



D5.4

Project data: information platform

WP n° and title	WP5 – From a holistic sustainability impact assessment model to a decision support tool
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Dissemination level	PU

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

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01	28/11/2023	First draft	Carolien Knockaert
02	08/12/2023	Internal feedback	Jelle Rondelez
03	12/12/2023	Second draft	Carolien Knockaert
04	02/01/2024	Feedback on second draft	Sue Ellen Taelman
05	23/01/2024	Final	Carolien Knockaert, Charlotte Dhondt, Jelle Rondelez, Sue Ellen Taelman

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Acronyms

WP	Work Package
SAB	Strategic Advisory Board
ScAB	Scientific Advisory Board
BCS	Belgian Continental Shelf

ES	Ecosystem Services
MDA	Marine Data Archive
IMIS	Integrated Marine Information System
ESA	Ecosystem Services Assessment
ERA	Ecological Risk Assessment
LCA	Life Cycle Assessment

1. Introduction

This deliverable is a part of WP 5 (From a holistic sustainability impact assessment model to a decision support tool) and linked to Task 5.3 which involves the integration of data in an information portal. This task combines all relevant scientific information and deliverables from WPs 1 to 5 in a user-friendly information source.

The information portal serves as a knowledge base for methods and indicators for ecosystem services assessment (ESA), ecological risk assessment (ERA) and life cycle assessment (LCA) and provides access to information on different biotic and abiotic (data) sources which were relevant in developing and applying a comprehensive and quantitative sustainability assessment method.

The information portal is very valuable to marine actors such as professional end-users and stakeholders primarily including researchers and R&D departments of companies involved with activities at sea as well as policy makers responsible for the management and protection of our Belgian Exclusive Economic Zone and the implementation of EU legislation like the Marine Strategy Framework Directive.

The SUMES portal is accessible through the following website: <https://sumesproject.be/>. This deliverable describes the design of the website, developed and managed by the VLIZ team, and provides especially details on the data platform.

2. About the SUMES website

2.1. Technical Information

The website is developed by VLIZ using Drupal 9 software, and is hosted on the in-house servers of VLIZ. Drupal is a free and open-source content management framework that can be customized and is suitable for developing simple websites or complex applications. The website content is bilingual; the English content was provided by UGent-STEN, UA-Ecosphere and was translated by VLIZ in Dutch (double checked by UGent-STEN to remove any spelling mistakes or translations errors).

2.2. Website Maintenance

The SUMES website is hosted and maintained by the VLIZ Marine Datacenter. VLIZ guarantees that the website will be kept online and preserved once the project has ended. However, input for changes to the website once the project has ended is only possible based on specific request by the SUMES partners, and in agreement with VLIZ. If no specific website adaptations appear to be necessary within one year after the project ends, VLIZ can convert the website to a static HTML format.

3. Website Content

3.1. Homepage

The homepage of the SUMES website intends to give an initial overview about the goal of the project. Website visitors can easily switch between the English and Dutch version by clicking the language button at the upper right (Figure 1). A short abstract is provided which briefly explains the aim of SUMES. Also, a video is plugged to present the SUMES project and inform on its goals in related to the marine environment. In the homepage, at the bottom, logos of the project and the different project partners are integrated together with a link to the Blue Cluster (Blauwe Cluster), subcontractor in this project (Figure 2). The home page gives users access to six menu-items, which are explained in more detail below.

