

S-102 extension as proposal to implement source metadata



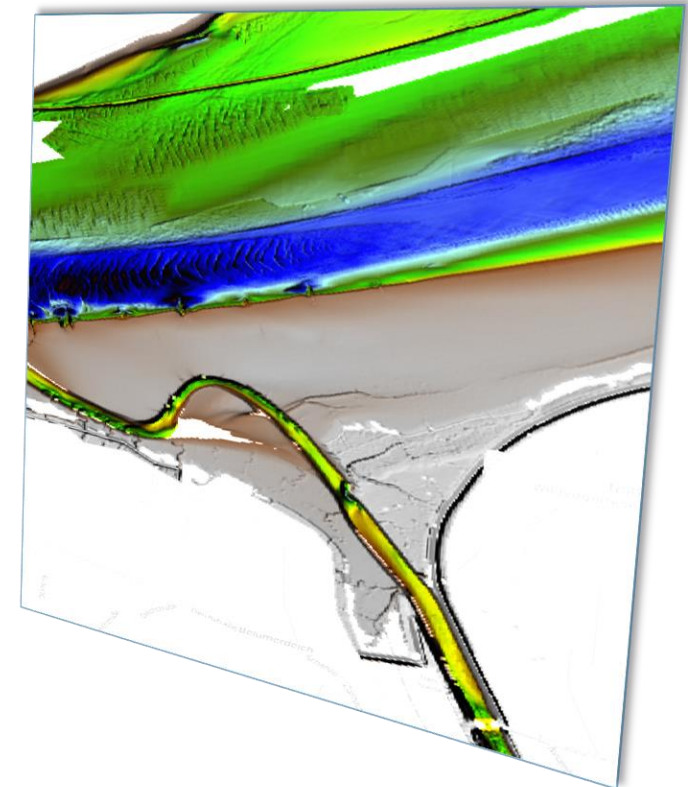
Purposes of S-102 data products

Navigation

- For a safe navigation in congested and confined waterways
- For a more precise route planning
- For the most efficient use of existing transport areas

Production

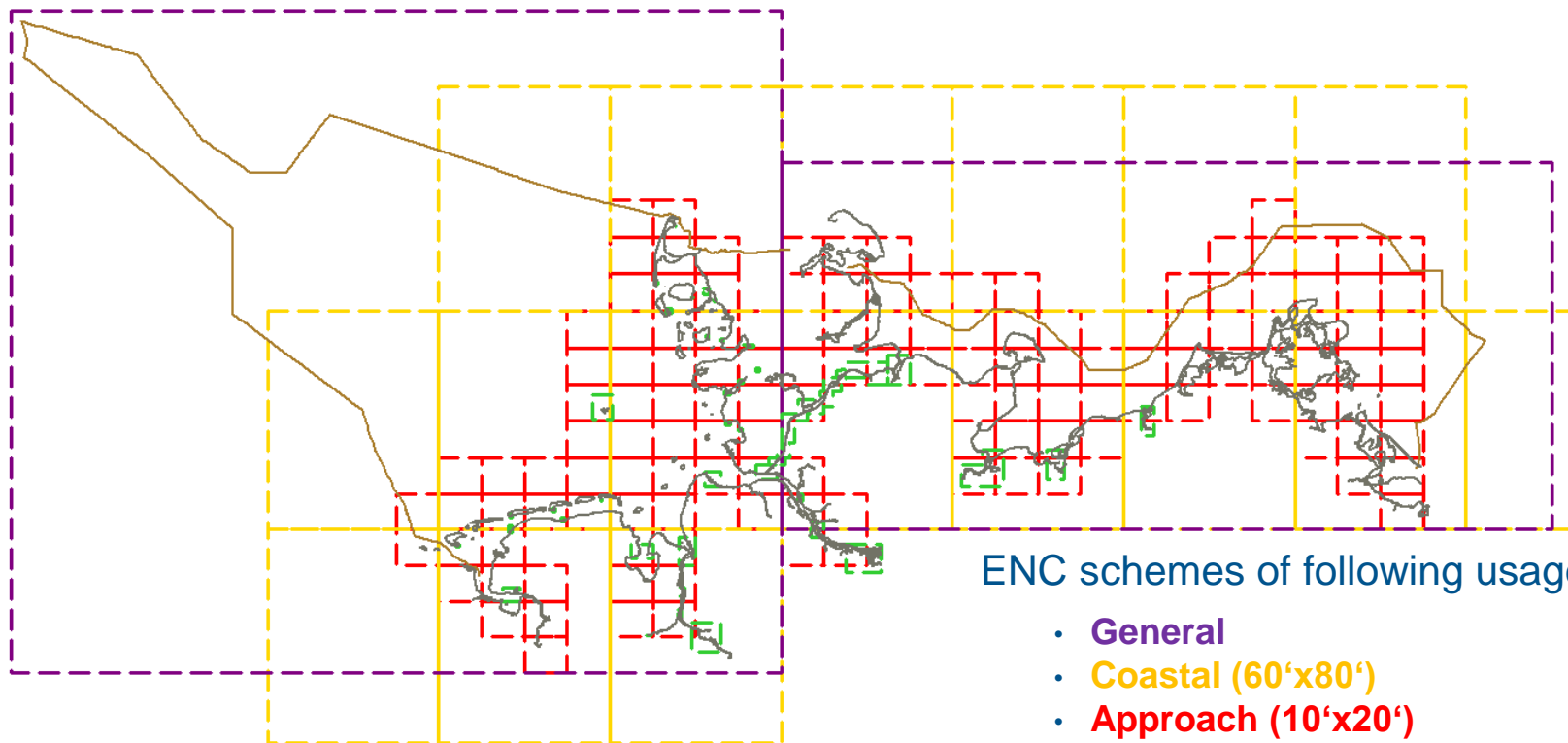
- As uniform basis (DTM) for the production of all cartographic products (ENCs, Paper charts) - consistency, timeliness and reliability



