

Towards a Marine Research &
Innovation Strategy 2021
Summary of Consultation Responses



CONTENTS

| | |
|---|----|
| 1. Introduction – Towards a Marine Research & Innovation Strategy | 2 |
| 2. Consultation | 4 |
| 3. Responses to the Consultation Questions..... | 6 |
| General Observations/Overview | 6 |
| Responses to the General Consultation Questions | 6 |
| Responses to Theme Specific Questions | 10 |
| 4. Further Information | 13 |
| 5. Appendix – Submissions to the Public Consultation..... | 14 |

1. Introduction – Towards a Marine Research & Innovation Strategy

The marine policy landscape has evolved significantly over the last decade, mirrored at both EU and national level. Key milestones include the development of Integrated Maritime Policy by the EU (and related initiatives such as its Blue Growth Strategy) and nationally the publication in 2012 of Ireland's first integrated marine plan – Harnessing Our Ocean Wealth. Spearheaded by the Interdepartmental Marine Coordination Group, Ireland is putting in place a range of integrated enabling actions to achieve the goals and ambitions set out in Harnessing Our Ocean Wealth. A number of these actions are focused on research, knowledge, technology and innovation.

The Marine Institute, as Ireland's national marine research and development agency, engaged in a process of preparing a new National Marine Research & Innovation Strategy, as called for under Harnessing Our Ocean Wealth.

The preparation of the draft National Marine Research & Innovation Strategy 2021 included:

- The development of a Research Capability Maturity Model for marine related research themes.
- A detailed assessment of the 15 themes, including:
 - A review of the major policy and sectoral drivers relevant to the theme
 - An assessment of the research capacity at a national level that exists for the theme
 - A statement of the major research topic areas required in the theme
 - A recommendation of research funding focus for the years ahead
- A review of the major funding requirements to advance the research capacity in each area across the dimensions of Human Capacity, Infrastructure, and Networks & Relationships; together with a mapping of this requirement to existing funding instruments.

As part of the process a public consultation was undertaken in 2016 and the Institute received a total of 30 responses from a range of stakeholders, including individual academics, HEIs, Industry representative organisations, marine professionals, community groups and individuals. The consultation also included a range of briefs and discussions with departments, agencies and Higher Education Institutions (HEIs). Updates were provided to the Marine Coordination Group (MCG) and the Innovation 2020 (I2020) Implementation Group. The feedback received as a result of the public and stakeholder consultations was reviewed and considered and the Strategy was updated. This report presents a summary of the consultation responses by question/theme. Replies to the feedback, including where appropriate how the feedback has been addressed in the final Strategy, are also provided.

The National Marine Research & Innovation Strategy 2017-2021 was published in June 2017 – launched by the Minister for Agriculture, Food and the Marine, Michael Creed T.D. at the annual Our Ocean Wealth Summit.

2. Consultation

A public consultation on the draft Strategy was launched on 1 November 2016. An online survey was developed to enable the submission of feedback to the draft Strategy. During the initial consultation period a number of stakeholders requested that the draft Strategy be made available in the Irish language. To facilitate this the consultation was made available on a dual language platform and the consultation period was extended to 31 December 2016.

The public consultation comprised of:

- A Draft of the Marine Research & Innovation Strategy (*Towards a Marine Research & Innovation Strategy 2021*);
- A series of background analysis documents; and
- An online survey with ten questions – five general questions and five theme specific questions. Stakeholders could then choose to answer the General Questions and/or the Theme Specific Questions for any, or all, of the 15 research themes.

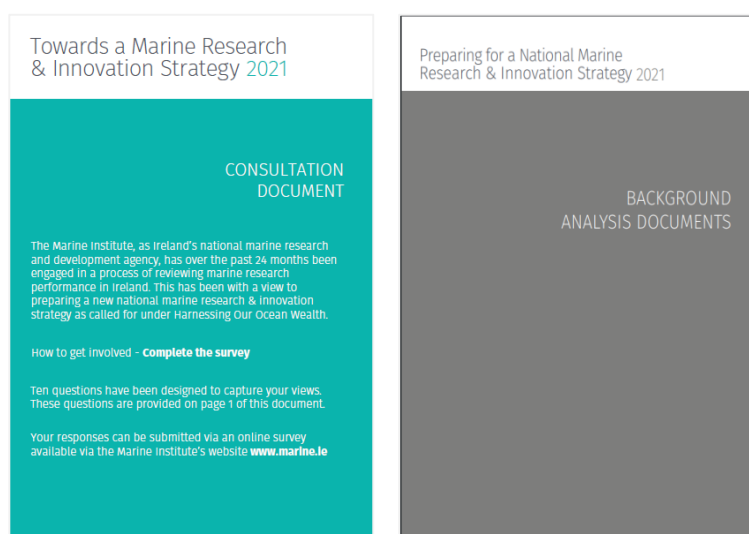


Figure 1: Consultation Documents: Draft Strategy and associated analysis

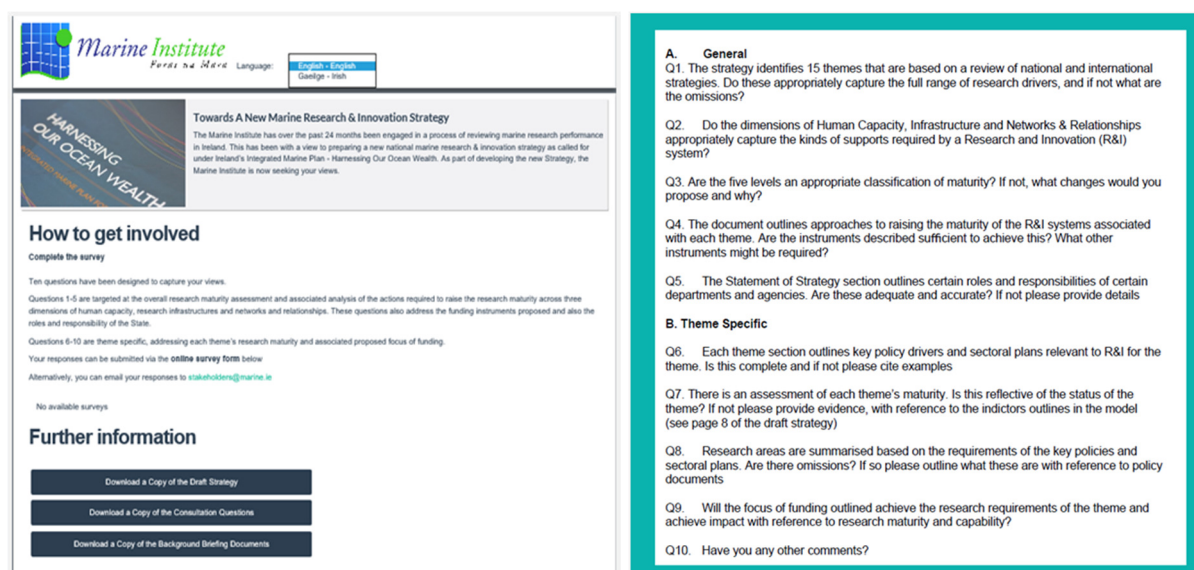


Figure 2: Online survey used during the consultation

A range of stakeholder engagement activities were undertaken before and during the consultation period, including a press release, promotion via social media channels, and targeted meetings with key stakeholder groups using already established networks.

Following the consultation 30 written submissions were received from a range of stakeholders, as can be seen in the chart below.

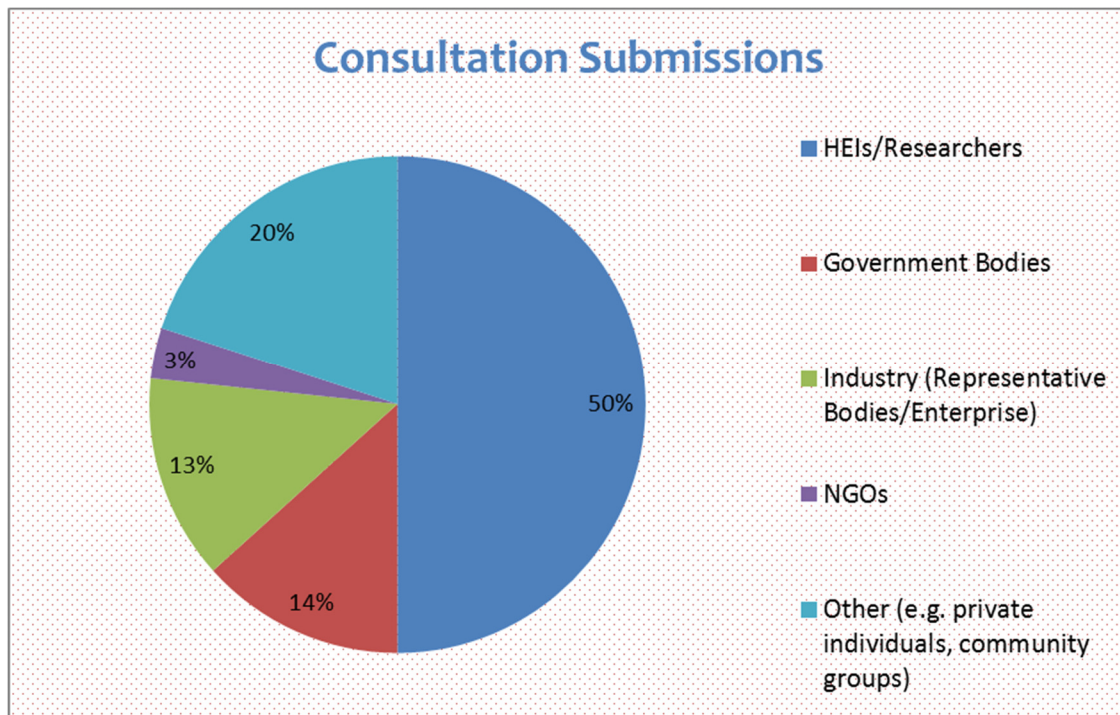


Figure 3: Breakdown of submissions by organisational type

3. Responses to the Consultation Questions

Overview

Overall, respondents welcomed and supported the development of a new national Marine Research and Innovation Strategy.

The majority of respondents were supportive of the draft Strategy and the proposed approach.

A number of responses suggested where the Strategy could be refined to avoid ambiguity and these were taken into consideration. Other responses identified the need for further context or for further information.

Several responses contained statements on general marine policy and the development of the sector. These included commentary on the need to build resilience in coastal communities, the need for economic development, and the requirement for community engagement and outreach. Where possible, these comments have been taken into account in the Strategy text insofar as they relate to research and innovation actions.

A number of suggestions and information provided were outside the scope of this Strategy; these points were noted and will be considered in the appropriate manner as part of future initiatives and in the implementation of the Strategy up to 2021.

Responses to the General Consultation Questions

Question 1 – The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

There were 22 responses to this question, with eight fully endorsing the themes as described in the Strategy.

A number of the respondents mentioned the need for the inclusion of further “coastal” topics such as coastal erosion, coastal change, coastal resiliency and geomorphology. These topics have been considered in a number of the research themes such as Climate Change, Ocean Observation and Seabed Mapping, and Integrated Policy and Governance.

Also, under this question a few respondents expressed the view that the scope of the Litter theme was too narrow and should be expanded to include pollution, contaminants, ocean

acidification etc. Accordingly, the Litter theme was expanded and renamed as Pollution and Litter. The expanded Pollution and Litter section, including the Research Capability Maturity Assessment, was recomplied on the basis of the findings of a new background document on the subject of Marine Pollution. This is discussed further under “Responses to Theme Specific Questions”.

In addition to the responses received under this question, a number of the specific theme responses included commentary on the appropriateness of those themes. These included:

- Subsea Resources: responses were received that expressed the view that oil and gas resources should be separated from other mineral resources; and that the section should be linked with the renewable energy theme.
- Ocean Observations: a number of comments highlighted the importance of seabed mapping and building national capacity.
- The importance of Marine Spatial Planning, and the related issues of Integrated Coastal Zone Management, was highlighted on a number of occasions.

Based on the feedback above:

- The overarching research theme of Subsea Resources covering both mineral resources and oil and gas was retained. This was on the basis that the research themes for both significantly overlap.
- The Renewable Energy and Subsea Resources sections are retained as distinct themes. In common with many of the themes in the Strategy, there is overlap between the two. The emphasis on these linkages was strengthened in the final Strategy.
- The section on Ocean Observation was renamed as Ocean Observation and Seabed Mapping, and the capacity of the INFOMAR and the Irish National Seabed Survey programmes was highlighted further.

Other changes suggested are outlined in the Responses to Theme Specific Questions section.

Question 2 – Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

There were 21 responses to this question with 12 in full agreement with the dimensions used in the Strategy. In general, the remaining nine responses noted that the dimensions are appropriate but respondents included some suggestions for improvement. Comments from these respondents included the following:

- Human Capacity dimension could be expanded to include consideration of researcher terms & conditions and job security.
- Include the role of local coastal communities under Human Capacity.

- Input an additional dimension of Research and Innovation Outputs.
- Evolution of many research fields is non-linear and the Strategy needs to address this.
- One respondent indicated that they did not fully understand the *Research Capability Maturity Model* in the draft Strategy.

In response to the above feedback, a new discussion paper explaining the Maturity Model was drafted and inserted into the final background discussion document that accompanies the final published Strategy.

Question 3 – Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?

There were 21 responses to this question with eight respondents confirming that the five levels are an appropriate classification of maturity. The majority of the remaining respondents agreed that the five levels of maturity are appropriate but they also raised a number of points; the most prominent responses were seeking clarification in relation to how the five levels were chosen/evaluated, how the maturity of the individual themes was determined and how recent the evaluation of the themes occurred. In this case it is important to note that the Strategy was developed based on the comprehensive background analysis papers. These background papers provide further information on all aspects of the Research & Innovation Strategy and in-depth analysis of the Maturity Model and the 15 research themes. The Strategy could not include all of this information and the background papers were therefore published as an addendum to the final Strategy.

A couple of respondents voiced their concern regarding the use of the term “Ad-hoc” as a level of maturity and how that might be perceived. The responses indicated that it should be replaced by a different term – suggestions such as “niche” and “individual” were proposed. These responses were reviewed and considered, however, “Ad-hoc” was ultimately retained as it is widely regarded as an accepted term for the initial level in maturity models.

The linearity of the Maturity Model was referenced again and, as discussed earlier under Question 2, a new discussion paper explaining the Maturity Model was drafted to address this. Also, it is important to note that a full analysis of the respective research themes is available in the background papers, which explains that the maturity assessment is based on overall capacity across the three dimensions.

Question 4 – The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

There were 19 responses received under Question 4, with general agreement that the instruments described in the Strategy are sufficient. There were a number of important points raised by the respondents, which were considered and dealt with in the final Strategy.

A key message received during the consultation process was that the Funding Instruments section of the draft Strategy was too detailed / difficult to understand and it was suggested that the section be removed from the Strategy and the most important information be subsumed into the document elsewhere. A few of the responses mentioned the need for more funding instruments targeted at the lower levels of research maturity, basic research grants in the marine area, infrastructure/funding for PhD studentships etc. The need for more funding instruments targeted at supporting collaboration between enterprise/industry and research communities was also proposed.

This feedback was considered and the Strategy was updated. In implementing these changes, the Funding Instruments section was revised and moved from before the Analysis of the Research Themes to after this section. The Funding Instruments section was simplified and consolidated and the fundamental information from the original section was dispersed as appropriate throughout the document under the relevant themes. As outlined in the Strategy's Implementation Section, funding instruments will be reviewed as part of the implementation of the Strategy.

Question 5 – The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

There were 20 responses provided to this question with six respondents satisfied with the Statement of Strategy. Of the remainder there were a number of responses that posited that not all the relevant agencies were represented adequately in the Strategy and that there was also a lack of EU level agencies listed. The view of some respondents was that the organisational roles listed needed to be broadened. One respondent also suggested moving the Statement of Strategy to the front of the document, after the Introduction.

In the final published Strategy, a new Implementation section was inserted. This new section lists the various agencies that are involved in funding marine-related research and outlines their roles in implementing the actions of the Strategy up to 2021, including the proposed creation of a Marine Research Funders Forum. The Statement of Strategy has also been given more prominence in the final published Strategy.

