



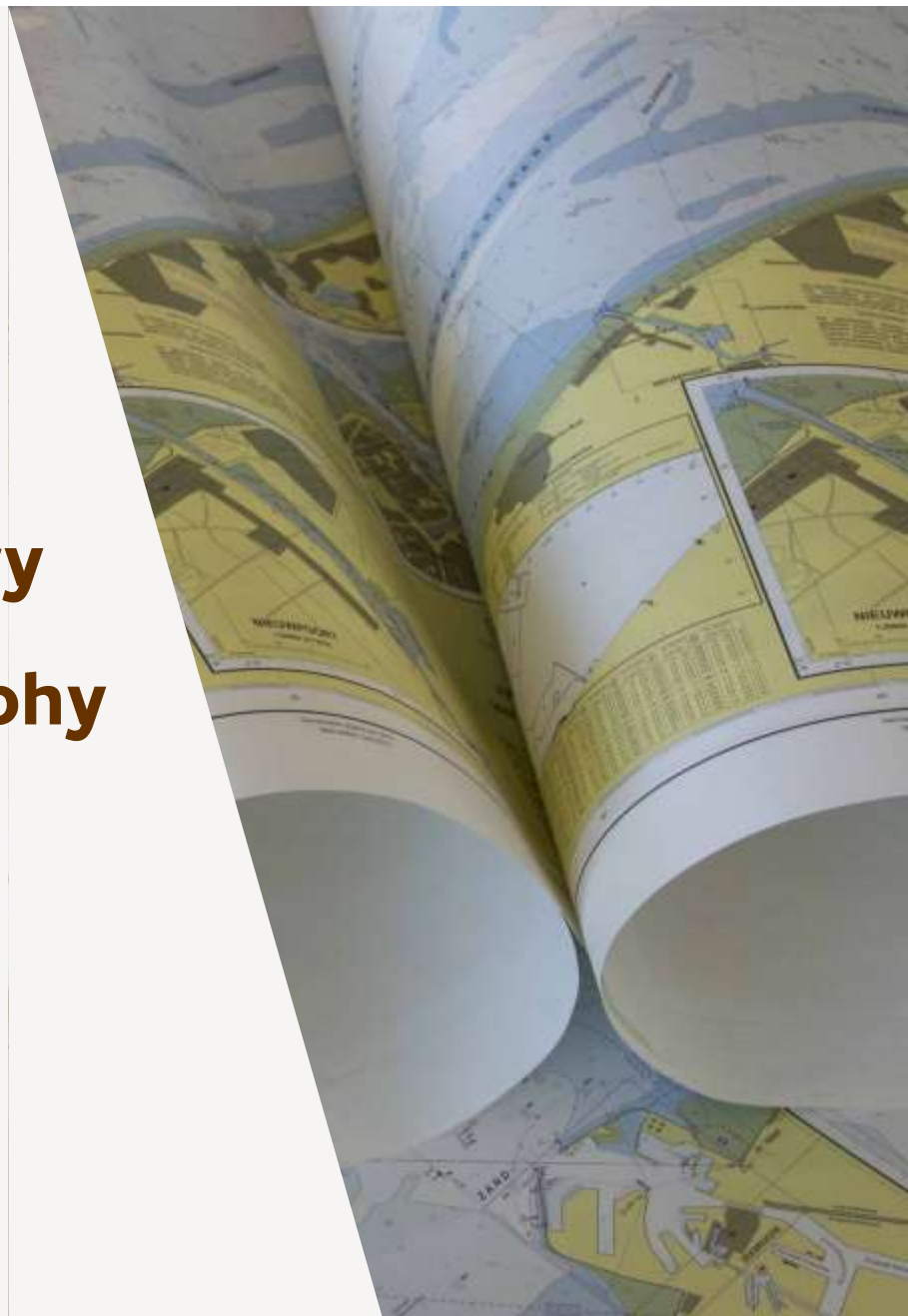
Vlaanderen
is maritiem

Dataportal Bathymetry

Team Flemish Hydrography

Marc Roesbeke

***INSPIRE KEN workshop
Elevation and Orthoimagery
29 & 30/09/2015***



Some background information



Implementation of the Bathy DataBase (BDB) since 2006

- The CARIS BDB TRITON is operational and actively used since 2007
- In the last few years a lot of enhancements are made:
 - Splitting the BDB in 1 big archive TRITON and 4 smaller production BDB on separated servers
 - Using customized filters and scripts in the production process
 - More powerful client workstations, servers and network infrastructure

Implementation of the Spatial Fusion Enterprise (SFE) since 2011

- The CARIS SFE TRITON is operational and actively used on the Intranet since June 2013 and on the internet since March 2014:
 - WMS & WMTS for using Google Maps as background reference
<https://maps.google.com/maps/api/js?v=3&sensor=false>
 - WMTS to visualize the bathymetric grids (Sea Area, River Scheldt and Canal Ghent-Terneuzen)
<https://bathy.agentschapmdk.be/spatialfusionserver/services/ows/wmts/OPENSFE?request=getcapabilities&service=WMTS&version=1.0.0>
 - WCS for selecting and downloading bathymetric grids and point clouds
https://bathy.agentschapmdk.be/spatialfusionserver/services/ows/wcs/WCS_Public?request=getcapabilities&service=WCS&version=1.1.2
- End of 2014 WFS is also be activated for downloading S-57 objects (e.g. wrecks)
https://bathy.agentschapmdk.be/spatialfusionserver/services/ows/wfs/WFS_ENC?request=GetCapabilities&service=WFS&version=1.1.0

Dataportal Bathymetry



What?

