

NSHC Tidal Working Group (TWG)

TWG Report to the NSHC 38th Conference 8-9 April 2025 - Agenda Item 3.6

1. Status of Working Group

According to its Terms of Reference, the objective of the working group is “to provide technical advice and promote co-ordination on tidal issues especially within the North Sea Hydrographic Commission (NSHC)”.

Since the NSHC 37th Conference (8-10 April 2024), Andreas Boesch (DE) has acted as new permanent Chair of the TWG. A handover of the chairmanship with the outgoing Chair Thomas Hammarklint (SE) took place via video conference on 3 May 2024.

The communication within the TWG has been done mainly by e-mail correspondence. One physical meeting (TWG27) took place on 4-5 February 2025 at the UK Hydrographic Office in Taunton, UK (see below under Section 2).

Following the annual meeting of the North West European Shelf Operational Oceanographic System ([NOOS](#)) in October 2024, the Chair was informed that NOOS is potentially interested in an exchange with the TWG. The Chair has been in contact with the new NOOS Chair Annette Zijderveld and is now on the NOOS mailing list. There is a “Tide, Waterlevel and Wave Working Group” of NOOS, but no specific details are yet available. The Chair will remain in contact with NOOS to explore possible co-operation.

All the NSHC member states have nominated delegates to the working group:

Country	Name
Belgium	Johan Verstraeten
Denmark	Nicki Riber Andreasen Kristian Villadsen Kristmar
France	Gaël Andre
Germany	Andreas Boesch (Chair)
Iceland	Guðmundur Birkir Agnarsson
Ireland	Sean Cullen
Netherlands	Ronald Kuilman
Norway	Aksel Voldsund
Sweden	Thomas Hammarklint
United Kingdom	Chris Jones

2. The TWG27 meeting

The 27th meeting of the Tidal Working Group took place as a face-to-face meeting in Taunton, UK, on 4-5 February 2025. The meeting was attended by 11 delegates from all 10 member states of the NSHC (see list of members above), as well as two guest from UKHO and remotely two guest from the Federal Agency for Cartography and Geodesy of Germany (for an online presentation). The meeting documents, including the minutes, will be made available on the TWG website:
<https://www.bshc.pro/working-groups/twg/>

The main objectives of the meeting were to review and update the Terms of Reference, Work Plan and List of Actions and coordinate the work within the working group. The agenda included presentations and discussions related to the group's work packages (WP):

- LAT/CD/Reference Systems (WP 16/04, WP 18/01, WP 18/02, WP 22/01)
- Implementation of S-104/S-111 (WP 24/01)
- Data Rescue and Data Archaeology (WP 24/02)

as well as further topics contributed by the participants.

3. Open actions from NSHC related to the TWG

Currently, there is 1 action item from NSHC assigned to the TWG. All other tasks related to the TWG were closed at NSHC36 and NSHC37.

No/year agenda item	Subject	Decision / Action	Responsible	Time frame	Status
Action 4/2024 C.3	TWG	The Commission tasked the TWG to report to NSICCWG on the progress of S-104 and S-111 implementation coordination. Reference: Decision 6/2023 C.2	TWG Chair	Continuous	

Answer to Action 4/2004 C.3:

Several Member States have reported on their progress of S-104 and S-111 implementation at the TWG27 meeting. In general, the state of implementation is very heterogeneous across Member States. In most countries, the responsible authorities for the products have been identified and timetables have been set. Some countries have started to produce test datasets.

The report to the NSICCWG on the implementation status of S-104/S-111 is currently being finalized and will be send to NSICCWG and made available at the [TWG webpage](#) at the end of March.

4. Amendments to the Terms of Reference

The work packages discussed in the TWG cover a broad range of topics in oceanography, meteorology, geodesy and related fields. In order to be able to work on these topics in the best possible way and also to strengthen networking with other working groups (inside and outside IHO), the possibility of inviting expert contributors to the TWG should be explicitly mentioned in the TOR.

The TWG proposes to add the following to the TOR as point 3.a.4 (see Annex A for TOR):

[The TWG should: ...]

invite meteorological, oceanographic and geodetic experts to the working group as contributors as appropriate.

