

Theme session G

Diversity, equity, and
inclusion in marine science
and related sectors



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H.C. Andersens Boulevard 44-46
DK-1553 Copenhagen V
Denmark
Telephone (+45) 33 38 67 00
Telefax (+45) 33 93 42 15
www.ices.dk
info@ices.dk

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Theme session Report

Diversity, equity, and inclusion in marine science and related sectors

Conveners: Ellen Johannesen (ICES Secretariat), Alina Madita Wieczorek (New Zealand), Lara Funk (UK)

Theme session G brought together researchers and practitioners working on aspects of Diversity, Equity, and Inclusion (DEI), including gender equality in the marine, maritime, and/or ocean space. Contributions shared experiences on methods, implementation, and development with eight oral presentations and four poster presentations. During the session poster presenters were given the opportunity to highlight their contribution in a 1-minute pitch. The session showcased advances in practices aimed at enhancing DEI by sharing good practice and experiences in working on DEI in marine science, the importance of DEI in marine science as well as additional needs and pathways. Contributors were invited to be creative with the format of their presentation, and while all contributors used a conventional PowerPoint presentation style, personal accounts of lived experiences shared during some of the presentations were particularly effective, and the audience was visibly engaged.

This was the first theme session of its kind in ICES, and highlighted that equality is fundamental to marine science that aims to respond to societal needs for impartial evidence on the state and sustainable use of our seas and oceans. Looking at issues of diversity, equity, and inclusion from an international perspective highlighted the importance of defining underrepresentation in a context-specific manner, and in designing initiatives to support identified needs.

During the session, attendees learned about a range of initiatives, starting with presentations that looked at the marine science institutional contexts and changes needed to create more inclusive working cultures that support underrepresented groups in marine science. The ongoing underrepresentation of women in leadership roles in marine science organizations and institutions, including ICES as an organization was documented.

Measuring representation can be an important part of recognizing bias and making visible inequality in science institutions and processes. New techniques for understanding gender bias in publications, as well as the ICES publication archive are facilitated by the new ICES library and growing digital archive.

The value of participatory approaches, and limits of institutional plans without adequate resourcing were highlighted. Identifying barriers and addressing inequality are critical for high-quality interdisciplinary marine science. Diverse viewpoints, embracing a broad range of disciplines, worldviews, and career stages are essential for marine science.

The challenges and importance of interdisciplinary marine research was in focus in two presentations. The role of communication and integration of different knowledge to understand complex systems was highlighted, noting the links between knowledge production and equity, where the value and power of different types of knowledge requires critical reflection to flatten power hierarchies and promote inclusion.

The session also highlighted initiatives aiming to attract a greater diversity of young people to marine science careers through paid courses and internships, with examples at the high school and college level of providing people from underrepresented groups opportunities to experience marine science and consider it as a career path. Initiatives like the Woods Hole Partnership Education Program ([PEP](#))

and IN FISH demonstrate that inclusion is an action that requires targeted recruiting and removal of barriers to access such as funding. Intentional mentoring is required to support and retain students from backgrounds and identities that have been historically excluded from science careers.

A suggested strategy to facilitate diversity and support a range of people through life stages was to promote social learning via establishing communities of practice in stock assessment.

Making seagoing leadership roles accessible was the aim of the Scientist in Charge pathway for Seagoers. Developing a transparent pathway with increasing responsibility over time was found to facilitate succession planning and provide the opportunity to learn new duties and skills. This made leadership roles more accessible for a greater diversity of people and added greater capacity to the workforce.

Acknowledging that parental responsibilities brings new challenges, with added complexity for parents who conduct fieldwork at sea, additional support is needed to help parents in their return to work. Cultural change towards parental responsibility can be fostered through peer support and parental leave champions can offer advice to employees and managers outside the formality of line management.

Equality also needs to be considered from the perspective of human rights for fishers, where the inclusion of their voices has significant implications for science and industry.