Tiling schemes

Tiling schemes of ENC's and bENC's reorganized / extended at BSH

- Basis for all products is a grid of 2' x 2' minutes (even-numbered) = bENC schema
- ENC schemes for all 6 usage bands are different multiples of bENC schema



ENC schemes of following usage bands:

- **General**
- **Coastal (60'x80')**
- **Approach (10'x20')**
- **Harbour**

BSH S-102 properties and extensions

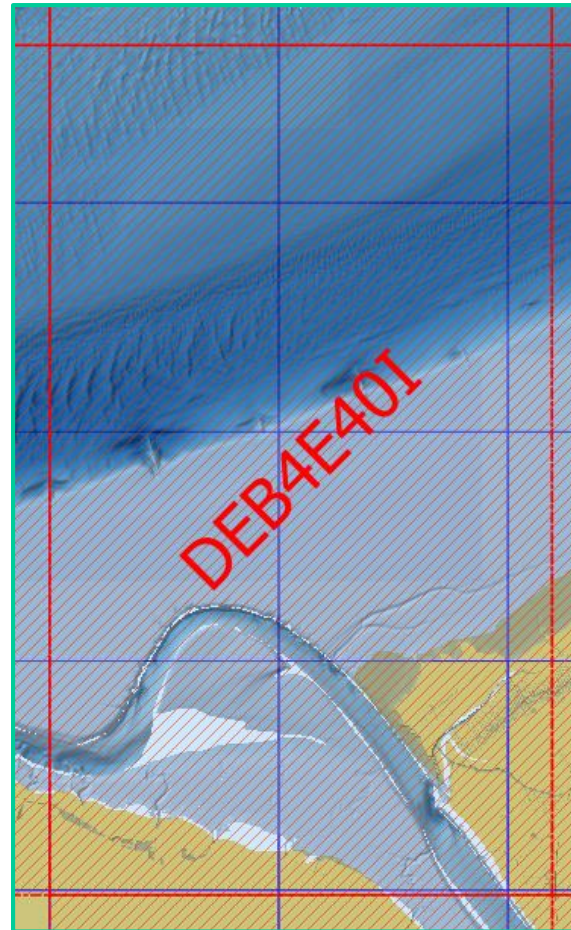
- Concerned usage bands: Harbour, Approach (= bENC Usage bands which are compliant with corresponding ENCs)
- Coordinate reference systems: ETRS89 / UTM (epsg: 25832)
- Grid-resolution: 1m
- Source metadata → to meet user requirements and to guarantee quality-assured production
 - dateStart
 - dateEnd
 - surveyAuthority
 - techniqueOfVerticalMeasurement
- Publication of a New edition: source-driven (depending on the dynamic of the sea area)
- First development stage:
 - Coverage of pilotage waters / fairways (to replace the bENCs)
 - Restricted user group – pilots and traffic control centers
 - Distribution via FTP

