



**Marine Climate Change  
Impacts Partnership**

**MCCIP “Light-touch” Evaluation Report  
2013/14**

**Supplementary to:  
Brooks and Orr (2014)**

October 2014

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Front cover reference:

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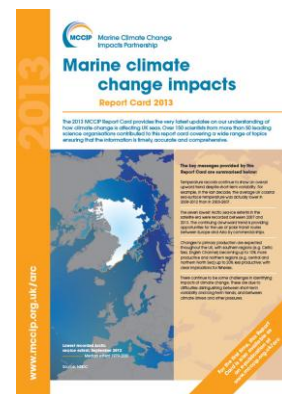
## Acronyms

ARC	Annual Report Card
ARC10-11	2010-2011 Annual Report Card
ARC13	2013 Annual Report Card
BBC	British Broadcasting Company
BMF	British Marine Federation
CCRA	Climate Change Risk Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CSSEG	Clean and Safe Seas Evidence Group
CSW	Climate Smart Working
Defra	Department of Environment, Food and Rural Affairs
HBDSEG	Healthy and Biologically Diverse Seas Evidence Group
LWEC	Living with Environmental Change
MACCAP	MARine Climate Change Adaptation Project
MBA	Marine Biological Association
MCCIP	Marine Climate Change Impacts Partnership
MG	Management Group
MP	Member of Parliament
MSCC	Marine Science Coordination Committee
MSP	Member of the Scottish Parliament
NAP	National Adaptation Programme
NERC	Natural Environment Research Council
NOC	National Oceanography Centre
OPEG	Ocean Processes Evidence Group
PSEG	Productive Seas Evidence Group
SG	Steering Group
SSPO	Scottish Salmon Producers' Organisation
ST	Special Topic Report Card
ST09	2009 Special Report Card - Ecosystem Linkages
ST12	2012 Special Report Card - Fish, Fisheries and Aquaculture
UKCIP	UK Climate Impacts Programme
UKMMAS	UK Marine Monitoring and Assessment Strategy
WG	Working Group

# 1 MCCIP products launched in 2013/14

## 1.1 2013 Annual Report Card

MCCIP commissioned 33 groups of scientists (150 in total from 52 organisations) to produce a new set of scientific review papers to review the current state of understanding of climate change impacts in the UK marine environment. These groups provided reviews on a range of topics, based on the UKMMAS evidence groups, including the newly added Arctic Sea-Ice paper. The key findings were summarised in the 12-page “Marine climate change impacts Report Card 2013”<sup>1</sup> (ARC13). The card includes regional “snapshots of marine climate change impacts” showing how areas around the UK are likely to be affected. As well as the key findings, the report card explains the difficulties in distinguishing between short-term variability and long-term trends, and between climate drivers and other pressures.



### 1.1.1 Launch

The ARC13 was launched by press release (Appendix 1) on 28<sup>th</sup> November 2013, via a soft launch with a press release being distributed to the MCCIP mailing list ((1040 people on 28/11) and a list of 50 environmental journalists. Prior to the launch, a pre-release flyer (Appendix 2), was circulated to the MCCIP mailing list and handed out to attendees of the IPCC launch event “Climate Science: Next Steps” at the Royal Society in London<sup>2</sup>.

### 1.1.2 Media

There was a small amount of media interest in MCCIP following the ST13 launch, yet this mainly remained close to the community, e.g. peer newsletters and blog articles. Almost 20 articles appeared either in print or online media, with news stories written by the Herald Scotland, SAMS, CEH, Huffington Post and the Met Office (see Appendix 3 for further detail).

### 1.1.3 Dissemination

The backing papers used to populate the ARC13 were published after formal peer review process. All backing papers and the 12-page ARC (pdf and e-pub) were published on the MCCIP website, and the pages relating to the ARC received 3,288 page views spending an average of over 3 minutes on each visit (189.54 seconds).

The ARC was also publicised on Twitter to over 100 followers, distributed as hardcopies and presented at three meetings and three events to approximately 200 people (Table 1). Tweets relating to the ARC were the three most clicked in over 100 tweets sent in 2013/14 (Appendix 4). 3,350 newsletters were distributed (Appendix 5), where only 1,000 of these were distributed to authors and their organisations.

<sup>1</sup> <http://www.mccip.org.uk/arc>

<sup>2</sup> <https://royalsociety.org/events/2013/climatescience-next-steps/>

**Table 1: Dissemination events**

Event	Host	Presenter	Attendees
MCCIP and climate change webinar	Natural England	PB	43
LWEC Steering Group meeting	LWEC, London	PB	~15
Defra Lunchtime Seminar	Defra, London	MF	~20
MCCIP and climate change webinar	Environment Agency	GBB	102
Climate UK Annual General Meeting	Climate UK	GBB	~10
MCCIP and climate change webinar	MASTS	GBB	12

## 1.2 Climate Smart Working Report Card

MCCIP, the British Marine Federation (BMF) and the Environment Agency's "Climate Ready" support service, have worked together to produce the first Climate Smart Working Report Card, "Climate change and the UK marine leisure industry". Developed as a result of a workshop, this card acts as a step-by-step guide to key climate change impacts and adaptation responses to support single and multi-site operators of boatyards, marinas and support services. The Report Card includes a summary of key climate change impacts of relevance to the UK marine leisure industry; information on threats and opportunities for the sector; recommendations for collective and individual actions; and, a two-page interactive workspace to identify and record your own issues and adaptation responses.



### 1.2.1 Launch

The Marine Leisure Report Card was launched by news release on 5<sup>th</sup> February 2014 to the MCCIP mailing list (1021 people on 05/02) and to all members of the British Marine Federation representing 4,200 organisations. It was presented to the sector at the 2013 Marina Conference in May 2013.

### 1.2.2 Media

There was community interest in the CSW card following its launch, notably it stimulated interest from future partners for adaptation work (Seafish in 2014/15) and has been used to form the main content for a presentation by the Clyde Forum at the Southampton Boat Show in September 2014.

### 1.2.3 Dissemination

The CSW card in several versions (e-publication, pdf and interactive) were published on the MCCIP website, and the pages relating to the CSW adaptation received 902 page views spending just under two minutes on each visit (110.54 seconds). The CSW was also publicised on Twitter to almost 150 followers, distributed as 1,443 hardcopies and presented at three meetings and three events to approximately 200 people (Table 1).

## 1.3 Knowledge gaps and research prioritisation

During 2011 and early 2012, MCCIP sought guidance from the MSCC on the development of a knowledge gaps paper, in order to ensure that it is of value to the broad, and varied, membership of

the MSCC. MCCIP published its eight-page knowledge gaps paper, based on the report card submissions, in May 2012. The paper presents 72 individual gaps, split into the four UK Marine Monitoring and Assessment Strategy<sup>3</sup> (UKMMAS) evidence groups in the ARC, namely OPEG, HBDSEG, CSSEG, PSEG or, in full, the ‘ocean processes’, ‘healthy and biologically diverse seas’, ‘clean and safe seas’ and ‘productive seas’ evidence groups<sup>4</sup>.

Drafts of the 2014 Knowledge Gaps and Research Prioritisation papers were provided to the MSCC for discussion at their biannual committee meeting on 12<sup>th</sup> March 2014<sup>5</sup> and released on 11<sup>th</sup> March 2014.

