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ABSTRACT

Global sea-level rise (SLR) is among the most alarming aspects of anthropogenic climate change. The human impacts of SLR are experienced unequally between and within municipalities. Existing research has identified social variables that predict municipal adoption of adaptive SLR policy, but this work does not account for the locally specific social factors that shape particular policies to fit particular cases. This study describes social conceptions of the ocean and SLR policy for two coastal cities in western Washington: Aberdeen and Bainbridge Island. Examining conceptions of marine spaces provides insight into the complex process by which local physical and socio-demographic characteristics shape local policy. The study uses a grounded theoretical approach to content analyses, resulting in localized typologies of marine spaces as well as SLR policy profiles for each case. Results indicate that municipalities vary by both social conception of the ocean and SLR policy form. These findings elaborate upon the relationship between socioeconomic conditions and municipal climate change policy adoption, suggesting that in local media and policy discourse, the absence of relevant resources is related to adversarial conceptions of local marine spaces, while abundance of relevant resources is associated with a conception of marine spaces as natural resources.

Introduction

In January of 2015, the city of Aberdeen, WA, was struck by the worst storm it had seen since 1933. As its creeks and rivers vanished under high harbor tide and heavy rain overflow, so did its roads, houses, offices, and schools. In this context, local news is a vital actor: warning Aberdeen's residents, advising them on safety practices, later taking stock of devastation, and with pride reminding residents that durability in the face of flood disaster is synonymous with Aberdeen. In spite of such events, speculation about global anthropogenic climate change and its impacts on local storm surges remain rare in Aberdeen, but not for those living a few hours' northeastern drive in the city of Bainbridge Island, WA. For Bainbridge Island, insulated by Puget Sound and high sloping beaches, such a disaster is unlikely. Yet, the uncertainty of climate change has driven its local media and policymakers to drastic preparatory measures. It is true of both climate change alarm and disaster recovery that what is unthinkable for one

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municipality is the other's reality, but why should those least affected be most alarmed, and vice versa? These cases suggest the important role that vulnerabilities to disasters, socioeconomic conditions, and discursive conceptualizations of place play in influencing adoption of coastal climate change adaptation policy.

The work presented here is a qualitative analysis that examines discourse of the meanings of place used by local media in the form of socially constructed "ocean-spaces" (Steinberg 2001) as well as localized sea-level rise (SLR) policy for these two cities in western Washington. This project seeks to answer the following research question: How are localized conceptions of ocean-space in Aberdeen, WA, and Bainbridge Island, WA, characterized in the local print media and policy, and how might these conceptions influence SLR policy? To answer this question, this study uses content analyses of policy and media documents for both municipalities. It develops a grounded theoretical, bottom-up typology of ocean-space in order to construct locally specific profiles of ocean-space conceptions, thereby inductively developing a theoretical framework by which to understand extant manifestations of ocean-space conceptions and to inform Steinberg's (2001) broader theory of socially constructed ocean-spaces. Furthermore, this study compares SLR policy from both municipalities to best practice SLR policy (IPCC 2014) to develop policy profiles for both cities, elaborating the nuance of localized policy, which is often obscured in quantitative studies of SLR and other climate change-related policy adoption. Results suggest that both localized media conceptions of ocean-space and localized SLR policy differ significantly between the two cases, and furthermore, that this variation may be influenced by salient physical and socio-demographic municipal characteristics.

This study reveals a part of the process by which socioeconomic conditions, physical vulnerability, socio-spatial constructs, and related policy are reciprocally informing and informed through local media and policy discourse. These findings build upon existing quantitative sociological work linking socioeconomic conditions and vulnerability to adaptive climate change policy by exploring in-depth the discursive processes of the socio-spatial construction of the ocean, onto which the threat of SLR is disparately mapped. In particular, findings suggest that Aberdeen, a coastal city with fewer economic resources, has developed adversarial social conceptions of the ocean, while Bainbridge Island, a coastal city with more economic resources, has developed resource-based conceptions of the ocean. The analysis connects these contrasting media conceptions to the two cities' disparate SLR policies.

Literature review

Sea-level rise

Contemporary climate change assessments suggest that the change of global sea levels is among the most alarming aspects of anthropogenic climate change (IPCC 2014). Affected coastal zones may face increased risk of flooding and storm surges, coastal erosion, damage to industrial and residential property, loss of human life, and even total inundation (ibid.). Over recent decades, enhanced modeling of the complex processes by which climate change increases the frequency and/or intensity of storm surges, cyclones, and hurricanes (Emanuel 2005; Knutson, Tuleya, and Kurihara 1998) and by which ice sheet melting continues to accelerate (Zwally et al. 2002) has garnered urgency

among climate scientists (Risbey 2008, Dunlap and McCright 2015). Compelling in its immediacy, ubiquity, and systemic nature, SLR has become of interest to professionals in many fields. As environmental sociologists consider the consequences of anthropogenic climate change, SLR explicitly requires confrontation. Though widespread, the impacts of SLR are not estimated to be experienced equally between nor within cases. Researchers are beginning to consider the intersection of this developing disaster with the inherent structural social inequalities of affected communities (Stallworthy 2006; Portman 2012; Martinich et al. 2013).

Sociological research has approached human impacts of SLR from a variety of directions. Research has identified disparate and unequal exposure to hazards (Heberger et al. 2011; Martinich et al. 2013); elaborated inequalities inherent to negotiations of climate change responses and solutions (Harris and Symons 2010; Stallworthy 2006); addressed the issues of human migration and displacement due to SLR (Farbotko and Lazrus 2012; Kothari 2014; Wyett 2014); and anticipated the unequal distribution of aid (Portman 2012). Existing sociological research on SLR has mostly relied on quantitative approaches to describing vulnerabilities (Lichter and Felsenstein 2012; McGranahan et al. 2007; Moser, Jeffress Williams, and Boesch 2012). While such methods have also been used to predict support for and adoption of various climate policies, these studies de-emphasize localized threats and distinct subjectivities (Zahran et al. 2006; Rice 2014). Moreover, "place effects," or the effects of regional cultural variation, have been quantitatively described as associated with individual-level perceptions of environmental issues (Hamilton et al. 2010), but have yet to be elaborated with qualitative methods. This work responds to a need for increased qualitative approaches to SLR, which are useful in attending to locally specific social vulnerabilities and adaptive social processes (Marino and Ribot 2012). Localized analyses of social vulnerabilities to climate change elaborate the variable manifestations of vulnerabilities (Adger 2001). Contrary to a trend in the narrowing of suggested adaptation options, this kind of work demonstrates a need for broad sets of adaptive strategies based on local need (Barnett and Adger 2003).

The social construction of ocean-space

Sociological understandings of marine spaces require us to think beyond their physicality, toward the meanings that human groups attach to those spaces: the mystery of depth, the fear of an uncontrollable force, the value associated with an aquatic resource, and far more. One prominent theoretical framework used to interpret such inquiries into space is Henri Lefebvre's dialectical spatial "triplicité," consisting of *perceived*, *conceived*, and *lived* manifestations of space (Lefebvre 1991; Gottdiener 1993). *Perceived* space refers to what is commonly called "space:" the physical, material nature of space that includes what can be mapped and measured. *Conceived* space is then comprised of the semiotic meanings attached to physical spaces, wherein, for example, a Fjord system becomes "beautiful Puget Sound" (as it is sometimes called) or floodplains such as those surrounding Aberdeen are deemed unsuitable for human development. Finally, *lived* space refers to the processes by which spatial conceptions are made real through social practices, the interactions of human actors developing spatial meanings through shared activity. "Beautiful Puget Sound" does not self-sustain its meaning, but rather, its

meaning is reproduced by actors who take pleasure boat rides, practice photography, paint scenic representations of the sound, and otherwise take action to maintain its associated spatial conception. While usually applied to the terrestrial spaces on which human societies thrive, a Lefebvrean spatial framework applies equally to physical spaces that are more commonly socially abstracted, an example of which is oceanic space.

