



The South-West Marine Ecosystem Model

Building Social Capital to produce an Annual State of the South-West Marine Ecosystems Report

The aim of the SWME model is to enable and produce an annual report on the state of south-west marine ecosystems and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

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Copies of this paper can be downloaded from the SWME website or obtained from the authors

<https://swmecsystems.co.uk/swme-organisation>

Version 3: November 2023 Note

This paper describes what SWME *has done*, but it also includes many points that are very *current* to decision making in the near future – it is a working document. Each version of the SWME Model papers has had a distinct function so if earlier versions are required please contact the authors. Version (3) has benefited from extensive discussions of SWME in the context of the EAST Marine Ecosystems (EASTME) Pilot Project.

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Summary

The South-West Marine Ecosystems Model – Key Points (USPs)

The aim of the SWME model is to enable and produce an annual report on the state of south-west coasts and seas and to build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment (the SWME community).

Each year SWME provides a communications platform including webinars, YouTube channel, annual conference, annual report and wider publicity that enables the SWME community to share the changes they have recorded.

SWME Development This paper describes the major developments of the South-West Marine Ecosystems model since its inception in 2007 and the rapid developments during the period of the Covid epidemic. It seems very likely that it will continue to develop to meet the needs of its partners and audience. We will continue to develop thematic teams and the ideas around communities of practice not only in relation to building resilience but also to canvass expertise in relation to annual change.

Reporting Annual change Reporting annual change (RAC) is a considerable challenge, and a paper is being developed. This challenge arises largely because the way we measure and report the different thematic topics varies considerably. The mix of professional and citizen science varies with topics as with the nature of data. Developing the RAC paper will be done collaboratively with the thematic topic team members. It will prove helpful in providing guidance to other groups regionally on how this might be approached.

The Communications Platform The communications platform has developed steadily since Covid, especially with webinars and the YouTube channel. There is considerable scope for developing SWMEs social media and the use of the existing platforms in terms routine communications beyond the main spring programme period.

SWME Building Social Capital and Social science input There is a need for social science evaluation of SWME and EASTME (See S5.8). SWME would welcome inputs from social scientists in assessing the model and measuring benefits, impact and the SWME communications platform.

EAST Marine Ecosystems The EASTME pilot begun in 2023 will be launched with the establishment of teams, Communities of Practice and a conference in 2024 in the East Marine Planning region. The idea for this project is to invest in its establishment so that it continues. That would provide a broader basis for assessing the benefits of the development of annual reporting at a regional level and the model as a whole.

This SWME Model paper describes the communication platform using meetings, a report and digital media, how this links to social and natural capital, how the annual reporting is being approached, regional boundaries for natural systems and for human geographic systems.

Contents

1. Introduction

1.1 South-West Marine Ecosystems Model - Key Points (USPs)	4
1.1 The development of SWME	5
1.2 The Benefits of SWME	5
1.4 The purpose of this SWME Model Paper	6

2. Reporting Annual Change in the South-West Marine Environment - What does SWME Report on?

2.1 Introduction: The development of SWME and thematic topics	6
2.2 Reporting Annual Change – Management Systems – Benefits of Annual Reporting	7
2.3 What Thematic Topics does SWME cover?	8
2.4 Reporting Annual Change: The purpose of State of Seas Reporting	9
2.5 The types and sources of data and information	10
2.6 Reporting Annual Change – Futures Challenges	10

3. Regional Reporting: Boundaries in the South-West

3.1 Natural systems boundaries	11
3.2 Human geographic governance boundaries	12

4. Communications – the Communication Platform: Conferences, Webinars, Annual State of the Seas Report, Press & Media and Social Media

4.1 Introduction – the development of a communication platform	13
4.2 Conferences	14
4.3 Webinars	14
4.4 Comparing the function Conferences & Webinars	15
4.5 State of the Seas Annual report	16
4.6 Press & Media	16
4.7 Communications infrastructure	16

5. Building Social Capital: SWME Organisation and Who is involved?

5.1 Social and Natural Capital – the context	17
5.2 SWME organisation structure - who is involved?	18
5.3 The developing model – communities of interest, practice and teams	19
5.4 Outreach: Who is the audience for SWME?	20
5.5 Annual Convening	21
5.6 Funding	21
5.7 Freedom to experiment	21
5.8 Measuring benefits – value - outreach	22

6. Conclusions	22
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7. References	23
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Appendix 1 South-West Marine Ecosystems – Aim & Objectives	23
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Appendix 2 Tables of webinar and YouTube engagement 2021-2022	24
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The South-West Marine Ecosystem Model

Building Social Capital to produce an Annual State of the South-West Marine Ecosystems Report

1. Introduction

1.1 The South-West Marine Ecosystems Model – Key Points (USPs)

The aim of the SWME model is to enable and produce an annual report on the state of south-west seas and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment. Each year SWME provides a communications platform including webinars, YouTube channel, annual conference, annual report and wider publicity that enables this community to share the changes they have recorded.

The key points of the South-West Ecosystem Model (SWME) can be described in several ways. The objectives that we have used are outlined in Appendix 1, whilst the Unique Selling Points are outlined below and are as follows:

- **Annual** The programme of communication runs on an annual cycle to report change and the state of south-west marine ecosystems in a timely way to influence research, management and recovery.
- **Communication: Meetings** Through conferences and webinars.
- **Communication: Reporting - State of the South-West Marine Ecosystems** The reports cover a number of thematic topics on natural systems: oceanography, plankton, seabed and seashore, fish, seal, marine and coastal birds, cetaceans, and management thematic topics: spatial management, MPAs, fisheries, water quality and plastics pollution.
- **Audience** Citizen scientists, scientists - researchers, managers & policy advisors, organisations and the wider public
- **Regional scale & resonance** Covering the Celtic Sea & English Channel and adjacent countries, achieving a level of granularity that is not achieved at a larger national scale and having a relevance and resonance with the target audiences
- **Social capital, organisation, partnership & collaboration** Building social capital through meetings that enable greater co-operation and collaboration through an informal partnership. To provide a network for cascading information and raising awareness
- **Voluntary – Finance** Relying on the voluntary input of the south-west marine community to build continuity and certainty which is not dependent on fund raising
- **Freedom of decision making** SWME has no official status or affiliation with any research, management or policy programme or with any organisations. This gives the steering committee the freedom to act as it sees fit in relation to any year's programme.

1.2 The development of SWME

The South-West Marine Ecosystems (SWME) model has evolved as an informal partnership since 2007. SWME has always relied upon the wide voluntary support of individuals and institutions. The SWME 'financial model' has been based on an enormous level of voluntary support and on low cost conferences that recovered their cost and covered other running expenses (e.g. website). In this sense SWME can be described as a sustainable model which has developed and adapted.