- An online portal system where survey data, metadata and data products can be queried, displayed and downloaded through a web browser.
- The portal SFE has a central database TRITON with depth and height information.
- Is an automated system with Web services where the GIS component provides a good visualization of the data.

Why?

- Offers the possibility for partners of the Flemish Hydrography to download wet and dry measurements as quickly as possible.
 - Public partners: aMT, WL, VLIZ, NGI, LINZ, BEMM, RUG
 - Private partners: DEME, TCARTA, NAVIONICS, ELIA, TOTAL
- Is user friendly and more accessible.

How?

- Composite Grids are Open Data.
- Detailed survey data through registration on <http://bathy.agentschapmdk.be/>
- After receiving an account you can select the appropriate hydrographic or terrestrial survey and download it.

Source Data & Conversion to EMODnet



Source Data

- Bathymetric database *TRITON* where survey data, metadata and data products can be queried together, displayed and exported.
- The Cartographic production software CARIS has all the *necessary tools* for making Composite GRID and associated metadata.
- A *semi-automated system* developed on top of the CARIS application for conversion of the bathymetry and associated metadata to combined grid and CDIs.

EMODnet conversion

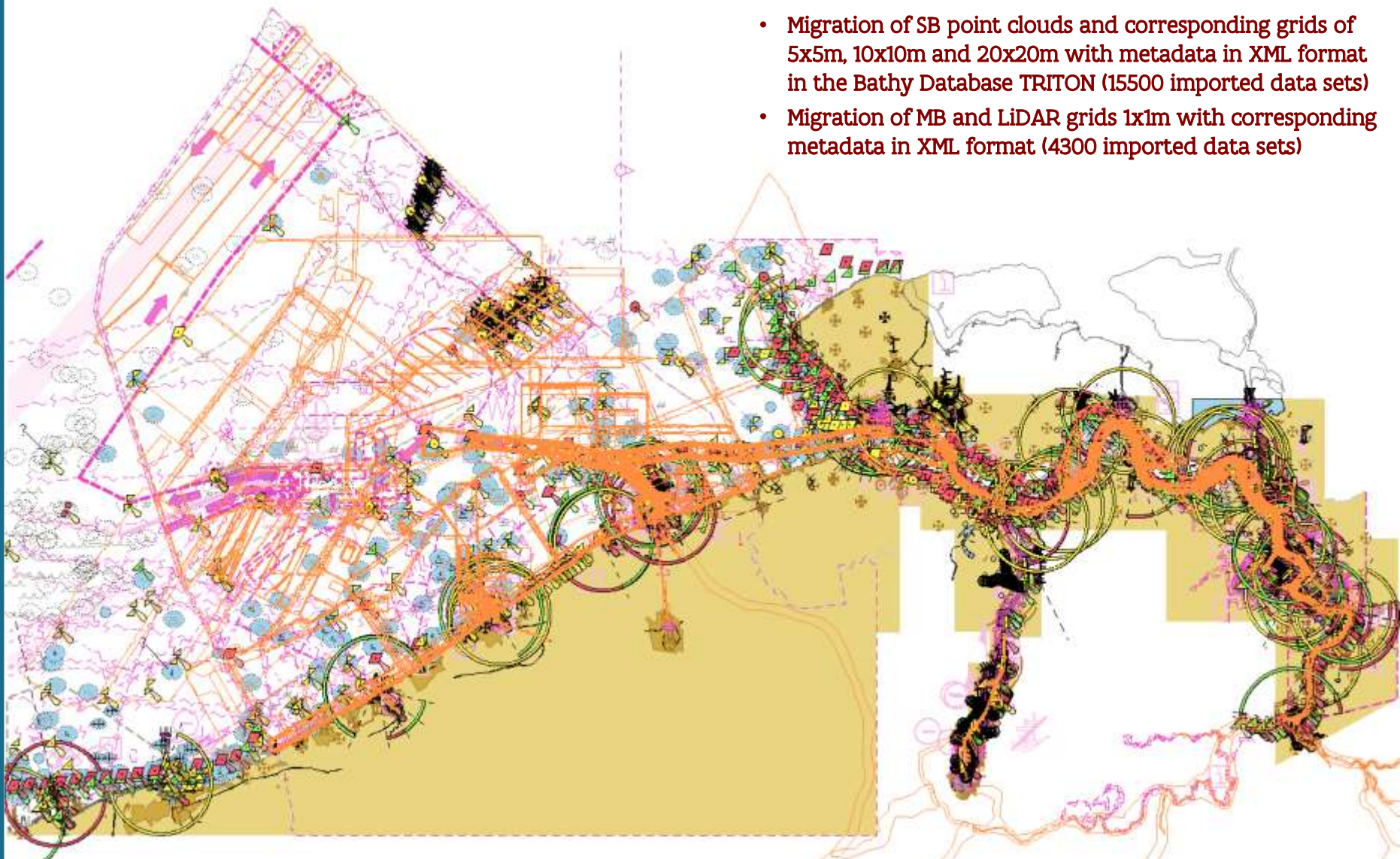
- Annual production of a *new composite DTM* of the Belgian Continental Shelf (BCS) in the EMODNet format for inclusion in the EMODnet Bathymetry.
 - For SB <Position Long>;<Position Lat> and <Depth Min>.
 - For MB <Position Long>;<Position Lat>;<Depth Min>;<Depth Max>;<Depth Average>; <Depth StDev>;<Number of Soundings> and <CDI ID>.
- The grid resolution is 60x60m (1/32').
- Delivering CDI metadata of the new SB- and MB-surveys for import in *SeaDataNet Metadata Bank*.
- Import metadata of the composite DTM in the European *Metadata Bank SEXTANT*.