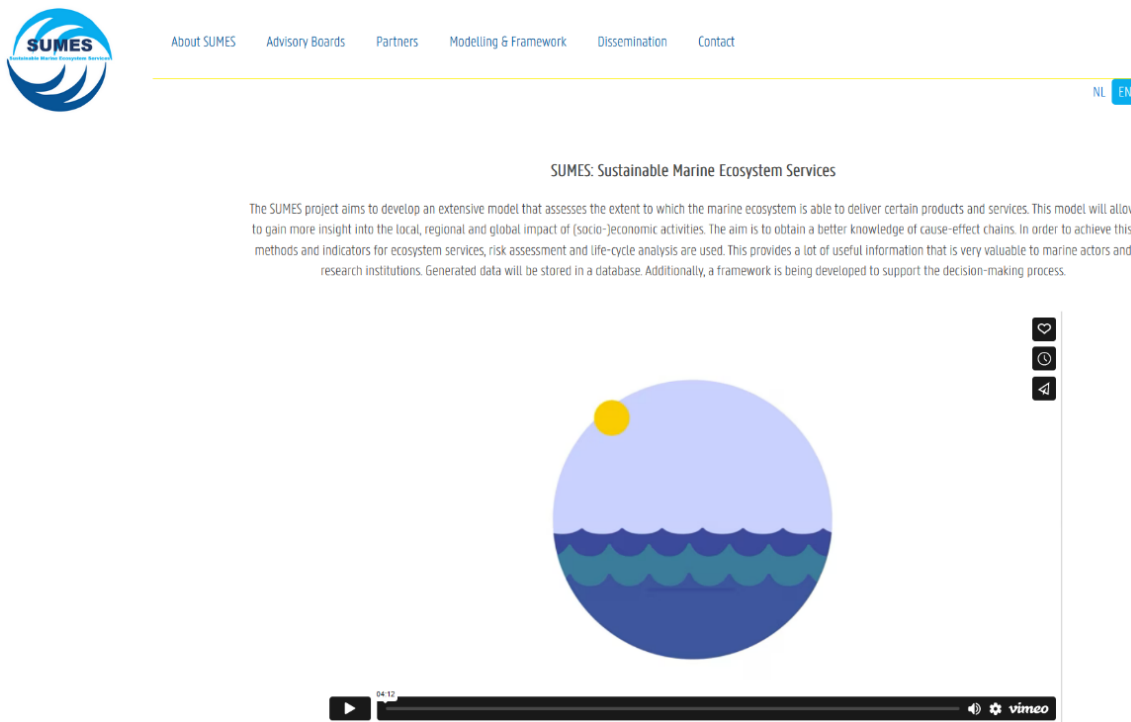


Figure 1: Homepage of <https://sumesproject.be/> (picked from SUMES website)



Figure 2: SUMES consortium with link to the Blue Cluster, shown at the homepage (picked from SUMES website)

3.2. Menu-item 1: About SUMES

By entering the first menu-item the mission statement of SUMES is listed (Figure 3) and a more detailed description of the project's mission is provided.

OUR MISSION:

- Investigate the interrelationships between ecosystem processes, habitats, functioning mechanisms and ecosystem services, especially in the Belgian Continental Shelf
- Verify potential imbalances among the supply and demand of ecosystem services
- Better understand and measure the environmental burdens and benefits that come along with marine operational activities
- Steer sustainable management and multi-use of the North Sea and beyond, by identifying ways to improve the value chain, e.g. the design, technologies or process stages
- Identify data gaps for a full sustainability assessment as an input to setup monitoring programmes

Figure 3: SUMES project mission (picked from SUMES website)

3.3. Menu-item 2: Advisory Boards

Strategic advisory board

Within the SUMES project a strategic advisory board (SAB) (Figure 4) is established to create a strong industrial driving force. It consists of 10 companies which are involved in specific tasks within SUMES. More information to be found on <https://sumesproject.be/en/strategic-advisory-board>.



Figure 4: SAB members (picked from SUMES website)

Scientific advisory board

Apart from the SAB, a scientific advisory board (ScAB) was established, comprising a variety of (inter)national scientific experts (Figure 5). It consists of 7 members exchanging knowledge with the SUMES project partners. More information to be found on <https://sumesproject.be/en/scientific-advisory-board>.

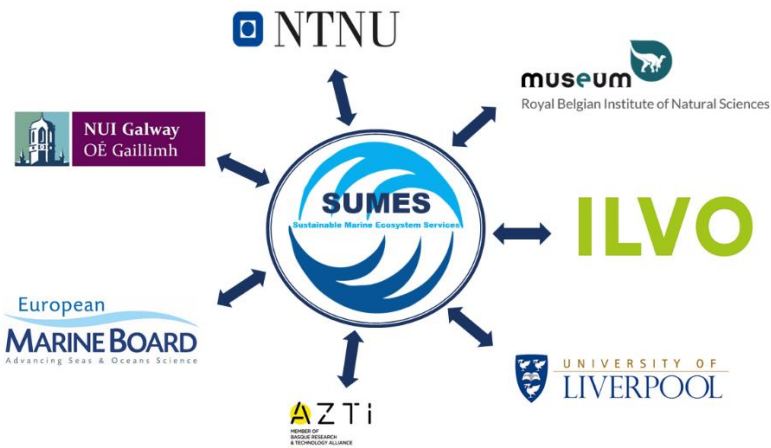


Figure 5: ScAB members (picked from SUMES website)

Blue Cluster (Blauwe Cluster)

The Blue Cluster aims for sustainable blue growth and therefore specifically commits to several domains (Figure 6): sustainable seafood and marine biotechnology, blue tourism, coastal protection and use of mineral resources, maritime connectivity, renewable energy and freshwater production, solutions to ocean pollution and waste, and two crosscutting domains "smart sea" and "ecosystem approach". The SUMES project fits into the latter domain aiming at further development of sustainable human activities offshore. More information to be found on <https://sumesproject.be/en/blue-cluster>.