[...]

5. Amendments to Work Plan and List of Actions

See Annex B for the Work Plan and List of Actions with the following proposed amendments:

Work Plan:

- Only editorial changes to the Status of WP16/04

Actions:

- New action item AP27/01:
Collect information on how LAT/CD surfaces are calculated by the HOs and make it available to the group
- New action item AP27/02:
Conduct questionnaire on implementation status of S-104/S-111
- The action points AP22/02, AP22/03, AP23/02, AP25/01 (all related to the comparison of LAT/CD surfaces) are replaced with one new item, AP27/03:
Investigate the differences of national LAT/CD surfaces at all MS borders using the norm "50% max TVU (S-44 Order 1a)" and at the overlapping parts of the surfaces.
- The Status of AP26/1 is changed to Permanent.

6. Actions for the NSHC 38th Conference

The NSHC is invited to:

1. note this report
2. endorse the answer given from the TWG on the NSHC37 Action
3. endorse the amendments to the TOR
4. endorse the amendments to the Work Plan and List of Actions
5. give further guidance to TWG, as seen appropriate

ANNEX A**NSHC Tidal Working Group
Terms of Reference**

Changes to be approved by NSHC38, 8-9 April 2025
As proposed by TWG27, 4-5 February 2025

1. Objective

To provide technical advice and promote co-ordination on tidal issues especially within the North Sea Hydrographic Commission (NSHC).

2. Authority

The Tidal Working Group (TWG) is a subsidiary of the NSHC and its work plan is subject to NSHC approval. Subject to approval by NSHC the TWG is especially involved with the regional interpretation and implementation of tidal issues as identified by Tides, Water Level and Currents Working Group (TWCWG).

3. Procedures

a. The TWG should:

1. work according to the agreed NSHC work plan
2. monitor and report the progress of the work plan
3. propose new work plan items for consideration by the NSHC.
- ~~3.4.~~ invite meteorological, oceanographic and geodetic experts to the working group as contributors as appropriate.

To support the identification of new work plan items deemed relevant for the NSHC, the TWG should:

- ~~4.5.~~ liaise with relevant Hydrographic Services and Standards Committee (HSSC) working groups, such as TWCWG.
- ~~5.6.~~ Exchange views and experiences concerning tidal issues like unifying vertical datum, analysis, modelling and related issues like sea level rise and surge.
- ~~6.7.~~ Coordinate the implementation of S-104 Water Level and S-111 Surface Currents and report on the progress to NSICCWG.

b. The TWG will conduct its business mainly by correspondence. Meetings and workshops should be scheduled as deemed necessary for the accomplishment of the work plan.

4. Composition and Chair

1. The TWG shall comprise representatives of the NSHC Member State and expert contributors if applicable.
2. Decisions should generally be made by consensus, if a majority is required each Member State has one vote.
3. External contributors can contribute to the work plan but are not entitled to vote.
4. The Chair will be nominated by the TWG and approved by the NSHC Conference.
5. The Chair should monitor and report on the work plan to the NSHC.

ANNEX B

NSHC Tidal Working Group Work Plan and List of Actions

Changes to be approved by NSHC 38, 8-9 April 2025
As proposed by TWG27, 4-5 February 2025

Work Plan

Item Number (TWG/Item)	Objective (Why/Priority)	Task Description (What/How)	HO Involved	Status
WP 16/04	Enable GNSS-based tidal reduction and the connection with the vertical datum on land	Follow developments on geoid, MSL and LAT computations for the North Sea area	All	Permanent, see also WP18/01
WP 18/01	Improve North Sea wide realization of reference surfaces	Explain and reduce differences in reference surfaces at the international boundaries	All	Permanent
WP 18/02	Improve methodologies for ERS	Exchange between HO's on operational methodologies for ellipsoidal referenced surveying for GNSS based surveys	All	Permanent
WP 22/01	Ensure common European LAT surface adoption	Follow the developments of European initiatives on new LAT surfaces	All	Permanent
WP 24/01	Regional cooperation and coordination of the implementation of S-104 Water Level and S-111 Surface Currents	Coordinate the implementation of S-104 Water Level and S-111 Surface Currents and report on the progress to NSICCWG. Make available S-104 and/or S-111 test datasets which could be compared at national boundaries in the North Sea region, investigate and collaborate on resolving any differences.	All	Permanent
WP 24/02	Data Rescue and Data Archaeology	Exchange between HO's on details and methods used in the rescue of national / international archive tidal & water level datasets, for the purposes of climate change studies, tsunami research and any such activity requiring access to these important assets	All	Permanent

