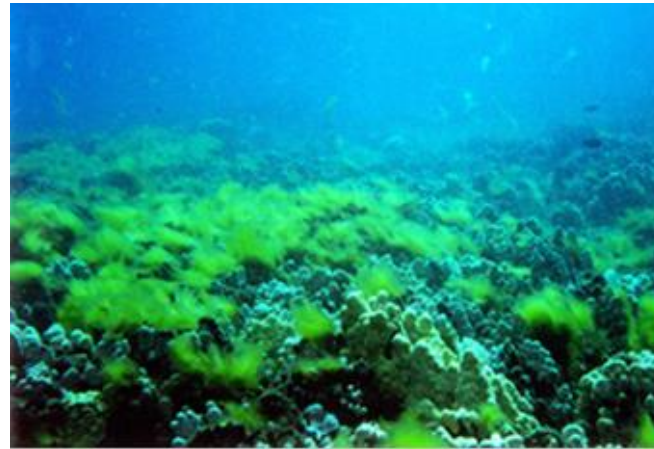


Soil On (a little bit) of Drugs

The effect of ultralow-dose antibiotics exposure on soil nitrate and N₂O flux

Stephanie DeVries

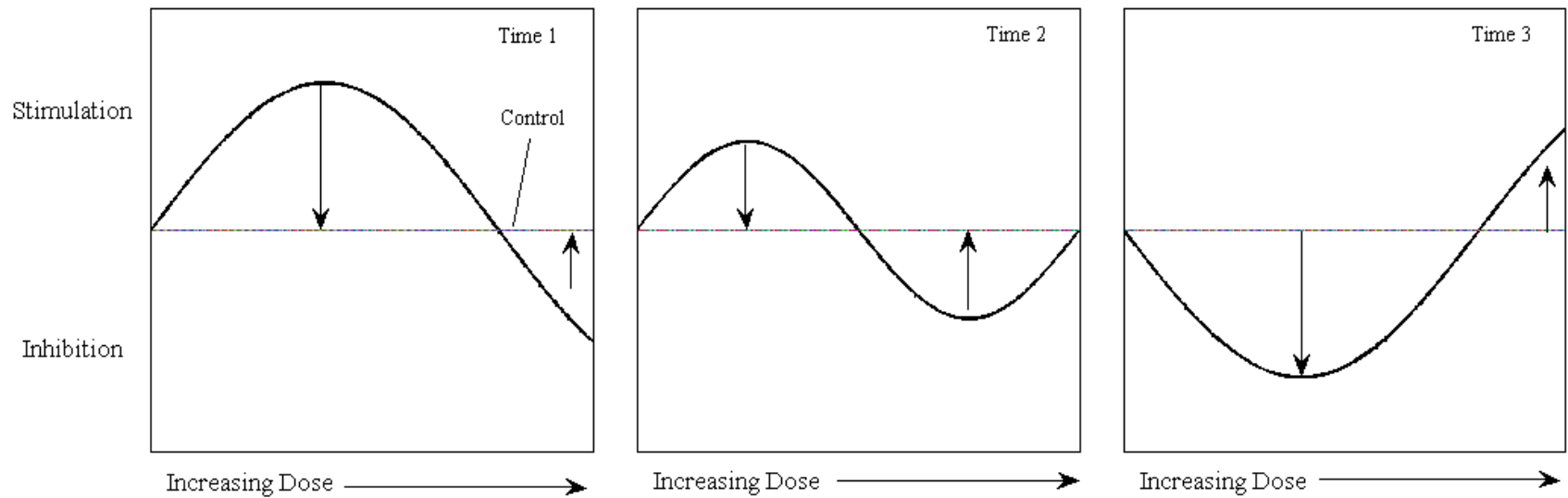
A little bit of history...



How does this affect the nitrogen cycle?

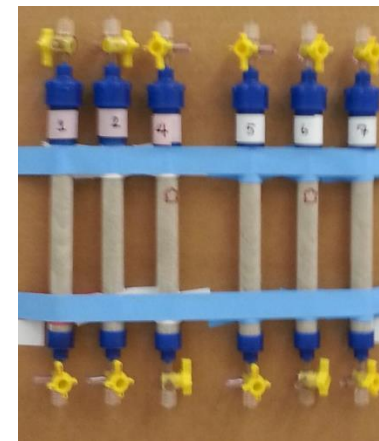
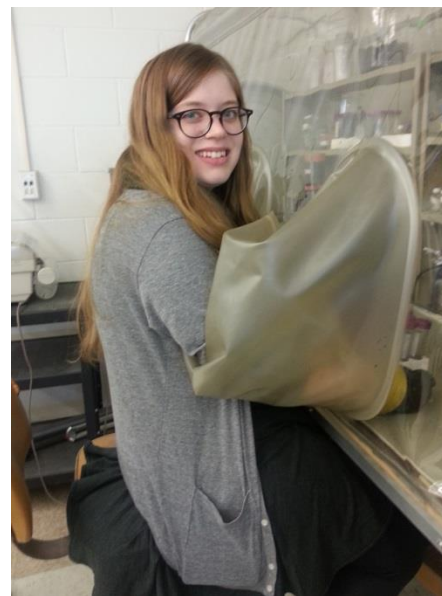


Hormesis?