A recurring theme which came up in the questions and discussion section, was barriers to participating in field work and in particular long sea-going voyages. It is therefore relevant that the theme session “Creating supportive fieldwork in marine sciences” will address these issues at the 2024 ICES Annual Science Conference.

The common thread between all the presentations emerged as how inclusion is an intentional act that is not limited to the start of a career journey but must be considered in all workplaces and interactions. Inequality must be treated holistically. Having a range of contributions from all over the world, the session contributions exemplified how DEI needs to be addressed in a context-specific way all along the marine researcher career “pipeline”, in the way we do science, via creating communities of practice, acknowledging the need for interdisciplinary science, in programs that give people and new perspectives access, with young people who have been historically excluded, through supporting mid-career researchers with transitions from parental leave and managing caring responsibilities, as well as how training and shadowing can help people to leadership roles in the field.

Conclusions

Diversity, Equity, and Inclusion in marine science is important for social justice but is also critical for high quality marine science. Inclusion is an action, and supporting DEI along all career stages and aspects of research is a critical part of developing best available science. Acknowledging this work is only the first step, continued allocation of funding and resources is necessary to support these initiatives, which are often under-funded and conducted in the margins of other responsibilities.

This theme session was well attended despite taking place at the same time as two theme sessions which addressed topics of relevance to a large proportion of the ICES community. Taking place in the smallest venue of the conference, the session was in fact so well attended that at times people had to stand in the back or sit on the stairs. A brief collection of demographic information at the start of the session highlighted that the majority of attendees identified as being from Europe (68%), woman (77%), Early-career (55%), from an underrepresented group in the ICES community (42%). To continue to address inequality, DEI theme and network sessions should be regular features of the ICES Annual Science Conference.

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CM 62: Promoting marine science in historically marginalized groups with a high school internship

L.R. Brewster¹, G. Fay¹, S.X. Cadrin¹

Diversity is integral to progress and excellence in science because people's backgrounds influence their question development and approach to answering them. However, individuals of color and from under-privileged backgrounds have historically been excluded from science, technology, engineering and mathematics (STEM) careers and one barrier is opportunity for research internships. Internships provide critical practical experience, mentorship and skill-building that can increase interest and employability, and act as a pipeline for early career scientists. However, "pay-to-play" or unpaid internships preclude financially challenged applicants. Conversely paid internships have demonstrated success at increasing recruitment, retention, and graduation rates of historically marginalized and minoritized populations to STEM degree programs. In 2022, The University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST), a world-class marine science organization in the state's most diverse city, developed a paid summer internship program that supports high school students from under-represented groups. SMAST faculty collaborated with New Bedford High School to hire students as full time, temporary employees at SMAST and the Massachusetts Division of Marine Fisheries. The internship promotes higher education and careers in marine science to high school students by exposing them to the range of research occurring at the university and state level and providing an opportunity to collaborate with faculty, staff and students. The internship included an orientation week that covered introductions to marine science, lab safety, and selection of research projects, followed by four weeks conducting a project in a lab of their choosing and attending a weekly marine-science related field trip. The program culminated in a Marine Science Symposium where students developed important career skills as they presented their research projects and answered questions from members of the SMAST community and public. Participant feedback was extremely positive, with students indicating they would apply again if eligible and would consider pursuing further education in marine science. SMAST plans to expand the summer internship program to other under-represented groups in the community to improve diversity, equity and inclusion in marine science.

