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On the Brink: The Great Lakes in the 21st Century, by Dave Dempsey

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BOOK REVIEWS

On the Brink: The Great Lakes in the 21st Century. By Dave Dempsey. East Lansing, Michigan State University Press, 2004. Pp. 304. $24.95 paper.

The Great Lakes are one of the most important resources of the United States. They provide opportunities for both recreation and commerce. They also are an important freshwater supply and a habitat for numerous species. Recently, a number of concerns about the Great Lakes have arisen. These include the damaging impacts of invasive species such as the zebra mussel[1] and discussions about possibly transferring Great Lakes water to the West.[2] This review examines *On the Brink: The Great Lakes in the 21st Century*, by Dave Dempsey, to draw lessons about what we can do to protect the Great Lakes. In this book, Dempsey recounts a long history of mismanagement of the Great Lakes, along with stories of individuals who took responsibility for protecting the lakes. Through this history, we learn the necessity of adopting an ecosystem approach. Dempsey also motivates individuals to participate in the improvement of the lakes. We also see the importance of institutions in the design, implementation, and enforcement of policies to improve the Great Lakes.

The Ecosystem Approach to Managing the Great Lakes

One primary theme is that decisions about managing the Great Lakes must use an "ecosystem approach."[3] Dempsey defines an ecosystem approach as one

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1. DAVE DEMPSEY, ON THE BRINK: THE GREAT LAKES IN THE 21ST CENTURY 144–45 (2004).

2. *See* GREAT LAKES COMMISSION ADVISOR, Winter 2006, at 1, *available at* http://www.glc.org/advisor/06/advisor_winter06.pdf (discussing the agreement to prevent such "out-of-basin" transfers). *See also* JOSEPH L. SAX ET AL., LEGAL CONTROL OF WATER RESOURCES 207 (3rd ed. 2000) (citing Robert H. Abrams, *Setting Regional Policy on Diverting Great Lakes Water to the Arid West: Scaling Down the Myths*, WAYNE LAW., Fall 1982: "From a Great Lakes perspective, however, the enormity of Western water desires appears almost trivial. Unlike other regions of the nation, the reservoir capacity of the Great Lakes is not measured in acre-feet or even millions of acre feet. Great Lakes capacity is measured in cubic miles....The average flow of the Detroit River is roughly ten times that of the mighty Colorado. If the Central Arizona Project were allowed to draw its full capacity of water from Lake Michigan, it would lower the level of Lake Michigan-Huron...by only 2 ¾ inches. In contrast, the long-term natural fluctuation of the level of Lake Michigan exceeds five and one-half feet.").

3. DEMPSEY, *supra* note 1, at 179.

> considering humans as part of a complex natural system that includes air, water, land and other living things; addressing the decline of the lakes holistically; considering the possibility of unanticipated consequences from proposed actions; and dealing with the problems of the ecosystem by addressing their causes rather than treating symptoms.[4]

Under this approach, "'maintenance of the ecosystem depends upon the consistency of man-made standards, laws and boundaries with those that have evolved through natural processes.'"[5]

Dempsey offers compelling examples in which individual decisions about managing the lakes led to significant detrimental consequences because policy makers failed to appreciate the full effects on the ecosystem of the lakes. For example, Dempsey recounts how the construction of numerous canals and waterways has led to the detrimental[6] introduction of numerous exotic species into the lakes.

In the nineteenth century, there were many plans to make the Great Lakes "a major thoroughfare for commerce and settlers."[7] However, in many places, the lakes themselves were not directly connected with each other. To reduce the cost of transporting vessels between the lakes, the construction of numerous canals and other waterways was proposed. These proposals continued on into the twentieth century, culminating in the St. Lawrence Seaway project, completed around 1959.[8]

While the construction of these interconnecting waterways did aid commerce, they also had other unintended effects. Previously, the separation between the lakes enabled containment of exotic species. However, the construction of these interconnecting waterways provided new means of access to the lakes. Exotic species could cling to the sides of vessels traversing the waterways, stowaway in ballast that otherwise might have been dumped, or swim themselves through the canals.[9]

