Living Beyond the "End of the World"

A Spirituality of Hope

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Of Earthquakes and Hurricanes

or,

Learning to Face Disaster

In time of crisis,
we summon up our strength.
—Muriel Rukeyser[1]

There is no question that we are in a time of crisis. We will need all the strength we can muster. How else will we be able to look honestly at our situation? Aren't we already overwhelmed with disaster upon disaster, one horror after another? Are these, indeed, apocalyptic times or just the usual turbulence of human history, which each generation considers exceptional?

—The day after Christmas 2004, more than 250,000 people are killed in Indonesia, Thailand, and Sri Lanka by a tsunami that strikes islands and coastal areas without warning. On October 9, 2005, more than 85,000 people are killed in an earthquake in Northern Pakistan and India. Earlier in October, 1,300 Guatemalans are buried under a landslide after several days of rain—villages become instant cemeteries. On May 27, 2006, an earthquake strikes the Indonesian island of Java, killing 6,700 people and injuring 36,000.

—On August 29, 2005, a Category Four Hurricane strikes the southern Gulf Coast of the United States. More than 1,800 people are killed in its aftermath, a major US city is destroyed, half a million people are left homeless. In 2003, 26,000 thousand people are killed in a massive earthquake that destroys much of the Iranian city of Bam. In late October 1998, it begins to rain in Central America and does not stop for seven days. Several feet of rain fall on Honduras and parts of Nicaragua, El Salvador, and

Guatemala. Eighty percent of Honduras is affected. More than 9,000 people die, many of them washed away.

—In 2005 scientists and world health officials work urgently to prepare the world for a potential pandemic of an avian flu strain (H5N1) that could kill hundreds of millions of people, an estimated two million in the United States alone.

Add disasters to the list. There are, and will be, many more. There are many ways to interpret such events. Here's one version:

The signs and portents don't look very good. We are seeing signs in the sun and the moon and the stars, and on earth nations are indeed in agony, "bewildered by the clamor of the oceans and its waves" (Lk 21:25). The end times are surely upon us. The wrath of that old warrior God of the Old Testament has come over us. God is announcing to us that he has had enough of our earthly sinfulness, our corrupted souls, and our filthy ways, of homosexuality and feminism, of working women and abortionists, of sexuality and rock n' roll that sickens our children, of secularism and liberalism that oppress the people of God and drive God out of the public marketplace. Nonbelievers, apostates, and "heathens" are striking out at the faithful with great violence, flying planes into tall buildings, blowing up commuter trains, beheading captives, and spouting their hateful ideology over the Internet. The hand of God is no longer there to protect us; it has been withdrawn.

God has waited long enough for us to repent. We have been deaf to his commands, and now it is too late; his vengeance is upon us. First come the earthquakes, floods, and other natural disasters. These are the final warnings—get ready, the time comes soon.

Any minute now, the one next to you will be taken up—and when that person is taken and you are not, you will know you are in big trouble.

Living earth

Well, as I said, that's one version of events.
Here's another:

The earth is alive, constantly shifting, seething, creating, and destroying. There have always been earthquakes, floods, hurricanes, tornados, avalanches, and volcanic explosions. What is different is that we have reproduced exponentially in the past one hundred years and our planet has gotten a bit crowded. In 1950 the world's population totaled two billion people; by 2000, we had reached 6.5 billion. We are headed for over 9 billion by 2050.

Masses of people now live in very dangerous places—on fault lines and along seacoasts, on fragile bluffs with an ocean view, in desert communities dry as tinder

each summer—and when disasters strike, many people are likely to die and homes and businesses will be destroyed. Human beings have put enormous stresses on very vulnerable geography and have altered the climate of the planet in a way that is likely to increase the fury and unpredictability of these natural disasters.

Once upon a time the vast forests of Central America and the Yucatan put a brake on the power of a hurricane as it struck land. Much of the forest no longer exists. In Central America, as in many parts of the world, poor people have little choice about where to build their simple houses and grow subsistence crops. The safer lands, the more productive lands, are in the hands of the rich and the business classes. Poor people are forced up onto steep mountainsides or into ravines prone to flooding, living in housing of sticks, cardboard, dirt, and clay that cannot withstand a torrential downpour or the trembling of the earth. Lacking electricity or the ability to tap into existing energy sources, they are forced to cut down trees for wood to heat their stoves for cooking, adding to the pressure on forests already decimated by timber companies to supply the wood for our housing developments and our throw-away chopsticks, our brown paper grocery bags, and our corrugated cardboard boxes.

In August 2005 I was driving through southwestern Montana on highway 93, an area where more than two dozen fires were burning in the mountain wilderness. Brown smoke and haze wafted through the broad valley, and the smell of burning trees filled the air. I expressed my dismay and sorrow to the man behind the desk in the motel and asked about how this year compared to others. Oh, he said, this was actually not such a bad year, fewer fires than the last, fewer fires than usual.

The fires burn every year, and always have, set off by lightning storms during the dry late-summer months. The difference is that now many people have moved closer to the wilderness and so the fires come closer to populated areas, now they must be fought, now they are on the TV news.

He explained that the fire fighters fight the flames as they come close to human habitation, steering the fires toward the wilderness. At that point, they just let them burn.

