Project name: Measuring the Socioeconomic Impacts of Water Restoration Projects: Contributions to Community Vibrancy

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Introduction

Bordering four of the five Great Lakes, and with more than 11,000 5-acre or larger inland lakes, Michigan is deeply connected to its water resources. While water is vital to Michigan's economy, communities, and identity, industry has also played a central role in Michigan economies and community identity, with industrial structures situated on or near the Great Lakes and their tributaries. But the US recession of 2008 coupled with shifts in US production more generally catalyzed widespread economic downturn within the state. In turn, industrial closures created economic hardship in many Michigan coastal communities, drawing attention to the need for diversification. Seizing the opportunity for transition, many waterfront communities have begun investing in recreation and tourism-based industries, as well as diverse water restoration projects (e.g., beach clean ups) and other opportunities for increased water access for local residents - and tourists - to interact with water resources (e.g., boardwalks, kayak launches). To date, the impacts of water restoration and community development efforts have been studied almost exclusively from an ecological or economic perspective. It is yet unclear how and in what ways such water restoration efforts impact community well-being. This report examines the social metrics of water restoration to better understand if and how water restoration and revitalization efforts in waterfront communities impact community vibrancy. Through a literature review and four-phase data collection process (interviews, focus groups, surveys, and community-wide forums), this project realizes four goals:

1. Identifies the social characteristics of communities that lead to the successful implementation of water resource restoration and development projects;
2. Offers a practical definition of community vibrancy and what it looks like in place;
3. Develops a framework that connects social characteristics and community vibrancy;
4. Discusses the ways in which water resource restoration and development catalyze community vibrancy in coastal towns.

All four towns in our study - Alpena, Manistee, Port Huron, and Sault Ste. Marie - have populations below 30,000 and a history of an industrial presence on the waterfront. All have made recent investments in water resources restoration and development projects that were deemed successful in some way by the Office of Great Lakes (OGL), the statewide agency leading "efforts to protect and restore [Michigan's] waters" through "policy development and strategic program implementation" (OGL). Our goal was to: (a) understand what successful means in place, (b) understand commonalities in process and outcomes across these towns, and (c) investigate barriers to this transition from industrial to more recreation and tourism economies in coastal communities.

This report describes our findings from the four data collection phases. The mixed-method approach led to a conceptual framework that shows community vibrancy emerges through a series of feedback relationships driven by governance and/or community leadership, both of which create access to water resources, which then catalyzes a myriad of environmental,

social, and economic opportunities and relationships to the natural world. While the process can be catalyzed by either ground up (community-driven) or top down (policymaker-driven) efforts, our research shows that for vibrancy to be sustainable over time, both types of leadership need to be in place, as well as be collaborative.

Literature Review

To develop a framework to describe vibrancy related to water resources restoration, we examined the interdisciplinary literature on natural resources and place relationships, which collectively defines individual and community dynamics in relation to place or the natural world. Below is an overview of each of these literatures - sense of place, community vitality, quality of life, community wellbeing, community resilience - to situate the impacts observed in each of the four towns, providing context for our conception of community vibrancy as related to water resources restoration. Each of these literatures contributes important qualities to the ways we understand living well in place now and over time, and often the concepts are nested within or echoed by each other. By presenting the literatures as distinct perspectives and bridging them here, we can observe similarities and differences that are important for interpreting the results from the study.

Sense of place

Sense of place is a framework commonly applied in tourism, conservation, and recreation literature that is used to describe the meaning and importance of a setting held by an individual or group (Ardoin, 2006; Kudryavtsev, Stedman & Krasny, 2012). Most sources break sense of place down into three primary components: place attachment, which describes an emotional or sentimental connection to place; place dependence, which is more utilitarian and describes a functional or activity-based connection to place; and place identity, which describes a psychological connection to place, as it reflects on one's own identity or self-perception through repeated visits over time (Kudryavtsev et al., 2012). Descriptions of sense of place vary across the disciplines, but often place attachment is used as a proxy for sense of place, describing a positive emotional connection to a specific place (Ardoin, 2006). In our study, we were interested in the ways people were already connected to place, and how these connections impacted their perceptions of or tolerance for economic transitions and community development. Therefore, we were both interested in this positive emotional connection to place - why do they live where they live, what makes it special to them, and how would community development enhance this specialness or capitalize on assets already in place - as well as the ways that participants' sense of the specific place was threatened by change or potential development. For while sense of place is often connected to pro-environmental behavior (Walker & Chapman, 2003), it can also lead to an isolationist perspective that could be perceived as provincial, whereby a place is so 'special' any outside influence is deemed negative (Sullivan et al., 2009).

Community Vitality

Although there is no standard definition of community vitality, the literature describes strong relationships and social networks as central to vital communities (Scott, 2009; Scott, 2010; Dale, Ling & Newman, 2010). This description of the social dynamics of vital communities

includes connections among and between individuals, groups, organizations, and those in power (Scott, 2009; Scott, 2010). This focus on the dynamics of power within community relationships sets the vitality literature apart from the other scholarship we review here and is integral to community development and change in place. All of these cross-group social dynamics contribute to the social capital communities can leverage to effectively respond to local challenges and opportunities related to natural resources restoration (Emery, Fey & Flora, 2006).

