The varying economic impacts of Marine Spatial Planning across different geographical scales: a Q methodology study

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1. Introduction

Home to 40% of the global population and believed to be the next economic frontier (K. Morrissey, 2017), the coast is of strategic importance for future sustainability trends (J. E. Morrissey & Heidkamp, 2017). Traditionally seen as a sector dominated by the seafood industry (K. Morrissey, Donoghue, & Hynes, 2011), 'emerging', often high-tech, research led sectors such as marine renewable energy, offshore-aquaculture and bio-technology have entered the core of the marine economy (K. Morrissey & O'Donoghue, 2012; K. Morrissey, O'Donoghue, & Farrell, 2013). Effective social control of technology has been a constant concern for industrial societies (Berkhout, Smith, & Stirling, 2004). In order to manage both incumbent and new sectors in the ocean space, the last two decades has seen a rapid increase in interest and action at varying political levels to implement spatially explicit management of marine resources (Halpern et al., 2012; McLeod & Leslie, 2009).

Emerging from Integrated Coastal Zone Management, Marine Spatial Planning (MSP) is increasingly promoted by governments and international bodies as a means to reduce sectorial conflicts and maintain the good environmental status (GES) of the marine environment (European Commission, 2011). As a management tool, MSP aims to move away from a traditional, failing, sectorial focus on the management of marine space to a more holistic approach which understands the full use of marine space (Kidd, Plater, & Frid, 2011; White, Halpern, & Kappel, 2012). In its broadest sense, marine spatial planning can be defined as (Ehler & Douvere, 2007, p. 13):

"Analyzing and allocating parts of three-dimensional marine spaces to specific uses or non-use, to achieve ecological, economic, and social objectives that are usually specified through a political process."

Complimenting the current spatial focus occurring in the transitions literature (Coenen, Benneworth, & Truffer, 2012), MSP brings a spatial dimension to the regulation of marine activities by identifying which areas of the ocean are appropriate for different uses or activities in order to reduce conflicts and achieve ecological, economic and social objectives (see Jay, Ellis, & Kidd, 2012). Within the Blue Economy agenda, MSP is seen as a means of creating "an optimal investment climate for maritime sectors and give operators more certainty as to what opportunities for economic development are possible[1]". A report by the European Commission in 2011 (p.7) found that if MSP is managed properly economic benefits would arise from: (a) "enhanced coordination and simplified decision processes", (b) "enhanced legal certainty for all stakeholders in the maritime area", (c) "enhanced cross boarder cooperation" and (d) "enhanced coherence with other planning systems". Through these gains, the study estimated that the effects of MSP has potential to cumulate in a saving of between €400 million to €1.8 billion due to the reduction of transaction costs and from €155 million to €1.6 billion due to the acceleration of activities such as wind energy and aquaculture, by 2030.

In the UK, the non-governmental organisation RSPB (2004) highlighted the economic potential of MSP, in particular to three areas:

[1] Maria Damanaki (European Commissioner for Maritime Affairs and Fisheries)

1. "Facilitating sectoral growth – the MSP can provide a framework that facilitates the sustainable development of different economic activities, therefore helping to enhance incomes and employment
2. Optimising the use of the sea – MSP can help to ensure that maximum benefits are derived from the use of the sea by encouraging activities to take place where they bring most value and do not devalue other activities
3. Reducing costs – MSP can reduce costs of information, regulation, planning and decision-making" (RSPB, 2004, p. 69).

Furthermore, Jay (2013) suggests that expansion of new marine sectors and economic activities through MSP can lead to increases of state revenues by means of licensing fees and taxes on potential developers. With its focus on GES and the integration and co-evolution of emerging sectors such as marine renewable energy and biotechnology, with traditional marine sectors, MSP offers an important tool in transiting towards a sustainable coastal zone. However, from a sectorial perspective, Jay (2013, p. 519) notes that: "Newcomers to the marine environment, such as the wind energy industry, appear to be benefitting well from the allocation of space, whilst more traditional users, such as the fishing industry, feel more constrained as a result".

