

available at www.sciencedirect.comwww.elsevier.com/locate/ecocon

Opening the policy window for ecological economics: Katrina as a focusing event

Joshua Farley*, Daniel Baker, David Batker, Christopher Koliba, Richard Matteson, Russell Mills, James Pittman

ARTICLE INFO

Article history:

Received 3 March 2006

Received in revised form

21 July 2006

Accepted 22 July 2006

Available online 20 October 2006

Keywords:

Public policy

Political agenda

Katrina

Policy window

Focusing event

ABSTRACT

Ecological economics and its allied trans-disciplinary fields are well established in academia, but so far have failed to have significant influence on policy makers. Public policy research and theory suggest that three process streams must converge in order to shape the political agenda and change policy [Kingdon, J. 1984. *Agenda, Alternatives, and Public Policies*. Boston: Little, Brown.]. First, the “problem” stream emerges when an existing condition is defined as a problem – a discrepancy between current reality and a desired goal – and critical policy makers accept the definition of the problem. The “policy” stream emerges as consensus grows around policy instruments to solve the problem. The “politics” stream emerges as the “national mood” and leading politicians accept the gravity of the problem and are willing to implement the policies required to address it. When these three streams converge, a policy window is created that can move issues onto the political agenda and into formal policy. A focusing event, like Katrina, can bring these three process streams together. However, different strategic representations of the situation may allow entirely different problem definitions and policies to dominate the political agenda. This paper analyzes the extent to which Katrina has opened a policy window for ecological economics. We find that Katrina has strengthened the three streams necessary to create a policy window for ecological economics, but that the dominant economic paradigm currently on the political agenda – market fundamentalism – is strategically presenting Katrina as supporting its own problem stream and policy stream. Key elements of the ecological economic agenda, such as investing in natural capital, are making it on to the political agenda, but overall market fundamentalist policies appear likely to dominate. We argue that ecological economists have failed to galvanize public acceptance for the policy goals of sustainable scale and just distribution, thus failing to effectively communicate their perspectives on problem definition and/or policy solutions to policy makers and the voting public. We conclude with suggestions for how ecological economists can still take advantage of the Katrina window, and better prepare for future windows opening.

© 2006 Elsevier B.V. All rights reserved.

1. Introduction

Over the past few decades, a number of trans-disciplinary fields have emerged that focus on critical problems at the interface of the human system and the ecosystems that contain and sustain it. These fields include ecological

economics, ecological engineering, conservation biology, restoration ecology, environmental justice and many others. With international and regional societies, flagship journals with high impact factors and a small but growing number of graduate programs, these fields are well on the way to becoming established in academia (Costanza et al., 2004;

* Corresponding author.

E-mail address: joshua.farley@uvm.edu (J. Farley).

Mitsch and Jorgensen, 2003; Solomon, 2005). This fact is of little comfort however if we fail to move our public policies onto the political agenda and eventually see them implemented, which ultimately will require the cooperation and collaboration of political decision makers. These fields have thus far failed to cross the institutional threshold between academia and politics in a meaningful way, and we thus risk irrelevance on a very important level: the polis.

How can we make ecological economics and its allies politically relevant? How can we convince the general public and the decision makers that we have the correct diagnosis for pressing problems and the correct policy options to resolve them? How can we move these policy options onto the political agenda? Is the answer to continually refine our science, develop better policies, and prove to decision makers that ecological economics is the most rational alternative? This approach alone is inadequate. Policy makers do not rationally evaluate policy proposals to meet predetermined goals and objectively choose the best alternative. Politics is about the strategic representation of problems and policies in a way that brings together coalitions and alliances needed to move them on to the policy agenda. Politics is often more about emotion, metaphor, story telling and party loyalty than reason and objective facts (Stone, 2002).

The concept of policy windows is well supported by and builds upon conclusions from social psychology, evolutionary biology and policy theory. Since the 1950's action research and change management pioneers have described social systems as generally resistant to change with cycles of unfreezing–moving–refreezing wherein the status quo is interrupted by new information that changes attitudes, values, feelings, behaviors and policy structures (Lewin, 1951). Modern researchers have used a similar model of punctuated equilibrium to emphasize that incremental change in social systems is interrupted by periodic accelerations of deep structural change (Wollin, 1999), as can be specifically seen through trends in public agenda and policy change in American politics (Baumgartner and Jones, 1993). In a new era of public policy theory (John, 2003), Kingdon's precedent concept of "policy windows" offers insight into when, why and how such periodic change occurs.

In particular, catastrophes have provided the emotional leverage necessary to force fundamental policy changes, serving as "focusing events" that create policy windows (Kingdon, 1984). As is the case with most natural disasters and other catastrophes, Hurricane Katrina was an event that suddenly punctuated social and political attention; what is not yet clear is how deeply this punctuation will sink into appropriate policy responses.

This article explores the potential for Katrina to serve as a focusing event that could open a policy window for ecological economics and its natural allies: though hereafter we refer primarily to ecological economics, we believe our insights are equally relevant to all the emerging trans-disciplines mentioned in this introduction, and that we are only likely to achieve our goals working together. The first section will focus on what generally creates policy windows. The second section will describe how catastrophes in the past have opened such windows, while the third and fourth sections will briefly summarize the ecological economists' definition of the

problems illuminated by Katrina as well as their policy solutions, contrasted with the problem definition and policies currently dominating the political agenda. We refer to the philosophy behind this dominant set of problem definitions and policies as market fundamentalism — the belief that that markets and the private sector almost always allocate resources more effectively than the public sector (regardless of the physical characteristics of the resources), that virtually all goods have adequate substitutes, and that the market system provides the best incentives for developing those substitutes. The fifth section will explain why the market fundamentalists have been able to take advantage of the policy window created by Katrina and suggest what ecological economists might still do before this window slams shut. The article concludes with suggestions for how ecological economists can move their policies onto the political agenda in the future in light of a growing number of ecological catastrophes.

2. Policy windows

Understanding how governments decide which alternative policies make it onto their agendas is one of the most difficult issues facing social scientists today. Birkland (2001, p. 106) defines agenda setting as "the process by which problems and alternative solutions gain or lose public and elite attention." Groups are in constant competition with one another to try and push their items to the top of the agenda or "prepare for the time when a crisis makes their issue more likely to occupy a more prominent space on the agenda" (Birkland, 2001, p. 106). A policy window is a confluence of events that allows advocates to push their policy solutions to problems onto the political agenda (Kingdon, 1984).

Increasingly, public policy experts critique the traditional rational decision making theory of policy making and argue that government actors do not act based solely on the merits of a particular policy but rather act within a "garbage can model of organized choice" (Kingdon, 1984, p. 89). Policies are moved to prominence on the agenda through three process streams – the problem, policy, and politics streams – and decision opportunities are the 'garbage cans' in which these streams are mixed. The garbage can metaphor describes a process through which actors seek out problems for their solutions (e.g. particular policy tools) as often as solutions to their problems (Birkland, 2001).

