Supplement

N_2O isotope approaches for source partitioning of N_2O production and estimation of N_2O reduction – validation with ^{15}N gas-flux method in laboratory and field studies

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Table S1: Comparison of SP/O Map results of all calculation cases (Case 1 and Case 2) and mixing scenarios (bD-fD and bD-Ni).

		r_{N2O}				f_{bD}			
scenarios		bD-fD		bD-Ni		bD-fD		bD-Ni	
cases		Case1	Case2	Case1	Case2	Case1	Case2	Case1	Case2
L1	min	0.15	0.14	0.14	0.14	0.96	0.79	0.98	0.84
	max	0.24	0.24	0.26	0.24	1	1	1	1
	mean	**0.19**	**0.18**	**0.19**	**0.18**	**0.99**	**0.93**	**0.99**	**0.95**
L2	min	0.16	0.15	0.16	0.16	0.94	0.88	0.96	0.91
	max	0.52	0.53	0.45	0.46	1	1	1	1
	mean	**0.27**	**0.27**	**0.25**	**0.25**	**0.98**	**0.96**	**0.99**	**0.97**
F1	min	0.68	0.70	0.44	0.48	0.62	0.55	0.81	0.66
	max	1.00	1.00	0.76	0.77	0.84	0.83	0.91	0.87
	mean	**0.86**	**0.86**	**0.62**	**0.64**	**0.74**	**0.70**	**0.86**	**0.77**
F2	min	0.30	0.36	0.22	0.27	0.84	0.64	0.94	0.73
	max	0.43	0.49	0.38	0.39	0.95	0.89	0.97	0.92
	mean	**0.38**	**0.42**	**0.29**	**0.32**	**0.92**	**0.77**	**0.96**	**0.83**
F3	min	0.26	0.27	0.25	0.25	0.97	0.92	0.98	0.94
	max	0.47	0.47	0.46	0.46	1	1	1	1
	mean	**0.33**	**0.32**	**0.32**	**0.32**	**0.99**	**0.97**	**0.99**	**0.98**

