Oceanography Seminar

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"*The Ocean Doesn't Take Up and Emit CO_2 The Way You Think it Does*
The Career Path from Electron-transfer Kinetics at the
Surface of Mercury Drops to Gas Transfer Experiments
on the High Seas South of Greenland:
A Memoir"

Our High Wind Gas Exchange Study (HiWinGS) conducted a gas-flux and wave physics cruise in the Labrador Sea during October/November 2013. We encountered winds above 28 m/s, with 100 hrs in the 15-22 m/s range. Eddy covariance measurements by three instruments confirm that the CO2 gas exchange coefficient did not rise according to the square or a higher power of wind speed (a formulation widely used in climate models), but leveled off or dropped above 15 m/s. The ocean surface physics above 15 m/s is of course completely different from that below, and so is gas exchange. Sadly, wind speed may not be a useful independent variable (x-axis) for parameterizing gas exchange in the breaking-wave regime. Furthermore, how do I happen to know about this? How does one get from a PhD in Physical Chemistry electrochemical lab kinetics (I've never had an oceanography course) to being a Professor of Oceanography/atmospheric chemist claiming "high-wind CO2 gas exchange has been done wrong for a couple of decades"? Like most careers, mine encountered a number of forks in my road, some leading pretty far from my Ph.D. work. You may also encounter some of these decision-points, if you haven't already. We'll talk about several on our way to CO2 uptake in the Lab Sea.

Teaching, research, or what balance?
Disciplinary evolution and change
Mentoring and being mentored
Moving on from a position
Watching for opportunities, even if they seem a bit far afield

In this process you might internalize a few fundamental issues that will motivate you for decades. Mine was: *What happens at the bottom of the atmosphere to create gradients in the air above the surface, and how can you make really defensible measurements of these surface fluxes?*

This saga starts with nitric acid gradients in two forms; detours through IGAC, SOLAS, and a bunch of big airborne field programs using Lagrangian budgets; includes aerosol studies, and finally gets to direct eddy covariance flux measurements of DMS, CO, and CO2.

Thursday February 19, 2015 3:00 p.m. MSB 100