One of the most troublesome exotic species introduced as a result is the zebra mussel, which was "first detected in the lakes in great numbers in 1988."[10] Zebra mussels present problems because they

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4. *Id.* at 188.
5. *Id.* at 168 (citing Lynton K. Caldwell, *The Ecosystem as a Criterion for Public Land Policy*, 10 NAT. RESOURCES. J. 206 (1970).
6. Some may say catastrophic.
7. DEMPSEY, supra note 1, at 134.
8. *Id.* at 139–40.
9. *Id.* at 141–46, 198–99.
10. *Id.* at 144.

"reproduc[e] rapidly and copiously" and cling to water pipes.[11] Dempsey recounts different stories of zebra mussels' effects on water pipes. In one, "thirty tons of mussels clogged the intake pipe at an Ontario drinking water plant." [12] In another, mussels forced closure of a drinking water plant in Michigan for three days, in addition to forcing a "nearby electric utility plant...to reduce its power generation because the mussels coated the pipes."[13] A *Newsweek* article described the situation thus:

> It may lack the girth of the Blob or the menacing chirp of Hitchcock's birds, but the zebra mussel is staging a classic creep-show routine on the western shores of Lake Erie....The prolific mollusks are now entombing boat hulls and beaches, disrupting a large fishing industry and clogging waterlines that support cities and factories. Unless the invasion is stopped, experts speculate, 26 million people could lose their water supplies....The voracious youngsters have increased water clarity threefold—but they've done it by grabbing up the plankton and algae that support the rest of the aquatic food chain.[14]

As a result, zebra mussels were a "potential villain for the decline in numerous [fish] species."[15] This put the "sport and remaining commercial fisheries of the lakes...at risk."[16]

In tales such as these,[17] Dempsey demonstrates the dangers of making decisions about managing the Great Lakes without adequately understanding the multitude of effects that one change may have on the entire ecosystem of the lakes. He also points out that "the ecosystem concept slowly began to win a public constituency, in part because each pollution problem solved seemed only to lead to the next."[18]

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11. *Id.*
12. *Id.*
13. *Id.* at 145.
14. *Id.* (citing *Marauding Mollusks Terrorize Great Lakes*, NEWSWEEK, Nov. 20, 1989, at 66).
15. *Id.* at 198 (discussing one theory suggesting that the mussel might be responsible for an extreme reduction in the population diporeia, which serves as food for whitefish, alewifes, and other fish species).
16. *Id.*
17. Another story is that of the Asian carp, which, after being "introduced to the southern United States to control algal blooms and snail populations, "escaped confinement during floods in the early 1990s and headed up the Mississippi River," *id.* at 243.
18. *Id.* at 167.

Inspirational Stories of the Power of Individuals in Protecting the Lakes

The other main theme of this book is that individuals can make a difference in protecting the Great Lakes. Throughout the text, Dempsey offers colorful narratives of individuals taking it upon themselves to protect the Lakes, and succeeding.[19] In one of these narratives, Bess Sheahan "lobbied untiringly for a national and then a state reserve"[20] for the Indiana Dunes. Eventually, the effort was successful, as the Indiana Legislature approved a bill for a Dunes state park. However, this effort drained her, and she then "retired from active advocacy for the dunes."[21] She wrote, "'The people here all gave up the struggle; seemed I was the only one who stuck. Had I known how discouraged the others were I guess I would have given up too.'"[22]

Dempsey emphasizes these stories of individuals because he believes that the solution to the proper management of the Great Lakes lies with common citizens. In telling the story of Gilbert Pugliese, who refused to send wastes from his mill into the Cuyahoga River in the 1960s, Dempsey includes this quote from Pugliese himself: "'When you read and hear about all the pollution and industries don't seem to be taking heed but go on stalling and alibiing and getting permits from authorities, well, then you feel there is only one alternative....*That's the people.*'"[23]

