

Mapping the Public:

Dynamics of Participatory GIS and Marine Spatial Planning

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Abstract

Coastal and marine spatial planning (CMSP) efforts have increased in application and scope around the world over the past decade. These approaches seek to apply comprehensive, collaborative, and science driven approaches to managing the ocean. These CMSP approaches represent an extension of many terrestrial environmental planning problems onto the ocean. This paper discusses an example of tensions between new and existing ocean interests and users through a case study from the United States. The State of Oregon initiated a two year public participation initiative as a central component of a new CMSP program. Unique to this effort was the extensive use of public participatory geographical information systems (PPGIS). These systems were used to solicit and organize data on commercial and sport fishing effort. This spatial representation of interests on the ocean for fishing proved to structure how other interests engaged the policy process, including recreational users, local residents, and the emerging ocean renewable energy industry. Using content analysis of public meetings and agency work sessions, and semi-structured interviews with key stakeholders, this paper shares how the narratives of ocean use and public interest worked with the technology of PPGIS to create a particular set of coalitions around shared data creation, interpretation, and use. These narratives are at the same time managed by public agencies charged with planning. Collecting, managing, and using these new PPGIS data becomes a public manager task that centers on crafting a particular set of "publics" that seek to represent resolve a larger public interest. This case study shows how this crafting of the public runs into barriers as those that are being characterized in a public and rational system seek to control outcomes.

Introduction

In early 2008, the Oregon coast feared a new "Gold Rush" was about to begin. Motivated by renewable energy demand from California, and investors looking to discover the next new industry, wave energy developers proposed sites on Oregon's ocean for new renewable energy facilities. It was envisioned that through deploying power generating buoys a new and more reliable clean energy source would change power production on the West Coast. Because waves energy from the Pacific travels for long distances, it makes power generation predictions easier. Developers claimed the ability to forecast power for multiple days in advance for wave energy, in comparison to terrestrial wind that can only be foretasted in 15 minutes increments.

The federal and state response to this new ocean use was receptive as it met climate change and clean energy goals, but this response was also fragmented with multiple jurisdictions and authorities. Prior to this proposed development, federal ocean leasing had only been concerned with oil and gas prior. State ocean management rarely considered leases outside of seafloor cables. Recognizing the shortcomings of existing regulatory structures, the Federal Energy Regulatory Commission and the State of Oregon entered into an agreement to halt all leasing until a comprehensive plan was developed for the ocean areas off of Oregon. The state planning agency, the Department of Land Conservation and Development (DLCD) launched an ambitious public outreach effort to plan the state's territorial sea and to also provide guidance on management of federal waters further offshore.

This process was known as the Territorial Sea Plan (TSP), Part 5 Amendment process (hereafter referred to as the TSP). This process was the first effort by Oregon to conduct planning for the three nautical mile ribbon of ocean offshore that the state has full authority over.

At the same time debates over the health of ocean and coastal areas internationally have resulted in calls for the creation of marine protected areas for conservation of species and habitats. At the same time the ocean renewable energy systems such as wave and wind power, have emerged as a new ocean user. Debates about the role of the ocean in sustainable development bring more attention to the incorporation of ocean and coastal areas in to economic systems. To address these multiplying claims on the ocean for many uses, coastal and marine spatial planning (CMSP) efforts have expanded internationally, seeking to manage conflict between uses, and to administer rights for access and use (Ehler and Douvere 2009).

Central to CMSP is a focus on increasing public participation and engaging in science based planning (Bonzon, Fujita, and Black 2005). These two thrusts for increasing engagement and rationalizing environmental planning create a tension in claims on common spaces and goods (Cortner and Moote 1998; Gilliland and Laffoley 2008; Halpern et al. 2012). On the one hand, the calls for increased engagement broaden the set of stakeholders and interests involved in the planning process. However, this can also complicate the other stated goal of science based planning where expertise and knowledge claims are privileged from a smaller set of actors in the planning. Empirically, these collaborative approaches are also not

guaranteed to create improved environmental outcomes compared to traditional political decision making (Layzer 2008). One effort to bridge this tension has been through the development of mapping tools to visualize, collect, and query datasets from different sources. In particular, CMSP as a practice has focused on the potential of geographical information systems (GIS) developments, including participatory mapping tools. These participatory tools include formal applications such as public participatory GIS (PPGIS) where public involvement is conducted in a spatial data collection effort. Development of PPGIS both terrestrially and for CMSP in other cases have raised important questions about the role of the technology and its influence on how groups or interests are engaged.