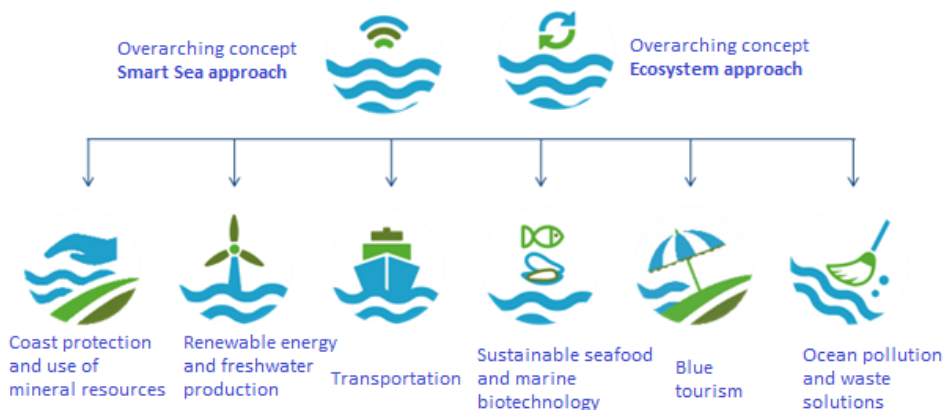


Figure 6: The different blue growth domains of the Blue Cluster, illustrating the transversal aspect of the ecosystem system based approach of SUMES (picked from SUMES website)

3.4. Menu-items 3 and 6: SUMES partners and contacts

This menu-item provides an overview of the partner consortium related to their specific function within SUMES can be consulted through <https://sumesproject.be/en/partners>.

Furthermore, the SUMES website also provides a contact page (<https://sumesproject.be/en/contact>) for more specific questions on the project, website or related to any matter of data management (Figure 7).

Info on the project	Info on datasets and publications	Info or remarks on the website
Sue Ellen Taelman	Carolien Knockaert	Jelle Rondelez
Universiteit Gent - Sustainable System Engineering (STEN)	Vlaams Instituut voor de Zee (VLIZ)	Vlaams Instituut voor de Zee (VLIZ)
Postgraduate researcher	Senior Data Manager	Project Manager
Contact: Email - Website	Contact: Email - Website	Contact: Email - Website

Figure 7: Contact persons for the SUMES project (picked from SUMES website)

3.5. Menu-item 4: Modelling and framework

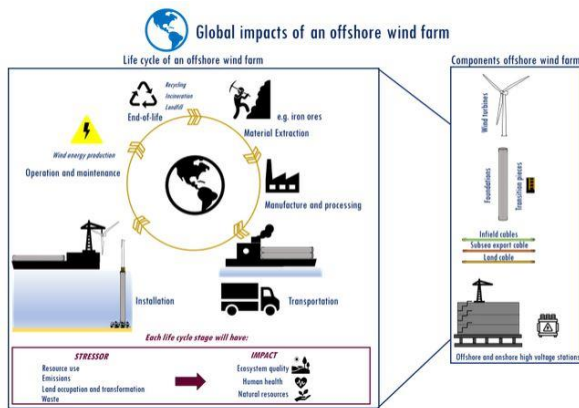
Case studies

The validation of the SUMES sustainability impact assessment model is based on 2 selected case studies related to the Belgian Continental Shelf (BCS) (Figure 8).

More detailed information on the showcase of offshore wind energy and the advanced case on marine multi-use can be found through:

- <https://sumesproject.be/en/offshore-wind-energy>
- <https://sumesproject.be/en/multi-use>

Showcase



Own design, not scaled proportionality.

Advanced case

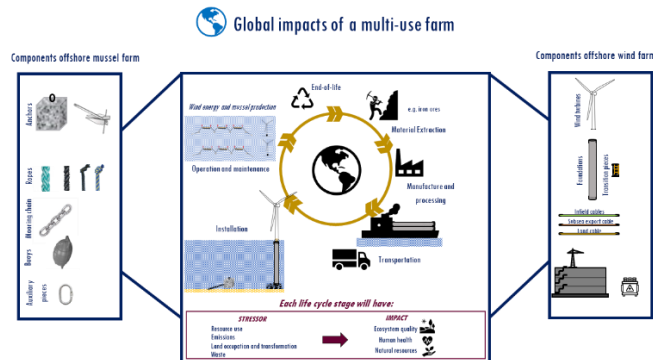


Figure 8: SUMES case studies (picked from SUMES website)

Ecosystem services model

The ecosystem services model is applied to the showcase and to the advanced case and it allows to quantify impacts the activities under study on 9 relevant ecosystem services (Figure 9). More information on how and which ES were selected can be found on the following webpage: <https://sumesproject.be/en/ecosystem-services-model>.

