

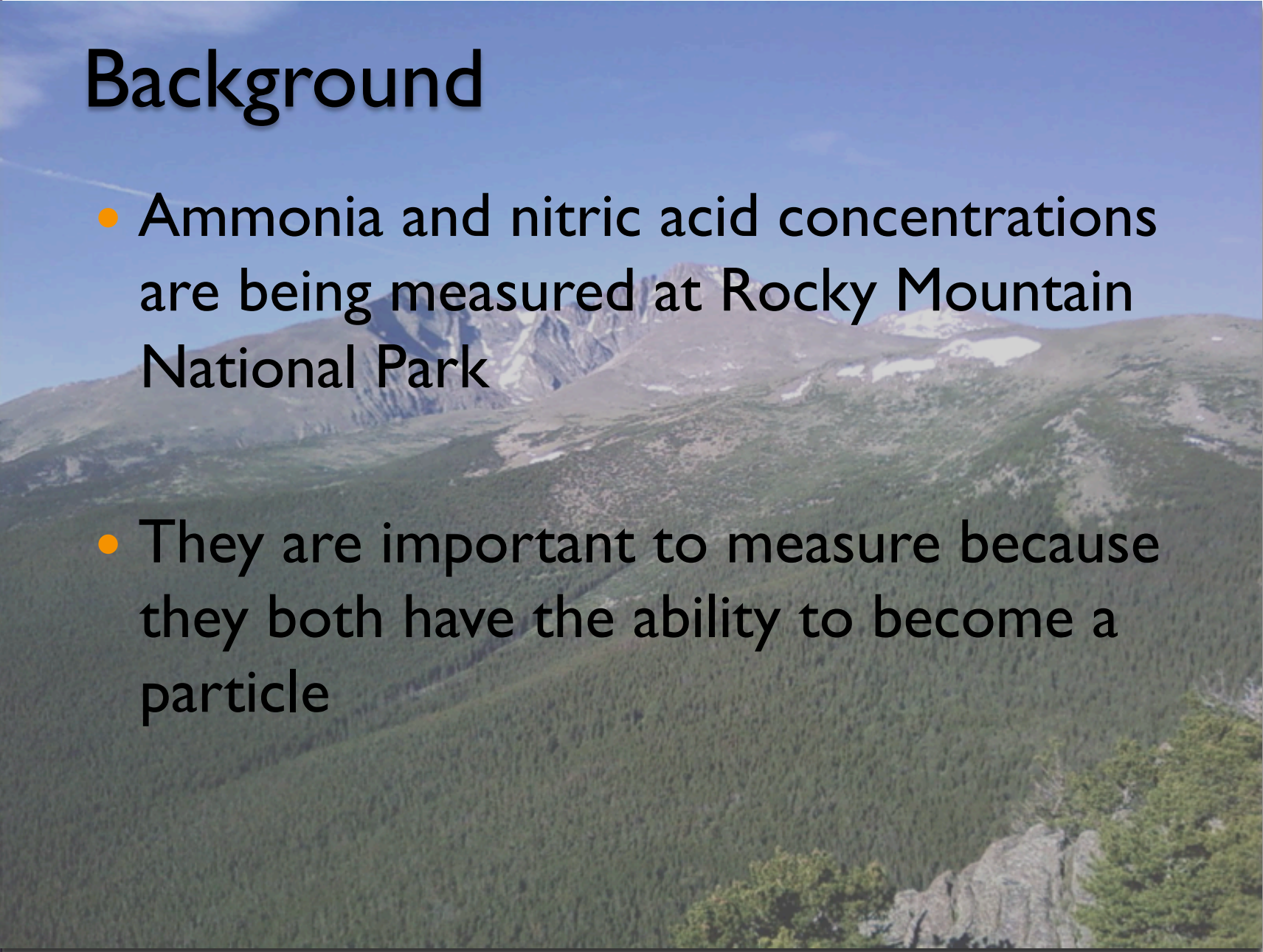


Lab and Field Testing of the Mist Chamber

By: Liz Huddle



Background

- Ammonia and nitric acid concentrations are being measured at Rocky Mountain National Park
