

# Policy Needs for Oceans and Human Health



**Seas, Oceans & Public  
Health in Europe**

Linking oceans and health research

European  
**MARINE BOARD**  
Advancing Seas & Ocean Science

# European Marine Board

The European Marine Board provides a pan-European platform for its member organizations to develop common priorities, to advance marine research, and to bridge the gap between science and policy in order to meet future marine science challenges and opportunities.

The European Marine Board is an independent and self-sustaining science policy interface organisation that currently represents 34 Member Organizations from 18 European countries. It was established in 1995 to facilitate enhanced cooperation between European marine science organizations towards the development of a common vision on the strategic research priorities for marine science in Europe. The EMB promotes and supports knowledge transfer for improved leadership in European marine research. Its membership includes major national marine or oceanographic institutes, research funding agencies and national consortia of universities with a strong marine research focus. Adopting a strategic role, the European Marine Board serves its member organizations by providing a forum within which marine research policy advice is developed and conveyed to national agencies and to the European Commission, with the objective of promoting the need for, and quality of, European marine research.

## European Marine Board Member Organizations



This policy brief is based on a report\* which examines several regulatory strategies and tools linked to the EU Integrated Maritime Policy, and how they relate to Oceans and Human Health. The report was created by Seascope Belgium within the scope of the Seas, Oceans and Public Health in Europe (SOPHIE) project\*\*. It also takes input from the SOPHIE Strategic Research Agenda\*\*\* led by the European Marine Board. SOPHIE was funded by the European Union's Horizon 2020 research and innovation programme, grant agreement N° 774567.

\* McMeel, O., Tonné, N. and Calewaert, J.-B. (2019) Human health and EU maritime policy: Closing the loop. H2020 SOPHIE Project. Brussels, Belgium. DOI: 10.5281/zenodo.3663620. <https://sophie2020.eu/resources/maritime-policy-brief/>

\*\* [www.sophie2020.eu](http://www.sophie2020.eu)

\*\*\* H2020 SOPHIE Consortium (2020) A Strategic Research Agenda for Oceans and Human Health in Europe. H2020 SOPHIE Project. Ostend, Belgium. ISBN: 9789492043894 DOI: 10.5281/zenodo.3696561. <https://sophie2020.eu/strategic-research-agenda/>

## What is Oceans and Human Health?

Humans are inextricably linked to and reliant on the ocean. Therefore you cannot have healthy humans without a healthy ocean. Oceans and Human Health (OHH) is an emerging framework to explore and understand the complex links between the health of the ocean and that of humans, to achieve beneficial outcomes for both.

The COVID-19 global health crisis has highlighted more clearly than ever the importance of understanding the links between human health and the environment. It has also demonstrated the importance of open science and collaboration between scientists and policy in practice, based on data and evidence.

### Balancing risks and benefits

Humans interact with the ocean for food, transport, work, and recreation. These interactions are largely beneficial for humans but directly or indirectly impact the health of the ocean, which in turn also have implications for human health<sup>1</sup>. For example, living near the coast has been shown to be beneficial for mental health<sup>2</sup>, but probably not when the coast is damaged by mass tourism or pollution. However, being at the coast can also pose dangers to human health, such as jellyfish stings and harmful microbes in seawater. Extracting benefits, while controlling risks to both human and ocean health, is at the core of OHH. Ultimately, we should find a balance for the whole system: where human-ocean interactions

are positive for the health of both, taking into account the costs of achieving this balance. OHH is about unravelling these complex and nuanced links between the ocean and humans.

### Collaboration at its core

The study and practice of OHH are inherently transdisciplinary and trans-sectoral. They require collaboration across disciplines such as marine science, medicine and public health, social science, environmental science, economy, law, and policy, as well as engaging citizens, business, NGOs and governments. An example of this need for transdisciplinarity arises when considering terminology. Terms such as “ecosystem”, “health” and “sustainability” mean very different things to different communities. Only through working together can clarity be gained and all viewpoints be taken into consideration.

This requirement for transdisciplinary and trans-sectoral collaboration also applies to the development and implementation of OHH supportive policies. A wide range of perspectives are needed to ensure that policies take both ocean and human aspects into consideration.

