

## Abstract

In the past five years, important updates have taken place in the Central Analytical Laboratory (CAL). In the fall of 2007, the bucket cleaning room was moved to a refurbished and expanded area, which allowed the CAL to purchase and start using two new washers for cleaning buckets, lids, and bottles. In the summer of 2010, a new flow injection analysis instrument (FIA) was purchased. The new instrument is capable of doing low flow analysis as well as the method currently run at the CAL. Both methods on the new instrument were tested and results compared to the current method on the original FIA. In the summer of 2011, a new system and autosampler was purchased for ion chromatography (IC). With the AS-40 autosamplers which are currently used, the new ICS-5000 system is being tested and the results compared with the ICS-2000 systems. The new AS-AP autosampler was also tested on the ICS-2000 systems and results compared to the ICS-2000 systems with the AS-40 autosamplers. Purchases such as these new instruments are important developments and show that the CAL is striving to progress and move forward along with the changing technology, while at the same time maintaining the standards of accuracy and precision which the lab already adheres to.

## New IC and autosampler

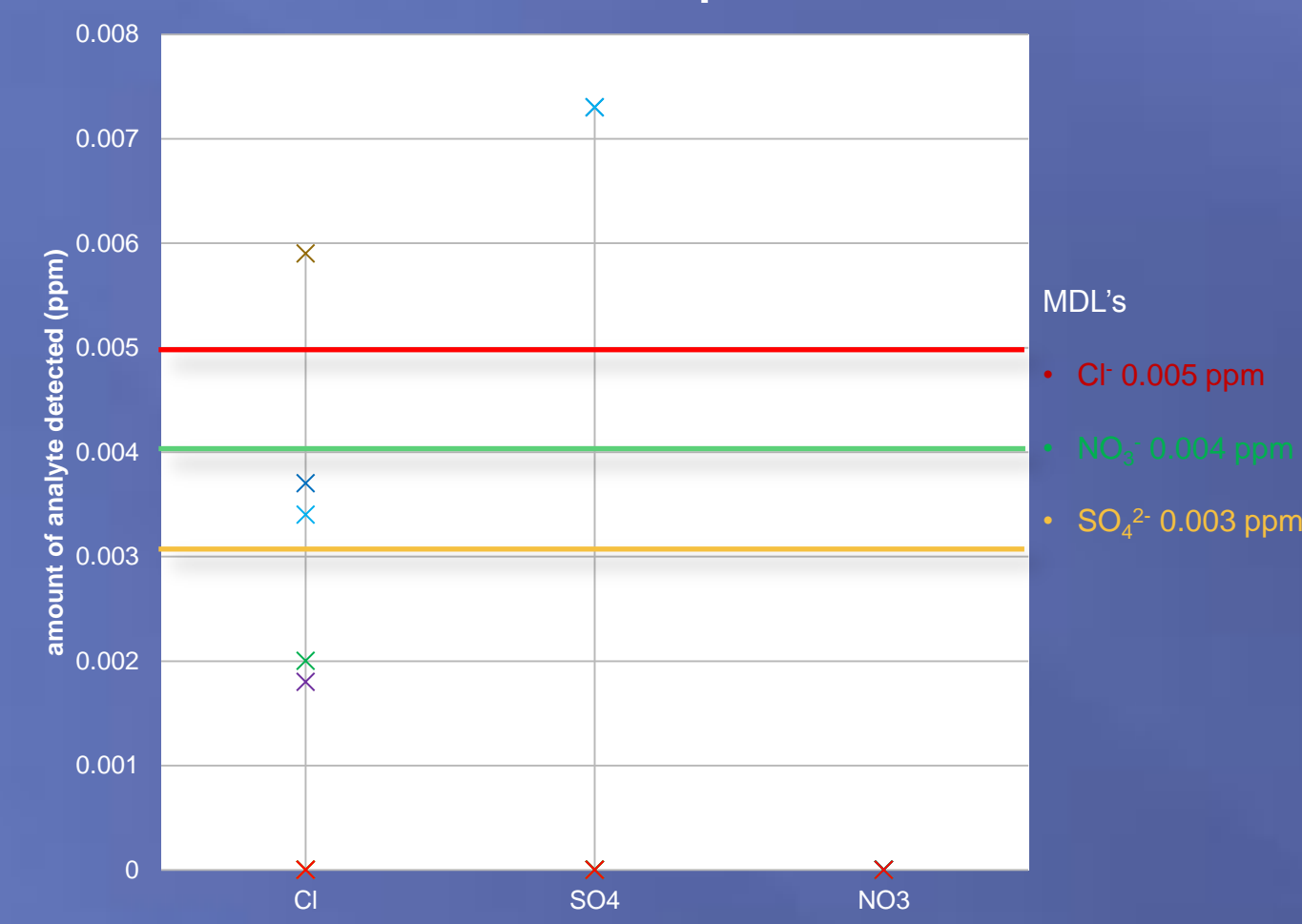
A new ICS-5000 system and AS-AP autosampler were purchased in the summer of 2011.