### 1.3.1 Knowledge gaps paper

As a key part of the ARC13 submission templates, contributing authors were asked to name the ‘*top priority knowledge gaps that need to be addressed in the short term, to provide better advice to be given to policy makers*’.

The responses represent the views of almost 150 marine and climate scientists, spread across 52 science institutes. Both the knowledge gap responses and the confidence sections for each of the 33 topics were subject to independent peer-review by specialists in each of those topics. The 58 identified gaps for 2013 are listed as a supplement<sup>6</sup> to the Research Prioritisation paper.

### 1.3.2 Prioritisation exercise

These knowledge gaps were listed, and provided to the four UK Marine Monitoring and Assessment Strategy<sup>7</sup> (UKMMAS) evidence groups, namely OPEG, HBDSEG, CSSEG, PSEG or, in full, the ‘ocean processes’, ‘healthy and biologically diverse seas’, ‘clean and safe seas’ and ‘productive seas’ evidence groups<sup>8</sup>. The chairs of the evidence groups were asked to score the knowledge gaps by their importance to three items: marine policy drivers, science drivers and, growth and sustainability. The full methodology is also available as a supplementary paper<sup>9</sup>. These scores were collated and the key findings of the Research Prioritisation Exercise 2014 were complete<sup>10</sup> and are listed as 19 research priorities for the marine climate change impact discipline, from the perspective of scientists and academics.

### 1.3.3 Launch, media and dissemination

The Research Priorities key findings and supplementary papers were launched by news release on 11<sup>th</sup> March 2014 to the MCCIP mailing list (1010 people on 11/03), 27% of subscribers opened the newsletter and a further 10% clicked through to the relevant pages. Unfortunately, since its launch, this work has received very little attention and this is something that will advantage from a focussed communication working group, as proposed for Phase III.

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<sup>3</sup> <http://archive.defra.gov.uk/environment/marine/documents/science/ukmas/ukmmas-strategy.pdf>

<sup>4</sup> <http://chartingprogress.defra.gov.uk/feeder/HBDSEG-FeederReport-sec1.pdf>

<sup>5</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/325603/MSCC-140312.zip](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/325603/MSCC-140312.zip)

<sup>6</sup> [http://www.mccip.org.uk/media/25003/researchpriorities\\_feb14\\_supplementary\\_final.pdf](http://www.mccip.org.uk/media/25003/researchpriorities_feb14_supplementary_final.pdf)

<sup>7</sup> <http://archive.defra.gov.uk/environment/marine/documents/science/ukmas/ukmmas-strategy.pdf>

<sup>8</sup> <http://chartingprogress.defra.gov.uk/feeder/HBDSEG-FeederReport-sec1.pdf>

<sup>9</sup> [http://www.mccip.org.uk/media/25006/researchpriorities\\_feb14\\_methodology\\_final.pdf](http://www.mccip.org.uk/media/25006/researchpriorities_feb14_methodology_final.pdf)

<sup>10</sup> [http://www.mccip.org.uk/media/25236/researchpriorities\\_feb14\\_final.pdf](http://www.mccip.org.uk/media/25236/researchpriorities_feb14_final.pdf)

## 2 Regular MCCIP products

### 2.1 MCCIP website

Data on MCCIP website usage, for the period 1<sup>st</sup> April 2013 to 31<sup>st</sup> March 2014, was collected using Google Analytics.

The data show that during this time period there were:

- 11,608 visits
- 8,862 individual “unique” visitors
- 29,387 page views
- 2.53 pages / visit
- 2 min 19s average time on site
- 10% of visits were made using mobile devices (iPad, mobile phones. iPod etc)

Compared to 2012/13, we have had 82 more visits; 227 more unique visitors; 3006 more page views; people are viewing 0.24 more pages per visit, spending 32 seconds more per visit and 700 more visits were performed using a mobile device than in 2012/13.

#### 2.1.1 Visits per day

Figure 1 shows that the number of visits per day where the average number of visitors per day was 31.8 (less than 34.5, 2012/13). It can be seen that the number of visits is steady with a spike at the time of the ARC2013 launch (November 2013) with an additional peak on 5<sup>th</sup> February 2014 (139 visits), coinciding with the launch of the CSW Card. The most visits (341) were on 28<sup>th</sup> November with over 1250 visits in the two weeks following the launch.

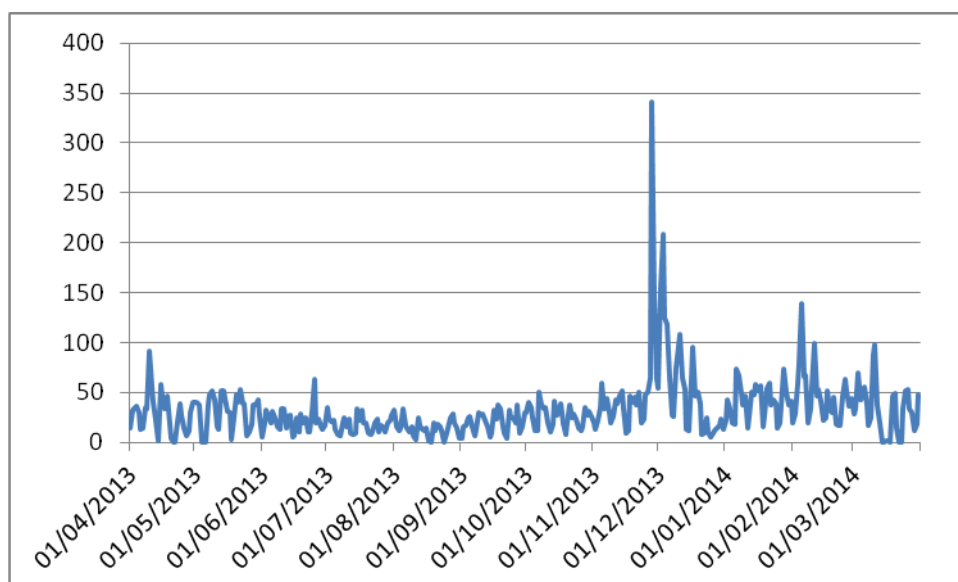


Figure 1: Number of visits each day to the MCCIP website for the period 1/4/2013-31/03/2014

#### 2.1.2 Countries

Visitors accessed the site from 133 countries (126 countries in 2012/13). The top 10 countries can be seen in Table 2. This list reflects that presented for the 2012-13 evaluation with very few place changers with China replacing the Netherlands in tenth position.

**Table 2: Top ten countries from which the MCCIP website were accessed**

<b>Country/Territory</b>	<b>Sessions</b>
United Kingdom	7653
United States	1801
India	185
Canada	132
Australia	128
Ireland	118
Germany	104
Philippines	102
France	94
China	63

### **2.1.3 Surfing time**

Although the average time spent on the site was 2 minute and 19 seconds, 70% of visits lasted less than 10 seconds (as last FY). Of the remaining visits, the majority lasted between 1 and 3 minutes and 172 visits lasted more than 30 minutes.

## **2.2 MCCIP newsletter**

Newsletters are sent out monthly (unless replaced with a news release), via e-mail by the Secretariat up to July 2013 when MailChimp was adopted to manage the mailing list. They provide a brief summary of marine climate change news and events, often five to six key items, also used to update the front page of the MCCIP website. The newsletter takes approximately half a day per month of staff time: To source material, draft the text, distribute, publish online and administer the mailing list. The drive to produce the newsletter is to help maintain awareness of MCCIP between high profile events, such as report card launches, as well as providing a mechanism for keeping people informed about marine climate change issues.