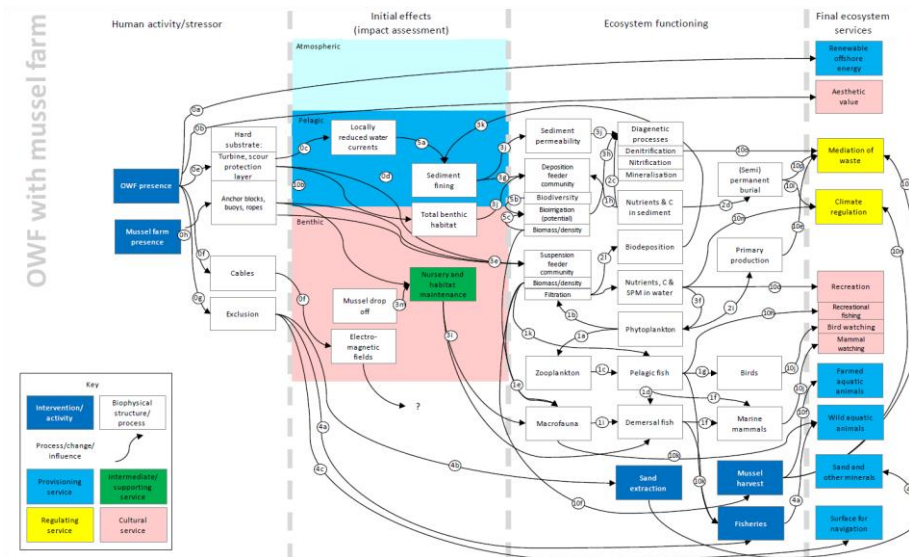


Figure 9: Ecosystem services model (picked from SUMES website)

Sustainability impact assessment methodology

This methodology integrates the results of the local ecosystem services assessment which focusses on the marine environment with the results of life cycle assessment (the latter methodology being adapted to also account for local terrestrial ecosystem services changes due to land use, next to traditional global impacts such as climate change) (Figure 10).

More information on this methodology is available through <https://sumesproject.be/en/sustainability-impact-assessment-methodology>.

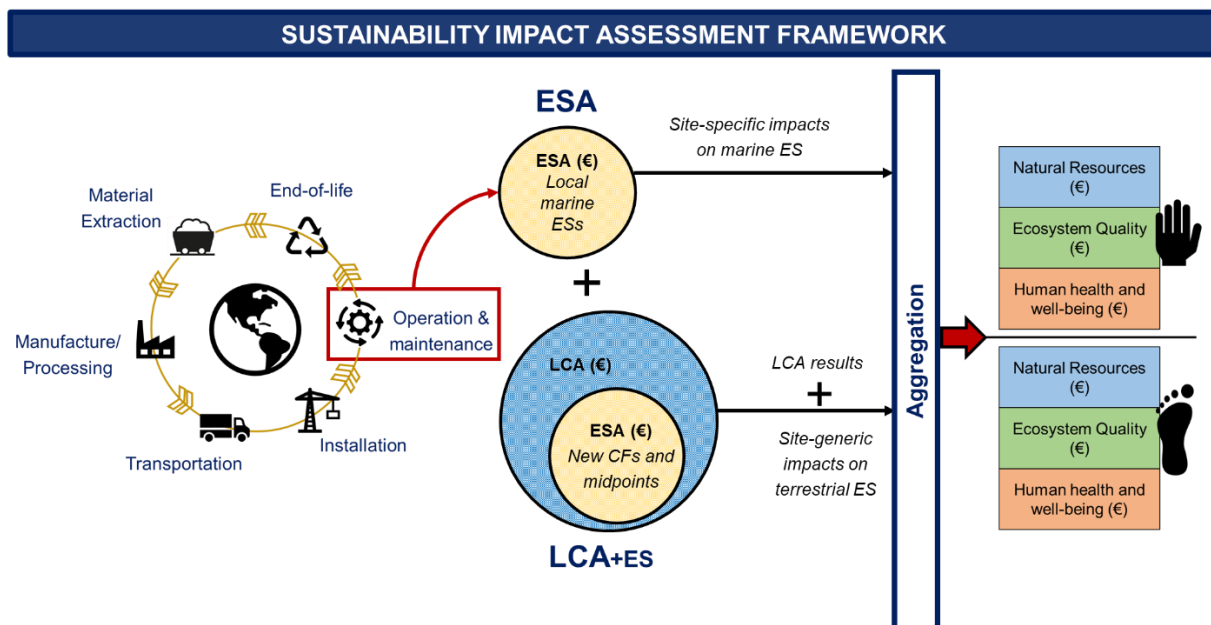


Figure 10: Sustainability impact assessment methodology (picked from SUMES website)

Datasets

Significant amounts of data and information are necessary to create an accurate sustainability impact assessment model, which accounts both for local and global impacts along the value chain of marine activities. To assess the conditions of ES from the BCS, or to gather data on the value chain, its emissions, waste and natural resources use, several types of data needed to be collected to provide information on parameters and indicators that have been identified as being decisive. For each of these parameters, availability was checked within national and international databases, scientific and grey literature, project and technical reports, and other types of existing data sources. Data collection was performed by all SUMES partners. Datasets collected and used within the SUMES project were archived (when possible) within the Marine Data Archive (MDA) of VLIZ. The metadata records of these datasets are findable through the Integrated Marine Information System (IMIS). All these datasets are grouped in a special collection which is available at the SUMES website in order to support the dissemination of these data. This dataset special collection contains already existing datasets to feed the model as well as datasets created as part of a specific SUMES deliverable. Metadata information and dataset download (if data is allowed for sharing) can be accessed by clicking in the 'More info' button (Figure 11).

