



MASTS-SFC Saltire Emerging Researcher Scheme (MASTS-SERS)

Final Report

MASTS in association with the Scottish Funding Council supported the Saltire Emerging Researcher Scheme, which represented an important and exciting opportunity for Post Graduate Researchers (PGR) and Early Career Researchers (ECR) to engage in substantive collaboration with colleagues from Europe (EA, EEA and EFTA countries).

The scheme aimed to promote mobility between Scotland and European research partners with the aim of strengthening existing, and seeding future, research relationships. Participants are expected to demonstrate the impact of their exchange through the publication of novel research work, the formation of new collaborations and project/ funding submissions, and the dissemination of their results.

As your exchange has now come to a close, we ask that you reflect on the exchanges and provide a report by filling in the form below. The reports will need to demonstrate the potential benefits of the grant for both the recipient and their collaborators. Please return this within four weeks of completing your exchanges to masts@st-andrews.ac.uk. When you do so, you are agreeing that your answers may be used to promote the activities of MASTS, including being used on the website and social media channels.

Please note that MASTS may also contact you, the participants, and/or your supervisors to gather additional post-exchange impact information. This information must be provided on request.

Contact information

Participant name	Magnus Sten Harald Janson
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Host name	Åsa Strand
University or Institution & Department	Kristineberg Marine Research Station, IVL Swedish Environmental Research Institute
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Exchange overview

Title	Assessing faunal diversity and status of European flat oyster beds in Sweden through analysis of soundscapes, eDNA and visual surveys
Start date	1st April 2022
End date	7th August 2022
Project location(s)	Kristineberg Marine Research Station Kristineberg 566 451 78 Fiskebäckskil Sweden

Abstract (max 300 words)

Provide a brief summary of the exchange using language accessible to a non-specialist. Describe what the exchange objectives were, the activities that were carried out, and the subsequent outcomes. This may be published on the MASTS website.

The aim of the new collaboration between the IVL Swedish Environmental Research Institute, SUPER DTP student Magnus Janson (MJ) and MASTS was to co-conduct novel research on the soundscapes of European Native Oyster Beds (EFOBs) along the Swedish west coast soundscapes and seed future research relationships.

Following several online meetings between MJ, his supervisors from Edinburgh Napier and Heriot-Watt Universities and the IVL team, MJ visited the IVL twice to strengthen the collaboration and conduct field work. The main objective of the mobility exchanges was to record soundscapes (for the first time for this species) of relatively undisturbed EFOBs still present at the west coast. In addition to deploying passive acoustic monitoring (PAM) units and other sensors, eDNA samples were taken and visual habitat surveys conducted. These data will be used to assess the diversity of fauna associated with EFOBs at varying states of their development/degradation/recovery, as an indicator for ecosystem complexity and status.

Initial fieldwork focused on finding appropriate EFOBs, since information regarding their distribution was several years old, and the status of some formerly dense beds had deteriorated. At sites with a recorded spatial change in oyster density, four PAM devices were deployed for up to two weeks to record soundscapes along the density gradient. Water/sediment samples for eDNA analyses were also taken, as well as video surveys of associated biodiversity and oyster density surveys. Forthcoming results will demonstrate whether the applied methods, individually or combined, can be used as time and cost-effective tools to adequately assess/monitor EFOB ecosystem complexity and status, and inform EFOB conservation and restoration efforts. The data will also be compared with similar studies undertaken by MJ in Scotland.

The research conducted under the MASTS-SERS scheme will produce joint publications and facilitate collaborative follow-up grant proposals. Outcomes will inform EFOB restoration efforts throughout Europe.

Impact (max 600 words)

Please demonstrate the impact of your exchange from your perspective, and that of your exchange partner. Describe what the wider benefits of the exchange were to you as participant, your own and host institutions, and the wider community.

The exchange had many benefits to my (first year) PhD project, my personal/academic development, to the host institution in Sweden, as well as MASTS institutions.

- I benefitted from the exchange in multiple regards. Firstly, in year 1 of my PhD the MASTS-SERS grant gave me the opportunity to record the soundscape of still reasonably dense EFOBs, which have become very rare. The Swedish host lent me equipment in-kind, needed for the field work, such as three acoustic recorders, anchoring devices, buoys and a bespoke GoPro Sledge, which ultimately made my research possible and increased the quality of the data. The data can be compared with similar measurements in Scotland, which will bring an international component to my data collection. Regarding my personal development it allowed me to develop skills in networking and I have gained many new contacts which are of great value to my present and future research. The collaboration also led to an exchange of ideas and techniques, which proved to be useful and will likely continue being so throughout my entire PhD.
- My home institution – the MASTS partner Edinburgh Napier University - where I am a PhD student and Heriot-Watt University - where my second supervisor is based – benefitted from meeting the IVL team online (and vice versa) and have already started to discuss writing joint grant proposals to allow follow-up research. In the future, other MASTS institutions wanting to engage with IVL would benefit from a collaboration already being in place.
- The host institution will benefit from joint publications of the novel research, from the newly established academic network more generally (see above) and also gain valuable data on boat noise from my recordings, which they are interested in.

