

Can There Be a Silver Lining in Sandy? (Part 1)

This is the first in a three-part post about the potential for sustainable recovery along the Atlantic Coast in the aftermath of Hurricane Sandy.

As the communities on the East Coast contemplate rebuilding after Hurricane Sandy, here is a story they might consider. I've told it [before](#). It seems like a good time to tell it again.

In the late 1970s, a small community in Wisconsin made a big decision. The Village of Soldiers Grove decided that when people and nature come into conflict, it's sometimes better for people to get out of the way.

A little [history](#) is necessary. From its founding in 1856, the Soldiers Grove had been a river town. It was built on the banks of the Kickapoo River, a 126-mile-long tributary of the Wisconsin River in the southwestern corner of the state.

Being "river rats", as the townspeople liked to call themselves, made sense then. The river furnished mechanical power for the village's principal industry, a sawmill, and provided an easy way to transport logs cut from the forested hillsides upstream. The Kickapoo eventually provided the village with electricity, too.

But in 1907, the community's relationship with the river began to change. The Kickapoo hit Soldiers Grove with its first big flood. Forestry and farming were denuding the hills so that runoff flowed more freely into the river. More big floods slammed into the community in 1912, 1917 and 1935. Each time, the villagers cleaned up the muck, repaired the damage as best they could, and resumed their routines.

The 1935 flood persuaded Soldiers Grove and its neighboring river communities that they needed to lobby Congress to dam the Kickapoo River. But Congress, always slow, was slowed down more by World War II.

There still was no dam when in 1951, the Kickapoo surged down Main Street with such force that it sent cars tumbling side-over-side and pushed homes off their foundations, floating them away like houseboats.

In 1962, Congress finally authorized the U.S. Army Corps of Engineers to build a dam and recreational lake on the upper Kickapoo River, the largest public works project in Wisconsin history at the time. In the late 1960s, the Corps used eminent domain to buy 149 farms. Construction began in 1971.

That's when I came into the picture. I bought the village newspaper in the mid-1970s and became its editor, looking forward to a bucolic country life. That dream ended with my first assignment: a public meeting in which the Corps presented its plan for saving Soldiers Grove from more floods.

Because the village was far downriver, the dam would not offer much protection, so the Corps proposed to build a \$3.5 million levee around the community. It didn't make much sense to the villagers. The levee would protect only about \$1 million worth of property, including the community's business district and a few homes. If the levee was ever topped, it would keep water inside the village rather than keeping it out. To prevent that possibility, the Corps recommended several pumping stations. But the cost of maintaining the levee and pumps would double local property taxes.

As we left the meeting, the owner of one of the community's several taverns cracked: "They ought to just pick this town up and move it out of here." We laughed.

But at 3 a.m. the next morning, the idea of moving the town woke me up from a sound sleep. I got dressed, went to my office and hammered out a counter-proposal to the Corps: Let us spend the \$3.5 million to move the town's flood prone buildings to higher ground. We'd never ask for federal disaster assistance again.

The Village Board endorsed the idea, but the Corps declined. It was not in the business of moving people; it was in the business of building things and naming them after members of Congress.

In 1975, after opposition to the dam grew intense and after the Corps had spent \$19 million and built half of the dam, Congress withdrew its support for the Kickapoo Valley flood control project. Soldiers Grove decided to march on with the idea of relocation anyway. In the late 1970s, with innovative local financing and federal grants, the village began moving its business district to higher ground.

It was not an easy project. Soldiers Grove was an economically depressed community. Students from the University of Wisconsin helped with much of the planning. There were regrets about leaving the "river rat" tradition behind. There were frictions about who got the best lots at the new site, or whether disaster recovery funds were distributed equitably. Some people took their disaster assistance funds and left town for good. Others believed the village should remain where it was – that there wouldn't be any more big floods.

In searching for federal help, the villagers found there was no single source of government money for relocating a community, so they became skilled grant writers and lobbyists. At one point after public attention in Washington shifted from Soldiers Grove to other more current issues, federal funding stopped, leaving the village only partly moved. But in 1978, another record flood hit the community and funding resumed.

