

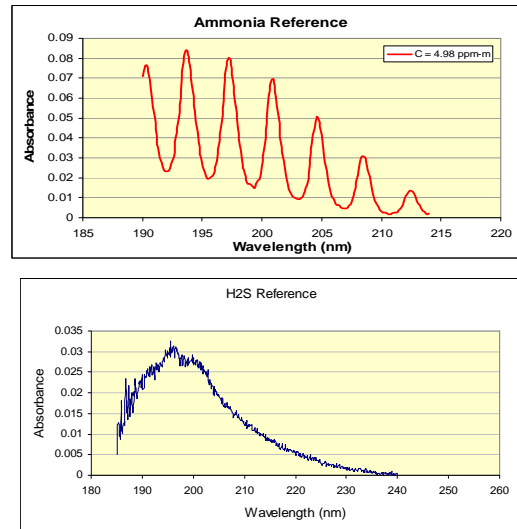
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- Research Scientist - University of Washington Dept. of Environmental Health
- Technical Consultant for Cerex: data analysis, air monitoring field support
- 14 years of experience in air pollution monitoring – remote sensing

UV Hound



Ammonia vs H₂S



Previous Dairy Research – West Coast

- University of California Davis - 1999
- Upwind and downwind ammonia concentrations were measured at two commercial dairies in the San Joaquin Valley in February and March of 1999.
- Dairy 1 – 6000 cows, Dairy 2 – 3300 cows

Results

- Ammonia concentrations exhibit diurnal pattern, with highest concentrations occurring between 1 – 6 pm.
- Dairy 1 downwind concentration range: 75 -1118 ppb
- Dairy 2 downwind concentration range: 37-873 ppb

Existing Ammonia Guidelines

- Minnesota Dept. of Health – Chronic 115 ppb
- Missouri Dept. of Natural Resources - 141 ppb one producer
- EPA Chronic – 100 ug/m³ (141 ppb)
- ATSDR acute – 500 ppb
- California (chronic annual) – 200 ug/m³ (287 ppb)
- Michigan (24 hr average) – 100 ug/m³ (141 ppb)
- Massachusetts (annual average) – 100 ug/m³ (141 ppb)

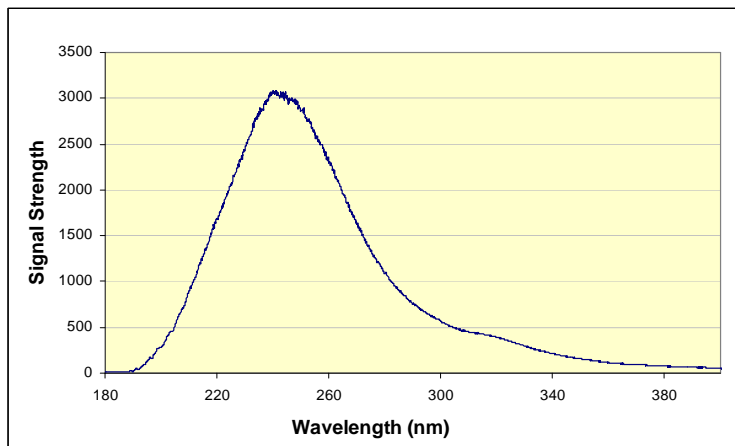
*Source Iowa CAFO study 2002 and Ontario Air Standards for Ammonia 2001

Washington State Dairy Monitoring

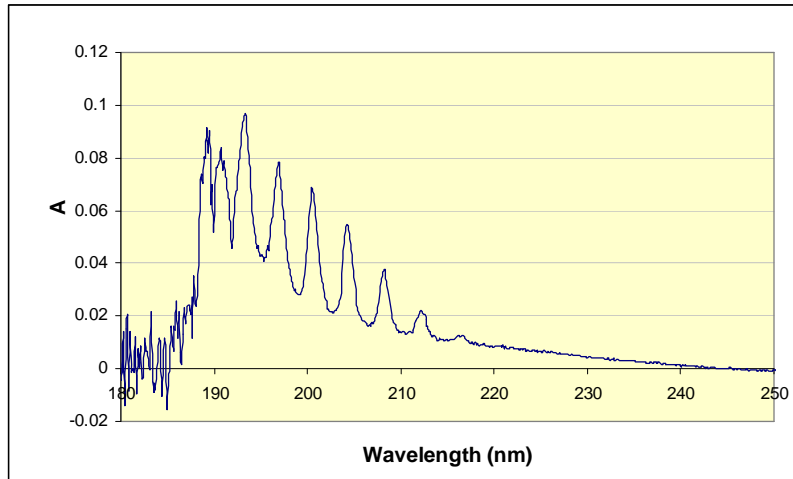
- Yakima Valley
- Dairy size: 2000 – 8000 cows
- All data from inside homes or resident's yards.
- Instrument: Cerex UV Hound
- Continuous 5 minute readings for several days at a time
- Spectra analyzed for Ammonia



