regions, the pH of precipitation is generally less than 5.6 (the carbon dioxide - clean water equilibrium value, sometimes used as the "clean rain" reference value). On the other hand, at continental sites in semi-arid regions, with low population density and little industry producing acidic pollutants, the wind blown dust which is generally high in alkaline substances results in rain with pH values much greater than 5.6. It is important to understand the reasons for the, sometimes observed, high acidity in remote locations so that the source-receptor relationships in the regions of maximum acidic deposition can be placed in their proper context.

Historically, the earliest remote measurements which suggested relatively high values of acidity were obtained at the Mauna Loa Observatory (3400 meter altitude on the island of Hawaii). Confirmation that this was not due to local volcanic emissions was obtained by upwind measurements on the island of Kauai. Both here and at other remote sites around the world, median annual values of about pH = 5.0 and on rare occasions individual events as low as pH = 3.8 to 4.0 have been confirmed. A recent paper attempts to explain how such low pH values may arise. Sparse observations in remote locations indicate that (excluding the neutral sulfate contribution from sea-spray) the acid sulfate aerosol concentrations range from 0.5 to 1.0 μg of sulfate per cubic meter in the lower troposphere. In the absence of any significant alkaline material in the cloud air (very likely at remote oceanic sites) then, depending upon the cloud liquid water content, the resultant pH could range from 3.7 to 5.1. It is interesting to note that observations above the general level of the earth's surface at a few mountain sites or with aircraft in both remote and polluted regions indicate that the pH tends to decrease (i.e. the acidity increases) with height and pH values of 4.0 or less can occur in the lower parts of clouds. Sulfate aerosols are small (< 1.0 micrometer) and have long residence times because of small