When analyzing DI water in the vials manufactured for the ASAP autosampler, the background of sulfate and chloride routinely exceed our current detection limits.



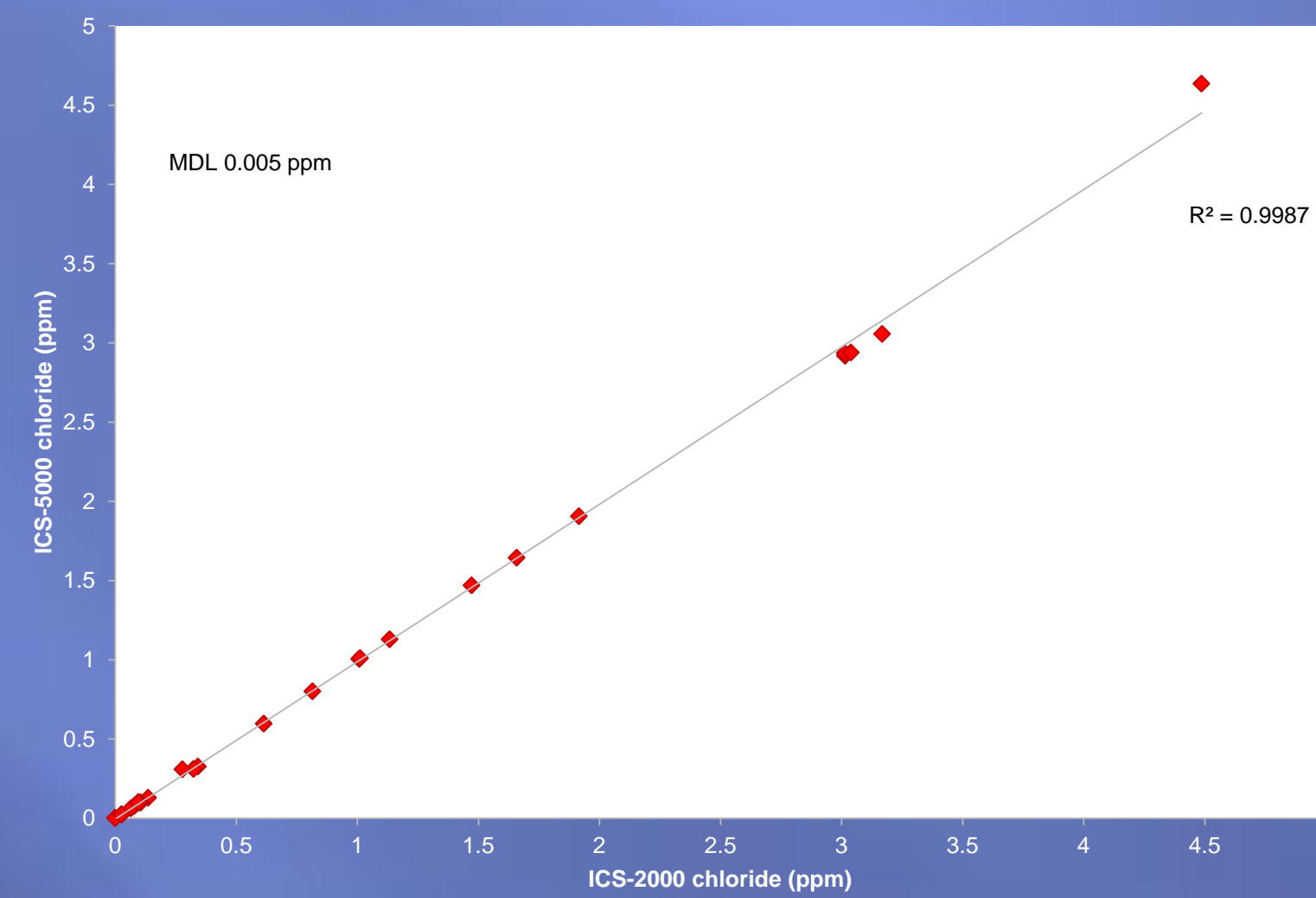
2 Models ICS-2000 (2004)

