ARI Mobile Lab Activities

(reported by Scott Herndon)

Update March 10: Tres Padres

"The Instruments are stable, the people are not"
We have all developed some form of ailment. The data is accumulating. We should be able to go into a maintenance mode as we finish out our time at pico de tres padres. There are some important cals and characterizations to be done, and we are trying to cue these so they all happen at the same time. This approach should get of off the mountain before rush hour. If we leave at 5 we are home by 6, when we leave at 6 we don't get home until 8. And we all know how 'truck time' tends to go. It is a requirement of our stay that we arrive by 8:30 am, which means we leave by 7:15 am. So we need to carve out a little more time for data party and just relaxation.

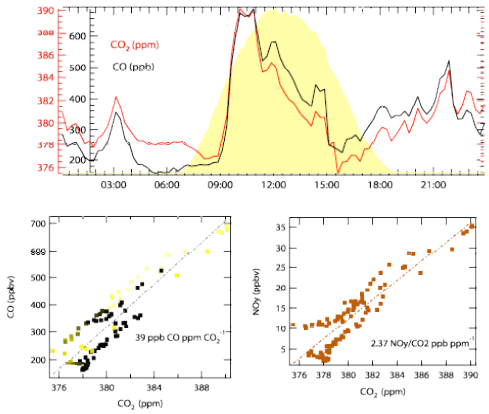
On a more positive note, Miguel has submitted our first data plug to the UCAR in-field data site. We are well aware of some issues (NO, NOx, NOy), CO2 +/- 3 ppm between three instruments, CO seems to be systematically low (which we'll correct), no PTR data submitted yet, and spotty AMS (which will also be corrected). But hey, it took us almost three years to submit any of the MCMA2003 data, so by that scaling we are light years ahead of where we've been.

The weather is predicted to be unpredictable. We are trying to carefully consider our next move after we bring the truck off the mountain. Today should be fun, Luisa is brining a contingent of dignitaries and television crew.

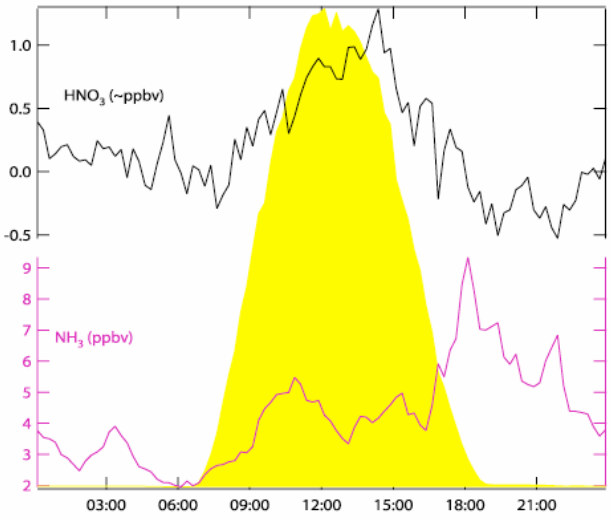
Update March 11: Tres Padres

We are on the mountain collecting nice data. Here is a quick presentation. We still have considerable QA to do before we are fully quantitative, however there are some interesting things emerging. We welcome your comments. I tried to keep this file small, but the pictures are bigger.

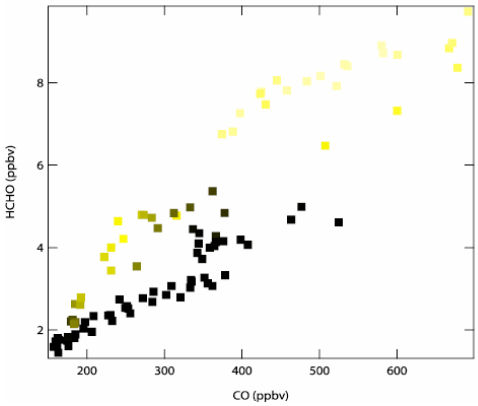
CO CO2 Ratios and a quick NOx/CO2 number



HNO3 Measurement? And NH3

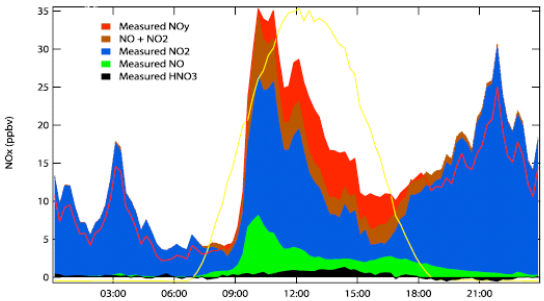


HCHO and CO



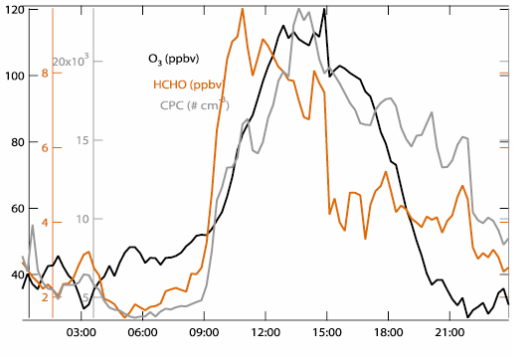
The noon time production of HCHO is more efficient than the pollution layers trapped at night

NOx Budget



This will require full QA in order to be quantitative, however the initial look indicates we are seeing NOz species during the daylight hours

Oxidation Velocity!



