VOCALS Quadrupole Aerosol Mass Spectrometer

Preliminary Results

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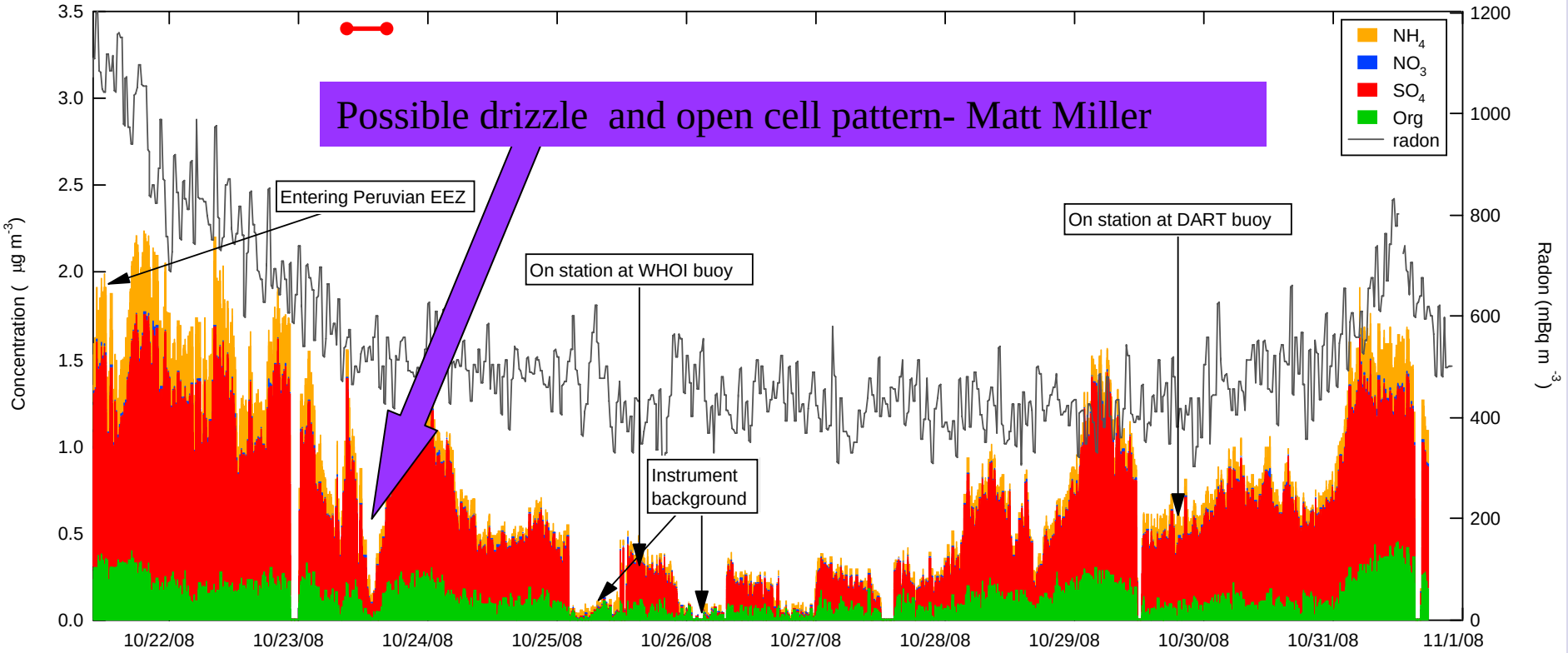
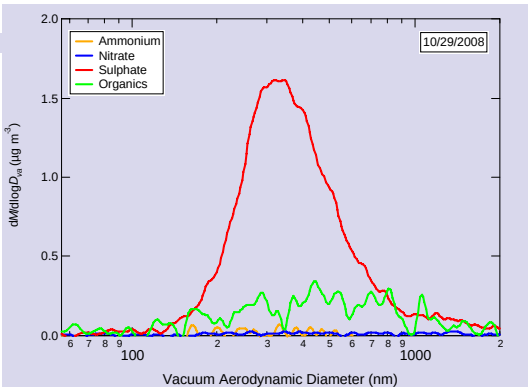
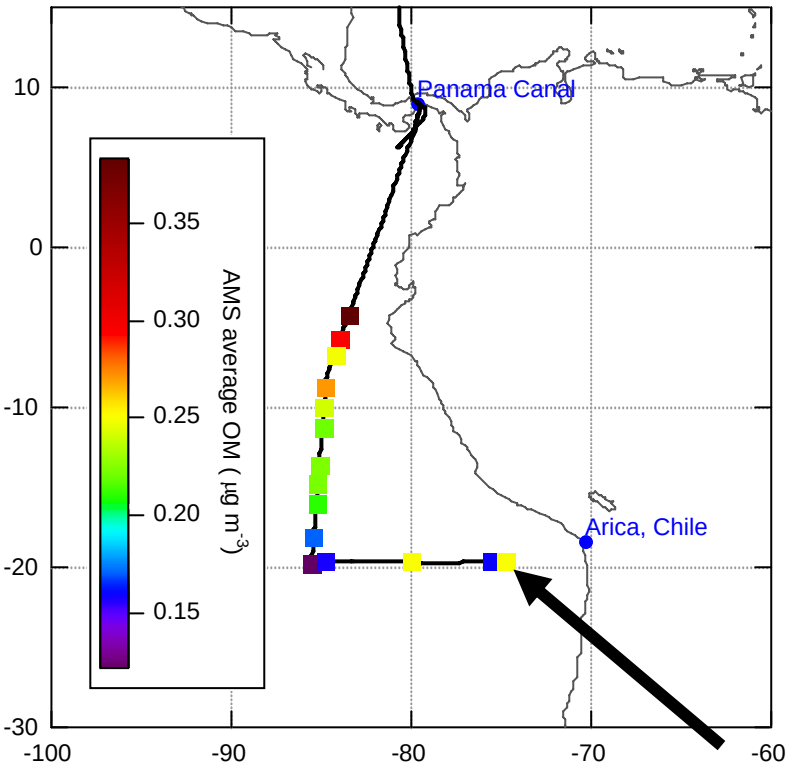
Accumulation mode composition