Importantly, it is not the mere existence of these social networks that enable community vitality. Rather, it is the ability of all members of a community to access them (Scott 2009); thus, diversity and inclusion are key aspects of community vitality (Scott, 2009; Scott, 2010; Grigsby, 2001; Dale et al., 2010). As well, the literature points to agency, or the capacity of a community to take action together in the pursuit of collective visions or goals, as a core component of community vitality (Scott, 2009; Scott, 2010; Grigsby, 2001). Vital communities are described as those who can anticipate, effectively respond, and adapt to change (Scott, 2010; Grigsby, 2001); in other words, vital communities resemble resilient communities. In this vein, Scott (2010) describes a number of characteristics beyond social relationships that are central to vital communities, including economic and educational opportunities, public health and wellness, environmental sustainability, safety and security, arts and culture, and sense of place (Scott, 2010). Importantly, many if not all of these attributes are also considered necessary for community well-being (Scott, 2009) and quality of life (Andereck & Nyaupane, 2011a, Andereck & Nyaupane, 2011b); therefore, it can be argued that achieving vitality as a community also paves the way for fostering community well-being and increased quality of life.

Quality of life

Quality of life (QOL) studies in relationship to natural resources or place are often tied to scholarship in tourism (Andereck & Nyaupane, 2011a; Andereck & Nyaupane, 2011b) and parks and recreation (Bricker et al., 2016). According to Spradley (1976, p. 100) QOL generally refers to "an overall state of affairs in a particular society that people evaluate positively," but specific elements included as valued vary across cultures. Andereck and Nyaupane (2011a) state that while there are over 100 definitions and models of QOL, these varying definitions agree that QOL is multidimensional, interactive, and describes how people view or feel about their lives. In tourism studies, this is an important indicator for how tourism development has impacted or might potentially impact resident lives, and thus resident attitudes about tourism development more generally (Allen et al., 1993; Andreck & Nyuapane, 2011a).

Generally evaluated with a survey instrument, QOL describes the standard of health, comfort, and happiness experienced by an individual in a particular setting related to: (1) Emotional and psychological wellbeing, (2) Interpersonal and social relationships, (3) Material wellbeing (e.g., employment and economic security), (4) Personal development, competence, and goals, (5) Physical wellbeing, (6) Self determination, (7) Social inclusion, and (8) Rights (including privacy). Example indicators include safety, spirituality, contentment, family, friendships, food security, economic status, education, health, leisure, autonomy, community activities, and civic responsibilities (Andereck & Nyaupane, 2011a). Because the towns in our study are all transitioning from more industrial economies to more natural resources-based recreation and tourism economies, quality of life was a central framework at the start of our study. A limitation of QOL studies for our context, though, is the sharp focus on the individual (Andereck and Nyaupane 2011a), as well as the fact that QOL studies are most effective when they are longitudinal (Uysal, Sirgy, Woo & Kim, 2016). As well, the ability to describe the quality of life in a particular place relies on a large sample size. Because of our small sample sizes, and

because we were interested in rich context about the specific impacts of water restoration for communities, we are interested in the general state of subjective wellbeing that QOL describes, but QOL instruments do not directly capture the specific context we are interested in.

Community Wellbeing

Wellbeing is a widely studied concept across fields from philosophy to psychology to sustainability. We use it here to describe wellbeing in a social or community context, capturing community-wide vibrancy impacts of water resource restoration and development in a particular place, rather than the more commonly studied characteristics of individual psychological wellbeing. Similar to QOL, the wellbeing literature generally assumes that a collection of individuals who demonstrate high wellbeing leads to a community that also demonstrates high wellbeing (Atkinson, Bagnali, Corcoan & South, 2017). In this way, community wellbeing describes the collective physical and mental health, spirituality, sense of place, and connectedness of individuals in place (Russell et al., 2013), therefore encapsulating qualities captured across sense of place, community vitality, and quality of life.

Community wellbeing is also more than the sum of the individual parts. Scholars, primarily in public health, describe social and cultural dynamics of community life that are central to wellbeing in place, "recognising the influence of health, poverty, transportation and economic activity, and of environmental and ecological considerations," (La Placa, McNaught & Knight, 2013, p. 119) that characterize the "social, economic, environmental, cultural, and political conditions.... .essential [for people] to flourish and fulfill their potential" (Wiseman & Brasher, 2008). This perspective is particularly useful for the goal of understanding the contributions of ecosystem services and natural resources relationships on community vibrancy.

Russell et al. (2013) describe the types of environmental interactions that impact wellbeing as knowing (e.g., thinking about or conceptualizing an ecosystem), perceiving (e.g., viewing a landscape), interacting (e.g., active recreation in nature) and living within (i.e., daily interactions with the surrounding environment). These interactions can create connection with a physical location, which may contribute to a sense of place. The natural world can also contribute to feeling socially connected, whether it is based on a perception of connectedness with life at large (Russell et al., 2013) or though actual interpersonal connections that result from sharing experiences in nature (Poe et al., 2016). Connectedness to nature itself has also been shown to be as important to human well-being as other, more traditional considerations like education, income, and marriage (Russell et al., 2013). Finally, participation in environmental restoration activities - taking action to care for, clean up, and protect natural resources - has a demonstrated impact on wellbeing and place attachment (Russell et al., 2013). In one study, researchers in the Puget Sound found that restoration activities build community by providing time and space for people to connect and share knowledge with others (Poe et al., 2016). Additionally, scientists found that explicitly linking restoration efforts with sense of place allowed participants to consider project improvements that could contribute to human wellbeing, e.g. responding to local needs and priorities (Poe et al., 2016). This relationship between restoration, sense of place, and community wellbeing is particularly useful for our study and illuminates some of the interrelationships across the literatures discussed here.

Community Resilience

Ecological resilience is well defined in the literature, generally described as the capacity of a system to absorb or adapt to change while retaining the same function, structure, and identity (Walker, Holling, Carptenter & Kinzig, 2004). Essentially, resilience refers to the ability to survive and thrive over time in an environment characterized by change. While community or

social resilience is less clearly defined in the literature, it is often an extension of similar principles to social systems, whereby a social system absorbs or adapts to shocks or disturbance, e.g., shifting environmental, political, or economic conditions. Change is inevitable, including at the local community scale, where adaptation to challenges and opportunities continuously takes place; resilient communities are those that learn to not only live with change, but to also leverage it to their continued benefit (Magis, 2010).