Keywords: research experience, youth, recruitment, diversity, equity

Affiliation: ¹Department of Fisheries Oceanography, School for Marine Science and Technology, University of Massachusetts Dartmouth, 836 South Rodney French Blvd., New Bedford, MA 02719, USA

Contact Info: lbrewster@umassd.edu

CM 138: Fostering Diversity, Equity and Inclusion into interdisciplinary marine research

Samiya Selim¹, Laura Kaikkonen², Charles Addey, Bia Dias, Sara Garcia-Morales, Ignacio Gianelli, Shenghui Li, Katherine Maltby, Juliano Palacios-Abrantes, Rebecca Shellock

Early career researchers (ECRs) are increasingly expected to work across various disciplines, and to have skills in several domains to navigate ocean sustainability challenges. ECRs are well placed to innovate and champion new approaches to addressing critical research priorities. However, it is unclear how Diversity, Equity, and Inclusion (DEI) issues affect ECR participation in interdisciplinarity and how can DEI issues be better considered in research practices across different regions and cultures. This study draws on an online workshop organized in October 2022 on the challenges and opportunities for progressing DEI in interdisciplinary marine science. The workshop was attended by ECRs from both the Global North and South, representing various disciplinary backgrounds within marine science. The workshop was organized in small groups through semi-structured interviews, which allowed participants to discuss the following three questions: 1) What does DEI mean for you and your research community? 2) What are the main challenges or barriers to DEI being an interdisciplinary marine researcher? and 3) How can DEI be better considered or fostered within interdisciplinary marine research? In this presentation we reflect on the barriers to DEI faced by marine ECRs across disciplinary settings based on the workshop outcomes and discuss opportunities to overcome them.

Keywords: barriers to inclusion, diversity in science, early career researchers, equality, intersectionality, interdisciplinarity

Affiliation: 1 - Center for sustainable development, University of Liberal Arts, Bangladesh, 2 - University of Helsinki, Finland

Contact Info: samiya.selim@ulab.edu.bd | laura.m.kaikkonen@helsinki.fi

CM 329: Bumps, bairns and support for parents working as marine scientists

Lynda Blackadder¹, Harriet Cole, Nicola Beaton, Helen Holah

The demographic disparity of senior leaders in science has long been recognised, with women more often underrepresented. Parenthood has previously been identified as a barrier to career progression and many staff at the Marine Laboratory in Aberdeen identify with this issue. This is a particular concern for marine scientists as their role is often not limited to desk-based tasks and may involve time away from home or duties at sea. This paper will discuss some of the key issues; including financial, physical, mental and emotional worries, which have been highlighted when marine scientists consider or experience parenthood.

A lack of support was identified as one of the main problems that staff experienced when considering parenthood or upon returning to the workplace. As part of a wider application to the Athena Swan (AS) Charter, a number of actions were suggested to address this. These included staff establishing a number of Champions (including Maternity, Paternity and Shared Parental), a monthly support session (Bumps to Bairns) and useful documentation (Frequently Asked Questions and templates for discussions with managers). The overall aim was to provide support for all parents, but it was acknowledged that women are often disproportionately affected and reasons for this will be discussed.

The AS Bronze Charter was awarded to Marine Scotland Science (MSS) in November 2019 – only the second award to a UK Civil Service department, a significant achievement for which MSS received substantial recognition. Diversity, Equality and Inclusion continue to be considered within the organisation as part of a legal duty and as a mandatory staff objective. This paper will discuss the wider benefits of the support systems that have been established and provide a qualitative review of how the services have impacted staff. We will discuss what could be possible in future to provide additional support for working parents, women in particular, in an attempt to reduce demographic disparity at senior levels.

Keywords: gender bias, diversity, equality, support, working parents

Affiliation: ¹Marine and Freshwater Research Centre, Atlantic technological university (ATU), Dublin Road, Galway, Ireland

Contact Info: Lynda.Blackadder@gov.scot

CM 373: Changing author gender patterns in over 100 years of ICES publications

Ffion Bel¹, Nils Olav Handegard, Ellen Johannessen, Søren Larsen, Jörn Schmidt, Ruth Anderson

ICES has been publishing for over 100 years, creating a rich archive of historical content. At the start of 2022, ICES launched a new library platform, which enables easy tagging and extraction of information related to the publications. By inferring author gender based on first names, this has allowed a first study into how author gender patterns have changed over time. Since the process of adding historical documents is ongoing, this is a preliminary study that will evolve as the archive becomes more complete. However, the documents currently available already date back to 1899, and offer a unique time lapse into the changing diversity of ICES authors.

