



ANNUAL REPORT 2017





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The Flanders Marine Institute (VLIZ) promotes accumulation of marine knowledge and excellence in marine research in Flanders. The marine research areas are the oceans and seas, the coast and the tidal systems. The target groups for knowledge accumulation are the marine research community as well as educational institutions, the general public, policymakers and the industry (within the scope of the blue economy).



PROF. DR. JAN MEES
General Director of VLIZ

Dear reader,

In early 2017, VLIZ entered into a new covenant with the Flemish government and the province of West Flanders for the period 2017-2021. It goes without saying that the current service mission of VLIZ remains in full effect within the scope of the new covenant. In addition, we received the mandate to initiate and conduct research. To achieve this strategic objective, VLIZ established a new Research division in 2017. The 7-strong research team immediately set to work and in December they presented a comprehensive and substantiated research framework supported by the marine research community.

Flanders is a pioneer in terms of cross-fertilisation between companies, knowledge institutions and governments. In 2018, we will capitalise on this strength in the marine/maritime industry with the approval of the Blue Cluster in which VLIZ plays an important part. As part of the new covenant, VLIZ began to develop the interface between marine research on the one hand and the 'blue economy and innovation' on the other hand in 2017. In the long run, this should result in an efficient transfer of marine scientific knowledge for the benefit of economic developments at sea. In 2017, we also appointed an International Liaison Officer. This is an 'ambassador' who helps to put marine research in Flanders on the world map and support collaboration between VLIZ and its international partners in a global context. This way, the international policy pursued by Flanders is elaborated from a marine perspective.

The entry into force of the new management agreement marked the beginning of the year in which VLIZ made great progress in all fields. As a result, the number of employees increased significantly from 66 to 80, the strongest growth since the start of the previous covenant in 2012. We continue to provide excellent services and the range of tools, data workshops as well as archived and disclosed data sets has even been expanded. The wave of renewal that took place in 2017 is also reflected in this annual report. The layout was thoroughly updated and the use of infographics provides the readers with a better insight into the daily activities of VLIZ.

Last but not least, the United Nations designated the years 2021 to 2030 as the 'Decade of Ocean Science for Sustainable Development' in late 2017. Under the motto "The ocean we need for the future we want!", the Intergovernmental Oceanographic Commission (IOC) of UNESCO will join forces in order to achieve the 14th Sustainable Development Goal (SDG 14): 'Conserve and sustainably use the oceans, seas and marine resources'. The UN thus recognises that the achievement of SDG 14 as well as other goals requires a great deal of marine research. With the designation of the Decade of Ocean Science for Sustainable Development, we are without doubt entering a very interesting period for ocean sciences.

We hope you enjoy reading this annual report!

JAN MEES
General Director of VLIZ

Ostend, March 2018

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HIGHLIGHTS 2017

The highlights are the special events, achievements, activities or projects of VLIZ that took place in 2017. They are often the result of intensive cooperation between various divisions.



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© Westtoer - Jan D'Hondt

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SUPPORT TO INTERNATIONAL ORGANISATIONS

By order of the Flemish government, VLIZ supports several international organisations. This capitalises on VLIZ's international experience and reputation, and makes it possible to embed important European initiatives in Flanders. This chapter briefly explains the specific partnerships in which VLIZ participated in 2017.



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KEY PERFORMANCE INDICATORS

The key performance indicators (KPIs) refer to important services provided by VLIZ to marine scientific researchers, policymakers, educators and the general public. These are criteria to evaluate the operation of VLIZ. As stated in the new covenant for the period 2017-2021, VLIZ has to deliver on twelve KPIs every year.

ANNEXES

📄 Only available in digital format: downloadable from the VLIZ website www.vliz.be/en/vliz-annual-report



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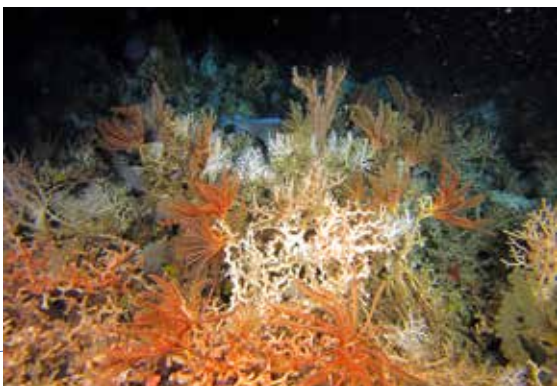
MANAGEMENT INDICATORS

The management Indicators refer to important services provided by VLIZ to marine scientific researchers, policymakers, educators and the general public. They complement the Key Performance Indicators (KPIs), which are criteria to evaluate the operation of VLIZ.

4 *(Annexes)*

ORGANISATION VLIZ

VLIZ is administered by the Board of Directors and consults the Scientific Committee for its scientific support tasks. The General Assembly provides assistance in managerial and administrative decisions.



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38 *(Annexes)*

OTHER ANNEXES

An overview of the national and international networks in which VLIZ participates, projects for which VLIZ receives external funding, the scientific equipment and infrastructure made available by VLIZ, the events (co-) organised by VLIZ and the publications published by VLIZ.

HIGHLIGHTS

The highlights are the special events, achievements, activities or projects of VLIZ that took place in 2017. They are often the result of intensive cooperation between various divisions.



THE RESEARCH MANDATE

For more information about the Research division:

www.vliz.be/en/research-vliz

In 2017, VLIZ concluded a new covenant with the Flemish government for the period 2017-2021. This covenant provides that VLIZ fully retains its current mission, and is additionally mandated to initiate and conduct research at the service of, in collaboration with and as a complement to the Flemish and international marine research groups.

To achieve this strategic objective, VLIZ established a new Research division in 2017. It encompasses a Research Manager, a Data Science Manager, an Infrastructure Science Manager, science officers and researchers. One of the Research division's tasks is to identify challenges and opportunities for marine research in Flanders. In 2017, the Research division drew up the VLIZ research framework (approved by the Board of Directors on 13 December 2017). This research framework describes the research topics VLIZ wishes to actively focus on and communicates transparently about VLIZ's research ambitions. By means of this research framework, VLIZ strives to strengthen the Flemish marine research community and contribute to the accumulation of marine knowledge and excellence in marine research in Flanders. In addition, the research team has initiated the prospection of projects and the preparation of partnerships to implement the identified priorities.

The research framework is structured around six major research topics: 'Ocean Services in a Changing Ocean', 'Ocean Past', 'Ocean Observation', 'The Ocean and Human Health', 'Policy driven and Responsive Mode Research' and 'Blue Sky Research'. During the implementation of the research topics, the opportunities for data and infrastructure driven research are evaluated to add value to

the relevant capacity built up within VLIZ. In addition, attention is paid to the possible contributions of research to the blue economy. All topics make a multidisciplinary approach to fundamental as well as applied marine research possible. Multidisciplinary *Centres of Excellence* and platforms will support the research both within VLIZ and within the Flemish marine research groups.

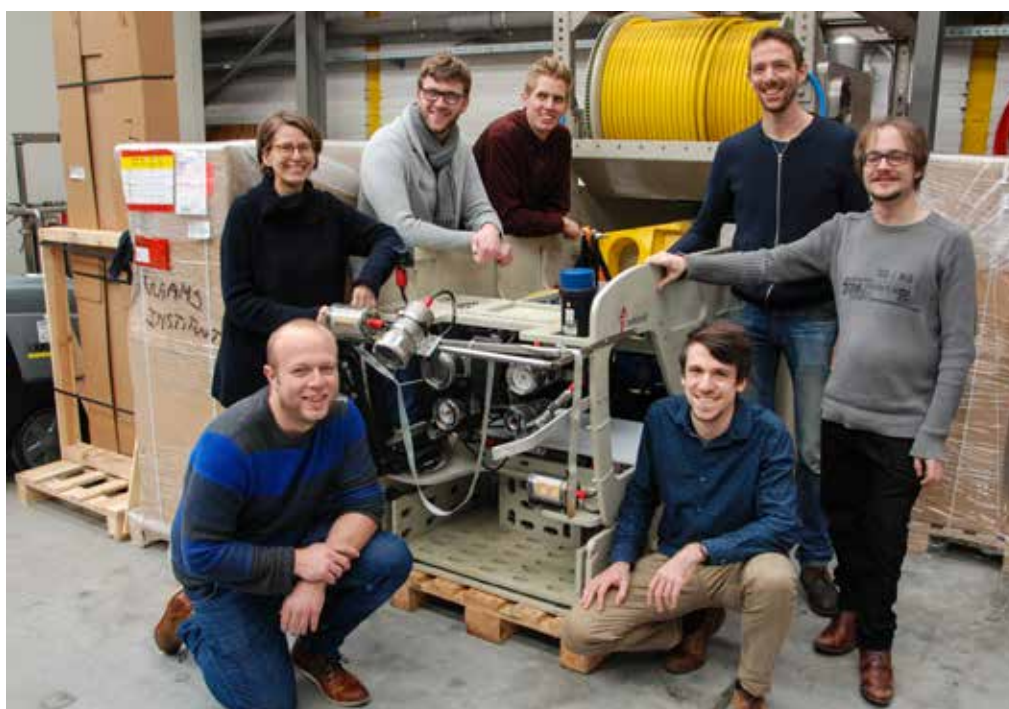
The research framework is publicly available at the VLIZ website and was explained at the VLIZ Marine Science Day on 21 March 2018 in Bredene.

» By means of this research framework, VLIZ strives to strengthen the Flemish marine research community and contribute to the accumulation of marine knowledge and excellence in marine research in Flanders. «

MICHIEL VANDEGEHUCHTE, VLIZ RESEARCH MANAGER



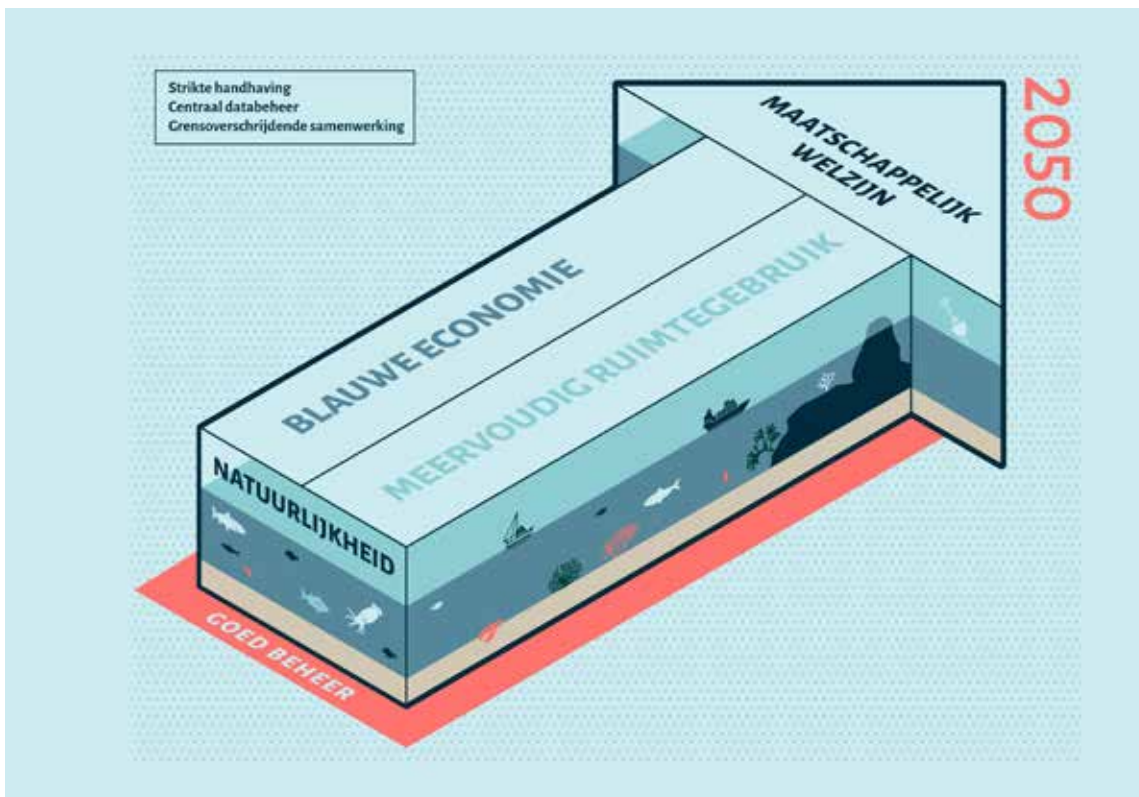
'The Ocean and Human Health' is one of the six research topics which the newly established Research division will focus on. © VLIZ



The newly established Research division of VLIZ in December 2017. Left to right: Gert Everaert (Data Science Manager), Tine Missiaen (Senior Researcher), Maarten De Rijcke (Infrastructure Science Manager), George Westmeijer (Science Officer Research), Pascal Hablützel (Senior Science Officer Research), Michiel Vandegheuchte (Research Manager), Wim De Winter (Science Officer Research). © VLIZ



VLIZ was given the task of further developing the interface between marine research on the one hand and the blue economy and innovation on the other hand. © VLIZ



The VLIZ Policy Information division participates in formal consultative forums, e.g. discussing the long-term vision for the North Sea 2050 which is now continued in the form of a 'North Sea Think Tank'.

POLICY ADVICE ON ECONOMIC DEVELOPMENTS AT SEA

(BLUE ECONOMY)

In 2017, VLIZ was given the task of further developing the interface between marine research on the one hand and the blue economy and innovation on the other hand within the scope of the new covenant with the Flemish government and the province of West Flanders. These additional services will be provided by the Policy Information division, which received the mandate to represent the Flemish marine research community in formal consultative forums relating to the blue economy. Within this context, the division acts as a knowledge broker. It conducts an active screening of policy issues regarding the blue economy across all policy areas and links them to marine research. This way, VLIZ provides an innovative transversal consultation model which is required for an efficient transfer of marine scientific knowledge in the interest of the economic developments at sea.

This new aspect of the VLIZ mandate is illustrated below by means of three examples. First, VLIZ and Flanders' Maritime

Cluster (FMC) organise the event 'Marine Science meets Maritime Industry' (MSMMI) which sheds light on the needs and expertise of marine/maritime companies and knowledge institutions with a view to cross-fertilisation and alignment. In 2017, the MSMMI event was organised for the third time (see p. 43). Second, VLIZ supports the development of a scientific basis for the request to recognise the blue economy as a key cluster. A decision on the recognition of the so-called Blue Cluster is expected to be made in the spring of 2018. Third, VLIZ is a member of the policy committee of the Complex Project Coastal Vision (formerly called Flanders Bays) aimed at the adoption of a long-term approach for the development and protection of the Flemish coast. VLIZ undertakes to create a digital information platform for studies which form the basis for the Complex Project Coastal Vision. In addition, a briefing note of these studies was prepared in 2017 and will be launched in March 2018.



VLIZ increased its focus on internationalisation, for instance by signing a cooperation agreement with the Benioff Ocean Initiative to work closely together in marine research © VLIZ

INTERNATIONALISATION

With the entry into force of the new covenant and the allocation of various international mandates, VLIZ appointed an International Liaison Officer in 2017. The International Liaison Officer serves as an ambassador for VLIZ and the Flemish marine sciences in general, and acts as the link between VLIZ and various (international) institutions, organisations and networks. Dr Ann-Katrien Lescauwet was appointed to this position in 2017.

The task of the International Liaison Officer is threefold and will in the first instance consist in promoting and supporting the image of Flemish marine research at an international level. To do so, the International Liaison Officer represents VLIZ and the Flemish marine research community at international events, hearings and conferences. On 10 November 2017, VLIZ participated in a panel discussion on marine data at the COP23 international climate conference held in Bonn from 6 to 17 November. The panel discussion was part of the EU Oceans Day, a COP23 side event organised by the European Commission. In

addition, the International Liaison Officer is responsible for the creation of new opportunities for international marine research partnerships by establishing connections with existing strategies and agendas concerning foreign policy and science policy. Finally, the International Liaison Officer aims to promote the image and visibility of the InnovOcean site and its international partners in Europe and the rest of the world. The pooling of the complementary expertise of VLIZ and its international partners is a major asset which the InnovOcean site will continue to invest in over the coming years.

Within the scope of increased investment in internationalisation, VLIZ and the Benioff Ocean Initiative (BOI) at the University of California, Santa Barbara, concluded an agreement in Monterey (USA) on Thursday 26 October 2017 to work closely together in marine research. The official ceremony was attended by members of the Flemish Parliament (Committee for Environment, Nature, Spatial Planning, Energy and Animal Welfare) and the Mayor



COP23 © @EUClimateAction on Twitter.

of Monterey, Clyde Robertson, and was supported by Flanders Investment & Trade (FIT), a government agency promoting Flemish businesses internationally.

Through this international collaboration, VLIZ and BOI intend to exchange their expertise in order to tackle the major marine challenges of the future. Both institutes will work together to conduct research into the anthropogenic change in and human-induced impact on the North Sea ecosystem. They agreed to exchange their expertise and foster the mobility of researchers to strengthen their common missions and strategic goals. For both institutes, it is their first agreement with an American/European counterpart.


» As an 'ambassador', the International Liaison Officer helps put Flemish marine research on the world map, and supports cooperation with VLIZ and its international partners in a global context. «

ANN-KATRIENLESCRAUWAET, INTERNATIONAL LIAISON OFFICER

242 500

MARINE SPECIES

Over the past 10 years, the number of valid marine species names contained in WoRMS has increased from 122 500 to over 242 500.

 www.marinespecies.org/



The Mediterranean feather star (*Antedon mediterranea*) is one of the thousands of organisms listed in the World Register of Marine Species. © Roberto Pillon - www.marinespecies.org

10 YEARS OF WORMS



The aim of the World Register of Marine Species (WoRMS) is to provide an authoritative and comprehensive list of names of all marine organisms worldwide. WoRMS went online in 2007 and celebrated its tenth anniversary in 2017. Over the past 10 years, the number of valid marine species names contained in WoRMS has increased from 122 500 to over 242 500. This near doubling is thanks to the contributions of the 280-strong international editorial board and the externally hosted and managed species databases which WoRMS closely collaborates with.

The tenth anniversary of WoRMS is a milestone, and the steering committee therefore decided to give the web interface a makeover. A decade is a very short period from a taxonomic perspective, but it seems an eternity from a technological perspective. That's why the technology underlying the WoRMS interface was thoroughly modernised to make it compatible with the current techniques.

In addition to a new look and feel, the WoRMS website also got a brand-new logo for which a competition had been organised in 2017. The winning proposal was created by Sarita Camacho da Encarnação, one of the Foraminifera experts within WoRMS. The selected logo convinced the jury thanks to the minimum deviation

in style from the previous logo, as a result of which the register remains recognisable. On the occasion of its tenth anniversary, the WoRMS steering committee published an Open Access Opinion Paper on the importance of nomenclatural consistency and how this is dealt with in WoRMS based on its 10-year experience. This paper appeared in the *European Journal of Taxonomy* at the end of 2017.

Furthermore, it is now possible to consult all publications that make use of (or refer to) WoRMS. This publication list has been developed by means of strong interdepartmental cooperation with the VLIZ Library. The majority of publications is digitally available via the VLIZ Library.

The update of the WoRMS portal has been made possible thanks to the support of LifeWatch Belgium. WoRMS is an important component of the LifeWatch Taxonomic Backbone aimed at (virtually) bringing together different taxonomic and species databases and filling gaps in our knowledge.

INTERNAL COMMUNICATION

The number of VLIZ employees increased from 66 in 2016 to 80 in 2017. This strong growth is largely due to the allocation of the new research mandate to VLIZ in 2017. A growing institute comes with numerous challenges, including the maintenance and reinforcement of cohesion between the different divisions and the employees. To this end, various internal initiatives were started in 2017, including new working groups and additional activities.

Twice a month, VLIZ begins the working week with a **Breakfast@Bib** session, a pleasant mix of coffee, Danish pastries and books. This activity always starts with a brief overview of the latest acquisitions, followed by a presentation of a book whose contents are related to the activities of one of the VLIZ divisions. Each division is covered once a year. In addition, the library provides a selection of related literature which can be consulted.

Also twice a month, the Communication division organises a lunch break with scientific literature and soup: the **Science Lunch**. The

aim of this activity is to inform VLIZ employees about interesting scientific publications regarding topical marine subjects, emerging research topics and gaps in our scientific knowledge. In each session, VLIZ employees give an oral presentation on three interesting peer-reviewed publications, followed by a short discussion.

The **A team** was founded in 2017 to organise internal social activities. This team consists of enthusiastic, young and dynamic VLIZ employees representing all VLIZ divisions. The activities organised by the A team in 2017 are very diverse, including a table football tournament, a 10 000 steps clash, sports activities taking place in sports centre De Spuikom (Ostend); a St Nicholas party and an Easter brunch. The A team also takes care of the organisation of the annual team building activity for VLIZ employees. Since 2017, every division has had the opportunity to organise their own team building event to strengthen the cohesion within the different divisions.



Above: Breakfast@Bib at the VLIZ Library ; left: the Data Centre division team building day ; right: VLIZ employees at the annual sports day. © VLIZ



The activities of the remotely operated underwater vehicle Genesis are closely monitored in the control room. © VLIZ

MARINE ROBOTICS CENTRE

In 2017, VLIZ began to develop a Marine Robotics Centre within the scope of the allocated research mandate. In this context, VLIZ receives support from the Flemish government, which approved an investment budget of 3 million on 22 December 2017. This new investment enables VLIZ to purchase two unique robots that move autonomously to perform detailed observations and sampling from the sea surface to a depth of 1 000 metres. Flanders strengthens its position in European marine research thanks to the purchase of an *Autonomous Underwater Vehicle* (AUV) and an *Unmanned Surface Vehicle* (USV).

