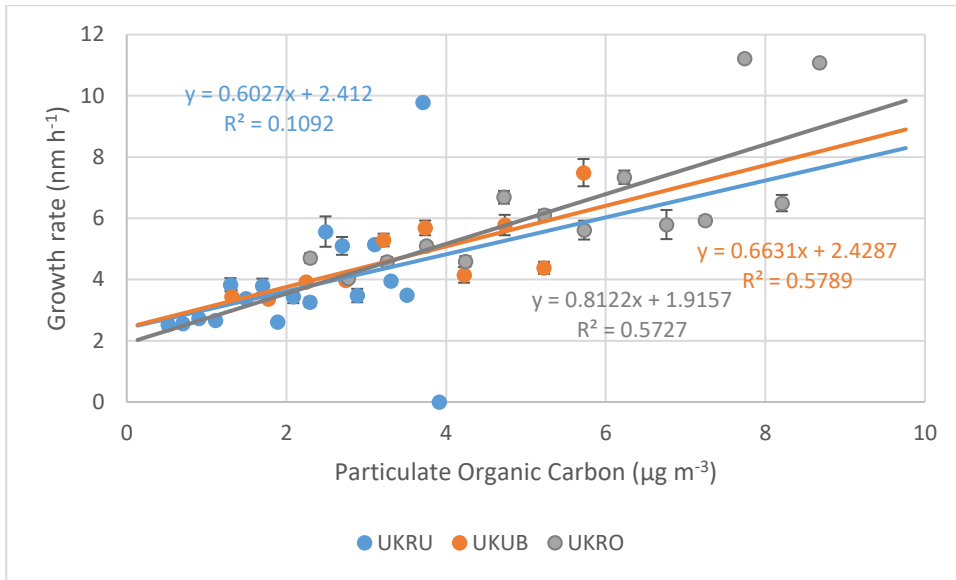




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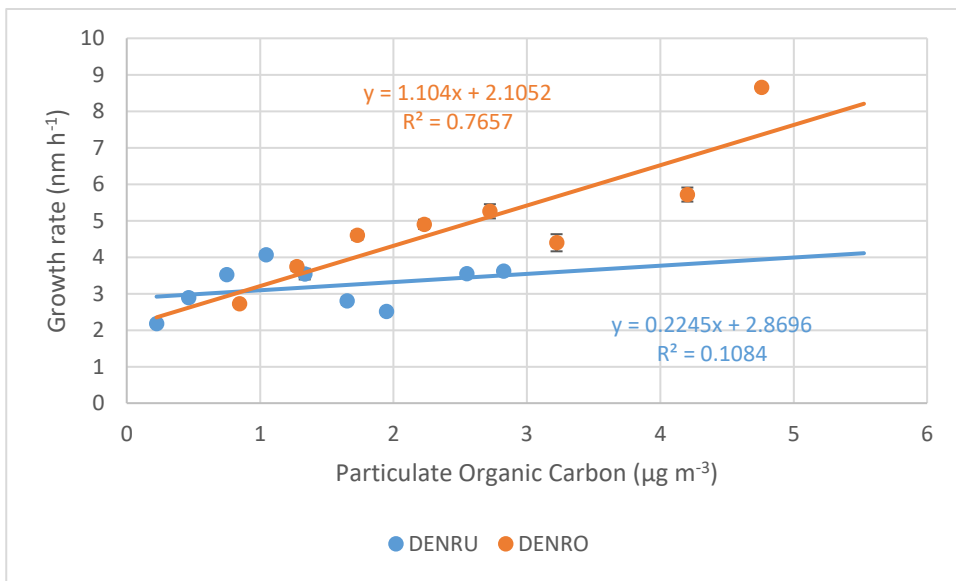
(c)



403

(d)

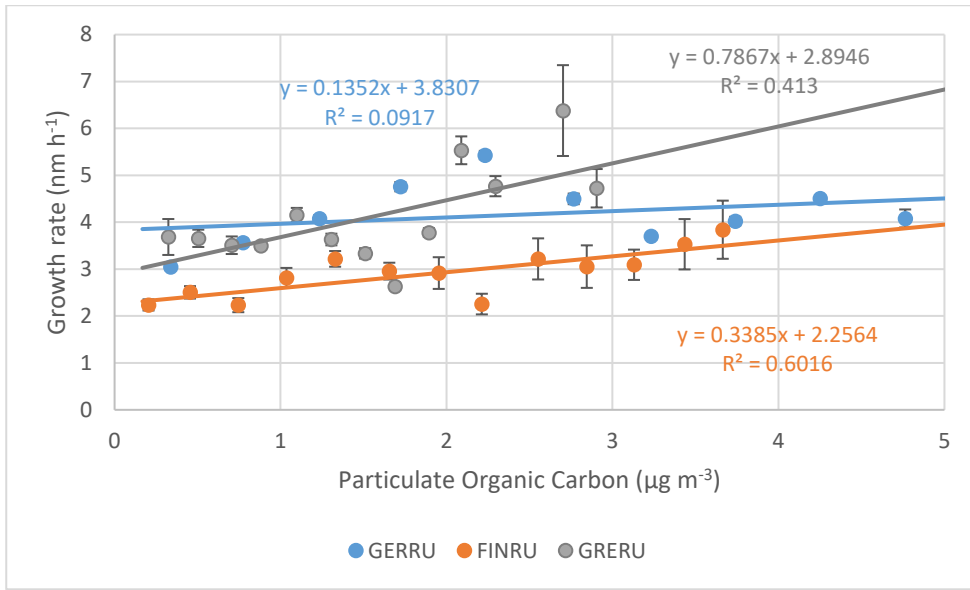
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(e)

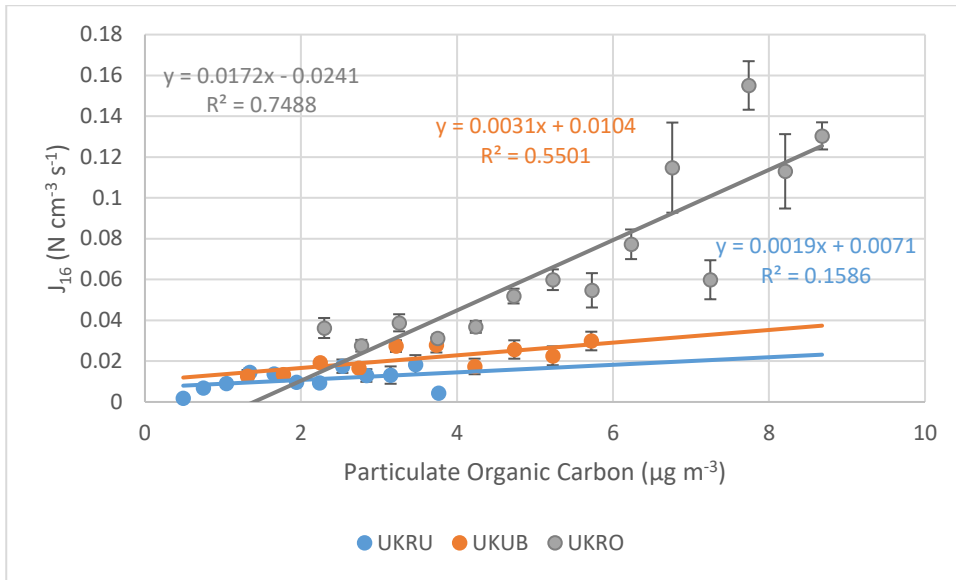
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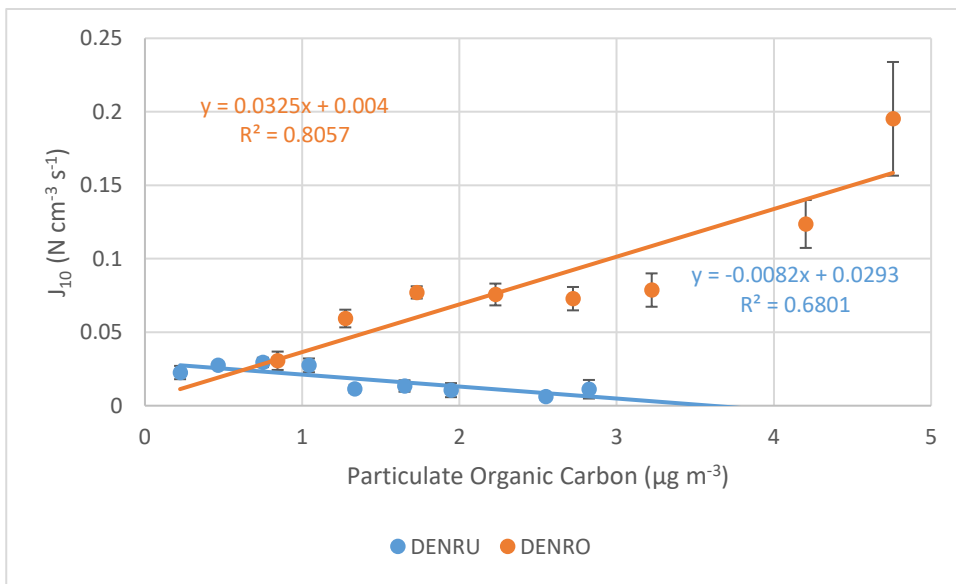
(f)



