GlobalSeaweedSTAR Capacity Building Fund

Completion Report

Awardee Details

Grant reference ID	GSS/CBF/008
Full name/title	Catherine Wilding
Position held	Senior Research Assistant
Organisation	Marine Biological Association of the UK

Details of Capacity-Building Activity

Name of activity	PRIMER 7 Online Workshop
Date held	22-26 February 2021
Organiser/provider	PRIMER-e

Biography

Cat Wilding has over 12 years' experience delivering applied marine research, education and conservation. Her background includes various marine outreach and survey roles, such as coordinating Seasearch dive surveys and mapping intertidal habitats along the 370 mile coastline of North Cornwall. More recently, she has specialised in seaweed harvesting and cultivation.

Since 2018, Cat has led a cultivation project entitled "Innovative approaches to seaweed cultivation: optimising species selection and culture strategies" which explored seeding methods, species diversification, and ecological impacts of seaweed farming in South West England. As well as leading on field and lab work, Cat enjoys collaboration with seaweed industry stakeholders including Exeter University, Plymouth Marine Labs, Cornish Seaweed Co., and Westcountry Mussels Ltd. She has also investigated the feasibility and sustainability of wild harvesting the non-native Asian Kelp Undaria pinnatifida from South Devon.

Most recently, Cat has reviewed seaweed harvesting and aquaculture in England and Wales, writing to inform management guidance which will underpin sustainable resource utilisation. She now intends to focus on data analysis and manuscript preparation arising from her cultivation project, while seeking opportunities for future collaboration in seaweed farming work and promoting sustainable blue growth.

Report on Capacity-Building Activity

I participated in a one-week statistics course for Plymouth Routines in Multivariate Ecological Research (PRIMER) software, by attending lectures and practical workshops online. As a result of my participation, I have achieved competence in the application of statistical methods for nonparametric analysis of multivariate data.

The course explored different pre-treatments for environmental and community composition data, for example standardisation, transformation, and normalisation to allow comparison of variables with scales in differing dimensions. I learned to group and sort data based on different factors, using resemblance matrices and measures of distance to create Multidimensional scaling (MDS) plots to visualise the level of similarity. Data were presented using dendrograms, which can be overlayed with clusters and MDS plots. I developed understanding of the tools for hypothesis testing of non-parametric data, such as Permutational multivariate analysis of variance (PERMANOVA).

Participation in the course has enabled me to develop the necessary skills to analyse and represent data which I collected during a seaweed cultivation project, with the aim of preparing manuscripts to submit for publication. These data include kelp biomass, abundance and biometrics resulting from differing seeding techniques, development of farm-associated faunal assemblages (fouling communities) over time, and a comparison of the habitat value of farmed kelp with adjacent wild populations. For example application of PERMANOVA to compare the spread between groups, testing hypothesis about seaweed yield resulting from different seeding methods. Analysis of these results using PRIMER will allow for statistical validation of seaweed cultivation procedures, while publication will share findings applicable throughout the emerging European kelp cultivation industry.

Currently in the UK, knowledge gaps on the environmental impact of cultivation are considered limiting to licensing. By working to demonstrate the habitat value of kelp farms, drawing comparisons with wild populations, my work has the potential to inform policy and landscape managers, ultimately overcoming barriers which impede licencing.

Publication of these findings will help to shape development of the seaweed industry, with practical applications to maximise biomass yield from trialling different cultivation methods in relatively high-energy, dynamic marine conditions. Furthermore, validation of cultivation techniques will be shared with commercial growers, through work with project partners Cornish Seaweed Co. and Westcountry Mussels Ltd.

Participation in the course also enabled me to broaden my network of seaweed industry contacts through informal "breakout room" sessions. These included productive conversations with regard to the state of wild harvesting in Wales, Integrated Multitrophic Aquaculture projects in England, and the development of a novel, low-impact mechanical harvesting vessel targeting green macroalgal blooms. Building on these introductions contributed content to my recent reports on seaweed harvesting and aquaculture for statutory agencies, ensuring inclusion of accurate, up-to-date information, which I used to inform best practice and develop management guidance.

Ultimately, completion of this course and subsequent manuscript preparation will progress my career by allowing me to contribute literature to my chosen field of applied seaweed research. This area of research is vital to ensure that blue growth in the nascent European seaweed cultivation industry is sustainable, innovative and evidence-based.