The relocation was completed in the early 1980s. The villagers not only accomplished one of the country's first nonstructural flood prevention projects; they also had built the nation's first solar community, requiring every new building in the cold Wisconsin climate to obtain at least 50% of its heating energy from the sun. Memories of the Arab oil embargoes in the 1970s were still fresh.

The community planned its new construction carefully to capture benefits well beyond flood prevention. The entire business district was built to be handicapped accessible long before the Americans With Disabilities Act became law.

Students surveyed townspeople to identify retail services the village needed so people wouldn't have to shop elsewhere. The Village Board set energy efficiency standards for new buildings, far more ambitious than required by state law. Those standards combined with solar heating meant that some of the new buildings paid very little for energy.

New ordinances encouraged business owners to use indigenous materials in their buildings to provide a few additional jobs for local lumber mills. Even the local Mobile gas station was a solar building.

In 1983 when the new village was largely finished, everyone turned out to dedicate it with a plaque that read:

Respectfully dedicated to all the minds who had the courage to dream, to all the hands who helped make the dream a reality, and to all the souls, some yet to come, who will nourish this idea: that people working together can make a better life.

Although we didn't know it at the time, Soldiers Grove was a pioneer in what today is called "mitigation and adaptation" in the vocabulary of global climate change.

Solar energy reduced the community's contribution to greenhouse gas emissions, while relocation adapted it to growing extreme weather events.

Those who were involved in the project hoped it would shift the paradigm of disaster mitigation by showing a viable alternative to the Corps' practice of deploying bulldozers to tame rivers with dams, levees, river channelization and the like. Congressional studies showed that despite billions of dollars of investment in flood control structures, deaths and property damage were increasing, often because the dams or nature didn't perform as expected.

It wasn't until 25 years later that the Kickapoo River confirmed the wisdom of relocation. In 2007 and again in 2008, all of the villages along the river were hit with the largest floods in their history – back to back “500-year” disasters. The floods caused incredible devastation to other Kickapoo Valley villages, but Soldiers Grove remained virtually unscathed.

Does the Soldiers Grove story offer lessons for how the neighborhoods in New York, New Jersey and elsewhere on the East Coast might rebuild? Can they find a silver lining in this disaster?

I'll answer those questions later. First, there are a few more stories to tell.

Bill Becker is the Executive Director of the Presidential Climate Action Project. For more specific information about the Soldiers Grove experience and its lessons for other disaster-affected communities, see Becker's report, ["Rebuilding for the Future"](#).

A Silver Lining in Sandy? (Part 2)

This is the second in a three-part post about what the Atlantic Coast can learn in the aftermath of Hurricane Sandy from victims of other natural disasters.

In 1993, flooding on the Mississippi and Missouri Rivers produced one of the country's worst natural disasters at the time, killing 50 people and causing \$15 billion in damages. Hundreds of flood control levees failed in nine Midwestern states. Parts of the region remained underwater for five months.

When floodwaters finally began to subside, public television aired a movie about Soldiers Grove's relocation to higher ground (see Part 1). People in several of the communities destroyed by "The Great Flood of 1993" saw the movie and tracked me down where I was working at the time -- the U.S. Department of Energy (DOE) -- to ask for advice as they considered moving out of the floodplain.

I assembled some of the country's best experts in sustainable community design and development. We selected two communities -- Valmeyer, IL, and Pattonsburg, MO. -- and held town-hall meetings to help residents identify what they wanted their villages to be like in the future. We helped them develop master plans for recovery that incorporated sustainable designs and technologies.

Both communities eventually [moved to higher ground](#) and incorporated "green" features. A web site described the process in [Valmeyer](#):

With funding from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, a Sustainable Redevelopment Team of national experts was assembled to help the town learn about and incorporate sustainable technologies into their new town's design. The group met three times with residents, concluding with a weekend community planning session in June 1994. Later that summer,

workshops were offered on passive solar design and ground-source heat pumps. Seeds planted during those sessions resulted in a number of steps taken to make the new Valmeyer a resource-efficient community.