Bathymetric Database TRITON



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- Migration of SB point clouds and corresponding grids of 5x5m, 10x10m and 20x20m with metadata in XML format in the Bathy Database TRITON (15500 imported data sets)
- Migration of MB and LiDAR grids 1x1m with corresponding metadata in XML format (4300 imported data sets)



All the necessary tools for production



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Export to ASCII

Options

Output file: R:\ArchiefBDB\DataMigratie\Werkfolder\ Browse...

Positions

☒ Coordinate System
WG84

Units: Geographic DD 7 Precision

Attributes

Available		Selected
Beam_Number	→	Depth
Interpolated		Deep
Profile_Number	←	Mean
Source_Name		Std_Dev
Time		Density
		Contributor

Attribute precision: 3

Delimiter: Other ;

☐ Filter attributes

☐ Include headers

☐ Include rejected

Z-axis convention in output: ☐ Up is positive ☒ Down is positive

☐ Bin

Size: m Bias: Deep

OK Cancel Help

Combine Surfaces

1 ☒

General

2 ☒

Options

3 ☒

Extents

4 ☒

Conflicts

New...

Modify...

Delete

Import...

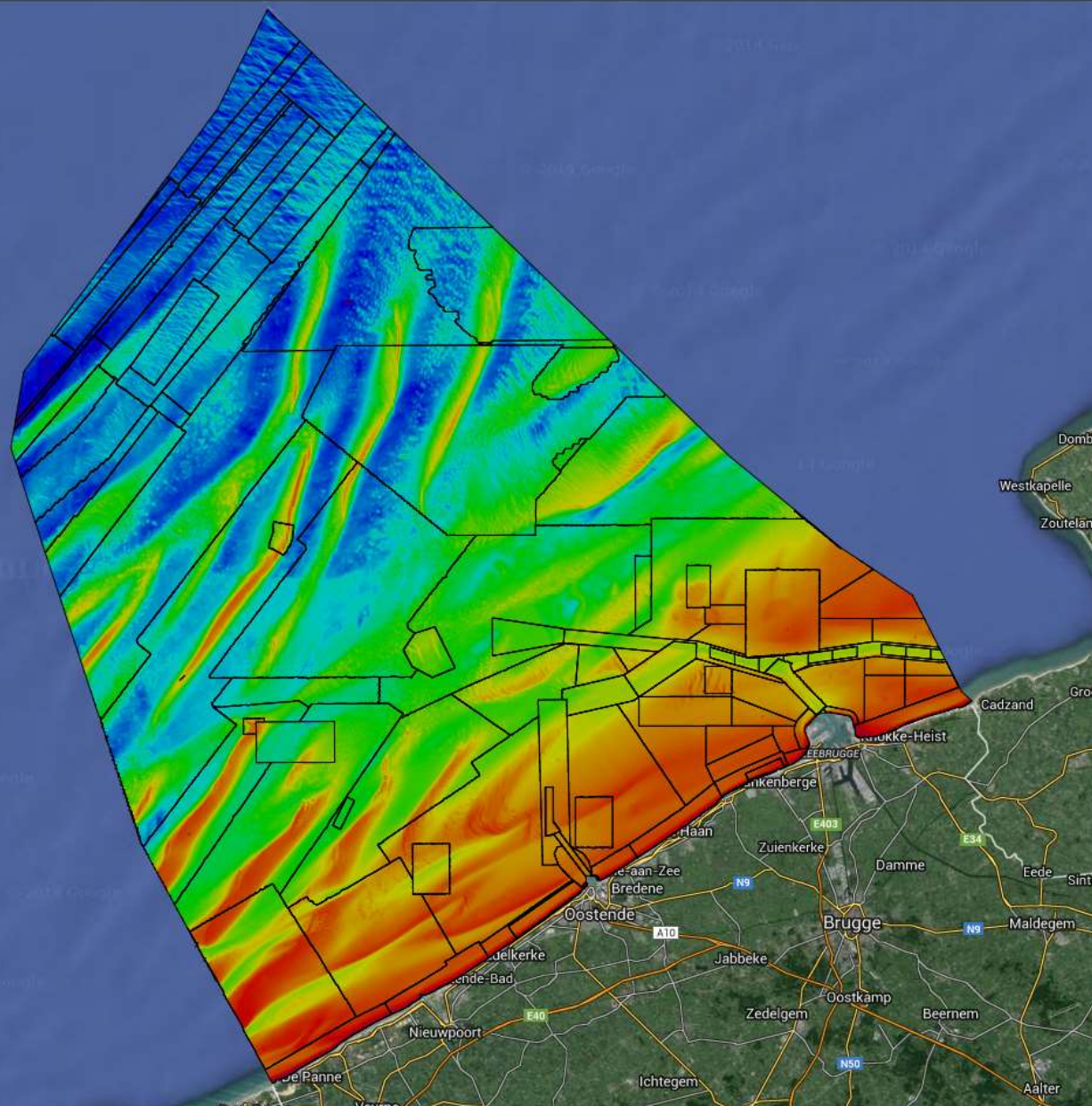
Export...