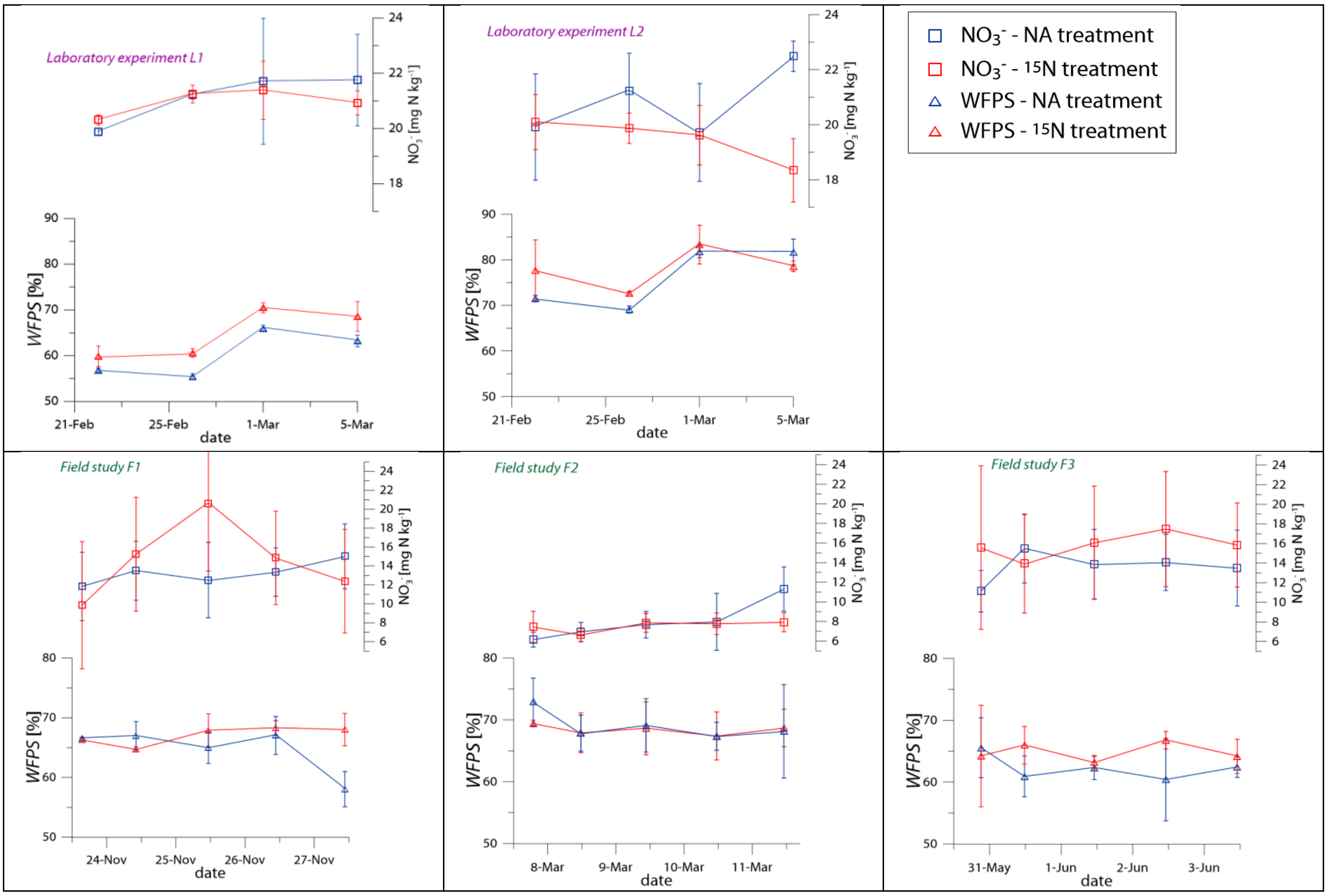


Fig. S1 Soil conditions during laboratory incubations and field campaigns. Water filled pore space (WFPS in %) and nitrate content in mg N kg-1 dry soil is shown for NA treatment (blue symbols) and ^{15}N treatment (red symbols). Note different Y-Axis scaling for laboratory and field studies.