With financial incentives from the state, homeowners incorporated energy efficiency features as they rebuilt. Some homes used passive solar design; others installed geothermal heat pumps. The fire hall is a model of energy efficiency and renewable energy. Energy efficiency measures in Valmeyer's new school were expected to save \$35,000 a year.

Back at DOE, my bosses and I created a "Center of Excellence for Sustainable Development" to provide similar help to other communities. One was [Arkadelphia, AK](#), population 10,000. In the spring of 1997, an F-4 tornado tore through buildings and infrastructure across 60 of its blocks. Six people were killed, nearly 100 were injured, and more than 150 residences were destroyed. In the city's business district, the tornado destroyed or damaged 45 businesses and 16 public buildings.

In the aftermath of the disaster, President Clinton toured the city and asked its residents, "What would you like this community to look like in 25 years?" His question changed the context of the city's recovery from rebuilding the way it was to rebuilding the way it wanted to be.

City officials acted quickly. Within two days, they instituted strict guidelines for how buildings should be repaired or rebuilt. They created a task force, then an "Arkadelphia 2025 Commission" to explore how best to [rebuild for the future](#).

Four months after the tornado, the 2025 Commission invited me to brief it on the concept of sustainable development. I gave the Commission a slide presentation on what sustainability could mean for the city's recovery. As the idea took hold, citizens formed a Task Force on Rebuilding, held weekly community meetings, organized a

housing fair and held workshops to gather input from townspeople on the type of business district and neighborhoods they wanted.

Fifteen years after Arkadelphia's tornado, the University of Colorado's Natural Hazards Research and Applications Information Center commissioned a study of the community's progress. County Assessor Kasey Summerville told the researchers: "After the initial shock of the tornado, community leaders quickly banded together to create a plan to rebuild. Businesses, churches, and homes were all repaired or rebuilt better than they were originally."

"Certainly, DOE's efforts to introduce sustainability worked", the [researchers reported](#), but "federal efforts to promote sustainability must come with financial resources." As was the case in Soldiers Grove, the lack of coherent federal technical and financial help had made sustainable recovery a long, difficult and risky process.

Then came Hurricane Katrina. The State of Louisiana commissioned me and two other sustainable development experts – pioneering green architect [Bob Berkebile](#) and real estate expert [Bill Browning](#) -- to work with the people who remained in the devastated Lower Ninth Ward.

In a series of meetings with survivors, we coaxed out their aspirations on a wide variety of topics, including public safety, historic preservation, open space and preservation of natural areas, compact development, housing, infrastructure, recreation, mobility, public health, economic renewal, energy efficiency and renewable energy, the remediation of contaminated areas, and the community's ability to survive future disasters. It was clear the Lower Ninth could not be relocated, so Berkebile gently persuaded people who had lost their homes in the lower portion of the Ward to rebuild on vacant lots in the Ward's higher parts.
<http://davidrmacaulay.typepad.com/SustainableRestorationPlan.pdf>

The result of these sessions was 50 pages of [grassroots recommendations](#) the city officials folded in to a formal recovery plan. [Community groups](#) in the Lower Ninth Ward are still working to implement the plan today, but rebuilding the neighborhood has proven to be a painfully slow process.

In Soldiers Grove, Valmeyer and Pattonsburg, we hoped to change the paradigm of disaster prevention by demonstrating an alternative to bulldozing rivers. Congressional studies showed that despite billions of dollars of investment in flood control structures over the decades, deaths and property damage were increasing, often because the dams or nature didn't perform as expected.

In Arkadelphia and New Orleans, we hoped to change the paradigm of disaster *recovery* by making sustainability and its co-benefits (we called it multi-purpose planning) an intrinsic part of rebuilding.