Steinberg (2001) calls these overlapping physical and social marine spaces "ocean-spaces" and constructs a historical narrative of the transformation of human society's most prominent conceptions of ocean-spaces through broad developmental epochs. His analysis, greatly informed by the works of Henri Lefebvre (1991) (and therefore Karl Marx), indicates that from pre-modern to post-industrial ages, society has broadly retained some conceptions of ocean-space (e.g., oceanic territory, ocean as void) and also has developed very new conceptions (e.g., defensible ecosystem, fuel extraction site). Importantly, Steinberg identifies prominent ocean-space manifestations extant to contemporary human societies: frictionless transportation surface, territorial space, stewarded or protected environment, and resource extraction site. While there is substantial precedent in sociological research for application of Lefebvre's more generalizable spatial theory (Rebotier 2012; Zhang and Spicer 2014), Steinberg's theory remains much more popular with geographers, likely due to its specificity to an under-examined object of study.

For Steinberg (2001), the ocean's meaning is largely determined by broad political economic transitions, its social construction a product of each major development of capitalism. However, when one's lens narrows to the local scale, to a specific place or set of places wherein a socio-spatial dialectic actively "takes place," the myriad cultural and sub-cultural representations of ocean-space, their economic pre-conditions, and the practices that reproduce those representations are left unaddressed. Moreover, as globalization continues its international social transformation, Steinberg's analysis is quickly becoming dated. The present study extends Steinberg's theory into the local, the practiced, and the transforming physicality of global climate change. No one-size-fits-all state- or corporate-sponsored ocean-space type can map neatly onto a single municipality, nor can a port city be said to reside simply in proximity to "the ocean." Rather, this study seeks to inductively develop ocean-space "profiles" to describe the cases, while drawing connections from local marine practices to the particular conditions of marine spaces and the localized risks associated with impending SLR in Bainbridge Island and Aberdeen.

This study thus uses an empirical analysis of specific cases to develop alternative notions of ocean-space thus far neglected in Steinberg's (2001) typology, expanding it considerably but limiting this expansion to two specific cases. Lefebvre's triplicate spatial framework is used to interpret these profiles, thereby elaborating the processes by which social conceptions of the ocean relate to policy production. The process by which physical, conceptual, and practiced social spaces dialectically inform one another's continual reproduction is a process played out in the development of physical realities of SLR, shared conceptions of the ocean, and local practices.

Field sites

Aberdeen and Bainbridge Island were selected as the most suitable comparable pairing of cases for this study in terms of available data that are useful in addressing the

Table 1. Characteristics of Aberdeen, WA, and Bainbridge Island, WA (2013).

	Aberdeen	Bainbridge Island
Population	16,371	23,196
Population Density (per sq. mile)	1,540	840
% Urban	99	89
Median Household Income	$38,120	$95,877
Median Resident Age	35.3	48.4
% White Alone	70.8	86.3
% Democrat	56.1	55.3
Most Common Industry (Males)	Manufacturing	Professional, Scientific, and Technical
Most Common Industry (Females)	Health Care and Social Assistance	Health Care and Social Assistance
Most Common Occupation (Males)	Production	Management
Most Common Occupation (Females)	Office and Administrative Support	Office and Administrative Support
# of Natural Disasters / Floods (in recorded history)	22 / 17	14 / 9

Source: City-data.com, Homefacts.com, United States Census Bureau.

primary research question as well as accessibility. Cities were chosen that were in many respects similar to cities across the United States facing varied vulnerabilities with similarly varied capacities to address those conditions. There are hundreds of understudied small-to-medium sized U.S. municipalities facing potential significant losses due to SLR (Climate Central 2015; Strauss, Kulp, and Levermann 2015). The cases examined represent two of the best suited cases in Washington for a variation finding comparison. The two cities are both coastal, relatively near one another, are similar in population size (although not population density) and are similarly politically liberal. They are mostly urban spaces, demographically populated by those middle-aged and white. However, the cities differ industrially and economically. As of 2015, median income for Aberdeen is about $39,000 per year, with employment largely in manufacturing and production, while Bainbridge Island is considered a hub of high-tech and Internet-based employment, with a 2015 median income of about $95,000 per year[1] (United States Census Bureau 2015). Moreover, the cities differ drastically in exposure to natural disasters, with Aberdeen documenting seventeen flood disasters in its recorded history and Bainbridge Island documenting only nine. Table 1 provides details of these comparative factors.

Aberdeen

Late in the 19th century, Aberdeen, Washington, was established as a port where the Chehalis River empties into Grays Harbor, supporting a lucrative timber industry. Compared to its sister cities on the Harbor, Aberdeen is more affluent and moderately larger in population and size than Hoquiam, while it is less affluent and much larger in population and size than Cosmopolis. Aberdeen's prosperity rose and fell through the 20th century, marked by both the rapid construction of dozens of sawmills and the eventual closing of nearly all of them by the 1980's. Today, the city's economy remains tied to the decline of local timber, as multinational corporations such as Weyerhaeuser have abandoned the area for enterprises in western Canada, India, and China (White 2009).

The cities on Grays Harbor are in many ways interdependent, sharing hospitals, colleges, roadways, economies, and political committees. One such committee is the

Chehalis River Basin Flood Authority (CRBFA), a local municipal collaborative developed to pool resources and information toward flood mitigation and adaptation. Aberdeen's participation in the CRBFA represents its greatest effort to develop local flood hazard prevention. However, this fact is also indicative of Aberdeen's inability to develop solutions independently. The decline of Aberdeen's material resource base and the socioeconomic destruction associated with flood events have been mutually reinforcing phenomena.

The Chehalis River Basin itself, a system of tributaries and floodplains covering the surrounding area, is topographically and ecologically co-evolved with a consistent pattern of inundation. This natural balance of land and sea is disrupted by widespread deforestation and urban development, a process of soil degradation linked to increased likelihoods of landslides and decreased water quality (Turner et al. 2010). Flood events are not only expected to increase in frequency, but local human, physical, and ecological systems are likely to experience increased difficulty in recovery. According to Climate Central's *Surging Seas* SLR analysis, there is a 100% likelihood that Grays Harbor will experience a three-foot flood event by 2020 (Climate Central 2015). Additionally, 91% of Aberdeen's residents are described as being at an at least medium level of social vulnerability when considering socioeconomic variables that contribute to a community's ability to prepare for and respond to natural disasters (Hazards and Vulnerability Research Institute [HVRI] 2013). Over the last decade, Aberdeen has experienced such catastrophic events every few years, most recently in January of 2015. The town has a long history of coping with an environmental propensity for inundation, but as economy, climate, and sea levels change, the 21st century holds dramatic increases in risk for local residents.