List of Actions

Item Number (TWG/Item)	Objective (Why/Priority)	Task Description (What/How)	HO Involved	Status	Corresponding Work Plan Item
AP 18/01	Explain differences in realizations of LAT	Exchange on bilateral basis between involved HO's to investigate further the origin of observed differences at the boundaries between national reference surfaces	All	Permanent	WP 18/01
AP 19/03	Make an overview over existing separation and hydrodynamic models, including metadata	Each member state sends the information to UKHO	All, UK	Done	WP 18/01
AP 22/02	Investigate the differences in national LAT reference surfaces at all borders	Each member state should supply all LAT updates to NL who will update the LAT differences matrix accordingly	NL, All	<u>Periodical closed, merged into new 27/03</u>	WP 18/01
AP 22/03	Investigate the differences in national LAT reference surfaces at all borders	Make error estimates in LAT surfaces	All	<u>Permanent closed, merged into new 27/03</u>	WP 18/01
AP 22/05	Ensure common European LAT surface adoption	Follow the developments of European initiatives e.g. EMODnet on new LAT	All	Permanent	WP 22/01
AP 23/02	Investigate all LAT differences at the borders and overlapping parts of surfaces using the redefined Norm	Investigate the differences at all MS borders (and overlapping parts of surfaces) between national LAT reference surfaces	All	<u>Permanent closed, merged into new 27/03</u>	WP 22/01
AP 24/01	UK and FR to supply 'CD to Ellipsoid' separation values along their common boundary to NL to investigate if this improves the result in any way	Charted depths in this region are reduced to 'CD', which is approximately LAT. Therefore it is important to ensure the correct surfaces are being compared with each other, then used in the 1% norm calculation (or other suitable method as decided by TWG)	FR, UK, NL	TWG27 Feb 2025 <u>done</u>	WP 18/01

<u>AP 24/04</u>	<u>Elect a permanent Chair of NSHC TWG</u>	<u>As directed by NSHC; the Chair should expect to be in place for a 5-year minimum term</u>	<u>All</u>	<u>Done</u>	<u>2024-04-10 Approved at NSHC37</u>
AP 25/01	Investigate LAT differences at overlapping parts of surfaces	Each member state should supply LAT surfaces for an as large as possible area of the North Sea to NL who will compare the surfaces	All	TWG27 Feb 2025 <u>closed,</u> <u>merged</u> <u>into new</u> <u>27/03</u>	WP 18/01
AP 26/01	Provide links to S-104 and S-111 test datasets	Link to existing IHO website, which already coordinates this. https://iho-ohi.github.io/S100Resources	All	TWG27 Feb <u>2025Perm</u> <u>anent</u>	WP 24/01
<u>AP 27/01</u>	<u>Exchange information on LAT / CD calculation and implementation</u>	<u>Collect information on how LAT /CD surfaces are calculated by the HOs and make it available to the group</u>	<u>Chair</u>	<u>Permanent</u>	<u>WP 18/01</u>
<u>AP 27/02</u>	<u>Coordinate implementation of S-104/S-111</u>	<u>Conduct questionnaire on implementation status of S-104/S-111</u>	<u>Chair</u>	<u>TWG28</u>	<u>WP 24/01</u>
<u>AP 27/03</u>	<u>Investigate LAT differences at the borders and overlapping parts of surfaces</u>	<u>Investigate the differences of national LAT/CD surfaces at all MS borders using the norm “50% max TVU (S-44 Order 1a)” and at the overlapping parts of the surfaces.</u>	<u>NL, All</u>	<u>Permanent</u>	<u>WP 18/01</u>