

# COASTAL HERITAGE

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## Calm After the Storm?

*Disasters and  
Mental Health*



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PHOTO/GRACE BEAHM

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S.C. Sea Grant Consortium  
287 Meeting Street  
Charleston, S.C. 29401  
phone: (843) 953-2078  
e-mail: [Annette.Dunmeyer@scseagrant.org](mailto:Annette.Dunmeyer@scseagrant.org)

Executive Director  
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**Patriarch.** *The late Jimmy Scott, a McClellanville, S.C., shrimper, and his family endured a long night of terror when Hurricane Hugo struck in 1989.*  
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## Calm After the Storm? *Disasters and Mental Health*

by John H. Tibbetts

**J**ohn Scott was nine years old when Hurricane Hugo's storm surge ripped his father's 68-foot shrimp trawler, *Mary Margaret*, from its moorings and tossed the boat ashore into a tree. It would be stranded there for months.

The storm surge rammed into the Scotts' home near Jeremy Creek, swamping the entire first floor and driving furniture into the backyard. The surge also poured into the Crab Pot restaurant, where the Scotts and another family had taken refuge on the evening of September 21, 1989.

The Crab Pot, now shuttered, was located in a single-story, concrete-block structure on relatively high

ground on state Highway 17, some two miles inland from the vast salt marshes that buffer this part of the South Carolina shoreline from the heaviest Atlantic storm waves.

John Scott's father, Jimmy, who passed away in October 2010, knew that stretch of coastline as well as anybody. You couldn't miss him on the fishing dock—he was the one with the red-and-white beard of biblical proportions.

After his Navy service, Jimmy Scott returned to live in his hometown of McClellanville (pop. 495), S.C. In 1973, he built his shrimp boat and captained her on his last healthy day before he died.

Jimmy Scott was known as a serious, conscientious man—not someone to take unnecessary risks. So it must have stunned him when the Crab Pot's front door blew open and water poured in. "Jimmy knew we were in trouble when we saw fish swimming by, because that meant it was salt water," recalls his wife Mary.

Before Hugo made landfall, most coastal South Carolinians shrugged at hurricane warnings. The tropical cyclones of living memory had spawned unimpressive winds and downpours. Hugo was the first major hurricane (Category 3 or higher) to strike the U.S. Atlantic Coast in 25 years.

The Scotts made a wise decision to evacuate their low-lying home in town near Jeremy Creek and take refuge in a sturdy building farther inland—a decision that might have saved their lives. Scientists later found that Hugo's surge (19.8 feet) was one of the highest ever recorded in the continental United States.

The surge had lost most of that height by the time it reached the Crab Pot, but it remained a potential killer. Not long after midnight when the shrieking wind outside suddenly stopped, Jimmy Scott and his close friend, Larry McClellan, knew they were in the eye of the storm and decided to move their families to higher ground.

Everyone mobilized outside—the Scott family, the McClellan family,

and three dogs. They waded through a vast muddy lake formed by the surge and piled into a pickup truck. Riding slowly along the dark highway, they watched floodwater “boiling over the hood of the truck,” Jimmy Scott told the *Charleston Post and Courier*. “When we left that restaurant, I wouldn't have given you five cents for anybody's life in that truck.”

After a hundred yards or so, they came to a friend's home on higher ground where they huddled the rest of the night.

When the sun rose, they looked outside at the ruined landscape of mud and soaked, broken trees. It turned out that huge numbers of shattered pines had fallen across the roads, blocking routes to Charleston and Georgetown, the nearest urban centers, 35 miles and

23 miles away, respectively. Volunteers over days struggled to clear roads so that news of their troubles could reach emergency responders in Charleston.

John Scott, now 31 and still living in McClellanville, has fragmented memories of their night in the Crab Pot. “It was pretty scary for a nine-year-old. We could hear trees breaking outside, some hitting the building. There were nasty smells and the water coming in. It was rough. I was holding tight to my sister, Margaret, who is 10 years older.”

He has a deeper recall of Hugo's long aftermath—the sights and sounds of people working together to rebuild.

“Pretty much all of my family is here, on both my mom and dad's sides,” he says. “I heard them discussing things, talking things over, and I saw a lot of



**FAMILY TIES.** The Scott family, including (left to right) brothers Jim, Hugh, John, mother Mary, and sister Margaret, recall the hardships of Hurricane Hugo at home in McClellanville, S.C. The storm surge swamped their entire first floor, but the family quickly moved into the second floor and began repairs.

PHOTO/GRACE BEAHM

people volunteering to help others.”

John felt safe and protected within the warm circle of his extended family, and he soon returned to the world of childhood. “After several days, it was kind of an adventure for me. There was debris scattered from one end of town to the other, and I spent a lot of time rummaging around. We didn’t have school for a month.”

His brother Jim, eight years older, recalls a more anguished McClellanville after the storm. He was visiting some friends at Clemson University when the hurricane struck, and he raced home.

He found nearly every structure in town severely damaged. There was a thick layer of mud over everything—mud, mud, and more mud. Countless dead fish rotted in the streets and in ruined kitchens and dining rooms.

Yet Hugo’s psychological impacts seemed as devastating as its physical ones.