DI Water Samples Analyzed Using the ASAP Autosampler

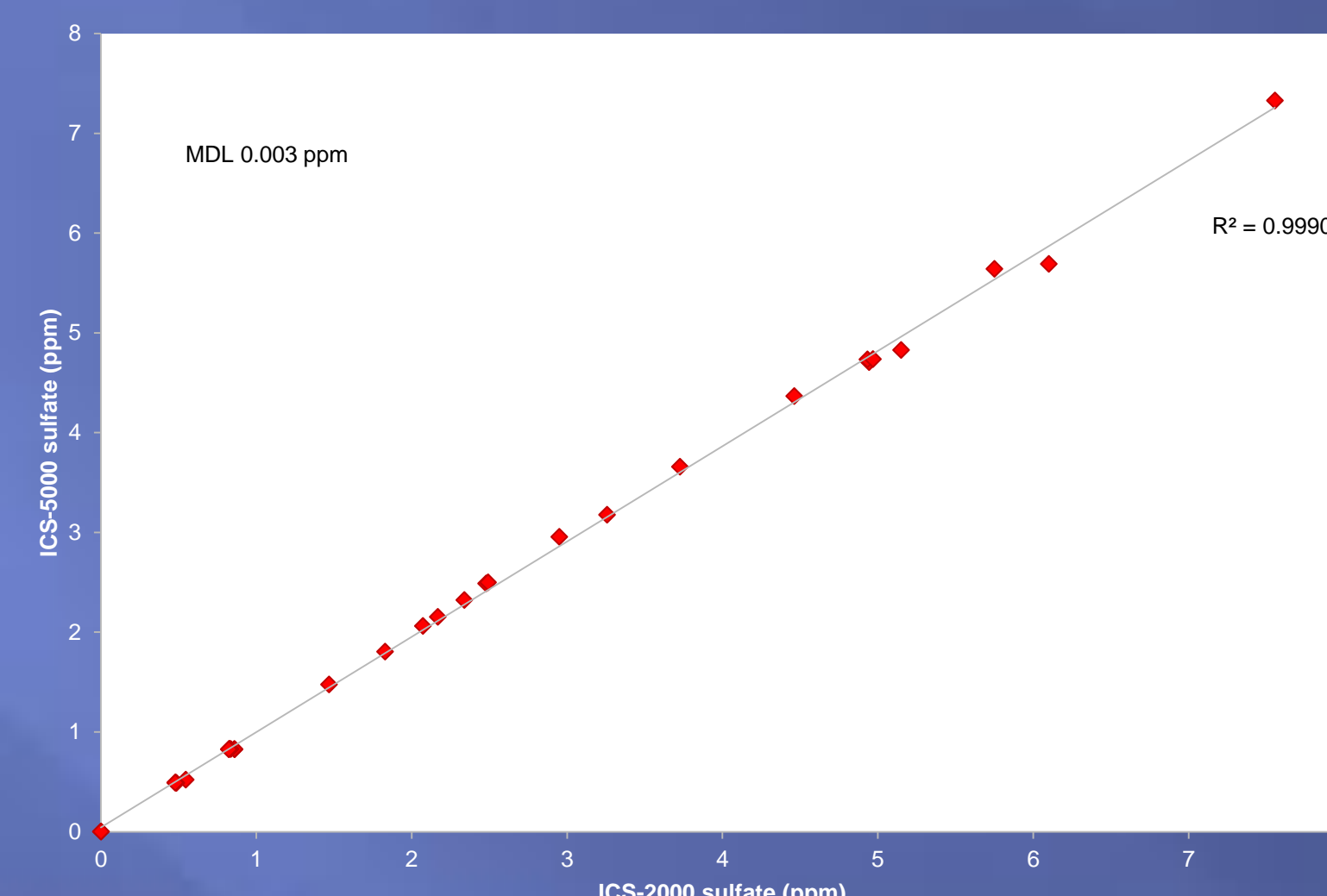


ICS-5000 (2011)