There has been some progress. The federal government no longer ignores nonstructural alternatives to disaster prevention. Congress has added some reforms to federally subsidized flood insurance. But the old paradigms have not shifted. As the [New York Times](#) noted recently about the aftermath of the Great Flood of 1993, "governments at all levels acted to try to limit development in flood plains and Washington spent billions of dollars relocating resident from these areas. But as pressure grew from agriculture and from housing developers, especially in the exurbs of cities like St. Louis, the regulations and guidelines were eroded and bypassed in subsequent years."

Today, as the weather gets more extreme and the extremes become more frequent, oceans and rivers remain magnets for development.. Communities with million-dollar views are more vulnerable than ever to billion-dollar disasters. Half of the U.S. population lives on our coasts and the number is growing. When disaster strikes, the victims' first impulse is still to call in the engineers to subdue nature – a futile response in the long term -- and their politicians' first impulse is to help them.

The “it won’t happen here” illusion doesn’t apply only to waterside communities; climate change is a versatile threat. But communities can be versatile, too. If they can’t move away from hazards, they can retrofit to manage the risks.

In the West where record wild fires are occurring, homeowners can create “defensible borders”. Heat waves are now the [No. 1 weather related killer](#) in the United States, causing more fatalities each year than tornadoes, hurricanes, lightning and floods combined. Cities can reduce inner-city temperatures during heat waves by planting trees, promoting roof gardens and light-colored roads and rooftops. More cities can create “cooling centers” for their most vulnerable citizens.

Coastal buildings can be strengthened to withstand most hurricane-force winds. Homes, schools and churches in tornado alley can be equipped with safe rooms.

In fact, any disaster-prone community achieve greater resilience, even when resources are scarce. Often, the most important resource is not financial capital from the government, but intellectual capital from the citizenry. In Soldiers Grove, for example, the passive solar buildings in the new town cost no more to construct than conventional buildings. The new buildings were just built smarter.

Still, there is no question that disaster mitigation, particularly moving out of harm’s way, is a slow and arduous process. More enlightened federal funding policies and programs would make sustainable recovery easier and more common. More about that in Part 3 of this post.

Bill Becker is the Executive Director of the Presidential Climate Action Project. For more specific information about the Soldiers Grove experience and its lessons for other disaster-affected communities, see Becker’s manual, [“Rebuilding for the Future”](#).

A Silver Lining in Sandy? (Part 3)

This is the last in a three-part post about what the Atlantic Coast can learn in the aftermath of Hurricane Sandy from victims of past natural disasters.

When it comes to solving problems, elected officials are inclined to support solutions that allow people to keep behaving as they always have, but with less damage. That's how it has been with America's response to weather-related disasters.

It's a response that won't work anymore. America's experience with weather disasters over the past century proves that the least *political* risk often imposes the greatest *physical and financial* risks. What's more, as federal disaster policies are structured today, all taxpayers are helping insure people who choose to live in harm's way and all of us share the cost of cleaning up the messes after disasters occur.

It's questionable whether these policies can be sustained politically; it's almost certain they can't be sustained financially. There is a dangerous confluence of factors <http://www.huffingtonpost.com/william-s-becker/can-we-handle-natures-new-1-b-947873.html>

coming together like a superstorm: At the same time we are experiencing more extreme weather and after years of destroying natural systems that once protected us, our disaster prevention infrastructure is aging

<http://www.americanprogress.org/press/release/2012/09/20/38808/release-crumbling-dam-and-levee-infrastructure-threatens-public-safety-economic-stability> and funds to fix it are scarce.

To be clearer, the natural disasters I refer to in this post are not really natural. They are the extreme weather events influenced by anthropogenic climate change, made worse by the destruction of ecosystems and by poor building practices, and made more deadly by people's insistence on living and working in known hazard areas. They include floods, heat waves, extreme storms, hurricanes, drought and wildfires.

Broadly speaking, federal policies encourage people to build and rebuild in disaster-prone areas. No one with a heart would suggest that government should not help disaster victims.; it's quite another thing, however, to help people *become* victims. The government's [one-stop-shop](#) for disaster assistance lists 72 programs across 14 agencies, including taxpayer subsidized flood and crop insurance and low-interest loans to repair or reconstruct buildings that have been damaged by weather events.