“People were dazed,” Jim says. “They seemed lost. Shaken to their core. From a young person’s perspective, it was distressing to see people who were pillars of the community, strong people, stoics, who seemed broken by the hurricane, saying, ‘We’re never going to recover, we’re never going to get the town back.’ I’d never seen any of them like that.”

An attorney, now 40, Jim Scott still lives in McClellanville and commutes to his office on Broad Street in Charleston. “The initial shock and awe, though, faded pretty quickly,” he says. “People started rolling up their sleeves, neighbors helping neighbors.”

Still, it was a grueling time. Hugo’s surge had thrown Jimmy’s fishing boat into someone’s yard, and he missed the traditionally lucrative fall shrimping season, so money was tight. The family home was still standing, but the surge ruined the entire first floor. The Scotts moved into the second floor and began repairs.

Every day was exhausting. “I would get up and *do mud*,” says Mary, “then I’d line up something to eat. That’s what a mother is supposed to



**RESILIENT.** “During Hugo, we lost a lot of physical things—trees, boats that tied up here—but the village recovered quite well,” says John Scott, shown here on the shrimp boat, Olivia Anne, that he owns with his father-in-law.  
PHOTO/GRACE BEAHM

do, isn’t it—feed her family?”

A year passed before the Scott family fully regained their lives’ normal rhythms. But belonging to a close-knit community seemed to ease some feelings of loss and disruption.

“This town is a large extended family,” says Jim, the eldest son. “Six or eight core families have been here for generations, with newcomers sprinkled in. Everybody knows everybody. There’s a sense of we’re all in this together. We have a sense of community and the bond of neighbors, who are really our aunts and cousins and everything. If we didn’t have a lot of close friends and family to help us, it would have been a lot harder.”

Just as important, McClellanville witnessed the kindness of strangers.

“During the first days,” Jim says, “no one outside seemed to realize the extent of our problems here, but later on there was an incredible amount of assistance from across the country. That lasted weeks, months. It was the most impressive thing about the experience. The sustained help over time amazed

me. People came in here to help us fix things all over our little town.”

### THE THOUSAND-YARD STARE

Some disaster victims, unfortunately, don’t bounce back. Children grieve the loss of their homes, neighborhoods, and schools. Many adults struggle with debt after losing jobs and businesses, their emotional and financial resources shattered.

Over the past 30 years, there has been a dramatic change in the understanding and treatment of mental-health trauma caused by overwhelming fear and stress. Hundreds of studies have focused on post-disaster mental health alone, and the field continues to grow.

According to the scientific literature, the mental-health impacts of Hurricane Katrina, which hit South Florida and the Gulf Coast in 2005, has far outstripped that of any other natural disaster in U.S. history.

Researchers have learned that close, trusting relationships among

family members, romantic partners, friends, neighbors, and coworkers are essential in helping people recover emotionally after frightening, stressful events.

Studies show that individuals are more likely to suffer psychological disorders after a disaster if they:

- were injured or had seen people hurt or killed,
- experienced additional extreme stress, such as loss of a loved one or loss of a job, a business, or a home,
- are lower income, minorities, or women, or
- lack emotional and social support before, during, and after the event.

It's normal to suffer some psychological strain after a life-threatening disaster. The body, including the brain, can't snap back to a calm state once a terrifying event has passed. Charged by fear and stress, the body continues to run hard on emergency fuel.

The body's first response to potential danger begins in the primary senses—smell, sight, and hearing—that send alarm messages to a network of structures in the brain. This complex brain network evaluates a potential threat by measuring it against stored memories of past dangers.

Is the threat real? Is it imminent?

If the answers are yes and yes, the brain sends emergency messages to the nervous and endocrine systems, which in turn flood the body with energy reserves. The heart beats faster, adrenaline surges, and the body is ready to fight or flee.

Although our fight-or-flight biological mechanisms allow us to compete and survive in a dangerous world, they can become over-sensitized, hair-triggered. After a series of traumatic experiences, ordinary events and common stresses can repeatedly trip the brain's emergency alarms.

A McClellanville man who asked that his name be withheld was 15 years old when he and his family experienced Hugo's terrifying storm surge. One night, weeks after the hurricane, a booming thunderstorm hit the town. "Yeah, I was frightened again," he says.



**SHELL-SHOCKED.** This Marine exhibited a "thousand-yard stare" after combat in World War II. PHOTO/LIBRARY OF CONGRESS

"I was pretty shook up. We all were."

Again, this is a common response to a terrifying event. But if symptoms of reoccurring intense stress and fear don't eventually disappear, they might indicate Post-Traumatic Stress Disorder (PTSD).

Victims of PTSD suffer a variety of symptoms, including intense anxiety, nightmares, insomnia, fatigue, emotional numbness, repetitive and unwanted memories, social isolation, and "hyper-response" in which they overreact to perceived threats.

For obvious reasons, certain populations—combat veterans and emergency responders, for example—are especially susceptible to PTSD.

A study by Jeanne Mager Stellman, a psychiatrist at Mount Sinai School of Medicine in New York City, and her colleagues tracked 10,132 workers involved in the rescue, clean-up, and recovery operations at the World Trade Center after the 9/11 terrorist attack. Workers completed a mental-health questionnaire 10 to 60 months following the attack.

Stellman's survey found that 11.1% of the responders met the study criteria for probable PTSD. That's nearly the percentage of probable PTSD prevalence among U.S. veterans returning

from Afghanistan (11.5%) and it's far higher than that of the U.S. general population (about 3%).

