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## Apocalypse Now

Global warming, hurricanes and the Georgia coast

By Jim Morekis

WE can argue the particulars all day long, but two indisputable facts are self-evident:

- 1) The earth is getting warmer.
- 2) Hurricanes are getting bigger, stronger, and more frequent.



Tybee Island Mayor Jason Buelterman

Reasonable people can disagree whether global warming is natural, manmade, or a combination of both. They can also disagree about the link between global warming and tropical weather patterns.

But with every Category 5 storm, every lengthening storm season, every year of increasing global temperature, every year of retreating glaciers and melting permafrost, the evidence continues to pile up that something very alarming is happening -- something no generation in living memory has had to cope with.

Washington, D.C., is dealing with the problem the way it often deals with complex issues of profound importance: by ignoring it.

For those who live on the southeast coast of the U.S., however, the issue is anything but hypothetical. And for those of us who live in Chatham County, sticking our head in the Tybee Island sand is simply no longer an option.

"Folks on the coast will be the first ones clamoring for something to be done about this because of the potential consequences," says Tybee Island Mayor Jason Buelterman, who has taken a lead role in combating global warming at the local level.

"Whatever the City of Tybee is going to do will be minimal, but we can set an example for others," Buelterman tells Connect Savannah.

Elected last November, the 31-year-old recently joined over 250 other mayors around the country in signing onto the U.S. Climate Protection Agreement, which is essentially a municipal



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version of the international Kyoto Protocol addressing global warming.

"A lot of people still don't think global warming is really happening," he says. "But I think people who are elected are supposed to look 20, 50 or even 100 years down the road."

The idea is that by making city fleets more fuel-efficient and using more eco-friendly urban design, America's cities can fill the leadership vacuum left by a reluctant -- and in some cases openly hostile -- federal government.

Buelterman admits that Tybee's efforts so far are fledgling.

"The main thing we've done is we've started a curbside recycling program. We're the only government in Chatham County that does that," he says. "We also have a policy that I put in place last year about fuel efficiency in city vehicles."

Buelterman says that while no Tybee vehicles have had to be replaced yet, when they do, fuel efficiency will be balanced with return on taxpayer money.

"If we get a Honda Civic for Parking Services, they cost \$13,000 versus a hybrid for \$20,000. Then we have to look at the cost," he says. "If it's more cost-efficient in terms of long-term fuel savings, then we'd go with the hybrid. If we can save the taxpayers money and be more energy efficient at the same time, of course that's the way to go."

Other cities in Georgia that have signed the U.S. Climate Protection Agreement include Atlanta, East Point, Macon and Athens.

While a self-described progressive city government like Savannah's would seem to be a likely candidate to sign onboard the Climate Protection Agreement, city officials say that's premature.

"I would not want to comment on that until I've actually read the agreement," says Alderwoman Edna Jackson, who is serving as Mayor Pro Tem during Mayor Otis Johnson's recuperation from a recent heart attack.

"And then of course it's something that our city attorney and our city manager would have to take a look at as well."

(Our calls to the City Manager's office were not returned as of press time.)

Despite the often contentious political nature of the global warming debate, Buelterman so far

has received no criticism for signing the agreement.

"I really haven't gotten any negative comments. I guess I hope that's not how it goes, with it becoming a political thing. I'm really more of a centrist, myself," he says.

"I think it's more geographical really, because it affects folks on the coast. Global warming will really impact property owners, especially in low-lying areas like ours."

The hurricane/warming link

Though Mayor Buelterman signed the Climate Protection Agreement, he's still not sold on the link between global warming and hurricanes.

"I just went to a national hurricane conference in Orlando, and one of the sessions was about that," he says. "From what I heard, it's very much in dispute - many think it's cyclical."

But while the jury of science has yet to render a conclusive verdict, there is a clear link between a rise in water temperature and storm activity.

"I don't think you can argue there's a climate change going on," says Phillip Webber, director of the Chatham Emergency Management Agency.

"If the temperature has gone up X degrees over X amount of time, you'll have warmer sea temperatures that lead to increased tropical storm activity. The controversy comes when you debate what is the cause of that warming," Webber tells Connect.

"Still, we've been keeping records on this for what, 100, 125 years? That's just a blip in the timeline of the planet," he says.

"But suffice to say, it's warm, it's getting warmer, and that's going to cause more of this activity."

Most leading scientists agree.