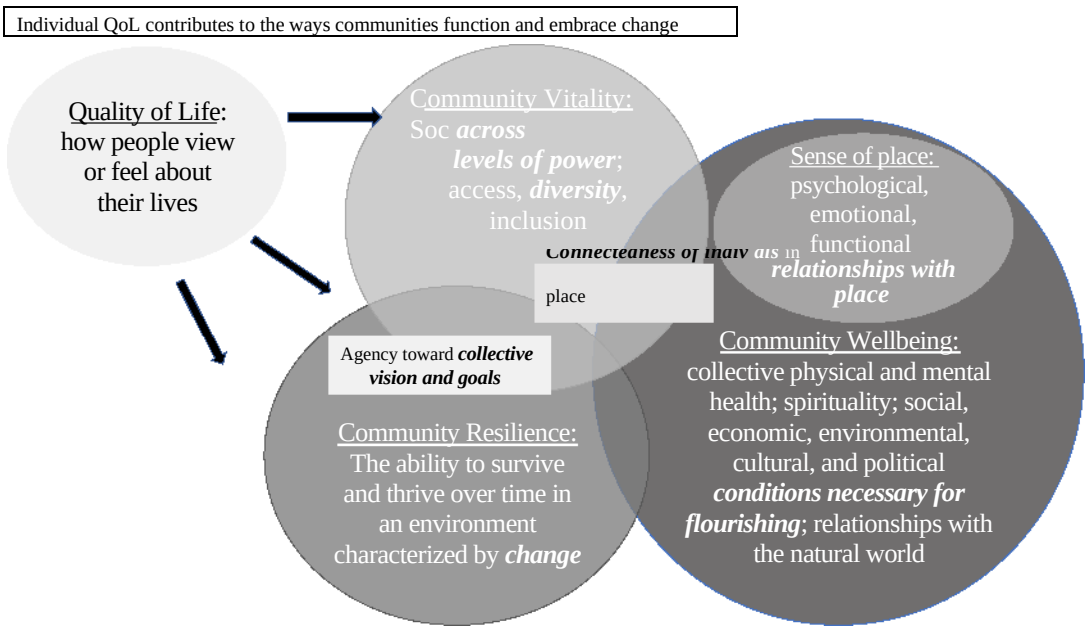
The level of resilience in a community is dynamic and will also change over time; it is something that can be impacted and bolstered by internal dynamics and resources and external forces (Magis, 2010). For example, as people move into or out of a community, and as power changes hands among new leaders and generations, priorities change and places are developed and inhabited in different ways (Magis, 2010). This is all relevant to the context of our study, as all four towns have experienced a significant economic shock in the last 10-15 years, and all have experienced changes in community dynamics, with the general trend of an aging population and limited resources to retain younger populations, who move to more urban areas for greater job prospects. Also relevant is the inherent relationship between resilience and collective action, which requires participation from and collaboration among members throughout the community, including individual citizens, local organizations and businesses, and governing bodies (Magis, 2010; Zautra, Hall & Murray, 2008).

While much of the other literature reviewed here describes the experience of an individual in a place, or the collective experience of a population of individuals in place and/or the attitudes individuals might have about change in place, resilience describes instead the capacity of groups to work together in the face of inevitable change. The actions of a dedicated individual or a handful of key players - often referred to as community champions in our study areas - are not enough to sustain community resilience in the long run (Magis 2010). They can spark energy or generate ideas, but adapting to environmental and social change requires the collective agency of the larger community working toward shared goals.

Defining Community Vibrancy

Looking across these literatures provides a picture of individual and community characteristics that might describe components of vibrancy in place. Figure 1 details the central concepts from each of these literatures and highlights the characteristics that contribute to our understanding of vibrancy in place based on the community contexts, our ongoing community interactions, and the analysis we present here. Principally, perceived quality of life informs both a community's vitality (social networks across levels of power, inclusion, and diversity) and resilience (ability to survive and thrive in a social-ecological environment characterized by change), both of which describe collective agency toward vision and goals. Perceived quality of life is informed by sense of place (psychological, emotional, and functional relationships to place) and community wellbeing (collective physical and mental health), both of which describe the connectedness of people to place. While community vibrancy is not a term that arises directly in the scholarship, our review of these literatures has led us to use the term here to describe general energy for, and momentum toward, positive change. Vibrancy also captures individual attitudes about place and community capacity to invest in place, with a specific focus on natural resources relationships.

Figure 1. Relationships across the literature that describe community dynamics in relation to place or the natural world



Methods

This project pursued four-phases of data collection, yielding a robust qualitative and quantitative dataset.

Interviews

In early 2018, two researchers conducted five semi-structured, in-depth interviews (Hesse-Bieber, 2017; Rubin & Rubin, 2012) in each of the four study towns, for a total of 20 interviews. Interviewees were first identified through convenience sampling (Given, 2008), which relied on personal contacts and existing relationships with local officials from recreation and tourism organizations (e.g. convention and visitors bureaus). Following the first 1-2 interviews in each town, researchers employed a snowball technique (Schutt, 2018) to identify other key stakeholders with knowledge about development, natural resources, and water restoration in place. Final samples in each town included representatives from community foundations, municipal governments, natural resource management agencies, volunteer groups, and recreation and tourism organizations (Appendix 1).