A similar sentiment is echoed in the closing three sentences of the book: "There are signs that *the people*, if not the governments, have the capacity to learn from this history and have learned from it. Now it is time for them to instruct their governments on how to do so. If they act, they can show the world."[24] These two principle themes are therefore used to motivate people to take action. The theme of mismanagement stirs people, and then the theme of the individual success stories gives them confidence. In doing so, Dempsey is explicitly appealing to our emotions. In making Great Lakes policy, Dempsey quotes Lana Pollack

19. See, for example, Dempsey's narrative of "Diana of the Dunes," *id.* at 88-93 (recounting the tale of "Diana," Alice Mable Gray, who fought for a national park in the Indiana Dunes, in addition to "shedding clothes to skinny-dip" in the Lake, and causing "rumors that she almost magically disappeared at the approach of visitors"); and "Johnny Biosphere," *id.* at 187-93 (recounting the tale of "Johnny," J.R. Vallentyne, who used drinks from a whisky bottle to emphasize his testimony before the International Joint Commission for the Great Lakes).

20. *Id.* at 80-81.

21. *Id.*

22. *Id.*

23. *Id.* at 126 (emphasis added).

24. *Id.* at 276 (emphasis added).

of the Michigan Environmental Council: "'There's nothing wrong with emotion and there's nothing wrong with an emotional connection to the Great Lakes.'"[25] Dempsey goes on to state, "Protecting the Great Lakes in the end will depend not just on how *people* feel about them, but how strongly they feel, and how willing they are to fight for them."[26]

The Role of Institutions in Managing the Lakes

This emphasis on the role of individuals comes at the cost of less emphasis on the role institutions should play in proper management of the lakes. Implementation of an ecosystem approach for managing the lakes is infeasible for a single individual. Instead, the complexity of the ecosystem approach—a complexity suggested by the complex definition of the approach that Dempsey offers above—requires coordination of the efforts of a multitude of specialists. Institutions are therefore required to adopt an ecosystem approach.

Furthermore, institutions are required simply because we need to organize a long-term approach to improving the Great Lakes and, when improved, maintaining them in pristine quality. One problem with a focus on individuals is that individuals eventually will end their commitment to the management of the lakes. As noted above, even the "tireless" advocate Bess Sheahan grew weary and retired from advocacy after she had achieved her primary objective of having the Indiana legislature create a park. When it comes to protecting the lakes, there will not be any defined endpoint at which all interested individuals can retire. Instead, an evolving commitment is required, and that commitment can be provided by institutions.

Dempsey himself does recognize the need for institutions. These institutions are necessary to create policies, implement them, and enforce them.[27] In his description of the Bi-national Program to Restore and Protect the Lake Superior Basin,[28] Dempsey offers an example of the folly of creating a policy that is not effectively implemented. American and Canadian governments "hailed the agreement as a breakthrough and a demonstration of agreement."[29] However, difficulties in interpreting the

25. *Id.* at 265.

26. *Id.* at 267 (emphasis added).

27. For more on this classification of institutions, see Dale B. Thompson, *Beyond Benefit-Cost Analysis: Institutional Transaction Costs and the Regulation of Water Quality*, 39 NAT. RESOURCES J. 517 (1999)

28. DEMPSEY, *supra* note 1, at 203–05.

29. *Id.* at 203.

actual text of the agreement meant that the commitment "'was so vague as to be meaningless.'"[30]

Dempsey offers another episode where the goals of protecting the Great Lakes are frustrated when a policy is inadequately enforced. In the 1990s, the budget of the environment ministry of Ontario was cut by "more than 40 percent while slashing the agency's staff by a third."[31] As a result, "'Monitoring and enforcement of [environmental] violations have been lax,"[32] and Dempsey connects this lack of enforcement with "drinking water disaster[s]" in Milwaukee and Walkerton, Ontario.[33]

Recognizing this need, Dempsey calls for the "invention of institutions likely unseen before anywhere on the planet."[34] A critical task of these institutions would be to collect "good data to evaluate the progress—or slippage—of the ecosystem."[35]