### **2.2.1 Subscribers**

At the end of 2011/12, 1,036 recipients were subscribed to the newsletter. By the first release of the newsletter of 2012/13, this had increased by 32 recipients. Throughout the year, this gradually depleted to 1,004 subscribers. The opens and clicks on the newsletter, recorded since joining MailChimp in July have decreased yet exceed the industrial average. A rapid reduction in membership was experienced with each request for taking part in the questionnaire for the Mid-Term Review. Despite this the opens and clicks on other announcements, such as the ARC, CSW and research priorities work has remained high. MailChimp allows for subscribers to unsubscribe in a single click and so for those on the periphery of the topic, or relocating to new roles, may opt out of receiving the newsletter sooner than if they had to send an email to so, as they would have done in the past.



**Table 2: Subscribers per month to all news releases**

Month	Monthly newsletter				Other announcements			
	Item	Subscribers	Opens	Clicks	Item	Subscribers	Opens	Clicks
April	NL	1068						
May	NL	1071						
June	NL	1071	-	-				
July	NL	1061	27.8	12.6				
August	NL	1042	26.6	8.9				
September	NL	1032	23	5.2				
October								
November					ARC	1040	29.1	11.8
December	NL	1036	21	3.5				
January					MTR	1031	22.7	5.3
					MTR	1024	22.3	3.4
February					CSW	1021	25.3	9
					MTR	1016	27	9.7
					ResP	1010	27	9.7
March	NL	1004	24.4	7				

### 3 Citations

A review, using Google Scholar, of academic resources (papers / thesis / books), and Google searches for grey literature and websites referring to MCCIP was undertaken. There were 94 citations in academic materials (including journal articles and theses); 16 citations in reports and other grey literature; and 7 references on websites in 2013/14. In 2012/13, there were only 41 citations reported.

## Appendix 1: ST13 press release



**Embargoed until 00:01 28<sup>th</sup> November 2013**  
**Climate change continues to impact UK waters**

The Marine Climate Change Impacts Partnership (MCCIP) published its latest Report Card today (28 November), providing its most comprehensive assessment yet on how climate change is affecting UK waters.

For the first time, Arctic sea-ice coverage is considered by the report's authors. A long-term decline is clearly apparent, with Arctic sea-ice extent retreating and the ice becoming thinner as temperatures rise. This may provide opportunities for European and Asian commercial ships to cross the globe via northern polar routes, but could herald other geopolitical challenges.

The report card explains how short term variability means some years will be cooler than others. However, long term records clearly demonstrate an overall warming trend in recent decades, which is expected to continue in the future.

In addition, the 2013 report's regional maps highlight differences across the UK's seas and show the importance of local-scale impacts. For instance, the movement of fish species – important to commercial and recreational fishermen – and how non-native species are expanding their range are both covered.

### **Some key findings in the 2013 MCCIP Report Card include:**

- Temperature records continue to show an overall upward trend despite short-term variability. For example, in the last decade, the average UK coastal sea surface temperature was actually lower in 2008-2012 than in 2003-2007.
- The seven lowest Arctic sea-ice extents in the satellite era were recorded between 2007 and 2013. The continuing downward trend is providing opportunities for the use of polar transit routes between Europe and Asia by commercial ships.
- Changes to primary production are expected throughout the UK, with southern regions (e.g. Celtic Sea, English Channel) becoming up to 10% more productive and northern regions (e.g. central and northern North Sea) up to 20% less productive; with clear implications for fisheries.
- There continue to be some challenges in identifying impacts of climate change. These are due to difficulties distinguishing between short-term variability and long-term trends, and between climate drivers and other pressures.

Dr Matthew Frost of the Marine Biological Association and Chair of the MCCIP Report Card Working Group said:

"The marine environment is subject to a wide range of man-made pressures but can also change in response to natural processes. Disentangling these factors to enable identification of current and potential future impacts of climate change continues to be one of the greatest challenges facing marine scientists today. We have sought to clearly explain these challenges whilst continuing to report on the rapid and significant impacts of marine climate change."

Marine Environment Minister George Eustice said:

“This report improves our understanding of how UK seas are already influenced by climate change and of potential changes in the future. Understanding these impacts, threats and opportunities is an essential basis for managing our marine environment.”

The report card highlights how little is known about climate change impacts on the “marine economy”, despite its importance for food (fish and aquaculture), energy (oil, gas and renewable energy), transport and coastal tourism and marine recreation. Coastal tourism and marine recreation is a key economic sector that could be highly sensitive to climate change (e.g. the threats of flooding, coastal erosion and opportunities for increasing visitor numbers), but little is known about future social and economic impacts.

#### **Notes for news editors**

1. All online material, including the 12 page summary report card and the 33 topic reports will be available from 08:30 on 28<sup>th</sup> November 2013 at [www.mccip.org.uk/arc/2013](http://www.mccip.org.uk/arc/2013)
2. MCCIP’s principal aim is to provide a co-ordinating framework for the UK to transfer high-quality evidence on marine climate change impacts and guidance on adaptation and related advice to policy advisors and decision-makers.
3. Over 150 scientists from 55 leading UK science organisations contributed to the 2013 report, which covers more than 30 marine and coastal topics. The detailed peer-reviewed briefings on all the topics covered in the summary are found on the MCCIP website: [www.mccip.org.uk/arc](http://www.mccip.org.uk/arc)
4. The Marine Climate Change Impacts Partnership (MCCIP) was launched in March 2005 and is a partnership between scientists, government, its agencies, non-governmental organisations and industry.

MCCIP partner organisations are:

- Agri-Food and Biosciences Institute, Northern Ireland
- Centre for the Environment, Fisheries and Aquaculture Science
- Department of Energy and Climate Change
- Department for Environment, Food and Rural Affairs
- Department of the Environment, Northern Ireland
- Environment Agency
- International Union for Conservation of Nature
- Isle of Man Government
- Joint Nature Conservation Committee
- Marine Institute, Ireland
- Marine Biological Association - Marine Environmental Change Network
- Marine Management Organisation
- Marine Scotland
- Met Office
- National Oceanography Centre
- Natural England
- Natural Resources Wales
- Royal Society for the Protection of Birds
- Scottish Environment Protection Agency
- Scottish Natural Heritage
- Seaweb
- Sir Alister Hardy Foundation for Ocean Science
- States of Guernsey
- States of Jersey
- University of East Anglia - Climatic Research Unit
- Welsh Assembly Government

#### **Press enquiries:**

The MCCIP Secretariat is hosted at the Centre for Environment, Fisheries & Aquaculture Science (Cefas). Contact Stephen Dye at Tel: **01502 524508** | Email: [office@mccip.org.uk](mailto:office@mccip.org.uk)

## Appendix 2: Pre-launch release flyer

2013  
[www.mccip.org.uk/arc](http://www.mccip.org.uk/arc)



**MCCIP** Marine Climate Change  
Impacts Partnership



To be launched in  
**NOVEMBER 2013**

### Marine climate change impacts Report Card 2013

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- The very latest updates on our understanding of how climate change is affecting seas around the UK
- Contributions from over 150 scientists from more than 50 leading science organisations covering a wide range of topics ensuring that the information is timely and accurate
- 12-page Report Card supported by 33 peer-reviewed topic reports
- Regional scale impacts are highlighted where possible
- Available as a PDF and an e-publication



*Minimum Arctic sea-ice extent observed in 2012*

median 1979-2000      Credit: NSIDC

To view or download the Report Card, visit:  
[www.mccip.org.uk/arc](http://www.mccip.org.uk/arc)

The Marine Climate Change Impacts Partnership (MCCIP) is a partnership between scientists, government, its agencies, non-governmental organisations and industry. The principal aim is to provide a coordinating framework for the UK, so as to be able to transfer high quality evidence on marine climate change impacts, and guidance on adaptation and related advice, to policy advisers and decision-makers.