409

(g)

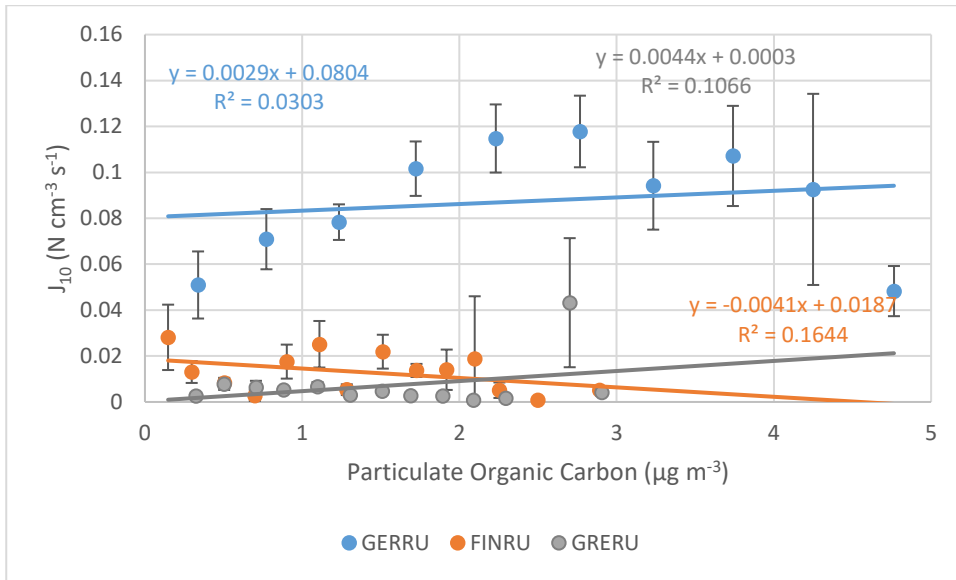
410



411

(h)

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413

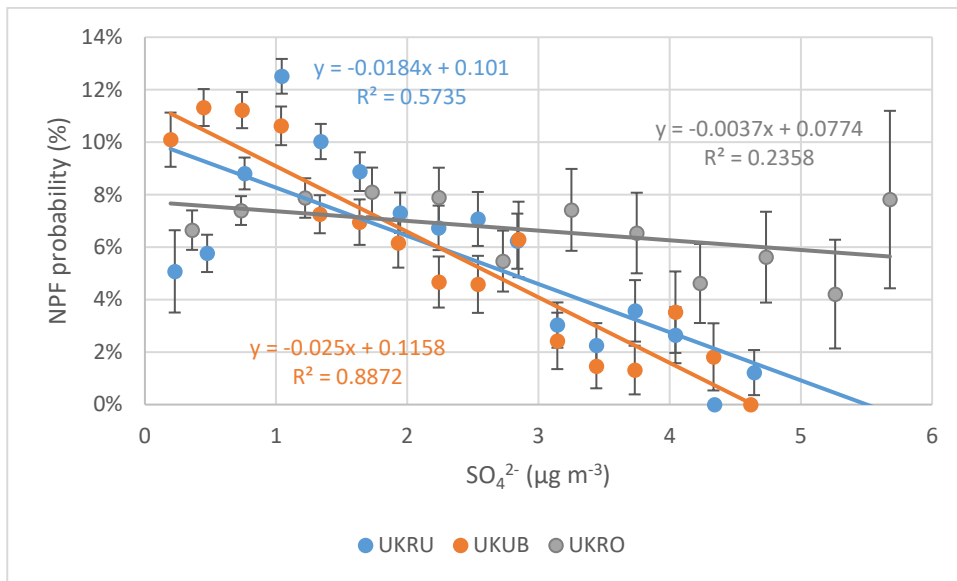
414

415

(i)

416 **Figure S10:** Relationship of SO_4^{2-} concentration with NPF variables.

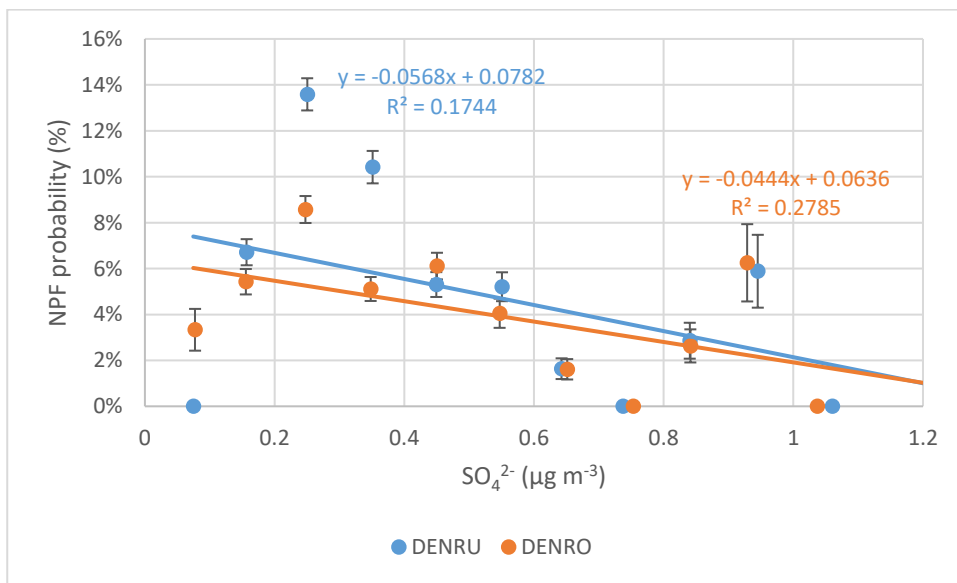
417



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(a)

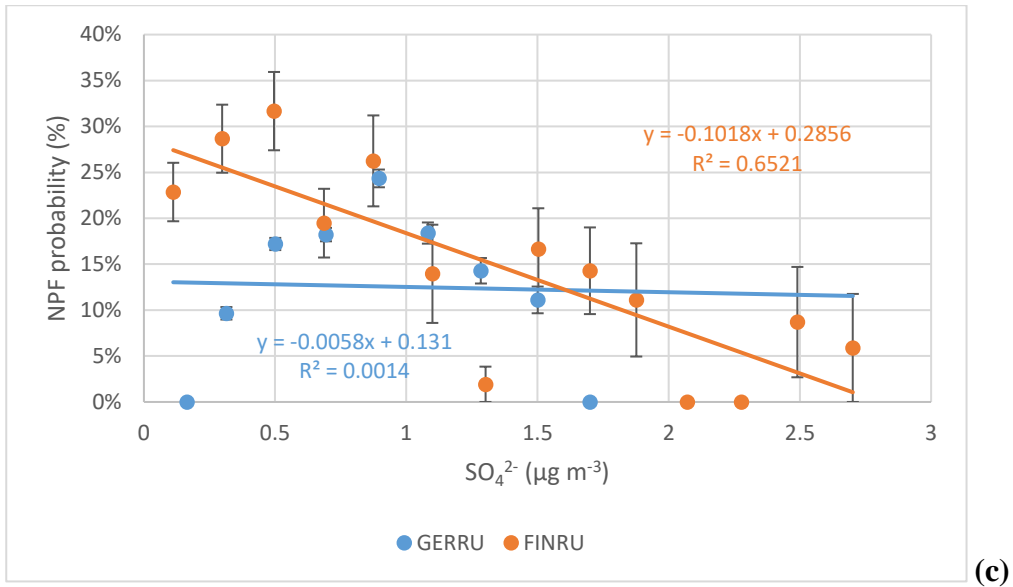
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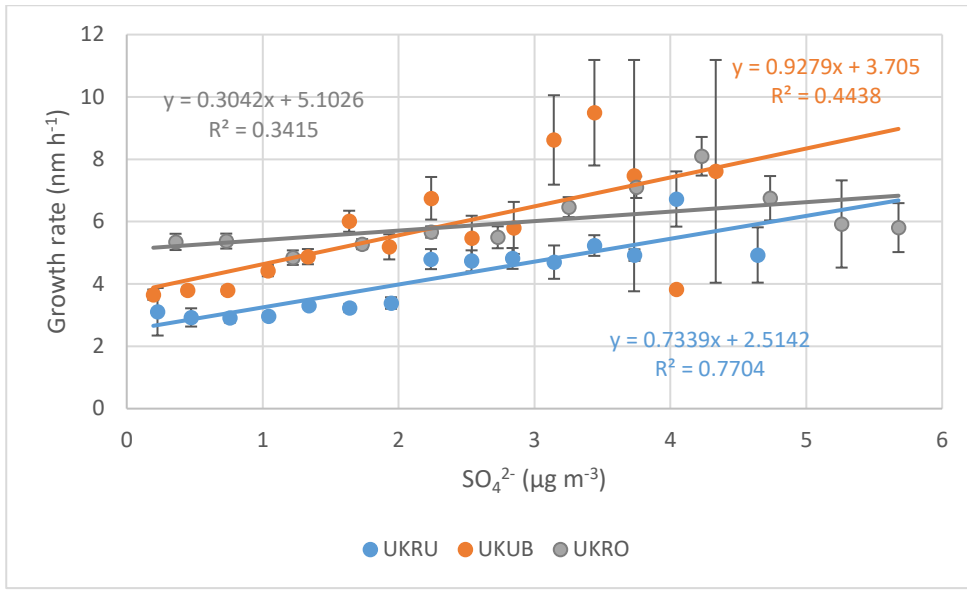
(b)