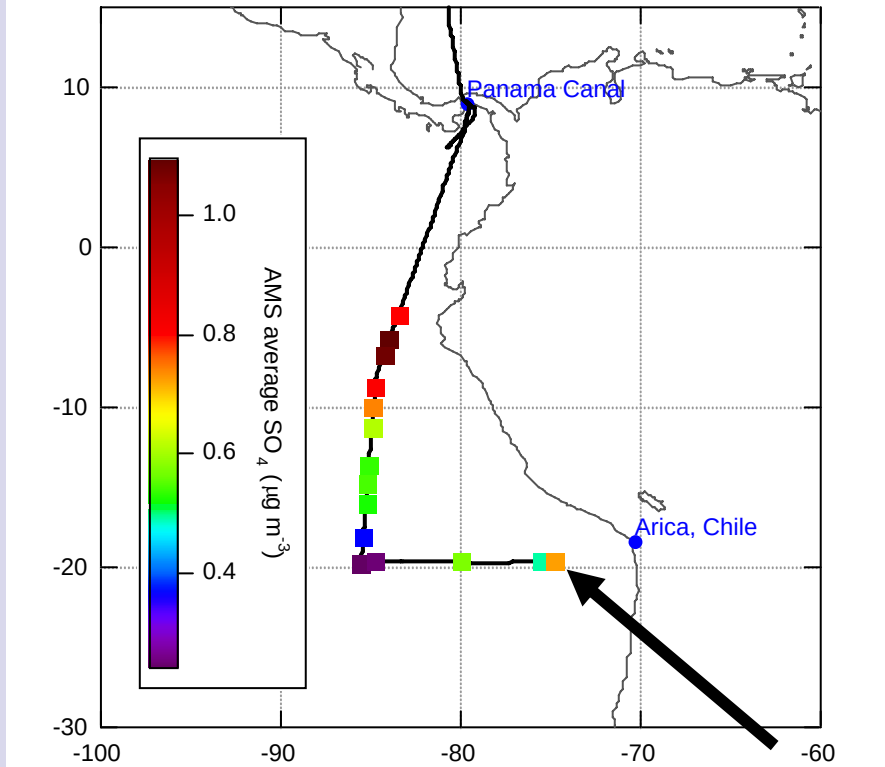




- 15 minute averages
- Sulfate dominates accumulation mode mass
- Very low organic aerosol concentrations
- Radon increase indicates SEP MBL had recent land contact

