Working Paper 2007-08

BERKELEY
iurd
INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT

MACARTHUR FOUNDATION RESEARCH NETWORK ON BUILDING RESILIENT REGIONS

A Case Study Approach to Understanding Regional Resilience

Kathryn A. Foster

November 2006

UNIVERSITY OF CALIFORNIA

A Case Study Approach to Understanding Regional Resilience

Kathryn A. Foster, Ph. D.
University at Buffalo Regional Institute
The State University of New York
Beck Hall
Buffalo, NY 14214-8010
716-829-3777
kafoster@buffalo.edu

Working Paper prepared for the Building Resilient Regions Network
and presented at the
Annual Conference of the Association of Collegiate Schools of Planning,
Fort Worth, Texas
November 9-12, 2006

To begin, three vignettes in resilience.

Vignette 1. MM is a university professor *emerita*, a Hungarian Jew born in 1921 and raised in a place and time when habitual anti-Semitism would turn virulent. When MM is 14, in 1935, Hungary passes its First Jewish Law limiting the share of Jewish employment in most businesses and professions to no more than 20 percent. In 1938, when MM is 17 and in anticipation of the Second Jewish Law, which will more severely restrict Jewish employment, MM's parents determine that MM should emigrate from Hungary.

They provide this advice and directive: MM must master skills that provide a livelihood independent of her native language or level of education. Though a talented student, MM heeds her parents. She ends her formal education and trains instead to dress hair, apply makeup, cleanse skin and manicure nails, thus equipping herself with the capacity to survive anywhere. And she does survive, escaping Hungary and making her way first to Palestine and eventually to London after the war. She will never again see her family: MM's mother, father and younger sister will die in concentration camps, three of the 550,000 Hungarian Jews killed in the Holocaust.

At 85, MM remains emotionally, mentally and, although slowed by age, physically capable. Throughout life, she has drawn upon these strengths to withstand and recover from trauma, indeed to survive situations and stresses that felled many others. She attributes her resilience to talent—she will later use her creative skills as an artist—generous friends and a healthy constitution.

Vignette 2. Hanging on the living room wall of LC, a 35-year old elected official in Buffalo, New York, is a poster of "Rocky" atop the steps of the Philadelphia Art Museum, his arms raised in triumph and the familiar tag line, "his whole life was a million to one shot." It's a fitting wall piece for LC, not simply because he's a film expert, but because he

has defied odds since birth. Born with thalassemia, an inherited and incurable type of anemia, LC was given a life expectancy of 10 to 13 years. At 3 months, he began a lifetime of biweekly trips to the hospital for blood transfusions. Active, upbeat, private and wired to take things in stride, LC long outlasts the doctor's predictions. He treats chronic illness as second nature and trivial to his identity; many people, even close friends, are not aware of his condition.

Despite conscientious care and an optimistic outlook, however, LC, at age 22 in the spring of his senior year at college, experiences acute heart and liver failure. He and his parents are told that his only chance to survive is a double organ transplant. LC later says that the ensuing eighteen months of waiting and enduring—for permission from insurance companies to pay for a rare and risky operation, for heart and liver organs that match, for the uncertainty and fatigue of a debilitating body—was the worst part of subsequent years of operations, procedures, side effects and recovery. Now with a master's degree and more than ten years after the double transplant, LC attributes his beat-the-odds resilience to three things: a positive and circumspect attitude; devout following of doctors' orders; and, perhaps perversely, drugs that *weaken* his immune system so it cannot reject the transplanted organs.

Vignette 3. On July 20, 1984, accomplished marathoner Jim Fixx, author of the still-in-print and best-selling book, *The Complete Book of Running,* dropped dead of a massive heart attack while running along back roads in Vermont. He was 52. By all outward appearance, Fixx was in impressive physical shape: although sedentary much of his life, at age 35 he had famously quit smoking, started jogging, dropped fifty pounds and built the

stamina and leg muscles from which he would become well known and well off. He had run 20 marathons and at the time of his death was logging 60 miles a week.[1]

In the aftermath of his surprising death, several medical issues came to light. One was that his father had died of a massive heart attack at age 43, suggesting a genetic predisposition to heart disease. Another was that Fixx was aware, but chose not to treat, warning signs of heart disease that included cholesterol levels above 250. The autopsy, which found three main arteries blocked at levels of 95%, 85% and 50% confirmed that his heart disease was advanced, even if those signs were not evident to Fixx during daily workouts. A third explanation offered years later was that high levels of exercise—levels characteristic of Fixx's daily workouts—might actually do a body harm by generating free oxygen radicals, molecules associated with a range of heart and other diseases.

In the end, no one could be sure. Did Fixx's running actually extend his life beyond genetic expectations? Might Fixx's running, by building his strength and physical capacity, perhaps have lured him into a false sense of health and well-being, prompting him to neglect troubling warning signs? Or was running and its biochemical byproducts the cause, rather than the antidote, of his untimely death?

If resilience is, as the American Psychological Association puts it, "the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress,"[2] then these vignettes display key attributes and elements of the concept. Evident in these stories are commonly cited factors of individual resilience, including the capacity to

---

[1] Ted Kreiter. Nov.-Dec. 1994. Book Review of *Antioxidant Revolution* by Dr. Kenneth H. Cooper. *Saturday Evening Post,* accessed online at http://findarticles.com/p/articles/mi_m1189/is_n6_v266/ai_15879293.
[2] American Psychological Association. N.D. "The Road to Resilience," p. 1. Accessed online September 14, 2006 at http://www.helping.apa.org/.

anticipate change, skills at developing plans and solving problems, a positive view of life, activities that build a strong body and mind, and caring and supportive relationships.

At the same time, the vignettes reveal fundamental challenges in understanding and applying the complex concept of resilience. On what basis can we say MM, LC and Fixx are resilient when one had physical advantages, another ranks low on most measures of health and the third did not survive past 52? Could we evaluate these and other cases to determine that one person is more resilient than another? If so, on what absolute or relative scale and using what measures might we gauge resilience, given obvious differences in time, circumstances, and personal endowments? More fundamentally, if a person's vital signs—say of strength or stamina—are absolutely or relatively low, then regardless of behaviors would the person by definition lack resilience? In contrast, might a person who survives despite behaviors and actions be a *prima facie* case of resilience simply by the fact of survival?

The purpose of this paper is to explore how such questions and concepts of resilience may apply in the complex setting of a metropolitan region, that is, to understand what we'll call "regional resilience." How might regions, like individuals, adapt to adversity and stress? What factors account for a region's resilience and how can we measure them? As with individuals, given clear differences in challenges, assets and cultures, is it possible to compare places on the basis of their regional resilience? Can regions intervene to increase their resilience and, if so, why might a region fail to intervene well or at all?

Other papers in this roundtable tackle these questions through aggregate analysis and modeling. The current effort seeks insights by proposing a framework for case study analysis of regional resilience. It begins with a review of literature on resilience drawing from fields as varied as psychology, management and disaster studies and distilling common themes that cut across these studies. It then offers a generic framework for assessing

regional resilience through case study analysis. To test the framework I use the case of economic stress in the Buffalo-Niagara Falls Metropolitan Area, a two-county region that has suffered prolonged economic decline for half a century. I conclude the paper with a summary of insights on case study approaches to regional resilience and a modest proposal for planners and regional leaders to more effectively assess and build regional resilience.

I. Understanding Resilience

The literature from several disciplines, notably psychology, ecology, engineering and planning, management and anthropology, illuminates concepts of and approaches to resilience.

As the vignettes suggest, studies of individual resilience have long been of interest to psychologists seeking to understand coping mechanisms and particularly why some people fare better than others in dealing with difficult circumstances and major life events.[3] While the faculties of an individual differ in important ways from those of a multi-faceted region, two concepts from psychology are most salient. First is the finding that resilience is an *ordinary* rather than *extraordinary* way of being.[4] Although they will choose different means, such as exercise, prayer, work or writing in a journal, people suffering trauma generally have the capacity and inclination to bounce back over time. Being resilient is normal.

The second finding from the psychology literature is that resilience is not simply an inherent personal trait—although one can exhibit resilience—but also a set of capacities, behaviors and external resources one can develop and draw upon to deal with difficult

---

[3] Linda R. Winfield. 1994. "Developing Resilience in Urban Youth." Chicago, Ill.: North Central Regional Educational Laboratory, p. 1.

[4] American Psychological Association, "Road to Resilience," p. 1.

challenges.[5] As such, resilience can be acquired and fostered both through internal steps, such as strengthening one's friendship networks and taking physical and mental care of oneself, and through external interventions, such as supportive and protective social structures like good schools, health clinics and social services networks. Resilience thus manifests as both end-state competency and the process of coping with challenges.