Responses to Theme Specific Questions

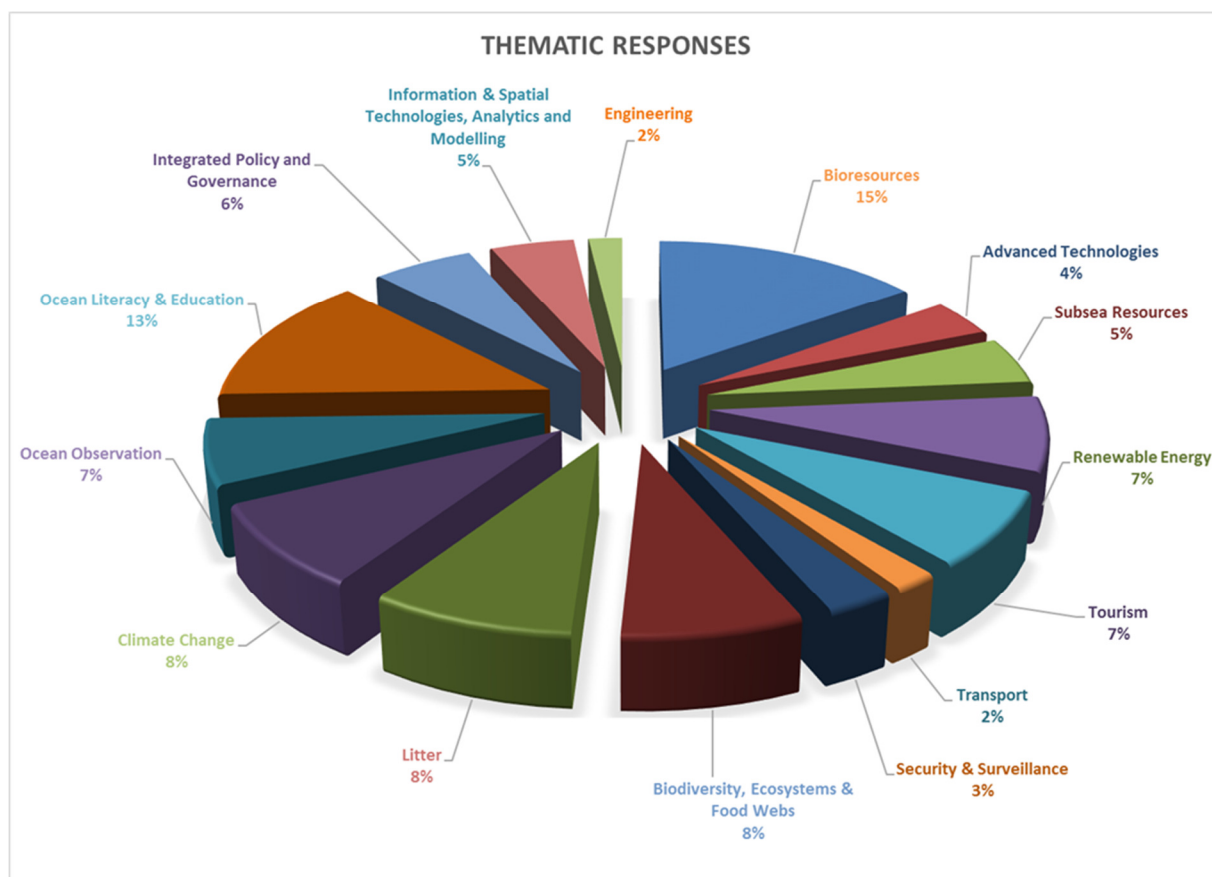


Figure 4: Breakdown of Thematic Responses

Questions and Method of Analysis

The theme specific section of the consultation included the following five questions:

Question 6 – Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Question 7 – There is an assessment of each theme’s maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy).

Question 8 – Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Question 9 – Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Question 10 – Have you any other comments?

Under these five questions respondents had the opportunity to provide feedback on as many or as few themes as they wished.

Once the consultation period ended, the responses were collated, grouped by theme and considered by the Marine Institute, supported by a number of subject matter experts who were involved in the original background analysis.

Summary of Responses and Actions

The types of responses received and their resultant actions varied from noting the comments (if not deemed appropriate in the final Strategy), to manageable text changes, to full section amendments.

With regard to the more easily implementable revisions, under each of the themes individual respondents identified numerous sections of the text that they believed could benefit from the addition of a word, a sentence or a reference to unmentioned policies, papers, plans, models, strategies etc. These suggested additions were then reviewed and the final Strategy was updated as appropriate. This was the case on the majority of occasions. Respondents also highlighted the need to define more of the acronyms used in the Strategy and many of the acronyms were amended so that the full names were also stated.

As a result of feedback received during the consultation process linkages between the themes were also made more explicit, as were implied assumptions. The need for this was a common thread identified from the answers of several respondents who indicated that the Strategy could stand to be more overt in style and should not assume that the reader will inherently understand the linkages in the manner intended. For example, the respective Subsea Resources and Renewable Energy research themes now explicitly state that links exist between the two.

Numerous theme sections were updated to reflect these types of responses.

Responses that resulted in more noticeable changes to the Strategy included suggestions to rename, merge and/or expand certain themes. On review of this feedback five themes (including one sub-theme) were ultimately renamed, these were:

- Bioresources – Value Added Products ➡ Bioresources – High Value Products
- Tourism ➡ Tourism & Leisure
- Transport ➡ Transport & Logistics
- Litter ➡ Pollution and Litter
- Ocean Observation ➡ Ocean Observation and Seabed Mapping

With regard to the requests for the expansion or revision of respective themes, two themes in particular stood out among the rest in terms of the number of requests – the Litter Theme and the Ocean Literacy & Education Theme. From a group of 30 consultation respondents

nine provided comments related to Litter, while 14 commented on Ocean Literacy & Education.

The general feeling among the respondents was that Litter was too narrow a theme to account for the variety of other pressures exhibited on the marine environment and corresponding research areas. Specific areas highlighted for inclusion were:

- Emerging contaminants
- Microbiological pollution (links to food safety, Water Framework Directive and Marine Strategy Framework Directive)
- Biological introductions
- Underwater noise
- Effects of land-based development on the marine environment
- Harmful Algal Blooms (HABs) and Biotoxins
- Cumulative effects
- Technological solutions (detection, response, monitoring and treatment)

As a result of the assessment of the responses, a separate Marine Pollution Background Analysis was undertaken. Subsequently, the Litter Theme of the Strategy was updated incorporating the findings from this analysis, and the theme was renamed Pollution and Litter.

Due to the large volume of responses received related to the Ocean Literacy & Education theme the entire section was also reviewed and updated. A revised background paper on the theme was drafted, which considered many of the issues raised by the respondents. The final Strategy was then updated accordingly, including changing the theme's maturity capability assessment from "Ad-hoc" to "Defined".

Another common thread that was identified from the consultation responses was the importance of engagement between key departments, agencies and enterprise/industry with regard to the focus of funding required to raise research maturity across the 15 themes and for the overall strategy implementation.

The implementation section in the final Strategy included 16 actions grouped under the following four headings:

- Alignment of Funding;
- Raising Research Capacity;
- Thematic Coordination; and
- International Relationships.

4. Further Information

Further information on the National Marine Research & Innovation Strategy 2017-2021 can be found on www.ouroceanwealth.ie and www.marine.ie. Details of the submissions received during the consultation are provided in the Appendix below.

Appendix – Submissions to the Public Consultation

30 submissions were received during the public consultation process between 1 November and 31 December 2016. Stakeholders that provided permission to publish (26) are listed below. Their submissions are appended to this report.

- Athlone Institute of Technology
- Burke, Noirin
- Cork Institute of Technology
- Croot, Peter
- Dublin City University Water Institute
- Dublin Institute of Technology
- Deane, Aoife
- Edwards, Maeve
- Farrell, Eugene
- Galway Mayo Institute of Technology
- Irish Maritime Administration, Department of Transport, Tourism and Sport
- Irish Offshore Operators' Association
- Johnson, Mark
- Leave No Trace Ireland
- Lisheenkyle National School
- Loophead Summer Hedge School
- MacCabe Durney Barnes
- Marine Renewables Industry Association
- Murray, Patrick
- Ní Fhéinne, Máire
- Scarrott, Rory
- Trinity College Dublin
- Údarás na Gaeltachta
- University College Cork
- Waheed, Shazia
- Wheeler, Andy

Disclaimer: Responsibility for the information and views presented in this report rest solely with the respondents and do not necessarily represent those of the Marine Institute.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-20

User Information

Respondent

Siobhán Kavanagh

Are you filling out this survey on behalf of an organisation?

Yes

Organisation Name

Athlone Institute of Technology

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Yes

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Yes from Established to Translational. For the earlier levels undefined and Ad-Hoc, basic research grants in the marine area would be useful to fund new researchers, particularly within the IT sector.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

Yes

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Wild Resources]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Value Added Products]

Yes

Group: Wild Resources

Wild Resources Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes

Wild Resources Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes

Wild Resources Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

No

Wild Resources Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Yes

Wild Resources Q5. Have you any other comments?

The development of novel cultivation techniques for marine microorganisms, both lab based and in-situ, should be a focus of future funding to fully develop our Marine Biotechnology potential.

Group: Value Added Products

Value Added Products Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes

Value Added Products Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes

Value Added Products Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

No

Value Added Products Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Yes

Value Added Products Q5. Have you any other comments?

No

Noirin Burke

From: [REDACTED]
To: [stakeholders](#)
Subject: Feedback on Draft Marine Research Strategy
Date: Tuesday 22 November 2016 23:59:06

To whom it may concern,

Apologies for leaving it so late to forward my feedback on the draft strategy to you.

I work in the area of education and ocean literacy and am passionate about communicating marine topics to members of the general public.

After reviewing the draft strategy I have to comment on the general structure and wording first.

While I am aware this is a formal document and must follow a certain layout and structure, Personally I found it quite confusing and was unsure how to respond in a number of the questions, hence leaving it till tonight to go back online to submit the form, and missing the deadline.

However, maybe it was just me that found the survey challenging.

On the other hand, if the language used in the document did result in a low number of people submitting their response I do feel it is a missed opportunity to get the public's feedback on a national strategy document that will impact the areas and levels of marine research that is carried out in the coming years.

I think the areas proposed for marine research are well covering, but I would feel that a level of outreach/ public engagement needs to be written into each one, as is common place in Science Foundation Ireland funded projects.

In the area of education and ocean literacy I think we need to work together with the Department of Education to make marine a common example / theme used for subjects and strand and strand units, I.e marine examples in the curriculum documents for both primary and secondary level. Also more marine themes in school text books would introduce more teachers/ students to marine topics. Online evaluation tools could be linked with these to research the impact of this on levels of awareness of ocean literacy amongst different age/ class groups.

We would love to see the Marine Institute funded Explorers Education Programme™ being developed more.

At Present:

- Modules delivered by 10 outreach centres working with teachers reaching over 21,000 students around Ireland in ten coastal counties
- Development of teachers training through education centres
- Development of student teacher training at third level institutes
- Development of teacher and student resources that are fit purpose

- Development of long term evaluation using data collected by the Explorers Education Programme™

-attendance at national events highlighting ocean literacy to the general public.

To help promote education and ocean literacy we would be love to see an increase in the areas listed above as well as Increased evaluation and research into there impact. This can be challenging without the expert knowledge of those involved in research and evaluation. More collaboration between industry and business and research organisations would benefit this area greatly.

Also Evaluation of events such as Seafest on people awareness of ocean literacy principles would highlight the best ways to engage with different audiences.

Other ideas include:

Collaboration with third level institutes with knowledge of research techniques to formulate a citizen science ocean literacy project and Collaboration with other national programmes/ institutes/ events such as an Taisce/ the green flag programme Seai/ Sfi/ Discover Primary Science and Maths / the young scientist to increase the reach and impact of existing programmes such as the Explorers Education Programme.

Thank you for giving me the opportunity to give my feedback on the strategy and apologies for not submitting it through the online survey earlier ,

Kind Regards
Noirin

Cork Institute of Technology response to the Consultation Document “Towards a Marine Research & Innovation Strategy 2021”

Incorporating the response of the National Maritime College of Ireland as a constituent college of CIT

Preamble

The Cork Institute of Technology engages in marine and maritime research and innovation activity through a number of its research groups and Centres. The *Halpin Centre for Research and Innovation* is designated CIT's *maritime* research centre under the Institute's Research and Innovation Strategy and is based in the *National Maritime College of Ireland*, a constituent College of CIT. *Halpin* takes a leading role in supporting CIT's marine and maritime research and innovation engagements. The Centre undertakes research and innovation activity under two principle themes; Maritime Mechatronics (a theme that includes marine **Engineering**) and Maritime Operations (that includes maritime **Security & Surveillance** and **Transport**). *Halpin* works closely with other CIT research teams including the *Nimbus Centre* (embedded systems, Internet of Things), *BIO-Explore* (Bio Analysis, Human Factors), the *Hincks Centre* for Entrepreneurship Excellence (Business & Enterprise), the *Software Innovation and Machine Intelligence Applications Group*; *SIGMA* (machine intelligence, software solutions), the *Sustainable Infrastructure Research Group*; *SIRG* (coastal civil and environmental engineering), and the *Centre for Advanced Photonics & Process Analysis*; *CAPPA & the Photonics Device Dynamics Group*; *PDDG* (photonics). Reflecting the cross-cutting nature of marine and maritime research all of these CIT research teams have and continue to engage in marine and maritime related research projects. CIT has specific marine and maritime research projects in the following thematic areas set out in the consultation document:

- **Transport:**
 - *Halpin, Nimbus, Hincks* and *SIGMA*
 - The *Nimbus Centre* is extensively involved in European Smart Cities focussed research and innovation activities and is working with *Halpin* and other collaborators on the specific challenges and opportunities that arise in the context of Smart littoral (coastal) cities
 - Example; *Halpin* is a partner in the H2020 supply chain project SYNCHRO-NET concerned with vessel smart-steaming and synchromodal logistics
- **Engineering:**
 - *NMCI, Nimbus, Halpin, SIGMA, SIRG, CAPPA* and *PDDG*
 - CIT has an international engineering pedigree spanning the marine, mechatronics, transport, environmental, mechanical, electrical, electronic, energy civil, and instrumentation specialisms and has strong vibrant computer science and informatics activities
 - Example; *Halpin* and *Nimbus* are leading AEOLUS-2, an Enterprise Ireland Commercialisation Fund project to develop a mid-altitude airborne maritime monitoring platform for maritime safety, security and surveillance applications
- **Security & Surveillance:**
 - *Halpin* plays a leading national role in maritime security and surveillance research activities. Since 2012, 11 externally European funded research and innovation projects have been undertaken in this space with the support of *NMCI* partner, the *Irish Naval Service*

- Example; *Halpin* is coordinating Ireland's national engagement in *EU-CISE2020*, Europe's project to specify and pilot the maritime Common Information Sharing Environment across the European Union. *Halpin* is supporting the *Irish Naval Service* and the *Irish Coast Guard* in the project
- **Integrated Policy and Governance – Business Development:**
 - *Hincks* and *Halpin*
 - Example; *Halpin* and *Hincks* were partners in the FP7 project REMCAP concerned with maritime business innovation clusters development across Europe
- **Advanced Technologies:**
 - *CAPPA*, *PDDG*, *Bio-Explore*, *Nimbus* and *SIGMA*
 - All these centres have various technologies developed or under development that have potential application in marine and maritime contexts spanning photonics, bio-analysis, embedded electronic and sensors and data analytics and intelligent software systems
- **Ocean Observation:**
 - *Halpin*, *Nimbus* and *SIGMA*
 - Example; *Halpin* has a number of projects such as *AEOLUS-2* (with the *Nimbus Centre*), *SeaMote* and *Droplet* developing disruptive coastal and ocean data collection platforms to support maritime operations, safety, security, surveillance and earth and ocean science applications

In addition to these primary thematic areas, CIT will make supporting research contributions in the following additional thematic areas:

- **Information & Spatial Technologies, Analytics & Modelling:**
 - *SIGMA*
- **Subsea Resources**
 - *Halpin*
- **Renewable Energy**
 - *SIRG*, *Nimbus*
- **Bioresources**
 - *BIO-Explore*
- **Climate Change**
 - *SIRG*

CIT see particular opportunity for Ireland in relation to three specific themes as set out in the consultation document; **Transport, Engineering** and **Security & Surveillance**.

Responses to Consultation Questions

A. General

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

The 15 themes capture the principle research drivers.

It is suggested that the **Transport** theme should be renamed **Supply Chain** in order to fully capture the depth, breadth and scale of this opportunity. Today's maritime transportation takes place within a deeply integrated international supply chain ecosystem and cannot be considered in isolation from it.

It is suggested that the **Tourism** theme should be renamed and expanded to **Tourism and Leisure** to capture the growing opportunities arising from how an increasing number of citizens (not just tourists) chose to spend their leisure time i.e. engaging in sea and coastal related leisure activities

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes. Under the Human Capacity dimension, appropriate consideration should be given to national issues with regard to researcher terms and conditions, particularly job security. A stable and attractive employment environment for high calibre researchers will be required to deliver the strategy.

Q3. Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?

The levels are fit for purpose. There is an explicit assumption in the consultation document that quality and impact of research output is directly related to scale (level definitions make frequent reference to scale and number of physical facilities, number of researchers etc.). While this is often the case it is by no means always the case. It is suggested that consideration be given to refining the levels definitions so they place more emphasis on quality and impact i.e. research excellence as indicators of sectoral maturity.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

The instruments described are considered appropriate. More funding instruments targeted at lower levels of classification i.e. ad-hoc, Defined and Established are needed. More funding instruments targeted at supporting enterprise to engage with research are needed.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details

Yes.

B. Theme Specific

Q6. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Advanced Technologies; a missing research driver is the challenge of scaling up in-situ ocean observation to achieve data collection across large areas (i.e. whole oceans) involving long duration

missions. Existing high resolution data collection missions are universally of short duration. Current data collection platforms e.g. AUVs, ROVs, research vessels etc. do not provide a sustainable trajectory to significantly increased density and frequency of in-situ observation and data collection in the Oceans. New paradigms are required.

Renewable Energy; Explicit mention of the need for affordable new concepts of maritime operations as renewable energy platforms move further offshore should be included.

Tourism; should be renamed **Tourism and Leisure** and scope extended to fully capture the opportunities in the growing marine leisure sector.

Transport; should be renamed **Supply Chain** and scope extended in order to fully capture the depth, breadth and scale of this opportunity.

Security & Surveillance; Brexit should be included as a driver, albeit one the implications of which are only beginning to emerge.

Q7. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlines in the model (see page 8 of the draft strategy)

Theme maturities are considered appropriate.

Q8. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

No omissions identified.

Q9. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Tourism; CIT supports in particular the suggested funding focus for PhD positions.

Transport; Investment to grow national capacity in **Transport** (Supply Chain) research and innovation is needed. Ireland is significantly behind the European research, technology and innovation curves where **Transport** (Supply Chain) is concerned. A coordinated national action is needed.

Security & Surveillance; CIT supports in particular, the ambition to establish a National Research Centre for Maritime Security and Surveillance.

Ocean Observation; Funding to support research into new paradigms for in-situ ocean observation and data collection at sea should be included. This funding should cover research into new technologies, new concepts of operations and policy aspects.

Ocean Literacy & Education; Funding should be provided to existing nationally recognised marine and maritime centres to enable them to promote greater Ocean Literacy in the course of their current operations and to enable them to engage in providing new targeted ocean literacy focussed education programmes.

Q10. Have you any other comments?