Datasets

Datasets collected and used within the SUMES project are being archived when possible, within the Marine Data Archive of VLIZ. The metadata records of these datasets are made findable through the Integrated Marine Information System (IMIS). IMIS links metadata and information on datasets, publications, persons and institutes and makes them findable in an online catalogue. In doing so, 'special collections' are defined to categorize information coming from one project or region. Therefore, IMIS is used within a wide range of national and international projects to support the dissemination of data and information.

All metadata records of datasets in the 'SUMES special collection' of IMIS are available via the interface below:

45 records found

Zoeken Filter Reset

Belgian sea transport statistics
Citation: Statbel, Department of Agriculture and Fisheries: Belgian sea transport statistics. Accessed at <https://statbel.fgov.be/en/themes/mobility/transport/sea-transport> on yyyy-mm-dd.

Seafloor habitats in the Belgian Part of the North Sea (EUNIS and Natura2000)
Citation: Royal Belgian Institute For Natural Sciences (RBINS), Directorate Natural Environment (OD Nature), Ecosystems Data Processing And Modelling (ECODAM). (2021). Seafloor habitats in the Belgian Part of the North Sea (EUNIS and Natura2000) [Data set]. Royal Belgian Institute for Natural Sciences (RBINS), Directorate Natural Environment (OD Nature), Belgian Marine Data Centre (BMDC). <https://doi.org/10.24417/85bdc087-e46a-4a76-ab98-f19145e52915>

Windfarm concessions in the Belgian Part of the North Sea
Citation: Royal Belgian Institute For Natural Sciences (RBINS), Directorate Natural Environment (OD Nature), & Royal Belgian Institute For Natural Sciences (RBINS), Directorate Natural Environment (OD Nature), GeoCell. (2021). Windfarm concessions in the Belgian Part of the North Sea [Data set]. Royal Belgian Institute for Natural Sciences (RBINS), Directorate Natural Environment (OD Nature), Belgian Marine Data Centre (BMDC). <https://doi.org/10.24417/7fca7cfe-f1da-448b-aad3-acc5038f5b8a>

SUMES project. D4.3: Identification and selection of Risk Assessment indicators and the coupling with the SDES model (supporting files)
Citation: Lorré, D., Laboratory for Environmental Toxicology (GhEnToxLab), Ghent University, Belgium; (2023). SUMES project. D4.3: Identification and selection of Risk Assessment indicators and the coupling with the SDES model (supporting files).

SUMES project. D3.3: SUMES ES-model: A quantitative marine ecosystem services model (supporting files)
Citation: Van der Bliet, K., ECOSPHERE Research Group, University of Antwerp, Belgium; (2024). SUMES project. D3.3: SUMES ES-model: A quantitative marine ecosystem services model (supporting files).

Figure 11: SUMES collection on available datasets and entry to IMIS (picked from SUMES website)

The 'More info' link will guide you to the metadata record in IMIS (Figure 12) where you can access more information related to the dataset (metadata describing the dataset, information on linked publications, persons and institutes and data license).

Data Policy Publications | Datasets

[\[report an error in this record \]](#) [\[view external version \]](#)

SUMES project. D3.3: SUMES ES-model: A quantitative marine ecosystem services model (supporting files)

Citation

Van der Blest, K., ECOSPHERE Research Group, University of Antwerp, Belgium; (2024) SUMES project. D3.3. SUMES ES-model. A quantitative marine ecosystem services model (supporting files).
<https://marineinfo.org/dataset/8533>

Contact: data@vliz.be

Availability: Restricted
The data are withheld from general circulation and disclosure but access may be obtained on a case-by-case basis through negotiation.

Special collections:

SUMES website (1063)

Description

Supporting files to SUMES D3.3 presenting the SUMES ES-model which consists of a suite of individual ES models (one per ES) and one integrated, dynamic model in which multiple co-dependent ES are coupled to each other.

Scope

Themes: Biology > Benthos, Biology > Benthos > Epibenthos, Biology > Birds, Biology > Ecology - biodiversity, Biology > Fish, Coastal studies (e.g. shores, estuaries)
 Keywords: Marine/Coastal, Ecosystem services, Belgian part of the North Sea

Geographical coverage

Belgian part of the North Sea [\(Maine Region\)](#)

Contributors

Vlaamse Instuut voor de Zee (VLIZ), [more](#), data manager
 Universiteit Antwerpen: Faculteit Wetenschappen, Departement Biologie: ECOSPHERE, [more](#), data creator
[Van der Blest, Katrien](#)

Related datasets

Source datasets:

- Agency Agriculture and Fisheries - Fishing stats, [more](#)
- Belgian recreational fisheries monitoring, [more](#)
- STATBEL: Belgian sea fishing statistics, [more](#)
- STATBEL: Belgian sea transport statistics, [more](#)
- Data for: "A synthetic map of the northwest European Shelf sedimentary environment for applications in marine science", [more](#)
- EMODnet Human Activities, Vessel Density Map, [more](#)
- European Seabirds at Sea - data collected by the Research Institute for Nature and Forest (INBO), Belgium, [more](#)
- FishBase, [more](#)
- TROPHOS: Higher trophic levels in the Southern North Sea. Distribution of birds in the Belgian Part of the North Sea (2002-2006), [more](#)
- DATRAS: ICES Database on Trawl Surveys, [more](#)
- WINMON: Impact of offshore wind farms on the marine environment in the Belgian Part of the North Sea, [more](#)
- Sediment Volume of the Upper Holocene Layer in the Belgian Part of the North Sea in cubic meters, [more](#)
- Simulated net primary productivity (NPP) in the southern North Sea 2003-2013 forced by epibenthic and epibenthic reconstructed blue mussel filtration, [more](#)

Project

SUMES: Sustainable Marine Ecosystem Services, [more](#)

Publication

Based on this dataset

Van der Blest, K. (2024). SUMES ES-model. A quantitative marine ecosystem services model. Deliverable 3.3. SUMES Consortium: Antwerpen/Gent/Oostende. 109 pp. [more](#)

Dataset status: Completed
 Data type: Data
 Data origin: Research
 Metadata record created: 2024-03-21
 Information last updated: 2024-03-21

All data in the Integrated Marine Information System (IMIS) is subject to the [VLIZ privacy policy](#)

Figure 12: Dataset record in IMIS (picked from SUMES website)

VLIZ made an inventory of datasets that are needed for the research within SUMES. This inventory list contains information on different data types, parameters, source, confidentiality and availability. Several sources were consulted in providing already existing datasets which were stored on MDA. However, in some cases data lack and hence some data needs were not able to be filled in, which we identified as data gaps. The table below gives an overview of datasets available within the SUMES project of which at least metadata could be made available through IMIS. These include the SUMES datasets generated as new ones in the context of a specific project deliverable, as well as the external source datasets (existing datasets which were used to feed the model).

Table 1: Available datasets in SUMES

Datasets	#
SUMES	6
External	39

3.6. Menu-item 5: Dissemination

Within SUMES, output is generated through deliverables, peer-reviewed scientific papers or other relevant scientific literature (e.g. conference proceedings). These are described in more detail below. Table 2 gives an overview of all dissemination products currently available within SUMES and can be accessed through <https://sumesproject.be/en/publications>. More information on each dissemination product is available below.

Table 2: SUMES dissemination

Publications	#
Open-access deliverables	10
Restricted deliverables	6
SUMES papers	5 ⁽¹⁾
Literature	706
Abstracts	1

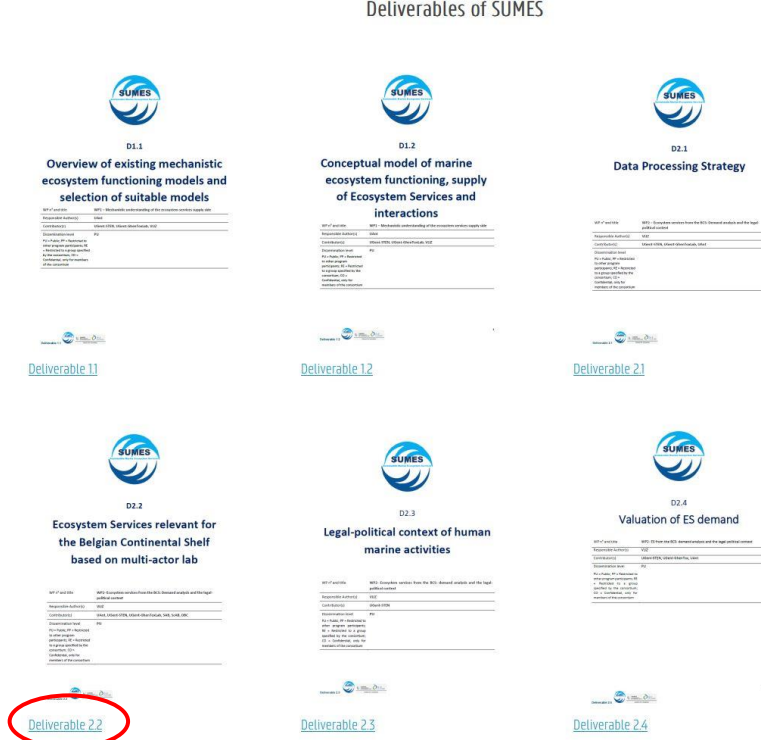
(1) At the time of submission of D5.4, 1 paper is submitted and 1 paper is under preparation.

Open-access deliverables

These deliverables are made available in open-access meaning immediately accessible, readable and downloadable in PDF through the SUMES website (Figure 13).