To the public, PTSD is usually associated with men emotionally damaged by combat experience. But women are more likely than men to suffer this psychological injury on the home front or in peacetime. Victims of rape, for example, have very high rates of PTSD.

"Psychological trauma is an affliction of the powerless" in the face of an "overwhelming force," writes Judith Herman, a clinical psychiatrist at Harvard University Medical School, in her 1992 landmark book *Trauma and Recovery*.

Besides PTSD, there are two other major mental-health disorders associated with traumatic events: depression (having persistent feelings of hopelessness) and anxiety (having worries that become debilitating). Some PTSD victims suffer one or both of these disorders as well.

A strong signal of PTSD is a closed-down, glassy-eyed expression. Veterans in World War II called this dazed, unfocused look the "thousand-yard stare." Unresponsive and numb, a soldier had lost awareness of events and people around him, cut off from the world. If he was fortunate, he would be treated in a hospital for shell shock or battle fatigue.

Bessel A. van der Kolk, a Boston-based clinician and researcher, has said, "The traditional thing about PTSD is a hyper-response, but we have come to understand more in recent years . . . that the worst thing that happens in trauma is that people shut down and become like zombies. Then people really lose their capacity to engage in and attend to their current environment. Their whole system gets shut down."

Mental-health workers have their own term for this shutting down symptom: "dissociation." It is interesting to note that the word "dissociate" comes from Latin words that when translated mean a "reversal of unity or companionship."

## LOST TRUST AND EXILE

The American cultural ideal of rugged individualism is new in human history. The reality, of course, is that our ancient ancestors evolved over hundreds of thousands of years in the context of group dynamics. They were nomads who moved in kin-based bands from place to place, searching for food and shelter. As individuals, Paleolithic people were not imposing figures. They lacked claws, horns, or sharp teeth to kill prey or fight off predators and enemies.

Their modest weapons were made of stone, bone, and wood. They survived by trusting one another, hunting and gathering in small parties, solving problems together, and older generations passing down knowledge. Life in a Paleolithic band was hard and short, but life as an outcast was far harder and shorter. A lone-wolf personality wouldn't have survived long in the Paleolithic times.

To develop emotionally, each of us needs a well-founded trust in others, especially during our earliest years. When very young, children first find a sense of self that is dependent on a parent or other caretaker's gentle authority. Through this powerful attachment, children trust a caretaker's love, protection, and guidance.

Later, this faith in others can be extended to a broader circle of siblings, aunts, uncles, and cousins, close friends, and in adulthood to spouses and other romantic partners. The desire to trust and care for others is imprinted in our DNA. Without that trust, we are more vulnerable to psychological injuries.

In 2007, Ron Acierno, a clinical psychologist at the Medical University of South Carolina and the Veteran Affairs Medical Center in Charleston, and his colleagues published a study showing that individuals who developed strong connections to social networks—churches, synagogues, mosques, senior centers, schools, and other institutions—preceding four damaging hurricanes (Charley,

## Veterans sailing and building friendships

**E**ach Friday afternoon, teams of military veterans sail from Ashley Marina into Charleston Harbor, testing their skills against currents, tides, and winds as part of a nonprofit initiative called Veterans on Deck for men and women who have suffered Post-Traumatic Stress Disorder (PTSD) and other serious psychological injuries.

Ron Acierno, a psychologist and director of the PTSD Clinical Team at the Veteran Affairs Medical Center in Charleston, has established a two-step process for patients.

"First, you have to address the symptoms," exposing the patient to stress in a controllable way, he says. "We'll have the guy go to Walmart, starting him off easy, at 2 p.m. on a Thursday when nobody's there, and then we'll gradually build up his exposure to a 2 p.m. on a Saturday when it's packed. Then we'll have him describe his memories of the horrible things that happened to him [in combat] in excruciating detail. We'll even tape-record it, and then have him listen to it two or three times a day for weeks. When he's done with that, the symptoms are very low" because he has become desensitized to his traumatic memories.

Later, spouses update Acierno on veterans' progress. "A wife will call and say, 'He's not jumping out of his skin anymore, and he's not so upset all the time. But he doesn't go out to dinner anymore, he doesn't play athletics anymore.'"

Acierno realized that the veterans need another therapeutic step toward recovery. "Therapy without social and community interaction isn't enough."



**TEAMWORK.** A Veterans on Deck sailboat.  
PHOTO/GRACE BEAHM

So he founded the nonprofit Veterans on Deck, an organization that uses sailing to contribute to socialization, teambuilding, and personal growth among male and female veterans recovering from PTSD, substance abuse, and military sexual trauma.

"We are putting them in a situation that has a little stress and seeing them work their way through it—that's sailing," says Acierno. Veterans collaborate to overcome fear, build relationships, and find success in making a boat move through the water.

"Now guys are coming down the marina and working on the boats. Unless you get them motivated to get out of the house, they won't do it. The wives call and say, 'This is great. He's getting out. He never did that before.'" ♡

Frances, Ivan, and Jeanne) that struck Florida in 2004 were more protected from major psychological disorders following the storms.

It's not uncommon for seniors especially to be emotionally harmed by a disaster because of their social isolation.

"As you get older, your social-support networks naturally decline," says Acierno, "particularly if your ability to replace them declines because you have less access to transportation."