Ecological scientists likewise formulate resilience as a characteristic and process, in their case to understand natural phenomena, such as how forests regenerate after a fire or how lakes recover from pollutants. Ecologists' use of resilience is quite different from that of psychologists, however. They define resilience as a measure of vulnerability to surprise and shocks, rather than as a response to such stresses.[6] In this scheme, high resilience is associated with low vulnerability, a condition that is greatest when a system is in a high state of reorganization, growth and innovation, such as the period of regeneration following a forest fire. At such times, the system is most responsive to and interactive with external forces, making surprises unlikely. In contrast, when a system settles down or levels off after a period of growth, it tends to become more rigid, conservative and internally focused, leaving it more vulnerable to an external shock or stress. As ecologists describe it, the system is now an "accident waiting to happen," especially susceptible to a triggering action such as a lit match in a dry forest.

Of relevance to regional resilience is the recognition by ecologists that human or organizational agency makes the patterns of adaptive cycles tendencies rather than

---

[5] Winfield, "Developing Resilience," pp. 2-3; see also American Psychological Association. 2003. "Resilience in a Time of War." Washington, D.C.: American Psychological Association; and "Project Resilience" materials accessed September 14, 2006 online at http://www.projectresilience.com.

[6] C.S. Holling and Lance H. Gunderson. 2002. "Resilience and Adaptive Cycles." In *Panarchy: Understanding Transformations in Human and Natural Systems,* edited by Lance H. Gunderson and C.S. Holling. Washington, D.C.: Island Press, pp. 27-33.

inevitabilities.[7] Conscious choices may shape the duration and nature of regional adaptation. Ecologists specifically cite three features that distinguish human systems from natural systems: 1) foresight and intentionality; 2) communication; and 3) technology.[8] Foresight and intentionality enable a region to make, debate and respond to forecasts and warning signs, thereby reducing the potential for surprise and increasing resilience. Communication permits a region to document and learn from experience, to ask for help from external relations, and to motivate popular action against unwise choices by system leaders. Use of technology and innovation in regional systems such as transportation, economic development and health care enable regions to better control the social and economic environment and establish new competencies for resilience.

System capacities and human behaviors likewise garner interest from engineers and planners who posit resilience as a cornerstone of disaster response.[9] As the much-studied case of Hurricane Katrina suggests,[10] regions with low resilience cope poorly with system disturbance, faltering in the face of environmental, political and economic blows. Regions

---

[7] See "Resilience and Adaptive Cycles, pp. 44.

[8] C.S. Holling, Lance H. Gunderson, and Garry D. Peterson. 2002. "Sustainability and Panarchies." In *Panarchy: Understanding Transformations in Human and Natural Systems,* edited by Lance H. Gunderson and C.S. Holling. Washington, D.C.: Island Press, pp. 99-101.

[9] See, for example, P. R. Berke and T. J. Campanella. 2006. "Planning for Postdisaster Resiliency." *The Annals of the American Academy of Political and Social Science* 604(1): 192 – 207; Louise K. Comfort, ed. 1988. *Managing Disaster: Strategies and Policy Perspectives.* Durham, NC: Duke University Press; Timothy Beatley, Philip R. Berke, Raymond Burby, Robert E. Deyle, Steven P. French, David R. Godschalk, Edward J. Kaiser, Jack D. Kartez, Peter J. May, Robert Olshansky, Robert G. Paterson, and Rutherford H. Platt. 1999. "Unleashing the Power of Planning to Create Disaster-Resistant Communities." *Journal of the American Planning Association*, Vol. 65; and Lawrence J. Vale and Thomas J. Campanella. 2005. *The Resilient City: How Modern Cities Recover from Disaster.* Oxford: Oxford University Press.

[10] See for example, Amy Liu. 2006. "Building a Better New Orleans: A Review of and Plan for Progress One Year after Hurricane Katrina." Washington, D.C.: The Brookings Institution; Eugenie L. Birch and Susan M. Wachter, eds. 2006. *Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina.* Philadelphia, PA: University of Pennsylvania Press; and Thomas Campanella. 2006. "Urban Resilience and the Recovery of New Orleans." *Journal of the American Planning Association* 72(2): 141-146.

with high resilience more readily absorb such disturbance, either because they better anticipate and prepare for impending crises or because they are better endowed or structured—with such assets as sound infrastructure, ample human capital, effective communications systems and strong external relations—to react effectively to a crisis.

A recent article by Michel Bruneau and others represents the genre and provides a framework for assessing community resilience. Bruneau et al. identify four properties of resilience, each useful for assessing regional capacity to respond to a disturbance:[11]

- **robustness**: the strength of a system and its elements to withstand disruption without suffering degradation or loss of function
- **redundancy**: the extent to which a system or its elements have substitutes to ensure functioning in the event of a disruption
- **resourcefulness**: the capacity within a system to identify problems, establish priorities and mobilize and apply resources in face of disruption
- **rapidity**: the capacity to meet priorities and achieve goals in a timely manner to contain losses and thwart future disruption

Notably, and consistent with the psychological perspective, these properties measure two types of resilience. The first and last properties, robustness and rapidity, measure end-state resilience, that is, the actual performance of system in responding to a disturbance. The middle two properties, redundancy and resourcefulness, gauge the capacity and potential of a system to build and achieve resilience.

---

[11] Michel Bruneau, Stephanie E. Chang, Ronald T. Eguchi, George C. Lee, Thomas D. O'Rourke, Andrei M. Reinhorn, Masanobu Shinozuka, Kathleen Tierney, William A. Wallace and Detlof von Winterfeldt. 2003. "A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities." *Earthquake Spectra* 19(4), pp. 737-38.

Extending their model, Bruneau et al. conceptualize resilience as encompassing four interrelated dimensions: technical (physical systems, infrastructure), organizational (governance, service delivery), economic (fiscal, market) and social (community, individual). The performance of each dimension in the face of disaster—that is, its robustness, redundancy, resourcefulness and rapidity of response—invites precise gauges, such as the percentage of disaster assistance centers set up within one day of the disaster (a rapidity measure of the social dimension) or the presence of backup power supplies for key businesses (a redundancy measure of the economic dimension). The result is a framework for assessing overall and specific resilience of a community in the face of a major disturbance.

Principles useful for assessing community resilience are likewise useful in the field of management for understanding why some enterprises perform better than others in the face of business disruptions. As firms have gravitated toward "just-in-time" delivery systems and increased their dependence on global supply chains, however, the risk assessment and preparation facets of resilience have assumed special importance. In his recent book, Yossi Sheffi mines stories of natural disasters (Toyota supply chains disrupted by fires, Unilever plants shut down by a hurricane, Dell and Apple chip manufacturing impeded by an earthquake) and non-natural disasters (U.S. Pacific ports shut down by strategically timed labor strikes at the holidays, McDonald's suffering as a target of anti-American protests and terrorism) to distill the factors that make one business more resilient than another.[12] Sheffi emphasizes first the importance of assessing the probability of and potential damage from specific company risks and vulnerabilities. He then identifies redundancy and flexibility as

[12] Yossi Sheffi. 2005. *The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage.* Cambridge, Mass.: MIT Press.

the two key factors for enterprise resilience, enabling a firm to best mitigate and bounce back from a disruption. Companies achieve redundancy through strategically positioned back-up systems (technology, parts, labor, suppliers), standardized parts and processes, and deep collaborative relations with each link in a supply chain. They achieve flexibility through decentralized and cross-trained leadership and decision-making systems, effective communications systems to distribute useful knowledge, and adaptable parts and contracts able to change on short notice.

Despite safeguards and good intentions, however, some social systems perform better than others at assessing situations, preparing for the future, stewarding community assets and thriving economically, environmentally and politically. The literature of anthropology focuses on why. From his recent analysis of societal and environmental collapse in ancient and modern settings as varied as Easter Island, Mayan civilization, Rwanda and Montana, Jared Diamond distills five factors often or always present in situations of social failure.[13] The first four, which vary across the cases in their significance and may be uncontrollable or inadvertent, are environmental damage, climate change, hostile neighbors and friendly trade partners. The fifth factor, which always proved significant to the collapse, is society's response to its environmental problems. In his analysis, resilience depends not only on properties of the environment—the fragility of an ecosystem or external trends, for example—but also on properties of people, such as prudence, the nature of external relations and habits of conservation.[14]

This scan of the literature yields several conclusions about attributes of resilience. First, resilience comes in two different though connected types, namely resilience as preparation and resilience as performance. Second, resilience applies not only to a system as

---

[13] Jared Diamond. 2005. *Collapse: How Societies Choose to Fail or Succeed.* New York: Viking Penguin.
[14] Diamond, *Collapse*, pp. 11-15.

a whole, but to system elements, such as infrastructure, information, the physical environment, civic organizations, governance and economic systems. Third, a system that is resilient on one element may not necessarily be resilient on another. And fourth, resilience can be developed.