Interviews were audio recorded for accuracy and transcribed into text files. Qualitative analysis of the interview transcripts was an iterative and collaborative process. All interviews (n=20) were coded for emergent themes (Miles & Huberman, 1994; Rubin & Rubin, 2012; Miles, Huberman & Saldana, 2014) using the constant comparative method (Glaser, 1965; Boeije, 2002). Four researchers each manually coded one interview from each of the four towns, meeting weekly to develop a working codebook, which included 76 total codes (7 main codes, 39 primary subcodes, 20 secondary subcodes, and 10 tertiary codes) (Appendix 2), with definitions, rules for application, and examples for each code (Appendix 3). Two coders used this codebook to independently code four more interviews, one at a time, meeting weekly with a third researcher to discuss coding strategy, work through disagreement, and streamline code

and category definitions. These conversations continued until inter rater reliability reached 90% (Miles, Huberman & Saldana, 2014), where coders agreed on the application of at least nine out of ten codes.

When the codebook was saturated and stable (Mason, 2010), the two coders split the interviews evenly and coded the entire data set using Dedoose, a qualitative analytical and organizational software. During the coding process, the two coders met weekly with two other researchers to discuss emerging themes within and across the four towns. This process led the research team to identify the following thematic code categories related to water restoration and community vibrancy that were most salient across all four towns: (a) Access, (b) Buy-in/Engagement, (c) Collaboration, (d) Governance, (e) Future Vision, (f) Opportunities, (g) Pride, (h) Recreation, (i) Relationship w/Nature, (j) Strategic Process, (k) Tension, (l) Tourism, (m) Unique/Special Place, and (n) Use of Place (which had three sub-categories: aesthetic, emotional, and social).

Exemplar text from these codes was extracted from the transcripts and placed into data display tables (Rubin & Rubin, 2012; Miles, Huberman & Saldana, 2014) that were organized by town. The two primary coders independently drafted summary statements for each category for all four towns, and created memos about the patterns and trends they were able to identify within and across towns (Miles & Huberman, 1994). The two coders and a third researcher then reviewed, compared, and synthesized the summary statements, which were added to a data display table (Miles, Huberman & Saldana, 2014). This table described the shared and distinct processes and perceptions related to water resources restoration and development across all four towns.

Focus Groups

Eleven focus groups were held, with three in Port Huron, Sault Ste. Marie and Alpena, and two focus groups in Manistee, totaling 54 participants (Appendix 4). Each focus group represented one of three broad sample populations; (1) young professionals and college students, (2) volunteers engaged in water restoration projects, and (3) an economic development group.

The invitation to participate in the focus group was sent via email to community contacts, including all those who participated in the interviews. For those participants that did not respond within one week to the email invitation, a follow up call was placed. One researcher facilitated the focus groups and two others took notes, which were used in this report analysis. During the focus group, a participatory quantitative technique known as Q method was utilized to identify individual and shared values related to water and future visioning related to water restoration. Q-methodology is a statistical approach that explores intercorrelations of participants' viewpoints through analysis of a sorting activity (i.e., participants prioritize statements about their values and perceptions) (Stephenson, 1953). Focus group participants were invited to rank 15 value statements (Appendix 5), which were based on the findings from the literature review and the data collected during the stakeholder interviews. One statement box was left blank for participants to fill in with any concepts we might not have included. All focus groups were audio recorded for accuracy and analysis. Since focus groups were designed to test questions that arose in the interview analysis, in-depth qualitative analysis of the transcripts has not been completed. Rather, focus group results from researcher memos and Q method analysis were integrated into the conceptual model presented below.

Survey

The survey instrument (Appendix 7) was informed by the both the interviews and focus groups. The questions in the survey were predominantly close-ended, including a Q sort style matrix to help enable cross comparisons between the research phases (question 3 and 4; see methodological explanation above). The survey was launched on Qualtrics and sent to community partners, including all interviewees and focus group participants, who were asked to help disseminate the link. A Facebook page was also created and shared widely across social media using the handle @h2oSocialMetrics (Appendix 8). The initial survey was to close September 30, but due to a low response rate (<300), the survey link remained open and was disseminated during the community-wide forum (paper copies in pre-stamped/addressed envelopes). In addition, the survey was disseminated *in situ* at all four community locations (Appendix 9). The data from the survey was imported into Statistical Package for Social Sciences (SPSS), cleaned (i.e., removing errors), and a codebook was created. Descriptive statistics and frequencies were run for each individual community, as well as a combined data set (i.e., all four communities).

Community-Wide Forum

One community forum to present results back to the communities for discussion was held at each of the four community sites. Each forum was 2.5 hours in length. Invitations were sent by email to community contacts in advance of the forum via Eventbrite, as well as a request to circulate the invitations throughout the community. Similar to the survey, participants were also recruited by social media using the handle @h2oSocialMetrics (Appendix 8). The purpose of the forum was twofold; (1) share the research findings from the interview, focus group, and survey data, seeking feedback from community members with respect to accuracy of our preliminary findings, as well as (2) facilitate the front-facing aspects of the dashboard, including how communities can utilize the tool. This report will discuss the results from the former, which was an interactive presentation that was used to facilitate dialogue about: (a) local dynamics related to the research findings, (b) holes in the research findings related to community vibrancy as impacted by water restoration activities, and (c) insight into the particular relationships between community groups and local appointed officials related to water restoration efforts. This was achieved through two participatory activities – a scorecard (Appendix 10) and an opportunity to provide place-based findings about community vibrancy related to water restoration on a handout of the conceptual model presented below. Both were used for reflection and group discussion.

Results

Interviews

From the analysis of the summary statements identified in the analytical process, five pattern codes emerged (Miles, Huberman, and Saldana, 2014) as the most consequential and impactful drivers and impacts of vibrancy related to water restoration across these four towns: (1) Governance; (2) Community Leadership; (3) Access to Water Resources; (4) Socio-economic and Environmental Opportunities; and (5) Relationship with Water. The research team also identified potential barriers to implementation of water restoration efforts during the coding process.