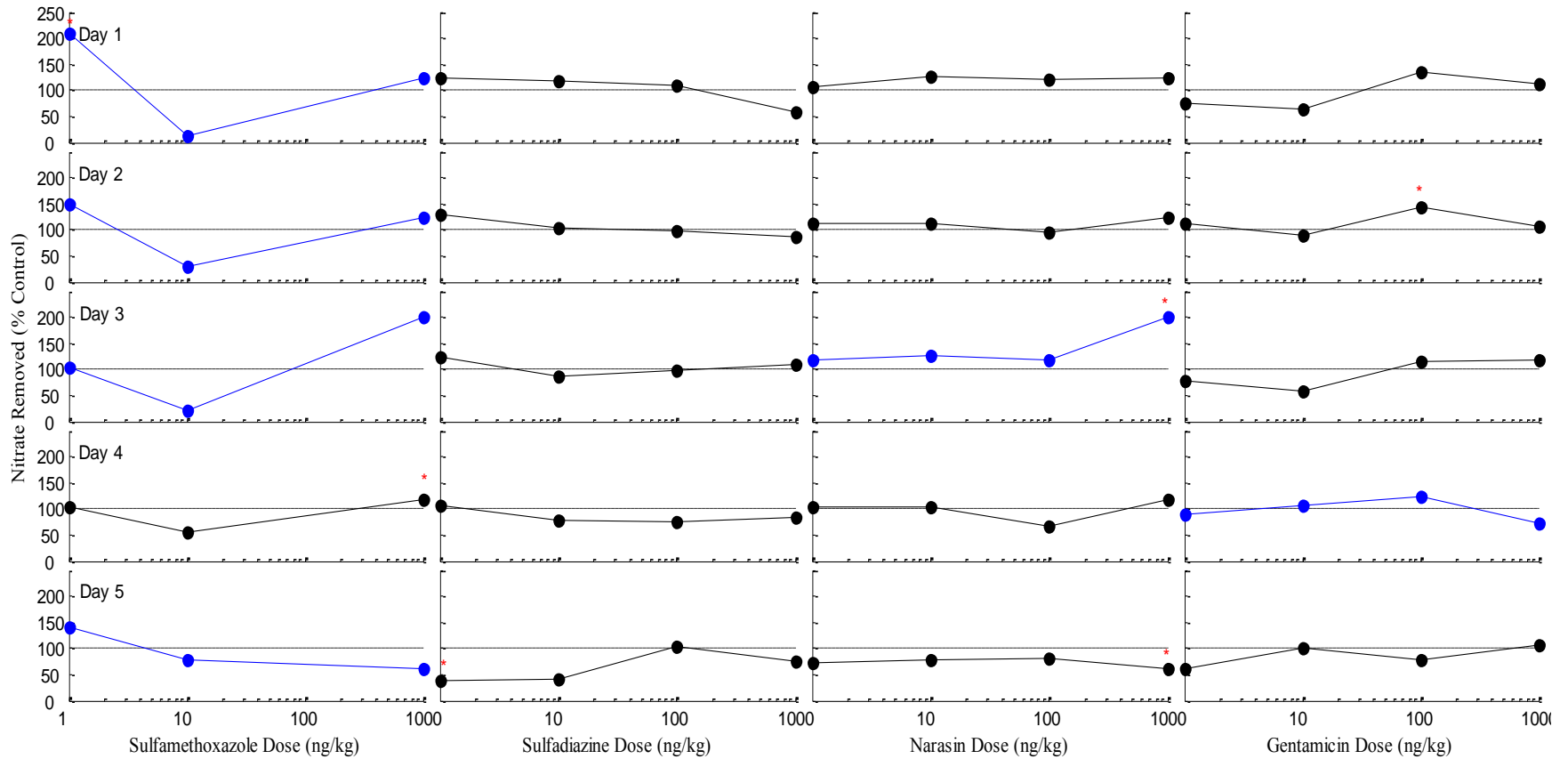


Three Experiments

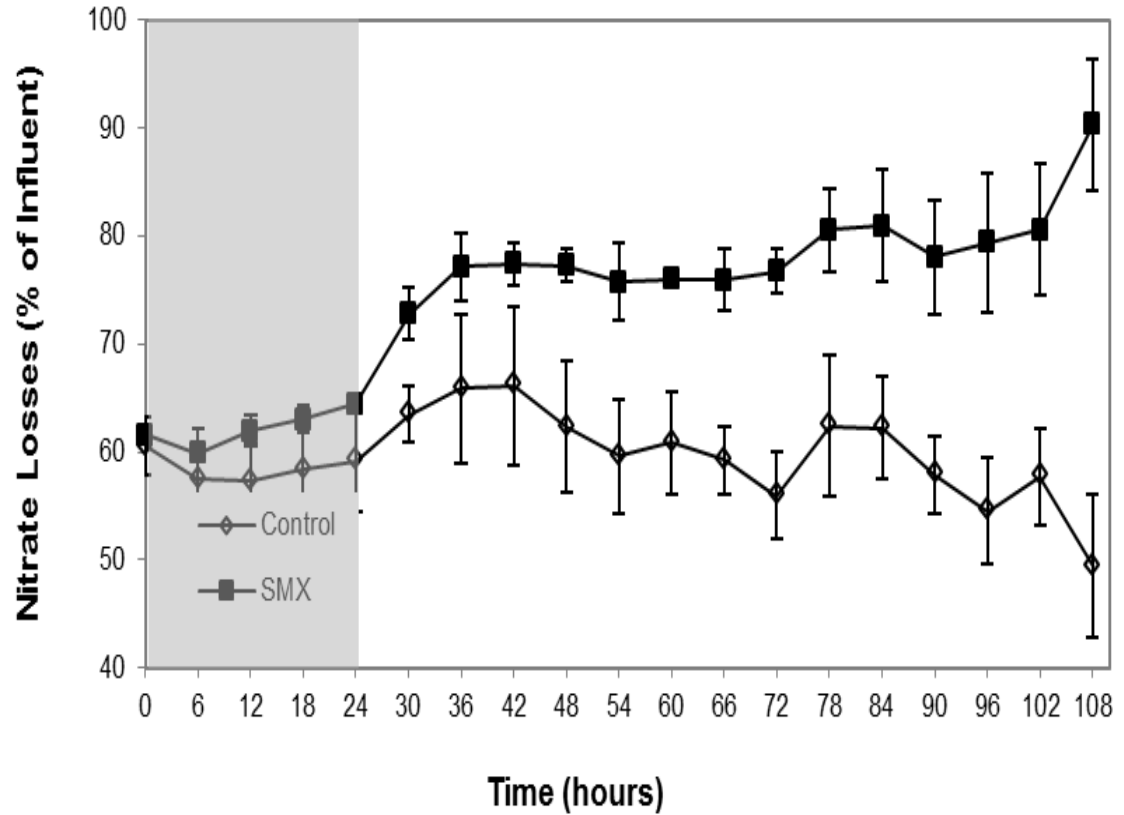
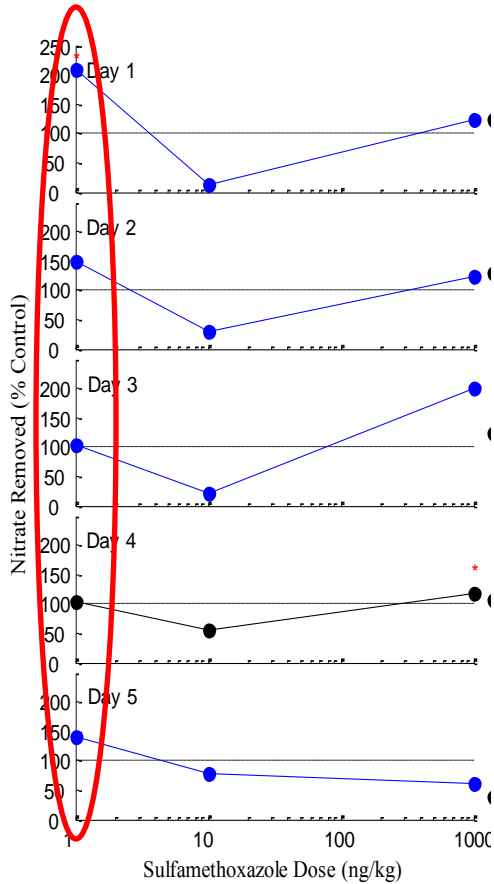
- Anaerobic denitrification in soils
- Anaerobic denitrification in column transport experiments
- N₂O flux from aerobic soils