The 2014 Message from Bedruthan<sup>3</sup> called for a review of the OHH policy landscape. The policy report<sup>4</sup> and Strategic Research Agenda<sup>5</sup> (see box overleaf), which form the basis for this Policy Brief, arise from that call.



Human activities that impact the ocean in turn impact human health. These impacts can be beneficial, such as those from food, renewable energy, recreation, and biomedical research, but can also be negative, such as those associated with floods, storms, and pollution.

<sup>1</sup> <https://www.marineboard.eu/publication/linking-oceans-and-human-health-strategic-research-priority-europe>

<sup>2</sup> Garrett, J. K., Clitherow, T. J., White, M. P., Elliott, L. R., Wheeler, B. W., & Fleming, L. E. (2019). Coastal proximity and mental health among urban adults in England: The moderating effect of household income. *Health & Place*. <https://doi.org/10.1016/j.healthplace.2019.102200>

<sup>3</sup> <https://www.marineboard.eu/publication/message-bedruthan>

<sup>4</sup> <https://sophie2020.eu/resources/maritime-policy-brief/>

<sup>5</sup> <https://sophie2020.eu/strategic-research-agenda/>



The study and practice of Oceans and Human Health requires collaboration across many backgrounds such as those shown here.

## EU marine policy and human health

Most marine and maritime policies are set at the EU level, with Directives and other instruments applicable for all Member States. By contrast, there are not many overarching EU level health policies, and Member States generally define their own health policies.

These differing mandates and competencies can pose a challenge when considering OHH topics, such as measuring and monitoring marine pollutants and their impacts on public health. It also means that at present there is no European or national policy that explicitly addresses both ocean health and human health. This does not necessarily mean that new dedicated OHH policies should be developed. Instead, existing policies might be adapted to include OHH considerations.

## Taking a holistic approach to policy

OHH requires a holistic approach to policy. Some existing EU-level marine legislation, such as the Marine Strategy Framework Directive<sup>6</sup> (MSFD), explicitly refer to human health. However, typically only one type of OHH interaction is referenced, e.g. pollution or seafood contamination. Additionally, the marine Directives do not give any details about how to take OHH interactions into account. Existing marine policies (such as the Maritime Spatial Planning Directive<sup>7</sup> for instance) should be reframed, adapted or reinterpreted to more clearly consider the human component. This can be achieved by implementing an ecosystem-based approach with humans considered as part of the marine ecosystem, e.g. by including human health-relevant indicators within marine Directives. In essence, there is a need to take human health and well-being into account in all marine policies. Conversely, it is also appropriate to consider environmental and sustainability aspects in health policies.

## The SOPHIE Project [www.sophie2020.eu](http://www.sophie2020.eu)

The Seas, Oceans and Public Health in Europe (SOPHIE) Coordinated Support Action project, funded under the European Commission's Horizon 2020 framework, ran from December 2017 to May 2020. SOPHIE built a foundation for Oceans and Human Health (OHH) research capacity in Europe through community building, stakeholder engagement and pilot demonstrators. The project produced a Strategic Research Agenda<sup>5</sup> (SRA) for OHH in Europe, which presents key research questions and requirements to enable its development. The SRA also discusses what stakeholders and citizens think about OHH, what training and capacity will be needed, and how to enable OHH collaborations. The three target action areas of the SRA are:



<sup>5</sup> <https://sophie2020.eu/strategic-research-agenda/>

<sup>6</sup> [https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm)

<sup>7</sup> [https://ec.europa.eu/maritimeaffairs/policy/maritime\\_spatial\\_planning\\_en](https://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning_en)

## Raising awareness of Oceans and Human Health

Raising awareness of OHH as a framework to address common ocean and health goals more efficiently is an important first step towards embedding it within policy and practice. Environment and Health<sup>8</sup> and Planetary Health<sup>9</sup> are known concepts, but the synergies between ocean health and human health have been less well recognized.

OHH can also highlight and address issues around equity and equality within human populations. Examples include unequal access to blue spaces, unequal impacts from marine pollution, and designing marine policies that work for all.

OHH is relevant to everyone. Citizens and other stakeholders should understand how the ocean affects their health, both positively and negatively, but also the impact their actions have on the ocean. Going from awareness to action, OHH-related initiatives can engage more people (and to a larger degree) directly with the ocean, with greater potential for positive behavioural change. Citizens and other stakeholders should be empowered to engage in the policy-making process, through consultation and co-creation. However, for OHH this first requires that citizens become literate in OHH and its relevance to their lives.

