3-18-2013

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Erin Muench

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Erin K. Muench
RIT College of Liberal Arts
STS/Public Policy
March 18, 2013

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Submitted by:
Erin K. Muench

Under the Faculty Guidance of
Dr. M. Ann Howard

March 18, 2013

Accepted by:

Faculty Thesis Advisor – Dr. M. Ann Howard	Signature	Date
Committee Member – Dr. Christine Keiner	Signature	Date
Committee Member – Dr. Franz Foltz Public Policy Graduate Coordinator	Signature	Date
Public Policy Program Chair – Dr. Deborah Blizzard	Signature	Date

Abstract

Government approaches to the management of the North American Great Lakes have evolved following the introduction of ecosystem management principles in the 1978 *Great Lakes Water Quality Agreement* between the United States and Canada. This approach was adopted as a way to address the complexities associated with the interconnections between the air, land, and water in the Great Lakes basin and its more than 30 million inhabitants. Although there is no universally accepted definition of ecosystem management, a key element is stakeholder participation in policy formulation and implementation to validate decisions within the public sphere. In this thesis I assess public participation as an aspect of the ecosystem management approach to policy making by analyzing public participation activities associated with two programs in the Great Lakes: the Great Lakes Regional Collaboration and the Great Lakes Restoration Initiative. Using an outcome goals analytical framework, I evaluate the effectiveness of stakeholder participation and policy responses to the problem of aquatic invasive species in the Great Lakes.

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Methods of managing natural resources in the United States have evolved since the beginning of the European colonization of North America. More recently, policy and decision-making reflect the importance of ecological understanding and scientific information as a part of effective environmental management. Traditional management strategies used throughout most of the twentieth century used scientific experts within responsible government agencies in order to determine, draft and execute policy implementations (Rowe et al, 2011). However, in recent years there has been much debate over what is the best way to develop public policy. Ecosystem management approaches have been proposed as more effective methods of resource management. Further, many have recognized public participation in the form of stakeholder input as a desirable attribute of the policy formation process (Lackey, 1998; Rowe et al, 2011). Ecosystem management incorporates public participation and stakeholder involvement in all stages of the policy-making process.

This thesis explores the effectiveness of public participation as an element of the ecosystem management approach to policy development with a specific focus on two programs implemented in the North American Great Lakes: the Great Lakes Regional Collaboration and the Great Lakes Regional Initiative. Rather than look at all the complexities associated with Great Lakes resource management, I have focused on a significant current issue associated with the Great Lakes: the control and mitigations of aquatic invasive species. Using a framework to examine public participation outcome goals, this research is designed as a case study to examine potential success and the impact of public participation in the environmental policy making process.

CHAPTER 2: LITERATURE REVIEW

Evolution of resource management's relationship with the public

Land and resource management is above all the relationship of human beings with their surrounding environment. In the United States it has been a crucial, yet sometimes understated, part of the country's history (Cronon, 1983, 1992, 1993). Beginning with the British colonization of the Americas, the settlement and expansion of the United States was dependent on human interaction with their surrounding environment (Cronon, 1993). The distinctive land characteristics of the New England colonies and the Southern colonies influenced what types of communities would form. In the north, settlers found farmable land and a climate, which lent itself to growing vegetable and fruit crops in addition to an abundance of available wildlife to hunt. In the south there was considerably more land available to farm and with a warmer climate large tobacco and cotton plantations were quickly established.

As the original colonies established, so too did their relationship with the land. Environmental attributes shape and change human societies while developing boundaries between the environment and its inhabitants. In studying history it can be seen that the transition back and forth over the boundary between people and nature is quite interdependent. The wellbeing of American settlers depended on the wellbeing of the land and their ability to adapt to that land (Valencius, 2002; Cronon, 1992). Soil quality, climate, game and/or mineral resources and water systems all factor into settlement and what kind of culture is created. By examining the available resources in a given area, there is a greater understanding of how communities became established (Cronon, 1992).

Moving into the nineteenth century, U.S. domestic policy regarding the use of natural resources mainly focused around the concept of manifest destiny - the belief that the United States was destined to expand across the North American continent. The American Industrial Revolution also encouraged settlers to expand westward for its new and abundant resources. By the 1850s industrialized urban centers were gaining momentum fueled by the ability to transport goods by steam-powered ships. Westward expansion was further promoted by land grants to railroad companies during the 1850s and 60s. The frontier resources desired by growing urban centers along the east coast were finally connected and accessible by the rail system in 1869 with the completion of the transcontinental railroad. By the late nineteenth century industrialized centers were well established due to the invention of the internal combustion engine and electric

power generation. Government's role in environmental policy at this point was to encourage individual use of resources without dictation or regulation (Cortner & Moote, 1999).

As a result of an exploitative approach to resource management throughout the earlier years of the United States, concerns began to arise, leading to government-initiated programs defining public land boundaries and uses. For the first time the federal policy reflected a different approach to resources, one that valued resources beyond their value simply for human consumption. In the latter part of the nineteenth century, Congress authorized the granting of Yosemite Valley to the State of California for use as a public park[1]. This marked the beginning of a series of actions to protect several aspects of land and wildlife across the country. From efforts to preserve the population of fur bearing animals[2] to providing means of growing timber in the prairie states[3] to protecting certain species of plant and tree life[4], by the mid 1870s Congress was responding to an increasing popular interest in nature as a resource for recreation and responded with legislation to support a different management approach. The concerns of the public for government action and resource protection became strong and influenced by early conservationist writing about the importance and beauty of nature especially in the context of the new landscape of the west (Cronon, 1992).

Congress continued to exercise authority over land management through the close of the nineteenth century with the establishment of the U.S. Geological Survey in 1879. The U.S. Geological Survey was set up as a bureau of the Department of the Interior and became responsible for the classification of the public lands[5]. The Public Lands Commission was also created to review federal public land policy and reported to Congress expressing differing views on how to rationalize land policy. By the 1890s, Congress also declared several land areas either public land or national park land; parks such as Yosemite, Yellowstone and Sequoia National Parks were established during this time.

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[1] An Act authorizing a Grant to the State of California of the Yosemite Valley, and of the Land embracing the Mariposa Big Tree Grove. U.S. Statutes at Large, Vol. 13, Chap. 184, p. 325.
[2] An Act to prevent the Extermination of Fur-bearing Animals in Alaska. U.S. Statues at Large, Vol. 16, Chap. 189, pp. 180-182.
[3] An Act to encourage the Growth of Timber on Western Prairies. U.S. Statutes at Large, Vol. 17, Chap. 277, pp. 605-06.
[4] An act to protect ornamental and other trees on Government reservations and on lands purchased by the United States, and for other purposes. U.S. Statutes at Large, Vol. 18, Part 3, Chap. 151, pp. 481-82.
[5] An act making appropriations for sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for other purposes. U.S. Statutes at Large, Vol. 20, Chap. 182, pp. 394-95.

In 1897 Congress passed the Forest Management Act or Organic Act (U.S. Statutes at Large, Vol. 30). Unlike national parks that were created to safeguard wilderness, Congress determined that forest reservations were intended for managed use, not for wilderness preservation. This Act reflects the thinking of early conservationists regarding the management of natural resources: they should be used to their full potential so as not to be wasted.

Federal control of land management was reserved for administrative agencies with little public involvement, by the time the United States entered the twentieth century. As a result, the National Forest Service set precedents for environmental management that largely followed conservationist principles. These principles were first largely tested in the timber industry by the sustained-yield approach which promoted the conservation of forests not because they are beautiful or were habitats for wildlife, but because they contain economic value (Hayes, 1959). Forestry policy left to experts, often in alliance with corporate forest interests, produced management decisions aligned with the sustainable yield approach and gradually became widely used throughout the twentieth century.

Forestry management policies promoting economic prosperity were quickly noticed by other interest groups. Waterway organizations, cattle associations, lumberman organizations and engineering societies were among those who supported rational development resource policies throughout the Theodore Roosevelt Administration because they supported their goals of economic growth. Such rational development policies and the scientific approach to forestry management are closely associated with the U.S. Progressive Movement. Beginning in the 1890s and continuing on to through the first two decades of the twentieth century, the Progressive Movement sought to cure many of the problems in American society established during industrial development and westward expansion periods of the last quarter of the ninetieth century (Cortner & Moote, 1999). There were efforts to restrict monopolies, promote direct community involvement and establish a collective purpose for people and the use of natural resource.

While conservationists pushed for controls on hunting and fishing resources and grazing of livestock on public lands, Progressives brought to light the consequences of westward expansion and industrialism (Hayes, 1959). Preservationists rejected the ideals of industrialism and urbanization to focus on the importance of the countryside and the natural world. They saw

nature as a sacred entity with inherent values and the right to thrive independent of human interference (Smith, 1998; Hayes, 1959).

As a result these two management ideologies, conservationism and preservationism developed in tandem. Conservationists supported the expansion of executive authority over natural resources and public lands. The Forest Reserve Act of 1891, allowing the President of the United States to set aside forest reserves, and the Forest Management Act of 1897, establishing how national forests are created (US Forest Service, 2011), demonstrate the federal government's use of legislation to maintain unilateral control over national resource utility. Preservationist principles also began to seep into federal legislation; most notable is the Lacey Act. As a result of the Act plant and wildlife species were protected for the first time, civil and criminal penalties were established for various violations, and trading protected wildlife, fish, or plants that had been illegally taken, possessed, transported or sold was prohibited. Furthermore, the Lacy Act fortified existing laws protecting wildlife by more clearly carving out individual violations of existing laws for possession, document falsification, and wildlife shipments (Michigan State University College of Law Animal Legal & Historical Center, 2003). Although it appears that the movement and public support for each environmental philosophy seemed to push the creation of legislation, government did not fully engage the general public sector in the policy formulation process through this period. Both movements were able to garner enough support to be recognized. However, it would not be until the close of the twentieth century that policy makers sought direct public consultation in the policy development process.

In addition to this rise of environmental philosophy, the rise of a scientific era in the twentieth century produced advancements in science and technology at a rate unparalleled throughout modern history. In the 1920s, water-based industries in cities along the Atlantic coast from Maryland to Maine declined significantly due to industrial pollution resulting in a movement to address oil and sewage pollution. Dr. Alice Hamilton's research in Industrial Toxicology published in 1934 clarified countless adverse effects of human-made chemicals often used in industry. Deadly smog episodes in 1948 in Pennsylvania, 1952 and 1956 in London, 1953 in New York, and 1954 in Los Angeles increased public awareness of the potential for an air pollution crisis. In 1957, the Oceanographic Institute published evidence of surprising levels of increasing CO2 buildup. Rachel Carson's book Silent Spring, published in 1962, highlighting

the adverse impact of human-made chemicals on wildlife, reflected rapidly growing environmental concerns (Kovarik, 2008).

The perceived certainty and authority of science led to broad acceptance of the reliance on scientific information in regulatory implementation and policy decision-making in the United States. Science appears to provide reliable data (Bocking, 2004). Environmentalists utilizing scientific research methods presented their results to Congress; the quantity of these testimonies rapidly increased throughout the 1950s and 1960s. Scientists and researchers previously accustom to a small audience now presented to a much larger one to make instrumental contributions to policy formulation on the national environmental agenda (Keller, 2009; Innes & Booher, 2005). Federal agencies developed environmental regulations by consulting expert advisors and relying on scientific information, (Rowe et al, 2011).

During the final quarter of the twentieth century political and economic interests grew to understand the value of science's contribution in United States public policy. During this time public policy decisions were riddled with technocratic and politicized outcomes. Technocratic outcomes result when decision-making excludes other legitimate participants or stakeholders because of the control of scientists and politicization occurs when bias from individuals and/or group interests is introduced into scientists' actual work (Keller, 2009).

Because policy makers increasingly utilized a technocratic approach throughout the late twentieth century (Fischer, 2000, Keller, 2009) there was little to no opportunity for individuals and/or groups to directly participate in the policy making process without politicization. As a result, the public sector became increasingly alienated from the decision making process. The citizen's role in public policy was limited to responding to what scientists and professionals told them about the decisions being made. Information was often unreliable and often filtered to accentuate scientific or political intentions. Public dissatisfaction in this process led to a lack of trust in government agencies, their managers and expert advisors (Rowe et al, 2011) and gave rise to the idea of a participatory democracy concept which began in the 1960s (Pateman, 2012). Participatory democracy is a process that highlights and encourages the broad participation of the public with the government system involving people directly in decision-making that affects them.

Ecosystem Management – A Method of Collaborative Decision Making

Traditional studies of Western culture test the ability of human communities to endure or adjust in the same ways that natural communities are able to adapt. Both plant/animal communities and human communities use resources to move toward the highest state of diversity and complexity. It is possible to see similarities between natural and human communities throughout history when looking at both from an ecological model perspective.

However the relationships in natural vs. human communities and the interactions between community members in each setting are inherently different. The major difference is that natural communities are characterized by a variety of species, where human communities are dominated by one species (Gunn, 1998). Of course, humans need other species of plant and animal life for survival, but humans often do not perceive their role within natural systems beyond meeting their own basic needs. Ecosystem management is an environmental management philosophy that incorporates the biological components, but also human values and social and economic conditions that affect natural and physical resources and reflects that humans are part of the ecosystem.

Such a philosophy has been developing since the late 1980s and has become known throughout the scientific, political and academic world as ecosystem management. The history of resource management throughout the nineteenth and early twentieth centuries has demonstrated how conservationism established a foundation for an ecosystem approach to environmental policy. The concept of ecosystem management applies ecological values to natural resources in order to address both conservation and social needs. This management approach attempts to define goals and objectives clearly, uses integrated science to collectively address concerns from multiple scientific disciplines and establishes adaptable policy institutions while encouraging collaborative decision making (Cortner & Moote, 1999).

Ecosystem management as an environmental policy tool can be further understood by examining the differences between conservation (traditional) resource management principles and ecosystem management principles. First, traditional environmental management and/or conservationism focus on the resources that can be extracted out of an environment (Meffe, 2002). We saw this throughout the nineteenth and early twentieth centuries with the scientific management approach to natural resource utility beginning in the timber industry and the management of forestlands. Ecosystem management looks at the same resources as certainly

valuable individually, but more importantly as the result of a well functioning larger picture within an ecosystem. In order for an ecosystem to produce resources such as timber, it is important to maintain clean water, air and other amenities. Without these other elements, healthy resources will not be produced at all or only for a limited period of time.

Secondly, traditional environmental management and/or conservationism had been largely based upon the idea that periods of equilibrium naturally occur for long and stable periods of time. Once an ecosystem reaches the point of its highest stability, known as a climax community, it was thought to have reached the potential of what a given ecosystem is supposed to produce and could naturally continue producing resources at that level (Meffe et al, 2002). These views have been changed by the recognition that management is not one single, linear action (Slocombe, 1998). Ecosystem management seeks to work within this complexity rather than eliminate or ignore it. These stability shifts must be recognized in adaptive management goals that do not limit the dynamic nature of an ecosystem (Slocombe, 1998). Within every ecosystem there are mechanisms to accommodate stressors, which result in inevitable change (Lackey, 1998); applied management practices should be able to adapt with these changes. Ecosystem-based management includes adaptable practices that can accommodate the continuing evolution of social values and priorities (Lackey, 1998); adaptability and accountability are integral themes to ecosystem management.

Third, traditional environmental management not only addressed individual problems, it addressed them one at a time. Single concerns were pinpointed and individually managed within a specific geographic location (Meffe et al, 2002). Historically, environmental management concerns were addressed by focusing on one species of plant or wildlife at a time within a single geographic location or on a single medium such as air or water. This management approach hinders overall success by limiting concerns to only one species or one medium within one location, and allows that plant or animal species to define the problem instead of examining the entire location in an inclusive manner to address overall health (Lackey, 1998). Ecosystem-based management allows each problem to develop on a scale of its own and allows the ecosystem boundary to define concerns instead of the individual elements within (Christensen et al, 1996). Furthermore, it recognizes that within a defined area of concern, benefits must be maximized for both ecological and societal reasons (Lackey, 1998).

