

WHERE ON EARTH ARE WE NOW?

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Abstract: The Department of Survey and Mapping Malaysia (JUPEM) is the competent authority in maintaining the National Spatial Reference System. This is carried out through the setting up of geodetic infrastructures that includes horizontal and vertical survey controls throughout the country for the eventual purpose of national development, security and defence. Since 1997, JUPEM has been developing the capability for real-time data streaming from a network of 18 to the current 78 continuously operating reference Global Navigation Satellite System (GNSS) stations known as MyRTKnet.

The coordinates of MyRTKnet stations are in Geocentric Datum of Malaysia or GDM2000, defined by its relationship to ITRF2000 reference frame at a specified epoch of 1 January 2000. The datum definition was fixed at this epoch and did not include time dependencies although time series were produced as a by product for other geodynamic applications. However, due to the 2004, 2005 & 2007 earthquakes in Sumatra, large coordinate jumps had occurred. The earthquakes have generated motions and caused significant displacements to the geodetic infrastructures in Malaysia with magnitude of the displacements ranging from 1.0 to 25.8 cm. Modelling of more uniform time dependencies need to be applied in new computations in order to remove systematic errors due to earth deformation. This modelling is based on a velocity model and would effectively be a time-dependent transformation. All results would be converted back to the reference epoch and expressed in terms of that epoch.

This presentation seeks to address the review taken on GDM2000 by looking at the new GNSS data available after the incidents of earthquake in Sumatra and to produce a revised datum that is able to represent the present coordinate reference system for Malaysia. The newly revised datum is now known as GDM2000 (2009).