Print | Link | Map Information

Themes

Vlaamse Banken ▾

- ☐ Boeien en wrakken
- ☒ Lines
- ☒ BELGIUM_BCP_DTM_240315



330099.87124; 6760461.68937

Google

Kaartgegevens ©2015 Google Afbeeldingen ©2015 TerraMetrics

File Edit Search Project View Format Column Macro Advanced Window Help

0 10 20 30

```

762603 51.3915072;003.1321578;12.03;12.41;12.
762604 51.3915060;003.1330026;13.79;14.07;13.
762605 51.3915608;003.1343395;14.98;15.51;15.
762606 51.3914890;003.1347149;15.20;15.58;15.
762607 51.3915120;003.1361542;15.03;15.36;15.
762608 51.3917471;003.1369085;14.97;16.44;15.
762609 51.3915436;003.1378694;14.94;15.29;15.
762610 51.3915002;003.1385218;15.16;15.56;15.
762611 51.3917232;003.1395943;15.27;15.57;15.
762612 51.3915694;003.1398560;15.30;15.51;15.
762613 51.3915558;003.1414812;15.43;15.78;15.
762614 51.3917800;003.1417309;15.34;15.61;15.
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762622 51.3918683;003.1492689;14.49;N/A;N/A;N
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762645 51.3917871;003.1684219;11.44;11.80;11.

```

For Help, press F1 Ln 937141, Co

File Edit Search Project View Format Column Macro Advanced Window Help

0 10 20 30 40 50 60 70 80 90 100

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```

For Help, press F1 Ln 762611, Col. 89, CW DOS Mod: 18/02/2015 16:05:00 File Size: 92465758 INS

```
C:\mikado>REM  
C:\mikado_U3.3.4>REM  
#  
C:\mikado_U3.3.4>REM  
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C:\mikado_U3.3.4>REM  
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C:\mikado_U3.3.4>REM  
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C:\mikado_U3.3.4>REM  
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C:\mikado_U3.3.4>REM  
#  
C:\mikado_U3.3.4>REM  
se\OCS-15_0\lib3p\C:\m32;\C:\Windows\C:\Win_0;\C:\Program Files\WIDCOMM\Bluetooth64;\C:\Program Files\x86)\Common File es\Roxio Shared\10.0\ e Vault\EUCClient\C:\0\  
C:\mikado_U3.3.4>REM  
#  
C:\mikado_U3.3.4>javajar dist/mikado.jar
```

Mikado 3.3.4 SDN V2
Manual / CDI : R:\ArchiefBDB\DataMigratie\Werkfolder\VHO\Marc\CDI\CSAR&CDI_100215\CDI_140122_ZUYWE_SB_...

Manual Automatic Options Tools ?

Identification Where When What How Who Where to find the data Cruise/Station Documentation Quality Others

Geographic coverage (bounding box)

West longitude *	East longitude	South latitude *	North latitude
* 2.45	2.77	51.09	51.26

Measuring area type

Object type code * surface

Horizontal Datum

Name ETRS89
code list value 4937

Horizontal resolution

Value 0.1
Unit * t.org/urnurl/SDN:P06::ULAA

Vertical datum

name .owest Astronomical Tide
identifier .org/urnurl/SDN:L11::D01

Vertical resolution

Value 0.01
Unit * t.org/urnurl/SDN:P06::ULAA

Depth observation

Minimum depth 0.262
Maximum depth 21.378
Water depth -9999
Unit metres

GML

None Curves ☒ Surface

enter waypoints against the clock and repeat the first waypoint as last waypoint

Descripti...	name	Coordinates
140122_...	Blighbank	2.538997400000...

```
"D:\Python\BDBtoxml.py" - Notepad++
File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window

BDBtoxml.py
1 from math import *
2 from datetime import date
3 import xml.etree.ElementTree as ET
4 import caris.bathy.db
5 from caris.bathy.db import *
6 import os
7
8 #register xml namespace
9 ET.register_namespace("gmd", "http://www.isotc211.org/2005/gmd")
10 ET.register_namespace("gml", "http://www.isotc211.org/2005/gml")
11 ET.register_namespace("srv", "http://www.isotc211.org/2005/srv")
12 ET.register_namespace("gco", "http://www.isotc211.org/2005/gco")
13 ET.register_namespace("dxx", "http://www.isotc211.org/2005/dxx")
14 ET.register_namespace("gmx", "http://www.isotc211.org/2005/gmx")
15 ET.register_namespace("link", "http://www.isotc211.org/2005/link")
16 ET.register_namespace("gaa", "http://www.isotc211.org/2005/gaa")
17 ET.register_namespace("gmi", "http://www.isotc211.org/2005/gmi")
18 ET.register_namespace("gsl", "http://www.isotc211.org/2005/gsl")
19
20 #login informatie op server
21 host = "10.135.224.20"
22 user = "gaa"
23 passwd = "Mercurator_mow"
24
25 #Connecteer met de server
26 try:
27     #connect to node
28     nm = NodeManager(user, passwd, host)
29
30 except RuntimeError as e:
31     if "Error code = 30" in str(e):
32         sys.exit("Error: Login informatie")
33     else:
34         sys.exit(str(e))
35
36 #Print een lijst van de actieve databases
37 for db in nm.databases:
38     # print(db + ' ' + str(nm.get_data
39     database = "TRITON"
40
41 #Open de database
42 try:
43     db = nm.get_database(database)
44
45 except RuntimeError as e:
46     if "Error code = 21" in str(e):
47         sys.exit("Error: Database does not exist")
48     elif "Error code = 23" in str(e):
49         sys.exit("Error: Database does not exist")
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```

```
C:\Windows\system32\cmd.exe
Microsoft Windows [versie 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. Alle rechten voorbehouden.