## Considering data and indicators

Evidence-based and scientifically informed OHH policy requires reliable and openly available data. Since its establishment, the EU's Marine Knowledge 2020 Strategy<sup>10</sup> and successive European Commission funded marine research projects and initiatives (e.g. the SeaDataNet<sup>11</sup> and MyOcean<sup>12</sup> project series, and EMODnet<sup>13</sup>) have enabled significant progress in marine data collection, analysis and sharing across borders. However, at a European level, human health data are far more scattered and inconsistent. Compliance and ethical issues around data privacy and the requirements of the EU's General Data Protection Regulations<sup>14</sup> (GDPR) add to the complexity in health data sharing and harmonization. Best practice and experience gained from open data sharing already conducted by European marine data and information hubs should inform human health data sharing.

In the first instance, however, there is a need to identify what marine and health data are most useful for OHH, what data are already being collected and what data are already publically available. Additional indicators necessary to fully understand the links between oceans and human health should be developed by transdisciplinary collaborations between OHH researchers. As an example, marine species' indicators showing exposure to toxins or harmful chemicals could be used in early warning systems and for monitoring<sup>15</sup>.

A cost-benefit analysis will be needed to support the case for new indicators and monitoring. It should not only show the monitoring

costs (e.g. for MSFD), but also the benefits gained from protected ecosystem services, and the public health and healthcare savings that can be made from achieving Good Environmental Status (GES).

## Why we need collaboration

A 2019 study<sup>16</sup> on the impact of sewage on the health of coastal communities and coral reefs identified the threats to both from contaminated water. Of the 17 threats identified, nine affected both humans and coral reefs:

- Lack of sanitation
- Industrial pollution
- Sewage pollution
- Coastal development
- Communicable disease
- Agricultural pollution
- Ocean acidification
- Thermal stress
- Overfishing

In almost every shared threat, they were independently addressed by the conservation sector and the health sectors. With increased collaboration, monitoring efficiency could be increased, data could be shared and common solutions to common problems could be explored.

Taking this further, a periodic and systematic assessment for OHH is required, to ensure that ocean and human health is safeguarded in Europe. These assessments would be similar to those already conducted for MSFD. They would check the indicators that are currently monitored, and the data that is being collected, and based on an assessment of their suitability, would feed back any required changes into the monitoring system.

Within the health sector, the practicalities of recording and sharing additional health indicators will have to be defined at Member State level. However, European-level oversight and standards could help. The current crisis has raised awareness of the need for more rapid access to EU-wide public health data, particularly given the mobility of EU citizens. Indeed, the 2019 EU communication<sup>17</sup> on enabling the digital transformation of health and care in the Digital Single Market, calls for better data to advance research, prevent disease and personalise healthcare, as one of their three priority areas. The COVID-19 crisis has already led to a significant increase in health-related collaboration and data sharing in a very short time. This momentum should be maintained and carried into OHH data sharing.

Innovative solutions for data collection involving stakeholders and citizens, such as citizen science, may also be appropriate as a means of gathering very relevant OHH data.

<sup>8</sup> <https://www.eea.europa.eu/themes/human>

<sup>9</sup> <https://www.planetaryhealthalliance.org/planetary-health>

<sup>10</sup> [https://ec.europa.eu/maritimeaffairs/policy/marine\\_knowledge\\_2020\\_en](https://ec.europa.eu/maritimeaffairs/policy/marine_knowledge_2020_en)

<sup>11</sup> <https://www.seadatanet.org/About-us>

<sup>12</sup> <https://www.copernicus.eu/en/myocean>

<sup>13</sup> <https://www.emodnet.eu/>

<sup>14</sup> <https://eur-lex.europa.eu/eli/reg/2016/679/oj>

<sup>15</sup> Knap et al (2002). Indicators of ocean health and human health: developing a research and monitoring framework. *Environmental Health Perspectives* 110(9). <https://doi.org/10.1289/ehp.02110839>

<sup>16</sup> Stephanie L. Wear (2019) Battling a Common Enemy: Joining Forces in the Fight against Sewage Pollution, *BioScience* 69(5) <https://doi.org/10.1093/biosci/biz025>

## Supporting Oceans and Human Health

The availability of continued financial support and funding is critical. For OHH, these are needed at local, regional, national, and international levels. Given the diversity of people and marine environments in Europe, top-down policy measures and bottom-up initiatives are equally important in taking OHH forward.

