

Article

The Controls of Iron and Oxygen on Hydroxyl Radical ($\bullet\text{OH}$) Production in Soils

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Table S1. Summary of water additions and comparison to natural rainfall for each set of mesocosms. The summer rainfall amount for comparison was 271 mm, recorded between 1 June and 30 September 2017. Total H₂O added (mm) is the amount of water added during the first and second flushing periods.

Variable	Older (Imnavait)		Younger (Toolik)		Older (Imnavait)		Younger (Toolik)	
Vegetation	Tussock	Wet sedge	Tussock	Wet sedge	Tussock	Wet sedge	Tussock	Wet sedge
Acclimation period	First				Second			
Total H ₂ O added (mm)	270 ± 30	300 ± 40	200 ± 10	290 ± 30	320 ± 30	300 ± 30	200 ± 10	320 ± 10

Mesocosm Experimental Setup

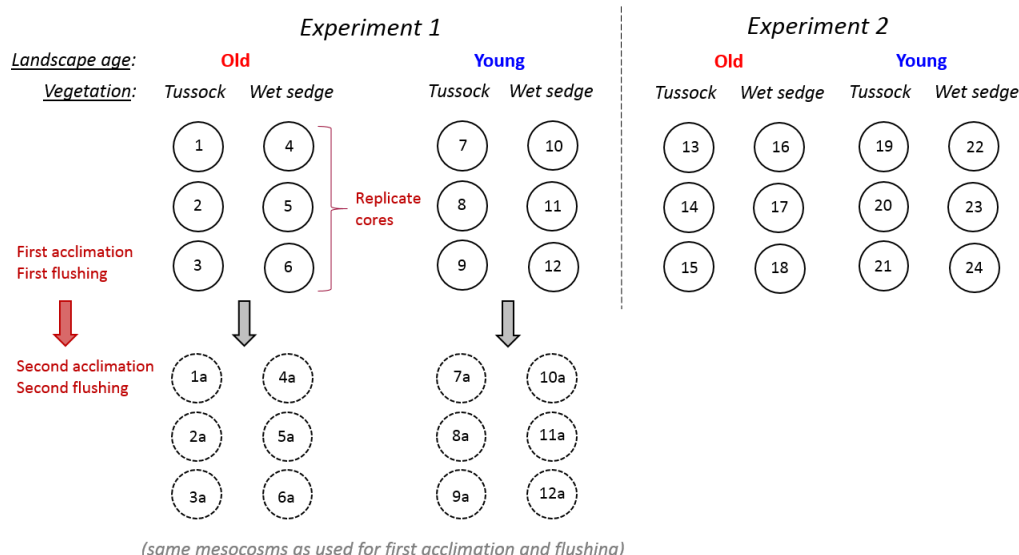


Figure S1. Overview of the mesocosm experimental design. A total of 24 cores was collected (3 replicate cores x 2 landscape ages x 2 vegetation types x 2 experiments). For the first experiment, there were two acclimation periods and two flushing periods. This experiment was repeated on a second set of cores (#s 13-24), but with only one acclimation period and one flushing period (due to time constraints in the field). Averages and comparisons made in the main text used different combinations of cores. For example, in Table 1 the average values for soil properties of old-landscape tussocks (at

the end of the experiments) were taken from cores 1a-3a and 13-15 (N = 6). In Table 2 the variable averages after the acclimation periods for old-landscape tussocks used cores 1-3, 1a-3a, and 13-15 (N = 9). Similarly, the averages for young-landscape wet sedge used cores 10-12, 10a-12a, and 22-24 (N = 9). In Table 4, the variable averages for old-landscape tussocks after the acclimation periods were taken from cores 1-3 and 13-15 (N=6), and averages for young-landscape wet sedge used cores 10-12 and 22-24 (N = 6). In Table 4, the comparison between the first and second flushing periods, for old-landscape tussocks, used cores 1-3 and 1a-3a (N = 3 comparisons of the same cores at different time points).

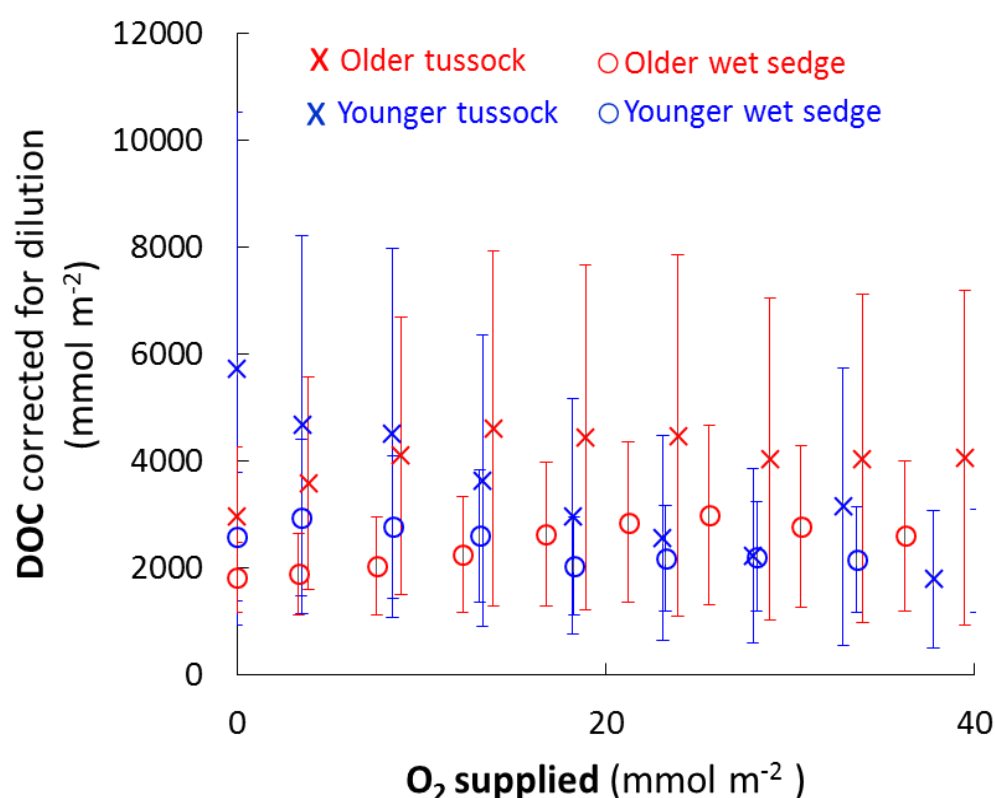


Figure S2. DOC export in soil waters corrected for dilution by DI water added with flushing events, versus the O₂ supplied during flushing. DOC export was calculated from the DOC concentration measured from the soil water after each flush multiplied by the total volume of water in each of the soil mesocosms plus the volume of DI water added with each flush (i.e., concentrations were corrected for dilution by the DI water used to flush the soils). The mmol of DOC exported in the soil water was then divided by the surface area of the soil mesocosm. Values shown are average $\pm$ SE (N = 9; Figure A1).

