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# Evaluation of research production at the Centre of Maritime Health and Society

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Academic report from The Danish Centre for Studies in Research and Research  
Policy

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## 1.0 Introduction

This report presents the results of an evaluation of the Centre of Maritime Health and Society's (CMSS) research and collaborative relations with key stakeholders. The evaluation was conducted during the period December 2023 – February 2024 by the Danish Centre for Studies in Research and Research Policy (CFA), Department of Political Science at Aarhus University.

The evaluation consists of two parts. The first part is an analysis of the Centre's research output, based on publications authored or co-authored by CMSS staff during the period 2003-2023. The second part is an interview study of collaboration partners and other key stakeholders for CMSS. The interviews examine stakeholders' assessment of the quality of research conducted by CMSS, its relevance to the area of maritime health and society, the Centre's prioritization of research topics, collaboration with external stakeholders, and benefits for research within the area and for society.

The evaluation seeks to assess CMSS's activities both in relation to the Centre's goals and objectives as set out in their strategic plan for 2020-2024 and in looking forward to relevant areas and issues for future years.

### 1.1/ About the Centre of Maritime Health and Society

CMSS is a research unit providing research and documentation that can help optimize the working environment, health, safety and the shipping economics within industries, such as shipping companies, the fishing industry, shipyards, industry suppliers, offshore companies, the wind power industry, as well as supporting maritime educational institutions and authorities<sup>1</sup>. CMSS is the result of a merger in 2011 between two maritime research units at SDU; the former Centre of Maritime Health and Safety (Health faculty), which was established in 1992, and the former Centre of Maritime Research and Innovation (Social Science faculty). This merger aimed to strengthen and promote the synergies between the two maritime research fields. The main share of resources remained focused on health and safety, currently with 3-4 researchers within marine life and socioeconomics partially affiliated with CMSS (1 full-time equivalent in total). Over the period from 2006 to 2024, total staff at CMSS (measured in terms of full-time equivalents) increased from 6.2 to 9.3.

An earlier evaluation in 2005<sup>2</sup> recommended that CMSS (at that time, Forskningsenheden for Maritim Medicin (FMM)) should seek to grow in size and increase its research publication, expand efforts to identify and have greater contact with their main stakeholders (with particular focus on shipping), and that it should broaden its focus from health to other relevant topics for Blue Denmark. As this evaluation shows, CMSS has made progress on all these fronts.

According to their most recent strategic plan for 2020-2024<sup>3</sup>, CMSS has the following overall objectives:

- To identify, explore and address present and future health and safety challenges in the work environment of the maritime setting,
- To identify, explore and address present and future environmental and business economic challenges in the maritime industry,
- To develop and contribute to maritime education in the core areas of CMSS,

<sup>1</sup> <https://www.sdu.dk/da/cmss>

<sup>2</sup> Bach og Moen (2005) Evaluering af Forskningsenheden for Maritim Medicin (FMM), Syddansk Universitet Esbjerg - Ekstern peer review af den videnskabelige production.

<sup>3</sup> [https://www.sdu.dk/da/om\\_sdu/institutter\\_centre/ist\\_sundhedstjenesteforsk/forskning/maritimsundhedsikkerhed/strategiplan](https://www.sdu.dk/da/om_sdu/institutter_centre/ist_sundhedstjenesteforsk/forskning/maritimsundhedsikkerhed/strategiplan)

- To develop skills and competencies of the staff to get academic qualifications that are in line with requirements of University of Southern Denmark,
- To ensure that the research within CMSS contributes to the existing knowledge and has an impact on the Danish Maritime sector (Blue Denmark) in matters of safety, health, environmental economics and business administration,
- To assist the Danish Maritime Authority on matters relating to maritime health and safety,
- To engage in addressing and including United Nations Sustainable Development Goals (UN SDGs) relevant to the Centre,
- To develop the visibility of the Centre.

## 1.2/ About the evaluation

The first part of the evaluation is a bibliometric analysis of the publications by CMSS during 2003-2023. The bibliometric analysis will focus primarily on journal articles, their citation impact on literature within the field, and collaboration patterns. The bibliometric analysis will be based on publications registered in the PURE database and construct the following indicators:

- Number publications
- Citation impact (field normalized)
- Share of journal articles that are among the top 10% within their area in terms of citation impact
- Identification of most utilized journals
- Most frequent collaboration partners (measured through co-authorship)

The indicators used in the analysis are described in greater detail below.

The second part of the evaluation is an interview study of collaboration partners and other key stakeholders for the Centre of Maritime Health and Society (CMSS). The purpose of the interviews is to examine stakeholders' assessment of the quality of research conducted by CMSS, its relevance to the area of maritime health and society, the Centre's prioritization of research topics, collaboration with external stakeholders, and benefits for research within the area and for society.

