

## Appendix 5

### Results from Principal Components Analyses from Monthly, Start/End, and Amelioration Analyses

Below are tables depicting the individual factorial loadings for several data analyses identified in the main text. Each table depicts the main factorial components identified by the main PCA test (those with Eigenvalues exceeding 1), and the individual loadings for each factor. Items with a loading of more than 0.4 are considered to be strongly loading. These were then further discussed in the main text.

**Table 1 - PCA results from 'Start' data |** Factorial loadings from principal components factor analysis on the 'Start' data from the analysis on the start and end data. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
Soil bulk density	-0.031	-0.019	0.035	0.027
Soil moisture	<b>0.517</b>	<b>0.431</b>	<b>-0.621</b>	-0.396
Soil pH	-0.004	-0.005	0.023	0.025
Soil EC (Salinity)	<b>0.779</b>	-0.352	<b>0.498</b>	-0.145
Soil phosphate	-0.305	-0.197	0.101	<b>-0.768</b>
Soil nitrate	0.048	<b>-0.789</b>	<b>-0.595</b>	0.137
Soil ammonium	-0.169	-0.167	0.036	<b>-0.461</b>
Eigenvalue	22.20	10.50	4.06	2.29
% of variance	55.40	26.30	10.20	5.70

**Table 2 – PCA results from 'Flooded' data |** Factorial loadings from principal components factor analysis on the 'Flooded' data from the analysis on the start and end data. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor Loadings				
	1	2	3	4	5
Soil bulk density	-0.042	0.016	-0.012	0.003	-0.018
Soil moisture	<b>0.955</b>	-0.274	-0.029	-0.102	0.021
Soil pH	-0.001	-0.001	0.024	0.013	0.022
Soil EC (Salinity)	0.278	<b>0.929</b>	0.228	0.054	0.067
Soil phosphate	-0.062	-0.206	<b>0.931</b>	-0.250	0.153
Soil nitrate	-0.076	0.125	-0.264	<b>-0.924</b>	0.236
Soil ammonium	0.012	0.056	0.100	-0.266	<b>-0.957</b>
Eigenvalue	50.50	16.00	5.29	2.86	1.26
% of variance	66.50	21.00	3.80	3.80	1.70

**Table 3 – PCA results from 'Control' data |** Factorial loadings from principal components factor analysis on the 'Control' data from the analysis on the start and end data. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
Soil bulk density	-0.046	0.018	-0.007	-0.013
Soil moisture	<b>0.958</b>	-0.244	0.112	-0.069
Soil pH	0.004	0.006	-0.003	0.019
Soil EC (Salinity)	0.269	<b>0.896</b>	-0.340	0.069
Soil phosphate	0.042	-0.349	<b>-0.801</b>	<b>0.481</b>
Soil nitrate	-0.008	-0.075	<b>-0.437</b>	<b>-0.827</b>
Soil ammonium	-0.073	-0.099	-0.201	-0.272
Eigenvalue	54.50	11.00	8.63	2.74
% of variance	70.00	14.10	11.10	3.50

**Table 4 – PCA results from ‘Overall’ data set** | Factorial loadings from principal components factor analysis on the ‘Overall’ data (all months, all sites) from the analysis on the detailed sites. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings		
	1	2	3
CO <sub>2</sub> flux	0.009	-0.044	-0.053
Infiltration rate	-0.028	0.005	-0.070
Plant biomass	0.099	<b>-0.427</b>	-0.034
Soil bulk density	0.010	0.042	-0.002
Soil pH	0.002	0.011	0.026
Soil EC (Salinity)	<b>-0.969</b>	-0.084	0.207
Soil phosphate	-0.020	<b>0.889</b>	0.123
Soil nitrate	-0.217	0.108	<b>-0.927</b>
Soil ammonium	-0.041	-0.018	-0.206
Worm numbers	-0.022	-0.068	0.173
Eigenvalue	22.40	6.38	3.07
% of variance	61.20	17.40	8.40