We are not modelers yet, but it seems that HCHO may be produced more rapidly than O3 And finally the particle formation kicks in and endures longest

Update March 13: Tres Padres

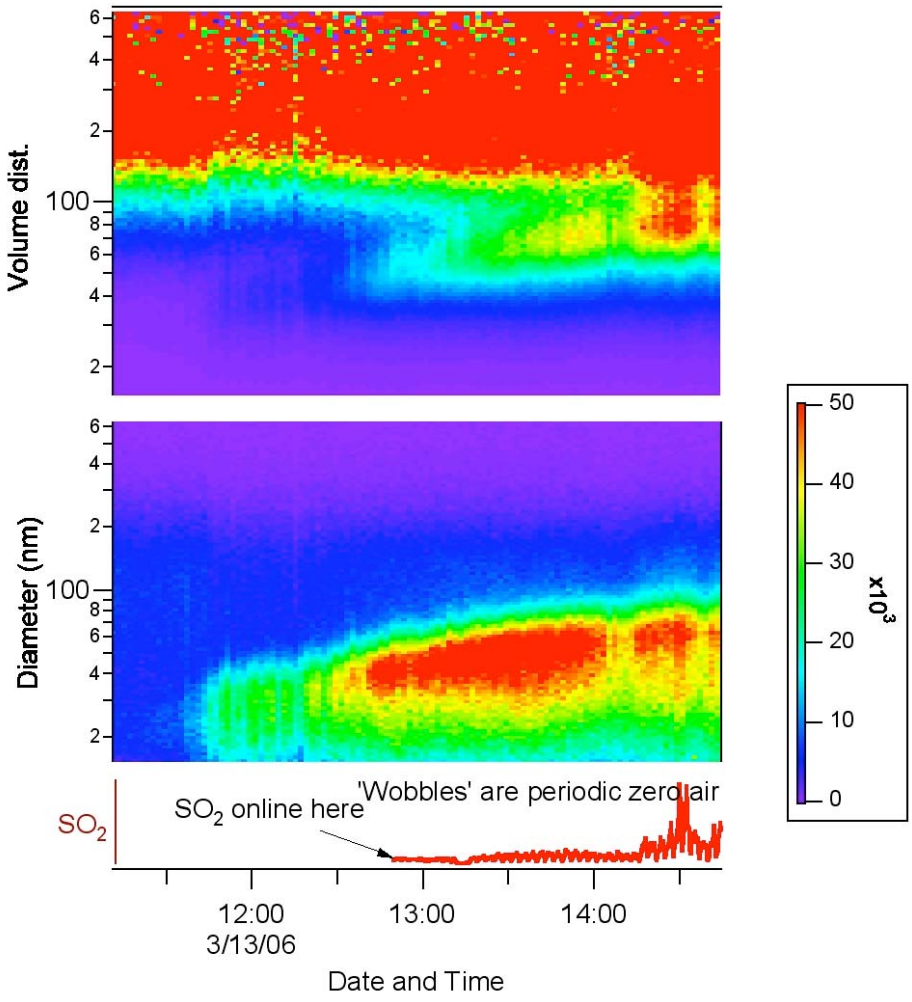
Most of the days we have been at Pico de Tres Padres, so far, the wind has come from the city. Today the wind was coming from the North, el estado de México.

The signals were very different today, we had a very modest rise in CO and NOx (relative to the other days) and Ozone was late and very low. I'm working on Berk to work up any biogenic compounds he may have seen today. Essentially, like one might expect when the wind is from the north, things are different.

Gustavo will be very excited because we have begun to record the SO2 instrument; and we had a very interesting event. The following figure shows the data output from the SMPS as well as the SO2 instrument. Tim got this online just in time. The AMS was reporting 40 ugm3 of SO4 on the real time screen.

We had a power outage and got to witness the true power of this TV station. Within 40 seconds they had restored power using a generator that is larger than our truck. The power outage had an unfortunate effect on the TPS box, Tim has a plan to get this fixed.

Thanks to Rafael Ramos, we have secured permission to remain at Pico Tres Padres for another few days. The flow prediction has us experiencing air from all compass points, which (given today's experience) should round out our understanding of this site and provide a very useful dataset to the Milagro mission. In other words, even when the wind is not coming from the city we are seeing interesting events.



Update March 14-15: Tres Padres

The instruments are essentially stable and we have lots of "up" time. The wind pattern on our first four days was very consistent from the south. The wind pattern in the last week has been somewhat weaker and we are seeing air from the north. We have started logging a taller anemometer which might help sort out where the wind is "really" coming from.

The amount of afternoon HCHO as well as the PTR compounds are all considerably lower than when the wind was from the south.

We asked for permission to stay through until Sunday. The sub-jefe explained that we already had permission according to his interpretation of the instructions to stay all month, but now that we officially asked for permission to stay until Sunday, we now have to leave on Sunday.

Though the wind from the north coming around the mountain gives us some evaporative emissions from the station and various vehicles parked behind us; I think it will still give us some valuable contrast to the city plume we were so strongly sampling earlier.

The predictions as of last night were calling for a strong south to north (city plume coming to us) flow on Saturday and Sunday. So we'll definitely wait to shut down until midday on Sunday, unless the forecast gives us a strong reason to be somewhere else and measuring that evening.

We are loaded with data and getting off the mountain a little sooner and should get back to giving some figures.