

Geodetic Datum in Hydrographic Survey Practices: WGS84 versus ITRF

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SUMMARY

The measurement techniques of the physical features of the oceans, seas, coastal areas, lakes, and rivers for marine activities have evolved over time. With the advancement of hydrographic positioning involving space-based geodetic approach, the real-time positioning has become possible. Generally, World Geodetic System 1984 (WGS84) has been implemented as a reference datum for hydrographic survey purposes due to its direct satellite-based solution. However, the realisation of the International Terrestrial Reference Frame (ITRF) is another alternative that can be adopted as a reference datum for hydrographic survey practices. The ITRF geodetic datum is regularly revised by taking into account the dynamic of the Earth and focusing on the changes in station position and motion. On the land areas, the assessment of the coastal geohazard usually involves relative positioning with respect to ITRF as its reference datum. This heterogeneous system between land and water will complicate the surveying works and scientific research especially when engaging with the land and water management (e.g., coastal inundation, sea level rise and, coastal mapping and management) at the shoreline. The data integration between the land and water must refer to the one common datum, as the differences in reference surfaces could result in coordinate variations for both horizontal and vertical components. Nevertheless, further studies on the coordinate differences between series of WGS84 and ITRF by incorporating the absolute positioning method are required to evaluate the positional accuracy in hydrographic practices. In conclusion, subject to the desired accuracy, the measurement technique chosen must be compatible with the geodetic datum.

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