BSH S-102 data products

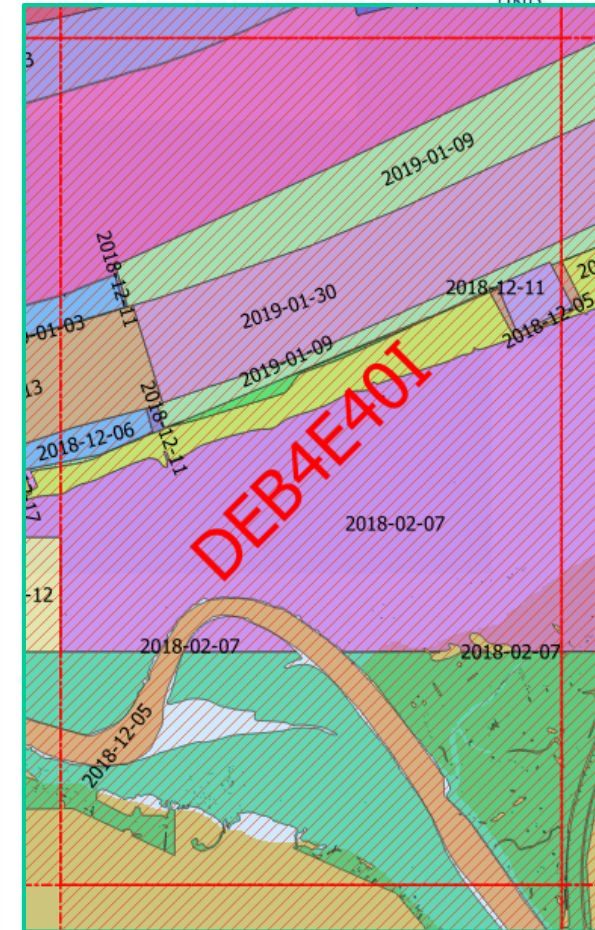
Final S-102 product is an up-to-date and non-overlapping DTM

Quantity of data

- Measured data and metadata – 5.013 MB
- Metadata – 83 KB (< 2%)