Ten online interviews with stakeholders have been conducted. The stakeholders were selected based on a list supplied by CMSS including stakeholders with different professional backgrounds and knowledge of CMSS and their research and documentation regarding working environment, occupational health and safety and environmental economics in relation to Blue Denmark and the maritime industry in general.

In the semi-structured interviews, stakeholders were asked about their relation to CMSS, their impression of the quality of CMSS' research including CMSS' expertise within the area. Also, they were asked about their assessment of collaborative relationships, participation in networks (both international and Danish), visibility and relevance within the Danish maritime sector, as well as in relation to contemporary and future knowledge needs, their services provided and their ability to attract new projects, fundings and researchers. Finally, the stakeholders were asked about topics and areas they believe require further research and that CMSS could advantageously focus on in future work.

The interviews were conducted by two or three researchers from CFA. One researcher facilitated the conversation and posed questions, while the other took detailed notes. The interviews have been recorded but not transcribed. However, CFA has coded the notes to predefined, deductive themes in compliance with the questions asked as mentioned above.

## 2.0 Research quality and competences

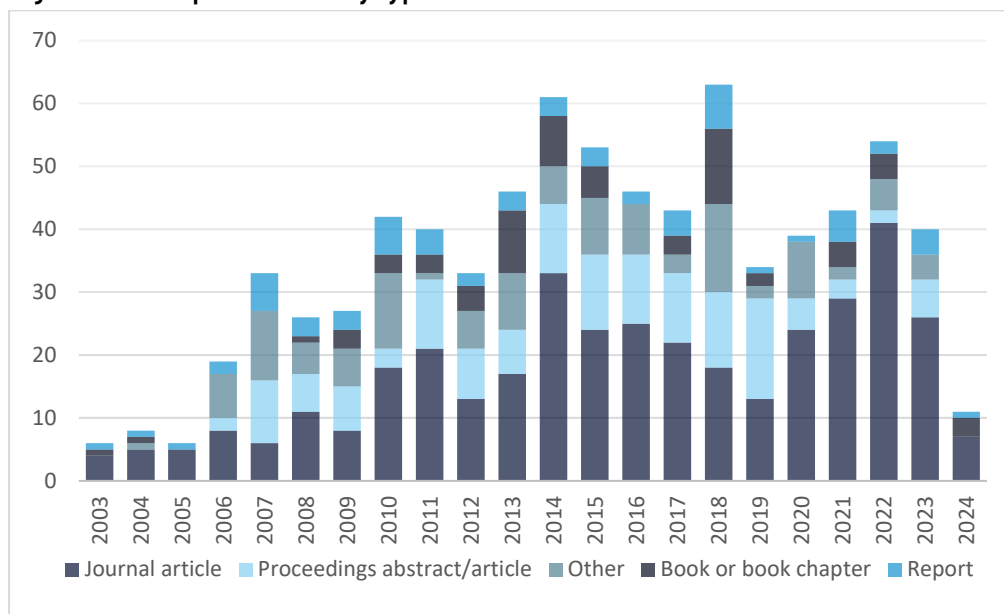
To achieve its objectives, it is important that CMSS conducts high quality research within their core areas and ensures that their research and other activities contribute to Blue Denmark within safety, health and environmental economics. Through both review of CMSS research and interviews with stakeholders, this section assesses CMSS's work and competences, and the importance of their activities for Blue Denmark.

This section first reviews CMSS's research in the period from 2003 to 2023. Thereafter, the section examines stakeholders' assessments of CMSS's competences and contributions. In particular, we examine the role of research-based approaches and competences, methods, strength areas, their experience and familiarity with the area, and advisory support to the Danish Maritime Authority. In addition, the interviews provide illustrative examples of CMSS's work to support Blue Denmark within safety, health and work conditions.

### 2.1/ Publications

In all there are 775 publications registered for CMSS in the PURE database for the period 2003-2024. Note that 2024 only includes publications from January 1 – February 22. A variety of types of publications are listed. In figure 1 below, we have grouped publications in five categories: journal articles, conference and proceedings articles and abstracts, books, monographs and book chapters, reports and other (working papers, posters, newspaper articles, etc.). The number of publications increased strongly from 2003 to 2014 and has fluctuated between 34 and 63 publications per year since 2014. There appears to have been a strong increase in the share of journal articles over time. This was also the case for proceedings articles and abstracts, though the share of these has been lower in the last five years.

A manual review of publications over the last few years, from 2021 to present, shows that publications cover a broad range of topics and fields, and in some cases are related to topics more generally, without specific focus on the maritime sector. Based solely on review of publication titles, 84 out of 146 publications in this most recent period were directly related to the maritime sector, while 62 out of 146 were within core topics for CMSS but not directly related to the maritime sector. Among the areas covered by research publications in this most recent period are work environment and occupational health, marine wildlife, fishing and fishery, marine economics, mental and physical health.