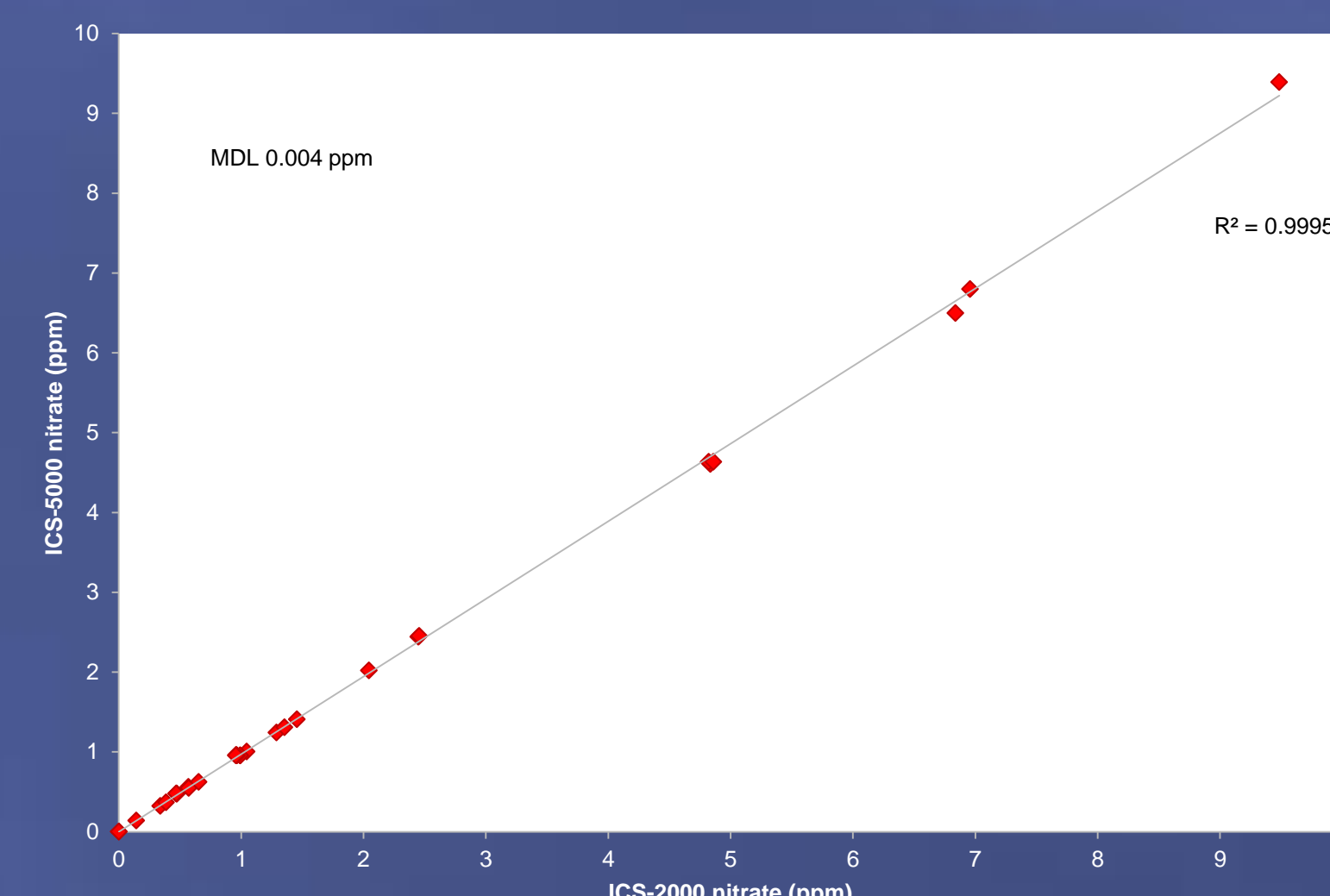
ICS-5000 vs ICS-2000 Chloride



ICS-5000 vs ICS-2000 Sulfate



ICS-5000 vs ICS-2000 Nitrate



The ICS-5000 is being tested and results are comparable to the ICS-2000 using the AS-40 autosampler.

## New Bucket Washers

- ❖ Two new washers started being used in fall of 2007.
- ❖ Four buckets can fit in each washer at one time, which doubled our total washing capacity.
- ❖ The washers feature heated wash and rinse cycles.



Forma Fury Model #8887 (1982) replaced in 2007



Thermo Forma Fury Model #8891

# Recent Updates in the CAL

Kim Attig, Nina Gartman, Lee Green, and Tracy Dombek  
National Atmospheric Deposition Program  
Central Analytical Laboratory (CAL)  
Illinois State Water Survey  
Institute of Natural Resource Sustainability  
University of Illinois at Urbana-Champaign  
Champaign, IL 61820; attig@illinois.edu