- There is a critical need to ensure Ireland's nascent marine and maritime enterprise sector is appropriately supported by both policy and funding. The strategy document should give appropriate attention to ensuring mechanisms are put in place to enable effective collaboration between commercial companies (including in particular micro-enterprises) and research entities.
- Attention should be given to drawing out and making explicit natural complementarity that exists between certain research themes e.g. Security & Surveillance and Ocean Observation, Tourism and Transport, Sub-sea Resources and Renewable Energy etc.
- Integrated Policy and Governance is an overarching theme in the context of marine and maritime activities. De-risking commercial operations in the maritime sector is mentioned in the context of contributions that Ocean Observation makes. Of equal importance to policy and governance and critical to de-risking seagoing activities is how to achieve safe, sustainable and effective maritime operations at sea. Across many of the themes set out in the consultation document More Research and innovation work needs to be done on how to perform operations safely, sustainably and successfully.
- "Marinising" is key to quickly upscaling marine and maritime research activity so Ireland can make up lost ground on European and International competitors.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-22

User Information

Respondent

Peter Croot, Earth and Ocean Sciences, School of Natural Sciences, NUIG

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

The 15 themes do capture the range of research drivers and there are no major omissions.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

In the main yes, though there are cross overs with other sectors where support for the marine aspects could be made more specific, this would be in the cases of bioinformatics and information systems, with respect to developing the framework of a digital ocean within Ireland.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Yes - this is a good approach to classifying research maturity over a broad range of subjects.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

The instruments described are sufficient to achieve this.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

This aspect of the document could prove to be very helpful in terms of addressing the current problems with how certain responsibilities and resources of the state are assigned to different aspects of the marine environment. A critical area that needs further attention at present is funding for research that provides data on GES for the MSFD and WFD, or climate relevant gases, as partnering with industry with this is moving too slowly as an industry needs to be developed first.

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Biodiversity, Ecosystems & Food Webs]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Litter]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Climate Change]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Observation]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Literacy & Education]

Yes

Group: Biodiversity, Ecosystems & Food Webs

Biodiversity, Ecosystems & Food Webs Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

There needs to be a focus on marine genomics and to develop this in partnership with biodiscovery programs, good examples of such programs can be found in Norway and Portugal and this is helping them to lead in the development of blue ocean research and industry. The focus on natural products as biodiscovery is only part of the scientific information that is needed for this field, you also need to put the production of these products into an environmental and physiological context.

Biodiversity, Ecosystems & Food Webs Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Marine biodiversity also includes the bacterial and viral communities and there is currently a major gap in Irish Marine Science regarding work on this. Marine Genomics and Bioinformatics is a key area of human capacity that needs to be supported in Ireland .

Biodiversity, Ecosystems & Food Webs Q5. Have you any other comments?

Marine Biogeochemistry underpins research on food webs but was not mentioned in this context, support for work in this field is critical to the long term development of this sector. Ecosystem modelling is also vital in this regard, particularly with respect to assessing ecosystem services.

Group: Litter

Litter Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

There is a growing number of researchers working on microplastics in the marine environment in Ireland, there is an urgent need however to link and coordinate these groups and their work on a national basis in order to achieve an effective critical mass. This could be through either a spoke in an SFI centre or through a virtual institute perhaps coordinated by the Marine Institute.

Litter Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

The document refers mostly to microplastics but nanoparticles in cosmetics and pharmaceuticals can also be important in urban and industrial zones.

Litter Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

It was not clear how the traditional monitoring and assessment approaches could inform on micro plastic pollution, a modelling approach (e.g. ROMS), using known sources and sinks could be more appropriate in much the same way as the HAB forecast models work. This could also be linked to biogeochemical ecosystem modelling developed in other themes.

Group: Climate Change

Climate Change Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Ireland should be more involved in international oceanographic and biogeochemical programs such as bio-argo and look to develop capacity in using floats and gliders to obtain real time observations from across the Irish shelf and EEZ. There are already groups in Canada, the USA and Europe who are looking to cooperate with Ireland.

Climate Change Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

The document does an excellent job in making the request for a research programme of scale in this important field. Currently it is difficult to achieve the necessary scale to address the question of the natural greenhouse gas emissions/uptake by Irish waters as the funding tools available limit what can be achieved (e.g. DAFM & SFI) or are not appropriate to the task due to the requirement of including shiptime requests and coordination within the project (e.g. linking SFI and MI more closely for these applications - as external reviewers may see risks to the project as the shiptime allocations for are only year by year and so shiptime over 4 years can't be guaranteed).

Climate Change Q5. Have you any other comments?

This is an area of research where work is needed urgently to build on the expertise that Ireland is developing in this field, in order to develop this further investment is needed in both infrastructure and training to build up a critical mass in resources and human capacity.

Group: Ocean Observation

Ocean Observation Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Ireland should be more involved in international oceanographic and biogeochemical programs such as bio-argo and look to develop capacity in using floats and gliders to obtain real time observations from across the Irish shelf and EEZ. There are already groups in Canada, the USA and Europe who are looking to cooperate with Ireland.

Ocean Observation Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Funding support for a large scale long term program is needed in this critical area of research. The current focus on short term, small scale, projects don't provide enough quality baseline data to adequately inform marine policy for all of Ireland's marine environment.

Group: Ocean Literacy & Education

Ocean Literacy & Education Q5. Have you any other comments?

Long term funding support for SMART is essential as this program has been recognized nationally and internationally as a leader in maritime education.



Summary responses:

We are delighted to have an opportunity to respond in the consultation process. The document reads well as a strategy. There is a need to marry the tensions [commercial versus preservation and protection] between Harnessing our Ocean Wealth - A thriving maritime economy and Healthy Marine Ecosystems and Engagement with the sea. It is thought that from the strategy list of areas - we would foreground tourism - as an Island race - and promoting 'green environment' - our oceans/waterways also feeds into this mindset. This could be linked to Climate Change - as key 'challenge' for Ireland with fears of coastal and other flooding. There should be a key research agenda around water and Climate Change – this is of course all linked to Ocean Literacy and Education. Anything which brings science of water/oceans etc.. into the lived experience and 'culture' of oceans and water is good for all.

The challenge of a strategy is to set out vision, include evaluation and identify how things can be implemented to achieve the goals. Once a strategy is agreed, and then adopted we are tied to the terms and characterization. Therefore, care is needed not to use terminology that may not reflect what seems to be an excellent vision for building a strong long-term capacity for the marine area using co-funding as a mechanism to achieve success and growth.

Some specific comments:

1. The presentation of data as a series of graphs with defined boundaries takes from the objective of the strategy, which we believe is to map the current activity, the funding landscape and where we need to focus resources.
2. The discussion around where we want to be should be up front in the strategy. This should include what level of scale we would like to see, and what the expected impact will be. Do we need centres, PhDs, collaboration, industry engagements etc. in a research programme?
3. There is a concern in relation to terminology used for the hierarchy i.e. Ad-Hoc – this may indicate lack of excellent science/engineering – rather the intention is probably indicating that there is no capacity. This might be re-considered so that we don't remove the potential for blue-skies research that can lead to capacity.
4. There is a large list of funders at different levels. Is it clear that all of these options will fund marine related themes?
5. There is a concern on an operational level in the lack of coordination between funding application deadlines and academic rhythms. This really relates to implementation of a programme and it's rollout. This does affect the level of take up from academics and should be considered in order to get the best out of the programme.

“The ever-changing application dates and conditions on the calls that make planning very difficult.” “In the part discussing any of the mechanisms for developing human capacity, several funding instruments are listed but do they have hard numbers on how many or relative percentages from agencies (e.g., IRC, SFI IVP) are actually funding people in the marine space?”

Some specific comments that may be too topic focused:

6. It seems to me that the Strategy document is rather prescriptive when it comes to defining focus areas for funding. For example in the context of litter it states “Research is required to identify measures that can lead to a reduction of marine litter”. We would interpret this as excluding any support for research on the development of technological solutions (water treatment for example). Being this prescriptive is useful in helping the research community adapt to identified needs but it would be good if there was some recognition of the need to evolve outside of hard set focus areas.
7. In the discussions about tourism, how about tying in some of the demonstration projects with eco-tourism. For instance, demonstration seawater to drinkable water stations along the Wild Atlantic Way.
8. Litter is mentioned but little mention of poorly treated/untreated wastewater discharges which played havoc on Dublin beaches this year; study of power plant cooling loops and unwanted thermal effects; desalination opportunities in Ireland
9. Very blue sky here but... the whole issue of treating the ocean as an infinite sink/reservoir for discharges/emissions/litter - what is the quality tipping point?
10. The value added section sort of dances around the idea of marine natural products.

Overall we welcome the strategy, the emphasis on supporting different activities at different levels is a very welcome approach. We think that consideration should be given to establishing mechanisms for follow-on funding for successful teams in order to retain capacity past the end of grants. This is a real issue currently in the research environment in Ireland and poses a threat to the marine area in terms of growing and retaining expertise and reputation.

Feedback on the national Marine Research & Innovation Draft Strategy - DIT

School of Architecture

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

I would suggest that somewhere the relationship to human habitation in terms of infrastructure, settlement and engagement could be identified. I have argued separately that in terms of planning that the country should move to a geospatial pattern of planning and development legislation covering Upland & Mountains; River Valley & Watersheds; The Plains; Urban Settlements; Coastal Zones. Some of these have overlaps but this approach would allow for more consistent and contiguous planning and development regimes which would not fall foul of clientism or local politics. The coastal zone management proposal could be considered somewhere but not as a subset of the themes indicate, perhaps this is a singular overarching theme.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes, no further comment.

Q3. Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?

Yes, though one could use another term “Applied” though the “Translational” may cover this to some degree. Applied research or the ambition to get to the field should be a priority especially where there is the possibility of IP related spinoffs...

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Funding

The table is a bit crude in terms of the range of funding and this is probably due to the wide range of projects and their scale or complexity. However perhaps a finer grain funding model from small scale desktop studies through to R&D test bed projects could be determined which would relate the scale of enterprise, the staffing, the outputs to euro amounts as a guide it may save a lot of later paperwork. A graduated curve would be useful in regard to developing a sense of where the rewards are located.

Human Capacity

There are a number of key areas in relation to spatial intelligence from architects to landscape design to other geographers and palatial planners are not even in the frame for this sector of research. It is recommended that a broader sweep of potential contributors be undertaken

especially with regard to the statement above on settlement impacts etc... In this area many are sub masters with lots of practice (applied research) though this is changing.

Infrastructure Capacity

See comment on Human Capacity as many of the same themes re-emerge here.

Networks and Relationships Capacity

No comment save that already indicated above.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details

Unable to comment further on this item.

B. Theme Specific

Q6. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

No Comment

Q8. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

See earlier comment, though Planning & Governance appears to cover the ground it does not provide the planning and infrastructural integration necessary to unite the boundary condition of the country into one seamless agency or unit.

Q9. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Possibly but this depends on the range of projects that can be supported within the framework and how well they are tailored into a single unified approach.

School of Hospitality Management and Tourism

I am really pleased to see the section on tourism and hope that it might encourage more research in this area. I have just a couple of comments/suggestions

1. In the document generally there is much focus on the importance of networks, but as a consequence of the development of the Wild Atlantic Way proposition a key issue for tourism is how do coastal destinations cooperate and interact with each other along the route in order to attract tourists, enhance the tourist experience and 'sell' the route idea. Thus I

suggest that cooperation between coastal destinations should be added to the list on p. 54 under research topics.

2. On page 54 in the bullet point relating to funding a Marine Tourism Innovation scheme I suggest it is considered to add businesses as well as community/academic partnership research to make the scheme more far reaching.

3. The third proposal is to fund PhD positions to support EU and funding applications. It is worth considering whether it would be preferable to make this either a post doc or researcher position, as it is unlikely that a PhD candidate, particularly in the early years of their study would have the experience or time required to draft such applications.

4. Elsewhere in the document support for travel is noted, this would also be of benefit under this theme as it would facilitate the development of linkages with international coastal destinations and networks which would be vital in moving this theme from 'add hoc' to 'defined' status.

School of Civil & Structural Engineering

My research interest is in concrete durability. I recently submitted a H2020 application in this area. One of the partners was Smartbay.

One research area that the strategy should include is using its facilities to assess and improve durability of concrete structures. The current cost of repairs due to concrete durability in the EU is €30 billion per year and represents up to 50% of the initial construction cost. The improved durability of Offshore Wind Energy Devices is of strategic importance to delivering the European Union (EU) energy policy objective for 2020 and beyond. Investment in this area was approximately €4 billion in 2012. Currently, more than 90% of all offshore wind power is installed in northern Europe, in the North Baltic and Irish Seas, the North Sea and in the English Channel and have overtaken solar as the 3rd highest power generator. The National Renewable Energy Laboratory estimates that the US has approximately 4,150GW of potential offshore wind generation capacity.

By making savings will allow offshore power generation to become one of the main cost-competitive technologies. By providing test bests to improve these structures' durability, it puts Ireland in a great position to lead research in this area.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-22

User Information

Respondent

Aoife Deane, MaREI Centre for Marine and Renewable Energy, Beaufort Building,
Environmental Research Institute, University College Cork, IMERC Campus

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Yes

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Yes

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

Yes

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Literacy & Education]

Yes

Group: Ocean Literacy & Education

Ocean Literacy & Education Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

- Department of Education and Skills 2014, 'Education for Sustainability' – The National Strategy on Education for Sustainable Development in Ireland 2014-2020.
- 'Our Sustainable Future: A Framework for sustainable development for Ireland', Department of Environment, Communications and Local Government, 2012.
- The Rome Declaration, adopted on October 8th 2014 at the EuroOCEAN conference calls for 'sustained support for ocean literacy, best practice in science communication, citizen science initiatives and knowledge transfer to be embedded in marine research projects and programmes'.
- Navigating the Future by the European Marine Board recommends:
 - o Stimulating the coordination of ocean science education efforts across Europe;
 - o Stimulating nations to adopt the principles of ocean literacy;
 - o Developing an action plan to upgrade and reinforce ocean literacy in Europe;
 - o Assisting in the integration of the essential principles of ocean science into education curricula across Europe.

Ocean Literacy & Education Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Although the Networks and Relationships dimension of the research capability remains underdeveloped, it is progressing beyond stage one of the maturity level, and could be considered to be on the same level as human capacity and infrastructure on the model. There is a growing recognition that Ocean Literacy is an important part of the development of Ireland's strategy for blue growth and the development of our marine resources and this is increasingly reflected in various projects and initiatives up taken nationally. A network has recently been established (The Irish Ocean Literacy Network) that aims to bring together partners from across the whole island of Ireland that have an interest in the marine environment and wish to promote ocean literacy. The network will be used to encourage collaborative efforts in marine education and for promoting ocean literacy in both education and the wider community in Ireland. This network originated from the Seventh Framework Programme (FP7) funded Sea for Society Project, funded under the FP7 Science in Society theme. It aimed to develop and enrich the concept of the 'Blue Society' among stakeholders, citizens and youth. Following on from Sea for Society, the

H2020 SeaChange project (NUIG and AquaTT as Irish project partners) aims to create a deeper understanding of how the health of European citizens depends on the health of the ocean and how the health of the ocean depends on the actions of our citizens.

Ocean Literacy & Education Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Harnessing our Ocean Wealth includes a section on Capacity, Education, Training and Awareness – a key theme relating to ‘Engagement with the Sea’ as this will provide the platform for people to become engaged with the oceans through education and training. An assessment of the levels of ocean literacy in Ireland may be required in order to see where we are at in terms of knowledge levels amongst the general public. Other documents that highlight the gap in necessary skills include ‘Our Sustainable Future: A Framework for Sustainable Development for Ireland’ (DECLG 2012). This document highlights that ‘education for sustainable development needs to be embedded at every level of the formal and informal education system’ and that ‘public communication is vital for sustainable development to be better understood and implemented’ and identifies a number of skills and training gaps relating to: • Education, communication and behavioural change • Innovation research and development • Skills and training The National Strategy on Education for Sustainable Development aims to ensure that ‘education contributes to sustainable development by equipping learners with the relevant knowledge (the ‘what’), the key dispositions and skills (the ‘how’) and the values (the ‘why’) that will motivate and empower them throughout their lives to become informed active citizens who take action for a more sustainable future’ (DES 2014). Significant work has been done in primary level education where the Marine Institute’s Explorers Education Programme has provided training courses and workshops for teachers and students in some regions. However, there is scope to expand on these efforts to ‘marinise’ curricula at primary and secondary level linking to cross cutting topics such as marine ecology, climate change, earth observation, etc. The Department of Education & Skills and the National Council for Curriculum and Assessment would need to be engaged in order to make this a reality (through teacher CPD, curriculum links, etc). This is vital as we want to ‘marinise’ graduate and vocational training programmes to raise the skills base available in the blue economy as suggested.

Ocean Literacy & Education Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

The newly formed Irish Ocean Literacy Network has been developed from the experience, interest and expertise generated from the Sea for Society project and should be supported. Engaging with government and industry to support the cross-cutting nature of ocean literacy is essential to secure maximum funding for the initiative. There is great potential in the likes of the ‘Science with and for Society’ programme in H2020 and future such calls which could be given serious consideration by the members of the Irish Ocean Literacy Network should its coordination be supported.

Ocean Literacy & Education Q5. Have you any other comments?