**Figure 1. CMSS publications by type 2003-2024**

As part of the evaluation, we have conducted a more detailed analysis of journal articles co-authored by CMSS during the period. The analysis is based on articles in peer-reviewed journals that are indexed in the Web of Science database (WoS)<sup>4</sup>, which allows us in particular to measure the extent to which articles are cited by other research.

Of the 775 publications, 272 are articles in peer-reviewed journals that have a DOI (digital object identifier) number and are published in 2022 or earlier, and of these, 225 were found in the Web of Science database. The remainder of the publication analysis is based on these 225 articles. We use a citation window of three years after publication year, so that the period where other articles can cite an article is the same over time. For this reason, we have excluded articles published in 2023 and 2024. We have chosen to keep the years 2021 and 2022, though it should be noted that the citation window is smaller for these two years than for the rest of the period.

## 2.2/ Journal articles

Figures report results for both whole counting and fractional counting. Whole counting is simply based on the number of articles with at least one co-author from CMSS, where each article counts as one. Fractional counting considers the share of co-authors from CMSS (for example, for an article with two authors where one is from CMSS, the fractional count would be 0.5). To ensure that there are a sufficient number of articles for analysis in each period, the period 2003-2022 is broken down into four 5-year periods.

Figure 2 shows the number of articles over time, covering the four 5-year time periods. The number of articles increased from 14 to 84 over the four periods. While less marked, fractional counts have also increased strongly, from 6.7 to 25 (or 370%). When comparing the last two periods, whole publications have increased much more (87%) compared to fractional counts (13%). This indicates that research collaboration (in terms of number of co-authors) has increased greatly over time, particularly over the last ten years.

<sup>4</sup> The WoS citation database includes an extensive number of international and national journals (around 12000), though not all journals or proceedings. Its coverage is most complete within the natural and health sciences and least complete within the arts and humanities, along with smaller and less well-known journals.

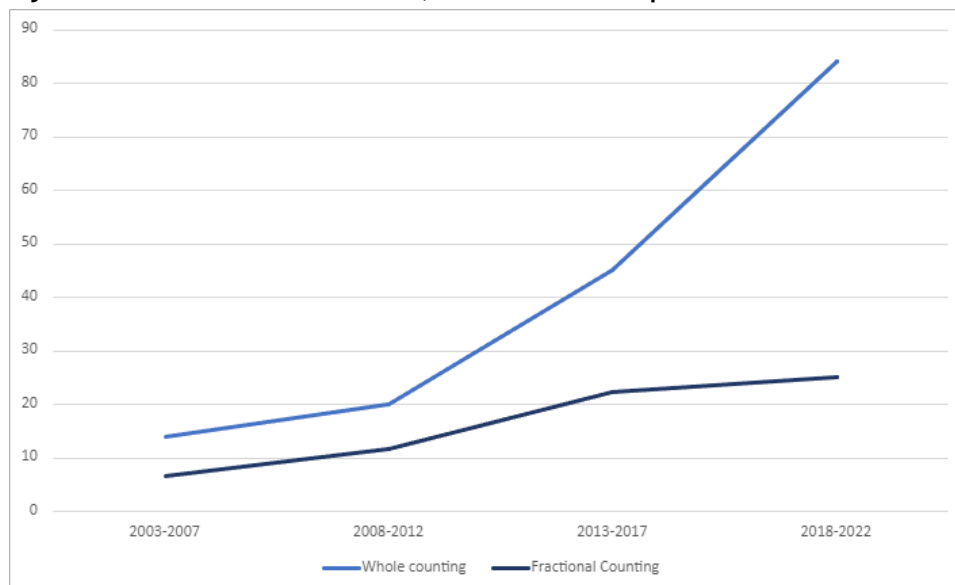
**Figure 2. Number articles over time, full and fractional publication counts**

Table 1 lists the most frequent journals for CMSS articles, where all journals with more than three articles during the period are shown. In all 32 articles (14%) were published in the journal *International Maritime Health*, making this by far the most frequent journal. The next three journals on the list, each with 7 or 8 articles, are *Maritime Policy*, *Science of the Total Environment*, and *BMC Public Health*. The remaining 8 journals on the list have 4-6 articles, while any journals not on the list have three or less articles co-authored by a CMSS researcher. Hence, with the exception of the top journal (*International Maritime Health*), articles appear to be fairly spread out in terms of journals.