The problem stream arises from interactions between "indicators, focusing events, and feedback." Indicators (e.g. number and strength of hurricanes and tropical storms, the rate or extent of wetland loss, mortality rates by income group) give policy makers a quantitative measure of how well the system is performing, defining problems when this performance is poor. However, there are far too many indicators to monitor continually and problems are not always self-evident; Kingdon points out that often "they need a little push to get the attention of people in and around government" (Kingdon, 1984).

Focusing events are often what provide this push, presenting "a crisis or disaster that comes along to call attention to the problem, a powerful symbol that catches on, or the personal experience of a policy maker" (Kingdon, 1984, p. 100). Focusing events can bring less visible policy items to the forefront of an

agenda or reinforce already prominent agenda items, leading to timely political action in response to the problem, but alone may have only transient effects on agenda setting (Kingdon, 1984, pg. 103).

The likelihood of changes in the problem stream is further amplified by feedback from bureaucratic experience, citizen input or other outside forces engaged in systematic monitoring and evaluation studies. However, the tendency is for policies to remain frozen from change, as such feedback is often ignored until policy makers “are compelled by outside forces either to change their behaviors or go out of existence” (Baumgartner and Jones, 2005, pg. 18).

Kingdon describes the policy stream as a “primeval soup” where ideas rise to prominence, are confronted, combined, tested, and ultimately selected: “The soup changes not only through the appearance of wholly new elements, but even more by the recombination of previously existing elements. While many ideas float around in this policy primeval soup, the ones that last, meet some criteria. Some ideas survive and prosper; some proposals are taken more seriously than others” (Kingdon, 1984, pg. 123). This evolutionary model suggests that certain combinations of ideas have the potential to evolve into policy, while others do not. Once an idea “takes off” to become policy, however, a bandwagon effect often follows, opening the window for related policies.

The relevant question for ecological economists and their allies is how does an idea take off? To make it to the short list of policy proposals a policy must find a receptive policy community. Through the process of “softening up”, policy entrepreneurs (people who invest resources in hopes of a future return in the form of policies they favor) (Crenson and Ginsberg, 2002) take their ideas to specific communities where they hope that their policies will be received favorably. Proposals that are technically feasible, acceptable in the policy community, and in line with current budget priorities are likely to gain the attention of decision makers. “The policy stream thus produces a short list of proposals. This short list is not necessarily a consensus in the policy community on the one proposal that meets their criteria; rather, it is an agreement that a few proposals are prominent” (Kingdon, 1984, p. 151). Of course, ideas never considered can never evolve into policy as Stone (2002, p. 245) points out, “keeping things off the agenda is a form of power as important as getting them on.”

Finally, the politics stream is “composed of such things as public mood, pressure group campaigns, election results, partisan or ideological distributions in Congress, and changes in administration” (Kingdon, 1984, pg. 152). Including politics in the public policy analysis process is vital to understanding how policy makes it onto agendas. How decision makers interact with and perceive these political forces determines which policies they prioritize over others. Bargaining may be more important than persuasion as these actors strive to manipulate systems to align problems with policies.

When these three streams come together at critical times, a policy window opens, providing “an opportunity for advocates of proposals to push their pet solutions, or to push attention to their special problems” (Kingdon, 1984, pg. 173). Kingdon asserts that policy advocates such as members of think tanks wait around for an opening and then push their solutions that were crafted before the problem arose. While “[p]olicy

windows open infrequently, and do not stay open long... the major changes in public policy result from the appearance of these opportunities” (Kingdon, 1984, pg. 175), consistent with the punctuated equilibrium model of social change.

Though all three streams are important to open a window, “the agenda is affected more by the problem and politics streams and alternatives are affected more by the policy stream” (Kingdon, 1984, pg. 176). A change in the problem stream such as a natural disaster or a terrorist attack tends to allow more specific policies to be enacted, while changes in the political stream such as the change of an administration can introduce a new set of ideals and priorities. Political and problem streams are related. “When a window opens because a problem is pressing, the alternatives generated as solutions to the problem fare better if they also meet the tests of political acceptability. Similarly, when a political event opens a window, participants try to find a problem to which the proposed solution can be attached” (Kingdon, 1984, pg. 183). Nonetheless, without the presence of a viable alternative policy, there would be no action to take on the window. The three streams must be working in sync in order for a policy window to come to fruition. “If one of the three streams is missing then the subject’s place on the decision agenda is fleeting. The window may be open for a short time, but if the coupling is not made quickly, the window closes” (Kingdon, 1984, pg. 187).

Policy proposals that tend to find success in one area are usually used in other arenas. “The first success creates tremendously powerful spillover effects. Policy entrepreneurs are encouraged to rush to the next available issue, coalitions are transferred, and arguments from analogy and precedent take hold” (Kingdon, 1984, pg. 203). Policy entrepreneurs are quite different from policy experts, as they seek to manipulate the three streams to achieve their objectives, frequently using the media or the courts to achieve their goals (Crenson and Ginsberg, 2002). The question is, to what extent will Katrina focus attention on ecological economic policies, leading to their successful implementation so that policy entrepreneurs can then push the policies, creating a spillover effect?

3. Catastrophe as catalyst

Catastrophes have a long history of serving as focusing events that open policy windows, often resulting in profound societal change. Three brief case studies serve to illustrate our point.

The Johnstown flood of 1889 occurred during the heyday of the so-called robber barons. Johnstown was a thriving steel town of 30,000 inhabitants on the banks of the Conemaugh River. In 1879, a number of industrial tycoons purchased an abandoned dam upstream from the town, along with surrounding lands, to create the South Fork Fishing and Hunting Club. The club widened and lowered the dam, aggravating existing problems. Professional inspections revealed that the dam was an accident waiting to happen. Confronted with the inspector’s conclusion, the South Fork club manager proclaimed, “You and your people are in no danger from our enterprise” (Ruff, 1880, as cited by Shappee, 1940).

Following heavy rains in May of 1889 the dam collapsed, releasing a massive wall of water that rushed through the

valley and decimated Johnstown. As broken houses, trees and other debris caught on a local bridge, people swept away by the floodwater escaped to safety on this tangle of debris only to burn to death as oil spilled in the flood caught fire and engulfed the bridge.

News of the 2200 who perished and the accounts from survivors shocked the nation. A suit was brought against the Club, but despite the obvious neglect of the safety of the dam, neither the Club nor any individual member was held liable and no damages were paid. The court reasoned, it was an “act of God”. This became a national scandal, an event symbolic of the carelessness of wealth and power (McCullough, 1968). In an era when the federal government supported *laissez-faire* capitalism (Birkland, 2001), the flood focused attention on the “government’s duty to protect public safety” (Cupper, 2000), on the problem of monopoly capitalism (Brooks, 2005) and on laws which protected industries from liability for accidents (Shugerman, 2000), strengthening the political stream of the existing progressive movement and the call for the implementation of trust-busting policies. The event helped move these policies onto the political agenda, leading congress to pass the Sherman Anti-Trust Act in 1890 (McCullough, 1968) – the first action by the US federal government to limit monopolies held by trust companies – which Theodore Roosevelt relied on in the anti-trust campaign he initiated 11 years later (Posner, 1976).