Consider an older female who has macular degeneration and can't drive anymore. She lives in a single-family home in a sprawling, car-dependent neighborhood, and it's too far for her to walk to the grocery store, her monthly book club, and her weekly bridge game.

"You can see the train wreck coming," says Acierno. "You see people who are getting less and less social contact because of aging." An older person's isolation becomes a risk factor for depression or PTSD if a natural disaster or other trauma occurs.

"In walking cities such as New York and Chicago and Seattle," says Acierno, "an older adult can go to the

butcher every week and to the baker every week, and if they don't show up, people will say, 'Where is so-and-so?'"

A community's intervention for older adults, Acierno says, could "come down to [providing access to some form of] transportation to help their social re-connection."

Still, it can be humiliating for proud, resourceful individuals to ask for aid following a disaster.

Rebecca White, a child-and-family development specialist with the Louisiana State University AgCenter in Baton Rouge, guided Hurricane Katrina evacuees to disaster-aid resources. Many evacuees had lost everything in the storm and needed food, shelter, clothing, and medicine.

"All of us at some time need support from others," White says. "We need support from others to live optimally in this world we live in, and this is even more important after a disaster. It's my instinct that if you have been comfortable asking for help before a disaster, you will be more comfortable asking for help after one."

Hurricane Katrina was a reminder that it's important to have "family,

friends, and faith" when coping with disaster, White says. People who have all three assets seem more emotionally resilient.

White was especially struck by the faith community's response to Katrina evacuees. "Churches didn't just wait, they started doing. They deserve accolades for opening their doors to people. It was amazing to see them live out what they believe in."

## TIME TRAVELING

Human beings are natural time travelers, though we do it only in our minds. Our brains have evolved in ways that allow us to think often of the past and dream of the future. Our memories, hopes, and plans allow us to experience time travels countless times a day. But extended, overwhelming stress can damage this essential cognitive ability.

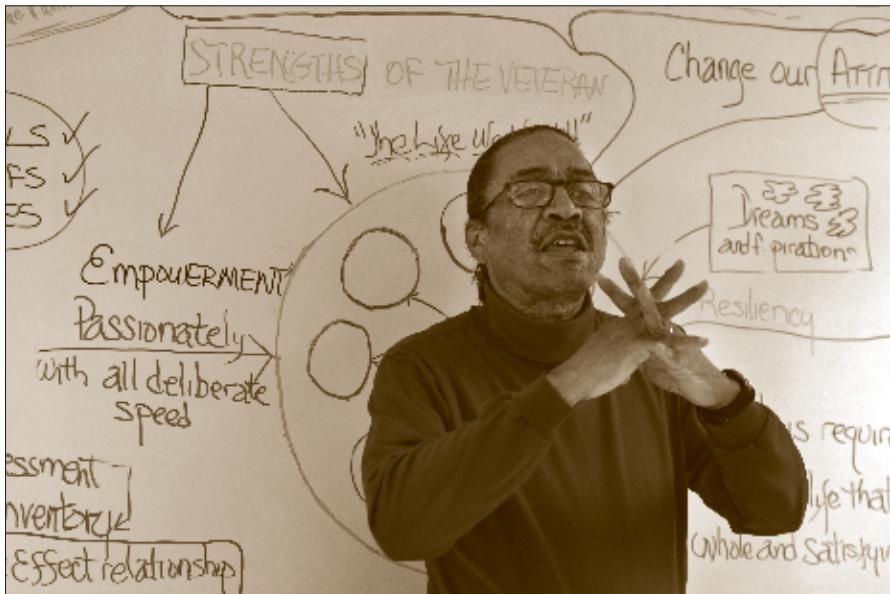
The novelist Joyce Carol Oates once explained how memory is central to our emotional and intellectual lives: "All of civilization . . . is the consequence of never being exclusively *here, now* but [also] having the conscious ability to be *there, then*."

When you read to a child, plan a wedding, ask for a raise, serve on a jury, write a birthday card, watch a play, reminisce with a friend, perform an experiment, or decide to work harder at a task next time, you are not only engaged in the present—*here, now*—but you are imaginatively and intellectually engaged in other places and times as well.

Think of a man working late again at the office. When he finally walks to his car, a spring breeze carries a familiar scent.

"Freshly cut grass," he says to himself. "Those evenings playing catch with the kids. Why don't I have time for that anymore? I have to make time. But how?"

In a few moments, he has been physically located in one time and place, while recalling other times and places and deciding to make plans for the future.



**HEALING PROCESS.** Frank Wainwright leads a discussion during a "Fundamentals of Recovery" class for a group of veterans living with mental illness at the Ralph H. Johnson Veteran Affairs Medical Center.

PHOTO/GRACE BEAHM



How does the human brain perform such mental time travels?

First, the man's sense of smell sent a message to his brain, which translated and organized this information into language ("freshly cut grass"). Then he remembered moments of similar sensory experiences ("playing catch with the kids") and put those events in the context of his life story ("Why don't I have time for that anymore?"). And, finally, he decides to make a plan ("I have to make time. But how?") to change his behavior.

A person with a healthy brain experiences mental time travels many times a day, his mind cycling rapidly through memories, present sensory experiences, and plans for the future.

Prolonged, intense fear and stress, however, appear to harm a crucial brain structure—the hippocampus—that allows human beings to remember and learn.

