TEMPORAL CHANGES IN pH, NON-SEA SALT SULFATE, NITRATE CONCENTRATIONS, SULFATE: SODIUM AND NITRATE:SODIUM RATIOS ASSOCIATED WITH CHANGES ANTHROPOGENIC EMISSIONS IN THE PENSACOLA BAY REGION

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Anthropogenic sulfur dioxide, nitrogen oxides and mercury emissions can lead to enhanced atmospheric deposition of these constituents and associated negative environmental impacts. Atmospheric wet deposition of mercury (Hg), trace metals, and the major ions nitrate (NO_3^-), chloride (Cl^-), sodium, and sulfate (SO_4), etc. have been made in Pensacola, FL, USA from November 1, 2004 to December 31, 2012. Event based rain samples were collected at three inland sites since in 2004 and one marine background site since 2009. Over the last 7 years, local industries have completed multiple environmental projects that aim to reduce the emissions of chlorides, mercury, and sulfur to the environment. Examples of these projects include the installation of a flue gas Desulfurization System by a coal-fired power plant, Plant Crist. Our analyses indicate that there are statistical significant differences in the pH of wet samples collected in summer and winter compared with samples collected in spring and fall. We examine the effect of near regional sources (i.e. nearby coal power plants, cement plants, ocean) and their effect on rainwater pH, and major ion concentrations as well as ratios of Hg:Na, SO4:Na and NO3:Na. While there were no trends in mercury concentrations, both non sea salt sulfate and nitrate concentrations significantly declined over the seven year period. Ratios of Hg:Na did not change while SO4:Na and NO3:Na declined over this period. Nearby stations of the National Atmospheric Deposition Program showed a similar response.

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