Nearly 40 years later, heavy winter snows in the Mississippi Valley were followed by persistent and heavy rain in the spring of 1927. With reports of record flooding and breached levees upriver, New Orleans grew tense. The City convinced the Army Corps of Engineers to dynamite the levee at Caernavon below New Orleans lowering the flood height but flooding poor and middle class communities in St. Bernard and Plaquemines Parishes. Promises to compensate these communities were never fulfilled, fueling significant populist anger. Secretary of Commerce Herbert Hoover managed the rescue and relief effort. His quick and effective response propelled him from dark horse to the Presidency in 1928 but also created demand for a larger federal role in disaster relief. In addition, mistreatment of blacks in refugee camps under Hoover’s command began the shift of African-Americans from the Republican to the Democratic party, helping Roosevelt win the Presidency in 1932 (Barry, 1997).

The 1927 Mississippi flood brought all three process streams together, creating a policy window. The disaster focused attention on the extreme inequality between rich and poor and between black and white, and the need for institutions at the scale of the problem to be addressed. Upstream cities strengthening levees worsened the potential downstream impacts. As the major city along a shipping route of national importance, the welfare of New Orleans affected the welfare of the nation. The policy solution to both of these problems was timely and comprehensive federal intervention in regional disasters, which presented not only an institution at the scale of the problem, but also a counterweight to the political influence of local elites. The powerful populist and progressive political movements in both the Republican and Democratic parties aligned to provide the necessary political stream.

The terrorist attacks of September 11, 2001 offer a recent example. The Project for a New American Century, a “non-profit educational organization” founded by William Kristol, Dick Cheney, Paul Wolfowitz, Jeb Bush, Donald Rumsfeld and others in 1997, called for massive increases in defense expenditures so that America could carry out its “global responsibilities”. In a document dated September 2000 entitled “Rebuilding America’s Defenses” (Donnelly, 2000) they claimed the need for a “substantial American force presence in the Gulf transcends the issue of the regime of Saddam Hussein” (p. 14). They argued that the huge defense increases needed for this plan would take a long time to be built up “absent some catastrophic and catalyzing event — like a new Pearl Harbor” (p. 51). Essentially, the neo-conservatives defined a problem, threats to American pre-eminence, and a policy solution, massive military buildup and military presence in strategic areas. George Bush’s election created the political opening. However, the focusing event of September 11, 2001, viewed on live TV, moved these policies to the top policy agenda, initiating the New American Century program. The bandwagon effect has helped neo-conservatives move a whole suite of policies onto the political agenda, ranging from tactical nuclear weapons and nuclear power to eroding civil rights in the Patriot Act.

The U.S. experience with 9/11 has been a particularly interesting example of managing a policy window. A theoretical background was formalized through a policy framework that provided solutions in anticipation of a problem. When the Trade Towers were attacked the neo-conservatives recognized that their focusing event had arrived. The political stream that had been built over many years was capable of moving their policy solutions forward. The greatest strategic success was being able to maintain the policy window. The Bush administration took the catastrophe of 9/11 and turned it into a new problem stream: the war on terror. This effectively created a new focusing event into which additional policy “solutions” could be added.

Hurricane Katrina has also focused public attention. People are demanding an explanation of what happened, and policies for dealing with the current disaster and preventing similar ones in the future. To be re-elected, politicians need to show they understand the problem and have credible solutions to offer. Both ecological economists and market fundamentalists have explanations of the problems associated with Katrina and accompanying policy solutions. The window is open. Our task is to understand who is and is not taking advantage of it, and why.

4. Katrina and the problem stream

The substantial differences in how ecological economists and market fundamentalists define the problem of Katrina are briefly summarized here in Table 1. Though market fundamentalists accept the neoclassical definition of the economic problem as choice under conditions of scarcity in the presence of unlimited wants – which is from their perspective solely an efficiency problem – their proposed policies have profound impacts on both ecologically sustainable scale and socially

Table 1 – Problem definitions for the causes and effects of Katrina, from the perspectives of ecological economics and market fundamentalism

Problem	Ecological economics	Market fundamentalism
Scale (the size of the economy relative to the global ecosystem that sustains and contains it)	<p><i>Scale is fundamental. Katrina results from 4 types of unsustainable scale:</i></p> <ol style="list-style-type: none"> 1. Greenhouse gas releases in excess of waste absorption capacity causes global warming. 2. Costs of toxic releases exceed benefits, and difference worsens as toxics accumulate. 3. Costs of wetland loss exceed benefits, wetlands may be entering into spontaneous decline. 4. Fossil fuels are being depleted faster than substitutes are being developed. 	<p><i>Scale is irrelevant.</i></p> <ol style="list-style-type: none"> 1. If global warming exists, costs of amelioration are greater than benefits. 2. Benefits of toxic release exceed costs. Economic growth provides the resources to clean up the environment. 3. Benefits of wetland loss exceed costs. Market substitutes possible. 4. There is no absolute resource scarcity, only relative scarcity. Relative scarcity → price increase → innovation of substitutes.
Distribution (who gets what)	<p><i>Distribution takes precedence over efficiency.</i></p> <ol style="list-style-type: none"> 1. Allowing the private sector to monopolize land, degrade wetlands, pollute the environment and capture the rent from fossil fuels and minerals contributes to poverty. 2. Industrial pollutants, wetland loss, and other negative externalities have disproportionate impacts on the poor. 3. Wealth begets wealth, and inequalities worsen over time. <p><i>What allocation mechanisms are most efficient depends on the desirable end and the specific resource.</i></p> <ol style="list-style-type: none"> 1. Externalities and subsidies for oil extraction and other market activities generate inefficiencies. 	<p><i>Distribution does not matter as long as property rights are clearly defined.</i></p> <ol style="list-style-type: none"> 1. Resource produced by nature should be privatized. The minimum wage increases unemployment, and economic growth is the solution to poverty. 2. The poor do not value the environment.
Efficiency (how resources are allocated to produce the most value)	<p><i>What allocation mechanisms are most efficient depends on the desirable end and the specific resource.</i></p> <ol style="list-style-type: none"> 1. Externalities and subsidies for oil extraction and other market activities generate inefficiencies. 2. Markets lead to inadequate production of inherently non-excludable resources such as levees and wetlands. 3. Markets lead to inadequate consumption of non-rival resources such as alternative energy technology. 	<p><i>Markets are always the most efficient allocation mechanism.</i></p> <ol style="list-style-type: none"> 1. Government regulations, taxes, minimum wages and other interventions prevent markets from functioning efficiently. 2. Markets lead to inadequate production of non-excludable resources, but all can be made excludable. 3. Non-rivalness is irrelevant.

just distribution. Scale, distribution and efficiency are therefore used as the framework for both perspectives.

How strong is the problem stream for ecological economics? Kingdon identifies three currents in the problem stream: indicators, focusing events and feedback. Many systematic indicators support the problem definition of ecological economists: overwhelming evidence for global climate change (IPCC, 2001); the increasing gap between hydrocarbon discoveries and annual consumption (Campbell and Laherrère, 1998); evidence of endocrine disruptions from toxic chemicals (Colborn et al., 1997); the increase in US poverty in the last 4 years (DeNavas-Walt et al., 2005); and studies documenting the efficiency of investing in natural capital (Balmford et al., 2002; Millennium Ecosystem Assessment, 2005), among others.