The 2020 SWME conference had to be cancelled because of Covid and the epidemic forced a major rethink and adaptation of our approach to many aspects of SWME. In 2021, 2022 and 2023 a series of webinars were organised covering the SWME report chapter thematic topics.

All sorts of events and discussions in 2021 highlighted that SWME is a powerful idea coupling social capital and annual reporting at a regional scale. If funded, SWME could develop in many ways, however, in order to take that step, we need a document to describe what this idea is – hence this paper. '*Money follows ideas*' and as such SWME could provide a significant opportunity for organisations and individuals in the region. Funding for the idea of piloting the SWME Model in another English Region – the East Marine Ecosystems Pilot (EASTME) - funded by the Defra Natural Capital Ecosystem Assessment programme has, in 2023, provided such funding. One of the most significant outcomes of the EASTME process has been to explain to many other people what SWME is and this in turn has led to the clarification on many points of the SWME Model which are presented in this latest version of the SWME Model paper.

1.3 The Benefits of SWME

We have not measured either what people see as the benefits of SWME or how they use the outputs. There are, however, a variety of surrogate measures that could be investigated to measure the benefits – value - of the SWME process and we will assess this systematically in the near future. These surrogates relate to measures of the effectiveness of the different parts of the communication and include:

- Annual changes in the marine environment are communicated to a wide audience in a timely manner.
- These changes can be set in context and can lead to action by researchers, managers and policy advisors.
- There is very strong resonance with the regional (local) community of interest across the thematic topics.
- This work can be viewed in terms of the webinars on YouTube or read in the State of the Seas reports.
- Lots of people see the benefits of communicating their work – in terms of the conference and this can be tripled by the webinar presentations.
- The webinar attendance and YouTube viewing figures are a measure of the interest the SWME programme generates – 2500+ by August 2023 for the review of 2022 (Appendix 2).
- If 'networking' conversations are taken as 10 per delegate – which is a very low figure, it is not difficult to see how the impact of the event on 140+ delegates could work.
- The annual report was sent to 1250+ contacts and has been opened 500+ times (since August 2023).
- SWME is not part of formal process and so the outputs are not constrained by any particular programme or outcomes.

- SWME can also provide a vehicle to promote and explore common interests should the need arise. For example in 2021 the opportunity of a Masters Student arose to look at the issue of indicators in SWME's work (Falconer, 2022).
- The SWME process supports many citizen science initiatives and provides feedback to many volunteers that are involve.

1.4 The purpose of this SWME Model Paper

Each of the preceding versions of the SWME Model paper has had very distinct objectives and can be seen as stand-alone documents.

Version 1 simply explained the basic SWME idea and some points in relation to development.

Version 2 explored how SWME might continue to develop after Covid.

Version 3 is less about SWME development and places greater emphasis on the current model. The purpose of version 3 is as follows:

1. To describe and update the SWME Model based on responses to questions raised by the EASTME discussions.
2. To use the SWME model paper so that the idea can be communicated widely.
3. To act as reference to stimulate further academic project work both on reporting annual change in the thematic groups and building social capital.
4. To be the basis of a prospectus to seek funds should this need arise.
5. To describe and explore options for future development of SWME in 2023 – 2024.

2.Reporting Annual Change in the South-West Marine Environment - What does SWME Report on?

2.1 Introduction: The development of SWME and thematic topics

At the outset SWME meetings covered a range of topics mainly with birds, seals and cetaceans. However, these topics soon expanded to cover oceanography and plankton. As the conferences developed, the thematic topics expanded to include other natural systems such seabed and seashore species and fish and also a number of management topics such as fisheries and MPAs.

In 2014 the first annual report for SWME was produced using speaker notes gathered during the conference; it was 25 pages long. 2015 saw the first of the current style of SWME Annual reports based on chapter thematic topics with editors generating these. In 2016 that the report was 67 pages, and subsequent reports have steadily grown in length with 2022 including 117 pages. The reports *only exist* in a digital format; it has never been printed. The annual reports can be viewed online at <http://swmecosystems.co.uk/annual-reports>.

The structure of the report is very traditional, with the content based on thematic topic chapters – see Table 1. There are natural systems thematic topics, oceanography and plankton, seabed and benthos, fishes and turtles, marine and coastal birds, seals, cetaceans and then a number of 'management' categories which have usually included marine planning, marine protected areas, fisheries, water quality, marine plastics and development. In the 2022 webinars climate change and water quality have been included.

It was in during Covid in 2021 that the idea of re-framing the report as an Annual 'State of the Seas' Report for the South-West was initiated. There is no doubt that this framing provides a greater focus

for the report and the intention is that this will raise its profile and impact, in the process supporting the work of many of its contributors. For the 2021 report editors were also asked to include conclusions to their chapters. In 2021 the SWME Report has been adopted by the Marine Biological Association and given a DOI code.

2.2 Reporting Annual Change – Management Systems – Benefits of Annual Reporting

Why annual reporting? There are a number of benefits of annual reporting; the four key points are:

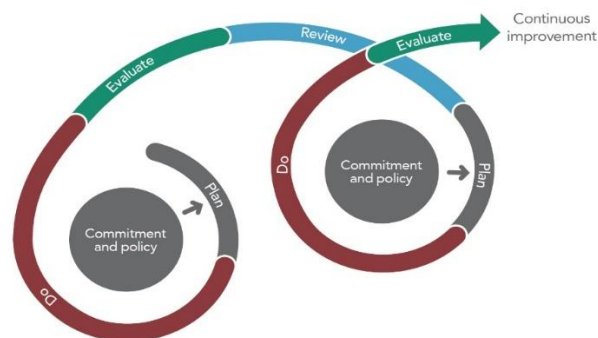
- We want to know what's going on – many of our working practices and tools are enabling a quicker turn-around of information.
- Interested & Concern – our interest is driven by concerns for the marine environment.
- Keen to share - this is a common thread, sharing and communicating is important to us.
- We want to act – if we can in a timely way and at a scale which makes sense.

There are many reasons why we should be interested and aware in the marine environment but there is a growing and commonly shared concern among SWME participants over what is happening in the natural environment. Hundreds of citizens scientists providing a wide range of observations supporting many professional projects being undertaken in the south-west provides a valuable early warning of changes taking place in the marine environment and the platform to communicate this helping to develop marine citizenship and ocean literacy (Buchan, 2023).

For marine reporting nationally over the last 30 years, the period of comparison has varied from the 3-4 years for the North Sea Ministerial Meetings, or 5 or 6 year period for the OSPAR, EU MSFD and currently the UK Marine Strategy (UKMS). The SWME model and state of seas reporting makes this process annual, facilitating comparisons between one year and the next. The state of the seas process poses a variety of questions such as, what is being compared, and it drives comparisons of one period with another.