C:\Users\vduvlieto>D:\Python\BDBtoxml.py
Geef de OBJNAM in van de gewenste surface: 150430_DR_FRED_MB_300

C:\Users\vduvlieto>
```

- Selecting survey from the TRITON Bathy Database
- Reading metadata
- Reading GML template MIKADO
- Completion of metadata in the CDI

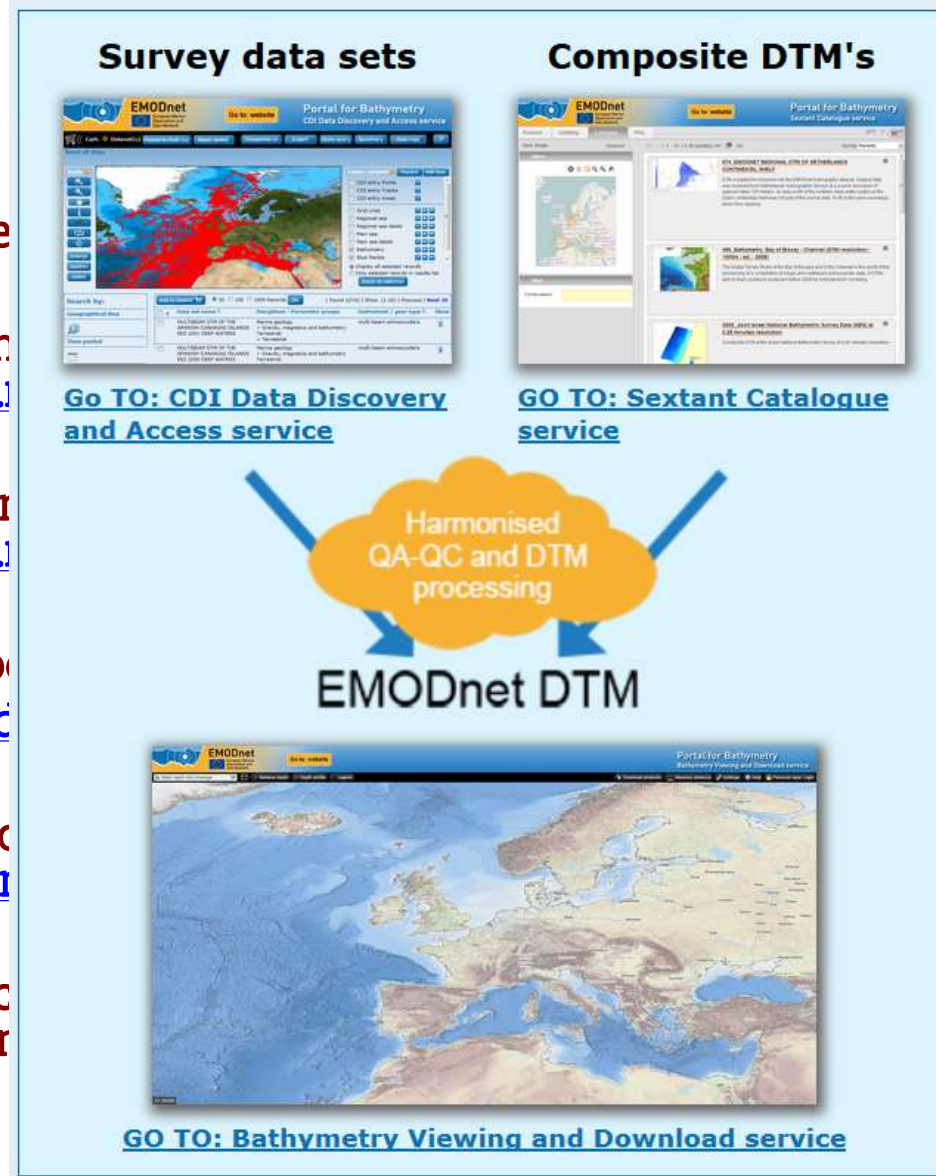
Both the CDI Data Discovery and Access service have been upgraded and now make use of the ISO19139 XML formats and have become INSPIRE compliant. Moreover all SeaDataNet metadata directories now make use of the Version 2.0 of the Common Vocabularies.



Examples of CDI GML coding

Release of CDIs, Composite GRID & Surveys

- Checking the correct
- CDIs are entered in <http://seadatanet.net>
- After approval to <http://seadatanet.net>
- Entering the composite <http://portal.emodnet.eu>
- Entering the metadata <http://sextant.ifremer.fr>
- At the request of the Data Portal Bathymetry





LARIS.



te:

e Service:
[sextant](http://sextant.ifremer.fr)

registering on our

HOW?												
Instrument / gear type	multi-beam echosounders											
Horizontal resolution	0.1 Metres											
Vertical resolution	0.01 Metres											
Platform type	research vessel											
Cruise name	Uranus											
Alternative cruise name	11UR											
Cruise start date	20140704											
Station name	Uranus											
Alternative station name	11UR											