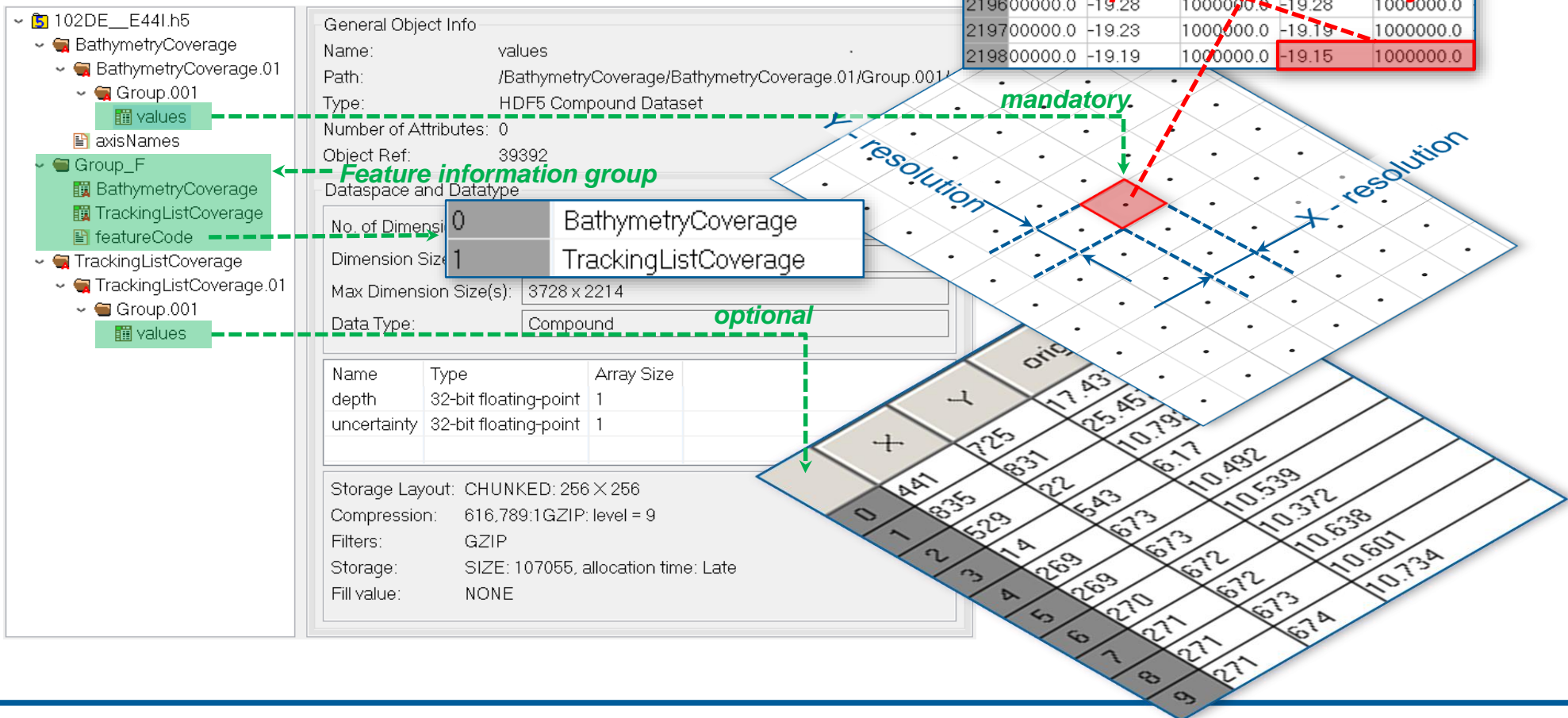


Blended surveying data



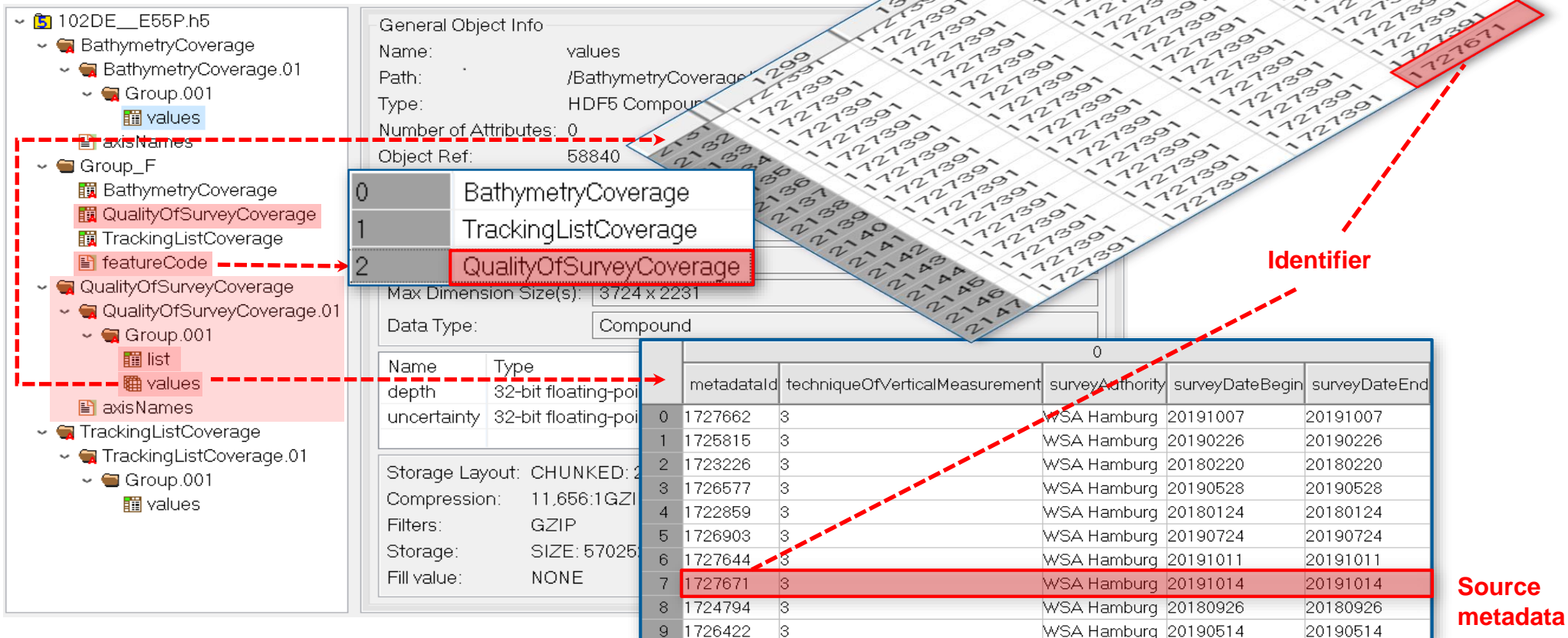
Blended metadata

Current S-102 data structure



Extension of S-102 data structure

Transfer of necessary metadata from the source data to the final product is possible



General Object Info

Name: values
Path: /BathymetryCoverage
Type: HDF5 Compound
Number of Attributes: 0
Object Ref: 58840