II. A Framework for Assessing Regional Resilience

The challenge of assessing resilience is exemplified by a case study of South Central Los Angeles ten years after the 1992 civil unrest there sparked by the acquittal of white police officers accused of beating black motorist Rodney King.[15] The case found that, "ten years after the civil unrest, both statistical indicators and anecdotal reports suggested that the ravaged parts of the city were still doing poorly."[16] The vast majority of damaged buildings remained unfixed, commercial redevelopment, housing construction, new investment and job creation were scant, and metropolitan poverty remained highly concentrated in South Central L.A. Nonetheless, the author concluded, "these statistics do not mean that L.A. was not a resilient city." Rather, the case argues, the rebuilding project was simply larger and more complex than expected and the nature of community resilience does not show up in readily measured gauges. "But if by resilience we mean confidence, energy, and sheer *chutzpah,* then Los Angeles clearly showed considerable resilience in the decade after 1992."[17]

At first glance, it seems misguided to label a place resilient for its confidence, energy and chutzpah when it otherwise shows dismal economic and social performance. Resilience could become nearly tautological: if a place has merely survived a stress or shock, no matter

---

[15] William A. Fulton. 2005. "After the Unrest: Ten Years of Rebuilding Los Angeles Following the Trauma of 1992." In *The Resilient City: How Modern Cities Recover from Disaster,* edited by Lawrence J. Vale and Thomas J. Campanella, pp. 299-312. New York: Oxford University Press.

[16] Fulton, "After the Unrest," p. 306.

[17] Fulton, "After the Unrest," p. 306.

how dismally it must be resilient *ipso facto*. That said, confidence, energy and chutzpah legitimately imply a certain kind of resilience and represent an important facet of the complex concept. A challenge of measuring resilience will be incorporating non-performance-based aspects of resilience into the framework.

A second methodological challenge is the different nature of disturbances that emerge as regional blows with immediate powerful impact versus those that manifest as chronic "slow burn" trends. These chronic disturbances comprise individually small but cumulatively significant clusters of episodes that amount collectively to prolonged conditions, such as economic decline, demographic shifts or gradual environmental change. One consideration for case study work is exploring how marshalling and sustaining resilience under slow-paced traumatic stress may differ from resilience in the face of rapid catastrophic trauma.

One selling point of case study analysis is its latitude for nuanced assessment of complex concepts like resilience. Such latitude permits distinct gauges for different aspects of a multi-faceted concept. For example, assessment might determine that those who study diligently, seek out help, come to class prepared and participate fully are "good students," even if they do poorly on exams. In a similar vein, vignette 2 demonstrate's LC's resilience, even when quantified measures of his health show weak performance relative to those of the general public.

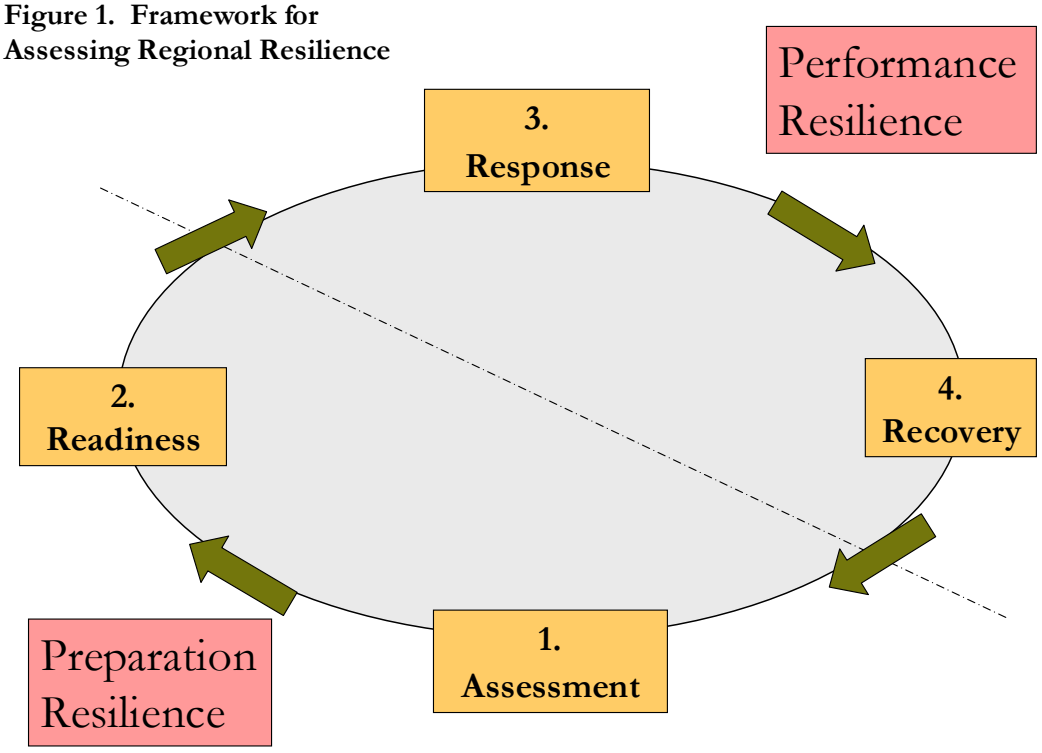
In the case study framework that follows, I take advantage of the latitude of case study analysis to propose questions and assessment measures of resilience unavailable to aggregate quantitative analysis due to lack of systematically collected and available data. The framework applies to disturbances of either the shock or slow burn type, and can assess

resilience either in regions overall or instead to particular regional dimensions, such as social, environmental, or economic sub-systems.

III. A Framework for Assessing Regional Resilience

From the literature review and summary, I define regional resilience as **the ability of a region to anticipate, prepare for, respond to and recover from a disturbance.** Figure 1 outlines a framework reflecting this definition.

Figure 1. Framework for Assessing Regional Resilience



The framework posits two types of resilience, **preparation resilience**, comprised of two stages of regional assessment and readiness, and **performance resilience**, comprised of two stages of event response and recovery. While the framework suggests for convenience a starting point at the assessment stage, as a practical matter the stages of resilience

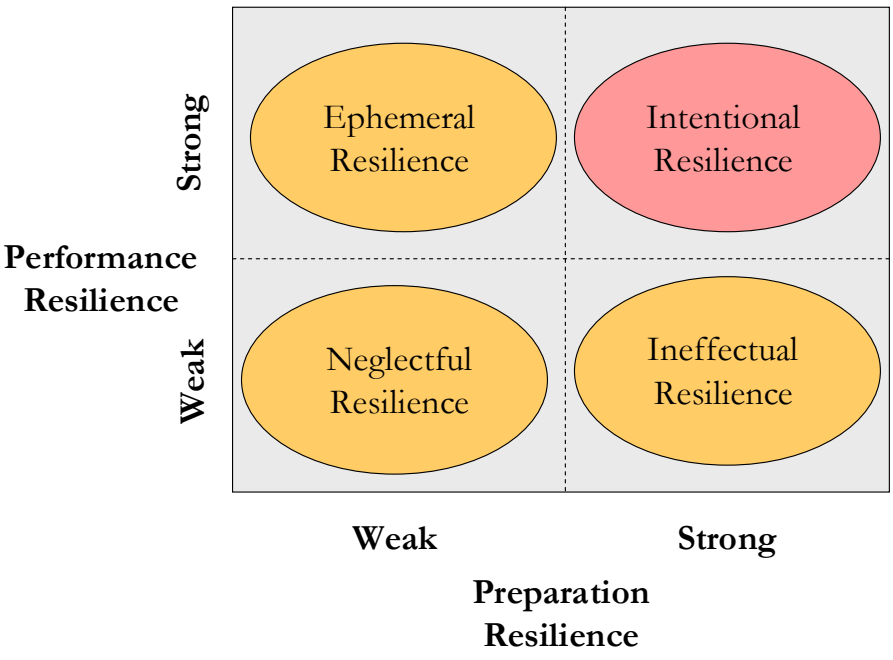
preparation and performance are continual and overlapping for different regional dimensions (such as physical infrastructure, social systems and governance, with assessment and readiness focused on one dimension potentially coinciding with activities of response and recovery on others.

A key facet of the framework is recognizing that a region could perform poorly or well at each stage. For example, a region might get high marks for preparation resilience, carefully coordinating information gathering, appropriately assessing and communicating vulnerabilities and strengths, mobilizing and empowering actors and organizations to address system gaps or weaknesses, and training and drilling to address potential stresses and crises. Despite that preparation, the region may get low marks in performance resilience, responding relatively poorly and failing to recover from an event or condition. Such an outcome may occur if a region is overwhelmed by factors beyond its control or if its capacities are simply weak. In contrast, a region might have weak performance resilience, failing to assess conditions and consciously plug gaps, yet still exhibit high performance resilience relative to other places faced with similar circumstances.

Figure 2 simplifies the possibility set faced by regions into two phases of preparation and resilience.

Only with conscious preparation (assessment and readiness) and performance (response and recovery) are regions judged to achieve an ideal, **intentional resilience**. Each of the other cells in the matrix suggests a form of resilience that falls short of intentional resilience. Regions that respond and recover well, but do so despite lack of assessment and preparation have achieved what I'll label **ephemeral resilience**. They are lucky this time and perhaps will be next time due to strong endowments or good fortune, but cannot expect to sustain that luck without deliberate regional attention to assessment and readiness preparation. In contrast, regions that deliberately assess vulnerabilities and strengths and succeed in readying themselves for high-consequence risks, but nonetheless fall shy in performing in the face of a disturbance exhibit what I'll label **ineffectual resilience**. These regions did all they could to prepare for shocks and disturbance, but were ineffective in

Fig. 2. Regional Resilience Matrix



responding to and recovering from traumas when they came. Finally, regions that fail to prepare and subsequently perform poorly in the face of challenges display **neglectful resilience**. Their inattention to or poor performance at assessment and readiness contributed to predictably poor outcomes.