**Table 5 – PCA results for ‘Site 4’** | Factorial loadings from principal components factor analysis on ‘Site 4’ data (all months). The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	-0.017	-0.086	0.046	0.078
Infiltration rate	-0.058	-0.061	0.133	-0.016
Plant biomass	0.222	<b>-0.444</b>	<b>0.828</b>	-0.143
Soil bulk density	0.007	0.007	-0.012	0.007
Soil pH	0.007	-0.017	0.000	0.000
Soil EC (Salinity)	<b>-0.851</b>	-0.012	0.234	<b>0.402</b>
Soil phosphate	-0.051	<b>-0.859</b>	<b>-0.473</b>	0.057
Soil nitrate	<b>-0.454</b>	-0.029	-0.030	<b>-0.871</b>
Soil ammonium	-0.111	-0.203	0.123	0.196
Worm numbers	0.035	0.105	0.000	0.101
Eigenvalue	16.80	4.78	3.40	1.65
% of variance	60.30	17.20	12.20	5.90

**Table 6 – PCA results for ‘Site 7’** | Factorial loadings from principal components factor analysis on ‘Site 7’ data (all months). The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings		
	1	2	3
CO <sub>2</sub> flux	-0.063	0.077	-0.095
Infiltration rate	-0.049	0.044	0.064
Plant biomass	-0.285	0.320	-0.357
Soil bulk density	0.008	-0.008	0.005
Soil pH	0.022	-0.008	0.026
Soil EC (Salinity)	<b>0.910</b>	0.351	-0.053
Soil phosphate	0.229	<b>-0.741</b>	<b>-0.613</b>
Soil nitrate	-0.056	0.437	<b>-0.610</b>
Soil ammonium	-0.106	0.092	-0.087
Worm numbers	0.126	-0.132	0.317
Eigenvalue	9.01	3.19	1.48
% of variance	56.50	20.00	9.30

**Table 7 – PCA results for ‘Site 14’** | Factorial loadings from principal components factor analysis on ‘Site 14’ data (all months). The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	0.058	-0.038	0.011	0.030
Infiltration rate	0.020	-0.049	0.020	-0.140
Plant biomass	<b>0.542</b>	-0.305	<b>0.779</b>	0.012
Soil bulk density	0.000	0.000	-0.004	0.007
Soil pH	0.000	0.008	0.004	-0.004
Soil EC (Salinity)	<b>-0.832</b>	-0.162	<b>0.516</b>	-0.078
Soil phosphate	0.059	<b>0.895</b>	0.307	-0.210
Soil nitrate	0.037	-0.078	-0.033	<b>-0.876</b>
Soil ammonium	-0.024	0.004	0.010	0.036
Worm numbers	-0.061	0.263	0.172	<b>0.401</b>
Eigenvalue	13.10	5.17	3.18	1.31
% of variance	54.90	21.70	13.40	5.50

**Table 8 – PCA results for ‘Site 15’** | Factorial loadings from principal components factor analysis on ‘Site 15’ data (all months). The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	0.007	0.040	-0.065	0.045
Infiltration rate	-0.026	0.120	0.088	0.237
Plant biomass	0.052	0.141	-0.111	-0.333
Soil bulk density	0.010	-0.034	-0.024	0.079
Soil pH	-0.007	-0.008	0.038	-0.009
Soil EC (Salinity)	<b>-0.995</b>	0.045	-0.030	-0.075
Soil phosphate	-0.016	<b>-0.860</b>	<b>-0.438</b>	-0.163
Soil nitrate	0.021	0.332	<b>-0.820</b>	0.260
Soil ammonium	0.071	0.248	-0.113	<b>-0.851</b>
Worm numbers	-0.009	-0.221	0.307	-0.032
Eigenvalue	36.40	2.66	1.48	1.06
% of variance	84.50	6.20	3.40	2.50