0 BathymetryCoverage
1 TrackingListCoverage
2 QualityOfSurveyCoverage

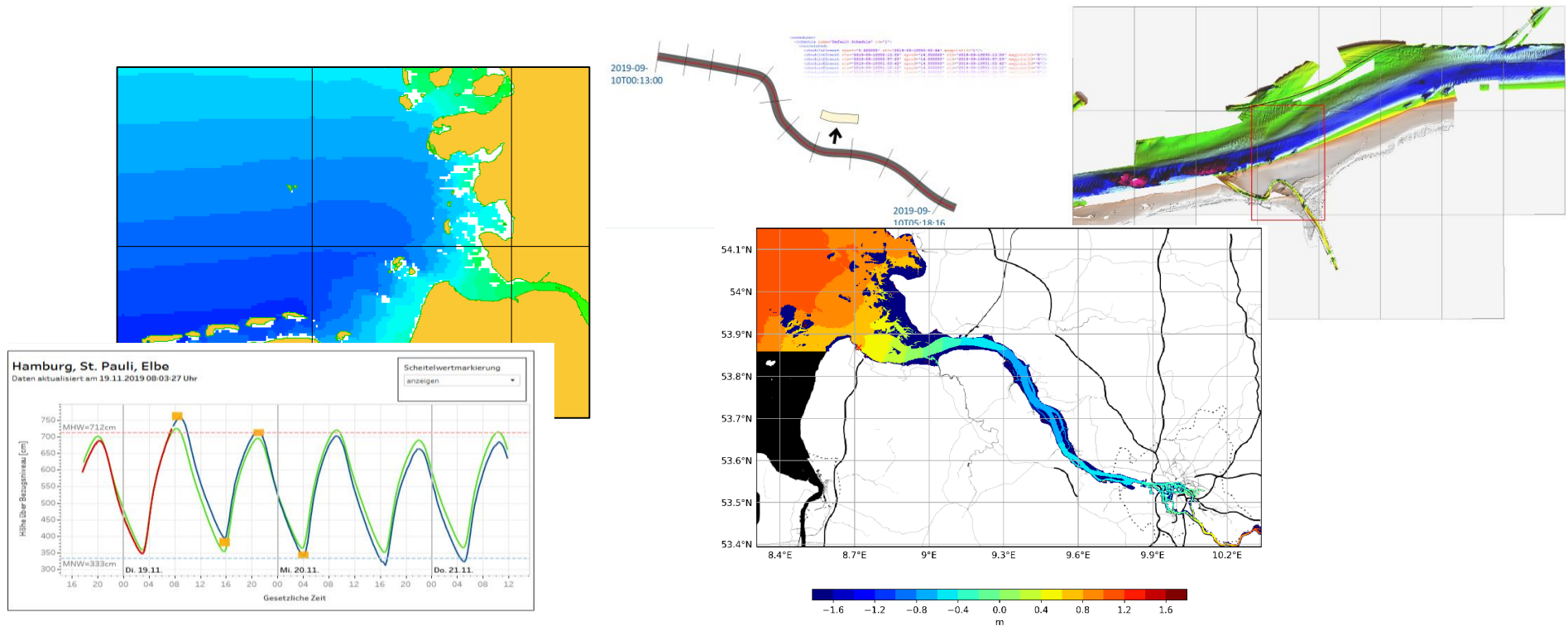
Max Dimension Size(s): 3724 x 2231
Data Type: Compound

Name	Type	metadataId	techniqueOfVerticalMeasurement	surveyAuthority	surveyDateBegin	surveyDateEnd
depth	32-bit floating-point	0	1727662	3	WSA Hamburg	20191007
uncertainty	32-bit floating-point	1	1725815	3	WSA Hamburg	20190226
		2	1723226	3	WSA Hamburg	20180220
		3	1726577	3	WSA Hamburg	20190528
		4	1722859	3	WSA Hamburg	20180124
		5	1726903	3	WSA Hamburg	20190724
		6	1727644	3	WSA Hamburg	20191011
		7	1727671	3	WSA Hamburg	20191014
		8	1724794	3	WSA Hamburg	20180926
		9	1726422	3	WSA Hamburg	20190514

Source metadata

Integration of high-resolution marine geodata in electronic Navigation systems

- New data services for narrow and congested waterways
- Cooperation between BSH, smile consult and SevenCs
- Combination of bathymetric data with current water level data, water level forecasting and others (S-102, S-104, S-111)



Thank you!



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