The framework can be fleshed out with criteria associated with each stage of the resilience cycle. These criteria, which suggest the nature of and means of building regional resilience, would be further specified when assessing particular regional dimensions or sub-systems, such as the resilience of physical infrastructure or environmental resources, in the face of a particular challenge. The criteria are more readily written for and applied to instances of shocks and surprises, for which the stages are more distinct. That said, the criteria apply also to chronic disturbances, such as economic decline, demographic shifts or environmental evolution.

Stage I: Assessment Criteria

Overarching Question: How well can and does the region assess its vulnerabilities to disturbances and its capacity for responding to them?

- Does the region have the capacity [actors, policies, processes, relations and resources][18] to…

[18] Generic categories for actors: officials and entities of municipal, state and federal government, regional agencies, special-purpose governments, labor unions, secondary education, community colleges, 4-year colleges and universities, media, foundations, business interests (owners, chambers, coalitions), faith-based institutions, minority-interest organizations, civic organizations operating at local, regional and higher levels, nonprofit organizations, professional associations, service delivery entities, taxpayer and resident associations, and leadership groups. Generic categories for policies and processes include means of identifying, debating and acting on rules and regulations for regional operations, including those enacted by higher level governments with implications for the region. Generic categories for relations include the nature and scope of inter- and intra-sector and cross-border interactions affecting regional outcomes, such as labor-management, public-private, local-state, and minority-majority relations and general levels of social trust and capital. Generic categories for resources include financial capital, intellectual capital, natural resources, infrastructure networks, communications and information networks, regional economic and social assets, physical endowments and habits of place that constitute resource advantages or disadvantages.

  - monitor regional trends and patterns
  - identify and assess the probability of risks and disturbances, such as through vulnerability diagrams and forecasting
  - assess and distill lessons from prior regional experience with disturbances and challenges
  - set regional action priorities based on risk assessments and probabilities
  - establish relevant "trigger points" signaling a need for regional response
  - communicate findings to entities capable of taking action on them
- What is the quality of regional assessment products [e.g., data, forecasts, risk assessments, trigger points] in terms of…
  - timeliness
  - accuracy/reliability
  - relevance/scope
  - usability/actionability/legitimacy

Stage 2. Readiness Criteria

Overarching Question: How well can and does the region ready itself to respond to assessments and potential disturbances?

- Does the region have the capacity [actors, policies, processes, relations and resources] to…
  - authorize or mandate readiness actions
  - coordinate readiness actions, such as fixing infrastructure, filling organizational gaps, mitigating identified weaknesses and vulnerabilities, leveraging strengths and assets, and building effective networks and connections

- implement readiness actions

- What is the quality of regional readiness in terms of….
  - redundancy built into system
  - flexibility built into system
  - inter-actor and inter-policy relations and connections
  - effectiveness of readiness drills and other forms of practice
  - actual level of readiness of infrastructure, resources, policies, assets to respond to disturbance
  - leadership and training levels to respond to disturbance

Stage 3. Response Criteria

Overarching Question: How effectively, in absolute and relative terms, does the region respond to actual disturbances?

- How well does the region respond in terms of …
  - reacting at appropriate level to disturbance (e.g., not under- or overreacting)
  - containing and minimizing physical, economic and social damage and other negative outcomes resulting from disturbance
  - sustaining viable, cost-effective levels of service delivery
  - leveraging and using effectively networks of internal and external relations
  - demonstrating effective leadership in authorizing, coordinating, communicating and taking action to respond to disturbance
  - performing capably relative to other places that have faced similar disturbances
  - framing the nature and response to the disturbance in media and other communications outlets

Stage 4. Recovery Criteria

Overarching Question: How effectively, in absolute and relative terms, does the region recover from the disturbance and learn from its lessons and insights?

- How well does the region recover from disturbance in terms of …
    - repairing systems damaged in the disturbance
    - the rapidity of return to expected levels of regional functioning
    - the quality of back-up systems needed to bridge recovery period
- How effectively does the region learn from and adapt to the experience in terms of…
    - distilling lessons and insights to improve systems for next disturbance
    - framing the discussion to usefully learn from the experience of regional assessment, readiness, response and recovery
    - taking action to adapt, repair or change regional systems [e.g., actors, policies, processes, relations, resources] to build resilience for new disturbance

IV. Testing the Framework: Resilience in the Face of Economic Decline in Buffalo-Niagara Falls Metropolitan Area, 1970-2000

To test the four-part framework I'll use the case of a chronic disturbance, namely prolonged economic decline in the Buffalo-Niagara Falls Metropolitan Area from 1970 to the present. This era of decline followed more than a century of economic vitality, one shaping the region's identity, infrastructure, and institutions. Challenges to regional economic potency had been evident from at least the mid 20th century, however,[19] so the case

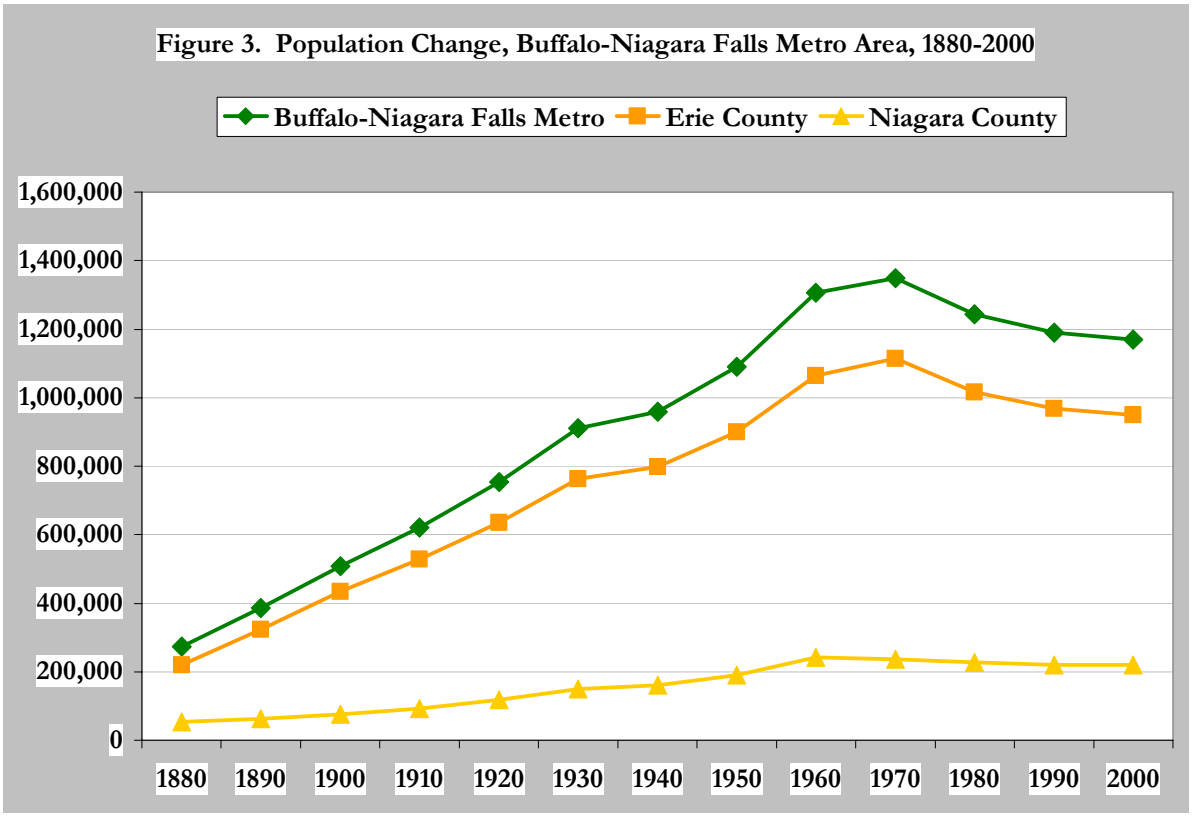
[19] A number of observers peg downturns from much earlier in the century. John Henry Schlegel in an unpublished 2005 paper, "Like Crabs in a Barrel: Economy, History and Redevelopment in Buffalo," puts the turning point at 1916 when "America's railroad system […] registered the first decrease in active trackage since

provides an opportunity to assess not only regional performance, but also the region's effectiveness in anticipating and readying itself for difficult economic times.