Not God, just a sprawling population, just some folks wanting a summer home in the mountains, bringing attention to one of the many ways nature has controlled and replenished the forest over millennia.

Less than a decade after the big event, I traveled to Washington State to pay homage to Mt. St. Helens, which blew its top—literally—back on May 19, 1982. It is one of my favorite places in the United States, a place where one can get a glimpse of the power that boils and rumbles under our feet, deep down below the earth's surface. The explosion took thirteen hundred feet of elevation from the mountain's glorious cone. The first time I visited,

it was largely a moonscape—except for the places where the wild flowers were growing across now-treeless mountain valleys, except in the newly formed lake brimming with life, except for the gentle reminder of abundant life as a deer strolled by, softly wading on the shoreline.

What to us looks like moonscape and disaster is just the earth still creating itself, replenishing, renewing.

Around the other side of the mountain is the site of Harry Truman's Spirit Lake Lodge. Born in 1896, Truman was by many accounts a cranky old man with a checkered past and few friends. He had lived long on the side of the volcano and, when the warnings came, he did not want to leave his property. He knew the mountain, he said, and the mountain would never hurt him. "When you live someplace for fifty years, you either know your country or you're stupid."

Truman and his lodge lie buried under some 150 feet of the rock and ash that came cascading toward the lake within seconds of the blast—his burial ground, his own private cemetery. I wonder if he had time to address the mountain in the instant before his death, a word of protest, perhaps, at the betrayal, or a word of defiance. Scientists say he may have had just enough time to turn his head.

A few years later I visited a second time and stopped by the brand-new Visitor Center. There I attended a talk given by one of the National Park rangers describing the geology and history of the volcanic Cascade Mountains. The Cascade Range, which stretches from Canada south across Washington and Oregon, has several active volcanoes; Mt. St. Helens is not the only one that rumbles and roars from time to time.

One of them is Mt. Rainier, which many seismologists believe will blow within the next fifty to one hundred years. The death toll will be different this time. St. Helens is away from densely populated areas; still, fifty-seven people were killed by blast, ash, and toxic gas. The blast created winds of three hundred miles per hour. It darkened the region for hundreds of miles.

But as anyone who has visited Seattle knows, Mt. Rainier is a near neighbor. It is—right there. As you drive around the Seattle area, you see signs all around—in case of evacuation, run *up*.

There is no way we humans can outrun, or drive fast enough to escape, the winds and rock flows that will come from the explosion of so much pent up gas and energy; therefore, go up. Schoolchildren are taught this.

So, back at the Mt. St. Helens Visitor Center, after the presentation, I asked the ranger more about the impact of a Mt. Rainier eruption. Which way would it go? Would there be lava? Would it be mostly gas, rock, and ash, like Mt. St. Helens?

He took out a geological map of the Seattle area and pointed out exactly where the flows would go, down which ravines and valleys, down which streets and highways.

And then, with an obvious frustration just below the surface, he pointed out exactly which of those spots are now prime real estate being built up by developers.

I wonder if these developers show prospective home buyers these geological maps. I wonder if they encourage them to go talk to a ranger.

How many of the Indonesian and Thai people who died in the 2004 tsunami were workers servicing a coastline tourist industry that exists for the pleasure of the affluent of other countries? How many who died were tourists? We love the coast, the warm waters. We want to live there, build vacation houses, escape the cold winters, tip the waiter for bringing us a drink on the beach. We don't think much about the impact this is having on the ecosystems of coastal lands or on their peoples. Won't they just welcome the jobs, the investment?

We don't think much about the natural disasters that will come, because they have always come and will come again. We can't imagine being limited by nature, or needing to consider the impact our lifestyles might have on notoriously volatile natural systems. Even though lava flows and tsunamis and earthquakes do not distinguish among peoples, will destroy what we build, will destroy lives and economies, will strike where they are intended to strike by the nature of this living planet—can't we still live wherever we want to? Can't we still build whatever we want, wherever a buck is to be made, wherever the view is wonderful? Can't we just pretend it will never happen—and buy insurance, just in case? And won't technology and human ingenuity make all things possible?

Are we really going to rebuild the areas around New Orleans that flooded when the levees broke?

New Orleans.

Navigation is a major foundation of the economies of thirty-three states along the Mississippi. The river provides the means for the commerce and recreation that sustain tens of millions of people. But it has an inherent problem; it is prone to flooding.

And so, to service this human activity and to secure the burgeoning communities being built along the river banks from these periodic natural disasters, early European settlers, and later the US Army Corps of Engineers, built levees along the river banks, redirected water flows, dammed and dredged, in order to beat this enormous natural waterway into submission—literally, to force it to submit to human will—thus supporting a thriving and critical economy through the heart of the nation.

And thus also helping to create the conditions that would destroy New Orleans.

It seems that one result of these monumental efforts, undergone over a couple of centuries, has been the slow erosion and destruction of the protective wetlands in the Mississippi delta that provided a buffer for storms like

Hurricane Katrina. The frequent flooding of the river brought down to the delta the sediment that replenished the large swath of wetlands that protected the coast. Because of the diminishment of sediment flow, the delta is disappearing. A part of Louisiana is now inexorably sinking. Meanwhile, New Orleans, which is also sinking, is a city surrounded by lakes, rivers, and marshes, built on land below sea level, protected by levees, an enormous act of faith and trust in the human power to tame and subdue the forces of nature.

