

## NSHC Tidal Working Group (TWG)

### Report to the NSICCWG on the Implementation Status of S-104/S-111

#### Background

The North Sea Hydrographic Commission (NSHC) has decided to task the Tidal Working Group (TWG) with coordinating the implementation of S-104 and S-111 and reporting to the North Sea International Charting Co-ordination Working Group (NSICCWG) on the progress (Decision 6/2023 C.2 and Action 6/2023 C.4 from NSHC36).

#### Status of implementation

At last meeting of the TWG on 3 February 2026 (VTC) the following Member States gave **presentations** on the national activities to implement these two products (the TWG28 agenda and presentations are available at the [TWG Website](#)):

- France
- Sweden (including activities within BSHC-CDWCWG and the e-Nav project)
- Netherlands
- Belgium
- Germany

A **questionnaire** was conducted in 2025 to collect detailed and standardized information from the Member States on the implementation status of S-104 and S-111. The results from the survey were presented at TWG28 and are available [online](#). The main findings are:

#### For S-104 (water levels):

- Some countries are already producing test datasets. Others are in a stage between initial preparations and development.
- Most countries plan to produce water level forecasts using hydrodynamic models. Some countries use a hybrid method, e.g. a combination of hydrodynamic models with observations or statistical tools. (See Table 1)
- Most countries look into the possibility of providing tidal (astronomical) predictions in the S-104 format.
- RENCs (IC-ENC or PRIMAR) will be used for data distribution.
- Horizontal reference system: Mostly WGS84 (EPSG: 4326), Also: EPSG 4258 and 32631.
- The vertical reference system of S-104 matches the one of S-102 for all countries.
- Temporal resolutions: Mostly 15 minutes, in some cases other resolutions between 10 and 60 minutes.

#### For S-111 (surface currents):

- Some countries are already producing test datasets. Others are in a stage between initial preparations and development.
- Almost all countries plan to produce surface current data using hydrodynamic models. (See Table 2)

- Some countries look into the possibility of providing real-time observations or tidal (astronomical) predictions.
- RENCs (IC-ENC or PRIMAR) will be used for data distribution.
- Horizontal reference system: Mostly WGS84 (EPSG: 4326), Also: EPSG 4258, 32631 and 1390.
- The chosen depth or layer thickness of the currents varies between the countries or has not yet been determined
- Temporal resolutions: between 10 and 60 minutes.
- No country has concrete plan to provide information on uncertainties.

### Related action items

Until the next meeting in February 2027, the TWG wants to

- create a draft of harmonisation guidelines for the production for S-104 and S-111 (AP 28/02),
- conduct a follow-up survey (towards the end of 2026; AP 28/03)

Already at the previous TWG meetings it was

- suggested to strengthen cooperation in the provision of tide gauge related data (availability of real time data and forecasts, information on datum and levelling),
- decided to place links to test datasets and information on testbeds on the [IHO S-100 Resources](#) website,
- decided that the co-operation could include the comparison of national products at maritime borders and the exchange of software.

### Interoperability of S-102 and S-104

When developing and producing S-104 data sets, close attention needs to be paid to the development of S-102, as these two data sets need to interact with each other. It was therefore suggested by members of the TWG that there should be close co-operation with the NSICCWG and that information on the North Sea-wide implementation of S-102 (incl. test data sets) should also reach the members of the TWG.

**Which type of water level data do you plan to produce?**

(see Section 7.1 of product specification)

	NL	SE	DE	UK	NO	DK	FR	BE
<b>Real-time observation</b>	In the far future	No	No	No	No	Undecided	around tide gauge sites	Maybe
<b>Astronomical prediction</b>	Maybe	No	Maybe	Maybe	Yes (12/2025)	Undecided	Yes (Mid 2026)	Yes (Q4 2026)
<b>Analysis method</b> (statistical or other indirect methods)	Maybe	No	No	No	No	Undecided	No	No
<b>Hybrid method</b> (combination of methods)	Maybe	No	Yes (2026)	Yes (unknown)	Yes (12/2025)	Undecided	No	No
<b>Forecast</b> (Hydrodynamic models)	Yes (2026)	Yes (01/2028)	See hybrid method	Yes (unknown)	See hybrid method	Undecided	Yes (2027)	Maybe

**Table 1:** Planned types of S-104 data by country (with time frame if provided)

**Which type of surface current data to you plan to produce?**

(see Section 7.1 of product specification)

	NL	SE	DE	UK	NO	DK	FR	BE
<b>Historical observation</b>	No	No	No	No	No	Undecided	No	No
<b>Real-time observation</b>	Maybe	No	No	No	No	Undecided	No	Maybe
<b>Astronomical prediction</b>	Maybe	No	No	Yes	No	Undecided	Yes (Mid 2026)	No
<b>Analysis method</b> (statistical or other indirect methods)	No	No	No	No	No	Undecided	No	No
<b>Hybrid method</b> (combination of methods)	No	No	No	No	No	Undecided	No	Yes
<b>Forecast</b> (Hydrodynamic models)	Yes (2026)	Yes (2029)	Yes (2026)	Yes	Yes (12/2025)	Undecided	Yes (2028)	No

**Table 2:** Planned types of S-111 data by country (with time frame if provided)