As we analyzed the dynamics among and between these patterns, two main findings emerged:

1. *There are identifiable processes and actors that facilitate successful water-based restoration efforts:*
    a. Governance, including strategic processes and public participation
    b. Community Leadership, including local buy-in, collaboration, and fundraising
2. *There are observable impacts of water-based restoration efforts in each town, including improved:*
    a. Access to Water Resources, including change over time, the scale and breadth to which access is prioritized, and implementing universal (ADA) access
    b. Socio-Economic and Environmental Opportunities**,** including attraction / retention of new and/or younger residents and tourism
    c. Relationships with Water**,** including catalyzing recreation opportunities and (re)building connections to water

Nested within these main findings are potential barriers to success in prioritizing, implementing, or sustaining water restoration, including resistance to change, land ownership, and limited capacity. We further explored these findings across different audiences in the focus groups, survey, and community forum.

Q methodology (focus groups and surveys)

During the focus groups we asked key stakeholders to complete two Q sort activities: one describing their personal valuation of water resources and one speculating how they perceive their community to value water resources. Based on the former, we can group our key stakeholders into four types; (1) *environmental stewardship* (i.e., people on the land who are also responsible for the caretaking of the land); (2) *intrinsic valuation* (i.e., natural world as good in and of itself with a non-consumptive appreciation of nature); (3) *family togetherness* (i.e., water as place to be together as a family); (4) *recreation* (i.e., water connects self and landscape through recreation). When the key stakeholders were asked how they perceive the broader community to value water, it was clear that all stakeholders grouped the community similarly, with a focus on economic opportunities through tourism and recreation. As detailed in Appendix 11, key stakeholders ranked ecosystem service 3rd, but indicated their community values it much lower (11th). Key stakeholders ranked transportation as the least important value (16th), but stated that their community would value it 4th. There was also a significant difference placed on tourism, which key stakeholders valued near the bottom (11th) but indicated their community would value highly (3rd).

However, the results from the community survey reveal the community does not value transportation or tourism highly and actually ranked them the same as the key stakeholders (16th and 12th, respectively), demonstrating the two groups' share values more than the key stakeholders assume (Appendix 11). Recreation and tourism were also ranked the same across both groups (3rd and 14th, respectively). Therefore, the broader community does have values that align with the key stakeholder values identified in the focus group. The greatest discrepancy is with respect to sense of place; individuals in the focus groups ranked sense of place as the most important value (1st), but the surveyed community participants ranked it near the bottom (12th). These findings underscore an important need to bridge communications and networks to address the currently misaligned perceptions.

Survey

A total of 569 surveys were completed, with 27% of respondents from Port Huron, 21% from Alpena, 17% from both Manistee and Sault Ste. Marie, and 18% from other surrounding

townships and communities. Due to page limitations, a summary of key findings is provided below, with a complete analysis of descriptives and frequencies in the appendix, including the combined results across all four communities (Appendix 12), as well as for each individually for Alpena (Appendix 13), Manistee (Appendix 14), Port Huron (Appendix 15), and Sault Ste. Marie (Appendix 16).

There was agreement across all four communities that the qualities that best describe respondents' towns are also the qualities that they consider to be the greatest benefits, including publicly accessible waters, recreational opportunities, beauty, and affordability. Similarly, all four communities agreed that the qualities that least describe their town are also considered the greatest barriers to community well-being, which included economic opportunities, open-mindedness, and diversity. The one exception is Sault Ste. Marie, which in addition to accessibility and affordability, residents stated that being touristic also best describes their town and that being industrial is one of their greatest barriers to community well-being. All four communities agreed or strongly agreed that they are protective of the water resources in their town (mean score of 4.3 with 1 strongly disagree and 5 strongly agree), are concerned about the water resources in their town (4.3), feel connected to the water in their town (4.1) and that their town is meaningful to them (4.1).

The majority of respondents in all four communities (43%) indicated that water resources in their community have improved over the past 5-10 years (e.g., cleaner shorelines, better access, reduced bacteria levels), with 18% indicating water resources have become worse (e.g., erosion, sewage, runoff from farms, invasive species). The majority of respondents indicated that their quality of life has remained the same (48%), with 44% indicating that their quality of life has improved as a result of cleaner waters, increased access to water resources, more opportunities for water-based recreational activities, and increased tourism. Residents in Port Huron reported the greatest improvement in their water resources (64%) and in turn, over half the respondents (53%) indicated that their quality of life has improved as a result of changes in water resources. Manistee reported the least improvement, with 22% of respondents indicating that water resources have become worse, but only 7% indicated their quality of life has been impacted by changes in water resources. Sault Ste. Marie reported the most negative impacts on quality of life, with 15% indicating their quality of life has worsened over the last 5-10 years as a result of changes in water resources.

Respondents unanimously agree that the responsibility to care for water resources belongs to everyone, with the greatest responsibility placed on local government, community residents and oneself. The four communities are largely in support of tourism development, with agreement that tourism will generate economic opportunities (4.18, with 1 being strongly disagree and 5 strongly agree) and few concerns that development will impact quality of life (2.24), result in overcrowding (2.27), or that tourism is developing too quickly (2.31). Manistee is the most neutral towards tourism development, with neither strong agreement nor disagreement regarding the promotion (3.5), investment (3.5) and/or desire to attract more tourism (3.6). Both Port Huron and Sault Ste. Marie support tourism development the most, indicating that it will generate positive economic opportunities (4.3) and should thereby be promoted (4 and 4.2, respectively) and invested in (4).

