

SOCIOECONOMIC INDICATORS OF COMMUNITY VITALITY: RESEARCH AND CASE STUDIES OF COASTAL COMMUNITIES IN MICHIGAN



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FINAL REPORT

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Tracking Social Indicators and Analytics of Vibrancy in Coastal Communities in Michigan

Abstract

This Research Project addresses data and information resource issues affecting the ability of planners and decision makers to make sound, informed, and cost-effective investment decisions that may affect environmental quality, social and economic equity, and health conditions in their communities. Blue Accounting, and other indicator-based research methodologies including the *Social Progress Index* and *City Resilience Index*, provide an overall structure for defining user needs, data requirements and accessibility, developing indicators that measure values leading to community vibrancy, analytics, and utilizing metrics that can be tracked over time to allow communities to determine progress toward meeting goals.

Four coastal communities in Michigan – Alpena, Manistee, Port Huron, and Sault Ste. Marie – were selected to participate in the project. These cities were proposed by the Michigan Office of the Great Lakes¹ following the completion of the Michigan Water Strategy, completed in 2016. Selection of the final list of coastal communities was based on recent projects in each of these communities including water infrastructure improvement, downtown and harbor/marina redevelopment, providing increased access to water features, and water-based tourism.

The project consisted of a series of local engagement opportunities including interviews, surveys, and public forums that resulted in the development of a series of measurable indicators of community vibrancy, a prioritization of metrics to assist planners and decision makers in determining the relative value of enhancing existing water resources and amenities and in proposing new water-related projects, as well as engaging the public to accept such proposals.² Funding for this project was provided through the Great Lakes Restoration Initiative.

An online, publicly available and interactive data dashboard was developed that allows planners, decision makers, business leaders, and residents to review the indicators of vibrancy, respond to questions about water resources in their community, and track progress on water projects. The dashboard also allows members of a community to track and compare their relative vibrancy with other Michigan communities. The dashboard provides a template for and serves as a mechanism by which state agencies can monitor growth and progress, determine the status of development, and evaluate the need for additional education, funding and other resources needed by communities throughout the state.

1.0 Introduction and Background

The growth, health, and well-being of communities, measured through the development and use of indicators and metrics can help local planners, decision makers, and the public set goals for community development and measure progress toward meeting those goals. Recent and varying metrics of community well-being that have been proposed and applied in community settings throughout the United States and Europe have included such terms as growing, prosperity, redevelopment ready communities, best practices, sustainability, resiliency, placemaking, sense of place, cool cities, and so on (see: Redevelopment Readiness Communities Program, Michigan Economic Development Corporation,

¹ The Michigan Office of the Great Lakes was reorganized and moved to the Michigan Department of Environment, Great Lakes, and Energy in 2019.

² The public engagement program and development of a working definition of community vibrancy was conducted by the Department of Community Sustainability at Michigan State University.



<https://www.miplace.org/communities/rrc/>). In addition, the MSU School of Planning, Design, and Construction offers a pilot program on community for visiting scholars, which helps define and measure characteristics of vibrant communities.³

This project seeks to define communities in terms of vibrancy, community vibrancy may be defined 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.”*⁴ Vibrancy in a city or town or coastal community in Michigan connotes a place where people want to live, work, and recreate; a place in which people feel comfortable, safe, stimulated, engaged; a place where people want to be.

Given this terminology of characteristics or descriptors, how do we determine whether a place is vibrant? Which characteristics are indicative of vibrancy? What can be defined, measured, and tracked over time to describe a vibrant community, to determine how “vibrant” a community is, and to see whether a community – through actions taken by local residents, government, businesses - is becoming more or less vibrant? The objectives of this project are to: 1) develop a set of vibrancy indicators that can help answer the questions listed above; and 2) design and implement a set of metrics in an online system that can use these indicators to measure and track community progress for achieving these vibrancy goals.

Four representative coastal communities in Michigan, Alpena, Manistee, Port Huron, and Sault Ste. Marie, were selected to determine the social impacts of successful water restoration projects and the community characteristics that led to success. Selection criteria included (a) location along the Great Lakes, including major rivers connecting to them, (b) populations of less than 20,000, and (c) long histories with connections to Great Lakes industries, resource development, and cultures. Each of these communities has made relatively recent investments of both internal and external resources that have enhanced, rehabilitated, or remediated aquatic ecosystems to protect human health, improve recreation, increase commerce, and foster economic development opportunities, resulting in the creation of vibrant waterfront communities.⁵

The study was divided into two coordinated research, analytical, and outreach projects. The first project focused on community engagement and was conducted by a research team from the Department of Community Sustainability at Michigan State University (MSU), identified as the Community Engagement Team.

The second project focused on data analytics and modeling by a team from the Institute of Water Research (IWR) at MSU and MSU’s School of Planning, Design, and Construction. Results and findings of the [Community Engagement Project](#) were used to develop indicators of community vibrancy that could be used to measure, track, and display in an online dashboard water-related community goals and progress toward meeting these goals.

The principal foci of the second project, described in this report, were:

³ Building Vibrant and Resilient Environments: SPDC Visiting Scholar Pilot Program, Spring 2018.

⁴ This report pertains to the development of indicators and metrics used in the creation, testing, and implementation of the online community vibrancy dashboard. Refer to the final report prepared by the MSU Community Engagement Team for the final/working definition of community vibrancy and how this definition was derived through community engagement, including interviews, surveys, and public forums conducted in each of the four representative coastal communities.

⁵ Excerpt from MSU Department of Community Sustainability Proposal, entitled, “Measuring the Socioeconomic Impacts of Water Restoration Projects: Contributions to Community Vibrancy.”



1. Analysis of potential social indicators of community vibrancy,
2. Development of systematic metrics of community vibrancy, and
3. Development and implementation of on-line tools that allow communities to track and demonstrate progress toward meeting goals, community vibrancy, and social well-being.

The Analytics and Metrics Project addressed the requirements of local planners and decision makers to use community vibrancy information and metrics to inform and educate the public about the need for and benefits of water resource improvement. In addition, the project was designed to assist water-related state agencies in obtaining information needed to implement statewide water strategies and provide tools to most effectively use this information to measure social progress. In doing so, this system would serve as a template for Michigan communities, which are considering long-term strategies for managing water resources; adopting water conservation policies and strategies; supporting the building and maintenance of safe, efficient, and cost-effective water systems; creating new funding opportunities; and engaging public participation in planning and decision making.

2.0 Methodology

2.1 Development of Social Indicators

An indicator is an instrument, gauge, or index (commonly called a metric) that can be used to observe and describe characteristics about the state of a phenomenon – something that can be measured. Often, indicators are used as proxies, particularly when a phenomenon is large, complex, or complicated; similar to a community. Learning about a community through the use of indicators can include economic, social, cultural, health, and environmental quality units of measure. This project takes these factors into consideration but focuses primarily on social indicators.

In a public works project that is evaluated and funded using traditional cost-benefit analysis, it is extremely difficult to separate social from economic benefits. Therefore, the project determined to go beyond a traditional literature review of potential social indicators of community vibrancy by working closely with the Community Engagement Team, which engaged members of the four coastal communities in a series of surveys, interviews with leaders and other representatives, and open forums. The Community Engagement Team was instrumental in asking the questions and leading the discussions that focused on separating the social indicators from other factors, particularly economics. This step helped the Analytics and Metrics Team identify a specific set of social indicators that would be applicable, meaningful, and understandable to the coastal communities, as well as serve as a useful template to a broader audience of Michigan communities.

The procedure included a line-by-line review of the 20 interview transcripts consisting of five interviewees in each community. In the review of responses to interview questions, the primary focus was on seeking interviewees' feelings of connectedness to water; about the success, attractiveness, and use of water resources, amenities, and how well decisions about water development are made and funded.

Results were compiled in a spreadsheet and categorized in terms of physical characteristics (i.e., the built and natural environment) and local governance. The preliminary list of potential social indicators was winnowed down by the project's Technical Advisory Team, consisting of the MSU Community Engagement and Analytics and Metrics Teams, and representatives of the Office of the Great Lakes (OGL). Using this process, the initial set of 240 potential indicators were reduced to a list of 61 social indicators in two general combinations. The first combination focused on the natural and built environment, including water resource related projects, physical characteristics of projects, and how



people interact with projects. The second combination of indicators focused on community governance, including visioning, planning, and leadership. The two combinations and applicable indicator categories are as follows:

Built and Natural Environment

- Attracting Visitors to Water Resources and Amenities
- Availability of Water Resources
- Accessibility of Water Resources and Amenities
- Water and Economic Development
- Environmental Quality and Restoration
- Supporting Community Water Infrastructure

Community Governance

- Local Governance: Community Visioning and Planning
- Support for Quality of Water Resources
- Building Coalitions and Collaboration
- Public Participation
- Fundraising: Taxation, Donations, and Grants
- Leadership
- People's Connectedness to Water
- Population and Demographics

Results of analysis were compiled in an Excel spreadsheet and shared with the Technical Advisory Team for review and comment. It was determined that the list of potential indicators be further reduced to a set of indicators that would be applicable in any of the four coastal communities, measurable without the creation of additional data, and that could be incorporated in the online Community Vibrancy Dashboard. A final set of 16 indicators was selected. The spreadsheet also served as the principal tool and common thread for supporting the rest of the tasks being conducted in this project in the development of indicators of community vibrancy, the online dashboard, and the template for the decision support system.

