



Marine Ecosystems  
Research Programme

## BIANNUAL ACHIEVEMENTS REPORT June 2015 *MARINE ECOSYSTEMS RESEARCH PROGRAMME*

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### **Programme's key achievements and overall progress over the last 6 months:**

Progress within the programme is on track and reports are available on the website ([www.marine-ecosystems.org.uk](http://www.marine-ecosystems.org.uk)). Progress was reviewed by the Programme Advisory Group during the Annual Science Meeting in Scotland on May 20<sup>th</sup>. Members of the group noted our involvement with our stakeholders, our recognition of the importance of ecosystem services work within the programme, and that excellent science is being delivered.

### **Metabolic scaling in species with contrasting developmental phases**

Larger organisms tend to have lower metabolic rates per unit of body mass than do smaller ones. Two major groups of theories aim to explain the body size dependence of metabolism: Resource Transport Network models (e.g. the Metabolic Theory of Ecology) and Surface Area Dependent models. These diverge in their predictions when organisms elongate or flatten in body shape during growth. Many marine invertebrates have radically different growth forms during ontogeny. We have used these attributes to test the contrasting model predictions and found strong evidence to support the Surface Area Dependent model of metabolism.

### **MERP Model Ensemble**

We are building an ensemble of models to generate and compare predictions of elasticity for top-down and bottom-up effects in marine size spectra. Using one member of the model ensemble (SSSM) a theory for the formation of dome patterns in size spectra was developed that reproduces the patterns and explains them as resulting from amplifying top-down cascades. All models of the ensemble are continuously being developed to adapt them to the study region, link them to ERSEM, and to take new empirical data from elsewhere in the programme into account. The modelling contributes directly to assessments by IPBES (Intergovernmental Platform for Biodiversity and Ecosystem Services).

### **Ecosystem Services Workshop**

A consortium wide workshop identified four key services that are important for both policy and stakeholders and which we will address: food provision, leisure and recreation, biological checks and balances, and bioremediation. Significant progress was made in developing links between the empiricist, modelling and ES researchers, improving understanding of ES across the community.

### **Issues and remedial actions**

There was a slight delay in accessing the full inventory of datasets collated by the programme. Partners, particularly Cefas and BODC, are working to remedy their access issues. Data access for Ecosystem Services workers relying on websites (such as BODC, MEDIN, MERMAN) proved difficult. This was addressed by communicating directly with data facility managers. Progress on Ecosystems Services and embedding them within work across the programme, seen to be slow, is now on track following the workshop in Scotland.