List of open-access deliverables

Deliverables of SUMES



Direct download of deliverable D2.2



Figure 13: SUMES deliverables in open access (picked from SUMES website)

Restricted deliverables

Some deliverables are provided as non-open access (Figure 14) because they contain restricted information and/or data. However, metadata is made available through IMIS. Access to the deliverable is upon request and will be negotiated by the authors.

List of restricted deliverables

- D3.1: [Methodologies for quantifying ecosystem services supply. A case-study for an offshore wind farm in the Belgian Continental Shelf](#)
- D3.2: [Methodologies for quantifying ecosystem services supply: A case-study for a multi-use platform \(mussel aquaculture and offshore wind energy\) in the Belgian Continental Shelf](#)
- D3.3: [SUMES ES-model: A quantitative marine ecosystem services model](#)
- D4.1: [Description and \(semi-\) quantification of a first selected case study: a showcase. A basis for assessing the environmental impact from a life cycle perspective](#)
- D4.2: [Selection, description and \(semi-\)quantification of advanced case studies. A basis for assessing the environmental impact from a life cycle perspective](#)
- D4.3: [Identification and selection of Risk Assessment indicators and the coupling with the SDES model](#)

SUMES ES-model: A quantitative marine ecosystem services model

Van der Biest, K. (2024). SUMES ES-model: A quantitative marine ecosystem services model. Deliverable 3.3. SUMES Consortium: Antwerpen/Gent/Oostende. 109 pp.

Available in

[VLIZ: Non-open access 395627 \[download pdf\]](#)

Project

Sustainable Marine Ecosystem Services , [more](#)

Authors

Van der Biest, K., [editor](#), [more](#)
Prigge, P.
Dupont, R., [more](#)
de Luca Peña, L.V., [more](#)

Taelman, S.E., [more](#)
Custódio, M., [more](#)
Bas, B., [more](#)

Dataset

SUMES project. D3.3: SUMES ES-model: A quantitative marine ecosystem services model (supporting files), [more](#)

All data in the *Integrated Marine Information System (IMIS)* is subject to the [VLIZ privacy policy](#)

Figure 14: List of SUMES deliverables (confidential for the wider public) only advertised in IMIS (picked from SUMES website)

Scientific publications

Several scientific papers were published by partners within SUMES. These contributions are immediately downloadable in PDF (Figure 15) and the metadata is also described in IMIS (Figure 16).

List of publications

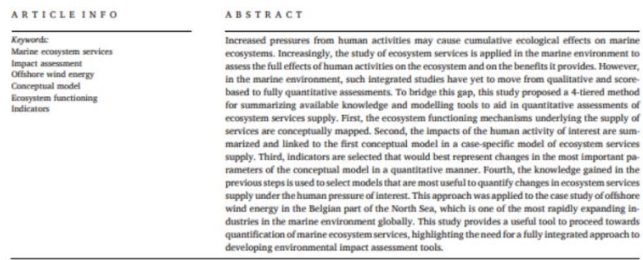
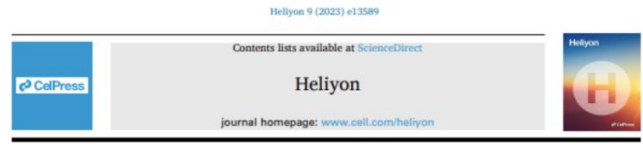


[L. Van de Pol, et al. \(2023\)](#)
[Metadata](#)



[M. Custodio, et al. \(2022\)](#)
[Metadata](#)

Direct download of publication



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<https://doi.org/10.1016/j.heliyon.2023.e13589>
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 Available online 15 February 2023
 2405-8440/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).



[S. Taelman, et al. \(2023\)](#)
[Metadata](#)



[L. Vittoria De Luca Peña, et al. \(2023\)](#)
[Metadata](#)

Figure 15: SUMES papers in open access (picked from SUMES website)

Publication

Metadata in IMIS



[L. Van de Pol, et al. \(2023\)](#)
[Metadata](#)

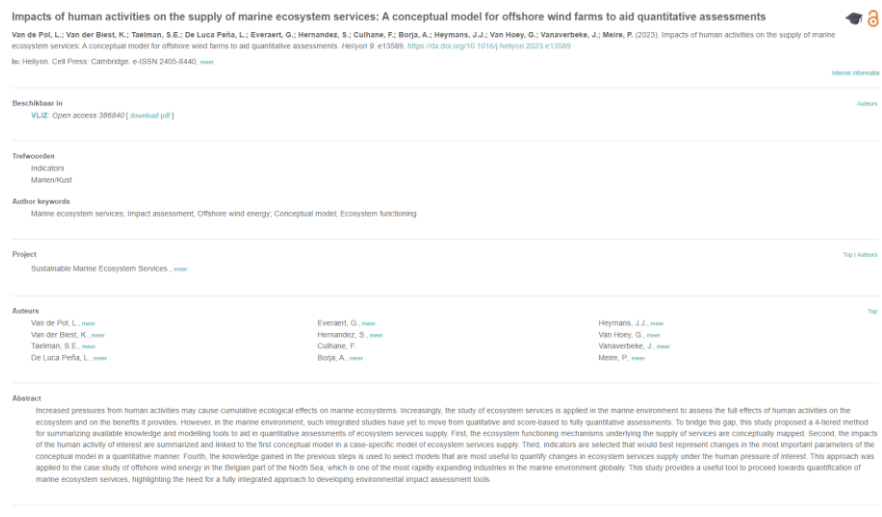


Figure 16: SUMES paper in IMIS (picked from SUMES website)

Abstracts

Conference proceedings are also made available through SUMES (Figure 17). These are also advertised and downloadable through IMIS (Figure 18).