Keywords: ICES library; ICES publications; author gender; diversity

Affiliation: 1 - H. C. Andersens Boulevard 44-46, 1553 Copenhagen V, Denmark

Contact Info: ffion.bell@ices.dk

CM 404: Institutional actions for empowering women & underrepresented groups in an intergovernmental marine science organization

Ellen Johannesen, Francis Neat, Susan Buckingham, Momoko Kitada

International marine science institutions have an important role to play in fostering workplaces that promote gender equality. While women are active in ocean science disciplines, they continue to be underrepresented in leadership roles. Institutions that wish to address ongoing inequality between genders in leadership roles must make plans, that begin with critically assessing current status, and then identifying goals, and actions to improve equality. Many research organizations have recently created gender equality plans. The International Council for the Exploration of the Sea (ICES) is an intergovernmental organization that works to coordinate marine science in the North Atlantic Ocean and adjacent seas. ICES is a science network, with 20 member countries, >150 working groups, and 6000 experts. Based on a 2019 commitment in the ICES strategic plan, various initiatives have been developing to support diversity, equity, and inclusion, including a gender equality plan.

This work draws on a feminist participatory action research approach, as well as ethnographic methods to link theoretical frameworks to the drivers that initiated a change agenda for developing new policy and analyzing resistance experienced along the way.

Using both quantitative and qualitative data gathered during the development of the ICES gender equality plan and drawing on feminist institutional perspectives and reflections on how “insider” feminist activists engage in internal policy-making, this research critically reflects on the value and limits of participatory approaches and the implications for expectations of culture change.

Keywords: gender, equality, diversity, inclusion, action, marine, science, empower

Contact Info: ellen.johannesen@ices.dk/w1904103@wmu.se

CM 424: Undergraduate diversity programs that work: A different process for a different outcome

G. Liles¹, N. Cabana, A. Jearld, A. Price, O. Scott Price

The Inclusive NOAA Fisheries Internship Program (IN FISH) is a ten-week summer internship serving undergraduates primarily from groups historically underrepresented in marine and environmental sciences. Established in 2021, IN FISH is modelled on the Woods Hole Partnership Education Program (PEP), which has been bringing diverse cohorts of undergraduates to Woods Hole, MA since 2009.

Both programs are funded and administered by NOAA Fisheries with partners who have a shared concern with building a more inclusive research and management community. Both programs bring together diverse cohorts of students and provide a credit-earning undergraduate course, career-building activities, and mentored ten-week research or management projects.

IN FISH and PEP have identical goals: (1) recruit diverse talent from a network that includes Historically Black Colleges and Universities (HBCUs) and other Minority Serving Institutions (MSIs); (2) change the hosting community by providing program mentors and staff with opportunities to learn to be more welcoming and more inclusive; and (3) provide positive developmental opportunities to students so they are more likely to stay in science.

The PEP model was designed to differ from most existing internship models in all program elements, including recruitment, selection, matching, mentoring, and program development. The model calls for ongoing training for program mentors and staff, and ongoing connection with the students throughout the program (and after). Intern recruitment relies on in-person campus visits and ongoing network building with HBCU faculty and administrators. Intern selection is a holistic process that has the potential to change the way we think about who gets to participate in the STEM enterprise. A result of this approach is that students feel welcomed and included, and participating institutions learn how to make welcoming, inclusive work environments.