 - They are important to measure because they both have the ability to become a particle
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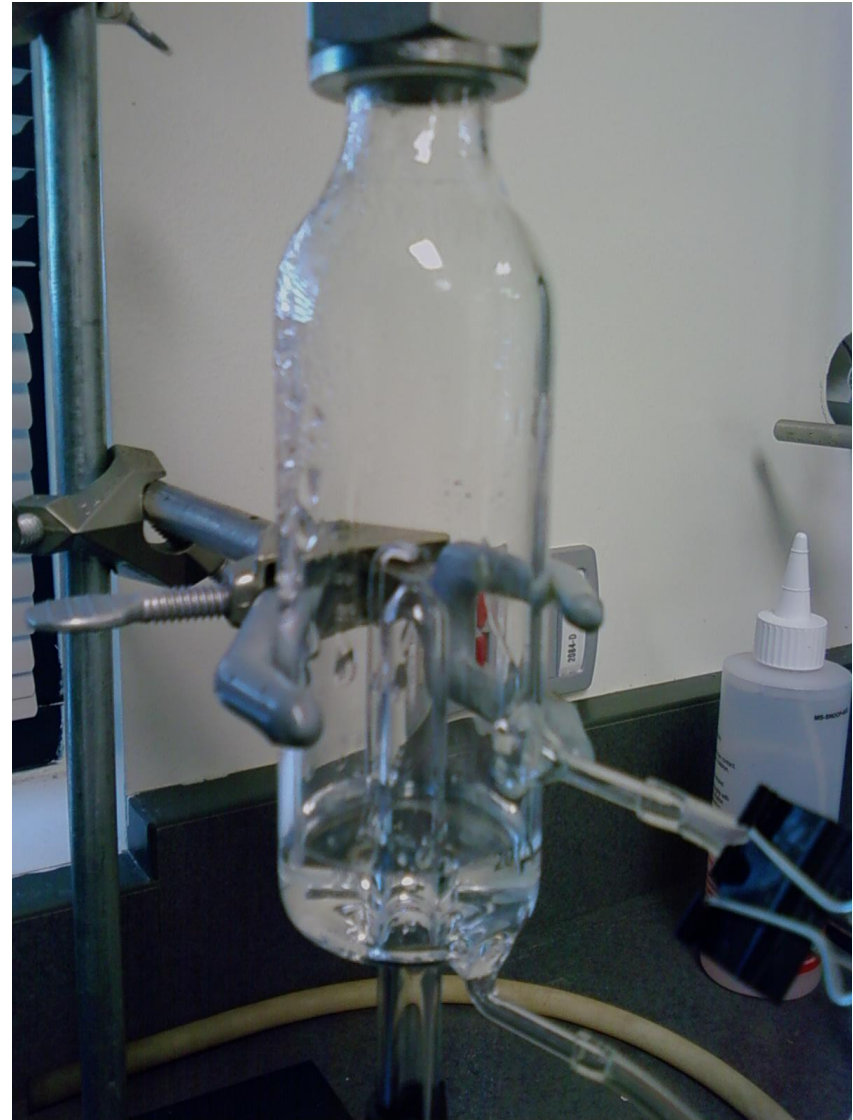
Motivation