Cortisol, a steroid hormone, is released naturally in the brain during times of stress. But during long-term, terrifying experiences, cortisol can rise to concentrations that appear to kill neurons in the brain, especially in the sensitive hippocampus, which allows people to store and retrieve memories.

Excess cortisol seems to shrink the hippocampus and cause memory deficits and other symptoms of PTSD, according to Victor Carrion, a psychiatrist at Stanford University School of Medicine.

The hippocampus is one of the first brain areas to indicate damage from Alzheimer's disease, which destroys memory and traps sufferers in the immediate present, among other symptoms.

Brain scans of Vietnam veterans with severe PTSD symptoms have shown significant losses in hippocampus volume. Brain scans of adolescents with severe PTSD show similar atrophy.

PTSD is isolating in part because its victims struggle to think effectively, to integrate thoughts of the past, awareness of the present, and expectations of tomorrow.

Researchers are exploring whether psychotherapy and anti-depressants can restore hippocampus volume in some PTSD patients and fully restore lost brain functions.

A single traumatic event can't atrophy brain tissue, according to researchers. Instead, only longer-term trauma appears to shrink the hippocampus. Combat veterans, severely abused children, or children living in unstable, high-stress, or violent environments are some populations that can have elevated cortisol concentrations in the brain.

A traumatized person with an atrophied hippocampus is more likely to struggle mentally and emotionally, having lost some of the cognitive powers needed to learn, adapt to challenges, and sustain relationships with friends, family, and broader social circles.

## RELATIONSHIPS AND RESILIENCE

Newer medicines, including anti-depressants, and therapy can help severely traumatized people recover. Even so, as Suniya Luthar, a professor of psychology and education at Columbia University, points out, "Resilience rests, fundamentally, on relationships."

Jonathan Shay, an author and psychiatrist who works with traumatized military veterans, has said that PTSD sufferers improve their mental health by connecting with others who have experienced similar dangers. "Recovery only occurs in community." Among combat-trauma victims, talking with other veterans is essential. "Peers are the key to recovery."

Disaster survivors, research shows, suffer fewer long-term mental-health consequences if they feel physically, emotionally, and financially *safe* once the immediate danger has passed. Those who lack such crucial resources—the poor, the isolated, the elderly, the sick, and children who have lost caretakers—are more vulnerable to psychological disorders.

## Checklist of PTSD symptoms

There are three categories of PTSD symptoms, according to the National Institute of Mental Health.

### 1) Re-experiencing symptoms

- Flashbacks—reliving the trauma again and again, including physical symptoms like a racing heart
- Bad dreams
- Frightening thoughts

### 2) Avoidance symptoms

- Staying away from places, events, or objects that are reminders of the experience
- Feeling emotionally numb
- Feeling strong guilt, depression, or worry
- Losing interest in activities that were enjoyable in the past
- Having trouble remembering the dangerous event

### 3) Hyperarousal symptoms

- Being easily startled
- Feeling tense or "on edge"
- Having difficulty sleeping or having angry outbursts

Hyperarousal symptoms are usually constant instead of being triggered by things that remind someone of a traumatic event.

## How is PTSD detected?

A doctor who has experience helping people with mental illnesses can diagnose PTSD. To be diagnosed, a person must have all of the following for at least one month:

- At least one re-experiencing symptom
- At least three avoidance symptoms
- At least two hyperarousal symptoms
- Symptoms that make it hard to go about daily life, go to school or work, be with friends, and take care of important tasks

Source: *Post-Traumatic Stress Disorder*, a booklet, National Institute of Mental Health. ✓



**SUPPORT NETWORK.** *Pastor Joseph Bolick greets members of St. Matthew's Lutheran Church after Sunday morning service in Charleston, S.C. People with strong ties to social networks—churches, mosques, synagogues, schools, and other institutions—are more protected from major psychological disorders after disasters.*

PHOTO/GRACE BEAHM

It's understandable that most hurricane victims want to rebuild their lives and social networks in the same places that were devastated by wind and water.

New Orleans, for instance, recovered its population far more quickly than expected. Six years after Hurricane Katrina in 2005, the city has 350,000 residents, the same population as pre-Katrina. The metropolitan area has nearly the same number of people living there as it did before the storm.

Its recovery was aided by the federal government's National Flood Insurance Program, which is supported and subsidized by taxpayers. Flood insurance and other sources of federal disaster aid have allowed many property owners to rebuild there.

The geographer Peirce Lewis once wrote that New Orleans is "an inevitable city on an impossible site." The city was inevitable because the original fort and town were built on

a rare crescent of high land overlooking the vast swampy delta of North America's largest and most important trading waterway, the Mississippi River.

For centuries, settlers drained miles of swamps to build port facilities, oil pipelines, factories, roads, schools, and homes. Ever since, delta sediments have been slowly compacting so that the city, surrounded by levees, sinks further below sea level, and every year becomes a little more vulnerable to devastating storm surges.

Perhaps because of our immigrant heritage, Americans are optimistic, forward thinking, and skilled at shaping profoundly stressful experiences into narratives of struggle and renewal. We believe that we can rise above almost any challenge.

"We are a resilient people," says Bill Read, director of the National Hurricane Center.

Americans, though, can also be reckless. We ignore warning signs and

forget lessons learned. "Memories of a hurricane," says Read, "soften after five years."

