MERP M1 Meeting in Sheffield, 9-11 September 2014

Present: Tom Webb, Peter Evans, Kate Searle, Sarah Wanless, Ruedi

Nager, Michaela Schratzberger, Mark Bolton, Martin Lilley, Paul

Somerfield, Remi Vergnon, Conor Waldock

The aims of this meeting were:

1. Identify priority datasets for major taxonomic and functional groups of the Western Seas
2. Discuss potential M1 analyses and outputs arising from novel combinations of these data
3. Ensure that M1 data is provided in suitable form for other MERP modules
4. Develop a strategy for effective communication within M1

Priority Datasets

Relevant data for MERP include information across taxonomic and functional groups on:

- Distribution & Abundance

- Traits & Trophic Relationships

- Pressures & Drivers of Change

- Environmental Variables

Conor Waldock reported on his work to inventory suitable datasets (Module 1 Deliverable D1), focusing on existing meta-databases held at Cefas, ICES, and elsewhere. We discussed additional key meta-databases which may be held at Marine Scotland, AFBI, Natural Resources Wales, as well as in the BODC (MERP contact: Rob Thomas). The UK Environmental Observation Framework (ukeof.org.uk) also contains a list of observational datasets. Conor has identified >1000 potentially useful datasets, of which ~450 of these identified as potential priority datasets. He has documented key meta data in a standard format for each. In order to ensure effective coverage of all major taxonomic and functional groups, we discussed each in turn and attempted to identify the key sources of data. Results are listed in the Appendix.

ACTION POINT (TJW/CW): ENSURE ALL OF THESE DATASETS ARE DOCUMENTED IN STANDARD FORMAT WITHIN A SINGLE COLLABORATIVELY-GENERATED GOOGLE SPREADSHEET. A PRELIMINARY VERSION OF THIS IS AVAILABLE HERE.

Ultimately, this spreadsheet will assess the suitability of each dataset for potential uses (e.g. community composition, relative abundance, size spectra). The aim is to establish a 'traffic light' system matching each dataset to various uses (e.g. mapping distributions, building size spectra, time series of change, etc.). The aim is to have this spreadsheet in good shape for November 1st when PDRA Remi Vergnon starts work.

ACTION POINT (ALL): CHECK THROUGH THE LIST OF DATASETS, ADD MISSING DATASETS, IDENTIFY KEY PRIORITIES: DATA WE *HAVE* AND WANT TO IMPROVE ACCESS TO; DATA WE *WANT* ACCESS TO

An important goal of MERP is to link data across trophic levels, and also to link data on the distribution and abundance of organisms to data on their biological traits, trophic relationships, etc. We identified sources of diet data for various functional groups, and agreed that diet databases for

mammals and birds are a priority. These should be constructed similarly to enable easy integration.

ACTION POINT (JG/SW/PE/OTHERS): MAMMAL AND BIRD GROUPS TO CONSULT AND DRAW UP TEMPLATE DIET DATABASE SUITABLE FOR ENTERING DATA FOR BOTH BIRDS AND MAMMALS

An issue to think about is how we incorporate population structure within species (and intraspecific variation more generally) into these databases. This may be best addressed by working at the population level where possible, amalgamating to species-level where necessary.

Some efforts have already been made to collate trait data, for instance under the EU EMODnet initiative (emodnet.eu), with pilot projects for a range of taxonomic groups including benthos (TJW lead) and seabirds (led by Mark Tasker) which will ultimately be open access and incorporated into the World Register of Marine Species.

ACTION POINT (TJW): LIAISE WITH EMODNET SECRETARIAT TO ESTABLISH THE CURRENT STATUS OF THESE TRAIT DATABASES.

To aid prioritisation in the collection of diet data, we agreed to draw up lists of key (i.e. most abundant, most important for tourism, most at risk from human pressures) mammal and bird species, possibly on a regional basis (e.g. using the JNCC regional seas).