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*To receive regular updates from MCCIP:  
Subscribe to the mailing list by email: [office@mccip.org.uk](mailto:office@mccip.org.uk)  
Follow us on Twitter @MccipOrgUk*

## Appendix 3: Media activity

News articles	
1	CEH, "Marine Climate Change scorecards published today for Coastal Margin habitats and Seabirds" <a href="http://cehsciencenews.blogspot.co.uk/2013/11/marine-climate-change-scorecard-impact-uk.html">http://cehsciencenews.blogspot.co.uk/2013/11/marine-climate-change-scorecard-impact-uk.html</a>
2	Climate News Network "UK waters grow cooler – and more acid" <a href="http://www.climate-news-network.net/2013/11/uk-waters-grow-cooler-and-more-acid/">http://www.climate-news-network.net/2013/11/uk-waters-grow-cooler-and-more-acid/</a>
3	Herald Scotland, "Revealed: how global warming is changing Scotland's marine life" <a href="http://www.heraldscotland.com/news/home-news/revealed-how-global-warming-is-changing-scotlands-marine-life.23052108">http://www.heraldscotland.com/news/home-news/revealed-how-global-warming-is-changing-scotlands-marine-life.23052108</a>
4	Huffington Post, "Climate change impacts ripple through fishing industry" <a href="http://www.huffingtonpost.com/2013/05/17/ocean-climate-change-fishing-industry_n_3275505.html">http://www.huffingtonpost.com/2013/05/17/ocean-climate-change-fishing-industry_n_3275505.html</a>
5	Huffington Post, "Ocean of trouble - When climate change and fish collide" <a href="http://www.tomzeller.com/cv/FISH_CLIMATE_SCIENCEb.pdf">http://www.tomzeller.com/cv/FISH_CLIMATE_SCIENCEb.pdf</a>
6	LWEC, "Marine Report Card Update" <a href="http://www.lwec.org.uk/news-archive/201311">http://www.lwec.org.uk/news-archive/201311</a>
7	MBA, "Climate change continues to impact UK waters, says new MCCIP report card" <a href="http://www.mba.ac.uk/2013/11/28/climate-change-continues-to-impact-uk-waters-says-new-mccip-report-card/">http://www.mba.ac.uk/2013/11/28/climate-change-continues-to-impact-uk-waters-says-new-mccip-report-card/</a>
8	Met Office, Barometer Magazine, "Understanding our seas" <a href="http://www.metoffice.gov.uk/barometer/features/2013-12/understanding-our-seas">http://www.metoffice.gov.uk/barometer/features/2013-12/understanding-our-seas</a>
9	OA, "Marine Climate Change Impacts Partnership publishes latest Report Card" <a href="http://www.oceanacidification.org.uk/Latest-News/Marine-Climate-Change-Impacts-Partnership-publishe">http://www.oceanacidification.org.uk/Latest-News/Marine-Climate-Change-Impacts-Partnership-publishe</a>
10	SAMS, "Alien count is on the up" <a href="http://www.sams.ac.uk/news-room/news-items/alien-count-is-on-the-up">http://www.sams.ac.uk/news-room/news-items/alien-count-is-on-the-up</a>
11	Sunday Herald, "Climate pollution will hurt the Scottish fishing industry, say scientists" <a href="http://www.robbedwards.com/2013/12/climate-pollution-will-hurt-the-scottish-fishing-industry-say-scientists.html">http://www.robbedwards.com/2013/12/climate-pollution-will-hurt-the-scottish-fishing-industry-say-scientists.html</a>
12	Truthdig, "U.K. Waters Grow Cooler and More Acidic" <a href="http://www.truthdig.com/report/item/uk_waters_grow_cooler_and_more_acidic_20131130">http://www.truthdig.com/report/item/uk_waters_grow_cooler_and_more_acidic_20131130</a>
Newsletters	
1	CLASP, "New Year 2014 Sustainability Update" <a href="http://media.claspinform.org.ccn.cdn.faelix.net/sites/default/files/CLASP%20update%20%28start%202014%29.pdf">http://media.claspinform.org.ccn.cdn.faelix.net/sites/default/files/CLASP%20update%20%28start%202014%29.pdf</a>
2	Climate Change North West "Newsletter: December 2013" <a href="http://www.climatechangenorthwest.co.uk/sites/default/files/NWCCP%20Project%20Updates%20Dec%202013.pdf">http://www.climatechangenorthwest.co.uk/sites/default/files/NWCCP%20Project%20Updates%20Dec%202013.pdf</a>
3	Climate News Network, "November 2013" <a href="http://www.climate-news-network.net/2013/11/">http://www.climate-news-network.net/2013/11/</a>
4	IOC-UNESCO, "Harmful Algal News No48 April 2014" <a href="http://www.ioc-unesco.org/hab">http://www.ioc-unesco.org/hab</a>
5	JNCC, "Nature news 31" <a href="http://jncc.defra.gov.uk/page-6598">http://jncc.defra.gov.uk/page-6598</a> International Shipping Logistics Group "Newsletter: 14(2) Winter 2013" <a href="http://www.pynda.com/IS&amp;L_NEWS_Winter_2013.pdf">http://www.pynda.com/IS&amp;L_NEWS_Winter_2013.pdf</a>
6	Seafish, "E-zine: December 2013" <a href="http://www.seafish.org.uk/media/Publications/SeafishAquaculture_e-alert_2Dec2013.pdf">http://www.seafish.org.uk/media/Publications/SeafishAquaculture_e-alert_2Dec2013.pdf</a>
7	Seafish, "Newsletter: December 2013" <a href="http://www.seafish.org/media/publications/SeafishCLG_NewsSummary_201312.pdf">http://www.seafish.org/media/publications/SeafishCLG_NewsSummary_201312.pdf</a>