This State of the Seas framing is also set in management systems thinking (Figure 1) which has developed over 60 years in the business setting but applied more routinely in environmental settings since the 1990s. The water industry in the UK, for example, has a number of major management systems run on five-year cycles which focus on the price review, flooding, water quality and water resources. Management system thinking is also the basis of the UK Marine Strategy (UKMS) that operates on a six-year cycle. The management system approach has also given rise to the concept of indicators.

Figure 1. The Management System cycle (from Earll, 2018)



Framing the SWME Report on an annual basis offers a number of benefits including:

- It provides a clear focus for the thematic chapters and how we view their conclusions, giving the whole process more significance and value.
- An annual view enables issues to be addressed more quickly – an early warning system. The increase in bluefin tuna and spiny lobsters have both lead to research and then fishery management actions. Waiting for a six yearly review/reporting process of these changes at a national level is not responsive enough to local requirements.
- The current SWME finance model is ‘sustainable’ and so facilitates year on year reporting and discussions on key issues.
- It should, over time, improve the reports impact.
- It links very strongly to the concept of indicators which should help us to communicate to a wider range of people, including the public, scientists, managers and policy makers

2.3 What Thematic Topics does SWME cover?

The thematic topic list in Table 1 is currently being used by SWME for the individual webinar programme, the conference programme and the chapters in the State of the Seas reports. Table 1 also illustrates the close alignment between these SWME thematic topics and the UK Marine Strategy (UKMS) descriptors and policy response categories. This alignment provides a pragmatic and useful link between regional annual and national reporting. The important point to note is that the UKMS descriptors are widely recognised and enable UK to harmonise their legal reporting with OSPAR, and also align to European EU MSFD scientific programmes of work.

Table 1. SWME Thematic Topics and UKMS Descriptors

SWME Thematic Topics	UKMS Descriptors & Policy response
Natural systems	
Oceanology & Meteorology	<i>D7 Hydrographical conditions</i>
Plankton	<i>D1 & D4 Pelagic habitats</i>
Seashore and seabed	<i>D1 & D6 Benthic habitats; also D4</i>
	<i>D2 Non-indigenous species</i>
Fish & turtles	<i>D1 & D4 – Non-commercial fish – [turtles may end up as part of pelagic habitats]</i>
Coastal & Marine birds	<i>D1 & D4 Birds</i>
Seals	<i>D1 & D4 Seals</i>
Cetaceans	<i>D1 & D4 Cetaceans</i>
Management categories	<i>Policy Response categories</i>
Marine planning	
Marine Protected Areas & Recovery & Restoration	<i>MPAs are policy responses rather than descriptors</i>
Fisheries	<i>D3 Commercial fish</i>
Water Quality	<i>D5 Eutrophication</i>
	<i>Overlap with Pelagic Habitats</i>
<i>Mainly coastal e.g. sewage</i>	<i>D8 Contaminants</i>
	<i>D9 Contaminants in seafood</i>

Plastics pollution
Not covered

D10 Marine litter
D11 Underwater Noise

2.4 Reporting Annual Change: The purpose of State of Seas Reporting

The communications processes of the webinars and the conference are now focussed on the state of the south-west seas reporting. From 2016, objectives were set for the reporting process and these included collecting observations, supporting recording and science, helping to build networks and provide feedback to everyone involved. It also helps provide the 'horizon scanning' and context (temporal and spatial) for records and to make a difference in protecting and managing our marine environment. Work on indicators was started in the 2021-22 programme. A breakdown of reasons (objectives) for producing the report includes:

1. Describing and reflecting on the normal patterns of events for ecosystems
2. Species: Highlighting significant ecological and population changes including:
 - Noting new records for the south-west - Highlighting remarkable sightings e.g. Bowhead whale, Cornwall in 2016 or the Dalmatian pelican and Wally the Walrus, etc.
 - Describing the transition of 'new' species populations year on year e.g. Gilthead bream, Couches Bream
 - Good years & bad years – relative status - trends for species like spiny lobsters, bluefin tuna, jellyfish e.g. basking sharks, sunfish, kittiwakes
3. Larger species of conservation & management importance For species such as some fish such as the larger sharks, bluefin tuna, some seabirds, turtles, seals and cetaceans there are a relatively small number of species of interest. Many of these species clearly have small, finite populations albeit that the south-west is only part of their overall geographic range. Many of these species are recovering from past predation or persecution and this is recognised by their protected status under UK & European conservation laws. Many of these species migrate through the south-west and so SWME can help provide spatial context to the sightings of these species; examples include:
 - Seal movements at sites throughout the Celtic Sea.
 - White beaked dolphins - Lyme Bay, site fidelity of this population.
 - Bottlenose dolphins: inshore pod movements from Brighton to Cornwall (2020).
 - How species distributions are linked to summer oceanic frontal systems e.g. blue sharks and common dolphins.
 - Manx shearwaters – To and from South Wales Islands to Lyme Bay.

In many cases there are strong networks in the south-west recording these species on an annual basis and there are metrics which give a broad indication of the population status which could be used to provide at least a traffic light representation.

4. Recording major events and their effects e.g. the major winter storms of 2013-14 or the polyisobutylene (PIB) incident, the impact of Covid on species disturbance and science.

5. Making a difference – managing human activities Reporting change in a timely manner to enable science and management e.g. spiny lobsters.

- Recording recovery e.g. seabird populations after rat eradication on islands.
- Acting to focus interest. Publishing provides a focus for further research, year on year e.g. tuna, spiny lobster, bottlenose dolphins.

- Posing questions and exploring interactions – making the links between environmental, species, habitat and management changes.
- Telling stories about what we know and providing access – education & outreach.

2.5 The types and sources of data and information

The types of data and information SWME uses includes:

- One-off observations by named recorders.
- Qualitative information – descriptive in nature, this could be called natural history.
- Quantitative data and information from major programmes, a more analytical approach – time series data.
- SWME makes the link between the descriptive and the analytical science.
- Management information from monitoring programmes using existing indicator systems – time series data e.g. bathing water results.
- Policy announcements e.g. National Marine Parks, development of offshore wind.

SWME does not hold data, but within the network we know the people who do.

Sources of data and information for the SWME Reports include:

- Personal sources and contacts; increasingly, social media groups e.g. Facebook groups
- Citizen science programmes and recording schemes. There has been huge growth in citizen science over the last 20 years focussing on many marine species
- Formal science and management programmes, reports and research papers
- News and information from the wider media

The importance of citizen sciences is being increasingly recognised (Earll, *et al.* 2023) Citizen science networks in the south-west covering many of the thematic topic areas from cetaceans to plastics. It would be fair to say that without that input we would have little or no information on which to report many of the thematic topics. The SWME communications process reinforces and supports many of the citizen science initiatives and recording schemes.