Ecosystem management highlights key objectives when binding a geographic area to a specific management policy. When establishing recognizable geographic boarders, the management area needs to be clearly defined and the construction of boundaries, and accompanying goals, must not be restricted by political lines (Meffe et al, 2002). This division is important because many environmental management areas cross geopolitical boundaries, requiring federal policies rather than individual state policies to be effective. Ecosystem management suggests that large-scale goals be linked to values and ethics and smaller scale goals be linked to what people in a particular place at a particular time desire. Balancing and integrating these two dimensions with both public and scientific understanding is a major challenge and key aspect of successful ecosystem management (Slocombe, 1998).

Fourth, traditional environmental management of resources follows a practice of tight control and regulation of natural resources. Legislation was often used to manage natural resource utility throughout the nineteenth and into the twentieth century. By the mid-twentieth century, communities generally became reliant on the use of technological advancements to combat many, if not all, environmental problems. Wildlife, game and fishery programs are good examples that use control techniques. Desired fish and game species migratory patterns and populations are often altered by the introduction of dams or through bait and shoot programs (Meffe et al, 2002) demonstrating human control of environmental conditions that limit natural diversity.

Ecosystem management places emphasis on decentralized decision-making in order to help accommodate nature's uncertainty. (Cortner & Moote, 1999; Slocombe, 1998). Ecosystem management plans have built-in flexibility that is able to adapt to ever changing ecological conditions. This approach to unpredictability tries to adjust management to the natural flow of ecosystems on a broad and flexible scale. Cooperation of government agencies at various levels and the introduction of stakeholder participation are important for successful application (Meffe et al, 2002).

Fifth, traditional environmental management has a tendency to compartmentalize disciplines by using experts to work on the corresponding concerns. These experts often have a degree of influence in their respective disciplines and by using this influence they usually have the ability to make authoritative decisions which limits collaboration. However, research in the social and policy sciences demonstrate that conventional science does not have an

unquestionable advantage (Fischer, 2000). Moreover, traditional scientific attention to resource management focuses on immediate impacts rather than on larger environmental and social issues. There is also a tendency to exclude other forms of knowledge including public contributions and/or local ideas and understanding of environmental and social issues (Bocking, 2004). As a result a few individuals end up making decisions for a whole community.

The ecosystem approach requires open dialog between local and regional levels of government in partnership with scientific experts. Local knowledge has a distinct function in the application of public policy. By examining a community's collective 'informal' knowledge important circumstantial themes may emerge that may have previously been overlooked. Citizen participation plays an important role in validating both the policy formulation process and its implementation (Fisher, 2000). Without the benefit of local knowledge, consensus, and understanding of local players, the chances of effective policy implementation is less than favorable (Fisher, 2000; Slocomb, 1998). Ecosystem management supports the idea that participation should be collaborative by incorporating citizens, as well as organized interests, profit and non-profit organizations, public planners and administrators. This level of engagement allows all participating bodies to interact and influence each other essentially joining learning and action allowing policy, stakeholder interests and citizenry to co-evolve (Innes & Booher, 2005).

Lastly, traditional environmental management practices often result with differences of opinion among groups working on the same issue. As seen in the past, scientific investigation uncovered certain problems and an overseeing agency would execute solutions and/or recommendations resulting from that same research; these solutions may not take into account all aspects of the ecological and societal needs of the region. As a result, agencies and individuals that should logically work together were often in conflict with each other. Also, during the conservation movement many environmental lobby groups grew too close to the agencies that were responsible for providing polices they promoted. This resulted in many conservationist groups becoming loyal to one agency. In areas where collaboration could have helped advance environmental health, agencies and groups that had established loyalties had difficulties cooperating with each other (Slocombe, 1998). The ecosystem approach calls for consensus building to address issues and arrive at solutions developed through partnerships (Meffe et al, 2002). By recognizing that humans are included in ecosystems it is clear that local residents and

interest groups need to be a part of the solution (Christensen et al, 1996). Therefore, collaborative decision making is important to establish a balance between government agencies, interest groups and the general public in order to achieve sustainable practices (Cortner & Moote, 1999).

In summary, ecosystem-based management includes the incorporation of the following goals: sustainability, adaptability and accountability, reflective boundaries, flexibility, stakeholder involvement, and consensus building.

Direct Public Participation in the Policy Making Process

Support for public participation in policy development has been, in large part, a response to the loss of trust in government and expert bodies (Rowe et al, 2011). In theory, public and stakeholder inclusion in the policy development process produce improves policy decisions, increases trust in decision-makers and results in a more knowledgeable public (Parkins & Mitchell, 2005; Rowe et all, 2001). Public participation can reveal public preferences, incorporate local knowledge and establish legitimacy during the decision making process (Innes & Booher, 2005). However, there is limited research that emphatically demonstrates any of these outcomes (Rowe et all, 2011; Innes & Booher, 2005). Notions of successful public participation largely depend on the definition of "success."

There are two themes that many researchers accept as measurements for public participation: outcome goals and process goals (Rowe et all, 2011; Rowe & Frewer, 2000; Chess & Purcell, 1999). Outcome goals focus on whether the participants or stakeholders will accept an exercise's end result (Rowe et all, 2011, Rowe & Frewer, 2000). This acceptance is largely due to public perception that their input was included in or supported the final decision (Chess & Prucell, 1999), creating ownership. The sense of ownership also often correlates to the level in which program outcomes are achieved and the participants' confidence in the decision making process (Beierle, 1999). The Rowe – Frewer framework for outcome goals is outlined below (Adapted from Rowe & Frewer, 2000).

<u>Equal Representation</u> *– public participants should be proportionately representative of the broad population of the affected public.*

Ensuring participation representativeness of the broader public, rather than a selected subset, is often expressed in the public participation literature. Excluding poorer groups or addressing only intelligent, motivated, expert members of society in participation efforts will not produce credible outcomes and the ability to gauge the viewpoint of the general public is reduced. Representativeness is only achieved when members of all affected communities become involved. To practically represent all stakeholders in the general population a large sample is usually desired (Rowe et all, 2011; Rowe & Frewer, 2000).

Although equal representation is an important criterion, practical constraints will limit its complete application. Fair representation of all stakeholders through the general public requires a large sample of interests, which has the potential to be inefficient. Financial constraints and the ability to reach all sectors of the public also impose recognizable limits to implementing equal representation.

Unbiased Collection – the participation process should be conducted independently.

The chosen method of public participation should always be unbiased. Selected managers should not have any affiliation with the sponsoring body and be visible to participants as such. Likewise, participants should be independent of the sponsoring body. Any relationship between participants and the sponsoring body would need to be disclosed to confirm independence to the wider public. It is also suggested that, depending on the participation method, the use of a reputable facilitator could also increase perceived independence.

Independent participation can reduce the control and influence of the sponsoring organization. The control and influence of the sponsoring organization is a shortcoming, especially when the sponsoring organization is using participation methods simply to garner support for decisions that have already been made (Rowe & Frewer, 2000; Chess & Purcell, 1999). Under these circumstances the sponsoring organization might allow independent participation while retaining control by defining how the results will be used in an end product.

Early Involvement – participation should be engaged as early as possible during the policy formulation process to ensure a full reflection of public/stakeholder desires.

The stage at which public and/or stakeholder participation becomes appropriate varies during policy formulation. Participation during stages where highly technical actions requiring scientific expertise is not appropriate. However, once official matters are settled then value

judgments become important and it is critical to consider public viewpoints. Such public debate addresses any underlying concerns or problems and the earlier it is incorporated into the policy making process the sooner such issues can be addressed.

However, broad involvement at each stage has the potential to confuse the public on the intent, delay decision-making and establish arguments between opposing opinions. Therefore for each stage of the participation process, no matter how early, an appropriate level of involvement may not include all parties equally.

Direct Policy Impact – the output of the participation should have a genuine impact on the resulting policy

Information gathered from participation efforts should influence the policy plan or proposal that results. Among complaints about public participation methods, this is the most common. Many believe public participation to be ineffective and used solely to legitimize already-made decisions by giving the appearance of public consultation. This ultimately leads to public skepticism about the resulting policies and distrust of their sponsors or leading agencies.

Assuring that participants have a clear understanding of how their contributions will be used to direct policy at the onset of participation will help ease concerns of those who are doubtful of the process as a whole. Sponsors or administrating agencies should also highlight the areas where public input has been adopted.

Transparency – the participation process should be open so that the public (both participants and non-participants) can see what and how decisions are being made.

Transparency in government, policy development and public participation is a general goal. Achieving transparency allows the wider public to see what is going on during the decision making process. It is also likely to reduce public skepticism about program sponsors and/or administering agencies. Transparency could include releasing information pertaining to important details on operational procedure and important results or making sure to disclose when certain information is being kept confidential due to sensitivity or security concerns. Being proactive in providing this information upfront is always best rather than risking the possible backlash that could result should the public find out it was purposely withheld.

Process goals differ from outcome goals but are also a means to measure success of public participation. This perspective focuses on the means or method used in participation programs rather than the results that are produced to measure success (Rowe et all, 2011). Gauging success on the participatory process allows elements such as fairness, the exchange of information, group process and procedures to be considered (Chess & Purcell, 1999; McCool & Guthrie, 2001). Criteria to achieve process goals includes participant access to necessary resources, clear definitions of what participants should be doing/accomplishing, an organized method in order for participants to make educated decisions and cost effectiveness (Rowe et al, 2011).

The lack of general public knowledge of environmental issues also directly affects the quality of public contributions and the public's ability to apply pressure to environmental offenders and therefore the potential outcomes of participation efforts. Public education is becoming increasingly important to a well functioning environmental regulatory system (Beierle, 1999). Knowledge about environmental issues allows the public to be appropriately and effectively involved in environmental policies and regulatory decisions. This is increasingly important as many environmental planners and officials now include participation requirements as an element of policy decision-making (Innes & Booher, 2005).

Ecosystem Management in the Great Lakes Water Basin

As the largest freshwater system in the world, the Great Lakes provides drinking water to over 30 million people, a substantial source of food, recreational opportunities, and millions of dollars of shipping revenue each year. In addition to the five Great Lakes, there are several rivers, lakes and streams connected to the water basin, all of which run along or through the border between the United States and Canada. The Great Lakes basin has even been referred to as the fifth coast of North America (US EPA, 2005).

This complexity of composition of the Great Lakes basin makes environmental policy very difficult, and has become the focus of ecosystem management approaches. For far too many years, the great misunderstanding of the Great Lakes has been that the water resources have been in such large supply that they were virtually limitless. Formed by glacier erosion, the Lakes seem to convey a sense of agelessness. However, real problems have compounded

throughout the entire basin, slowly leading to the complete alteration of this unique resource. (Ashworth, 1986).

There has historically been little reason to address water conservation in the Great Lakes region because it is such an abundant resource. However, the realization of misuse and neglect throughout the Great Lakes has renewed a sense of appreciation for them (Annin, 2006) and solidified the need for action. As the greatest source of fresh water on the planet, the importance of addressing its environmental problems is paramount. Successful application of an environmental management approach within the Great Lakes water basin can serve as a model for other fresh water systems around the world.

International Joint Commission and the Great Lakes Water Quality Agreement

The United States and Canada share a long history of working together to address the needs of the Great Lakes basin. In 1909 the Boundary Waters Treaty established the International Joint Commission (IJC) to address the issues that faced the water systems that crossed the U.S./Canadian border (IJC Who We Are, Section 1). The IJC's fundamental role is to help prevent and resolve international water resource and environmental disputes between the U.S. and Canada.

Throughout the early twentieth century the Great Lakes region of the United States grew at a rapid rate. As Great Lakes cities grew, commerce expanded. The lakes became a major transportation route for the region; Great Lakes shipping capabilities supported industries from paper to steel to automobiles. With the completion of the St. Lawrence Seaway in 1959, the region became important in international shipping and supported the promise of long-term economic prosperity (US EPA, 2005).

Over time, growing industry in the United States Great Lakes cities had a significant positive impact in the regional the economy, but at the same time caused physical changes to the Great Lakes ecosystem. For example, the St. Lawrence Seaway and the opening of the Lakes to worldwide trade also opened the entire basin to destructive exotic species. Within only a few years of their arrival, non-indigenous species, such as the sea lamprey, had major adverse impacts on native species, such the lake trout. Other non-native species quickly followed the sea lamprey aboard international ships and now over 160 non-native species exist throughout the Great Lakes water basin (US EPA, 2005).

By the mid 1960s it appeared that the Great Lakes were in terrible trouble. Changes to the landscape quickly included degraded water quality, wetland destruction and invasive species damage (Ashworth, 1986). By the 1970s, the Great Lakes' image as an economic symbol for the nation's strength was tarnished. Many areas remained pristine; other areas became a national embarrassment. The image from northeast Ohio of fire on the Cuyahoga River in 1969 exemplified the decades of abuse to the Great Lakes while also foretelling possible additional consequences (US EPA, 2005).

In response to the degradation occurring throughout the Great Lakes basin, the U.S. Environmental Protection Agency (EPA) began to formally identify key environmental problems and the need to tighten lax pollution regulations. Several federal environmental laws were passed during the 1970s including the core provisions of the Clean Air Act in 1970 and an expansion of previous water regulations to form the Clean Water Act in 1972 (Alexander, 2009). Federal pollution controls exposed specific problems throughout the Great Lakes (Ashworth, 1986). Recognizing the need for direct action to protect Great Lakes during the onset of these discoveries, the U.S. and Canada partnered to develop the Great Lakes Water Quality Agreement.

Signed in 1972 by Prime Minister Pierre Trudeau and President Richard Nixon, the Great Lakes Water Quality Agreement (from here on known as the Agreement) assists all levels of government: national, state, local and tribal. The International Joint Commission was given the responsibility of overseeing the implementation of the Agreement. The Agreement established basin-wide water quality objectives, implementation strategies and a monitoring system for municipal and industrial pollution control programs (IJC Great Lakes Water Quality Agreement, para. 12).[6] The Agreement is the cornerstone of U.S.-Canadian cooperative efforts in the Great Lakes basin and incorporates international and multi-level government strategies (Annin, 2006).

Collaborative efforts in the Great Lakes initiated through the Agreement include broad goals that are collectively agreed upon; objectives that outline specific and achievable tasks; targets that provide important feedback on goals and objectives; and criteria that provide benchmarks when goals and objects should be met. The Agreement includes an important step in stakeholder participation by assuring collaboration across multiple levels of government to develop and implement policies that are accessible to each involved level of government.

[6] It should be noted that in 2009 the governments of Canada and the United States began a multi-year effort to update The Agreement. Proposed provisions to that update are beyond the scope of this research.

Such federal and international actions are important steps in addressing Great Lakes concerns. New pollution controls developed in the U.S. in the 1970s and 80s limited the amount of waste that could be discharged into surface water. Industries and cities alike were forced into investing billions in water treatment equipment to meet the new water standards.

The Clean Water Act (1972) alone decreased the discharge of conventional pollutants, improving water quality and the health of aquatic life significantly (Alexander, 2009). However a significant omission in legislation, including the Clean Water Act, is the failure to address biological pollution. As a result, ballast water discharges within the shipping community, a major vector for invasive species, were not addressed as a source of pollution. The EPA acknowledged this exemption by concluding that ballast water exchanges "cause little pollution." Because the EPA determined that ballast water generated an insignificant amount of pollution, it did not include ballast water in the law's waste category, concluding that this would "reduce administrative costs dramatically" (Alexander, 2009). The ballast water exemption within the Clean Water Act remains problematic because of the potential for the transfer of deadly viruses and harmful foreign wildlife during ballast exchanges. During the three decades following the passage of the Clean Water Act ships dumped millions of gallons of ballast water containing hundreds of foreign species into the Great Lakes (Alexander, 2009).

The Problem of Aquatic Invasive Species in the Great Lakes

Aquatic invasive species (AIS) introductions have been a growing concern in the Great Lakes St. Lawrence Seaway water system since the Seaways' completion in 1959. The unintentional introduction of AIS has had an alarming effect on the ecosystem and economy of not only the Great Lakes, but also the many tributaries of this massive water system. Because the Great Lakes are a significant gateway to the water systems of the Eastern United States, the problem of AIS has spread due to shipping, organism trading, recreational boating, and canal and coastal decay. Without significant attention, further introductions show no signs of slowing down (GLRC, 2003).