Bainbridge Island

Bainbridge Island, Washington, is an affluent island community in Puget Sound, roughly a half-hour's ferry trip across Elliott Bay from Seattle. Owing to its natural beauty and relative isolation, today's Bainbridge is comprised of luxurious homes, quaint shops, bustling restaurants, and thick interstitial woodlands, giving it the feel of a summer vacationer's town. The city was once called the second best place to live in the United States (Money 2005). As both a popular location for Seattle day-trippers and the home of many who commute to Seattle for work, Bainbridge Island's relationship with the city is economically symbiotic. However, Bainbridge closely guards an independent political identity. When necessary, Elliott Bay provides a physical barrier from Seattle's greatest contemporary social problems, such as homelessness. Instead, local committees debate smaller matters, such as whether to fund new marine police vehicles (Bainbridge Island Review 2005) or whether small public properties should be developed as parks (Bainbridge Island Review 2002). At once firmly connected to western Washington's urban center and permanently isolated by physical spatial barriers, Bainbridge Islanders precisely control the extent of their political autonomy.

The environmental and disaster-based policies associated with SLR provide other useful comparisons between the two cases. According to *Surging Seas*, almost none of Bainbridge Island is at physical risk of experiencing SLR directly, and no Bainbridge

residents are estimated to be highly socially vulnerable to such events (Climate Central 2015). Bainbridge Island rises steeply out of Puget Sound, lacking the low-elevation riparian spaces associated with flood risk. Nevertheless, the City of Bainbridge Island exhibits political concern and preparation for SLR events by dedicating substantial efforts to construct resilient, ecologically healthy shorelines, as well as in becoming an ecologically sustainable community that contributes minimally to global climate change (City of Bainbridge Island 2004).

Research methods

Archival data were collected to examine localized ocean-space and SLR policy. Part of the analysis relied on publically available city data (e.g., United States Census Bureau 2015) and SLR projections (e.g., Climate Central 2015) to provide insight into the topographical and urban characteristics of each city. The policy analysis draws on planning documents and local governmental meeting minutes, textual products that not only reflect socio-spatial construction on behalf of the state but actively inform local socio-spatial discourse (Espeland 1993; Smith 1990). Media behaves as an institutional actor in the public sphere, in which and from which social constructions are generated in dialogue with the state, and also elucidates social practices (Baiocchi 2003; Habermas 1989; Oliver and Meyer 1999). Together, these data sources represent a triangulation of dominant (though incomplete) socio-spatial discourse by allowing investigation into two major institutional actors, media and local government, providing a well-rounded account of localized ocean-spaces.

Qualitative content analysis is employed to characterize locally specific ocean-spaces and SLR policy profiles in an in-depth case comparison of Aberdeen and Bainbridge Island. The analysis follows a dialectical grounded theory approach, whereby coding text reveals emergent patterns that are consolidated with like codes, constructing a typology from which to inductively build new theory (Abu-Lughod 2011; Corbin and Strauss 2007; LaRossa 2005). The author constructed new theoretical ocean-space types and SLR profiles by identifying emergent patterns in the data and assessing the relationship of those patterns to Steinberg's (2001) existing ocean-space typology and best practice SLR policy characterization (Abu-Lughod 2011; Emerson, Fretz, and Shaw 1995; IPCC 2014). The author coded all documents for ocean-space conceptions and SLR policy type and compared relative code counts to determine the greatest discrepancies in expressed type. Such content analyses have a substantial history of use in social scientific research but are often constructed with great variation, indicative of the flexibility of the method, which consists of applying a fixed interpretational strategy to text such that interpretation is both systematic and objective (Schreier 2014). Dialectical grounded theory allowed for differentiation between the ocean-space conceptions most frequently produced in Aberdeen and Bainbridge Island and elaboration of many ocean-space conceptions unaccounted for by Steinberg (2001). For example, this analysis allowed for differentiation between habitat, ecosystem, protected space, Mother Nature, etc., where Steinberg's typology groups these perspectives into a single "Stewardship" ocean-space conception. Future analyses may aggregate these smaller categories into a broader typology in order to inductively reveal broader patterns.

Policy analysis

Data used in this policy analysis are made up of all publicly available information on state-sponsored responses to SLR demonstrated by both Aberdeen and Bainbridge Island circa 2014. Data were collected from archival online sources and city hall records requests. Data collected for Aberdeen consist of forty-nine documents. In total, this dataset includes fourteen emergency support function documents, nine flood-related maps, nine public hazard preparation documents, three strategic presentations, two meeting minutes' documents, two hazard plans, one comprehensive plan, one emergency preparedness checklist, one public meeting announcement, one meeting report, one project master list, one project plan, one critical areas ordinance, one recommendation report, and one chapter of municipal code. Data collected for Bainbridge Island consist of forty-five documents. In total, this dataset includes twenty-three meeting minutes' documents, four environmental technical advisory reports, three environmental element aspects, two development plans, two addendums to science reports, two appendices to comprehensive plans, two comprehensive plan updates, two commissioned environmental protection reports, one commissioned scientific report, one commissioned development assessment, one informational sheet on shoreline armoring, one city ordinance, and one critical areas ordinance.

The scope of policy data was broadened to include the Chehalis River Basin Flood Authority and Grays Harbor County in the case of Aberdeen due to a desire to fully recognize a broader set of policies in place for that community. Aberdeen is a primary actor in the flood authority and remains a part of that organization in an effort to confront flood risk. The difference in scope of available data sources between the two cases is a symptom of their structural differences as communities and governments. As such, CRBFA policy is treated as a variety of Aberdeen policy. A similar logic underlies the choice to use a broad range of state-sponsored documents. For example, related commissioned reports are included in the case of Bainbridge Island (no such reports exist for Aberdeen), as these documents appear to greatly influence the city's policies. Differences in purpose and structural impact of documents were factored into analysis in the interpretation of results. For example, adaptive strategies listed among proposed initiatives were afforded less importance than strategies outlined in established comprehensive plans.

All policy documents for this analysis were coded using NVivo software. Research suggests that use of this software in qualitative content analysis increases the transparency and validity of analyses by providing a standardized process base and encouraging imitable descriptions of methods among client users (Kaefer, Roper, and Sinha 2015). In the analysis of marine spatial concepts, socially produced ocean-space types were identified by coding all mentions of ocean and ocean-related concepts. In each unique case, the coded ocean-space conception was defined by taking the coded phrase in isolation and determining the single word that best defined ocean-space in that case. If this conception was occurring for the first time, a coding category was created; if it was reappearing, the phrase was coded into an existing category. This type of "latent coding" is used in qualitative content analyses to extrapolate meaning from text and is associated with losses of external and internal reliability as well as increases in internal validity, as the meaning or use of the text is arguably more accurately represented in

findings associated with latent coding processes (Hsieh and Shannon 2005). In total, three rounds of coding were completed: the first in order to develop the total typology of ocean space conceptions, the second to ensure passages were coded correctly following the development of new emergent types, and the third to code for SLR policy. Coded phrases are here sometimes described as "nodes" for simplicity. For example, the phrase "an island tsunami has the potential for no warning" has been coded as "Ambusher" because the ocean is there described as a place of *concealed* danger[2].