Station start date	20140704											
WHO?												
Originator	 Flemish Ministry of Mobility and Public Works; Agency for Maritime and Coastal Services; Coastal Division											
Data Holding centre	 Flemish Ministry of Mobility and Public Works; Agency for Maritime and Coastal Services; Coastal Division											
HOW TO GET THE DATA?												
Data Distributor	 Flemish Ministry of Mobility and Public Works; Agency for Maritime and Coastal Services; Coastal Division											
Access/ordering of data	web data access with registration											
Internet access/ordering												
Access restriction	by negotiation											
OTHER INFO												
Quality info	<table><tr><th>Name</th><th>Date</th><th>Comment</th></tr><tr><td>COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata</td><td>2008-12-04</td><td>See the referenced specification</td></tr><tr><td>IHO S-44</td><td>2014-07-08</td><td>Validated survey</td></tr></table>			Name	Date	Comment	COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata	2008-12-04	See the referenced specification	IHO S-44	2014-07-08	Validated survey
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IHO S-44	2014-07-08	Validated survey										
Lineage	The data centres apply standard data quality control procedures on all data that the centres manage. Ask the data centre for details.											
CDI-METADATA												
CDI-record id	2204369											
CDI-record creation date	20150401											
CDI-record last update	20150409											

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Openen 1 (1 van 1) 177% Gereedschappen Invullen en ondertekenen Opmerking

  **Ifremer**

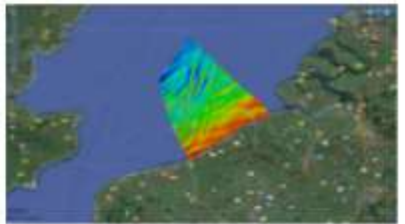
2 results

2243_EMODNet Regional DTM of the Belgium Continental Shelf (Version 3)

Abstract Source data for the EMODNet DTM for the Belgium Continental Shelf (BCP) is compiled by the **Vlaamse Hydrografie** (<http://www.vlaamsehydrografie.be/>) at a resolution of **60x60 meter**. The data set covers the Belgium Continental shelf area.

Keywords SDN:EDMERP::12055 = EMODNet Bathymetry, SDN:L054:12:156 = single-beam echosounders, SDN:L054:12:157 = multi-beam echosounders, SDN:L056:3:POS04 = Differential Global Positioning System receivers, SDN:P021:68:MBAN = Bathymetry and Elevation, Hydrography, Oceans

Resources [Metadata](#) | [Metadata\(XML\)](#) | [\(PDF\)](#)

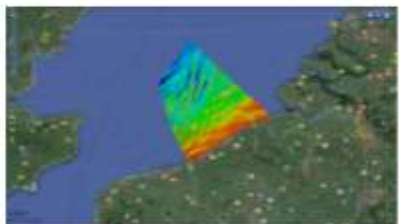


2243_EMODNet Regional DTM of the Belgium Continental Shelf (Version 2)

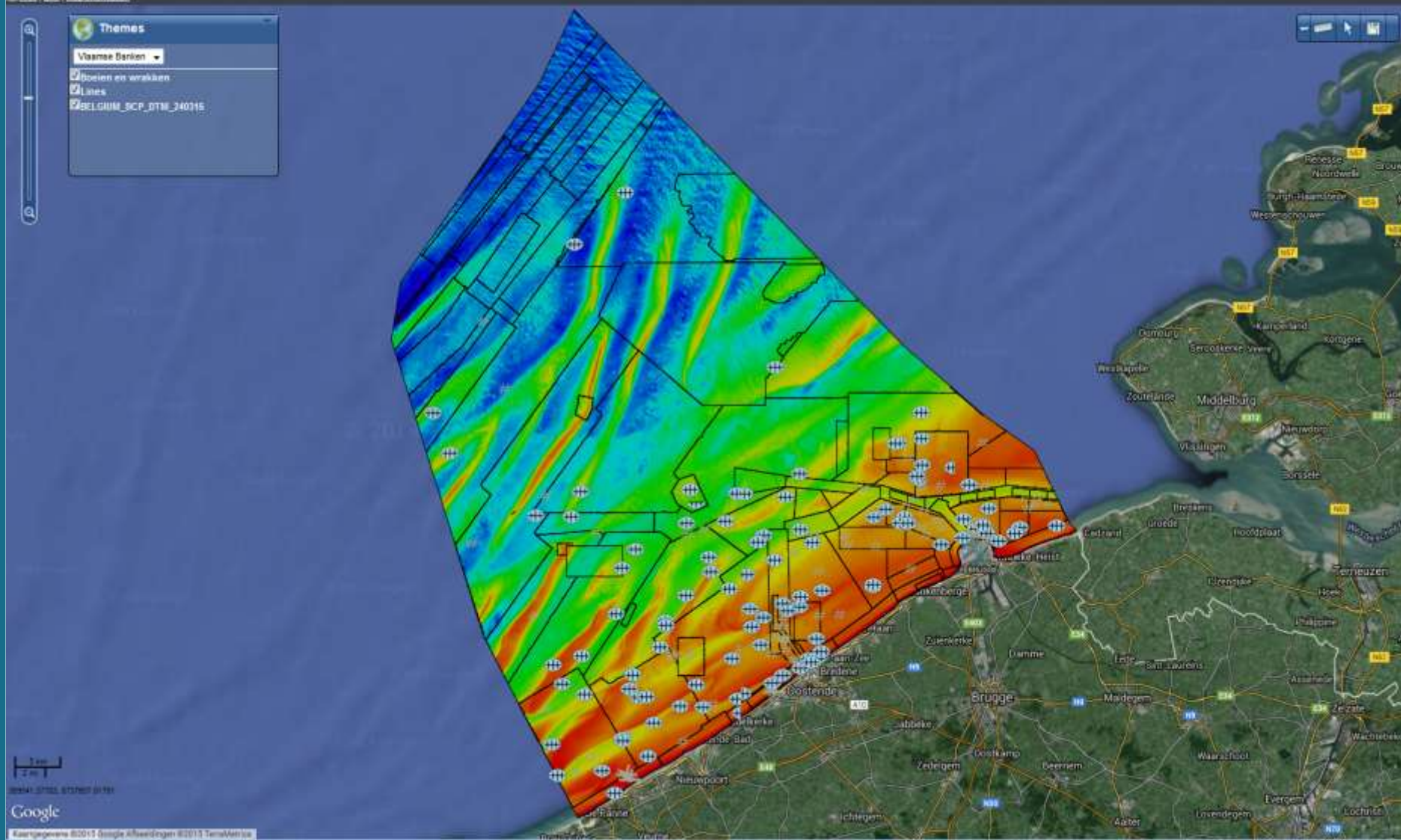
Abstract Source data for the EMODNet DTM for the Belgium Continental Shelf (BCP) is compiled by the **Vlaamse Hydrografie** (<http://www.vlaamsehydrografie.be/>) at a resolution of **125x125 meter**. The data set covers the Belgium Continental shelf area.