**Table 1. Most frequent journals for CMSS articles**

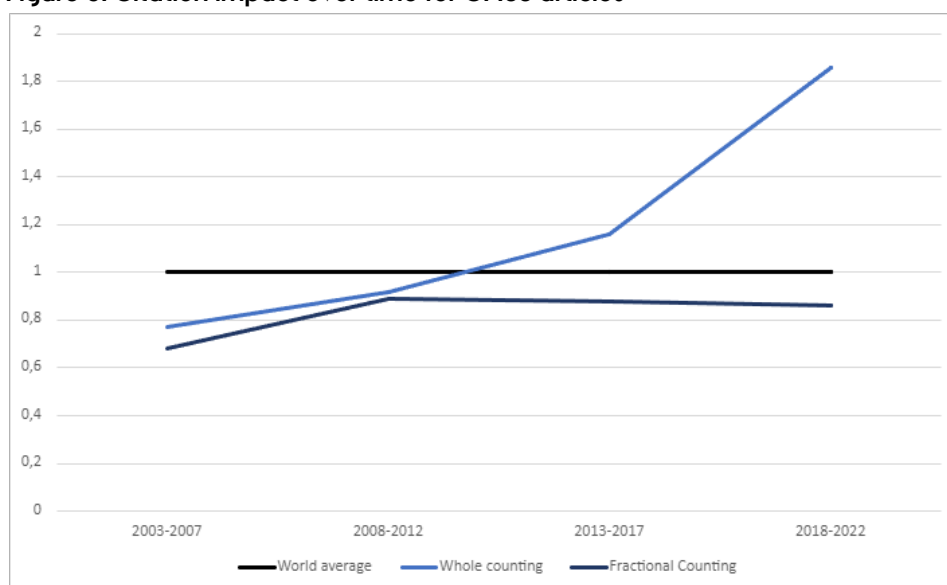
Journal	Number articles
Int. Marit. Health	32
Mar. Pol.	8
Sci. Total Environ.	7
BMC Public Health	7
Saf. Sci.	6
J. Occup. Med. Toxicol.	5
Biol. Invasions	5
Am. J. Ind. Med.	4
Int. J. Environ. Res. Public Health	4
Mar. Resour. Econ.	4
Occup. Environ. Med.	4
Scand. J. Public Health	4

### 2.3/ Citation impact

We first examine citation impact for these articles, measured by the mean normalized citation score (MNCS). The MNCS measures the number of citations normalized according to field and year of publication, hence what the citation impact is in comparison with other articles within the same field. A MNCS of one is equal to the world average within a given field. For the period 2018-2022, there were 84 articles that have received in all 498 citations<sup>5</sup>. The fractional count for this period was 25 articles (on average 3.2 co-authors per article) and 116 citations.

Figure 3 shows the MNCS over time. As mentioned above, the MNCS is normalised to one, so the world average within a given field is equal to one. As can be seen from figure 3, MNCS was under one for the first ten years of the overall period, but has increased greatly, rising to 1.16 for 2013-2017 and to 1.86 for 2018-2022. Hence citation impact for the last period is 86% percent higher than average citation impact within the same research areas. This corresponds well with the results of a recent report on research in the Danish maritime sector, where it was found that Danish research within maritime human resources for 2008-2017 was more than double the OECD average<sup>6</sup>. Fractional citation impact has not increased by nearly as much and has remained under one for the entire period. An interpretation of this is that citation impact is highest for those papers with broad collaboration (ie. a large number of co-authors).

**Figure 3. Citation impact over time for CMSS articles**



PPTop10% measures the number of articles that are among the top 10% most cited within a field. A share of 10% corresponds to the world average. PPTop10% is useful as an additional indicator as it measures the share of articles that are highly cited. Citation activity is typically very skewed, where a small number of articles may have received the large majority of citations (hence, in some cases, high MNCS can be due to a single very highly cited paper).

As figure 4 shows, in the first period no articles were among the top 10% in terms of citation impact, however this share has grown steadily in the subsequent periods. In the next two periods, PPTop10% was around 10% but reached 19% in the final period. Fractional counts show that

