

PMG meeting – 2 pm (Stanley, Falkland Islands) - 13/12/2022

Attending: Jesse van der Grient, Paul Brickle, Paul Brewin, James Bates, Michael Harte, Will White

Agenda

1. Progress update

An update on the activities in the last three months was given. Zooplankton survey were carried out, totalling to 4 surveys now. Each survey consists of sampling three stations, with triplicate transects for each station. The most recent survey (Dec) shows a very different community than in the previous months, switching from high phytoplankton and krill abundance to high lobster krill and *Themisto gaudichaudii*. Few to no fish larvae or jellyfish and comb jellies were present in the December sample.

The physiology experiments have not progressed as much. While respiration data have been taken for amphipods and squid eggs (ASC), a power cut resulted in early termination of the experiments. The experiment with the squid eggs (SSC) did not succeed because of mistakes in the setup. Lessons have been learned and expectations are high for success next year. Various species (pencil urchins, whelks, kelp limpets, squid (eggs though, not hatchlings), lobster krill and *Themisto gaudichaudii*) seem to be able to be kept alive (mostly) in the tanks, suggesting that controls will be reliable. Squid hatchlings so far have not survived. They have been kept in large tanks and small tubs, with and without kelp, provided with phytoplankton, zooplankton from survey, water (collected in rock pools), dried copepods and brine shrimp, but they do not want to feed. The question was raised why rotifers were not tried. There were no rotifers during the ASC available. Barend (from Fortuna) has now a stock which we may be able to use as well. The lobster krill are changing colour, and this may be the result of not eating. However, they have been observed consuming brine shrimp so perhaps the change in colour is related to feed, but they are not starving.

An Ecopath model has been designed, but it is not finished. The model is currently unbalanced, which means that there is energy incorrectly represented. This can be the result of poorly defined biomass pools, consumption or production ratios that are incorrect, or migration patterns are not correctly defined. The model is currently in the standard Ecopath platform.

Several outreach activities were conducted to promote the project and marine science in the Falkland Islands. Two talks were given by the project manager (Falkland Islands Women Association, Falkland Islands Science and Humanities). An update on the physiology experiments on FITV was given in a short segment. Further, via engagement with the FICS CREST Award fieldtrip (organised by the project manager) and the fundraiser for the Seafarers Mission via the Christmas Tree Festival marine science was promoted in the local community.

2. Steps forward

In January, Rhian Taylor, the PhD student (University of Aberdeen) who will work up the zooplankton survey data, will come to the Falkland Islands to start analysing the samples taken so far, as well as help on ongoing survey days. The aim is to find more money to extend the fieldwork for another year. Further, the squid egg survey needs to be designed, planned and conducted, to understand better the distribution of squid eggs in the Falkland coastal environment. Paul Brewin mentioned the Loligo database from the Shallow Marine Surveys Group and photos that may aid in this work. SMSG

also has a small ROV (bluerobotics) that can go deeper and has a tether of 300 m which can help with video transects. It further is being refurbished now to include an arm, so potential sample collection may be possible.

Bachelor student Gareth Price (University of Portsmouth) will be coming to conduct experiments on various kelp-forest associated species to understand their responses to different rates of warming. He will be looking at serolid isopod, kelp limpets, snails, pencil urchin, and lobster krill, and conduct two rates of change experiments ($^{\circ}\text{C}/\text{day}$ & $^{\circ}\text{C}/\text{hour}$ increase) over the Christmas holiday. Jesse will conduct $^{\circ}\text{C}/\text{week}$ experiment in 2023. The reason for the delay of this experiment is because the setup has to be moved to a new area. This could not happen in 2022 anymore because the electrician that has to do the electricity had no time. In January and February Simon Morley will visit again and he will support the experiments in this time. Rock cod, either just Patagonian rock cod (from offshore samples) or various rock cod species, still are wanted to be included in the study.

There is a lot of work to do for the Ecopath model. The model needs to be balanced, needs to be extended to include Ecosim (to simulate temporal scenarios – that is, climate change scenarios). It needs to be coded in R to incorporate metabolic-dependent temperature responses, which the standard Ecopath model cannot do. The model needs to be validate – there are fisheries data for various fish species and population surveys for some pinnipeds and seabirds available, but that is all to validate the model against. The climate change scenarios need to be designed. A visit to Oregon needs to be organised (this will include hosting the workshop – see below).

3. Workshop

The aim of the workshop was discussed. The objective in the log frame for this workshop is: “4.1 A workshop with local and international experts (ecologists and modellers) will create a framework for the first ecosystem model for FI Y2Q2.”

It was originally proposed to learn from workshops hosted by Debbie Barlow (Falkland Islands Government) as well as potentially use a toolkit designed by the Environmental Defense Fund. Michael and Will know people from EDF well and recommend working with them. However, it became clear that this avenue was not inline with the aim of this workshop, which is more technical, and instead that the EDF may well be used for the second workshop that is earmarked for 2024 (where the model and the policy are decoupled).

As the first workshop is more technical, the proposal was made to host it in the USA where there is more expertise in this. This also requires to delay the workshop to April or May to get it in people's dairy. Jesse is working with Teresa to put in a change request for the Darwin fund as the workshop will now be in a different financial year. Jesse will contact Will and Michael in January to flesh out the objectives for the workshop, and identify who to invite.

4. AOB

No AOB was mentioned other than Merry Christmas.