There are many factors that can influence the survival of native species and unintentional introductions of AIS (Sax, Stachowicz & Gains, 2005). Such factors include, but are not limited to, competition for resources, interference competition, mutualism, and top-down phenomena such as herbivore availability, predation, and disease although there is no conclusive authority on

the ultimate success of any of these factors. The adaptation frequency of native species is also an important attribute, as trade-offs should always be considered (Sax, Stachowicz & Gains, 2005). Even with the introduction of alien species, native species populations may acquire the resources to become sustainable; in other words, not all introduced or alien species become dangerous invasive species.

Signed by President Clinton February 8, 1999, Executive Order 13112 provides definitions for invasive species as well as establishing the National Invasive Species Council. Under the Order an "Alien Species" is defined as: "[respecting a particular ecosystem] any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem." An "Invasive Species" is defined as: "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Federal Register / Vol. 64, No. 25 / Monday, February 8, 1999 / Presidential Documents).

According to the International Association for Great Lakes Research (2002), scientists estimate that approximately 10% of introduced species become established. Of those that are established, about 10-15% becomes harmful to the original ecosystem. In addition to the environmental consequences, a 1993 study by the Office of Technology Assessment calculated that at least 100 billion U.S. dollars were lost over the preceding 80 years in Great Lakes economic activity due to the introduction of 79 new species. In North America there are over 300 aquatic invasive species (AIS); 164 (54%) can be attributed solely to shipping (Ruiz & Carlton, 2003).

Action Regarding Aquatic Invasive Species Policy (1990-2003)

The first action addressing AIS in the Great Lakes was federal legislation passed in 1990 known as the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA). This legislation identified the exchange of ship ballast water as the largest vector of unintended introduction of nonindigenous species. The NANPCA defines ballast water as "any water and suspended matter taken on board a vessel to control or maintain, trim, draught, stability, or stresses of the vessel, regardless of how it is carried" (US EPA, 8/15/05). Ballast water is taken on or released at port when cargo is either loaded or unloaded as means of compensating for the lost or added weight of the cargo. The process increases traveling efficiency and cruising safety

for crew by ensuring that the ship sits at proper water levels. During these water transfers organisms may be unintentionally included. When the ballast water is exchanged in the arrival port, nonindigenous species from the originating port are introduced.

The NANPCA (P.L. 101-646) included three focus areas. The first was the development of a better understanding of water ballast exchanges from ocean water to fresh water. Second, research facilities and programs were established to monitor and track the ecological and economic impacts and relationship between water ballast management procedures and invasive species introduction. The third key area was authorizing the United States Cost Guard to formulate regulations and guidelines for implementation to prevent the further introduction of nonindigenous species into the freshwater systems of the continental United States (United States Geological Survey, 7/18/05).

The U.S. Coast Guard adopted a series of implementation steps. All ships entering the Great Lakes were to perform a ballast water exchange if traveling inland from outside the Economic Exclusive Zone (EEZ) – any area 200 nautical miles offshore. Ships traveling more than 200 nautical miles offshore were presumed to be traveling cross-ocean, increasing the potential for native species to be harboring inside ballast chambers. By requiring a water ballast exchange under such conditions at that distance offshore, any living organisms should theoretically be eliminated due to their inability to survive the salinity level change.

By 1996 the Coast Guard had developed and implemented a Ballast Water Management Program Procedure, which included instructions on ballast chamber maintenance and exchange measures. The procedure outlined mandatory operations for each vessel regardless of the EEZ (33 Code of Federal Registry (CFR) 151.2035(a)) and additional protocols for those traveling outside the EEZ (33 Code of Federal Registry (CFR) 151.2035(b)). It also identified two problem scenarios with ballast management practices: safety and No Ballast on Board (NOBOB) vessels. Safety guidelines permit the elimination of water ballast exchanges in instances where the ship's master thinks it would jeopardize the safety of the crew and/or ship. In such instances, water ballast exchanges made by such a vessel upon entering U.S. waters must remain minimal while still allowing for proper functioning of that vessel (33 CFR 151.2035(a) & 33 CFR 151.2035(b)). However, most of the vessels reporting no ballast water exchanges declare themselves as NOBOB. In recent years at least 75% of the vessels reporting as NOBOB vessels are not performing any ballast exchange (NOAA, 2006).

One study showed only 20.8% of ships subject to the reporting requirement submitted reports in the first 12 months since [water ballast management] requirements became effective. Within those ships reporting, only 8.9% and 6.3% of reporting vessels declared partial and complete exchange. Another 14.1% of the reporting vessels declared no exchange of ballast water. Most others declared no intention to discharge ballast water within U.S. territory. Furthermore, nationwide compliance is only around the 75% level and penalty enforcement for noncompliance is implemented in only 20-30% of arrivals (Perkis & Yang, 2003).

Policy Formulation: The Great Lakes Regional Collaboration

In 2003 a Congressional delegation representing the Great Lakes states urged further action to address ecological concerns throughout the water basin. In response, President George W. Bush signed executive order 13340 on May 18 2004, acknowledging the national significance of the Great Lakes and creating a cabinet-level Great Lakes Interagency Task Force. The executive order also called for the development of a Great Lakes Regional Strategy through a collaborative effort involving citizens, business representatives, scientists, public officials, tribal leaders, state and federal agencies and environmental interest groups.

After extensive discussions, the Interagency Task Force, Council of Great Lakes Governors, Great Lakes Cities Initiative, Native American Tribes, and Great Lakes Congressional Task Force agreed to a framework for a Great Lakes Regional Strategy. From this framework a collaboration process was designed to develop, by consensus, a strategy and action plan to restore and protect the Great Lakes. A draft statement on the ideas that GLRC members and their executive committee developed was issued on January 7, 2005. This document establishes eight strategy teams – non-point source pollution, toxic chemicals, aquatic invasive species, habitat and species, restoration and sediments, indicators and information, sustainable development, and coastal health – as the primary bodies to address each priority. The GLRC used a group of 1,500 interested stakeholders to develop priorities for the strategy teams and release a draft strategy for Great Lakes restoration. Each team will execute a plan to address area concerns by involving individuals with varying backgrounds and expertise to first develop, and eventually execute, their policy plans according to team topics. The proposals that were developed as a result of this original and collaborative strategy teamwork became the content of the draft statement (Framework for the Great Lakes Regional Collaboration, 2004).

As a specific element to the development of the Strategy, public input was solicited to assist in the development strategy team recommendations. Public comments were taken during a 60-day public comment period in the summer of 2005 from various stakeholder groups: individuals, non-governmental organizations, industry and federal, state, local and tribal governmental agencies. Comments were received directly by the GLRC Program office from all Great Lakes stakeholders online and in writing. Additionally, six public meetings were held in locations throughout the Great Lakes basin – July 28 in Gary, Indiana; August 1 in Grand Rapids, Michigan; August 4 in Superior, Wisconsin; August 18 in Detroit, Michigan; August 23 in Cleveland, Ohio; and August 30 in Buffalo, New York – to seek the public's views on the recommendations and to help establish priorities. By the close of the public comment period, the GLRC had received over 6,000 comments. Following the Public Comment Period, the GLRC Executive Committee considered the public comments in developing the final Great Lakes Regional Collaboration Strategy to Restore and Protect the Great Lakes, which was signed on December 12, 2005 by the GLRC participating members.

Great Lakes Regional Collaboration - Aquatic Invasive Species Strategy Team

The GLRC strategy team for aquatic invasive species (AIS) calls for "immediate action to stop the introduction of more aquatic invasive species to prevent significant future ecological and economic damage to the Great Lakes" (GLRC Executive Summary, p. 4). The following recommendations, published in the GLRC Action Plan (2005) by the AIS Strategy Team, outline goals addressing the mitigation and control of AIS:

- Prevention of AIS introductions by ships through ballast water and other means
- Stopping invasions of species through canals and water ways
- Restricting trade in live organisms
- Passage of comprehensive federal AIS legislation establishing a program for rapid response and management
- Education and outreach on AIS introductions and prevention.

(Executive Summary, GLRC 2005)

After establishing these goals within the GLRC, the AIS strategy team members worked in accordance with the GLRC framework to execute their objectives. A Federal AIS Rapid Response (FAISRR) Subcommittee was formed in 2006 and the Great Lakes Clean Boat

Initiative was launched in October of 2007 in support of the GLRC Strategy's overall goals of stopping the spread and introduction of aquatic invasive species. The Aquatic Invasive Species Rapid Response Initiative was endorsed by the GLRC Executive Committee on March 2, 2007. The FAISRR Subcommittee was designed to explore the options surround the creation of a rapid response system. Such a system would serve as a central point of contact for information relating to invasive species introductions, dispersion and concentration. As the GLRC invasive initiative moves forward the coordination of the rapid response system will become increasingly important. (GLRC, Rapid Response Communication Protocol).

The Clean Boat Initiative sets goals to reach out to the Great Lakes boating community. The Great Lakes is one of the top boating destinations in the nation, and due to its tourist draw significant efforts to educate the entire population, both visiting and local, on best boating practices in order to prevent further spread and/or new introductions across the basin. The Clean Boat Initiative also calls for a basin-wide awareness day to coordinate the distribution of a compellation of safe boating practices to shoreline communities and media events (GLRC, October 2007). Across the basin "Clean Boats Every Day" programs specifically highlight the work of several national, state, and local outreach campaigns. These events, held throughout the summer of 2008, taught participants how to inspect, clean, and drain their boats in order to prevent the spread of AIS. (GLRC, September 2008).

Strategy Implementation: The Great Lakes Restoration Initiative

In response to the actions, accomplishments and support of the GLRC and such programs as the Rapid Response and Clean Boating Initiative, a $475 million federal budget allocation was proposed by the U.S. Environmental Protection Agency's Great Lakes Program Office in 2009 to develop the Great Lakes Restoration Initiative (GLRI). The initiative addresses five areas of greatest concern: cleaning up toxics and areas of concern, combating invasive species, promoting near-shore health by protecting watersheds from polluted run-off, restoring wetlands and other habitats, and tracking progress and working with strategic partners. Approved by the U.S. Congress in 2009, the funding covered fiscal years 2010 through 2014 (US EPA, 2009).

Funds to support programs for the five focus areas will be used or directly distributed by the United States Environmental Protection Agency mostly through competitive grants, but cooperative or interagency agreements will also be considered. The proposed grants are

designed to stimulate the Initiative's long-term goals that include fishable and swimmable water throughout the Great Lakes basin, safe drinking water, and a healthy ecosystem for fish and wildlife (FY2010 Great Lakes Restoration Initiative Interagency Funding Guide, 2009).

The Great Lakes Restoration Initiative Action Plan (referred to as the Plan) released in February 2010 outlines the proposed uses for the federal allocation. This Plan identifies that Great Lakes restoration has been significantly undermined by the effects of invasive species and their ability to out-compete native species within the food web. The Plan supports the Collaboration by revising and outlining five long-term goals for aquatic invasive species:

- Eliminate any new AIS introductions into the Great Lakes water basin,
- Control species importation into the Great Lakes,
- Control the spread of already introduced AIS by preventing transfers though means of recreational activities and connecting waterways,
- Develop a comprehensive program for detecting and tracking newly identified species to provide up-to-date critical information needed by decision makers and responders, and
- Implement a management program for containment, eradication, control and mitigation (Great Lakes Restoration Initiative Action Plan, 2009).

Additionally the Plan sets forth several objectives including the establishment of a state based rapid response management plan in the eight Great Lakes States by 2011 and mock exercises to practice response techniques so that the can be implemented by 2014. The investigation of technological solutions and monitoring protocols for basin-wide species surveillance are set to be piloted by 2011 and operational by 2014. A 40% reduction in the yearly average rate of newly detected invasive species is targeted for 2014. Educational tools on best practices for recreational and resource users will be increased to address a target of 10 million people by 2014. Finally, these objectives also call for a measurable control of 6,500 acres of managed area, which would remove 5,000 pounds of invasive species from the Great Lakes ecosystem by 2014 (Great Lakes Restoration Initiative Action Plan, 2009).

With the resources from the GLRC, the Plan also identifies specific actions that will be needed to achieve progress on goals and objectives. A ballast water treatment plan that protects freshwater ecosystems, early intervention plans to address water pathways as a vector, stakeholder outreach and education, control technology development, support of states roles and

early detection are all important actions in the Plan's implementation. These actions will be the focus of the Plan's policy through FY 2014 when they are all expected to be reviewed.

Similar to the GLRC, after funding allocations to the Great Lakes Program office were approved, a public comment session was held on the GLRI Framework during July and August of 2009. Comments were again taken through a write in process and a regional public meeting schedule. Public meetings were held in each of the great lakes states as follows: Wisconsin, July 21; Illinois, July 22; Indiana, July 23; Ohio, July 27; Pennsylvania, July 28; New York, July 29 & 30; Michigan, August 3; and Minnesota, August 4 & 5. Additionally an agency meeting was convened as well as two conference calls, which were held on July 31 - one for Great Lakes Cities and one for Great Lakes Tribes. In total the GLRI reports that 1,063 individuals attended the meetings (Great Lakes Restoration Initiative & Multi-Year Restoration Action Plan Outline, 2009). The EPA reported that during the public meeting process more than 200 comments were collected from stakeholders representing multiple levels of government (federal, state and local), Native American Tribes, individuals and various non-governmental organizations throughout the Great Lakes basin. Stakeholder comments were solicited and received either by the EPA directly or gathered during regional meetings.

Research Questions

- Considering the emphasis on public participation in ecosystem management, how do we evaluate public participation efforts associated with addressing Great Lakes issues?
- Can we determine if recent public participation efforts associated with the GLRC and the GLRI were successful?
- What are the lessons learned for enhancing public participation in GL ecosystem management decisions?

CHAPTER 3: METHODOLOGY

Public participation in the form of public comment periods and/or public meetings are the most common practices utilized to convey information from the public into the policy making process. Such procedures are intended to assist policy managers incorporate the collected information from the public into the decision making process (Beierle, 1999). In addition, public comment periods and public meetings also provide an opportunity to clarify both public and agency goals (Chess & Purcell, 1999).

The United States Environmental Protection Agency (EPA) has outlined their commitment to public participation in a "Public Involvement Policy" released in May of 2003. The Policy outlines intentions to integrate the knowledge and opinions of others into the decision-making process citing that public involvement can improve the content of EPA and all affiliate decisions, promote democracy and civic engagement, and build trust in government. The Policy also outlines goals for public involvement in environmental programs and proposals and different mechanisms to achieve those goals. The Policy is not mandatory, but may be used in programs and/or activities where the public has meaningful involvement, to enhance public involvement or to use public involvement for building new programs as they are developed (EPA, 2003).

The data used in this research was collected from the public comment periods of both the Great Lakes Regional Collaboration and the Great Lakes Restoration Initiative. I performed a content analysis of this data. A content analysis refers to a "systematic, replicable technique for compressing many words of text into fewer content categories based on rules of coding" (Stemler, 2001). This type of analysis enables researchers to filter through a large data set to coordinate a number of outcome possibilities with several stakeholder groups. Because each of the programs resulting from their respective comment periods addresses multiple areas of concern, my analysis focused specifically on data pertaining to aquatic invasive species.

Great Lakes Regional Collaboration Data Method

I requested public comments by phone from the GLRC for my analysis by contacting AIS team leader James Schardt in Chicago, Illinois. I received 208 documents from participating individuals, governments, groups and organizations on a CD. On their website, the GLRC had reported a total of 6,000 comments collected as a result of the comment write in and regional

meeting process. After inquiring about the discrepancy though an e-mail to Mr. Schardt, I was informed that the GLRC recorded each comment as a single reference, recommendation, or acknowledgement of or for any of the strategy teams (e-mail, Schardt.James@epa.gov, 3/30/10). This could account for the inconsistency since each of the 208 documents could contain multiple comments under this scenario. Using the same logic tallying a comment at each reference of a strategy team, my review calculated 747 total comments.

To log data, I sorted comments by GLRC strategy team; each document made reference to at least one (sometimes multiple) GLRC strategy teams. Some submitted documents were prepared more formally, including section headings within the document to indicate which strategy team they were commenting on. However, several documents were submitted as more of a discussion and I logged those comments to the closest fitting strategy team. For example: documents referencing growing concerns about Asian carp populations the comments were logged as AIS; documents discussing problems with wetland deterioration were logged as habitat and species; documents concerned with run-off water contamination were logged as non-point pollution; and documents addressing rising concerns of mercury in fish as a toxic pollution concern.