UV Hound Spectra

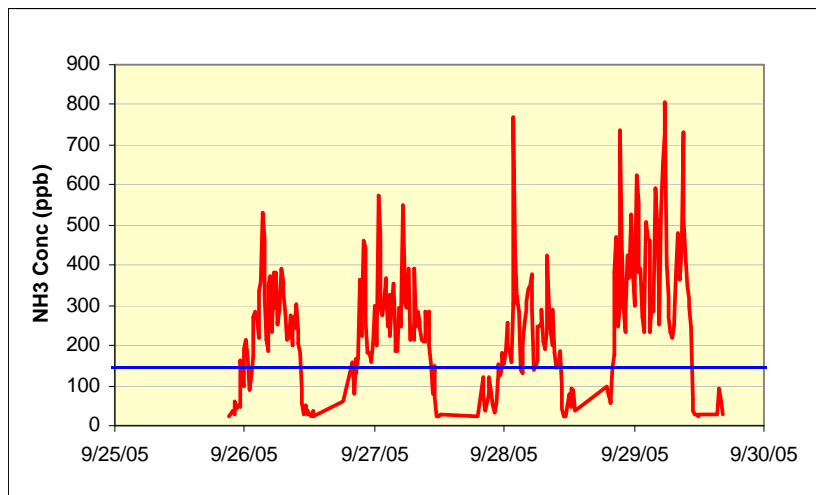


Absorbance Plot of Yakima Spectra



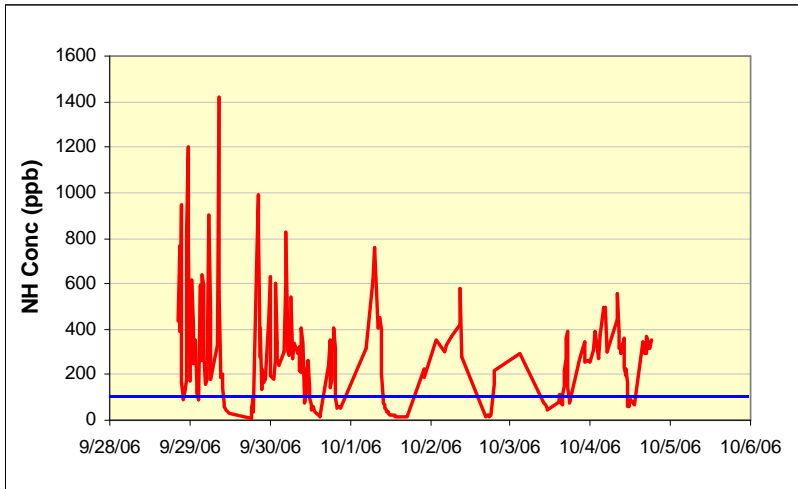
Yakima Results

blue line indicates EPA chronic exposure guideline (141 ppb)



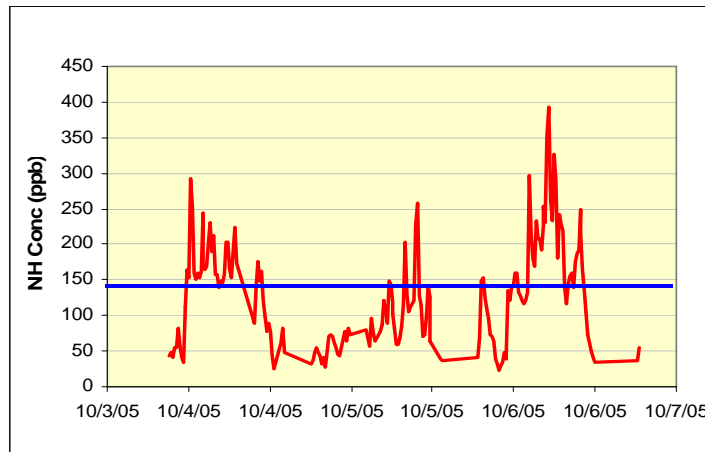
Yakima Results

blue line indicates EPA chronic exposure guideline 141 ppb



Yakima Results

blue line indicates EPA chronic exposure guideline 141 ppb



Yakima Results

red line indicates EPA chronic exposure guideline 141 ppb