Studying five ocean plans: two in North America; two in Europe; and one in Australia, Blau and Green (2015) found that economic benefits were not shared equally. In particular, they found that capital-intense projects, such as wind farms, have gained the largest benefits because of the increased certainty and enhanced speed of regulatory processes. The same authors found that commercial and recreational fishing; tourism and shipping (so called 'incumbent' industries) did not receive any substantial economic benefits. However, they argue "a case can be made that they could have lost greater economic value without the plans (e.g., if wind farms were sited in spawning areas or shipping lanes)"(Blau & Green, 2015, p. 6). Drawing on these findings, the authors suggest that ocean planning has the potential to produce net benefits at little costs but that the "distribution of these benefits [...] depends on the context, politics and goals underlying the plan" (Blau & Green, 2015, p. 7). In contrast, White *et al.* (2012) found that optimal planning create in Massachusetts Bay, US, led to over $10 billion from wind energy development whilst not compromising the commercial fishing industry. Lester *et al.* (2013) found similar results in their study of wave energy in Oregon, US.

Although researchers have recognised diversity in economic impacts across sectors, very little attention has been paid to how these link to the onshore communities involved in the marine economy (St. Martin & Hall-Arber, 2008). In reality, all policies have spatially differentiated outcomes. In order to formulate effective management policies, it is necessary not only to understand the nature and the operation of policies at the national level but also to evaluate the likely impact of policies on activity at the local level (K. Morrissey & O'Donoghue, 2012). With regard to MSP, Flannery and Ellis (2016, p. 121) note that:

"While MSP is quickly becoming the dominant marine management paradigm, there has been comparatively little assessment of the potential negative impacts and possible distributive impacts that may arise from its adoption".

The spatial implications of MSP are particularly important within the context of a sustainable coastal transitions literature as many coastal areas are undergoing rapid sociotechnical change (J. E. Morrissey & Heidkamp, 2017), of which the impact on the local community is unclear. Drawing on these insights and using Q methodology, this paper seeks to elicit the perception of the potential economic impact of MSP

across different scales including households, coastal, rural versus urban communities, regional and national level.

2. Methods

This UK-based study uses a Q methodology approach to understand sectorial perspectives on the potential impact of MSP across different scales including households, coastal, rural versus urban communities, regional and national level. The Q methodology has been described as the 'science of subjectivity' in that it examines the subjectivities of individuals in a systematic way (McKeown & Thomas 2014b). Q methodology differs from other data rich empirical (quantitative) methods in that it does not seek to identify traits across a population, nor provide results that are generalisable. As such, one of the advantages is that Q methodology does not rely on large numbers of participants. The focus of Q methodology is on identifying shared ways of thinking about an issue through revealing a number of different discourses (Eden, Donaldson, & Walker, 2005; Ellis, Barry, & Robinson, 2007; McKeown & Thomas, 2014b).

In Q methodology, participants are asked to organise a pre-determined number of statements into a range of categories according to which they agree with the most, or, the least. Only a fixed number of statements can be sorted in one particular category of agreement (see Figure 1). This means that participants need to choose carefully the number of statements they completely agree with (or completely disagree with, etc.) a process referred to as 'forced distribution' or "forced choice" (McKeown & Thomas, 2014a, p. 3). The sorted statements are the 'data' of Q methodology – also called 'Q-sort'.

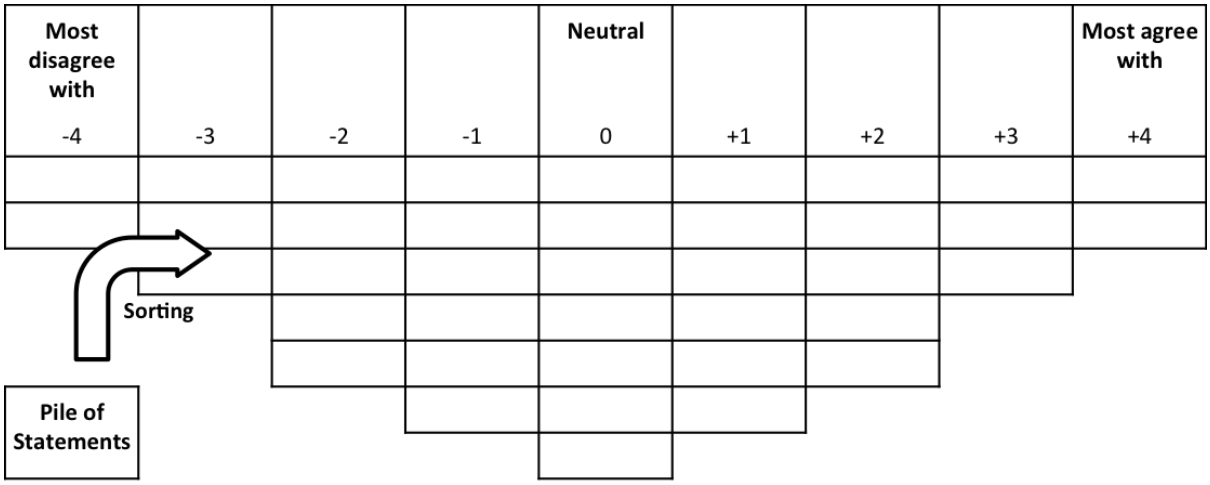

Figure 1.The Q sort 'forced distribution' which is used in the current study. The total number of statements are 39, and one statement should be places in each box.

