



Department of
Environmental
Conservation

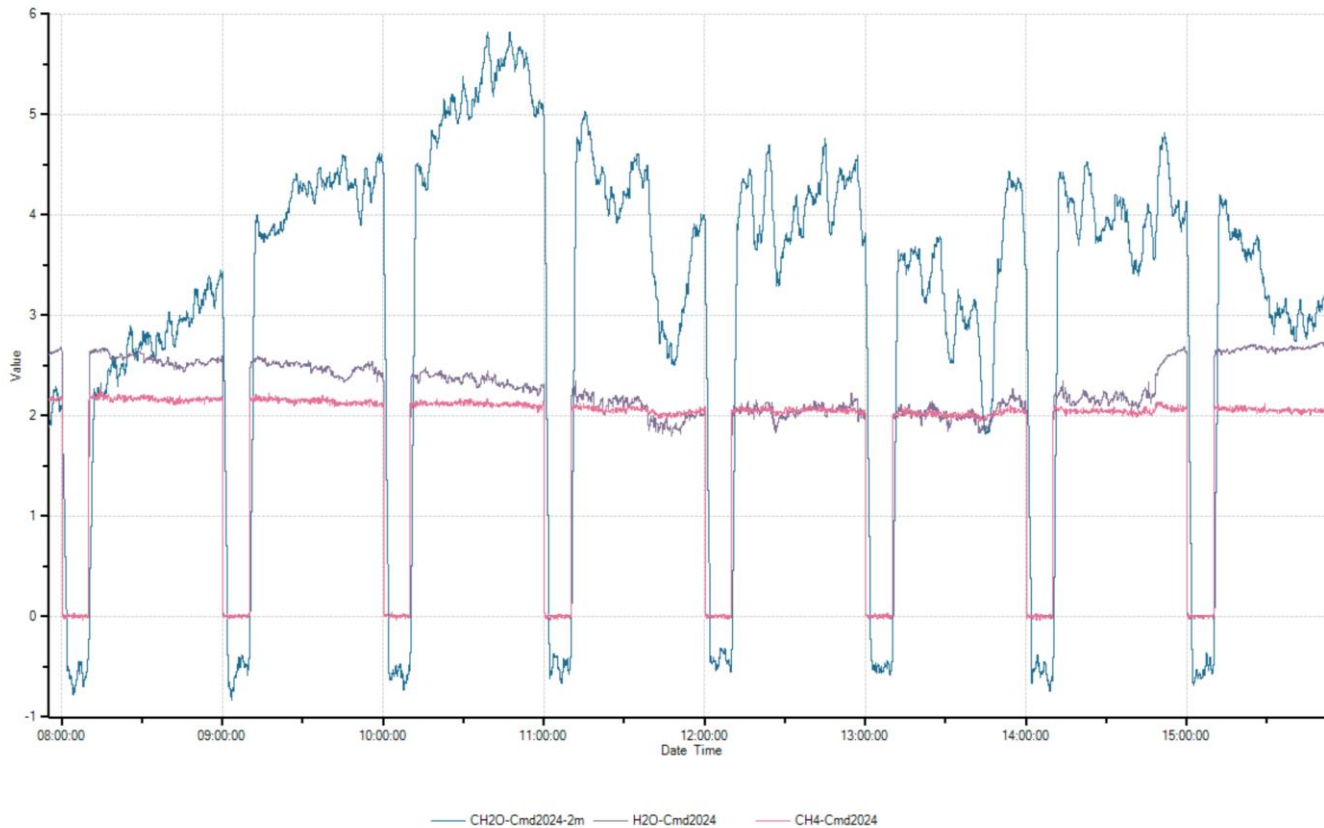


Field Calibration of Picarro G2307 HCHO Analyzers

New York State Department of Environmental Conservation
Division of Air Resources - Bureau of Air Quality Surveillance

NACAA Monitoring Steering Committee Meeting
January 30-31, 2024

Zero Drift - Resolution



Formaldehyde Field Calibration

Good News: Instrument is very linear and relatively stable

Bad News: Formaldehyde calibration gas cannot be diluted to ambient levels without at least 15-20% loss