In the analysis of SLR policy, best practice policy as defined by the IPCC was divided into key elements, and policy documents for each case were coded for frequency of those elements. The IPCC (2014) Fifth Assessment Report identifies best governmental practice in relation to SLR as including (1) endeavors to maintain coastal wetland and coral reef health, as these systems protect against storm surges; (2) the maintenance of wetlands and green spaces, which prevent the exacerbation of flooding; (3) the identification of impoverished communities as being at greater risk; (4) plans to incorporate SLR risks into infrastructural engineering; and (5) disaster preparation in the form of drills or other forms of heightened awareness. Use of IPCC assessment reports as documents representative of international scientific consensus regarding the aspects of global climate change follows precedent in related social scientific research (McCright and Dunlap 2003; Ford, Vanderbilt, and Berrang-Ford 2012), and IPCC findings have also been endorsed by the National Academy of Sciences (National Research Council 2001).

During the coding process, some phrases of policy were coded as relating to more than one component of best practice policy. Nodes were then counted and compared within the Bainbridge Island and Aberdeen cases to construct profiles of municipal SLR policy in both cities. As an example, where policy data for Bainbridge Island exhibited no mention of disparate socioeconomic vulnerability to SLR, policy was then characterized as not adhering to that aspect of best practice policy, a finding that is discussed further below.

Media analysis

The author also conducted an analysis of local newspaper coverage concerning events and general topics related to the ocean, flooding, and SLR in Aberdeen and Bainbridge Island, which allowed for the development of the final categories for this research. The analysis was restricted to the cities' leading local newspapers, Aberdeen's *The Daily World* (circulation 10,000) and Bainbridge Island's *The Review* (circulation 2,360). Owned by Sound Publishing Inc., both newspapers are deeply entwined with local history. *The Daily World* has been in print for more than a century, and *The Review* is renowned for being the only English language newspaper on the west coast to openly oppose the internment of Japanese-Americans in the 1940s. While the *Seattle Times* (circulation ∼230,000) probably does receive greater readership in the Bainbridge community, the significantly smaller paper was selected because of its inward focus. This results in a set of data that de-emphasizes the important relationship between Bainbridge Island and Seattle, but one that captures a perspective unique to Bainbridge Island.

Newspapers were selected as data rather than magazines, radio, television, or other media sources due to the broad and variable range of coverage, historical relevance, accessibility, and prominent role amongst media in affecting public thought. Research has shown that print newspapers have generally declined in popularity since 1990 (Pew Research Center for the People and the Press 2018). However, the Internet presences of newspaper outlets have increased to adapt to a reader base that is more frequently finding news online, such that newspapers are a changed yet still popular news platform (Pew Research Center for the People and the Press 2010). Use of local newspapers ensured locally relevant coverage, as well as incorporation of many public voices via letters to the editor, obituaries, etc.[3]

Using the Newsbank database, articles were selected for relevance by using a keyword search for the exact terms "ocean," "marine," "sea level," "sea levels," "storm surge," and "flooding." Newsbank has been previously used by scholars when collecting newspaper data for analysis (Altheide and Michalowski 1999), and this particular method of selecting articles from Newsbank using keyword searches to obtain relevant documents has also been previously demonstrated. The keywords provided parameters for the dataset that both honed in on the central subject of SLR and widened the sample to include a broader set of ocean-related discourse. Articles in which the keywords appeared as acontextual metaphors (e.g., "flooding phone lines") or as irrelevant objects of prepositions (e.g., "extending from the ocean to") were excluded from the sample. Articles were collected from *The Review* dating 2000–2015 and from *The Daily World* dating 2005–2015 due to availability within the Newsbank database. From these selected sample groups (for Bainbridge Island $N = 386$; for Aberdeen $N = 1413$), random samples of 100 documents were created for each case. Randomization was performed by assigning each article a number, generating a random number sequence electronically, and selecting the first 100 articles delineated by the random sequence. The articles in each random sample were then coded for ocean-space conceptions using the same method applied to policy data. In the same manner, mentions of the ocean were coded by new or existing definitional categories, and count totals were then established for each conceptual ocean-space type.

Results

This section proceeds to explain the results of the count-based "grounded theory" approach (Abu-Lughod 2011) to this qualitative content analysis of policy and media data in order of those results pertaining to *perceived* ocean-spaces, followed by *conceived* ocean-spaces. Then, findings regarding *lived* spaces are elaborated, which require a less systematic methodological approach but a more in-depth qualitative analysis of the comparative cases of Aberdeen and Bainbridge Island as a whole. Results of the SLR policy analysis are then described. Finally, the triplicité of ocean-space is addressed as a whole, as well as its relation to SLR policy production, bringing these disparate findings into a cohesive description of results. In doing so, the discussion returns to the central research question: How do municipal economic and industrial factors and localized media conceptions of marine spaces influence municipal SLR policy?

Perceived ocean-space

Perceived ocean-spaces here refer to the physical and material realities of marine spaces surrounding Aberdeen and Bainbridge Island, as well as disparate levels of exposure to floods caused by SLR. This dimension of space is not informed by the content analysis, but is, as previously mentioned, knowable from archival city and geographical data. Generally, it is most significant to this analysis to note that Aberdeen is at high risk of experiencing SLR-related flood events, while Bainbridge Island is at little risk. It is also significant that Aberdeen's natural environment is largely comprised of floodplains, while Bainbridge Island is highly elevated and forested. Finally, the economic and industrial realities of Bainbridge Island and Aberdeen (described in Table 1) as having a material spatial reality that is related to *conceived* and *lived* spatial realities should be considered. Aberdeen is characterized by a mutually reinforcing combination of low socioeconomic status and high vulnerability, while Bainbridge Island exhibits high socioeconomic status and low vulnerability.

Conceived space: ocean-space conceptions

The *conceived* aspect of Lefebvre's triplicate spatial framework is operationalized here as ocean-space conceptions. The most common conceptions are presented below in Table 2. These results may be reported with four distinct attentions: 1) to notable within-case results, 2) to differences between policy and media documents, 3) to differences between documents associated with Aberdeen and Bainbridge Island, WA, and 4) to differences at the intersection of attentions 2 and 3. This analysis emphasizes attentions 3 and 4. To the first point, both policy and media documents for both cities appear more likely to describe the ocean as something like recreational space, polluted space, or protected space than to describe it as, say, a mystery. These discrepancies appear to indicate a macro-level, perhaps international conception of ocean-space in the vein of Steinberg's (2001) analysis. This large-scale ocean-space conception may be of great relevance to studies of human–ocean relations. However, speculations into its properties are beyond the scope of this project, and the analysis continues by emphasizing differences between the specific cases examined here.

Attention to differences between media and policy documents yields some results that indicate relevant distinctions, and more importantly, the comparison behaves as a useful "axis" (demonstrated below) with which one might make apparent ocean-space conceptions associated simultaneously with both cities and document types. Media

Table 2. Frequently coded ocean-space conceptions by city.

Concept	Aberdeen	Bainbridge Island	Total
Habitat	29	45	74
Recreational Space	37	32	69
Trade Conduit	11	38	49
Polluted Space	24	25	49
Reactionary	13	34	47
Protected Space	15	26	41
Destructor	26	11	37
Ecosystem	10	27	37
Inundator	30	5	35
Killer	15	12	27

Table 3. Ocean-space conceptions most associated with intersections of document types and cities.