Since it rains in New Orleans—often a lot—the city had to be protected not only from the waters of rivers, lakes, and the Gulf of Mexico, but also from the water that falls from the sky. So, besides the levees, enormous pumps were constructed to take out every drop of rain that falls into the "bowl" that holds the city.

This system failed in the wake of the hurricane.

Researching the topic on a variety of websites, I found revealing examples of the spiritual or relational divide around this question of how human beings approach the forces of nature, in this case, the Mississippi River and the issue of water.

Here is how the US Army Corps of Engineers approaches the challenge:

> Without question America's greatest river, the Mississippi, has made major contributions to the physical and economic growth of the nation. It is a navigation artery of great importance to the nation's transportation system, carrying an ever-growing commerce. Coursing through the heart of America, it supplies water for the cities and industries that have located along its banks. More and more the Mississippi's importance is emphasized as America continues to grow. This great river is, truly, one of the nation's outstanding assets. *Uncontrolled, it would be just as great a liability.*
>
> *The Mississippi River always has been a threat to the security of the valley through which it flows* [I am sure the poor river didn't know it was a security threat to the United States, and you know what we do to security threats]. Garciliaso de la Vega, in his history of the expedition begun by DeSoto, described the first recorded flood of the Mississippi as severe and of prolonged duration, beginning about March 10, 1543, and cresting about 40 days later. By the end of May the river had returned to its banks, having been in flood for about 80 days.
>
> Since that time, explorers, traders, farmers, men of commerce, and engineers have known—sometimes too well—the Mississippi in flood.
>
> The Mississippi River has the third largest drainage basin in the world, exceeded in size only by the watersheds of the Amazon and

> Congo Rivers. It drains 41 percent of the 48 contiguous states of the United States. The basin covers more than 1,245,000 square miles, includes all or parts of 31 states and two Canadian provinces, and roughly resembles a funnel which has its spout at the Gulf of Mexico. Waters from as far east as New York and as far west as Montana contribute to flows in the lower river.
>
> The lower alluvial valley of the Mississippi River is a relatively flat plain of about 35,000 square miles bordering on the river which *would be overflowed during time of high water if it were not for man-made protective works*. This valley begins just below Cape Girardeau, Missouri, is roughly 600 miles in length, varies in width from 25 to 125 miles, and includes parts of seven states—Missouri, Illinois, Tennessee, Kentucky, Arkansas, Mississippi, and Louisiana.
>
> Floods of 1849 and 1850, which caused widespread damage in the Mississippi River Valley, revealed *the national interest in controlling the mighty river*.
>
> By the year 1879, the need for *improvement* of the Mississippi River had become widely recognized. The necessity for coordination of engineering operations through a centralized organization had finally been accepted.
>
> Accordingly, in that year, the Congress established the Mississippi River Commission and assigned it the duties . . . "to take into consideration and mature such a plan or plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River, improve and give safety and ease to navigation thereof, prevent destructive floods, promote and facilitate commerce, trade, and the postal service." (emphasis added)[2]

And you thought, as you gazed upon Ol' Man River with awe, watching the barges float lazily along the channel, that you were gazing upon a natural wonder. It certainly was one, once.

What nature took hundreds of thousands of years to create was seen by European settlers, including us, as a *problem*, a problem to be solved by resolute human will and ingenuity.

No one can say we tried to tame the river out of ignorance. We knew what it could do. Is it possible that the river knew best how to protect its own banks, that it knew, innately, what it was doing, that the point would have been to live *with* it, rather than to alter it for our economic benefit?

But, it is true, commerce and the economy built around it would not have developed as it did, many cities would never have been built, the entire country would have developed differently, and New Orleans may never have existed as a large metropolitan area to be destroyed in 2005.

When humans try to outwit nature

So that's one view, powerfully anthropocentric, seeing the human project as something to which the earth is made to submit, whose forces are to be tamed for our use. And that is magnificent and wonderful, deserving of awe over our amazing ingenuity.

Here is another view. This one comes from a report in September 2002 by Daniel Zwerdling for National Public Radio.[3]

"Right now, an entire region of the United States is crumbling and sinking into the sea. Scientists say it's causing one of the worst and least-publicized environmental disasters in America's history. . . . There's a moral to this story: when humans try to outwit nature, it can strike back with a vengeance."

As he flew over Louisiana's wetlands with biologist Bill Good three years before Katrina struck, Zwerdling described what he was seeing: "Coastal wetlands are lands that get flooded by tides. They're bursting with life, like rainforests, and these are some of the greatest wetlands on Earth. They sprawl 300 miles along the Gulf of Mexico, and they go up to 50 miles inland. They're the heart of the Mississippi Delta; and this astonishing landscape is vanishing." Good says, "If we'd taken this helicopter trip 50 years ago, it would have looked like the Great Plains . . . like the prairies in the Midwest, solid, vast expanses of grass . . . verdant green from horizon to horizon." Now it is "a ragged patchwork," with "thousands of streams and lakes and canals eating away at the grasslands like cancer."