CAL Staff (1982) replaced in 2010



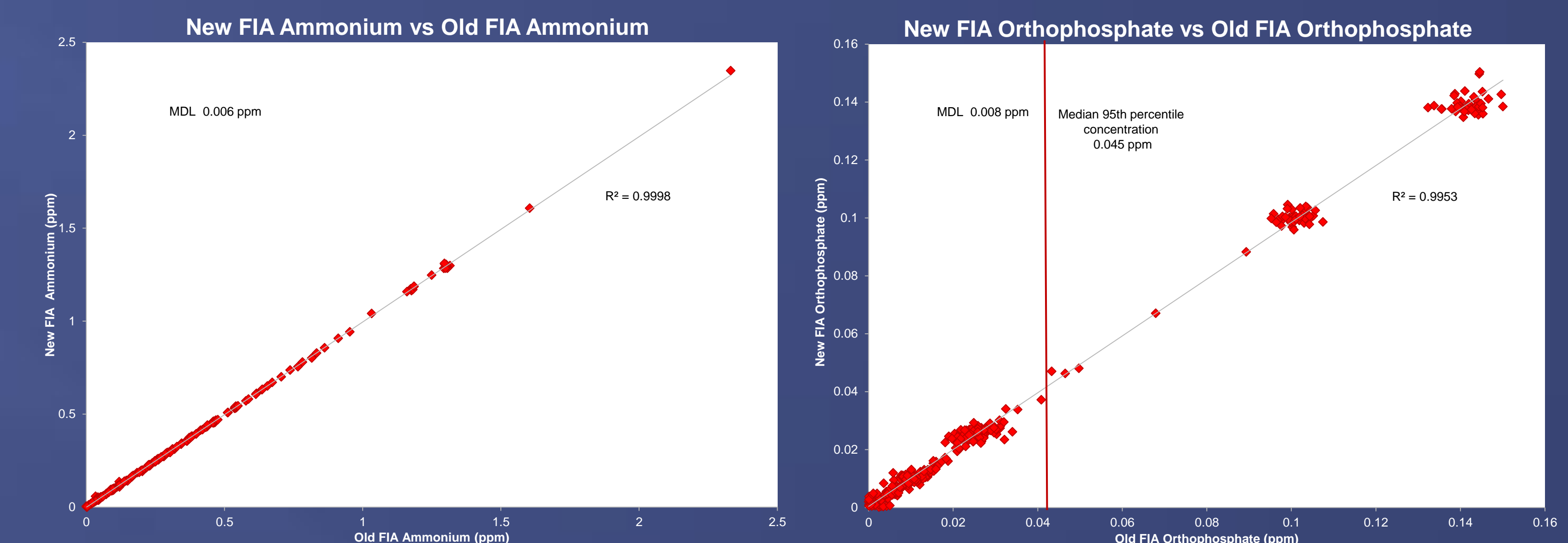
QuikChem 8000 (1996) replaced in 2010



QuikChem 8500 (2010)

## New FIA

A new FIA was purchased in summer of 2010 to replace the aging FIA.