The programs have succeeded in attracting diverse talent: in 14 years, PEP has graduated 214 students, more than half of whom attended HBCU/MSIs. More than 80% of the 244 PEP/IN FISH graduates self-identify in one of the demographics underrepresented in science. Data gathered in 2019 show that 70% of PEP interns go to graduate school, including 25% in PhD or MD/DVM programs. In 2019, 81 of the first 122 PEP alumni (66%) were employed in science, with 17 employed by government (federal, state, local, tribal), 15 at an NGO, 21 working in industry, and 28 doing science in academia. The PEP/IN FISH model can be employed in other locations and STEM fields to increase diversity in the scientific and management workforce.

Keywords: diversity, equity, inclusion, marine science, environmental science

Affiliation: 1 - National Oceanic and Atmospheric Administration

Contact Info: George.Liles@noaa.gov

CM 475: Developing a Scientist-in-Charge (SIC) pathway and resources for Marine Scotland research vessels to increase diversity and create a gender balanced SIC pool

H. Smith, L. Clayton, H.L. Holah, B. Rabe, R. Watret, C. Pert, L. Clarke, S. O'Connell, G. Grewar, H.F. Holah

A new training and development pathway for the Scientist-in-Charge (SIC) role on Marine Scotland's (MS) research vessels has been created to enable progress towards a wider and more diverse pool of SICs. Historically, successors for SIC roles were chosen by existing SICs and contingency planning was sometimes lacking. The MS Athena-SWAN Diversity Charter bronze award action plan included an Action Point (AP) to develop a structured, open and fair approach to SIC succession planning and training (the "SIC Pathway"). The AP was created in response to the low numbers of female SICs on MS research cruises (~10% in 2015-19), relative to the notably higher % of female MS sea-goers (~32%) and female SIC equivalents at other international institutions (~20-30%). The overall aim of this AP was to achieve a 100% increase in female SICs, from three (2019) to six by 2022. The training role of co-SIC was created, whereby prospective SICs could shadow existing SICs under supervision to take on tasks typically undertaken by the SIC, over time gaining enough experience to become an SIC themselves. A junior training role of Scientist-in-Training (SIT) was later added to allow a greater number of staff, particularly those less experienced, to train in one or two specific cruise tasks for shorter time periods, and to act as a stepping stone to co-SIC. The SIT and co-SIC roles have been tested on a number of cruises since 2020, with feedback gathered from the trainees and SICs to help refine the pathway. Feedback has been extremely positive and five staff have already progressed through the pathway from Co-SIC to active SICs. In parallel, we have developed resources to support seagoers in using the pathway. These include a Seagoer's Skills Logbook, formally released in March 2023, to be used by all seagoers to track their experience and skills across cruises, and to evidence their progress through the pathway, and an FAQ document to provide information about the SIC Pathway and logbook use. A staff network was established, hosting in-person drop-in sessions and online events to provide further information to interested staff. Buy-in from senior staff has proved vital in getting the SIC Pathway off the ground and promoting staff engagement. While originally gender-driven, the pathway aims to benefit everyone by making the path for development and training consistent, transparent, and fair, and improving resilience and contingency planning of cruises.

Keywords: training, Chief Scientist, Scientist-in-Charge, development, succession planning, diversity, equality, inclusion

Contact Info: helen.smith@gov.scot

CM 516: Speaking the same language? (Re)current challenges in interdisciplinary marine research

