

AN INVESTIGATION OF THE CHANGES IN THE GEOID
AND THE DIRECTIONS OF THE VERTICAL CAUSED BY
FIVE LARGE MAHAWELI RESERVOIRS

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The five Mahaweli reservoirs, Randenigala, Victoria, Maduru Oya, Ulhitiya-Rathkinda & Kotmale together impound about 2.5 billion tonnes of water. The gravitational potential due to this new mass has been calculated, at points on a rectangular grid 100 km by 100 km, by dividing the water bodies into rectangular columns 500m X 500m in area and with the depth determined from contour maps. The calculations show that the shape of the geoid has been changed by about 1mm in the locality of the reservoirs and the changes of the direction of vertical area of the order of 0.001 seconds. Both these changes are extremely small. However, there is a surprising coincidence in the area of maximum change and the area in which land slides have occurred recently as mapped by the Survey Department. This question needs further investigation ; the cause of the landslides probably lie elsewhere.

The methodology adopted in this work follows a similar investigation carried out in South Africa, where the Hendrik Verwoerd dam impounds 5.0 billion tonnes of water and the change in the geoid is of the order of 10mm.