Further efforts to integrate the marine into the Irish education system will be required. Courses, modules and subjects should be 'marinised' from primary school level through to secondary and beyond to ensure maximum impact and maximise interest from an early age in the marine. As an island nation with a huge maritime economy, the marine sector should already be a key area in the education sector. Positive developments such as the new Marine Environment theme within the Green Flag schools programme could be further enhanced by contributions from MaREI and others on marine ecology and marine renewable energy, for example. In terms of public engagement events like SeaFest, Cork Harbour Festival and World Oceans Day should continue to be supported as they represent an opportunity to engage the Irish public on marine issues. At a community level, successful community led initiatives like Tidy Towns and Clean Coasts can be built upon to raise awareness on marine litter. MaREI at UCC partnered on a project called Marlisco which developed educational resources on the topic of marine litter including a short animation, lesson plans, posters, etc. Existing resources developed through past projects like Marlisco and Sea for Society should be utilised going forwards. Support for a group like the Irish Ocean Literacy Network could enable this to happen by requesting all stakeholders to list resources available through past and current projects and initiatives.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-25

User Information

Respondent

Maeve Edwards

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Broadly, yes.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

The five levels are broadly appropriate for classification of research maturity. However there are perhaps real-life examples which could occasionally be classified as a mixture of levels, particularly between 'ad hoc' and 'defined'.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

The instruments described would probably raise the maturity of the R&I systems, but there is little to no mention of instruments that encourage collaborations between industry and research communities (such as Enterprise Ireland/European funds). In general, this also reflects a general lack of perception that industry also drives research questions through necessity and even curiosity.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

I did not think other departments or agencies were well represented in this document. They were referred to briefly but their role within the marine sector (particularly BIM and Údarás na Gaeltachta who have direct roles in strategy and community affairs) was not at all clear. These agencies have supported marine research (e.g. BIM and seaweed research) for decades. Secondly, and referring to my comments in Q4, the role of industry was ignored when research funders, development agencies and the Marine Institute were covered. While marine research is a fascinating area of study, it shouldn't be a means to an end in itself, purely existing as a self-perpetuating entity with no further use outside its own borders. Industry, as a potential end beneficiary needs to have more of a defined role in the consultation.

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted.
[Aquaculture & Biomass Production]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Wild Resources]

Yes

Group: Aquaculture & Biomass Production

Aquaculture & Biomass Production Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Yes

Aquaculture & Biomass Production Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

I believe the maturity of aquaculture research should be increased at least one level, if not two to 'established', however there are several factors to consider. On the positive side, dedicated facilities exist for research aquaculture in both NUIG's Carna Research Station (in existence for over 30 years), and the Daithi O' Murchu Marine Research Station in Gearhies, Cork. UCC also have campus-based aquaculture facilities too. In the explicit example of the Carna Research Station, the facility is currently (and in past 5+ years) been dedicated mainly to finfish aquaculture and seaweed production. Through national/international collaborative research projects worth well in excess of €7 million during this time, a significant track record in publications (>25 papers) is evidence of maturity in this theme. A negative aspect of the maturity of this theme is that there are very few permanent PIs in Irish research that are dedicated to aquaculture per se. Much of the research has been completed by a progression of postdoctoral researchers (with little or no prospect of obtaining permanency) working with a permanent member of academic staff that may or may not have direct aquaculture experience. It is therefore quite difficult to build and maintain teams of people with complex sets of skills for marine aquaculture research which is often conducted at semi-commercial scale.

Aquaculture & Biomass Production Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

As mentioned earlier, it is not clear from this document if the aquaculture industry is being considered as a driver alongside key policies and sectoral plans. The aquaculture and biomass production industries often have specific needs that can be addressed by bespoke assistance from the marine research community.

Aquaculture & Biomass Production Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Broadly, yes. However, perhaps it might also be interesting to place some funding emphasis on encouraging the spin-out of research ideas into industry.

Aquaculture & Biomass Production Q5. Have you any other comments?

No

Group: Wild Resources

Wild Resources Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes

Wild Resources Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes

Wild Resources Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

No

Wild Resources Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Yes

Wild Resources Q5. Have you any other comments?

No

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-21

User Information

Respondent

Eugene Farrell, NUIG

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

No. There is no theme that list 'coastal geomorphology' or 'coastal dynamics' or 'coastal sedimentology'. Marine research and innovations needs to include the shallow nearshore, inter-tidal and coastal areas. For example, coastal erosion and flooding is intrinsically linked with nearshore bathymetry. Marine and "coast" are certainly not mutually exclusive. Marine habitats are dependent in many cases on sediment exchange between terrestrial beach-dune systems and the nearshore. Similarly I would include themes such as "Coastal Change" and "Catchment Dynamics" to reflect the impact of marine system on the coast/land (e.g. coastal squeeze from rising sea levels and increased storminess) and vice versa (impact of contaminants in sediment and water input from inland sources). These are also partly subsumed within climate change as we need to monitor out natural coastal and marine systems in order to be able to predict their response if climate change projections come to pass.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes with the small exception of the need to support clear pathways through school to undergraduate and postgraduate training. This should start in primary and secondary schools through promotion of marine and coastal science within the existing subjects: Geography, Biology, Environmental Sciences (and like). Support of field based postgraduate training is very important as it is expensive. A great example is the Marine Institute support for ship-led training. These experiences make Ireland world-leading in this sector. Universities offering such field/lab training should be provided extra monies for these programmes - including monetary support to market abroad. Finally, increased availability of PhD funding awards will increase the capacity of research clusters, staff and students.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Yes

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

It would be beneficial to have links between the multi-disciplinary datasets that are being used to inform the different policies - which would identify where researchers can contribute to and improve. It is also important in order to make the links between hard science and policy more transparent.

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Climate Change]

Yes

Group: Climate Change

Climate Change Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

There is a pressing need to link storm response and recovery processes with policy and management strategies - especially if we expect the climate projections to hold true. Long term monitoring programmes of marine and coastal environments are critical to inform County Council coastal management plans. Further these Councils highlight the need in establishing baseline data for marine environments ahead of developing Climate Change Adaptation Strategies (as required). The results of long term monitoring programmes can inform the Sectoral Adaptation Plans and Local Authority Adaptation Strategies in County Councils and elsewhere in response to the pending Government Climate Change National Mitigation Plan (NMP) and National Adaptation Framework (NAF).

Climate Change Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Sectoral Adaptation Plans and Local Authority Adaptation Strategies in County Councils require fundamental field observations via long term monitoring programmes. These are required in response to the pending Government Climate Change National Mitigation Plan (NMP) and National Adaptation Framework (NAF). Field research programmes should be prioritized.

Climate Change Q5. Have you any other comments?

Direct utilization of coastal dunes and beaches form an important economic role in many rural and urban coastal communities, rendering them key physical components in the socio-economic fabric. Ecosystem services provided by beach-dune systems include recreational and tourism benefits, carbon sequestration, and habitat “functions” such as water purification, erosion control and habitat provision (Barbier et al., 2001). These are unique environments and, in many cases, are designated as Special Areas of Conservation (SAC) under the European Union (Natural Habitats) Regulations, 1997 and Natural Heritage Areas (NHA), designated under the Wildlife (amendment) Act 2000. Protecting these coastlines will not be easy and will come at a price. For example, the most recent winters may be viewed as a window into our future if current climate change projections come to pass. From the period mid-December 2013 to February January 2014, there were storms in and around Ireland approximately once every three days. These coincided with high spring tides which resulted in widespread coastal flooding and erosion and massive damage to infrastructure. The estimated costs for clean-up, repair of infrastructure and restoration works by Local Authorities exceeded €110m (OPW, 2014). The estimated cost of insurance claims arising from damage caused by the W2013-14 storms and flooding was estimated at €156 million, according to the Irish Insurance Federation claims. The cost of one winter exceeded €0.3 billion! Is this the future? As scientists, managers, and planners, we need to promote a cultural shift from disaster management based on response towards a strategic approach that emphasizes a focus on prevention, adaptation and mitigation to build societal and economic resilience. This can only be done using evidence-based decision making and changing legacy practices. In addition, without fully understanding the drivers of change in our unique and varying coastal systems any long term management strategies and policies may be ineffective, especially in practice.

Towards a Marine Research & Innovation Strategy: Marine Institute Consultation Process

Institutional Response: GMIT

As a HEI with strengths in strategically targeted areas of marine research and innovation, GMIT welcomes the opportunity to comment on this review of marine research performance in Ireland and to inform the development of a new national marine research and innovation strategy. Feedback is provided in response to the consultation questions presented in the document.

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Taken together, the 15 themes are comprehensive and appear to cover the full range of drivers of marine research and innovation in Ireland. Individually, some topics are very broad (e.g. bio-resources) while others are narrow (e.g. marine litter). There is a danger that by highlighting very specific areas, the strategy will exclude or discourage activity in other related areas of comparable importance. For example, the problems posed by chemical pollutants are no less pressing than impacts of marine litter; *marine pollutants* may be more appropriate as a thematic area. In contrast, research to support the management of wild fisheries falls under one of four sub-themes within the bioresources theme. This emphasis appears disproportionate given the economic value of this resource and the research strengths that exist nationally. The breadth of each the 15 themes should be roughly equivalent.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

We acknowledge the difficulties of devising a classification scheme to accurately capture all the complexities of the R&I system. We also appreciate that the main purpose of the current scheme is to highlight in relative rather than absolute terms the maturity of the various themes so that funding can be directed effectively. However, the proposed classification scheme seems best aligned and more appropriate to the Technological Readiness Level scales that may support enterprise development. The scale suggests that translational outcomes arise only at the higher ends of the scale and does not differentiate that, for research supporting policy development and advice generation, translational outcomes can arise at lower levels on the scale.

If research maturity is viewed as entirely linear, smaller-scale activity in an emerging area which has some translational impact may not be able to access appropriate research instruments. Many Irish marine researchers are involved in activities that qualify as translational according to the criteria on page 8 (*participating in legislatively based or ministerial appointed for a that inform legislation or regulation; consistent leadership roles in international standard setting forums; consistent leadership roles in international governmental mandated scientific organisations*). While the related research may be at an earlier stage of maturity in terms of scale and broad impact, its applied impact for advice provision may warrant more long-term thematic supports than the instruments directed at defined or established research areas.

Q3. Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?

It is difficult to evaluate the appropriateness of the maturity classification without sufficient supporting data. We appreciate that the assessment is qualitative rather than quantitative, however it is presented as if it has arisen from a quantitative evaluation. Regular re-evaluation of the maturity classification would be required as the strategy is implemented. To support this, a transparent

classification scheme which shows how the maturity classifications have been assigned should be presented.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

As outlined in answer to Q2, design of funding instruments should recognise that research maturity is not always linear, and that end-points may differ between R&D that supports policy development and that which supports enterprise development. For example, industry linked PhD or post-doctoral awards may be appropriate where translational activities occur at lower level of research maturity. Also, in these cases funding may be more effective if spread over a longer-time frame to allow for programme level planning of activity.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details

Descriptions appear accurate although not all relevant agencies are listed (e.g. BIM)

B. Theme Specific

Q6. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

The major national and international drivers are identified. Some relevant international policy drivers are not cited; United Nations Agenda 2030 and FAO Sustainable Development goals (overlaps with all themes, particularly bioresources, climate change, biodiversity, ecosystems and food webs).

Q7. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlines in the model (see page 8 of the draft strategy)

As above, it is difficult to evaluate the accuracy of the evaluation without seeing the data that was used to assign the categorisation.

Q8. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

Q9. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

The focus on ocean observation is welcome given the recent growth in available technology and access to data. The strategy articulates the requirement to develop and expand national ocean observation research capacity. However, what is missing from the strategy is an acknowledgement of the importance of coupling the resulting physical and chemical data with existing biological time series. Continued investment is needed to maintain, preserve and integrate long-term biological time series so that improved monitoring of the physical and chemical environment will lead to better understanding of biological responses to change and improved delivery of resource management requirements.

The required funding supports identified under the biodiversity ecosystems and food-webs theme include investment in human capacity with the necessary skill sets and experience to engage in the next generation of marine biodiversity, marine food web and ecosystem research. There is an emphasis here on expert level knowledge in mathematics, statistics and coding. Given the shortage nationally of biology/ecology graduates with these skills, this does capture a support that is very much needed to sustain excellent research and innovation in this thematic area. As a HEI that

prioritises a quantitative focus within our research and taught programs, GMIT welcomes this emphasis in the strategy. Another aspect worthy of prioritisation within this thematic area is the development of emerging analytical techniques (e.g. environmental DNA). Investment is required to support the development and optimisation of methodologies that may currently be at a very early stage of technological readiness but could ultimately drive applied research to support regulatory driven environmental monitoring.

Q10. Have you any other comments?

The section describing the maturity assessment of research capabilities under the bioresources theme cites an absence of postgraduate training programmes in the area of fisheries and seaweeds. It is worth noting that GMIT are a partner on the new Erasmus+ International Master of Science in Marine Biological Resources which will replace the EMBC+ Masters program from September 2017 and which includes several fisheries related modules. www.imbrsea.eu

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-21

User Information

Respondent

Siobhán Kelly

Are you filling out this survey on behalf of an organisation?

Yes

Organisation Name

Irish Maritime Administration, Department of Transport, Tourism and Sport

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Goal 2 of Ireland's integrated Marine Plan "Harnessing Our Ocean Wealth" is the protection, preservation and restoration of healthy marine ecosystems. As stated in the Plan, "Protection of our marine ecosystems and compliance with environmental legislation are essential components of our ecologically sustainable future and need to be seen as an essential enabler for a thriving maritime economy." Bearing this in mind, the inclusion of the topic of ship-sourced marine pollution and response in the Marine Research and Innovation Strategy is important in achieving the goals of "Harnessing Our Ocean Wealth". While it is welcome that the Strategy includes a section on Litter, this does not encompass the full range of pollutants which threaten Ireland's marine environment, for example oil and hazardous and noxious substances. In relation to pollution by oil and hazardous and noxious substances, the International Convention on Oil Pollution Preparedness, Response and Co-operation (the 1990 OPRC Convention, to which Ireland has acceded) and the related Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (the 2000 OPRC-HNS Protocol) are in force internationally. Parties to the Convention and its Protocol agree to promote research related to the "enhancement of the state-of-the-art of preparedness for and response to pollution incidents, including technologies and techniques for surveillance, containment, recovery, dispersion, clean-up and otherwise minimizing or mitigating the effects of pollution incidents, and for restoration." This also ties in with the EU Atlantic Action Plan objective of "supporting initiatives undertaken by Member States in the Atlantic, including risk assessments, coordinated response mechanisms and investments in state-of-the-art equipment that contribute appropriately to enhancing coordinated preparedness and responses to marine threats, natural disasters, marine accidents, spills of oil and hazardous material or trafficking." It therefore important that research into ship-sourced pollution from illegal discharge or ship casualties is included in the Strategy. Assessment of risk and preparedness for pollution incidents as well as analysis of operational response capability at national, local and port authority level to incidents are topics which are particularly worthy of mention. The inclusion of such topics in the Marine Research and Innovation Strategy would aid in protecting marine ecosystems and marine industry and in achieving the goals of "Harnessing Our Ocean Wealth".



Irish Offshore Operators' Association

Suite No. 2119, Fitzwilliam Business Centre, 26, Upper Pembroke Street, Dublin 2, Ireland
Tel: +353 1 637 3996 Fax + 353 662 0365 Email: iooa.chairman@gmail.com Website: www.iooa.ie

21 November 2016

Submitted via email to stakeholders@marine.ie

Re: IOOA Submission to public consultation on: Towards a Marine Research & Innovation Strategy 2021

Founded in 1995, the Irish Offshore Operators' Association (IOOA) is the representative organisation for the Irish offshore oil and gas industry. Its members are companies licensed by the Irish Government to explore for, and produce, oil and gas in Irish waters. IOOA provides a forum in which its member companies work together to identify and tackle issues facing Ireland's offshore industry. By co-operating and providing a common approach to issues such as safety, the environment, legislation and employment, IOOA proactively assists in the environmentally-responsible exploration and development of oil and gas natural resources in Ireland's offshore waters.

IOOA welcomes the publication of the Marine Research and Innovation Strategy 2021 consultation document, issued on 1 November 2016, and is pleased to provide our responses (below) to the feedback questions.

A. GENERAL

Question 1: The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

- IOOA commends and supports strongly the approach taken in the consultation document, and in the associated backup documentation, recognising the inter-dependencies and synergies between and across the 15 themes. IOOA also endorses the approach taken in not prioritising any one of the themes above the other. Particularly welcoming is the acknowledgement that the 15 themes are cross-sectoral in nature including elements such as energy, transport, food and biodiversity.
- While recognising that the oil and gas sector is a Subsea Resource it would be more technically correct to differential this from subsea mining. The oil and gas sector is primarily an energy provider, e.g., gas to the wholesale market, liquids to the refining market. Consideration should be given, as per the Bioresources and Integrated Policy themes, to breaking the Subsea Resources theme into, for example, Offshore Energy and Subsea Mining.

Question 2: Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

- The dimensions are appropriate and provide adequate resolution to highlight priority areas.

Question 3: Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?



Irish Offshore
Operators'
Association

Irish Offshore Operators' Association

Suite No. 2119, Fitzwilliam Business Centre, 26, Upper Pembroke Street, Dublin 2, Ireland
Tel: +353 1 637 3996 Fax + 353 662 0365 Email: iooa.chairman@gmail.com Website: www.iooa.ie

- The five maturity levels are appropriate. Perhaps include a footnote regarding “Unassessed” which is included in several sections as a default maturity descriptor.

Question 4: The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

- The Maturity and Dimension matrix is effective. As the document lists a number of areas which are targeted to be advanced up the Maturity continuum, consideration should be given to the addition of a single figure with each of the themes plotted (and labelled) on a blank matrix showing where it currently is and a vector showing where it is targeted to be. This could be included in an executive summary and would highlight the target areas and measures of success of the strategy.

Question 5: The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details

- Department and agencies list is not exhaustive and the only organisation role described in any details is that of the Marine Institute. It is suggested that the addition of a table listing the top tier organisations, and the themes to which they are most relevant, would be helpful.
- Although mentioned in several of the theme sections there are no European Union (EU) level agencies listed here. Identification of key EU agencies would be beneficial.

B. THEME SPECIFIC

Question 6: Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples?

Subsea Resources

- Include a reference to the European Commission – Energy Union Package. Action point 2 includes diversification of gas supply within and into the EU. Also add references reflecting the sensitivity of “energy islands” and the importance of infrastructure and integration of renewables with existing energy supplies to ensure security of supply http://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF. This is equally applicable to the Renewables Energy theme.