- Currently, the concentration is being measured mainly by denuders

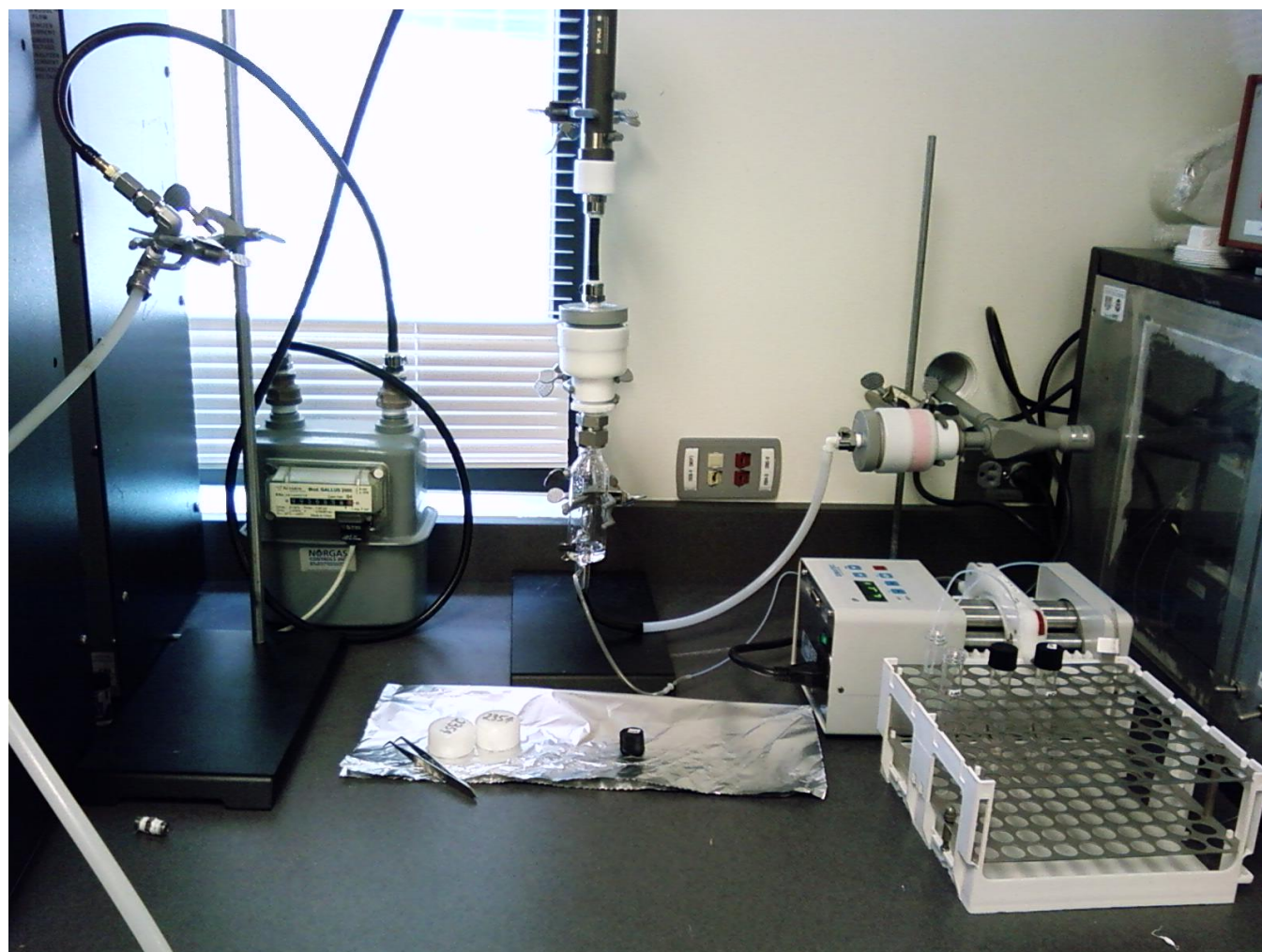


Motivation

- The mist chamber is an appealing alternative to denuders

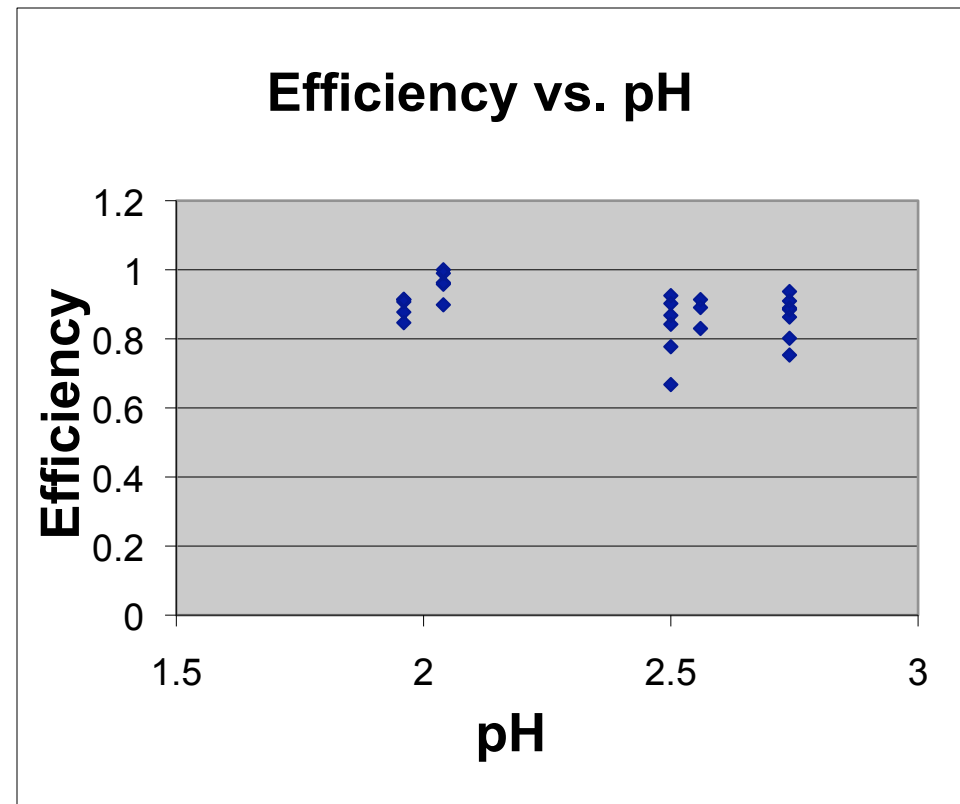


Experimental Set-Up