After an initial review of each document provided by Mr. Schardt, I observed certain reoccurring themes: the need to insure available funding, community involvement and educational programs, legislation and the importance of ensuring that programs already working at addressing strategy team areas were still able to operate. After identifying these areas I conducted a second review of the data and logged which documents also included these themes.

The complete review of all submitted documents was compiled in a database allowing me to catalogue each comment while providing a uniform method to view data according to name, mission statement (if applicable) and comment content. Comment contents extracted key points of interest for that stakeholder and this information is summarized in the comment column of the database. The final database also allowed me to have entry options for each of the eight GLRC strategy teams as well as identified reoccurring themes. If a comment referenced a strategy team and/or reoccurring theme, I was able to record the reference with a positive entry for that row in the corresponding column. This entire dataset can be reviewed in Appendix I and the extracted AIS comments can be found in Appendix II.

Great Lakes Restoration Initiative Data Collection Method

Original comments were never released for direct review. Instead a publication entitled "Great Lakes Restoration Initiative and Multi-year Restoration Action Plan Outline: Summary of Comments" was released in August of 2009. The Great Lakes Commission, under contract with the EPA's Great Lakes Interagency Task Force, prepared this document.

The Summary of Comments, designed to report on various sections of the Regional Initiative's Framework and proposals, is broken down into four sections. Section 1 includes an introduction to the GLRI, timetable and method through which the comments were collected. Section 2 is broken into subsections and includes comments discussing various plans and strategies, project selections and funding cycles and grants. Section 3 included the comments made regarding specific strategy teams; aquatic invasive species was reviewed in Section 3, subsection 3. The final section, Section 4, reports on accountability, monitoring, evaluation, communication and partnerships.

The majority of comments are reported in Sections 2 – 4. These sections are broken down into *recurring comments, general comments,* and *specific comment*s. The report defines *recurring comments* to highlight the most often-repeated comments and *general comments* to represent comments that were repeated (but less frequently) or which were submitted on behalf of government agencies, organizations or groups. *Specific comments* are reported to be included in the sections where they are applicable and relate to very detailed recommendations, specific locations, issues or concerns that were submitted by one entity. Finally, none of the comments are listed in any particular order (Great Lakes Restoration Initiative & Multi-Year Restoration Action Plan Outline, 2009).

Because the Summary of Comments document was already broken down according to focus areas, I only reviewed Section 2 related to procedural aspects and Section 3.3 focusing on AIS. After a complete review I logged comments using techniques similar to those used when logging GLRC comments. Again, similar to reoccurring themes that I found in my GRLC review I also found some reoccurring themes in my review of the GLRI comments. My GRLI database includes the following reoccurring themes: funding importance, whether or not the GLRC was mentioned, whether or not the comment was supportive or expressed concerns with the Initiative, and whether or not the ideas presented at the time of the GLRI collection of public comments were also included in the GLRC's comments.

The complete review of Sections 2 and 3.3 was compiled in a database allowing me to catalogue each comment while providing a uniform method to view the comment content and selected themes. If a comment referenced a reoccurring theme that I was tracking, I was able to record the reference with a positive entry for that row in the corresponding column. This entire dataset for Sections 2 and 3.3 can be reviewed in Appendix IV and extracted AIS comments can be reviewed in Appendix V.

Analysis Framework

With the content analysis results, an evaluation was conducted using qualitative (comments) and quantitative (percentages from coded results of comments) from the review of the data. As an evaluator, I looked to identify the success of the public participation process in the outcomes – the GLRC and the GLRI Strategies. Success of the exercise for this case study included Outcome or Acceptance Criteria:

- *Equal Representation*: participants should cover a broad spectrum of the affected public (collaborative approach),
- *Unbiased Collection*: the participation process should be conducted in an independent fashion,
- *Early Involvement*: participants should be included in the early stages of policy development,
- *Transparency*: the participation method should be open so that the public recognizes what and how decisions are being made, and
- *Direct Policy Impact*: the output of the participation should have a genuine impact on the resulting policy.

(Rowe & Frewer, 2000; Rowe et all, 2011)

Figure 1 demonstrates the inclusion of each criterion for both the Great Lakes Regional Collaboration and the Great Lakes Regional Initiative in respect to my review of each public comment session.

CHAPTER 4: FINDINGS

Figure 1 – Participation Matrix

Outcome Participation Criteria:		Great Lakes Regional Collaboration	Great Lakes Regional Initiative
Equal Representation		?	?
Unbiased Collection		?	?
Early Involvement		+	+
Transparency		+	+
Direct Policy Impact		+	+

? indicates inconclusive results
+ indicates it was included in the results

Great Lakes Regional Collaboration Public Participation Findings

Equal Representation – Inconclusive GLRC Participation

GLRC data appears to be inclusive of all interest groups in that the participation was open to anyone that either wanted to attend a formal scheduled public meeting or submit a comment to the EPA. Comments supported the idea of equal stakeholder representation:

> Believing that balanced representation of all interested parties in the Great Lakes basin is important to successful development and implementation of the plan, we urge that a balanced representation of all stakeholders is achieved (Submitted to the GLRC September 1, 2005).
>
> The main ingredient that can make this plan work is 'citizen involvement'! … plans do not work without people putting them on the ground. We believe that one solution is to form citizen involvement groups similar to [our] proactive volunteer environmental group that works for the community. Our goals are directed towards promoting better water quality, a cleaner Lake…, and greater public awareness concerning our waterfront stewardship (Submitted to the GLRC September 1, 2005).
>
> Formulation of this plan and the unprecedented cooperation that led to its development creates a unique opportunity to take advantage of this momentum to develop a shared

> vision for Great Lakes restoration and make that vision a reality. Logically, consensus on that shared vision and what constitutes 'restoration' should have been a first step in the development of this effort. We believe this still should take place as an important step to establishing the goals and objectives necessary to achieve that desired state (Submitted to the GLRC September 8, 2005).
>
> The outcome of the hard work invested by this broad group of stakeholders is a focused and forceful report that represents an excellent first step to set the Great Lakes on the proper path to a restored and sustainable ecosystem (Submitted to the GLRC September 9, 2005).
>
> The Collaboration has led an unprecedented level of coordination among all the interest groups who care about the Great Lakes (Submitted to the GLRC Sept 7, 2005).

However, many of the contributors were not individuals, but established organizations that operated with vested interested in the resulting policy decisions. In addition to extracting AIS information from the original GLRC data I was also able to filter comments submitted by individuals (Appendix III). Individual citizens comprised only 164 (21.95%) of the total 747 comments while established organizations comprised 583 (78.04%) of the 747 comments I recorded.

Many of the non-governmental organizations (NGOs) have non-profit, 501 (c)(3) status. These are entities have a clear environmental purpose and often lobby both the state and federal government to support their mission. Drawing from information retrieved from Internet sources, I have included a representative sample of groups participating in the comment period of the GLRC, their mission statements and their memberships:

> Clean Water Action reports one million members. Their mission statement includes goals to provide "clean, safe and affordable water; prevention of health threatening pollution; creation of environmentally safe jobs and businesses; and empowerment of people to make democracy work."
>
> Ducks Unlimited reports 579,000 members. Their mission is to "conserve, restore, and manage wetlands and associated habitats for North America's waterfowl. These habitats also benefit other wildlife and people."
>
> The Sierra Club reports 1.4 million members. Their mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives."

> Citizen's Campaign for the Environment reports that they have 80,000 members. Their mission is to "build widespread citizen awareness and advocacy for the protection of our natural environment and public health."
>
> Water Environment Federation reports 36,000 individual members and 75 affiliated member associations. Their mission statement outlines their goals to "develop and promote cost-effective practices and policies in management, design, construction, operations, and maintenance; promote comprehensive water quality solutions including addressing issues related to overflows; support scientifically sound and environmentally-friendly regulatory policies by providing technical and feasible solutions and serving as advisors to policy makers; advance the profession through recruiting, mentoring, and developing collection system practitioners; educate the public and policy makers on collection system issues; identify and acknowledge effective tools and materials, emerging technologies, and products; promote collaboration within WEF and related organizations; provide a forum for collection system topics; and facilitate cooperation throughout the integrated water environment systems."
>
> The Nature Conservancy reports over one million members. The mission of The Nature Conservancy is "to conserve the lands and waters on which all life depends."

Each of these environmental groups reported the membership online along with their mission statement. These example organizations have clear environmental agendas and their comments reflected environmental concerns.

Other commenting organizations include for-profit organizations. The following are examples of for-profit companies and their mission statements:

> OceanEnviro – "To adapt our cutting edge patented products into specific technologies for the removal of polluted soil and waters throughout the world. This enables an improvement in the quality of life for both the people, and the environment, through the restoration of the world's environment. OceanEnviro , LLC, will demonstrate bold strategies can cost less, not more, and will contribute to a healthier world."
>
> Council of Great Lakes Industries – "To promote the economic growth and vitality of the region in harmony with its human and natural resources sustainable development."
>
> The Detroit Edison Company – "Commitment to creating long-term value for its shareholders while operating in an ethical, legal, environmentally sensitive and socially responsible manner."
>
> Ecology & Environment, Inc. – "Carefully incorporating ecological, social, and economic considerations into our business planning and decision-making processes while striving to balance the interests of the present with those of future generations."

> Minnesota POWER – "To promote regional economic vitality and diversification and enhance corporate citizenship through the attraction, expansion or retention of electric customers."
>
> Ohio Steel – "To make our customer's, our associates and our supply partner's job easier."

Each of these organizations also reported their mission statement online. Although some of the mission statements for the above businesses include overtones of environmental concerns, their primary emphasis is on economic values. Because of the environmental nature of the GLRC, their comments reflect acknowledgement of ecological concerns while conveying the importance of being able to secure a strong economy. (All mission statements, where applicable, for participating comments are included in Appendix I.)

These groups or organizations, as with all public comment participants, have established interests that will remain constant regardless of outcomes. However, by examining each company's mission statement we can see why groups would elect to contribute in an open forum about the Great Lakes environment and, further infer which values are reflected in their comments. Environmental groups possess vested interests in preserving ecological integrity of the Great Lakes basin while profit seeking companies within the region have vested interests due to their location within the basin and the possibility of new polices effecting the sustainability of their business. Because of limited complete information for unaffiliated individuals the values of participating environmental groups and area businesses are largely substituted for popular opinion. This inequity between organized interest groups and individuals does not represent equal representation, and it is inconclusive for the GLRC comments.

Unbiased Collection – Inconclusive in GLRC Participation Results

In early July of 2005 the GLRC released a draft "Strategy to Restore and Protect the Great Lakes." This draft had been the culmination of many months of work by interested stakeholder participants on the defined eight strategy teams. Following the release of the draft the GLRC launched a 60 day public comment period from July through August 2005 along with a schedule of public meetings to solicit input from additional stakeholders in order to further establish the Collaboration's priorities. Many groups commented:

> We appreciate the opportunity to comment on this important initiative and remain committed to working with the Great Lakes Regional Collaboration Stakeholders Group throughout the public policy process (Submitted to the GLRC September 9, 2005).
>
> I would like to thank you for the opportunity to offer our comments on the Great Lakes Regional Collaboration's Draft Strategy to Restore and Protect the Great Lakes (Submitted to the GLRC September 9, 2005).

The comment period and public meeting schedule was sponsored and executed by the GLRC. Because the federal Interagency Task Force of the GLRC is considered the administering agency for both the comment period and public meetings, the independence of the public participation process is diminished. This might be remedied if the comments or at least comment period participants were available to the public. One comment illustrates just that:

> List your entire membership… this would be helpful: 1. It is more real when it can be linked, by name, to the participants who have the power/clout to make things happen. 2. To assure the public that everyone who should be a part of your team is a part of your team. This would inspire a great deal of trust for the public, to your benefit. 3. To encourage participation – let like-minded groups join (if this is possible) or to know that they are, in fact, being represented by partners to those already part of the collaboration (Submitted to the GLRC July 26, 2005).

Further, Lindblom and Woodhouse (1993) disclose that interest groups will seldom address issues outside of their immediate scope and because of this it is likely that most if not all action is biased in some way. Since the GLRC as the administrating agent of their public comment period would indeed have a particular scope, bias is inherent.

However, the Rowe – Frewer framework (2000) argues that sponsoring agency involvement in the administration process allows some ability to better define how the collected information will be used as long as they practice a policy of full disclosure. Through the engagement of stakeholders during the early stages of the draft process and public release of draft ideas, it appears that the GLRC informed participants of the intended use of the collected information received during the public comment period. This attempt to establish a relationship between the administrative agency and the participants establishes some credibility, but in theory inconclusive.

Early Involvement – Present in GLRC Participation Results

The GLRC used a group of approximately 1,500 individuals from all levels of government and nongovernmental organizations to develop priorities from 2003 to 2005 for the strategy teams' release of the Draft Strategy for the Great Lakes Restoration. The proposals that were developed as a result of this original and collaborative strategy teamwork became the content of the draft statement that was used for public comment during the GLRC public comment and public meeting time period. Participants adding support for priority items prior to public consultation of the 2005 Draft Statement included technical experts from the participating organizations across the Great Lakes basin (GLRC, 2005).

Activities within the Collaboration during this time period would have also included navigation through the complexities of launching the partnership among several agencies, establishing governance for said partnership, defining priorities and preparing a framework for those priorities. The Great Lakes Interagency Task Force provided instrumental support at setting working priority issues and facilitating considerable outreach and discussion among partners and interest groups across multiple governmental levels for the GLRC.

The above actions by the Interagency Task Force in support of the GLRC and their action plan demonstrate successful early involvement, and although comments submitted during the public comment period of the GLRC did not directly reference "early public involvement" they did reflect an importance of "general public awareness". The method of development for the GLRC allowed early involvement of interest groups in a controlled fashion; interest groups contributed to the Draft Statement later used for general public comment, but an open public forum was not held until the completion of that document. The importance of continuous public awareness for the common good of environmental resources is highlighted in comments referencing the Public Trust Doctrine with such public awareness representing public involvement. Submitted comments illustrating this concept include:

> Any use of Great Lakes water … should be assessed under the Public Trust Doctrine embodied in the Constitution of the State of Wisconsin and other states – meaning these resources are held in trust by the states for the common good (Submitted to the GLRC August 22, 2005).

> I am writing to protest any changes that would endanger the common legal heritage of the Public Trust Doctrine that protects the Great Lakes waters and the watersheds that support them for the common good (Submitted online to the GLRC August 2, 2005).

Transparency – Present in GLRC Participation Results

The method the GLRC conducted their release of information during the public comment period and public meeting process appears to be done transparently. Background information on the proposal and the draft itself were shared online and/or by request through the GLRC EPA Program Office. Comments also expressed support or enthusiasm for the open process in which comments were collected and information was shared:

> In such an endeavor, the process can often be of equal or greater importance than the product. The Collaboration's leadership has done an exceptional job of energizing and focusing the broad suite of Great Lakes Stakeholders through an open and inclusive process. This inclusiveness and transparency are part of the reason for the extremely supportive reception the draft Action Plan has received. We are hopeful that this emphasis on an open and inclusive process will continue through the finalization of the Action Plan and beyond (Submitted to the GLRC September 9, 2005).
>
> For a large-scale Great Lakes restoration initiative to be successful, all stakeholders will need to be engaged in planning, decision making and action. In this regard, ***the GLRC has set an excellent precedent, with an open and inclusive process that has drawn diverse interests together***. The publicity generated by this initiative has done much to draw the public's interest toward this topic (Submitted to the GLRC September 9, 2005).

Other commentators expressed their support for ensuring and even enhancing the transparency of the GLRC's public meetings and public comment period:

> The continued input of various stakeholders will be important throughout these deliberations [and that] the core section of the draft action plan … has been extensively reviewed by collaborating stakeholders and represents, to the extent possible, consensus reached (Submitted to the GLRC September 9, 2005).
>
> We strongly urge the Task Force to commission such a plan, led by the independent academic community, and to support projects selected through a process of competitive, peer review (Submitted to the GLRC September 9, 2005).

The comments show that there is support for transparency within the open forum public participation process. Transparency in the method which the GLRC conducted the public meetings and gathered the public comments is also confirmed through the review of the public comments.

