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.

**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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