The indicators spreadsheet was continually modified throughout the project to include the ability to use the indicators and public input regarding the relative importance of local desires, planning, governance, and decision making to weigh, rank, and prioritize projects that potentially lead to social vibrancy.

2.2 Development of Indicator Metrics and Thresholds

2.2.1 Metrics

A general review of literature pertaining to the measurement of potential indicators of community vibrancy was combined with a review of research materials developed by the Community Engagement Team, including a Codebook and Checklist. A list of suggested metrics for each of the social indicators is shown in Table 2-1. Suggested metrics fell into two types: (1) those indicators in which a physical attribute of a water resource or project/amenity could be measured (e.g., proximity to, distance to, number, size, users, etc.) and (2) those water resource-related indicators that could be observed as attributes that were either present or not. This latter category tended to be a Yes/No attribute. These suggested metrics were then reviewed by the Technical Advisory Team, revised, and added to the spreadsheet. A brief explanation of the objective and importance of each indicator in supporting community vibrancy was also listed in the spreadsheet.



The indicators spreadsheet was further modified to include the ability to use the indicators and public input regarding the relative importance of local desires, planning, governance, and decision making by weighing, ranking, and prioritizing projects that potentially lead to social vibrancy. This method has been used successfully in Michigan and other states on various projects including prioritization of brownfield redevelopment; highway alignment, transmission line, and pipeline siting; land preservation; and endangered species habitat protection (Thomas, 2002, 2003, 2004 and other relevant technical reports).⁶

As shown in the following Table (2-1), a preliminary set of weighted values by indicator was developed to allow the user to score and rank water projects to: (a) evaluate an existing or proposed project, (b) compare between competing projects, (c) track community vibrancy, and (d) compare vibrancy with other communities.

Table 2-1. Initial Set of Measurable Indicators and Relative Value from Public Input

Indicator Categories	Total "Votes" by Category	Relative Value (%)
"Built/Natural Environment" Indicators		
ATTRACTING VISITORS TO WATER AMENITIES	27	26.0
AVAILABILITY OF WATER RESOURCES	25	24.0
WATER AND ECONOMIC DEVELOPMENT	21	20.0
ENVIRONMENTAL QUALITY AND RESTORATION	16	15.0
SUPPORTING COMMUNITY INFRASTRUCTURE	15	14.0
Subtotal	104	99.0
"Governance" Indicators		
LOCAL GOVERNANCE: COMMUNITY VISIONING AND PLANNING	30	31.0
SUPPORT FOR QUALITY OF WATER RESOURCES	25	26.0

⁶ See, for example, Thomas, M. (2003) The use of ecologically based screening criteria in a community-sponsored open space preservation program. *Journal of Environmental Planning and Management*. 46(5), 691-714, September 2003, and Thomas, M. (2003) Brownfield redevelopment: information issues and the affected public. *Environmental Practice*. 5(1): 62-68. Thomas, M. (2004) *Brownfields and Michigan Communities: Information Resources and Tools to Assist Redevelopment Decisions*. Michigan Agricultural Experiment Station Research Bulletin No. 584, Michigan State University, East Lansing, Michigan. March 2004.



BUILDING COALITIONS AND COLLABORATION	14	15.0
PUBLIC PARTICIPATION	11	11.0
FUNDRAISING: MILLAGE, GRANTS, FOUNDATIONS AND DONORS	9	9.0
LEADERSHIP	7	7.0
Subtotal	96	99.0

Further interaction with the prospective user community through the public forums resulted in a reduction of measurable indicators to 16, revision of relative importance values of the indicators and proposed weighting, and total point values used in the dashboard. The point values were assigned according to relative importance of each indicator to project participants. Cumulative point values were reduced to a maximum 500 points. The revised indicatory categories and measurable indicators are shown in Table 2-2.

Table 2-2. Final Quantitative/Weighted Indicator Values

Indicator Categories	Measurable Indicator	Point Values
Access to Water Resources	Accessibility of water resources.	40
	Promoting opportunities to use water resources.	31
	Diversity of water resources.	29
	Adequate recreation and greenspace enhanced by water resources.	26
Total Points for Category		126
Governance	Supporting community planning.	48
	Advocates, leaders, and organizers.	45
	Collaboration and cooperation.	33
Total Points for Category		126
Community Development	Attracting new businesses, retaining existing businesses.	63
	Adequate visitor accommodations.	18
	Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).	13
	Value of adjacent property.	6
		100
Community Engagement	Revenue available for funding.	40
	Fundraising campaigns.	26



	Active volunteer groups.	15
Total Points for Category		81
Relationships with Water	Connectedness with water.	36
	Public perception.	31
Total Points for Category		67
Total Cumulative Points		500

In addition, discussions with the technical advisory team resulted in the creation of additional qualitative indicators that would help local decision makers understand the level of public education regarding understanding and acceptance of proposed water-related projects, and willingness to participate in project development through local funding/donations and volunteering. Public opinion indicators were considered bonus with a total value of 500 points as well.

In all, the proposed dashboard evaluation process would result in a maximum vibrancy score of 1,000 points. Communities can use this to assess their within-community vibrancy as well as compare their community with others using the dashboard.

2.2.2 Measurement Thresholds

Thresholds for each of the social indicators were developed and added to the spreadsheet. Thresholds were established through literature review and focused on best practices in engineering; environmental quality and regulatory compliance; economic development, recreation, and tourism: community planning and zoning; accessibility; and related project experience. The majority of the Natural and Built Environment indicators could accommodate physical measurements, whereas most of the Governance indicators were answered by a Yes or No response.

2.3 Stakeholder Involvement

The MSU Analytics and Metrics Team participated in the Community Forums in in the four pilot communities. These forums were organized and led by the Community Engagement Team (refer to the community engagement report for details and results). A PowerPoint presentation was developed to introduce participants to the 16 indicators and provide them with the concept of an online tool that could be used by community planners, elected officials, and the public to review existing and future water projects using these indicators.

The presentation provided a “cross-walk” for each indicator that could be included in the dashboard. The presentation linked the dashboard graphic (e.g., a dial, bar chart, etc.) that could be used to show the current status or progress toward meeting a community objective, a question posed to the user of the Dashboard, and the specific indicator and the objective/importance of that indicator being measured and tracked.

Using a modified Delphi method⁷, forum participants were asked to review the indicators and “vote” on those they felt were most important to them and their community. Data from the participatory process were used to calculate and prioritize a relative importance ranking and weighting process. These results were then combined with scores of the community interviews and added to the spreadsheet.

⁷ A modified Delphi Method is used to engage (typically) non-expert participants in determining opinions rather than in forecasting and usually consists of a single round/questionnaire to determine, for example, community priorities or preferences. The process is also not conducted by a strictly anonymous panel of experts.



2.4 Development of an Indicator Dashboard

The use of indicator dashboards is gaining traction with the increasing use of online resources by community-based organizations, including county health departments and regional planning commissions throughout Michigan. An example of a community-based indicator/data/metrics dashboard is the City of San Antonio, Texas SA2020 project (<https://www.sa2020.org/what-is-sa2020/>). In addition, the MSU Institute of Water Research has used data dashboards in a number of projects.⁸

The presentation at the public forums provided a “cross-walk” for each indicator that could be included in the dashboard. The presentation linked the dashboard graphic (e.g., a dial, bar chart, etc.) that could be used to show the current status or progress toward meeting a community objective, a question posed to the user of the dashboard, and the specific indicator and the objective/importance of that indicator being measured and tracked. Several versions of the dashboard were created following development and review of the indicator and metrics spreadsheet. These versions were shared with the Technical Advisory Team for review and comment.

2.4.1 Metrics

The Excel spreadsheet described above included a listing and brief description of each proposed indicator, suggested metrics, and measurement thresholds. Review sessions were conducted by the Technical Advisory Team organized by OGL. Once the final list of indicators and metrics was selected for the dashboard, a question for each indicator was developed that would be posed to the users of the dashboard. An example of an indicator, objective of the indicator (i.e., why is this important in measuring an indicator, the suggested metric, suggested metric/threshold, and user question is shown in Table 2-3.