OHH research is different from traditional disciplines in the following ways: 1) Collaboration between a wide range of research fields is at the core of OHH, and given that different sectors have very different ways to communicate, collaboration can take longer to establish and implement; 2) Engagement with a wide range of stakeholders is very important, and it can take time to establish working relationships and trust; and 3) OHH approaches are unlikely to be “solved” and implemented in the space of one project, and may require ongoing adaptation and/or review. These aspects all mean that OHH funding and support need to be fit for purpose. It may need to span longer timescales than traditional 2-3 year projects, may need to actively request and ensure collaboration and engagement, and require successive and/or linked projects or initiatives.

### Training communities

Ensuring that graduates from OHH-relevant backgrounds gain awareness about the wider relevance of their work, receive cross-disciplinary training as part of their degree courses, and gain exposure to transdisciplinary collaboration as well as working with stakeholders will be important. For other stakeholders, providing a range of topic- or profession-specific training or Continuous Professional Development (CPD) courses will enable smoother development of OHH and more effective implementation of relevant policies.

Approaches for successful transdisciplinary and trans-sectoral collaboration are still being developed and defining best practice

approaches for collaboration, with different groups of people, will benefit the whole OHH field.

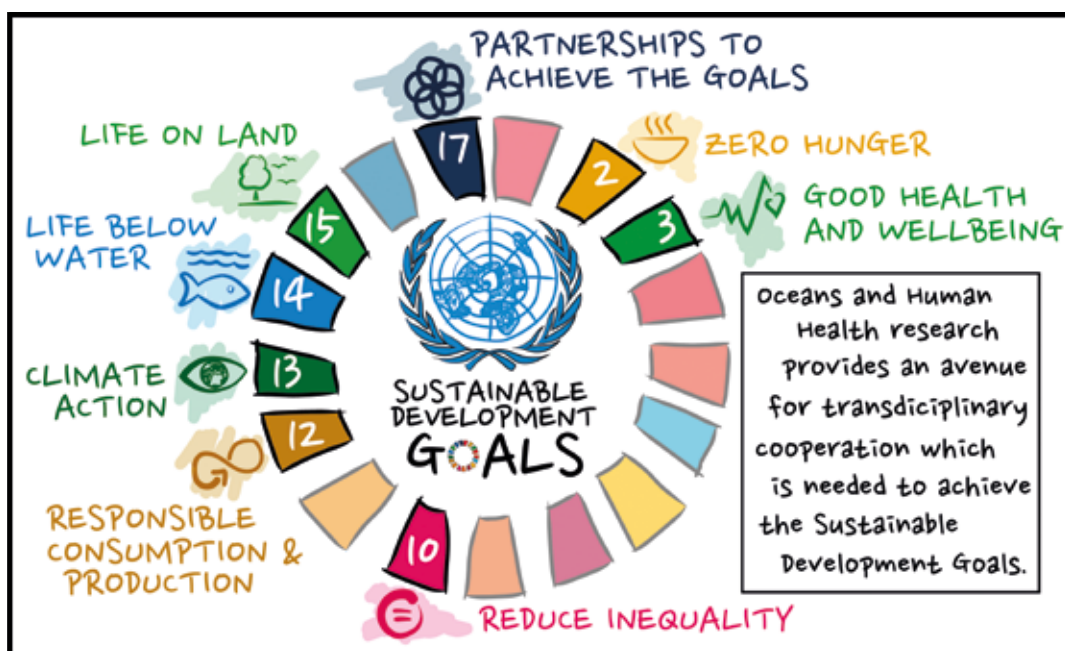
### Big Data potential

OHH data will, by their very nature, cover large temporal and spatial scales, be multifaceted and multi-layered, and will continually evolve. Big Data analytical methods will offer significant opportunities in research, management, and forecasting, with a small number of examples already in existence<sup>18</sup>. These opportunities, and their inherent challenges, should be explored in collaboration with data analytics and management experts. Appropriate training will also be required. The EU is a global leader in marine data management, and is making progress in the management of marine big data. Some inherent problems to working with cross-border marine data have already been addressed, including developing common vocabularies, standards and interoperability. Creating collaboration between the marine, public health and relevant terrestrial data communities is an important first step in enabling big data to support OHH.