Problems of Polarized Dialogue: Symbolic Politics and Overreaching

While Dempsey does discuss institutions somewhat, they deserve even more attention in discussions of Great Lakes policy. This relative lack of attention seems to derive from a distrust of government and business interests, and these interests' historical role in institutional processes. Perhaps the biggest weakness of this book is a few portions where Dempsey interjects an attitude toward government and business interests that is entirely too one-sided. Sometimes, Dempsey uses inflammatory language in describing business and government interests. For instance, on the last page of the book, Dempsey writes, "Shame-proof governments captured by exploitative industries often betray the lakes in quiet defiance of the public."[36]

Statements such as these are unnecessary. The narratives offered by Dempsey display with clarity, time and time again, the ineptitude of our mismanagement of the Great Lakes. Moreover, this attitude can lead to the frustration of the very goals Dempsey is trying to achieve. This attitude leads to polarized dialogue in the political arena. There is no middle ground here, only a call for "uncompromising recommend-dations."[37] Unfortunately, polarized political dialogue sometimes leads to two things that will frustrate the goals of its advocates: symbolic

30. *Id.* at 204.
31. *Id.* at 210.
32. *Id.* at 211.
33. *Id.*
34. *Id.* at 244.
35. *Id.* at 249.
36. *Id.* at 276.
37. *Id.* at 252.

politics and overreaching. Dempsey himself offers episodes where these did occur in the context of the Great Lakes.

Symbolic politics is when politicians support programs that look like they are addressing issues—and so it makes them look good—while at the same time these programs are actually ineffective at solving underlying problems. Dempsey notes:

> Beginning in the 1980s politicians repeatedly and successfully crafted new laws and programs that sounded reassuring but failed to protect the lakes. On closer examination, most of these initiatives proved to be riddled with exemptions, gaping with loopholes, and either unenforceable or not intended to be fully implemented. Yet their enactment or proclamation would, for a time, satisfy a concerned public that something meaningful had been done....This...is a result of an intention to quiet public concern, as much as it is a result of a *balancing of the interests of commerce and the environment*.[38]

As examples of symbolic politics, Dempsey points to the program to address zebra mussels, which was significantly weakened by an exemption for ships that "reported they had no ballast on board (NOBOB) after pumping."[39] He also points to the Bi-national Program to Restore and Protect the Lake Superior Basin, discussed above and below, as an example of another program that sounded good in principle, but led to no specific steps because it was "'so vague as to be meaningless.'"[40]

Another outcome of polarized political dialogue can be overreaching. Overreaching is when a policy is so extreme that, upon its implementation (or attempted implementation), it is determined that the policy is so infeasible that it must be repealed quickly. One instance of overreaching described by Dempsey is the Lake Superior demonstration zone policy. In its 1990 report, the International Joint Commission (the dominant Great Lakes policy venue at the time) "challeng[ed] the United States and Canada to make Lake Superior a 'demonstration zone' for the concept of zero discharge of persistent, bioaccumulative toxic chemicals."[41] Industrial interest groups reacted with alarm to this recommendation. One advocate stated, "'There's always the potential that you are precluding beneficial economic activity in the mistaken

38. *Id.* at 201 (emphasis added).
39. *Id.* at 199.
40. *Id.* at 204.
41. *Id.* at 185.

belief that it's necessary to protect the environment.'"[42] Nonetheless, it initially seemed that the recommendations would be adopted by federal, state, and provincial governments.

Following up on these recommendations, in 1991 the governments of the United States, Canada, Ontario, Minnesota, Wisconsin, and Michigan signed the "Bi-national Program to Restore and Protect the Lake Superior Basin" agreement. This agreement stated: "The challenge to designate Lake Superior as a 'demonstration area where no point source discharge of persistent toxic substances will be permitted,' is *accepted*....The governments will...pursue the goal of zero discharge."[43]

Included in this agreement was a commitment to "'designate all U.S. Lake Superior basin waters as a special resource.'"[44] One environmental group advocated that this terminology was equivalent to a term in the Clean Water Act, "outstanding national resource water." If Lake Superior were thus designated, "any new or increased discharge of toxins from a factory or municipal sewage point" would be prohibited under the Clean Water Act.[45] This designation seems consistent with the language of the agreement stating that the states would pursue the goal of zero discharge.