Table 2-3. Example Indicator and Objective

Indicator Category	Access to Water Resources
Indicator Objective	Increasing the level of accessibility to a diversity of water resources and associated amenities to a diversity of users.
Suggested Metric	Number of water resources available or proposed for users (e.g., less than 5/more than 5, less than 10 more than 10).
User Question in Dashboard	How many new or proposed water projects are accessible to residents and visitors?

Tables 4-1 through 4-4 in section 4.0 below show the final list of indicators, measurement thresholds, and user questions.

2.4.2 User Interface

For this project IWR developed an online system (<https://iwr.msu.edu/CI>) to facilitate the administration of community indicator surveys and analyze indicator scores from those surveys through the dashboard. The system provides users with an overview of the Community Vibrancy project (Figure 2-1), asks them to categorize themselves from a range of options (e.g. local elected official, community volunteer, business owner, local resident, etc.), select their community, and then walks them through a brief survey comprised of questions that measure the metrics described earlier (Figure 2-2). Upon completion users are given the option to view an interactive dashboard that displays the overall indicator score for their responses and how their scores on the individual indicator categories (e.g. Community Engagement, Access to Water Resources, and Relationships to Water) (Figures 2-3 and 2-4). Users can

⁸ See www.iwr.msu.edu for several online decision support systems.



also view how their scores, both overall and on the sub-categories, compares to the average overall score among other responses for their community. For example, a user from City “X” can view how their indicator score for Community Development compares to all other survey responses submitted for City “X”.

Home Begin Evaluation Here Contact Register Log in

Water Resources in Your Town and Their Contributions to a More Vibrant Community

Evaluate Your Community's Relationships with Michigan's Unique Water Resources

What is the Community Vibrancy Dashboard?

The Community Vibrancy Dashboard, presented by the Michigan Office of the Great Lakes, with technical support from the Institute of Water Research at Michigan State University, is a tool for measuring and evaluating the role that local water-related projects play in enhancing people's connections to water and contributing to overall community vibrancy. Funding for this project was provided through the Great Lakes Restoration Initiative.

What are Community Water Resource Development Projects and Amenities?

We are investigating the extent to which water resource development projects have made positive contributions to local communities. Water-related projects might include habitat restoration; beach, river, or stream cleanup; creating waterfront parks, river walks, kayak trails; marina and harbor redevelopment; fishing piers; and so on. The Dashboard will help us measure the value of such projects to our communities.

What is the Great Lakes Community Vibrancy Project?

Over the past year, we have been working with local leaders, planners, businesses, Native American tribes, residents, and other stakeholder groups in the coastal cities of Alpena, Manistee, Port Huron, and Sault Ste. Marie to determine what defines community vibrancy, well-being, and sense of place that can be enhanced by investment in water resource planning, development, volunteerism, and philanthropy.

How is the Dashboard Useful in Community Visioning and Planning?

The Dashboard is designed to ask people about their connection to water and whether and how they and their communities include water amenities in their day-to-day activities and long-term decision making. Feedback from the dashboard allows community leaders to set project goals and measure progress toward meeting those goals. They can also compare their communities with others conducting similar projects. The Dashboard provides valuable feedback regarding the effectiveness of water management programs sponsored by the Michigan Office of the Great Lakes.

Figure 2-1: System overview.

Home Begin Evaluation Here Contact Register Log in

Community Indicator Survey

Water Project Indicators

Access to Water Resources

1. How many special projects are underway to create or enhance local water resources, features, and amenities within the last 20 years? [Learn More](#)

none
 1-4
 5-9
 10 or more
 unsure / don't know

2. How many local water resources, features, and amenities are accessible within your community? [Learn More](#)

none
 1-4
 5-9
 10 or more
 unsure / don't know

Figure 2-2: Sample questions from the system survey.

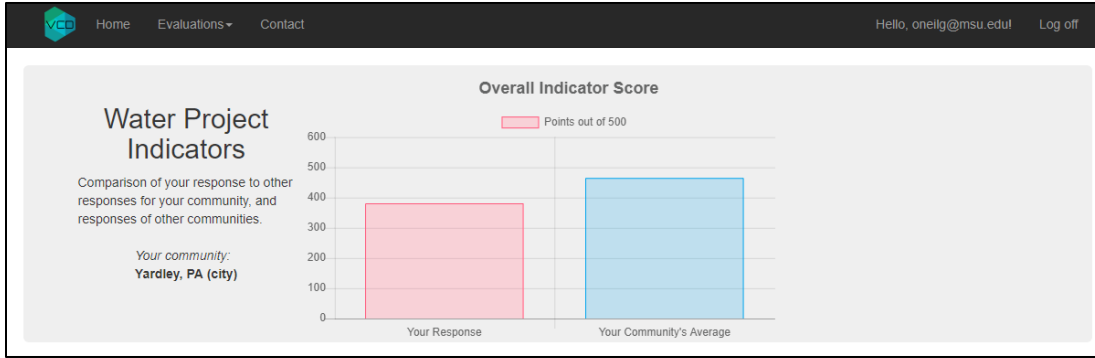


Figure 2-3: Display of user indicator score.

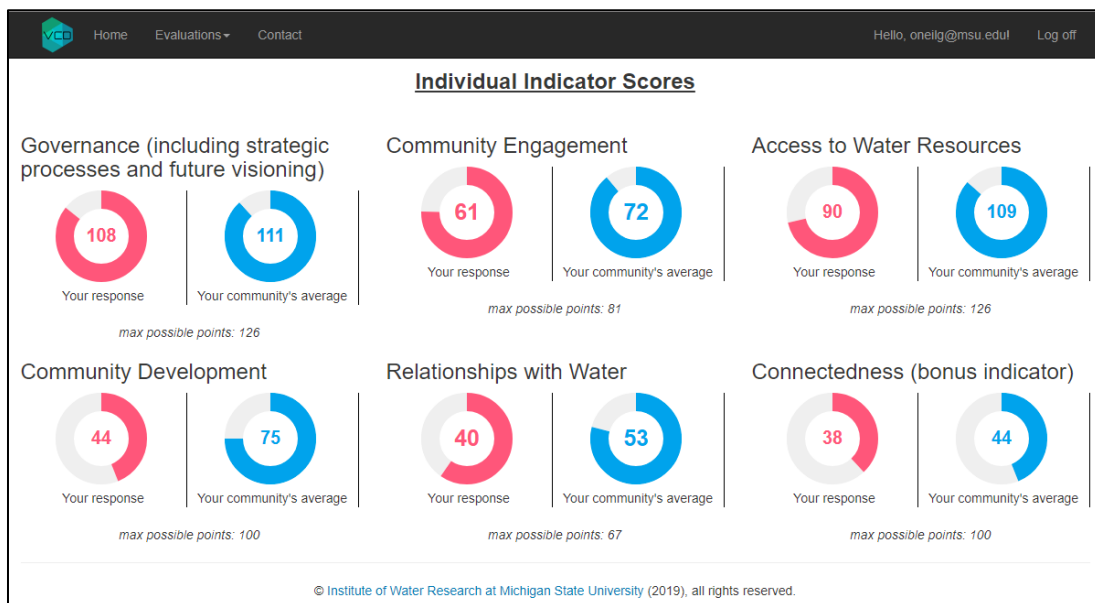


Figure 2-4: Display of user sub-category indicator scores.

The system contains additional analysis features for authorized administrators, such as a user overseeing multiple community vibrancy assessments across the state. Through this administrator interface, users can view distributions of individual indicator scores for a selected community (Figure 2-5), compare indicator scores between communities (up to 10 at a time) (Figure 2-6), and view where individual communities fall on the Vibrancy Curve graphic shown below in Section 3.0 (Figure 2-7). It is important to note that these results are effectively anonymous. Administrators are only shown the dates on which a survey was submitted and what category of user they identified themselves as (e.g. business owner, local resident), and for which community they submitted the survey.