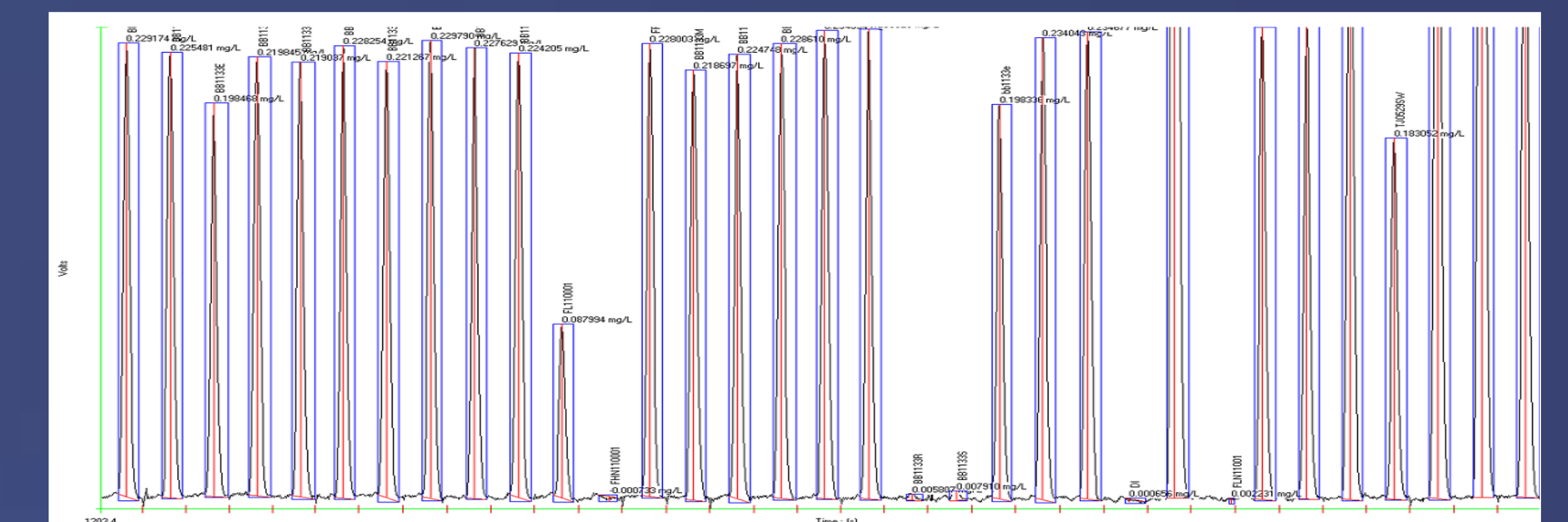


The new FIA was tested and results were found to be comparable and reliable using the same methods as the old FIA. No significant statistical differences were observed between the instruments.