Katrina focused attention on unsustainable scale, unjust distribution and inefficient allocation as critical problems. Research suggested a relationship between hurricane intensity and global warming (e.g. Goldenberg et al., 2001; Emanuel, 2005; Knutson et al., 1998; Webster et al., 2005), but it took Katrina to bring the issue into mainstream media, political discourse and the public eye (see for example Kluger, 2005; Black, 2005; Gelbspan, 2005; Pearce, 2005; Milloy, 2005). Loss of wetlands and the services they provide (such as storm protection) received some media coverage (e.g. Hirsch, 2005), as did oil depletion (e.g. Mouawad and Treaster, 2005) and the excessive waste emissions behind the 'toxic gumbo' (e.g. Urbina and Wald, 2005), though coverage of the role of natural capital depletion in the Katrina tragedy left much to be desired (see Miles and Morse, 2007-this issue). Post-Katrina

headlines focused on distribution as well: "Katrina Reveals Poverty Reality" (Vlahos, 2005), "Another War on Poverty?" (Samuelson, 2005), "Race, Class Re-Enter Politics After Katrina" (Neal, 2005). Even President Bush mentioned the "legacy of inequality" claiming that "we have a duty to confront this poverty with bold action" (Bush, 2005). Calls for substantial government investment in natural capital and public goods suggest broad support for public investment as more efficient than private sector investments in recovery.

However, as Kingdon points out, focusing events such as Katrina still require a pre-existing perception of a problem, and a problem is a discrepancy between goals and actual conditions. Most Americans fail to share the ecological economists' pre-analytic vision of the economic system sustained and contained by the global ecosystem, and thus do not share the goal of achieving a steady state economy defined by a non-growing rate of extraction of natural resources from the sustaining ecosystem subsequently returned as waste. They therefore fail to define the problem as the discrepancy between the actual scale of the economy and the desirable steady state, and concern over poverty does not lead to calls for a more just distribution, as poverty can be alleviated through ever more economic growth.

It would in fact appear that the majority of the voting public and the ruling decision makers still accept the market fundamentalist's definition at least in part: We must choose within conditions of scarcity how to best satisfy our unlimited wants. As long as wants are accepted as unlimited, Americans are unlikely to confront the problems of sustainable and desirable scale.

5. Katrina and the policy stream

Table 2 briefly summarizes some different policy solutions offered by ecological economists and market fundamentalists. As different policy solutions flow from different problem definitions, we continue to categorize them according to scale, distribution and efficiency.

We believe the policy stream for ecological economics is robust. There is strong agreement between neoclassical and ecological economists on many recommendations, political support across the ideological spectrum for some recommendations, and a record of success where policies have been implemented.

For example, though ecological economists tend to favor cap and trade policies because they address scale first, then distribution, then efficiency (Daly, 1997), while conventional economists primarily laud their efficiency, both support the basic policy. Cap and trade policies have proven cost effective for waste emissions and fisheries (Roodman, 1998; Portney and Stavins, 2000), and are politically acceptable across the

ideological spectrum. Conditions may therefore be appropriate for ‘spillover effects’, where this policy solution is applied to more and more problems such as wetland loss, CO₂ emissions and even fossil fuel depletion. There are legitimate concerns that caps are frequently too lenient, trading can lead to pollution ‘hot spots’ when local communities have no say in the caps, and the initial distribution of tradable permits is often unjust, rewarding existing polluters. These concerns however would more likely be addressed if the ecological economists’ problem definitions were more widely accepted.

Pigouvian taxes seem to be more acceptable in Europe, which provides a strong record of success (Ekins, 1999). Financial assurance bonds are used for hard rock mining and oil well decommissioning (Ferreira et al., 2004). In terms of the democratic right to determine macro-allocation, several states in the US have “declared in their constitutions that natural resources belong to the people and that government acts as the people’s trustee” (Friends of the Commons, 2004, p. 3). The Pennsylvania constitution states that “natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth

Table 2 – Policy solutions for the causes and effects of Katrina, from the perspectives of ecological economics and market fundamentalism

Category	Ecological economics	Market fundamentalism
Scale	<ol style="list-style-type: none"> 1. Policies should allow a margin of error when dealing with biophysical systems that are both poorly understood and susceptible to irreversible and/or unpredictable change. 2. Cap greenhouse gas releases at the minimum estimate of waste absorption capacity. 3. Cap toxic releases at the minimum estimate of local waste absorption capacity, or at the point where increasing marginal costs are equal to diminishing marginal benefits for the affected population. 4. Restore wetlands at a minimum to the point where they are self-sustaining, or to the point where the benefits of restoration cease to exceed the costs. 5. Demand financial assurance bonds be posted to cover uncertain ecological impacts. 6. Invest royalties from fossil fuel extraction in the development of renewable, decentralized substitutes. 	<ol style="list-style-type: none"> 1. Negative impacts of human activities on biophysical systems must be proven, and costs of activities shown to exceed benefits, before considering market based instruments. 2. Relax environmental regulations to encourage more fossil fuel extraction; open currently off-limit sites for exploration and extraction; reduce sector taxes. 3–4. Relax environmental regulations and taxes on industries that pollute and/or degrade wetlands. 5. Exempt business from liabilities for ecological damages. 6. End royalty payments on fossil fuels to encourage new discoveries and faster extraction.
Distribution	<ol style="list-style-type: none"> 1. Decisions on macro-allocation (the share of ecosystem structure that should be left to provide ecosystem services, and the share that can be converted to economic services) should be democratically decided by the communities benefiting from those ecosystem services. Campaign finance reform may be required to prevent plutocratic outcomes. 2. Capture all rents from those who convert ecosystem structure to economic output and waste and use them to compensate the rest of society for this privilege. 3. Compensation for negative externalities should accrue to those affected. 	<ol style="list-style-type: none"> 1. Decisions on macro-allocation are decided by market forces, i.e. one dollar, one vote (plutocracy). 2. End royalty payments and rent capture. Repeal Bacon–Davis act. 3. No internalization of externalities (note that conventional environmental economists favor internalization of externalities, but believe that compensation for those who suffer their impacts is generally inefficient).
Efficiency	<ol style="list-style-type: none"> 1. Internalize externalities via Pigouvian taxes or auctioned quotas, and eliminate subsidies for market activities. 2. Increase government investment in natural capital and other public goods. 3. Increase government investment in open source technologies that provide or protect public goods. 	<ol style="list-style-type: none"> 1. Reduce existing taxes, create no new ones. 2. Reduce government investment in public goods and natural capital. 3. Increase enforcement of intellectual property rights.

shall conserve and maintain them for the benefit of all the people” (*Friends of the Commons*, 2004, p. 4).

In summary, support for most of these policy options is strong and/or increasing, and is probably not where ecological economists should be concentrating their efforts.

6. Katrina and the politics stream

The politics stream seems to be the weakest current for ecological economics, and is probably the strongest for market fundamentalists. The Executive and Legislative branches of the federal government are controlled by market fundamentalists.