2.6 Reporting Annual Change – Futures Challenges

Reporting change annually is challenging, not least because the methods employed to collect and report information on each thematic topic are very different. Reading the SWME annual topic reports, watching the webinars year on year, or listening to the conference presentations it is possible to see recurring patterns in the way editors and their teams describe what is happening to species, habitats and ecosystems and human activities. In 2021 this comparison process was further developed when the editors of State of the South-West Seas Report (SSWSR) were asked to prepare conclusions for their topic chapters for the first time and to report annual change. This is challenging not least in terms of the *language* we use to describe the changes that are reported across the topics.

SWME reporting has not been set in any prescriptive framework and has evolved. Year on year it is also possible to see how this reporting process is developing and maturing. Another challenge is how to describe the dynamics and interactions between the thematic topics. The ecosystem does not work in silos, and we have started to use cross cutting information boxes to summarise interactions between topics. .

To address these challenges a Reporting Annual Change (RAC) paper is being prepared and describes how the SWME topic editors are describing change and explores the emerging methodologies they

are using both in terms of the information inputs and how these are reported. The RAC paper is the first attempt that has been made to describe how SWME editors and their teams are doing this and is being compiled by reviewing the custom and practice of their reports.

The objectives of the RAC paper are to:

- Look across the board and describe the common elements of the how SWME editors and editorial team members are working.
- Describe the types of change editors are reporting.
- Explore what methodologies editors are using.
- Engage with the SWME editors and editorial team members collaboratively to develop this paper.
- Enable the evolution of annual reporting process, helping to develop a more consistent and systematic approach to reporting year on year.
- Provide guidance and to describe for other groups – beyond the SWME family – how annual reporting is being taken forward.

The RAC paper will be in two parts:

Part 1 Generic points

- Thematic topics and comparison with other assessment programmes.
- Types of change being assessed.
- The sources and types of data and methodologies used for assessment.
- The methodologies used for reporting.

Part 2 Thematic themes

- The topics being described.
- The sources and types of data and methodologies used for assessment for the thematic topic.
- The methodologies used for reporting.
- Opportunities for development.
- References .

3. Regional Reporting: Boundaries in the South-West

There are a number of ways of thinking about the 'South-West' however, the two main ways relate to natural systems and human governance approaches.

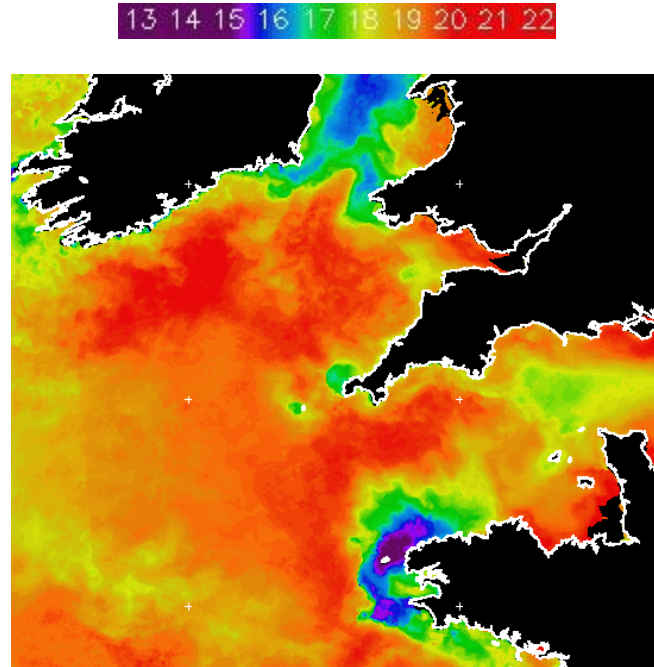
3.1 Natural system boundaries

SWME began, and retains, a strong emphasis on natural systems. The reality of *natural systems* is that many of oceanographic phenomena and biological community and species dynamics SWME describes pay no regard to human geographic governance boundaries. In the SWME process we interpret boundaries creatively since there are no formal constraints in a programme or organisational-governance sense.

Oceanography. The south-west includes the coastal and marine environments of the English Channel, Bristol Channel and [Celtic Sea](#). From an oceanographic sciences perspective the south-west is a complex area with a variety of influences varying from the oceanic in the far west to the major estuarine – coastal influences of the Severn Estuary. The seasonal stratification of the western

waters in the summer resulting in fronts is of major importance to the feeding and distribution of many pelagic species in the Celtic Sea and English Channel.

Figure 2. South-west from space showing sea surface temperatures (August 6-12th, 2022) This also reflects main boundary areas where major frontal systems occur. Source: Peter Millar, PML.
Temperature °C



Species. There are physiographic and biogeographic 'break points' around the south-west seas creating provincial characteristics. Those breakpoints are incorporated into the coastal sectors used by the Marine Nature Conservation Review of Great Britain but there are others. Many algal and invertebrate species are distributed widely in the south-west region. Debris from America often washes up on the more south-westerly beaches with invertebrate and algal species that have crossed the Atlantic.

For many of the vertebrate species it has become apparent that they routinely move between English, Irish, Welsh and French waters and often beyond to the wider Atlantic. Some of these movements are illustrated below, for example:

- Manx Shearwaters from the South Wales Islands routinely fly to feed in Lyme Bay during the summer.
- The south-west resident Bottlenose Dolphin pod is well known from Padstow to Brighton and can travel that distance in 4 days.
- Bass tagged on the Dart can migrate as far as Milford Haven in less than a year.
- Bluefin tuna – spend the late summer in the south-west but travel to mid-Atlantic waters as well as the Mediterranean coast of Tunisia.
- Grey seals routinely move between and use haul-outs throughout the south-west coasts of England, Wales, Ireland and France.

3.2 Human geographic governance boundaries

In terms of marine governance the south-west is a region for the purposes of marine spatial planning in England (Figure 3). The inshore and offshore zones are important for both planning (MMO: inshore marine plan area ranges from mean high water spring or the tidal limit out to 12 nm and the offshore marine plan area ranges from 12nm to 200nm or the territorial limit), marine protected

areas and fisheries regulation (IFCAs out to 6 nm). The English region of the south-west includes the local authority counties of Cornwall, Devon, Dorset, Somerset and Avon. The national entities of England, Wales, Ireland and France host many of the species we report on in SWME. In pragmatic terms any geographic region will have boundary issues, and these are probably best addressed by custom and practice that make sense in terms of natural systems.

Figure 3. MMO planning regions



4. The Communications Platform: Conferences, Webinars, State of the Seas Reports, Press Work & Social media

4.1 Introduction – the development of a communication platform

Since 2007 a series of developments have led to the creation of a communication platform with a number of distinct components which are described in this section and outlined in Figure 4.

Communication Programme & Platform

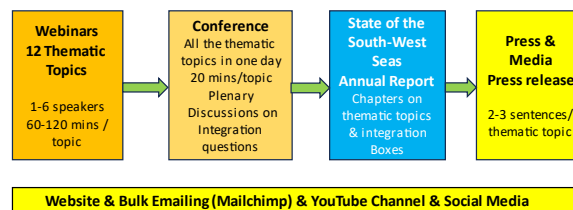


Figure 4. The SWME Communications platform and how it operates.