To administer the survey, the online software 'Q sortware' (www.qsortware.net) was utilised and a total of 10 participants were recruited to this study. The 39 statements presented to participants in this study (see Table 1) were derived from an extensive literature review (Eden et al., 2005) on the economics of marine spatial planning, marine economic geography and the economics of specific marine sectors. The selected statements were chosen to represent a diverse set of positions on the economic impacts of MSP across our four stakeholder groups. To ensure the clarity and comprehensiveness of statements, the research used a

piloting phase were three participants completed the online exercise (and measured the time needed for completion) and provided feedback and suggestions for improvements. As this study uses a fairly large number of statements, the sorting is preceded by an initial sorting where participants are asked to simply read the statements and store them into a small set of piles without restrictions (Agree, Neutral and Disagree) in order to become familiar with the content of each card before the final sorting. The final 'Q-sort' sets are analysed through factor analysis using the software PQMethod (Schmolck, 2014) to produce a number of 'ideal sort', or factors, which represent the different discourses identified.

Before engaging with the Q-Sort, respondents were asked a number of background questions. These included the number of employees, location of the business and importantly their 'position' on MSP and whether they had or were involved in the MSP process. This qualitative data was used to interpret and make sense of the results of the factor analysis of the Q sorts.

2.1 Selection of participants

Q methodology relies on theoretical sampling rather than random sampling (Eden et al., 2005; McKeown & Thomas, 2014b). Participants of this study were selected based on 4 sectors of interest: (1) recreational sea angling fishing (2); marine renewable energy (3); aquaculture (4) and commercial fisheries. The justification for choosing these specific sectors is as follows:

1. Pre-existing conflicts that have been reported between recreational sea anglers and fishers. This conflict stems from the exclusion of sea anglers from fishing quotas which fishers deem unfair (Voyer, Barclay, McIlgorm, & Mazur, 2017). Some studies have already touched on the relation between recreation fishing and MSP (Hooper, Hattam, & Austen, 2017) and therefore we have some pre-existing knowledge which to build our study on.
2. Marine renewable energy (wave, tidal and offshore wind energy) is a recent addition to the marine economy (K. Morrissey & O'Donoghue, 2013) and as such poses particular challenges to already existing marine activities, as well as possibilities for growth of the marine sector.
3. Aquaculture currently composes 50% of seafood production and it is one of the marine sectors that are expected to expand rapidly over the short to medium term. Licensing and planning for aquaculture sites is contentious across other marine sectors and across public stakeholders. Conflict between inshore fisheries and aquaculture is already evident, while the push to move aquaculture further offshore will mean that aquaculture will be competing for space with a wider range of marine sectors (Alexander, Wilding, & Jacomina Heymans, 2013; Asche & Khatun, 2006).
4. Literature suggests that commercial fisheries can become displaced from areas used in the past as space is allocated to new marine sectors (Berkenhagen et al., 2010).

Within each stakeholder group, the researchers sought to include diverse representatives from the small and large scale sector, located in urban as well as rural areas, and operating on global, national, regional and local levels. Each of these sectors, for the reasons listed above, is likely to hold a specific perspective on the issues pertaining to MSP. The specific businesses and organisations were identified through online searches in databases held by national and regional associations representing these sectors.