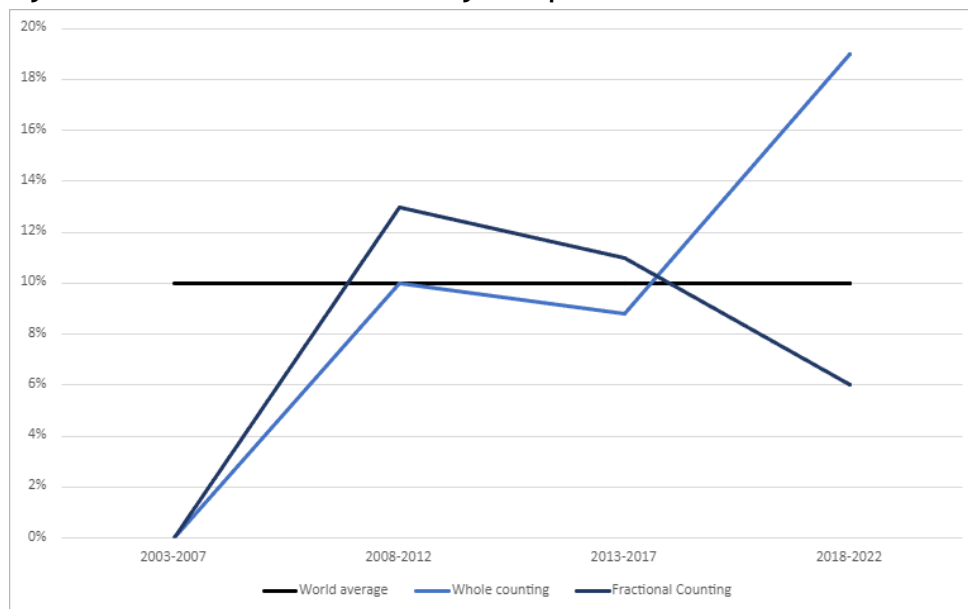
<sup>5</sup> Excluding self-citations, ie. where co-authors cite their own publications.

<sup>6</sup> Damvad Analytics (2019) Danish Maritime Research 2008-2017. [https://www.dendanskemaritimefond.dk/wp-content/uploads/2018/10/executive\\_report\\_danish\\_maritime\\_research\\_web.pdf](https://www.dendanskemaritimefond.dk/wp-content/uploads/2018/10/executive_report_danish_maritime_research_web.pdf)



particularly in the last period, highly cited papers involved broad collaboration with external partners. In the section on collaboration below, we show a visualization of CMSS's collaboration partners.

**Figure 4. Share of CMSS articles among the top 10% most cited within their field**



#### 2.4/ Research competences and expertise

We now turn our focus to assessment of CMSS's expertise and competences from the perspective of interviewed stakeholders.

The interviewed stakeholders identified CMSS as a professional centre with a high level of expertise within their core areas of maritime safety, health and work environment. A few stakeholders highlighted that they considered the research from CMSS to be among the best in their field. A number of stakeholders emphasized the importance of CMSS's research-based approach for the quality of commissioned studies, ensuring the validity and credibility of the reports and their results. Having a centre that is "uncompromising" in its approach and can be seen as an objective third party meant according to stakeholders that the results could be trusted to be presented in an unbiased way.

Some stakeholders highlighted specific competences of CMSS, particularly within methodology and knowledge of the field. Being part of the Department of Public Health at the University of Southern Denmark, CMSS is able to tap into a broad range of quantitative and qualitative methods and experience with various forms of data. Some mentioned CMSS's ability to create appropriate and feasible research designs, knowledge and handling of GDPR-rules and other basic familiarity with conducting research within Blue Denmark. There has been a growing interest from the business sector in gathering additional data on maritime health and safety, and the general ability to collect and process register data at CMSS was mentioned as an important factor in this regard.

Stakeholders specifically highlighted the skills in qualitative and epidemiological research. CMSS's experience within maritime research was also considered essential for some studies,

such as being able to conduct interviews with seafarers or come on board ships to conduct observation studies.

Some stakeholders further commented on CMSS's success in getting external funding. One stakeholder highlighted that CMSS is in a unique position, both domestically and internationally, with access to and ability to combine register-based health data and data on evacuations and accidents. CMSS has the access and research ability to combine these data, and this was highlighted as an especially unique and important advantage and shows both the data-processing abilities of CMSS and their broad external network.

The stakeholders provided examples of how CMSS's research and competences impacted their own organisation or the maritime sector. One described CMSS as a bridge-builder from research to practice. An example is within maritime education, where CMSS's support was considered essential in helping to develop a more research-based education program and to further the research commitments for maritime schools.

Several stakeholders referred to the recent report by CMSS on bullying and harassment in Danish shipping<sup>7</sup>. The report has been effective in drawing attention to issues on the psychological work environment in shipping, and stakeholders have been able to use the report as a tool to suggest changes to practice and to international guidelines for example in the World Health Organisation (WHO) and the International Maritime Organisation (IMO). Hence, the report appears already to have impacted policy and practice, though other stakeholders have emphasized that much more will need to be done to maintain focus on these issues and achieve real change.

Another stakeholder described how they have presented a CMSS report on maritime work conditions more broadly to staff within their organization, which inspired related work in other business areas. Stakeholders also identified some areas where they considered the research and competences of CMSS to be less connected to practice. An example was economics-related work, which was found to be less applicable in practice. A similar comment was made on work related to environmental engineering and the green transition. However, at the same time, stakeholders acknowledged that it was important for CMSS to maintain focus on its core areas of expertise and avoid overly broadening its domain.