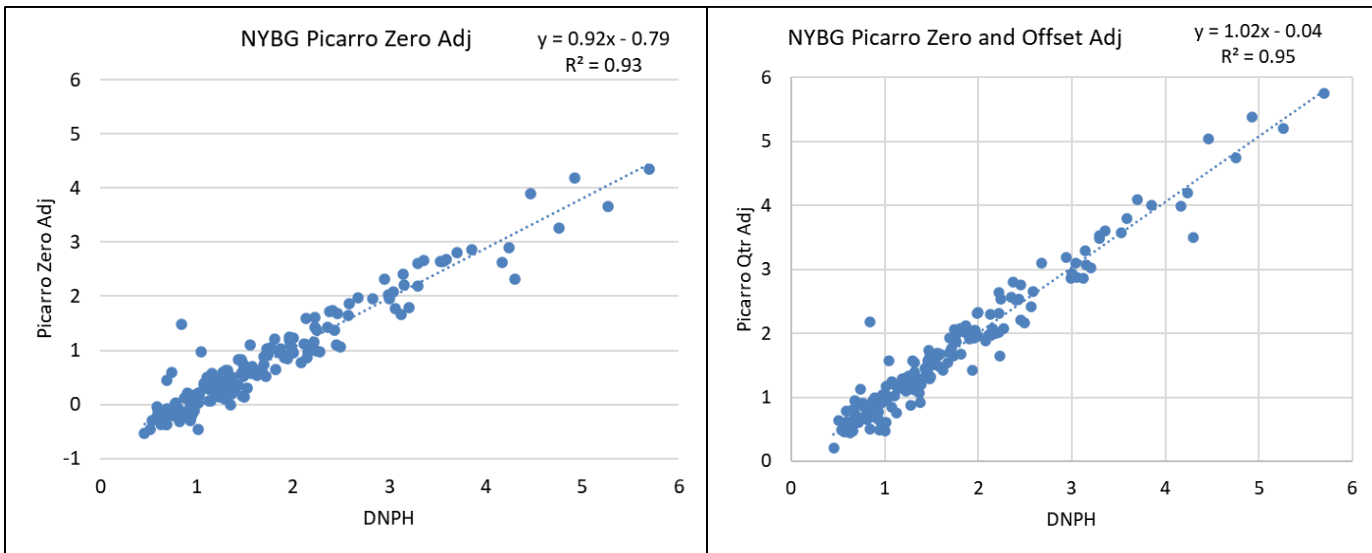
May 2022 - Picarro used certified cylinders at 500, 1000 and 2000 PPB to determine a traceable calibration factory calibration span value (1.168)

In comparison to DNPH, the new span value improves the slope but does not correct for the intercept

Collo 1-in-6 Day DNPH data are used to adjust (re-scale) the intercept on a quarterly basis (average difference)

