

The Effects of College Recreational: A Study of College Parties and Their Impact On Soil Nitrogen of the Surrounding Land

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Introduction

-Social activities may pose a threat to the health of soil in terms of pollutants from human-related activities at parties.

-Nitrogen (N) & coliform bacteria can come from anthropogenic sources like unregulated disposal of human waste as seen on and off campus during social activities.

-We wanted to determine how an average party of roughly 100 people provided inputs of additional N to soils along a gradient from the house down to the stream.

Methods

-6 areas and a control were flagged around the yard of the house hosting the activities

-Before & after the weekend, soil samples were taken from all six areas, and the control area

-Deionized water was filtered through the soil and tested for ammonium, nitrate and coliform.

Results

Nitrate (NO_3^- -N):

-Both Samples 1 & 2 recorded concentrations around 10 mg/L post-party

-Assuming unequal variance, a 2-tailed t-test revealed no significant differences between the before and after NO_3^- -N concentrations. ($P > 0.05$).

Ammonium (NH_4^+ -N):

-Post-party concentrations were higher than the pre-party concentrations.

-Locations 1 and 2 were almost 9x greater than the pre-party tests

-No significant increase in NH_4^+ -N concentrations in samples 4, 5 and 6.

-Assuming unequal variance, a 2-tailed t-test revealed a significant difference between before and after NH_4^+ -N concentrations ($P = 0.017$).

Coliform:

-The E. Coli tests came back positive for every location including the control location.

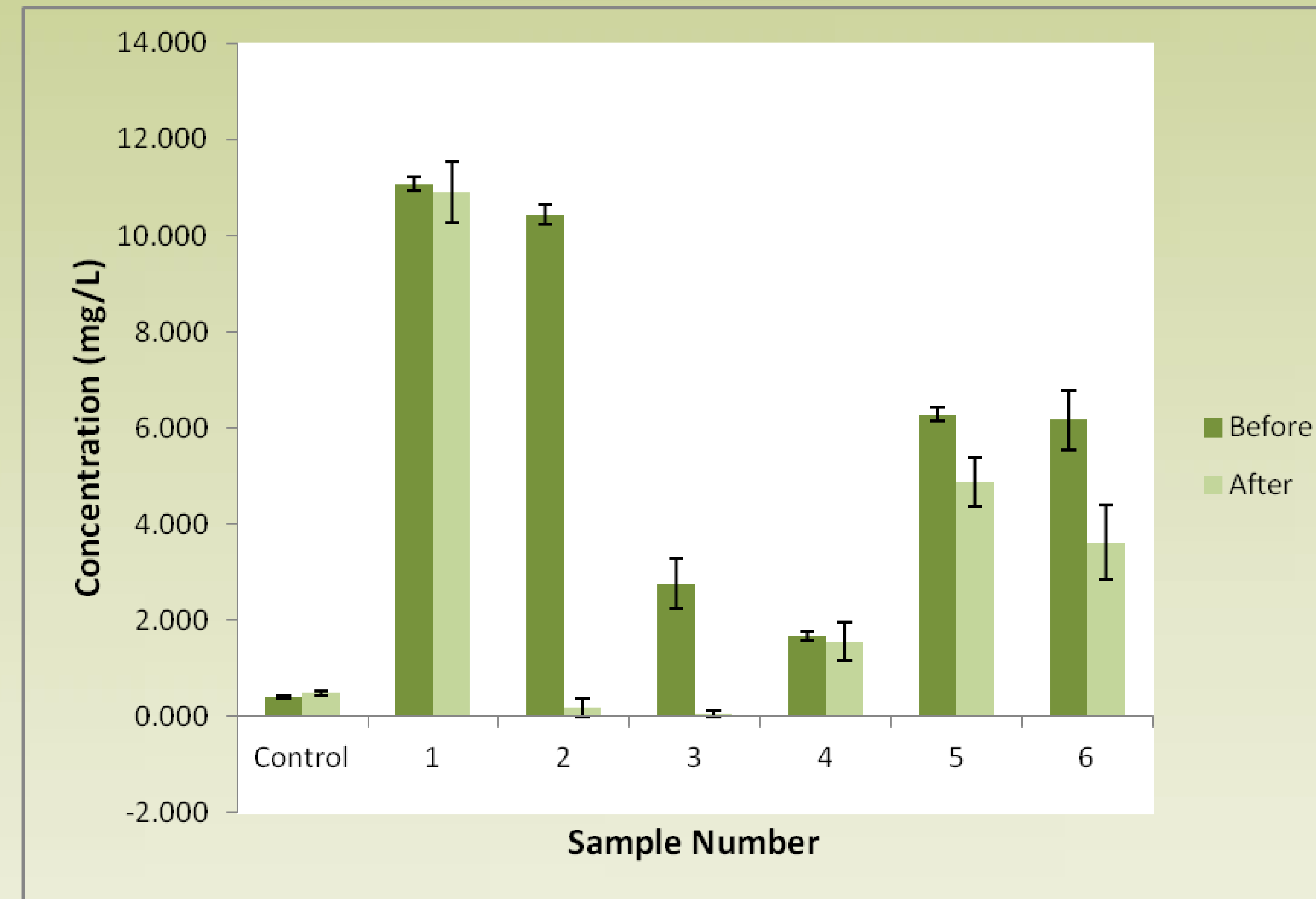


Fig. 1 Nitrate concentration (\pm standard deviation) of soil tested before and after weekend activity measured in mg/L