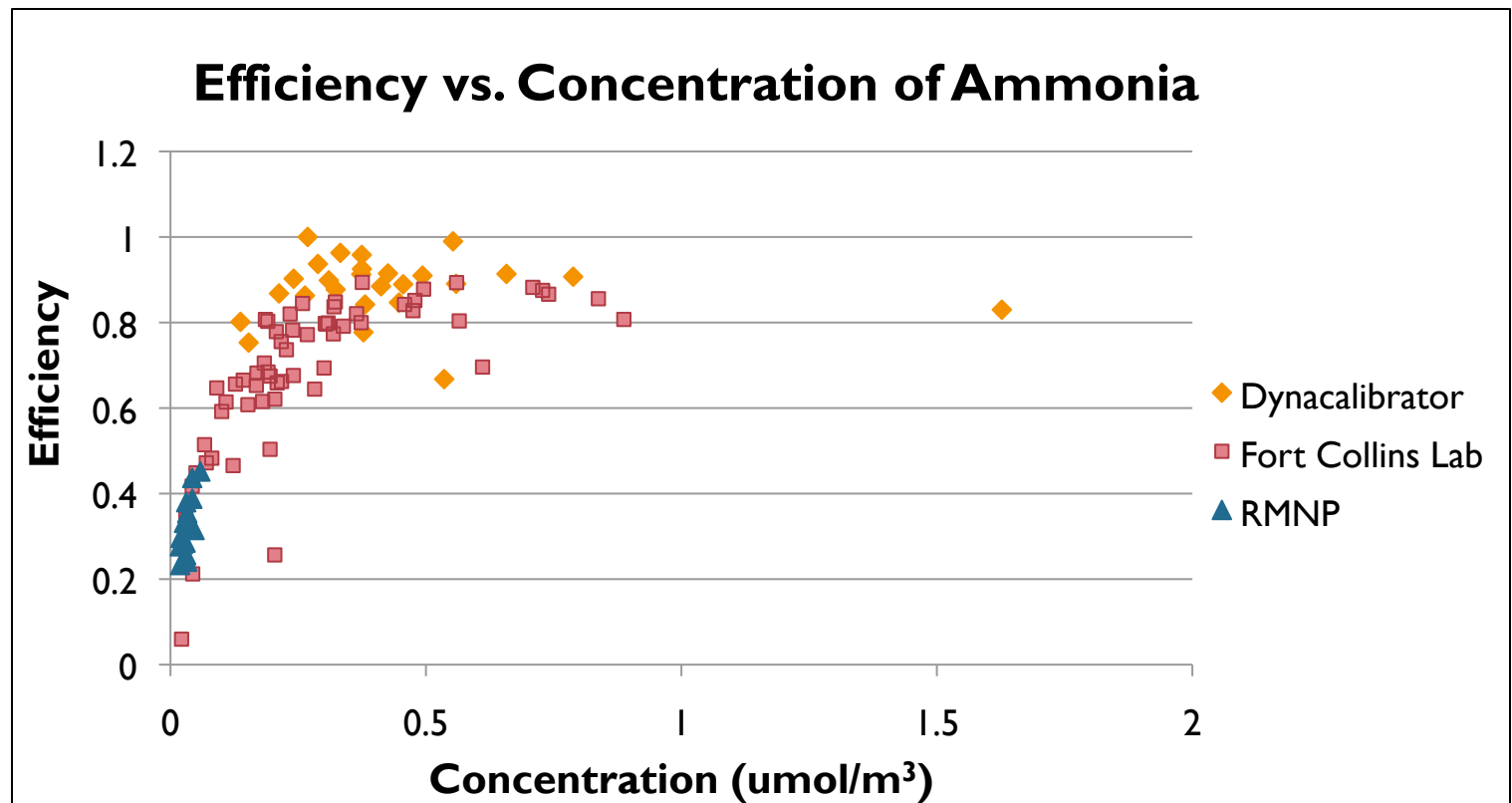
Trials and Results

- Variables such as pH, volume and temperature of the trapping solution were changed with out much effect
- It was decided that the trapping solution would have a pH of around 2.00, a volume of 10 mL, and be room temperature