The bottom line is this: Our current development patterns and disaster prevention strategies will either bust government budgets, or kill more people and destroy more property, or both.

Flood control, increasingly an oxymoron, is a case in point. Since 1936, the principal responsibility for controlling floods in the United States has been assigned to the U.S. Army Corps of Engineers. That revealed two mindsets that still dominate our approach to disaster prevention: first, the solution is to subdue natural systems and second, engineers are smart enough to control natural forces.

History shows, however, that dams, levees and other structural measures can actually increase danger for the populations they are built to protect. Assuming it's safe to live and work below dams and behind levees, people build there. Many of the structures were not built to protect the level of human development or the intensity of weather events we're experiencing today.

When a structure fails, or nature exceeds its designed protection levels, or intense rainfall occurs below a dam rather than above it, more property can be destroyed and more people killed than if the structure had never been built.

Numbers help tell this story. According to [American Rivers](#), the inflation-adjusted investment of tax dollars in flood control structures has been \$123 billion since 1937. Yet, from the early 1900s to 2000, flood damages in United States [increased 6-fold](#), to nearly \$6 billion annually. Today, floods remain America's most deadly storm-related killer.

The average age of the 85,000 dams in the United States today is more than 50 years. Experts rate about 15,000 dams as "high hazards", meaning their failure would cause fatalities. More than 4,000 dams have structural deficiencies that make them susceptible to failure.

In 2009, the Association of State Dam Safety Officials reported that the number of [deficient dams](#) rose by 137% from 1998 to 2008. The Association estimates that \$9 billion is needed to repair the most dangerous publicly owned dams, and \$7 billion is needed to fix the most dangerous privately owned dams.

To make matters worse, some engineered solutions are like a game of whack-a-mole. When we channelize a river to protect one community from flooding, the greater intensity of water flow causes more damage downriver. One expert calls channelization projects "flood threat transfer devices".

The same term could be applied to structural attempts to prevent coastal erosion; they often transfer the problem to other coastal locations. The 2010 Census found that nearly [160 million Americans](#) – more than half the U.S. population – live in coastal counties, up 7.6% since 2000. According to the National Oceanic and Atmospheric Administration (NOAA), [coastal erosion](#) alone causes \$500 million annually in losses to structures and land. The federal government spends an average

of \$150 million a year on “beach nourishment” and erosion control. Nevertheless, the Heinz Center has estimated that by mid-century erosion may claim one of every four houses located within 500 feet of shoreline.

So, what should we do differently? Here are some suggestions:

Improve hazard mapping . The Federal Emergency Management Administration (FEMA) is in charge of mapping flood hazard areas. The National Academies estimate that these maps are used an estimated [30 million times](#) each year by government agencies, FEMA contractors, lenders, insurance agents, land developers, realtors, community planners, property owners, and others for insurance purposes, land management, mitigation, risk assessment, and disaster response.

In many cases, however, FEMA’s maps are outdated. They don’t reflect changes in community development, human impacts on wetlands and other ecosystems, building practices or weather trends.

For understandable reasons, FEMA bases its floodplain maps on historic data rather than on projections of how climate change and other factors will increase the size of hazard zones or the vulnerability of people and property in them. Communities are more likely to accept floodplain designations based on experience rather than computer models. But when weather is growing more violent, maps based on history mean we’ll always be planning behind the problem rather than anticipating and managing its risks.

According to Larry Larson, director emeritus of the Association of State Floodplain Managers, federal funding for floodplain mapping has been cut from \$220 million to \$89 million, in part because the Department of Homeland Security, where FEMA resides, focuses far more on other domestic threats such as terrorism.

As disaster victims will readily testify, however, extreme weather is a form of domestic terrorism, too, and its potential victims need better intelligence to prevent it.

Larson says the cost of re-mapping the nation would be at least \$2 billion, and could be as high as \$8 billion, over the next 15 years, but much of the cost could be offset if accurate maps result in savings for disaster response and recovery.