The exchange has the potential of informing restoration efforts of EFOBs, which could have a great number of benefits, e.g. improve water quality, increase overall biodiversity, store carbon and serve as a potential food source. Overfishing in the early 1900's vastly reduced number and extent of EFOBs in Europe and to save/restore these precious ecosystems it is important that European countries collaborate.

Outputs (max 300 words)

Has this exchange resulted in clear outputs, such as the generation of a proposal, research results, or publication? Please provide brief details here. Do any of these outputs have relevance to larger programmes such as the UN SDGs, Blue Economy Action Plan etc?¹

The exchange ended only recently and outputs are still in the making. Forthcoming analysis of the recorded soundscapes, eDNA and visual biodiversity surveys have the potential of generating impactful results, both when it comes to understanding the complexity of EFOBs and when comparing relevant assessment tools. As the novel research also incorporates the first ever systematic recording of EFOBs, it will likely lead to a well-cited publication(s) within the field of research. My supervisors and the IVL team are keen to remain in contact and develop joint grant proposals, with planned follow-up online meetings.

The novel research is relevant and timely. It is aligning closely with the objectives of the recently launched UN Decade of Ecosystem Restoration and the UN Ocean Decade, by informing restoration efforts within the threatened marine environment. As healthy EFOBs store carbon, increase the marine biodiversity, and improve water quality, e.g. UN Sustainable Development Goals #14 (Life below water), #13 (Climate Action), and #17 (Partnerships for the goals) can all be linked to the project. The research could also benefit long-term successful restoration of EFOBs and aid the sustainable development and resilience of the Scottish marine fishery, all in accordance with the Blue Economy Action Plan.

¹ All successful applicants will be expected to represent, promote and formally acknowledge the sponsors (MASTS, SFC & Scottish Government) during the course of their project and in any subsequent related outputs. All research outputs and any material used publicly must carry the funders' logos. The following acknowledgement should be used in all publications resulting from this funding. ["This work received funding from the Scottish Funding Council Saltire Emerging Researcher Scheme and the MASTS pooling initiative (The Marine Alliance for Science and Technology for Scotland) and their support is gratefully acknowledged. MASTS is funded by the Scottish Funding Council (grant reference HR09011) and contributing institutions"]

The Future (max 300 words)

How do you plan to ensure a sustainable collaboration in the longer-term and maximise opportunities and impact in the future? How will you carry forward the benefits now the exchange has been completed? Please outline five concrete plans for future collaboration as a result of your exchange.

1. Given the relevance to larger programmes I hope to be able to obtain further funding in the future, based on the successful collaboration, which was established through the exchange. The Royal Swedish Academy of Science yearly advertises several stipends for projects (including collaborative) that promote scientific progress within Sweden, which is highly in line with our joint project. I am also a member of the British Ecological Society and thus eligible for their grants.
2. By collaborating on the analysis of the acoustic recordings, we will share new insights into, both of biological and anthropogenic activities related to EFOBs.
3. The novel research has great potential when it comes to publishing and by working closely together with different researchers of various expertise in both Sweden and Scotland, it is expected that we will produce a highly-cited publication(s)
4. The field work was conducted in Sweden in 2022 and, depending on forthcoming preliminary data analysis, it would possibly be interesting to replicate or expand upon the sampling in 2023, e.g. to increase robustness and incorporate temporal variability. My partners at the IVL have already commented that they would be pleased, in principle, to host me again.
5. Another possible outcome of the collaboration is that researchers from Sweden would like to visit the Scottish research institutions and thereby 'complete' the exchange, by performing measurements in Scotland or involving students that could benefit from immersing into new international academic environments.

Any further comments (max 500 words)

Please use this space to provide any additional comments. These may include, but are not limited to; what you would do differently if you could take the exchange again; what contingency measures you had to use (if any); details of any unexpected benefits or problems; any significant variations in costs;

Final expense report

Item Number	Description	Cost per Unit	Number of Units	Total Amount (£)
1	Return airfares + train	N/A	N/A	371,67
2	Accommodation, bench fee & boat hire	N/A	N/A	1 663,20
3	Car rental + fuel	N/A	N/A	622,69
4	Field work equipment	N/A	N/A	177,51

5	Food	N/A	N/A	146,32
Total				2 981,40
In-kind contributions	<p>Swedish Host (i) Free use of the station' acoustic recorders, anchoring devices, buoys and bespoke GoPro sledge, (ii) free technical and expert advice, as well as local topic specific network provided by the host institution</p> <p>Edinburgh Napier University: Use of the Schools acoustic equipment; light/temperature sensors, back-up GoPro cameras, high performance laptop for soundscape analysis, external hard drives</p> <p>NERC/ Edinburgh Napier University: PhD salary incl oncosts</p>	<p>>5 000,00</p> <p>£ 4 000,00</p> <p>£ 1 300,00</p>	<p>1</p> <p>1</p> <p>2</p>	<p>> 5000,00</p> <p>4 000,00</p> <p>2 600,00</p>
In-cash contributions				
Grand Total (Total requested from scheme + In-kind + Cash)				14 581.40