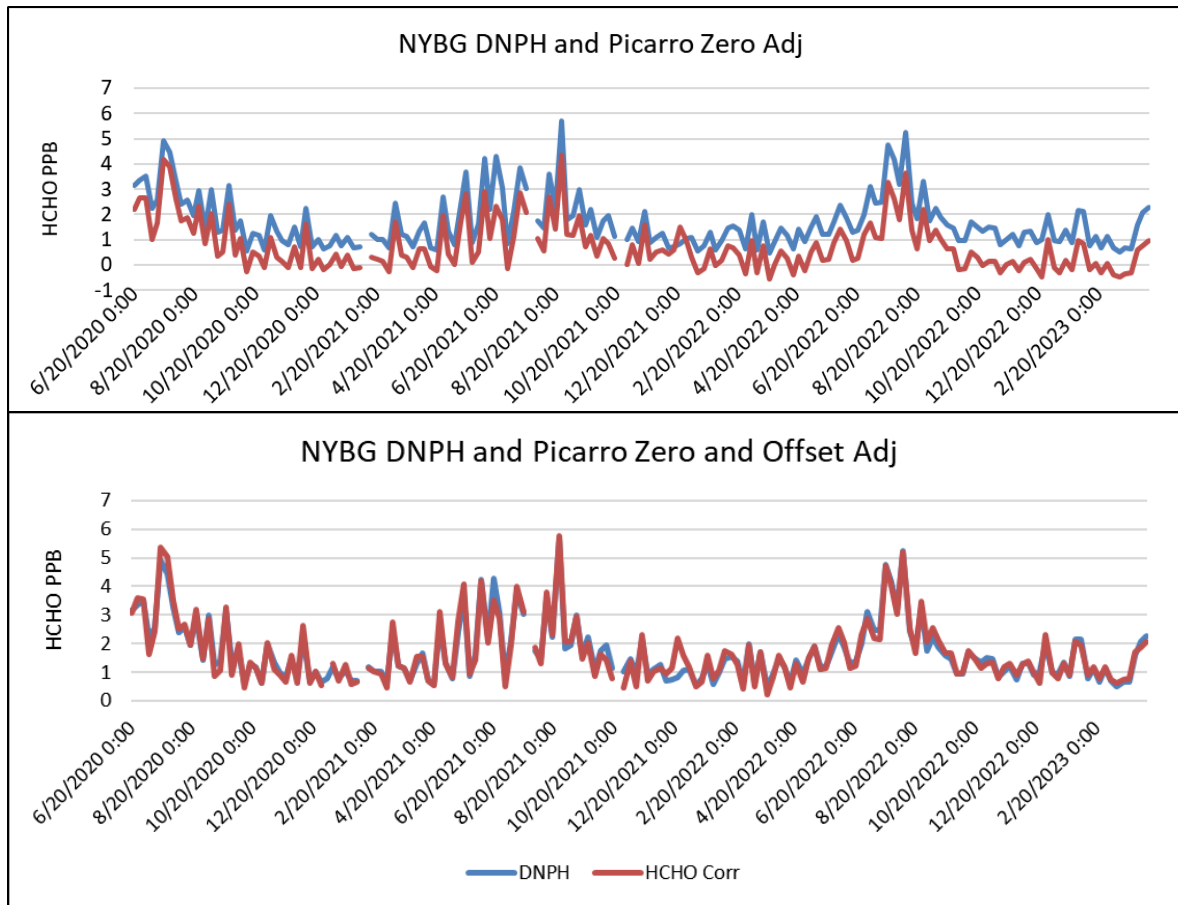


Scatter 24-Hr Values



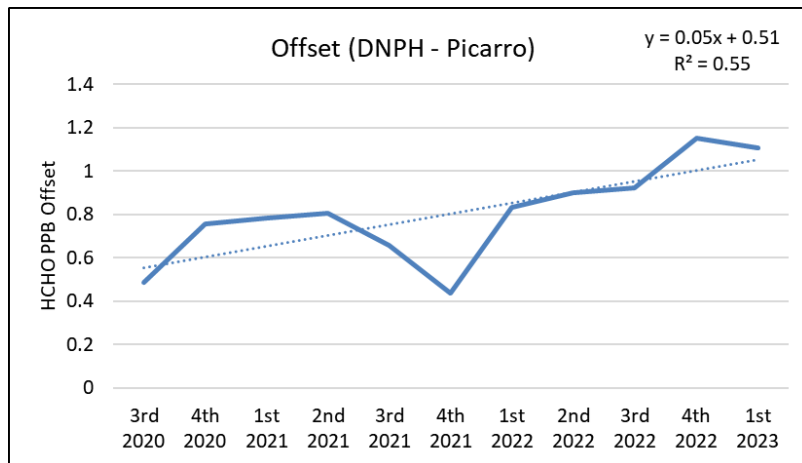
172 (24-Hour) pairs – DNPH 1-in-6 Day
all data, no outliers removed