The tension between participatory and expert driven approaches is not a new concern for GIS. GIS as a tool for planning has been recognized as potentially a reformulation of expertise in a new medium (Duncan 2006; Lejano 2008; Pickles 1995). These critiques suggest that the expertise of the GIS technician or analyst is used to convert the values and concerns of the public into a rational object for inclusion in scientific analysis. This process raised the concern that the underlying politics of ocean uses and values are removed from deliberation in an effort to make CMSP "post-political" (Tafon 2017). This critique suggests that PPGIS or similar public involvement processes avoid questions of power and often are ahistorical. This stance can then leave key conflicts or disagreements unaddressed in a push towards a collaborative or consensus driven outcome, which is undermined from the start by the removal of political conflict.

This paper takes these observations as a starting point to explore a case study from the Western United States, off the coast of Oregon and the development of the Territorial Sea Plan. In by looking at the interactions around PPGIS in this case, this paper asks how PPGIS technologies and techniques reshape the politics of ocean management. In particular, it is argued that these technologies are an example of ecological modernization that seeks to pull in not just the environment but also human activity at sea to order it for new industrial development on the ocean. This is a process I argue is the use of new public involvement technologies seek to become a “political sorting device” to facilitate the management of populations, territories, and values (Mukerji 2003). This sorting seeks to remove the political charge from planning in an effort to make planning a more technical exercise. Yet these efforts do not remove underlying storylines or narratives that stakeholders or groups hold. These come in to conflict with the technical exercise, but in a unique way as often stakeholders are also supportive of a depoliticized environment – until it impedes their interests. The case study from Oregon represents an effort to extend state planning authority over a previously fragmented commons, and with the goal of maximizing or modernizing the ecological and human relationships at sea.

Method

In 2017, the author conducted semi-structured interviews with key participants in the TSP process. Interview subjects included state and local agency representatives, elected local officials, user groups, and science advisors. These

interviews were conducted in person and transcribed for coding and analysis. Additionally, much of the public involvement process and stakeholder deliberation meetings were video recorded and preserved in agency records. The author coded the video files, and selectively transcribed portions that address key issues for this research. Finally, the research relied on observer-as-participant for a portion of the planning process. In 2013, the author was a technical advisor to the state planning agency while also conducting research on the process. The author shared this dual role with those involved in planning, and observed the development of new planning data products for use in the TSP.

Public Involvement, Ocean Planning, and Making Meaning

The role of public participation has been understood to have a series of possible relationships with planning and decision making, from instrumental arguments to secure agreement to substantive arguments based in learning from the public (Fiorino 1990). CMSP efforts have largely started from this substantive perspective, with a goal to better understand who uses the ocean and how these uses interact. This sits in tension with the other drive for CMSP, to reduce impacts from human uses and to increase ecological considerations in planning through science based policy choices (Halpern et al. 2012). At the center of this tension sit state agencies and planners managing these claims on the ocean. CMSP thus represents a new engagement between the interest groups tied to the ocean, science, and efforts to define the public interest in management.

Environmental and natural resource policy and management have seen a shift over the past half century from a model of centralized control relying in the "decide-announce-defend" model into a new set of practices focused on increasing participation or levels of engagement (Hajer 1993). The new era of environmental policy making has multiplied into a series of methods that have been explored through models including ecosystem based management (Cortner and Moote 1998); alternative dispute resolution and environmental governance (O'Leary, Nabatchi, and Bingham 2004); and public engagement or involvement (National Research Council 2008). Several shared themes exist across these new approaches. They include expanding the types and number of participants in environmental decision making. These approaches also attempt to shift the dynamics of environmental conflict from adversarial to collaborative or consensus based approaches. Examples of this include negotiated rule making or facilitated decision making. Proponents of these approaches claim that they provide more durable agreements without the costs of conflict or litigation (O'Leary, Nabatchi, and Bingham 2004).