<sup>7</sup> <https://portal.findresearcher.sdu.dk/en/publications/cmss-research-report-bullying-and-harassment-in-the-danish-fleet>

### 3.0 Prioritisation of topics

A key topic in the interviews was priorities for CMSS's activities. There are several dimensions or trade-offs involved in setting priorities, such as which areas or topics to focus on, efforts devoted to networking and building relationships, and balance between research and research-based consultancy activities. Each of these balances are complex, and no single stakeholder had full in-depth knowledge of all of CMSS's activities. Nonetheless, many of the stakeholders had valuable input on CMSS's prioritization of its different activities.

CMSS's strategic plan for 2020-2024 identifies three core areas: Maritime health, Maritime safety and Environmental and business economics. While health (including work environment) and safety areas were discussed extensively in the interviews, issues concerning Maritime environmental and business economics were essentially absent from discussions. Possible explanations are that CMSS indeed has its main focus and strengths within health and safety (as is also reflected by the interviews), or that it is due to the selection of stakeholders. In addition, the majority of our interviews focused on stakeholders outside of academia. Hence, an additional possibility is that CMSS's work within economics is more limited to academic research and not to its outreach activities. A review for example of CMSS's publications during recent years indicates that their research spans a broader range of areas than maritime health and safety. In any case, the evaluation both here and below is focused on the interviews, and hence on CMSS's work and strengths within Maritime health and safety.

All stakeholders were very positive about CMSS's prioritization of research topics and areas within safety onboard ships and offshore, physical and psychological work environment, health and medical care. These are the areas that CMSS has its strongest expertise and as described above, has its greatest impact for Blue Denmark. There have however been a number of suggestions for topics or areas to focus on in the future, which we discuss below.

The balance between research activities and research-based consultancy is complex. On the one hand, CMSS is a research centre, and its evidence-based research has importance for Blue Denmark and also forms a foundation for their consultancy and advisory work. As noted above, the value of CMSS's research-based expertise was emphasized in a number of the interviews. On the other hand, consultancy work such as their recent report on bullying and harassment is more directly targeted at the implementation of changes (for example in practices or policies) based on results. While we do not have data on what share of CMSS's activities are devoted to consultancy work, it is very apparent from the interviews that CMSS has a large presence among the different stakeholders in Blue Denmark and conducts a lot of work that is cited and used by actors, whether it is to improve work conditions or safety procedures. It was however, suggested that CMSS could further improve the impact of their consultancy work by placing more emphasis on the practical relevance of the study and less on its relevance for research. For example, basic descriptive results from a study can in some cases be more easily put to use in designing and implementing change in practice than more complex, research driven studies that seek to shed light on a research question, such as understanding the underlying factors behind some phenomenon. This point is also touched on in the next section.

Also connected to the above is to what extent CMSS should devote resources to following up on results of their work to help improve dissemination and uptake of the results and actual implementation of changes based on the results. Some stakeholders noted that CMSS was fairly good at holding contact and in that way following up on its studies. However, another stakeholder argued that CMSS could do more to actively participate in follow-up processes.

### 3.1/ Future topics

The stakeholders suggested a number of topics that they felt should be given priority in the future. The first issue concerns recruiting and the attractiveness of a maritime career. Due to declining uptake of new, younger staff, the average age of employees that work in the Blue Denmark, in fishing, shipping or offshore, is increasing. The maritime sector thus faces serious challenges in recruiting and maintaining employees. In addition, the share of female employees in these areas is very low. Based on this, three questions were suggested to better understand this decline and how it can be turned around:

- Examination of why a lot of people leave their maritime careers.
- Analysis of how to increase the number of young people that enter into a maritime career.
- Analysis of how to make maritime careers more attractive for women.

Existing studies indicate that seafarers generally do not have a healthy, varied diet while on ships, which can potentially affect their health. This second topic concerns the food habits of seafarers, what influences their habits and how this affects their health in the short and long term.

A third topic concerns emergency medicine at sea, how it functions and the role of emergency medical advice from doctors on land. This encompasses for example, education, the selection of healthy seafarers, how to ensure that we send out healthy individuals, how to handle illnesses at sea, what medications they carry and whether they can use them, and how skilled they are as medical practitioners.

A fourth suggested topic was a follow-up examination of the report about harassment and bullying on board. Issues concerning the psychological work environment are complex and likely difficult to change, hence it would be valuable both to further probe this area and to examine whether changes have been implemented and their impact on the work environment.

Finally, it is expected that cargo ships increasingly transition to green fuels. The fifth topic is an examination of the implications of new ammonia-based fuels for safety precautions and protocols and for health conditions. For example, what are the health effects of fumes from ammonia-based engines, even very low levels, for health conditions.