2.2 Analysis

PQMethod (Schmolck, 2014) was used to analyse the Q-sorts. To begin with, Principal Component Analysis (PCA) was used to calculate eigenvalues to identify the strength of each Factor. Following Addams and Proops (2000), Factors with eigenvalues greater than one were maintained. This final set of eigenvalue-selected factors was then rotated using a Varimax rotation. The built in add-on application PQROT was used

for automatic 'flagging' (i.e. load particular Q-sorts onto a specific factors). The factor loadings represent the correlations between extracted factors and the variables (i.e. participants) (Farrell, Carr, & Fahy, 2017). Following this, PQMethod was able to identify a number of 'ideal sorts' or 'Factors', which represents the different discourses identified on the studied topic within the studied sample. These 'ideal sorts', similar to a Q sort, organises statements on a scale from 'most agree with' (+4), to 'most disagree with' (-4) (see Figure 1 and Table1). The PQMethod analysis also determines the strength of each factor within the final set, group participants according to factor similarity of their Q-sorts, and calculates a z-score, which represent the relative rank-order of each statement, for each sorted Q statement for each factor. PQMethod also analyses which statements are distinguishing a factor (and produces a p-value for these), and/or, which statements are so called 'consensus statements' – similar across all factors.

3. Results

All respondents loaded on a factor, which cumulatively explained 68% of the total variance within the data. The factor analysis revealed that there are three operating discourses (see Table 1). Factor Group 1 is composed of six individuals: all three representatives from the marine renewable energy (all limited companies less than 10 years of age, located in urban areas or towns, with between 4-60 employees operating on a national to global level), two from aquaculture (one large scale limited company of 25 years located in a town with 10 employees operating on a national level; and one 10 years old small-scale sole trade registered company located in an 'isolated dwelling' operating on local scale) and one representative from a fisheries organisation (mainly representing the large-scale fisheries sector with regional to national scope). Factor Group 2 comprises 2 individuals, one from a charter boat for sea angling (one registered partnership, approx. 20 years of age, with 2 employees located in a village, operating on a local scale) and one from a fisheries producer organization (limited company approx. 20 years old with only one employee which is operating on a regional scale). Factor Group 3 consists of two individuals, one from a sea angling club (with 50 members that has been around for over 60 years with local scope) and one from aquaculture (Limited company with 10 years of age, located in an urban area with 8 employees operating on a national level). As will be discussed, the discourse held by respondents loading onto Factor 1 will be referred to as 'place-makers', respondents loading onto Factor 2 will be referred to as 'place-holders' and respondents loading onto factor 3, 'place-less'. The Eigen value of the place-makers discourse is 3.98; it is 2.1598 for the place-holder discourse and 1.15 for the place-less discourse. The composite reliability is 96%, 89% and and 89%, respectively.

Table 1 Statements presented to participants. The Q-sort position for each statements in respective factor (F1=Factor 1; F2=Factor 2; F3= Factor 3) is presented in table (dark grey indicates distinguishing statements with p-value <0.01 and light grey indicate p-values <0.05). Consensus statements – that is statements that all are similar across factors - are marked grey in the statement column.

	Statement	F1	F2	F3
1	MSP is an important process for equitably dividing space between different users	+3	+1	+1
2	MSP will reduce costs for development at sea	0	-3	-1
3	Allocation of space within MSP should be based on sound scientific principles and economic rationality seeking to maximise national economic revenues from the sea	0	+3	+4
4	Economic diversification can help traditional industries adapt to the negative economic impacts caused by Marine Spatial Planning	+1	-2	+3