Research on public involvement finds there is no single rationale for public involvement. In reviewing both the theory and practice of public involvement, three general arguments are made for public involvement: substantive, normative, and instrumental (Fiorino 1990). Substantive arguments for public involvement are based on expanding the types of information and knowledge considered in decision making. Perspectives of local communities or affected groups are included to open up more the analysis and to broaden both the knowledge and criteria considered.

Normative arguments for public involvement urge that democratic principles require broad participation in decisions. This relies on an image of decision making where all have a say to share in a broad political process. Finally, the instrumental perspective on public involvement argues that public involvement develops legitimacy for decisions. This perspective can be framed in a more cynical perspective where processes are designed to build support versus solicit new information. Alternatively, instrumental public involvement can be understood as an effort to develop social capital or cooperative capacity within contentious settings (Abelson et al. 2003). These three arguments are not rigid, often in practice there is overlap as public involvement might try to solicit new viewpoints, with the intent to be democratic and the hope to build new support for a decisions.

The structure of how to conduct public involvement builds from these three perspectives. Depending on the purpose for engaging in public involvement, the work of public involvement is structured differently. In a meta-analysis of public involvement research and talks, Delgado et al explored the challenges in understanding different components of public involvement based on the starting orientation on public involvement (2011). Who to engage in public involvement immediately presents a challenge based on the scale of the decision or policy. Complete participation by a community is impossible outside of the smallest of groups. This decision touches on a key tension in rational planning efforts - whether there is a purity of science or information that must be protected from the public or if all science and information is value laden. In CMSP applications internationally,

the drive to make public involvement "scientific" manifests in heavily structured processes meant to make the public knowable as an entity. Examining CMSP in Scotland, Smith and Brennan have noted that an essentializing process unfolds in analyzing the public in the use of PPGIS, notably when mapping becomes a process of reducing the perspective of a simple spatial representation (2012). Through expert mediated processes, certain problems are focused on for planning - and these become "obligatory passage points" where all other interests or information must conform to fit the particular world view of these problems (Callon 1986). A broad inclusion of public involvement inevitably adds more values and politics to the process. Those that seek to maintain a more pure science model suggests limiting or structuring involvement based on the public capacity to contribute (Collins and Evans 2002). Critics of this perspective argue that values and culture are already structuring the science and experts involved in decisions and to claim the public is more problematic is to ignore this institutional structuring (Wynne 2003). This value laden perspective on science and expertise urges public involvement to better understand the public meaning making processes and engage them.

By approaching public involvement as a value laden and political exercise requires understanding the planning problem as one of social construction. Environmental controversies are often about conditions that are still evolving, especially issues that involve uncertainties or planning around new activities. Freudenburg and Grambling in their study of oil and gas exploration attitudes on the Gulf Coast and California coast noted that perspectives on risk and acceptance

of development followed historically institutionalized pathways (Freudenburg and Gramling 1994). In their analysis, the acceptance or opposition to new development on the ocean was not so much about physical, economic, or environmental threats as it was about the story of past developments that the communities shared. This conception of how the past worked channeled ideas on how future development might provide either benefits or impacts. For proposed developments that have not been deployed elsewhere, the process of defining impacts and who should bear them becomes heavily influenced by ideas of worth, rights, value, and moral terms (Schneider and Ingram 1993). These examples of environmental policy problems as social construction underscore a challenge for public involvement technologies: they tend to be ahistoric or are simply representations of a snapshot in time for a public. The question that arises is what happens when these two systems collide?

This question is addressed in part by narrative discourse analysis in environmental planning cases examined by Hajer in acid rain debates (Hajer 1995). Hajer starts his examination of environmental debates in the late 20th century by noting the rise of ecological modernization in both policy and research communities. In particular Hajer characterizes ecological modernization as a dominant frame of thinking among policy making where there is a perception that win-win scenarios are able to be developed with better technological or institutional adjustments (Hajer 1995, 25–27). This is in opposition to a perspective that suggests win-win is not possible due to deeper conflicts within the debates over the economy and the environment. Ecological modernization seeks to shift environmental problems from

political issues to technical issues. Using the language of Ulrich Beck (Beck 1992), Hajer notes there is a "displacement of important political decisions to other, formally non-political realms" (Hajer 1995, 39).