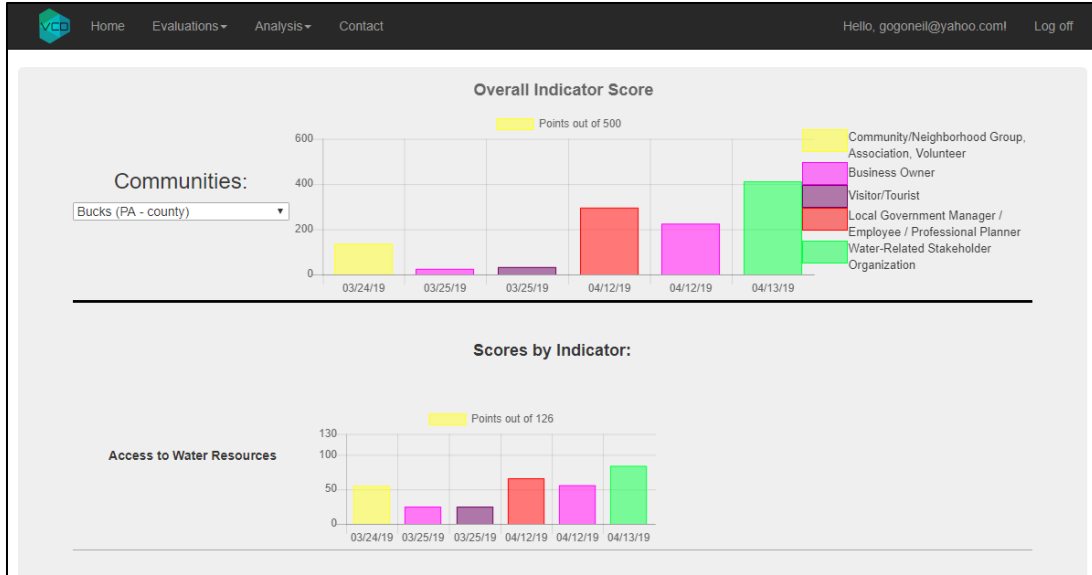


Figure 2-5: Distribution of indicator scores for a community.



Figure 2-6: Comparing community indicator scores.

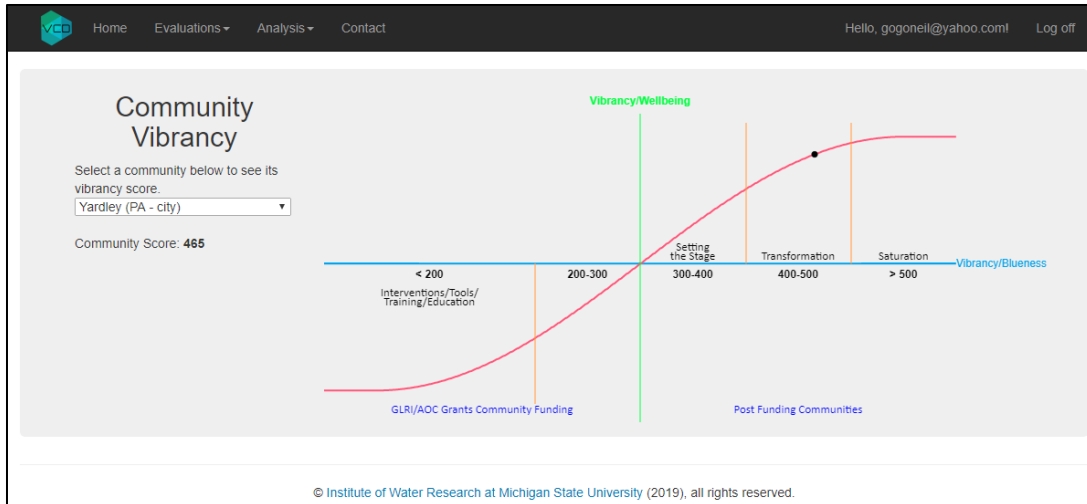


Figure 2-7: Community vibrancy status.

The system’s web architecture is comprised of a mix of backend server and database technologies and front-end interfaces for user interaction and visualization. The system uses ASP.NET as its core platform, with data stored in a Microsoft SQL Server hosted at Michigan State University. On top of that core, it employs a mix of jQuery and Bootstrap libraries for display purposes and to facilitate user inputs. The system uses SurveyJS JavaScript library for administering the surveys, and the ChartJS and jQueryKnob libraries for visualization of the results.

2.4.3 Testing and Refinement

IWR developed an initial version of the online system based upon early drafts of the indicators and their associated metrics. This version captured survey inputs and displayed overall community results through the dashboard. Through each iteration of the development process IWR modified the system based upon feedback from the testing. These modifications included altering the structure and composition of survey questions, capturing individual user categories, displaying indicator scores on sub-categories, and creating administrator level analysis capabilities.

Dashboard testing and refinement went through three iterations:

1. Initial working draft and observed “alpha” test using invited participants.
2. Revised draft and controlled public roll-out of user interface for invited and anonymous public “beta” test and revision.
3. Fully accessible roll-out of public version of the final dashboard.

Final version of the dashboard was initially accessible through a link provided and maintained by IWR. Eventually, the dashboard could be adopted by the four participating communities. If this step is not complete, MSU will continue to host the dashboard in cooperation with OGL (EGLE).

3.0 Development of a Vibrancy Template

Development of the community vibrancy dashboard, described above resulted in the creation of a systematic approach to reviewing, measuring, and tracking progress regarding the ability of a community to set goals, a timeline to reach these goals, and a visual tool that shows progress and compares progress within and across communities. The objective of this task was the development of a prototype community scoring instrument as part of a three-tiered approach to measuring and comparing community vibrancy. This approach is outlined below:



TIER 1:

- On-line dashboard: 15-20 questions about the local community.
- Focus on the built environment and other local water-related projects.
- Anticipated participants include elected/appointed officials, planners, developers, citizens.

TIER 2:

- Focus on local governance: planning, participation, volunteerism, and fundraising.
- On-line weighted vibrancy scoring process.
- Anticipated participants include elected/appointed officials, planners, developers, citizens.

TIER 3:

- Measuring effectiveness of GLRI funding and community preparedness
- Anticipated participants include state and federal organizations, NGOs.

The community analysis and comparison system has been designed to accomplish two objectives. The first objective is to provide a tool to conduct an in-community analysis of water resource developments, projects, and other initiatives to determine whether a proposed project is feasible and acceptable and to evaluate whether a project has been effective as implemented. The tool would be used in a community setting to measure community vibrancy through a multi-attribute, weighted scoring system. This tool could be administered by community planners and leaders in person at public forums, stakeholder meetings, and planning meetings. The tool will also be provided in an on-line form.

The second objective is to provide a mechanism by which state and federal agencies responsible for funding local projects can determine the effectiveness of the project. This includes: (1) determining a community's readiness to develop water resource and amenities (i.e., capability of requesting and using funds efficiently); (2) meeting programmatic and funding goals set by various agencies, such as GLRI; (3) showing progress in moving a community toward vibrancy, a means to compare communities, and (4) having a template for future Great Lakes initiatives and funding goals.

A final version of the weighted scoring system used in the dashboard is provided in Section 4.0. As each community reviews and responds to questions in the dashboard pertaining to the measurement and tracking of the various indicators, a cumulative raw score for that community appears as a point along the curve. The maximum number of points for each indicator category is included in the dashboard, including additional qualitative indicators. Qualitative indicators (i.e., opinion-based questions) were added to the dashboard following input from participants of the public forums. Each participating community receives its own unique cumulative score. This information is accessible only to qualifying state agencies and is not shared among communities.

4.0 Results and Discussion

4.1 Indicators of Community Vibrancy

The spreadsheet also contains descriptive materials for reviewing and analyzing the results of the process that went into development of the spreadsheet, including raw data gleaned from the analysis of interview transcripts, indicators and metrics selected, and the measurement thresholds that went into creation of the dashboard.

Preliminary Categories and Number of Measurable Indicators resulting from the review of the transcripts of the local interview include the following:

- People's Connectedness to Water – 6 Indicators



- Availability of Water Resources – 5 Indicators
- Accessibility of Water Resources and Amenities – 5 Indicators
- Attracting Visitors to Water Amenities – 5 Indicators
- Water and Economic Development – 4 Indicators
- Site Restoration Opportunities – 3 Indicators
- Supporting Community Infrastructure – 3 Indicators
- Population and Demographics – 1 Indicator
- Environmental Quality and Restoration – 8 Indicators
- Support for Quality of Water Resources – 6 Indicators
- Local Governance, Community Visioning and Planning – 10 Indicators
- Building Coalitions and Collaboration – 3 Indicators
- Leadership – 1 Indicator
- Public Participation – 3 Indicators
- Fundraising – 4 Indicators

Of these 61 Indicators 30 consisted of Yes/No responses and 37 were considered Objective (Measurable). The final set of indicators and metrics is shown in Table 4-1.