Fanny Barz^{*1}, Stefanie Haase¹, Maraja Riechers¹

Worldwide, interdisciplinary work is on the rise. Funding programmes call for the integration of different sciences, project teams are staffed interdisciplinarily and research questions are thus examined from different angles. Interdisciplinary research, in theory, can describe and solve a problem holistically – but does that work in practice? The authors of this questions come from different disciplines (social scientists and fisheries biologist), and we experience and observe that cooperation and collaboration between different fields is not always easy. This is particularly noticeable at the interface between the natural and the social sciences. The increasing efforts for interdisciplinary research taking place worldwide suggests a growing together of the disciplines and a building up of mutual understanding, as well as the synthetisation of results. However, interdisciplinary research does not mean a separate work package from a different discipline or hiring one spokesperson to represent the vast domain of “humanities and social sciences”. In practice, we experience prejudices like “greenwashing”, “for job creation only” towards social scientist or “ignoring the holistic approach” towards natural scientist, highlighting maybe a lack of understanding for the need of interdisciplinary research. We want to find out about the current perception of the ICES community on interdisciplinary collaboration. Is it profitable? Is it annoying? Do we even understand what our colleagues are doing and why we need each other? We would like to use this session to ask those present and interested about their opinions and experiences. In order to ensure a common understanding, we would start off with a short input of what interdisciplinary research is and how it differs e.g., to multi-disciplinary or transdisciplinary research. We also want to stimulate discussion by bringing questions to the session which will be answered live, and feedback will be shown via an app without delay. Further, this will give an insight into the current status of interdisciplinary research and cooperation within the ICES community. Because in the end, the production of knowledge and its incorporation into research and politics is also a question of equity.

Keywords: interdisciplinarity, knowledge production, knowledge equity, collaboration

Affiliation: ¹Thuenen Institute of Baltic Sea Fisheries

Contact Info: Fanny Barz, e-mail: fanny.barz@thuenen.de

CM 574: Improving science through social learning: defining the need for an international fish assessment community of practice

Kristan Blackhart

A sense of community has been found to benefit the workplace, including higher employee engagement, productivity, and creativity, as well as lower stress levels. When the workplace is focused on conducting research or developing operational science, these results can translate beyond individual satisfaction to meaningful impacts on the quality of science products. Mutual learning is an important component of fostering a sense of community by enabling people to learn from each other in non-formal ways. This presentation will focus on the need for, and potential benefits to be gained from, developing a formalized international community of practice focused on fish assessment. The goals of such a community could include innovation, knowledge stewardship, and development and dissemination of best practices in the field of fish assessment. A community of practice could also foster a code of conduct for the field focused on equity and inclusion, organize workshops with inclusion as a major planning element, and broaden participation and even support capacity building in fisheries assessment science. Many components for an international fish assessment community of practice already exist, and building from these existing components with a focus on equity and inclusion will ensure a diversity of voices are engaged in the community moving forward while simultaneously contributing substantially to community goals.

Keywords: fish assessment, community of practice, social learning

Affiliation: NOAA Fisheries, Office of Science and Technology, National Stock Assessment Program

Contact Info: kristan.blackhart@noaa.gov

CM 592: The acceptance of manuscripts in ICES Journal of Marine Science is unrelated to the gender of the corresponding author

Szymon Smoliński¹, Howard I. Browman²

Gender-related biases in the editorial decision making of journals can amplify gender inequities in science. We evaluated the level of gender equity in ICES Journal of Marine Science, focusing on i) the number of submitted manuscripts by gender of the corresponding author, ii) the long-term (13 years) trend in the gender ratio of the corresponding author, and iii) gender-related differences in the acceptance of manuscripts.

Data on 4975 corresponding authors and the fate of 7264 manuscripts (acceptance or rejection) submitted to ICES Journal of Marine Science from January 2009 to November 2022 were collected. The gender of each co-author (female or male) was assigned based on the author's given name using the *generizeR* package linked to the *generize.io* database. The number of manuscripts and percentage contribution by gender and year, and the ratio of female to male corresponding authors by year, were calculated. Trends over time in the gender ratio were evaluated and the null hypothesis that there is no difference in the mean annual acceptance rate between gender was tested using linear mixed models.

Successful prediction of gender was achieved for 98.1% of corresponding author names; 1.9% could not be assigned to gender. 34.3% of all corresponding authors were female and 63.8% were male. The ratio of female to male corresponding authors increased from 38.7% in 2009 to 67.3% in 2022; there was a significant linear time trend ($p < 0.001$). The overall average annual acceptance rate was at the level of 39.5% and no long-term trend was observed ($p = 0.337$). There were no statistically significant differences in the mean annual acceptance rate between male and female corresponding authors ($p = 0.118$). Interannual variation in acceptance rate was ~15 times higher than the between-gender variation.