Two positive trends suggest hope. First, the political stream behind ecological economics may be gaining steam at the local level. Politicians across the ideological spectrum in Louisiana have come together to demand public sector investments in levees and wetlands, which implicitly supports both our scale and efficiency policies.

Second, polls suggest that the “national mood” increasingly supports the ecological economic agenda, at least to some degree. For example, a Pew survey found that the number of Americans citing energy problems as a top domestic priority for Bush and Congress rose from 47% to 58% between January 2005 and January 2006, while support for protecting the environment rose from 49% to 57% (*Pew Research Center*, 2006). A Harris-interactive poll found that agreement with the statement “Protecting the environment is so important that requirements and standards cannot be too high and continuing environmental improvements must be made regardless of cost” increased from 56% in 2002 to 74% in 2005 (*Americans and the World*, 2003). Attitudes can shift policy. Nearly half of the US population lives within regions where the state or local governments have agreed to follow the Kyoto Protocol (*Fisher and Costanza*, 2005).

With the national mood supportive, why does the politics stream for ecological economics remain so weak? The attitudes across political parties are crucial. For example, while nearly 70% of Democrats believe problems of the poor are a top issue, only 36% of Republicans agree. There is a similar partisan gap on protecting the environment (*Pew Research Center*, 2006). Thus, though a majority of Americans supports substantial elements of the ecological economics agenda, only a minority in the ruling party does so. However, even the Clinton administration failed to commit to the Kyoto Protocol, and Al Gore stated that the “The maximum that is politically feasible, even the maximum that is politically imaginable right now, still falls short of the minimum that is scientifically and ecologically necessary” (as quoted in *McKibben*, 1995). While the Republican majority appears hostile to the ecological economic agenda, the Democrats offer only very limited support. It appears that a majority of our politicians believe sustainable scale is irrelevant, and just distribution and efficient allocation are both achieved by unhampered market forces. Thus, in spite of some positive signs, there is little question that the politics stream is the dominant current holding the policy window shut for ecological economics.

In summary, the strongest current pushing ecological economics onto the political agenda, the policy stream, is also the least effective alone: Though the other currents mean little

without effective policies, the problem stream and politics stream are more likely to open the window. Ecological economists must therefore learn how to strengthen these other two streams.

7. Strengthening the problem stream

The problem definitions of ecological economics flow from the discrepancy between our goals and current reality, but there is little public or political acceptance of the goals themselves. As Donella *Meadows* (1997) argued, changing goals is one of the strongest levers for changing an entire system, second only to a shift in the paradigm from which the goals themselves arise.

Before we suggest options for “getting the message out,” we must discuss the message itself. What are strategies to convey our core concepts to the public?

Stone (2002) identifies four key goals accepted by virtually all policy makers and the public: security, equity, efficiency and liberty. These goals have broad acceptance because they can be defined in so many different ways, but become “the object of political struggle” as policy makers strive to build coalitions and alliances around their specific definitions. In fact, ecological economists use these same general goals to describe their specific objectives. Security is about meeting human needs, which demands we preserve the ecosystems providing both life support functions and the raw materials essential for all economic production. Just distribution is about equity, both within and between generations. Free choice in a market system and the right not to suffer from the actions of others (negative externalities) are issues of liberty. Macro-allocation concerns the efficient apportionment of natural capital between ecosystem services and the raw materials needed for economic production. Micro-allocation is the efficient apportionment of raw materials among different economic products. Our challenge is to build coalitions around our definitions of these goals, so that people and policy makers will accept our problem definitions.

The solution is not simply better science. While good science can help gain broad public support for our goals, average citizens and policy makers often do not understand scientific explanations of ecological thresholds, ecosystem services, and other important scientific issues, which makes it easy to sow public doubt about scale problems with almost universal scientific acceptance, such as global warming. When asked how skilled scientists and researchers were at presenting their case to Congress, Congressman Brown gave a telling answer: “Very unskilled. They, generally speaking, have too great a faith in the power of common sense and reason. That’s not what drives most political figures, who are concerned about emotions and the way a certain event will affect their constituency. If you’re going to work in a political environment, you have to know the reasoning of the people you’re dealing with” (as quoted in *Dreifus*, 1999).

As a result, instead of using objective scientific explanations to gain support for our goals and policies, we would be more effective drawing upon literary techniques such as metaphor and synecdoche (*Stone*, 2002) to convey our message, particular when the audience extends beyond economists. Some British officials have begun equating global

warming with “weapons of mass destruction” (May, 2005), tying it closely to the security issue. The best writers in ecological economics already rely heavily on metaphor: Boulding’s (1966) “spaceship earth,” Daly’s (1991) Plimsoll line, Rees and Wackernagel’s (Rees, 1992; Rees and Wackernagel, 1994) “ecological footprint.” Such metaphors not only create graphic images that help people understand the issue of scale, but accepting the metaphors forces one to accept the goal of sustainable scale — we need to maintain the life support functions of a spaceship, we cannot acquire so many goods that the planet’s Plimsoll line is submerged, or leave too large a footprint. Most ecological economists were probably influenced by at least one of these metaphors.

Symbols by their very nature are not exact, and are subject to interpretation. An ongoing dispute in ecological economics is over the appropriateness of monetary valuation of ecosystem services. As good science, there are plenty of reasons to be concerned with the normative and methodological issues behind valuation (Gowdy, 1997; Vatn and Bromley, 1994; Daly and Farley, 2003), but in politics, even numbers are just symbols (Stone, 2002). When Costanza et al. (1997a,b) place a dollar value on ecosystem services, they are not saying these services are exactly like market goods, that they can or should be exchangeable for money, or that they are fungible with other market goods. What they are saying is that these services are an important source of wealth and well-being, at least as important as those produced by the economy, and we should therefore do our utmost to preserve them. The public readily grasps the metaphor.

In addition to communicating in appropriate language, ecological economists must also learn to communicate an appropriate message — including a positive vision of a sustainable and desirable future emphasizing our central goals and values (Meadows, 1996; Farley and Costanza, 2002). A vision provides a goal to strive towards and a metric for evaluating our progress. It will prove far more effective than a litany of policy proposals. As long as an end to physical growth of the economy and more just distribution are viewed as hardships, it will be very difficult to gain broader acceptance, no matter how compelling the scientific evidence that current trends are unsustainable. Without a positive vision, ending economic growth cannot even be discussed in politics, and is thus permanently off the political agenda. As Shellenberger and Nordhaus (2005) point out, Martin Luther King’s “I have a Dream” speech was far more empowering than an “I have a nightmare” speech could have been. A positive vision creates the goal which defines the problem and inspires political support, and problem definitions in turn determine the policies.

Good scientists need to be clear and unambiguous. Good public policy makers need to gain broad support for their vision and policies, but gaining broad support often requires vague and ambiguous statements (Stone, 2002). Ecological economists trying to bridge science and public policy need to work with both methods. Goals are normative, not objective. To gain support for our goals requires the language of good poetry and story telling. Katrina should become a synecdoche — a figure of speech in which the part is used for the whole — for what happens when we exceed sustainable scale, allow unjust distributions, and allocate our resources inefficiently between public and private goods. While many ecological economists

have already shown themselves to be masters of metaphor, if we hope to strengthen the political stream we must learn to communicate to broader audiences.