## Appendix 4: Twitter statistics

Rank	Date	Post	Clicks
1	Nov 28, 2013	<a href="http://ow.ly/r4UX0">http://ow.ly/r4UX0</a> <a href="http://www.mccip.org.uk/annual-report-card.aspx">http://www.mccip.org.uk/annual-report-card.aspx</a> "Temperature records continue to show an overall upward trend despite short-term variability" #ARC2013 <a href="http://ow.ly/r4UX0">http://ow.ly/r4UX0</a>	15 clicks
2	Nov 28, 2013	<a href="http://ow.ly/r4WHw">http://ow.ly/r4WHw</a> <a href="http://www.mccip.org.uk/annual-report-card.aspx">http://www.mccip.org.uk/annual-report-card.aspx</a> "Changes to primary production are expected throughout the UK...with clear implications for fisheries" #ARC2013 <a href="http://ow.ly/r4WHw">http://ow.ly/r4WHw</a>	7 clicks
3	Nov 28, 2013	<a href="http://ow.ly/r4VKn">http://ow.ly/r4VKn</a> <a href="http://www.mccip.org.uk/annual-report-card.aspx">http://www.mccip.org.uk/annual-report-card.aspx</a> #ARC2013 combines knowledge of >150 scientists from >50 leading science org's on how #climatechange affects UK seas <a href="http://ow.ly/r4VKn">http://ow.ly/r4VKn</a>	5 clicks
4	Feb 5, 2014	<a href="http://ow.ly/tip7l">http://ow.ly/tip7l</a> <a href="http://www.mccip.org.uk/adaptation">http://www.mccip.org.uk/adaptation</a> #Adaptation for #ClimateChange and UK marine leisure industry" - A product of @britishmarine @EnvAgency @MccipOrgUK <a href="http://ow.ly/tip7l">http://ow.ly/tip7l</a>	4 clicks
5	Oct 19, 2013	<a href="http://ow.ly/pz7bj">http://ow.ly/pz7bj</a> <a href="http://www.mccip.org.uk/media/10937/sep13.pdf">http://www.mccip.org.uk/media/10937/sep13.pdf</a> Movement of marine life follows speed and direction of climate change @Princeton As featured in September MCCIPnews <a href="http://ow.ly/pz7bj">http://ow.ly/pz7bj</a>	4 clicks
6	Oct 1, 2013	<a href="http://ow.ly/pnlUL">http://ow.ly/pnlUL</a> <a href="http://www.mccip.org.uk/media/10937/sep13.pdf">http://www.mccip.org.uk/media/10937/sep13.pdf</a> September's MCCIP news released today <a href="http://ow.ly/pnlUL">http://ow.ly/pnlUL</a>	4 clicks
7	Jan 3, 2014	<a href="http://ow.ly/rXbMe">http://ow.ly/rXbMe</a> <a href="http://www.mccip.org.uk/media/21931/dec13.pdf">http://www.mccip.org.uk/media/21931/dec13.pdf</a> #climatechange Is creating anxious fish <a href="http://ow.ly/rXbMe">http://ow.ly/rXbMe</a> @Scripps_Ocean	3 clicks
8	Oct 15, 2013	<a href="http://ow.ly/pz8Md">http://ow.ly/pz8Md</a> <a href="http://www.awi.de/en/news/press_releases/detail...">http://www.awi.de/en/news/press_releases/detail...</a> Recent warming of the Greenland Sea Deep Water is ~10x higher than rates estimated for the global ocean @AWI_Media <a href="http://ow.ly/pz8Md">http://ow.ly/pz8Md</a>	3 clicks
9	Oct 13, 2013	<a href="http://ow.ly/pzawJ">http://ow.ly/pzawJ</a> <a href="http://www.adaptationscotland.org.uk/10/16/402/...">http://www.adaptationscotland.org.uk/10/16/402/...</a> Presentations from the successful Scotland's Adaptation Conference 2013 are now available on @AdaptationScot website <a href="http://ow.ly/pzawJ">http://ow.ly/pzawJ</a>	3 clicks
10	Aug 16, 2013	<a href="http://ow.ly/nSsdB">http://ow.ly/nSsdB</a> <a href="http://grist.org/climate-energy/climate-change-...">http://grist.org/climate-energy/climate-change-...</a> Rising ocean temps rearranging the makeup of oceans-forcing species toward the poles by 4.4 miles every yr <a href="http://ow.ly/nSsdB">http://ow.ly/nSsdB</a> @gcitweet	3 clicks

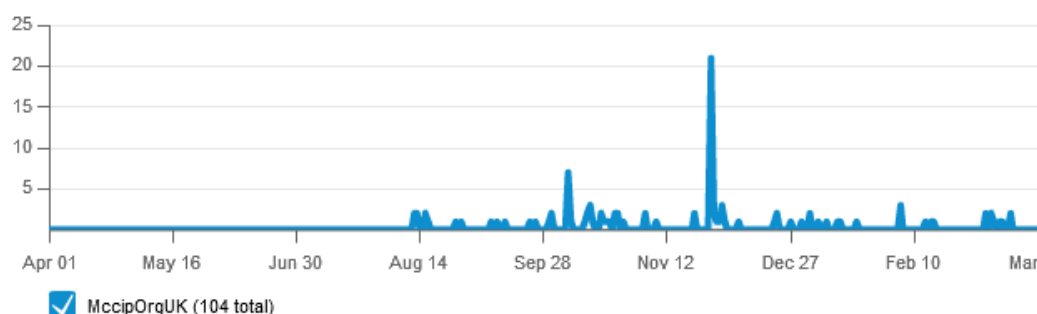
nb: Yellow sections are directly related to the launch of the ARC13.

Followers: 153

Following: 94

(correct at 15 October 2013)

### Summary Stats



## Appendix 5: ARC13 and CSW distribution

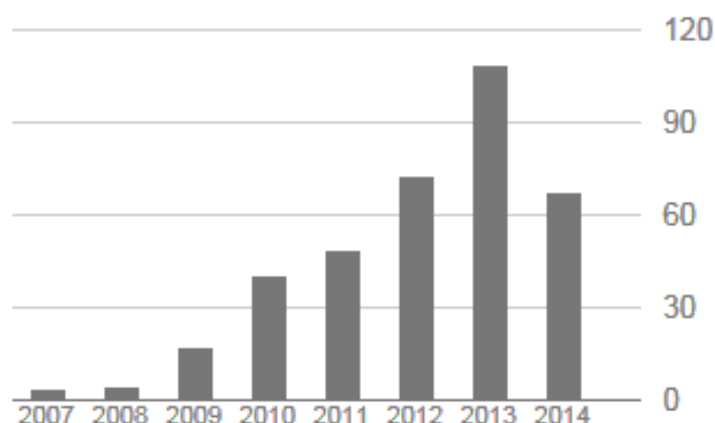
Name	Organisation	2013 ARC Orders
		TOTAL: 5000
Adam Cook	MMO	10
Adam Mellor	AFBI	300
Alexander (Sandy) Downie	SEPA	12
Beth Stoker	JNCC	10
Dan Laffoley	IUCN	25
Greg Morel	States of Jersey	50
John Baxter	SNH	600
Jonathan Tinker	UK Met Office	50
Kathryn Dawson	Natural England	20
Ken Wright (Briony Bowe)	DECC	4
Martyn Cox	Marine Scotland	600
Matt Frost	MBA - MECN	300
Narumon Withers Harvey	Defra	105
Philip Taylor	RSPB	20
Dave Frame	Wellington University (via J Tinker)	10
Authors		750
Authors organisations		250
Susan Ballard		10
Phil Williamson	NERC	20
LWEC report card working group		20
Climate-UK		12
Ocean Literacy		2
BMF		50
Arni Finnson	Iceland Nature conservation association	50
IMSCC		30
Defra Day		20
Cefas Day		20
		<b>3350</b>
Name	Organisation	2014 CSW Orders
		TOTAL: 2000
Brian Clark	BMF	500
Bev Mackenzie	IMARest	6
Susan Ballard	LWEC	5
Rob McCall	CCW	75
Kathryn Dawson	Natural England	5
Matt Frost	MBA	10
Adam Cook	MMO	10
Adam Mellor	AFBINI	25
Jon Tinker	Met Office	10