Keywords SDN:EDMERP::12055 = EMODNet Bathymetry, SDN:L054:12:156 = single-beam echosounders, SDN:L054:12:157 = multi-beam echosounders, SDN:L056:3:POS04 = Differential Global Positioning System receivers, SDN:P021:68:MBAN = Bathymetry and Elevation, Hydrography, Oceans

Resources [Metadata](#) | [Metadata\(XML\)](#) | [\(PDF\)](#)



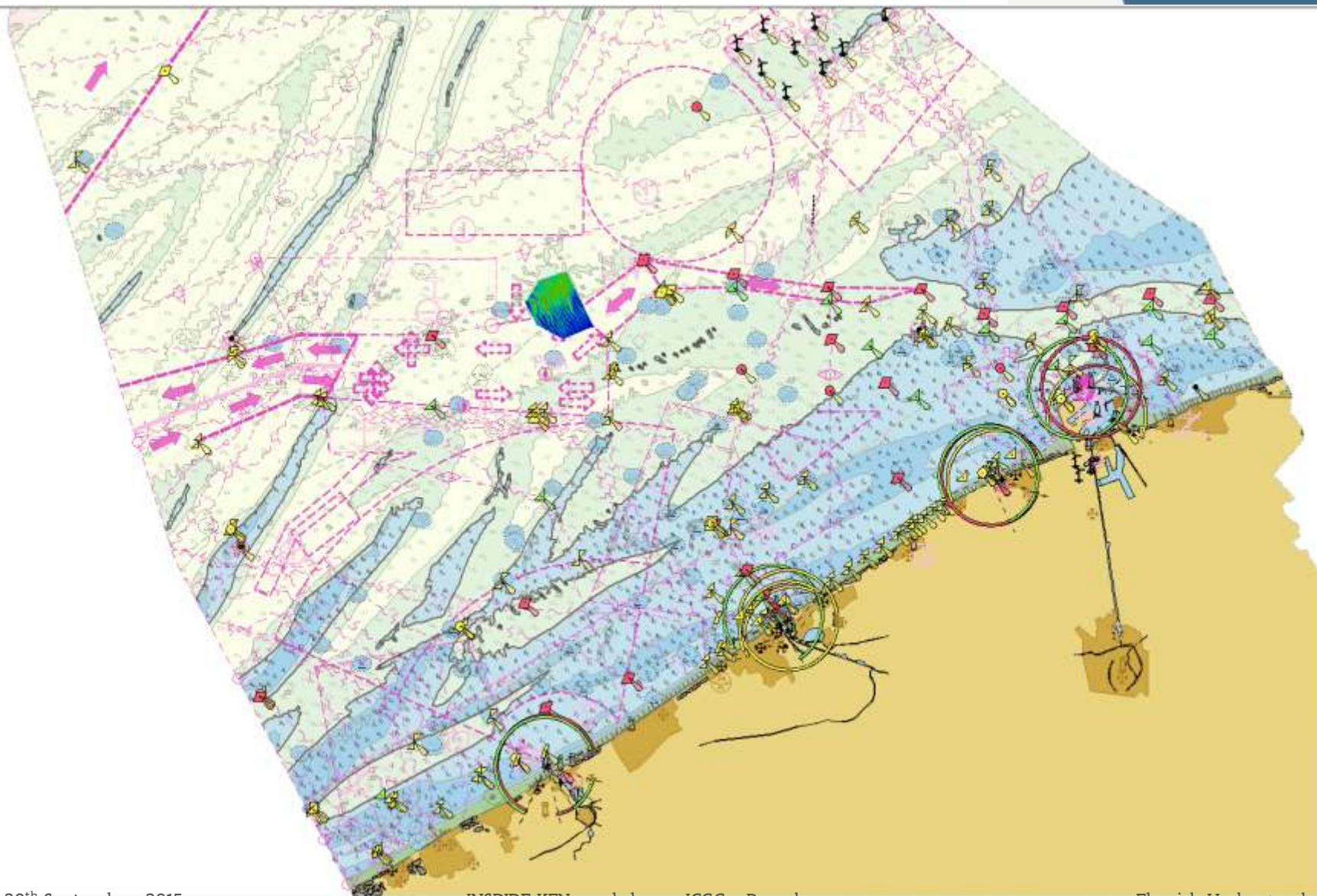
MapServer / Link / Map information



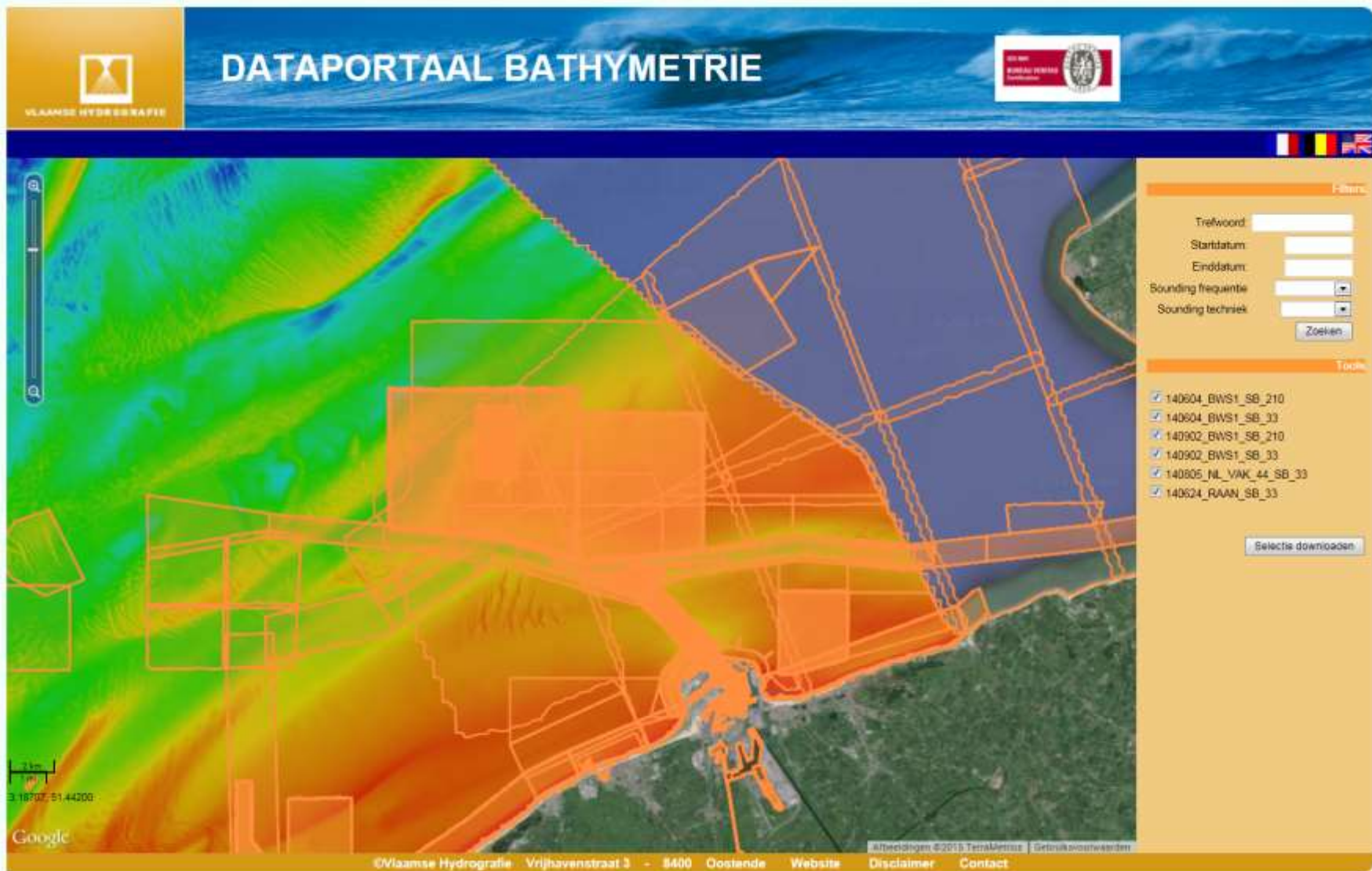
Dataportal: gateway to depth and height data



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Own customized Dataportal Bathymetry



Further plans



- Follow-up of the European directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).
- For a number of data sets there are concrete plans for further opening to INSPIRE:
 - Combined bathymetric grid Belgian Continental Shelf, Canal Ghent-Terneuzen and River Scheldt.
 - Bathymetric and terrestrial surveys.
 - Sea areas and coastline.
- Delivering Composite Grid BCP on behalf of EU Coastal Mapping Project:
 - Resolution 30x30m within the 12-mile zone.
- Creating a Composite Grid BCP with multi-resolution on behalf of EU EMODnet Project:
 - Resolution 30x30m within the 12-mile zone.
 - Resolution 60x60m outside the 12-mile zone.

Thank you for your attention



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