421



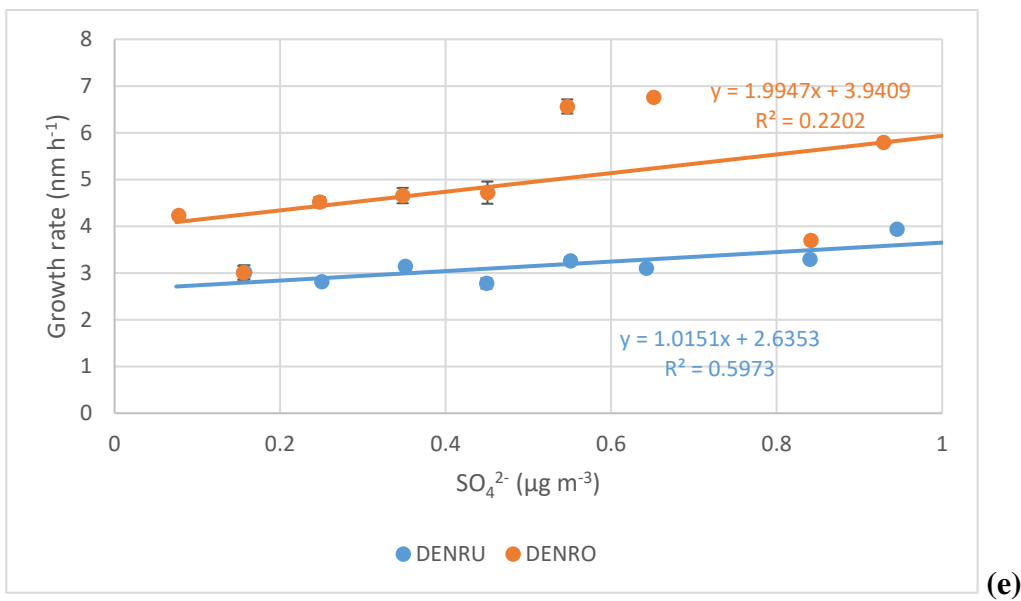
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423



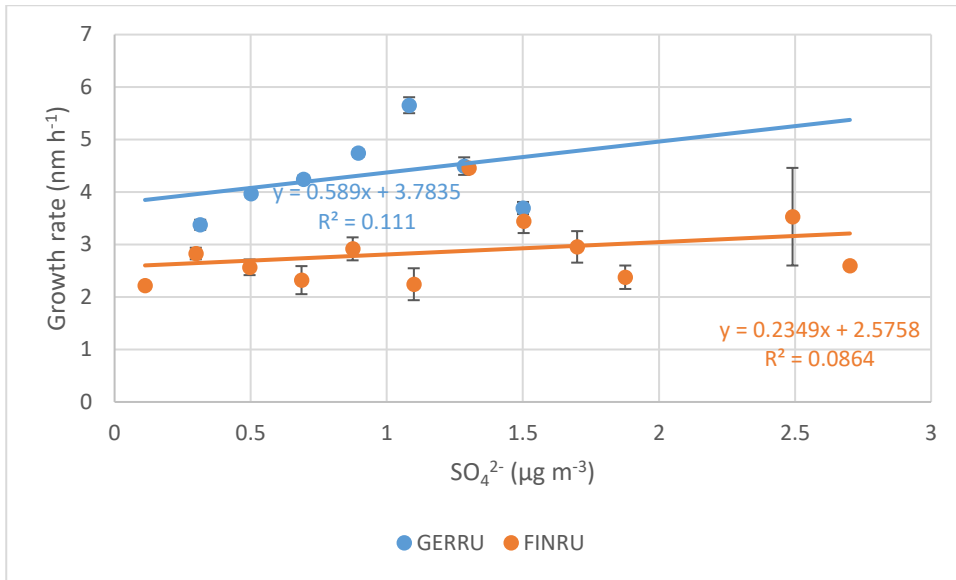
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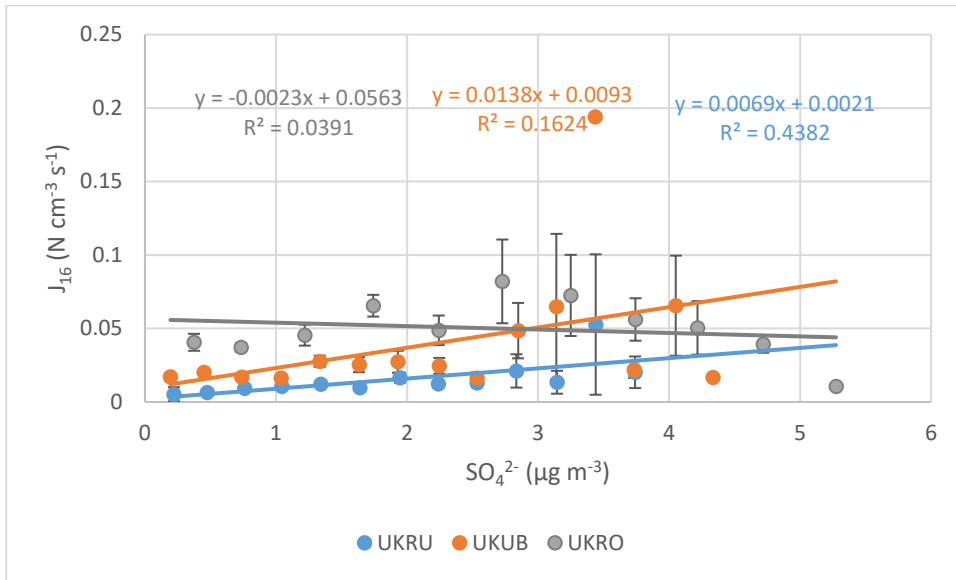
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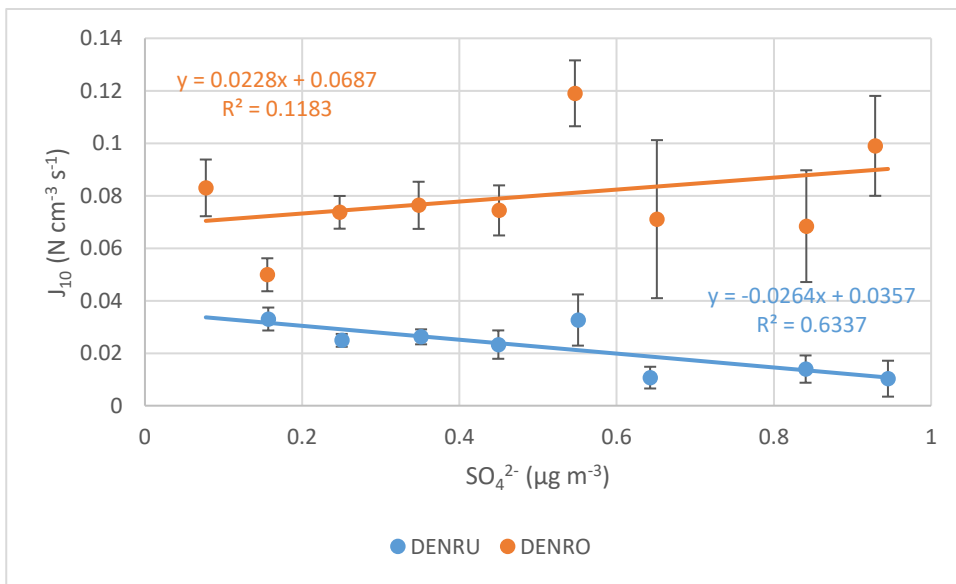




430

(g)