**Table 9 – PCA results for the Overall Amelioration data** | Factorial loadings from principal components factor analysis on ‘Overall’ data (all months, both sites) for the Amelioration study. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	-0.009	0.011	0.021	-0.052
Infiltration rate	-0.036	0.246	-0.008	<b>-0.784</b>
Plant biomass	-0.029	0.093	0.176	-0.283
Soil bulk density	-0.001	0.003	0.008	-0.010
Soil pH	0.004	0.001	-0.022	0.008
Soil EC (Salinity)	<b>0.997</b>	-0.028	0.044	-0.048
Soil phosphate	-0.034	<b>0.943</b>	-0.119	-0.284
Soil nitrate	-0.049	0.166	<b>0.880</b>	0.009
Soil ammonium	0.003	0.107	-0.291	0.331
Worm numbers	-0.003	0.037	-0.305	-0.332
Eigenvalue	399.00	15.50	2.81	1.40
% of variance	94.80	3.70	0.70	0.30

**Table 10 – PCA results for Site 12 |** Factorial loadings from principal components factor analysis on ‘Site 12’ data (all months) for the Amelioration study. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	-0.009	0.011	0.021	-0.052
Infiltration rate	-0.036	0.246	-0.008	<b>-0.784</b>
Plant biomass	-0.029	0.093	0.176	-0.283
Soil bulk density	-0.001	0.003	0.008	-0.010
Soil pH	0.004	0.001	-0.022	0.008
Soil EC (Salinity)	<b>0.997</b>	-0.028	0.044	-0.048
Soil phosphate	-0.034	<b>-0.943</b>	-0.119	-0.284
Soil nitrate	-0.049	-0.166	<b>0.880</b>	0.009
Soil ammonium	0.006	-0.107	-0.291	0.331
Worm numbers	-0.003	0.037	-0.305	-0.332
Eigenvalue	399.00	15.50	2.81	1.40
% of variance	94.80	3.70	0.70	0.30

**Table 11 – PCA results for Site 12 – December Only |** Factorial loadings from principal components factor analysis on ‘Site 12’ data (December only) for the Amelioration study. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor loadings			
	1	2	3	4
CO <sub>2</sub> flux	-0.009	0.013	0.148	0.053
Infiltration rate	0.006	0.009	-0.043	0.019
Plant biomass	0.040	-0.010	-0.231	-0.130
Soil bulk density	-0.002	0.005	0.018	-0.003
Soil pH	0.000	0.003	0.006	-0.001
Soil EC (Salinity)	<b>0.963</b>	-0.265	0.018	-0.023
Soil phosphate	-0.266	<b>-0.945</b>	0.050	-0.114
Soil nitrate	-0.029	-0.162	<b>-0.453</b>	0.140
Soil ammonium	-0.006	0.068	<b>0.419</b>	<b>-0.825</b>
Worm numbers	-0.006	-0.073	<b>0.733</b>	<b>0.516</b>
Eigenvalue	39.50	10.90	1.82	1.15
% of variance	73.00	20.10	3.40	2.10

**Table 12 – PCA results for Site 16 |** Factorial loadings from principal components factor analysis on ‘Site 16’ data (all months) for the Amelioration study. The table includes eigenvalues and percentages of variance for soil environmental variables. Coefficients in bold depict items strongly loaded on factorial components.

Variable	Factor Loadings	
	1	2
CO <sub>2</sub> flux	-0.018	-0.121
Infiltration rate	0.412	<b>0.883</b>
Plant biomass	0.130	0.100
Soil bulk density	-0.005	-0.010
Soil pH	-0.011	-0.003
Soil EC (Salinity)	<b>0.775</b>	-0.348
Soil phosphate	0.032	0.061
Soil nitrate	0.452	-0.256
Soil ammonium	-0.032	0.023
Worm numbers	-0.078	-0.063
Eigenvalue	3.75	1.56
% of variance	58.10	24.20