Table 4-1. Final Set Social Vibrancy Indicators and Metrics

Indicator Category	Measurable Vibrancy Indicator	Proposed Metric
Access to Water Resources	Accessibility of water resources.	Number of water resources available or proposed for users (e.g., less than 5/more than 5, less than 10 more than 10).
Access to Water Resources	Promoting opportunities to use water resources.	User days by number of participants (e.g., 100/500/1,000, etc.).
Access to Water Resources	Diversity of water resources.	Number of water resource projects completed (e.g., 1, 2, 3, 4, etc.).
Access to Water Resources	Adequate recreation and greenspace enhanced by water resources.	Calculation of the amount of green space per resident or anticipated users (under the assumption that a minimum of 110 sq. ft. per person is recommended).
Governance	Supporting community planning.	Available public documents addressing water resources (e.g., master plan/recreation plan/water development plan/etc.). The presence of each document "moves the needle" ahead.
Governance	Advocates, leaders, and organizers.	Number of projects envisioned over a specific time period (e.g., 1, 2, 3, 4, etc.).
Governance	Collaboration and cooperation.	Number of water attractions that were enhanced by (or would not have been possible without) intergovernmental cooperation (e.g., 1/2/5/10/etc.).



Community Development	Attracting new businesses, retaining existing businesses.	Number of business development projects (new or transitioned businesses (e.g., 1/2/3/etc.)).
Community Development	Adequate visitor accommodations.	Count of spaces/accommodations (e.g., 100/500/1,000, etc.).
Community Development	Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).	Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).
Community Development	Value of adjacent property.	Estimated real value or percentage (e.g., revenues, taxes, SEV, etc.) of adjacent properties (pick the metric ranges).
Community Engagement	Revenue available for funding.	Annual value of funding (\$ thousands) made available for water projects (e.g., \$5-\$10/\$10-\$50/\$50-\$100/more than \$100, etc.).
Community Engagement	Fundraising campaigns.	Ratio of successful to unsuccessful fundraising campaigns (e.g., less than 1:1/1:1/2:1/more than 3:1/etc.).
Community Engagement	Active volunteer groups.	Number of active versus ad hoc volunteer groups ("always the same people showing up").
Relationships with Water	Connectedness with water.	Historic and strong community connectedness with water resources and amenities (high, medium, low).
Relationships with Water	Public perception.	Number of water attractions that would not have been available before water quality improvement (e.g., 1/2/5/10/etc.).
Connectedness	Access to water resources.	The connectedness of access that is important is how it catalyzes (or doesn't) relationships to water/place, participation in governance or community engagement activities, or engagement with other environmental, social, economic opportunities related to water, e.g. across major categories.
Connectedness	Public perception and connectedness to water resources in the community	Community vibrancy as a result of local government and citizen support of water projects.
Connectedness	Ability to raise local revenues (millage, bonds, donations) to pay for water projects.	Community vibrancy as a result of local willingness to "tax themselves" to support water projects.



Connectedness	Multi-stakeholder participation and collaboration.	An increase in community vibrancy through multi-stakeholder connectedness, leadership and participation in water projects (e.g., campaigns led by community groups and volunteers, led by government, or led by a collaboration between the two?)
Connectedness	Level of volunteerism.	Community vibrancy as a result of local residents that volunteer their time to participate in water projects.
Connectedness	Connectedness among social, economic, and environmental values as a measure of community vibrancy.	Community vibrancy as a result of improving water resources, restoring habitat, and remediating environmental hazards providing both ecological and human health benefits.

4.2 Community Forums

Presentations at the four community forums introduced the concept of using indicators of community vibrancy to measure characteristics within the community pertaining to water resources, soliciting public feedback on the proposed indicators, and prioritizing the indicators in order to weigh and rank them to quantitatively evaluate a community in terms of meeting goals. The presentations also introduced the development of an on-line interactive Community Vibrancy Dashboard to track indicators of community vibrancy in Michigan’s coastal communities.

This interactive dashboard was designed to help local units of government and the State of Michigan measure whether and how local water-related development or restoration projects, local planning, philanthropy, and volunteerism could lead to a more vibrant community. Examples of water projects discussed in the forums included such things as:

- restoring aquatic habitats in lakes and streams;
- cleaning up beaches, rivers, or streams;
- creating waterfront parks, river walks, kayak trails, etc.;
- redeveloping harbors and marinas;
- constructing fishing piers, birding platforms, and/or scenic overlooks, for example.

Results of the modified Delphi process are shown in below in Table 4-2. Community forums were an opportunity to receive verbal feedback on the relative importance of individual measurable indicators through the prioritization and ranking process, as well as to develop additional qualitative, opinion-based indicators. During the forums, there seemed to be remarkable consistency among the four communities in prioritizing the indicators.



Table 4-2. Indicator Preference from Community Forum from Delphi Process

Indicator Category	Measurable Indicator	Alpena	Manistee	Port Huron	Sault Ste. Marie
Access to Water Resources	Increasing accessibility to water resources and associated amenities to a diversity of users.	3	5	4	4
	Providing a diversity of water resources and multi-use amenities.	0	2	2	1
	Increasing the use of water resources (etc.) by promoting opportunities to discover local attractions.	4	3	6	0
	Providing an adequate amount of recreation and green space per person.	3	7	3	0
Governance	Supporting community planning (Presence of a master plan, parks and recreation plan, waterfront redevelopment plan) that recognizes the value of water resources.	8	9	4	4
	Increasing the number and diversity of water related actions that demonstrate collaboration and cooperation .	3	4	3	2
	Advocates, leaders, and organizers that make and support proposals, recruit and motivate participants, secure funding, and carry out a project to completion.	6	14	2	5
Community Development	Attracting new businesses, retaining existing businesses in downtown and waterfront with a focus on water-related enterprise.	10	8	10	5



	Adequate accommodations for visitors including hotel rooms, campsites, RV sites, B&Bs, restaurants, boat slips, etc., that increase public use of water resources.	3	1	2	0
	Increasing revenues generated by users of water resources.	2	2	0	2
	Long-term increases in the value of adjacent property , including housing values.	2	0	1	1
Community Engagement	Increase in revenue generated to fund water-based projects and enhance water-based amenities.	11	4	2	5
	Increasing the probability of successful versus unsuccessful fundraising campaigns.	2	4	0	5
	Number of active volunteer groups that have past successes and use this as a model to increase partnership, collaboration, and public participation.	1	3	3	2
Relationships with Water	Historic and strong community connectedness with water resources and amenities.	4	3	3	4
	Water-related attractions and events that increase public perception of water importance and values.	4	7	8	1

4.3 Dashboard Development, Testing and Implementation

4.3.1 User Interface

The final design, user interface, and graphics used in the dashboard are shown above in Section 2.4.2.

4.3.2 Indicator Metrics and Relative Importance

Tables 4-3a and 4-3b provide a complete summary of public input incorporated in the dashboard, including the final set of ranked measurable (objective or quantitative) indicators, relative importance of



the indicators, metrics used in the dashboard, user questions and available responses offered to the user, and additional clarifying information. A brief description of each input is as follows:

- Indicator Categories, Descriptions, and Participant Rankings. Input from the community engagement process, including interviews, surveys, and the public forums was used to develop a set of measurable indicators of community vibrancy. A ranking of relative importance was developed for each indicator, allowing dashboard developers to create a scoring system that allows communities to prioritize and value potential water resource actions and track progress on these actions over time.
- Metrics. Each indicator included a proposed measurement or evaluation criterion.
- User Questions. The dashboard questionnaire provides two types of questions. The first set of questions pertain to the 16 indicators that can be objectively measured and are divided into the categories of (1) access to water resources, (2) governance, (3) community development, (4) community engagement, and (5) relationships with water. The second set of questions is opinion-based and is meant to provide a qualitative measure of local community connectedness with water resources, amenities, and projects.
- Additional/Clarifying Information. The scope of the analytics and metrics project did not allow the collection, archiving, and dissemination of data to users of the dashboard. However, an attempt was made to provide access to as much information as possible to assist the user in understanding the context of the question and a set of assumptions that a user could apply to their response.