Pointing toward the fishing boats in a nearby bay, Good noted that in the 1980s the area was "solid ground."

"That scale is monumental and the significance is really hard to put into words. . . . It's very hard to get your mind wrapped around how large and important and productive and unique all of this is. To see it simply dying is a tragedy, a tragedy of immense proportions."

(In February 2005 National Geographic News was reporting that chunks of land the size of a football field were being lost *every thirty-five minutes*.[4])

To get to the source of the wetlands disaster, Zwerdling went off to view the levee system along the banks of the Mississippi River with Oliver Houck, head of the environment program at Tulane University's Law School. Houck said, "There is no place in the world that has a levee system that is as extensive as this one—it's a monster system."

"The banks here are about 20 feet high," Houck explained, as they stood atop a grassy embankment. "When we cross the banks, you'll see on the other side [that] if these levees were not here, that water would be at about eaves' level across the houses behind us"—a bit like what happened in August 2005.

"I always wondered what 'levees' meant," said Zwerdling. "A levee is a wall. A levee is a wall to keep the river out of your living room."

To keep the water out of the living rooms of Louisiana coastal residents, engineers built two thousand miles of levees along the Mississippi and its branches. All of this was to prevent the floods that are a natural part of the river's long history, floods that come frequently, and sometimes disastrously, in terms of lives and property.

The system was also intended to protect the city of New Orleans as these floods washed down to the delta. That was the disaster for which they had prepared. Engineers pretty much ignored the other possibility, the disaster that could come from the south.

"Before people built these walls," said Zwerdling, "the giant Mississippi [and its tributaries] helped build America, washing millions of pounds of soil from all over the country down to the Gulf of Mexico."

"That's what built south Louisiana," added Houck. "The Mississippi built five million acres of land."

Under the weight of this heavy, rich soil, the marshland is always sinking, but before the dams and levees stopped the flow, the river always brought more, and the marshes provided a protective barrier to New Orleans and nearby communities from the full brunt force of tropical storms. When hurricanes strike land, they begin to lose strength. While the coast is hit with fury, much of the punch of the storm then begins to abate, like taking a steaming kettle off the burner. As the wetlands disappear, the Gulf of Mexico is growing inexorably closer to the city of New Orleans.

Houck reflects on how the Army Corps of Engineers persistently fought the river with more dams, more dredging, and always more levees. "And every time they thought they'd conquered nature, the river proved them wrong," said Zwerdling. "So the army built more walls and they built them higher." Houck says, "The army has finally won the war—they've tamed the Mississippi."

But the victory was pyrrhic, to say the least. Soon after building the system, the delta region began to sink. The wetlands are now sinking into the sea, or, as Zwerdling put it, "The Gulf of Mexico is essentially drowning them." What had once been marshland prairie that could support giant oak trees is now riddled with ponds and mud, a sign that it is coming apart. As the land sinks and the water levels rise, the marsh grasses can no longer hold the soil. "The plants die," said scientist Denise Reed, whom Zwerdling interviewed for this report, "and when plants die, there's nothing to hold it together."

How much land is Louisiana losing? Zwerdling reports that right now, the state's coast accounts for 80 percent of the land loss in the United States. Louisiana's Department of Resources Office of Coastal Restoration and Management reports that, at the current rate, the state will have lost 527,000

acres of coastal lands by the year 2050, along with the rich biodiversity that it once harbored. The Gulf of Mexico will have moved thirty miles north, and New Orleans will be still more exposed to the full force of a hurricane—or any tropical storm, for that matter.

As evidence of the loss of resilience, S. Jeffress Williams, a coastal scientist with the US Geological Survey, told Congress at a hearing in fall 2005 that some of the marshes lying east of the river lost more than 25 percent of their land area during Katrina.[5] They were simply too deteriorated to hold together.

But there is still more to this story, other ways that humans managed to beat up on the delta. Zwerdling's report points out that thousands of canals have been dug through the marshland by energy companies like Shell and Texaco since the 1950s, when they found vast amounts of oil and gas buried there. Aerial views reveal these waterways crisscrossing the delta, dredged and straightened to make way for drilling holes to extract oil and gas. "There are thousands and thousands and thousands of these across coastal Louisiana," said Reed.

The energy industry is Louisiana's largest, which means there are powerful economic interests at work here. And those interests span everything from the power and influence of the oil industry itself to the economy of a relatively poor state that needs jobs and a tax base, to politicians who want to be elected to office, to gas the people need to drive their cars, to the heating oil and natural gas necessary to cool or warm homes. A confluence of economic interests, a fossil-fuel-based consumer society, and human hubris have conspired to destroy the wetlands of Louisiana's coast, bringing disaster ever closer to the city of New Orleans and other coastal communities.

"This marsh cannot survive in this state much longer. It's like the edge of a blanket starting to fray. Once it starts, it goes very rapidly," warns Reed.

Next, Zwerdling went off on a boat with Rick Eddy, who runs a bait-and-tackle shop in the town of Leeville, to visit a nearby cemetery, "because this is the only way you can see it." Headstones stick up out of the water when the tide is low and virtually disappear when it is high.