There is now a clear time sequence for the SWME annual programme reporting on the events of a particular year. The SWME Steering Group are convened afresh each year in the autumn. A simple plan for webinars, conference, report and media is agreed (Figure 4).

This process of events gradually hones-down key messages on the state of south-west seas. From the webinars, which usually involve many inputs on particular thematic topics, to the much shorter 20 minute conference presentations, to the chapters in the report which require conclusions and finally the press release where short – one or two sentences – summarise key messages that enables us to communicate to a very wide range of audiences.

Presentations to national audiences on the SWME Model were made to the Healthy and Biologically Diverse Seas Evidence Group ([HBDSEG](#)) ([Bob Earll](#)), [The Porcupine Marine Natural History Society](#) ([Keith Hiscock](#)) in 2021 and at Coastal Futures - 2022 ([Ruth Williams](#)). These have highlighted the benefits of annual reporting on a regional scale and demonstrated how the SWME model has helped develop social capital and how many organisations work effectively with citizen science networks. The EAST Marine Ecosystems project has also prepared [FAQ video briefings on SWME](#) and the EASTME project.

4.2 Conferences

Russell Wynne had the original idea for South-West Marine Ecosystems (SWME) conference. He was then based at the National Oceanographic Centre and was working on a project on Balearic shearwaters with fieldwork based at Gwennap Head, Cornwall which involved a large number of volunteer recorders. In 2007 he set up a meeting at the Marine Biological Association (MBA) and invited a wide range of the professionals and volunteers (50+) looking at marine species in the south-west; this became a regular event each spring. In 2012 Russell Wynne asked Bob Earll to take over organising the conferences. His first was in 2013 and held at the MBA and was attended by 50+ delegates, however, following an offer from Peter Millar at the Plymouth Marine Laboratory (PML) the 2014, 2015 and 2016 conferences were held at PML with over 150+ delegates attending. From 2017-2019 the conference moved to Plymouth University with 250+ delegates attending. The conference convenor from 2018-2020 was Natasha Bradshaw (with assistance from Ruth Williams and Cornwall Wildlife Trust) and Bob Earll.

The SWME conferences have had an audience-developed set of objectives since 2015 and these have been re-written for the 2021 Report (Appendix 1). The conferences up to Covid were very 'busy' with up to 25 presentations, short and long and large audiences of over 300 delegates. The SWME conferences create a collective awareness of the different interests across a wide range of subjects. Unlike the single topic webinars this means that the conference audiences are exposed to a wide cross section of interests.

Since Covid the conference programme has become much more focussed on the thematic topics, covering each of these in a systematic way linked closely to the webinar programme and the requirement to produce the annual report. In 2023 the conference at PML had an attendance of 140+ delegates.

The SWME conferences – like all conferences – are valued by delegates for the opportunity to 'network'. Evaluation feedback has always shown that 'networking' is seen as the most important aspect of these face-to-face conferences. If 'networking' is assessed in detail its complexity can be seen to be helping to build social capital.

4.3 Webinars

The 2020 conference was cancelled because of Covid but in 2021, 2022 and 2023 thematic topic webinars were arranged. Thematic topic editors set up the webinars usually with two or more

presenters and the webinar hosting platforms were provided by SWMEs main institutional supporters - Exeter University (Penryn), Plymouth University and the MBA, and more recently the Devon Maritime Forum. The attendance at the webinars in 2021, during a Covid lockdown, ranged from 70-300 (Appendix 2). The numbers attending the webinars fell in 2022 and 2023, however the webinar recordings are posted on the SWME YouTube channel set up to host the webinar recordings was getting a higher rate of views in 2022 than 2021 even though most recordings had only been posted or 3-4 months (Appendix 2).

4.4 Comparing the function Conferences & Webinars

In Autumn 2022 when the SWME 2022-2023 was reconvened there was a discussion about the mix of meetings in relation to webinars and a conference. Table 2 compares the benefits of the two types of meeting – webinars v face to face conferences. Apart from networking and integration single thematic topic webinars offer a broad range of benefits.

Table 2 The strengths and weaknesses of face-to-face meetings in comparison with Webinars.

	Face-to-Face Meetings	Webinars
1. 'Networking' in its many ways	Very good	Very poor
2. Programme formulation	A convenor with Steering Group support	Chapter thematic topic Editors convene sessions; stronger link to chapter outputs
3. Focus on SWME Chapter thematic topics	Yes, but time limits contributions	Very Good, enables many speaker contributors
4. Programme content: Integration across thematic topics	Could be the main purpose of face to face meetings	Not good
5. Team building with contributors	Much less useful; simple lack of time	Good potential, with a variety of speaker contributions
6. Teams & Resilience	Less useful because less speakers are actively involved	Stronger because more speakers are involved
7. Audience: Interested in all Chapters	The audience hear all the chapter thematic topics; better for issues of integration across thematic topics	Audiences both general AND those who are only likely to attend that thematic topic
8. Audience reach	Within easy travelling of conference location	Local & much further afield - via YouTube recordings - attendance by others who might not otherwise attend

9.Presentation Recordings	Not used as yet - only PowerPoints	Webinar recordings on YouTube channel give a much better sense of the presentation content
10. Carbon footprint	High	Lower

A first one day conference after Covid was held at PML in April 2023; 140+ delegates attended which was the maximum we had set. This conference covered all the thematic topics and there were two additional presentations of cross cutting interest which covered ocean fronts and marine life and how the assessment of floating offshore wind in the south-west would proceed. The 2023 conference was easy to organise because the speakers for each thematic topic had in effect agreed to speak when the SWME process was convened in October 2022. In order to maximise the benefit of the conference with regard to ‘integration’ speakers were asked to include at least one slide on how their thematic topic interacts with other topics. Also the 30 minute plenary discussion at the end of the three sessions during the day was only focussed on interactive questions. Appendix 2 illustrates the participation in webinars and YouTube recording viewing figures 2022-2023 SWME programme. These figures are very similar to those in the 2021-2022 programme.

4.5 State of the Seas Annual report

The development of the annual report is described in section 2.1 and, since COVID, the Annual Report has been the main focus of SWME to establish a record of what we do. The state of the south-west seas framing has also provided a clear focus on the reports function. The 2022 report links was sent by Mailchimp to 1285 contacts on the 15th July 2022 and by August 15th it had been opened 1300 times and received 331 clicks. The 2023 annual report was sent to 1270+ contacts and has been opened 490+ times (since August 2023).