As noted, chronic disturbances are less readily divided into four distinct resilience stages since a region is simultaneously assessing, readying, responding and recovering from aspects of the chronic condition. Rather than start with the assessment stage of the resilience cycle, then, I begin at the third stage of response to establish the degree of economic decline in absolute and relative terms. I then examine how well the region recovered from two decades of decline before considering how it anticipated and readied itself for hard times. While the case demonstrates the higher degree of difficulty in applying the framework to chronic conditions rather than discrete shocks, it also shows the framework's ability to reveal sources of resilience failure as well as the type of resilience---intentional, ineffectual, ephemeral or neglectful---best characterizing a region.

1830" (p.5). Mark Goldman in *High Hopes: The Rise and Decline of Buffalo, New York* (State University of New York Press, points to the acquisition of local steel, grain, automobile, banking, newspaper and other industrial enterprises by corporations outside the region during the 1920s as the region's "seeds of decay." There is ample evidence that regional leaders through the 1930s and 1940s understood the potential economic blow of the proposed St. Lawrence Seaway, which would bypass Buffalo and greatly erode its longstanding economic significance as a break of bulk point for Great Lakes shipping. Despite their concerted multi-decade efforts in Washington D.C. and beyond to block the project, however, regional leaders eventually lost to stronger U.S. and Canadian interests. The St. Lawrence Seaway opened in 1959 bringing the anticipated steep declines in regional shipping activity. For more, see Kathryn A. Foster. 1996. "Planning Without Plans: Evolution of Regional Planning on the Niagara Frontier. *Intersight* 5: 13-16. For present purposes, it's sufficient to focus on the recent decades and acknowledge simply that there were visible cracks in the economic picture window to challenge the assessment faculties of regional leaders.

A long view, shown in figure 3, illuminates the evolution of growth and decline in the Buffalo-Niagara Falls region from 1880 to 2000. The period began with a half-century boom from 1880 to 1930, an era of steady industrialization, commercialization, immigration and significant economic success.



By 1930, population of the two-county region exceeded 900,000 and it continued to increase through the Great Depression and subsequent decades. Newcomers entered the auto, chemical, and airplane industries, which broadened an already diversified regional economy sporting healthy lumber, steel, grain, agriculture and rubber industries.

The post-war period through the 1950s remained ones of steady population and economic growth, although the pace of growth slows in the 1960s. The two-county region

reached a metropolitan population peak of 1.35 million people in 1970 after which it declined steadily—a relatively rare phenomenon for U.S. metropolitan areas--to the 2000 level of 1.17 million population.

How relatively resilient was the region's performance during this 30 year period of decline, that is, how well did it navigate stages 3 (response) and 4 (recovery) of the resilience cycle? To allow the potential for assessing within this case both the response and recovery stages of resilience, I'll label the 1970s and 1980s, during which the nation experienced relatively slow economic growth and periods of recession, as the period of response. The 1990s, a period of general national prosperity, will serve as the decade of recovery.

Figure 4 indicates the performance of the Buffalo-Niagara Falls Metropolitan Region on a number of standard economic measures, namely population change, employment change, per capita income and poverty in the 1970s and 1980s. To gauge the region's relative performance, I define three groups of metropolitan peers that faced similar starting points and challenges to Buffalo Niagara Falls Metro. The manufacturing peer group consists of 14 metropolitan areas with 750,000 to 2 million population and a level of reliance on manufacturing employment in 1969 similar to the 31 percent share found in the Buffalo region.[20] The rustbelt peer group includes 17 metropolitan areas of the same age cohort (designated metropolitan by 1910 or 1920) and place cohort (northeast/midwest region) as the Buffalo-Niagara Falls metro.[21] The New York State peer group includes 10 metropolitan areas that faced the same state political-legal framework as did the Buffalo-Niagara Falls

---

[20] These are, in addition to Buffalo-Niagara Falls: Rochester, NY; Bridgeport, CT; Dayton, OH; Providence, RI; Hartford, CT; Milwaukee, WS; Louisville, KY; Cincinnati, OH; San Jose, CA; Indianapolis, IN; Minneapolis-St. Paul, MN; Columbus, OH; and Birmingham, AL.

[21] These are, in addition to Buffalo-Niagara Falls: Akron, OH; Toledo, OH, Rochester, NY; Cleveland, OH; Dayton, OH; Detroit, MI; Providence, RI; Erie, PA; Hartford, CT; New Haven, CT; Milwaukee, WS; Pittsburgh, PA; Cincinnati, OH; St. Louis, MO; Scranton, PA; and Syracuse, NY.

Figure 4. Economic Response Resilience Analysis, Buffalo-Niagara Falls Metro versus Peers

Buffalo Niagara Falls Metro and Peer Comparison Groups	Pct. Population Change		Pct. Employment Change		Per Capita Income		Poverty			
	1969-79	1979-89	1969-79	1979-89	1989 ($)	Pct. Chg., 1969-89	Rate, 1970	Rate, 1990	Central City to Suburbs Ratio 1970	Central City to Suburbs Ratio 1990
Buffalo Niagara Falls Metro	-6.0%	-6.1%	3.0%	4.2%	$24,865	34.2%	9.0%	12.0%	2.65	3.13
Manufacturing Economy Metro Peers (N=14)	5.6%	6.0%	21.0%	18.3%	$28,740	45.5%	9.4%	10.3%	1.92	3.02
B-NF Metro rank in group (1 = highest)	*14*	*14*	*14*	*14*	*12*	*13*	*12*	*12*	*14*	*9*
Rustbelt Age-Place Metro Peers (N=17)	-0.6%	-0.3%	10.7%	9.1%	$26,649	39.6%	9.0%	11.1%	2.09	3.17
B-NF Metro rank in group (1 = highest)	*17*	*16*	*17*	*14*	*15*	*12*	*9*	*12*	*16*	*10*
New York State Metro Peers w/ NYC (N=10)	-2.0%	2.4%	2.7%	14.9%	$25,986	41.5%	9.6%	10.2%	1.88	2.84
New York State Metro Peers w/o NYC (N=9)	1.5%	0.9%	9.8%	14.5%	$25,041	40.5%	9.6%	10.0%	1.82	2.80
B-NF Metro rank in group (1 = highest)	*10*	*10*	*7*	*10*	*7*	*8*	*4*	*8*	*10*	*6*
U.S. Benchmark	11.6%	9.9%	23.9%	19.1%	$25,727	42.8%	n/a	n/a	n/a	n/a

region during this period.[22] For each peer group I report average performance on the economic performance measures as well as the Buffalo-Niagara Falls region's rank within that peer group (where a rank of 1 is highest performance).

The data reveal Buffalo-Niagara Falls's consistently weak response resilience in the 1970s and 1980s relative to metropolitan peers. The region's population losses of -6.0 percent in the 1970s and -6.1 percent in the 1980s are universally inferior to population change experienced by its manufacturing, rustbelt and New York State peer groups, with the Buffalo-Niagara Falls region always ranked low or lowest of all individual comparison metropolitan areas.

The region likewise performs poorly on employment change measures, consistently ranking low or lowest in each decade relative to each peer group. Its per capita income in 1989 at the response period's end as well as its change in per capita income from 1969 to 1989 tell a similar story, reinforcing the relatively weak economic performance of the region. The only exception to the general pattern of economic decline is the relatively lower levels of poverty in Buffalo-Niagara Falls metro in 1970 and 1990 relative to metropolitan peers. On the other hand, the region's intra-metropolitan poverty disparity, measured by the ratio of central city to suburban poverty rates, was high relative to comparison metros.

Quite clearly, for a range of economic measures and in comparison to other metropolitan regions with similar industrial, political-legal or geographic/age conditions, the Buffalo-Niagara Falls Metropolitan region performed poorly relative to its peers, achieving weak response resilience during the 1970s and 1980s.

---

[22] These are, in addition to Buffalo-Niagara Falls Metro: New York City (with assessment done with and without this metro); Kingston; Elmira; Rochester; Syracuse; Albany; Utica-Rome; Poughkeepsie; and Glens Falls.

Before suggesting several explanations for this performance, I consider how well the Buffalo-Niagara Falls metro and peer metros did in the 1990s to recover from two decades of chronic economic decline. Figure 5 provides economic indicator data for the region and comparison groups for the 1990s recovery period.

Immediately evident is that the Buffalo-Niagara Falls Metro's population growth, economic growth, per capita income and poverty measures remained generally inferior to those of each peer metropolitan comparison group. Even poverty levels, the only measure for which the Buffalo-Niagara Falls Metro had seen outcomes somewhat better than its peers in 1969 to 1989, rose more rapidly in the 1990s than those of comparison metros. By 2000, the Buffalo-Niagara Falls region's poverty levels exceeded those of its peers and its intra-metropolitan disparities were higher than those of any comparison group. The region's recovery resilience was evidently weak compared to its peer metropolitan areas.

The framework criteria provide a means for understanding why the region fared so poorly in responding and recovering from economic decline. Did the region fail to properly assess, anticipate or perceive its economic conditions? If not---that is, if the region was reasonably well informed about its economic conditions---did it have sufficient resources to respond and implement recovery efforts? Did it follow through to mitigate economic weaknesses, establish systems and networks for economic recovery, and formulate and implement policies and processes to respond to economic conditions? If it did all these things and still performed poorly, were its response efforts perhaps flawed by over- or under-reaction, weak leadership, poor internal or external relations or counterproductive stories used to frame regional economic decline? If such causes of low resilience are not evident, might it be that the region did all it could, but that economic problems simply outweighed any potential solutions?