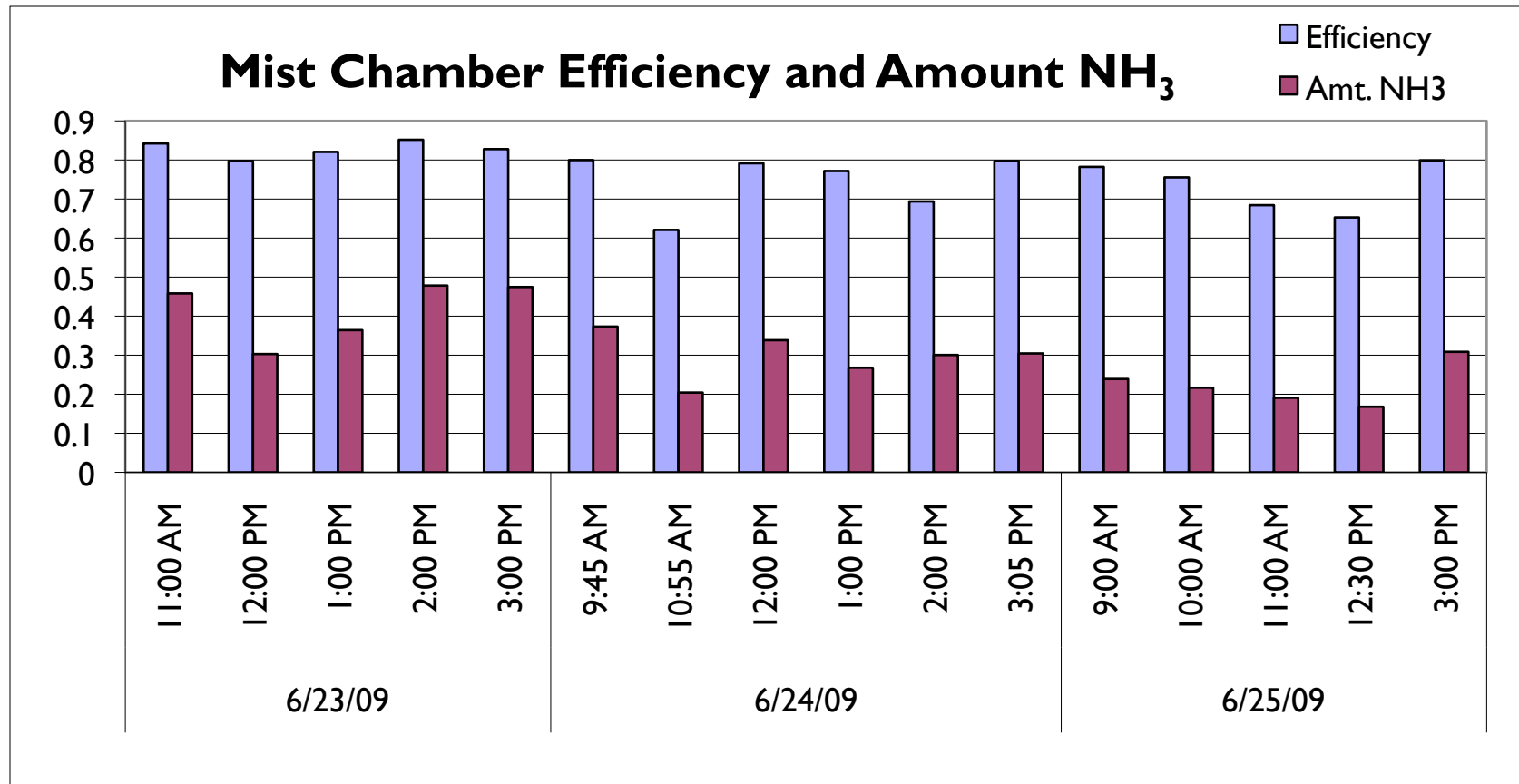
Results

- The concentration of ammonia varied by site and instrumentation



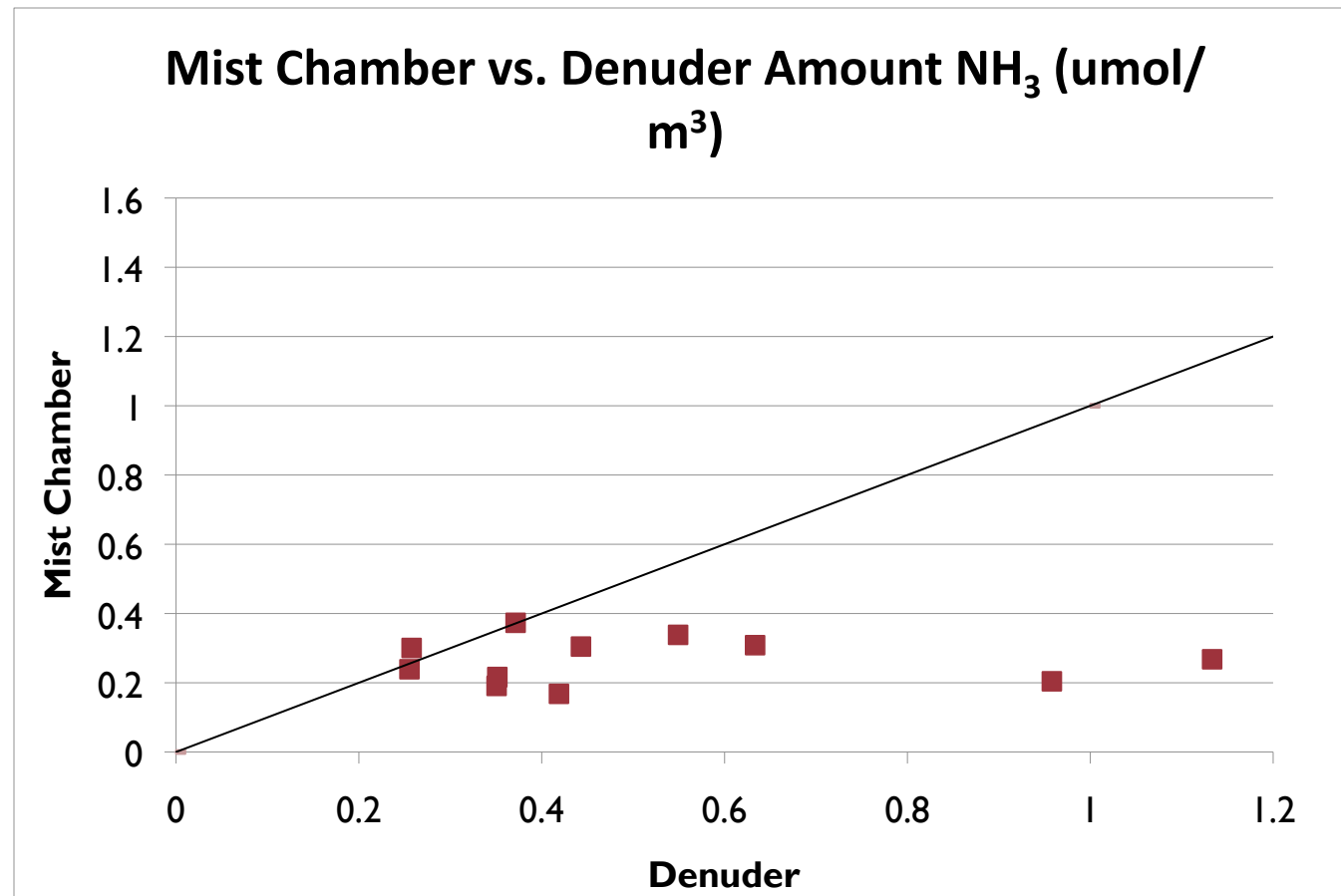
Results

- Throughout different trials, the mist chamber efficiency was directly correlated to the ammonia concentration