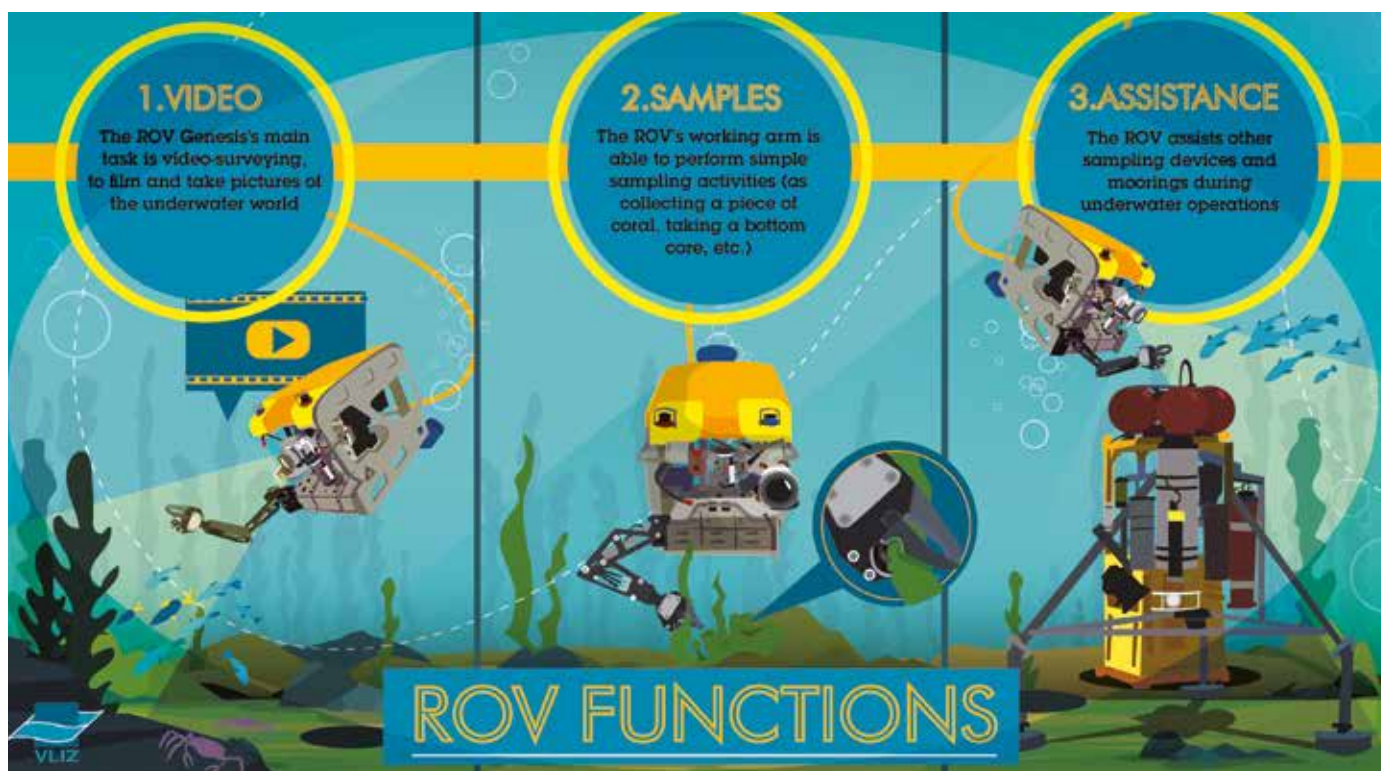
Both vehicles are complementary to the research infrastructure which is already available to VLIZ. In addition to Flemish research vessel Simon Stevin, VLIZ has deployed a *Remotely Operated Vehicle* (ROV) for inspection and exploration purposes for many years. This remotely operated underwater vehicle is put at the disposal

of all members of the national and international marine research community. In 2017, VLIZ illustrated the functioning and features of the ROV by means of an informative animation.

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MILLION

The investment budget reserved by the Flemish government for the development of the Marine Robotics Centre by VLIZ.



In 2017, VLIZ illustrated the functioning and features of the ROV by means of an informative animation. The movie is available at the VLIZ YouTube channel (VLIZOstend). © VLIZ

Both new autonomous measurement platforms perfectly complement the existing on-board activities and can for instance be deployed in areas which are not easily accessible to ships. With this investment, the Flemish government responds to the rapid technological evolution taking place within the offshore sector and marine scientific research. In these areas, robotics and submarine technology play an ever greater part in operations which would otherwise be too expensive, risky or time-consuming. The combination of an ROV, AUV, USV and a modern research vessel is particularly well suited to address the challenges of the future.

As a central point of contact for marine sciences in Flanders, VLIZ is the ideal institution for managing these specialised marine robots. This infrastructure will benefit all Flemish players who are active in innovation within this field.

» The Marine Robotics Centre consolidates the leading position of the Flemish marine research community and gives VLIZ a niche position in the European research landscape. «

JAN MEES, GENERAL DIRECTOR OF VLIZ

'DE GROTE REDE' IS RESTYLED

'De Grote Rede', the information magazine on the coast and sea published by VLIZ in collaboration with numerous professional editors, underwent a major restyling in 2017. With three leading articles and nine standard features, 'De Grote Rede' has provided its readers with a varied yet objective outlook on current knowledge

about the coast, sea and ocean as well as an explanation of the conducted research and pursued policy since 2001. The popular format was kept, but after 17 volumes and 45 issues 'De Grote Rede' needed a makeover. More attention has been paid to informative illustrations supporting and explaining the contents of the articles and features.

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SUBSCRIBERS

The number of subscribers to
'De Grote Rede' since 1999.

Moreover, it is now possible to read 'De Grote Rede' online on a smartphone or tablet. A so-called responsive web design has been developed for this purpose. If desired, over 8 000 subscribers will continue to receive the paper version free of charge. Each article can also be downloaded separately in PDF format. So all requirements are met!

Issue 46 of 'De Grote Rede' is the first issue with the new layout. It includes interesting articles about the old town of Ostend and the island of Testerep, nature in the North Sea and underwater noise and its effects.



The layout of 'De Grote Rede' was modified in 2017.
© VLIZ



In 2017, it was made easier to read 'De Grote Rede' online on a smartphone or tablet. © VLIZ



The fish tracking network for monitoring tagged fish currently consists of 166 acoustic receivers. © VLIZ

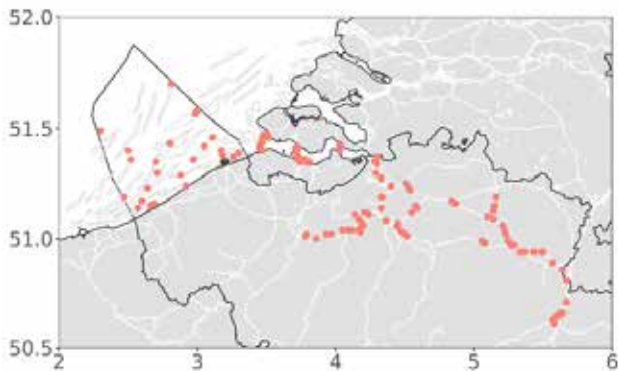


Image from an animated film launched in 2017 about tagging research on eels in Belgium developed by VLIZ in the context of the LifeWatch project. © VLIZ

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ACOUSTIC RECEIVERS

The number of acoustic receivers currently making up the fish tracking network in the Belgian part of the North Sea, the Western Scheldt and various Belgian rivers and canals.

- 📄 Marine Observatory: www.lifewatch.be/en/sensors
- 📄 Data management portal: www.lifewatch.be/etn/
- 📄 Animation about eels: www.vliz.be/en/2017-03-20-critically-endangered-eel-animation



LIFEWATCH FISH TRACKING NETWORK

Marine biologist Jan Reubens is tagging a cod within the scope of the LifeWatch fish tracking network.
© VLIZ

LifeWatch Belgium is part of the European LifeWatch infrastructure and can be considered a virtual laboratory for biodiversity research. VLIZ has developed a marine observatory within the scope of the Flemish contribution to LifeWatch. The purpose of this observatory is to collect scientific data by means of innovative technology and in an automated fashion. Several plankton samplers are used on board RV Simon Stevin (e.g. a video plankton recorder for zooplankton and a flow cytometer for phytoplankton), and a number of networks have been developed to track larger organisms such as birds, porpoises and fish.

An operational acoustic receiver network to track tagged fish has been established by the Research Institute for Nature and Forest (INBO) and VLIZ. The fish tracking network currently consists of 166 acoustic receivers spread across the Belgian part of the North Sea, the Western Scheldt and various Belgian rivers and canals. Since 2012, over 800 fish have been tagged, the overwhelming majority being eel, cod and stocked smolt. VLIZ has created a data management platform to store the large amounts of gathered data in a coordinated manner. This system makes it possible to add (meta)data to the database and access and process these data.

However, aquatic systems such as the North Sea and the Western Scheldt are not isolated entities, but are highly interconnected, enabling fish to cover large distances between various habitats (e.g. between salt water and fresh water in case of eel) and across national borders. Gathering data across borders requires international cooperation. Several large-scale networks have been established around the globe over the last few years, but Europe has been lagging behind until recently. To close the gap, the European Tracking Network (ETN) was set up in partnership with LifeWatch in 2017 within the framework of the EU Horizon 2020 project AtlantOS. In the spring of 2017, a kick-off meeting was organised at the InnovOcean site in Ostend, and was attended by representatives from all over Europe. At this meeting, the decision was made that the database (and online portal) developed by VLIZ will serve as the central ETN database. Various countries, such as the Netherlands and Portugal, have now joined ETN and it is expected that the network will continue to expand in 2018.



The laureates of the VLIZ Master Thesis Awards 2017: Niels van Putte (UA – Ecosystem Management Research Group) and Kathleen Wils (UGent – Renard Centre of Marine Geology). © VLIZ

SCIENTIFIC AWARDS

Every year, VLIZ presents several scientific awards to meritorious young or experienced marine researchers. This way VLIZ aims to encourage marine scientists to continue to provide high-quality scientific contributions in the future and to promote marine scientific research in Flanders and the North Sea.

A special highlight of 2017 was the award of the **Dr Edouard Delcroix Prize** (granted in 2016) organised by VLIZ in partnership with HYDRO vzw. This triennial international scientific prize of 25 000 EUR is awarded to a researcher or research group for a scientific study on the links between oceans and human health. The prize was named after Dr Edouard Delcroix (1891-1973), Belgian orthopaedic surgeon and pioneer in thalassotherapy. The 2016 Dr Edouard Delcroix Prize was won by Dr Irina Vetter (The Centre for Pain Research, Institute for Molecular Bioscience, The University of Queensland, Australia) for her research into the pathophysiological mechanisms of ciguatera, globally the most

common cause of poisoning from ingesting a marine toxin via fish. In addition, for the first time since the creation of the prize, a Dr Edouard Delcroix Incentive Award of 2 500 EUR was presented to a young scientist at the beginning of their academic career. The laureate of the 2016 edition was Dr Eng Marjolein Vanoppen (Particle and Interfacial Technology Group, PaInT, Ghent University, Belgium) for her research into seawater desalination.

Other awards granted in 2017 are the **VLIZ North Sea Award** (1 000 EUR), the VLIZ Master Thesis Awards (2 x 500 EUR) and the VLIZ Communication Award. The VLIZ North Sea Award honours post-graduate or post-doctoral research relating to the structure, functioning and sustainable management of the North Sea's ecosystem. In 2017, the award was won by Dr Alberto Scoma for his collection of articles entitled 'The "Alcanivorax paradox": Mild hydrostatic pressure impacts deep-sea oil bioremediation'. The **VLIZ Master Thesis Awards** are aimed at recognising and



Dr Irina Vetter (University of Queensland) receives the prestigious 2016 Dr Edouard Delcroix Prize from Hydro and VLIZ for her research into ciguatoxins. © VLIZ

rewarding the work of meritorious young marine researchers. This way VLIZ hopes to encourage them to continue to provide high-quality scientific contributions in the future and to promote marine scientific research in Flanders. The 2017 VLIZ Master Thesis Awards were granted to Kathleen Wils (UGent – Renard Centre of Marine Geology) for her Master Thesis *‘Reconstruction of the seismic history of Aysén fjord (South Chile) by means of seismic stratigraphy and sediment-core analysis’* and Niels van Putte (UA – Ecosystem Management Research Group) for his Master Thesis *‘Groundwater flow in freshwater tidal marshes: A comparison of a natural and a restored marsh’*. The 2017 **VLIZ Communication Award** is aimed at providing guidance to young marine scientists and engineers when communicating their work. In 2017, the award was won by Maikel De Clercq (UGent – Department of Geology). For one year, the VLIZ Communication division provided personal communication coaching to Maikel with regard to the creation of an animated film on paleo-landscapes in the North Sea.

Finally, VLIZ awards prizes for Brilliant Marine Research Ideas, funded by the VLIZ philanthropic activities (maximum 5 000 EUR). These grants are intended to inspire and enable PhD students affiliated to a Flemish University or Flemish University College to execute a brilliant idea within the scope of their doctoral research. In 2017, the awards for **Brilliant Marine Research Ideas** were granted to: Emmanuel Van Acker (UGent, Laboratory of Environmental Toxicology and Aquatic Ecology), Laurine Burdorf (VUB, Department of Chemistry), Raf Meskens (Antwerp Maritime Academy) and Franz Maximilian Heindler (KULeuven, Laboratory of Biodiversity and Evolutionary Genomics).

OPEN SEA LAB: HACKATHON

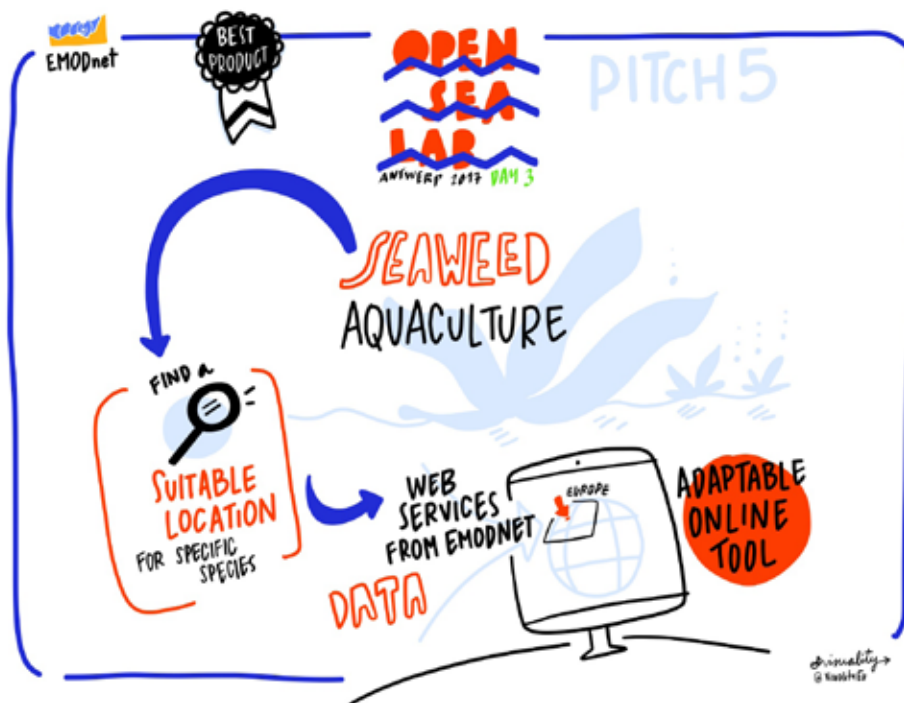
Further information on all developed demos as well as the after movie can be found on the EMODnet website:

🖱 www.emodnet.eu/missed-open-sea-lab-watch-film

In 2017, the European Marine Observation and Data Network (EMODnet) entered its third and final development phase (2017-2020) with the goal of being completely developed and operational by 2020. Adhering to the “collect once and use many times” philosophy, EMODnet encourages any marine data users, including policymakers, scientists, private industry and the public, to invest more in the use of marine open data. The first EMODnet Open Sea Lab took place at StartupVillage in Antwerp from 15 to 17 November 2017 to stimulate users to discover the potential of open data. The event was organised by EMODnet, R&D and innovation hub IMEC and VLIZ. This three-day boot camp and hackathon was attended by interested people with various backgrounds and skills from 15 different countries. They could participate in workshops under the supervision of experts as well as individualised training courses to improve their data manipulation, business modelling, user testing and pitching skills.

Then teams of participants competed with each other by trying to develop innovative and new applications, making use of marine open data offered by EMODnet. The ideas developed ranged from tools to support fishermen, environmental managers and the offshore wind energy sector to applications regarding marine and coastal tourism for the general public. A common topic was the need to develop an interface that utilises the huge quantities of available marine data and makes them accessible to users so that they become understandable and usable for specific purposes.

Seven international teams took part in this boot camp and competition. The resulting revolutionary concepts and demos were presented to a jury. The winning team (including a few VLIZ employees) developed an open-source tool to select areas suitable for seaweed farming in Europe (EMODnet).



The winning team developed an open-source tool to select areas suitable for seaweed farming in Europe. © EMODnet



The first Open Sea Lab organised by EMODnet, VLIZ and IMEC: a boot camp and hackathon to develop innovative applications by means of marine open data. © EMODnet – Leemans

PUBLIC ACTIVITIES

One of the five strategic objectives of VLIZ is to promote ocean literacy in Flanders and the visibility of marine research to the public at large. VLIZ tries to achieve this objective by disclosing high-quality marine information to very diverse target groups (young and old, professionals and the general public, local and international, education and research) and in different formats.

Every year, VLIZ reaches a large group of interested people through public events, open house days, exhibitions and symposia. At the annual **Science Day**, VLIZ opens the doors of the Marine Station Ostend, and the general public can board the research vessel Simon Stevin, where marine scientists explain their research in simple and accessible language. The **VLIZ Marine Science Day** is the most important event of the year for all those involved in marine sciences in Flanders and beyond. (Junior and senior) scientists and marine educational institutes as well as companies and marine policymakers come to this event for a day of networking and presentations about research conducted at universities and scientific institutions. Historians, archaeologists, ecologists, heritage experts, sociologists, fisheries biologists and all those interested in the rich history of Belgian sea fisheries are catered to at the biennial seminar '**Vissen in het Verleden**' (fishing in the past). VLIZ organises this event together with its heritage partners in order to shed light on the historical aspect of Belgian fisheries at sea and in the Scheldt estuary and to provide a multidisciplinary view. Other public events that took place in 2017 include **World Oceans Day** (8 June) with a varied programme (lectures, debates, stand-up comedy, interactive stands) concerning beach safety and '**Vlaamse Havendag**' (Flemish Port Day) which enabled the public to visit the research vessel Simon Stevin.

VLIZ not only organises numerous events, it also manages an **information desk** providing answers to sea-related questions (308 in 2017), gives **lectures** about marine scientific topics to the public at large and receives groups of visitors at the InnovOcean site. In addition, VLIZ was successful in terms of **press coverage**, e.g. with the widely visible actions concerning beach safety and the fossil graveyard off Zeebrugge. In 2017, VLIZ appeared 69 times in newspapers, magazines, TV programmes and radio broadcasts.

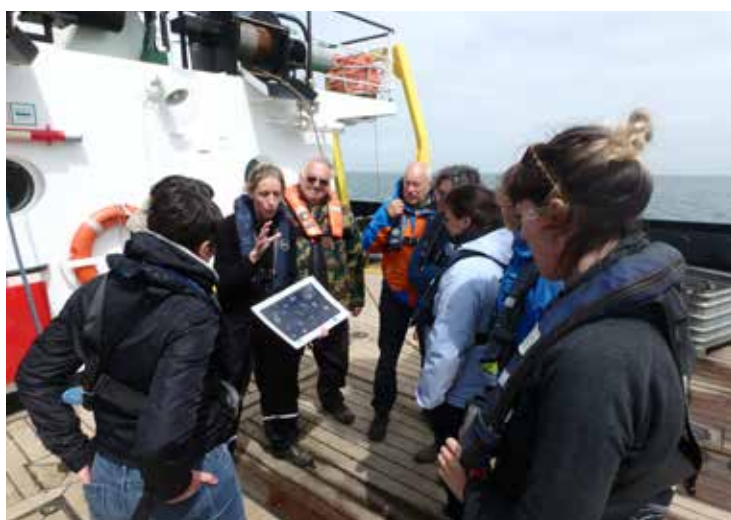
VLIZ invests a great deal in publications, including the free information magazine on the sea and coast entitled '**De Grote Rede**' (circulation of 9 000 copies – see p. 22-23), **de 'Zeekrant'** (circulation of 80 000 copies) and the **VLIZ Annual Report**. On a daily basis, VLIZ informs the public through its website, the digital newsletter '**VLIZINE**' (1 310 subscribers) and different **social media channels** (Facebook, Twitter, YouTube and LinkedIn).

VLIZ also plays a prominent role in informing teachers and other educators about the sea. '**Planeet Zee**', VLIZ's main educational project, is an online learning platform for youngsters featuring learning modules and assignments relating to investigation of the coast, seas and oceans. In 2017, VLIZ shifted the focus from educating youngsters to providing update training to teachers who want to learn more about current marine research. These update training sessions (so-called '**Zeebaden**') are aimed at reaching a wider group of students through their teachers. Furthermore, VLIZ organised the **PlaneetZee@Work** competition for the last time in 2017, after several fascinating editions. The educational team will use the coming year to develop creative ideas suitable for the new research mandate. In partnership with the province of West Flanders, VLIZ organises an annual seminar for **coastal guides** active on the Flemish coast. This event offers nature guides, regional guides, city guides, museum guides and children's guides a varied programme of lectures, guided walks and visits. The primary aim of the annual seminar is to facilitate networking and exchanging experiences between colleagues. In addition, VLIZ actively contributes to the SYNTRA training course for regional coastal guides.

For some time now, VLIZ has roused the general public's interest in **citizen science**, a new scientific research method which is rapidly gaining importance. In citizen science projects, nonprofessional volunteers help scientists by collecting or analysing data in a scientifically sound manner. VLIZ is strongly focusing on marine citizen science via SeaWatch-B, a beach observation network to monitor the status of the Belgian part of the North Sea. The project is part of the VLIZ philanthropic activities. VLIZ is also the coordinator of the three citizen science projects within the



The theme of the 2017 Science Day at the Marine Station Ostend was the many changes which the oceans and seas undergo. © VLIZ



Nature guides and teachers on board RV Simon Stevin. © VLIZ



SeaWatchers at work on the beach. © VLIZ

platform *'Iedereen (zee)wetenschapper'* created by the popular scientific magazine *Eos Wetenschap*, and has given lectures on this topic at different forums. VLIZ contributed to a European publication on marine citizen science produced by the European Marine Board, and compiled best practices within Europe at the Sea Change platform 'Ocean Edge'.

Finally, VLIZ is a membership organisation with 517 members at the end of 2017. Since 2016, VLIZ has organised a **members' day** to thank loyal VLIZ members for their longstanding support and to become acquainted with new members. Furthermore, VLIZ has been recognised as a philanthropic organisation with

the good cause of the sea. VLIZ's philanthropic activities include initiatives that contribute to the scientific knowledge about coastal and marine areas and help develop a worldwide interdisciplinary network of marine researchers. In 2017, revenues for the VLIZ philanthropic projects were largely from membership fees but also from donations, possibly to a specific project. You can become a member of VLIZ or make a donation at the webpage www.vliz.be/en/your-contribution.

- ☐ Planet Zee (Planet Ocean): www.planetzee.be/
- ☐ Citizen science: www.iedereenwetenschapper.be/
- ☐ Membership and donations: www.vliz.be/en/your-contribution

BASIC SERVICES

» The core activities of VLIZ in support of marine research conducted at Flemish universities and knowledge institutions are continued as usual within the scope of the new management agreement which entered into force in 2017. After all, they are part of the VLIZ DNA. «

JAN MEES, GENERAL DIRECTOR VLIZ

Since VLIZ was established in 1999, a large part of its activities have been carried out for the purpose of third parties. These services are an integral part of the VLIZ DNA. Within the scope of the new management agreement concluded with the Flemish government (for the period 2017 – 2022), VLIZ will continue to support and represent marine research conducted at Flemish universities and knowledge institutions as part of its core activities.

For instance, VLIZ supports different networks of marine scientists, provides access to the research vessel Simon Stevin and other research infrastructure, develops data systems and data products, and manages research data on behalf of marine research groups. The VLIZ Library makes various collections of

physical documents and online information accessible to marine scientists and the general public. This way, it contributes to the improvement, visibility and wider use of the Flemish marine scientific output. Policy-relevant products and services such as the Compendium for Coast and Sea are put at the disposal of the marine research community, policymakers and the industry. But VLIZ is also a strong ambassador for increased ocean literacy and promotes Flemish marine scientific research by means of exhibitions, public meetings, publications, public presentations, websites, seminars, workshops and symposia. Since 2017, these activities have been supplemented with initiating and conducting research at the service of, in collaboration with and as a complement to the Flemish and international marine research groups.



A demonstration stand at the VLIZ Marine Science Day 2017, one of the annual highlights in the general services provided by VLIZ. © VLIZ



The VLIZ Marine Library contains a wealth of information on the Flemish coast, the North Sea and the oceans, and can be searched both online and on site. © VLIZ



SUPPORT TO INTERNATIONAL ORGANISATIONS

By order of the Flemish government, VLIZ supports several international organisations.