	Ocean-space Conception	
Place	Media	Policy
Aberdeen	Inundator, Foraging Space	Adversary
Bainbridge Island	Trade Conduit, Habitat	Resource

appears to more often describe the ocean as culture maker, examinee, fishing resource, foraging space, habitat, industrial site, inundator, killer, muse, polluted space, recreational space, and trade conduit. Policy appears more likely to describe the ocean as resource, ecosystem manager, climate maker, and nurturer. The author does not attempt here to describe a pattern among these findings; their difference follows common knowledge notions of the subject matter of municipal policy and newspapers. These findings are brought to light for their relevance to the results produced by overlapping axes.

Between cities, one might begin to discern the broader different conceptions of ocean-space associated with each case. To report these results without that caveat would be to assume that only differentiated conceptions constitute a case's ocean-space conceptual profile. However, it is the difference between cases on which this analysis is intended to shed light. Comparatively, Aberdeen appears to more frequently exhibit ocean-space conceptions of adversary, ambusher, destructor, economic detractor, foraging space, inundator, and terror. Bainbridge Island appears to more frequently describe the ocean as esthetic object, ecosystem, habitat, historical site, home, jurisdiction, reactionary, resource, restoration project, and trade conduit. Unlike the between-document type results, the author will here attempt to draw rudimentary descriptions, as similarities between these in-case conception lists appear obvious. Specifically, these results appear to reinforce in part the apparent discrepancy between cases that leant itself to case selection; to Aberdeen, the ocean is often a destructive and fearsome outsider, while to Bainbridge Island it is often a valuable and foundational aspect of the community.

Finally, at the intersection of between-case and between-document type comparisons, four "quadrants" of ocean-space conceptions constitute the crux of further discussion of these results. The results are displayed in Table 3. For Aberdeen media, the ocean is often inundator and foraging space. For Aberdeen policy, it is often adversary. One key example of the adversarial conception comes from the Chehalis Basin Work Group's (a team of representatives from the Chehalis Basin organized by state governor Jay Inslee to assess flood risks and solutions) Recommendations Report, which states that the only consensus at the group's origin was that communities must be protected from flooding:

> When the Work Group started meeting two years ago there was consensus only around the idea that the fishery resource is degraded and that something must be done to protect families, communities, and infrastructure from catastrophic flooding. (Chehalis Basin Work Group 2014)

These types of discussions are indicative of the descriptions used in Aberdeenian policy more broadly that characterize the ocean as a kind of opponent to be protected against[4]. For Bainbridge Island media, the ocean is often trade conduit and habitat. For Bainbridge Island policy, it is often resource. One example of the extent to which Bainbridge Island considers a variety of environmental features as valuable resources

comes from a planning commission agenda packet, wherein it is described that industrial development should not be constructed so as to devalue shoreline resources:

> Water-dependent industrial development shall not be located on sensitive and ecologically valuable shorelines such as natural accretion shore forms, marshes, bogs, swamps, salt marshes and tidal flats, and wildlife habitat areas, nor on shores inherently hazardous to such development, such as flood erosion prone areas and steep and unstable slopes. (City of Bainbridge Island 2015)

Special significance should be attached to the individual case policy results, the terms *adversary* and *resource*, which isolate a particularly poetic dichotomy that is characteristic of the essential tension from which this project is grown.

Lived space

Having described *perceived* characteristics of ocean-space for each case, and having explained where results of these analyses delineate salient characteristics of *conceived* ocean-spaces for Aberdeen and Bainbridge Island, the analysis now attends to lived spaces. Here, the analysis is supplemented with selected textual representations of habitual practices that reinforce ocean-space conceptions and transform physical ocean-spaces. Most of these data come from media documents, where the public's routine oceanic activities are often documented. The author knows of no specific research that has described the usefulness of media data in describing lived experiences in contrast to policy data, but it is apparent when considering the separate policy and media datasets here that the media set contains significantly more information regarding residents' daily lives. The analysis constructs yet another profile for each city, one of *lived* space, to be used in our interpretation of results.

For residents of Aberdeen, the ocean is a space which is developed from many routine activities. Primarily, it is 1) a space in which industrial routines occur at some personal distance, 2) a place to be visited on special occasions, or 3) a space from which hazards may occur. These daily routines include primarily the large amount of shipping and receiving that take place at Grays Harbor's ports, but also commercial fishing. Below, one writer for the *Daily World* offers a description of the docks at Aberdeen:

> At the edge of the expansive Pacific Ocean, nestled among the evergreens and industrial infrastructure, massive ships make port along the shores of Grays Harbor. Long trains stretch across the waterfront as warehouses sit stocked for export. Work crews crowd the docks. (Jones 2011)

Special occasions on which Aberdeenians might visit the shore or waters of Grays Harbor include seasonal clam digs, recreational fishing ventures, and an occasional beachcombing contest (this is supplemented by the "Foraging Space" conception commonly found in Aberdeenian media documents, included in Table 3). Below, the *Daily World* offers a quote suggestive of both the popularity of clam digs and the impact of volatile climate on these events:

> With the rough weather we had during the last opener, digging dropped off significantly as people played it safe,' Aryes said. 'On the plus side, there are likely enough clams remaining in the quote to offer more digs later. (Daily World 2010)

Finally, the *lived* manifestation of Aberdeenian ocean-space also includes the routine practices of flood prevention, such as seasonal preparatory purchases, household

reinforcements, damage recovery, and family emergency preparation. For example, the Grays Harbor All Hazards Guide provides comprehensive recommendations for household disaster management, urging readers to consider the preparatory actions they might take. The quote that follows vigorously questions readers about their preparation for unforeseeable disasters:

> Do you know how to turn off the gas to your home? Do you know how to turn off the water? Do you know what emergency supplies your family must have to survive during a disaster? … Ask yourself these questions: *If disaster strikes am I prepared? Do I have a Disaster Supply Kit that will see me through until help arrives?* (Grays Harbor County 2010)

Taken together, one might consider lived Aberdeenian ocean-space to include daily work, occasional recreation, and consistent individualized disaster preparation.

Some Bainbridge Islanders exhibit enjoyment of a close relationship with the sea, reinforced through myriad activities. Broadly, these practices might be separated into categories of 1) transportation, 2) recreation, 3) culture-making, 4) pro-environmental action, and 5) property management. To the first point, citizens of Bainbridge as well as visitors frequently travel by ferry to and from the island, in some cases as a daily routine. In terms of recreation, Puget Sound around Bainbridge Island offers many opportunities, from sailing to fishing to swimming off a backyard pier. Bainbridge Islanders frequently cite the ocean in efforts to self-define a cultural identity, with artistic and scientific projects alike. Bainbridge Islanders also engage in daily practices of environmental ocean-space preservation, through measures to conserve individual energy use, and use pollution-free transportation such as bicycles, or recycle. Occasionally, pieces composed by residents appear in the *Bainbridge Island Review*, urging fellow islanders to actively participate in pro-environmental behavior. The quote below describes the ocean as "Mother," urging readers to take part in events such as beach walks, which are meant to restore the health of oceans and shorelines:

> … isn't it about time we all showed a little more respect and generosity of spirit toward our Mother, the ocean? The Puget Sound, our own local little branch of the ocean, is in trouble and needs help. Efforts are under way on many fronts to restore the health of the Sound and make it accessible to all of us … The Mud Up campaign is one such effort, and it's hosting a free, guided, low-tide beach walk … So come on down and get yourself muddy for a good cause. Your Mother will thank you. (Tyner 2008)

Many citizens of Bainbridge Island live in very close proximity to the Sound, often in beachfront homes. For these residents, the ocean is a constant aspect of living space, one which both enhances and threatens their property, and these individuals may engage in occasional shoreline protection measures, such as construction of armoring walls, personal endeavors to maintain soil health, and participation in local initiatives that clean up shorelines and educate residents as to their natural processes. Taken together, these aspects of *lived* ocean-space in Bainbridge Island reinforce the ocean's vital role as a *part* of Bainbridge as both natural resource and element of home.