"The cemetery's all under water," Eddy says. "It's eroded right away. I've been in this area for 15 years. When I first came into this area, there was all land there. It's very heartbreaking. And to have something like this come along—and erosion. Some of the headstones are all busted up. The mausoleums, it's just a pile of rubble really. Kinda hard to put it in words."

Right—he did pretty well.

Writer Anna Quindlen, in an essay entitled "Don't Mess with Mother," reflected on the deeper meaning of Hurricane Katrina:

> New Orleans lived for 80 years with the granddaddy of all environmentally misguided plans, the project that straightened out the mighty

> Mississippi so its banks would be more hospitable to homes and businesses. Little by little the seductive city at the river's mouth became like one of those denuded developments built after clear-cutting. It was left with no natural protection, girded with a jerry-built belt of walled-off water, its marshland and barrier islands gone, a sitting duck for a big storm.[6]

Another Mississippi anecdote, because it is important for this story: In 1993, spring deluges that fell on states adjoining the river caused the greatest floods in centuries. In the areas where the levees were built to protect river harbors and commerce, they worked. The damage was minimal. However, the levees also concentrated the flow of the water, increasing the pressure and the violence of the water flow. When the water passed the levees, it burst out into the unprotected farmlands and small towns, increasing the extent of devastation in those areas.

Water has to go somewhere, after all.

The disaster resulted in billions of dollars in economic damage alone.

The mighty Mississippi. In our human attempts to tame it, to put it to use for our commerce and our enjoyment, we had the hubris to believe we had beaten it into submission. We changed its behavior, all right. But it remains mightier than we and will at times break out of these constraints, reminding us of the earth's power, the power of water, and what it means when the earth, which took millions of years to create the delicate balance of its rich ecosystems, is put out of balance. The Mississippi was feeding the delta, the Mississippi had created its own flood plain to absorb the water, until we built on it, then leveed, dammed, and dredged it. The Mississippi needs vastly more space than it now has to be the river it was created to be. We have squeezed it into the dimensions that fit our human plans. It was bound to rebel. And this won't be the last time.

As Hurricane Katrina passed by New Orleans, a disaster predicted over two decades unfolded exactly as was inevitable, a disaster for which the ground had been long prepared.

Now the river is a way of life, it is river views and commerce, fishing industries, riverboat gambling, jobs for millions, economic life for cities and small towns. For now, our economic life depends on a faulty model of development, built on a faulty sense of the human as over and above nature, more powerful than it, following a religious mandate to dominate and subdue and put it at the service of "man"—with this result.

This disaster is a fine mixture of the forces of nature, mis-thought development, and global warming. They combined to destroy a major US city.

And what now for New Orleans? As the debate raged on about its future, as people insisted that they be allowed to rebuild their destroyed neighborhoods,

those on the other side of the grassy embankments holding back the water, there is another topic that no one wants to talk about, the elephant in the room that everyone still chooses to walk around rather than acknowledge—the disaster they did *not* prepare for.

Hurricane Katrina did not hit New Orleans directly. The eye hit nearly sixty miles to the south and east in the small community of Buras-Triumph. By then, it had diminished to a Category Three storm. The city has not yet experienced the bigger disaster long feared—a Category Four or Five storm making a direct hit from the south. New Orleans was flooded not by a storm surge from the Gulf of Mexico but from the collapse of levees after the storm had passed by, when people were breathing a sigh of relief that the city had been spared the worst.

So while scientists, meteorologists, and others had been trying to warn the city for decades about a potential disaster, this was not even the one they were most concerned about. The one that causes them to lose sleep is what would happen if a Category Four or Five hurricane hits New Orleans dead on.

In another Zwerdling report, Houck presented the concern: "It was always thought that the big threat of flooding in New Orleans was the river—and it was—because it flooded regularly. So we beat flooding by taming the river. The irony of history is that we—like one of those old citadels in an adventure story—defended ourselves against the enemy that we knew, which was the river, but to the rear and to the flank was this other threat, which we are only now beginning to appreciate, and it may be too late to prevent."[7]

Poignant reading three years *before* Katrina, isn't it? We didn't prepare well for the disaster we thought we had prepared for—floods from the river and lakes. What about the one still to come—what will it entail?

The fear is this: a Category Five hurricane makes a direct hit on the city. Now, before Katrina, which depopulated much of the city, there were half a million people in the metropolitan area, plus thousands more in nearby coastal communities. As of this writing, the city's population stands at 150,000, and is growing.

In studying this bigger threat to the former population, the examples scientists looked at are Hurricane Camille (1969), the largest storm ever to hit the United States (it missed New Orleans by one hundred miles), and Hurricane Andrew (1992). These were monster storms. They would have crushed the city. When Hurricane Georges approached in 1998, officials, aware of the studies, decided to play it safe and evacuate the city. What happened was not comforting. Roads were quickly clogged with traffic and, had the storm hit, tens of thousands of people would have been completely vulnerable, trapped on the highways in their cars. The other problem is that those very same roads would have probably flooded. Not only can people not get out, but rescuers cannot get in.

Now, back to the problem of the disappearing wetlands. With less protective buffer, a storm surge could put much of the "bowl" containing New Orleans under twenty to thirty feet of water. That water will be full of debris that will sweep over everything in its path. And because of the levee system, the water that gets in will not be able to get out; the pumps will be under water and not functioning.