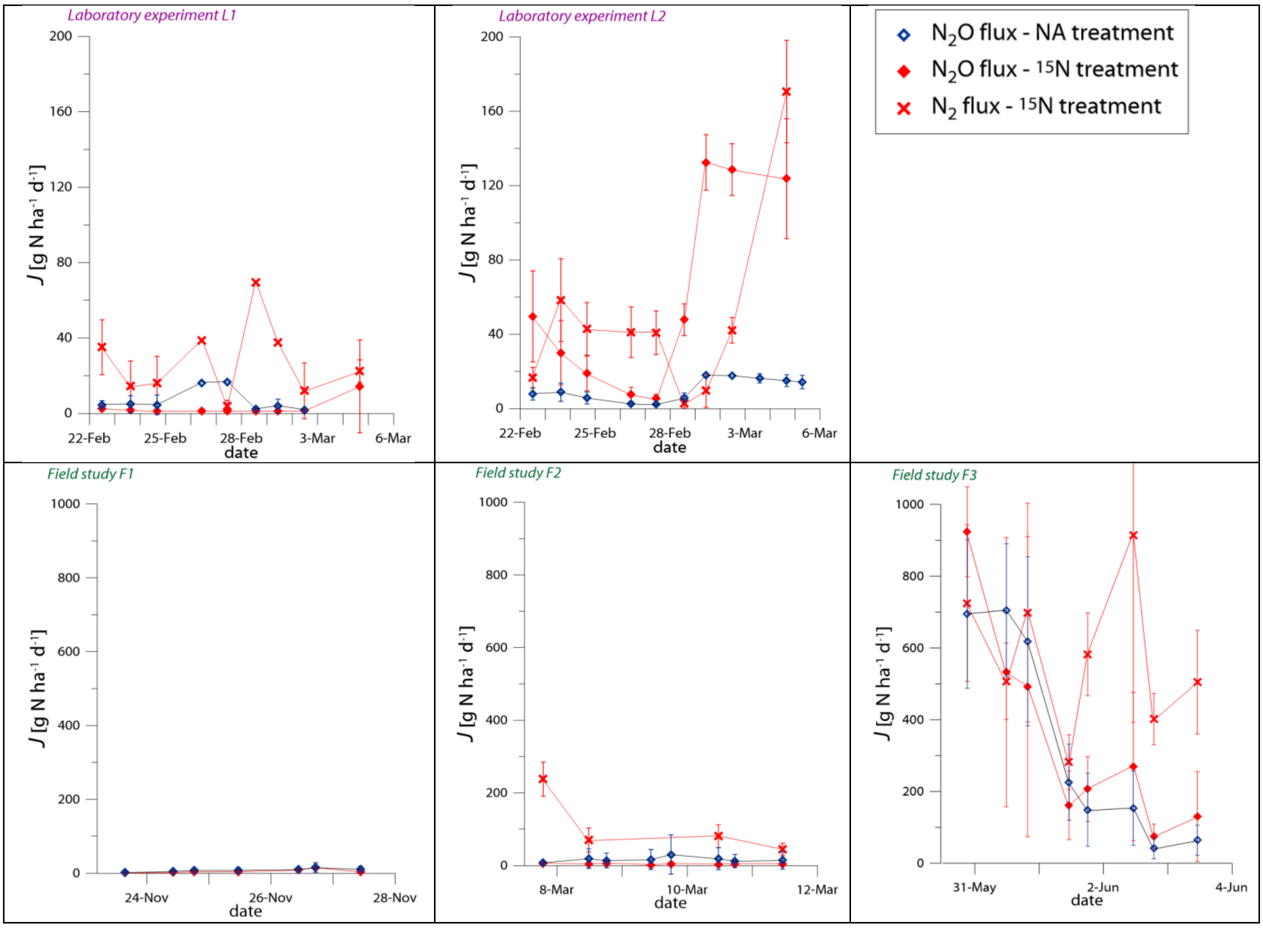


Fig. S2 Gas fluxes in g N ha^{-1} d^{-1}. Note different Y-Axis scaling for laboratory and field studies. Mean values for each sampling date with standard deviation (n=4) are shown. N_2O flux (diamonds) in NA treatment (blue symbols) and ^{15}N treatment (red symbols) and N_2 flux determined in ^{15}N treatment is shown (red crosses).