General

- The April 2015 publication: A study of the current and future skills requirements of the marine/maritime economy to 2020 <https://www.education.ie/en/The-Department/Bodies-and-Committees/EGFSN-Study-Current-Future-Skills-Requirements-Marine-Maritime-Economy.pdf>, captures several themes in relation to activity level outlooks for sub-sectors in the blue economy. In particular the study highlights a number of R&I roles relevant to this strategy that would be helpful to include, or cross reference.



Irish Offshore Operators' Association

Suite No. 2119, Fitzwilliam Business Centre, 26, Upper Pembroke Street, Dublin 2, Ireland
Tel: +353 1 637 3996 Fax + 353 662 0365 Email: iooa.chairman@gmail.com Website: www.iooa.ie

Question 7: There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlines in the model (see page 8 of the draft strategy)?

Subsea Resources

- Maturity assessment for networks and infrastructure, in particular in the geoscience in support of offshore hydrocarbon exploration, could easily fit into the Established category. There are numerous examples of geoscience research and innovation with international links and networks and equipment and training at an Established level (e.g., iCRAG research and training (PhD and postdoctoral levels), UCD National Centre for Isotope Geochemistry, UCD MSc Petroleum Geology course, UCD Fault Analysis Group, UCD Marine and Petroleum Geology Group).

Question 8: Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

Subsea Resources

- Research topics are aligned with key risks associated with R&I in offshore energy theme of subsea resources.

Question 9: Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Subsea Resources

- Focus of funding for this theme is aligned with the research topics and should be considered an iterative process, with results feedback back into defining future R&I areas and funding focus.

Question 10: Have you any other comments?

- Document would benefit from an executive summary.
- The background briefing document (<http://marine.ie/Home/site-area/news-events/press-releases/seeking-your-views-new-marine-research-innovation-strategy-2021>) is excellent and should be referred to throughout the Consultation document. For example, each theme section should refer the reader back to the appropriate section of the briefing document. This will ensure audience able to drill down into particular sectors for further information.
- Generally the theme of the connectedness and integration of sectors of the marine is not really explored until the final section on Engagement With the Sea. This is one of the key themes of the blue economy. It is suggested that this inter-connectedness of research priorities (spatial, baselines, engineering, and ecosystem health) could be introduced at the front of the document (e.g., executive summary).
- Fundamental similarities between subsea resources and renewable energy in term of marinisation, maintenance OPEX costs and installation in dynamic environments. Recommend that the linkages between these two sections of the report area could be highlighted as an area to be strengthened.



Irish Offshore
Operators'
Association

Irish Offshore Operators' Association

Suite No. 2119, Fitzwilliam Business Centre, 26, Upper Pembroke Street, Dublin 2, Ireland
Tel: +353 1 637 3996 Fax + 353 662 0365 Email: iooa.chairman@gmail.com Website: www.iooa.ie

Subsea Resources Pg 49-50

- The term “clean gas” is not really necessary. It is suggested that the first sentence could read “Yet to be discovered hydrocarbon resources offshore Ireland could generate transition fuels that complement intermittent renewable energy sources as Ireland decarbonises its energy generation to meet GHG emission targets”.
- Acronym GHG not defined anywhere and suggest CO₂ may be a better expression of this given COP21 outcomes.

Under Research Topics

- 3rd bullet point “Improved methods for optimising the *efficient* production of resources”
- The “and” at the end of the 2nd bullet point should be moved to the end of the 3rd bullet point.
- Research priorities identified in highly mature hydrocarbon provinces in their pursuit of producing hydrocarbons more efficiently should also be investigated as a blueprint. Examples from the Norwegian and UK North Sea sectors could be utilised.

Renewable Energy Pg 51-52

- Should also include environmental baseline acquisition studies. This aspect is critically important given the focus this sector will potentially have in inshore areas and again highlights the importance of integrating baseline studies in support of all offshore energy projects.

Yours sincerely

Prof. Pat Shannon
Chairman
Irish Offshore Operators' Association and on behalf of:

AzEire Petroleum
Cairn Energy,
Eni,
Europa,
ExxonMobil,
Faroe Petroleum,
Lansdowne Oil & Gas,
PSE Kinsale Energy,
Providence Resources,
Repsol,
Serica Energy,
Shell,
Statoil,
Woodside

Copy:
Gareth Parry – IOOA (Environment Sub-committee Chair)
IOOA Management Committee
IOOA Environment Sub-committee

Towards A New Marine Research & Innovation Strategy Consultation Period 1 November - 31 December 2016 Online Survey Response

Date submitted

2016-11-22

User Information

Respondent

Mark Johnson, NUIG

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes I think the themes are fairly comprehensive

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes. This is a good way of analyzing the issues.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

This seems like a good model and way to think about research communities. Perhaps 'excellence' is not quite captured as level 5 is applied research. ERC awards appear at level 4, but perhaps without a clear route to generating more applications.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

I have specific comments on biodiversity theme see elsewhere

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

Yes seem adequate

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted.
[Aquaculture & Biomass Production]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Wild Resources]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted.
[Biodiversity, Ecosystems & Food Webs]

Yes

Group: Aquaculture & Biomass Production

Aquaculture & Biomass Production Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Complete

Aquaculture & Biomass Production Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

The networks in 'algal cultivation' seem at a higher level than ad hoc. The size of the field is too small for significant national networks, but there is evidence of Interreg, FP7 and H2020 bid participation and grant awards. These signify of a higher level of networking - although there may be issues for the framework as a whole in describing fields that are too small in Ireland for a visible national network. In this respect the maturity framework is probably over-simplistic if it implies a progression of isolated to national to international in terms of networks.

Aquaculture & Biomass Production Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

More research needed on means to make businesses viable. Also small scale alternatives to current fish farm models. The National Strategic Plan for aquaculture is not fully covered by the text in the consultation, including: 'Provision of expert advice to improve environmental and business performance and enhanced strategic planning by aquaculture enterprises.' and 'Development of commercial scale growing systems for novel species'

Aquaculture & Biomass Production Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Needs continued thought and coordination for the best use of any investment in the area.

Aquaculture & Biomass Production Q5. Have you any other comments?

No.

Group: Wild Resources

Wild Resources Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes

Wild Resources Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

The strategy is sometimes uneven about whether the Marine Institute is included or not as a research performing organization. The rating of wild resources (fisheries) as level 3 seems to overlook the work of the Marine Institute. The Marine Institute clearly participates in fora that inform national and international fisheries legislation and regulation (as do other state agencies). There are multiple memberships of ICES working groups on fisheries and ecosystems (Networks and Relationships - leadership roles in international governmental mandated scientific organizations)

Wild Resources Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

No clear omissions

Wild Resources Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Yes

Wild Resources Q5. Have you any other comments?

No

Group: Biodiversity, Ecosystems & Food Webs

Biodiversity, Ecosystems & Food Webs Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Yes, including reference to, for example the Convention on Biological Diversity (CBD).

Biodiversity, Ecosystems & Food Webs Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes

Biodiversity, Ecosystems & Food Webs Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Yes

Biodiversity, Ecosystems & Food Webs Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Yes

Biodiversity, Ecosystems & Food Webs Q5. Have you any other comments?

There is a mismatch between the needs identified for focus and the type of funding available. This occurs nationally and internationally (where the lack of marine biodiversity calls in H2020 is mentioned). The strategy mentions that 'a funding mechanism is required'. The strategy could stress that this needs to be a new funding mechanism as goals like 'establishment of long-term study sites and a programme of research to be conducted within these sites' cannot be supported on the basis of opportunistic (ad hoc) PhD projects and possible limited-time participation in national or international consortia. This is an international problem, addressed by networking initiatives like the EMBOS COST action, but what is needed are small awards to incentivize data gathering by HEIs, interest groups and citizen science projects. The funding could be administered on the basis of submission of QC checked data to open access repositories, but a relatively modest investment could make a potentially large impact in this area.

From: [Leave No Trace Ireland](#)
To: [stakeholders](#)
Subject: New Marine Research and innovation Strategy
Date: Wednesday 16 November 2016 12:22:16
Attachments: [image001.jpg](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)

To whom it concerns,

I wish to include the following feedback to be considered in the new Marine Research & Innovation Strategy for the period 2016 – 2021 ,

We noted the section on ocean literacy currently not include the Explorers Education Programme. We believe this is a valuable and critical component for the purpose of ocean literacy so we have outlined some details below.

- a. The development of the Marine Institute's Explorers Education Programme™ is required "funding to build on the Marine Institutes national primary school programme Explorers Education Programme™
 - Modules delivered by 11 outreach centres working with teachers reaching over 21,000 students around Ireland in ten coastal counties
 - Development of teachers training through education centres
 - Development of student teacher training at third level insitutes
 - Development of teacher and student resources that are fit purpose
 - Development of long term evaluation using data collected by the Explorers Education Programme™

- b. The strategy needs to include partnerships with the Department of Education in the development of marine literacy at primary, secondary and third level (e.g. teachers training college).

Please do not hesitate to contact me if you have any questions at all

Maura

Maura Lyons, | Manager
Leave No Trace Ireland

To: stakeholders@marine.ie

From: Lisheenkyle N.S. Lisheenkyle, Oranmore, Co. Galway

Date: November 17th, 2016

Re: Marine Research and Innovation Strategy 2021 / Contribution to Public Consultation / Explorers Marine Education Programme.

For the second year running, Lisheenkyle National School, a large rural school with approximately 230 pupils, has had the pleasure of accepting an aquarium to the school on short term loan through the Explorers Marine Education Programme. The application system is straightforward and training is given prior to installation in the school. The guidance is expertly done and the aquarium is of great benefit to the schoolchildren and staff from an educational as well as a therapeutic point of view.

It is important to reach out to the community with programmes such as the Explorers Marine Education Programme. We successfully applied for the aquarium in the school on two occasions, but we could also have benefitted from guided marine project work in the classroom; a teachers' workshop in the Galway Education Centre or a trip away for the children to participate in an explorers seashore safari. We chose the aquarium in the school because we have a large cohort of children with special education needs and have found projects involving fish and animals highly therapeutic. As a Green School we have made a commitment to educating the children in biodiversity and energy conservation. We have our own eco classroom in the nearby woodland and our own 11KW wind turbine which helps with the electricity needs of the school – and powers the aquarium, which is an added bonus to the Explorers Marine Education Programme.

It is a pleasure to see the children stopping by the aquarium to see the daily progress of the fish. It encourages their imagination; their creativity in making up stories about the fish; their speech and language acquisition as they learn new terminology; their socialisation as they talk freely to each other about the fish; their care for biodiversity and ecology as they care for something other than themselves and their new learning. Books on fish are placed next to the aquarium to encourage further learning and projects and essays are undertaken in class to ensure that the experience is spread across the curriculum.

We are impressed that funding is available to allocate such a valuable resource to the school and to other schools throughout the country. We are proud to be stakeholders in the programme and our application year on year to participate is testament to our satisfaction that it is a valuable educational addition to the school. We hope that future funding assures that it will continue.

Anne Keary
Principal
Lisheenkyle NS

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-15

User Information

Respondent

Carmel Madigan

Are you filling out this survey on behalf of an organisation?

Yes

Organisation Name

Loophead Summer Hedge School

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Perhaps, an outreach/localization strategy to mobilize coastal communities in re-engaging with their local marine environment and in the documenting and re-evaluating of this dialogue, to find pathways that enable the strengthening of this community/marine linkage through sustainable economic development, well-being, and regularly feeding into and informing the national marine knowledge bank. Secondly, the real fear of coastal erosion and land/economic loss by local farming communities, and how they may reclaim their 'lost' land appears to have been missed from the list. Research and development of prevention measures would be valuable to these communities.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

These appear appropriate.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

These seem adequate and appropriate

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

The Failte Ireland capital grants scheme, appears sporadic and not always 'open'

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Tourism]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted.
[Biodiversity, Ecosystems & Food Webs]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Litter]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean
Observation]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean
Literacy & Education]

Yes

Group: Tourism

Tourism Q5. Have you any other comments?

Tourists arriving from the Continent of Europe, to visit Ireland, should be 'persuaded' to take an informed tour of our coastline. This is a unique NE Atlantic visitor experience, and to mind on a par with any man-made trophy such as a historical castle. We need to move beyond the 'wave action' and immerse our visitors in the immense detail and value of our coastline, together with providing such tourists with access to the local coastal community. This engagement could be achieved through subsidized marine events/seminars/festivals held locally.

Group: Biodiversity, Ecosystems & Food Webs

Biodiversity, Ecosystems & Food Webs Q5. Have you any other comments?

My research has centered around one beach, Ross Beach, Loophead, over a period of 8 years now. As a small organization, it is isolating to do this self-directed work, without the support/linkage system of a larger organization, yet the school has been driven in it's passion to continue this work. I believe that on-site bi-diversity recording and the work of the recorder would benefit from frequent walk throughs of the shore with various interested scientific parties, to enhance the sharing of knowledge, through questioning and observation. Marine based meetings could sometimes be held on such shores as opposed to in-house.

Group: Litter

Litter Q5. Have you any other comments?

Litter on our shorelines (let alone in the ocean) has been abandoned by all agencies and left to the goodwill of voluntary clean-up community groups and schools to sort out. I believe that litter must be analysed more, to see where the litter has originated. In my study of 'printed' packaging litter, I find, products like 'Kimachi' from Korea, oil cans with Spanish language, from South America, milk cartons from the Netherlands amongst plenty of Irish bred litter. Analysis of litter by organizations, like Councils, aimed at penalizing/educating the litter mongers, which include all the stake holders, together with installation equipment on vessels to shred litter at source, could improve the litter situation.

Group: Ocean Observation

Ocean Observation Q5. Have you any other comments?

As a member of a coastal family that stretches back at least ten generations, the first task of the morning was to visit the shoreline at Ross, Loophead. Through this process, our generations were sensitive to the ocean, its movements, thrown up offerings, or finding a life raft in trouble. It wasn't to observe the shore at creature/seaweed level, but on a more opportunistic/patrolling level, felled driftwood from Canadian forests arriving on shore for collection and fueling our winter fires, offloaded goods from sunken ships during World War i & ii, and watchout for sailors in trouble. All this activity has long since stopped as current generations have completely turned away from the ocean and its movements and surprises.

Group: Ocean Literacy & Education

Ocean Literacy & Education Q5. Have you any other comments?

I work with primary school teachers, primary school children and the broader public/tourists to provide immersion modules on ocean literacy. I provide a DES approved teachers summer course with significant elements of in-house and on shore literacy immersion. I work with the Explorers Education programme to provide a selection of marine/ocean literacy modules to children and I take guided tours of visiting tourists to Loophead for seashore safari based leisure learning modules. All of these sectors are visibly and positively enthused by these journeys into our Atlantic ocean. They are enthralled by its bio-diversity of seaweed and creature, never before having encountered such live species, They are encouraged to touch and feel the textures of seaweeds in particular and are surprised at the variation of form that exists, their seasonality and their uniqueness in reproduction, chosen habitat, usefulness and so forth. There is significant vacant capacity to provide this sort of connection, dialogue with the masses. We are an island nation, and this almost appears to be forgotten, perhaps through our linkage with the EU. We have by and large forgotten our coast, the fact that we are an island, the opportunities and challenges that that presents. Primary educators have a very low level of knowledge of ocean literacy, and therefore provide poor ocean literacy learning experiences in the classroom. I believe the ocean literacy and dialogue that the outreach explorers team provide is key to harnessing interest, energy, thinking, exploring and knowledge building in this subject matter.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-22

User Information

Respondent

Sybil Berne

Are you filling out this survey on behalf of an organisation?

Yes

Organisation Name

MacCabe Durney Barnes

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Integrated Policy & Governance]

Yes

Group: Planning & Governance

Planning & Governance Q5. Have you any other comments?

We broadly support the actions outlined on p78 of the Consultation document. The strategy duly recognises the lack of legal research in the maritime area and notes that one of the research topics should seek to "assess the adequacy of existing legislation and planning mechanisms and enable government departments and development agencies to establish fit-for-purpose processes." We respectfully suggest a number of additions to the actions for funding, namely: 1. The legislative landscape and Marine Brexit: With the impending rollout of the United Kingdom's withdrawal from the European Union, uncertainties and changes in policy and legislation will occur within the next few years, whether the UK remains in the Single Market or not. We so far know that Brexit means that compliance with EU legislation no longer applies in some cases. Marine Brexit implies the redundancy of some funding programmes such as Life and of a number of policies: - The Bathing Water Directive - Bird and Habitats Directives - Maritime Spatial Planning Directive - Common Fisheries Policy; and - The possible redundancy of MSFD This will significantly affect Ireland on many levels, from the achievement of Good Environmental Status to the loss of fishing grounds for the counties to the north. Conservation regimes will also likely differ owing to different legislative environmental safeguards. Mapping out changes and pitfalls will help policy and plan makers to adapt to changes and devise plans and policies which serve Irish interests. Measuring the adequacy of the current legislation and planning mechanisms should be at the forefront in these times of uncertainty. 2. Undertaking transboundary cooperation under ESPOO and OSPAR Transboundary cooperation will likely be carried under the ESPOO and OSPAR conventions but would no longer be required in accordance with the MSP Directive (and possibly MSFD). Research should address issues of transboundary cooperation and specifically review examples under these conventions. 3. Stakeholder engagement Stakeholder engagement is the key to good plan and policy making but has been relatively poor so far in relation to marine related development. Meaningful and democratic ways to engage must be identified. Ideally such research should be specifically tailored to Ireland and provide a blueprint for engagement. This does not appear to come across enough in the draft research strategy and should be clearly addressed. We support the efforts in improving ocean literacy but believe that ocean literacy is not sufficient without clear channels for public involvement.



Marine Renewables Industry Association

Submission to Consultation on 'Towards a Marine Research & Innovation Strategy 2021'

The Marine Renewables Industry Association (MRIA) represents the emerging ocean energy (i.e. wave and tidal generated electricity) industry on the island of Ireland.