Discussion

Based on the analysis of all four data-collection methods (interviews, focus groups, survey, community forum), five thematic categorizes emerged as most consequential and impactful drivers of, and in some cases barriers to, vibrancy related to water resources restoration in these four towns: (1) Governance; (2) Community Leadership; (3) Access to Water

Resources; (4) Economic, Social, and/or Environmental Opportunities; and (5) Relationship with Water. Figure 2 details relationships across these factors and describes the conceptual framework for community vibrancy that emerged from our mixed methods study.

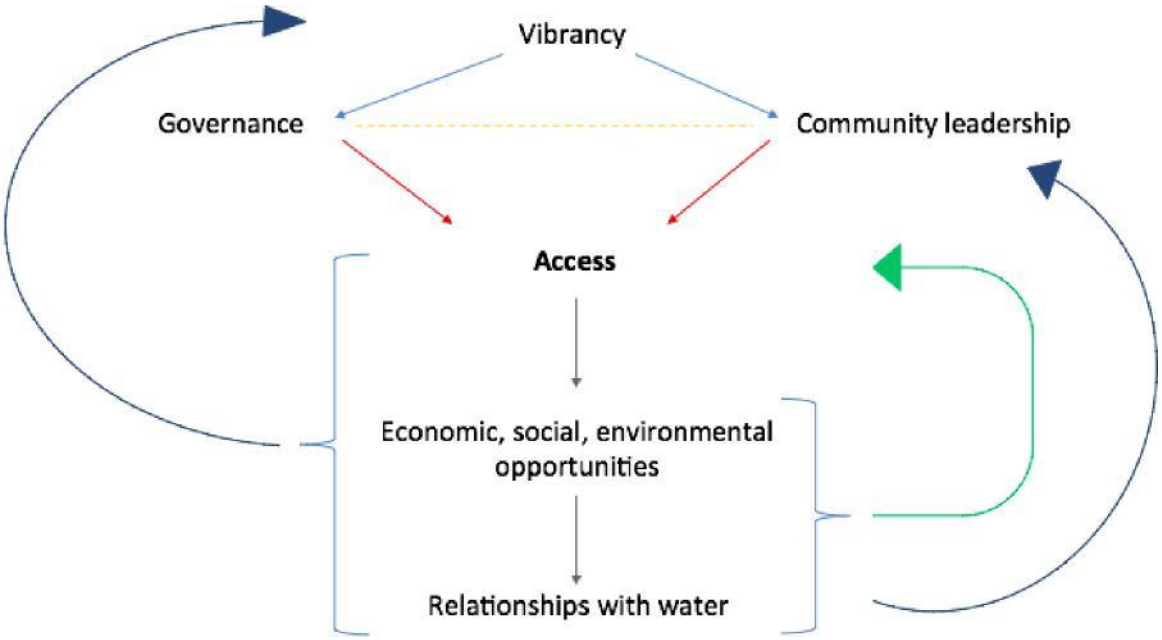


Figure 2: Conceptual framework of water vibrancy across all four Michigan towns

In exploring the interactions between social characteristics, community vibrancy, and water resource restoration and development, this study found many shared attributes among four small, waterfront towns. Our findings suggest that the social characteristics of communities who successfully implement water resource restoration and development projects are also constituents of community vibrancy. Thus, community vibrancy, as witnessed to varying degrees in these four towns, may be described as:

> **The existence of accessible processes and networks that facilitate collective action toward shared goals, catalyze diverse opportunities for pursuing long-term community wellbeing, and foster the capacities needed for effectively responding to change over time in a particular place and driven by connection to that place**

Looking at each of our four study areas, we observed that a certain level of existing community vibrancy is necessary for the successful implementation of water resource restoration and development projects. At the same time, these projects further catalyze community vibrancy in coastal towns by contributing to increased or improved access to water resources, creating new opportunities for community development, and connecting people with their local environments.

Access to Water Resources

Across all four towns, a priority that arose either out of conversations and visioning between local governance and community groups or directly from resident-led endeavors was an interest in increasing and improving access to water resources. Access to water resources in

all of the communities has changed over time, from little or no public access, due primarily to land ownership and industrial activities, to increasing public access along waterfronts. In the context of these four towns, increased or improved access to water resources includes boardwalks, beaches, green spaces, bike paths, kayak launches, and water trails. This access catalyzes opportunities for a variety of recreational activities and also allows for different kinds of natural resource relationships to be built, including active (e.g., kayaking, canoeing, stand-up paddle boarding, biking, walking) as well as passive (e.g., picnics, appreciating the view). New water resource development and restoration projects in the communities also prioritize and implement universal access by, for example, meeting design standards for the Americans with Disabilities Act or ADA. These newly available opportunities for access and recreation facilitates increased activity along the waterfront, as a participant in Port Huron described: "Now the entire mile shoreline is public access, including 2 beaches. People are just there all the time, in all seasons, all days and times of night."

Creating access to water resources is perceived as having a variety of benefits for residents of these communities as well as visitors. Thus, there is a desire among local leadership and community members to further increase access. However, there are differences in the way that access is prioritized. In some cases, access is pursued on a more limited scale with a primary goal of increasing opportunities for recreation. In other cases, access is seen as a catalyst for broader community development, as one participant in Port Huron asked: "How do we reclaim what used to be industrial waterfront, abandoned waterfront, neglected waterfront... to make an economic impact?" Although access is a priority and has increased, there still remain limitations, including private land ownership, which in some cases, for example U.S. federal government property, is seen as a significant barrier to the community's desires to increase water restoration efforts and create more access.

Access as described here is a multi-dimensional construct: in addition to physical access to natural resources, it also encompasses the ability of community members and local organizations to access political and planning processes. Communities are thought to have political capital if governance systems are accessible and inclusionary (Anglin, 2015; Emery, Fey & Flora, 2006), and in our estimation, this relates specifically to natural resource restoration and development planning as well as community visioning processes more generally.

