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.

Acknowledgements

Special thanks to Dr. Melanie Vile and her lab technicians, Hope Fillingim, Kelly McMillen, & Kimberli Scott for help with sample analyses, and to the residents of the house for allowing us to complete our study. We would also like to thank Eric Wagner for last minute printing.

References