The Association welcomes the consultation and is in broad agreement with the thrust of the draft strategy. MRJA's comments below encompass both the Consultation Document and the Background Analysis Documents. Our observations are principally captured under Q10 of the Consultation Questions but touch also on Q6-9 also.

A. Ocean Energy Strategic Roadmap¹

The Strategic Roadmap was published on November 7th, 2016 (i.e. post the commencement of this Consultation) and all of the indications are that it will be funded and become the official policy of the European Union. In essence, the Roadmap is all about innovation in this emerging technology sector with particular reference to funding and supporting R&D and prototype development generally.

The Association recommends that the final 'Towards a Marine Research & Innovation Strategy 2021' take cognisance of the Roadmap which was drawn up by experts across all aspects of ocean energy. In particular, there is a need to highlight the opportunities for Ireland represented by the Roadmap and to ensure consistency between Irish policy and what will almost certainly become European policy shortly.

¹ *Ocean Energy Strategic Roadmap – building ocean energy for Europe* Ocean Energy Forum 2016, commissioned by European Commission and available on the Commission's website under the sub-heading 'Ocean Energy Forum'

B. Ocean Power Innovation Network (OPIN)

A key concern of potential customers for ocean energy (n.b. utilities such as the ESB) is the mismatch between the plans for ocean energy deployment (e.g. the ESB want to deploy the WestWave project in 2020) and the scale and capability of the majority of ocean energy device developers. One solution to this is to facilitate the growth of companies by encouraging partnership and collaboration between device companies and also with established firms, particularly in the engineering sector.

In light of this analysis, development agencies in Ireland (led by SEAI but including Enterprise Ireland and IDA Ireland), Scotland (Scottish Enterprise) and Northern Ireland (InvestNI) together with MRIA and the ESB established OPIN. The first phase of activity –to enlighten companies about innovation and to facilitate networking - takes the form of ‘OPIN Days’ held sequentially in Dublin, Edinburgh and Belfast and involves participants from all three jurisdictions. The early indications are that companies welcome the initiative and the promoters are seeking support from the EU INNOSUP programme to support a full-time executive team. The role model being followed here is the successful IRDG initiative – *‘A non-profit, business-led Innovation network of member companies and colleges, working together to drive excellence in Innovation within Ireland’s industry to create growth, jobs and prosperity’* which has had a significant impact on more mature technologies.

The Association recommends that the ‘Towards a Marine Research & Innovation Strategy 2021’ recognises the challenge of commercialising R&D in ocean energy; identifies the OPIN initiative; and supports its development in future as an important ‘soft’ support to ocean energy R&D.

C. Funding of R&D

The Consultation Document and the associated background documents make reference to a Prototype Development Fund. The current PDF administered by SEAI is a tried and tested instrument which meets the needs of early stage projects in particular. It is allocated c€5m pa (and can also de facto draw on the support of the special Apple fund established to support Irish ocean energy) and the Association’s view is that it should be retained and, indeed, its current flexibility could be key to funding major prototypes at a later stage in the industry’s evolution.

The Consultation Document etc also makes reference to the need for SBIR-type initiatives and the Association holds similar views. The MRIA published a discussion paper on *'Funding the Development of the Ocean Energy Industry in Ireland* in February 2016². The paper recommended that Government should:

'Establish an SEAI-run Pre-Commercial Technology Fund (PCTF) to close the 'funding gap' for device and sub-system developers at TRL3+ and to complement the current Prototype Development Fund. The PCTF would give Ireland a needed and viable 'roadmap' for ocean energy and it could be accommodated within the funding already envisaged for ocean energy in the Offshore Renewable Energy Development Plan (OREDPP)'

The PCTF is derived from the Wave Energy Scotland (WES) model but incorporates tidal as well and builds on the 'learnings' from WES.

MRIA recommends that the final 'Towards a Marine Research & Innovation Strategy 2021' recommendations on Finance take account of the analysis behind the PCTF suggestion and adopt the carefully thought through PCTF model.

² Available at www.mria.ie

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-09

User Information

Respondent

Patrick Murray, University of Limerick

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes I believe so

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes I believe so

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Yes I believe so

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Yes I believe so

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

Yes I believe so

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Value Added Products]

Yes

Group: Value Added Products

Value Added Products Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes I believe so

Value Added Products Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

To an extent but there is a need to foster new collaborative relationships among marine and maritime -focused businesses, entrepreneurs and the research community with the aim of generating innovative environmentally and economically sustainable ideas is critical. This inclusive 'cluster' framework will drive innovation among its network of participants as a mechanism that improves product competitiveness on a global scale. Creation of an integrated and highly knowledgeable, ocean-focused community that encourages sustainable and responsible growth, trains and attracts professional talent, and will ultimately spur cooperative innovation.

Value Added Products Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

The areas appear sufficient.

Value Added Products Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

The economic and scientific potential of marine organisms remains disproportionately underexplored. Over the past decade, several marine research projects have focused on unlocking the potential of our seas and oceans. While these projects have deepened our understanding of the complexities of the marine environment and identified opportunities for industry, relatively few have resulted in new products. We need to progress more quickly from experimental outputs to commercial opportunities, facilitating growth and increased competitiveness of the industrial sector and contributing to European Union (EU) Blue Growth objectives. We need to partner our research organisations with companies active in target markets and strategically placed to exploit opportunities. Research organisations with expertise in marine biotechnology, sustainable marine cultivation, purification and structural chemistry, life cycle assessment, engineering, product development, marine law, intellectual property, innovation management and technology/knowledge transfer.

Value Added Products Q5. Have you any other comments?

To bridge the gap between research and the market development of realistic and innovative pipeline chains, overcoming existing bottlenecks associated with successful transformation of marine biomolecules and biomaterials from marine organisms into viable and sustainable products are required. We need to deliver new culturing systems for the target marine organisms, advanced systems of extraction and purification of bioactive molecules, optimised pilot scale production systems, and well characterised biomolecules tested in new product applications, supported by assessments of key socio-economic, environmental, sustainability and legal aspects. Market needs and market penetration strategies need to be defined by industrial partners, and the sector will benefit from design specifications for new technologies, standardised processing protocols for eco-friendly and non-exploitive systems of production, in addition to blue-prints and patents for new marine derived product applications.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-22

User Information

Respondent

Máire Ní Fhéinne

Are you filling out this survey on behalf of an organisation?

No

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Renewable Energy]

Yes

Group: Renewable Energy

Renewable Energy Q5. Have you any other comments?

Cá bhfuil an leagan gaeilge de seo?

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-22

Group: User Information

Respondent

Rory Scarrott

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

These are all either economic or science based. There also needs to be a recognition of the need for building strong resilient coastal communities and near-shore economies and infrastructures (capable of tolerating the impact of the 2014/2015 storm season for example, or undersea - landslide-induced tsunamis). Our coastal and near shore society and economies need to develop a resiliency to extreme weather- and oceanic-induced events. Maybe include a theme "Oceanic and Coastal Resilience Development", or something that sounds better. It is not entirely related to Climate Change and is a specific thematic focus which targets the Sendai framework from a European perspective. As a thematic focus area, it is trans-disciplinary in nature. Range of research areas include engineering, forecasting, modelling, communications, observation, disaster response, education etc. Target areas include coastal inundation, weather resilient communities, infrastructure planning and adaptation, Forecasting and warning systems, maritime environment and situational awareness, emergency response capabilities and planning. Having it as a thematic focus would also provide the support needed for Irish groups to bid for international disaster management and mitigation funding, exploring new systems, and place Ireland as a case study development area, which would benefit both research institutes, SME's and governance organisations who can respond to these calls. It is notable that Ireland's disaster response and resilience planning and capabilities trail those of other EU member states (for example see the haphazard response of the state to the 2014/2015 storm season). As such, fundamental work into building our driver and research maturity in these areas is essential, as is development of the governance structures and agency communication and response capabilities to implement new systems effectively.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Figure 4 makes absolutely no sense. Described below are needs identified on the basis of what has been mentioned, and not mentioned in Figure 4. Hope it aligns in somewhere....
Level 5 - HC: Only targets commercial application or policy definition, there is no mention of so-called "science for science sake", the origin of most disruptive innovations which would make Ireland a leader. Targeting effort and resources and funding to fundamental blue skies research is a critical element which has been missed. Level 5 - Infrastructures: why only post-doctoral training... much research is conducted by folks without a PhD... are they less capable to contribute and therefore being ignored? Ye need to take a look at who does the research in Ireland, and will very quickly realise that many non Dr.s conduct research of exceptional quality, yet are held back because they lack a piece of paper. Address this. Level 4 - All: Missing funding network development - the essential social and network development element of developing collaborative ventures. Level 3 - HC: Again the omission of non-PhD innovators, and a rigid adherence to a PI structure

that works, but many times doesn't work. Flexibility here would enable more of the workforce and unlock a great deal of innovative potential. Level 3 - Networks: Far too narrow in suggested funding scope - Expand beyond H2020/Framework - there are far more flexible and lucrative, and impactful funding opportunities out there including funding from the IODE, UN, Development Banks, Space Agencies etc., which are easier to win, and expand Ireland's influence beyond Europe. Diversity also reduces the susceptibility of our research strength to European level shocks. Level 2 - HC: Source solutions which enable postgraduate researchers and postdoctoral research to engage in teaching as part of their work (and not voluntarily as is currently the situation across all third level institutions), transferring more knowledge from Irish research into the next generation of maritime operators and researchers. Recognise that the education sector needs help to respond to the maritime sectors needs. Level 1- All: If I am reading this figure correctly it is recognising that there are severe gaps currently in supporting and promoting ad-hoc research and innovation. Given that some of the best innovations are ad-hoc chance discoveries - supporting the pursuit of these innovations could be a factor worth addressing. For example by providing work and work effort space (and funding) to de-risk the pursuit of potentially good ideas.

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

It didn't make enough sense for me to comment on. Communicating this maturity model will be a challenge for ye if the current description is used.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Table 1 - collaborative to established - could include to build non-PI-centric teams. PI's only exist in established research areas, However the novel innovative research is often generated by research staff outside the PI structure. Why not target support funding to help build thematic research groups for novel areas, whose development is currently held back by Irelands lack of an appropriate PI? These groups could then be the generators of new PI's as their research capacity matures, PI's who do not have to be brought in at greater expense from overseas. Table 1 - defined to ad-hoc - there is a perception that when in industry one goes "back" to University to undertake a PhD study. This is primarily due to the significant wage cut experiences, the loss of PRSI and pension, and the lack of any formal architecture to logically enable cutting edge researchers in industry and in institutions (e.g. established research staff in universities and government agencies), to enhance their capabilities with targeted research within a PhD framework. This needs to be addressed as the student fresh from an undergraduate and the student moving from industry have differing qualities, and different levels of experience to be brought to bear, and needs which restrict their potential to research (e.g. family, etc.). I have only reviewed the tables unfortunately. Table 2 - Unassessed to defined. There is nothing here that funds work space for multi-disciplinary business development. For example in the Harwell Space campus in the UK, there is a dedicated building where start-up SME's from a range of Space-related disciplines can explore applications to other sectors, and locate their work office at severely reduced rates. These offices are located next to experienced business development advisors and facilitators, and a European Space Agency BIC, with networking events organised to encourage trans-disciplinary innovations to be generated.

Build on the Nimbus Centre idea in Cork, but more Maritime focused would be ideal. Maybe capitalise on the IMERC campus in development and actually build a Start-up space for trans-sectoral maritime innovation. Table 2 - there is also a complete lack of recognition that the next generation of Maritime (and other sectoral) workforce, coming up through the school system, are an essential part of this infrastructure. People don't just enter the maritime sector after their 3rd level course (which appears to be the only focus of the marine strategy), but at primary and secondary level. Here Ocean literacy and education has a large role to play, but workforce development needs to be regarded as an infrastructure which extends into primary and secondary levels. We live on an island, yet our school leavers first encounter the maritime as a sector for working in when they leave school. Table 3 - There are no indications of addressing the need for proposal development post-networking to be supported. Going to a conference, meeting people, generating new innovations and ideas, is all well and good, except folks are slammed when they get back and the ideas fall away. Having a long term- low level funding pot that research institutes and SME's can bid for and allocate staff time to would be really helpful here, allowing those staff who are highly innovative to allocate some of their time to developing those innovation onwards to the benefit of the maritime sector. Table 3 - There is also a lack of recognition of the potential for trans-sectoral opportunities to be harnessed through targeted support. A classic example is the untapped potential in Ireland for the Space sector to contribute to advances in the Maritime sector and vice versa. Targeting network development funding towards the hosting of key multi-sectoral events, or supporting stands from one sector to be present at maritime events would be of great benefit here to breaking down the barriers between Ireland's various industrial and research sectors, allowing the maritime sector to harness the full potential of Ireland's knowledge economy, and not just the best of those working in Maritime. Overall, there is absolutely nothing in here which addresses the need to de-risk proposal writing. This is a serious hurdle for getting SME engagement, as time spent working on a proposal is time not spent earning (and potential business failure) for SME's. Simply look at the H2020 success rates, and figure out how targeted national funding could de-risk the potential of failure of a proposal on an SME. Also, it is worth noting that proposal writing by academic institution employees is essentially done voluntarily, therefore limiting the innovations being harnessed. Enabling researchers to allocate part of their working week to target funding opportunities (similar to the Google approach) would be a boost to both the researchers capacity to grow their research area, and the maritime sector in terms of the innovations which could be harnessed. This requires not only a funding solution, but also policy development at a national level (e.g. allowing challenges experienced by contractual issues to be clarified, and ultimately, in the long term, addressed).

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

No... at a quick glance, there is nothing in here referring to the HEA or the department of Education... Their significant role and potential to contribute to, and benefit from, a thriving maritime sector needs to be highlighted and their role clarified. Given this agency, and departments activities shape the graduates and school leavers entering (or not entering as the case may be) the Irish Maritime sector, they need to be included.

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Aquaculture & Biomass Production]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Advanced Technologies]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Renewable Energy]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Transport]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Security & Surveillance]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Climate Change]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Observation]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Literacy & Education]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Information & Spatial Technologies, Analytics and Modelling]

Yes

Group: Aquaculture & Biomass Production

Aquaculture & Biomass Production Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Incomplete - nothing here addresses the planning and application challenges being experienced by the sector, nor the potential solutions to address key hurdles. For example, why not provide a target goal regarding the application of EO technology to site appraisal, and environmental monitoring of aquaculture areas. The research has been done through a number of EU-funded projects (Asimuth, AquaUsers, SAFI), as well as European Space Agency initiatives, yet the potential (enhanced with the launch of Sentinel 3) not harnessed by our national strategy. This should be addressed.

Aquaculture & Biomass Production Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

No, there are elements of infrastructure left out - namely Ireland's access to European data infrastructure (the Sentinel satellites), and national capacity to derive information and deliver it to stakeholders and developers in the sector. The section as a whole does not highlight the assets at the aquaculture sectors disposal held in other sectors of the economy. This is also a feature in other themes (e.g. MRE).

Aquaculture & Biomass Production Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Yes, there is an omission - how the planning process works, and where EO-derived information can fit in to support farm siting in productive and more environmentally suitable areas would unbind the sector, and allow it greater scope to suggest better sites at the planning stage (wasting less money). The benefits of such research have already been explored by the EU projects suggested. Planning studies should also look at how inflexible the planning system is when considering the potential to co-locate multi-species aquaculture (e.g. co-locating salmon farming with seaweed farming, and develop a new policy framework that would enable such ventures to be explored by the aquaculture sector.

Aquaculture & Biomass Production Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

No, the research can be done, but the planning process, and current waste of money businesses experience making that application (due to a lack of adequate site information), will still restrict sectoral development. the licencing restrictions on co-locating species for aquaculture also hold this back, and restrict our ability to research.

Aquaculture & Biomass Production Q5. Have you any other comments?

I agree with all of the target areas, but these are very restricted. The aquaculture strategy does not take into account the big picture, the planning issues facing aquaculture, nor the potential for other sectors such as EO, to contribute and in doing so, cut development costs significantly.

Group: Advanced Technologies

Advanced Technologies Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

I think this is complete enough. Can't think of any other advanced technologies which need to be mentioned.

Advanced Technologies Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes

Advanced Technologies Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Maybe amend "in-situ and airborne monitoring platforms", to "in-situ, airborne, and space-borne monitoring platforms" to highlight the potential for Sentinel data to be applied to the Maritime sector, and the complementarity of the three levels of observation. It is free data after all we can get from orbit!

Advanced Technologies Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

1) Maybe specifically target funding on trans-sectoral application of technologies from other sectors to the maritime sector (e.g. what ESA BICs intend to do, but make it a national target. Also, highlight movement of technology in the other direction (e.g. from maritime to space, or maritime to ICT). Advanced technologies (both material and intellectual) are developed in Ireland by the Maritime sector, however it tends to stay within the Maritime sector, and not really capitalise on it's trans-sectoral potential.

Advanced Technologies Q5. Have you any other comments?

Nope

Group: Renewable Energy

Renewable Energy Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Target funding on EO derived resource assesment, and conditions assesment - to both validate model data, and give developers a clearer picture of the conditions facing offshore infrastructure. Parameters such as maximum wave heights, average wave heights, direction, wind strength and direction etc., can all be extracted from EO data, some of which have been collected repeatedly over 20 years. This is an untapped resource to inform farm location, design, procedures, operating schedules etc. These

factors can also be derived for climate and weather resilient offshore aquaculture.

Group: Transport

Transport Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Dont really know enough about the policy drivers to comment.

Transport Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Yes, however, it doesnt recognise the transport observation capacity developed in Ireland through research projects such as the ESA ANISTIAMO Initiative, or the ESA NG-RMP initiative, whose advances in situational awareness are being continued through projects such as the ESA funded SeaSearch project, or the H2020-funded Co-ReSyF project. All of these explore our potential to identify and track vessel traffic (focused on maritime safety and security), yet are not acknowledged here.