Improved and increased physical access to water resources creates opportunities for communities to approach and interact with their water resources in new or revitalized ways. Our findings indicate that these relationships with water catalyze new motivation for further increasing access and investing in additional water resource restoration and development projects. The process of restoring relationships with the water also contributed to improving community wellbeing and created opportunities for building social capital (Poe et al., 2016; Emery, Fey & Flora, 2006), which helps foster deeper connections to people and place well as more effective or committed community engagement.

Relationships with Water

Water surrounds all four towns and is part of their everyday lives. Residents value, feel connected to, and identify with water. For many of the participants, living in close proximity to water resources informs their sense of place and is a primary motivator for residing in these towns. Although community attachments to local water bodies existed prior to restoration and development initiatives, as access to and quality of water resources have changed over time, so have local relationships with water. Where industrial waterfronts were previously inaccessible or deemed unsafe and unattractive, they are now spaces where people gather in increasing numbers to take part in a variety of social, economic, and environmental activities.

For example, we heard from participants that water resource development and restoration projects create opportunities for more extensive and diverse ways to actively engage with the local environment. In particular, new opportunities for waterfront or water-based recreation have played a key role in transforming community members' relationships with place. "Prior to the park improvements you'd go down that direction and rarely see anybody in the water," a participant in Sault Ste Marie shared. "Now on a decent summer day when before you wouldn't see many people there at all, there's usually a handful of people out there paddling. Both in their own vessels and rented ones...It's gotten people out recreating in that part of town." In the context of these towns, recreation is key for building relationships with water.

Reclaiming formerly industrial, inaccessible waterfronts for the public, including residents and visitors alike, creates opportunities for the development of new types of water-dependent industries, namely, recreation and tourism. For the waterfront communities involved in our study, this transformation contributes to the emergence of a "Blue Economy", which, for these towns, includes increasing the appreciation and utilization of water resources, improving waterfront connectivity with areas of town where a diversity of service-oriented businesses and organizations can thrive, and helping to create a place that draws people in and keeps them there, all of which contribute to community vibrancy (Austin & Steinman, 2015). Responding to economic change by transforming from one industry to another in order to capitalize on the natural capital of a place in new ways exhibits community resilience (Magis, 2010).

A critical part of restoring and developing water resources is improving water quality, and the industrial history of the waterfronts in each of the four towns is still prominent in the minds of many study participants, who recalled that the water was considered a dumping ground for things like industrial waste and sewage. As their economies transition away from manufacturing and production, and as waterfronts are gradually reclaimed and repurposed for public access, the communities are noticing improvements in the quality and health of their water resources. Study participants highlighted a potential feedback loop between improving natural environments and public access, in that the ability of community members to approach and interact with cleaner water resources is seen as a way to raise awareness about the value of these assets, as well as build support for further increasing quality and accessibility.

Economic, Social, and/or Environmental Opportunities

Water resources and waterfronts are seen as assets that provide a multitude of benefits for local communities, including contributions to personal wellbeing and recreational values, as well as economic development and business opportunities. While there is some resistance to change, there is also growing recognition of the benefits associated with water resource development and restoration. As one participant in Manistee shared, "I think around water there is growing understanding and appreciation that it has multiple benefits. People are appreciating it because of the recreation value, personal benefits, but also for the economic benefits that they provide to our community as well."

Increasing or improved water access has created tangible economic opportunities for local entrepreneurs and businesses in all four towns, even in the cases where only limited access has been restored. For example, water-based activities are a core driver of recreation and tourism in these towns, all of which are experiencing growth in silent (non-motorized) sports such as kayaking. An increase in kayaking activity translates to new business opportunities for recreational outfitters and guides: "When I was growing up you never saw in the local sports stores a kayak or a canoe," explained a participant in Port Huron, and "now it's a feature item.

Every store in the area carries them because they see the value that they offer. ...[N]avigating the river has gotten easier [too] because there are access points now. (PH)"

The opportunities and benefits that arise as a result of water resource restoration and waterfront development are seen as assets that can help to attract and retain residents, especially younger generations. Many small, formerly industrial towns are challenged by out-migration of younger generations, who leave in search of, e.g., more diverse employment options and better quality of life (Winters, 2011). Our findings suggest that areas may be able to capitalize on water restoration efforts by strategically marketing themselves as vibrant, waterfront communities that offer the types of amenities, experiences, and lifestyles that young professionals and families desire. This has the potential to catalyze a number of advantages at the community level, for example, a more diverse talent pool and multigenerational workforce, increased entrepreneurship and business opportunities, and a revival of downtown areas for living and leisure (Lightbourn, 2005), all of which may help reinforce vibrancy. Perhaps most importantly, though, attracting and retaining younger generations likely plays a critical role in ensuring the success of local economic transformations as well as the sustainability of water restoration projects over time, thereby supporting long-term community vibrancy. Participants from each town expressed a desire to be able to draw (or, in many cases, draw back) young professionals and families to their communities. They recognize that doing so is contingent on the ability to provide diversified and attractive options for livelihoods, living spaces, and leisure, and they connect these opportunities to the impacts of water restoration.

Participants also expressed a belief that increased or improved access to water resources would result in or has already led to increased tourism, an increasingly important industry for these coastal communities. Residents' explained that residents generally appreciate the multiple benefits tourisms contributes, including impacts to the local economy through entrepreneurship and employment opportunities. Participants expect that support for tourism will likely continue to increase as quantifiable impacts like visitor spending are shared across the community. However, there is also concern across the communities that increasing tourism could negatively impact quality of life. For example, while there is a common desire to increase tourism, there is also shared appreciation for the small-town characteristics in these communities. A consistent refrain from participants was a fear - either their own or perceived in the community - of their town becoming busy and congested. Participants across the towns explicitly stated that they did not want to turn into a particular tourist town in the state that has experienced rapid growth. In some cases, resistance to change also stems from uncertainty about how new developments would impact existing relationships with local water resources.