This capitalises on VLIZ's international experience and reputation, and makes it possible to embed important European initiatives in Flanders. This chapter briefly explains the specific partnerships in which VLIZ participated in 2017.

EUROPEAN MARINE BOARD



The 6th European Marine Board Forum took place on the 6th of December 2017 in Brussels (European Marine Board / Fred Guerin, Scorpix)

📄 www.vliz.be/en/european-marine-board-emb 📄 www.marineboard.eu

The European Marine Board provides a Pan-European platform to its marine scientific member organisations to establish common research priorities, to promote marine research and to close the gap between science and policy. VLIZ represents FWO in the European Marine Board and was given the mandate by the Flemish government to accommodate and support the EMB secretariat.

The European Marine Board (EMB) secretariat, located at InnovOcean benefits from VLIZ support through the use of the general VLIZ infrastructure, IT support, and one EMB staff member responsible for the coordination and administrative tasks. Jan Mees, VLIZ General Director, has been the EMB chairman since 2014, with a mandate to Spring 2019. Until October 2017, Jan Seys, head of VLIZ Communication, chaired the EMB Communications Panel.

In 2017, VLIZ and the European Marine Board cooperated on two EMB flagship events in Brussels: the brainstorming session

for Navigating the Future V (NFV: 8-9/12/17, financed by VLIZ) and the 6th EMB open Forum (6/12/17, communication support provided by VLIZ).

During the NFV meeting, 17 marine science experts identified 5 key marine science areas to guide European and national research and science policy agendas. NFV aims to provide robust, independent scientific advice on future seas and Ocean research to 2030 and beyond.

The 6th EMB Forum discussed the role of marine science in the implementation of the UN 2030 Agenda. Over 150 representatives from marine science organizations, NGOs and Government attended the event.

EMODnet-SECRETARIAT

EMODnet, the European Marine Observation and Data Network, aims to centralise the abundance of marine observations in Europe and make them optimally accessible for use by government bodies, scientists and maritime companies, primarily so as to support sustainable economic growth and employment. The Flemish government has mandated VLIZ to accommodate and support the EMODnet secretariat.

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EU's Integrated Maritime Policy which work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products.

Since 2013, the EMODnet Secretariat is administered by Seascope and hosted at the InnovOcean site in Ostend by VLIZ with the support from the Flemish Government. VLIZ supports the EMODnet Secretariat by providing office space for four staff members as well IT support. Also, VLIZ contributes to the

development of the EMODnet Central Portal www.emodnet.eu. This central portal gives users access to the different EMODnet thematic activities (e.g. bathymetry, geology, biology, chemistry, human activities, etc.) and to the regional activities (EMODnet Sea-basin Checkpoints). The Central Portal has gone through a complete revamping in 2017, turning it into a more user-friendly and dynamic information hub and gateway to marine data in Europe. The new EMODnet Geoviewer was developed by VLIZ and is available in the Central Portal since September 2017. The Geoviewer allows for a multiple visualization and combination of EMODnet data layers from the different themes.

From 15 to 17 November 2017, EMODnet held its very first open data competition in Antwerp: the EMODnet Open Sea Lab. VLIZ joined forces with the EMODnet Secretariat and IMEC to co-organise this unique hackathon where teams competed to develop novel applications using marine open data. Members of VLIZ staff participated in the event as coaches, speakers and some even as members of the competing teams.

- 📄 www.vliz.be/en/european-marine-observation-and-data-network-emodnet
- 📄 www.emodnet.eu/about-secretariat



The first 'Open Sea Lab' hackathon organized by the EMODnet-Secretariat, VLIZ and IMEC.
© EMODnet - Leemans

JPI OCEANS



The second JPI Oceans conference in Lisbon with VLIZ as a co-organizer. ©JPI Oceans

www.vliz.be/nl/jpi-healthy-and-productive-seas-and-oceans-jpi-oceans
www.jpi-oceans.eu

The Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) is a coordinating and integrating platform open to all European countries that invest in marine and maritime research. Its aim is to combine national research funds and structure cooperation in the field of research policy. VLIZ has been commissioned by the Flemish government to support the JPI Oceans secretariat.

Through the mandate of the Flemish government VLIZ supported JPI Oceans with one staff member to the JPI secretariat in Brussels. With the support of VLIZ, JPI Oceans organised the briefing 'Multilateral Science-Policy Partnerships: Generating the Evidence to Underpin SDG Implementation' as a side event to the UN Ocean conference in New York. The event highlighted the

importance of scientific evidence for the sustainable development of the oceans and the realisation of the implementation of Sustainable Development Goal 14.

Within the framework of the CSA Oceans 2 project, VLIZ co-organised the 2nd JPI Oceans conference in Lisbon. The conference provided an excellent opportunity for stakeholders from research and industry to network and discuss with policy makers from across Europe. Partners involved in JPI Oceans joint actions discussed the outcomes, opportunities and future outlooks of their activities. Finally, VLIZ supported the organisation of the midterm review meeting of the four transnational research projects on microplastics in the marine environment – BASEMAN, EPHEMARE, PLASTOX and WEATHER-MIC.

UNESCO/IOC PROJECT OFFICE FOR IODE

📄 www.vliz.be/en/unescoioc-project-office-iode
 📄 www.iode.org

The deep-sea sponge *Farrea bowerbanki* was added to OBIS in 2017. Published in *Zootaxa* Vol. 4236 n°7. © AAMP



VLIZ has a special responsibility to accommodate and support the secretariat of the 'International Oceanographic Data and Information Exchange Programme' (IODE) of UNESCO's 'Intergovernmental Oceanographic Commission' (IOC). The 'UNESCO/IOC Project Office for IODE' is the principal training centre of the IODE programme worldwide.

VLIZ supports the 'IOC Project Office for IODE' by appointing employees who account for 3.5 full-time equivalents. In addition, VLIZ provides support to the operational activities focusing on the development and maintenance of online data and information services, the coordination of the global IODE network of oceanographic data centres and the organisation of specialised technical training sessions.

Thanks to its extensive experience in capacity development, in particular training sessions on data and information management, IODE extended its OceanTeacher Global Academy (OTGA, formerly called Ocean Teacher Academy) from a single regional training centre located (RTC) at the *InnovOcean* site in Ostend, to a network of regional training centres worldwide. In 2017, besides the RTC in Ostend, seven other RTCs were operational, namely in Colombia, Senegal, Mozambique, Kenya, India and Malaysia. Another two RTCs (China and Iran) might become operational in 2018.

The RTC model makes it possible to reach more people and offers trainings in different languages. The participation of invited teachers by using videoconferencing technology is often applied during the courses, and is coordinated by the 'IOC Project Office for IODE' in Ostend. The OTGA also supports training activities

from other IOC programs and partners, in particular through the use of its OceanTeacher e-learning platform. In 2017, more than 600 people from 98 countries benefited from the OTGA training activities.

The IOC Project Office for IODE currently coordinates the IOC's capacity development programme. Within this programme there is a close collaboration with the three regional secretariats in Cartagena (Colombia), Nairobi (Kenya) and Bangkok (Thailand), which coordinate the IOCARIBE, IOCAFRICA and WESTPAC regions respectively. Likewise, the IOC Project Office manages the IOC CD website (www.ioc-cd.org).

Since 2012, the IOC Project Office for IODE has accommodated the secretariat of the Ocean Biogeographic Information System (OBIS). OBIS builds and maintains a worldwide database containing data on the distribution, abundance and diversity of all marine species. The OBIS secretariat also provides training courses and technical assistance to the data providers and the OBIS nodes. In addition, the secretariat offers guidance for the development of new data standards and technical processes as well as the promotion of international partnerships.

VLIZ manages the European OBIS node and is the largest contributor of data to OBIS. The VLIZ data centre is actively involved in the OBIS activities such as the provision of training courses, the development of data standards, taxonomic quality controls (through WoRMS). VLIZ also makes a server room available to the OBIS database and handles IPT requests from other OBIS nodes. The VLIZ library serves as a repository for all publications citing OBIS.



KEY PERFORMANCE INDICATORS

The key performance indicators (KPIs) refer to important services provided by VLIZ to marine scientific researchers, policymakers, educators and the general public. These are criteria to evaluate the operation of VLIZ. As stated in the new covenant for the period 2017-2021, VLIZ has to deliver on twelve KPIs every year.

KPI 1

AT LEAST SEVEN A1 PUBLICATIONS ARE WRITTEN
BY VLIZ EMPLOYEES IN 2017 AND 2018



14

A1-PUBLICATIONS⁽¹⁾

written by VLIZ employees were published in 2017, including four A1 publications with a VLIZ employee as the first author and ten A1 publications with a VLIZ employee as a co-author.



© VLIZ

⁽¹⁾ in 2016: 9. An overview of the A1 publications is available on p. 58 of the annexes.

KPI 2

THE ORGANISATION OF THE ANNUAL EVENT 'MARINE SCIENCE MEETS MARITIME INDUSTRY'



© Port of Ostend - Laure Martroye



101

REPRESENTATIVES

from knowledge institutions, government agencies and the private sector attended the event 'Marine Science meets Maritime Industry' in 2017.



**PRIVATE
SECTOR**

45.5%



**KNOWLEDGE
INSTITUTIONS**

35.6%



GOVERNMENT

18.8%

The 'Marine Science meets Maritime Industry' event was organised by Flanders' Maritime Cluster (FMC) and VLIZ for the third time on 30 May 2017. The aim of this annual meeting is to facilitate the exchange of knowledge and ideas between scientists and industrialists in order to support the blue economy. The topic of this 3rd edition was the challenges put forward by the Blue Cluster. In addition to a plenary session, there were three break-out sessions where small groups could brainstorm about possible innovative solutions for three topical issues: coastal safety and aquaculture, a multifunctional island, and coastal safety, nature development and estuarine shipping.

KPI 3

AT LEAST 180 SAILING DAYS SPENT ON SCIENTIFIC RESEARCH,
MONITORING AND EDUCATION EACH YEAR

RV SIMON STEVIN



168

OTHER VESSELS EQUIPPED
WITH VLIZ EQUIPMENT



43

RIB ZEEKAT



12

ROV GENESIS



11

234

DAYS SPENT AT SEA ⁽¹⁾

The total number of days spent at sea with RV Simon Stevin, RIB Zeekat and other vessels equipped with VLIZ equipment.



© VLIZ

RV Simon Stevin is deployed for academic coastal oceanographic research in the Southern Bight of the North Sea and the eastern part of the English Channel. It also serves as a training platform for students from marine sciences as well as maritime training courses. In 2017, a total of 971 persons boarded the ship, including 575 scientists, 357 students and 39 volunteers. Eighteen marine research groups made use of RV Simon Stevin within the scope of 33 different projects (see annex p. 52). The vessel made 25 day trips for educational or demonstration purposes, e.g. within the scope of PlaneetZee@Work, the Week of the Sea and training courses

at the Antwerp Maritime Academy as well as the universities of Brussels (biology), Ghent (geology, biology, environmental toxicology), Hasselt (biology) and Leuven (biology). ROV Genesis is an unmanned underwater vehicle deployed nationally and internationally from research vessels (see p. 45). RIB Zeekat can be deployed from the research vessel Simon Stevin or from the shore, including for sampling in coastal waters, the Belgian ports and the Scheldt estuary. The reinforced keel is designed to run the vessel aground on tidal banks. In 2017, the 17-year-old RIB Zeekat was replaced by a new, faster rigid-inflatable boat.

⁽¹⁾ in 2016: 251

KPI 4

ROV GENESIS DEPLOYED ON AT LEAST
FOUR CAMPAIGNS A YEAR



© VLIZ

RV SIMON STEVIN



RV PELAGIA



 4

CAMPAIGNS ⁽¹⁾

Remotely Operated Vehicle (ROV) Genesis is deployed nationally – for research in the Belgian part of the North Sea – and internationally – mainly for deep-sea research – from research vessels. ROV Genesis has been operational since 2006 and has explored virtually all ocean basins: the Atlantic Ocean, the Indian Ocean, the South Pacific and the Southern Ocean. By 2017, the remotely operated underwater vehicle had carried out a total of 26 expeditions.

The number of campaigns in which ROV Genesis was deployed, including 1 campaign with RV Pelagia (24 April – 5 May, 5 dives, Rockall Bank, lying north-west of Ireland) and 3 campaigns with RV Simon Stevin (13-15 June, 5 dives; 7-11 August, 3 dives; 4 December, 1 dive; various locations in the Belgian part of the North Sea).

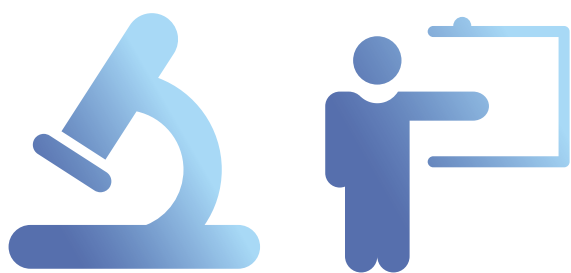
⁽¹⁾in 2016: 3

KPI 5

EXTERNAL PARTIES USE THE MARINE STATION OOSTEND FOR SCIENTIFIC OR EDUCATIONAL ACTIVITIES AT LEAST 120 CALENDAR DAYS A YEAR



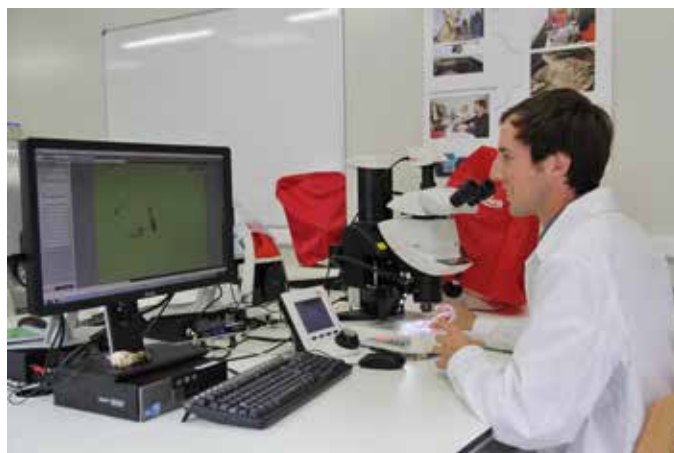
© VLIZ



134

DAYS ⁽¹⁾

when external parties used the Marine Station Ostend for scientific or educational activities. In addition, the MSO was used for ongoing experiments without the presence of scientists for 83 days.⁽²⁾



© VLIZ

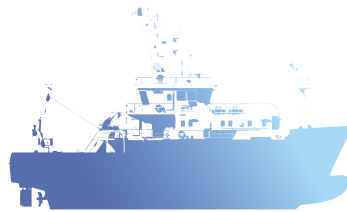
The Marine Station Ostend (MSO) is the satellite laboratory by the sea for all Flemish marine scientists and is used within the scope of the European infrastructure networks Lifewatch and EMBRC. The MSO comprises multifunctional wet, dry and molecular laboratories, cold stores with water tanks for marine organisms, a storage and working space for data and research equipment, a core repository for cold storage of drill cores and a space for public activities.

⁽¹⁾ in 2016: 134

⁽²⁾ An overview of marine scientific projects that made use of the MSO in 2017 can be found on page 53 of the annex.

KPI 6

AT LEAST 30 DATA SETS A YEAR MADE AVAILABLE TO FLEMISH MARINE RESEARCHERS AND PUBLISHED IN 'OPEN ACCESS' AFTER HAVING BEEN ACQUIRED BY RV SIMON STEVIN OR THE FLEMISH ESFRI RESEARCH INFRASTRUCTURES, OR AFTER HAVING BEEN SUPPLIED WITHIN THE SCOPE OF INTERNATIONAL NETWORKS OR PROJECTS IN WHICH VLIZ IS INVOLVED



© VLIZ



183

DATA SETS

A great deal of data are collected within the scope of Flemish marine research. Data supplied to VLIZ are archived and – with permission of data owner – integrated into data systems or processed into data products so that they can be efficiently disclosed. To facilitate the search for data, VLIZ provides a detailed description of the data in data sets and discloses them via an online information system. The data can be requested online via the VLIZ website: www.vliz.be/en/request-data.

made available to Flemish marine researchers and published in 'Open Access' in 2017 after having been acquired by RV Simon Stevin or the Flemish ESFRI research infrastructures, or after having been supplied within the scope of international networks or projects in which VLIZ was involved.

KPI 7

AT LEAST 3 DATA ANALYSIS AND TRAINING WORKSHOPS ORGANISED EVERY YEAR



12

DATA ANALYSIS AND TRAINING WORKSHOPS

were organised, including 4 LifeWatch-WoRMS editor workshops, 4 EurOBIS-OBIS training courses, 1 EMODnet Bio workshop, 2 LifeWatch Observatory workshops, and 1 OTGA/VLIZ Research Data Management Training Course.



EMODnet biology workshop in London in October 2017. © VLIZ

VLIZ manages several taxonomic, biogeographical and traits-related databases. Considerable investments were made in

training experts who provide data to these databases in 2017.

KPI 8

VLIZ MANAGES SEVERAL TAXONOMIC, BIOGEOGRAPHICAL AND TRAITS-RELATED DATABASES. CONSIDERABLE INVESTMENTS WERE MADE IN TRAINING EXPERTS WHO PROVIDE DATA TO THESE DATABASES IN 2017



1577
A1 ARTICLES

62.7%



898
BOOKS A.O.

35.7%



39
THESES

1.6%

The VLIZ Library manages a very extensive collection of (inter) national marine scientific literature. The collection contains books, maps, periodicals, reports and theses, and can be searched via the online catalogue. VLIZ strives for open communication. The VLIZ Library aims to make as many publications as possible freely available in digital form. A great deal of Belgian marine literature is digitally available via the Open Marine Archive (OMA), the principal collection component of the VLIZ Library. In addition, search engines such as Google Scholar give publications included in OMA a prominent ranking.

2514

NEW REFERENCES ⁽¹⁾

were added to the Open Marine Archive in 2017. This brings the total number of digital publications in OMA to 29 450.

⁽¹⁾ in 2016: 2 805

KPI 9

AT LEAST 90% OF LITERATURE REQUESTS PROCESSED BY THE LIBRARY RESULT
IN DOCUMENT DELIVERY WITHIN ONE WORKDAY AFTER THE REQUEST



© VLIZ



96.6%

DOCUMENT DELIVERIES WITHIN 1 DAY

In 2017, the VLIZ Library processed 872 literature requests.⁽¹⁾
96.6% of document deliveries were made within one workday after the literature requestna de literatuuraanvraag.

⁽¹⁾in 2016: 963

KPI 10

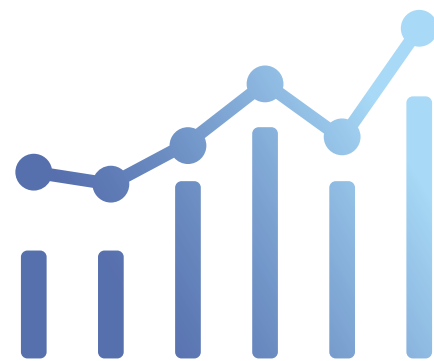
PARTICIPATION IN AT LEAST TEN CONSULTATIONS AT FORMAL CONSULTATION FORUMS (IN ACCORDANCE WITH THE ANNUALLY UPDATED WORK PLAN OR STRATEGIC PLAN) AND THREE POLICY RECOMMENDATIONS WITH REGARD TO RESEARCH INTO THE BLUE ECONOMY, PROVIDED WITHIN TWENTY WORKDAYS AFTER THEY HAVE BEEN REQUESTED, WITHIN THE SCOPE OF AN ANNUALLY UPDATED STRATEGIC PLAN CONCERNING 'POLICY ADVICE ON THE BLUE ECONOMY'



43

CONSULTATIONS

The number of participations in consultations at formal consultation forums, including 6 consultations within the scope of the Complex Project Coastal Vision, 12 consultations concerning the Blue Cluster, 15 consultations for the long-term vision for the North Sea 2050 and 10 sectoral consultations.



18

POLICY RECOMMENDATIONS

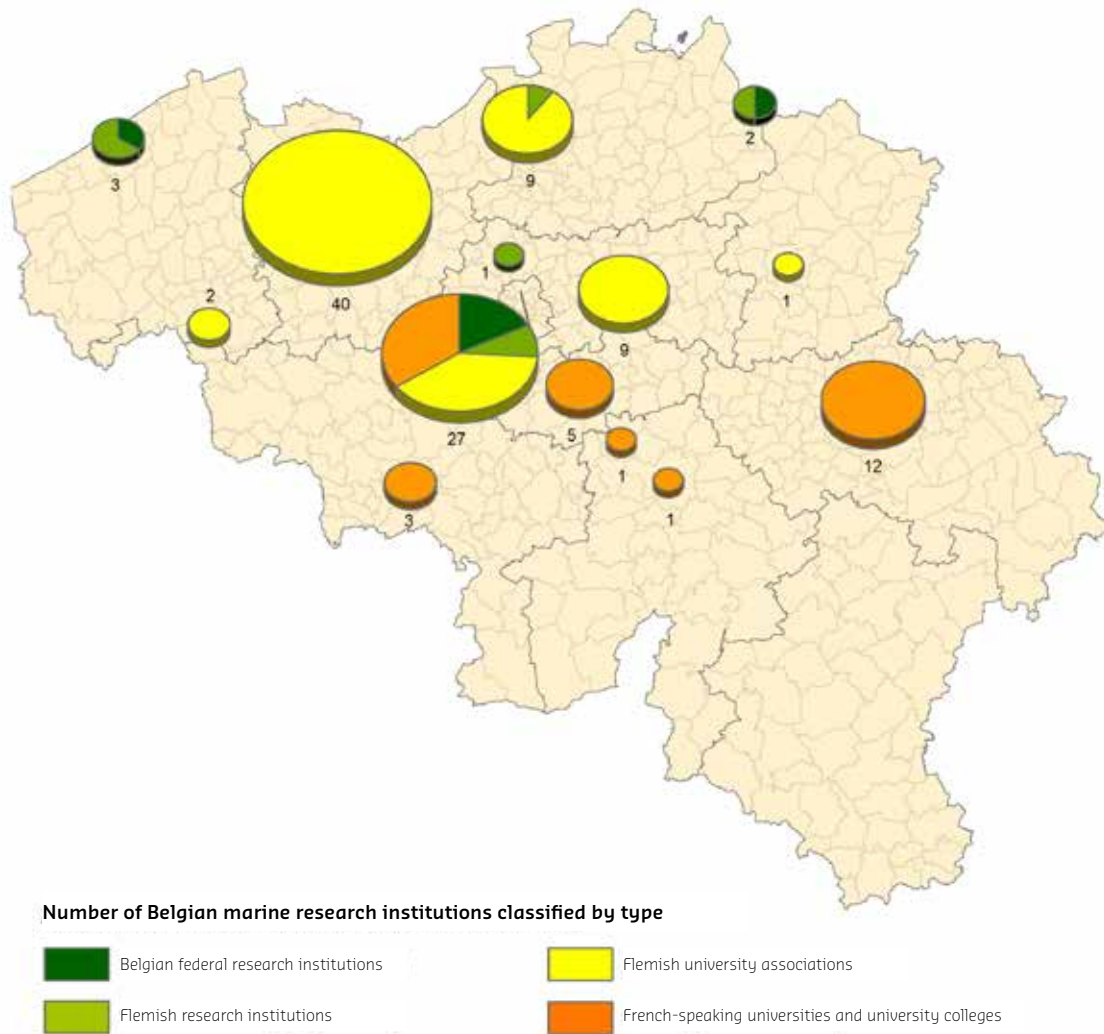
with regard to research into the blue economy. The majority of policy advice requests came from the Flemish government level, in particular the Policy Area of Economy, Science & Innovation (6), the Policy Area of Mobility and Public Works (2), the Department of Foreign Affairs (2) and the Policy Area of Environment (2). The other requests came from the European (1), Federal (1), Provincial (1) and local government levels (3).