Table 4-3a. Summary of Public Input Incorporated in the Vibrancy Dashboard

Indicator Category & Indicator	Overall Importance Rank and % of All Responses	User Question	Proposed Metric	Additional/Clarifying Information	Responses
Access to Water Resources: Accessibility of water resources.	4 (.316)	How many local water resources, features, and amenities are accessible within your community?	Number of water resources available or proposed for users (e.g., less than 5/more than 5, less than 10 more than 10).	Examples of local water resources, features and amenities include nearby rivers, lakes, scenic overlooks, river trails, land preserves, wetland preserves, public access locations, recreational watercraft launch sites, marinas, fishing piers, and aquatic or riparian habitat restoration sites.	none 1-4 5-9 10 or more unsure/ don't know
Access to Water Resources: Promoting opportunities to use water resources.	8 (.245)	How many user-days are supported by local water resources, features, and	User days by number of participants (e.g., 100/500/1,000, etc.).	For example, consider a local lake with a public-access beach and parking lot. If 30 cars utilize the parking lot each day during peak summer months (June, July, August), and each car represents 2 visitors, the local lake provides approximately 5,400 user days.	none 1-499 500-999 1,000 or more unsure/ don't know



		amenities?			
Access to Water Resources: Diversity of water resources.	10 (.235)	How many special projects to create or enhance local water resources, features, and amenities have been completed within the last 20 years?	Number of water resource projects completed (e.g., 1, 2, 3, 4, etc.).	Many water-related features and amenities have been present in the community for 20 years or more, such as a local park system or boat launch. Consider whether there have been new projects in recent years, such as habitat restoration or water quality improvements. Have these projects stimulated new interest in and support for water projects by local residents and leadership.	none 1-4 5-9 10 or more unsure/do n't know
Access to Water Resources: Adequate recreation and greenspace enhanced by water resources.	11 (.204)	How many acres of recreational space are provided by local water resources, features, and amenities?	Calculation of the amount of green space per resident or anticipated users (under the assumption that a minimum of 110 sq. ft. per person is recommended).	For each local water resource, feature and amenity previously identified, select those that provide recreational space. Then, add the approximate acreage of each selection to arrive at a total figure. A good rule of thumb would be to estimate approximately 20 acres for each recreational space.	none 40 acres or less 41-50 acres more than 50 acres unsure/do n't know
Governance: Supporting community planning.	2 (.378)	Available public documents addressing water resources (e.g., master plan/recreation plan/water development plan/etc.). The presence of each document "moves the	Does the community have a master plan, parks and recreation plan, and/or economic development plan that includes water resource development?	For example, local visioning documents such as master plans, parks and recreation plans and economic development plans often identify water resource development as an important community goal and include actions necessary for achievement.	no one or more all three unsure/do n't know



		needle" ahead.			
Governance: Advocates, leaders, and organizers.	3 (.357)	Number of projects envisioned over a specific time period (e.g., 1, 2, 3, 4, etc.).	How many projects to create or enhance a water amenity are envisioned over the next 5-10 years?	Master plans must be updated every 10 years. The question is whether current plans include visions, goals, and strategies for achieving new water-related development.	none 1-4 5-9 10 or more unsure/do n't know
Governance: Collaboration and cooperation.	7 (.265)	Number of water attractions that were enhanced by (or would not have been possible without) intergovernmental cooperation (e.g., 1/2/5/10/etc.).	How many local water resources, features, and amenities have been developed with intergovernmental collaboration?	For example, intergovernmental collaboration occurs when neighboring communities, local municipalities, state agencies, federal agencies or tribal governments work together to achieve a common water-related goal such as a cross-jurisdictional river walk or regional water quality enhancement.	none 1-4 5-9 10 or more unsure/do n't know
Community Development: Attracting new businesses, retaining existing businesses.	1 (.628)	Number of business development projects (new or transitioned businesses (e.g., 1/2/3/etc.))	How many businesses within your community feature products or services designed to enhance water-related recreation?	Water-related recreation may include swimming, boating, fishing, sight-seeing, nature study, walking/hiking, etc. Products or services designed to enhance water-related recreation may include retail/rental sporting equipment, waterfront hotel or restaurant operation, tourist services, etc.	none 1-4 5-9 10 or more unsure/do n't know
Community Development: Adequate visitor accommodations.	13 (.179)	Count of spaces/accommodations (e.g., 100/500/1,000, etc.).	How many overnight accommodations are available to support tourism within your community?	For example, consider the number of hotels, motels, campgrounds, and bed-and-breakfast establishments within your community. Large hotels typically feature 200 overnight accommodations (guest rooms), while smaller hotels and motels typically feature 100 overnight accommodations or less. Campgrounds vary widely in size; larger establishments typically feature	none 1-99 100-499 500-999 1,000 or more unsure/do n't know



				200-300 overnight accommodations (camp sites), while smaller establishments typically feature 100 overnight accommodations or less. Bed-and-breakfasts typically feature less than 10 overnight accommodations (private suites). Assume an average of 2 guests per accommodation.	
Community Development: Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).	15 (.128)	Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).	What is the total revenue generated by users of local water resources, features and amenities within your community each year?	Users includes all residents, visitors/tourists, private businesses, public institutions and governmental agencies within your community. When determining resident revenue generation, you might consider the dollar-amount your household contributes, and then multiply this figure by the number of households within your community. When determining visitor/tourist revenue generation, you might consider your response to the previous question and assign specific dollar-amounts to each type of overnight accommodation. For example, large hotels typically generate \$100 - \$200 per overnight accommodation (guest room), so total revenue for this type of establishment may be approximated by multiplying this dollar-amount by the number of total overnight accommodations. (Note 1: Consider only the portion of overnight accommodation establishments reserved for the purposes of water resource use, i.e., only waterfront hotels.) (Note 2: Respondents may want to add a 'premium' to whatever they determine for the per-guest-room-revenue. Moreover, each water resource user/visitor also generates tax revenue, food + beverage revenue, entertainment revenue, and so on.) (Note 3: Respondents may want to account for revenue generated by the rest of the water users, assuming businesses, schools, churches, governments agencies, etc. count as users.)	none less than \$ 10K \$10-\$49K \$50-\$99K \$100K or more unsure/do n't know
Community	16 (.064)	Estimated	Generally	When answering this question, it may	decreased



Development: Value of adjacent property.		real value or percentage (e.g., revenues, taxes, SEV, etc.) of adjacent properties (pick the metric ranges).	speaking, how have water-related projects affected adjacent property values?	be helpful to consider the various aspects of property that collectively determine the total property value. Common aspects include desirability, marketability, access, functionality, aesthetics and maintenance. For example, creating a neighborhood lake might increase neighborhood property values. A developer may charge extra for a "premium" lot adjacent to a water feature.	stayed the same gained value unsure/don't know
Community Engagement: Revenue available for funding.	4 (.492)	Annual value of funding (\$ thousands) made available for water projects (e.g., \$5-\$10/\$10-\$50/\$50-\$100/more than \$100, etc.).	What is the total revenue generated by water resource development within your community each year?	Revenue generation (i.e., incremental revenue or additional revenue tied to water projects) may include local property taxes, local sales taxes, hotel or resort taxes or fees, drain assessments, or a special millage to fund a project.	none less than \$10K \$10-\$49K \$50-\$99K \$100K or more unsure/don't know
Community Engagement: Fundraising campaigns.	11 (.317)	Ratio of successful to unsuccessful fundraising campaigns (e.g., less than 1:1/1:1/2:1/more than 3:1/etc.).	What is the ratio of successful to non-successful taxation and other fundraising campaigns for water projects?	The ratio of successful to unsuccessful proposals to fund a proposed local project can be determined by millage votes or municipal bonds issues.	less than 1:1 1:1 2:1 3:1 more than 3:1 unsure/don't know
Community Engagement: Active volunteer groups.	13 (.190)	Number of active versus ad hoc volunteer groups ("always the same people showing up").	How many active stakeholder and volunteer groups typically participate in water-related projects each year?	A popular and successful project is often the result of people willing to volunteer their time to make a project happen and help offset limited funds. Do individuals and stakeholder organizations show up to support local projects?	none 1 2-3 4-5 6 or more unsure/don't know
Relationships	6 (.538)	Historic and	Generally	Consider to what extent residents of	low (but p



with Water: Connectedness with water.		strong community connectedness with water resources and amenities (high, medium, low).	speaking, how well does your community identify or connect with local water resources, features, and amenities?	the community identify with local water resources through long-term family traditions, sense of place, well-being, employment, recreation, or aesthetics.	resent) medium high unsure/ do n't know
Relationships with Water: Public perception.	8 (.462)	Number of water attractions that would not have been available before water quality improvement (e.g., 1/2/5/10/etc.).	How many water-related attractions have become available through local water quality improvement projects with your community?	Consider whether cleaner water, beach or shoreline improvements, or habitat restoration projects have increased people's use and enjoyment of local water resources.	none 1-4 5-9 10 or more unsure/ do n't know

Table 4-3 below summarizes the list of opinion-based (qualitative) indicators, metrics, user questions and available responses offered to the user.