The Oregon Territorial Sea Plan and Mapping Users

In 2008, a series of ocean renewable energy developers started the process to stake claims to the Oregon ocean for installing wave buoys. This triggered uncoordinated federal and state responses. The state and federal regulators developed an agreement to pause claims in order for the state to amend its Territorial Sea Plan (TSP). This effort was led by the state's planning agency, the Department of Land Conservation and Development (DLCD). The agency administers the implementation of Oregon land use planning system. This land use system includes 19 statewide planning goals, four of which are related to the ocean and coastal areas. Oregon's management of the ocean is a fragmented system of overlapping agency authorities. DLCD holds authority to plan for the ocean, but implementation and enforcement is handled by other departments including the Oregon Department of Fish and Wildlife (ODFW), Oregon Parks and Recreation District (OPRD), and the Division of State Lands (DSL). This mix of agencies was often referred to as the "Alphabet Navy" during the planning process.

As the planning process began, it quickly became clear there were many competing claims for Oregon's ocean. The opportunity to develop renewable energy was a priority for the state to address climate change policy goals. Further, the new industry presented an opportunity to also become a leader in a new renewable

industry and to hopefully lure the nascent industry to put down roots in Oregon. At the same time a strong fishing sector was very concerned about losing access to the ocean, including the very high value Dungeness crab fishery. In between these concerns were the conservation and ecological priorities for the state. The ocean energy technology was and remains untested, its impacts unknown, and the public concerns over the potential local impacts from devices complicating a clear policy vision for the industry.

The growth of marine renewable energy was not the first time that fishers had faced limits on their access to the ocean. The groundfish fishery collapse in the 1990's resulted in a series of fishing area closures from federal managers. These closures placed large areas of the Outer Continental Shelf (OCS) off-limits to trawling. Other portions of the ocean had also been closed, but with more informal rules. A network of fiber optic cables comes ashore in Oregon from across the Pacific. These cables include buffered exclusion areas around the cables to protect this high value infrastructure. Also barge tow operators have also negotiated closures for shipping lanes within the Territorial Sea. Both cables and the tow lane exclusions are not strongly enforced – they are more important if actual impacts occur such as collisions or damaged cabling. And just before the introduction of wave devices, the state through its wildlife agency, had created new marine protected areas limiting all human uses for the benefit of biodiversity conservation.

To coordinate the CMSP effort on the Oregon ocean, the state planning agency chose to use a comprehensive participatory GIS approach. This first involved

collecting all of the existing data on ocean uses and values, and then overlaying them to explore the potential degrees of existing user conflict. Once this first step was taken it was determined that there were not sufficient data from the right interest groups to make a decision. It is important to note here that in some cases the data might have existed, but that its production or status was politically unacceptable. For example, commercial fishers must report locations of their fishing catch to state regulators. But these logbook datasets are protected from release by state and federal law, and any reporting of the data must be aggregated in ways that the fishers were suspicious of. This is the classic problem of not so much too little data, just not the correctly produced or stewarded data. This kicked off an effort to collect data to fill the gaps.

The first group to participate in data collection was the fishing community. The state itself could not collect the data, nor even afford to fund it. The data was ultimately collected by a local NGO supported by a large international environmental NGO . The local NGO developed the digital technology, and went into the field to collect areas of importance – primarily through a “bag of coins” exercise. Fishers delineated important areas, and were then given a set amount of coins, which they assigned to each area they outlined. Key to this process was the time period fishers were asked to map. The instructions asked the participants in the mapping to think about where they fished in their career (versus some other more recent time period.) A challenge with this instruction is that fishing effort chases the species in the fishery. Additionally, regulatory closures for some areas

have removed areas that may have historically been in the territory of the fisher. This left some fishers wondering if they should follow the rules to map based on their career, or to be more realistic about closures, shifting species distributions, or other concerns.