4.6 Press & Media

In 2022 with the timely publication of the SWME State of the Seas Report on 2021, a press release was produced based on 2 or 3 sentence summaries of the thematic topic reports. This was circulated to the Steering Group and various members then developed this for circulation to the wider media. A number of organisations represented on the Steering Group have communications staff with appropriate contacts in the media and social media channels. The onus is on partner organisations to lead and develop this as they see fit. The summer is often a good opportunity to communicate to the wider media. A similar process was undertaken in 2023.

4.7 Communications infrastructure

Website The SWME website was developed in 2018 as a communication tool as well as repository for annual reports and conference proceedings. Presentations & speaker notes are archived online at <http://swmecosystems.co.uk/archive>.

Bulk Emailing SWME has used the white listed Mailchimp bulk emailing systems since 2018. This is fully integrated with the SWME website with a sign-up page. SWME has a GDPR data policy. The main purpose of the mailing system is to advertise the conferences and webinars. It is also used to notify contacts of the annual report and, from time to time, other SWME compatible activities. It currently has 1250+ contacts, the contacts doubling during Covid.

YouTube Channel In 2022 the first webinars were recorded, and Ruth Williams set up a SWME YouTube channel: <https://www.youtube.com/channel/UCoJA2OkFX0fM-oq7bVTofhQ> This now has 39 videos from 2022 and 2023 and 191 'subscribers'.

Social media

In 2023 Lauren Storer (Exeter University) started to systematically use Facebook and Twitter to promote SWME webinars and the conference. In May 2023 we SWME had 107 followers on Twitter (X) and 57 on Facebook. The 2023 conference at PML also had an impressive outreach on social media.

5. Building Social Capital: SWME Organisation and Who is involved?

5.1 Social and Natural Capital – the context

SWME has always been about people, building relationship and networks, and this no less so currently. This paper is set in the context of current thinking on 'capitals', a development based on previous ideas set around sustainability. The idea of capitals was developed by [Jonathan Porritt in his book published in 2005](#), and is now widely understood and has also been updated in the Natural Capital Committee's 2019 paper on terminology (Figure 5).

Social and human capital have been at the heart of what SWME has done, not least because many people involved with SWME are concerned to communicate their work and see this making a difference to the way we manage the marine environment. People are key to this.

Building Social Capital is important because developing inter-personal relationships is key in collaborative working. To tackle any of the environmental issues that we face we need to be fully aware of other stakeholders with an interest in key topics.

In the EASTME process (2023) the question of how SWME links to social capital has been raised. The response to this is that SWMEs approach to social capital is pragmatic, nor has this ever been measured or assessed systematically. SWME would welcome input from social scientists with either SWME or EASTME (see S 5.8).

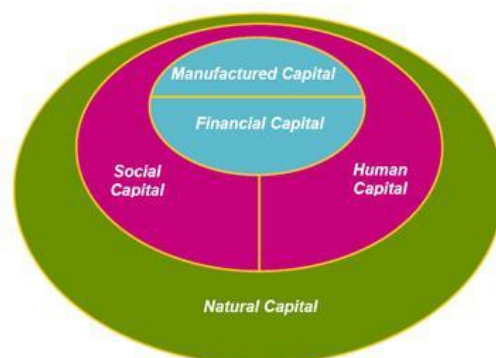


Figure 5. The capitals diagram from the Natural Capital Terminology report (2019).

The EASTME Pilot project is being funded by the Defra Natural Capital Ecosystem Assessment (NCEA) programme and so a similar question has arisen with regard to the relationship between SWME and Natural Capital and the specific methodologies of Natural Capital Assessments. The emphasis of SWMEs works has focussed on natural capital in terms of thematic topics that cover natural systems in the same way that the UKMS work does. SWME is not conducting Natural Capital Ecosystem

assessments but will report on these when the results are published in the appropriate thematic topics.

5.2 SWME organisation structure - who is involved?

SWME has developed into an informal partnership. SWME has no organisational status, no constitution or bank account. In many ways it is similar to an organisation Wildlife & Countryside Link which operates a ‘reverse umbrella’ model. The participant organisations retain their individual policies and working and have to ‘opt in’ to any collective effort (Earll, 2018). Figure 6 shows the main groups involved with SWME. Initially SWME meetings were convened and administered by just one person with the support of speakers, but this has now evolved since Covid and developed so that 30+ people now play an active part in the SWME Model each year. The following organisations and individuals are involved with SWME are described below.

The conference convenors Originally this was Russell Wynne, and has recently been Bob Earll and Natasha Bradshaw, in effect a person that takes the lead in instigating the programme for the year. Since 2021 the role of convening the programme as a whole has been undertaken by Bob Earll.

Institutional support: The initial meetings were held at the Marine Biological Association, then the Plymouth Marine Laboratory (Peter Millar, Tim Smyth & Angus Atkinson) and then Plymouth University (Martin Attrill). In covid with the webinars these organisations and Exeter University (Penryn) – Brendan Godley, and the Devon Maritime Forum (Steph Harper-Chung & Zuzanna Dusza) have provided the hosting platforms for the webinars. Ruth Williams (Cornwall Wildlife Trust) has enabled CWT to provide administrative and financial support for SWME.

Editors and webinar convenors: The report too has developed from simply a collection of speaker notes. There is now an editorial team, led by Keith Hiscock and Bob Earll. This is supported by thematic chapter editors (Table 3) whose role has changed and expanded since covid to also included convening the individual thematic topic webinar programmes as well as editing the report chapters.

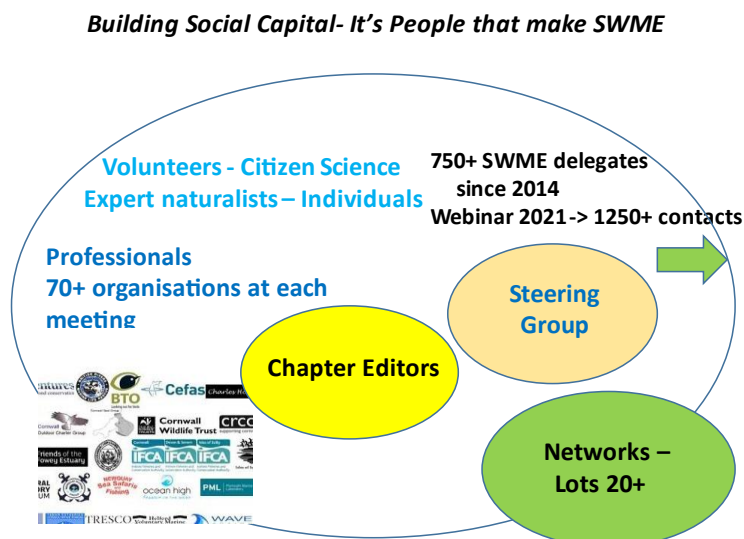


Figure 6. Social Capital: it's People that make SWME – who is involved? Conference figures from 2019

Table 3. SWME Editors in 2021-22

Oceanography	Tim Smyth
Plankton	Angus Atkinson
Benthos	Keith Hiscock
Fish & Turtles	Doug Herdson
Marine & Coastal Birds	Alex Banks
Seals	Sue Sayer
Cetaceans	Dan Jarvis, Duncan Jones, Abby Crosby
Fisheries	Libby West
Marine Protected Areas	Sian Rees
Water Quality	Steven Guilbert; 2022-2023 Steph Harper Chung & Zuzana Dusza
Plastic pollution	Delia Webb, Zara Botterell & Sarah Nelms
Climate change	Claire Wallerstein

We have also recognised the importance of marine spatial planning, not least in connection to the large scale development of floating offshore wind energy in the South-West and will be covered from 2022-2023 onward.