Table 4-3b. Summary of Public Input Incorporated in the Vibrancy Dashboard

Indicator Category & Indicator	Proposed Metric	User Question	Responses
Connectedness: Access to water resources.	The connectedness of access that is important is how it catalyzes (or doesn't) relationships to water/place, participation in governance or community engagement activities, or engagement with other environmental, social, economic opportunities related to water, e.g. across major categories.	In your opinion, does easy access to local water resources, features, and amenities within your community enhance your utilization of them?	no don't know unsure, but possible yes
Connectedness: Public perception and	Community vibrancy as a result of local government	In your opinion, does your local government	no don't know



connectedness to water resources in the community.	and citizen support of water projects.	view water resources, features, and amenities as essential contributors to community well-being?	unsure, but possible yes
Connectedness: Ability to raise local revenues (millage, bonds, donations) to pay for water projects.	Community vibrancy as a result of local willingness to “tax themselves” to support water projects.	In your opinion, how easy is it to secure funding from local sources (e.g., millage vote, bonds, donations) to finance water-related projects?	very difficult difficult easy very easy
Connectedness: Multi-stakeholder participation and collaboration.	An increase in community vibrancy through multi-stakeholder connectedness, leadership and participation in water projects (e.g., campaigns led by community groups and volunteers, led by government, or led by a collaboration between the two?	Based on your observations, do local water-related projects typically feature collaborative efforts between key stakeholder groups? Check all that apply.	Local government t management Community groups Volunteers State/federal agencies Tribal councils Industry Local businesses Residents
Connectedness: Level of volunteerism.	Community vibrancy as a result of local residents that volunteer their time to participate in water projects.	In your opinion, how easy is it to mobilize volunteer groups to support water-related projects?	very difficult difficult easy very easy
Connectedness: Connectedness among social, economic, and environmental values as a measure of community vibrancy.	Community vibrancy as a result of improving water resources, restoring habitat, and remediating environmental hazards providing both ecological and human health benefits.	In your opinion, have water-related projects increased public awareness and support of water quality?	no don't know unsure, but possible yes

4.3.3 User Questions and Scoring

Tables 4-4a and 4-4b summarize the scoring process used in the development of the dashboard. and scoring ranges and point values assigned to user responses. Scoring and point values are based on review of local interviews and feedback from the public engagement process. This process resulted in the development of indicators, as well as a ranking of what goals, characteristics, and aspects of local water projects participants considered most important to their community. A set of scoring algorithms



was developed to account for relative value of each indicator and how a community might prioritize future actions based on how a project may score in the forum of public interest, valuation, and acceptance.

The tables provide details for the assessment of quantitative indicators of community vibrancy (Table 4-4a) and an opinion-based qualitative assessment of community connectedness with local water resources (Table 4-4b). Notes on the use of the scoring system shown in the tables include the following:

- An arbitrary score is based on a maximum of 500 points. The scoring is weighted by Relative Importance within each of the five categories of indicators. Partial credit may be given by users of the tool.
- Proposed Response Value: If the scoring tool is automatically connected to the dashboard (i.e., the user does not enter point values), the user response to the question will trigger the value in the overall points/score for the community.
- Bonus points (up to 500) can be given to include qualitative input from the opinions of community members using the tool to provide a qualitative indicator or community “connectedness” between water resources and vibrancy.
- Results of the scoring can be used to evaluate an individual community, compare communities, and determine a community’s readiness in moving toward vibrancy, qualify for funding, and so on. We will continue to consider ways to use the results (raw numbers as well as inferences) provided by the dashboard.

Table 4-4a. Summary of Scoring Application in Dashboard for Community Vibrancy

Indicator Category & Measurable Indicators	Metrics	User Question	Importance Rank & Proportion (%) Multiplier	Available Responses	Response Values	Maximum Point Values
Access to Water Resources: Accessibility of water resources.	Number of water resources available or proposed for users (e.g., less than 5/more than 5, less than 10 more than 10).	How many local water resources, features, and amenities are accessible within your community?	4 (.316)	none 1-4 5-9 10 or more unsure/don't know	>10 = 42 5-9 = 30 1-4 = 10	40
Access to Water Resources: Promoting opportunities to use water resources.	User days by number of participants (e.g., 100/500/1,000, etc.).	How many user-days are supported by local water resources, features, and amenities?	8 (.245)	none 1-499 500-999 1,000 or more unsure/don't know	>1000 = 34 500-999 = 20 <500 = 10	31
Access to	Number of water	How many	10 (.235)	none	>10 = 34	29



Water Resources: Diversity of water resources.	resource projects completed (e.g., 1, 2, 3, 4, etc.).	special projects to create or enhance local water resources, features, and amenities <u>have been completed</u> within the last 20 years?		1-4 5-9 10 or more unsure/do n't know	5-9 = 25 1-4 = 15	
Access to Water Resources: Adequate recreation and greenspace enhanced by water resources.	Calculation of the amount of green space per resident or anticipated users (under the assumption that a minimum of 110 sq. ft. per person is recommended).	How many acres of recreational space are provided by local water resources, features, and amenities?	11 (.204)	none 40 acres or less 41-50 acres more than 50 acres unsure/do n't know	>110 = 21 90-109 = 15	26
Category Total			1.00			126
Governance: Supporting community planning.	Available public documents addressing water resources (e.g., master plan/recreation plan/water development plan/etc.). The presence of each document "moves the needle" ahead.	Does the community have a master plan, parks and recreation plan, and/or economic development plan that includes water resource development?	2 (.378)	none 1-4 5-9 10 or more unsure/do n't know	All Three = 45 One or More = 30 None = 0	48
Governance: Advocates, leaders, and organizers.	Number of projects envisioned over a specific time period (e.g., 1, 2, 3, 4, etc.).	How many projects to create or enhance a water amenity are envisioned over the next 5-10 years?	3 (.357)	none 1-4 5-9 10 or more unsure/do n't know	>10 = 34 5-9 = 30 1-4 = 10	45
Governance: Collaboration and cooperation.	Number of water attractions that were enhanced by (or would not have	How many local water resources, features, and	7 (.265)	none 1-99 100-499 500-999	>10 = 35 5-9 = 30 1-4 = 10	33



	been possible without) intergovernmental cooperation (e.g., 1/2/5/10/etc.).	amenities have been developed with intergovernmental collaboration?		1,000 or more unsure/do n't know		
Category Total			1.00			126
Community Development: Attracting new businesses, retaining existing businesses.	Number of business development projects (new or transitioned businesses (e.g., 1/2/3/etc.)).	How many businesses within your community feature products or services designed to enhance water-related recreation?	1 (.628)	none less than \$ 10K \$10-\$49K \$50-\$99K \$100K or more unsure/do n't know	>10 = 65 5-9 = 45 1-4 = 15	63
Community Development: Adequate visitor accommodations.	Count of spaces/accommodations (e.g., 100/500/1,000, etc.).	How many overnight accommodations are available to support tourism within your community?	13 (.179)	decreased stayed the same gained value unsure/do n't know	>1000 = 21 500-999 = 15 100-499 = 10 <100 = 2	18
Community Development: Increasing revenues.	Annual value in dollars (thousand \$) generated by users (e.g., 25/50/100, etc.).	What is the total revenue generated by users of local water resources, features and amenities within your community each year?	15 (.128)	none less than \$ 10K \$10-\$49K \$50-\$99K \$100K or more unsure/do n't know	>\$100K = 13 \$50-99K = 10 \$10-49K = 5 <\$10K = 2	13
Community Development: Value of adjacent property.	Estimated real value or percentage (e.g., revenues, taxes, SEV, etc.) of adjacent properties (pick the metric	Generally speaking, how have water-related projects affected	16 (.064)		Gained value = 8 Stayed the same =	6



	ranges).	adjacent property values?			4 <i>Decreased = 0</i>	
Category Total			1.00 (0.99)			100
Community Engagement: Revenue available for funding.	Annual value of funding (\$ thousands) made available for water projects (e.g., \$5-\$10/\$10-\$50/\$50-\$100/more than \$100, etc.).	What is the total revenue generated by water resource development within your community each year?	4 (.492)	none less than \$ 10K \$10-\$49K \$50-\$99K \$100K or more unsure/do n't know	>\$100K = 43 \$50-99K = 30 \$10-49K = 20 <\$10K = 5	40
Community Engagement: Fundraising campaigns.	Ratio of successful to unsuccessful fundraising campaigns (e.g., less than 1:1/1:1/2:1/more than 3:1/etc.).	What is the ratio of successful to non-successful taxation and other fundraising campaigns for water projects?	11 (.317)	less than 1 :1 1:1 2:1 3:1 more than 3:1 unsure/do n't know	>3:1 = 26 3:1 = 20 2:1 = 15 1:1 = 10	26
Community Engagement: Active volunteer groups.	Number of active versus ad hoc volunteer groups ("always the same people showing up").	How many active stakeholder and volunteer groups typically participate in water-related projects each year?	13 (.190)	none 1 2-3 4-5 6 or more unsure/do n't know	>5 = 14 4-5 = 10 2-3 = 5 <2 = 2	15
Category Total			1.00 (0.99)			81
Relationships with Water: Connectedness with water.	Historic and strong community connectedness with water resources and amenities (high, medium, low).	Generally speaking, how well does your community identify or connect with local water resources, features, and	6 (.538)	low (but present) medium high unsure/do n't know	High = 40 Medium = 20 Low (but present) = 5	36



		amenities?				
Relationships with Water: Public perception.	Number of water attractions that would not have been available before water quality improvement (e.g., 1/2/5/10/etc.).	How many water-related attractions have become available through local water quality improvement projects with your community?	8 (.462)	none 1-4 5-9 10 or more unsure/don't know	>10 = 27 5-9 = 20 1-4 = 15	31
Category Total			1.00			67
Cumulative Score for Measurable Indicators (Maximum Score Possible)						500