Figure 5. Economic Recovery Resilience Analysis, Buffalo-Niagara Falls Metro versus Peers

Buffalo Niagara Falls Metro and Peer Comparison Groups	Pct. Population Change 1989-2000	Pct. Employment Change 1989-2000	Per Capita Income 2000 ($)	Per Capita Income Pct. Chg., 1989-2000	Poverty Rate, 2000	Poverty Central City to Suburbs Ratio 2000
Buffalo Niagara Falls Metro	-1.4%	2.1%	$27,209	9.4%	11.9%	3.32
Manufacturing Economy Metro Peers (N=14)	9.9%	16.7%	$34,567	19.3%	9.7%	3.03
B-NF Metro rank in group (1 = highest)	*14*	*13*	*14*	*12*	*13*	*11*
Rustbelt Age-Place Metro Peers (N=17)	3.4%	10.3%	$30,070	12.9%	10.6%	3.06
B-NF Metro rank in group (1 = highest)	*15*	*14*	*14*	*13*	*14*	*13*
New York State Metro Peers w/ NYC (N=10)	7.2%	4.4%	$28,099	8.0%	11.4%	2.86
New York State Metro Peers w/o NYC (N=9)	2.1%	4.5%	$26,786	7.1%	11.1%	2.85
B-NF Metro rank in group (1 = highest)	*8*	*9*	*5*	*4*	*6*	*7*
U.S. Benchmark	14.3%	19.7%	$29,847	16.0%	n/a	n/a

Analysis of regional activity during the era of economic decline suggests that low resilience stemmed from a combination of flawed action (rather than inaction) and overwhelmingly difficult economic conditions aggravated by regional institutional culture, structural choices and relations. It would take a fuller case study to flesh out these themes, but in this pilot case I provide an overview to imply the potential for case study analysis of regional resilience.

I will start with the assessment and anticipation stage. It would be impossible to read the record and conclude that paralysis or inaction shaped resilience outcomes or that the region could not or did not assess its economic conditions during the period of decline. Rather, the region made significant effort to understand economic forces and trends and dozens of economic analyses shined light on the economy overall and its specific sectors.[23] These analyses came from both public and private sources---in many cases conducted by respected external consultants---and were widely disseminated. Supplementing these studies were daily insights on business and economic issues and events offered by *The Buffalo News* and, until its demise in 1982, the *Courier Express,* the region's two metropolitan newspapers.

The weak performance resilience was also not due to conflicting regional economic prescriptions. While the depth and quality of economic reports inevitably varied, the studies and plans were remarkably consistent in their conclusions about economic trends, regional economic assets (location, labor force, quality of life, manufacturing prowess), weaknesses

[23] A small selection suggests the range: Greater Buffalo Development Foundation. 1972. *Buffalo Area's Economic Prospects: A Growth Strategy for the Erie Niagara Area.* (Buffalo, NY: Greater Buffalo Development Foundation; Fry Consultants. 1978. "Strategy for the Development of High Technology Growth Industry in Erie County and the City of Buffalo, NY." (Buffalo, NY: Erie County Industrial Development Agency); Economic Development Coordinating Committee. 1988. "Planning Together: The Greater Buffalo Economic Development Strategy Agenda." (Buffalo, NY: EDCC); Economic Development Coordinating Committee. 1988. *Working Together: Projects in the Greater Buffalo Economic Development Strategy Agenda.* (Buffalo, NY: EDCC); Dennis Gorski. 1998. "Preparing for a New Century in a Changing World: An Action Plan for Regional Job Creation and Smart Growth." Buffalo, NY: Erie County; Niagara County Department of Planning, Development and Tourism. 2000. "Comprehensive Economic Development Strategy." Lockport, NY: Niagara County; New York State Assembly Ways and Means Committee. 2000. "Regional Economic Profile of Western New York." (Albany, NY: Assembly Ways and Means Committee).

(loss of population, depressed productivity, fragmented economic governance, scarcity of headquartered firms and attendant civic leadership, limited venture capital, poor image and excessive politics), opportunities (waterfront, university high tech expansion, downtown development, international border location, selected industrial sectors including tourism and transportation logistics) and threats (foreign competition, further reductions in manufacturing sectors, loss of productive population, scarce fiscal resources, increasing tax burdens). Moreover, the assessments drew on timely and reliable data and often offered practical agendas for specific action.

One effort of the late 1980s exemplifies both the action orientation and cross-sector nature of regional economic assessment. Completed in 1988 by the Economic Development Coordinating Council (EDCC)---a cross-sector consortium of leaders from the Western New York Economic Development Corporation (public), Greater Buffalo Development Foundation (private), Greater Buffalo Chamber of Commerce (private), Niagara Frontier Transportation Authority (public), State University of New York at Buffalo (academic, public) and Erie County Industrial Development Agency (public)---identified and provided financial and governance specifications for 83 projects and initiatives the authors believed would "be good for economic development in the Greater Buffalo area."[24]

For three reasons, the region's adeptness in the assessment stage was not sustained in the readiness and response stages. This is not because of inaction, however. Numerous of the 83 projects or initiatives called for in the 1988 report, including modernization of the airport and bus system, construction of light industrial parks, completion of academic facilities at the university, hosting a major international event [the World University Games in 1993], developing a high-tech corridor in downtown Buffalo, completing the Theater

[24] Economic Development Coordinating Council, *Working Together,* p. 1

District redevelopment, and beautifying the pedestrian mall downtown, were completed or well underway a decade later.

That said, regional response was comparatively tepid. The first hindrance to resilience was the region's lack of a structure and process for vetting and legitimizing assessments, consensually setting priorities emerging from them, and coordinating, mandating or advancing follow-through actions. This was not a problem of missing or incapable economic agencies, but, rather, a complication of the multiplicity of economic development agencies operating in the region. The six members of the Economic Development Coordinating Council were a small sample of the alphabet soup of dozens of economic entities serving the region during the era.[25] Many independent agencies operating without authority to advance regional projects and without a mandate to cooperate aggravated the already difficult mission of forging a unified regional vision and development goals. Fragmentation of economic governance also hampered coordination, duplicated services, required high administrative and overhead costs, and diverted attention as regional media and leaders spent time framing and debating the pros and cons of a regional economic "super-agency" rather than spending time attracting and retaining firms.[26]

---

[25] Also in the picture were six industrial development agencies (some operating at the municipal scale), numerous chambers of commerce, several similarly empowered but legally separate city and county agencies (e.g., the Buffalo Economic Renaissance Corporation, the Buffalo Urban Renewal Agency and the Department of Economic Development), a handful of state entities with economic development powers, at least three convention and visitors bureaus, several high-tech business development organizations, and several *ad hoc* groups formed to shepherd specific development projects (e.g., the Metro Buffalo Alliance for Economic Development and the Northwest Buffalo Commercial Coalition). That wasn't all: because of strong home rule powers and municipal control over planning and growth, virtually every city, town and village had some form of economic development committee working to spur jobs and create growth. The 1996 report by the University at Buffalo tallied 140 public and private agencies in Erie County alone engaged in job retention and training, economic development planning, marketing, productivity partnerships and provision of loans, bonds and other forms of financing for economic development. See University at Buffalo Governance Project. 1996. *Governance in Erie County: A Foundation for Understanding and Action.* Buffalo, NY: University at Buffalo, p. 129-133.

[26] The EDCC, for example, while recognizing the potential of more centralized economic governance, noted that a "consolidation, merger or substitution…would be a daunting, time-consuming task." See.Economic Development Coordinating Committee, "Planning Together," p. 48.

A second hindrance to regional readiness resilience was longstanding intra-region tensions and a culture of competition and distrust. As one report put it,

> "Communication between the large economic development entities, public and private, is very poor, with a great deal of distrust and little, if any, source of agreeable regional strategic action. The GBP [Greater Buffalo Partnership, a merger of the former Greater Buffalo Development Foundation and Greater Buffalo Chamber of Commerce] is perceived as highly aggressive in its advisory role to local governments, but it lacks fiscal power. The Erie County IDA [Industrial Development Agency], with more fiscal resources, is perceived as equally aggressive, attempting to move into new areas, but without strong regional political support. The Amherst IDA, with its recent success at attracting new industries is perceived as a hostile neighbor by economic development officers in the City of Buffalo who are critical of attempts by suburban municipalities to attract not only new firms but also to allegedly lure city firms to relocate in their jurisdictions. In at least one case, charges and countercharges of unfair economic competition are being resolved through legal channels.[27]

A decades-old rift between Erie County and Niagara County resulted in 1990 in a serious casualty, the demise of the region's only cross-county entity, the Erie Niagara Planning Board, just when its bicounty data compilation and analysis were most needed.[28] Also problematic for regional economic strategy and action were tense relations between the major central city of Buffalo and its suburban neighbors. The poorer, more racially diverse city with its pugnacious and abrasive mayor (James Griffin who served from 1977 to 1993) clashed continually with its more affluent very white suburbs over issues of economic development.[29] Government-business relations were often strained, manifesting on the one hand as anti-government sentiment held by business leaders and on the other as resentment

---

[27] University at Buffalo, *Governance in Erie County,* p. 140.