Simon Baldwin	WAG	15
Linda Horsfield	SAHFOS	50
Martyn Cox	Scottish Government	200
Ken Wright	DECC	10
Greg Morel	Jersey	25
Dan Laffoley	IUCN	25
Julian Wright	EA	50
Kristen Guida	Climate UK	12
Narumon	Defra	100
Laura Booth	Tay Estuary forum	80
Franco Marengo	Met office (to distribute to local sailing clubs)	50
Arni Finnson	Iceland Nature Conservation Association	10
Dan Hughes	CN marinas	5
fiona Wylie	Chair RYA Eastern region	5
Micheal moore	Chair RYA NW region	5
richard brown	vice chair, RYA southern region	5
David Staniforth	Chair, RYA yorks and humber region	5
gayle logan	Chair, RYA Northern Ireland Office	5
pauline mcgrow	administrator, RYA Scotland	5
ceri yeomans	office manager, RYA Wales	5
Bill Shepherd	Chair, RYA SE	5
Sarah Brown	Clyde forum (formerly green blue) for CC talk at the southampton boat show	100
GBB	IMSCC	10
Cefas Day		15
		<b>1443</b>



## Appendix 6: MCCIP citations

Citations per year



2013/14 academic citations	
1	Albrecht F, R Weisse - Ocean Dynamics, 2014 – Springer Pressure effects on regional mean sea level trends in the German Bight in the twenty-first century
2	Alfaro RM , G Born-Schmidt, IJM Mifsut, PÁ Torres - biodiversidad.gob.mx [PDF]especies invasoras acuáticas y caMBio cLiMático
3	Anderson HB, PGH Evans, JM Potts, MP Harris... - Ibis, 2014 - Wiley Online Library The diet of Common Guillemot <i>Uria aalge</i> chicks provides evidence of changing prey communities in the North Sea
4	Andresen CS, MJ Hansen, MS Seidenkrantz... - The ..., 2013 - hol.sagepub.com Mid-to late-Holocene oceanographic variability on the Southeast Greenland shelf
5	Bakker DCE, S Hankin, A Olsen, B Pfeil, K Smith... - Earth, 2014 - drs.nio.org An update to the Surface Ocean CO2 Atlas (SOCAT version 2)
6	Batstone C, M Lawless, J Tawn, K Horsburgh... - Ocean ..., 2013 - Elsevier A UK best-practice approach for extreme sea-level analysis along complex topographic coastlines
7	Baudron AR, PG Fernandes - Fish and Fisheries, 2014 - Wiley Online Library Adverse consequences of stock recovery: European hake, a new “choke” species under a discard ban?
8	Beare D, A McQuatters-Gollop, T van der Hammen... - PloS one, 2013 - dx.plos.org Long-term trends in calcifying plankton and pH in the North Sea
9	Bijma J, HO Poertner, C Yesson, AD Rogers - Marine pollution bulletin, 2013 – Elsevier Climate change and the oceans—What does the future hold?
10	Birchenough SNR , SG Bolam, RE Parker - Biogeochemistry, 2013 – Springer SPI-ing on the seafloor: characterising benthic systems with traditional and in situ observations
11	Byrne M , R Przeslawski - Integrative and comparative biology, 2013 - Soc Integ Comp Bio Multistressor impacts of warming and acidification of the ocean on marine invertebrates' life histories
12	Campos CJA - globalwaterforum.org Managing shellfish water quality under uncertain climate: Time to adapt?
13	Cheung WWL , R Watson, D Pauly - Nature, 2013 - nature.com Signature of ocean warming in global fisheries catch
14	Chust G, A Albaina, A Aranburu, Á Borja... - Estuarine, Coastal and ..., 2013 – Elsevier Connectivity, neutral theories and the assessment of species vulnerability to global change in temperate estuaries
15	Cota SEL - Interciencia, 2013 - redalyc.org Cambio climático y amniotas marinos: evidencias, hipótesis e incertidumbre
16	Crozier LG, JA Hutchings - Evolutionary applications, 2014 - Wiley Online Library Plastic and evolutionary responses to climate change in fish
17	Dale T, NB Dkhar, D Goswami, A Weber Smit, Å Åtland - 2013 - brage.bibsys.no Pre-project: Climate Change as an Opportunity towards Adaptive Sustainable Aquaculture (CADINAL)
18	Dangendorf S , T Wahl, E Nilson, B Klein, J Jensen - Climate Dynamics, 2013 – Springer A new atmospheric proxy for sea level variability in the southeastern North Sea: observations and future ensemble projections
19	Danino PA et al "Resource Status of Borongan Fish Sanctuary, RDE Journal 05/2013 6(1): 7-13