Steering Group Up until 2020 there was an informal group comprising Bob Earll, Keith Hiscock, Natasha Bradshaw and Ruth Williams which made decisions on the event. Since 2020 this has developed more formally, and in 2020/21 this was set up as a steering group which also included representatives of the institutional partners. For the 2021-2022 season the SG met monthly up to January and then more frequently as more co-ordination of the webinar programme has developed, with discussions about the May 6th face to face PML meeting and discussions around indicators. It is understood that SG members need not attend every meeting because they are ‘in the loop’ and can see the routine meeting notes. In 2022-2023 there was a convening meeting of all institutional backers and thematic team leads formed into one ‘steering group’ of now 30+ people.

Organisations At the last face-to-face meeting held in Plymouth in 2019 over 70 different organisations were represented. At that point there were 750 contacts on the mailing list. It seems likely that there will now be in excess of 100 organisations attending the webinar programme.

Networks There are over 20 marine ‘networks’ in the south-west which are associated with organisations, particular citizen science projects, partnerships and forums. There is a ‘network’ email list that is used for promotional mailings. This ranges from sports anglers to groups like the Cornwall Seal Group Research Trust with over 300+ contacts.

5.3 The developing model for SWME: Communities of Interest, Practice and Teams

The diagram below (Fig. 7) evolved during the discussions on the EASTME Project. It can be applied to both individual thematic topics and SWME as a whole.

Thematic topics

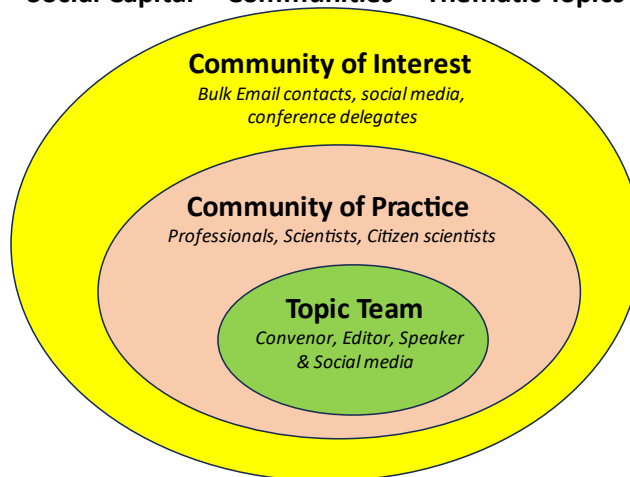
Communities of Interest In relation to thematic topics one can view the community of interest as being those people who sit in on the webinars or view the YouTube videos or who are just simply interested .

Communities of Practice A community of practice (CoP) is a *group of people who ‘share a concern or a passion for something they do and learn how to do it better as they interact’* and CoPs [are now well recognised in terms of social science](#) theory. In relation to SWME the community of practice

(CoP) are those people who play an active part in studying and working on the thematic topic, whether as scientists, citizen scientists, researchers, managers or policy advisors. In practical terms it can be an email group that can meet face to face or more often these days virtually. Thematic topic CoPs could have a number of functions, including:

- In general terms sharing news on, events, sightings, methodologies etc.,
- In SWME terms helping to develop the webinar content
- To take soundings on annual change from a broad cross section of views
- To help develop collaborative projects such as the Reporting Annual Change thematic topic report
- To help develop awareness of the SWME process, and team building to cover the various tasks by sharing the work of convening the webinar, giving the conference presentation, writing the chapter in report and promoting the topic on social media
- To build resilience in order to move away from the single 'editor-speaker' model which is SWME's greatest weakness

Social Capital – Communities – Thematic Topics



For SWME as a whole the community of interest could be viewed as the bulk email list of 1250+ contacts. SWME have never sought to measure the community of interest, but this might be viewed as people attending the conference or watching all the videos in a year. The 30+ people involved in the steering group could be regarded as the SWME CoP/team.

5.4 Outreach: Who is the audience for SWME?

We have not set out to formally assess outreach but there are a number of measures of this – see Appendix 2 – and outlined below which start to provide a basis for assessment; some summary measures of outreach for the 2022-2023 programme include:

- 1250+ contacts on the bulk emailing system SWME uses
- by August 2023 over 2500+ have watched the YouTube channel videos of the webinars (Appendix 2)
- 140+ people attended the 2023 PML meeting which also attracted a large Twitter (X) audience

- The annual report was sent to 1250+ contacts and has been opened 500+ times (since August 2023)
- Social media Twitter (X) and Facebook postings started in 2023.

5.5 Annual Convening

SWME relies on the wide-ranging input of many volunteers in any one year certainly in excess of 30 people; many of these volunteers are long standing supporters. In a development in 2022-2023 a formal convening process was introduced inviting all of these volunteers whether they would be prepared to input their efforts for the next year's programme. The main benefit is getting the buy-in of volunteers for the whole programme at the start of the process. At the first convening meeting we also agree the outline of the programme – webinars, conference, report and media. This convening process is invaluable in many ways, three examples:

- i) This process insures that all the volunteers are in an email group throughout the programme whether they could attend virtual meetings or not they were kept informed of the key elements of the process
- ii) The format of the monthly steering group meetings is identical following the programme headings and simply updating this
- iii) In terms of the conference since the editor-speakers of the thematic topics had signed up at the start it took only 2 hours to compile programme of the PML meeting in April; speakers did not have to be contacted – they had already agreed to speak in October.

5.6 Funding

SWME is sustainable in the sense the current model has developed, adapted since 2007. The main strength of the SWME model is that it is run by many people often contributing considerable time and expertise, often voluntarily. That collaborative ethos is what helped us adapt successfully to an online model during Covid. The face to face conferences have always been low cost (approx. £25 fee) using a not-for-profit rationale, which covers the main expenditure (venue & catering costs). This is a sustainable funding model for the conferences. Most importantly this also means that no time is spent either looking for funds or worrying whether the conference can take place or not because of funding.

In 2023 Defra have funded work on a pilot project to see if the SWME Model can be applied to another English Region. This work is starting with a pilot in the East Marine Planning region, and it has been called the EAST Marine Ecosystems (EASTME) project. It has brought both direct financial support to SWME supporters and process (a website upgrade) as well as huge benefit in the discussion process prompting a wide range of ideas highlighting the strengths and weaknesses of SWME.