Walter Maestri, working at the emergency command center in Jefferson Parish, told Zwerdling that the city will "look like a massive shipwreck. Everything that the water has carried in is going to be there. It's going to have to be cleaned out—alligators, moccasins, and God knows what that lives in the surrounding swamps, have now been flushed, literally, into the metropolitan area. And they can't get out, because they're inside the bowl now. No water to drink, no water to use for sanitation purposes. All of the sanitation plants are under water and, of course, the material is floating free in the community. The petrochemicals that are produced up and down the Mississippi River—much of that has floated into this bowl. . . . The biggest toxic waste dump in the world now is the city of New Orleans because of what has happened."

Army Corps of Engineer officials talk about the difficulty of rescue and recovery—neighborhoods and streets obliterated, no street signs to help them find their way, no medical facilities to take the sick and injured, no morgues for the dead.

Okay, what death toll were they anticipating back in 2002? Some estimated twenty thousand to forty thousand. An Army Corps researcher said more like one hundred thousand.

Maybe Katrina was as much a blessing as a curse. Maybe by cleaning out the city—although at the cost of more than 1,000 lives and 300,000 displaced—it saved the lives of tens of thousands more, depending on what we do now. Again, the portends are not favorable. We didn't listen to them before Katrina. Are we listening now? Yet the warnings are increasingly dire, more costly.

Some say the city should be abandoned and relocated farther inland, at least those sections below sea level. Many displaced residents still want to go home. Business owners have recreated a French Quarter playground. It's hard to give up on a city with such a rich history, such a deep impression on the soul of this nation. And it is utterly "un-American."

Houck thinks they could ring the major towns, but "if we aren't going to draw a line and try to protect every little town, we would have to do some serious people relocation, and that would humanely require compensation."[8] We couldn't even get the federal government to fund fully the temporary housing needs of the displaced in the immediate aftermath of the disaster. How can we realistically expect a commitment to "humane compensation" for permanent relocation?

In 2002 Houck was saying that it's time to "stop the foolishness of permitting yet more residential development. We are granting permits every week for new subdivisions right in the path of where this stuff is going to go. We're still covering those people with flood insurance."[9]

Maybe Houck and the park ranger should get together—for some consolation. It's hard to be the canary singing in the mine when everyone else wants to drown out the song.

Some people want to create a system of pipelines, pumps, and canals along the Mississippi to capture the river sediment and send it to the delta. Though many scientists believe this would work, it would take many years and billions of dollars. The coastal area probably does not have that kind of time.

Meanwhile, the displaced, mostly the poor of the city, still feel pretty much abandoned by their government at all levels.

Oh, a final anecdote for what I like to call the Katrina metaphor: Because of the drain on federal funds for the war in Iraq and the new Homeland Security Department, along with the infamous Bush administration tax cuts, the annual federal budget for levee restoration, pumping stations, and flood control for the Louisiana coast had been slashed in 2003 and 2004. There were several critical projects under way in the New Orleans area at the time, particularly to shore up levees around Lake Pontchartrain. The levees around the city, like everything else, are sinking. The levees need to be raised, but that cut-off of federal funds stopped the work in its tracks. Following the dreadful 2004 hurricane season (four struck Florida that year), the federal government proposed the steepest reductions ever for hurricane-and-flood control. Even an important research project to study the potential impacts of a Category Four or Five storm could not be completed.

Now, you tell me what we should do about New Orleans. And tell me, from this story, the message here about the human relationship with the forces of nature.

There are stories like these all along the coasts of the United States.

Investing in disaster

On October 10, 2005, the *New York Times* carried a story on its front page that reveals another kind of response along the spectrum of human reaction to dire situations. For some years scientists have been trying to draw our attention to the extent of the melting of the polar ice cap at the North Pole during the summer months. They predict that within a few short decades the Arctic Ocean will be totally liquid for several months of the year. In 2005 the ice cap had shrunk to the smallest size ever recorded by humans.

The article even reflected on how our familiar image of the earth from outer space will be altered—how the brilliant white that wraps the North

Pole will turn a seasonal blue. Imagine that! In our lifetime the image of the planet from outer space will be dramatically altered.

This is alarming for a couple of reasons. For one, it is another sign of global warming, another bit of evidence that shows us that the phenomenon is real. In fact, scientists are surprised that it is occurring this rapidly; they knew this would happen, but not so soon.

The other reason for alarm has to do with what the melt of the polar ice cap will mean for our coasts and for the warming problem itself. It is another indication of the melting that is going on around the earth, the receding of glaciers, the collapse of ice shelves in remote northern and southern climes. Scientists predict that this will raise sea levels around the world dramatically, threatening cities like New York and London with inundation. Forget New Orleans, or the million-dollar houses built on stilts in South Bethany, Delaware, or the high-rise hotels built smack on the sand beaches of Ocean City, Maryland, or the sweet summer beach houses on the Outer Banks of North Carolina.

This could all begin to happen in our lifetimes.

The ice melt is also likely to accelerate the warming of the earth. Ice reflects sunlight back into the sky. Water absorbs it. The more the water absorbs light, the warmer the earth gets.