The industry was added to the target groups to be served in the recently concluded management agreement between the Flemish government and VLIZ (2017-2021). VLIZ was also given the task of representing the scientific community in initiatives to support the blue economy. To perform this task, VLIZ makes

a valuable contribution to the implementation of the policy with regard to economic development at sea through participation in consultations at formal consultation forums and the provision of policy recommendations with regard to research into the blue economy.

KPI 11

ANNUAL UPDATE OF THE INVENTORY OF THE MARINE RESEARCH LANDSCAPE IN FLANDERS (COMPENDIUM FOR COAST AND SEA)



Marine research groups in Flanders and Belgium (yellow: Flemish university associations; orange: French-speaking universities and university colleges; light green: Flemish research institutions; dark green: Belgian federal research institutions). Graph from Pirllet *et al.* (2017).

Every year, the marine research landscape in Flanders and Belgium is surveyed by means of a fixed methodology. In November 2017, the current situation was reported in a policy informing brief by the VLIZ Policy Information division within the context of the Compendium for Coast and Sea. A total of 115 marine research groups were identified, a considerable increase compared to the 82 groups counted during the first survey of 2013. It appears that marine research in Flanders/Belgium is in the ascendant and is

preparing for a future where the blue economy and the seas and oceans will be increasingly important.

With this annual policy informing brief, VLIZ intends to inform marine and maritime (scientific) policymakers, the marine research community and other stakeholders. At the end of 2018, a new edition of the Compendium for Coast and Sea will be published, including a discussion of these figures in a broader context.

KPI 12

AT LEAST 8 EVENTS ORGANISED AND COMMUNICATION PRODUCTS CREATED A YEAR IN COLLABORATION WITH SCIENTISTS, WITH MARINE INFORMATION BEING TRANSFERRED TO RESEARCHERS, THE GENERAL PUBLIC AND/OR EDUCATORS



Left: The topic of World Oceans Day 2017 was beach safety © VLIZ;

Right: 'Strandvondsten' (beach finds): this practical field guide published in 2017 is a coproduction by Stichting Kunstboek, VLIZ, Natuurpunt and Strandwerkgroep. © Hans De Blauwe



14
EVENTS



9
COMMUNICATION
PRODUCTS

25

EVENTS, COMMUNICATION, A.O.

A total of 14 events organised (annex p. 54), 9 communication products and publications (annex p. 57) and 2 other activities, namely the information desk (annex p. 23) where various target groups can ask questions, and VLIZ's activities on social media (annex p. 25).

One of the strategic objectives of VLIZ is to promote ocean literacy in Flanders and the visibility of marine research to the public at large. VLIZ tries to achieve this objective by disclosing high-quality marine information to very diverse target groups (young and old, professionals and the general public, local and international, education and research) through events, communication products and publications as well as the information desk and social media.

COLOPHON

This 2017 Annual Report of the Flanders Marine Institute (VLIZ) has been presented for approval to the Board of Directors and the General Assembly on 26 March 2018.

COORDINATION AND FINAL EDITING

- **Jan Mees** - General Director of VLIZ
- **Tina Mertens** - VLIZ Assistant Director
- **Jan Seys** - Head of the VLIZ Communication division
- **Bart De Smet** - Senior Science Officer Communications

Many thanks to all who contributed to the completion of this document.

COVER PHOTO

Remotely operated underwater vehicle Genesis aboard RV Simon Stevin. © VLIZ

DESIGN

Zoe©k - Marc Roets & Yves Moerman

AVAILABILITY

This document is available as a PDF file on the VLIZ website (www.vliz.be/en/vliz-annual-report).

TO BE QUOTED AS FOLLOWS:

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ANNEXES

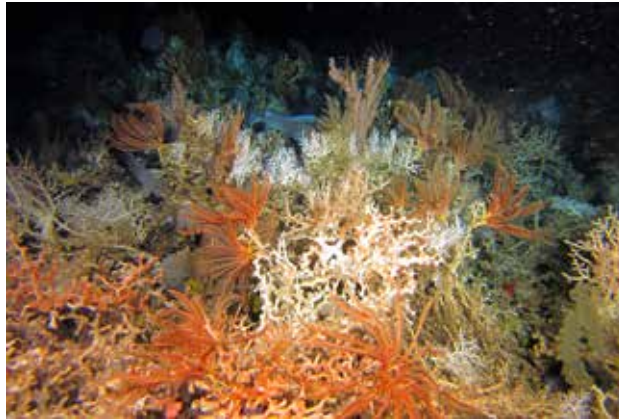
ANNUAL REPORT 2017



4

ORGANISATION AND FINANCIAL STATEMENT OF VLIZ

VLIZ is administered by the Board of Directors and consults the Scientific Committee for its scientific support tasks. The General Assembly provides assistance in managerial and administrative decisions.



14

MANAGEMENT INDICATORS

The management indicators refer to important services provided by VLIZ to marine scientific researchers, policymakers, educators and the general public. They complement the key performance indicators (KPIs), which are criteria to evaluate the operation of VLIZ.

ANNEXES ANNUAL REPORT 2017

ONLY AVAILABLE IN DIGITAL VERSION

ORGANISATION AND FINANCIAL STATEMENT OF VLIZ *p. 4*

VLIZ ORGANISATION *p. 6*

BALANCE SHEET AND INCOME STATEMENT *p. 12*

MANAGEMENT INDICATORS *p. 14*

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NATIONAL AND INTERNATIONAL NETWORKS *p. 40*

PROJECTS - EXTERNAL FINANCING *p. 42*

SCIENTIFIC EQUIPMENT AND INFRASTRUCTURE *p. 50*

2017 EVENTS *p. 54*

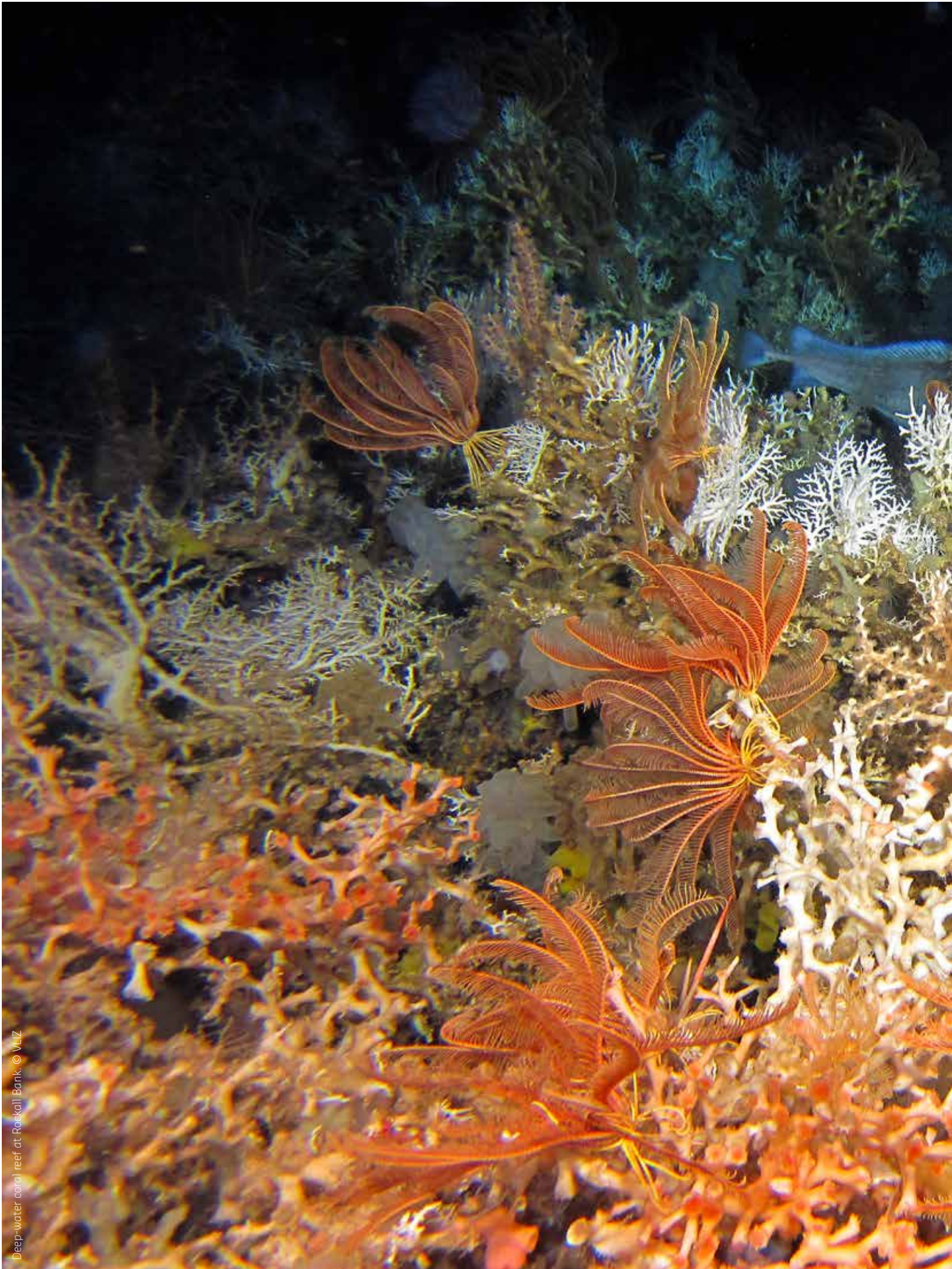
2017 PUBLICATIONS *p. 57*

38

OTHER ANNEXES

An overview of the national and international networks in which VLIZ participates, projects for which VLIZ receives external funding, the scientific equipment and infrastructure made available by VLIZ, the events (co-)organised by VLIZ and the publications published by VLIZ.






Deep-water coral reef at Rockall Bank. © VUZ

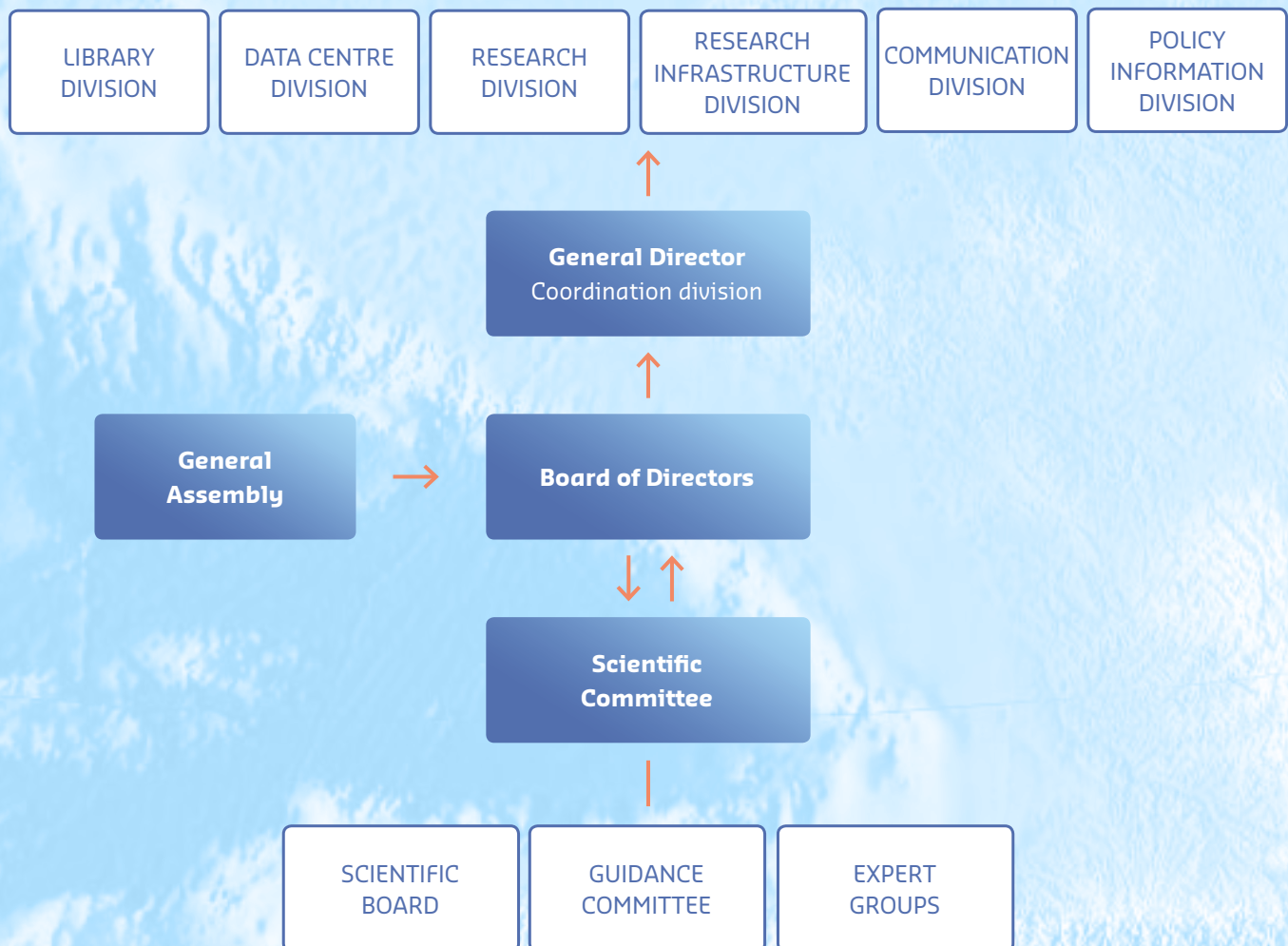
ORGANISATION AND FINANCIAL STATEMENT OF VLIZ

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 www.vliz.be/en/organisation

VLIZ ORGANISATION

For more information about the organisation of VLIZ, visit:
www.vliz.be/nl/imis?module=ref&refid=292447



The Flanders Marine Institute (VLIZ) is an autonomous institute with the legal status of a non-profit organisation under Belgian law that receives an annual allowance from the Flemish government, in particular from the department of Economy, Science and Innovation (EWI), and from the province of West Flanders. VLIZ is administered by a Board of Directors. The highest ruling organ of VLIZ is the General Assembly. The organisation is administered by a Board of Directors, and its daily operations are overseen by the General Director, assisted by the Coordination division. A permanent team of scientists in the Scientific Committee, which advises the Board of Directors on all scientific

aspects of the VLIZ operations, is consulted several times a year to define and adjust its scientific support tasks. This committee consists of three interconnected and mutually reinforcing components. The Scientific Board is a compact steering committee giving high-quality and scientifically sound advice to the Board of Directors. The Guidance Committee is convened annually for a plenary meeting open to a wide group of marine scientists to discuss important new and planned activities. Expert groups are thematic working groups composed of the most relevant experts from Belgium and abroad and are established for a limited or longer period of time.

COMPOSITION OF THE BOARD OF DIRECTORS

AT THE END OF 2017

Pursuant to the articles of association, the Board of Directors is composed of 14 members.

Mr **Carl Decaluwé**, governor of West Flanders, is **THE CHAIRMAN**.

THE EIGHT MEMBERS NOMINATED BY THE FLEMISH GOVERNMENT ARE:

- **Colin Janssen**, Ghent University, vice-chairman
- **Paul Breyne**, honorary governor
- **Nathalie Balcaen**, cabinet of the Flemish Minister for Mobility and Public Works
- **Jean Berlamont**, Katholieke Universiteit Leuven
- **Ilse Hoet**, Mobility and Public Works Department
- **Romina Vanhooren**, cabinet of the state secretary for the North Sea
- **Ann Vanreusel**, Ghent University
- **Hendrik Wallijn**, Director of Partool

THE TWO MEMBERS NOMINATED BY THE PROVINCE OF WEST FLANDERS ARE:

- **Guido Decorte**, member of the Provincial Executive (secretary)
- **Anthony Dumarey**, member of the Provincial Council

THE THREE OTHER MEMBERS ARE:

- **Ann Overmeire**, Innovation, Provincial Development Agency of West Flanders
- **Paul Gerard**, Port of Oostende
- **Willy Versluys**, fishing vessel owner

THE GOVERNMENT COMMISSIONERS ARE:

- **Frans Coussement**, on behalf of the Flemish Minister for Finance
- **Mark Andries**, on behalf of the Flemish Minister for Science Policy

ATTEND THE MEETINGS:

- **Gert Verreet**, Flemish Government Department of Economy, Science and Innovation
- **Patrick Braet**, province of West Flanders, financial manager
- **Jan Mees**, General Director of VLIZ
- **Tina Mertens**, VLIZ Assistant Director
- **Heidi Coussens**, VLIZ executive secretary and rapporteur

COMPOSITION OF THE GENERAL ASSEMBLY

AT THE END OF 2017

Mr **Carl Decaluwé**, governor of West Flanders, is **THE CHAIRMAN**.

THE TEN VOTING MEMBERS APPOINTED BY THE FLEMISH GOVERNMENT ARE:

- **Patric Jacobs**, Ghent University
- **Willy Baeyens**, Vrije Universiteit Brussel
- **Jean Berlamont**, Katholieke Universiteit Leuven
- **Ernest Schockaert**, Hasselt University
- **René Van Grieken**, University of Antwerp
- **Magda Vincx**, Ghent University
- **Philip Van Avermaet**, Flemish Government Department of Economy, Science and Innovation
- **Ulrike Vanhessche**, Coast Guard secretariat (MDK)
- **Ilse Hoet**, Mobility and Public Works Department
- **Jan Strubbe**, honorary director-general of the Waterways and Marine Affairs Administration

THE FOUR VOTING MEMBERS APPOINTED BY THE PROVINCE OF WEST FLANDERS ARE:

- **Guido Decorte**, member of the Provincial Executive
- **Anthony Dumarey**, member of the Provincial Council
- **Patrick Braet**, Provincial Treasurer
- **Jan Denys**, principal of the Mercator Maritime Institute

THE MEMBER APPOINTED BY THE RESEARCH FOUNDATION - FLANDERS (FWO) IS:

- **Hans Willems**, secretary general of the Research Foundation – Flanders

The members of the Board of Directors of VLIZ have the right to attend the General Assembly with an advisory vote. Sympathising members have the right to participate in the discussions of the General Assembly.

SCIENTIFIC BOARD

AT THE END OF 2017

The Scientific Board consists of 16 members and the composition reflects the inter-university and interdisciplinary character of VLIZ.

THE CHAIRMAN is the vice-chair of the Board of Directors, **Mr Colin Janssen** (Ghent University).

TWO DELEGATES FROM GHENT UNIVERSITY (UGENT):

- **Marleen De Troch** (substitute: David Van Rooij)
- **Gilbert Van Stappen** (substitute: Peter Troch)

TWO DELEGATES FROM KATHOLIEKE UNIVERSITEIT LEUVEN (KULEUVEN):

- **Filip Volckaert**
- **Jaak Monbaliu** (substitute: Erik Toorman)

TWO DELEGATES FROM VRIJE UNIVERSITEIT BRUSSEL (VUB):

- **Margaret Chen** (substitute: Marc Kochzius)
- **Marc Kochzius** (substitute: Karolien Van Puyvelde)

TWO DELEGATES FROM THE UNIVERSITY OF ANTWERP (UA):

- **Ronny Blust** (substitute: Gudrun De Boeck)
- **Filip Meysman** (substitute: Patrick Meire)

ONE DELEGATE FROM HASSELT UNIVERSITY (UHASSELT):

- **Tom Artois** (substitute: Natalie Beenaerts)

ONE DELEGATE FROM THE INSTITUTE FOR AGRICULTURAL AND FISHERIES RESEARCH (ILVO):

- **Hans Polet** (substitute: Bart Sonck)

ONE DELEGATE FROM THE RESEARCH INSTITUTE FOR NATURE AND FOREST (INBO):

- **Maurice Hoffmann** (substitute: Eric Stienen)

ONE DELEGATE FROM THE FLEMISH INSTITUTE FOR TECHNOLOGICAL RESEARCH (VITO):

- **Roger Dijkmans** (substitute: Bart Deronde)

ONE DELEGATE FROM THE FLEMISH ENVIRONMENT AGENCY (VMM):

- **Steven Vinckier** (substitute: Marleen Van Steertegem)

ONE DELEGATE FROM THE FLANDERS HERITAGE AGENCY:

- **Marnix Pieters** (substitute: Tom Lenaerts)

ONE DELEGATE FROM FLANDERS HYDRAULICS RESEARCH (FHR):

- **Frank Mostaert** (substitute: Toon Verwaest)

ATTEND THE MEETINGS:

- **Jan Mees**, General Director of VLIZ
- **Tina Mertens**, VLIZ Assistant Director
- **Jan Seys**, rapporteur (substitute: Nancy Fockedeey)

A DELEGATE FROM THE DEPARTMENT OF ECONOMY, SCIENCE AND INNOVATION (EWI):

- **Gert Verreet**



Visit by the Scientific Board to Ecotron, Hasselt University's high-tech field research centre located in Maasmechelen, on 6 October 2017. © VLIZ

BALANCE SHEET AND INCOME STATEMENT

DECEMBER 2017

BALANCE ON 31 DECEMBER 2017

ASSETS

(kEUR)	31-12-2016	31-12-2017
Intangible fixed assets	1.38	0
Tangible fixed assets	5 295.6	5 444.09
Financial fixed assets	4.15	0
Stocks	NVT	5
Amounts receivable within one year	1 290.74	1 061.16
Cash investments	260.78	0
Liquid assets	1 122.78	1 726.52
Deferred charges and accrued income	0	17.93
TOTAL	7 975.43	8 254.70

LIABILITIES

(kEUR)	31-12-2016	31-12-2017
Allocated funds	475	537
Profit and losses brought forward	1 370.28	1 620.44
Capital grants	4 693.77	4 800.30
Provisions for liabilities and charges	0	0
Amounts payable after one year	0	0
Amounts payable within one year	1 436.38	1 296.96
Deferred charges and accrued income	0	0
TOTAL	7 975.43	8 254.70

The figures of the balance sheet and income statement include all subsidies received by VLIZ as stated in the management agreement or the covenant.

No surplus of the allocated subsidy was brought forward as a reserve in 2017 (art. 12 § 3 of the covenant).

Budgetary deviations from the 2017 budget (art. 12 § 3 of the covenant): none.