- De Luca Peña, L.V.; Taelman, S.E.; Staes, J.; Bas, B.; Pr at, N.; Dewulf, J. (2023). How sustainable are offshore windfarms? An assessment to quantify local to global (socio-) environmental impacts of a case study in the Belgian Continental Shelf, in: Mees, J. et al. Book of abstracts – VLIZ Marine Science Day, 1 March 2023, Bruges. VLIZ Special Publication, 90: pp. 22 ([link](#))

Figure 17: SUMES abstract (picked from SUMES website)

How sustainable are offshore windfarms? An assessment to quantify local to global (socio-) environmental impacts of a case study in the Belgian Continental Shelf

De Luca Pe a, L.V.; Taelman, S.E.; Staes, J.; Bas, B.; Pr at, N.; Dewulf, J. (2023) How sustainable are offshore windfarms? An assessment to quantify local to global (socio-) environmental impacts of a case study in the Belgian Continental Shelf, in: Mees, J. et al. Book of abstracts – VLIZ Marine Science Day, 1 March 2023, Bruges. VLIZ Special Publication, 90: pp. 22

In: Mees, J.; Seys, J. (Ed.) (2023). Book of abstracts – VLIZ Marine Science Day, 1 March 2023, Bruges. VLIZ Special Publication, 90. Viaams Instituut voor de Zee – Flanders Marine Institute (VLIZ). Oostende. vi + 112 pp. <https://dx.doi.org/10.48470/41>, meer

In: VLIZ Special Publication. Viaams Instituut voor de Zee (VLIZ). Oostende. ISSN 1377-0950, meer

intern  informatie

Beschikbaar in

VLIZ. Open access 386937 [[download pdf](#)] Auteurs

Documenttype: Samenvatting

Trefwoorden

Energy
Sustainability
Marene/Kust

Author keywords

Offshore wind farms, ecosystem services, marine ecosystems, handprint, footprint, human activities

Project

Sustainable Marine Ecosystem Services , meer Top | Auteurs

Auteurs

De Luca Pe a, L.V., meer
Taelman, S.E., meer
Staes, J., meer

Bas, B., meer
Pr at, N., meer
Dewulf, J., meer Top

Figure 18: SUMES abstract in IMIS (picked from SUMES website)

Literature

An inventory was made on background literature deemed relevant for the SUMES project. In the literature module these publications and reports (besides to the SUMES deliverables and papers) are listed. Metadata can be accessed by clicking on the ‘More info’ button and, if publication is open immediately downloadable in PDF through the ‘Download’ button (Figure 19).

All publications that were deemed relevant for the SUMES project, are listed in the module below:

706 records found

Zoeken Filter Reset

Sort by Date | Author | Title

Ecosystems and human well-being. Synthesis - A report of the Millennium Ecosystem Assessment Published in 2005	MORE INFO + DOWNLOAD +
Milieueffectenrapport – Offshore North Sea Power windpark Published in 2011	MORE INFO + DOWNLOAD +
Strategisch beleidsplan voor toerisme en recreatie aan de Kust 2015-2020 Published in 2014	MORE INFO + DOWNLOAD +
Tendrapport Kust 2012-2013 Published in 2014	MORE INFO + DOWNLOAD +
Floating foundations: a game changer for offshore wind power Published in 2016	MORE INFO + DOWNLOAD +
Tendrapport Kust 2014-2015 Published in 2016	MORE INFO + DOWNLOAD +
Jaarverslag monitoringstelsel duurzaam oppervlaktedelfstoffenbeleid. Inzet primaire delfstoffen en alternatieve grondstoffen in Vlaanderen in 2015 Published in 2017	MORE INFO + DOWNLOAD +

Figure 19: Relevant scientific literature for SUMES (picked from SUMES website)

4. Conclusion

The SUMES portal is accessible through the following website: <https://sumesproject.be/>. The website will be kept online and preserved once the project has ended.

The portal gives access to all scientific information which is relevant for SUMES as well as publications and reports referenced through the different project deliverables. The output generated within SUMES is published through the dissemination page where the different (open and non-open access) deliverables as well as the scientific papers generated throughout the project are available.

A lot of data were needed to feed the SUMES model. Data are described in IMIS and datasets are made available through <https://sumesproject.be/en/datasets>.