Recent Monitoring of Suspended Sediment Stress, Selected Water Quality Parameters and Meteorological Forcing on Lake Abaya, Southern Ethiopia

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Comprehensive field data consisting of water quality measurements, lake bed sediment grab samples and meteorological observations were obtained from Lake Abaya. Water samples from fixed monitoring stations and depths were collected on a regular basis. Analysis of suspended solid concentration profiles was made using water sampling at the fixed monitoring stations. Data on suspended solid concentrations was compared between stations and depths. Profiles of water quality parameters were measured along transect and at fixed monitoring stations. Two automatic weather stations were established and operated since February 2004. These stations provide valuable weather data for the west shore of the lake. The data are used for the interpretation of measured water parameters. Records of wind at these stations are analysed on the same timescale for the period February to October. The analysis determines significant peaks, frequency of changes in wind direction and speed, and the correlation of wind with other parameters such as air temperature. A spatial difference in meteorology is analysed using these data sets and other weather data from stations around the lake and operated by the National Meteorological Organisation (NMO).

The water parameters provide information for understanding the hydrodynamics of the lake. Reactive parameters, such as water temperature, show great spatial variation. Correlation with meteorological records reveals contrasting dynamic conditions, in which wind forcing produces significant vertical mixing of the lake water. Conservative parameters, such as pH, are virtually spatially homogeneous. Overall, suspended solid concentration profiles show significant differences among stations and depths. Interestingly, a higher concentration of suspended solid near the surface was observed during the quiescent and dry season. In situ visual inspection of fresh grab sediment samples suggested depositional zones for sediments supplied by tributary rivers around the lake.