5	MSP will have positive economic effects as a result of better coherence between planning systems, such as between the sea and land planning systems	+4	0	+1
6	MSP should prioritise marine businesses and sectors who spend their money regionally	0	+1	-2
7	MSP is moving jobs from rural coastal communities to urban areas	-4	-1	0
8	MSP will have economic benefits as it will simplify decision-making	+3	0	-1
9	Stakeholder participation is crucial to reduce the negative economic impacts from Marine Spatial Planning	+2	+4	+2
10	Small-scale businesses will benefit economically from MSP	+1	+1	0
11	I believe that maximising the national economic profits from the use of the sea will lead to economic benefits for my sector	0	0	+3
12	MSP will have positive economic impacts for my sector as it will enhance cooperation across regional and national boarders	+2	-4	-3
13	Expansion of new marine industries will generate jobs in local coastal communities	+2	0	+2
14	Jobs will be created in cities and not in local coastal communities as a consequence of Marine Spatial Planning	-4	-1	-2
15	Banks will grant loans much more easily because of Marine Spatial Planning	-1	-1	-4
16	MSP will lead to economic growth of all marine based sectors and will create jobs and income	-1	-1	-2
17	In cases of displacement of previously existing activities economic compensation should be paid	-1	+2	-4
18	MSP will have economic benefits at the regional level	+1	+1	-3
19	Low levels of negative economic impacts to already existing activities are acceptable to make space for new profitable activities	0	-4	+3
20	The negative economic impacts from MSP will be felt on the household and local level whilst benefits will be gained at the national level	-2	+1	0
21	MSP has economic benefits as it improves the investment climate by clarifying who has the right of use to areas at sea	+1	0	-1
22	The development of stationary objects at sea ruins the aesthetic value of the sea which will have negative impacts on the local economy	-3	-3	-1
23	MSP will reduce conflicts between users which will lead to economic benefits for all marine sectors	+2	-2	+1
24	Competition for areas at sea will be greatest in inshore areas as these are the most profitable areas	-1	+3	+4
25	Coastal communities and families need to economically benefit from new marine sectors, or such activities should not be allocated space at sea	0	0	+1
26	MSP is benefitting sectors with large scale investments	-1	-1	0
27	MSP will speed up the process of investment in the marine sector	+1	-2	0
28	There will be no economic impacts (neither positive or negative) from MSP on any marine sector	-3	-3	-2
29	Rural coastal communities will benefit economically from Marine Spatial Planning	+2	-1	0
30	Better legal certainty from MSP will provide economic benefits to my sector	0	-2	+2
31	It is important that the use of the sea contributes to sustaining vibrant coastal communities	+4	+4	+2
32	MSP should seek to plan for co-existence of activities as much as possible to maximise economic output from the sea	+3	+2	+2
33	MSP will benefit the region as a whole, but won't have any significant economic impacts on the local level	-2	0	+1
34	Development of new marine industries will lead to the displacement of jobs in other marine sectors which were there previously	-2	+2	0
35	Skilled labour for new marine sectors can be found in rural coastal areas	+1	+2	-1
36	The necessary economic burdens from MSP will be carried by all marine activities equally	-2	-2	-2
37	Those sectors which historically used the sea (previous to Marine Spatial Planning) should be continuously allowed to do so	-1	+3	-1
38	New jobs in the marine economy has to be full-time jobs, not seasonal part-time jobs	-2	+1	+1
39.	The biggest threat to the marine economy is Marine Conservation Zones which is part of Marine Spatial Planning	-3	+2	-3

The questionnaire revealed that out of the 10 participants in the study, 7 were in favour of MSP and 3 were neutral, with no participant stating that they were 'against' MSP. Additionally, 4 companies had been involved in an MSP process. With regard to the percentage breakdown of the participant's sector and their position on MSP:

- 100% of both renewable energy and recreational sea angling business are in favour of MSP,
- 33% of aquaculture businesses and 50% of fisheries.

With regard to work location and the participant's position on MSP,

- 66% of urban, town, and village-based business are in favour of MSP, respectively,
- 100% of businesses located in isolated areas are in favour of MSP.

3.1 Factor 1 – The optimistic 'place-makers'

What is distinctive about this factor is that representatives are optimistic about MSP and its role in maintaining coastal communities in the future. Respondents loading onto Factor 1 assert that it is important for the marine economy to sustain coastal communities and that new marine economic activities will help to do so. Their optimism about using the sea to contribute to sustainable coastal communities, its capacity to equitably dividing space between activities and MSP capacity to harness positive economic effects as a result of better coherence between planning systems underpins a view of MSP as a 'place-maker'. Representatives loading onto Factor 1 do not agree that MSP will lead to negative consequences for households at the local level and they do not agree that jobs will be displaced from sectors historically present in local areas because of MSP. They disagree that MSP will result in significant negative economic impacts on the local level and that only seasonal (lower quality jobs) will be created in local communities. Furthermore, they strongly disagree that jobs will be created in cities rather than rural areas. From this, it could be understood that representatives loading onto this Factor are optimistic about MSP and the structural changes it can deliver and therefore see MSP as an opportunity to 'make places', as a means of creating new opportunities in coastal communities

3.2 Factor 2 – The Sceptical 'place-holders'

Representatives loading onto Factor 2 are distinguished by their strong sense of maintaining the historic practices associated with the sea, believing that the historical use of the sea should be taken into account when planning and implementing MSP. Given their strong preference for maintaining historic practices and coastal communities, we refer to this group as 'place-holders'. This factor strongly agrees that stakeholder participation is crucial to reduce the negative economic impacts from MSP and that it is important that the use of the sea contributes to sustaining vibrant coastal communities and that those industries previously using the sea should be continuously allowed to use these areas. In line with this they strongly disagrees that low levels of economic impacts are acceptable to make space for new profitable activities and, if businesses are displaced they should be compensated for their negative economic impacts. They do not agree that they will benefit from MSP and that most of the structural changes to marine governance that MSP brings about will benefit them economically. Also they do not agree that MSP will reduce conflicts that will benefit them economically. Furthermore, they do not agree that economic diversification can soften the negative economic impacts of MSP. From this, it could be understood that representatives loading onto Factor 2 are less optimistic about MSP than Factor 1 representatives and their main concern is that MSP maintain or 'hold' current practices in the sea.