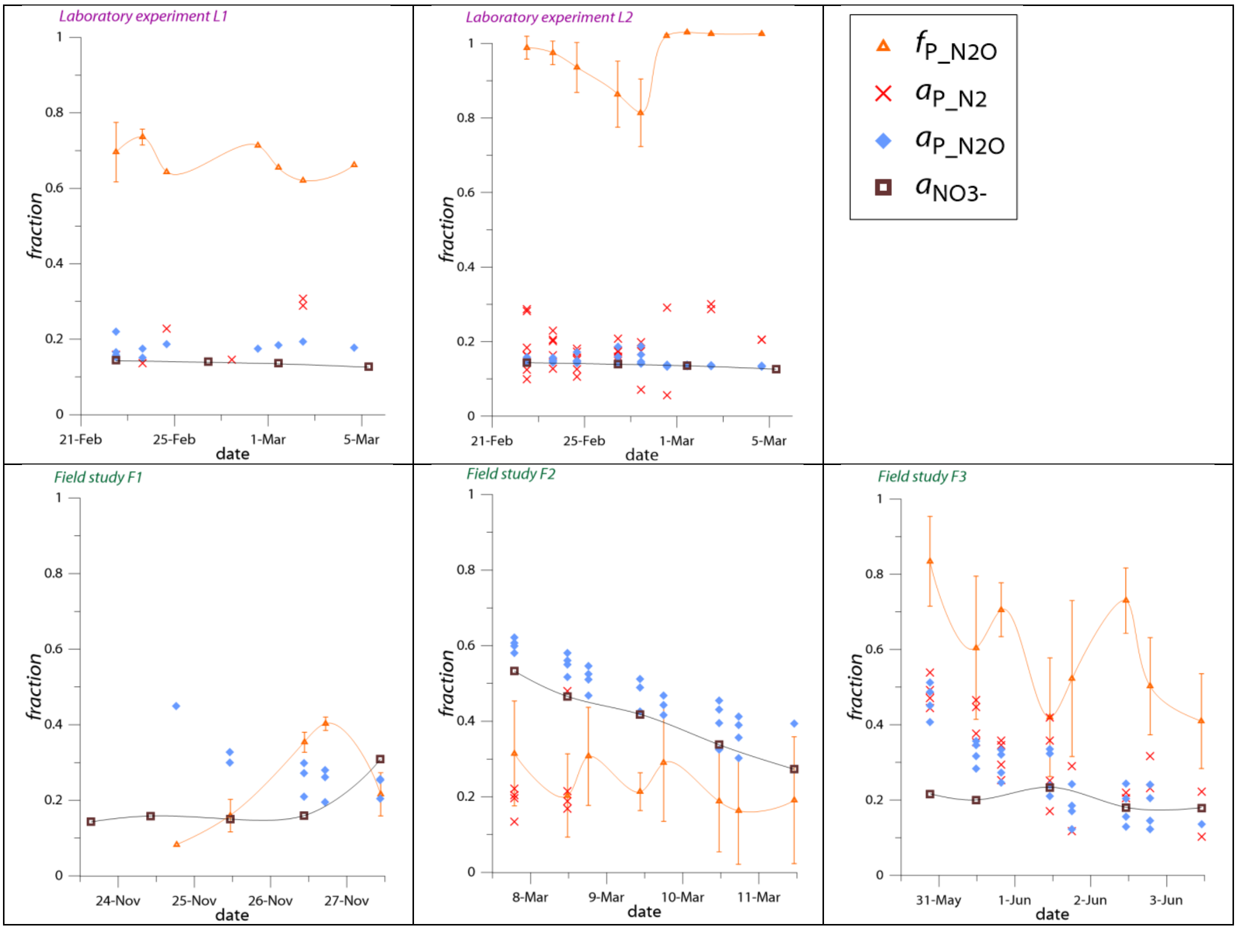
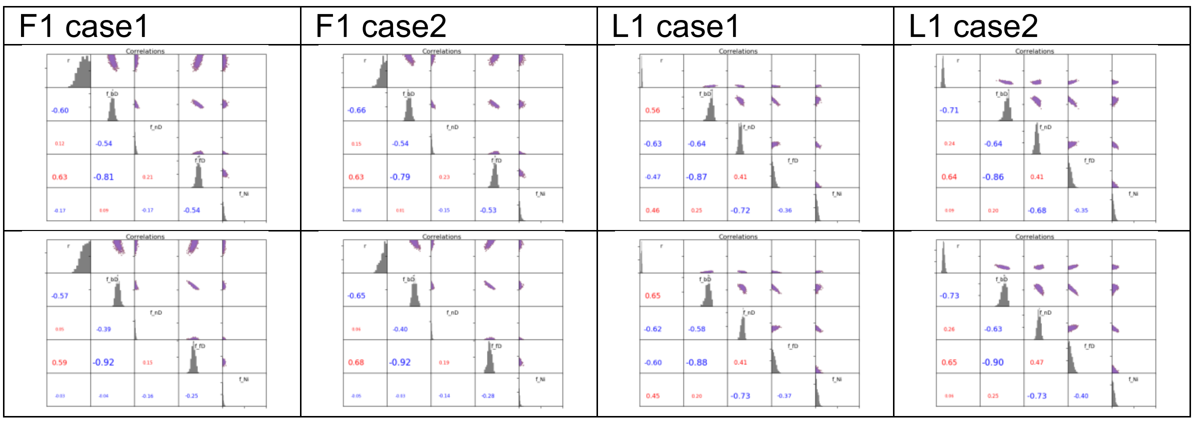