Direct Policy Impact – Present in GLRC Participation Results

The data that was collected during the review of the public comment period largely reflects the final outcome participation goal: direct policy impact. After conducting and cataloguing the content analysis reported in Appendix I covering all submitted comments to the GLRC, a filter function was preformed to separate the comments that discussed AIS into a separate database. The filtered data showed that 74, or 35.4%, of the original 209 documents included comments on AIS or 375 of the 747 total references. Out of the eight Strategy Teams the AIS Strategy Team received the third highest number of comment references, falling a half of a percentage point behind the Non-Point Source Pollution Strategy Team (35.9%) and four percentage points behind the Toxic Chemicals Strategy Team (39.2%). This suggests that the concern regarding AIS is fairly widespread despite its relative novelty vis a vis the "older" problem of chemical pollution.

With this information, the filtered AIS comments were then further examined according to the common themes of federal legislation, existing agencies, funding and education. In addition to these reoccurring themes, the comments also supported sustainability as an overall important component to the development of any environmental policy that would increase long-term successful maintenance of environmental, economic, and social well-being. The inclusion of sustainability as a review category was easily accomplished because it is a separate strategy team within the GLRC framework. The findings of the filtered AIS results by recurring theme can be found in Appendix II and are analyzed and summarized below.

Table 2

Aquatic Invasive Species Comment Results: 74 Total (35.4%) of 209 Documents

	Sustainability	**Existing Agencies**	**Education & Outreach**	**Funding**	**Federal Legislation**
Comments Collected	27	28	22	52	20
Percentage	36.5%	37.8%	29.7%	70.3%	27.0%

Sustainability

Through the content analysis of the 74 documents making a direct reference to aquatic invasive species 27, or 36.5%, also referred to sustainability as an important contributing factor to the overall success of any action taken to address AIS throughout the Great Lakes. The GLRC Draft Action Plan Strategy (2005) states that "sustainable development is an approach to

achieving balance between economic, societal, and ecological needs…" and needs to be "fully integrated into all aspects of the use, development, restoration, and conservation of Great Lakes resources".

Like the AIS strategy team, the GLRC sustainability strategy team also introduced goals in order to address multiple areas where economic competitiveness was hindering the attempts at establishing a sustainable environment. These goals encourage communities throughout the Great Lakes basin to promote a vibrant economy that supports societal and cultural needs in balance with a healthy diverse ecosystem (US EPA GLRC, 2005). Many comments supported such overarching ideas:

> Sustainable use of the Great Lakes to promote national economic and community development is the single most important reason to restore and protect the Great Lakes (Submitted to the GLRC August 23, 2005).
>
> …this section is the one overarching section of the entire report. The goal of the entire Great Lakes Regional Collaboration is a sustainable Great Lakes Basin" (Submitted to the GLRC September 9, 2005).
>
> [We] strongly believe that sustainable development is an overarching goal that relates to all of the strategy areas addressed by the GLRC and the leadership at all levels of government must embrace the concept of integrating ecological restoration with economic development (Submitted to the GLRC September 9, 2005).
>
> Creating sustainable communities and a sustainable Great Lakes region is critical…. The Great Lakes Region's greatest asset is its water. This resource cannot be allowed to be treated as a commodity as water-challenged areas of this nation reach their breaking points. Great Lakes water must be protected (Submitted to the GRLC September 9, 2005).

Sustainability inherently promotes the need for collaboration across all strategy teams. By establishing and maintaining well designed programs, forming policies that support long term management plans and encouraging on-going outreach, the Sustainability Team is promoting and providing leadership for sustainable development (US EPA GLRC, 2005). One commentator pointed out:

> Pursuing sustainable development is not a separate task or the responsibility of a single set of practitioners. The balancing of environmental, social and economic factors is key to sustainable development pursuits, and must be incorporated into each of the areas discussed… (Submitted to the GLRC September 9, 2005).

Another commentator submitted:

> …sustainable development is an overarching goal that relates to all of the strategy areas addressed by the GRLC and that leadership at all levels of government must embrace the concept of integrating ecological restoration with economic development. [We] support the recommendations to adapt and maintain programs that promote sustainability across all sectors and align governance to enhance sustainable planning and management of resources (Submitted to the GLRC public comment period with no date of submission).

The GLRC acknowledges the comments on the importance of sustainability and supports a commitment to it by including economic, social and organizational components in their priorities. The economic approach includes protocol for data gathering and scientific reasoning to establish support for a plan. A socioeconomic approach includes an assessment of community values, interests, assets and private sector responsibilities in order to maximize outcomes. "WATER MUST BE A COMMONS, NOT A COMMODITY! It needs to be kept clean, public, and abundant for all" (Submitted to the GLRC September 6, 2005). The institutional approach includes the cooperation of governing bodies at multiple levels along with the cooperation of the public sector understanding for enforcement of responsibilities.

The GLRC approach to sustainability is further directly supportive of AIS Strategy team goals for water ballast reform. Within the filtered AIS comments (Appendix II) 35% `r 26 of 74 total comments included a reference to the need for water ballast reform, maintenance and/or addressed the concern over water ballast transfers. Many comments discussed the impact of ballast water as the primary vector for AIS introductions. The development of new water ballast policies is an important part of establishing the Basin's sustainability. The prevention of AIS introductions by ships through ballast water and other means is the AIS Strategy Team's first recommendation.

> We would like to specifically highlight our support for... strong federal legislation preventing the introduction of invasive species through ship ballast water (Submitted to the GLRC public comment period with no date of submission).

> I believe we should also pursue monitoring <u>all</u> vessels coming and going to the system from foreign ports. Their ballast has given us zebra mussels and many other unwanted species (Submitted to the GLRC public comment period with no date of submission).

> We suggest that one agency be assigned as the lead agency with overall responsibility for development and enforcement of ballast water regulations (Submitted to the GLRC September 7, 2005).

> Long-term sustainability of the Great Lakes resources cannot occur without the prevention of the introduction of invasive species … Adequate funding should be given to [this] objective before other objectives receive funding consideration (Submitted to the GLRC September 7, 2005).

Comments presented in the AIS filtered data call for urgent attention to the problem of ballast water contamination. Without addressing ballast water policies the GLRC will not likely be able to control AIS spreading or mitigate future introductions. Without achieving either of those goals, it is difficult to argue that the GLRC can achieve sustainability.

Maintaining the Great Lakes as a priority across all levels of government is a priority of the sustainability team because the Great Lakes ecosystem is not restricted by political boundaries. Several comments applaud the efforts of the GLRC in this regard.

> The Great Lakes Regional Collaboration is an unprecedented opportunity to tell the federal, state and local governments what needs to be done to enhance our cherished freshwater [resources] (Submitted to the GLRC public comment period with no date of submission).

> The Great Lakes Regional Collaboration's draft action plan is a good first step towards comprehensive restoration of the Great Lakes on a national level. We first commend the Great Lakes Regional Collaboration for reaching consensus in the development of a plan to restore and protect our global treasure. Implementation of the recommendations put forth in the plan would result in substantial improvements in the health of the Great Lakes ecosystem (Submitted to the GLRC September 6, 2005).

As these comments indicate, multiple levels of government launching separate initiatives often result in inconsistent results. The comments received support a collaborative approach indicating a view that working between levels of government throughout the basin should yield a greater understanding of the concerns, a more consistent flow of knowledge, and overall a more efficient and withstanding progress. Aligning these levels of governments with environmental organizations in overarching practices to address AIS should contribute to the desired sustainability goal.

Existing Agencies

Many programs and policies have already been created and/or exist to address problems throughout the Great Lakes basin; there are certain organizations to specifically address the intrusive problem of AIS. Existing agencies, groups or organization present possible hurdles for new programs. These established entities already receive funding from various revenue streams

and have "a strong commitment for locally-led land stewardship which [they] encourage and would like to see continue" (Submitted to the GLRC Sept 6, 2005). Many commentators would also like to see the GLRC "re-enforce the need to recognize local governments and a grass roots component to implementation of the document goals" (Submitted to the GLRC September 9, 2005).

The comments below suggest that without much of the work done by existing organizations, the core data leading to discoveries regarding AIS introductions would be absent from available information. Data collections, among sport fishing and fishery organizations for example, provide case study information that reveals how AIS introductions have impacted community food chains. Many agencies and/or organizations viewed the comment period as a way to address their contributions up until this point and then leave themselves open to future consultation:

> There must be a shift in emphasis from some valued programs of the past to areas now found to be of higher priority and needed to support a going-forward strategy [and] we must maintain essential portions of existing programs that are successful (Submitted to the GLRC September 9, 2005).
>
> I would like to emphasize the need to have the strategy recognize, support, and incorporate the programs and organizations that have been working on Great Lakes issues for years…. I ask that programs and plans [that are] already in place and they are successfully meeting goals and objectives … be fully funding and programmatically supported (Submitted to the GLRC September 8, 2005).
>
> The Strategy must emphasize the value of and continuing role for existing programs. Given the level of effort that is already being put into Great Lakes restoration and protection … the good efforts already underway cannot and should not be undone through the GLRC (Submitted to the GLRC September 9, 2005).
>
> The collaborative report discusses the recommendations of additional committees and task forces. Many of the programs are in place, but do not work to the advantage of getting conservation on the ground… . We must maximize our exiting framework to work or the greater good of the Great Lakes (Submitted to the GLRC August 23, 2005).

Existing agencies have also provided information to demonstrate how to address individual ecosystem concerns. However, after looking at progress of AIS it can be seen that these existing organizations often work unilaterally. AIS concerns change throughout the Great Lakes basin from lake to lake as different AIS have taken hold in different places. Additionally, connecting water sources (i.e.: Mississippi River) have separate and varying food chains that are

affected differently according to AIS introductions present in differing areas. Although the basin is considered a single entity, and entire ecosystem, there are separate and discernable environments within it. As a result, many small organizations recognizing and cataloguing AIS separately according to their specific introduction cite/region become established. However, each lake, river, and stream is still connected as an ecosystem and therefore has to have AIS introduction information available throughout the entire basin for the potential threat that is present. A commentator illustrates this concept:

> We are encouraged that the Collaboration specifically acknowledges existing regulation, efforts and programs that will control…concerns. It is imperative that the Collaboration relay on such programs, policies, regulations, etc., in lieu of developing and implementing additional programs and efforts. It would be a waste of resources – governmental agencies' and the regulated community's – to develop, implement and comply with new efforts, in essence re-inventing the wheel and superseding recognized efforts/programs/regulations (Submitted to the GLRC September 9, 2005).

Because of the established and valuable resources on varying levels across the Great Lakes water basin, commentators urged the GLRC AIS Strategy Team to work in coordination with the many state, local and other non-for-profit agencies already doing work in the Great Lakes. Activities undertaken since the 2005 comment period appear to be consistent with the comments received during the GLRC review. The US Coast Guard and Army Corps of Engineers are the primary agencies currently responsible for monitoring water ballast policy throughout the Basin. The implementation of the Mandatory Ballast Water Management Program in 2004 continues to increase enforcement effort. Nationwide compliance with reporting regulations for foreign arrivals increased during the 2004-05 reporting period. Compliance increased by 32.9% (from 37.9 to 70.8%), totaling a compliance rate of 79.3% by 2005. Newly required reporting for domestic voyages also reached 60.8% by 2005 (Miller, Lion, Minton & Ruiz, 2007). The most common areas of noncompliance continue to be the lack of required onboard BWM Records and vessel-specific BWM plans.

The Coast Guard also continues to work with the National Ballast Information Clearinghouse to establish reliable quality control for those submitting BWM Reports. Established in 1997 as a statute in the National Invasive Species Act of 1996, the National Ballast Information Clearinghouse (NBIC) is a joint program of the Smithsonian Environmental Research Center (SERC) and the United States Coast Guard. NBIC collects, analyzes, and interprets data on the ballast water management practices of commercial ships that operate

within 200 nautical miles of United States shorelines (National Ballast Information Clearinghouse, 2008). NBIC goals include calculating the amounts and origins of ballast water discharged in US coastal systems and determining whether or not open-ocean exchanges, or alternative water ballast treatments, are administered.

NBIC also has continuing initiatives toward efforts that will make BWM reports more easily accessible. With an increased number of reports submitted, more available data, and better data management techniques, data correlations will be more accurate which will allow the Coast Guard to generate lists of non-reporting vessels (National Ballast Information Clearinghouse, 2008). With such increased accessibility, the hope is that compliance numbers will continue to rise so that more quality information is available. Other new initiatives include e-mail and web-based applications, which seek to continue to increase the amount of BWM information that is available. NBIC's BWM report updates also contribute to monitoring and tracking AIS by region throughout the Great Lakes Water Basin. The concept of information dissemination was noted frequently in the GLRC public comment period. The aforementioned advancements addressing AIS introductions by the National Ballast Information Clearinghouse show comments on information dissemination are valid. NBIC was developed with the foresight of the need for an informational tracking system for both AIS introductions as well as water ballast reporting.

The recognition of existing agencies is also addressed in further analysis of AIS comments that identify the importance of international cooperation. Founded as the international maritime governing body in 1958, the International Maritime Organization (IMO) oversees international shipping rates and international shipping regulations and has become exceedingly necessary with the development of industry. At the time of its inception, the United States, the United Kingdom, and Norway accounted for over 50% of the world gross tonnage shipped. However as developing nations became industrialized this soon changed; by the mid 1970s Liberia emerged as being the lead nation for tonnage shipped internationally. Upon entering the late 1990s data shows that Panama, Liberia, the Bahamas, Malta, Greece, and Cyprus account for 48% of the 543.6 million tones shipped internationally (Brookman, 2002).

As true with all international regulating bodies, nations voluntarily participate as members and therefore voluntarily follow their statutory implementations. It therefore becomes difficult to enforce international regulations or realize the full benefit of certain regulations

should the nations contributing to large percentages of shipping refuse to join. The IMO's effort to involve the international shipping community is important because developing countries are contributing to a greater percentage of total tonnage shipped. Such increased participation in the shipping industry means that there are greater numbers of originating ports.

Furthermore, as the problem of AIS is certainly related to international commerce, which has an impact on the health of water systems around the world, the IMO is a natural player in the control and prevention of AIS. Their importance is even more prevalent when looking at developing countries that might not have their own national policies on best management practices for shipping and ballast water treatment. As a result maritime concerns have continued to rise and on February 13, 2004 the IMO introduced its International Convention for the Control & Management of Ship's Ballast Water & Sediments. This convention marked the beginning of recognizing the problem of AIS by the international community. Under the convention guidelines, parties that agree to participate also agree to take action in order to prevent, minimize and ultimately eliminate the transfer of AIS through ballast management by implementing water ballast management policies (IMO Convention, 2006).

These are only a few examples of existing groups and/or agencies taking action against the spread of AIS. One comment pointed out

> The model of engaging nonprofits (and other groups) as active management and funding partners in the restoration of the Great Lakes is critically important…[these] entities are essential to the actual implementation of cost-effective and strategic projects to restore the Great Lakes (Submitted to the GLRC September 9, 2005).

Another stated:

> As the GLRC process moves forward, [We] stand ready to assist and support the implementation or report recommendations, where appropriate. [Our] Great Lakes Information Network, which has been a useful tool to coordinate communications during the planning and writing phase of the GLRC process, should be considered as a vehicle to publicize the final report and enhance the sharing of information once an implementation plan has been established (Submitted to the GLRC September 9, 2005).

Because there are so many organizations and agencies already promoting policies supporting AIS mitigation, I believe that although the concept of existing agency inclusion is not found the AIS strategy team goals, it is an important element in the GLRC dialogue. Public comments demonstrated support for their inclusion in the discussion. Of the 74 documents reviewed in the content analysis that address AIS 28 documents, or 36.5%, reference the importance of including

existing programs into the GLRC Plan and/or partner with them as the GLRC proposals move forward. The above examples outline some important existing agencies – sport fishing groups, the U.S. Coast Guard, National Ballast Information Clearinghouse and International Maritime Organization – and demonstrate a foundation that collaborative efforts such as the GLRC can grow from.