INCOME STATEMENT ON 31 DECEMBER 2017**INCOME**

(kEUR)	31-12-2016	31-12-2017
Operating income	8 683.74	9 261.33
Financial income	832.97	804.45
Exceptional income	0.4	12.46
TOTAL	9 517.11	10 078.24

COSTS

(kEUR)	31-12-2016	31-12-2017
Stocks	N/A	6.29
Remuneration and social security	4 816.82	5 551.44
Services and other goods	1 738.99	1 829.94
Provisions for liabilities and charges	0	0
Depreciation	942.04	1 070.21
Financial expenses	18.93	10.89
Other operating expenses	1 502.59	1 295.24
Exceptional expenses	0.09	2.07
TOTAL	9 019.46	9 766.08

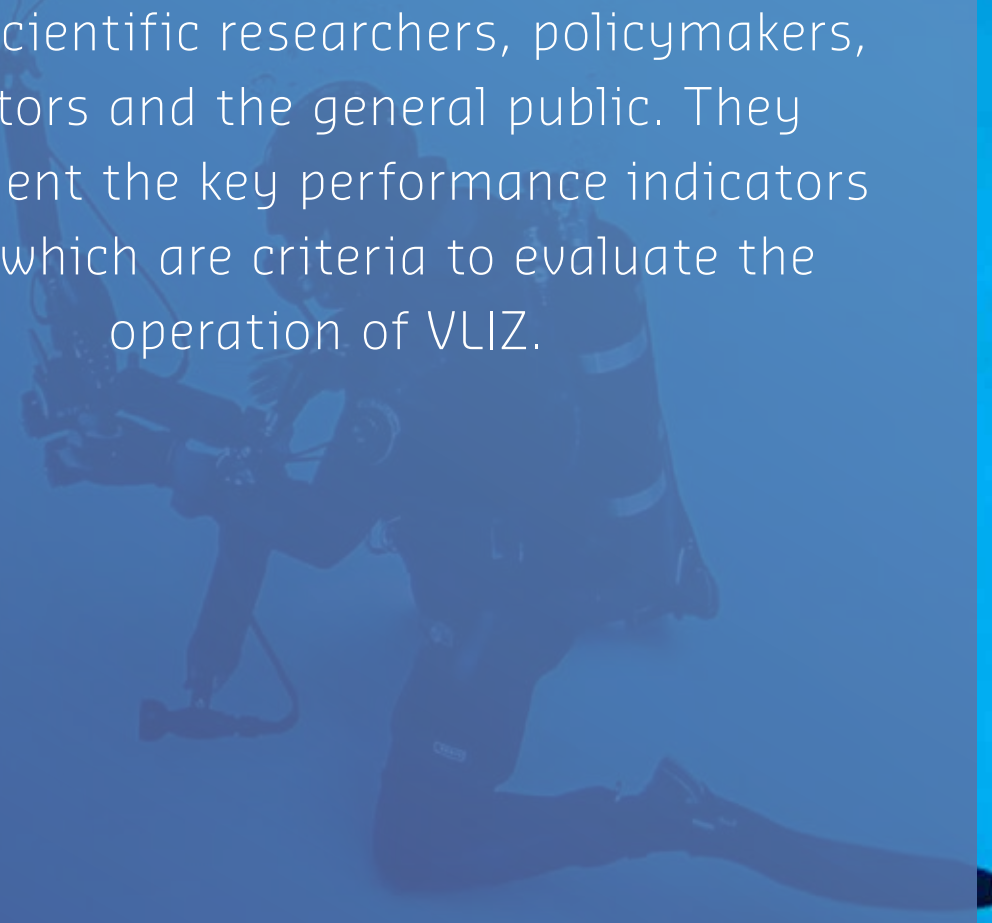
RESULT

(kEUR)	31-12-2016	31-12-2017
Result for the financial year	497.65	312.16
Transfer to allocated funds	100.00	62.00
Profit brought forward as of 31/12	1 370.28	1 620.44



MANAGEMENT INDICATORS

The management indicators refer to important services provided by VLIZ to marine scientific researchers, policymakers, educators and the general public. They complement the key performance indicators (KPIs), which are criteria to evaluate the operation of VLIZ.

A diver in a black wetsuit is seen underwater, holding a camera. The background is a deep blue ocean with some light filtering through. The diver is positioned in the lower half of the page, behind the text.

SOCIAL INDICATORS

2017

80

EMPLOYEES

Out of a total of 80 employees, 43 are permanent and 37 are temporary employees.

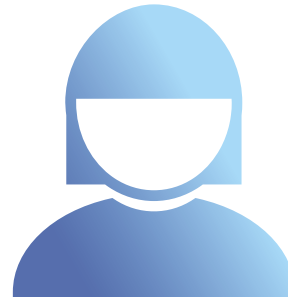
Two employees are of foreign origin ⁽¹⁾

Two employees with an employment disability.



MEN

43



WOMEN

37



PERMANENT

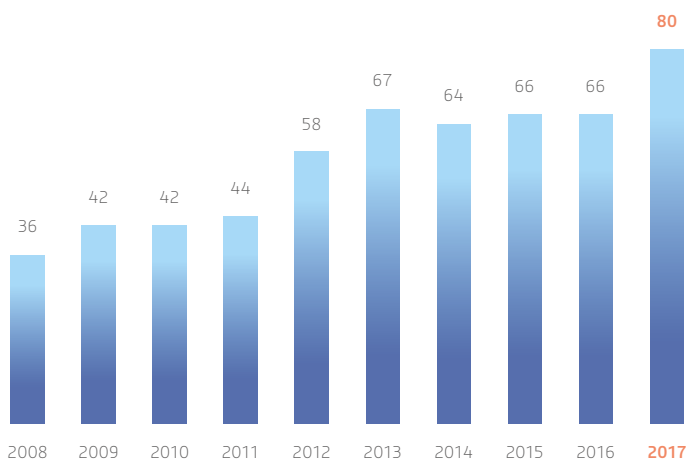
43



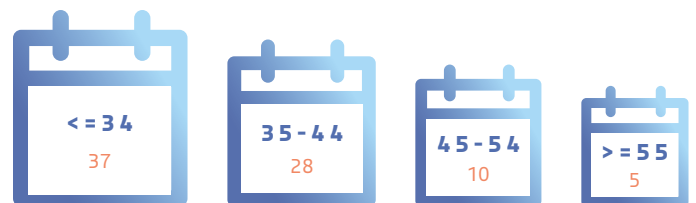
TEMPORARY

37

NUMBER OF EMPLOYEES



AGE OF THE EMPLOYEES



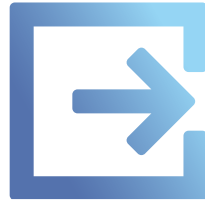
⁽¹⁾ Source: Wikipedia (Flemish perspective): any person living in the Flemish or Brussels Region, of whom at least one grandparent was born outside the European Union – excluding other Western and Northern European states, the USA and Canada).

STAFF TURNOVER



IN

23



OUT

9

22%

LEAVE ETC

The total number of days of absence as a result of maternity leave, parental leave, time credit, leave, sickness, etc. versus the total number of days to be performed. ⁽¹⁾



3%

SICKNESS ABSENCE

3% of the total number of days to be performed. ⁽²⁾



82

DAYS OF TRAINING ⁽³⁾

received by 39 employees.



63

PERFORMANCE INTERVIEWS ⁽⁴⁾

73

HIGHER-EDUCATED EMPLOYEES

and 7 persons who completed secondary education at most (ESF definition).



A
60

B
13

C
5

D
2

⁽¹⁾ decreased compared to 2016: 26%

⁽²⁾ this is an increase compared to 2016: 2.3%

⁽³⁾ in 2016: 124 days of training received by 33 employees

⁽⁴⁾ in 2016: 61

RESEARCH PROJECTS

2017

10 RESEARCH PROJECTS WITH EXTERNAL FUNDING INITIATED

PROJECT	TOTAL PROJECT BUDGET	VLIZ BUDGET	NUMBER OF PARTNERS ⁽¹⁾
Assemble+	€ 9 999 911.48	€ 276 776.84	22 (0)
OMES10	€ 2 756 860.93	€ 10 000.00	1 (1)
Persuade	€ 488 889.00	€ 78 785.00	2 (2)
EMBRC	€ 848 000.00	€ 222 600.00	2 (2)
TRIAS	€ 720 619.00	€ 19 987.00	11 (11)
EMODNET Biology	€ 1 770 000.00	€ 320 000.00	22 (1)
EMODNET Chemical	€ 2 805 000.00	€ 30 000.00	44 (2)
PCAD4COD	€ 300 045.00	€ 300 045.00	1 (1)
ICOS	€ 2 659 540.00	€ 2 659 540.00	1 (1)
Lifewatch	€ 3 643 220.00	€ 2 641 335.00	1 (1)

⁽¹⁾ number of Belgian/Flemish projects (figure between brackets)

6 RESEARCH PROJECTS WITH INTERNAL FUNDING INITIATED

Microplastics, Nearshore methane gas research, Southern Netherlandish Prize papers research, OBIS-Event-Data, Seaweed atlas, Scheur/Zeebrugge-project

NATIONAL AND INTERNATIONAL COOPERATION AGREEMENTS

2017



36

COOPERATION AGREEMENTS IN FORCE

In 2017, two national and three international cooperation agreements were concluded and 1 national cooperation agreement was amended.

A list of all agreements is available on www.vliz.be/en/cooperation-agreements

ENVIRONMENTAL INDICATORS

2017



88 246

NUMBER OF PRINTS AND COPIES

one print/copy corresponds to one page.



0.55

TONER CONSUMPTION

used for printers and photocopiers per staff member.

GAS, WATER & ELECTRICITY CONSUMPTION ⁽¹⁾



34 810
m³



206 415
kWh



569
m³

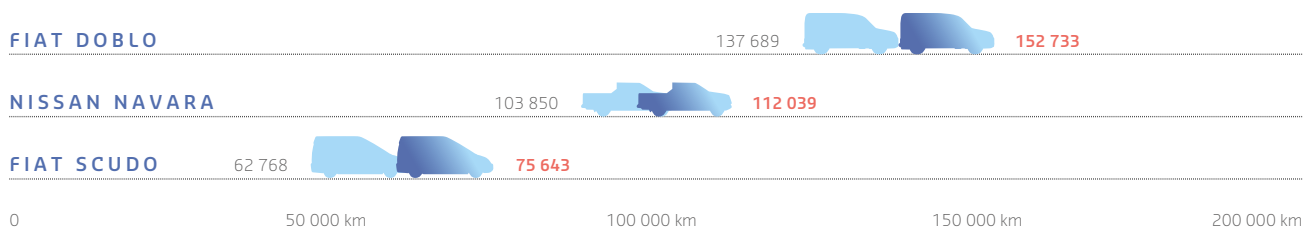
COMMUTING ⁽²⁾

€ 79 792

TRAIN, TRAM & BICYCLE ALLOWANCES

refunded to employees.

NUMBER OF KILOMETRES AND FUEL CONSUMPTION OF VLIZ CARS AT THE END OF 2017

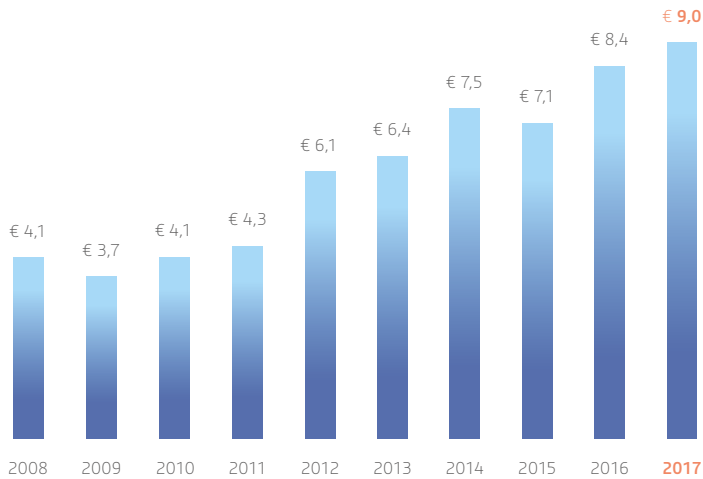


- Number of kilometres at the end of 2017
- Number of kilometres at the end of 2016
- Total fuel consumption: 3 689 litres

⁽¹⁾ in 2016 gas: 44 112 m³, electricity: 194 546 kWh, water: 651 m³
⁽²⁾ in 2016: € 57 341

VLIZ TURNOVER

IN MILLION EURO

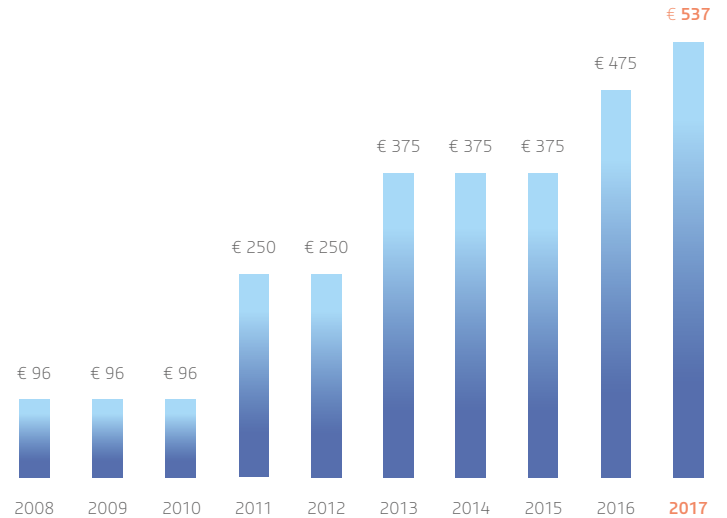


2017: € 9 004 157

Membership fees, donations, legacies and subsidies

SOCIAL LIABILITIES

IN THOUSAND EURO



2017: € 537 000

TURNOVER OF INNOVOCEAN SITE PARTNERS

IN EURO

€ 1 133 855

TOTAL TURNOVER



IOC PROJECT OFFICE FOR IODE

€ 653 516



EUROPEAN MARINE BOARD
SECRETARIAT

€ 191 200



EMODNET-SECRETARIAT

€ 187 140

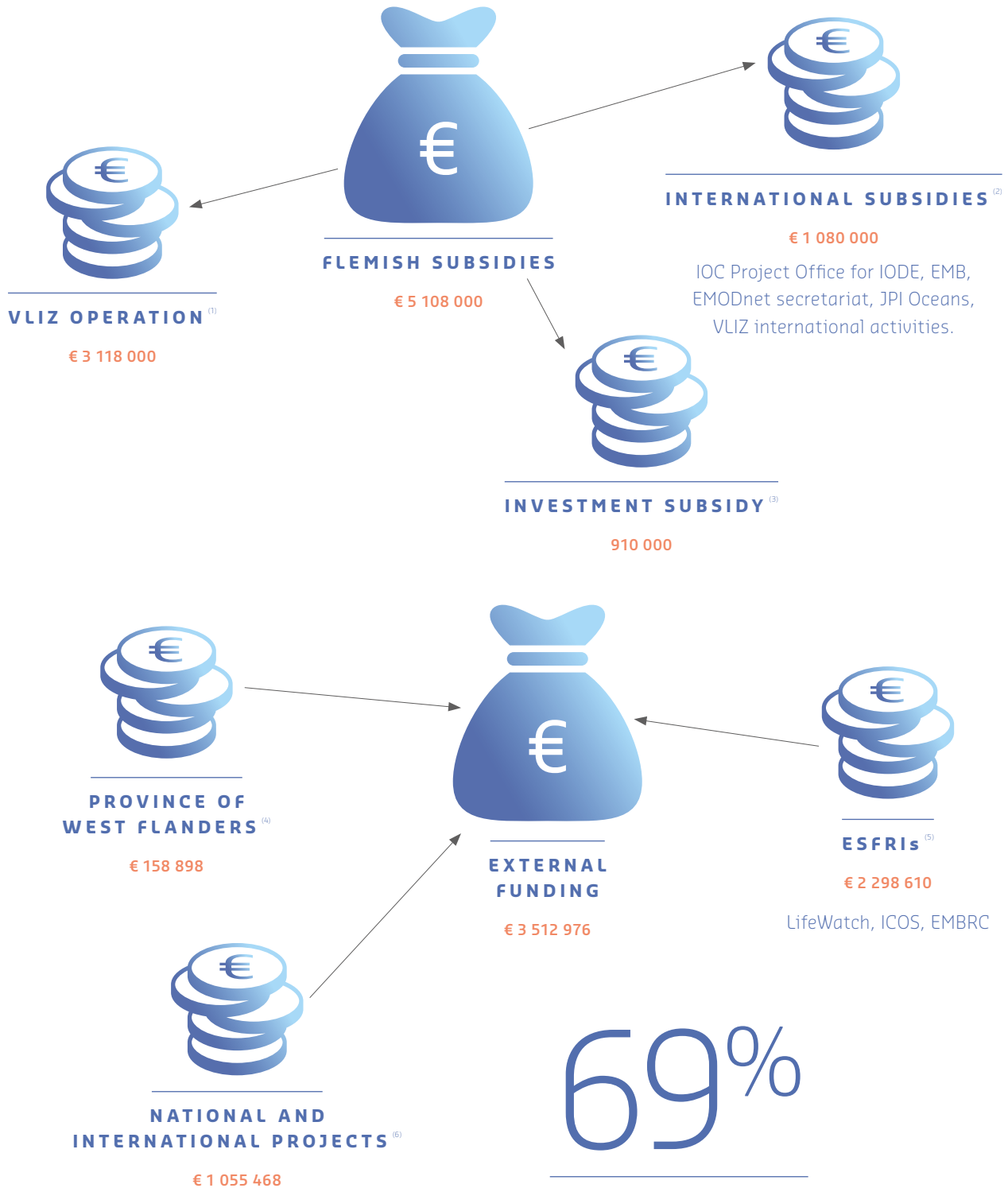


JPI OCEANS

€ 102 000

OVERVIEW OF SUBSIDIES

IN EURO



⁽¹⁾ in 2016: €1 938 000, in 2012: €1 697 000, in 2007: €1 160 000
⁽²⁾ in 2016: €1 080 000, in 2012: €900 000, in 2007: €700 000
⁽³⁾ in 2016: €1 090 000, in 2012: €1 122 000, in 2007: not applicable

⁽⁴⁾ in 2016: € 156 120; in 2012: € 146 548; in 2007: € 136 035
⁽⁵⁾ in 2016: € 1 877 000; in 2012: € 1 464 750; in 2007: not applicable
⁽⁶⁾ in 2016: € 1 780 957; in 2012: € 1 147 951; in 2007: € 825 443

EVENTS

2017

1408

OVERNIGHT STAYS

The number of overnight stays in Ostend by people visiting the InnovOcean site or attending events organised by the InnovOcean partners in Ostend.



71

INTERNATIONAL VISITS

The number of meetings and events with an international character that took place in Ostend, attended by 2 098 participants in total.



3877

NUMBER OF PARTICIPANTS IN ORGANISED EVENTS

The number of participants in events (co)organised by VLIZ.



152

MISSIONS

The number of missions to 23 countries.

517

VLIZ MEMBERS ⁽¹⁾

The total number of VLIZ members, including 310 individual members, 89 partner members, 28 institutional members, 26 students, 15 honorary members, 19 members of the Board of Directors, 6 members of the General Assembly and 24 members of the Scientific Committee. In 2017, VLIZ was joined by 94 new members and 9 members resigned their membership.



10

VLIZ AWARDS ⁽²⁾

The number of awards granted by VLIZ, including 1 for pupils, 2 for master students, 4 for PhD students, 2 for post-doctoral researchers and 1 for master students, PhD students and post-doctoral researchers.



REQUESTS FOR INFORMATION

2017

308

QUESTIONS ANSWERED ⁽³⁾

Total number of requests for information granted across all VLIZ divisions via info@vliz.be.

872

LITERATURE REQUESTS ⁽⁴⁾

Total number of literature requests (incl. requests for information) to the library via library@VLIZ.be.

25

QUESTIONS COMPENDIUM

Total number of requests for information with regard to the Compendium.

⁽¹⁾ Total number of members in 2016: 430 members; in 2015: 328 members; in 2014: 222 members
⁽²⁾ In 2016: 14 awards

⁽³⁾ in 2016: 315
⁽⁴⁾ in 2016: 963

SUBSCRIBERS

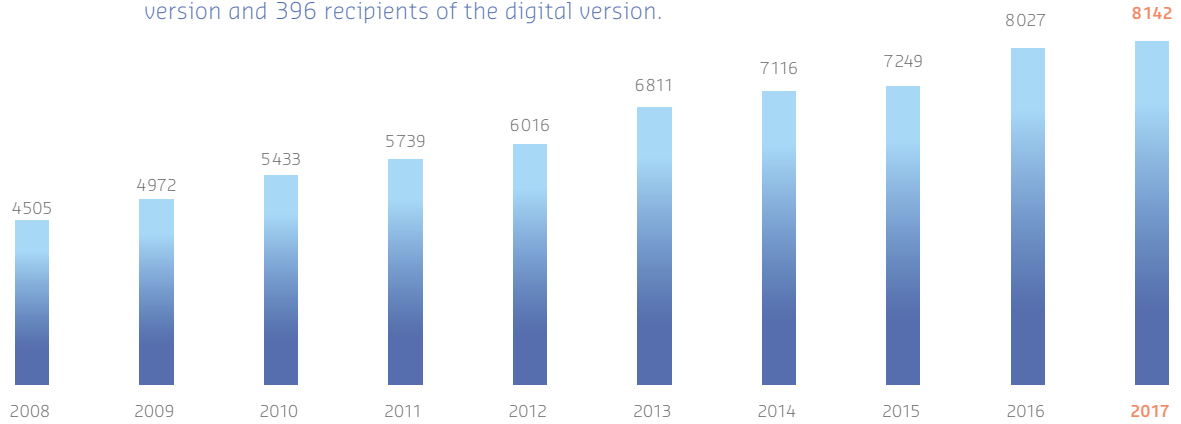
2017

8142



SUBSCRIBERS TO DE GROTE REDE

The number of subscribers to 'De Grote Rede' (since 1999), including 7 746 recipients of the paper version and 396 recipients of the digital version.

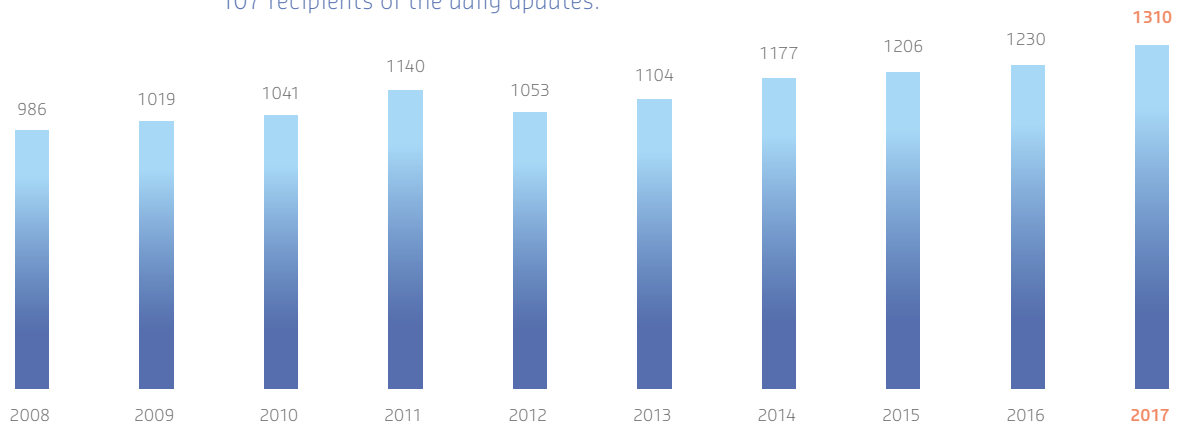


1310



SUBSCRIBERS TO VLIZINE

The number of subscribers to VLIZINE (since 1999), including 1310 recipients of the monthly updates, 294 recipients of the weekly updates and 107 recipients of the daily updates.



LECTURES

2017

1499

GENERAL PUBLIC REACHED BY INFORMATIVE LECTURES ⁽¹⁾

Members of the general public reached by means of 31 informative lectures on the VLIZ premises and elsewhere.



SOCIAL MEDIA REACH

2017



TWITTER (@jmeesvliz)	
FOLLOWERS	TWEETS
3 118	6 778



YOUTUBE	
FOLLOWERS	POSTS
92	362



FACEBOOK VLIZ (@VLIZnieuws)	
FOLLOWERS	POSTS
1 033	235

RV Simon Stevin (@rvsimonstevin)	
FOLLOWERS	POSTS
1 611	703



LINKEDIN Corporate page	
FOLLOWERS	POSTS
659	13

Discussion group	
FOLLOWERS	POSTS
218	43

⁽¹⁾In 2016: 3 668 members of the general public reached by means of 64 informative lectures.