Still, it's healthy for us to sustain some memories—even traumatic ones—that can strengthen our emotional connections to those closest to us. Katrina evacuees have returned to New Orleans because it's the place where they have homes, jobs, friends, and family, where they hope to be remembered, where their ancestors were born and lived and died.

The author Rebecca Solnit explains: "Before Katrina, [New Orleans] had the most stable population of any American city: people stayed in one neighborhood, sometimes one house, for generations; they knew their music, their food, their history, and their neighbors, and they celebrated their rituals, which are complex and frequent in this Catholic bacchanal of a port town that has a second-line jazz parade with dancing in the streets every Sunday."

Long-time residents of jazzy, touristy, industrial, port-city New Orleans share one characteristic with those of tiny McClellanville, S.C., battered by Hugo in 1989.

It's not a love of parades and dancing in the street.

McClellanville's quiet, oak-lined lanes are a world apart from Mardi Gras' urban grit and gaiety, its heraldic cornets and pounding drums. But this fishing village and the Big Easy both have held onto something that so many other places have lost: a sense of shared life challenges within families and through generations.

The Scott family of McClellanville remembers Hurricane Hugo every September. They recall a night of terror and a year of continual struggle together. It's a life marker for the family—events happened before or after Hugo.

The same is true of the people of New Orleans. As Bill Read of the National Hurricane Center says, "Someday they'll tell their grandkids everything they did on the day the levees failed." ♡

# For children and families, disaster traumas linger

**H**urricane Katrina and its aftermath were life-altering traumas for many Gulf Coast children who suffered continuing mental-health problems after being displaced from their homes.

In August 2005, Katrina killed more than 1,800 people, the great majority of them in New Orleans where flooding filled up 80% of the city after levees and floodwalls failed.

Many thousands more lost homes, jobs, businesses, schools, and communities, losses that affected the emotional lives of children.

Desperate families lived for days on New Orleans rooftops. Some saw people die. Thousands more families waited out the storm and its aftermath in shelters of last resort—the Superdome and the New Orleans Convention Center—where they endured brutal heat, no electricity or functioning toilets, and dwindling supplies of food and water.

When rescuers arrived, many children were misplaced in the transportation and shelter system. They were put on buses or planes alone with no idea about where they were going and who would care for them. After the storm, more than 5,000 children were reported missing to the National Center for Missing and Exploited Children. All were eventually recovered.

For months or years following the storm, thousands of families lived in crowded shelters, temporary homes, and trailers, moving frequently. Overwhelmed adults lost jobs and savings in the storm, and struggled to pay for food and clothing.

Children were torn away from everything familiar, safe, and stable. Numerous studies have shown that children and adolescents who are separated from their parents, homes, and communities during and after a natural disaster are more vulnerable to mental-health problems.

From 2005 to 2007, Howard Osofsky, a psychiatrist at the Louisiana State University Medical Sciences Center, and his colleagues screened more than 7,000 children and adolescents with a mean age of 14 from heavily affected Louisiana parishes

after Hurricane Katrina. Most of the children assessed had not returned to their pre-storm homes.

Children separated from a parent or caregiver at the time of the screening suffered increased trauma symptoms. Children also had more trauma symp-



**LOST CHILDHOOD.** Three days of cleanup after Hurricane Katrina in New Orleans left ruined children's toys and other debris at the curb.

PHOTO/WAIDE SPEES

toms if they had lived in a shelter or if they were living currently in a government-supplied trailer instead of their own home. Younger children (grades 4–8) suffered more trauma symptoms than high school students.

Osofsky and his colleagues argue that government disaster plans should account more for the needs of parents and children.

One of the tragedies of Katrina, researchers say, is that so many boys and girls lost part of their childhoods. Instead of having time to develop emotionally in safe environments, untold thousands of children were exposed to intense stress and disorder in shelters and emergency housing. Rebecca White, a child-and-family development specialist with the Louisiana State University AgCenter in Baton Rouge, witnessed the extreme stress among evacuee families after Katrina.

“There were hundreds of thousands of evacuees who had to leave the security of their own homes,” she says. “Suddenly they are surrounded by strangers in a group-living environment. Children are having nightmares and crying 24/7 because they are afraid. Emotions are so close to the surface, and some parents can react harshly. How can we help parents



**CAREFREE.** Richard and Emily Lynn Hertau enjoy a tire swing in their McClellanville, S.C., front yard. To develop emotionally, children need plenty of time to play in safe environments.

PHOTO/GRACE BEAHM

when they are at their wit’s end? We opened side rooms in the shelter where children could go and have art activities, so parents could take a

break. You always need a support system to help you be a better parent, and you especially need it during a disaster.” ♡



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# Friends learn to listen after disasters

An innovative program along the Gulf Coast is helping communities become more disaster resilient by strengthening their social and emotional ties.

A “peer listener” educational effort on the Gulf Coast has trained more than 600 local leaders in listening more effectively to friends, family, neighbors, and coworkers.

“Peer listening helps leaders—folks in the fishing industry, faith groups, extension, and the police—gain skills they need to create stronger social safety nets in their communities,” says LaDon Swann, director of the Mississippi-Alabama Sea Grant Consortium, which has supported the project on the Gulf Coast. “After the Deepwater Horizon oil spill, I saw that we needed a way for people to manage their stress.”