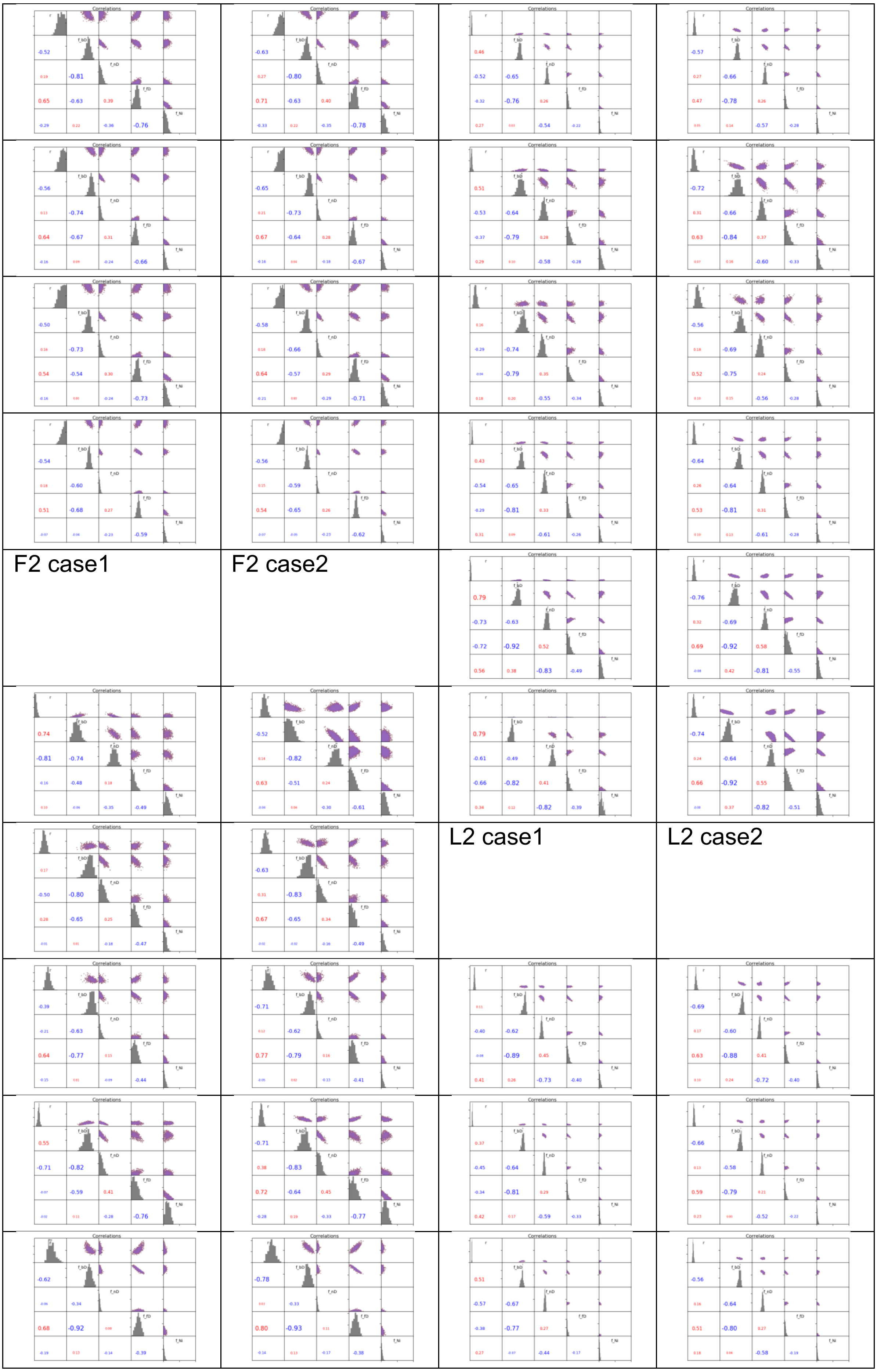
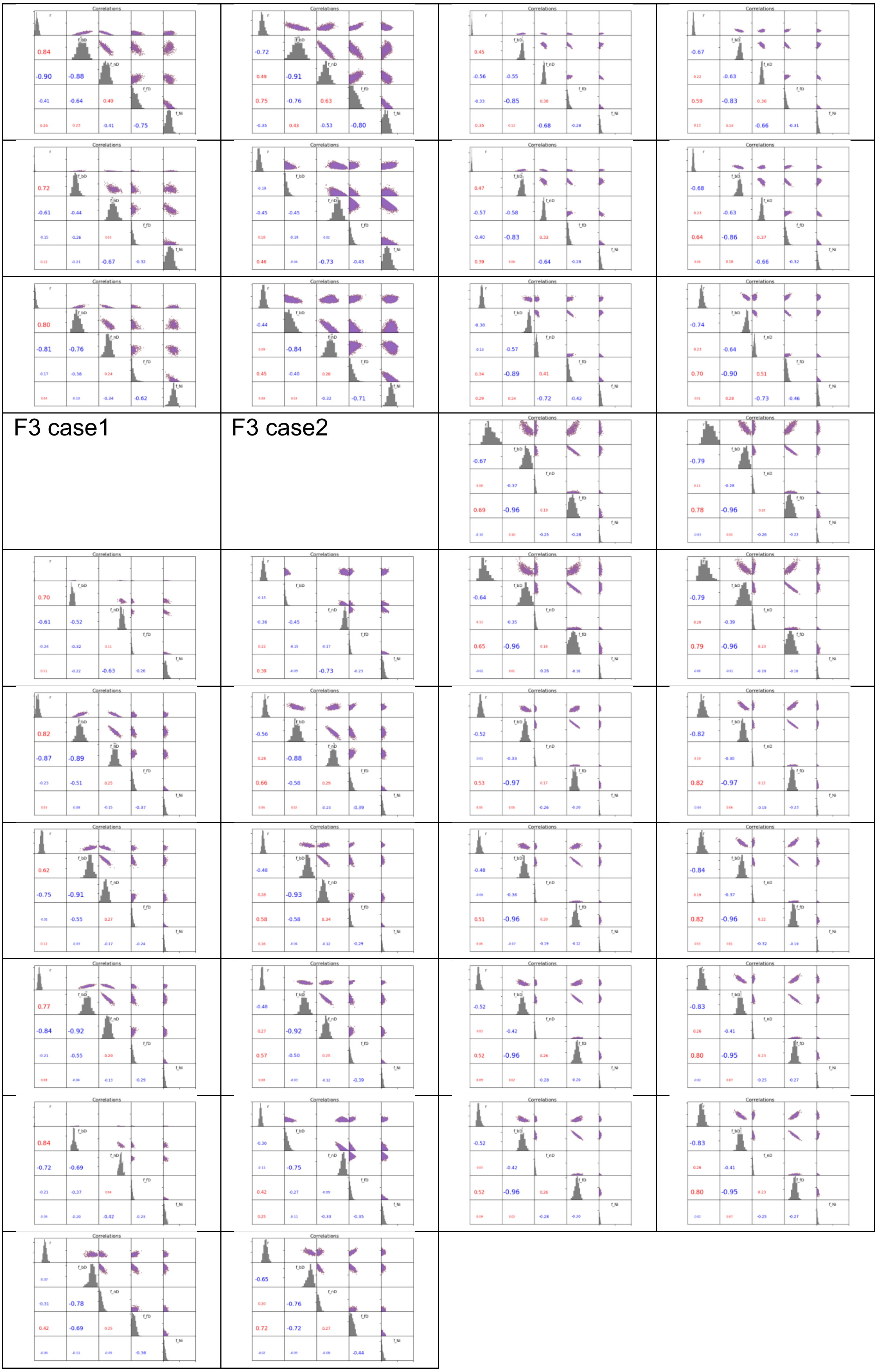