GROWTH OF THE LIBRARY COLLECTION

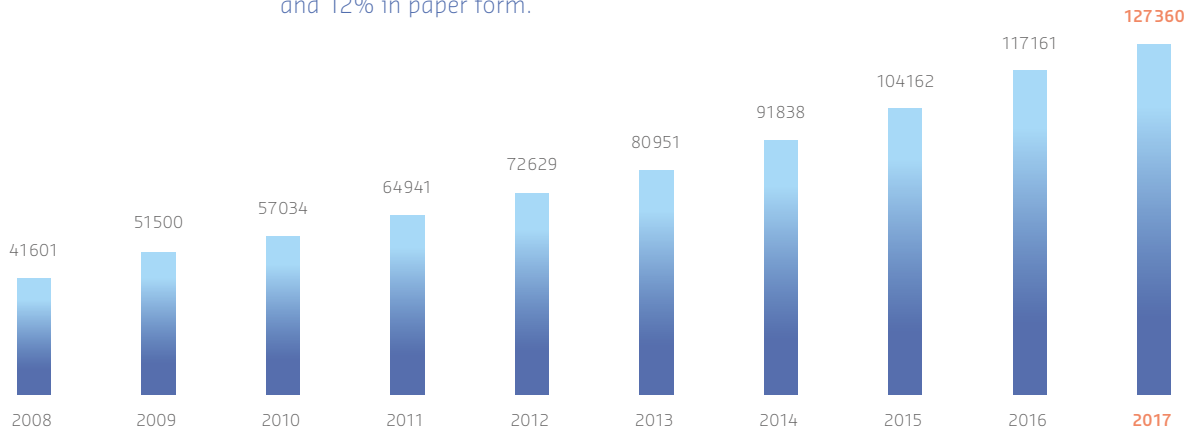
2017

127360



PUBLICATIONS

The total number of (paper and digital) publications in the library, i.e. the cumulative growth of the paper and digital collection. In 2017, the collection was expanded with 10 199 new publications, of which 88% in digital form and 12% in paper form.



VLIZ PUBLICATIONS

2017

96



PUBLICATIONS

with at least one author affiliated to VLIZ or published by VLIZ.

RESEARCHERS AND RESEARCH GROUPS IN A1 PUBLICATIONS

2017



Distribution of the 34 international researchers across all A1 publications authored by a VLIZ employee from 2017 (KPI1 p. 42) per country.

- >6
- 4-5
- 2-3
- 1

70

RESEARCHERS IN A1 PUBLICATIONS

The number of researchers in all A1 publications authored by a VLIZ employee (KPI1 p.42), including 36 Belgian and 34 international researchers (see world map).

45

RESEARCH GROUPS IN A1 PUBLICATIONS

The number of research groups in A1 publications authored by a VLIZ employee, including 15 Belgian and 30 international research groups.

CITATIONS

2017

542



CITATIONS

The number of citations of A1 publications authored by a VLIZ employee.

PUBLICATIONS ON VLIZ RESEARCH FACILITIES

SINCE 2001

480

PUBLICATIONS ON VLIZ RESEARCH FACILITIES⁽¹⁾

A total of 31 new publications on VLIZ research facilities appeared in 2017, including 27 on RV Simon Stevin, 3 on RV Zeeleeuw and 1 on the VLIZ equipment.



RV SIMON STEVIN

27



RV ZEE-LEEUEW

3



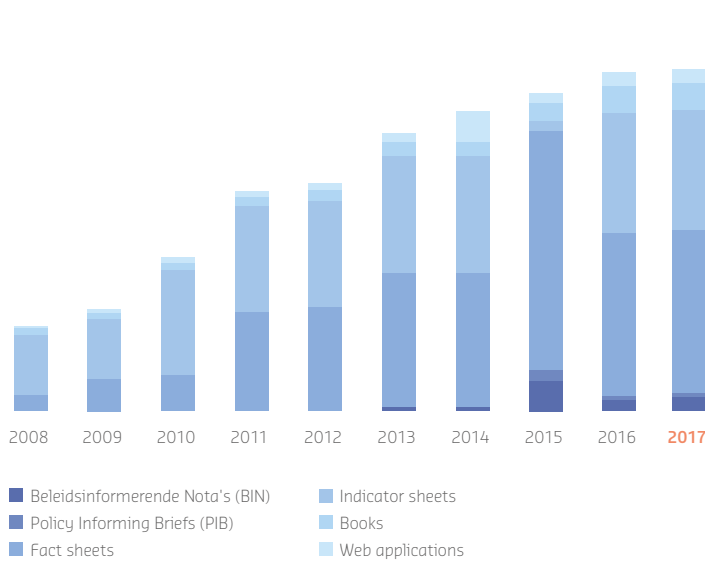
VLIZ EQUIPMENT

1

⁽¹⁾ The number of publications on VLIZ research facilities that have appeared since 2001 includes 292 publications on RV Zeeleeuw, 133 publications on RV Simon Stevin, 31 publications on the greenhouses at De Haan, 14 publications on ROV Genesis, 8 publications on VLIZ equipment and 2 publications on the Marine Station Ostend.

INFORMATION PRODUCTS

SINCE 1999



415

INFORMATION PRODUCTS

The number of information products since 1999.

In 2017, there were 5 new information products, including 4 'Beleidsinformerende nota's (BIN)' and 1 web application.

NEW COMPENDIUM FOR COAST AND SEA INFORMATION PRODUCTS

2017



18

COMPENDIUM FOR COAST AND SEA ⁽¹⁾

The number of new Compendium for Coast and Sea information products created in 2017; these are all updated sheets of marine research groups.



⁽¹⁾ In 2016: 44 information products, including 20 (updated) fact sheets of marine research groups and 24 (updated) fact sheets on laws and treaties.

VISITORS TO THE VLIZ WEBSITES

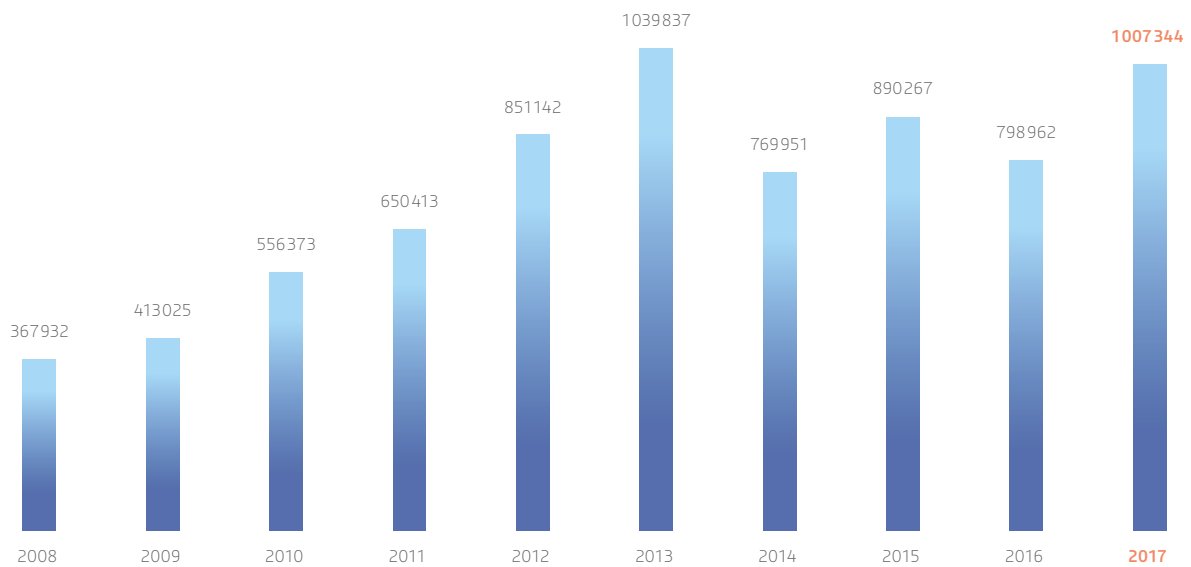
2017

1007344



UNIQUE VISITORS

The number of unique visitors to the informative websites managed by VLIZ (url: www.vliz.be).



DOWNLOADS

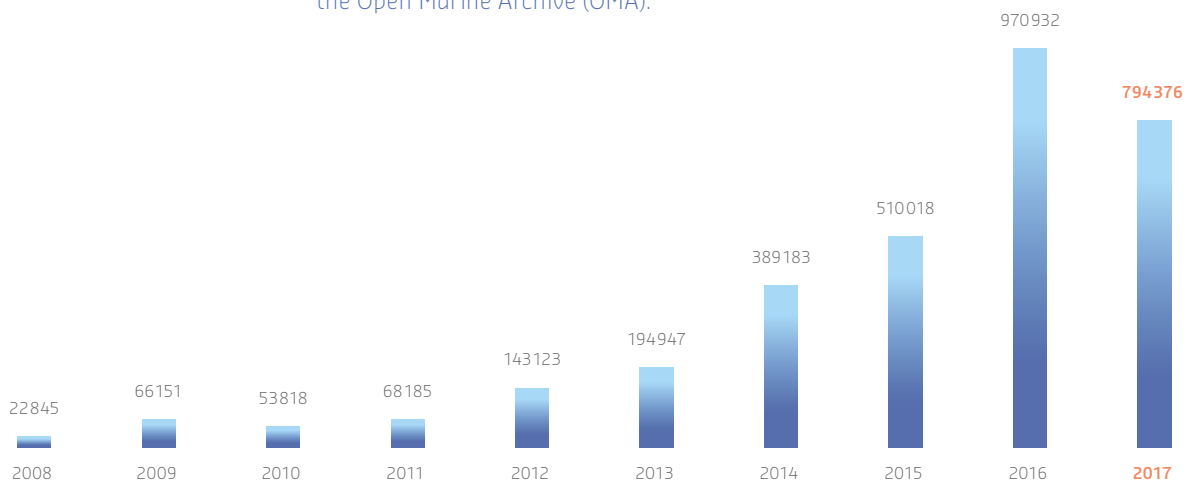
2017

794376



DOWNLOADS OPEN MARINE ARCHIVE

Total number of downloads from the Open Marine Archive (OMA).



23140

UNIQUE TITLES DOWNLOADED ⁽¹⁾

Unique titles downloaded from the Open Marine Archive.

22283

UNIQUE OPEN ACCESS TITLES ⁽²⁾

Number of unique Open Access titles downloaded from the library collection.

754553

OPEN ACCESS TITLES ⁽³⁾

Total number of Open Access titles downloaded from the library collection.



⁽¹⁾ in 2016: 22 777; ⁽²⁾ in 2016: 18 027; ⁽³⁾ in 2016: 807 134

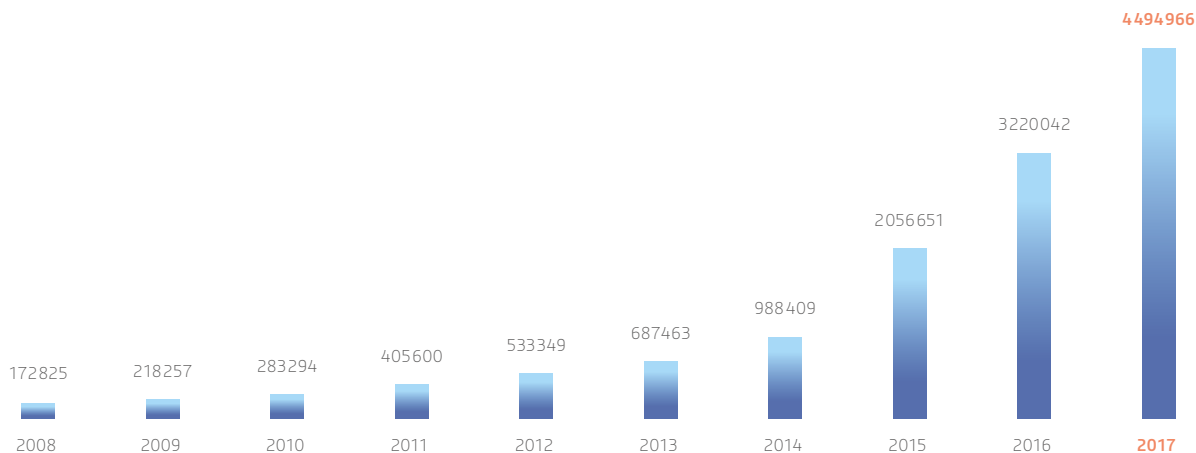
DATA DOWNLOADS

2017

4 494 966

NUMBER OF DATA DOWNLOADS SINCE 2006

In 2017, the number of data downloads was 1 274 924.



Cumulative figures

DATA DOWNLOADS

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Flemish Banks Monitoring Network	42 628	30 246	30 780	21 508	18 858	12 820	1 623	262	230	220
Sluice Dock	8 185	12 495	13 873	10 387	9 381	12 550	4 240	4 414	3 979	5 336
IOC Sealevel monitoring facility	N/A	107	16 954	85 538	92 516	119 348	284 518	1 052 948	1 145 428	1 248 812
Marine Regions	1 170	2 584	3 430	4 339	6 291	7 944	9 087	9 628	12 743	16 633
WoRMS	N/A	N/A	N/A	75	121	183	224	53	118	10
EMODnet	N/A	N/A	N/A	210	373	700	780	797	776	3 898
ScheldeMonitor	N/A	N/A	N/A	249	209	569	474	140	117	15
TOTAL	51 983	45 432	65 037	122 306	127 749	154 114	300 946	1 068 242	1 163 391	1 274 924

DOWNLOADS OF INFORMATIVE PRODUCTS

2017



TEACHING PACKAGES

7 603

downloads since 01.11.2011⁽¹⁾



DE GROTE REDE

58 985

downloads in 2017⁽²⁾



ZEEKRANT

1 347

downloads in 2017⁽³⁾



VIDEOS

386 484

downloads since 2005



PHOTOGRAPHS

23 648 966

downloads since 2005



COMPENDIUM PRODUCTS

1 516

downloads in 2017⁽⁴⁾

⁽¹⁾ in 2016: 6 654, 2012: 811, 2007: N/A; ⁽²⁾ in 2016: 74 494, 2012: 33 501, 2007: 13 829
⁽³⁾ in 2016: 1712, 2012: 2131, 2007: N/A; ⁽⁴⁾ (in 2016: 1 022, 2015: 373)

REGISTERED USERS OF VLIZ DATABASES

2017



3217

REGISTERED USERS

The number of registered users of databases managed by VLIZ.

SUPPLIED DATA

2017



260

DATA REQUESTS⁽¹⁾

The number of data requests (via data@vliz.be).

SCIENTIFIC PROJECTS

SINCE 1999

168

SCIENTIFIC PROJECTS

which have made use of RV Simon Stevin / RV Zeeleeuw since 1999.

See p. 52 for a list of the research projects which made use of RV Simon Stevin in 2017.



⁽¹⁾ in 2016: 237

MASTER THESES, PHDS AND INTERNSHIPS

2017



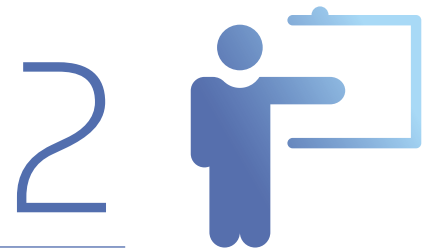
MASTER THESES, PHDS AND WORK PLACEMENTS

The number of master theses (1), PhDs (1) and internships (20) of which VLIZ is the (co-)supervisor.

See p. 56 for an overview of the master theses and internships in 2017.

KNOWLEDGE TRANSFER

2017



WORKSHOPS AND GUEST LECTURES

The number of workshops and guest lectures (knowledge transfer events) organised by VLIZ.

ABSTRACTS AND LECTURES BY INVITATION

2017

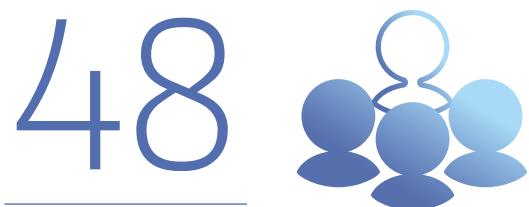


ABSTRACTS AND LECTURES BY INVITATION

The number of abstracts and lectures by invitation on research.

CONTRIBUTIONS TO WORKSHOPS

2017



WORKSHOPS

The number of contributions to workshops by 18 different VLIZ employees.

NUMBER OF DAYS SPENT AT SEA

2017

234

SAILING DAYS



NUMBER OF DAYS SPENT AT SEA

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RV Simon Stevin	N/A	N/A	N/A	N/A	100	147	183	176	184	168
RV Zeeleeuw	162	166	151	152	57	N/A	N/A	N/A	N/A	NVT
RIB Zeekat	39	32	57	40	37	5	17	21	18	12
ROV Genesis	N/A	N/A	N/A	N/A	6	26	20	4	3	11
Third-party vessels	37	36	84	73	110	42	48	50	36	43
TOTAL	238	234	292	265	310	220	268	251	241	234

SAILING DAYS WITH INTERNATIONAL PARTICIPATION

2017

11

SAILING DAYS ⁽¹⁾



The number of days spent at sea in foreign waters and/or with the participation of international research groups.

⁽¹⁾ in 2016: 14

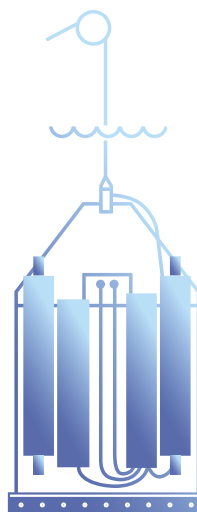
BORROWING OF VLIZ EQUIPMENT

2017

28

BORROWS

The number of times that VLIZ equipment was borrowed.



OTHER ANNEXES

An overview of the national and international networks in which VLIZ participates, projects for which VLIZ receives external funding, the scientific equipment and infrastructure made available by VLIZ, the events (co-)organised by VLIZ and the publications published by VLIZ.





Wind turbines in the Belgian part of the North Sea ©VLIZ

NETWORKS

2017

A FEW EXAMPLES OF NATIONAL NETWORKS IN WHICH VLIZ PARTICIPATES:

NATIONAL NETWORKS AND ADVISORY AND CONSULTATIVE COMMITTEES

- Advisory Committee of VNR Knokke-Heist & Westkust (ANB)
- Covenant for Sustainable Fisheries – WG Coast – SWG Education and Training
- Coastal Ecosystem Vision
- Flanders' Maritime Cluster vzw
- IkHebEenVraag.be consortium (RBINS)
- KVAB science communication awards
- Marine Strategy Framework Directive programme of measures of the Marine Environment Division
- Marine Spatial Plan long-term vision 2050
- Marine Biotechnology Platform Flanders
- NAVIGO scientific advisory group
- Consultation on sustainable coastal management by the province of West Flanders
- 'Surveillance, early warning and rapid response – Invasive Alien Species' steering committee
- Flanders Bays steering committee
- Flemish Platform for Algae Research
- Flemish Aquaculture Platform
- Flemish Association for Libraries, Archives and Documentation Centres (VVBAD)
- Coastal Barometer Working Group
- Science Information Network (WIN) of the Flemish government

A FEW EXAMPLES OF INTERNATIONAL NETWORKS IN WHICH VLIZ PARTICIPATES:

INTERNATIONAL NETWORKS AND ADVISORY AND CONSULTATIVE COMMITTEES

- Catalogue of Life Global Team, Editorial Board, Board of Directors
- Coastal Wiki Editorial Board
- Editorial board of Global Ocean Science Report of IOC-UNESCO (GOSR)
- European Association of Aquatic Sciences Libraries and Information Centres (EURASLIC)
- European Census of Marine Life (EuroCoML)
- European Centre for Information on Marine Science and Technology (EurOcean)
- European Marine Biodiversity Observatory System (EMBOS)
- European Marine Biological Resource Centre (EMBRC) national steering committee
- European Marine Board (representative of Research Foundation – Flanders and chairmanship)
- European Marine Board Communication Panel (EMBCP)
- European Marine Science Educators Association (EMSEA)
- European Network of Marine Research Institutes and Stations (MARS)
- European Research Vessel Organisation (ERVO)
- European network of Marine Biodiversity and Ecosystem Functioning (MARBEF+)
- Global Sea Level Observing System Network (GLOSS)
- IAMS LIC/IODE Group of Experts on Marine Information Management
- ICES Data and Information Group (ICES – DIG)
- ICES Working Group on Biodiversity Science (ICES – WGBIODIV)
- ICES Working Group on Recreational Fisheries Surveys (ICES – WGRFS)
- ICES Working Group on the History of Fish and Fisheries (ICES – WGHIST)

- ICES Expert Group: Working Group on Marine Litter (ICES – WGML)
- Integrated Carbon Observation System Marine Station Assembly (ICOS)
- Integrated Carbon Observation System Oceanographic Thematic Centre meeting (ICOS)
- International Coastal Atlas Network (ICAN)
- International Research Ship Operators (IRSO)
- IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices
- IODE Network of Oceanographic Data Centres (UNESCO/IOC) (IODE NODC)
- Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans)
- JPI Oceans reference expert group on marine spatial planning
- LifeWatch National Centers network (LiNC)
- National Marine Educators Association (NMEA)
- News & Information Group of the Partnership for Observation of the Global Oceans
- Ocean Biogeographic Information System (OBIS)
- Ocean Tracking Network
- Oceans Past Initiative (OPI)
- Partnership for Observation of the Global Oceans (POGO)
- Sea Data Network (SeaDataCloud)
- Seaweb Europe – Jury of Concours Olivier Roellinger
- Species 2000
- Steering Committee within the European Marine Observation and Data Network (EMODnet)
- Steering Committee of the World Register of Marine Species (WoRMS)
- Steering committee of the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science (FUST)
- Executive committee of the European Register of Marine Species (ERMS)
- Executive Council and General Assembly of the Intergovernmental Oceanographic Commission (IOC) of UNESCO
- Flemish-Dutch Scheldt Commission – Environmental impact assessment (VNSC)
- Working Group on Invasive Alien Species (WGIAS)
- World Data System of the International Council for Science (ICSU-WDS)

PROJECTS – EXTERNAL FINANCING

VLIZ RECEIVED EXTERNAL FINANCING FOR COORDINATION, COMMUNICATION AND/OR DATA MANAGEMENT WITHIN THE SCOPE OF 33 PROJECTS IN 2017. MOST OF THESE PROJECTS WERE CARRIED OUT IN COOPERATION WITH RESEARCH GROUPS.

EU

ALFF – *The Algal Microbiome: Friends and Foes*

Duration: 01.01.2015 – 31.01.2019

sams.ac.uk/Algal-doctorate-EU-Marie-Curie/algal-microbiome-friends-or-foes-alf

ALFF is a research project which involves both fundamental and applied scientific investigations into algae and microalgae. Various doctoral research projects are funded through this project. VLIZ plays a modest role in communicating the results and collaborates with the Multimedia Technology programme of Karel De Grote University College in Antwerp in this context.

ASSEMBLE Plus – *Association of European Marine Biological Laboratories Expanded*

Duration: September 2017 – September 2021

www.assembleplus.eu/

ASSEMBLE Plus operates under the umbrella of the European Marine Biological Resource Centre (EMBRC) and integrates 32 marine biological research stations worldwide. It provides scientists from academia, industry and policy with a high-quality programme of transnational and virtual access to marine biological research facilities, historical observation data and advanced training opportunities. VLIZ provides transnational access to the infrastructure offered within EMBRC and manages a work package concerning the improvement of virtual access to marine biological data, information and knowledge. UGent acts as a subcontractor of VLIZ for specific activities.