SLR policy analysis

Count comparisons of aspects of best practice SLR policy reveal disparate policy profiles across the cases of Aberdeen and Bainbridge Island, WA. These results are reported in

Table 4. Components of best practice sea-level rise policy in policy documents for Aberdeen, WA ($N = 49$) and Bainbridge, WA ($N = 45$).

	Aberdeen			Bainbridge Island		
	Total Nodes	Unique Documents	% of Nodes	Total Nodes	Unique Documents	% of Nodes
Emergency Preparation	95	37	30%	7	6	3%
Wetland and Greenspace Maintenance	101	12	32%	45	10	21%
Coast and Reef Maintenance	10	4	3%	128	22	61%
Infrastructure Development	101	15	32%	63	18	30%
Identification of Poverty as Source of Increased Risk	5	4	1%	0	0	0%

Table 4 (note: Percentages in the table do not add up to 100%, as they represent percent of total documents for each category independently). Both cities are similar in exhibiting strong interest in developing infrastructure around SLR and developing wetlands and other greenspaces such as buffers and natural floodplains. Additionally, Aberdeen exhibits very weak interest in identifying impoverished community members as being at heightened risk, while this concept is absent entirely from Bainbridge Island policy. The cities differ in that Aberdeen exhibits strong interest in emergency preparedness and weak interest in developing protective reefs or shorelines, while Bainbridge Island exhibits weak interest in the former and strong interest in the latter. These differences are associated with physical necessities as well as social differences across the two cities. This count-based content analysis is supplemented with an in-depth analysis of the documents used as data.

Unlike the analysis of ocean-space types aforesaid, this best practice policy analysis is not limited to comparison between cases. Each set of counts may stand alone as a complete profile of a city's adherence to best practice SLR policy as described by the IPCC. Individually, these profiles are as follows. Policy developed by Aberdeen and its constituent organizations currently plan a strategy emphasizing disaster prevention and mitigation. These measures include developing urban infrastructure that is resistant to flood damage; constructing levees, dams, and other water retention structures; creating and sustaining wetland spaces to drain floodwaters naturally; and most saliently, instituting comprehensive public disaster awareness and preparedness programs. This overall plan is perhaps best demonstrated by the goals set out by the Chehalis River Basin Flood Authority's Comprehensive Flood Hazard Management Plan, which include the need for better organizational structures, as well as increased funding, information, and coordination:

The Flood Authority … agreed to the following goals in the Interlocal Agreement:

- To create a Basin Flood Control District as soon as is practicable.
- To inform state and federal funding sources of project options and the needs of basin communities.
- To work with the State of Washington to develop appropriate policy for a basin-wide flood control project.
- To seek adequate funding for the Basin Governments to identify, study, and permit projects for localized problems.
- To disseminate information to residents about options and alternatives.
- To coordinate flood control activities, actions and responses. (CRFBA 2010)

Aberdeen has no plans in place to mitigate SLR by establishing shoreline protections, nor does it have substantial plans to formally acknowledge disparate levels of exposure to risk based on economic status within the community.

In contrast, Bainbridge Island has adopted SLR policy that emphasizes environmentalism, including endeavors such as divestment from fossil fuels, as well as substantial efforts to develop naturally sustainable shorelines. For Bainbridge Island, SLR is part of the larger problem of global climate change, and local solutions must fall in line with the sustainable practices that contribute to mitigation of climate change writ large. This sentiment is most clearly expressed in the environmental element of Bainbridge Island's Comprehensive Plan, where language of ecological sustainability is often paired with descriptions of attached social well-being:

> Understanding the functions of the Island's valuable natural systems and what types of activities may impact these functions is key to protecting these lands and natural resource areas. Retaining the viability and ecological functions of our natural systems and protecting those areas that are sensitive to development is paramount to maintaining a healthy natural environment and a high quality of life (City of Bainbridge Island 2004).

Therefore, shoreline armoring and other ecologically destructive measures which may protect against SLR are discarded in favor of funding scientific research into the maintenance of the island's particular beaches. Absent from Bainbridge Island's current policy is concern for individual-level adaptation, including potential disparate risk positions, but especially indicated by an apparent lack of emergency preparedness.

Sea-level rise policy and the triplicité of ocean-space

The analysis now turns to explain the relationship between the aspects of the three-part manifestation of ocean-space for Bainbridge Island and Aberdeen, WA, and SLR policy profiles for each city using the Lefebvrean socio-spatial framework previously described. Table 5 collects the details of these case aspects into an easily comparable format. While analyses here are used to empirically identify these characteristics, interpretation of these results relies on theory to explain their dynamic relationships. From the Lefebvrean socio-spatial theoretical perspective, these aspects of ocean-space affect one another along an historical causal chain. However, this causal chain is unknowable from data regarded here. Instead, the relationships between parts of the ocean-space triplicité

Table 5. Ocean-space manifestation and sea-level rise policy for Bainbridge Island and Aberdeen, WA.

City	Perceived ocean-space	Conceived ocean-space	Lived ocean-space	Sea-level rise policy
Aberdeen	Low Elevation, High Population Density, Highly Urban, Large Floodplains, Land Use for Manufacturing	Ocean as Adversary	Transportation, Labor, Occasional Recreation, Disaster Preparation	Emergency Preparation, Wetland Maintenance, Infrastructure Development
Bainbridge Island	High Elevation, Low Population Density, Moderately Urban, Land Use Residential	Ocean as Resource	Natural Resource, Routine Recreation, Transportation, Property Maintenance, Culture Making	Coastal Maintenance, Wetland Maintenance, Infrastructure Development

are examined, demonstrating the production and productivity of ocean-space conceptions. In this case, policy behaves both as a thing developed from socio-spatial conceptions and practices and a thing acting in the development of those conceptions and practices. Said differently, localized SLR policy not only reacts to local physical realities of ocean-space, conceptions of ocean-space, and practices therein, but may also be related to the reproduction of each element of this triplicité. For example, infrastructural development and maintenance of coastlines constitute manipulation of physical space; repurposing land as wetlands or retreat from shorelines redefines social conceptions of those spaces; and emergency preparation develops individualized routine actions. Therefore, policy may be said to operate at all levels of the spatial triplicité as both affecting and effect. The analysis proceeds by interpreting each case individually, comparing the two cases, and then entering a discussion of the general processes elucidated here, as well as their generalizability.

Development of Aberdeenian ocean-space and SLR policy are characterized by conflict – between the dissolving land and rising sea, between the large storms looming ahead and the constantly rebuilding city, between residents of Aberdeen and their local government, and in some grander sense, between humanity and nature. Aberdeen's SLR policy does not appear to be a consensus strategy, but rather one characterized by conflict between residents and policymakers. Specifically, this conflict is apparent in the meeting minutes of the Chehalis River Basin Flood Authority (CRBFA). Those who sit on this organization are unsure of its usefulness, while those who rely on it are largely unimpressed with its progress and transparency. In one meeting, fed-up residents openly berated the efforts of the CRBFA, while officials demonstrated little motivation to defend either the previous choices of the authority or the related choices of policymakers elsewhere in city government. This dynamic is evident in the following excerpt from that meeting, in which residents criticize policymakers' progress and policymakers appeal to organizational inadequacy and unfortunate structural developments:

Resident comments:

"Everything you've done is backwards to what will work. You won't get anything in place."

