

Resolution 3/1919: Chart Datum definition.

“The challenge of covering tidal and non-tidal areas within the definition partially deals with the connections between terms in the Hydrographic Dictionary (HD) and the importance of generating a concise definition. The guideline is to define recommendations as generic as possible not omitting the practical use of it.”

At TWLWG6, it was agreed to make an editorial amendment to the definition contained in IHO resolution 3/1919, as amended, to ensure consistency with the HD definition and move the additional wording into a new paragraph, Annex H draft proposal from TWLWG6 report, with subsequent presentation to HSSC 6 for endorsement. In particular, wording for point 8. of 3/1919 resolution was suggested (see extract of 6/8annex H draft proposal in compromise n°1, here below).

3/1919 resolution aims to take into account ocean tidal areas and inland waters. Several points drove the exchanges. Some are listed below to introduce some points of understanding. Chart datum precision is required for tidal water not omitting inland waters. The amendment is built to do it. The reason why 3 cases were defined for chart datum definition resolution is the following (see compromises introduced after the context and understanding paragraph, below in the text):

One "generic" definition should be defined and be coherent with the cases identified by the TWLWG. Due to distinct dynamics and different hydrographic practices, sub-definitions were settled for Ocean areas and inland waters. If chart datum is defined as mean sea level, it would not fit the hydrographic centres liability for navigational safe datums for marine chart datum. If lowest astronomical tide is defined as chart datum for waters where there is no tidal signal or a very weak tidal signal, it would not fit the liability for navigational safe datums - Amazonian River, Finland waters areas, and others areas among these, certainly the Canadian waters regions with a wide marine and rivers areas. These countries face to the same questioning.

There is a need for multi-year time series of data to determine seasonality and longer-term mean water level and to determine the datum in non-tidal waters areas. In river, estuaries and inland waters, the datum is normally set to be lower than the water level, using a method that may be specific to each country but that should be referred to a stable geodetic reference. In these areas, variability of water level is large, partly due to changing weather conditions and changing river flow. The datum is then chosen based on low flow periods of reference that have to be selected.

In a river, the chart datum is not constant. In first approximation, it follows a slope. Non-tidal waters are often assigned to a datum elevation on a given vertical datum. It is recommended to refer to the system recommended by the international reference system. It is the goal of the point 10 Inland waters of the resolution.

So, today, I see 3 issues to be suggested: my first option is that we could reword 3/1919 resolution and address it again to members for consideration:

“In oceans and geographical areas connected to oceans” by “Ocean tidal areas”.

“In geographical areas with limited connections to oceans and negligible tide range (<30cm)” by “Areas where tidal range is negligible and non tidal areas”

Point 8. Rewording replacing “It is resolved that depths, and all other navigational information should be referred to Mean Sea Level (MSL) or other equivalent to this as is practically acceptable to Hydrographic Offices.” by “It is recommended that depths and all other navigational information should be referred to the geodetic datum and uncertainty of this geodetic datum should be delivered with the chart datum value.”

Or we could reword TWLWG 6/8-Annex H.Extract of 6/8annex H draft proposal starting from point 8 of 3/1919 resolution:

8. “It is recommended that LAT and HAT be calculated either over a minimum period of 19 years using harmonic constants derived from a minimum of one year’s observations or by other proven methods known to give reliable results. Tide levels should, if possible, reflect the estimated uncertainty values obtained during the determination of these levels.

In geographical areas with limited connection to oceans and negligible tidal range (< 30 cm)

9. It is resolved that depths, and all other navigational information should be referred to Mean Sea Level (MSL) or other level as closely equivalent to this as is practically acceptable to Hydrographic Offices.

Note: The adopted level may be a well-defined geodetic datum as used for heights in land survey applications or an observed local Mean Sea Level (MSL) based on long series of water level observations.

10. In order to support other non-navigational applications as UNCLOS and also to indicate the characteristics in the area, it is recommended to adopt the mean of yearly lowest/highest water levels observed over a long time period.

Inland Waters

11. It is resolved that depths, and all other navigational information should be referred to an appropriate level practically acceptable to Hydrographic Offices or if needed LW as a reference level for depths and HW for vertical clearances. The selection of which one of the alternatives to be used is a difficult issue which can only be determined locally and which will be largely dependent on seasonal hydrological conditions. LW and HW are defined preferably as the mean of lowest/highest water levels, or as a suitable percentile of lowest/highest water levels, observed over a long time period.”

A third issue could be to separate the technical recommendation to get a coherent chart datum relative to physics and the definition part, for areas under tidal influence (tidal height > 30cm) and those where tides represent less than 30 cm of water height."