8. Strengthening the politics stream

The Johnstown and 1927 floods and 9-11 disaster benefited from political streams — a progressive movement for the first two, and the neo-conservative movement for the third — which allowed policy windows to open. The progressive movement at the turn of the last century turned to social science to improve society. Tired of rampant corruption, social movements evolved which resulted in reforms: the civic service system, standard budgeting practices, systemic performance appraisals, and so on. It was the melding of a social movement and “good science.” Even the neo-conservatives call on the “good science” of market fundamentalism to improve society, for they believe as Milton Friedman (1962, p. 135) stated, that “[f]ew trends could so thoroughly undermine the very foundation of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible”.

Ecological economists are also seeking to improve society through the synthesis of the social and natural science, but still lack the necessary political stream. We can’t build political support by assuming there are 100 million policy wonks eager to digest a bleak list of problems and policies (Shellenberger and Nordhaus, 2005). We need to promote our goals and vision before our problem definition will be accepted. We also need to make sure that our policy responses are readily available to policy makers the instant they are needed. We can learn much from the market fundamentalists.

The neo-conservative, market fundamentalist alliance spent the last four decades, beginning in earnest with the defeat of Barry Goldwater in 1964, to create an infrastructure designed to frame public problems. A network of neo-conservative think tanks, funded by a relatively small, but effective group of private foundations and funders, has evolved (Covington, 1997; Covington and Parachini, 1995). They advanced the think tank organization to encompass media outreach, often measuring success by the number of op-ed pieces published and policy experts they get on television and radio programs.

This network of think tanks, funders and policy experts backing market fundamentalist policies has all but captured the politics stream in the United States. To alter this landscape, several changes need to take place. It is true that numerous foundations, social movements and non-profit organizations are advancing pieces of the paradigm, and some local governments are taking the lead on promoting progressive policies and views of problems that integrate pieces of the ecological economic paradigm. Yet to date, this movement has been decentralized, without a comprehensive framework integrating the separate elements of ecologically sustainable scale, just distribution and efficient allocation. This has led to the widespread argument that the progressive and environmental movements are issue based, without a unifying vision or values to coordinate them (Shellenberger and Nordhaus, 2005).

Ecological economics could provide that integrating vision, but it unfortunately remains largely confined to the ivory towers (though as a trans-discipline, it roams the terrain between the towers as well). Efforts need to be made to coordinate and activate progressive networks that challenge the neo-conservative hegemony. Ecological economics must become trans-institutional as well as trans-disciplinary.

First, ecological economists should make strategic alliances with think tanks and policy groups that share our values and help create new ones. Inherently interdisciplinary, such institutions actively cultivate a stable of experts to produce timely op-ed pieces, policy briefs, and books, and to appear on television and radio. Think tanks are better than academia at strengthening the policy stream for three key reasons: they respond promptly to focusing events, they write for a lay audience, and their output is readily accessible on appealing websites. In the immediate aftermath of crisis, both politicians and journalists must show they understand the issues, and turn to think tanks for their analysis. When the crisis resulted from failed policies, politicians are most open to considering new ones. The Heritage foundation took less than two weeks after Katrina to provide a suite of policy recommendations for dealing with the aftermath. Their recommendations were reported in the media and are clearly guiding many of the policies currently being implemented. In contrast, it may take a year or more for policy recommendations to appear in academic journals which neither politicians nor journalists will read. Finally, think tank experts themselves often become political appointees, giving them even greater ability to push their agenda.

Second, ecological economists should link to the foundations, social movements and non-governmental organizations (NGOs) working on pieces of the agenda, and show how ecological economics provides the unifying framework and vision that can bring them all together. As one example among many, the labor movement shares our goal of a more just distribution of resources, but often views pro-environment policies as a threat to jobs. Capturing and fairly distributing natural resource rents however improves both the environment and distribution, and investing in wetland restoration increases jobs in fisheries and tourism. The labor force in Louisiana's cancer alley would likely see enormous health benefits from more stringent environmental regulations and even more jobs — when Louisiana dramatically tightened pollution controls between 1988 and 1992, manufacturing jobs soared while toxic emissions declined by 50%. Systematic studies in fact show that states with the weakest environmental regulations have the most unemployment, so that “spending to control pollution constitutes a progressive policy with respect to income distribution” (Temple, 2003). From within the ecological economic paradigm, labor movements and environmental movements are natural allies.

Working closely with project-oriented non-governmental organizations (NGOs) can be particularly advantageous. NGO's often see benefit in strengthening the theoretical framework in which they operate. They also provide “ground-truthing” for theory and can offer the experience in applied ecological economics that provides the meaningful and persuasive stories needed to develop the political stream.

The combination of academics, ecologically-oriented think tanks and NGO's operating at the community level can help break the log-jam in the political stream that keeps ecological economics a theoretically inspiring but politically weak discipline.

Finally, we should cultivate the political stream locally and regionally wherever possible. In Louisiana, the impact of Katrina is still devastating socially, economically, politically, and environmentally, and both populace and politicians appear increasingly open to our agenda. Though Federal interest may wane, the state and its people, particularly the displaced, continue to languish, keeping the policy window open much longer at the local level. And it is not only Louisiana that is now living in fear of the next category five hurricane season, and open to another problem definition.

In fact, the politics stream for the ecological economics agenda is already strong in Louisiana. Wetland restoration and hurricane protection are seen by local politicians (of both parties), the general public and particularly coastal communities and New Orleans residents, as a life and death issue. Even prior to Katrina, Louisiana: Vision 2020, a program supported throughout the state, outlined \$15 billion in restoration projects in the Louisiana wetlands (Louisiana Economic Development Council, 2003). Even groups such as the New Orleans Chamber of Commerce and the US Army Corps of Engineers have recognized that the storm protection in the Gulf Coast states requires expansive, healthy wetlands and barrier islands. While the federal government has moved to eliminate royalty payments on fossil fuels (Andrews, 2006), Louisiana's Governor has recently demanded that royalties from off-shore oil drilling be returned to Louisiana (Rivlin, 2006).

Even the vision of a steady state economy might sell better in Louisiana than elsewhere. Louisiana is one of the poorest states. Most of the counties hit by Katrina have much higher poverty and unemployment levels than the US as a whole. The reigning vision in the US is one of economic growth driving ever-increasing consumption levels leading to a higher quality of life. The current administration has kept the neo-conservative/market fundamentalist policy window open through fear: fear of oil shortages, fear of economic collapse, fear of terrorists. Fear works well as a motivator but is exhausting and for that reason not sustainable. An increasingly unattainable vision driven by fear is the equivalent of the “I have a nightmare” speech. We need to counter with a dream, a positive vision describing the benefits of sustainable scale (less work, less consumption, less environmental degradation), just distribution (common ownership of natural assets and fair returns to labor) and efficient allocation (increasing investments in natural, social and human capital).

What makes the local approach even more appealing is the spillover effect Kingdon describes, where a policy applied successfully in one situation gains adherents and is soon applied elsewhere and in other situations. Investing in natural capital in Louisiana will make it more likely in the Puget Sound; if Louisiana captures hydrocarbon royalties, other states will do the same; if slashing toxic waste emissions in Louisiana increases employment, other states will follow, with the support of labor. Local action can lead to national action.