Table 4-4b. Summary of Scoring Application in Dashboard for Community Connectedness

Connectedness Indicators	Metrics	User Question	Available Response/Value	Maximum Bonus Points
Connectedness: Access to water resources.	The connectedness of access that is important is how it catalyzes (or doesn't) relationships to water/place, participation in governance or community engagement activities, or engagement with other environmental, social, economic opportunities related to water, e.g. across major	In your opinion does access to water resources and projects in your community enhance your use and enjoyment of these resources?	Yes = 22 Maybe = 10 Unsure/don't know (but possible) = 5 No = 0	(22)



	categories.			
Connectedness: Public perception and connectedness to water resources in the community.	Community vibrancy as a result of local government and citizen support of water projects.	In your opinion, does your local government, along with citizen support, view water resources and projects as essential contributions to a community well-being?	Yes = 22 Maybe = 10 Unsure/don't know (but possible) = 5 No = 0	(22)
Connectedness: Ability to raise local revenues (millage, bonds, donations) to pay for water projects.	Community vibrancy as a result of local willingness to "tax themselves" to support water projects.	In your opinion, how easy is it to solicit and obtain funding from local sources (e.g., millage vote, bonds, donations) to pay for water resource projects?	Very easy = 20 Easy = 18 Difficult = 5 Very difficult = 0	(20)
Connectedness: Multi-stakeholder participation and collaboration.	An increase in community vibrancy through multi-stakeholder connectedness, leadership and participation in water projects (e.g., campaigns led by community groups and volunteers, led by government, or led by a collaboration between the two?	In your opinion, have projects been collaborative across multiple stakeholder groups? Check all that apply. <ul style="list-style-type: none"> • Local government management • Community groups • Volunteers • State/federal agencies • Tribal councils • Industry • Local businesses • Residents 	2 Points for each group checked off.	(16)
Connectedness: Level of volunteerism.	Community vibrancy as a result of local residents that volunteer their time to participate in water projects.	In your opinion, how easy is it to solicit and recruit volunteers to support water resource projects?	Very easy = 10 Easy = 8 Difficult = 3 Very difficult = 0	(10)



<p>Connectedness: Connectedness among social, economic, and environmental values as a measure of community vibrancy.</p>	<p>Community vibrancy as a result of improving water resources, restoring habitat, and remediating environmental hazards providing both ecological and human health benefits.</p>	<p>In your opinion, have water enhancement and restoration projects increased public interest and awareness in water quality?</p>	<p>Yes = 10 Maybe = 5 Unsure/don't know (but possible) = 2 No = 0</p>	<p>(10)</p>
<p>Connectedness Bonus Points</p>				<p>(100)</p>

4.3.4 Dashboard Testing

Eight official alpha tests were conducted. During the alpha tests, which were all observed in person, test subjects were asked to navigate the site on their own, go through and answer the user questions, view the graphic results, and provide verbal feedback to the dashboard developers. Overall responses to the test were generally favorable and provided valuable feedback to the developers.

Requests for beta tests were sent out to participants of the public forums and the interviews. Local planners and decision makers participating throughout the project were also invited to conduct a review. Approximately 90 invitations were sent via email, but only four responses from the public beta test and questionnaire were received. This represents a 4% return, which is far below an expected 13-17 percent return rate. Both preliminary and follow up reminder invitations were sent, as well as calls to local representatives.

The Survey Questionnaire consisted of the following questions:

1. Please give us your opinion regarding Dashboard content, format, and overall use as a tool to evaluate the contributions of water resources, features, and amenities to vibrancy in *your* community.
 - Overall appearance and “user friendliness”: ___ Positive, ___ Negative, ___ No Opinion.
 - Project Background and Objectives: ___ Positive, ___ Negative, ___ No Opinion.
 - Indicator Questions: ___ Positive, ___ Negative, ___ No Opinion.
 - Additional information to help answer each question: ___ Positive, ___ Negative, ___ No Opinion.
 - Range of answers for Indicator Questions: ___ Positive, ___ Negative, ___ No Opinion.
 - Appearance and usefulness of dashboard graphics (results of the survey): ___ Positive, ___ Negative, ___ No Opinion.
 - Results of the comparison between your responses and the community responses: ___ Positive, ___ Negative, ___ No Opinion.
 - Results of the comparison between your community and other communities: ___ Positive, ___ Negative, ___ No Opinion.
2. Were you able to use the dashboard website without instructions or did you use the instructions provided? ___ With Instructions ___ Without Instructions.



3. The Indicator Questions and Additional Information for each question were ___ easy, ___ moderately easy, ___ moderately difficult, or ___ very difficult to understand and answer.
4. List Indicator Questions that gave you the most difficulty answering? List all that apply ____.
5. Provide any additional comments you'd like to make in the box provided below. Indicate what you liked, didn't like, and what the project might do to improve the usefulness of the dashboard.

To date, none of the reviewers to the beta test returned a completed survey. Email responses that were received focused primarily on the following feedback:

- Ability of participants to have access to adequate information to answer specific questions.
- Request the ability to print out a cumulative result of scores for each question.

Development of the dashboard included the provision of as much information as possible to assist the user in answering the more quantitative questions. It would have been appropriate to provide a link to as much publicly available data/information as possible; however, this was beyond the scope of the project. Links in the dashboard provided additional or clarifying information that could assist the user in better understanding the context of the question, as well as to provide ways that the user could create assumptions about the subject of the question to better answer it without access to additional information. In addition, the user was referred to community government and other resources (e.g., the planning department, online information resources provided by the community, and so on) to assist them in answering specific questions.

Regardless of the paucity of constructive or critical feedback, developers of the dashboard have made revisions to the interface when suggested by participants in the reviews.

4.3.4 Community Implementation

Implementation of the vibrancy dashboard depended on positive responses from community participants, particularly from local planning officials. To date, however, responses from local leaders, planners, and decision makers in the four communities have been scarce, including phone calls and emails attempts.

Despite this shortcoming, the developers at IWR will provide access to the dashboard via MSU servers and will continue attempting to contact local representatives to seek permission to place the dashboard on community websites.

4.4 Statewide Template for Community Vibrancy

Although the methodology is based on sound procedures and has precedence in other community and project-related settings, actual results in the four Michigan communities have not been encouraging. Data developed from the public beta test have not been sufficiently extensive to provide the feedback OGL and other state agencies would have needed to review the status of community vibrancy in the project communities in order to use these results in developing a statewide template, as well as continue the project by seeking further input from these communities.

However, the results of the project are encouraging overall, particularly in engaging community participation in developing definitions of vibrancy, indicators of and measuring vibrancy resulting from water-related projects, and visual mechanisms that provide opportunities for public review and feedback to local leaders, planners, and decision makers regarding past and future projects. The project also developed a means of tracking progress in meeting community goals.



5.0 Summary and Conclusions

This Research Project addresses data and information resource issues affecting the ability of planners and decision makers to make sound, informed, and cost-effective investment decisions that may affect environmental quality, social and economic equity, and health conditions in their communities. Blue Accounting, and other indicator-based research methodologies including *Social Progress Index* and *City Resilience Index*, provide an overall structure for defining user needs, data requirements and accessibility, development of indicators that measure values leading to community vibrancy, analytics, and metrics that can be tracked over time to allow communities to determine progress toward meeting goals.

An online dashboard was created to provide a quantitative measure of vibrancy within a community. It was difficult to gauge the ability of dashboard indicators to align with what the Community Engagement Team described as “vibrancy” based on their surveys and interviews, due to lack of participation from the pilot communities. In order to accurately test the dashboard, the pilot communities needed to complete the online dashboard with representative community populations, including city officials, residents, business owners, and visitors. Results from the dashboard would then be able to be reviewed and weighting and ranking thresholds could be altered to better fit the Community Engagement team’s results.

A robust framework has been established to help translate community vibrancy into a measurable score, despite the challenges encountered with low participation. This framework provides a mechanism to fine-tune indicator weighting, ranking, and scores to more closely align with the Community Engagement Team’s findings. These slight modifications can help numerically represent *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.”*

To improve the likelihood of successful implementation of the dashboard with communities of interest, it is recommended that community leaders play an active role in sharing, promoting, and engaging residents, business leaders, and other stakeholders in the process. This may require additional upfront preparation and planning to help build enthusiasm and vision for how the dashboard can assist the community in identifying areas of improvement and providing a path toward a more vibrant community.



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