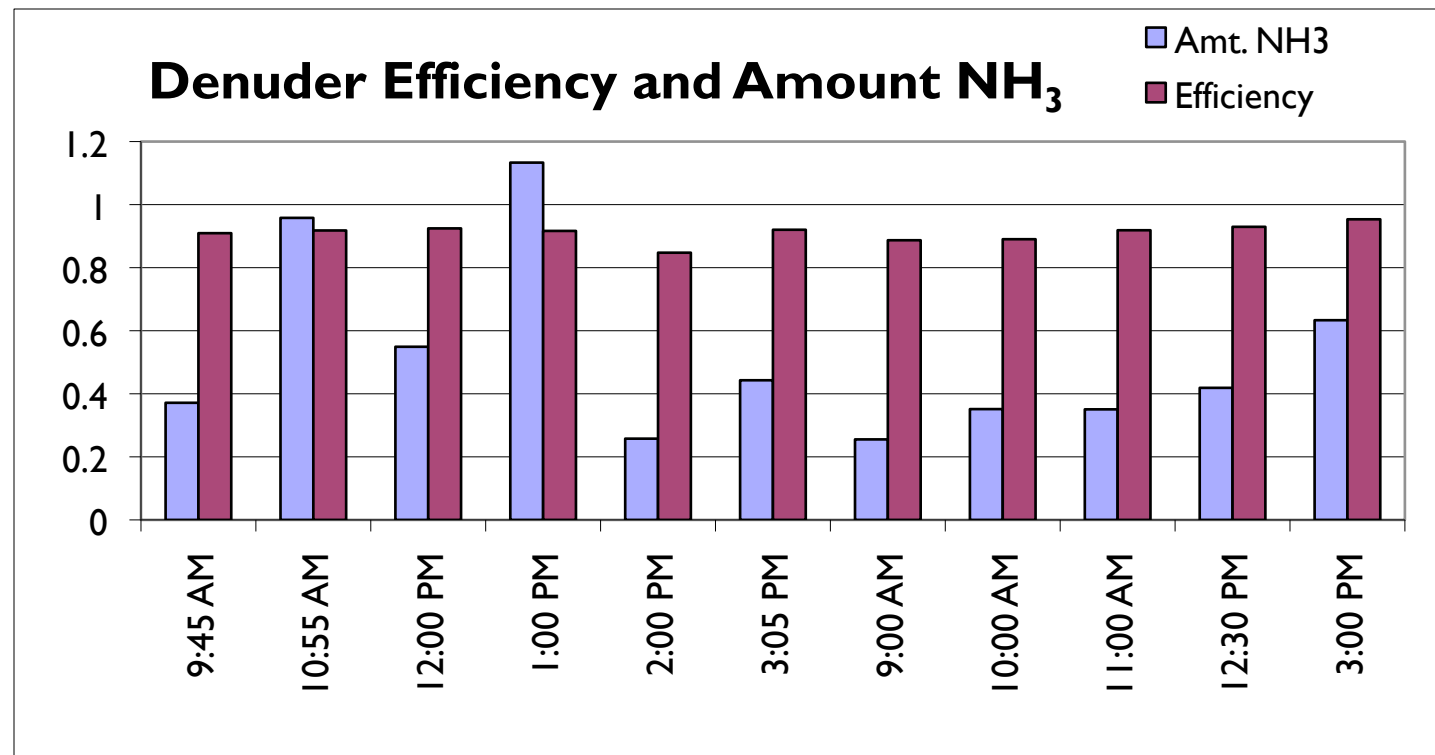
Results

- Denuders still detected more ammonia than the mist chamber



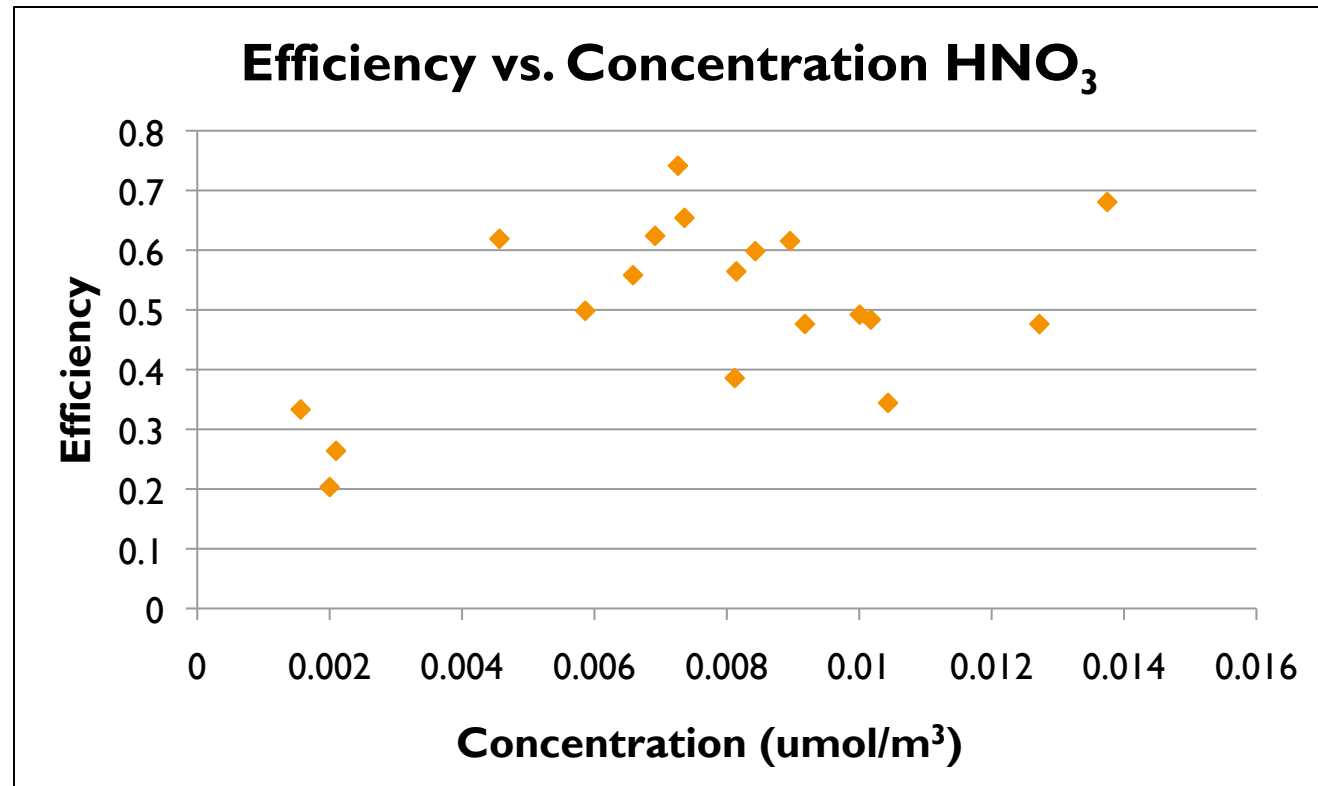
Results

- Denuders have a consistently high efficiency which is not dependent on concentration



Results

- The efficiency of nitric acid was not dependent on the concentration





Conclusion

- The mist chamber required less labor than the denuders but parameters must be better established for the mist chamber to confidently deploy it in the field
- Throughout this research, the mist chamber had lower efficiencies and was more inconsistent than denuders when sampling ammonia and nitric acid
- The mist chamber had low efficiencies when the concentration of ammonia was low but the same effect was not observed for nitric acid