Education and Outreach

Educational programs are significant mechanisms that promote stakeholder involvement, public participation and overall consensus building. Of the 74 sample comments reviewed that addressed AIS, 22 separate comments, or 29.7%, made a reference to the importance of educational campaigns as a contributing factor for lasting success for the GLRC and AIS strategy team. One comment pointed out it is "essential to [have] public understanding of the issue and encourage citizens to emphasize this topic to their elected official[s] at all levels" (Submitted to the GLRC public comment period with no date of submission). Comments pointed out that

> ...the value of fostering public interaction with the Great Lakes cannot be overstated. In our area a large portion of the population takes Lake Michigan for granted or is barely aware of its presence in spite of the fact that many of these people get their water from the lake. By bringing people to the lake, both for educational and recreational purposes, we can cultivate an emotional tie to the Great Lakes…. We strongly encourage the action plan include a recreational/educational component (Submitted to the GLRC July 28, 2005).

Also, that

> It is increasingly clear that long-term protection of the environment will require conservation action on all of our parts. The premise is that with the right tolls and information we all can do simple things in the course of everyday live to contribute to conservation efforts… (Submitted to the GLRC September 9, 2005).

Educational programs have long been important for environmental movements. They provide a mechanism to make the general public and other involved stakeholders aware of the problem and information on how they can have a positive impact on their community.
A commentator illustrated this after attending the Gary, Indiana meeting:

> Many of the outdoors persons that I talked with expressed concern that the grassroots citizens are unaware of your efforts. Why not send a two sided newsletter out to scout councils, sports persons organizations, civic associations, institutions of higher learning, high school district, marina operators, bait store owners, boat dealers, etc., updating

> activities and giving contact information. If asked, many of these units might copy the news letter for additional local distribution (Submitted to the GLRC August 22, 2005).

Community awareness, enthusiasm and involvement are integral pieces to the success of environmental policies when looking to apply ecosystem management principles.

> Public outreach and education programs are an important means of ensuring that the restoration efforts are supported by, and that they meet the needs of, an informed, interested, and engaged public. Public education on all aspects of the Action Plan will be critical to its success (Submitted to the GLRC September 9, 2005).

Without a knowledgeable population, it is also common for the majority of the community to be uninformed about potential problems or concerns within the ecosystem where they are living. Commentators supported community involvement across interest groups and multiple levels of government:

> Resources for the education and support of local municipalities … could help curtail numerous local losses…. Too often, local municipalities feel they must trade environmental degradation for the preservation of jobs and tax base. Research and education must be funded to address these misconceptions (Submitted to the GLRC September 9, 2005).

> I agree it is [also] important to have effective education campaigns to reach the various people who can be agents for the spread of invasive species (Submitted to the GLRC August 25, 2005).

> We agree that outreach will be particularly important as restoration priorities will likely differ from state to state, or at least lake to lake, and may evolve over time. [Our] outreach professionals have worked cooperatively… to design activities that effect behavior change through constituent-driven programs focused on outcome-based objectives using a variety of educational processes and techniques (Submitted to the GLRC September 9, 2005).

Environmental strategies for governmental interaction with the public have, in the past, included posting public advisories on best practices for recreational activities throughout the basin. Postings along United States shores hope to be able to identify regional concerns and specific problems or information regarding that point of entry. Additionally these signs will universally highlight the danger of AIS introductions, the fact that they are often transported through recreational watercraft and illustrate methods of removing organisms from watercrafts to avoid those kinds of scenarios.

The development of an education, outreach and training programs directed toward local businesses including marinas and marina operators has also been suggested. Programs to institute initiatives including screening procedures for checking for live organisms and removal techniques have been suggested. Marinas could also have programs to encourage regular hull cleaning and maintenance, provide assistance if required, and, upon discovery of AIS, provide procedures for proper disposal of live species.

Various campaigns by environmental organizations have already begun to education the boating community independently. For example the 100th Meridian Initiative is a cooperative effort encouraging state, provincial, and federal governments to prevent spread of zebra mussels and other aquatic nuisance species westward in North America. Additional goals of this initiative also include monitoring and controlling zebra mussels and other AIS when detected, educating water basin communities, influencing change in industry's water ballast policies, establishing rapid response techniques for AIS and providing continuous studies and research which identify AIS introductions so that they can be addressed appropriately (100th Meridian Initiative, 2007).

The 100th Meridian Initiative also supports an AIS task force to survey owners of recreational watercraft being transported westward across the 100th meridian. The task force will record the locations of use, and therefore possible potential AIS introduction threats, of recreational vessels. Such a task force will also provide information to recreational boaters on the importance of cleaning watercraft before transporting to avoid the transfer of AIS. The 100th Meridian Initiative has also recognized the need for additional educational programs to be established within the National Park Service. These programs will be geared toward recreational watercrafts that are being used throughout national parks to prevent AIS introductions in park water sources.

Funding and Legislation

The need for funding is clearly important to the success of any public policy and is arguably sometimes the most difficult. Receiving a budget allocation for a new program can often take years. The filtered GLRC AIS comments revealed an overwhelming response highlighting the importance of funding. The analysis showed that 52 of the 74 comments or 70.3% expressed the need for available funding. Simply put, without available and/or committed

funding the GLRC will remain a proposal and nothing further and that is why many organizations that submitted comments came out to directly support funding:

> To insure the plan for restoring the Great Lakes becomes a reality, a funding strategy must be included as a part of the document with specific responsibilities, timelines and funding levels set forth…. Without the financial backing, the GLRC runs the … of remaining a paper exercise (Submitted to the GLRC September 9, 2005).

> We also call on both federal and state leaders to demonstrate their commitment by fully funding the various recommendations in accordance with the draft report. We cannot achieve the long-term health of our cherished Great Lakes resources without first investing sufficient financial resources (Submitted to the GLRC August 18, 2005).

Timelines and benchmarks are always important components of funding requests so that measurable outcomes can be collected and evaluated. Since progress is often incremental, it is important to have points where some type of measurable data or quantifiable information can be reported. This provides accountability for expenditures as well as possible evidence to support further and/or increased funding levels.

The support for legislation shows the desire for government to formally address problems that are occurring within the Great Lakes water basin. Through the content analysis and the 74 comments that specifically spoke about AIS, 38.5% (20 separate comments) pointed out the need for and support for National AIS legislation. Many comments directly stated that they

> …strongly support efforts to protect the Great Lakes from aquatic invasive species and urge our elected officials to support the quick passage of (a) National Aquatic Invasive Species Act (Submitted to the GLRC public comment period with no date of submission).

Another comment acknowledged

> I have also read about legislation to ban the release of ballast water into the great lakes from ocean going vessels and have to ask why is there such a delay in implementing these new restrictions (Submitted to the GLRC July 27, 2005).

Other comments alluded to the fact that existing legislation needs to be enforced. "The Environmental Protection Agency needs to immediately begin enforcing ballast water regulations within its purview under the authority of the Clean Water Act," (Submitted to the GLRC September 7, 2005) and "the Lacy Act should be amended to include all non-native species to the Great Lakes Region to help control the spread of (aquatic invasive) species" (Submitted to the GLRC September 7, 2005) were noted several times.

The following comment stood out as a summary of the support for both funding and regulatory action:

> All of these strategies can be implemented if these programs are adequately funded. This means the monies need to be ALLOCATED as well as appropriated. And, many of the goals can be accomplished at a minimal or not cost if existing regulations are enforced as intended in the original legislation (Submitted to the GLRC public comment period with no date of submission).

Many of the policy implications from the public comments received by the GLRC are reflected in the subsequent effort known as the Great Lakes Restoration Initiative. In a review of the priorities established by the Initiative, it can be concluded that these priorities were consistent with the public comments. This is discussed in more detail in the following section.

Great Lakes Restoration Initiative Public Participation Findings

Equal Representation – Inconclusive in GLRI Participation Results

The method in which public comments were reported makes it difficult to assure the criteria of equal representation. The report released after the period of public consultation for the GLRI was prepared by the Great Lakes Commission through contract to the U.S. Environmental Protection Agency for the Great Lakes Interagency Task Force. While this third party consultation may support other participation criteria, it makes it difficult to assess whether or not public input was gathered or received from a broad representation of the affected public. This is the case because the report consolidates comments that were submitted for each section: general comments, recurring comments and specific comments. For the sections on general and recurring comments, the original comments were not given.

Examples of Recurring Comments:

> **Invest in ballast water treatment technology and encourage the adoption of ballast water policy.** Multiple comments stressed that it is critical that ballast water discharges are addressed, and that this is one of the easiest mechanisms for halting the spread and introduction on invasive species in the Great Lakes. It was noted that the elimination of invasive species in ballast water may require regulatory or policy action (GLRI Summary of Comments, August 2009).
>
> **Increase funding for invasive species.** States strongly supported provisional funding proposals to implement state management plans. There was some discussion as to whether there is enough money allocated to invasive species under the GLRI (GLRI Summary of Comments, August 2009).

Examples of General Comments:

> **Fund AIS outreach and education.** Outreach campaigns are often the most effective mechanism for combating AIS issues.
>
> **Develop a centralized and coordinated data management system to allow for reporting and tracking of invasive species** (GLRI Summary of Comments, August 2009).
>
> **Fund the development of rapid response programs.** Rapid response needs to more attention. A recent mock exercise indicated that much additional work is needed to prepare the region…(GLRI Summary of Comments, August 2009).

Examples of Specific Comments:

> While there was support generally for control of invasive species, there was caution that too stringent controls might hurt the ability of the Great Lakes ports to stay cost-competitive (GLRI Summary of Comments, August 2009).
> The GLRI must also recognize the important role of private landowners in invasive species prevention and control efforts (GLRI Summary of Comments, August 2009).
>
> EPA has not adequately explained how it intends to coordinate with the U.S. Coast Guard, the U.S. Maritime Administration, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service, all of which have important roles to play in the federal government's response to the invasive species problem (GLRI Summary of Comments, August 2009).

Of the 112 comments included in the sections that I reviewed in the Great Lakes Commission Report there were seventeen (15.2%) *general comments*, twelve (10.7%) *recurring comments* and eighty-one (72.3%) total *specific comments*. However because the authors of the comments were not identified, there is no way to determine whether or not the affected community was equally represented. The Commission also neglects to provide the number of comments provided for comments logged as recurring or general which eliminates the possibility of knowing the actual size of the sample. The recurring and general comments seem to be broad and paraphrased, potentially covering a large base of individuals and/or groups. The absence of information on the frequency of the comments and specific authors of each comment logged under recurring or general comments limits the analysis of these criteria. The fact that comments were aggregated may impact other success factors as discussed below.

Unbiased Collection – Inconclusive in GLRI Participation Results

Similar to the GLRC, the organization and administration of the GLRI public meetings, conference calls and public comment periods were overseen directly by the GLRI allowing them to maintain control over the entire process. They were, however, forthright with the intended purpose of information gathered through a period of public participation and that enhances the credibility of their collection process.

Additionally, the retaining of a third party – the Great Lakes Commission – to review all submitted public comments and issue a report on the contents increases the independence of the reporting for the public consultation data of the GLRI. The Great Lakes Commission is a public agency that was established in a collaborative manner to help its members (both states and provinces) to establish their vision for the region. This action, however, is only indicative of the reporting method and not the actual criteria of *collection* of comments.

In reviewing the summary report, and considering the reporting method, the decision on how to present the information might also be questioned. It seems that by choosing to report comments by general, recurring and specific, more attention is drawn to the general and recurring sections. Again, the use of a third party facilitator to report comments provides an element of independence to the GLRI's reporting process alone, but the fact that comments are classified suggests reporting bias.

General and recurring comments are both presented before the specific comments section and the primary statement is also bolded. This could indicate a greater sense of importance to some individuals/reviewers. After reviewing the content of such statements, those reporting as *recurring* (the most frequent) seem to carry the most weight when considering GLRI goals/outputs. This raises further concerns about the possibility of reporting *recurring comments* purposely to support predetermined GLRI goals instead of the goals being supported by the comments.

Regardless of the consultation of a third party to report on the information gathered by public consultation, the criterion of independence in the collection process remains inconclusive due to the direct oversight of the GLRI during the public meetings and comment periods. A reporting bias by the Great Lakes Commission's classification of comments also factors into inconclusive results, but has to be recognized as a symptom of the decision to use third party

consultation. The outcome criteria being evaluated is *unbiased collection* therefore the success rate of the criteria needs to be focused on the collection not the reporting.

Early Involvement – Present in GLRI Participation Results

Public consultation for the development of the GLRI Plan was conducted in 2009 almost directly following a budget allocation for Great Lakes Basin restoration. The budget allocation was issued at the beginning of the calendar year 2009 and the public consultation period started in July and continued through August of the same year. Participation at an early stage was practical for the GLRI because they had access to the foundation and priorities sent by the Collaboration.

Because the GLRI had the use of the GLRC framework, documents and priorities, the analysis of comments is slightly different from that of the GLRC. The review of comments from the Collaboration is intended to determine if the comments are reflected in the objectives/goals that were published by the AIS Strategy Team. The review of comments from the Regional Initiative is to see if there is not only support for action by the AIS strategy team, but for the implementation of the GLRC as a policy. Swift public consultation was appropriate to show that the Initiative was responding to the Collaborations recommendations and moving forward with restoration priority proposals as intended.

Transparency – Included in GLRI Participation Results

The GLRI document "Summary of Comments" states that

> This document represents a collection of comments and recommendations made by more than 200 states, tribes, cities, individuals and organizations around the region. Comments were submitted directly to the EPA or were recorded during a series of meetings held around the region between July 21 and August 5, 2009…. These comments should assist federal agencies as they move forward with the GLRI implementation and are intended to help guide revisions to the Action Plan (GLRI Summary of Comments, August 2009).

Additionally they report that

> The GLRI and the Action Plan stress on-the-ground restoration, transparency and accountability. These concepts were broadly endorsed by states and stakeholders who seek to meet these objectives while minimizing paperwork and transaction costs (GLRI Summary of Comments, August 2009).

The public meetings were held in an open forum setting and comments could also be submitted directly to the Initiative. The report issued under contract of the GLRI by the Great Lakes Commission also became available on line or by request.

Although the report is mostly a summation of comments with no detailed explanation of what criteria was used to establish each grouping (recurring, general and specific), the report does acknowledge that there was a method used to organize the comments. Additionally the report does provide a chart listing attendance at public meetings. This chart also includes a notation that the numbers reported as attendance "represent only those participants who signed in and may [therefore] underestimate the actual number of participants" (GLRI Summary of Comments, August 2009).

Direct Policy Impact – Present in the GLRI Participation Results

The framework of the GLRI makes it easier to focus solely on AIS comments (Section 3.3). However direct policy impact review of the GLRI is different from the review of the GLRC because my task was to determine if public participation in the GLRI supports the successful implementation of GLRC AIS Strategy Team goals. To achieve this I reviewed Section 3.3 pertaining to AIS as well as Section 2 pertaining to the GLRI strategy framework. A total of 112 comments were reviewed and catalogued in Sections 2 and Section 3.3 according to the recurring themes that were prominent during the content analysis. The complete review of the comments can be found in Appendix III and are summarized in the following table.

Table 3

Great Lakes Restoration Initiative – 112 Comments Total				
	AIS Comments	**Existing Plans and Strategies**	**Funding**	**Included in GLRC comments**
Collected Comments	**48**	**66**	**48**	**30**
Percentage	**42.9%**	**58.9%**	**42.9%**	**26.8%**

Existing Plans and Strategies for Aquatic Invasive Species

The GLRI comments demonstrate support for the EPA to move forward with the Initiative using the foundation of the Great Lakes Regional Collaboration (GLRC) Strategy. Of the 112 GLRI comments 66 comments, 58.9%, supported the continued use of the GLRC's existing plan/strategies. This support for existing strategies mirrors and even exceeds the support

given for existing programs that were received in the GLRC (36.5% of filtered GLRC AIS comments reported support for existing agencies). *Recurring comments* (which, again, according to the Action Plan Outline are the most frequently reported comments) in Section 2.1 on Plans and Strategies included:

> **Use the GLRC as the blueprint for the GLRI.** Numerous agencies, individuals and organizations expressed support for the GLRC Strategy as the blueprint for the Great Lakes restoration. The Strategy remains the centerpiece for the Great Lakes restoration and protection in the United States (GLRI Summary of Comments, August 2009). And

> **Utilize existing plans and strategies.** There was strong support for utilizing existing plans and strategies, such as wildlife action and fishery management plans, Areas of Concern (AOC) Remedial Action Plans (RAPs) and fishery management plans developed under the auspices of the Great Lakes Fishery Commission. Concern was expressed about EPA or partner federal agencies funding proposals to develop new plans or studies, or funding new activities that would compete with existing state plans and priorities. … (GLRI Summary of Comments, August 2009).