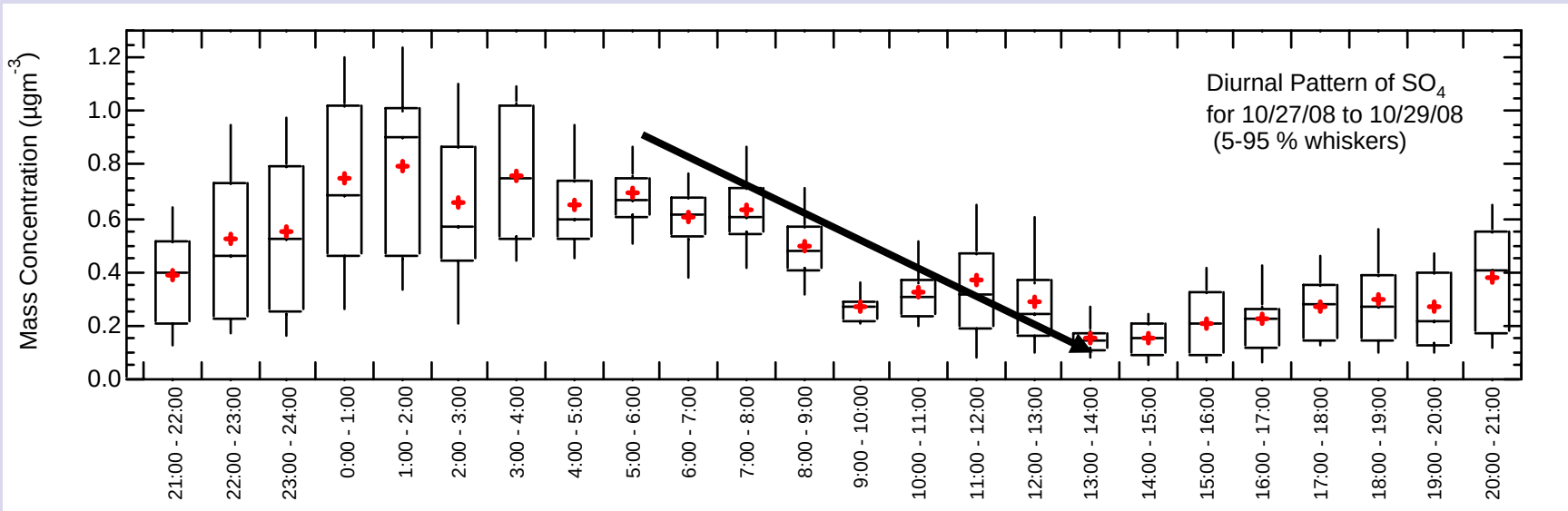
Coastal Influences on SO_4 and OM

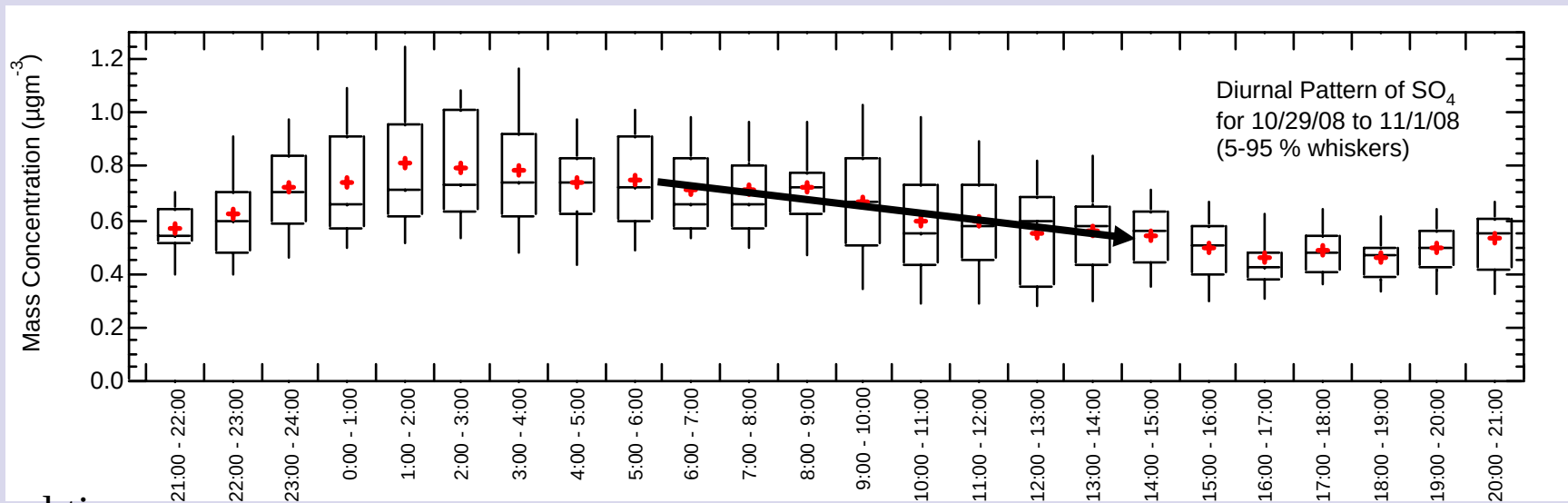




- Near shore samples are roughly double the concentrations of sulfate and organics
- Stronger off-shore winds brought increased mass (marked by arrows) from land sources (e.g. copper smelters and fossil fuel combustion)

Diurnal cycle of sulfate: boundary layer mixing, production, or advection





*Local time

Summary and Remaining Questions…

- Accumulation mode is dominated by sulfate. Organics are rarely much above instrumental noise.
- Concentrations are higher closer to shore.
- Radon variability (as a proxy for continental influence on air mass) roughly correlates with AMS measured aerosol mass.
- For short periods, diurnal trend in SO_4 is clear.

- How does the chemistry of the smaller particles (below 50 nm, not measured by AMS) differ from the accumulation mode (50 nm - 1000 nm)?
- How does aerosol chemistry differ inside and outside Pockets of Open Cells (POCs)?
- What roles do boundary layer height, mixing, and advection play in the particulate sulfate concentration?
- Is continental (anthropogenic) air the major source of accumulation mode particles to the SEP?

Thank You!