However, state environmental officials were not willing to go that far. Instead, they coined a new term, "outstanding international resource water," which would permit "the total amount [of toxic discharges to] increase if the plants expanded and the volume of their discharge increased—even though this would move the lake away from the zero discharge goal."[46] In adopting this approach rather than the more stringent "outstanding national resource water" approach, an official at the Minnesota Pollution Control Agency explained, "'Declaring the lake an Outstanding National Resource Water, as the National Wildlife Federation wants, would virtually ban any new development anywhere in the Lake Superior basin.'"[47]

Meanwhile, the Ontario Ministry of the Environment, consistent with the agreement, adopted a "rule requiring pulp mills to halt the discharge of chlorine-related compounds by 2002" and a "requirement

42. *Id.* at 186.

43. *Id.* at 203 (emphasis added) (citing U.S. ENVIRONMENTAL PROTECTION AGENCY AND ENVIRONMENT CANADA, A BI-NATIONAL PROGRAM TO RESTORE AND PROTECT THE LAKE SUPERIOR BASIN (1991)).

44. *Id.* at 205.

45. *Id.*

46. *Id.*

47. *Id.*

that mills explain how they would reach a zero discharge goal."[48] In response, the Ontario Forest Industries Association complained, "'We feel that the zero goal is not environmentally justifiable and would like to see the reference to the goal—removed from the regulation.'"[49] In response to this complaint, the Ministry (under the government of a different political party) revoked this rule and requirement.[50] Dempsey summarizes these developments thus: "Ecosystem integrity sounded nice in theory, but its political and economic costs—prove[d] too high for the governments to pay."[51]

Another instance of overreaching is provided by the inclusion of a requirement included in the Annex 2001 addendum to the 1985 "charter of principles [agreed to by the Great Lakes states] designed to resist threats to the region's water quantity."[52] Under this requirement, applicants for water withdrawals must "improve the water quality and the natural resource qualities of the basin."[53] While this sounded good, it became impossible to implement. As one of the participants explained, "'If the states agree to the original concepts of Annex 2001 they will, in effect, be putting their own communities in a position of having additional water supply costs putting them at a competitive disadvantage for potential new industrial/commercial users.'"[54] In the end, "Annex 2001 was colliding with domestic political realities"[55] and had to yield.

More Problems of Polarized Dialogue: Barriers to Effective Institutions

Polarized political dialogue makes it extremely difficult to develop effective institutions. Effective institutions must include the participation of all affected parties. Dempsey seems suspicious of industry participation in developing institutions. After describing an "inclusive" approach to cleaning up "hotspots" based on "collaboration and co-operation" among business, local government, and the general public, Dempsey cautions,

48. *Id.* at 206.
49. *Id.*
50. *Id.*
51. *Id.* at 187.
52. *Id.* at 236.
53. *Id.* at 240.
54. *Id.*
55. *Id.* at 241.

> The risk of the approach was that, by emphasizing a process, it might play into the hands of politicians unwilling to invest the cleanup funds or make the difficult choices to restore the contaminated areas. Generating meetings and reports and good feelings of cooperation, remedial action planning had the potential to become a way of postponing rather than making a governmental ecosystem commitment.[56]

In the view of the history he recounts, Dempsey's suspicion is justified. This history includes a long sequence of seemingly promising policies for protecting the Great Lakes that are frustrated by inadequate implementation, inadequate enforcement, and gaping loopholes. These frustrations are enabled by government institutions lobbied by business interest groups.

However, Dempsey takes his suspicion too far. In describing the Great Lakes Commission, he seems to imply that inclusion of businesses will lead to too high a priority for commercial interests:

> [The Great Lakes Commission] organized the region's governments to seek a multibillion dollar U.S. federal funding commitment to protect, restore—and develop—the lakes.
>
> But that last verb was pivotal....On the one hand, [the commission's] president...promoted stewardship as a fundamental part of the commission's work. On the other hand, port and shipping interests regarded the commission as *their* panel and assured that protection of the lakes as an avenue for commercial navigation got equal billing with environmental concerns.[57]

In this case, Dempsey seems to suggest that "equal billing" for commercial interests gives them too high a priority.