GLRI comments exhibit a heightened level of concern for the inclusion of existing agencies' established plans and/or strategies as the Initiative moves forward. Their inclusion acknowledges the Initiative's intent to execute new polices toward restoration. They are important because it shows community desire to continue building partnerships between the GLRI, possible new projects, and the already developed local, state, regional and/or non-governmental entities.

Section 2.2 of Action Plan Outline reviews comments relating to project selection. Several comments reported in this section support the inclusion of existing agencies in the federal government's process to select projects for funding. Among these suggestions comments urged the GLRI to

> **Focus on on-the-ground restoration activities.** There was broad support for the Action Plan's focus on efforts that accelerated restoration work and attempt to direct funds toward effective, on-the-ground restoration activities. Given the explicit goals for 'shovel-ready' projects stated throughout the proposal, numerous groups are hopeful that the plan will accelerate restoration activities through a combination of direct restoration work (e.g., wetland restoration; establishment of buffer strips; shoreline softening and other hydrological restoration). At the same time, it is also understood that methodology development activities, including planning/design and assessment, are needed to ensure that more projects will be ready in the future for construction/implementation (GLRI Summary of Comments, August 2009).

By supporting shovel-ready projects, not only do existing agencies have the opportunity to have planned projects funded, but also it allows for more immediate restoration action. Financial resources will also be put to use immediately while giving notably worthy projects that need more development the opportunity to do so and become eligible for the next round of funding.

Recurring comments in Section 2.2 also include the importance of recognizing the unique geographic, governmental and administrative differences among states.

> **Acknowledge the unique difference in funding priorities and geographic, governmental and administrative challenges between states.** States commented that there are unique geographic, governmental and administrative differences amount the states that federal agencies should consider when selecting projects. … [States encouraged] Federal agencies to select projects based on each state's priorities [and] please see the original comments submitted by state agencies for details (GLRI Summary of Comments, August 2009).

The differences in funding priorities between states and regions are an important distinction captured in the *recurring comments*. Other important ideas that were introduced for GLRI consideration in the section included when funding existing plans/initiatives

> **Avoid duplicating efforts and use states to coordinate projects.** Multiple states expressed concerns about projects within states that might compete with or conflict with state priorities. There is also a significant concern that local government and non-government organizations will become competitors rather that collaborators on projects within a watershed. …(GLRI Summary of Comments, August 2009).

These comments reflect the concern that it would be counterproductive if organizations and governments began to work against each other due to competition for grant opportunities. It is important for federal agencies to develop a mechanism to promote coordination between existing agencies and/or organizations rather than competition.

Funding and Grant Cycles

Similar to the GLRC, the importance of funding availability and appropriate allocation was also apparent in the GLRI comments. Of the entire 112 reviewed comments, 42.9% (48 comments) included a funding reference. When looking at the 48 comments specifically referencing AIS, 20.8% (10 of the 48 comments) also included a funding reference. These figures are lower then the support found in the GLRC filtered AIS comments with 70.3% of comments making a reference to the importance of funding. This may be attributed to the fact

that the GLRC is considered to be a proposed strategy for Great Lakes restoration and the GLRI is in fact the of implementation of the strategy.

While the Collaboration focuses on the importance for availability of funding, the Initiative was given federal funding spanning five years. Comments regarding funding submitted to the GLRI therefore focus on how and where to award funding. Section 2.3 provides an overview of comments that were received referencing the process that the GLRI outlined for awarding funding contracts and grants. Of the reviewed sections in the GLRI Summary of Comments publication, this section also has the largest number of recurring comments (almost double the other sections reviewed). I believe this demonstrates its importance to stakeholders.

Important comments in the *recurring comments* addressing funding included:

> **Increase coordination among federal agencies to consolidate funding and to reduce the administrative burden on grantees.** All states and numerous other stakeholders strongly encouraged the federal agencies to coordinate and consolidate duplicative funding opportunities, which are currently distributed across multiple agencies. This will improve coordination and reduce duplication of multiple federal programs for restoration and protection. … (GLRI Summary of Comments, August 2009).

Because different government agencies across multiple levels and different organizations all have varying requirements when applying for grant funding, those seeking grant funding often submit applications for funding several times. Each time that an organization has to prepare an application there are certain costs associated with that in addition to duplicated reviewing on the part of governmental agencies. This kind of duplication of funding also takes away resources that could be applied to different types of projects elsewhere.

Having federal agencies consolidate funding opportunities into broader grant opportunities would reduce the number of agencies receiving the same amount funding in future years and streamline the paperwork requirements on both grantor and grantee.

> Some suggestions for increasing coordination included using some of the funds to set up a coordinative body to administer funds, allowing applicants to submit a single consolidated application encompassing several grant opportunities, having one agency coordinate the distribution of funds through the different agencies, and creating a mechanism by which all project proposals are submitted to either the GLRI in general or to one federal agency for review so the proposals are considered by one decision-maker before the various federal partners fund specific projects (GLRI Summary of Comments, August 2009).

Funding and grant cycle comments also point out the desire of many states and other groups to establish a “bundled” grant approach.

> Many states and other groups expressed support for a large, bundled grant approach, which would enable the states to administer and manage sub-grants at a reasonable cost. Such an approach would allow states and others to manage the funds in an efficient manner, minimize administrative work, focus on its highest priorities, assure visible results rather than spread funds across too broad a geographic and programmatic range, improve transparency and accountability and help ensure that spending is coordinated and consistent with the GLRI, state plans, state fishery and Wildlife Action Plans, Lakewide Management Plans (LaMPs) and other related efforts. Projects could also be packaged by critical geographic area to maximize environmental results and reduce grant paperwork (GLRI Summary of Comments, August 2009).

The proposal for the bundled approach would allow states and/or other groups to administer grants on a priority basis according to their own needs. States and other non-governmental groups seem to support this measure the most for its flexibility to focus on addressing their respective and varying priorities independently.

> Several states [also] asked for clarification on potential state re-granting authority. States would like flexibility to focus on addressing their respective priorities creatively. There is some concern regarding the need to adhere to specific federal program guidelines (GLRI Summary of Comments, August 2009).

Tribal government funding challenges are also recognized within funding comments. Although tribal governments may share similar goals for the environment as their counterparts at various state and federal levels, they clearly have different needs and priorities that will result form those same goals.

> **Recognize and address the unique challenges faced by tribal governments.** It is important that EPA and federal agencies remain cognizant of their responsibility to each of the tribes as sovereign governments. There were serious concerns from tribal governments regarding a scoring system that rewards bundling … (and) differences in tribal capacity, needs, and priorities may hinder tribal willingness or ability to develop partnerships. The specific authorities of tribes under various treaties and federal status vary. … Tribes recognize and are willing to work with federal agencies for efficient management of GLRI funds (GLRI Summary of Comments, August 2009).

Tribal governments have different approaches to land management. As a result there may not always be the same willingness and/or desire to build partnerships or work collaboratively. As a result, tribal governments are encouraging the U.S. federal government and the EPA to respect these differences and still recognize their need for funding opportunities as a sovereign nation.

Finally, funding comments include support for the elimination of match requirements. A local match often deters some agencies/organizations from applying for a grant.

> All of the states, most cities and many tribes and other organizations noted the problems associated with meeting local match, especially during these times of fiscal crisis, budget deficits, staff reductions and hiring freezes. Multiple comments noted that rewarding project proposals that can produce a high match could have the effect of rewarding project proposals that can produce a high match could have the effect of rewarding those areas of greater wealth, not the areas with the most significant environmental needs, benefits or potential returns (GLRI Summary of Comments, August 2009).

The issue of match funding, especially the argument that it favors wealthy areas, is an ongoing concern with respect to fairness. From a government standpoint, match funding makes sense as it allows for a greater number of projects with the same amount of money. The argument still remains that wealthier communities could be more likely to come up with matching funds for a grant application easier than less fortunate communities. Therefore the comments urge federal agencies "to exercise maximum flexibility in reducing or eliminating match requirements …" (GLRI Summary of Comments, August 2009).

Included in GLRC AIS Comments

Because the Initiative is intended to be the implementation of the GLRC, it is important to acknowledge bridges between the GRLC Strategy and the GLRI Implementation Goals. In the review of all 112 GLRI comments 26.8% (30 comments) expressed similar ideas to those in the GLRC comments. Within the 48 GLRI comments specifically referring to AIS 37.5% (18 comments) paralleled AIS comments found within the GLRC.

The establishment of a best practices water ballast maintenance policy and/or managing water ballast activities can be used as an example of important area addressed by the GLRC (Goal #1). Within GLRC filtered AIS Comments 35.1% (26 of 74 comments) addressed the importance of addressing ballast water management. Within the 48 GLRI AIS comments 31.3% (15 comments) also referenced the importance of addressing ballast water management, inspections and policy. Recurring Comments included a recommendation to

> **Invest in ballast water treatment technology and encourage the adoption of ballast water policy.** Multiple comments stressed that it is critical that ballast water discharges are addressed, and that this is one of the easiest mechanisms for halting the spread and introduction on invasive species in the Great Lakes

Specific comments pointed out:

> Add a Measure of Progress on the number of ships operating in the Great Lakes with ballast water treatment on board. All ships should have treatment onboard by 2014 (GLRI Summary of Comments, August 2009).
>
> The principle actions for this focus area regarding ballast water treatment option implementation …must include stakeholder processes to ensure success (GLRI Summary of Comments, August 2009).
>
> The first Principle Action on ballast water treatment should be edited to emphasize installation of systems, not study of systems (GLRI Summary of Comments, August 2009).

GLRI comments included support for investing in ballast water treatment technology and the adoption of a new ballast water policy. This directly aligns with not only the Regional Collaboration's AIS Strategy Team's first recommendation, but also with the Restoration Initiative's AIS Focus Area's second objective to reach their proposed goals. The information provided about the contributions of ballast water to the AIS problem is overwhelming. Not only will ballast water technologies assist in stopping new introductions into the Great Lakes, it has the potential to contribute to the control, mitigation and spread of the over 160 existing species already established within the water basin for those ships traveling solely with the Great Lakes.

GLRI comments regarding the need for a new ballast water policy also addressed the feasibility of ballast water technologies. Addressing AIS ballast water transfers is important to the health of the Great Lakes Basin. Suggestions also included introducing a partnership with industry to develop ballast water treatment systems that would accommodate both environmental desires and industry needs. This will also allow for opportunities to conduct further research through a joint effort of the two major stakeholders: the Great Lakes shipping industry and the EPA.

> Many individuals and groups recommended a partnership with industry. They suggested that agencies and industry work together to develop a ballast water treatment system that can accommodate the volumes and pumping rates of Great Lakes vessels. Multiple comments also supported funding the development of new and innovative technologies. While there are some ballast water treatment systems in existence, none has been proven effective in a cold, freshwater environment. The Great Lakes shipping industry is prepared to be a full partner with the EPA in the groundbreaking research. There was concern that the shipping industry will be harmed without this research (GLRI Summary of Comments, August 2009).

Of the 112 GLRI comments examined 48 comments, 42.9%, also referred to AIS and expressed the importance of outlining clear regulations and enforcement standards; centralized and coordinated data management systems; and early detection, monitoring and tracking systems. Comments included:

> **Develop a Centralized and coordinated data management system to allow for reporting and tracking of invasive species** (GLRI Summary of Comments, August 2009).
>
> **Fund the development of rapid response programs.** Rapid response needs more attention. A recent mock exercise indicated that much additional work is needed to prepare the region. Through the Great Lakes Regional Collaboration's AIS Rapid Response effort, the region has begun developing rapid response protocols. GLRI funding could support further development and refinement of these necessary protocols (GLRI Summary of Comments, August 2009).
>
> GLRI could be used to fund the installation of invasive species rapid response equipment abroad lakes. The equipment could be generically designed to deliver a biocide or range of biocides to respond to a specific introduction of a new invasive species from a variety of other vectors. This program provides a risk-based approach and fills the gap between Best Management Practices and full ballast water treatment (GLRI Summary of Comments, August 2009).

The establishment of the GLRC Rapid Response and Clean Boat Initiatives provided invaluable information on the potential of effective early detection, monitoring and tracking to wards the goal of mitigating and controlling AIS introductions.

The GLRI has been able to provide funding for the Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS), which resulted in several improvements in early detection and rapid response efforts. A high priority watch list for species identified as high potential risks for invading and becoming established has also been developed. The list is considered a culmination of research conducted up to 2010.

CHAPTER 5: ANALYSIS

Research Question #1: *Considering the emphasis on public participation in ecosystem management, how do we evaluate public participation efforts associated with addressing Great Lakes issues?*

By using a model for participation, such as the Rowe and Frewer model, we hope to be able to evaluate achievements, impacts and/or influences of the participation activities further than whether participation is "present or not present". However, with the growing popularity of including public participation in the policy development process, some participation methods seem to be employed simply to fulfill a need to involve the public in some way. As a result, participation frequently becomes an element within the policy making process included to satisfy such a need rather than having it included as an integral part of policy development. This may also reflect the intentions for the use of public participation techniques by having it appear present, but where policy decisions have already been settled regardless of recommendations included in participation exercises. The participation model aims to provide a basis of understanding and recommendations for reviewing what constitutes good, desirable participation (Rowe and Frewer, 2000) that will ultimately impact the production of meaningful outcomes.

Research Question #2: *Can we determine if recent public participation efforts associated with the GLRC and the GLRI were successful?*

Rowe and Frewer observe that many authors have suggested the necessary criteria for successful public participation. Unfortunately there is little overall consensus within the literature as to what constitutes "effectiveness" and how we might determine this, either theoretically or empirically. The Rowe and Frewer model provides a set of criteria to test what could be considered valuable participation as opposed to participation garnered to support preconceived policy ideas by introducing goals that evaluate characteristics of the participants themselves, the timing of participation, participation activities used and the potential results of the participation. Through the evaluation of these goals, we are able to make observations concerning what kind of impacts the participation potential had on policy development.

The findings of my research demonstrate effective outcome goals in the criteria of early involvement, transparency and direct policy impact for both the GLRC and the GLRI. In reviewing the criteria of equal representation and unbiased collection in my research, I found that

there was not enough information to draw any specific conclusions. Such inconclusive findings demonstrate the need for the implementation of additional measures to be considered effective, while also revealing basic trends about the policy development process and human behaviors. I discuss my observations below:

Equal Representation

Equal representation results demonstrated that a large portion (78%) of comments was submitted by organized interest groups. The United States is considered to be a pluralistic society; pluralism being the theory that a multitude of groups, not the people as a whole, act as governing agents. These organizations, which include environmentalists and environmental rights activists, produce formal and informal coalitions of like-minded citizens who influence the making and administration of laws and policy. Since the participants in this process generally constitute only a fraction of the populace, pluralist theory places the universal public as bystanders because there are logistical problems of having every citizen meet at one time to decide policies. It has also been argued that political issues require continuous and expert attention, which the average citizen does not have (Hunter & Dahl, 1962). Lindblom and Woodhouse (1993) attest that organized groups are indispensable resources, which contribute to the intelligence of the policy-making process and to a diversity of viewpoints by providing specific expertise often times on otherwise very complex issues.

While taking into account pluralistic attributes that organizational participation may provide, , many researchers observe that organized interests and lobbyists have the potential to obstruct democracy by exerting too much influence. As a result, special interests achieve more from government than individuals do. This view reflected in the of literature on participatory democracy theory is rooted in the work of John Dewey and other early 20th century political philosophers. In participatory democracy theory, participation in government is thought of an inherent right of citizenship. During the late 1960s a renewed interest in participatory democracy theory evolved, placing a high value on the concept of equal representation in policy formulation. Participatory democracy promotes the concept that that the more individuals become involved in participation activities the better able they become to do so (Pateman, 1970 & 2012).