Steven Picou, a sociologist with the University of South Alabama, developed peer-listener training in Alaska from 1995 to 1997 after the Exxon Valdez oil spill. He has done extensive research on communities, disasters, and “collective trauma.”

Technological disasters such as the Exxon Valdez oil spill in Alaska and the Deepwater Horizon oil spill in Gulf Coast states are far more damaging than natural disasters to personal relationships in communities, says Picou.

After a hurricane strikes, you clean up the mess and rebuild. It’s frequently a straightforward but expensive process. A technological disaster’s effects, by contrast, are harder to measure and recover from. The Deepwater Horizon spill lasted for 87 days after the oil first started leaking, and emotional stresses mounted as workers lost jobs and businesses suffered.

“The spill looked like it could go on and on,” says Picou.

Triggered by human error, technological disasters corrode a community’s

sense of trust among friends, family, neighbors, and leaders.

“When a natural disaster strikes, people quit blaming God after about a week,” Picou says. “Usually a therapeutic community emerges. Local people help one another. All of the external resources—food, blankets, water—coming in are positive.”

But in a technological disaster like Deepwater Horizon, a corrosive reaction tends to grow. In many cases, the principle party that caused the technological disaster does not step forward to accept responsibility and address the problem. In a vacuum of accountability, residents tend to self-isolate, and

the community fragments instead of coming together.

Peer listeners are not trained to become counselors or therapists. Instead, they emphasize empathy and understanding. Still, they are taught how to listen for red flags, such as increases in drinking and family violence, and how to refer people to professional resources.

Peer listeners, in short, listen more than they talk.

“I’ve found myself peer-listening every day,” says Swann, who has taken the training several times. “It tends to be very therapeutic—people just want someone to talk to.”



**EMOTIONAL RELEASE.** An impromptu art display outside Bobby Pitre’s tattoo shop, in Larose, La., reflects Gulf Coast residents’ anger during the Deepwater Horizon oil spill in 2010.

PHOTO/PAULA OUDER/LOUISIANA SEA GRANT

# NEWS & NOTES

## Governors' South Atlantic Alliance receives NOAA funding

The National Oceanic and Atmospheric Administration (NOAA) has announced Regional Ocean Partnership funding of two Governors' South Atlantic Alliance (Alliance) initiatives that will support the coordinated efforts of North Carolina, South Carolina, Georgia, and Florida to develop a multi-state framework for planning activities in the region's coastal and ocean areas. Federal funding will support ocean data-gathering and analyses for multi-use ocean planning and hazards resiliency, and the continuation of the development and organization of the Alliance. The combined award of \$1,062,431 million will be administered by the S.C. Sea Grant Consortium, on behalf of the Alliance, over an 18-month period that began January 1, 2012.

"With this financial support from our federal partner, the Alliance will build its capacity to work across state lines and regulatory jurisdictions to transform the way we promote and manage our shared ocean and coastal resources," said Earl Hunter, chair of the Alliance's Steering Group and commissioner of the S.C. Department of Health and Environmental Control.

According to Hunter, the Alliance will be working over the next 12-18 months with a number of partners, including the Southeast Coastal Ocean Observing Regional Association and the Skidaway Institute of Oceanography, to begin the design of a multi-state and regional framework for coastal and ocean planning and decision-making. The Alliance will

engage a diverse set of partner organizations and multi-disciplinary teams of scientists and resource managers to gather existing data about the region's coastal and ocean waters, including winds, currents, fishing grounds, sea-floor depths and contours, marine mammal and turtle migratory pathways, shipping lanes, military traffic, tourism, and other uses.

The Alliance will also provide the framework for the synthesis and delivery of coastal and ocean information, enhance collaborations among users, and begin development of decision tools that can be used by state and regional resource managers and local community officials as they balance ocean uses with conservation.

"This coordinated approach will help bolster our coastal economies, improve our environmental quality, and preserve our shared natural heritage. I'm optimistic that we can work together to find common solutions to shared challenges and opportunities," said Hunter.

The Governors' South Atlantic Alliance was formally created in October 2009 by an agreement signed by the governors of North Carolina, South Carolina, Georgia, and Florida. The Alliance fosters collaboration to more efficiently manage and protect the region's immense and diverse ocean and coastal resources, prepare and respond to natural disasters such as hurricanes, and promote economic sustainability.

In December 2010, the Alliance released its Action Plan identifying four priority focus areas for the southeastern United States: healthy ecosystems, working waterfronts, clean coastal and ocean waters, and disaster-resilient communities. In July 2011, the

Alliance released an Implementation Plan that promotes science-based policies and solutions to enhance and protect the value of coastal and ocean resources and support the region's culture and economy.

"We look forward to working with Alliance leadership and its many program partners in support of these important regional coastal and ocean initiatives," said Rick DeVoe, executive director of the S.C. Sea Grant Consortium.

The mission of the South Atlantic Alliance is to significantly increase regional collaboration among South Atlantic states to sustain and enhance the environmental, natural resource, economic, public safety, social, and national defense missions of the respective states and the South Atlantic region.

For more information, visit the Alliance website at [www.southatlanticalliance.org](http://www.southatlanticalliance.org).