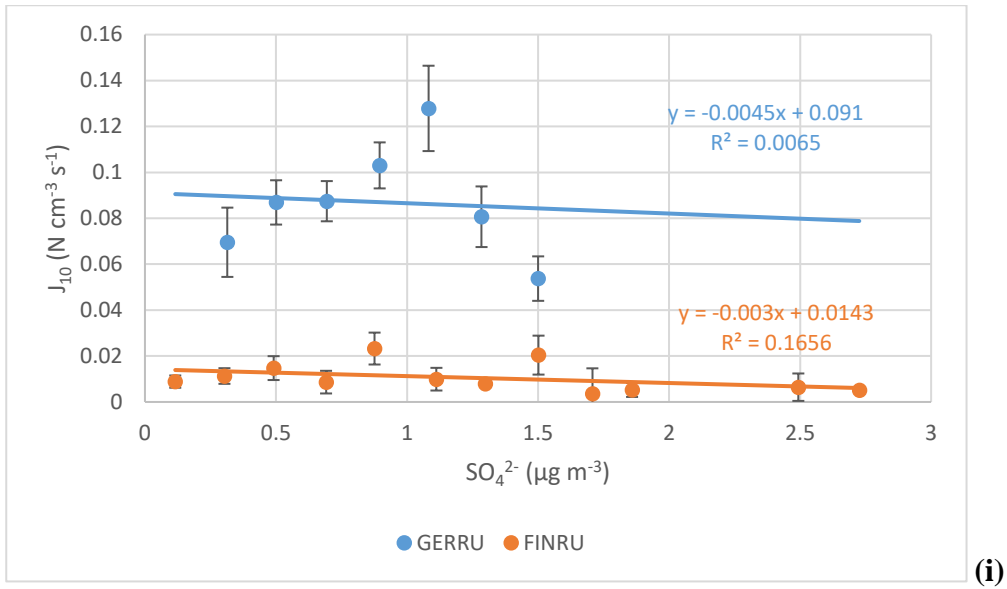
431



432

(h)

433



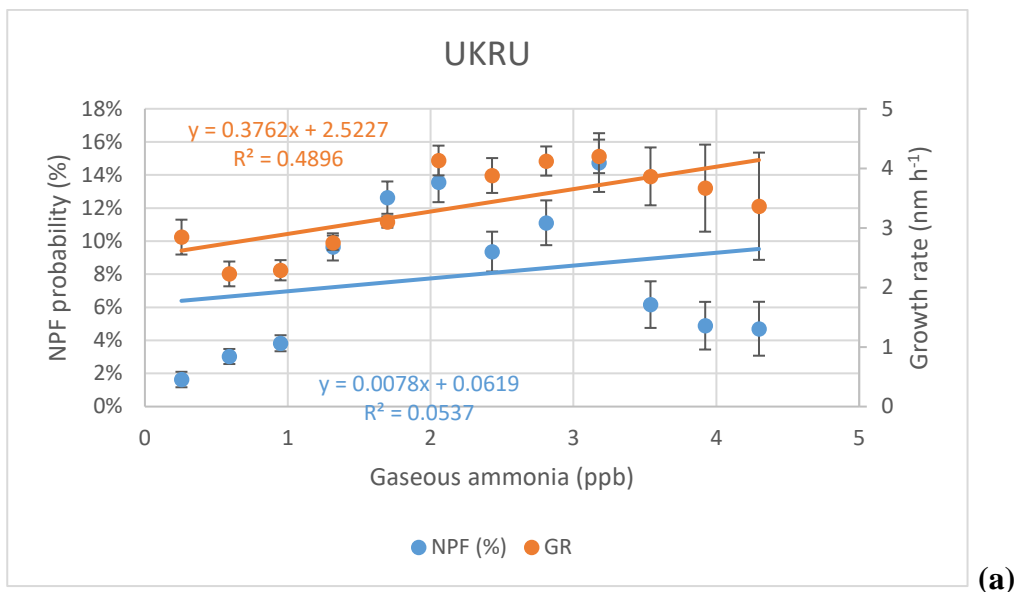
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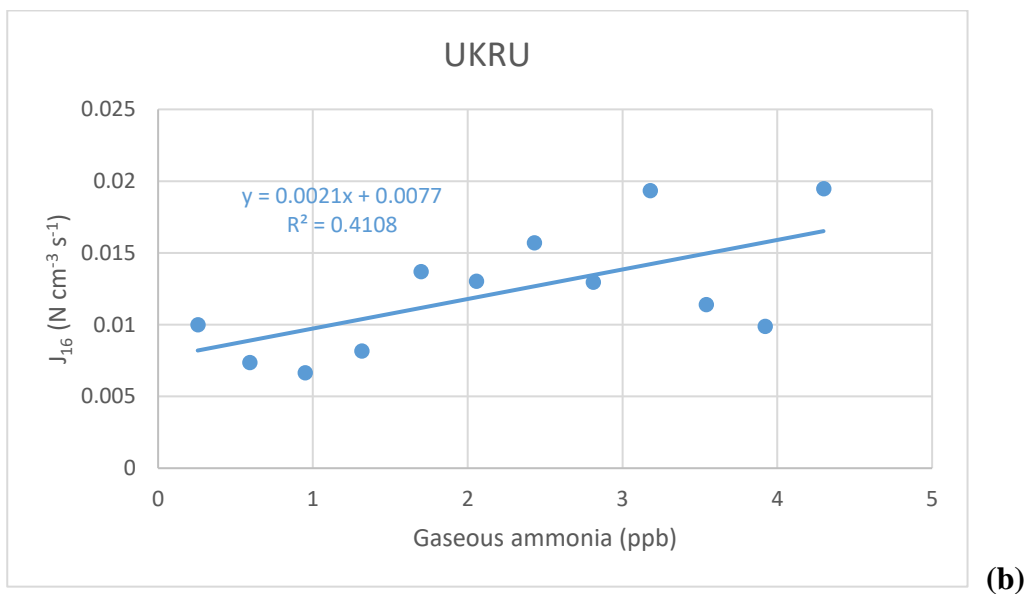
437 **Figure S11:** Relationship of gaseous ammonia concentration with NPF variables.

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439

440



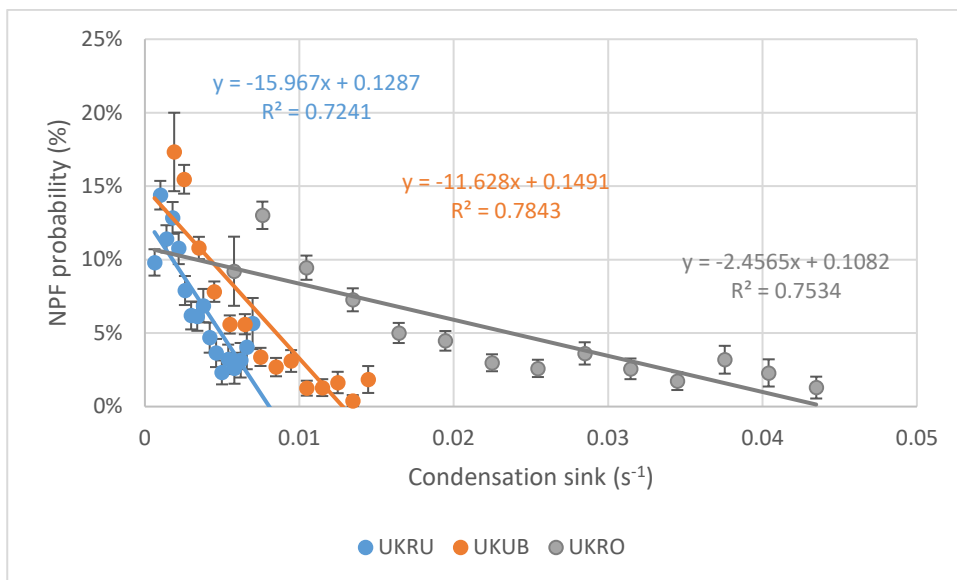
441

442

443

444 **Figure S12:** Relationship of the condensation sink with NPF variables.

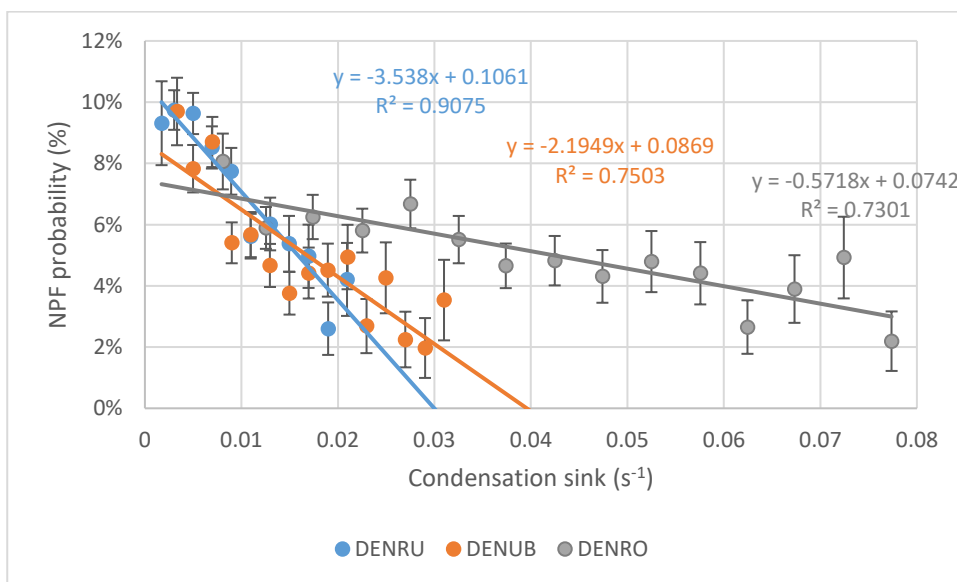
445



446

(a)