"My question is when do the studies end and something actually begin to happen? The studies have been going on for 100 years. They had studies on flood control and nothing is happening. When do the studies end and the action start going?"

Policy maker comments:

"We know you need projects. We've been trying to do projects since the 30's. We're trying to put something together so we can get there and actually do something … The Authority was not meant to last this long. We thought we'd have a district by now. Our next chore is to move to a district so people in the business of solving flooding are in control of this instead of part-time politicians."

"Commissioner Schulte says he agrees. Whoever decided to put I-5 where it is should be committed." (CRBFA 2010)

This last comment, which resentfully addresses the decision to build Interstate-5 through an area known to experience frequent flooding, is particularly revealing the helplessness felt at all levels of local government with regard to SLR. Interstate-5 is a

critical component of the economy of Grays Harbor, as its traffic brings opportunity for service industries surrounding the interstate, and it simply cannot be abandoned, yet to construct one's business in proximity to it is to expose oneself to consistent flood risk. This is a problem, much like the collapsing of the local timber industry or climate change more broadly, that is far beyond the scope of the CRFBA. Yet, these are the concerns residents bring to the table at open meetings such as the one quoted above – concerns that reflect the intersection of low socioeconomic status with high physical vulnerability to natural disasters.

With limited control over infrastructure, an inability to prevent the loss of income and the social vulnerability there associated, and no access to the funds required to even attempt the physical wrangling of storm surges and rising sea levels via state-of-the-art off-coast technologies, Aberdeen's primary actors in flood prevention policy are forced to disseminate responsibility to individual residents already beleaguered by the challenges of rebuilding from prior disasters. It is at this point that disaster preparation pamphlets, checklists, and other materials of individualized relief responsibility are necessarily generated. And, it is at this point that one might begin to consider the inter-play of Aberdeen's triplicate ocean-space with its SLR policy. More specifically, one might see the productivity and production of Aberdeen's conceptual emphasis on oceanic conflict as interrelated processes, related to both local material realities and lived experiences.

At base, Aberdeen's *perceived* space is problematic. It is a city located in an area that frequently floods, in a time when global SLR threatens to drastically increase the frequency and intensity of those flood events. Moreover, it is an increasingly economically disadvantaged community, whose location, once an economic asset, now poses a great threat. Consequently, Aberdeen's *conceived* relationship with the sea is primarily adversarial, frequently a real struggle to defend human lives, constructs, and local economy from harm. This adversarial relationship is *lived* through simultaneous individualized economic dependence upon the sea and individualized defensive practices such as disaster preparation. Finally, policy production is related to this dialectical process. In reaction to the potential of SLR, Aberdeen acts to recreate floodplains where possible, to develop levees, and force individuals not to build in highly threatened areas, physically transforming itself in relation to the sea. In terms of *conceived* space, Aberdeen speaks in its SLR policy documents of the ocean as a literal adversary, as indicated by the content analysis presented here. And, Aberdeenian SLR policy demands individualized, routine *lived* action to prevent and recover from impending disaster.

In a wholly separate case, the ocean-space of Bainbridge Island is generated through a dialectic emphasizing the ocean as a fundamental resource on which the city is established and through which it continues to thrive. Unlike Aberdeen, SLR policy in Bainbridge Island is developed with a unity of purpose reflecting the essential idea on which the city was apparently founded: The natural beauty of the island must be preserved, for it is the thing that makes Bainbridge a special place to live. Said differently, for Bainbridge Island, environmental protection and self-protection are one and the same goal. This distinction from the Aberdeenian case is emphasized by returning to the content analysis results that indicate that where Aberdeenian policy characterizes ocean-space most often as *adversary*, Bainbridge Island instead characterizes the ocean

as *resource*. This idea is played out at scales large and small, from Bainbridge Island's concerns over contributing to global climate change, to its great attention to the preservation of individual local beaches.

Largely at no risk to the worst physical, social, and economic impacts of SLR, Bainbridge Island's SLR policy switches focus to the health of its beaches, the terrestrial and marine ecosystems surrounding them, and the inland greenspaces at any potential risk of inundation. This is also manifest in the generation of ocean-space in Bainbridge Island. The *perceived* ocean-space of Bainbridge Island is one almost universally considered beautiful, one which creates few hazards and many benefits. The *conceived* ocean-space follows logically: The ocean is a natural resource, one which must be preserved and sustained. *Lived* ocean-space commits itself to the same endeavor, as islanders practice recreational activities and environmentally conscious behavior in order to maintain the high value placed on their local ocean-space. As with Aberdeen, the production of SLR policy is here again related to socio-spatial production. That impacts of climate change such as SLR may pose this risk at some point or on some level is reason enough to use this policy to reinforce Bainbridge's *resourceful* ocean-space through simultaneously physically preserving shorelines while protecting their health; by speaking in SLR policy of the ocean as a resource; and by regulating individuals' ability to interfere with beach health and promoting environmentally conscious behavior.

This analysis elaborates the connections between local SLR policy and ocean-space constructions for Bainbridge Island and Aberdeen, WA separately, but also draws implicit comparisons, some of which should be explicitly addressed. In the first place, it is apparent that disparate exposure to flood risk and disparate economic conditions not only are related to the production of distinct ocean-space conceptions, but that environmental prosperity is clearly in some ways linked to economic prosperity. What is of direct concern is the impact of these factors on both ocean-space conceptions and SLR policy. Simply said, the themes presented above indicate that poor economic and environmental conditions may be associated with both conflict-based ocean-space conceptions and SLR policy that is limited in capability and largely individualizing of adaptive responsibility. On the other hand, economic and environmental prosperity appears to be related to symbiotic human–ocean relations, conceptions of the ocean as a valuable resource, robust SLR policy that protects both natural and built environments, and perhaps individualizing of environmental responsibility.

Discussion & conclusion

This study empirically identifies localized ocean-space manifestations, SLR policy profiles, and economic and industrial factors for Aberdeen and Bainbridge Island, WA. Overall, meaningful variation is found between the two cases for all three variables. This essential finding indicates that municipalities face differing local physical and socioeconomic challenges regarding SLR; that communities have place-specific forms of discussing the ocean (and therefore marine-related topics such as SLR) in both media and policy; and that communities do not simply adopt SLR policy, but rather a nuanced, place-specific form of policy. This study finds support for sociological SLR research that has emphasized these distinct vulnerabilities, "place effects," and SLR policy cost-benefit

tradeoffs (Adger 2001; Barnett and Adger 2003; Hamilton et al. 2010). Specifically, this study supplements such work by providing an in-depth account of these phenomena for two coastal cities. More generally, while the study does not imply causality, it elaborates the relationship that quantitative work has thus far found between economic/industrial factors and policy adoption (Rice 2014; Zahran et al. 2006). This is particularly demonstrated by Bainbridge Island's apparent alarm and comprehensive planning regarding SLR despite its low level of exposure. Finally, these findings also appear to some degree to support existing quantitative research that suggests vulnerability to SLR is greatly related to economic vulnerability (Lichter and Felsenstein 2012; McGranahan et al. 2007; Moser, Jeffress Williams, and Boesch 2012). In fact, it seems that vulnerability may be associated with drastically different conceptions of ocean-space as well as policy outcomes, although more research is required to definitively identify this relationship.