9. Conclusions

Ecological economics and its allied trans-disciplinary fields are too important to remain cloistered in academia. There is growing scientific evidence that we are exceeding sustainable scale, which will force us to pay greater attention to just distribution and the efficient allocation of investments across natural, social, human and built capitals. The irreversible outcomes that may occur when we cross critical ecological thresholds mean that we must be proactive in pushing our policies, not reactive. We have honed our problem definitions and policies, but have so far failed to create the political stream necessary to move them on to the political agenda. Coastal catastrophes not only serve as exceptionally good examples of the explanatory power of our paradigm, and its superiority to market fundamentalism as a means of increasing human quality of life for this and future generations, but also focus public attention. We must take advantage of the policy windows created by these and other minor catastrophes before we face cataclysmic catastrophes on a global scale.

To achieve this, we must draw on insights from the field of public policy to learn how to open policy windows. To strengthen acceptance of our problem definitions, we need more support for our goals, which requires a positive, shared vision of the sustainable and desirable future our policies would create. We need to convey that vision through the language of literature and poetry, but back it up with solid objective science. We must become trans-institutional as well as trans-disciplinary, working with think tanks, social movements, NGOs, the media and policy makers. We must create the political stream that will carry our ideas onto the political agenda, locally, nationally and globally.

Ecological economics and the other emerging trans-disciplinary fields discussed here are ideally suited to meet these challenges. We already pride ourselves on being trans-disciplinary problem solvers who integrate ideas and methodologies from any field as required to address a given problem (Norgaard, 1997; Costanza et al., 1997a,b). The field of public policy provides important insights into solving the big problem of extending our paradigm shift to politics, and to do so we must become trans-institutional as well as trans-disciplinary.

REFERENCES

- Americans and the World, 2003. Global Warming. (www.americans-world.org/digest/global_issues/global_warming/gw5.cfm [03.01.06]).
- Andrews, E., 2006. U.S. has Royalty Plan to Give Windfall to Oil Companies. New York Times. February 14.
- Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R., Jenkins, M., Jefferiss, P., Jessamy, V., Madden, J., Munro, K., Myers, N., Naeem, S., Paavola, J., Rayment, M., Rosendo, S., Roughgarden, J., Trumper, K., Turner, R.K., 2002. Economic reasons for conserving wild nature. *Science* 297, 950–953.
- Barry, J., 1997. Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America. Simon and Schuster, New York.
- Baumgartner, F., Jones, B., 2005. *The Politics of Attention: How Government Prioritizes Problems*. University of Chicago Press, Chicago.
- Baumgartner, F., Jones, B., 1993. *Agendas and Instability in American Politics*. University of Chicago Press, Chicago.
- Birkland, Thomas A., 2001. *An Introduction to the Policy Process: Theories, Concepts, and Models of Public Policy Making*. ME Sharpe, New York.
- Black, R., 2005. Hurricanes and global warming — a link? Analysis Environment Correspondent, BBC News (news.bbc.co.uk/1/hi/sci/tech/4276242.stm. [03.01.06]).
- Boulding, K., 1966. The economics of the coming spaceship earth. Presented at the Sixth Resources for the Future Forum on Environmental Quality in a Growing Economy in Washington, D.C. on March 8, 1966.
- Brooks, D., 2005. The Storm After the Storm. *The New York Times*. September 1.
- Bush, G., September 15, 2005. Presidential Address. (www.whitehouse.gov/news/releases/2005/09/20050915-8.html [03.01.06]).
- Campbell, C., Laherrère, J., 1998. The end of cheap oil. *Scientific American* 78–83.
- Colborn, T., Dumanoski, D., Peterson Myer, J., 1997. *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?: A Scientific Detective Story*. Penguin Group, New York.
- Costanza, R., Cumberland, J., Daly, H., Goodland, R., Norgaard, R., 1997a. *An Introduction to Ecological Economics*. St. Lucie Press, Boca Raton, Fla.
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R., Paruelo, J., Raskin, R., Sutton, P., van den Belt, M., 1997b. The value of the world's ecosystem services and natural capital. *Nature* 387, 253–260.
- Costanza, R.D., Stern, B., Fisher, L., He, C.M.A., 2004. Influential publications in ecological economics: a citation analysis. *Ecological Economics* 50, 261–292.
- Covington, S., 1997. *Moving a Public Policy Agenda: The Strategic Philanthropy of Conservative Foundations*. National Committee for Responsive Philanthropy, Washington, D.C.
- Covington, S., Parachini, L., 1995. *Foundations in the New Era*. National Committee for Responsive Philanthropy, Washington, D.C.
- Crenson, M.A., Ginsberg, B., 2002. *Downsizing Democracy: How America Sidelined its Citizens and Privatized its Public*. Johns Hopkins University Press, Baltimore, MD.
- Cupper, D., 2000. *Working in Pennsylvania: A History of the Department of Labor and Industry (Illustrated)*. Pennsylvania Department of Labor and Industry. (www.dli.state.pa.us/landi/cwp/view.asp?a=11 and Q=59307 [03.01.06]).
- Daly, H., 1991. *Steady-State Economics*. Island Press, Washington, D.C.
- Daly, H.E., 1997. *Beyond Growth: The Economics of Sustainable Development*. Beacon Press, Boston, MA.
- Daly, H., Farley, J., 2003. *Ecological Economics: Principles and Applications*. Island Press, Washington, DC.
- DeNavas-Walt, C., Proctor, B., Lee, C., 2005. *Income, Poverty, and Health Insurance Coverage in the United States: 2004*. US Census Bureau. (www.census.gov/prod/2005pubs/p60-229.pdf [03.01.06]).
- Donnelly, 2000. *Rebuilding America's Defenses*. Project for a New American Century. (www.newamericancentury.org/RebuildingAmericasDefenses.pdf [03.01.06]).
- Dreifus C., 1999. A conversation with: George E. Brown jr.; the congressman who loved science *New York Times*, March 9, 1999.
- Ekins, P., 1999. European environmental taxes and charges: recent experience, issues and trends. *Ecological Economics* 31 (1), 39–62.
- Emanuel, K., 2005. Increasing destructiveness of tropical cyclones over the past 30 years. *Nature* 436.
- Farley, J., Costanza, R., 2002. Envisioning shared goals for humanity: a detailed, shared vision of a sustainable and desirable USA in 2100. *Ecological Economics* 43, 245–259.