ACTION POINT (PE/SW): LIST OF KEY MARINE MAMMAL AND SEABIRD SPECIES BY REGION

Body size was recognised as among the most important traits to record for use by MERP's modeling community. However, body size can be measured in a number of different ways, and standard practices vary between taxonomic groups. For instance, linear measurements vs. mass, and total length is common in fish, cetaceans whereas in seabirds it is more common to measure wing length. Likewise, 'size' can mean individual size, species maximum (or average) size, offspring size, size at sexual maturity, growth rates, size structure of the population. These are all potentially useful, but some will be of more use to the MERP modeling community.

ACTION POINT (TJW): LIAISE WITH MODULES 3, 4, 6 (AXEL, JULIA, JORN) ABOUT PREFERRED CURRENCIES OF BODY SIZE

Finally, we discussed other sources of data most relevant to ecosystem services, e.g. cumulative stress maps covering threats to and pressures on top predators such as fishing, noise, shipping, pollution, as well as the spatial distribution of wildlife tourism (e.g. WISE database). Peter has these for marine mammals. Relative sensitivities of different species to different threats could be scored as a 'trait', as could importance to recreation, fisheries, etc.

Module 1 Analyses & Outputs

Several potential avenues were identified for Module 1's data integration to fuel developments in science and policy:

- Use multiple integrated datasets to derive evidence-based case studies for management based on well-sampled locations
- Develop concepts of functional diversity / trait space filling by combining distributional and biological trait databases across trophic levels
- How do the ways in which organisms trade-off various life history traits in order to adapt to their environments vary across trophic levels?

Other ideas included combining diet information with distributional data to present a preliminary, macro-scale food web of the Western Seas; and more generally to combine our various data into an interactive atlas of UK Marine Biodiversity.

In order to develop these (and other) ideas into tangible outputs, we decided to establish a shared document of potential paper titles, with self-identified contributors.

ACTION POINT (TJW): SET UP GOOGLE DOC OF POTENTIAL PAPER TITLES AND OTHER OUTPUT IDEAS.

In order to better integrate with the wider ecological community, a M1 deliverable is to run a joint meeting with the British Ecological Society's Macroecology Special Interest Group. We decided that 2015 is too soon for this to be useful, and a tentative date was set for Spring 2016. This will need to be decided by September 2015 at the latest in order to go into the BES 2016 budget.

ACTION POINT (ALL): THINK ABOUT POTENTIAL LOCATIONS, NOMINATE A MERP ORGANISER, LIAISE WITH BES.

Communication and Collaboration Strategy

We discussed the importance of effective and regular communication within the module, and decided that a dedicated email list was the best way to achieve this. More generally, we will use the MERP SharePoint site to share files and archive documents, but we also decided that for some collaborative purposes Google docs were preferable, and that we should investigate options for sharing reference lists.

ACTION POINT (JG): EXPLORE MENDELEY FOR SHARING REFERENCES

ACTION POINT (TJW): LIAISE WITH JESS HEARD RE. SETTING UP A DEDICATED MODULE 1 JISCMAIL LIST

One other point that was raised concerned the institutional requirements for reporting outputs under RCUK's researchfish. This has been discussed by the MERP Steering Committee and we aim to have a shared document on SharePoint into which we can all add MERP-relevant outputs information as it arises and, importantly, that each institutional PI can use as a source of information for entering into researchfish. The aim is to make the reporting process as consistent and efficient as possible.

Appendix: Key Datasets by Functional Group

Phytoplankton

Cefas buoys measure chlorophyll

Historical secchi depth data

CPR 'greenness' index

Remotely sensed data from oceancolor.org (includes SEAWIFS, MODIS)

PML has Chl *a* maps

AVISO (aviso.altimetry.fr/en)

ICES (via datras.ices.dk)

Key MERP contacts from M1 and elsewhere: Angus Atkinson (PML), Pierre Helaouet (SAHFOS)

Macrophytes

Key MERP contact: Mike Burrows, SAMS

Zooplankton

CPR Survey - distribution, abundance, biological traits (SAHFOS pilot study for EMODNet), fish larvae, nematocysts