"What we see when we look at the Atlantic, even if we just focus our attention on the last 35 years where we've had very good hurricane records, is a rather spectacular correlation between sea surface temperature and aggregate measures of hurricane activity," says Massachusetts

Institute of Technology hurricane expert Dr. Kerry Emanuel.

The news here is that fresh research is convincing many scientists to put less stock in the natural theory of hurricane activity, the somewhat comforting "multidecadal cycle" that global warming skeptics often speak of.

"I no longer believe there is any evidence for a natural cycle of Atlantic hurricanes, even though a year ago I did," Emanuel says.

"It was largely an error that was made by people who assumed that global change was some nice linear ramping up of temperature, and it hasn't been," he says. "We don't expect now to see, on a decadal time scale, a downturn in activity."

Dr. Peter Webster is a professor at the Georgia Institute of Technology and author of a landmark study in Science Magazine that found the average strength and duration of hurricanes has doubled in the last 50 years.

"The data is fairly unequivocal in what it says. Overall in all of the ocean basins, one is finding almost a doubling of the number of Category 4 and 5 storms," Webster says.

Not only that, but the window for opportunity for these monster storms is increasing as well.

"Since 1915 the number of days in the hurricane season has increased by about 5.5 days per decade. That increase has become even more rapid during the last 30 years," he says. "2005 was a good example of that, where June and October were two very, very active months, which indicates the increase in length of the season."

Global warming skeptics frequently point to the fact that ocean temperatures actually fell from 1950 to about 1990 as proof of a natural cycle.

But Emanuel says there's a specific reason for that.

"The cooling of the north Atlantic from the 1950s to the 1980s had nothing to do with a natural cycle, but with actually the consequence of a different kind of air pollution, most of it manmade, which are aerosols," he says.

Emanuel says that once aerosols -- yes, the stuff that used to come out of spray cans -- were banned in the '70s to conserve the ozone layer, the cooling effect aerosols had on the atmosphere tailed off. Global temperatures subsequently rose precipitously.

"Since about 1985 or 1990, the effect of that kind of air pollution has been overwhelmed by the effect of increasing greenhouse gases," Emanuel says.

What about the talking heads on the Weather Channel who take great pains to avoid any mention of global warming?

"I think it's cultural really," Webster explains.

"While Max Mayfield (of the National Hurricane Center) does a fine job, his main worry is where a Katrina will be tomorrow and at what intensity," he says. "I think where the difference is that most of us viewing hurricanes in a more global sense take a much more holistic view on the role of hurricanes in the general circulation of the planet."

Still, scientists admit that because only ten percent of tropical cyclone activity is in the north Atlantic -- and an even smaller percentage of storms worldwide actually makes landfall -- global warming will never be the prime factor in determining our risk here.

"When it comes to landfalls, even for the next 50 years, it is lady luck that is the main determinant about whether you get hit -- and you shouldn't forget that," Emanuel says.

Prepared for the worst?

"I feel we're much better prepared here in Chatham County than in some other parts of the state," says Pete Liakakis, Chatham County Commission chairman.

"We're in excellent shape, particularly when you talk about other municipalities," echoes Savannah's Edna Jackson.

"We've got one of the best emergency agency staffs in the state of Georgia," says Liakakis, who has a lot of CEMA experience himself. "In fact, our director was being considered to replace the retiring state director."

Tybee's Buelterman says, "Phil Webber is really good, and I'm very comfortable with him and how prepared the county is for these types of situations."

Indeed, in a complete turnaround from the post-Katrina stereotype of the clueless and bumbling disaster response chief, current CEMA Director Phillip Webber brings a wealth of experience to the table as well as a refreshingly non-bureaucratic outlook.

Webber chuckles when he's asked about lessons his agency has learned from Katrina.

"We're still taking into account lessons learned from David in '79, Hugo in '89 and Floyd in '99," he says.

"Our main interest right now is in capitalizing on the interest of others. And the thing Katrina caused is a lot of interest. People came to the table and said, this is something we need to be involved in," Webber says.

"What we need to do now is match that interest with our energy, and leverage that interest to build capacity."

Webber says his disaster approach is a community-wide effort in which no sector -- public, private, for-profit, nonprofit, faith-based, neighborhood -- is not involved.

It's that holistic approach that Webber says will keep Savannah from turning into another New Orleans, where a clash of bureaucracies made an already overwhelming job of disaster recovery nearly impossible.