AtlantOS – *Optimizing and Enhancing the Integrated Atlantic Ocean Observing System*

Duration: 01.04.2015 – 31.07.2019

www.atlantos-h2020.eu

The overall objective of AtlantOS is to evolve from a not well-coordinated series of existing ocean observations to a sustainable, efficient and fit-for-purpose Integrated Atlantic Ocean Observing System (IAOOS). The AtlantOS consortium consists of 62 partners from 18 countries. VLIZ takes part in work package 7: data flow and data integration.

COLUMBUS – *Monitoring, Managing and Transferring Marine and Maritime Knowledge for Sustainable Blue Growth*

Duration: 01.03.2015 – 31.03.2018

www.columbusproject.eu

The COLUMBUS project develops a strategy for monitoring, identifying and selecting successful marine and maritime research projects in terms of their output and impact on the Blue Growth agenda as well as those supporting the European Marine Strategy Framework Directive. VLIZ is one of the organisations responsible for collecting, analysing and disseminating information relating to different topics (marine management and government, monitoring and observation). VLIZ will also conduct a pilot study investigating nationally funded marine projects in Belgium.

COST- OPP – Oceans Past Platform

Duration: 01.01.2015 – 31.12.2018

www.tcd.ie/history/opp

The project investigates when, how and with what socio-economic, political, cultural and ecological implications humans have impacted marine life in the European seas since the last ice age. OPP makes use of historians, archaeologists and other social scientists as well as colleagues from marine sciences. OPP builds on various studies carried out within the scope of the History of Marine Animal Populations project, which demonstrated we are able to quantify the history of marine extractions through interdisciplinary collaboration. OPP explores the human, social and cultural consequences of changing dietary habits and extractive techniques (coastal fisheries, deep water, aquaculture) and promotes dialogue between studies of the distant past and recent developments. The network enters into a dialogue with marine managers and policymakers about the relevance of historical findings for the regeneration and development of coastal communities.

CSA Oceans 2 – JPI Oceans Preparatory Action

Duration of phase 1: 01.09.2012 - 31.08.2015

Duration of phase 2: 01.03.2016 - 28.02.2019

www.jpi-oceans.eu/csa-oceans-2

CSA Oceans 2 is aimed at facilitating and supporting the implementation of JPI Oceans' Strategic Research and Innovation Agenda (SRIA). CSA Oceans 2 will continue to build on the outcomes of the FP7 CSA Oceans project and will be linked closely to the JPI Oceans structures. Its principal activities are: 1) deal with the implementation of joint transnational activities; 2) maintain and further develop the relationships between JPI Oceans with different relevant actors; 3) support the implementation of the SRIA; and 4) deliver the necessary tools for information management as well as outreach and dissemination (VLIZ). The CSA Oceans 2 project will be implemented by a consortium of funding, coordinating and research organisations.

EGI-Engage – Engaging the Research Community towards an Open Science Commons

Duration: 01.03.2015 – 31.01.2018

www.egi.eu

This project aims to accelerate the implementation of the Open Science Commons, and investigates the expansion of a European backbone of federated services for the processing and storage of data, communication, knowledge and expertise. In addition, it investigates the expansion possibilities within specific research communities. The aim of LifeWatch EGI CC is to capture and address the requirements of biodiversity and ecosystem research communities. To achieve this, the CC will (1) deploy cloud and GPGPU based e-Infrastructure services required to support data management, data processing and modelling for Ecological Observatories, (2) explore possibilities to increase the participation of citizens in data-intensive biodiversity research, and (3) facilitate the adoption and exploitation of the EGI infrastructure by the LifeWatch user community. Together with the Spanish CSIC, VLIZ will ensure the formulation of the requirements as to grid-based e-infrastructure services in support of data management, data processing and modelling.

EMODnet – European Marine Observation and Data Network

Duration: continually since 2014

www.emodnet.eu

The European Marine Observation and Data Network (EMODnet) develops a data infrastructure to make marine data available so as to support scientists, policy makers and other end users within the scope of the new European maritime policy. VLIZ is responsible for the biological pilot project (www.emodnet-biology.eu). It will use the existing European atlas with distribution data of marine species (EurOBIS) as a basis and complete it. VLIZ is also involved in the chemical project of EMODnet. In addition, VLIZ is expanding the EMODnet Central Portal (www.emodnet.eu) which should provide access to the data products and data collected within the EMODnet thematic networks. The EMODnet Secretariat is located at the InnovOcean site in Ostend.

EUROFLEETS – Towards an Alliance of European Research Fleets

Duration of phase 1: 01.09.2009 - 31.08.2014

Duration of phase 2: 01.03.2014 - 28.02.2017

www.eurofleets.eu

A network of 24 European research institutes that want to deploy their vessels and research infrastructure more efficiently and develop a central system in order to gain access to other European research vessels (www.eurofleets.eu). VLIZ coordinates a recommendation for an ecological regional research fleet and contributes to the development of a strategic view of the European research fleet. Broadly speaking, EuroFleets II continues the tasks of EuroFleets I but has a different focus. Within the second project, VLIZ continues to contribute to the strategic vision and to a generic design of regional research vessels. In addition, it needs to contribute to the organisation of training courses for young researchers and 'floating universities'. The main contribution of VLIZ consists in making RV Simon Stevin available to foreign researchers for a project in the Southern Bight of the North Sea.

JERICO NEXT

Duration: 01.09.2015 - 30.09.2019

www.jerico-fp7.eu

JERICO-NEXT is the continuation of the JERICO project. One of the project's objectives is to establish a pan-European network of marine observatories. In this context, alignment takes place with ongoing initiatives such as the pan-European Infrastructure for Ocean and Marine Data Management (SeaDataNet) and the European Global Ocean Observing System (EuroGOOS). Within the scope of JERICO-NEXT, VLIZ will take part in Work Package 5, in which data management standards will be set, the quality and quantity of biological, chemical and physical data within the infrastructure will be increased, and the project's impact on ongoing initiatives such as Copernicus, EMODnet and OBIS will be examined.

Marine Biotechnology ERA-NET – ERA-MBT

Duration: 30.01.2015 - 29.01.2018

www.marinebiotech.eu

The social and economic importance of marine biotechnology is steadily increasing. However, the current marine biotechnological landscape in Europe is highly fragmented and lacks coordination. The CSA MarineBiotech project has been successful in creating a network of funding institutions and programme managers interested in joint support of marine biotechnological research. The 20 partners from 13 countries have formed the Marine Biotechnology ERA-NET (ERA-MBT). ERA-MBT is aimed at paving the way for common programmes and collaborations so as to move beyond the current fragmentation and avoid duplication. This includes the provision and use of shared research infrastructure. VLIZ coordinates the communication tasks within ERA-NET.

ODIP – Extending the Ocean Data Interoperability Platform

Duration: 01.04.2016 - 30.04.2018

www.odip.eu

The ODIP project strives for a European, American and Australian IOC-IODE coordination platform. Its objective is to establish the interoperability of oceanographic and marine data management infrastructures and to demonstrate this coordination by means of different joint EU – USA – Australia – IOC/IODE prototypes. These need to ensure the continuous availability and effective exchange of data across scientific domains, organisations and national borders. VLIZ will provide input for workshops and the resulting tasks with regard to marine biological data management and the standardisation of marine place names.

Sea Change

Duration: 01.03.2015 - 31.03.2018

www.seachangeproject.eu

On the basis of the compilation of knowledge and best practices, this Ocean Literacy project will translate the topic of Ocean & Human Health for the widest possible public. This takes place at a European level and in cooperation with transatlantic partners. VLIZ is involved in all work packages and is leader of the work package 'Engage with the public'.

SeaDataCloud – *Further developing the pan-European infrastructure for marine and ocean data management*

Duration: 01.11.2015 - 31.10.2020

SeaDataCloud is a continuation of SeaDataNet where professional data centres from 35 countries collaborate to make the data sets collected by the pan-European oceanographic research fleet and the new automated observation systems available within one efficiently distributed data system.

FLEMISH GOVERNMENT, FLEMISH EGOVERNMENT COORDINATION UNIT (CORVE) AND EWI**WILOD** – *Wetenschap & Innovatie Linked Open Data*

Duration: continually since 2012

The Wetenschap en Innovatie Linked Open Data (WILOD) project is aimed at developing an Open Data platform which brings together and discloses a variety and multiplicity of research information. This project is aimed at the promotion of multidisciplinary research, the maximum disclosure of research data, the development of innovative products and services, and increasing the strategic intelligence within the policy area of Science and Innovation.

FLEMISH GOVERNMENT, WATERWEGEN EN ZEEKANAAL (W&Z)**OMES** – *Research on the environmental effects of the SIGMA plan*

Phase VI: 01.02.2012-30.04.2014

Phase VII: 01.02.2014-30.04.2015

Phase VIII: 01.02.2015-30.04.2015

Phase IX: 01.02.2015-30.04.2016

Phase X: 01.02.2016-30.04.2017

VLIZ is responsible for the integrated OMES database and ensures its dissemination through the OMES website (www.vliz.be/projects/omes).

FLEMISH GOVERNMENT, MARITIME ACCESS DIVISION**ScheldeMonitor** – *Flemish-Dutch knowledge platform for research and monitoring of the Scheldt estuary*

Duration of current phase: 01.01.2015 - 31.12.2018; started in 2010

www.scheldemonitor.org

The ScheldeMonitor website underwent a total makeover in 2015. The website offers information and, since 2010, data in support of the cross-border monitoring and research in the Scheldt estuary.

FEDERAL GOVERNMENT, BELSPO**4DEMON** – *Four decades of Belgian marine monitoring: uplifting historical data to today's needs*

Duration: October 2014 – December 2017

www.4demon.be

Historical data are essential for understanding long-term changes in the quality of the marine environment. The 4DEMON project aims to centralise, integrate and valorise data collected during expeditions in the Belgian part of the North Sea over the last four decades. 4DEMON focuses on contaminants and data for determining the level of eutrophication and acidification.

HyperMaq – *Hyperspectral and multi-mission high resolution optical remote sensing of aquatic environments*

Duration: December 2016 – November 2018

www.4demon.be

In the HYPERMAQ project, hyperspectral satellite images will be calibrated. In partnership with the Directorate Natural Environment (OD Nature), VLIZ will conduct field measurements during regular and project campaigns. In addition, VLIZ ensures the development of a rotating platform to remotely position spectroradiometer systems for the calibration of light measurements during satellite passages.

NewSTHEPS – *New Strategies for monitoring and risk assessment of Hazardous chemicals in the marine environment with passive samplers*

Duration: 01.12.2014 – 31.03.2019

www.belspo.be/belspo/brain-be/projects/NEWTHEPS_en.pdf

In this project, novel and integrated passive sampling techniques will be developed in marine waters. The focus is on the quantification of micropollutants and metals. VLIZ is a subcontractor for the creation of a website and the data management activities relating to the further development of the INRAM and ENDIS-RISKS database.

PERSUADE – *ExPERimental approaches towards Future Sustainable Use of North Sea Artificial HarD SubstratEs*

Duration: January 2017 – April 2020

The project is aimed at the construction of an in-situ underwater hard-substrate garden where organisms will be collected for mesocosm experiments. The marine food chain near offshore artificial hard substrates will be imitated in the seawater tanks of the Marine Station Ostend (MSO). VLIZ supports the development of the underwater garden and provides technical assistance for the setup of the experiments.

Proba4Coast – *Proba-V for total suspended matter and turbidity retrieval in coastal areas*

Duration: 01.12.2015 -31.12.2017

VLIZ is a subcontractor in this project in which VITO and the Hydraulics Laboratory of KU Leuven collaborate to make the Proba-V imagery (used for global vegetation mapping) also usable for turbidity and suspended matter measurements in coastal waters. VLIZ is responsible for the necessary samplings during satellite overpasses.

TrIAS – *Tracking Invasive Alien Species: Building a data-driven framework to inform policy*

Duration: January 2017 – December 2020

https://www.belspo.be/belspo/brain-be/projects/TrIAS_en.pdf

TrIAS is primarily aimed at the establishment of a data mobilisation framework for alien species on the basis of different data sources. The combination of these data with a Belgian checklist of alien species will feed indicators for the identification of emerging species, their level of invasion in Belgium, changes in their invasion status and the identification of areas and species of concern that could be negatively impacted. The second objective is to develop data-driven procedures for risk evaluation based on risk modelling, risk mapping and risk assessment.

FEDERAL GOVERNMENT, MARINE ENVIRONMENT DIVISION*Proposal for Fisheries Measures in Belgian waters*

Duration: 1 May 2016 to 1 May 2017

In this project, the necessary preparations are carried out to negotiate the fisheries measures required to achieve 'good environmental status' in the Belgian marine waters. In an extensive background document, all information is provided to substantiate the Belgian proposal for fisheries measures required to comply with the obligations of the Marine Strategy Framework Directive (2008/56/EC). This document is discussed and endorsed by the member states with direct fishing activities in Belgian marine waters. As part of the final objective of the negotiations, Belgium presents a Joint Recommendation for launching the formal procedure with the EC.

PROVINCE**HisGisKust** – *Historical maps of the coastal zone*

Duration: continually since 01.07.2015

A selection has been made of approximately 70 maps from the 16th, 17th and 18th centuries, the golden age of cartography in Flanders and the Low Countries, including detailed information on the coastal zone, the Belgian part of the North Sea, the Zwin area and/or the Scheldt estuary. These maps have been scanned and georeferenced (including error analysis). They can be accessed free of charge via the website www.vliz.be/hisgiskust together with information about the maps and their geometrical accuracy. A chronological sequence of several maps of the same region makes it possible to create time-lapse movies about the evolution of the coastal zone. These products are also at the user's disposal on the website. In 2016, cooperation agreements were concluded with the Research Institute for Nature and Forest (INBO), Sinfala (Zwin Museum) as well as the Royal Museum of the Armed Forces and Military History, and a 2nd selection round took place at Cultuurbibliotheek in Bruges (cooperation agreement signed in 2015). All these institutions have cartographical materials and aerial photographs relating to the coastal area which were made accessible on the HisGISKust website in 2017.

FWO (FORMER HERCULES FOUNDATION)**LifeWatch** – *Flemish contribution to LifeWatch.eu*

Duration: continually since 2012

www.lifewatch.be

The Flemish contributions to the LifeWatch infrastructure are coordinated by the Research Institute for Nature and Forest (INBO) and, as far as the marine component is concerned, by the Flanders Marine Institute (VLIZ). Flanders contributes to the central LifeWatch infrastructure with a taxonomic backbone which is developed through various projects, including the World Register of Marine Species or WoRMS (www.marinespecies.org) and EurOBIS (www.eurobis.org). WoRMS aims to provide an authoritative and comprehensive list of names of marine organisms, including information on synonyms. EurOBIS is a distributed system which makes it possible to simultaneously search for biogeographic information on marine organisms in various data sets. EurOBIS has been developed within the MarBEF network and serves as the European node of OBIS. As part of LifeWatch, Marine Regions is a standardised geographic data system which makes geographic information on marine place names and maps freely available. It integrates geographic information on seas, oceans and undersea features, and indicates the boundaries of various marine areas throughout the world. Marine, freshwater and terrestrial observatories are developed regionally within LifeWatch, as are different biodiversity data systems, web services and models.

EMBRC – *European Marine Biological Resource Centre*

Duration: continually since 2015

www.embrc.eu

EMBRC will be a distributed infrastructure for research and training at leading marine research stations in Europe. It constitutes a virtual network of marine stations for the study of marine species, biodiversity and ecosystem functioning, developmental biology and evolution, biogeochemistry, global change, biomedical sciences and marine products. EMBRC will provide end users from SMEs, academia and industry with access to marine biodiversity, associated metadata and extractable products. Services include access to marine species (model species), biobanks, dedicated 'omics' platforms, structural biological facilities and imaging (microscopy, cytometry, etc.). The Flemish contribution is coordinated by the Marine Biology Laboratory (Ghent University) and VLIZ, with VLIZ making seagoing and land-based facilities available and providing technical support.

ICOS – *Integrated Carbon Observing System*

Duration: continually since 2012

www.icos-infrastructure.eu

ICOS provides the long-term observations required to understand the present state and predict future behaviour of the global carbon cycle and greenhouse gas emissions. VLIZ performs the oceanographic measurements which Flanders will transfer to ICOS through the University of Antwerp. Within this scope, VLIZ performs measurements aboard RV Simon Stevin. Within the scope of ICOS, VLIZ collaborates with NIOZ-Yerseke and the University of Liège (Alberto Borges).

UNESCO**GLOSS** – *Sea Level Station Monitoring Facility*

Duration: continually since 2008

www.ioc-sealevelmonitoring.org

A worldwide service for real-time sea level monitoring by means of measuring stations in cooperation with GLOSS (Global Sea Level Observing System) and IOC (Intergovernmental Oceanographic Commission).

VLAIO (FORMER IWT - STRATEGIC BASIC RESEARCH)**CREST** – *Climate resilient coast. Wave action in a changing climate: effects on the dynamics of the coast and implications for future safety. Een veerkrachtige kustzone.*

Duration: November 2015 – October 2019

www.crestproject.be

In the CREST project, research is conducted to gain a better understanding of the littoral processes resulting from currents, waves and wind so as to assess the impact of future coastal safety measures and developments along the coastline (e.g. Flanders Bays). All results are analysed by a Guidance Committee comprised of governmental bodies, market players and ecological experts. In addition, interim feedback is organised with technical experts from Belgium and abroad. The consortium consists of experts with an academic background in the field of physical aspects of coastal processes (waves, currents, sediment dynamics) and with experience in scientific research, and more specifically representatives from KU Leuven, Ghent University, VUB, Flanders Hydraulics Research, Maritime Access division, RBINS-Directorate Natural Environment and VLIZ supplemented with valorisation partners (IMDC and Fides Engineering). VLIZ is responsible for the support activities relating to data management and communication.

TOERISME VLAANDEREN

The battle of the North Sea, exhibition on WWI and the sea

Duration: October 2014 – September 2018

From 23 April to the end of September 2018, an exhibition on WWI and the sea is organised in Provinciaal Hof at the Markt square in Bruges. On this occasion, VLIZ cooperates with the tourism services, WWI experts, the Bruges museums, the cabinet of the governor and the Agency for Maritime and Coastal Services (MDK).

FUST – FLANDERS UNESCO TRUST FUND FOR SCIENCE

SPINCAM III

Duration: 01.06.2017 - 30.06.2021

www.oceanconference.un.org/commitments/?id=18743

The project has been designed to establish an integrated coastal area management (ICAM) indicator framework in the countries of the Southeast Pacific region (Chile, Colombia, Ecuador, Panama and Peru) focusing on the environment and the socio-economic conditions in the context of sustainable development and integrated coastal zone management. The application of a harmonised methodology and the development of a set of indicators among the participating countries will permit the calculation of a core of common indicators at regional level. In addition, information systems will be developed at national and regional level to support the creation of the indicators and the dissemination of the results.

JOINT INDUSTRY PROGRAMME ON E&P SOUND AND MARINE LIFE

PCAD4COD

Duration: 01.04.2017-31.03.2019

The PCAD4COD project is an integrated set of studies into the impact of airgun sounds on fish which combines different models with the collection of field data on behaviour, physiology, growth and maturation. VLIZ is involved in the collection of field data by means of acoustic telemetry.

SCIENTIFIC EQUIPMENT AND INFRASTRUCTURE

2017

OVERVIEW OF SCIENTIFIC EQUIPMENT AND INFRASTRUCTURE FOR SCIENTIFIC RESEARCH MADE AVAILABLE BY VLIZ.

WATER SAMPLING AND CHARACTERISATION EQUIPMENT

- Acoustic current meter (ADCP) and speed log
- Dissolved inorganic carbon analysis system
- System for oxygen analysis by means of Winkler titration
- Seawater acidity analysis system
- Aquadopp current profiler (ADCP)
- Carrousel 6 x 4 litre Niskin bottles
- CTD equipped with sensors for:
 - o Photosynthetically active radiation (PAR)
 - o Dissolved oxygen and redox potential (ORP)
 - o Turbidity
 - o Chlorophyll a
- Aeolian sand transport monitoring network
- Fluorometer
- 10 litre GO-FLO bottle
- Methane sensor
- Multibeam sonar
- 5 litre Niskin bottle
- Nutrient analysis system
- Underway data acquisition system on board RV Simon Stevin with:
 - o Thermosalinograph
 - o Fluorometer
 - o Atmospheric pCO₂ analysis system
 - o Oxygen sensor
 - o Turbidity sensor
- Secchi disk
- Total alkalinity sensor
- LISST-100X and LISST-200X turbidity meter

BENTHIC SAMPLING AND SEAFLOOR MAPPING EQUIPMENT

- Bowers & Connelly multi-corer
- Cohesive Strength Meter (CSM)
- Hamon grab
- Multibeam sonar
- Multibeam sonar system for shallow areas
- Multi-transducer sub-bottom echosounder
- Reineck Box Corer
- Sediment Profile Imaging (SPI) system
- Singlebeam sonar
- Van Veen grab
- Gilson dredge
- Vibrocorer

BIOLOGICAL SAMPLING EQUIPMENT

- Bat recorder
- Bongo net
- Beam trawl
- Otter trawl
- Pelagic otter trawl
- Bowers and Connelly multi-corer
- Porpoise detectors – C-PODs
- Fast repetition rate Fluorometer (FrrF)
- FlowCam
- Flow cytometer
- Fluorometer
- Gilson dredge
- Hamon grab
- Hydrophone
- Hyperbenthic sledge
- MIK net
- Neuston net
- Sieving table
- Apstein plankton net
- CalCoFi plankton net
- Vertical plankton net – WP2
- Plankton pump
- Reineck Box Corer
- Sediment Profile Imaging (SPI) system
- Sensor network for large birds
- Van Veen grab
- VEMCO fish acoustic receiver network in the Western Scheldt and coastal waters
- Video plankton recorder
- Wilson auto-siever
- Zooscan

MISCELLANEA

- Augmented reality sandbox
- Biological laboratory
- Bird tracking camera
- Chemical laboratory
- Compressor for filling diving cylinders
- Core repository – cold store for drill cores
- DGPS hand-held unit
- Freezers
- Weather station on board RV Simon Stevin:
 - o Atmospheric pCO₂
 - o Wind speed
 - o Wind direction
 - o Temperature
 - o Atmospheric pressure
- Microscopes
- Mini ROV
- Molecular laboratory
- Underwater camera
- RIB Zeekat
- ROV Genesis
- Video frame
- Water tanks for marine organisms
- Web cameras

RESEARCH PROJECTS

WHICH MADE USE OF RV SIMON STEVIN IN 2017

RESEARCH PROJECTS RV SIMON STEVIN

MARINE RESEARCH GROUP	PROJECT	NUMBER OF DAYS SPENT AT SEA
FPS Economy – Continental Shelf Service	Sand extraction monitoring	1
ILVO – Fisheries	Flatfish survival	7
ILVO – Fisheries	DISCAV	2
ILVO – Fisheries	TECHVIS	7
ILVO – Fisheries	Demersal Young Fish Survey (DYFS)	6
ILVO – Fisheries	Shrimp valorisation	2
INBO	Monitoring of seabirds	9
Directorate Natural Environment	INDI67	2
Directorate Natural Environment	Monitoring of marine mammals	1
Directorate Natural Environment & UGent – Marine Biology	PERSUADE	1
Directorate Natural Environment & UGent – Marine Biology & ILVO & ULg – MAST	Face-It	11
UGent – Marine Biology	Migration of cod	3
UGent – Marine Biology	Fish migration in coastal areas	11
UGent – Marine Biology	Plastox	2
UGent – Marine Biology & ILVO & Directorate Natural Environment	WINMON: Monitoring of wind turbines	3
UGent – Morphology	Flatfish injuries	14
UGent – PAE	Microbial food web	2
UH	Molecular evolution of flatworms	1
ULg	DMSP	3
VLIZ	LifeWatch VEMCO & C-Pods	5
VLIZ	Search	5
VLIZ	ICOS	18
VLIZ	Multibeam survey	7
VLIZ	Vibrocoring	5
VLIZ	ROV	8
VLIZ	LifeWatch measurement campaigns	22
VLIZ	JERICO Next	5
VLIZ	PlaneetZee@Work	1
VLIZ	Scheur Survey	2
VLIZ	PCAD4COD	9
VUB	Electrogenic sulphur oxidation	1
VUB – Chemistry	NewSteps	2
Flanders Hydraulics Research	Shipmotions	5

In 2017, RV Simon Stevin was used for 33 projects (including 6 new ones), amounting to a total of 183 days at sea.

