An Empirical Investigation of the Effect of Sea Level Variation on Vertical Reference Frames: Case study of Lagos state

Joseph Odumosu, Augustine Abiodun, Senior Lecturer (Nigeria), Kelly Kevin, Geodesist (USA) and Gbedu Adamu (Nigeria)

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SUMMARY

The Mean Sea level as a result of its “near-coincidence” with the equipotential surface of the geoid is universally adopted as a reference surface for the physical realization of the vertical reference system. Unfortunately, the effect of climate change has continued to alter the value of the mean sea level across the globe by as much as 10mm per annum at certain locations. The Gauss-Markov functional model has been used in this study to determine the effect of Sea Level variation on sea-related physical heights along selected ZTT-control series in Lagos state using the different International Association of Geodesy (IAG) standard geo-potential values as representative indicators of sea level rise. Results obtained show very minimal effect of MSL variation on the VRF with a standard deviation of ∓ 0.000000000015m

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