**Use Case – Community Use**

**AUSHYDROID**

**ICSM**

**CANBERRA, ACT**

**17 December 2021**

**Version Control**

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| 0.01 | First draft | GJ Broadbent | 09/03/2020 |
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# Issue

The vertical datum of mapping of land below the sea and land to landward of it are disconnected. Integration of topography and bathymetry into a single map is impossible.

# Introduction

This Use Case has been developed to demonstrate how the creation of an AUSHYDROID can benefit all of those parts of the community that rely on mapping to conduct activities that are associated with the use, management and enjoyment of the coastal and marine environment.

The community is increasingly depending on 3-dimensional (and possibly 4-dimensional) positioning to measure and map their activities in a digital form.

Presently, mapping of the “land” i.e. upland from the littoral zone is widely available in terms of a national reference frame to meet mapping needs.

This cannot be said of bathymetry i.e. the “land” below the sea.

# Terms and Definitions

AUSHYDROID The surface separation between the National Ellipsoid and chart datum.

GNSS Global Navigation Satellite System

AHO Australian Hydrographic Office

SP9 ICSM Australian Tides Manual

LAT Lowest astronomical tide

Littoral Pertaining the interface between the land and sea

Bathymetry The 3-dimensional representation of the land below the sea.

Topography The 3-dimensional representation of the land above the sea.

Chart Datum The datum or the plane of reference to which all charted depths and drying heights are related [but not other heights and elevations]. It is a level so low that the tide will not frequently fall below it. Usually defined in terms of low-water level such.

Port datum As for Chart Datum [Substitute “port depths” for “charted depths”]

# Use Case

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| **Name of Use Case:** | | Community Use | |  |
| **Created By:** | ICSM AUSHYDROID WG | | **Last Updated By:** | GJ Broadbent |
| **Date Created:** | 09/03/2020 | | **Last Revision Date:** | 17-Dec-2021 |

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| **Description:** | Mapping of land above and below the sea is fundamental to the management, use and enjoyment it.  Jurisdiction/responsibility of land below the sea is shared between the states, territories and the commonwealth and in some special cases the first nation peoples. |
| **Actors:** | Mapping of land below the sea is principally undertaken by:   1. Commonwealth agencies, GA and AHO 2. State authorities, in their own right and by port managers 3. Research bodies, e.g. CSIRO, AIMS etc. |
| **Preconditions:** | The vertical reference surface (surfaces) of the marine and littoral zones are disjoint and is/are not an element of the national geodetic reference frame, i.e. not connected to it. As such, they do not contribute to an overall 3-dimensional map of Australia. |
| **Postconditions:** | 1. The AusHydroid consolidates and integrates the vertical reference surfaces of the national paper and ECDIS charts and the port datum of the ports of Australia into the national geodetic framework; 2. Provides the ability to create an overall 3-dimensional map of Australia; and, 3. Facilitates charting (Aka mapping) that contributes to the implementation of: 4. The National Oceans Policy; 5. The Queensland Coastal Plan, and equivalents in the other states and territories; and, 6. Marine research and monitoring that will lead to quality management of the Australian marine ecology and resources. |
| **Flow:** | 1. Assemble contemporary knowledge i.e. identify the existence of places where tidal stations suitable for preparation of an AusHydroid exist; 2. Undertake a gap analysis, identifying critical gaps in our knowledge for priority attention e.g. Torres Strait; 3. Where identified, plug gaps by charting/surveying using accurate GNSS methodology; and, 4. Create an AusHydroid by: 5. Obtaining the geodetic elevation of existing tidal datums; 6. Deploy tidal observations to infill the gaps; 7. Analysing observations to deduce the elevation of LAT relative to GDA2020/94 for subsequent adoption as chart datum and port datum; 8. Interpolate a gridded surface at the elevation of LAT; 9. Adopt the gridded surface as the AusHydroid, epoch 2020 to correspond with the epoch of the GDA2020 and a proposed 2020 Tidal Datum Epoch; and 10. Adopt the AusHydroid as chart datum and port datum. |
| **Exceptions:** | None known |
| **Requirements:** | 1. Funding for all flow activities leading to:    1. Adoption of the AusHydroid as:       1. Chart datum; and,       2. Port datum.    2. Inclusion of the AusHydroid in the national geodetic framework |

Sponsor Acceptance

Approved by the ICSM AUSHYDROID Working Group:

Date: 17-Dec-2021