Transport Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Clarification of the area of sea as a nation we have a remit to monitor vessel traffic in, and development of information display systems which allow us to do so with.

Transport Q5. Have you any other comments?

Nope

Group: Security & Surveillance

Security & Surveillance Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Need to highlight the potential of joining in-situ, airborne, and space borne monitoring and measurement platforms
Need to highlight the potential of harnessing information from communications and observation data streams
Need to highlight the development of practical, and useful decision support tools and services for those decision makers in charge of maritime safety and security.

Security & Surveillance Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

No, there needs to be a fundamental assessment of the safety and security needs of the responsible agencies, with those needs matched with available monitoring systems. There also needs to be funding targeted at the development of secure (in terms of non-hackable), Decision Support and territorial awareness systems to enable INS and Coastguard situation rooms to be aware of vessel and hazard movement throughout the Irish territorial area, and adjacent seas (where incoming vessels and hazards are coming from).

Security & Surveillance Q5. Have you any other comments?

There is a lot Ireland can do in this sector, the section needs to be more ambitious. There is capacity in Ireland currently to develop demonstrations of potential systems, just not the national funding for us to target what we've learned on the national need.

Group: Climate Change

Climate Change Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

No, there is a policy opportunity which remains untapped by Ireland. This is the potential for Ireland to opt into the European Space Agency's Climate Change Initiative Programme which it currently doesn't. Bidding into this funding pot would unlock our ability to not only develop Maritime Remote Sensing capacity in key oceanic variables, but also develop derivative decision support products which address national needs and apply the ESA CCI data.

Climate Change Q5. Have you any other comments?

There is a gap here regarding our potential to capitalise on and apply emerging technologies (such as Earth Observation). There is also a gap concerning building our coastal and nearshore societal and economic resilience to Climate Change enhanced extreme weather events. The skills and organisations do exist within Ireland, and are talking about it, but there is no funding, or policy remit within which viable systemic forecasting, disaster response, and coastal resilience building can occur. Happy to talk about this if ye want to follow up on this.

Group: Ocean Observation

Ocean Observation Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

"A refocusing on operational oceanography skills and research is needed nationally to ensure that the basic skills required to support a range of other thematic areas is available" YES!!!! This is absolutely critical, and is holding us back. This also applies before the third level sector, capacity in oceanography needs to build at primary and secondary education levels as well to teach core concepts, and build oceans into the next generations frameworks.

Ocean Observation Q5. Have you any other comments?

Just one, maybe highlight the potential to combine measurements from in-situ, airborne, and space borne platforms here. and target funding to demonstrating the utility of this approach.

Group: Ocean Literacy & Education

Ocean Literacy & Education Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Bizarrely, there is no reference to Ireland's education sector, it's primary goals, nor how ocean literacy can contribute to them. There is also no reference to the Science centres which are trying to contribute to ocean literacy in their own way (e.g. Blackrock Castle Observatory), nor the use of the SFI centres outreach and education initiatives to build ocean literacy. No mention either of Science Week, Engineers Week, etc., all of which are national policy responses to build capacity in STEM, and all of which could harness the innovations achieved in the maritime sector and build upon them. w

Ocean Literacy & Education Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

I would agree with the maturity assessment. Ocean literacy and education currently appear to be haphazard, ad-hoc and unfocused in terms of target audiences, and aligning with national education curricula, and societal information needs. This sector needs a lot of work, as does the section describing the theme.

Ocean Literacy & Education Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

Research is required into: 1) Where can ocean research contribute to the national curricula of primary and secondary schools - what are the key information transfer points and who are the key actors 2) What critical information and topics should be the focus for delivery to the public and key educators, what Irish maritime research areas can it be derived from, and how should it be delivered (form and method) 2) How can science centres contribute to increasing ocean literacy and education (with demonstration activities). These are a highly untapped resource. 3) How can the education sector collectively (Dept. of Education, HEA, Science Centres, and education companies such as Lifetime Lab), be involved in, and capitalise on, and drive ocean literacy and education in Irish society.

Ocean Literacy & Education Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Ye need to be looking at the education system, funding the scoping of where in the system, maritime researchers can provide information for teachers, at both primary and secondary level. From reading this, funding is still only targeted at the third level sector,

and not the science centres, or those that engage with the primary and secondary school students, or those who engage with curriculum developers and provide information to teachers.

Ocean Literacy & Education Q5. Have you any other comments?

The scope of this section needs to be revised. It needs to be expanded beyond third level (targeting primary, secondary, and third level), and it needs to adopt the long term approach, with interim short term measures to support it. Full engagement and review by the HEA and the Department of Education, and Science centres would also be strongly advisable here as the focus and funding suggested will make little progress in addressing the issues hampering ocean literacy and education.

Group: Information & Spatial Technologies, Analytics and Modelling

Information & Spatial Technologies, Analytics and Modelling Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

There is also an opportunity to build upon experience in the Space sector with people already dealing with long term data archives and Big Data, already engaged in initiatives such as the ESA Thematic Exploitation Platforms, and already working with ocean observation data. The research topics section doesn't adequately acknowledge the skills held in other sectors in Ireland which are easily transferrable to maritime issues.

Information & Spatial Technologies, Analytics and Modelling Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

No

Information & Spatial Technologies, Analytics and Modelling Q5. Have you any other comments?

I think it covers this quite comprehensively. There might be room to harness the potential of a European Space Agency BIC, co-located with a Maritime cluster here in Cork, whilst ensuring that the benefits from the link up spin out to all other maritime hubs. Feel free to contact me regarding the findings (and recommended measures) of the CINMarS project which specifically looked at how Clusters could contribute to the generation of, and harnessing of, Space to maritime (and maritime to space) applications development, and technology transfer. The documents have not yet been cleared for public release by ESA, final meeting is next week when this will be finalised. Note that this project also conducted an analysis of Ireland's current Maritime strategy and review, highlighting opportunities for trans-sectoral applications which the maritime strategy missed, so the report would be of interest here once cleared for release by ESA.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-12-02

User Information

Respondent

James Wilson

Are you filling out this survey on behalf of an organisation?

Yes

Organisation Name

TCD

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

The themes are comprehensive and broadly cover the range of drivers. However, we would like to see Ecological Goods and Services (EGS) as a major driver (see e.g. www.ipbes.net), and also perhaps a commitment to funding Best Science – i) aim for/encourage excellence; ii) evidence of further prospects for entrants to field. An important point here is that we should be aiming to attract the best people into the marine field and this means there has to be some thought of a career structure for marine scientists. The themes also seem rather lacking in regard to coastal and near-shore topics (e.g. ecosystem function), especially as these are subject to the greatest anthropogenic pressures and underpin many of the other themes themselves (e.g. aquaculture).

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes, with the proviso to consider a weighting to produce strategy appropriate for and tailored to Irish situation in terms of e.g. size (capacity), themes (direction) etc. and not overly driven by external priorities (e.g. EC themes or funding).

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Levels are appropriate, but with some cautions to be borne in mind: With regard to the Irish situation – are levels appropriate? Are there sufficient scientists (now or under future funding scenarios) to bring all to full maturity? May there be better definitions e.g. level 3 ('Established') where many scientists may be running what are (by international standards) small teams, but have a high level of international cooperation (in a number of thematic areas) even if they do not have industry support (why is this latter a criterion? Is it appropriate for e.g. management-oriented research?)

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

See also responses to Q2 & Q3. Importance points here are flexibility, inclusiveness, and range of instruments/levels supported across the themes.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

What is not clear is how this will be integrated and what mechanisms are in place to prevent either duplication or omission of some areas across Depts/Agencies. Likewise, since Marine may only be a small part of a Dept/Agency remit, the same caution as Q2 (driven by external priorities) needs to be entered.

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted.
[Biodiversity, Ecosystems & Food Webs]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Litter]

Yes

Group: Biodiversity, Ecosystems & Food Webs

Biodiversity, Ecosystems & Food Webs Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

These underpin almost all of the previous section (with the possible exception of Transport). See also previous section comment about EGS.

Biodiversity, Ecosystems & Food Webs Q5. Have you any other comments?

Does this encompass climate change? This also feeds into ecosystem function and the other themes.

Group: Litter

Litter Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Litter is in itself a rather small and specific topic: if it is intended as shorthand for the larger anthropogenic influences, then this needs to be made clear. There are many emerging problems (e.g. endocrine disruptors (EDCs), microplastics) which feed into ecosystem function and hence into other themes.

Údarás na Gaeltachta

A Marine Research and Innovation Strategy 2021

A. General

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

From our perspective, the 15 themes are both comprehensive and inclusive. We would further add that the cross-cutting theme of marine spatial planning be prioritised so as to promote and mainstream this territorial approach to integrated development. Such an integrated approach will identify and legislate for a more effective model of spatial planning which will support the maritime coastal communities. This policy focus will foreground the social and institutional structures which are central to the core development challenges. These institutions include public agencies which have statutory responsibility for key policy and development domains including environmental, economic and social sustainability. This developmental perspective will prioritise the fullest exploitation of local and regional endogenous development resources, and the creation of a development framework which recognises the central role of local communities and other sectoral interests in the design, implementation and review of development policy in the marine resource sector.

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

These dimensions accurately capture the range of support required to give effect to the strategic objectives as set out in the consultation document. We would suggest that the broad definition of Human Capacity be extended in such a way as to more formally recognise and prioritise the role of local coastal communities in the conceptualisation, implementation and monitoring of public policy interventions. Such a focus can potentially improve the alignment between public policy objectives and the fundamental role which local and representative community structures have to play in creating the maximum conditions for securing public and private sector investment in the maritime economy and for generating successive rounds of public welfare interventions, including employment, added-value and other material benefits.

Q3. Are the five levels an appropriate classification of maturity? If not, what changes would you propose and why?

The classification indices are relevant and accurate.

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

In our view, the strategic interventions which are identified to increase the maturity and capacity within the various R&I systems are coherent and supportive of a longterm investment programme in these key sectors.

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details

The strategic role for Údarás na Gaeltachta, along with the other development agencies, prioritises the agency's role in "should be targeted on those research themes where the research base is sufficient to achieve economic development." (: 37). We agree with this analysis and as part of our strategic plan for the 2017-2020 planning period, An tÚdarás will focus on specific thematic areas which represent those key economic sectors which can be exploited in a sustainable manner to create employment, increased economic return from the marine resource, new infrastructure development, new skills and research capabilities amongst client companies and key sectoral partners. The identification of new market opportunities for existing and emerging productive sector enterprises is a key concern for the agency's strategy and is fully aligned with the overall orientation of the Research and Innovation Strategy. Specifically, we will focus on Bioresources, Advanced Technologies; Renewable Energy and Tourism.

In those instances where the research capability is categorised at 'lower maturity levels' (:37), An tÚdarás will partner with the Marine Institute, BIM, the Department, and with HIEs as appropriate to examine the most effective interventions in support of identifying and resourcing relevant research programmes in those policy domains and key economic sectors which have the longer term capacity to create public welfare outputs based on regional endogenous resources in the Gaeltacht districts.

B. Theme Specific

Q6. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

The framework adopted within the document which cross-references and contextualises the key sectoral plans and the strategic and statutory policy documents emanating from EU, national and institutional plans is comprehensive and inclusive.

Q7. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlines in the model (see page 8 of the draft strategy)

The maturity status ascribed to the different research themes is considered accurate.

Q8. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents

The proposed research areas are comprehensive. We are not aware of any particular omissions in terms of the analytical and policy framework from which they have been selected.

Q9. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Based on our experience of developing and investing in productive sector enterprises, and also in adopting a sectoral approach to resource development, the funding priorities have considerable potential to attract investment and to create new research, employment and economic development potential. For example, we consider the Small Business Innovation Research (SBIR) initiative to represent a key, innovative intervention. In the same way, the emphasis within the tourism sector the proposals for a Marine Tourism Innovation Scheme is to be especially welcomed given the significant development potential within this sector. An tÚdarás will commit resources to support the further development of such initiatives and support their implementation and localisation within the Gaeltacht.

Q10. Have you any other comments

Údarás na Gaeltachta welcomes the opportunity to contribute to the consultation process in support of the 'Towards a Marine Research & Innovation Strategy 2021'. The proposals are far-reaching and strategic in their orientation and represent a significant contribution to creating a policy and funding environment which can link research outputs to key development and investment opportunities in the marine sector. It has significant potential for the sustainable development of the Gaeltacht in terms of socioeconomic and enterprise regeneration.

Given the planning and governance framework within which An tÚdarás operate, we particularly welcome the commitment to partnership and collaboration and the pooling of expertise and resources. An tÚdarás are currently preparing a Marine Development Strategy for the Gaeltacht. This will be developed in collaboration with the Marine Institute, BIM, the Department, the HEIs and the Local Authorities.

Such a partnership model needs to focus on a longer-term research and planning process which can examine the interrelationship and interaction effects of different factors (economic, social, linguistic, environmental) and develop a range of new skills

and competencies in this area amongst statutory agencies, private enterprises and local community structures within the Gaeltacht. It will also commit to engaging with a process which recognises the important of experimentation and flexibility, one which is underwritten by various forms of 'social learning', and the facilitation of local community involvement to the greatest extent possible.

We are committed to development a relevant research action programme which will assist in establishing the parameters of a spatial planning model which could identify and quantify the development potential, or the 'carrying capacity', of the marine and coastal resource at different spatial scales. Such a model could form an important diagnostic and planning instrument which would help public bodies, private enterprises and local communities alike determine the form and scale of development which might be undertaken in the marine and coastal sector in a progressive, innovative and sustainable manner.

It might, for example, through systematic analysis and comprehensive, integrated planning measures, support the existing natural resources productive sector to increase its income, productivity, innovation and output measures. In a similar fashion, it could identify new routes to mapping latent development potential within underutilised resource sectors including marine, coastal and 'blue' tourism, community enterprise initiatives and new training and skills development interventions. In such a way could a model of this type identify a form of localised development which might realise both material efficiency objectives while also striving to address in a co-ordinated manner, important equity objectives in alleviating structural problems of outmigration from the coastal areas, longterm under- and unemployment, diminished social capital, and community dislocation and fracture at local level. It goes without saying that these longstanding development issues represent formidable challenges for policy interventions and the institutions which are charged with their implementation.

From our experience, the operating environment particular to this form of sectoral and spatial planning is often complex and uncertain. This is particularly true given the range of institutional and interest-based stakeholders which are implicated in this type of development process. This is true in terms of the prescriptive and regulatory dimensions of the overall statutory governance and planning regime, the public administration hierarchy and the functional competencies and responsibilities of different development organisations. It is also inherently complex in terms of the challenge of integrating development and investment interventions in the different sectors which the consultation document outlines in such a way as to provide the fullest possible return to the local community.

Support for such a multidimensional and integrated conceptualisation of development is well grounded in the regional and local development literature. This argues that the type of spatial model proposed must engage with the interrelated spatial and sectoral objects which represent stages in the development process including 'quality of life' dimensions, the productive and socioeconomic base, social infrastructure, institutional capacity and community coherence. In its idealised form, the model rests on this continuum process striving for progressive and effective development built on local and regional resources, competencies and local capacity.

Building on such a framework, Keane and Cawley¹, for example, argue for a strategic approach to local/regional development which sets out to realise gains for the community through productivity enhancement and the creation of local assets (rather than relying on redistributive transfers); which addresses market failures in the local/regional economy; which emphasises the process, participation and potential of different stakeholders and their resource bases; which utilises systematic analyses of local internal dynamics and their linkage to broader, external processes and dynamics. In sum, they argue that such an approach must ‘[...] focus attention on solving remedial aspects of known problems and identify courses of action that move marginally, incrementally and through successive approximations away from unsatisfactory social and economic conditions, even when “optimal” or ideal goals cannot be agreed upon, and explore alternatives on which diverse interests can act jointly’ (Keane and Cawley, 1999: 150).

In this context, there are two short-term opportunities which we are relevant to the implementation of the proposed strategy for marine research and innovation.

The first relates to examining how such a diagnostic model might be developed and deployed based on international best practice and drawing on the expertise within the state planning and policy agencies and the HIEs with a focus on the marine sciences, geography, economics and rural /coastal development. Given the Gaeltacht context within which we operate, we argue that it is reasonable to contend that such an approach is merited given the particulars of local circumstances within the coastal communities and the significant development potential of the marine resource. Such an approach needs to be set within an overall Atlantic-coast framework, given the statutorily designated districts within which An tÚdarás operate, but should be sufficiently capable of intervening in localised spatial areas.

The second refers to our commitment to developing Páirc na Mara at Cill Chiaráin, located in the very heartland of the Conamara Gaeltacht. Investment in access and services infrastructure has already been undertaken. The thirty-acre site represents, in our view, a significant platform for development where new services, facilities and infrastructure can be developed which will create new research opportunities, enterprises and products, extend employment opportunities locally and within the broader region and generate new measures of socioeconomic welfare. The conceptualisation, design and implementation of the investment and development plan which we are committed to holds out real opportunity to build an exemplar project of scale which can act as a demonstration project in its own right.

In order for An tÚdarás to undertake a sectoral and a territorial approach to marine and coastal development we must re-orientate how we will work in the future within regulatory, planning and funding constraints and do so in an informed and dedicated manner. For this reason, we consider that the action research projects which are identified in the consultation document should be undertaken over a longer-time period, and built on a partnership model with research institutes and development agencies. Such an approach represents a highly significant dimension to the required project planning. There are very real opportunities for establishing new learning and development interventions, for dedicated post-graduate research programmes, and

¹ Cawley, M. and Keane, M.J. (1999) ‘Current Issues in Rural Development’ , in Davis, J. (ed.) *Rural Change in Ireland*. The Queen’s University of Belfast: The Institute of Irish Studies.

for the establishment of an inclusive and integrated approach to planning for the marine and coastal resource. Such an approach might also generate significant new opportunities for consolidating institutional alliances between the different agencies operating within the Gaeltacht and for creating resilient collaborative projects with industry and with the local community.