## 4.0 Collaboration

An important part of CMSS' strategy in recent years, and in their activities since the previous evaluation in 2005, has been to cultivate external funding sources and collaborative partnerships. While we do not have detailed, complete information on the external funding that CMSS has secured over the years, it is clear from developments that CMSS has grown in size since 2005. Both the interviews and analysis indicate active and growing collaboration with external partners. For instance, they currently maintain a strong relationship with Radio Medical, the unit that provides remote medical assistance to Danish ships at sea. However, CMSS is not limited to engaging solely in Danish networks, relationships and research collaborations. An integral part of their strategy involves actively seeking international collaborations. For instance, CMSS participates in the ErgoShip conference (and hosted the conference in 2023), and they have previously collaborated with the International Maritime Health Association (IMHA) on research projects related to Maritime Health.

This section evaluates CMSS's collaboration and relations with both the Danish Maritime Authority (Søfartsstyrelsen) and other national as well as international actors. Before reviewing the qualitative assessments of CMSS's interaction with external partners, in particular non-academic stakeholders, we examine research collaboration patterns based on analysis of co-authorship patterns. Figure 5 displays a network analysis, where the size of nodes indicates the number of co-authorships and different clusters of networks are identified by colours.

Interestingly, collaborations are grouped around 7 clusters. One cluster appears to involve marine biology and collaborations with Norwegian research institutions, another cluster around maritime shipping and yet another with focus on environmental issues.



tional example is the study on bullying and harassment, conducted by CMSS for the Danish Maritime Authority, which several stakeholders refer to as an important project when discussing the collaboration between CMSS and the Danish Maritime Authority.

However, it was also argued that CMSS could strengthen its role of contributing to the Blue Denmark through its consultancy activities. In particular, three points were emphasised. First, while it was acknowledged that CMSS already actively reaches out to various stakeholders, CMSS could expand on these activities, further benefitting the maritime sector and also giving CMSS a broader understanding of sector needs. The second point concerns the goals orientation in public consultancy projects, where there can be a balance between on the one hand utilizing a research-based approach and on the other hand ensuring that results have a practical application. One stakeholder argued that placing too much emphasis on deeper research-based questions, such as causal relationships, can be at the expense of basic descriptive analysis which would have greatest practical impact. Hence, opportunities for improvement arise in the need for clearer expectations from the Danish Maritime Authority regarding projects outcomes, reporting, and data dissemination. Finally, it was argued that CMSS could play a larger role than is currently the case in follow-up on projects to participate in discussions and activities to implement changes based on project results.

#### **4.2/ Network connections and collaboration**

Several stakeholders emphasize the importance of “knowing the people within the maritime sector” and “being part of the maritime cluster in Denmark”. They describe the maritime sector as a “maritime community” where people know each other. Therefore, reaching out and prioritizing the maintenance of contacts and network relationships benefits everyone working within the maritime sector.

The majority of respondents view that CMSS possesses a strong network, and they themselves maintain a positive relationship with CMSS. Furthermore, they mention that CMSS is positioned effectively within the overarching maritime network, both domestically and internationally. For instance, one stakeholder mentions that CMSS maintains a relationship with the Maritime Fund, visiting them several times to uphold good contact. Additionally, CMSS participate in annual meetings organized by Danish Shipowners' Association. In this context, stakeholders argued that participation is crucial not only for networking but also for the relation with the Danish Shipowners, as they play a significant role in determining the recipients of funds from various foundations in the field.

The stakeholders also viewed that CMSS places a high priority on reaching out to, among others, fishermen and individuals working at sea. For instance, CMSS participates annually in a forum where shipping companies share their experiences and concerns, providing insight into what is relevant to further explore from a research perspective. Additionally, it is mentioned that CMSS is able to conduct studies aboard ships to observe the working environment and that this opportunity is available to CMSS because of the strong relation with seafarers.

While satisfaction with CMSS's ability to reach out and prioritize its network is a predominant viewpoint among stakeholders, one stakeholder suggests that it could be advantageous for CMSS if they establish an even stronger relation with the industry organizations.

In addition to CMSS's connections with other maritime organizations and participation in meetings and conferences, several stakeholders also mention CMSS's ability to maintain strong personal connections with stakeholders within the maritime sector. For instance, one stakeholder mentions that CMSS maintains a high level of openness towards its stakeholders, exemplified by the stakeholder feeling that one can always reach out to CMSS and obtain the information needed. However, while some stakeholders state that they have a long-standing and strong relationship with CMSS, others express a need for improved communication and collaboration.

#### 4.3/ International relations and collaboration

A general perception among the stakeholders is that CMSS has a strong foundation in international collaboration, as evidenced by its partnerships, impactful contributions, and active participation in conferences.