## Knauss fellows from S.C. selected

Two College of Charleston graduate students were recently selected as Knauss executive fellows in the 2012 class of the prestigious John A. Knauss Marine Policy Fellowship. Nominated by the Consortium, the students were among 42 selected from a nationwide pool of over 100 candidates.

Jennifer Bennett recently completed a M.S.



Jennifer Bennett

# NEWS & NOTES

in marine biology, and will serve in the NOAA Office of Oceanic and Atmospheric Research Ocean Acidification Program.

Anna Manyak also completed a M.S. in marine biology, and will serve in the NOAA National Ocean Service Office of



Anna Manyak

Response and Restoration.

To further the education of tomorrow's leaders, the National Sea Grant Office sponsors the John A. Knauss Marine Policy Fellowship Program, bringing a select group of graduate students to the nation's capital, where they work in the federal government's legislative and executive branches.

The students learn about federal policy regarding marine and Great Lakes natural resources and lend their scientific expertise to federal agencies and congressional staff offices.

Each of the nation's 32 Sea Grant programs can nominate up to six students to the Knauss fellows program annually. Selections are then made competitively from among those nominations. Visit [www.scseagrant.org/Content/?cid=56](http://www.scseagrant.org/Content/?cid=56) for more information about the Knauss fellowship. ♡

## Tougher building codes strengthen new homes

Good fences make good neighbors. But good roofs might make even better ones, according to a new study by Sea Grant researcher WeiChiang

Pang, a civil engineer at Clemson University.

"Your home will likely have less damage from flying debris during a hurricane if your neighbors have retrofitted their roofs or built new homes under current codes," Pang said.

Coastal building codes have been improved since Hurricane Hugo struck South Carolina in 1989. For instance, builders in coastal areas are now required to attach a home's roof sheathing to rafters with additional nails, which helps prevent roof losses.

Pang and his colleague, Scott Schiff, also of Clemson University, have created computer models to test the degree to which stronger building codes have improved the structural integrity of coastal housing.

Intense hurricane winds can rip plywood sheathing off a roof and carry it airborne as a dangerous missile through a neighborhood, where it can crash through windows and walls.

When intense wind enters a house's protective "envelope," it increases air pressure inside like blowing up a balloon beyond its capacity. If enough pressure builds in the house, the structure will break at its weakest point, usually the roof, which can fly off and create additional airborne debris.

Pang and Schiff have created a computer model that simulates a Hurricane Hugo-sized catastrophic storm hitting northern Charleston County—the same location where Hugo made landfall in 1989. The simulated storm was directed into a



Hurricane Irene tore siding off this building in Kitty Hawk, N.C., damaging the structure's "envelope" that should protect it from high winds.

PHOTO/WEI CHIANG PANG

simulated subdivision including a few dozen homes built under today's coastal construction code. Then the same storm was directed through a similar simulated neighborhood but with homes built under typical construction practices of 1989.

Today's tougher building codes, it turns out, have made roofs stronger in high winds.

"If another storm the size of Hugo hits the coast, we would see less roof failure and less debris because of today's improved roofing practices," Pang said.

The scientists, moreover, have created a computer model that will be used to analyze the trajectories of wind-borne debris and their impacts on buildings.

This product could eventually be used to design better impact-resistant windows and shutters, determine the orientation of buildings and placement of windows in respect to the coastline and typical hurricane paths, and refine building codes to make structures stronger. ♡



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# EBBS & FLOWS

## 2012 Ocean Sciences Meeting

Salt Lake City, Utah  
February 20-24, 2012

The American Society of Limnology and Oceanography and the American Geophysical Union sponsor this international gathering of more than 4,000 attendees. Eighteen sessions feature presentations and discussion about physical, biological, and chemical oceanography, watersheds, climate change, ocean policy, and ocean observations. Visit <http://sgmeet.com/osm2012> for more information.

## National Hurricane Conference

Orlando, Florida  
March 26-29, 2012

This conference's primary goal is to improve hurricane preparedness, response, recovery, and mitigation in order to save lives and property in the United States and the tropical islands of the Caribbean and Pacific. It also provides a national forum for federal, state, and local officials to exchange ideas and recommend new policies for emergency management. For more information, visit [www.hurricanemeeting.com](http://www.hurricanemeeting.com).

## 2012 Land Grant and Sea Grant National Water Conference

Portland, Oregon  
May 20-24, 2012

Water scientists, engineers, educators, and managers can share knowledge and ideas, and identify and update emerging issues. The conference is hosted by a team from Land Grant and Sea Grant institutions around the nation, in cooperation with national program leaders from the U.S. Department of Agriculture and National Oceanic and Atmospheric Administration. Visit [www.usawaterquality.org/conferences/2012](http://www.usawaterquality.org/conferences/2012) for more information.

**Subscriptions are free upon request by contacting: [Annette.Dunmeyer@scseagrant.org](mailto:Annette.Dunmeyer@scseagrant.org)**

**ATTENTION SCHOOL TEACHERS!** The S.C. Sea Grant Consortium has designed supplemental classroom resources for this and past issues of *Coastal Heritage* magazine. *Coastal Heritage Curriculum Connection*, written for K-12 educators and their students, is aligned with the South Carolina state standards for the appropriate grade levels. Includes standards-based inquiry questions to lead students through explorations of the topic discussed. *Curriculum Connection* is available on-line at [www.scseagrant.org/education](http://www.scseagrant.org/education).