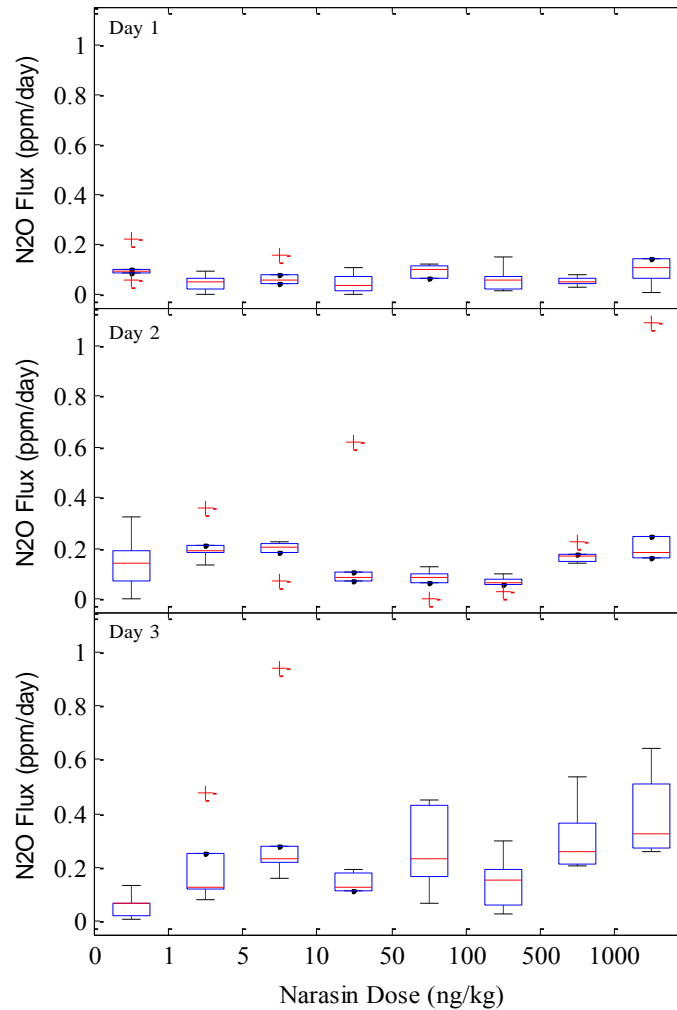
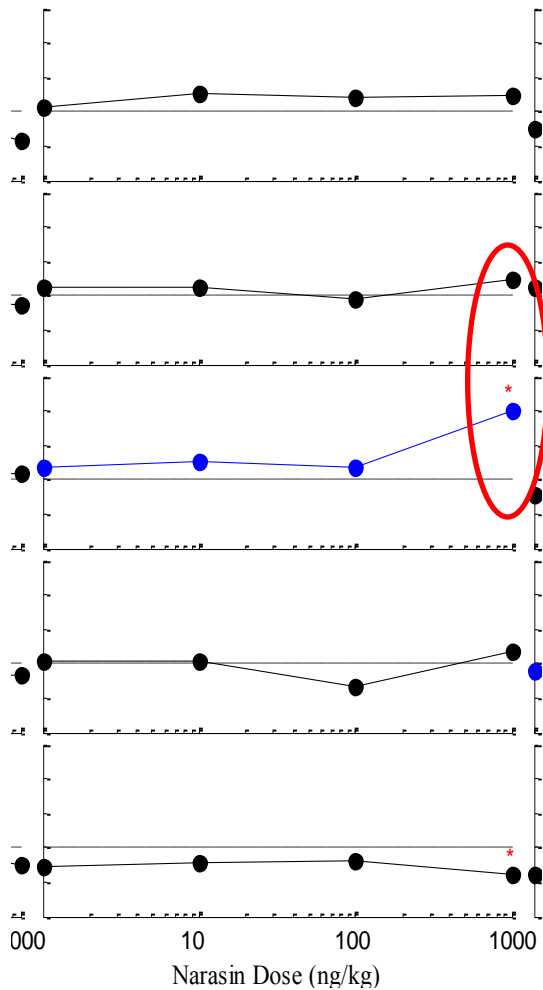
Nitrate Losses in Anaerobic Soils



Nitrate Removal in Anaerobic Columns



N₂O Flux from Aerobic Soils



Implications

- Environmentally relevant concentrations of antibiotics may have a measurable effect on the microbial N-cycle.
 - Increases in N_2O flux?
 - Changes to soil nutrient content and plant availability?
 - Changes in nitrate leaching potential from agroecosystems?

Future Directions

- Dose-response testing of nitrifying/denitrifying organisms.
- Additional incubation tests to explore a more diverse set of antibiotics.
- Long-term incubations – do short term impacts dissipate over time/adaptability of organisms?
- Field tests of N₂O flux.

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