[28] Foster, "Planning Without Plans," p.54.

[29] See discussions in University at Buffalo, *Governance in Erie County*; and Mark Goldman. 1990. *City on the Lake: The Challenge of Change in Buffalo, New York*. Amherst, NY: Prometheus Books, pp. 63-64.

from public officials at interference by business organizations. Finally, labor-management relations diminished as once-generous employers---in 1960, the region's factory workers were the highest paid in the state[30]---tightened their belts, reduced labor forces and relocated jobs and whole companies out of the region. Together these relations meant a culture of distrust and disunity, eroding the foundations for regional resilience.

A third roadblock to stronger regional readiness and response stemmed from the fact that individual places within the region were experiencing quite different economic fortunes, with some growing and others declining. Uneven growth rates impeded formulation of a regional perspective on economic development issues and policies. Were all parts of the region facing economic decline, then region-level programs bolstering economic growth would have more consensus. If all were growing, then region-level programs in growth management would gain favor more readily.

Do these factors account for the weak resilience of the period? As with other counterfactuals, it is impossible to know from this single case whether a region with more centralized economic development institutions, strong relations and common fortunes would have performed better in response to industrial restructuring and challenging economic factors. Perhaps the particularly onerous macroeconomic blows of the 1970s and 1980s would have overwhelmed the most talented and regionally focused group of leaders and institutions.[31] The constant and compelling economic crises over which they had scant, if any, control certainly sapped regional confidence and capital, two foundations of regional resilience. Regional leaders in Buffalo-Niagara Falls Metropolitan Area faced year after year

---

[30] Goldman, *City on the Lake,* p. 171.

[31] Douglas Rae makes this point in his book-length deep history of governance in New Haven, Connecticut from the early 1900s to the present. The essence of his argument is that a political simpleton could have succeeded in early 20th century New Haven given the favorable macroeconomic and civic forces of the time and that even a political genius was destined to fail in 1950s-1960s New Haven, given the unfavorable forces. See Douglas Rae. 2004. *City.* New Haven, CT: Yale University Press.

of economic blows over which they had scant, if any, control. Troublesome news in just the single decade from 1978 to 1988 includes these challenging events:

- 1978: President Jimmy Carter declares a federal emergency in the 15-acre working class Love Canal neighborhood in Niagara Falls, New York, the first manmade disaster to receive this recognition; widespread national coverage of hazardous waste—in this case, residue from a longstanding chemical industry--publicizes the legacy of an industrial economy and puts the region in poor light

- 1979-1982: nation suffers strong recession; regional unemployment rates jump to over 11 percent

- 1982: the *Courier Express,* a major region-serving newspaper dating back to 1834, abruptly ceases publication, leaving the region with a single metropolitan daily

- 1983: Bethlehem Steel ends steelmaking at its Lackawanna plant, eliminating 17,000 jobs in one action; previous and subsequent decline in the region's steel and related industries will mean a loss between 1977 and 1987 of over 45,000 manufacturing jobs, nearly one-third of the region's total manufacturing sector

- 1985: Light rail opens on Buffalo's Main Street; during the six years it took to complete the project, many downtown businesses suffered closure or relocation

  Trico, the world's largest manufacturer of windshield wipers and a deeply rooted home-grown company founded in Buffalo in 1917, announces relocation of all operations to a facility on the Texas-Mexico border

- 1987: Westinghouse Corporation, which in 1970 had employed 7,200 workers in the region, announced it would move its remaining 800 employees to Maryland and Virginia

Even Buffalo's "replacement industries" in the services, retail trade and finance, insurance, and real estate sectors suffered more than most. Two of the nation's largest savings and loan banks—the Buffalo-headquartered Empire of America Savings and Loan (nation's 12th largest) and the Buffalo-headquartered Goldome Bank (nation's 7th largest)—went under in 1990 in the nation's savings and loan scandal. Coupled with the Love Canal crisis and the nationally covered Blizzard of 1977, the region had an unprecedentedly difficult time.

In the end, regional leaders perceived economic problems and attempted to address them, albeit in the context of weak internal relations and a complex web of economic development agencies. The economic obstacles were overwhelming, however, and greater than the capacity of the region to overcome them. On these grounds, it seems fair to conclude that the Buffalo-Niagara Falls region showed ineffectual resilience in the face of prolonged economic challenges.

V. Conclusion

As I completed this analysis in mid-October 2006 the Buffalo region was hit by an unexpected freak fall snow storm that sent tens of thousands of tree limbs crashing down on cars, houses and utility lines. The snow disappeared within a day as temperatures returned to normal, but the loss of electricity and phone lines and the subsequent flooding wreaked havoc. Regional response was remarkable for its coordination, effectiveness and

cooperation in the face of immense damage to utility grids and properties. In comparison to its performance in addressing chronic economic decline, the Buffalo region is showing impressive resilience. Like the subjects of the vignettes that began this paper, the region capably did what it had to do to contain damage, keep up regional spirits and pave the way for rapid recovery.

The challenge of assessing resilience stems from the concept's multifaceted nature. People or places capable of coping with one kind of crisis in one moment may succumb to another trauma another time. That Buffalo can resolutely face a natural disaster and its after effects with relative aplomb but not its decades of economic decline speaks to the complexities of resilience and place.

This paper draws several conclusions from the case study approach in general and the Buffalo case in particular. First, the case study framework shows promise in offering insights on the nature and assessment of resilience. Positing resilience as a four-stage cycle permits independent evaluation of key aspects of resilience---assessment, readiness, response and recovery---and allows regions to perform well on some and poorly on others.

That said, the single case, as opposed to comparative cases, may be problematic in assessing resilience. There are limits to what we can conclude from evaluating resilience performance in the Buffalo-Niagara Falls region. Like the cases of MM, LC and Fixx that led the paper, the demonstration of resilience is established in part by understanding how well the region did relative to other places with similar starting places. The analyses in figures 4 and 5 comparing the Buffalo region to several peer groups of metropolitan regions imply the value of such relative assessment. These make clear that Buffalo performed less well than peer groups with similar economic, geographic and legal contexts, which suggests the significance of governance and leadership choices in shaping regional resilience

outcomes. Indeed, the single case reveals the significance of qualitative factors such as internal and external relations, levels of coordination and collaboration, and the byproducts of regional structure as important determinants of regional resilience, factors discerned best through a case study approach. Measuring and assessing such factors for a small set of comparison metro cases seems warranted.

Another finding is the seemingly trickier challenge of understanding and assessing resilience for chronic, rather than acute, regional disturbances. Chronic disturbances lend themselves less than one-time shocks to a tidy four-part resilience cycle. Because prolonged conditions like decline and demographic change occur continuously, so do the stages of the resilience framework. One option may be to reformulate the assessment criteria to address slow burn traumas. Another may be to retain the proposed criteria, but find ways to consider the criteria as a package rather than sequentially in stages as proposed.

The work also implies the underestimated significance of external factors in determining regional resilience outcomes. The Buffalo-Niagara Falls region has fallen further and longer than its peer regions in the rustbelt, manufacturing centers and New York State. As the case indicates, these outcomes stem in part from internal regional choices and habits of structure and relations that impede improved resilience performance. But it is also true that external macroeconomic factors put Buffalo-Niagara Falls in the line of especially tough challenges that its traditional locational and political-economic strengths could not beat. Only now is the region more directly leveraging its global economy advantages, including an international border, abundant water resources and natural endowments to recreate its economy.

This time factor raises the final conclusion of the analysis, that the period of response and recovery for chronic regional changes is far longer than would be expected

from singular snowstorms or hurricanes or man-made disasters. Perhaps a region requires a generation of assessment, readiness and response---including the attendant shifts in leadership, decision making and civic capacity---to appreciate and appropriately act to achieve recovery. Analysis of "normal" time periods of recovery would be useful in better understanding this aspect of the resilience cycle.

In his analysis of environmental collapse, Jared Diamond posits four explanations for why societies succumb to what seem in hindsight to be obvious threats to their viability.[32] Societies, Diamond argues, may: 1) fail to anticipate a disturbance (look the other way, suffer from poor intelligence, ignore warning signs); 2) fail to perceive a disturbance (possibly through intentional ignorance, blind spots, or undetected slow trends); 3) fail to respond to a disturbance (wishful thinking, overblown confidence, insufficient resources, weak leadership, groupthink, paralysis, denial); or 4) fail to act well or appropriately to a disturbance (overwhelmed by magnitude of disturbance, solutions too expensive, efforts insufficient to task, solutions exacerbate disturbance).