Perhaps as a result of this suspicion and his seeming unwillingness to recognize commercial interests as a fundamental priority in managing the lakes, Dempsey recommends the creation of institutions for managing the lake that exclude both business and government interests.[58] In the place of the Great Lakes Commission where business interests get "equal billing," Dempsey suggests "a

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56. *Id.* at 272.

57. *Id.* at 246–47.

58. Recall that Dempsey characterizes governments as "shame-proof" and "captured by exploitative industries," *Id.* at 276.

regionwide, future-oriented Great Lakes *citizens* commission [that would] slip the bonds of politics."[59] In addition, Dempsey also advocates the creation of a "Great Lakes *citizens* assembly."[60] Although excluding business and government representatives, he suggests that in this assembly, "thousands of *citizens*...[would] not only...discuss but also...*decide on management of the lakes*."[61] This assembly would then shift the locus of policy making from government institutions to itself.

It is a mistake to polarize the dialogue to such a point that there is no room for compromise, and no room for inclusion of business and government interests. Instead, it is essential to include both business and government interests in the institutions for properly managing the lakes, as well as citizens and other representatives of the ecosystem approach.

If business interests are excluded while government interests are included, the result would likely be symbolic politics, as suggested by Dempsey's own recounting of the history of the Great Lakes. Government interests are keenly aware of the impact of policies on businesses, even if those businesses are not directly included in policymaking discussions. Failure to include businesses in the policymaking process may result in policies that sound good to ecosystem advocates, but in the end are ineffectual because the government will be unwilling to implement and enforce them. The history of the Bi-national Program to Restore and Protect the Lake Superior Basin, discussed above, provides one example where this occurs. Dempsey offers another in describing changes to ballast requirements: "'Even though there may be legal authority to force retrofitting design changes on the vessels entering the Great Lakes through the Seaway, it will remain a political impossibility to do so as long as any such action discriminates against the Seaway trade.'"[62] In the end, government actions will reflect a fundamental "balancing of the interests of commerce and the environment."[63] This is because, as even Dempsey admits, "citizens respect the idea of development....In the United States, at least, development per se is a *good*."[64]

Meanwhile, if institutions excluded both business and government interests, as suggested by the example of the citizens assembly, the result would be the pinnacle in symbolic politics. This

59. *Id.* at 251–52 (emphasis added).
60. *Id.* at 253 (emphasis added).
61. *Id.* (emphasis added).
62. *Id.* at 200.
63. *Id.* at 201.
64. *Id.* at 266 (emphasis added).

assembly, in "decid[ing] on management of the lakes,"[65] could craft a wonderfully sounding policy. However, after having explicitly excluded government interests, and by extension government power, who would have the power to enforce this wonderfully sounding policy?

Recommendations for More Effective Institutions

Nonetheless, the inclusion of government and business interests does not mean that Great Lakes management institutions do not need to change. As noted before, inadequate implementation, inadequate enforcement, and gaping loopholes have rendered most Great Lakes policies ineffective. Different approaches are needed to make these policies effective.

Dempsey is on the right track with many of his recommenddations. An ecosystem approach is necessary and should be part of the institutional design. Also essential is the collection of "good data to evaluate the progress—or slippage—of the ecosystem."[66] The best way to ensure the effectiveness of policies is to actually measure their impacts. While this is easier said than done, collection of reliable metrics on the condition of the ecosystem of the Great Lakes will enable us to determine whether a policy is actually working or not. If it is not working, the next step should be to identify where the problem lies: is it inadequate implementation or enforcement, or is the policy itself faulty in design?

Another critical element is to communicate this information to the public, and to educate the public about its significance, while at the same time learning more about the public's own knowledge and preferences. Dempsey suggests that "regional institutions...[could] explain the role of the various governments in Great Lakes decisionmaking, provide updates on the actions of the many governments affecting Great Lakes ecosystem health, and provide for both formal and informal means of assessing public knowledge and attitudes."[67] With this information, the public would then be able to provide a political check against governmental institutions that were failing to adequately protect the Lakes.