20	Day JG , DJ Burt, UEM Achilles-Day... - International Journal of ..., 2013 - Taylor & Francis Future algal biofuels: implications of environmental temperature on production strain selection
21	DeBose JL , MF Nuttall, EL Hickerson, GP Schmahl - Coral reefs, 2013 – Springer A high-latitude coral community with an uncertain future: Stetson Bank, northwestern Gulf of Mexico
22	Defeo O , M Castrejón, L Ortega, AM Kuhn... - Ecol Soc, 2013 - dlc.dlib.indiana.edu Impacts of climate variability on Latin American small-scale fisheries
23	Dickey-Collas M , GH Engelhard... - ICES Journal of ..., 2013 - icesjms.oxfordjournals.org Ecosystem-based management objectives for the North Sea: riding the forage fish rollercoaster
24	Edwards RE - 2014 - smsd.org Forensic Quarterly
25	Falkenberg LJ - 2013 - digital.library.adelaide.edu.au Mediation of global change by local biotic and abiotic interactions.
26	Fernand L, K Weston, T Morris, N Greenwood, J Brown... - Biogeochemistry, 2013 – Springer The contribution of the deep chlorophyll maximum to primary production in a seasonally stratified shelf sea, the North Sea
27	Findlay HS, Y Artioli, J Moreno Navas... - Global change ..., 2013 - Wiley Online Library Tidal downwelling and implications for the carbon biogeochemistry of cold-water corals in relation to future ocean acidification and warming
28	Frederiksen M, T Anker-Nilssen... - Global change ..., 2013 - Wiley Online Library Climate, copepods and seabirds in the boreal Northeast Atlantic—current state and future outlook
29	Friedrich L, S Fletcher, S Gall, S Rees - 2013 - plymouth.ac.uk Securing the benefits of the Marine Conservation Zone Network: Evidence for a declining ecological baseline
30	Fullbrook D - The Water-Food-Energy Nexus in the Mekong Region, 2013 – Springer Food Security in the Wider Mekong Region
31	Groll N, I Grabemann, L Gaslikova - Ocean Dynamics, 2014 – Springer North Sea wave conditions: an analysis of four transient future climate realizations
32	Haasnoot M , JH Kwakkel, WE Walker... - Global Environmental ..., 2013 - Elsevier Dynamic adaptive policy pathways: a method for crafting robust decisions for a deeply uncertain world
33	Hackney C , SE Darby, J Leyland - Geomorphology, 2013 – Elsevier Modelling the response of soft cliffs to climate change: A statistical, process-response model using accumulated excess energy
34	Halsband C, H Kurihara - Marine pollution bulletin, 2013 – Elsevier Potential acidification impacts on zooplankton in CCS leakage scenarios
35	Harris V - 2013 - discovery.ucl.ac.uk Modelling multivariate spatio-temporal structure in ecological data and responses to climate change
36	Hawkins SJ, LB Firth, M McHugh, ES Poloczanska... - Marine Policy, 2013 – Elsevier Data rescue and re-use: recycling old information to address new policy concerns
37	Hawkins SJ, M Vale, LB Firth, MT Burrows... - ..., 2013 - esciencecentral.org Sustained observation of marine biodiversity and ecosystems
38	Howard T, AK Pardaens, JL Bamber, J Ridley... - Ocean ..., 2014 - ocean-sci.ne Sources of 21st century regional sea-level rise along the coast of northwest Europe
39	Howlett ER, JA Polton, TP Rippeth, MJ Howarth - J. Geophys. Res.(submitted for ..., 2013 Wind-induced straining and mixing in a region of freshwater influence
40	Jackson CR, JD Mackay, JP Bloomfield - 2013 - nora.nerc.ac.uk Changes in groundwater levels in the UK over the 21st century: an assessment of evidence of impacts from climate change
41	Jones MC, SR Dye, R Warren... - Aquatic Conservation: ..., 2013 - Wiley Online Library Applying distribution model projections for an uncertain future: the case of the Pacific oyster in UK waters
42	Katz O, A Mushkin - Quaternary Research, 2013 – Elsevier Characteristics of sea-cliff erosion induced by a strong winter storm in the eastern Mediterranean
43	Kwasniewski S, W Walkusz, FR Cottier, E Leu - Journal of Marine Systems, 2013 – Elsevier Mesozooplankton dynamics in relation to food availability during spring and early summer in a high latitude glaciated fjord (Kongsfjorden), with focus on Calanus / ...
44	Lehikoinen A, K Jaatinen, AV Vähätalo... - Global change ..., 2013 - Wiley Online Library Rapid climate driven shifts in wintering distributions of three common waterbird species
45	Mackenzie CL, MC Bell, SNR Birchenough... - Ocean & Coastal ..., 2013 – Elsevier Future socio-economic and environmental sustainability of the Irish Sea requires a multi-disciplinary approach with industry and research collaboration, and cross- ...
46	Maskell J, K Horsburgh, AJ Plater - Continental Shelf Research, 2013 – Elsevier Investigating enhanced atmospheric–sea surface coupling and interactions in the Irish Sea
47	Maskell J, K Horsburgh, M Lewis... - Journal of Coastal ..., 2013 - jcronline.org Investigating River-Surge Interaction in Idealised Estuaries
48	Meire L , KER Soetaert, FJR Meysman - Biogeosciences, 2013 - biogeosciences.net Impact of global change on coastal oxygen dynamics and risk of hypoxia
49	Miller KA, GR Munro, UR Sumaila... - Canadian Journal of ..., 2013 - Wiley Online Library Governing Marine

	Fisheries in a Changing Climate: A Game-Theoretic Perspective
50	Morgan E, RM O'Riordan, SC Culloty - Ecology and evolution, 2013 - Wiley Online Library Climate change impacts on potential recruitment in an ecosystem engineer
51	Moritz H, SL Stockton, JC Dalton, K White, J Simm... - ice.org.uk [PDF] Tiered Approach to Incorporating Sea Level Change into Planning and Engineering for a Resilient Coast
52	Morris DJ, DC Speirs, AI Cameron, MR Heath - Ecological Modelling, 2014 – Elsevier Global sensitivity analysis of an end-to-end marine ecosystem model of the North Sea: Factors affecting the biomass of fish and benthos
53	Morrison CA and RA Robinson - Iwec.org.uk Terrestrial biodeiversity climate chaneg impacts report card technical paper - Impacts of Climate Change on Migration
54	Mossman HL, AMA Franco, PM Dolman - Iwec.org.uk Terrestrial biodiversity climate change impacts report card technical paper
55	Nicholls RJ, IH Townend, AP Bradbury... - Ocean ..., 2013 – Elsevier Planning for long-term coastal change: Experiences from England and Wales
56	Nicholls RJ, SE Hanson, JA Lowe... - Wiley ..., 2014 - Wiley Online Library Sea-level scenarios for evaluating coastal impacts
57	PALIN EJ - Geoscience in South-West England - licco.eu CLIMATE CHANGE AND GEOHAZARDS IN SOUTH-WEST ENGLAND
58	Papili S, T Wever, Y Dupont, V Van Lancker - Marine Geology, 2014 – Elsevier Storm influence on the burial of objects in a shallow sandy shelf environment
59	Pitcher TJ, WWL Cheung - Marine pollution bulletin, 2013 – Elsevier Fisheries: Hope or despair?
60	Powell V, R Duck, D McGlashan - psmsl.org Relative sea level change in the Forth and Tay Estuaries, Scotland
61	Quinn N, PD Bates, M Siddall - Journal of Geophysical ..., 2013 - Wiley Online Library The contribution to future flood risk in the Severn Estuary from extreme sea level rise due to ice sheet mass loss
62	Ranger N, T Reeder, J Lowe - EURO Journal on Decision Processes, 2013 – Springer Addressing 'deep'uncertainty over long-term climate in major infrastructure projects: four innovations of the Thames Estuary 2100 Project
63	Rejertsen, TK - PhD Thesis - Seabirds, climate and prey : A population study of two seabird species
64	Robins PE, SP Neill, L Gimenez, SR Jenkins... - Limnology and ..., 2013 - bangor.ac.uk Physical and biological controls on larval dispersal and connectivity in a highly energetic shelf sea
65	Rodríguez-Labajos B - Wiley Interdisciplinary Reviews: ..., 2013 - Wiley Online Library Climate change, ecosystem services, and costs of action and inaction: scoping the interface
66	Rogers AD, D Laffoley, N Polunin... - Key Topics in ... - Wiley Online Library Ocean conservation
67	Rogers AD, D Laffoley - 2013 - 41.89.141.5 Introduction to the special issue: The global state of the ocean; interactions between stresses, impacts and some potential solutions. Synthesis papers from the ...
68	Rowley AF, ME Cross, SC Culloty... - ICES Journal of ..., 2014 - icesjms.oxfordjournals.org The potential impact of climate change on the infectious diseases of commercially important shellfish populations in the Irish Sea—a review
69	Salihoglu B, S Neuer, S Painting, R Murtugudde... - Journal of Marine ..., 2013 – Elsevier Bridging marine ecosystem and biogeochemistry research: lessons and recommendations from comparative studies
70	Sanneh ES, AH Hu, CW Hsu, M Njie - Mitigation and Adaptation Strategies ..., 2013 – Springer Prioritization of climate change adaptation approaches in the Gambia
71	Schulte-Rentrop A, E Rudolph - Climate Change and Disaster Risk ..., 2013 – Springer A Sensitivity Study of Storm Surges Under the Conditions of Climate Change in the Elbe Estuary
72	Shennan I - Geomorphology, 2013 – Elsevier Relative land/sea level change is not the same as vertical land motion: Comment on Rennie, AF and Hansom, JD (2011)“Sea level trend reversal: Land uplift ...
73	Siddiqui KS, TJ Williams - Annu. Rev. Earth Planet. Sci, 2013 - researchgate.net David Wilkins, Sheree Yau, Michelle A. Allen, Mark V. Brown, Federico M. Lauro, and Ricardo Cavicchioli1
74	Siddiqui KS, TJ Williams, D Wilkins... - Annual Review of ..., 2013 - annualreviews.org Psychrophiles
75	Simpson MJR, K Breili, HP Kierulf - Climate Dynamics, 2014 - Springer Estimates of twenty-first century sea-level changes for Norway
76	Smale DA, MT Burrows, P Moore... - Ecology and ..., 2013 - Wiley Online Library Threats and knowledge gaps for ecosystem services provided by kelp forests: a northeast Atlantic perspective
77	Smith KE, S Thatje - Ecology, 2013 - Eco Soc America The subtle intracapsular survival of the fittest: maternal investment, sibling conflict, or environmental effects?
78	Stansby P, N Chini, D Apsley... - Journal of Flood Risk ..., 2013 - Wiley Online Library An integrated model system for coastal flood prediction with a case history for Walcott, UK, on 9 November 2007
79	Sundin J, G Rosenqvist, A Berglund - Ethology, 2013 - Wiley Online Library Altered oceanic pH impairs mating propensity in a pipefish
80	Sutomo S - Jurnal Ilmu dan Teknologi Kelautan Tropis, 2013 - 202.124.205.111] STRUKTUR KOMUNITAS FITOPLANKTON DI PERAIRAN TELUK SEKOTONG DAN TELUK KODEK, KABUPATEN LOMBOK