5.7 Freedom to experiment

In discussions with EASTME scoping and in the wider liaison project it has become clear that SWME operates with considerable freedoms and that this is a major strength; some elements of this freedom include:

- Since SWME does not need to seek funds to continue it has the freedom to follow new directions and cover new topics – the freedom to experiment.
- SWME is not constrained by the time limits of project funding.
- Since SWME is not formally linked to any regulatory programme, organisation or specific monitoring or assessment regime so it can act quickly to respond to events and develop its work with relative freedom.

5.8 Measuring benefits – value - outreach

A consistent set of questions has emerged in the EASTME liaison project along the following lines – has or does SWME measure it's:

- Benefits?
- Value?
- Impact?
- Outreach – audience & rates of uptake?

At one level the answer to these questions is 'no' since we have never set out to do this systematically. In another sense the answer is 'yes' in that we have evaluated our activities as needs arise, for example we have evaluated the webinars and conference (Table 2) and measured outreach in various ways (Appendix 2). It is also important to note that SWME has the mechanisms to test these questions in the bulk emailing system and opportunities at the annual conference and with volunteers. Both qualitative and quantitative mechanisms could be used. We would be open to researchers to investigate these questions.

6. Conclusions

SWME Development This paper describes the major developments of the South-West Marine Ecosystems model since its inception in 2007 and the rapid developments during the period of the Covid epidemic. It seems very likely that it will continue to develop to meet the needs of its partners and audience. We will continue to develop thematic teams and the ideas around communities of practice not only in relation to building resilience but also to canvass expertise in relation to annual change.

Reporting Annual change Reporting annual change (RAC) is a considerable challenge, and a paper is being developed. This challenge arises largely because the way we measure and report the different thematic topics varies considerably. The mix of professional and citizen science varies with topics as with the nature of data. Developing the RAC paper will be done collaboratively with the thematic topic team members. It will prove helpful in providing guidance to other groups regionally on how this might be approached.

The Communications Platform The communications platform has developed steadily since Covid, especially with webinars and the YouTube channel. There is considerable scope for developing SWMEs social media and the use of the existing platforms in terms routine communications beyond the main spring programme period.

SWME Building Social Capital and Social science input There is a need for social science evaluation of SWME and EASTME (See S5.8). SWME would welcome inputs from social scientists in assessing the model and measuring benefits, impact and the SWME communications platform.

EAST Marine Ecosystems The EASTME pilot begun in 2023 will be launched with the establishment of teams, Communities of Practice and a conference in 2024 in the East Marine Planning region. The idea for this project is to invest in its establishment so that it continues. That would provide a broader basis for assessing the benefits of the development of annual reporting at a regional level and the model as a whole.

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Appendix 1 South-West Marine Ecosystems - Aim and Objectives

The aim of the SWME model is to enable and produce an annual report on the state of south-west marine ecosystems and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

The objectives of SWME were updated for the SWME 2021 report and are as follows:

- 1. Communication & Networking** Through the annual conferences, [webinars](#), [website](#) and social media mailings, to build social capital to provide a networking opportunities for a wide cross section of people to meet, exchange views and build networks for the south-west's marine ecosystems.

2. Audience & Collaboration To encourage collaboration between citizen scientists, researchers, scientists, managers, policy makers and the public and to provide active support for existing networks enabling and building citizen science projects.

3. Regional resonance to encourage links between researchers on science projects throughout the region’s seas including the English Channel, Bristol Channel, Celtic Seas and the wider Atlantic Ocean.

4. The State of the South-West Seas To report on the state of south-west ecosystems annual with a report covering a number of thematic topics on **natural systems**: oceanography, plankton, seabed and seashore, fish, seal, marine and coastal birds, cetaceans, and **management thematic topics**: MPAs, water quality, plastics, fisheries. This reporting will build on the use of a wide array of current indicators. [Annual reports are held on the SWME website.](#)

5. Ecology of marine species To promote citizen science recording and research studies that focus on the ecology of marine species, planktonic, benthic and ‘mobile’ species (fish, birds, mammals, turtles) and the ecosystem that supports them. To understand the status of populations of marine species in the region’s seas and how they are responding to environmental and anthropogenic pressures. To enable stories to be told about the ecology of our common species, their distribution, movements and numbers, and importantly to highlight the gaps in our knowledge.

6. Management of south-west marine ecosystems To encourage strong relationships between policy makers and scientists; to promote science and the evidence base that underpins management of human activities in the coastal and marine environment with a view to supporting and promoting the health of south west’s marine ecosystems.

7. Marine Education and Outreach To highlight marine education and outreach programmes in the south-west. To support the development of new programmes that promote marine management and make use of marine science. To promote good practice in environmental education, interpretation, signage and outreach.

...and to come together to celebrate being part of the South-West Marine Ecosystem.

Appendix 2 Webinar & YouTube viewing statistics 2021-2023

Table 1. SWME Webinar Attendance & YouTube Recording Statistics 2021 & 2022

YouTube stats as of 29/7/2022
[SWME YouTube Channel Link](#)

Thematic topic	2021	2022	2021	2022
	Webinar Attendance	Webinar Attendance	YouTube Views After 12 months	YouTube Views After 3 months
Oceanography & Plankton	At least 80	59	62	72
The Seashore & Seabed	190	No data	241	115
Fishes & Reptiles	>100	No data	55	73

Marine & Coastal Birds	105	No data	56	129
Seals	300	72	316	225
Cetaceans	170	89	269	152
MPAs	225	47	232	54
Fisheries	80	37	73	165
Plastic pollution	70	Not run	60	NA
Water Quality	Not run	No data	Not run	95
Climate change	Not run	39	Not run	74
SWME descriptions	Talks on SWME overall		RE 69, KH 34	RW 18*

* Given at Coastal Futures to 300+ delegates

Table 2. SWME 2023 Webinar Attendance and YouTube Viewing

Version 6/8/2023

<https://www.youtube.com/channel/UCojA2OkFX0fM-oq7bVTofhQ>

Thematic Topics

	Webinar Attendance	01/08/2023	Webinar & YouTube Viewings Combined
Oceanography*		48	
Plankton*		64	
Seabed & seashore	37	500	537
Fish & turtles	20	149	169
Coastal Birds	30	106	136
Seals	68	926	994
Cetaceans	87	173	260
MSP	34	122	156
MPAs	87	89	176
Fisheries	55	150	205
Water Quality	47	75	122
Plastic pollution	73	98	171
	538	2500	2853
Ocean fronts & marine life		32	
Floating offshore wind assessment		54	

Notes on Table

Videos on oceanography, plankton, ocean fronts and offshore wind were filmed at the conference; no webinars for these were held. 140+ people attended the conference
The seabed and seashore had 1200 views in June and 2.1K views in August