3.3 Factor 3 – The Utilitarian 'place-less'

Representatives loading onto Factor 3 are distinguished by their strong sense of economic rationality and the need to maximise national economic revenues from the sea. Given their utilitarian, national level focus

we refer to this fact as 'place-less'. Specifically, this factor strongly agrees that national economic gains will lead to benefits for their sector, and that at a sectorial level 'low levels of negative economic impacts to already existing activities are acceptable to make space for new profitable activities'. Representatives loading onto this Factor strongly disagree that compensation should be paid to affected businesses further demonstrating their utilitarian approach to MSP. With regard to location or 'place', Factor 3 representatives disagree that there should be some level of prioritisation given to businesses that benefit the local/regional economy. Interestingly, this factor does not tend to agree that the structural changes imposed by MSP will lead to specific economic impacts on their sectors. For instance, they do not agree that cooperation across regional/national borders will lead to economic benefits and do not agree that banks will easier grant loans because of MSP. From this, it could be understood that representatives loading onto Factor 3 have a more utilitarian approach to MSP compared to Factor 1 or Factor 2 representatives and their main concern is that MSP be carried out in a scientific manner that focuses on national level rather than sub national economic objectives for the marine resource.

3.4 Consensus statements

Though clear differences between the 3 groups can be seen, there are significant areas of consensus among the factors that can provide further insights on stakeholder's perception of the distributional impact of MSP across sectors and locations. First, all factors agree that stakeholder participation is crucial to reduce the negative economic impacts from MSP. They also agree it is important for MSP to seek the co-existence of activities to maximise economic output from the sea. They strongly disagree that there will be no economic impacts of MSP and that the economic burdens from MSP will be carried by all marine sectors equally. All factors disagreed that the development of stationary objects (such as offshore wind turbines) at sea ruins the aesthetic value of the sea, which have negative impacts on the local economy. All 3 factors also had some statements, which they all felt neutral about. For instance, factors do not highlight any conflicts between small-scale and large-scale businesses in terms of economic impacts of MSP. Also, the factors are neutral about the statement that coastal communities and families need to economically benefit from new marine sectors or such activities should not be allocated space at sea.

4. Discussion

The blue economy agenda (European Commission, 2017; Koundouri & Giannouli, 2015) has highlighted the economic potential which the marine environment offers. Simultaneously there have been concerns raised on the increased demand for – and potential conflicts over – the use of marine space and importantly the sustainability of the marine resource in the face of these conflicts. Against the background of the sustainable transitions literature, this paper investigated the perceptions of stakeholders in the fishing, aquaculture, sea angling and marine renewable energy sector of the (a) economic impact of MSP and (b) the geographical scale of this impact, using Q-methodology. The factor analysis revealed that there are three operating discourses. Results emerging from this study indicate that all three Factors agree that stakeholder participation is crucial to reduce the negative economic impacts from MSP, however each of the three Factors have a distinct sense of the distributional impact of MSP across sectors and places. Compared to Factor 3, representatives of Factor 1 and 2 are distinguished by their strong sense of location,

both Factor representatives agree that MSP should ensure local level to benefit from the marine economy. However while Factor 1 focuses on the role of MSP in emerging marine activities and their benefits to coastal communities, Factor 2 are distinguished by their strong sense of maintaining the historic practices associated with the sea for the benefit of local, coastal communities. In contrast, representatives loading onto Factor 3 have a more utilitarian viewpoint and are distinguished by their beliefs that it is the overall economic benefit of MSP that is important and that low levels of negative economic impacts to already existing activities are acceptable to make space for new profitable activities.

Whilst previous studies have recognised how MSP will lead to growth of the blue economy, not many studies have sought to understand the commonly asked question: growth for whom and of what? This study found that while each of the sectors represented in this study were either in favour or at least neutral on the implementation of MSP, only participants from the marine energy sector had the same perception on the economic impact of MSP at different scales. Representatives from fisheries, sea angling and aquaculture belong to a mix of the three identified discourse, the optimistic place-makers, the sceptical place-holders and the utilitarian place-less. Interestingly, business location was also not a strong indicator of the perception of the economic impact of MSP with participants from across the four identified locations, urban areas, towns, villages and isolated hamlets each belonging to the three discourse. More participants are, however, needed to draw any further conclusions regarding this.