In addition to these suggestions by Dempsey, we should also consider integrating the different components of institutions: initial policy making, implementation, enforcement, *and* compliance. One of the recent developments in engineering practices is the use of what is known

65. *Id.* at 253.
66. *Id.* at 249.
67. *Id.* at 252.

as "concurrent engineering."[68] Previously, engineering projects would typically proceed in a linear development path. For example, to create a printed circuit board, one engineer would do an initial theoretical design, a second engineer would do a physical layout of the board, and then a third engineer would adapt the physical layout to manufacturing requirements. Unfortunately, if the design were incompatible with some of these manufacturing requirements, this would not be discovered until the end of the process, and then the entire process would have to start again. Under a concurrent engineering approach, issues from the back end of this process (both layout and manufacturing) would be brought forward to the front end (design) by enabling direct communication among all of the engineers during the initial design process. This approach saves both time and money.

In a similar manner, effective institutions for the Great Lakes must bring together parties involved in all of these institutions' components. Policy makers must consult not only with ecosystem advocates, but also with administrative agencies responsible for implementing and enforcing the policy, in addition to businesses that must comply with these policies. With all of these parties together, policy makers can then determine appropriate tradeoffs among conflicting interests and discover effective mechanisms to achieve the desired balancing of these interests. Thus, effective policies result from involving all of these parties at all stages of policy making and then using data to determine when to adapt these policies as needed.

Conclusion

On the Brink: The Great Lakes in the 21st Century by Dave Dempsey offers a compelling history of the mismanagement of the Great Lakes along with inspiring stories of individuals who successfully made a difference in improving the ecosystem of the lakes. Through these narratives, we learn the necessity of adopting an ecosystem approach. Dempsey also motivates individuals to participate in the improvement of the lakes.

We also see the important role that institutions play in determining whether a policy will be effective. Initially promising policies may have no effect if they are not followed up with adequate implementation and enforcement. Otherwise, these policies run the risk of being yet another example of symbolic politics, where a politician

68. My knowledge about concurrent engineering derives from a research project at Stanford University conducted with Timothy F. Bresnahan and Elliott Levinthal.

shows support for a program that sounds good, but ultimately fails to address the underlying issue.

Dempsey also offers a number of suggestions for developing effective institutions. These include the collection of data to determine the health of the ecosystem and the communication of this information to the public. In contrast with Dempsey, this review suggests that these institutions also must include all parties involved: not just ecosystem advocates, but also business and government interests. Without all of these parties, the goal of ecosystem protection will be ultimately frustrated. On the other hand, involving all of these parties enables better integration of policy making, implementation, enforcement, and compliance.

While emotions are important to motivate people to participate, we will also need the cold calculation of data collection and the methodical plodding of institutional building to effectively manage the Great Lakes. Through all of these, perhaps we can serve as better stewards of the Great Lakes for the ecosystems of now and future generations.

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Pricing Irrigation Water: Principles and Cases from Developing Countries. By Yacov Tsur, Terry Roe, Rachid Doukkali & Ariel Dinar. Washington, DC: Resources for the Future Press, 2004. Pp. 320. $65.00 hardcover.

Pricing Irrigation Water provides the reader with an extensive literature review followed by the theoretical principles of irrigation water demand and supply and an application of this theory to case studies in Morocco, China, Mexico, South Africa, and Turkey. Particular emphasis is given by the authors to the policy implications of alternative strategies for pricing irrigation water.

There are four aspects of this book that distinguish it from the existing large body of literature addressing the "water pricing" issue. First, the authors go well beyond the standard arguments for the "efficient" pricing of water, based on the economist's paradigm of marginal cost pricing, to include analyses of the many pricing structures that actually exist in the real world. Examples include average pricing, the use of block-rate pricing, issues related to the question of "who pays for fixed costs," the pricing of multiple sources of water with differing quality, and volumetric pricing versus per-acre pricing. Analyses of