This research was also useful in drastically expanding Steinberg's (2001) existing ocean-space typology. At the local level, there exist many nuanced conceptions of ocean-space and that these conceptions can vary dramatically between communities. Moreover, by emphasizing one aspect of climate changes, SLR, the study finds some ocean-space manifestations that may be more prevalent now than when Steinberg's work was completed. More research and theory-building is required to draw concrete connections between this grounded, bottom-up theory of oceanic spaces and Steinberg's broader theory. However, it is evident that theory of the socially constructed ocean is thus far an incomplete project and potentially a fruitful area of future research.

This approach has been in line with Marino and Ribot's (2012) call for research that does not simply identify communities vulnerable to climate change, but attempts to understand those communities' relationship to climate change on their own terms. The primary results of the analysis are the dichotomous ocean-space conceptions found in policy documents of *adversary* (Aberdeen) and *resource* (Bainbridge Island). As the data used here are assembled with a keyword search for terms related to SLR and the ocean generally, these ocean-space conceptions are found specifically in the context of climate change. Beyond demonstrating variability, this dichotomy is suggestive of the reciprocal processes, frequently described by scholars of environmental justice, by which environmental hazards and benefits are unequally distributed (Mohai et al. 2009; Park and Pellow 2011). For Aberdeen, SLR represents a further devaluation of local environment. To local policymakers, the ocean exists in fundamental opposition to the city's well-being, not a natural resource but a force which acts to devalue local property and accrue repair costs for local residents. For Bainbridge Island, while climate change is no immediate threat, it offers an opportunity to establish ecological protections that ensure that Puget Sound, local beaches, and local riparian zones remain environmental benefits. These environmental benefits are essential to retention of property values on Bainbridge Island. Recent work in environmental sociology does not suggest that the variation described in these cases should be interpreted as occurring randomly. While this study cannot empirically define these processes, the in-depth description of policy and media discourse offered here suggests that local socio-spatial conceptions may be an important factor in the complex processes by which unequal resources and risks result in unequal policy outcomes. Moreover, discursive conceptions of ocean-spaces appear to occupy reciprocally reinforcing roles in cycles of socio-spatial reproduction associated with

socioeconomic conditions: For Aberdeen, an absence of resources results in an adversarial approach to planning around the sea, while for Bainbridge Island, the sea itself is a resource essential to maintaining the value of its other resources.

Finally, it is worth examining the relationships identified here between disparate local ocean-space conceptions and SLR policy in light of the IPCC's (2014) best practice advice for SLR adaptation. These best practices are used to develop profiles of each case's SLR policy and therefore attend only to practices mentioned by the IPCC. This study reveals that neither city attempts to follow all policy recommendations, instead mixing and matching to fit local conditions and conceptions. This suggests that the IPCC's best practices with regard to SLR may be followed on a case-by-case basis, perhaps because these suggestions are not equally desirable or even possible for all municipalities to implement. Moreover, the nuances of policy adoption may be affected by localized meanings associated with the ocean and other relevant things. For these reasons, the author suggests that greater attention be granted to national and international climate change adaptation efforts, which enhance the possibility of aid transfer to vulnerable communities. Moreover, fundamental renegotiation of communities' relationship to the sea may be required (where it may be possible) for ecologically sustainable adaptive climate change policy to appear viable. Lastly, it is important to reiterate that neither community has followed the IPCC (2014) SLR policy suggestion of identifying within-community intersections of physical and economic vulnerability. Future research is urgently needed to determine whether this important practice is being overlooked by municipalities.

This study is set out to describe characteristics of localized ocean-space conceptions and SLR policy for two comparable municipal cases in order to examine how media and political socio-spatial discourse might relate to the adoption of related climate change adaptation policy. Findings have indicated that there exists meaningful variation on both accounts. This analysis has discussed ways in which ocean-space conceptions may be related to SLR policy, but further research is required to establish empirical and theoretical connections between localized cultural meanings, vulnerabilities, resources, and policy adoption. Specifically, this project has linked Aberdeen's policy conception of the ocean as *adversary* to its high exposure to SLR, lack of relevant resources, and SLR policy based on emergency preparation and infrastructure development. Bainbridge Island's policy conception of the ocean as *resource* has been linked to its low level of exposure to SLR, abundant relevant resources, and SLR policy based on ecological sustainability. This work supplements related research into locally specific conditions that face municipalities as they confront the growing threats associated with climate change. Moreover, this work also supplements Steinberg's (2001) general theory of marine spaces.

The author has made several suggestions for specific avenues of research into the processes related to these findings. Broadly speaking, more research is required to determine the role of culture in predicting climate change policy outcomes; to expand and elaborate Steinberg's (2001) theory; to further link policy decisions to the processes by which environmental hazards and benefits are unequally distributed; and to describe the locally specific conditions of municipalities beyond the coast of western Washington. This work is associated with a few important limitations. Data and methods used are

unable to determine causal relationships between variables, nor can they identify predictive variables. Moreover, policy and media data can only be used as representative of their related populations to a point, and consequently, these analyses and findings may only pertain to certain portions of the residents of Aberdeen and Bainbridge Island, rather than the cities as a whole. The cases here vary in important ways that have been factored into analysis, but this variation also prevents description of how much sway cultural socio-spatial conceptions truly hold. Not all perspectives are here accounted for, and a perhaps problematic privilege is granted to the discourse of local policymakers. Finally, this analysis would benefit greatly from further qualitative data, especially on-site ethnographic observation, first-hand fieldnotes from open policy meetings, and interviews with local policymakers and residents.

Related quantitative research suggests that vulnerability to climate change and municipal affluence are predictors of municipal climate change policy (Zahran et al. 2006; Rice 2014). This work both supports and greatly complicates this understanding by suggesting that discursive analyses can reveal reciprocal relationships between socioeconomic-based conceptions of environmental spaces and environmental policies. Results suggest that as sociologists consider the factors that determine municipal adoption of appropriate climate change policy, local cultural factors must be assessed in order to understand vulnerability, risk perception, and policy.

Notes

1. This difference in employment type pertains only to men, and women in either city appear to work most often in the same positions: health care, social assistance, and administrative support.
2. Some codes, such as "Danger," were used initially but later separated into more specific categories that revealed the associated nuanced meanings. In this way, the depth of the coding partially followed the available depth of meaning within the datasets.
3. An ideal analysis would indeed examine many forms of media and incorporate as many local actors as possible. Some ocean-space conceptions infrequently documented here are probably more prevalent in alternative social forums. Additionally, media and policy documents are unlikely to represent all people equally. For example, although the Quinault frequently communicate with the Chehalis River Basin Flood Authority, whatever manner in which the ocean discursively manifests in Quinault texts is not knowable by the dataset. An ideal analysis would take greater care to compensate for the social dynamics that make important ocean-space conceptions less visible and therefore less accessible to the researcher.
4. Importantly, this quote does include the term "resource" in reference to the ocean. However, its inclusion here is as at most a counterfactual point, as the point is not that Aberdeen *never* use the term resource, but rather that it does so far more infrequently than the city of Bainbridge.

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