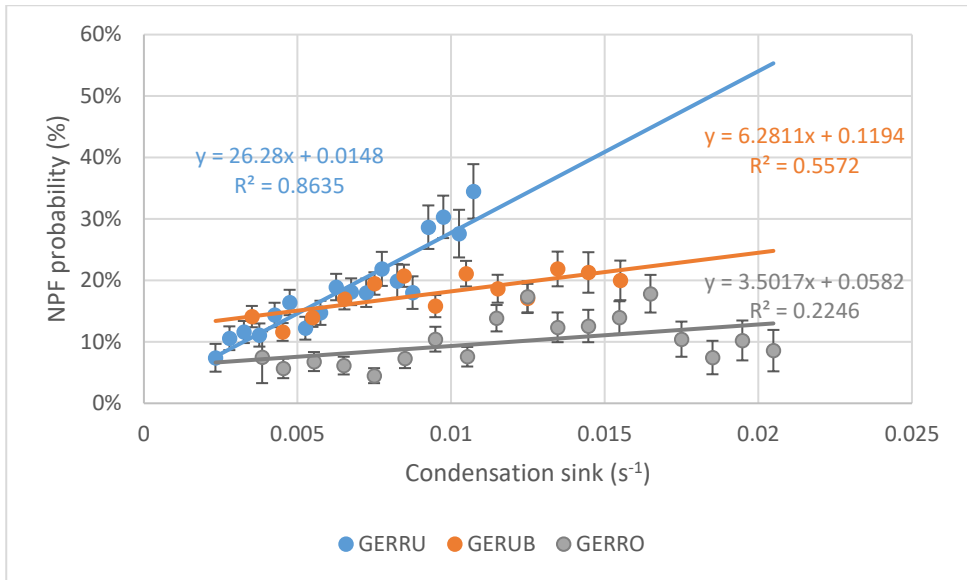
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448

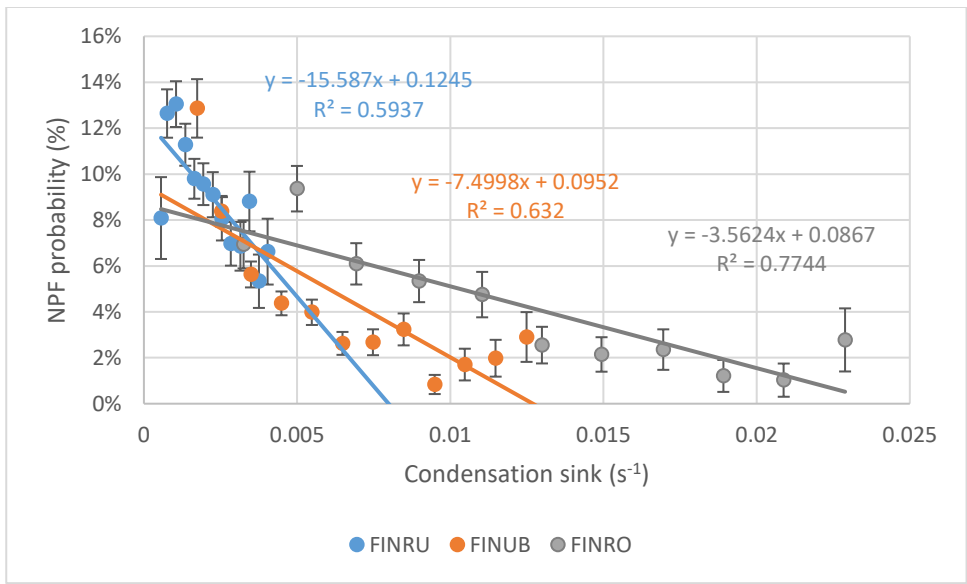
(b)

449



450 (c)

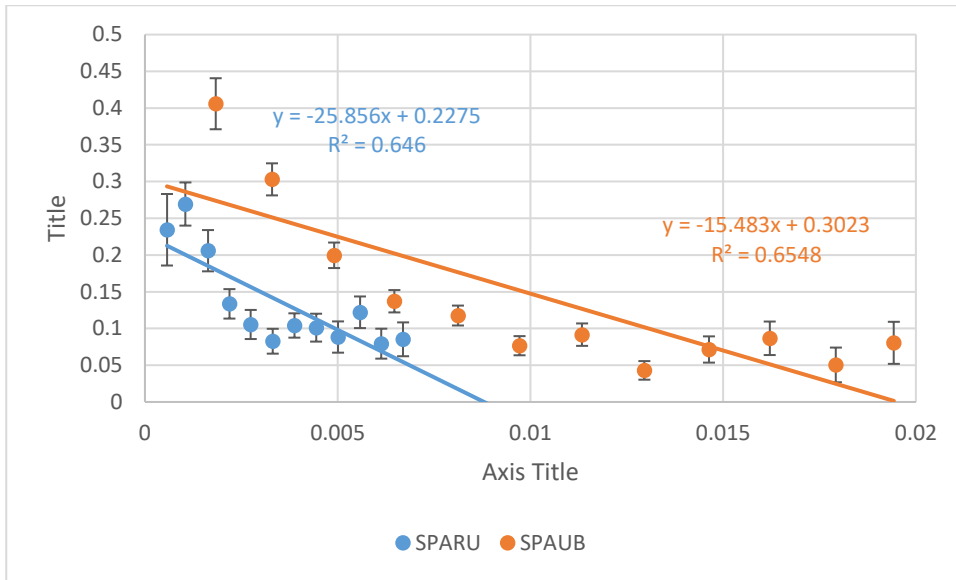
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452 (d)

453

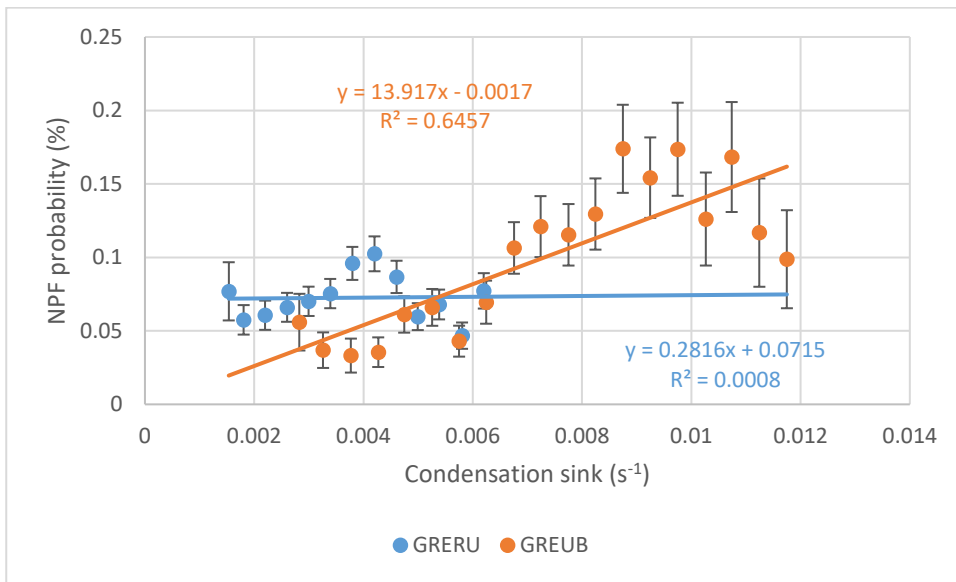
454



455

(e)

456



457

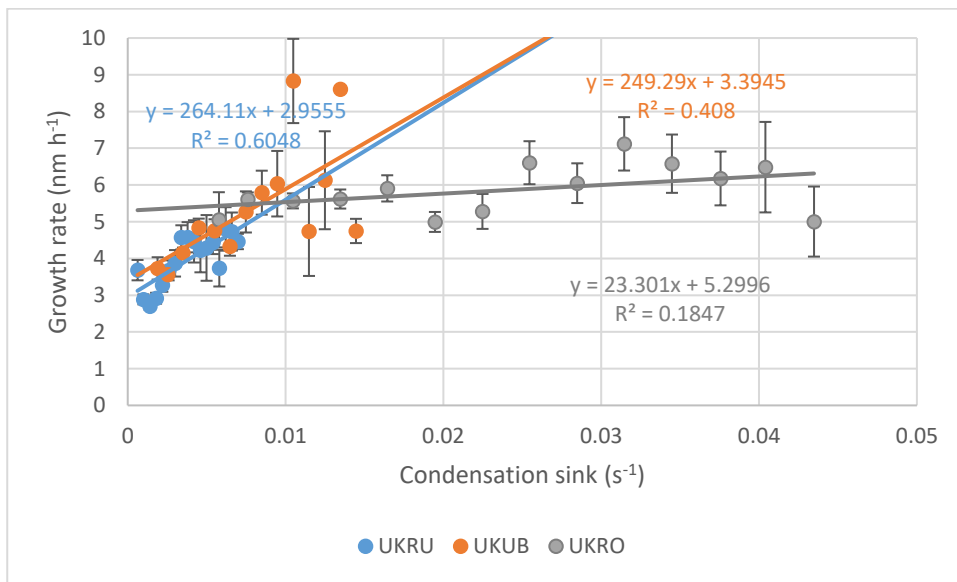
(f)