A few stakeholders outline CMSS's engagement with national and international maritime environments, focusing on relations with maritime entities in Norway, Gdansk, and Hamburg. In addition to direct international collaboration on research projects, the interviews also reveal that CMSS prioritizes representing itself globally. For instance, this is evident in its participation in conferences like ErgoShip, where the focal point is presentations with inputs from a global perspective.

It is not only the proactive international collaboration and conference participation that stakeholders highlight when discussing CMSS's international role. In fact, CMSS's research findings also seem to make an impact internationally. For instance, one stakeholder mentions how the aforementioned study on bullying and harassment is now utilized by organizations such as WHO and IMO.

The collective insights from the stakeholders affirm that CMSS actively engages in international collaborations, with a notable focus on shared thematic areas. This in particular is based on the organization's participation in conferences, collaborative initiatives, and impactful research outputs. While some stakeholders express satisfaction with CMSS's current efforts, others express opportunities for further enhancement, particularly in expanding European collaborations and increasing involvement in international associations. In conclusion, CMSS's commitment to collaboration and its existing international network provide a strong foundation for future growth and impact within the global maritime sector.



## 5.0 Advisory Board

CMSS has had an advisory board for a number of years, though where the format for the meetings has varied over time. In the current model, the advisory board consists of five members representing shipping, offshore, fishing and the Danish Maritime Authority, and meets twice a year. In the first session of the meeting, researchers from CMSS present the results of 3-4 recent projects in order to give the board an idea of their recent work. In the second session, CMSS management meets with the board to discuss selected issues.

Interviewed advisory board members had differing perspectives on how the board functioned, though the general impressions of the meetings were positive. Board members felt that CMSS was receptive to members' comments and suggestions and had a perception that their input was actively taken into account. At the same time, one interviewed board member noted that the value of advisory board meetings was also dependent on active participation by board members themselves, which could be increased.

Interviewed board members appreciated presentation and discussion of recent work, though some argued that strategic discussions could be further prioritized, and potentially also made more clear and concrete in their focus. The board has the greatest potential for influence through their input to discussions on specific strategic issues concerning what topics should be focused in the future and in what way. Arguably, CMSS's domain can be seen as broadening, for example as offshore activities increasingly includes the wind energy sector and offshore turbines, and the coming shift to renewable energy brings new perspectives for shipping. One member suggested that bringing in a representative from wind energy could be helpful at some point in the future. On the other hand, another member noted that it was important that CMSS maintained strong expertise and a critical mass within their core areas and avoided spreading themselves too thin in terms of the areas they are engaged in.

## 6.0 Conclusion

This evaluation has examined CMSS's activities through a bibliometric analysis of publications co-authored by CMSS during the last 20 years and through interviews with key stakeholders. In this conclusion we summarize key points from the evaluation.

CMSS has greatly increased their activities since 2005, which is also strongly reflected in their publications. There have also been strong increases in publication of journal articles and in the last five years, the visibility and citation impact of CMSS's research has strongly increased. This is particularly the case for research in broad collaborations. Increases in the average number of co-authors per article suggest that CMSS has broadened its research collaboration over time.

Interviews with stakeholders clearly point to maritime safety, health and work environment as core areas where CMSS is most well-known and respected, and where they have made the most visible contributions to the Blue Denmark. CMSS's research portfolio is broader than these areas and both includes other areas such as economics and marine life and to the literature outside of the maritime sector. This is not out of the ordinary. There can be strong synergies between different areas, and some topics, such as maritime safety, health and work environment, may be more oriented to applied studies that are directly applicable for the sector. Other areas of research may also be very relevant, though in a less direct way.

While differences between the orientations of research and consultancy activities should not be problematized, they can still motivate reflection in upcoming planning and strategies. For example, are there potentials for greater outreach in areas outside of maritime safety, health and work environment? Or given CMSS's size and composition, would it be beneficial to focus to a greater extent on core areas? Issues of research capacity are of course relevant here. For example, CMSS has a small share of staff devoted to economics and marine life, who have performed well in terms of their research but may have limited capacity to increase engagement in outreach activities.

Our impression from the interviews is that Blue Denmark is a tight-knit and dedicated community. CMSS is well-placed in this community, and the interviews provided numerous examples of how CMSS has maintained contact with stakeholders and contributed to their activities. The interviews both indicate that CMSS is proactive in reaching out to actors in Blue Denmark but also that there is potential for strengthening their contribution towards improving safety and health and working conditions. Examples here are greater focus on enhancing the impact of consultancy activities, expanding interaction with key stakeholders, and taking on a more active role in follow-up activities to implement change based on the results of CMSS studies.

The interviews suggest that CMSS is best placed to maintain a narrow focus on their core areas of expertise, though with a view towards new issues within maritime health and safety that will increase in importance. One example here is health and safety implications of the transformation towards the use of green energy sources.

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