"You need to have a well-defined process of operations, and while personalities and working with people is important, it has to be strictly process-driven," Webber says.

"You have to have a plan by which fire and police and utilities can work across jurisdictions. You have to think about how you would re-open after a large-scale event like a Category 5 hurricane or a terror incident -- and how you would protect your critical assets," he says.

"We're working to reinforce a lot of messages -- situational awareness being the chief one. And we're working to keep interoperability with elected officials. They're the decisionmakers," he says.

Alderwoman Jackson says there is near-unanimity among local elected officials as to the effectiveness of CEMA's current disaster response planning.

"I'm not going to say it's flawless, but if you ask me right now if we're prepared, I'd have to say yes, we are," says Jackson.

"Everyone learned from Katrina -- the whole United States learned from Katrina," Jackson says. "We know that we have to make sure that every aspect of this city is taken care of, particularly our residents in nursing homes and those who have special needs."

Liakakis says an important part of local disaster response is mutual aid between governments and organizations.

"What we did beginning in September of last year is work with the Coastal Regional Development Center -- comprising ten coastal counties and 35 cities that belong to it -- and bring up how all our cities and counties in the region are set up for mutual aid," he says. "And a number didn't have that."

Liakakis says further lobbying at the governor's hurricane conference last month reinforced the concept.

"I helped get our emergency management agency to work with the Regional Development Center for us to know exactly what kind of support we can get from the ten coastal counties," he says.

"Say they need something in Midway -- generators or trucks or public service workers or doctors or ambulances -- then they'll know that Savannah or Chatham County could provide some or all of that for them."

Liakakis concludes, "We just need to be in depth with our mutual aid, and we've done a good job right here because of CEMA."

Re-engaging communities

"People always ask me, what are we doing differently in the wake of Katrina," says CEMA's Phillip Webber.

"I'm here to ask, what are you doing differently? What are you doing to talk to people in your discipline and your field about the lessons learned? Have you talked to people in Mississippi, Alabama or Louisiana?"

Webber and local elected officials are pushing hard for communities and citizens to take more personal responsibility for disaster response at the micro level -- not to replace government, but to enhance it.

"Katrina showed such a failure of government operation. When you have people standing on rooftops holding signs saying 'help us,' government has failed those people. No question about it," he says.

"You can't make me believe that that large a percentage of people made a choice to just be obstinate."

But at the same time, Webber says Katrina was also a situation of people failing themselves.

"The other side is, let's work to diminish the demand on government," he says. "We also have to have a level of personal responsibility to achieve a standard of care so that we can get our families the heck out of here when the time comes."

To that end, Webber is constantly speaking to neighborhood groups and associations as to the importance of taking stock of the community around them and having a plan in advance.

"I've been going into neighborhoods and communities talking about personal and community preparations," he says. "I've been saying, if you know there's someone in your community who has special needs, we as neighbors can help them. So -- let's just help them."

Edna Jackson has been preaching the same message.

"We've been talking to our neighborhood associations telling them they have to be prepared to help those residents that may not have anyone to assist them, particularly the elderly or disabled," she says.

"We're also telling people if they have to be transported somewhere they should have a hurricane survival package to take with them, including water and crackers or something like that to eat," Jackson advises.

"We want to make sure that this time of year people have survival goods on hand, such as water and a flashlight, and other items you can get from CEMA, along with nonperishable food items," she says.

Webber says that in a city famous for having a church seemingly on every block, faith-based organizations should be taking a greater role in mobilizing community response.

"The thing to do is to get them to look at their rolls and say who's shut in or who has special needs. Don't just put them on a list for the government to take care of," he says.

"That's not the civic spirit that makes America what it is."



Insuring the uninsurable

No one but an insurance salesman enjoys talking about insurance.

But while it's perhaps the least sexy and media-friendly aspect of global warming, the affordability and availability of insurance -- or more precisely, the lack thereof -- may have the most immediate economic impact on the coast.

"We're already seeing the implications in the form of higher prices and restricted availability of insurance. There are also more subtle things going on, like higher deductibles," says Dr. Evan Mills, scientist with the U.S. Department of Energy's Lawrence Berkeley National Laboratory.

Mills says this "affordability crunch" could also trickle down to the real estate and banking sectors.