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460

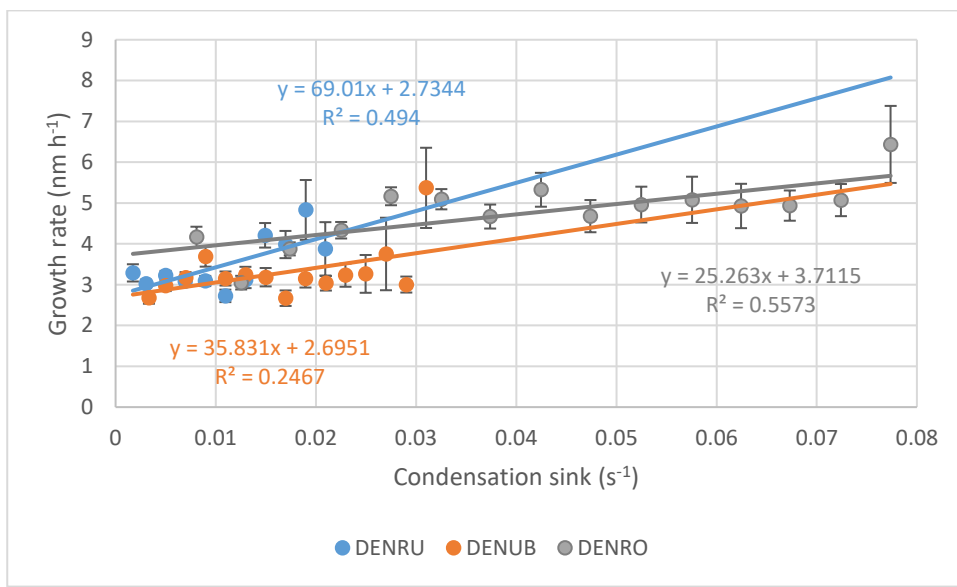
461



462

(g)

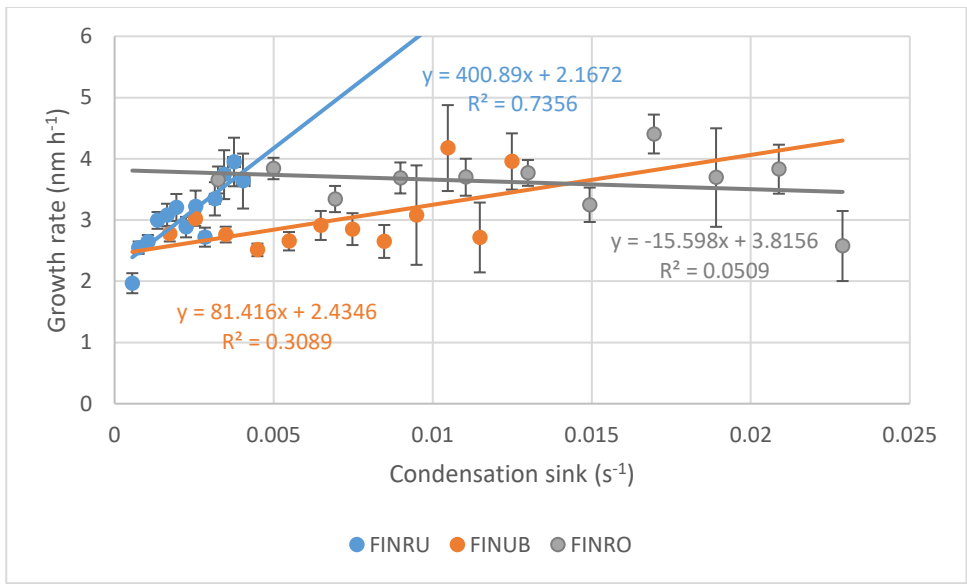
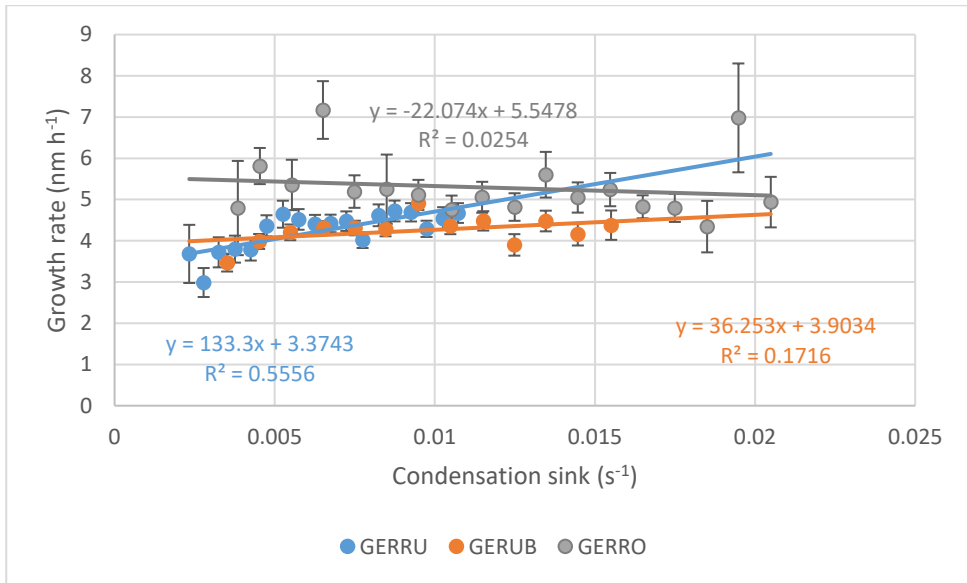
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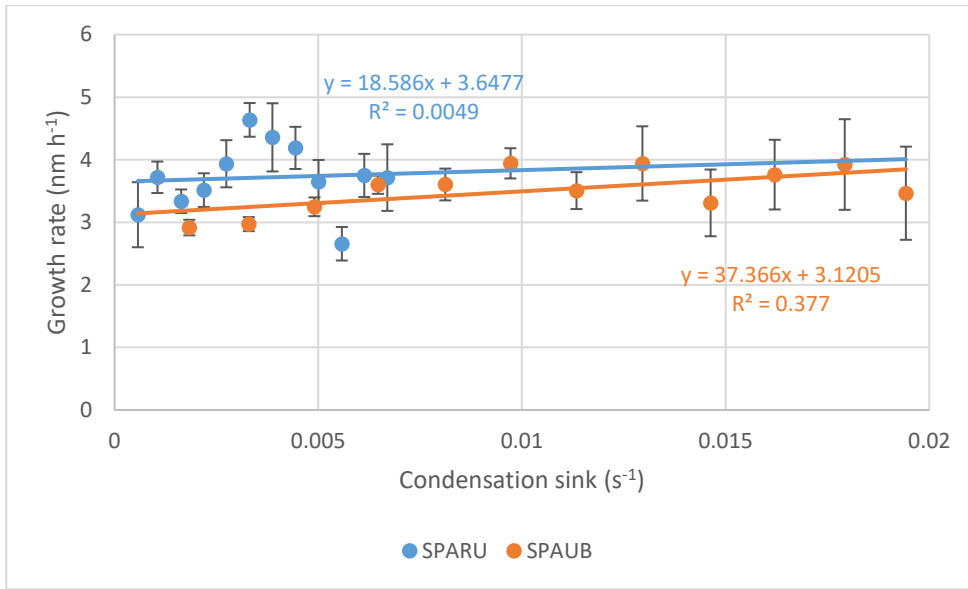


464

(h)

465

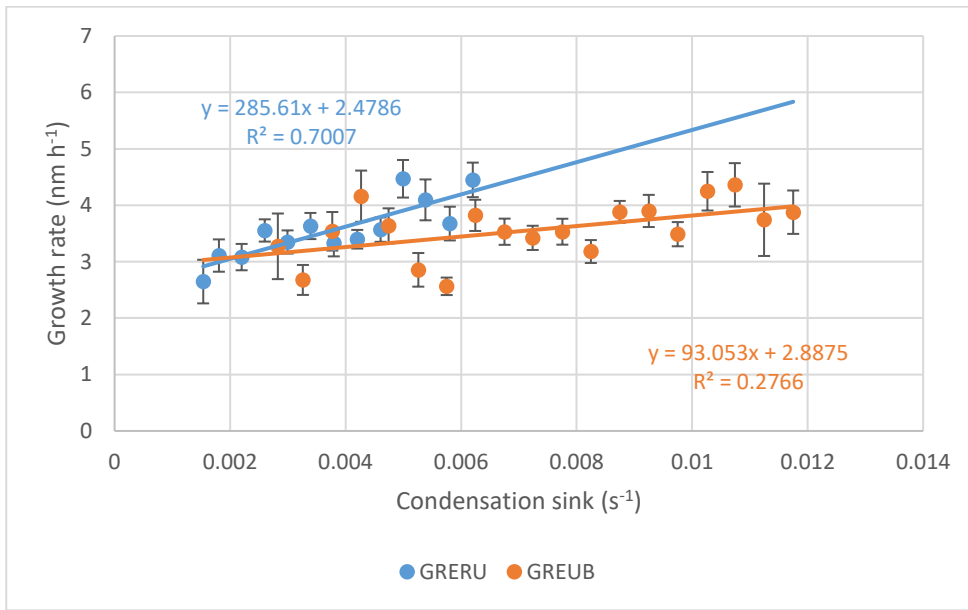




471

(k)

