

**5<sup>th</sup> IHO-TWLWG Meeting  
Helsinki, Finland, 14-16 May 2013**

**Paper for Consideration by TWLWG**

**Establishment and maintenance of vertical reference frameworks  
for high resolution bathymetric surfaces**

<b>Submitted by:</b>	IHB and NSHC Chair
<b>Executive Summary:</b>	This paper invites the IHO Tidal and Water Level Working Group to address the issue of establishing and maintaining vertical reference frameworks for high resolution bathymetric surfaces in order to develop associated work elements and identify tasks which could benefit from external support such as funding from the European Union.
<b>Related Documents:</b>	Minutes of the North Sea Hydrographic Commission 30 <sup>th</sup> Meeting (Ålesund, Norway, 19-21 June 2012)  IHO CL 87/2012 of 21 September 2012 - Memorandum of Understanding between the IHO and the European Commission  Summary of the Chairperson of the 2 <sup>nd</sup> High Level Forum on Global Geospatial Information Management (Doha, Qatar, 4-6 February 2013)

## Introduction / Background

1. In accordance with the Memorandum of Understanding on establishing a co-operation on maritime affairs between the IHO and the European Commission (EC), the 2<sup>nd</sup> EC-IHO meeting took place in Brussels, Belgium, on 5 April 2013. The meeting debated potential IHO/HOs initiatives which could benefit from EU support. The establishment of a European coastal vertical reference framework was acknowledged as one of the themes of interest. The European Commission noted that this was also a potential theme for transatlantic cooperation between the European Union (EU) and the USA and invited the IHO to investigate further how support from the European Commission could accelerate the work of the IHO. HOs representatives invited the IHB to refer the issue to the IHO Tidal and Water Level Working Group (TWLWG).

## Analysis

2. The Tidal Working Group of the North Sea Hydrographic Commission (NTWG) has been working on the definition and implementation of common reference surfaces (mean sea level, lowest astronomical tide, chart datum) for several years. During its 29<sup>th</sup> Conference (2010), the NSHC tasked the NTWG to formulate recommendations on the way forward to create a common and unique reference surface for the North Sea area related to the ellipsoid. The "Land and Sea Model" work package of the EU BLAST Project (2009-2012)<sup>1</sup> confirmed the importance of the issue for Europe as a key component for European projects which aims to provide common data surfaces. Products such as high resolution bathymetric models cannot be provided if there are still problems of discrepancies related to the reference surfaces. The 30<sup>th</sup> NSHC Conference (2012) tasked the NTWG to include the question of a tidal common reference surface within the EU cooperation framework.

3. The definition of a common tidal reference surface relates to the definition and establishment of vertical reference systems. The increasing need for the global geodetic system to track changes such as terrestrial

---

<sup>1</sup> BLAST Project: BLAST - Bringing Land and Sea Together - was a regional project for better integration of information across the coastal margin in the North Sea region. It was funded by the European Union as part of the Interreg IVB North Sea Region Programme. The project started in 2009 and was completed in 2012. Over three years, 17 partners from 7 countries, including governmental organizations, universities and private companies, collaborated on the harmonization and integration of land and sea data. See <http://www.blast-project.eu/> for further information.

adjustments and sea level rise require significant refinement to the current systems. The necessity to develop a worldwide height system as part of the International Terrestrial Reference System (ITRS) was acknowledged at the recent High Level Forum of the United Nations Initiative on Global Geospatial Information Management (UN-GGIM) hold in Doha (Qatar) in February 2013.

4. In parallel, there are a number of research programmes reported to Regional Hydrographic Commissions which aim at referencing bathymetric surveys to the ellipsoid rather than to a tidal surface. Developing this approach could facilitate the processing of survey data and the provision of seamless high resolution bathymetric surfaces which is one objective of the European Marine Observation and Data Network project (EMODNET).

5. Cooperation on vertical reference level has been proposed by Canada as a potential work item for the Artic Regional Hydrographic Commission (ARHC). The ARHC could be a vehicle for implementing transatlantic cooperation on this issue.

6. In that context, the 2<sup>nd</sup> EC-IHO Meeting held in Brussels on 5 April 2013 acknowledged the establishment of a European coastal vertical reference framework as a theme of interest with potential transatlantic extension as a cooperative endeavour between the European Union (EU) and the USA. It invited the IHO to investigate further how support from the European Commission could accelerate the work of the IHO.

#### **Action Required of TWLWG**

7. TWLWG is invited, in liaison with the NTWG and other RHCs, to:
  - a **assess** progress in defining and implementing coastal vertical reference frameworks at the national, regional, interregional and international level,
  - b **identify** additional work required to establish and maintain regional and international vertical reference frameworks for high resolution bathymetric surfaces,
  - c **identify** tasks, if any, which could benefit from external support, including EU funding, and **draft** the associated statements of requirements,
  - d **consider and propose** the relevant elements, with associated timelines, to be inserted in its work plan and in the work plans of any other bodies concerned, and
  - e **take any other action** as considered appropriate.