Through examining the perceptions held by stakeholders, this chapter has produced novel insights into the distributional effects of MSP across different geographical scales. Nevertheless, future studies need to engage more quantitative methods to measure the *de facto* economic impacts – rather than the perceptions held by stakeholders. Future research could also use the typology developed here to explore, more in-depth, the underlying socio-cultural identities which underpin these positions. A limitation of this research is that the results only reflect businesses involved in the blue economy; policymakers and other non-commercial entities were not surveyed. Regardless, the findings of this study have implication for sustainable coastal transition. Whilst participants of this study were not against MSP, they held varying positions in regards to the economic impacts of changed marine governance. Similar to previous research on sustainable transitions (Geels, 2011) differences between incumbents industries (fishing) and new industries (renewable energy) are identified.

Bibliography

Addams, H., & Proops, J. (2000). *Social Discourse and Environmental Policy: An Application of Q Methodology*. Cheltenham: Edward Elgar Publishing.

Alexander, K. A., Wilding, T. A., & Jacomina Heymans, J. (2013). Attitudes of Scottish fishers towards marine renewable energy. *Marine Policy*, *37*(0), 239–244. https://doi.org/http://dx.doi.org/10.1016/j.marpol.2012.05.005

Asche, F., & Khatun, F. (2006). Aquaculture: Issues and Opportunities for Sustainable Production and Trade. *Natural Resources*, (5), 1–52.

Berkenhagen, J., Döring, R., Fock, H. O., Kloppmann, M. H. F., Pedersen, S. A., & Schulze, T. (2010). Decision bias in marine spatial planning of offshore wind farms: Problems of singular versus cumulative

assessments of economic impacts on fisheries. *Marine Policy*, *34*(3), 733–736. https://doi.org/10.1016/j.marpol.2009.12.004

Berkhout, F., Smith, A., & Stirling, A. (2004). Socio-technological Regimes and Transition Contexts. In *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy* (pp. 48–75). Cheltenham: Edward Elgar.

Blau, J., & Green, L. (2015). Assessing the impact of a new approach to ocean management: Evidence to date from five ocean plans. *Marine Policy*, *56*, 1–8. https://doi.org/10.1016/j.marpol.2015.02.004

Coenen, L., Benneworth, P., & Truffer, B. (2012). Toward a spatial perspective on sustainability transitions. *Research Policy*, *41*(6), 968–979. https://doi.org/10.1016/j.respol.2012.02.014

Eden, S., Donaldson, A., & Walker, G. (2005). Structuring Subjectives? Using Q Methodology in Human Geography. *Area*, *37*(4), 413–422.

Ehler, C. N., & Douvere, F. (2007). *Visions for a Sea Change. Report of the First International Workshop on Marine Spatial Planning. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme*. Paris.

Ellis, G., Barry, J., & Robinson, C. (2007). Many Ways to Say 'No', Different Ways to Say 'Yes': Applying Q-Methodology to Understand Public Acceptance of Wind Farm Proposals. *Journal of Environmental Planning and Management*, *50*(4), 517–551. https://doi.org/10.1080/09640560701402075

European Commission. (2011). *Study on the economic effects of Maritime Spatial Planning*. *Framework*. Luxembourg: Publication Office of the European Union. https://doi.org/10.2771/85535

European Commission. (2017). Blue growth | Maritime Affairs. Retrieved 21 February 2017, from http://ec.europa.eu/maritimeaffairs/policy/blue_growth/

Farrell, D., Carr, L., & Fahy, F. (2017). On the subject of typology: How Irish coastal communities' subjectivities reveal intrinsic values towards coastal environments. *Ocean and Coastal Management*, *146*, 135–143. https://doi.org/10.1016/j.ocecoaman.2017.06.017

Flannery, W., & Ellis, G. (2016). Exploring the winners and losers of marine environmental governance. *Planning Theory & Practice*, *17*(1), 121–151. https://doi.org/10.1080/14649357.2015.1131482

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, *1*(1), 24–40. https://doi.org/10.1016/J.EIST.2011.02.002

Halpern, B. S., Diamond, J., Gaines, S., Gelcich, S., Gleason, M., Jennings, S., … Zivian, A. (2012). Near-term priorities for the science, policy and practice of Coastal and Marine Spatial Planning (CMSP). *Marine Policy*, *36*(1), 198–205. https://doi.org/10.1016/j.marpol.2011.05.004

Hooper, T., Hattam, C., & Austen, M. (2017). Recreational use of off shore wind farms: experiences and opinions of sea anglers in the UK. *Marine*, *78*, 55–60. https://doi.org/10.1016/j.marpol.2017.01.013

Jay, S. (2013). From disunited sectors to disjointed segments? Questioning the functional zoning of the sea. *Planning Theory & Practice*, *14*(4), 509–525.