472

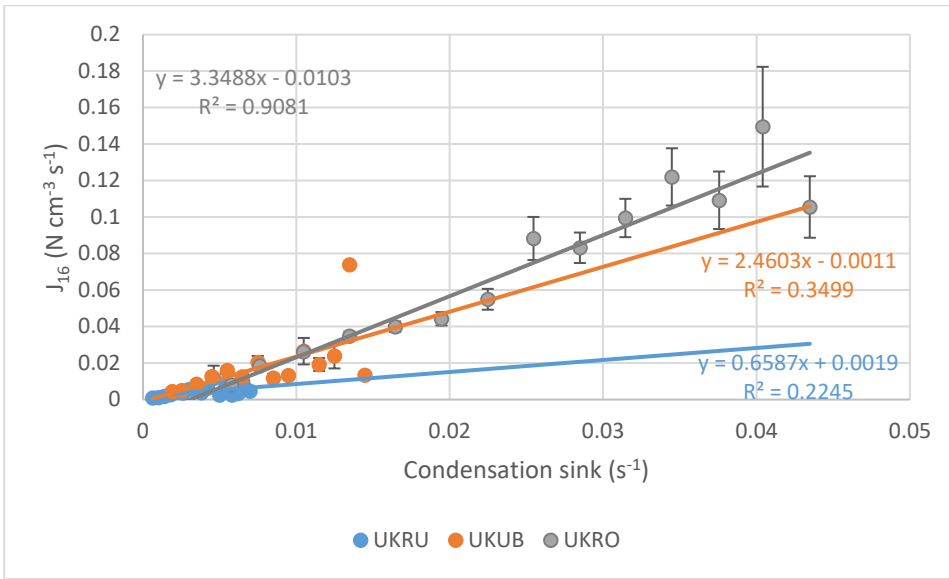


473

(l)

474

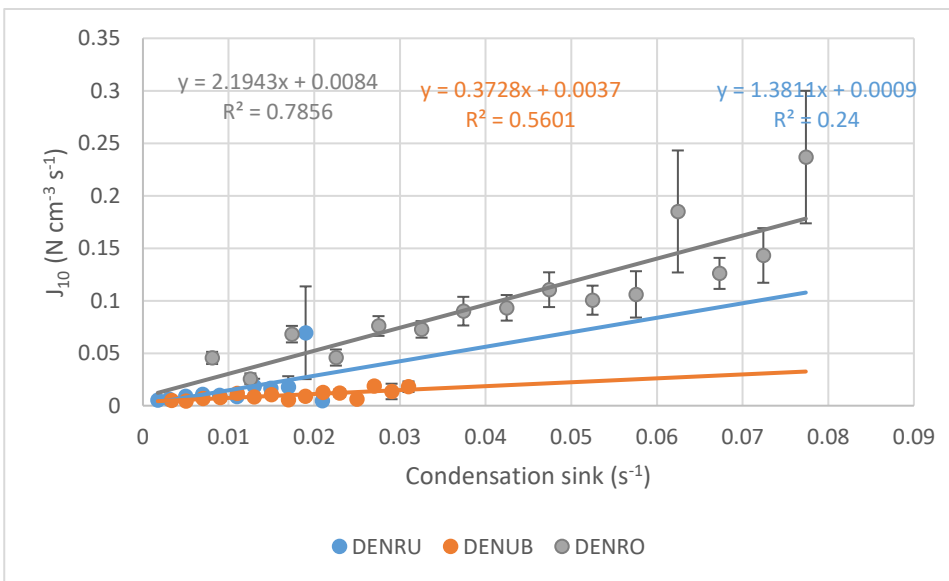
475



476

(m)

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478

(n)

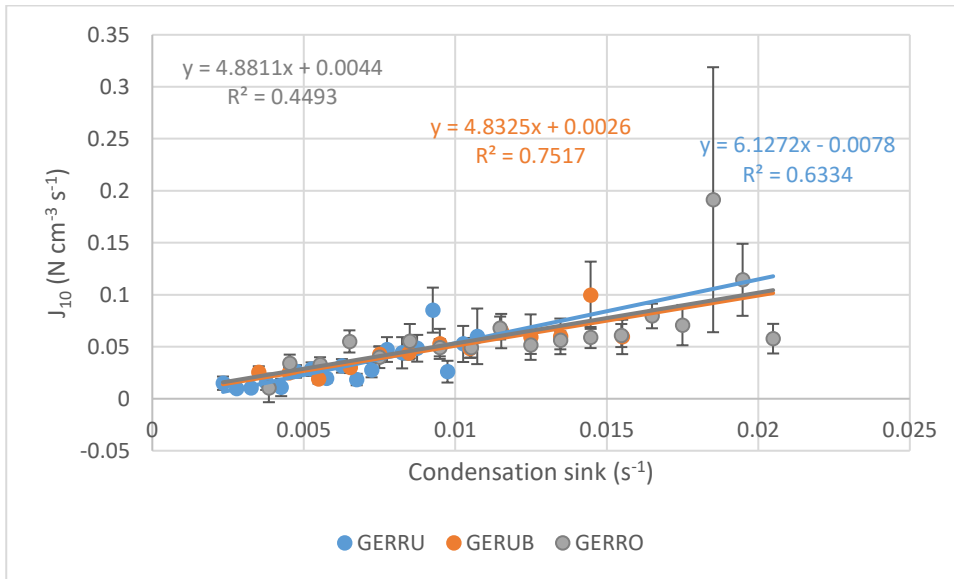
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482

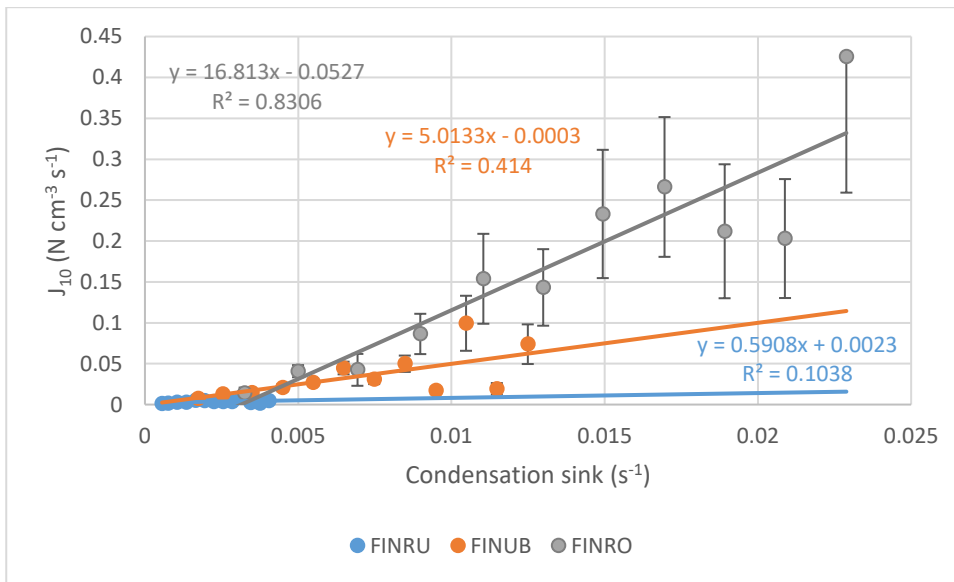
483



484

(o)

485

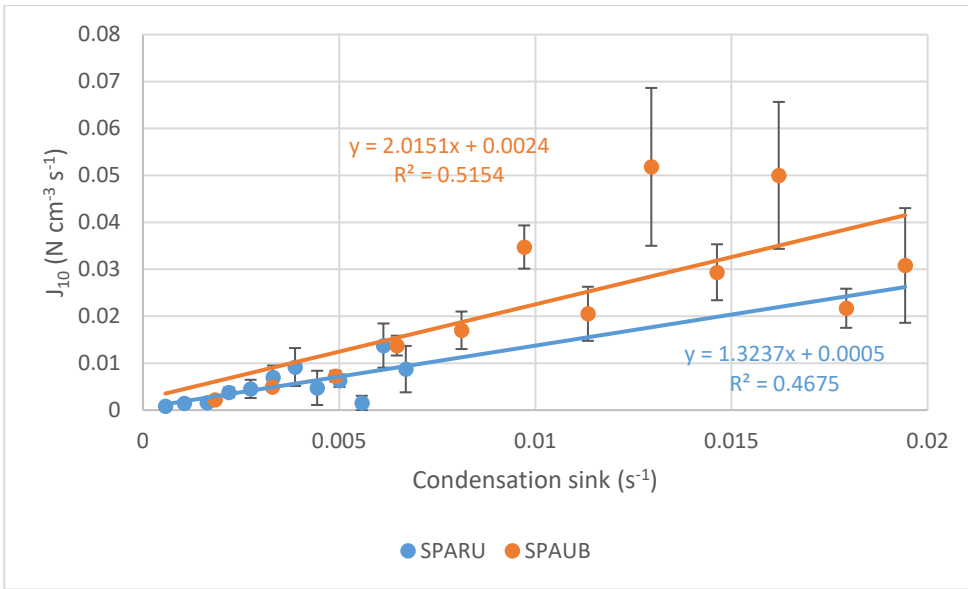


486

(p)