Fig. S3 ^{15}N abundance in total NO_3^- (a_{NO3} – brown squares), NO_3^- pool producing N_2O (a_{P_N2O} – blue diamonds), NO_3^- pool producing N_2 (a_{P_N2} – red crosses) and ^{15}N pool-derived fraction of N_2O (f_{P_N2O} – orange triangles). For a_{NO3} and f_{P_N2O} mean values for each sampling date with standard deviation (n=4) are shown. For a_{P_N2} and a_{P_N2O} all individual values are shown (due to numerous missing data).




F2 case1
F2 case2
L2 case1
L2 case2


F3 case1
F3 case2

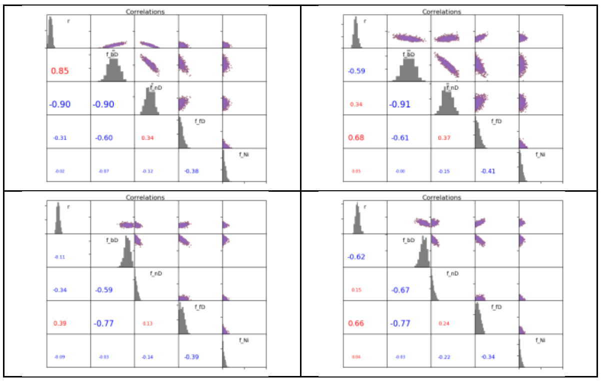


Fig. S4 Matrix plots presenting detailed 3DI model outputs for each sampling date for both calculating cases. The plots in the diagonal show histograms of posterior probability distribution of r_{N2O} and mixing fractions, the plots above the diagonal show correlations between the modeled fractions and the values below the diagonal show R coefficient of these correlations: in blue for positive correlations and in red for negative correlations with the size proportional to the R value.