- Ferreira, D., Suslick, S., Farley, J., Costanza, R., Krivov, S., 2004. A decision model for financial assurance instruments in the upstream petroleum sector. *Energy Policy* 32 (10), 1173–1184.
- Fisher, B., Costanza, R., 2005. Environmental policy: regional commitment to reducing emissions. *Nature* 438, 301–302.
- Friedman, M., 1962. *Capitalism and Freedom*. University of Chicago Press, Chicago.
- Friends of the Commons. 2004. State of the Commons, 2003/04. (friendsofthecommons.org/stateofcommons0304.pdf [03.01.06]).
- Gelbspan, R., 2005. Katrina's real name. *The Boston Globe*, Op-Ed August 30.
- Goldenberg, S.B., Landsea, C.W., Mestas-Nuñez, A.M., Gray, W.M., 2001. The recent increase in Atlantic hurricane activity: causes and implications. *Science* 293, 474–479.
- Gowdy, John, 1997. The value of biodiversity: markets, society, and ecosystems. *Land Economics* 73 (1), 25–41 February.
- Hirsch, T., 2005. Katrina Damage Blamed on Wetlands Loss. *BBC News*. (news.bbc.co.uk/2/hi/americas/4393852.stm [03.01.06]).
- IPCC, 2001. In: Watson, R.T., The Core Writing Team (Eds.), *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom, and New York, N.Y. USA.
- John, P., 2003. Is there life after policy streams, advocacy coalitions, and punctuations: using evolutionary theory to explain policy change? *Policy Studies Journal* 31.4 (18), 481.
- Kingdon, J., 1984. *Agenda, Alternatives, and Public Policies*. Little, Brown, Boston.
- Kluger, J., 2005. Is Global Warming Fueling Katrina? *Time On-line Edition*. (www.time.com/time/nation/article/0,8599,1099102,00.html [03.01.06]).
- Knutson, T.R., Tuleya, R.E., Kurihara, Y., 1998. Simulated increase of hurricane intensities in a CO₂-warmed climate. *Science* 279, 1018–1021.
- Lewin, K., 1951. *Field Theory in Social Science*. Harper and Row, New York.
- Louisiana Economic Development Council. 2003. *Louisiana: Vision 2020*. (www.lded.state.la.us/led/vision_2020/text_only_FINAL.pdf [03.01.06]).
- May, Lord Robert, 2005. Climate Change is Undeniably Real, Caused by Human Activities, and Has Serious Consequences. *People and Planet*. (www.peopleandplanet.net/doc.php?id=2608 [03.01.06]).
- McCullough, D., 1968. *The Johnstown Flood*. Simon and Shuster, NY, NY.
- McKibben, B., 1995. Not so Fast. *New York Times Magazine*. July 23.
- Meadows, D., 1996. Envisioning a sustainable world. In: Costanza, R., Segura, O., Martinez-Alier, J. (Eds.), *Getting Down to Earth: Practical Applications of Ecological Economics*. Island Press, Washington, DC.
- Meadows, D., 1997. Places to Intervene in a System, *Whole Earth Winter*. (www.wholeearthmag.com/ArticleBin/109.html [03.01.06]).
- Miles, B., Morse, S., 2007. The role of news media in natural disaster risk and recovery. *Ecological Economics* 63, 365–373 (this issue).
- Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC.
- Milloy, S., 2005. Katrina kicks up storm of global warming debate. *Fox News: Junk Science*. Thursday, September 01, 2005 (www.foxnews.com/story/0,2933,168247,00.html [03.01.06]).
- Mitsch, W., Jorgensen, S., 2003. Ecological engineering: a field whose time has come. *Ecological Engineering* 20 (5), 363–377 October.
- Mouawad, J., Treaster, J., 2005. Storms cast spotlight on energy's new reality. *New York Times*, Monday, September 26, 2005.
- Neal, T., 2005. Race, class re-enter politics after Katrina. *Washington Post*, Thursday, September 22, 2005.
- Norgaard, Richard, B., 1997. The case for methodological pluralism. In *The Development of Ecological Economics*, eds. Robert Costanza, Charles Perrings, and Cutler Cleveland. Edward Elgar, Cheltenham, UK., 1997 (reprint of 1989 article in *Ecological Economics*).
- Pearce, F., 2005. Is Global Warming Making Hurricanes Stronger? *New Scientist* 2528. (www.newscientist.com/channel/earth/climate-change/mg18825281.300 [03.01.06]).
- Pew Research Center. 2006. Economy now seen through partisan prism. (people-press.org/reports/display.php3?ReportID=268 [03.01.06]).
- Portney, P., Stavins, R. (Eds.), 2000. *Public Policies for Environmental Protection*, second edition. Resources for the Future, Washington, DC.
- Posner, R., 1976. *Antitrust Law: An Economic Perspective*. University of Chicago Press, Chicago.
- Rees, W., 1992. Ecological footprints and appropriated carrying capacity: what urban economics leaves out. *Environment and Urbanization* 4 (2), 121–130.
- Rees, W., Wackernagel, M., 1994. Ecological footprints and appropriated carrying capacity: measuring the natural capital requirements of the human economy. In: Jansson, A.-M., Hammer, M., Folke, C., Costanza, R. (Eds.), *Investing in Natural Capital: The Ecological Economics Approach to Sustainability*. Island Press, Washington, pp. 362–390.
- Rivlin, G., 2006. Governor Threatens to Block Energy Leases off Louisiana. *The New York Times*. February 8.
- Roodman, D., 1998. *The Natural Wealth of Nations: Harnessing the Market for the Environment*. WW Norton and Company, NY.
- Samuelson, R., 2005. Another War on Poverty? *Newsweek*. Sept. 22, (www.msnbc.msn.com/id/9429749/site/newsweek/ [03.01.06]).
- Shappee, N., 1940. *History of Johnstown*. Unpublished doctoral 1093 dissertation. University of Pittsburgh.
- Shellenberger, M., Nordhaus, T., 2005. The Death of Environmentalism: Global Warming Politics in a Post-Environmental World. *Grist Magazine*. (<http://www.grist.org/news/maindish/2005/01/13/doe-reprint/> [03.01.06]).
- Shugerman, J., 2000. The floodgates of strict liability: bursting reservoirs and the adoption of Fletcher v. Rylands in the gilded age. *Yale Law Journal* 110 (2), 333.
- Solomon, B., 2005. The size thing revisited: the optimal size of the trans-discipline of ecological economics. Keynote Address at the US Society for Ecological Economics Biennial Conference, Tacoma, WA. July.
- Stone, Deborah, 2002. *Policy Paradox: The Art of Political Decision Making*. WW Norton and Co., New York.
- Templet, P., 2003. Defending the public domain: pollution, subsidies and poverty. In: Boyce, J., Shelley, B. (Eds.), *Natural Assets: Democratizing Environmental Ownership*. Island Press, Washington, DC.
- Urbina, I., Wald, M., 2005. Storm and Crisis: Pollution; Residents Worry about the Threat of Hazardous Chemicals. *New York Times*. September 9, Friday.
- Vatn, A., Bromley, D.W., 1994. Choices without prices without apologies. *Journal of Environmental Economics and Management* 26 (2), 129–148.
- Vlahos, K., 2005. Katrina Reveals Poverty Reality. *Fox News*. (www.foxnews.com/story/0,2933,168842,00.html [03.01.06]).
- Webster, P.J., Holland, G.J., Curry, J., Chang, A., 2005. Changes in tropical cyclone number, duration, and intensity in a warming environment. *Science* 309, 1844–1846.
- Wollin, A., 1999. Punctuated equilibrium: reconciling theory of revolutionary and incremental change. *Systems Research and Behavioral Science* 16, 359.