Fishers raised other concerns about the mapping that related to how one's own data interacted with other users. One respondent noted that there was some gamesmanship in mapping areas – assigning values to places in order to impact other interests or regulators. Before this mapping data was collected a series of marine protected areas had been defined on the Oregon sea, limiting fishing effort. Some reported mapping in response to these designations, to shift the focus of the conflict analysis for considering marine renewable energy. This use of GIS and user developed data became a dominant tool for the political discourse around management decisions. Shortly after the mapping for commercial and charter fishing was completed, other groups started to develop spatial datasets. Non-consumptive recreation maps were developed using surveys and interviews to measure where beach walking, surfing, boating and kayaking occurred. The renewable energy developers also created areas on the ocean based on estimated engineering and construction preferences. The political battle for space moved to a GIS environment, and with a participatory flavor. For local community residents, the mapping felt exclusionary if they were not an active user of the ocean space. Many communities along the north coast of Oregon are tourism destinations for the residents in the Willamette Valley and Portland. These tourism economies are not

explicitly on the ocean - not in a way that can be mapped based on use. But noting that mapping was the dominant currency for negotiation, the local communities were able to require a visual and aesthetics assessment dataset to be created. This visual resource inventory created new viewshed polygons that projected local interests out onto the ocean via GIS. As one planner involved in the process explained, in order to have a seat at the table, a group must map.

This deployment of GIS in a coastal and marine spatial planning process struggled to fit the many values, perspectives and forms of knowledge into a common framework for deliberation. At the end of this planning process, the state did start a negotiation using the data to create a modified zoning system. I qualify this as modified because it was created as a zoning system based focused one use – ocean renewable energy. The zoning primarily defined the procedural steps required in each location for leasing to energy companies. To compare to a terrestrial example, the ocean was zoned with varying degrees of conditional use permit zones. These conditions created ambiguity on how easy or certain it might be to place devices, making the zoning much less certain for critics and proponents of ocean renewable energy. For example, large areas of the state waters were zoned for potential use – but with a very unclear permitting path managed by another agency.

The planning process unfolded with a series of public work sessions spanning two years. Two primary advisory groups consulted on the planning with the state planning agency. The first was the Ocean Policy Advisory Committee (OPAC) and is

chartered by statute with membership selected by the Governors office. The second was the Territorial Sea Plan Advisory Committee (TSPAC), a group created for the planning process and facilitated by the state planning agency. As the process drew to a close, various maps were developed to locate potential areas for ocean energy development. The two advisory groups developed a common set of levels of regulatory scrutiny for any development, and mapped the locations of these areas. But no single agreement emerged on a final map. As the process proceeded, there was pressure to settle the issue based on a concern that the lack of a plan could result in a lifting of the moratorium on ocean leases by federal agencies. If this were to occur, it was feared that it would represent giving up control over the ocean. A final staff plan was recommended by the state planning agency to the Land Conservation and Development Commission (LCDC), the political commission that has the final say over planning decisions in Oregon and oversees DLCD. LCDC adopted the staff plan, despite objections from OPAC over some small areas included for potential development. While the plan was adopted in 2013, it was immediately challenged in the Oregon Court of Appeals by members of OPAC in early 2014. The case is still undecided and under consideration by the court.

After the final decision in the planning process, the PPGIS data was stored and managed in a variety of ways, depending on the user group. The first set of data – the fishing data – is held by a new organization known as FISHCRED (Fishermen's Information Service for Housing, Confidential Release and Essential Distribution). FISHCRED sees their data as a private set of intellectual property

holdings. As a group, they managed data releases, and also the method for aggregating or reporting data, though they were reliant on the NGO that helped collect the data for technical services to do this. The other datasets largely resided with the state or a consortium of West Coast states. This has resulted in the state being able to set the tone for further negotiations with the federal government. By having this repository of data – they are able to highlight their relative expertise when other entities seek to make requests of space on the ocean. At the same time, the agencies and data producers continue to work together as their Oregon based knowledge provides a basis for the state to resist federal or other interests on the ocean territory.