81	Tománková I - 2013 - qub.ac.uk[PDF] The causes of diving duck population declines on Lough Neagh, Northern Ireland
82	Ungfors A, E Bell, ML Johnson, D Cowing... - Advances in marine ..., 2013 - gup.ub.gu.se Nephrops Fisheries in European Waters
83	van Leeuwen SM, J van der Molen, P Ruardij... - Biogeochemistry, 2013 – Springer Modelling the contribution of deep chlorophyll maxima to annual primary production in the North Sea
84	Vígfusdóttir F, TG Gunnarsson, JA Gill - Bird Study, 2013 - Taylor & Francis Annual and between-colony variation in productivity of Arctic Terns in West Iceland
85	von Oelreich J, A Carlsson-Kanyama, Å Svenfelt... - Local ..., 2013 - Taylor & Francis Planning for future sea-level rise in Swedish municipalities
86	Wadey MP - 2013 - eprints.soton.ac.uk Understanding defence failures and coastal flood events: a case study approach
87	Wadey MP, RJ Nicholls, I Haigh - Natural hazards, 2013 – Springer Understanding a coastal flood event: the 10th March 2008 storm surge event in the Solent, UK
88	Wahl T, ID Haigh, PL Woodworth, F Albrecht... - Earth-Science ..., 2013 – Elsevier Observed mean sea level changes around the North Sea coastline from 1800 to present
89	Wahl T, ID Haigh, S Dangendorf, J Jensen - 2013 - ics2013.org Inter-annual and long-term mean sea level changes along the North Sea coastline
90	Wall-Palmer D, CW Smart, MB Hart - Quaternary Science Reviews, 2013 – Elsevier In-life pteropod shell dissolution as an indicator of past ocean carbonate saturation
91	Wikner J, S Panigrahi, A Nydahl... - Limnology and ..., 2013 - diva-portal.org Precise continuous measurements of pelagic respiration in coastal waters with Oxygen Optodes
92	Wilkins D, S Yau, TJ Williams, MA Allen... - FEMS microbiology ..., 2013 - Wiley Online Library Key microbial drivers in Antarctic aquatic environments
93	Wit P, SR Palumbi - Molecular ecology, 2013 - Wiley Online Library Transcriptome-wide polymorphisms of red abalone ( <i>Haliotis rufescens</i> ) reveal patterns of gene flow and local adaptation
94	Yao CL, GN Somero - Chinese Science Bulletin, 2014 – Springer The impact of ocean warming on marine organisms
Grey literature references	
1	DOENI, “Rapid Assessment of marinas for invasive alien species in Northern Ireland” <a href="http://www.doeni.gov.uk/niea/marina_report_final.pdf">http://www.doeni.gov.uk/niea/marina_report_final.pdf</a>
2	EU, “Integrated Maritime Strategy for the Channel Region: A plan for action” <a href="https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/13_247_Camis_doc_strategie_maritime_UK_BD.pdf">https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/13_247_Camis_doc_strategie_maritime_UK_BD.pdf</a>
3	European Marine Board, “Presentation: Navigating the Future: VI Setting a European Agenda for seas and oceans science by McDonough” <a href="http://www.cost.eu/download/43937">http://www.cost.eu/download/43937</a>
4	JNCC, “Fifth National Report to the United Nations Convention on Biological Diversity: United Kingdom” <a href="http://jncc.defra.gov.uk/pdf/CBD_UK5NR_ConsultationDraft_Appendix2.pdf">http://jncc.defra.gov.uk/pdf/CBD_UK5NR_ConsultationDraft_Appendix2.pdf</a>
5	Marine Institute, “Marine Strategy Framework Directive Project: Ireland’s Initial Assessment Reporting Sheet for Non Indigenous Species Inventory” <a href="http://www.environ.ie/en/Environment/Water/WaterQuality/Marine/PublicConsultations/MSFDRreportingSheets/FileDownload,32988,en.pdf">http://www.environ.ie/en/Environment/Water/WaterQuality/Marine/PublicConsultations/MSFDRreportingSheets/FileDownload,32988,en.pdf</a>
6	National Oceanography Centre, “Research & Consultancy Report No. 43: State of the eastern North Atlantic subpolar gyre: The Extended Ellett Line Programme, Annual Report No. 2” <a href="http://eprints.soton.ac.uk/364391/1/NOC_R%26C_43.pdf">http://eprints.soton.ac.uk/364391/1/NOC_R%26C_43.pdf</a>
7	NERC, “RAPIC WATCH Work Plan” <a href="http://www.nerc.ac.uk/research/funded/programmes/rapidwatch/rapidwatch-workplan.pdf">http://www.nerc.ac.uk/research/funded/programmes/rapidwatch/rapidwatch-workplan.pdf</a>
8	Scottish Government, “Draft Seaweed Policy Statement Consultation Paper” <a href="http://www.scotland.gov.uk/Publications/2013/08/6786/21">http://www.scotland.gov.uk/Publications/2013/08/6786/21</a>
9	Scottish Government, “Management Proposals of Inshore Fisheries Groups” <a href="http://www.scotland.gov.uk/Publications/2013/08/7232/18">http://www.scotland.gov.uk/Publications/2013/08/7232/18</a>
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11	Scottish Government, “Scottish Climate Change Adaptation Programme” <a href="http://www.scotland.gov.uk/Publications/2013/06/2469/4">http://www.scotland.gov.uk/Publications/2013/06/2469/4</a>
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14	UK Government, “Protecting and sustainably using the marine environment – Guide” <a href="https://www.gov.uk/government/policies/protecting-and-sustainably-using-the-marine-environment/supporting-">https://www.gov.uk/government/policies/protecting-and-sustainably-using-the-marine-environment/supporting-</a>

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