RESEARCH PROJECTS

WHICH MADE USE OF THE MARINE STATION OSTEND IN 2017

RESEARCH PROJECTS MARINE STATION OSTEND

MSO INFRASTRUCTURE USED	REASON	MARINE RESEARCH GROUP
Water tanks for marine organisms	Dab quarantine	UGent - Morphology
Core repository	Analysis or collection of drill cores	DEME/UGent - RCMG
Base of operations	CREST	UGent - Geography
Lab infrastructure	ICOS	VLIZ
Lab infrastructure	LifeWatch	VLIZ

The Marine Station Ostend was used for marine scientific projects, educational purposes, visits, meetings and open house days for 134 days in 2017.

EVENTS (CO)ORGANISED BY VLIZ

IN 2017

EVENTS (CO)ORGANISED BY VLIZ IN 2017

DATE	TITLE	LOCATION	ROLE OF VLIZ	NUMBER OF PARTICIPANTS	KPI12 EVENT
26.01.2017	LifeWatch Observatory Sensors	InnovOcean site, Ostend	organiser	27	
20-22.03.2017	LifeWatch-WoRMS workshop: DiatomBase	Prague, Czech Republic	co-organiser	15	
21-22.03.2017	KdG University College field training	MSO, Ostend	organiser	18	
21-22.03.2017	KdG University College field training	InnovOcean site, Ostend	co-organiser	15	
19.04.2017	Zeebad: ecosystem services	UGent, De Sterre Campus, S8, Ghent	organiser	14	✓
19.04.2017	PlaneetZee@Work - closing event	UGent, De Sterre Campus, S8, Ghent	organiser	45	✓
24-25.03.2017	LifeWatch-WoRMS workshop: Parasites	InnovOcean site, Ostend	co-organiser	20	
24-25.03.2017	LifeWatch-WoRMS workshop: Nemertea	InnovOcean site, Ostend	co-organiser	3	
25-26.04.2017	EMODnet Biology Kick-off meeting	InnovOcean site, Ostend	organiser	41	
02-05.05.2017	Marine internship in Wimereux	Station marine de Wimereux (FR)	organiser	24	✓
05.05.2017	ICOS BE Consortium Study Day	InnovOcean site, Ostend	organiser	24	
07.05.2017	Zeebad, excursion to offshore wind turbines	Franlis Rederij, Ostend	co-organiser	54	✓
12-19.03.2017	Hydrography Midweek	MSO, Ostend	co-organiser	20	
16.05.2017	Educational trip by Mercator Maritime Institute, Ostend	InnovOcean site, Ostend	organiser	12	✓
16.05.2017	Visit by HoGent teacher training students	InnovOcean site, Ostend	facilitator	20	
17-18.05.2017	Excursion at sea for teachers and guides: North Sea wildlife	RV Simon Stevin, Ostend	organiser	54	✓
17.05.2017	North Sea Forum Vision 2050	InnovOcean site, Ostend	co-organiser	40	
18.05.2017	UPV seminar 'De Zee'	InnovOcean site, Ostend	facilitator	50	✓
22-24.05.2017	LifeWatch-WoRMS workshop: AnnelidaBase	InnovOcean site, Ostend	co-organiser	17	
24.05.2017	5 th anniversary of RV Simon Stevin	RV Simon Stevin, Ostend	organiser	23	
08.06.2017	World Oceans Day - SEAfety First	CC De Grote Post, Ostend	co-organiser	180	✓
09.06.2017	Seminar about Belgian sea sand	RV Simon Stevin, Hotel Andromeda, Ostend	co-organiser	60	✓
23.06.2017	VLIZ members' day	MSO, Ostend	organiser	90	
29.06.2017	Book presentation: 'Strandvondsten - een praktische veldgids' (beach finds - a practical field guide)	InnovOcean site, Ostend	co-organiser	48	
05.09.2017	Award of the Dr Edouard Delcroix Prize 2016	Ostend town hall	co-organiser	43	✓
06.09.2017	VLIZ Science Symposium: the Ocean and Human Health	InnovOcean site, Ostend	organiser	31	✓
15.09.2017	Visit by VIVES teacher training students	InnovOcean site, Ostend	co-organiser	55	✓
17.09.2017	Vlaamse Havendag (Flemish Port Day), Ostend	RV Simon Stevin, Ostend	co-organiser	1 070	✓
25.09.2017	Artesis teacher training workshop	Horizon Educatief, Ostend	co-organiser	16	✓
27.09.2017	UCLL teacher training workshop	InnovOcean site, Ostend	co-organiser	17	✓
05-06.10.2017	LifeWatch Workshop: Cetacean passive acoustic sensor network	InnovOcean site, Ostend	organiser	14	
10.10.2017	EMODnet Biology workshop	Europe House, Whitehall, London, UK	co-organiser	25	

EVENTS (CO)ORGANISED BY VLIZ IN 2017 (CONTINUED)

DATE	TITLE	LOCATION	ROLE OF VLIZ	NUMBER OF PARTICIPANTS	KPI12 EVENT
23.10.2017	Symposium 'Sant in eigen land'	InnovOcean site, Ostend	co-organiser	99	
25.10.2017	Belgica Society International – lecture by Prof. Patrick De Deckker	InnovOcean site, Ostend	co-organiser	28	✓
07.11.2017	Book presentation: 'Tot elke prijs'	InnovOcean site, Ostend	facilitator	112	
15-14.11.2017	1 st EMODnet Open Sea Lab	StartUp Village, Antwerp	co-organiser	75	
17.11.2017	Expert Group: Downs herring data analysis	InnovOcean site, Ostend	organiser	12	
17.11.2017	Vissen in het Verleden (fishing in the past)	InnovOcean site, Ostend	co-organiser	104	✓
23.11.2017	CREST Mid-term conference	InnovOcean site, Ostend	co-organiser	86	
24.11.2017	CREST expert group	InnovOcean site, Ostend	co-organiser	50	
26.11.2017	Science Day	RV Simon Stevin, MSO, Ostend	organiser	677	✓
06-08.12.2017	LifeWatch/Jerico-Next Data Analysis Workshop	Shipping Assistance Division, Ostend	organiser	9	
09.12.2017	Coastal guide seminar	Zwin visitor centre, Knokke-Heist	co-organiser	136	✓
18.12.2017	Sea Change T5.3 Brainstorm Visitors Centers	InnovOcean site, Ostend	organiser	12	✓
20.12.2017	Presentation of North Sea long-term vision 2050	Zeebrugge naval base	co-organiser	245	
15.05.2017	ALFF video showcase - Algae microbiomes: Friends or Foes?	UGC cinema, Antwerp	facilitator	47	
06.05.2017	ALFF showcase on open house day	Kunsthumaniora Sint-Lucas, Ghent	facilitator	60	
24.06.2017	ALFF showcase on end-of-year expo	Kunsthumaniora Sint-Lucas, Ghent	facilitator	60	

VLIZ (co)organised 48 events with a total of 3 877 participants.

TRAINEES AND MASTER STUDENTS

SUPERVISED BY VLIZ IN 2017

TRAINEES AND MASTER STUDENTS SUPERVISED BY VLIZ IN 2017

NAME	DIVISION	SCHOOL/UNIVERSITY
Al Khazali Mustafa	Data Centre	Howest
Álvarez Selene	JPIOceans	Vrije Universiteit Brussel
Bouquet Carolin	Data Centre	UFR (FR)
Cunha Ricardo	Data Centre	Ghent University
Cuyt Frederik	Policy Information	Ghent University
De Visscher Jill	Data Centre	Ghent University
Hidding Marit	Policy Information	HAS University of Applied Sciences, Den Bosch
Lanssens Thomas	Policy Information	Ghent University
Peers Zeno	Data Centre	Provinciaal Technisch Instituut Kortrijk
Perche Sarah	Data Centre	University of the Algarve
Pint Steven	Policy Information	Vrije Universiteit Brussel
Sandra Matthias	Policy Information	KU Leuven
Seyed Reza Nademi	Data Centre	Vesaliusinstituut, Ostend
Steenkiste Gregory	Communication	Artevelde University College
Strubbe Lode	Co-ordination	VDAB jobcentrum
Van Belle Veerle	Data Centre	Provinciaal Technisch Instituut Kortrijk
van den Hoed Bianca	Policy Information	Van Hall-Larenstein University of Applied Sciences (NL)
Vergara Gabriela	Data Centre	Ghent University
Vernhout Gerben	Policy Information	Van Hall-Larenstein University of Applied Sciences (NL)
Vissenaekens Elise	Policy Information	Ghent University
Willemse Stijn	Research	Ghent University

STUDENT EMPLOYEES

ACTIVE AT VLIZ IN 2017

STUDENT EMPLOYEES ACTIVE AT VLIZ IN 2017

NAME			
Adewumi Ibukun Jacob	Decock Siel	Locus Tatjana	Vanbiervliet Jeroen
Amadei Martinez Luz	Demuyneck Jozefien	Maslov Sil	Vandekerckhove Stef
Ana Rita Raleira	Dillen Nick	Mees Meskerem	Vanhooren Lore
Bouwens Jan	Festjens Felien	Mees Temesgen	Vasco Souza Dias
Buyse Jolien	Geldhof Ruben	Melger Hanneke	Vermeiren Serge
Callewaert Celine	Götze Eva	Meyers Nelle	Versteeg Jeroen
Cartuyvels Emma	Hamelinck Michiel	Naert Elien	Westmeijer George
De Boodt Charlotte	Hernandez Lisa	Robberecht Marie	Willemse Stijn
de Lichtervelde Astrid	Hernandez Samuel	Rondelez Jelle	Wittoeck Janne
De Wulf Leontien	Hernandez Simon	Seuryneck Michiel	Wittoeck Karlien
Debergh Reinout	Lescroart Jonas	van den Bosch Merijn	

PUBLICATIONS

2017

DE GROTE REDE

Issue 46 (November 2017) with leading articles on Ostend and Testerep; nature protection; noise in the oceans. Number of copies: 9 000 **(KPI12 publication)**

VLIZINE

A total of 12 issues of the e-newsletter 'VLIZINE' appeared in 2017, including a total of 162 articles. **(KPI12 publication)**

VLIZ LIBRARY ACQUISITIONS

total of 38 Library Acquisitions lists were forwarded by e-mail in 2017.

ZEEKRANT

Copejans, E.; Seys, J. (Ed.) (2017). Zeekrant 2017: annual publication of the Flanders Marine Institute and the province of West Flanders, Ostend. 8 pp. Number of copies: 80 000. **(KPI12 publication)**

BOOKS

A selection of books (co-)written or contributed to by VLIZ employees

- De Blauwe, H. (2017). **Strandvondsten: een praktische veldgids**. Photographer: Misjel Decler. Stichting Kunstboek: Oostkamp. ISBN 978-90-5856-570-9. 366 pp. **(KPI12-publicatie)**
- Fockedeey, N.; Lamour, L.; Vallet, E. (Ed.) (2017). **Guide des espèces à l'usage des professionnels. Pour un marché des produits de la mer durables**. Édition 2017. Ethic Ocean: Paris. ISBN 979-10-699-0840-6. 188 pp.
- UNESCO (2017). **Global Ocean Science Report - The current status of ocean science around the world**. UNESCO Publishing: Paris. ISBN 978-92-3-100226-7. 277 pp.

VLIZ SPECIAL PUBLICATIONS

Nr. 79: Mees, J.; Seys, J. (Ed.) (2017). **Book of abstracts - VLIZ Marine Scientist Day**. Brugge, Belgium, 3 March 2017. *VLIZ Special Publication*, 79. Vlaams Instituut voor de Zee - Flanders Marine Institute (VLIZ): Oostende. ix, 129 pp

TEACHING PACKAGES

Planeet Zee learning module: Ocean Ecosystem Services (3 modules).

MOVIES

- Rappé, K.; Verhelst, P. (Ed.) (2017). **Tagging research on eels in Belgium**. Animation. Production of Lifewatch Belgium. Flanders Marine Institute (VLIZ): Ostend. 3:03 min. pp. www.vliz.be/nl/multimedia/videogalerij?album=5156&pic=127059 **(KPI12 publication)**
- Rappé, K. (Ed.) (2017). **ROV Genesis, the remotely operated underwater vehicle of VLIZ**. Animation (English-spoken; voice: Emily Steel). Flanders Marine Institute (VLIZ): Ostend. 01:28 min. pp. www.vliz.be/nl/2017-03-20-ernstig-bedreigde-paling-animatie **(KPI12 publication)**

PUBLICATIONS

2017 (CONTINUATION)

A1 PUBLICATIONS WRITTEN BY VLIZ EMPLOYEES (KPI1)

- Staes, J.; Broekx, S.; Van Der Biest, K.; Vrebos, D.; **Beauchard, O.**; De Nocker, L.; Liekens, I.; Poelmans, L.; Verheyen, K.; Panis, J.; Meire, P. (2017). Quantification of the potential impact of nature conservation on ecosystem services supply in the Flemish Region: a cascade modelling approach. *Ecosystem Services* 24: 124-137. <https://doi.org/10.1016/j.ecoser.2017.02.020>
- Vrebos, D.; **Beauchard, O.**; Meire, P. (2017). The impact of land use and spatial mediated processes on the water quality in a river system. *Sci. Total Environ.* 601-602: 365-373. [10.1016/j.scitotenv.2017.05.217](https://doi.org/10.1016/j.scitotenv.2017.05.217)
- Tdesco, P.A.; **Beauchard, O.**; Bigorne, R.; Blanchet, S.; Buisson, L.; Conti, L.; Cornu, J.F.; Dias, M.S.; Grenouillet, G.; Hugueny, B.; Jezequel, C.; Leprieur, F.; Brosse, S.; Oberdorff, T. (2017). A global database on freshwater fish species occurrence in drainage basins. *Scientific Data* 4:170141. [doi:10.1038/sdata.2017.141](https://doi.org/10.1038/sdata.2017.141)
- **Devriese, L.I.**; De Witte, B.; Vethaak, A.D.; Hostens, K.; Leslie, H.A. (2017). Bioaccumulation of PCBs from microplastics in Norway lobster (*Nephrops norvegicus*): an experimental study. *Chemosphere* 186: 10-16. <https://hdl.handle.net/10.1016/j.chemosphere.2017.07.121>
- De Tender, C.; **Devriese, L.I.**; Haegeman, A.; Maes, S.; Vangeyte, J.; Catrijsse, A.; Dawyndt, P.; Ruttink, T. (2017). Temporal dynamics of bacterial and fungal colonization on plastic debris in the North Sea. *Environ. Sci. Technol.* 51(13): 7350-7360. <https://hdl.handle.net/10.1021/acs.est.7b00697>
- **Everaert, G.**; Ruus, A.; Hjermann, D.Ø.; Borgå, K.; Green, N.; Boitsov, S.; Jensen, H.; Poste, A. (2017). Additive models reveal sources of metals and organic pollutants in Norwegian marine sediments. *Environ. Sci. Technol.* 51(21): 12764-12773. <https://hdl.handle.net/10.1021/acs.est.7b02964>
- Deschutter, Y.; **Everaert, G.**; De Schampelaere, K.; De Troch, M. (2017). Relative contribution of multiple stressors on copepod density and diversity dynamics in the Belgian part of the North Sea. *Mar. Pollut. Bull.* 125(1-2): 350-359. <https://hdl.handle.net/10.1016/j.marpolbul.2017.09.038>
- Marin Jarrin, J.R.; Vanaverbeke, J.; **Fockede, N.**; de Grunauer, M.d.P.C.R.; Dominguez-Granda, L. (2017). Surf zone fauna of Ecuadorian sandy beaches: Spatial and temporal patterns. *J. Sea Res.* 120: 41-49. hdl.handle.net/10.1016/j.seares.2016.12.005
- **Mortelmans, J.**; **Debusschere, E.**; Vranken, S.; **Deneudt, K.**; **Hernandez, F.**; **Mees, J.** (2017). Two marine parasitic crustaceans new to the Belgian fauna. *Belg. J. Zool.* 147(2): 143-153. <https://hdl.handle.net/10.26496/bjz.2017.12>
- Raeymaekers, J.A.M.; Chaturvedi, A.; **Hablützel, P.I.**; Verdonck, I.; Hellemans, B.; Maes, G.E.; De Meester, L.; Volckaert, F.A.M. (2017). Adaptive and non-adaptive divergence in a common landscape. *Nature Comm.* 8(1): 9 pp. <https://hdl.handle.net/10.1038/s41467-017-00256-6>
- Breine, J.; Pauwels, I.; **Verhelst, P.**; Vandamme, L.; Baeyens, R.; **Reubens, J.**; Coeck, J. (2017). Successful external acoustic tagging of twaite shad *Alosa fallax* (Lacépède 1803). *Fish. Res.* 191: 36-40. <https://hdl.handle.net/10.1016/j.fishres.2017.03.003>
- **Vandorpe, T.**; Wienberg, C.; Hebbeln, D.; Van den Berghe, M.; Gaide, S.; Wintersteller, P.; Van Rooij, D. (2017). Multiple generations of buried cold-water coral mounds since the Early-Middle Pleistocene Transition in the Atlantic Moroccan Coral Province, southern Gulf of Cádiz. *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 485: 293-304. <https://hdl.handle.net/10.1016/j.palaeo.2017.06.021>
- Voultziadou, E.; Gerovasileiou, V.; **Vandepitte, L.**; Ganiyas, K.; Arvanitidis, C. (2017). Aristotle's scientific contributions to the classification, nomenclature and distribution of marine organisms. *Mediterr. Mar. Sci.* 18(3): 468-478. <https://hdl.handle.net/10.12681/mms.13874>
- Horton, T.; Gofas, S.; Kroh, A.; Poore, G.C.B.; Read, G.; Rosenberg, G.; Stöhr, S.; Bailly, N.; Boury-Esnault, N.; Brandão, S.N.; Costello, M.J.; **Decock, W.**; **Dekeyser, S.**; **Hernandez, F.**; **Mees, J.**; **Paulay, G.**; **Vandepitte, L.**; **Vanhoorne, B.**; **Vranken, S.** (2017). Improving nomenclatural consistency: a decade of experience in the World Register of Marine Species. *Eur. J. Taxon.* 389: 1-24. <https://hdl.handle.net/10.5852/ejt.2017.389>

A SELECTION OF PUBLICATIONS (CO)-WRITTEN BY VLIZ EMPLOYEES

- Costello, M.J. *et al.* (2017). [Methods for the study of marine biodiversity](#), in: Walters, M. *et al.* (Ed.) *The GEO handbook on biodiversity observation networks*. pp. 129-163
- De Backer, A. *et al.* (2017). [Swim bladder barotrauma in Atlantic cod when in situ exposed to pile driving](#), in: Degraer, S. *et al.* *Environmental impacts of offshore wind farms in the Belgian part of the North Sea: A continued move towards integration and quantification*. pp. 25-37
- De Pooter, D. *et al.* (2017). [Expanding the Ocean Biogeographic Information System \(OBIS\) beyond species occurrences](#). *Biodiversity Information Science and Standards 1*: e20196
- Degraer, S. *et al.* (2017). [Executive summary: A continued move towards integration and quantification](#), in: Degraer, S. *et al.* *Environmental impacts of offshore wind farms in the Belgian part of the North Sea: A continued move towards integration and quantification*. pp. 7-11
- Devriese, L.; Janssen, C. (2017). [Overzicht van het onderzoekslandschap en de wetenschappelijke informatie inzake marien zwerfvuil en microplastics in Vlaanderen](#). VLIZ Beleidsinformerende Nota's, 2017_001. Vlaams Instituut voor de Zee – Flanders Marine Institute (VLIZ): Oostende. ISBN 978-94-92043-34-4. 26 pp.
- Garcia-Soto, C. *et al.* (2017). [Advancing Citizen Science for Coastal and Ocean Research](#). European Marine Board Position Paper, 23. European Marine Board: Ostend. ISBN 978-94-92043-30-6. 109 pp. (KPI12-publicatie)
- Gorick, G.; Flanders Marine Institute (VLIZ) (2017). [500 Years of Ocean Change](#). Produced in cooperation with the Oceans Past Initiative, Oceans Past Platform and ICES Working Group on the History of Fish and Fisheries WGHIST. 'Sea Change' Ocean Literacy Project: [s.l.]. 1 sheet pp. <http://www.vliz.be/nl/imis?page=image&pic=127277> (KPI12-publication)
- Lagerveld, S. *et al.* (2017). [Spatial and temporal occurrence of bats in the southern North Sea area](#). *IMARES Wageningen Report*, C090/17. Wageningen Marine Research (University & Research centre): Den Helder. 52 pp.
- McMeel, O.; Pirlet, H.; Calewaert, J.-B. (2017). [Use and sharing of marine observations and data by industry](#). Good practice guide. [S.n.]: Oostende. 17 pp.
- Missiaen, T. *et al.* (2017). [The SeArch project: towards an assessment methodology and sustainable management policy for the archaeological heritage of the North Sea in Belgium](#), in: Bailey, G.N. *et al.* (Ed.) *Under the sea: Archaeology and palaeolandscapes of the continental shelf*. *Coastal Research Library*, 20: pp. 415-424
- Monbaliu, J. *et al.* (2017). [Status CREST onderzoek: beleidsinformerend mid term rapport](#). KULeuven/VLIZ: België. 19 pp.
- Pirlet, H.; *et al.* (2017). [Marien onderzoek in Vlaanderen en België: Een inventaris van het onderzoekslandschap](#). VLIZ Beleidsinformerende Nota's, BIN 2017_002. Vlaams Instituut voor de Zee – Flanders Marine Institute: Oostende. ISBN 978-94-9204-349-8. 59 pp.
- Provoost, P. *et al.* (2017). [Expanding the Ocean Biogeographic Information System \(OBIS\) beyond species occurrences](#). *Biodiversity Information Science and Standards 1*: e20515
- Rumes, B. *et al.* (2017). [Determining the spatial and temporal extent of the influence of pile driving sound on harbour porpoises](#), in: Degraer, S. *et al.* *Environmental impacts of offshore wind farms in the Belgian part of the North Sea: A continued move towards integration and quantification*. pp. 129-141
- Sterken, M. (2017). [Plastic in de oceaan](#). 'Sea Change' Ocean Literacy Project: [s.l.]. 1 sheet pp.
- Sterken, M. *et al.* (2017). [Sea Change: The European Beach Hazards Platform](#). Public Outreach website. SeaChange project, EU Horizon 2020 grant n° 652644: Belgium.

PUBLICATIONS

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