The ratio of manuscripts submitted to ICES Journal of Marine Science with females as the corresponding author is lower than those with male corresponding authors, which is consistent with the situation in many scientific fields. The representation of female corresponding authors has increased strongly over the last thirteen years but has not yet reached gender parity. There was no evidence of gender-related bias in the acceptance rate of submitted manuscripts. Further evaluations of potential gender bias should consider differences in the roles and structure (e.g., position in the author order) of the full list of contributing authors.

Keywords: scientific publishing, bibliometrics, sex, diversity, equity, inclusion

Affiliation: ¹National Marine Fisheries Research Institute, Gdynia, Poland; ²Institute of Marine Research, Bergen, Norway

Contact Info: ssmolinski@mir.gdynia.pl

CM 608: Understanding diversity, equity and inclusion in ocean science institutions: experiences from Kenya

Renis Auma Ojwala¹

Despite the existing efforts and actions towards an equitable and sustainable ocean, structural and institutional barriers still hinder people, especially women, from fully participating in and contributing to ocean science. The systemic biases and lack of diversity in ocean science have exacerbated the declining ocean health globally, including in Kenya. The ocean is increasingly exposed to severe and different threats resulting from harmful human activities such as pollution and overfishing because of the country's lack of integrated and inclusive ocean governance. The ineffective management of the ocean often affects women and men disproportionately due to their differentiated roles in this sector and society. Therefore, there is an urgent need for a cultural change to embrace diversity, equity and inclusion in all aspects of the ocean in order to achieve sustainable development. However, more information is needed about diversity, equity and inclusion in ocean science in Kenya. This paper addresses this gap by investigating the composition of students and staff in ocean science institutions in Kenya and exploring the challenges they face, as well as power relations, using an intersectional lens. The intersectional identities examined in this paper included ethnicity, education, class, age and marital status. The study targeted students and staff undertaking ocean science programmes, and the data was collected through questionnaires and in-depth interviews from June to October 2021. One hundred two students responded to the questionnaire, and 80 staff participated in the interviews. The findings revealed that there were considerable variations in terms of gender, generational (age) and ethnic diversity. There were more male students and staff than their female counterparts. Fewer early ocean science professionals were recorded than well-established researchers. Also, majority of the students and staff in higher education and workplaces were found to come from the dominant ethnic groups in Kenya compared to those from minority groups. Based on the results, this paper recommends the need to increase diversity, equity and inclusion of students and staff in ocean science programmes in all institutions to enhance the management and governance of the ocean and provides baseline information that paves the way for a more comprehensive analysis of inequalities in the ocean science and how it can be improved.

Keywords: gender, ethnicity, generational diversity, intersectionality, ocean science institutions

Affiliation: ¹WMU-Sasakawa Global Ocean Institute, World Maritime University, Fiskehamnsgatan 1, 211 18 Malmö, Sweden

Contact Info: w1904051@wmu.se/ renisauma@gmail.com

CM 659: Social responsibility tools and fisher voices

Lara Funk

Social responsibility is a relatively recent focus for the global seafood industry, which has been focused on environmental responsibility for decades. Reports of human rights abuses in global seafood supply chains garnered global media attention in 2015, leading to seafood industry actors adopting a variety of market-based assurance tools (e.g., third-party certifications, risk assessment tools) to provide assurance that workers within their supply chains were not suffering from poor treatment. However, how are these market-based assurance tools experienced at the fisher level? Is there space for fishers, who are often underrepresented, to be included in the discussion? This presentation will share experiences speaking to fishers about wellbeing in Scotland and the Maldives and highlight recent initiatives relating to worker voice for fishers.

Keywords: social responsibility, seafood industry

Affiliation: Heriot-Watt University

Contact Info: Laf2001@hw.ac.uk