Governance

Local government, including city managers and agency officials, play an important role in water resource restoration and development efforts. For example, all four towns have strategic processes in place for natural resource assessment, city planning, and community development. These processes include structured visioning exercises that help identify local priorities and aspirations, valued community resources, and new economic opportunities. It is critical that these processes involve the community in decision-making; leadership in each town recognizes the value of engaging residents in envisioning the future of the community and has taken steps to involve key stakeholders, including members of the public, in strategic planning processes. Incorporating public participation is seen as a way to help facilitate community buy-in and pave the way for successful project implementation. Explained one participant from Manistee, "The biggest thing is building consensus and trying to get the community to agree on what they want for the waterfront." This is important, because these transformations also

change people's relationships with and connection to local water resources, thereby strengthening their sense of place.

Importantly, this sense of place represents not only what a place is or even what it used to be, but also what it could be. If planning processes are accessible and allow for the participation of diverse stakeholders, these aspirational visions of place can help guide collective action in the pursuit of shared goals for prioritizing access, revitalizing waterfronts, and (re) building relationships with water resources (Dale, Ling & Newman, 2010; Scott, 2010; Grigsby, 2001). Ultimately, although local governments across these towns are generally supportive of water resource development and restoration efforts, they also face challenges due to limited capacity, especially in terms of financial assets and human resources. Where local government capacity is restricted, key players in the communities have stepped in to spearhead and shepherd water resource restoration and development projects. In the four study towns, this includes boundary spanning organizations, such as convention and visitors bureaus (CVB), downtown development authorities (DDA), and community foundations. These organizations are typically well connected to local governing bodies as well as other influential entities like business and industry and, in at least two of the towns, gather regularly to strategize. They also have ties to local community and volunteer groups. These organizations exhibit significant influence in terms of identifying local planning and development priorities, including those along the waterfront. They also have access to financial capital, including large philanthropic gifts from donors, that can be marshalled to support water resource development.

Community Leadership

Community leadership in the context of the four towns refers to grassroots efforts to implement water resource restoration and development projects, including on the part of individual volunteers, citizen groups, and local environmental non-profits. These community leaders are enthusiastic about and invested in improving their communities, including the quality and usability of water resources, which motivates them to action. In each of the four towns, these community members have played a key role in prioritizing water resource development and restoration projects, whether through participation in strategic planning processes or through their own collective action. In some cases, they have been instrumental leaders in mediating the vision and implementation of these projects and are recognized locally as community champions. Key players in each of the communities also actively collaborate to move water restoration and development projects forward. This includes collaboration among individuals and citizen groups as well as between community organizations and across various level of local governance. A participant in Sault Ste. Marie, where a good deal of recreational development is driven by community champions, explains their process: “One of the most transformative changes included a citizen driven group, where the city was a partner. Different entities, organizations, individuals in the community collaborated to develop a water trail, kayaking trail, using properties that the city owns and working them into the recreational tourism portfolio for the city.” Community leadership also encompasses the ability to successfully carry out grassroots fundraising in order to support water resource restoration and development, especially where the financial capacity of local governments is limited.

While community leadership plays an important role in each town, a mix of leadership is needed for the success and sustainability of water restoration projects. Projects led only by governance officials may not reflect public priorities or opinions. If community members don’t have a say in the extent to which tourism is prioritized as an economic growth opportunity, development of waterfront areas and water resources may negatively impact the quality of life for year-round residents by, for instance, increasing traffic, crowding, and cost of living

(Andereck & Nyaupane, 2011a). These adverse effects may erode local support for tourism and reinforce resistance to change (Harrill, 2004). Alternatively, projects led only by community leaders like local volunteers raise questions or concerns about ownership, long term maintenance, and liability, thereby undermining the sustainability of restoration and development efforts. Although the agency and ability to effect change at the local level is indicative of community vitality and resilience (Scott, 2009; Scott, 2010; Grigsby, 2001; Magis, 2010; Berkes & Ross, 2013), community members by themselves ultimately have limited capacity to fully support these projects over long periods of time (Magis ,2010).

Thus, we suggest that transparent and inclusive governance, in combination with an active and engaged citizenry, are indicators of community vibrancy. Our findings suggest that they are also foundational in facilitating the process of water resource restoration and development. Both provide initiative, momentum, and capital, including social, political, and economic, as well as an awareness of the natural capital of a place. These community capitals (Emery, Fey & Flora, 2006) can be leveraged to design and implement water-related projects. While one can exist without the other, our findings indicate that it is critical for the two to co-exist in more or less equal capacities: in order for water restoration and development projects to succeed in the long-run, there must exist a mix of commitment and leadership from both local government officials and engaged community members. Our results indicate that the process of inclusive visioning and planning, as well as the successful implementation of water resource restoration and development projects, further contributes to the vibrancy of a community, thereby creating a beneficial feedback loop.

Next Steps

Many communities with industrial pasts, including those chosen for this study, view their waterfronts as untapped public assets that can be redeveloped to pursue a variety of economic, social, and environmental opportunities. Prioritizing public access to water resources allows communities to capitalize on opportunities, particularly those related to water-based recreation and tourism. While our findings are robust, all towns in this study share important characteristics, including size and development trajectory. It is not yet clear how these findings will apply across scale. Toward that end, applying our conceptual foundation with a focus on valuation and leadership dynamics in communities that are both more and less developed in terms of water resources restoration, as well as in bigger communities, is an important next step.

Ongoing work will include numerous peer-reviewed publications (in progress), with one paper proposed for each of the four data collection phases. All related publications will be shared with the funding agency and each publication will acknowledge the support of OGL and EGLE.

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