### Linking to existing initiatives

The UN declaring 2021-2030 the Decade of Ocean Science for Sustainable Development<sup>19</sup>, the Decade of Ecosystem Restoration<sup>20</sup> and the Decade of Action<sup>21</sup> on the Sustainable Development Goals presents an opportunity to achieve wider awareness and integration of OHH into relevant fields and should be fully utilized. Clarification of the role of the ocean in support of delivering the EU Green Deal<sup>22</sup>, with consideration for human aspects, will also be required.

OHH is intimately linked to a number of Sustainable Development Goals<sup>23</sup>, including SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 10 (reduced inequality), SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (life below water), SDG 15 (life on land), and SDG 17 (partnerships). These goals cannot be achieved in isolation, and OHH is one way to link these goals and support their achievement jointly.



Many Sustainable Development Goals are relevant to Oceans and Human Health.

<sup>17</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A233%3AFIN>

<sup>18</sup> <https://link.springer.com/article/10.1186/s12889-018-5931-6>

<sup>19</sup> <https://www.oceandecade.org/>

<sup>20</sup> <https://www.decadeonrestoration.org/>

<sup>21</sup> <https://www.un.org/sustainabledevelopment/decade-of-action/>

<sup>22</sup> [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

<sup>23</sup> <https://sustainabledevelopment.un.org/?menu=1300>

## Recommendations

The overarching recommendations for OHH are:

- **To promote the development of a ‘Health (and Environment) in All Policies’ (HiAP)**, the OHH research community must champion HiAP and identify current shortcomings, taking into account equity and equality, using national and European science advice mechanisms and policy reviews;
- **To link human health to ocean health policies**, European policy makers should explore opportunities to reframe, adapt or reinterpret existing marine policies to incorporate OHH;
- **To embed “marine” in the study and practice of Environment and Health**, the OHH community must raise awareness, build the community, train and collaborate with interested parties;
- **To design and implement dedicated OHH indicators**, OHH researchers and relevant stakeholders need to co-create appropriate indicators, monitoring approaches and management tools through collaborative projects and initiatives at all relevant scales;
- **To support evidence-based management in an OHH context**, the OHH research community should develop dedicated OHH data streams by identifying data sharing, management and harmonization needs within existing data frameworks;
- **To build an integrated architecture for health and environmental data in Europe**, the marine and terrestrial data management and health data sectors should collaborate to share best practices and lessons learnt, building on relevant ongoing activities at European level such as the European Open Science Cloud;
- **To better understand the benefits of monitoring for policies covering both ocean and human health**, the OHH community in collaboration with economists and social scientists need to conduct cost-benefit analyses to justify the trade-offs;
- **To safeguard both ocean and human health**, the OHH community needs to support policy makers to conduct systematic assessments to ensure feedback on OHH data and indicators. To ensure consistency across Europe this might need to be coordinated at a European level; and
- **To increase the support for OHH in research, sectoral and regional cooperation programmes**, research funders should acknowledge the importance OHH, and fund collaborative, transdisciplinary research that is co-designed by all stakeholders.

## Suggested further reading

European Marine Board (2019) Navigating the Future V: Marine Science for a Sustainable Future. Position Paper 24 of the European Marine Board, Ostend, Belgium. ISBN: 9789492043757. ISSN: 0167-9309. DOI: 10.5281/zenodo.2809392. <https://www.marineboard.eu/publications/navigating-future-v>

H2020 SOPHIE Consortium (2020) A Strategic Research Agenda for Oceans and Human Health in Europe. H2020 SOPHIE Project. Ostend, Belgium. ISBN: 9789492043894 DOI: 10.5281/zenodo.3696561. <https://sophie2020.eu/strategic-research-agenda/>

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Cover Photo: Stone stack on a Scottish beach. While rock balancing meditation may help mental health, biologists have warned that people picking up stones may inadvertently disturb marine ecosystems.

Credit: Sheila Heymans

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