Geochemical Mapping in Namibia

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The Geological Survey of Namibia (GSN) has embarked on a countrywide Regional Geochemical Sampling Program (RGSP). The program was initiated in the year 2000, with the aim of establishing a National Baseline Geochemical Database of elements in the anthropogenically undisturbed geosphere. Since its inception, the RGSP has covered eight (8) Map Sheets, in the central and western parts of the country producing a total of 20 000 soil and stream sediment samples, which represent about 20% coverage of the country. Sampling methodology has been adopted from the final report of the International Geological Correlation Program (IGCP), project 259. Data generated from the RGSP survey is useful across a wide range of applications including land use planning, agriculture, mineral exploration and environmental monitoring. Regional Geochemical Sampling Survey on Okahandja Map Sheet (2116) at 1: 250 000 scale was carried out by sampling stream sediments at river catchments, and soil samples with a nominal sampling density of one samples per 10 square kilometres. Soil sample are collected in areas with poorly developed or non-existent streams. At each sampling site, five sample pits are dug, from which a composite sample is obtained and screened. Two size fractions are collected; a coarse (< 2 mm) and fine (<180µm) sample, respectively. The elemental concentration of all samples will be determined using various analytical techniques, such as; X-Ray Fluorescence Spectrometry (XRF), Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) and the Atomic Absorption Spectrometry (AAS). However, preliminary geochemical data for the Okahandja Map Sheet (2116) was obtained using a handheld Niton Energy Dispersive XRF (ED-XRF) spectrometer. The generalized distriburion maps, showing the elemental concentration for Cu, Sr, Mn, Fe and As, was compiled using geological maps and geochemical data recorded at each site. The results were compared against known crustal abundance of the same elements. This comparison show that some elements (e.g. strontium) are within reasonable margins to crustal values, however there are other elements such as Mn and Fe where the variation is too high for comparison. This variation in the measured values could be a result of different types of bedrock composition.