Much has been written about global warming in recent years, and I will have more to say about this in the next chapter. But the story in the *New York Times* was about something else; it was about how some people are dealing with this looming crisis—by investing in it.

The story begins with Pat Broe from Denver, who is betting on the disaster to come, having recently purchased a Hudson Bay port that may one day soon be at the epicenter of an old seafarer's dream come true—a northwest passage to the Far East. Seems Broe bought the port from the Canadian government for seven bucks. Apparently it isn't worth much—until the ice melts.

Some individual and corporate investors look at the looming crisis and see before them a great opportunity to make some money—a lot of money. Not only will there be a shorter passage for trade in goods from North America to Asia, but there is something else that lies under all that ice and permafrost—oil, once again oil, always oil.

Here's how the *New York Times* described it:

> By Mr. Broe's calculations, Churchill could bring in as much as $100 million a year as a port on Arctic shipping lanes shorter by thousands of miles than routes to the south, and traffic would only increase as the retreat of ice in the region clears the way for a longer shipping season.
>
> With major companies and nations large and small adopting similar logic, the Arctic is undergoing nothing less than a great rush for virgin territory and natural resources worth hundreds of billions of dollars.[10]

Scientists have found "hints" of oil within two hundred miles of the North Pole, the article says.

I love this, too: clever entrepreneurs see possibilities for new tourist cruise destinations, great fishing opportunities, and more.

Ports will be built, fragile terrain covered over with roads for oil-drilling rigs and pipelines, and soon, I imagine, the local Wal-Mart will appear.

There are human beings that will cash in on just about anything, I guess.

But my question is this: are we learning nothing from our predicament? While investors dream of fortunes (we always do, it is how and why we settled the frontier, after all), what do they think will be happening down south where once arable lands will be turning to deserts, where billions of lives will be threatened by the ramifications of drastic climate change, where major cities will be in crisis, where mass migrations from once-habitable areas will be part of the human landscape everywhere?

It would seem that we tend to adapt to these looming crises by wishful thinking and a heavy dose of denial, or by avoiding as much as possible any worry and stress (the culture treats these as bad things rather than as symptoms appropriate to our condition), or by hoping they will not upset our lives too drastically (trust me, recycling bottles and cans will not quite do it). We continue along, supporting a way of life from which we simply do not seem able to wrench ourselves.

Am I being too harsh? Let me share a couple more examples of what I mean.

Remember the Mississippi floods of 1993? Here is a tidbit from an Associated Press article dated February 18, 2006, while Katrina, one would think, was still a vivid memory. "Around St. Louis, where the Mississippi River lapped at the steps of the Gateway Arch during the 1993 flood, more than 14,000 acres of flood plain have been developed since then. That has reduced the region's ability to store water during future floods and potentially put more people in harm's way. . . . Similar development has occurred around Dallas; Kansas City, Missouri; Los Angeles; Omaha, Nebraska; and Sacramento, California."[11]

Nor did Katrina alter development plans in any way. Gerald Galloway, professor of engineering at the University of Maryland, cited in the article, said, "The half-life memory of a flood is very short."

One presumes all these property owners were able to obtain flood insurance.

Eighty-five percent of the Mississippi River that flows by St. Louis is contained behind levees. The Associated Press was told by Nicholas Pinter, professor of geology at Southern Illinois University, that these levees "have raised flood levels 10 feet to 12 feet higher than they were just a century ago." He noted the similarity with the levees in New Orleans.

Oh, and by the way, Missouri is also the site of the epicenter of four of the largest earthquakes ever recorded in the continental United States, occurring in 1811–12. The area that includes Missouri and surrounding states is called the New Madrid Seismic Zone, and its center lies along the southern border of Missouri, where it abuts Tennessee and Arkansas, and joins the southern tip of Illinois. Seismologists have been warning that the area may be ripe for another temblor soon, a high probability of a major earthquake within the next three decades—this time with a vast population sitting on top the moving plates, many of them living behind the levees.

Floods and earthquakes in the heartland of the nation. I wonder how many quake-proof buildings, or perhaps stricter building codes, have been or are being developed in areas around this ancient fault line. I wonder what happens to the levees when this temblor strikes. I wonder if restricting development in dangerous areas has been considered.

Sadly, since this would be costly and objectionable to developers and would-be property owners, and would hamper economic activity, what local jurisdictions are doing instead is getting better prepared for the disasters that inevitably will come.[12] At least that lesson is being learned from the sad story of the Gulf Coast. But have we added this cost into the price of the property, into the taxes on developers and home owners? Have developers and officials considered the human lives that will be lost? One can be warned, perhaps, of a flood, but an earthquake?

Another example: New Orleans is not the only metropolitan area in the United States that levees have made possible. East of San Francisco lies the delta of the Sacramento and San Joaquin Rivers, which receives runoff water from about 40 percent of California. The story may have a familiar ring. The land is below sea level, and one thousand miles of levees hold the water at bay. The area includes the city of Stockton. Its population is booming.

Jeffrey Mount, geology professor at the University of California-Davis, said, "We are reinventing Katrina all over again." He estimates "a two-in-three probability over the next 50 years of a catastrophic levee failure."[13] A large failure, say as result of an earthquake, would inundate the entire region.