Western Channel Observatory, and other observatories

Cefas fish egg surveys

Gelatinous zooplankton: Mnemiopsis via MEMO (ifremer.fr/defimanche_eng/Projects/Current/MEMO)

Martin Attrill's work on the Thames (e.g. *A Rehabilitated Estuarine Ecosystem: The Environment & Ecology of the Thames Estuary*, Springer, 1998)

Data from power station screens

Cefas acoustic monitoring of jellies

Irish Sea Miknet survey (AFBI) since 1994

Global Jellyfish Database Initiative (JeDI, http://people.uncw.edu/condonr/JeDI/JeDI.html)

NOAA COPEPOD global plankton database (st.nmfs.noaa.gov/copepod/)

Key MERP contacts: Angus Atkinson (PML), Pierre Helaouet (SAHFOS)

Cephalopods

Sepia is reasonably well-sampled in the IBTS (see *Fish*)

Possibly at the L4 station, WCO?

ICES Working Group on Cephalopod Fisheries & Life History (ices.dk/community/groups/Pages/WGCEPH.aspx)

Tracking data (David Sims, MBA?)

Acoustic Surveys

Benthos

Cefas UNICORN database (macrobenthos - infaunal, grab and beam sampled; nematodes), Cefas Epifauna

DASSH

Some info on the NBN (data.nbn.org.uk)

Site-specific surveys (e.g. Skomer - TJW to liaise with warden)

Key MERP contacts: Jan Hiddink (Bangor), Michaela Schratzberger (Cefas)

Trait data available from BIOTIC; Cefas Traits Database

Diet information contacts: Mark Hudson, Mark Emmerson

Fish

IBTS (ICES)

Celtic Sea isotopes data (Cefas)

DAPSTOM stomach content data (Cefas)

Acoustic surveys - which species targeted?

Sandeels? Danish fisheries (N Sea)

Sprat? AFBI Acoustic Surveys?

Power Station screens (Peter Henderson)

Tagging data (Cefas, David Sims)

Elasmobranchs

Basking shark tracking data (SNH / Exeter; David Sims, MBA; Cefas), also some data on skates

Modeled distributions of basking shark (Peter Evans, CREEM)

Seabirds

Seabird Monitoring Programme (breeding success at colony level), 3 x Colony Count Registers; most of these combined at JNCC into Breeding Bird Count

ESAS (some data not in yet, some restrictions on use)

JNCC portal: jncc.defra.gov.uk/page-4463

Some sites comprehensively sampled

BTO atlases

JNCC Report 431 seabird maps (subsumed within ESAS)

Traits: to be compiled by James & Reudi; EMODNet pilot project (Mark Tasker)

FAME - raw data available via RSPB - some negotiation required

Tim Guilford Manx Shearwater data from Irish Sea

Seabird Tracking Database

Most diet data limited to breeding season and often to chick diet. Some size data (e.g. from otoliths), size classes of some fish brought to chicks are available for some species. Prey shape may be as important as prey mass, emphasising functional and taxonomic differences.

Mammals

JCP brings together multiple datasets, with some restrictions on access (Peter Evans)

Irish Whale & Dolphin Group provides its data for JCP but permissions required; likewise for offshore renewables, Crown Estate, foreign data (French, Belgian, German, Dutch - especially important for southern N Sea)

JCP data held centrally by JNCC

Most data collected for the purposes of SAC designation or for offshore renewables planning

French data overseen by La Rochelle University

Possibly Faeroes dataset?

Exeter University (Brendan Godley)

Seal data from SMRU

Strandings data managed in IOZ Poseidon database (post-mortem results etc.)

Diet data for cetaceans available (Peter). Size-based feeding in sperm whales. Good data for some species e.g. harbour porpoises, seals (from stable isotopes, otoliths, scats). New SMRU study on chances in sea mammal diet through time.

Turtles

Cefas tagging data

Rob Penrose: strandings and sightings