



D3.4

# Ecosystem services maps

WP n° and title	<b>WP 3 Building a quantitative supply-demand model for the BCS</b>
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Dissemination level	
PU = Public; PP = Restricted to other program participants; RE = Restricted to a group specified by the consortium; CO = Confidential, only for members of the consortium	

## DOCUMENT INFORMATION

Project Title	<b>SUMES: Sustainable Marine Ecosystem Services</b>
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## DOCUMENT HISTORY

Version	Date (MM/DD/YYYY)	Description of changes	Contributors
<b>01</b>			<b>Katrien Van der Biest</b>

This deliverable gives an overview of the maps of the Belgian Continental Shelf that were created as part of the ecosystem services methodology development. The maps can be used as input for quantifying ecosystem services. They represent biotic or abiotic variables, as well as variables related to socio-economic demand (e.g. navigation routes). Due to constraints on data availability (no data exists or data exists but was not available to us), it was not possible to provide maps for all ecosystem services. However, this does not impact on the functioning of the SUMES ES-model as the methods for these ES are also not spatially explicit and they do not require maps. For each map, a short abstract is provided. Their usage in the quantification of the ecosystem services is explained in detail in Deliverable 3.3 (Integrated ecosystem services model). Table below provides an overview of the maps. All of the maps are collected in the SUMES folder on the Marine Data Archive, hosted by VLIZ.



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Ecosystem service	Dataset title	Vector or resolution	Raster resolution	Raster unit	Source	Open access	Abstract
Sand and other minerals	3_1_Available_sand_extraction_zones_m3	-	5 x 5 m	m <sup>3</sup>	FOD Economie	y	Volume of sand available in the legally defined extraction zones in the BCS, above the reference level
	3_2_Potential_available_sand_upper_holocene_m3	-	200 x 200 m	m <sup>3</sup>	TILES-project	y	Volume of sand present in the upper Holocene layer of the BCS, version 2020 (Hademenos et al. 2018)
	3_3_Sand_Extraction_concession_zones.shp	Polygon	-	-	FOD Economie	y	Locations of the legally defined sand extraction zones in the BCS
Surface for navigation	4_1_Shipping_density_nr_per_y	-	1 x 1 km <sup>2</sup>	number per year	EMODnet	y	Number of ships (all shipping types: cargo, tankers, fishing vessels, passengers, other) in the BCS in 2021
	4_2_Detour_km_per_route	Polygon	-	-	University of Antwerp	y	Navigation routes in the BCS anno 2021; identified shortest alternative route; length of the alternative route
Climate regulation	7_1_Shell_Caco3_gC_acc_per_year.tif	-	1 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	C in calcium carbonate accumulated in 1 year in the shell of a <i>Mytilus edulis</i> harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	7_2_Faeces_gC_acc_per_year.tif	-	1 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	Faeces production rate of C, calculated as a yearly average over the growth cycle of a <i>Mytilus edulis</i> harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	7_3_Shell_OrganicMatrix_gC_acc_per_year.tif	-	1 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	C in organic shell matrix (proteins in shell) accumulated in 1 year in the shell of a <i>Mytilus edulis</i> harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	7_4_Respiration_gC_prod_per_year.tif	-	1 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	Respiration flux of C, calculated as a yearly average over the growth cycle of a <i>Mytilus edulis</i> harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	7_5_Ingestion_gC_ing_per_year.tif	-	2 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	Ingestion rate of C, calculated as a yearly average over the growth cycle of a <i>Mytilus edulis</i> harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.



### D3.4 – Mapping of ecosystem service

<b>Mediation of waste (nutrients)</b>	7_6_Tissue_gC_acc_per_year.tif	-	3 x 1 km <sup>2</sup>	g C per year	Brecht Stecheler	y	C in tissue accumulated in 1 year in a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_1_Shell_Caco3_gN_acc_per_year.tif	-	4 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	N in calcium carbonate accumulated in 1 year in the shell of a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_2_Faeces_gN_acc_per_year.tif	-	5 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	Faeces production rate of N, calculated as a yearly average over the growth cycle of a Mytilus edulis harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_3_Shell_OrganicMatrix_gN_acc_per_year.tif	-	6 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	N in organic shell matrix (proteins in shell) accumulated in 1 year in the shell of a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_4_Respiration_gN_prod_per_year.tif	-	7 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	Respiration flux of N, calculated as a yearly average over the growth cycle of a Mytilus edulis harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_5_Ingestion_gN_ing_per_year.tif	-	8 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	Ingestion rate of N, calculated as a yearly average over the growth cycle of a Mytilus edulis harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_6_Tissue_gN_acc_per_year.tif	-	9 x 1 km <sup>2</sup>	g N per year	Brecht Stecheler	y	N in tissue accumulated in 1 year in a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_7_Shell_Caco3_gP_acc_per_year.tif	-	10 x 1 km <sup>2</sup>	g P per year	Brecht Stecheler	y	P in calcium carbonate accumulated in 1 year in the shell of a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_8_Faeces_gP_acc_per_year.tif	-	11 x 1 km <sup>2</sup>	g P per year	Brecht Stecheler	y	Faeces production rate of P, calculated as a yearly average over the growth cycle of a Mytilus edulis harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_9_Shell_OrganicMatrix_gP_acc_per_year.tif	-	12 x 1 km <sup>2</sup>	g P per year	Brecht Stecheler	y	P in organic shell matrix (proteins in shell) accumulated in 1 year in the shell of a Mytilus edulis harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
8_10_Respiration_gP_prod_per_year.tif	-	13 x 1 km <sup>2</sup>	g P per year	Brecht Stecheler	y	Respiration flux of P, calculated as a yearly average over the growth cycle of a Mytilus edulis harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.	



### D3.4 – Mapping of ecosystem service

	8_11_Ingestion_g P_ing_per_year.tif	-	14 x 1 km <sup>2</sup>	g P per year	Brecht Stechel e	y	Ingestion rate of P, calculated as a yearly average over the growth cycle of a <i>Mytilus edulis</i> harvested for aquaculture (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
	8_12_Tissue_gP_ acc_per_year.tif	-	15 x 1 km <sup>2</sup>	g P per year	Brecht Stechel e	y	P in tissue accumulated in 1 year in a <i>Mytilus edulis</i> harvested for aquaculture. Cumulative dry weight, calculated as a yearly average over the growth cycle of a mussel (length of growth cycle varies with location in the BCS). The map is output of the Dynamic Energy Budget model.
<b>Other</b>	<b>Dataset title</b>	<b>Ve ct or</b>	<b>Raste r resol ution</b>	<b>Raste r unit</b>	<b>Source</b>	<b>Ope n acc ess</b>	<b>Abstract</b>
<b>Habitat map</b>	0_1_EUSeaMap_ Atlantic_Habitats _BE.shp	Po ly go n	-	-	EMOD net	y	Map of the marine habitats following the EUNIS classification system
<b>Offshore wind farms</b>	0_2_EMODnet_O WF_Belgium.shp	Po ly go n	-	-	EMOD net	y	Locations of current offshore windfarms in the BCS
	0_3_OWF_Wind turbines.shp	Po int	-	-	KBIN	y	Locations of wind turbines in the current concession zones in the BCS
<b>Abiotic</b>	0_4_Median_grai n_size_D50_ug.tif	Ra st er	250 x 250 m	µg	KBIN	y	Median grain size in the BCS expressed as D50 (µg)