Mount told the Associated Press that there are two kinds of levees in California, "Those that have failed, and those that will fail."

Irony abounds. As the Associated Press reports, "In California, the modest investment required to shore up a levee protecting farmland can result in dramatic increase in the value of that land, Mount said. That, in turn, increases the likelihood a farmer will sell out to developers, ushering in the construction of houses on what had been flood plain. 'You actually spur development. It's a self-fulfilling process,' Mount said."

You gotta love the free market as it plays its vital role in this dynamic of disaster. All investors are doing is meeting demand. They are not responsible. And God forbid we should ever stop developers from doing their business, even if it ultimately means saving untold numbers of lives and more hundreds of billions of dollars in economic loss. There is an ideology at work here, and it says this is a rational way to do business.

Anna Quindlen writes:

> How many times do we have to watch homes cantilevered over canyons surrender to a river of mud or beach houses on stilts slide into the surf to know that when we do high-stakes battle with Mother Nature, Mother takes all? Once I heard a businessman at a zoning board meeting say, "Well, a person can do what he wants with his land." Actually, that's not true; that's why zoning exists. Is any city, town, or state brave enough to just say no to waterfront development that destroys dunes, despoils water and creates the conditions that will, when a storm strikes, create destruction?[14]

Yes? No? Anybody?

A final word from Nicholas Pinter: "If you want to look at what probably—unfortunately—will happen in New Orleans in the next 10 years, look at what has happened in St. Louis in the last decade."[15]

And this added note: a warming climate is likely to increase the severity of storms and therefore the frequency of extreme flooding. Expect more days ahead glued to your TV screens watching the horror of human beings killed, injured, their lives destroyed by the disasters to come. And for those who still do not believe that it will happen to them, or happen in their lifetime—whole cities destroyed, hundreds of thousands of people displaced, thousands dead here in this country—I give you Katrina.

It's about a relationship

Ben Franklin, in his inimitable wisdom, once said that "the definition of insanity is doing the same thing over and over and expecting a different result." In our case, we not only do the same thing, but more and more of it—from more housing developments in diminishing green spaces, on flood plains and fault lines, to more shoreline development and mountain homes, to increased oil-based mobility of humans and products, to consumption of what we believe are endlessly replaceable goods, and on and on. As we lose the natural beauty that once surrounded us and become saturated with consumer goods in this country, we try to force more and more cultures and economies to open up their markets and follow our example, trying to coerce

or entice them into living just like us. By Franklin's standard, we have truly gone insane.

As we crowd this planet, more disasters will affect more people. Some of these will be forces of nature, like earthquakes, tsunamis, and hurricanes. Some of these will be human made, natural disasters grown more unnatural because of the heavy human footprint on the planet. We have lived as if the earth would never move under our feet, or our nearby volcanoes would never explode, or the ocean would never send a killer wave to our coasts in our lifetime.

What happened on the day after Christmas in 2004 was *necessary* for life. That may be hard to hear, but the kind of earthquake that created the tsunami is, literally, something the earth needs to do so that there is life. That earthquake was the result of one tectonic plate slipping underneath another. It is a form of recycling. The oceans and continents drift on the earth's crust, moving inches every year. The crust recycles, creating mountains and volcanoes, enriching soils, maintaining the chemical balance of the oceans. This recycling makes the planet habitable. If the earth doesn't do this, life as we know it dies.

It is hard to grasp the renewing nature of what in human terms was such an enormous disaster. But it may tell us something about our planet that we need to know, what we are a part of, the meaning of the regenerating nature of life and death and life and death, and how we might learn to live more humbly, more appropriately, more tuned in to the forces of nature as they create and re-create life through the churning, teeming, often violent forces of this uniquely amazing planet.

At the same time, because we humans are everywhere, we had also best search deep within ourselves for the values and meaning, the deeply rooted spirituality, that will carry us through these disasters, horrific as they are in human terms, until we can achieve in future generations a better balance of human population with the forces and energies of the earth.

We will need all our spiritual and moral strength to bear the costs. We will need neither to be crushed by the death and suffering nor to turn away from it. We will need a whole lot more compassion that doesn't diminish with the passage of time. We will need to decide as a society what kind of people we are, what we are willing to let go and let be, as we face more of these crises.

The story of the Mississippi delta is in the end about a relationship, the relationship between humanity and the environment that surrounds us, forms us, is us. One could take an example from the therapeutic world as yet another metaphor—we are in an abusive relationship with an intimate other. We have created a dysfunctional relational dynamic, and now we don't know how to stop it. It is destroying both of us—one from the physical abuse, the

other from loss of soul. And deeply embedded in the dynamic of the abuser is the dynamic of power.

Comparing the relationship between the river and the Army Corps of Engineers with that of Rick Eddy at the tackle shop in Leeville, or scientists like Reed and Houck, those who feel the loss because it is a part of them, we begin to get a better sense of the choices before us. And none is more essential than the choice we make about the kind of relationship that will guide us now. More than anything else, this will determine what comes next and whether there is hope in the decisions we make about how to proceed. Those decisions will be very hard ones indeed. But if we choose to go on as we have been, then we had best prepare ourselves for the disasters to come. They will represent without doubt a culture that has truly gone insane.