Time Series 24-Hr values



Calibration Stability

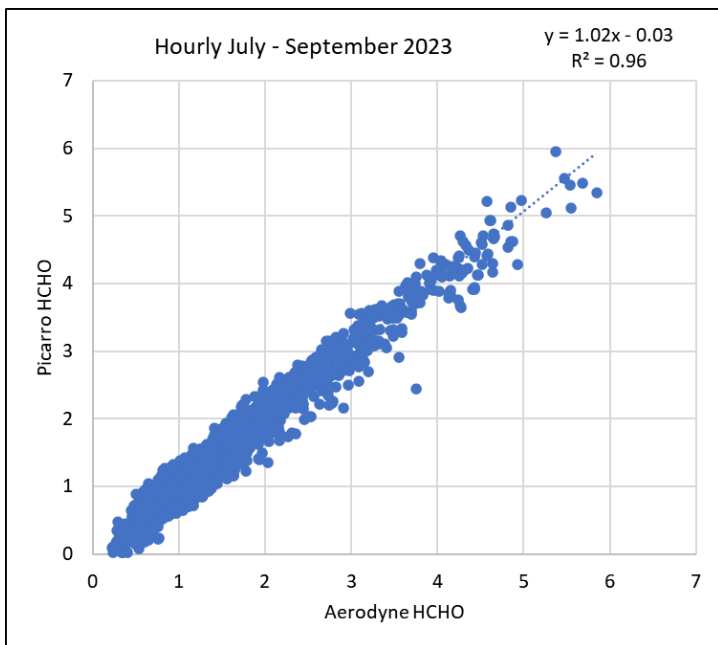
The offset (DNPH – Picarro) does change. At the Bronx PAMS site, the offset has increased over 2.5 yrs. This could be due to the Picarro losing sensitivity or the inlet system could be scrubbing some of the incoming HCHO.



The Picarro should not be operated indefinitely without a suitable calibration reference

3rd Party Verification 1-Hr values

An Aerodyne TDL was operated at Flax Pond last summer as part of the LISTOS campaign

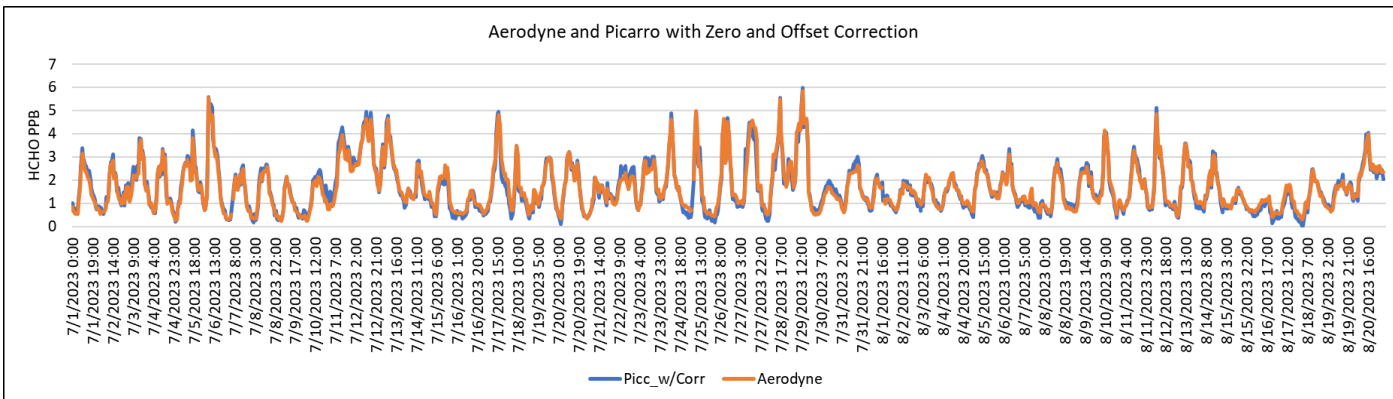


The zero and offset adjusted 1-Hr Picarro data are more than adequate for use in ozone modeling and source attribution studies

The Picarro hourly data are within about ± 0.3 ppb of the Aerodyne

3rd Party Verification 1-Hr Values

The zero and offset adjusted 1-Hr Picarro data are nearly indistinguishable from the Aerodyne



Thanks and Acknowledgements

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Thank You

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