Stories on the Ocean, Pixels at the Table

The original hopes for the PPGIS for the Oregon TSP planning process revealed a ecological modernization thrust: that the problem was a technical issue that could be solved with better data and that there existed a solution to meet all interests. In conversations with planners and those collecting data, there was a hope that as all of the data was stacked in GIS it would reveal a "hole" that would emerge across all interests allowing for the new use to be sited. But this did not emerge, and if anything happened the data collection expanded the extent of how and where users showed up on the ocean. Once the spatial medium became the political currency for debates, ocean space was quickly spoken for. As Hajer notes in his exploration of environmental debates, the issue that matters is less material or interest based coalitions, but rather discourse coalitions (Hajer 1995, 58–68). These

coalitions are formed by the shared presentation of story-lines that seeks to dominate the argument with a definition of the policy problem and thus the solutions that can be applied. This is a perspective that is contrasted with other coalition models of policy change such as the advocacy coalition framework (Sabatier and Jenkins-Smith 1999). Hajer seeks to shift the focus for policy analysis away from a model of interested based and individualistic actors to one where discourses are a shared and binding resource for policy arguments. The benefit of approaching this from the discourse perspective is that it captures a multitude of values that participants in the planning effort carried with them, but could not map effectively. In interviews with participants of the planning process there were often two threads of discussion that emerged: the first was a sharing of the long history of how the respondents came to hold their views and often a narrative trope to characterize it, and second a generally high regard for the mapping technology. I want to first address the first observation and then engage in the interesting durability of the regard for the technology.

Several storylines emerged in interviews with participants in the planning process. For local community leaders and fishers, the concern they share is that new energy development represented an industrialization of the ocean. This storyline was concerned with the energy industry as an outside economic interest looking to take advantage of the ocean and the communities near it. Industrialization also represented a need to commodify the ocean with territories that exclude some areas over others. This taps into a deep fear among many fishers about a shift of the

ocean from a highly self-regulated set of commons to a modern territory system (McCay and Acheson 1987). Discussion about the use of the ocean by fishers also relied on a series of agrarian metaphors around management and stewardship of the natural resource. In one case, the fishers were self described as the last remaining hunter-gathers of modern society. This imagery was used in opposition to the idea of modernization through the development of the ocean for renewable energy. This group also developed smaller storylines to oppose the new use, primarily focusing on the cost of proposed power development and using examples from other energy projects to show the possible harm. Those interviewed noted that the new technology only seemed viable with federal or state subsidies. For them this was a scandal in its own right, especially for a region with very low cost hydropower production from the Columbia River system.

For the advocates of energy development there was a story of progress and, to varying degrees, salvation of local economies. Energy proponents noted the state of the climate change and the need to shift from traditional power generation sources. Ocean renewable energy represented a chance to develop a powerful and reliable new source of clean energy. Oregon in particular was seen as a rich resource with its large wave heights and long term forecasting potential. At the same time, this progress story also wanted to share its riches with the local coastal communities. The development advocates shared that the job and revenue potential for coastal communities could help these relatively poorer areas recover from past natural resource crises such as the spotted owl closure for logging and the groundfish

collapse. This storyline also contested a sense that existing users had the power to veto entry of new ocean uses. They felt that there was a disconnect for the public between the goals and policy of the state as a whole versus local exercise of control over a public resource. The proponents, like the local fishers, also developed their own storylines opposing the traditional use of the ocean. They argued that the sustainability of the fisheries was being taken as a given - when the health of the ocean was in fact threatened by fishing. This is a claim that was raised in meetings, but quickly pushed to the side by many as politically unacceptable to raise.

The planners at the state agency level wrestled with these two storylines. There was a desire to shift the debate from larger claims on the ocean, and to just focus on the present needs of each group to try and accommodate them. There was also a series of efforts to frame the issues on behalf of the public in the state. One former planner interviewed hinted that a "Frankenstein" had emerged from earlier efforts to provide local input and inclusion in the public process. By granting that authority - or at least the appearance of authority - other claims for the ocean had been dismissed. Planners regularly raised the issue that the ocean was a public trust to be managed for all of Oregon. But this is a difficult storyline to manage by itself. The agency and planners tried to use the GIS representations of the storyline groups to settle or negotiate the problem spatially, as opposed to directly address the underlying conflict in the two storylines. This was done by digitizing or redefining the spatial extent of some uses or resources to accommodate concerns, but not to directly address issues. For example, if fishers were concerned that

certain areas might be made available for development, the planning staff occasionally suggested some other ecological or economic use will likely emerge with in the data to prohibit ocean energy use.