In a participatory democracy, equality in public representation also guides individuals and their collective action in effective decision-making through institutional planning. In an ideal setting a program designed to incorporate business professionals, blue-collar and white-collar workers, women and minorities would establish a coalition for policy development and cooperative public ownership of any resulting policy (Green, 1985). This largely occurs through political action resulting from public education (Pateman, 1970 & 2012). Thus, participatory democracy theory assumes that participation by individuals as well as organized interest groups will be continuous throughout a process of planning and policy development.

In my review of comments from the GLRC and GLRI public participation sessions, I postulate that organization submissions are *intended* to clarify and articulate what people throughout the general population want in addition to asserting their opinion of the government's performance. However, in doing so I would argue that an organization's participation during the policy-making process demonstrates the desire to have an influential role, making their motivation for participation not necessarily for the betterment of the policy, but for the advancement and inclusion of their missions and ideologies. Interest groups may neglect to address issues outside their immediate scope, and I therefore find it difficult to conclude that comments submitted by organizations would necessarily be indicative of the perspective of an unaffiliated individual; potentially the same individual that would be required to adhere to the resulting policy.

Unbiased Collection

Many proponents of more analysis and less politics in public policy making encourage the use of third party facilitators during the development process to increase the government's accountability of the data that they are using. However, Lindblom and Woodhouse (1993) argue that objective or unbiased human participation of any kind cannot be met because all human activities are conducted with some type of motivation. Groups that are developed to provide unbiased, nonpartisan analysis often form an interest group of their own. Members affiliated with such groups are motivated to participate for a reason; others are appointed or chosen to serve with the group for a reason. Either way, members of such third party facilitation seek information shaped by their own set of personal ideologies and seem to naturally develop as their own independent interest group with limited perspective (Lindblom & Woodhouse, 1993).

I observed that the GLRI's use of the Great Lakes Commission as a third party facilitator in developing their summary report of the comments raises these very concerns. As a part of their mission statement the Commission seeks to help its member states and provinces fulfill their vision for a healthy, vibrant Great Lakes. I wonder who is responsible or has influence in shaping the Commission's mission, goals and priorities and therefore remain skeptical that they were able to remain an impartial third party facilitator. Because third party facilitators seem to naturally develop as their own independent interest group, they also have a tendency to provide limited perspective (Lindblom & Woodhouse, 1993

Further, when considering unbiased collection during my review I would also suggest that stronger results would have been confirmed with better solicitation of participants. It appears that participation was received purely on a volunteer basis without any effort from the administrating agency to seek a representative sample. This type of voluntary participation supports the theory of Lindblom and Woodhouse (1993) that all individuals and/or entities have underlying motivation according to personal ideologies for their actions. Individuals that elect to participate in the comment period or at a public meeting probably had a previous interest in the Great Lakes and took the participation period to express their thoughts. Their comments likely neglected to address issues outside of this immediate scope (Lindblom & Woodhouse, 1993).

Direct Policy Impact

I believe that the content analysis conducted on the public participation activities of the GLRC and the GLRI demonstrate the direct policy impact criteria the most conclusively.

Great Lakes Regional Collaboration

The below table demonstrates these results by correlating GLRC Aquatic Invasive Species Strategy Team goals with themes established in the comments.

Table 4 – GLRC Direct Policy Impact Outcome Matrix

GLRC AIS Goals	Present in Comments – Yes	Present in Comments – No
Prevention of AIS introductions by ships through ballast water and other means.	**X – Sustainability & Existing Agency**	
Stopping invasions of species through canals and water ways.	X – Support for Existing Agencies	**X (although implied)**
Restricting trade in live organisms	X – Support for Existing Agencies	**X (although implied)**
Passing comprehensive federal AIS Legislation.	**X – Legislation**	
Education and outreach on AIS introductions and prevention.	**X – Education and Outreach**	

The content analysis findings demonstrate a link between the final goals that the GLRC promote and the themes that were present in comments submitted to the GLRC. There is, however, not conclusive evidence that the second and third final GLRC goals – stopping invasions though canals and waterways and restricting live organism trade – were the direct outcome of public participation section.

However, I suggest that this can be considered an example of the importance of balance between expert knowledge and the collaborative approach. Through the examination of the public comments it is clear that there is public support for continuing the work of established programs. Comments testify that ideas and important information that has been gathered though the success of smaller, perhaps more regionalized programs. These programs, including those addressing AIS invasions though canals and waterways and live organism trade, have helped experts shape priorities, and comments support continuing to use such existing agencies when moving forward with the GLRC proposal. Using this logic I note that although comments do not directly refer to the technical importance of addressing AIS in canals, waterways and live organism trade, the comments direct support for existing agencies imply support for programs already operational that address these very issues.

The only reoccurring comment theme that is not included directly in the GLRC goals is the public support for funding. The direct policy impact of these comments is represented by the funding granted in 2009 to launch the Great Lakes Restoration Initiative.

Great Lakes Restoration Initiative

The five goals presented for Aquatic Invasive Species in the GLRI Action plan reflect the reoccurring theme comments reported in the Summary of Comments document issued by the Great Lakes Commission. The correlation of AIS Goals and comments are represented below in bold.

Table 5 – GLRI Direct Policy Impact Outcome Matrix

GLRI Goal	**Present in Comments – Yes**	**Present in Comments – No**
Eliminate any new AIS into the Great Lakes water basin.	**X – Included in the GLRC**	
Control species importation into the Great Lakes	**X – Included in GLRC**	
Control transfers through means of recreational activities and connecting waterways.	X – Support for Existing Agencies	**X (although implied)**
Develop a comprehensive program for detecting and tracking newly identified species to provide up-to-date information.	**X – Included in GLRC**	
Implement a management program for containment, eradication, control and mitigation.	**X – Included in GLRC**	

The review of the Summary of Comments document shows that there was little attention given within the comments to the third goal – controlling spread of AIS though recreational means and connecting waterways. As with comments found in the Collaboration, GLRI comments showed considerable support for continued involvement of established organizations or other initiatives. I have marked goal three as not directly present in the comments, but note that the inclusion of the goal as a policy response is implied in the comments' support for maintaining important work done by existing agencies.

Again, the only reoccurring comment theme that is not included directly in the GLRI goals is the concern for grant funding. Disbursement of funds for 2010 can be viewed below:

- $255 million in EPA funds to 16 federal agencies
- $163 million in EPA funding of 286 grants
    - $42 million in grants to local governments

- $54 million in grants to state governments
- $30 million in grants to non-profits
- $32 million in grants to universities
- $5 million in grants to tribes
  (GLRI, 2011)

The disbursement of these funds could correlate to the suggestions that were reported in the GLRI comments. There is, however, no clear way to determine if the allocation of the total funding was directly influenced by the comments without further research into the appropriation process.

Early Involvement

My content analysis confirmed that there were credible attempts to include participants in the early stages of policy development based on the understanding that the GLRC sought the engagement of 1,500 interested stakeholders to develop priorities for the eight Strategy Teams and, with the foundation of the GLRC and federal funding, the GLRI was able to launch public participation activities on their implementation strategy almost immediately after it's inception. I did have some concern that the Collaboration did not provide reporting information on how the initial 1,500 stakeholders were selected. The GLRC fails to provide the method in which these participants were solicited and/or chosen to participate in the draft's development process. Only after the release of the draft action plan, when open public opinion was sought, was there any indication of how stakeholder comments were received through the 60 day comment period and public meeting schedule.

Transparency

The content analysis and review of the Rowe and Frewer model showed that the participation method was executed in a manner that allowed the public to recognize how comments would be used and subsequently how decisions would be made. My caution in this outcome goal criteria is the decision of the GLRI third party reporting agency's decision to assign categories in which to report the comments. Without providing access to the original comments, I would say that there is a reporting bias for the GLRI. This bias is compounded by categorizing the data, in this case into *general, reoccurring* or *specific comments,* without

providing any information on what would qualify an original comment to be included into each category.

Research Question #3: *What are the lessons learned for enhancing public participation in Great Lakes ecosystem management decisions?*

My research provides a good representation of Rowe and Frewer's observation that although the literature does not provide a conclusive means, either theoretically or empirically, to determine overall successful participation, effective public participation is dependent on a framework of ideas or criteria that we can test against what constitute good, desirable outcomes. Making sure the criteria are clearly defined when evaluating public participation activities will assist the overall evaluation process.

Furthermore, in order to establish and convey effective public participation across the Rowe and Frewer outcome model used in this research, they key element for success is disclosure and transparency. As policy makers continue to work with experts and scientists there need to be mechanisms that are able to measure effectiveness of public participation inclusion. This research supports the notion of overall government disclosure and transparency in the policy making process.

CHAPTER 6: LIMITATIONS

Great Lakes Regional Collaboration

This review was limited by the timing of the research. To adequately address questions of equal representation and unbiased collection of comments, it would have been necessary to commence this research at the time the public comment activities began. By attending public meetings and/or being involved in the GLRC comment review process, I would have been able to achieve a first hand account of protocol for the collection and review of submitted comments. Because my research began subsequent to the public meeting and public comment period I was unable to directly participate. Such involvement or direct observation of the public participation sessions would have allowed an opportunity to assess how attendance was accounted for and, further, could have clarified any failure of equal representation or evidence of collection bias.

Criteria for determining how comments were collected also limited my review of the GLRC. As noted in an earlier section, I provided an explanation that every time a strategy team was mentioned that was counted as a specific comment; often one submitted document contained multiple comments. This method produced 6,000 comments according to the GLRC final report but only 747 according to this review. If provided with a more detailed description of how they logged comments, I may have been better able to account for this discrepancy.

Great Lakes Regional Initiative

As a result of having the Great Lakes Commission contracted to develop a report on the comments I had no access to the original submitted comments. I was therefore unable to determine with any certainty the exact content or number of the original comments in the *recurring* or *general* sections because of third party summarization; for the comments that were provided, they were done so without the inclusion of any demographic information. I also did not have the Great Lakes Commission's criteria or definitions for how they determined to record a comment under either category.

Through the content analysis of the comments it appeared that there were sign in sheets provided at each GLRI meeting, but it cannot be guaranteed that each individual signed in and therefore an accurate representation on how many individuals were in attendance cannot be concluded. Furthermore, because I was not present in the review process of comments submitted

either on-line or through the mail, I do not have information on how this material was received and/or reviewed.

CHAPTER 7: RECOMMENDATIONS

This evaluation has utilized a framework for successful public participation as applied to public participation efforts of both the GLRC and the GLRI. Although each public participation process produced significant public input through testimony at public hearings and written comments, certain aspects of these efforts could be enhanced. Public concern for Great Lakes issues is widely understood; this is evident in the proliferation of organizations and activities focused on Great Lakes issues. Therefore the adequacy of public involvement processes is paramount to assure appropriate consideration of public concerns and suggestions. Based on the cases reviewed, below is a list of recommendations that I would suggest the federal government pursue in efforts to strengthen public participation.

Equal Representation

- Reach out to a random sample of the population through the use of phone or mailed surveys.
- If a random sample is not feasible, establish a value system or weighted score for each piece of data to account for the potential discrepancy of stakeholder influence of organizations versus individuals.
- Have those submitting comments include information for additional demographic information – i.e.: gender, race, age, location, income, education.

A random sample inclusive of comprehensive demographic information would help correct for concerns that interests were represented from across the basin. It could also further eliminate potential problems with organizational influence. Weighted scores could also help mitigate organizational influence should a random sample approach not be possible.

Unbiased Collection

- Document and increase local media coverage and public meeting announcements to provide accurate account of public solicitation.
- Publish a document outlining how all comments were received, whether it is during public meetings or on-line, and then the subsequent steps taken to log that data.

Unbiased collection is important to make sure that input is not specifically being gathered from a certain demographic or geographic location; collection methods matter. By documenting and publishing the actions of outreach through media outlets and/or public announcements it is clear what and where public solicitation efforts were made. This documentation could possibly explain subsequent response or participation in events, geographical influences or support or opposition from specific demographic groups.

Early Involvement

- Publish the process by which all stakeholders are selected or solicited.

Early involvement is important because it has the potential to curb project managers, experts and policy maker's influence. However, solicitation of participants is also important to understand the motivation behind their participation. This motivation may be better understood, or at least factored into the results, if there is a clear understanding of how participants came to be participants.

Transparency

- Allow or provide access to original data.
- Disclose method of data recording and/or reporting for policy usage.
- Report demographics of participants.
- Use a third party facilitator for participation events.

In evaluating public participation, reporting methods matter. Transparency across the participation process is important, but often difficult to achieve. By providing full access to original data, the methods that an administrative agency uses to apply the data or how outside facilitators contribute to the policy formulation process are important parts of understanding how public participation is implemented to shape policy.

Direct Policy Impact

- Agencies should report how comments either influenced or helped achieve the resulting policies or goals that public input was solicited for.

It is often difficult for the participating or general public to draw parallels to how public input impacts a resulting policy. In order for public participation to be seen as important, agencies need to show what and how participation influenced final policy actions. Having the administrating agency report how public input effected policy clarifies this relationship.

In summary, in order to establish and convey an effective and successful public participation session the key term is disclosure. The evaluation of both the GLRC and the GLRI has demonstrated that by publishing, or at least making available, data, procedures, protocols and any and all pertinent information a program can demonstrate a clearer picture of public participation and its value to policy decisions. I believe these inclusions would be an important part of environmental policy management's use of public consultation methods.

CHAPTER 8: CONCLUSIONS

With approaches to environmental management changing over the past century, the inclusion of public participation in the decision-making process has increased and become a more important factor in policy development. This change has been driven by increased public concern for the environment and a shift in the public's perception prompting environmental managers to incorporate human concerns as elements in environmental management plans. Although scientific information will always be an important influence in environmental management, the relevance of public participation has increased, reflecting the public's rejection of scientific information as the only consideration for developing solutions to environmental problems. These changes support the need for stakeholder input when looking toward policy solutions.

Through the examination of the history of ecosystem management we know stakeholder involvement is important, and we have seen attempts to include stakeholders in management decisions for the Great Lakes. Analysis of comments submitted to both the Great Lakes Regional Collaboration and the Great Lakes Restoration Initiative demonstrates the overall importance of understanding public participation in environmental policy management. The positive inclusion of public participation in this research – mostly within the area of direct policy impact – shows how stakeholder input can shape goals and directly impact policy decisions.

The goals of the GLRC AIS strategy team reported in the GLRC public participation results seem to have been influenced by the reoccurring themes we were able to extract from the stakeholder comments.

- Goal number one: prevention of AIS introductions by ships through ballast water and other means; the review of the sustainability and existing agency comments supports this goal.
- Goals two and three: Stopping invasions of species through canals and water ways and restricting trade in live organisms; the review of existing agencies and sustainability comment supports these goals.
- Goal number four: passage of comprehensive federal AIS legislation; the comments calling for federal legislation directly supports this goal.
- Goal number five: education and outreach on AIS introductions and prevention; the comments calling for education and outreach programs also directly support this AIS

Strategy Team Goal. Comments in support of funding support all five AIS Strategy Team goals as well as the entire GLRC Initiative.

The GLRI Goals pertaining to the Aquatic Invasive Species submitted in the Draft Action Plan also support the direct policy impact criteria through reoccurring themes found in the GLRI content analysis.

- Goals number one and two: eliminate any new AIS into the Great Lakes water basin and control species importation into the Great lakes; the comments submitted to the GLRI that were also included in GLRC comments support these goals.
- Goal number three: controlling transfers though means of recreational activities and connecting waterways; the comments encouraging the continued use of existing agencies and the comments included in the GLRC for education and outreach support this goal.
- Goals number four and five: developing a comprehensive program for detecting and tracking newly identified species to provide up-to-date information and the implementation of a management program for containment, eradication, control and mitigation; the comments submitted to the GLRI that were also included in GLRC comments support these goals.

Although the Rowe and Frewer criteria are not the only set of criteria to examine outcome or acceptance participation, the results included and not included through this content analysis demonstrates the value of each criterion in the public participation process. The majority of the data collected was only identified in the direct impact criteria, but the inconclusive results also demonstrate how each criteria is important to successful public participation.

Further research addressing public participation contributions or perhaps what purpose the public comment periods serve would further evaluate importance of the public participation process. This could be done through multiple case studies where different participatory mechanisms – surveys, public comments, and public meetings – were used to address different environmental issues. Such research may allow us to get beyond seeking ways to simply increase public involvement to helping determine under what circumstances public participation is meaningful.

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