487

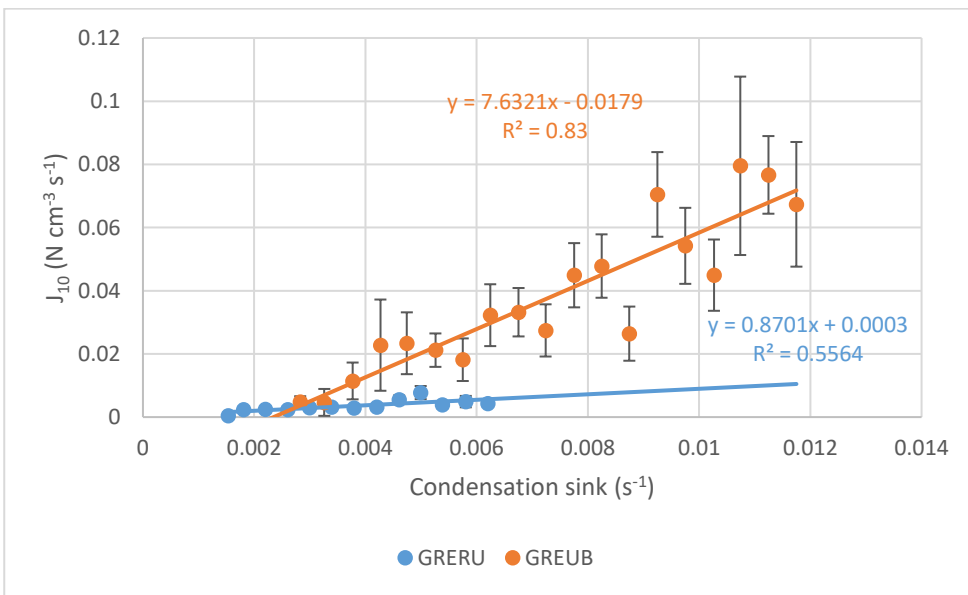
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489

(p)

490

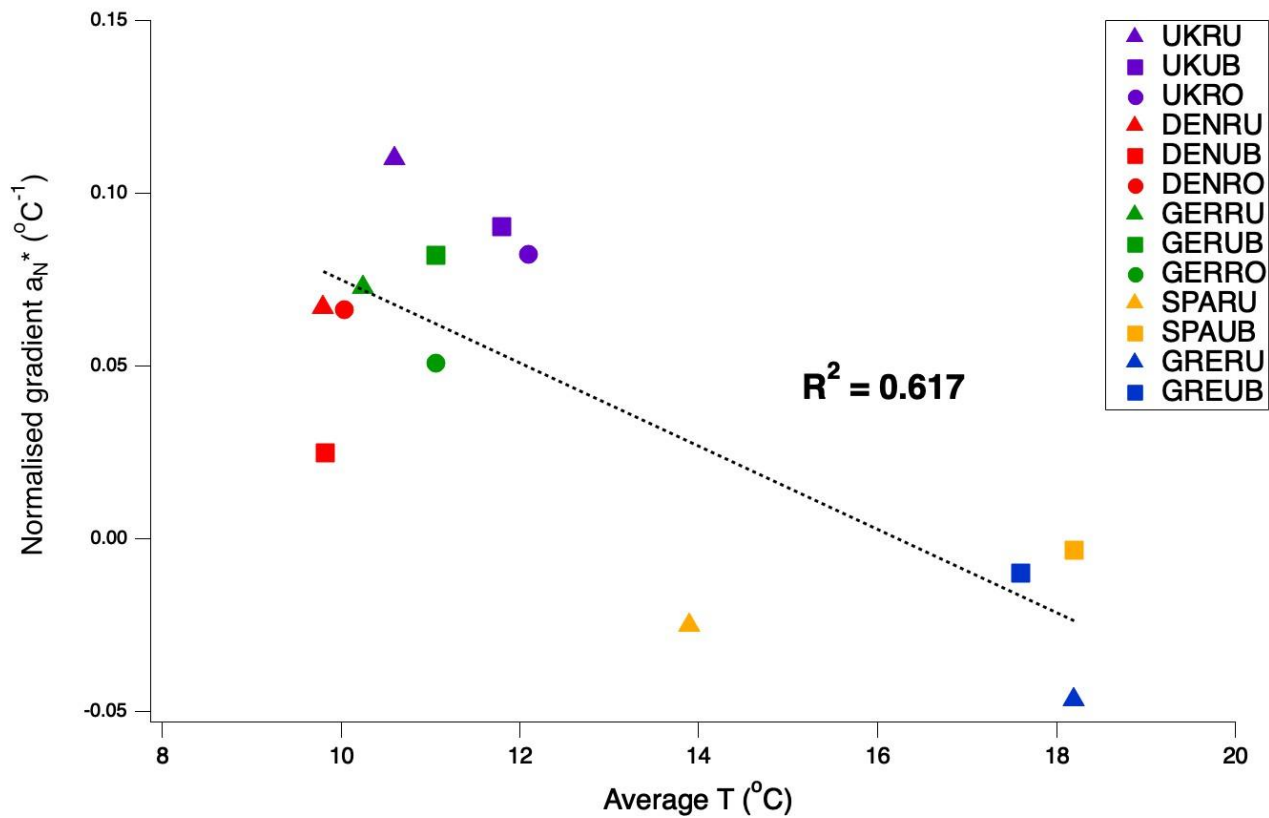


491

(q)

492

493 **Figure S13:** Relationship of average temperature and normalised gradients a_N^* for all but the Finnish
494 sites.
495

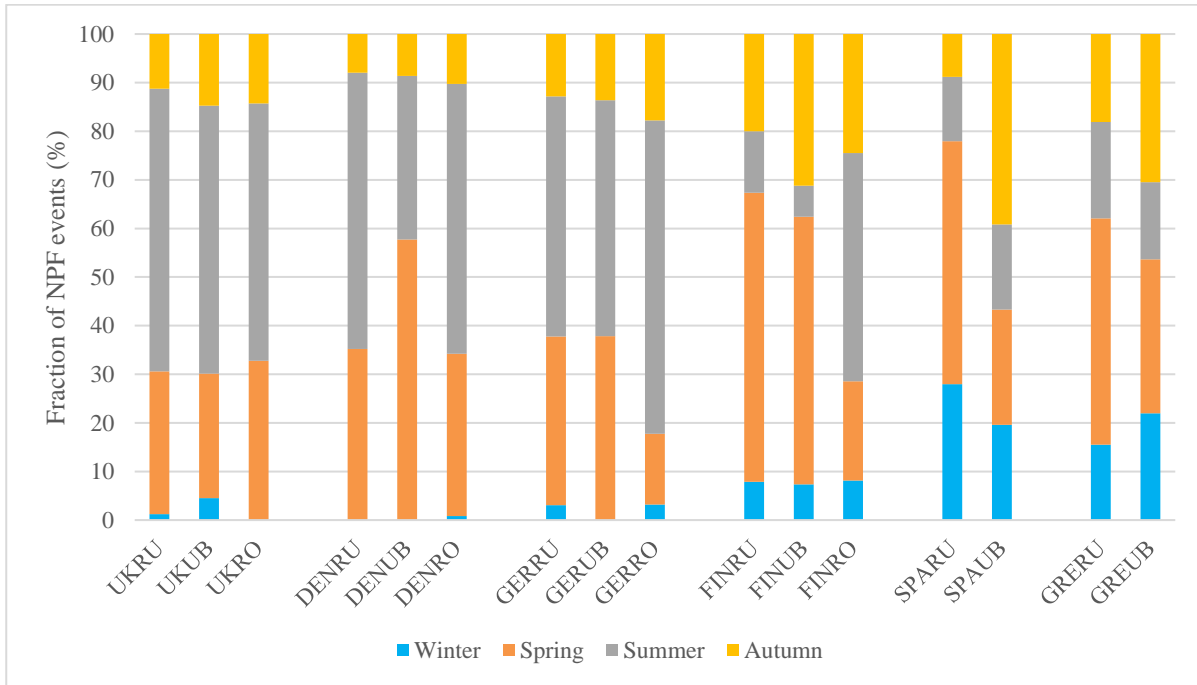


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498 **Figure S14:** Seasonal variation of NPF events

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