It is a rare society, however, that wishes to fail or to compare unfavorably to its peers. Deliberate analysis through comparative case studies of metropolitan regions facing acute and chronic disturbances provides a valuable means to understand why some places, despite their hopes and wishes, end up as cautionary tales and why others do not.

---

[32] Jared Diamond, *Collapse,* pp.

References

American Psychological Association. N.D. "The Road to Resilience." Accessed online September 14, 2006 at http://www.helping.apa.org/.

American Psychological Association. 2003. "Resilience in a Time of War." Washington, D.C.: American Psychological Association; and "Project Resilience" materials accessed September 14, 2006 online at http://www.projectresilience.com.

Berke, P. R. and T. J. Campanella. 2006. "Planning for Postdisaster Resiliency." *The Annals of the American Academy of Political and Social Science* 604(1): 192 – 207

Timothy Beatley, Philip R. Berke, Raymond Burby, Robert E. Deyle, Steven P. French, David R. Godschalk, Edward J. Kaiser, Jack D. Kartez, Peter J. May, Robert Olshansky, Robert G. Paterson, and Rutherford H. Platt. 1999. "Unleashing the Power of Planning to Create Disaster-Resistant Communities." *Journal of the American Planning Association* 65(

Birch, Eugenie L. and Susan M. Wachter, eds. 2006. *Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina.* Philadelphia, PA: University of Pennsylvania Press.

Bruneau, Michel, Stephanie E. Chang, Ronald T. Eguchi, George C. Lee, Thomas D. O'Rourke, Andrei M. Reinhorn, Masanobu Shinozuka, Kathleen Tierney, William A. Wallace and Detlof von Winterfeldt. 2003. "A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities." *Earthquake Spectra* 19(4): 737-38.

Campanella, Thomas. 2006. "Urban Resilience and the Recovery of New Orleans." *Journal of the American Planning Association* 72(2): 141-146.

Comfort, Louise K., ed. 1988. *Managing Disaster: Strategies and Policy Perspectives.* Durham, NC: Duke University Press.

Diamond, Jared. 2005. *Collapse: How Societies Choose to Fail or Succeed.* New York: Viking Penguin.

Economic Development Coordinating Committee. 1988. *Planning Together: The Greater Buffalo Economic Development Strategy Agenda.* Buffalo, NY: EDCC.

Economic Development Coordinating Committee. 1988. *Working Together: Projects in the Greater Buffalo Economic Development Strategy Agenda.* Buffalo, NY: EDCC

Foster, Kathryn A. 1996. "Planning Without Plans: Evolution of Regional Planning on the Niagara Frontier. *Intersight* 5: 13-16.

Fry Consultants. 1978. "Strategy for the Development of High Technology Growth Industry in Erie County and the City of Buffalo, NY." Buffalo, NY: Erie County Industrial Development Agency.

Fulton, William A. 2005. "After the Unrest: Ten Years of Rebuilding Los Angeles Following the Trauma of 1992." In *The Resilient City: How Modern Cities Recover from Disaster,* edited by Lawrence J. Vale and Thomas J. Campanella, pp. 299-312. New York: Oxford University Press.

Goldman, Mark. 1990. *City on the Lake: The Challenge of Change in Buffalo, New York.* Amherst, NY: Prometheus Books.

Goldman, Mark. 1983. *High Hopes: The Rise and Decline of Buffalo, New York.* Albany, NY: State University of New York Press.

Gorski, Dennis. 1998. "Preparing for a New Century in a Changing World: An Action Plan for Regional Job Creation and Smart Growth." Buffalo, NY: Erie County.

Greater Buffalo Development Foundation. 1972. *Buffalo Area's Economic Prospects: A Growth Strategy for the Erie Niagara Area.* (Buffalo, NY: Greater Buffalo Development Foundation.

Holling, C.S., Lance H. Gunderson, and Garry D. Peterson. 2002. "Sustainability and Panarchies." In *Panarchy: Understanding Transformations in Human and Natural Systems,* edited by Lance H. Gunderson and C.S. Holling. Washington, D.C.: Island Press, pp. 99-101.

Holling, C.S. and Lance H. Gunderson. 2002. "Resilience and Adaptive Cycles." In *Panarchy: Understanding Transformations in Human and Natural Systems,* edited by Lance H. Gunderson and C.S. Holling. Washington, D.C.: Island Press, pp. 27-33.

Kreiter, Ted. Nov.-Dec. 1994. Book Review of *Antioxidant Revolution,* by Dr. Kenneth H. Cooper. *Saturday Evening Post,* accessed online at http://findarticles.com/p/articles/mi_m1189/is_n6_v266/ai_15879293.

Liu, Amy. 2006. "Building a Better New Orleans: A Review of and Plan for Progress One Year after Hurricane Katrina." Washington, D.C.: The Brookings Institution.

New York State Assembly Ways and Means Committee. 2000. "Regional Economic Profile of Western New York." Albany, NY: Assembly Ways and Means Committee, State of New York.

Niagara County Department of Planning, Development and Tourism. 2000. "Comprehensive Economic Development Strategy." Lockport, NY: Niagara County.

Rae, Douglas. 2004. *City.* New Haven, CT: Yale University Press.

Schlegel, John Henry. 2005. "Like Crabs in a Barrel: Economy, History and Redevelopment in Buffalo," unpublished paper.

Sheffi, Yossi. 2005. *The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage.* Cambridge, Mass.: MIT Press.

University at Buffalo Governance Project. 1996. *Governance in Erie County: A Foundation for Understanding and Action.* Buffalo, NY: University at Buffalo

Vale, Lawrence J. and Thomas J. Campanella. 2005. *The Resilient City: How Modern Cities Recover from Disaster.* Oxford: Oxford University Press.

Winfield, Linda R.. 1994. "Developing Resilience in Urban Youth." Chicago, Ill.: North Central Regional Educational Laboratory.

BERKELEY
IURD
INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT

THE INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT CONDUCTS COLLABORATIVE, INTERDISCIPLINARY RESEARCH AND PRACTICAL WORK THAT REVEALS THE DYNAMICS OF COMMUNITIES, CITIES, AND REGIONS AND INFORMS PUBLIC POLICY.

ROOTED IN THE SOCIAL SCIENCES, IURD'S WORK HAS STEADILY GAINED RECOGNITION SINCE ITS INCEPTION OVER 40 YEARS AGO. IURD HAS BECOME THE GATEWAY TO THE UNIVERSITY FOR THOSE CONCERNED WITH URBAN AND REGIONAL ISSUES—INFRASTRUCTURE, HOUSING, SPRAWL, TRANSPORTATION, ENVIRONMENTAL QUALITY, DISASTER RECOVERY, AND POVERTY AND PHYSICAL DECLINE IN INNER CITIES—AS WELL AS A HOME FOR SCHOLARS WHO INTEGRATE REAL-WORLD METROPOLITAN PROBLEM-SOLVING IN THEIR TEACHING AND RESEARCH.

AT THE VANGUARD OF LOCAL AND INTERNATIONAL METROPOLITAN DEVELOPMENT. IURD RESEARCHERS ADDRESS TIMELY CHALLENGES, EMPLOYING COOPERATIVE METHODS TO ENCOURAGE JOINT LEARNING, RECOGNIZE INTERDEPENDENCIES, AND UNDERSTAND THE BIG PICTURE. IURD'S *CENTER FOR GLOBAL METROPOLITAN STUDIES* WORKS TO ANALYZE THE IMPLICATIONS OF WORLDWIDE GROWTH AND CHANGE IN METROPOLITAN AREAS AND DEVELOP STRATEGIES TO BETTER MANAGE URBANIZATION PROCESSES AND OUTCOMES. IURD IS ALSO HOME TO THE PRESTIGIOUS *JOURNAL OF PLANNING EDUCATION AND RESEARCH*, PRESENTING CONTEMPORARY ISSUES IN PLANNING.

A PIONEER IN COMMUNITY PARTNERSHIPS. IURD'S COMMUNITY PARTNERSHIPS ARE POWERFUL CATALYSTS FOR SOCIAL AND ECONOMIC CHANGE. ITS *CENTER FOR COMMUNITY INNOVATION* SUPPORTS AND EXPANDS ENTREPRENEURIAL COMMUNITY PROBLEM-SOLVING THROUGH OUTREACH, TECHNICAL ASSISTANCE, AND RESEARCH THAT BUILDS UPON LOCAL BEST PRACTICES. IURD'S *CENTER FOR CITIES AND SCHOOLS* BRIDGES THE FIELDS OF EDUCATION AND URBAN POLICY, STRESSING HIGH-QUALITY EDUCATION AS AN ESSENTIAL COMPONENT OF COMMUNITY VITALITY AND PROMOTING UNDERSTANDING AND COLLABORATION AMONG EDUCATORS, POLICYMAKERS, AND COMMUNITY MEMBERS.

UNIVERSITY OF CALIFORNIA INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT
316 WURSTER HALL # 1870 BERKELEY, CA 94720-1870 510.642.4874 T 510.643.9576 F iurd.berkeley.edu