Jay, S., Ellis, G., & Kidd, S. (2012). Marine Spatial Planning: A New Frontier? *Journal of Environmental Policy & Planning*, *14*(1), 1–5. https://doi.org/10.1080/1523908X.2012.664327

Kidd, S., Plater, A., & Frid, C. (Eds.). (2011). *The ecosystem approach to marine planning and management*. London: Earthscan.

Koundouri, P., & Giannouli, A. (2015). Blue growth and economics. *Frontiers in Marine Science*, *2*(November), 94. https://doi.org/10.3389/fmars.2015.00094

Lester, S. E., Costello, C., Halpern, B. S., Gaines, S. D., White, C., & Barth, J. A. (2013). Evaluating tradeoffs among ecosystem services to inform marine spatial planning. *Marine Policy*, *38*, 80–89. https://doi.org/10.1016/j.marpol.2012.05.022

McKeown, B., & Thomas, D. B. (2014a). A concluding subjective-science postscript. In B. McKeown & D. B. Thomas (Eds.), *Q methodology*. Thousand Oaks: SAGE publications.

McKeown, B., & Thomas, D. B. (2014b). *Q methodology*. Thousand Oaks: SAGE publications.

McLeod, K., & Leslie, H. (2009). *Ecosystem-Based Management for the Oceans*. Washington D.C.: Island Press.

Morrissey, J. E., & Heidkamp, P. (2017). Coastal Sustainability II: Frontiers for Regional Transition Towards Sustainability Transitions in the Coastal Zone. *Regions Magazine*, *308*(4), 9–10.

Morrissey, K. (2017). *Economics of the marine: modelling natural resources*. London: Rowman and Littlefield International.

Morrissey, K., Donoghue, C., & Hynes, S. (2011). Quantifying the value of multi-sectoral marine commercial activity in Ireland. *Marine Policy*, *35*(5), 721–727. https://doi.org/10.1016/j.marpol.2011.02.013

Morrissey, K., & O'Donoghue, C. (2012). The Irish marine economy and regional development. *Marine Policy*, *36*(2), 358–364. https://doi.org/10.1016/j.marpol.2011.06.011

Morrissey, K., & O'Donoghue, C. (2013). The role of the marine sector in the Irish national economy: An input–output analysis. *Marine Policy*, *37*(0), 230–238. https://doi.org/http://dx.doi.org/10.1016/j.marpol.2012.05.004

Morrissey, K., O'Donoghue, C., & Farrell, N. (2013). The Local Impact of the Marine Sector in Ireland: A Spatial Microsimulation Analysis. *Spatial Economic Analysis*, *9*(1), 31–50. https://doi.org/10.1080/17421772.2013.835439

RSPB. (2004). *Potential benefits of marine spatial planning to economic activity in the UK*. Plymouth.

Schmolck, P. (2014). PQMethod v.2.35. Retrieved 1 March 2017, from http://schmolck.userweb.mwn.de/qmethod/

St. Martin, K., & Hall-Arber, M. (2008). The missing layer: geo-technologies, communities, and implications for marine spatial planning. *Marine Policy*, *32*(5), 779–786. https://doi.org/10.1016/j.marpol.2008.03.015

Voyer, M., Barclay, K., McIlgorm, A., & Mazur, N. (2017). Connections or conflict? A social and economic analysis of the interconnections between the professional fishing industry, recreational fishing and

marine tourism in coastal communities in NSW, Australia. *Marine Policy*, *76*(November 2016), 114–121. https://doi.org/10.1016/j.marpol.2016.11.029

White, C., Halpern, B. S., & Kappel, C. V. (2012). Ecosystem service tradeoff analysis reveals the value of marine spatial planning for multiple ocean uses. *Proceedings of the National Academy of Sciences*, *109*(12), 4696–4701. https://doi.org/10.1073/pnas.1114215109/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1114215109