Emphasize non-structural measures. Congress and federal agencies have been increasing their emphasis on non-structural disaster mitigation in recent years, but that shift should be accelerated to get ahead of climate change.

In the final analysis, moving people out of harm's way is the most effective and permanent way to resolve the conflict between natural systems and human settlements in those places where hazard zones can be defined. But it is delicate and highly emotional process. Immediately after a disaster, many people acknowledge they must do something different. But what I call "floodplain amnesia" soon sets in, where the lessons of the disaster give way to peoples' desire to return life to normal. And "normal" usually means returning to the way things were.

Rivers and oceans reassert their magnetism. Common sense succumbs to machismo. As one geologist quoted by the [New York Times](#) explained, people take the attitude that "We're Americans, damn it. Retreat is a dirty word." For all these reasons, there usually is only a small window of time to persuade disaster victims that moving away is the best protection.

Use tough love. Like it or not, political leaders need to exert tough love in disaster zones. Building owners should be charged market rates rather than subsidized rates in the National Flood Insurance Program. Better premiums should reward people who employ better building practices.

The federal government should impose a “three strikes and you’re out” rule in which neighborhoods in definable hazard zones no longer qualify for federal relief after their third weather-related disaster. Several other ideas for reforming subsidized disaster insurance are detailed in an [excellent article](#) in the New York Times by Erwann Michel-Kerjan and Howard Kunreuther, co-authors of “At War with the Weather”.

Provide victims with information on “sustainable recovery”. During the Clinton Administration, FEMA set up “sustainable recovery” desks in its Disaster Assistance Centers, offering victims information about relocation, buy-outs, or repair and construction techniques that reduced their risks. FEMA also provided information on rebuilding with energy efficiency and renewable energy technologies to reduce carbon emissions. It’s a practice FEMA should resume.

States and localities also need better information to mitigate their disaster risks. House Republicans [voted down a proposal](#) in the president’s 2012 budget to create a National Climate Center at NOAA to improve the flow of climate information to state and local officials. Some feared NOAA would use the Center to distribute “climate propaganda”. The Obama Administration should continue fighting for ample funding to get timely information about climate risks to local decision-makers.

Deploy Sustainable Recovery Teams: The Obama Administration should organize and Congress should fund teams of sustainable development experts to work with disaster-affected communities as they consider whether to relocate or rebuild – the types of teams the U.S. Department of Energy deployed after the Great Mississippi River Flood of 1993. The principal function of these teams is to expand the menu of choices for disaster victims, identifying design and technology options most victims don’t know about.

Create public-private partnerships. During the Clinton era, FEMA administered Project Impact, which provided small grants to help establish disaster-mitigation partnerships between local governments, businesses and community organizations. A few of the [partnerships still exist](#). FEMA should revive Project Impact based on lessons the existing partnerships have learned.

Revisit recommendations from “[Human Links to Coastal Disasters](#)”.

This 2002 report from the H. John Heinz III Center for Science, Economics and the Environment contains wide-ranging recommendations related to the human and social dimensions of coastal hazards. Among them:

Federal initiatives such as the Robert T. Stafford Disaster Relief and Emergency Assistance Act, National Flood Insurance Program, beach nourishment programs, tax incentives for second homes, and infrastructure projects, as well as relevant state and local policies and practices, should be reexamined by legislative and executive bodies at all levels to reduce their role as possible stimulators of coastal growth and enhancers of vulnerability in known hazardous areas.

The growing incidents of extreme weather in the United States may finally have produced a political moment when governments at all levels can begin reforming the policies that help victims remain victims. For starters, some of these new ideas might help families in the devastated communities on the East Coast recover in ways that make them safer and stronger than they were before. That’s the silver lining in Hurricane Sandy.

Bill Becker is the Executive Director of the Presidential Climate Action Project. For more specific information about the relocation of disaster-affected communities, see Becker’s report, “[Rebuilding for the Future](#)”.