It is possible that there is no tool that the planners could have deployed to address the gap between the storylines. In particular, the use of the GIS technology appeared to complicate the process. In working meetings between the different groups, the planners facilitated exploration of the GIS data that had been collected. As new data was presented on the digital projection on the wall, the different groups would introduce cases that supported or refuted how the data should be interpreted. Because the GIS system needed a common unit of analysis, all of the data was standardized to a grid cell system. This allowed for some data to "grow" as the cell may have only had a small percent of the use present, but it "lit up the cell" entirely for that use. Users argued over how to interpret this, and it added ambiguity to arguments over the best place for the new ocean use. In the end the application of PPGIS in this exercise did not increase the shared understandings of the storyline, but rather reflected the dominant logic of ecological modernization to push the politics out of the process by using technical tools. This pre-empted a discussion about the underlying values that drove the public input, and thus pushed the political conflict off to the very end.

Interestingly, as I noted in the opening to this section, almost all of the groups interviewed in this process shared approval of the mapping technology and use of PPGIS. It was referred to as ground-breaking and innovative, and the best

approach with the challenging issues at play. The strong support for the mapping, but the disapproval of the outcome can be understood in a variety of ways. In part, the mapping should be separated from the outcome. Some claimed the mapping was great, it was just that the final decision failed to properly use the data from the mapping. Here the process was evaluated as great, despite the outcome being a failure. Second, the mapping itself captures a shared storyline that possibly explains the acceptance itself. As Hajer notes, ecological modernization has become a dominant model inside and outside of agencies (Hajer 1995). It is not only the agencies that believe in the potential of the technology, but the public as well. Here the blame falls to the user, not the tool. It speaks to the possibility that this process could easily be repeated because the technology is so readily accepted by planners, stakeholders, and the public. There is a shared belief that there is a way to use mapping and data tools to craft a solution out of the problem, but neither side recognizes the root difference in values as a barrier to the solution.

Conclusion

The drive to push politics out of a decision and focus on the issue as a technical one is an active social construction within the case studied here. The hope was to minimize conflict that can undermine the process, and to create a decision that stands on evidence the agency can marshal with its resources. Key to this effort is defending the state's role as steward of public interest - a claim that it needs to maintain legitimacy within its political institutions. But relying on PPGIS and data products to know the public is a challenging task. Thomas Catlaw explores this

problem of representation in modern politics by noting that we see a heightened number of groups represented and more pathways provided into governance, yet we also a loss of faith in government (Catlaw 2007, 43–44). These multiplying perspectives have created a problem for modern democracy. Representation of the public suffers from a tension of being general so as to claim authority for the whole, but also needing to be particular so its claims resonate with individuals. The older model of representation is based on working towards a single public – but this public has proliferated into many. The emergence of more groups make the ability to link the general and the particular a difficult project – one that requires exclusion to reduce the noise in the system. To address these multiple claims, Catlaw notes that modern states work to find equivalences to balance them (Catlaw 2007, 63–68). Examples of these are cost-benefit analyses and economic models of comparisons - all tools also seen in the ecological modernization shift. For DLCD, the claims had to be filtered to control the noise and that filter was found in applying the PPGIS technology to order and assemble the public into a dataset for shared deliberation.

This case suggests that there needs to be caution in applying PPGIS in CMSP or other settings. The underlying storylines are likely to create the political coalitions that drive outcomes. But these storylines are not easily translated from story to pixel. The users and interests engaged, even if co-producing the data, are just as likely to adopt a techno-optimism about the tools (Wynne 1992). They may allow their own storylines to be temporarily silenced in exchange for a data driven

seat at the table. It is not quite a hegemonic power that these technologies hold, but they do represent a powerful redirection of focus for public involvement that can obscure conflict as a process approaches a decision point.

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