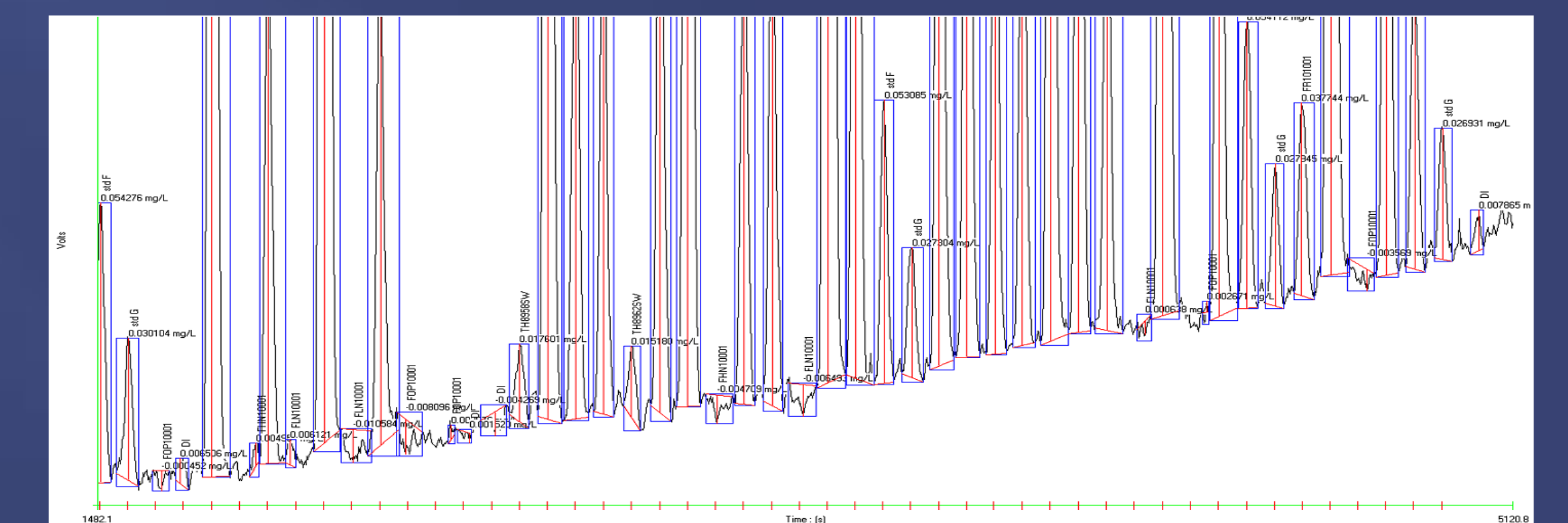
Low flow analysis was investigated on the new instrument, but the results indicated a loss of sensitivity with this method.



CAL Staff (2011)



The baseline of a normal run with the current method used for ammonium is stable and does not drift.



Using the low flow method, the baseline drifted drastically over the timespan of a few samples.

The NADP is National Research Support Project-3: A Long-Term Monitoring Program in Support of Research on the Effects of Atmospheric Chemical Deposition. More than 240 sponsors support the NADP, including State Agricultural Experiment Stations, universities, private companies and other non-governmental organizations; Canadian government agencies; state, local, and tribal government organizations; and federal agencies, including the U.S. Department of Agriculture-Cooperative State Research, Education, and Extension Service (under agreement no. 2008-39134-19508). Any findings or conclusions in this poster do not reflect the views of the U.S. Department of Agriculture or other NADP sponsors. The Illinois State Water Survey is a division of the Institute of Natural Resource Sustainability at the University of Illinois. Thanks to Pam Bedient and Chris Lehmann for poster formatting and review.

## Conclusions

- ❖ Testing of the ICS-5000 system is ongoing.
- ❖ The AS-AP autosampler may be replaced with a model that utilizes our current vials. We suspect that the background measured in the vials specifically designed for use with the AS-AP is not within our acceptable limits.
- ❖ The new FIA is working well with the current method.
- ❖ The bucket washers work well!