"It may affect home-lending as well. If insurance isn't available, banks won't engage as lenders, because insurance protects their collateral on their loans," he says.

Last year's storm season was a wake-up call for the global insurance industry.

"The numbers are still coming in. So far it's something in the vicinity of \$200 billion (in damages), part of which was insured and part of which was not," he says. "That certainly does not include the indirect effects, such as the world-shaking rise in oil prices."

The 2005 hurricane season was not only non-profitable for the insurance industry -- with about \$65 billion in insured losses -- but "it's sobering to note that that is significantly in excess of the losses from 9/11," Mills says.

"And so one has to ask our society why so much more attention -- not that terrorism doesn't deserve attention -- but certainly an equal or greater amount should be given to these issues."

Ominously, it was a bad year for the reinsurance industry as well -- that is, the companies who insure insurance companies.

"The reinsurers, who back up the insurers, they paid out \$1.36 for every dollar of revenue they took in," Mills says.

"So what we have here is a growing crisis of the availability and affordability of insurance, and we've seen withdrawals of insurers from various Gulf states."

In a sense, Mills says, the economy actually dodged a bullet with Katrina.

"The insured value of coastal property just for Florida and New York is about \$2 trillion for each state," he says. "The insured value of Mississippi, Louisiana and Georgia is about one-twelfth of that total."

Still, the exponential growth of the southeastern coast means even more damage is likely as storms increase.

So is the answer simply to develop elsewhere?

"If you look at this huge rise in damages over the last 100 years, it's almost all demographic," Emanuel says, referring to the growth in coastal population.

"But often this is portrayed as a false dichotomy as well -- that since it's all demographic, why should we worry about global warming. Problem is, they're compounding," he says. "It's not that you should worry about one or the other -- you have to worry about both."

The increased development and the subsequent increased threat of property damage to the coast may have a huge effect on the currently cheap and widely available federal flood insurance.

Mills says the largest burden of insurance loss from storms falls on the government, "and the insolvency of that national flood insurance program is the most poignant example of that. We're clearly not pricing the insurance to reflect the exposures."

As Emanuel says, "It's not surprising that when you subsidize risk, people take risk."

If increased hurricane activity forces the federal government to revisit the whole notion of subsidized flood insurance, it could have a huge effect on regional economies, one that local leaders are loathe to consider.

Tybee's Mayor Buelterman says, "It's scary to think about, but if we keep getting hits it's inevitable that's going to happen. But I don't think it would be fair. We absolutely need a federal flood insurance program."

Pete Liakakis agrees.

"We should have that flood insurance, because a lot of that protection is not covered by your homeowner's policy," he says.

"If it needs to be changed, maybe it could be changed to something where the money can be put in a fund to be able to pay for that if flooding was to occur, so that it doesn't put a huge burden on the government or one individual insurance company," says Liakakis.

Still, Buelterman says we don't have to just depend on insurance to mitigate the impacts of major storms.

"I think the long-term better solution is stronger building codes," he says. "Analysis has shown that in newer communities with stricter building codes, they really stood up pretty well in terms of what winds can be withstood."

DOE's Evan Mills agrees, and says there are a number of things that can be done to increase the resiliency of the coast.

"Certainly protecting and restoring mangroves and wetlands increases resiliency against tidal surge, and it also helps sequester carbons," he says.

"Dual-pane windows in houses decrease the likelihood of window shattering and water damage in buildings -- they also obviously reduce air-conditioning and heating energy. Distributed energy generation systems are less vulnerable to power outages, which have huge economic consequences," he says.

"It's important not to paint it as an either/or kind of public policy choice."

Georgia Tech's Webster concludes:

"It seems to me a very prudent thing to do is to start to take into account the possibility and likelihood of increasing intensity and start to use that as a planning basis," he says.

"If one doesn't take the potential of increasing hurricane intensity to heart, one is faced with repeating history, of putting up with \$200 billion worth of damage every so often -- every year or two years or three years -- rather than a more cautious approach, which might be to accept the possibility of more intense hurricanes and start talking about mitigation," says Webster.

"I'm not quite sure how many \$200 billion storms the country can afford."

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Since the article is built upon so-called indisputable facts without reference or citation, I, as a reasonable person politely disagree with the entire premise of the article. There has been no change in frequency or intensity of hurricanes in a long term sense that can be deduced with current observational tools and data records. In fact, no peer-reviewed article says as much in any meteorological journal.

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