É Ó Neachtain

**Manager – Research and Sectoral Development
Údarás na Gaeltachta**

December, 2016

Towards a Marine Research & Innovation Strategy 2021 Consultation Response from University College Cork

22/11/2016

In general, the draft strategy document was welcomed and is an excellent attempt to develop a reasoned and coherent strategy for marine research which is a hugely important area for Ireland. As such the authors are to be congratulated on producing such a comprehensive draft and the University welcomes the opportunity to contribute to the further development and evolution of this essential national Marine Research and Innovation Strategy.

For convenience, bulleted comments on the draft are considered below under the document headings with more general comments (over-arching considerations) are presented at the beginning of this document.

OVER-ARCHING CONSIDERATIONS:

- A general executive summary and implementation plans at the end of the review would both place the strategy in context and provide the “next steps” for the process.
- In addition to the CIT NMCI capacity in the maritime sector there is considerable maritime capability across UCC’s main campus (e.g. MSc Marine Biology degree run by School of Biological, Earth and Environmental Sciences) and notably the SFI Marine and Renewable Energy (MaREI) Centre and Lir National Ocean Test Facility based at the Environmental Research Institute Beaufort Building, Ringaskiddy which reflects significant capital and recurrent investment by the State in this research sector both in Cork and in the five MaREI partner HEI’s (CIT, UL, NUIG, UCD, MU).
- The Research Agenda needs to consider co-existence between sectors – governance has to demonstrate that everything is inter-linked.
- There is no mention of cross-border aspects specifically: planning, governance, invasive species, climate change (in our case to be further complicated by the UK decision to leave the EU).
- There is no mention of well-being and health (linked to the UN Sustainable Development Goals) - there seems to be funding in H2020 in the sector but perhaps capacity is limited nationally.
- Maritime Spatial Planning is the correct term and not Marine Spatial Planning as there is inconsistent / interchangeable use in the document.

Introduction and Research Themes

- The 15 research themes, cover the breadth of research and it was noted that there was no attempt to rank these themes. There was one notable omission, namely geomorphology / geomorphological change, and this would appear to be an oversight given the significant societal challenges associated with this field (e.g. erosion, siltation), the maturity of national capacity in this discipline and the huge fundamental and applied research opportunities that exist in this field at national and international level (linked to ICRA Centre).
- The grouping of the themes and their assimilation under the three Harnessing Our Ocean Wealth banners, namely Thriving Maritime Economy, Healthy Marine Ecosystems and Engagement with the Sea seems appropriate. As presented, currently however it does not adequately demonstrate the real and significant linkages between the themes or interconnected nature of the above groupings. It could also be argued that some of the themes, most obviously Climate Change, could have been deemed as cross-cutting.
- The significant work on Maritime Spatial Planning, crucial to a sustainable maritime economy undertaken by the Enablers Task Force appears not to have been recognised (Figure 1, for example)

Research Drivers

- The Sustainable Development Goals (SDG) and particularly SDG 2 and 3 (Hunger and Health); 6 (Clean Water), 7 Renewable Energy, 13 Climate Action and 14 Life Below Water should be recognised as research drivers.

- In terms of the policy drivers, JPI Water's Research and Innovation Agenda would have complemented that of JPI Ocean and would represent the emerging "Source to Sea" approach to research in the riverine, estuarine and marine fields.

Research Maturity Capability Assessment

- The three pronged approach to dimensions considered (Human Capacity, Infrastructure and Networks) appeared appropriate. The term "Ad-hoc" could represent individuals with significant research capacity and international recognition and as such should be replaced with a more appropriate term – "niche" or "individual" for example.
- The mechanism by which assessments were conducted and the actual results derived is currently unclear in the document. As a qualitative approach has been adopted to inform current capacity, it would appear while the relative capacities were realistic, overall capacity in the sector may be overemphasised.
- Ranking of the maturity levels from 1 to 5 (Ad-hoc to Transnational) without sufficient background information, could be misconstrued by those outside the research community, with e.g. Level 1 perceived as being the least worthy of funding.
- Allied to the above point, how funding under this Strategy, would be apportioned, relative to level of maturity needs to be clarified.
- The use of a linear 1-5 scale does not adequately reflect the non-linear evolution of many research fields, and the impact of relatively short funding periods on research maturity at a particular time.
- The link between maturity and capacity needs to be clarified as this is a complex area noting that in some themes, for example sub-seabed resources, climate change, renewable energy and ecosystems there is a need for infrastructural support and funding for PhD studentships to ensure both future capacity building and to sustain maturity levels.
- Some research areas are highly specialised and may be overlooked within the structures being proposed.
- How funding instruments would facilitate movement between levels of maturity, needs further clarification. It should also be noted that in addition to SFI, other agencies such as the Sustainable Authority of Ireland (SEAI) have provided significant research infrastructure funding.

A THRIVING MARITIME ECONOMY

Bioresources – Processing for Food and Other Use

- Research topics could be expanded to include the use of Renewable Energy for powering aquaculture; environmental impacts of aquaculture; potential for coexistence with other marine activities; and potential use of algae as a biofuel.

Subsea Resources

- Governance linked to this theme should be considered as a research topic given that current licensing capability is restricted to the oil and gas industry only.
- There is a need for research to consider decommissioning, for a range of offshore activities, including oil and gas, but also offshore wind farms.

Renewable Energy

- The strategy only appears to consider offshore wind, wave and tidal, and if this is the case then it should align with other national policy documents and policies and refer to this as "Offshore Renewable Energy".
- If this section is considering all potential renewable energy, then algae as a biofuel could arguably come within the scope of the term 'renewable energy' but then this section name should reflect its inclusion.
- Reference should be made to the recently published Ocean Energy Strategic Roadmap which has a section on the de-risking of environmental consenting of Ocean Energy (OE) projects through an integrated programme of measures. Most environmental research conducted in relation to OE is derived from Environmental Integrated Assessment and related consenting work, not pure science driven. There is scope to increase this and link a research agenda with device deployments.

- Ireland is also active in IEA-OES Annex IV which presents a state of the science in relation to environmental impacts of ocean energy: this has identified key research areas and needs, but with no identified funding mechanisms, and could represent an opportunity for Ireland.
- In terms of infrastructure, UCC is co-ordinating H2020 Marinergi and Marinet 2 projects – the former aiming to progress Marine Renewable Energy on the ESFRI Roadmap and the latter opens up virtually all the Marine Renewable Energy Infrastructures across Europe using a series of competitive calls.

Security & Surveillance

- There is a definite need to have a more cohesive, collaborative effort for all of the scientific effort (communities and end-users) focussed on different approaches (in situ, remote, satellite) and combine this with the significant national level of IT skills, to support key security aspects such as human trafficking and drugs interdiction.

HEALTHY MARINE ECOSYSTEMS

Biodiversity, Ecosystems & Food-webs

- There is no mention of the offshore hydrocarbon industry and links to key seabird species. Currently Ireland is poorly placed to predict or manage potential impacts of this industry on biodiversity. Ireland has more seabirds than any other EU country, bar the UK, and has an obligation to protect their populations under EU legislation (Birds Directive, Habitats Directive, Marine Strategy Framework Directive). Seabirds are also more visibly affected by oil spills than any other animal as they are commonly washed up on impacted beaches.

Litter

- It could be argued that there is more capacity in this area than indicated, given the success of the FP7 Marlisco project and the current raft of JPI Oceans funded research, into a wide variety of litter and pollution topics.

Climate Change

- Outcomes from Paris needed to be reviewed and updated in light of COP22 recently held in Marrakesh
- Research should go beyond on-site observation to modelling (computational and lab based) the likely impacts of increased temperatures (2degC +) on biological, chemical and physical parameters in the marine environment. In particular, it would be prudent to investigate how warming under climate change, may affect commercially important fisheries and aquaculture facilities in Ireland and whether we could see declines or increases in commercial fish stocks and biologically vulnerable species.
- The contribution of the marine environment to mitigating climate change and helping Ireland meet its greenhouse gas targets (offsetting agri emissions) should also be the subject of research, such as the sequestration of carbon using macroalgae (seaweed forests) and use of seaweed supplements for reduction of ruminant methane emissions in cattle.
- The impacts of extreme weather events at sea, on marine infrastructures (ships, aquaculture farms, wind farms, coastal structures, etc) requires further research.

ENGAGEMENT WITH THE SEA

Ocean Literacy & Education

Several Policies are relevant and could be included:

- Department of Education and Skills 2014, 'Education for Sustainability' – The National Strategy on Education for Sustainable Development in Ireland 2014-2020.
- 'Our Sustainable Future: A Framework for sustainable development for Ireland', Department of Environment, Communications and Local Government, 2012.
- The Rome Declaration, adopted on October 8th 2014 at the EurOCEAN conference, calls for 'sustained support for ocean literacy, best practice in science communication, citizen science initiatives and knowledge transfer to be embedded in marine research projects and programmes'.

- Other documents that highlight the gap in necessary skills include 'Our Sustainable Future: A Framework for Sustainable Development for Ireland' (DECLG 2012). This document highlights that 'education for sustainable development needs to be embedded at every level of the formal and informal education system' and that 'public communication is vital for sustainable development to be better understood and implemented' and identifies a number of skills and training gaps relating to:
 - Education, communication and behavioural change
 - Innovation research and development
 - Skills and training
- The National Strategy on Education for Sustainable Development aims to ensure that 'education contributes to sustainable development by equipping learners with the relevant knowledge (the 'what'), the key dispositions and skills (the 'how') and the values (the 'why') that will motivate and empower them throughout their lives to become informed active citizens, who take action for a more sustainable future' (DES 2014).
- Significant work has been done in primary level education where the Marine Institute's Explorers Education Programme has provided training courses and workshops for teachers and students in some regions. There is, however, scope to expand on these efforts to 'marinise' curricula at primary and secondary level linking to cross cutting topics such as marine ecology, climate change, earth observation, etc. The Department of Education & Skills and the National Council for Curriculum and Assessment would need to be engaged in order to make this a reality (through teacher CPD, curriculum links, etc). This is vital if we want to 'marinise' graduate and vocational training programmes to raise the skills base available in the blue economy as suggested.
- Navigating the Future by the European Marine Board recommends:
 - Stimulating the coordination of ocean science education efforts across Europe;
 - Stimulating nations to adopt the principles of ocean literacy;
 - Developing an action plan to upgrade and reinforce ocean literacy in Europe;
 - Assisting in the integration of the essential principles of ocean science into education curricula across Europe.
- Although the Networks and Relationships dimension of the research capability remains underdeveloped, it is progressing beyond stage one of the maturity level, and could be considered to be on the same level as human capacity and infrastructure on the model. There is a growing recognition that Ocean Literacy is an important part of the development of Ireland's strategy for blue growth and the development of our marine resources and this is increasingly reflected in various projects and initiatives taken up nationally.
- A network has recently been established (The Irish Ocean Literacy Network, developed from the FP7 Sea for Society Project) to bring together partners from across the whole island of Ireland that have an interest in the marine environment and wish to promote ocean literacy.
- Following on from Sea for Society, the H2020 SeaChange project (NUIG and AquaTT as Irish project partners) aims to create a deeper understanding of how the health of European citizens depends on the health of the ocean and how the health of the ocean depends on the actions of our citizens.
- A research based assessment of the levels of ocean literacy in Ireland may be required in order to see where we are at in terms of knowledge levels amongst the general public.
- Engaging with government and industry to support the cross-cutting nature of ocean literacy is essential to secure maximum funding for the initiative.
- Further efforts to integrate the marine into the Irish education system will be required. Courses, modules and subjects should be 'marinised' from primary school level through to secondary and beyond to ensure maximum impact and maximise interest from an early age in the marine. As an island nation with a potentially huge maritime economy, the marine sector should already be a key area in the education sector.
- In terms of public engagement events like SeaFest, Cork Harbour Festival and World Oceans Day should continue to be supported as they represent an opportunity to engage the Irish public on marine issues. At a community level, successful community-led initiatives like Tidy Towns and Clean Coasts can be built

upon to raise awareness on marine litter. Existing resources developed through past projects should be built upon in future funded projects.

Integrated Policy and Governance

- Maritime Spatial Planning should be given more prominence in terms of the research needed to successfully deliver it, transboundary aspects and the new legal basis in EU law, are not referenced in the current draft
- A number of research topics could be included here in the context of MSP, such as, addressing competing sectors, how trade-offs will be assessed, if they can be assessed and how this will inform/ influence implementation of MSP.

Information & Spatial Technologies, Analytics and Modelling

- There is potential to build on initiatives such as the long term, "Joined up Thinking from Joined up Data" project to support improved fisheries data handling and sharing for better fisheries management.

Engineering

- Whilst recognising that there is concern about capacity in this area, the University sector are currently working in partnership with industry (e.g. In MaREI), to develop teaching and research programmes, and it should be recognised that the sector has a key role to play in the development of this sector.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-18

User Information

Respondent

Shazia Waheed

Are you filling out this survey on behalf of an organisation?

No

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Aquaculture & Biomass Production]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Wild Resources]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Tourism]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Litter]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Climate Change]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Ocean Literacy & Education]

Yes

Group: Aquaculture & Biomass Production

Aquaculture & Biomass Production Q5. Have you any other comments?

I would hope that more focus be placed on developing aquaculture for shellfish species such as mussels which tend to have beneficial effects on water quality rather than salmon farming which is becoming ever more popular in spite of the many negative impacts salmon farms impose on the environment, including polluting coastal waters, spreading of sea lice to wild salmon, the fact that it may take 10kg of small fish as feed to produce just 1kg of salmon and the escape of farmed salmon which may then breed with the native wild population, to name a few.

Group: Wild Resources

Wild Resources Q5. Have you any other comments?

For harvesting wild resources sustainably, I think having a lot more independent observers on board the largest fishing vessels would be an important step in assuring that quotas are not exceeded or discards continued.

Group: Tourism

Tourism Q5. Have you any other comments?

I think there is a lot of scope for more ecotourism based businesses such as responsible whale and dolphin watch tours, considering that Ireland is one of the best whale watching locations in the world. Not only would this be good for the economy but also in developing an interest in the public in protecting the marine environment.

Group: Litter

Litter Q5. Have you any other comments?

I think developing ocean literacy is the most important step for raising awareness of the fact that most litter at sea actually originates on land and in waste water treatment.

Group: Climate Change

Climate Change Q5. Have you any other comments?

I believe developing ocean literacy is among the most important steps needed to tackle the issue of climate change, other than simply investing in renewable energy.

Group: Ocean Literacy & Education

Ocean Literacy & Education Q5. Have you any other comments?

I think it is very important for the public to be made aware of the issues that face our oceans. Developing an interest in the marine, particularly in young people, will not only allow people to make responsible decisions such as their seafood choices, but also help inspire a new generation of researchers and activists in years to come.

Towards A New Marine Research & Innovation Strategy

Consultation Period 1 November - 31 December 2016

Online Survey Response

Date submitted

2016-11-18

User Information

Respondent

Andy Wheeler, School of Biological, Earth & Environmental Sciences, University College
Cork

Are you filling out this survey on behalf of an organisation?

No

Group: General Questions

Q1. The strategy identifies 15 themes that are based on a review of national and international strategies. Do these appropriately capture the full range of research drivers, and if not what are the omissions?

Yes

Q2. Do the dimensions of Human Capacity, Infrastructure and Networks & Relationships appropriately capture the kinds of supports required by a Research and Innovation (R&I) system?

Yes

Q3. Are the five levels an appropriate classification of research maturity? If not, what changes would you propose and why?

Its a fair attempt but it is not clear how these are then applied. The maturity level is defined based on a survey? Although the results seem approxiately correct there is no indication of how reliable they are or where this data came from and it up to date

Q4. The document outlines approaches to raising the maturity of the R&I systems associated with each theme. Are the instruments described sufficient to achieve this? What other instruments might be required?

Yes

Q5. The Statement of Strategy section outlines certain roles and responsibilities of certain departments and agencies. Are these adequate and accurate? If not please provide details.

Yes

Group: Research Themes

Choose a Research Theme to comment on. Multiple selections are permitted. [Subsea Resources]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Renewable Energy]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Biodiversity, Ecosystems & Food Webs]

Yes

Choose a Research Theme to comment on. Multiple selections are permitted. [Climate Change]

Yes

Group: Subsea Resources

Subsea Resources Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Yes

Subsea Resources Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Hard to say , no data provided. Seems to be an overestimate

Subsea Resources Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

No

Subsea Resources Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Perhaps, needs more focus on infrastructure and PhDs

Group: Renewable Energy

Renewable Energy Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples

Yes

Renewable Energy Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

There is no data provided to hard to say. Seems to be an overestimate

Renewable Energy Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

No

Renewable Energy Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Needs to be a greater focus on infrastructure and Phds

Group: Biodiversity, Ecosystems & Food Webs

Biodiversity, Ecosystems & Food Webs Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Yes

Biodiversity, Ecosystems & Food Webs Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Hard to say, no data given. Seems to be an overestimate

Biodiversity, Ecosystems & Food Webs Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

No

Biodiversity, Ecosystems & Food Webs Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Perhaps, needs a greater focus on infrastructure and PhDs

Group: Climate Change

Climate Change Q1. Each theme section outlines key policy drivers and sectoral plans relevant to R&I for the theme. Is this complete and if not please cite examples.

Yes

Climate Change Q2. There is an assessment of each theme's maturity. Is this reflective of the status of the theme? If not please provide evidence, with reference to the indicators outlined in the model (see page 8 of the draft strategy). (see page 8 of the draft strategy).

Hard to say as no data is provided. Seems to be an underestimate

Climate Change Q3. Research areas are summarised based on the requirements of the key policies and sectoral plans. Are there omissions? If so please outline what these are with reference to policy documents.

No

Climate Change Q4. Will the focus of funding outlined achieve the research requirements of the theme and achieve impact with reference to research maturity and capability?

Perhaps, needs to be a greater focus on infrastructure and PhDs