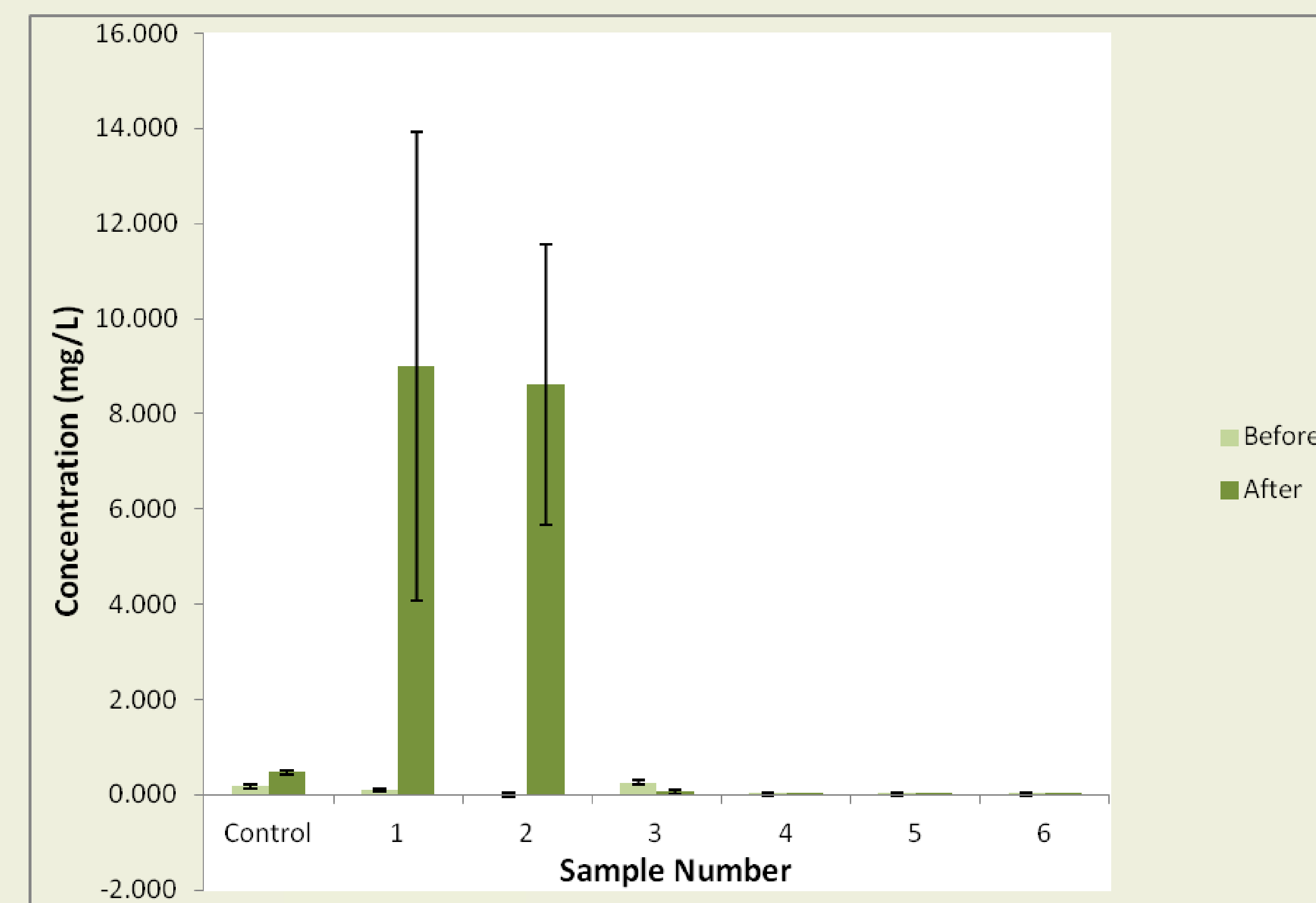


Figure 2: Ammonium concentration (\pm standard deviation) of soil tested before and after the weekend activity measured in mg/L

Discussion

-The decrease in NO_3^- -N concentrations between pre and post party samples could be from denitrification or from runoff washing NO_3^- -N away. For example, locations 3 and 4 are on a hill which is exposed to more runoff.

-Human urine is rich in N and NH_4^+ -N. Students will often relieve themselves outside, right above locations 1 and 2. These areas are constantly exposed to high levels of NO_3^- -N and NH_4^+ -N which would account for the increase in NH_4^+ -N concentrations in the post-party samples.

-Locations furthest from the deck showed little increase in NH_4^+ -N or NO_3^- -N concentrations because of their distance from the source. A combination of porous soil under the deck and little sloping ground up to these locations prohibit much of the urine to leave the immediate area.

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References

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