Climate Change Evidence All Around

www.coastalreview.org/2015/10/11237/

Brad Rich

Reprinted from the Tideland News

SWANSBORO — Despite what you might hear, there's strong evidence that climate change is having an impact on North Carolina: Look carefully at the fish.

The group of scientists, policy experts, journalists and meteorologists met at Hammocks Beach State Park to discuss living shorelines. Photo: Mark Hibbs, Coastal Review Online

That was one of the messages from Pete Peterson, a researcher and professor at the University of North Carolina's Institute of Marine Sciences in Morehead City. He was among the scientists, TV weathermen and journalists on the boat Friday touring the marshes of the White Oak River. The boat trip was part of a workshop on climate change's effects on coastal habitats organized by the N.C. Coastal Federation.

Greg "Rudi" Rudolph, the Carteret County Shore Protection Office manager, and Todd Miller, the federation's executive director, also spoke on the tour, which included stops at Bear and Jones islands in Hammocks Beach State Park.

Others on the trip – and who spoke and participated Friday evening and Saturday morning during sessions at the Duke University Marine Laboratory in Beaufort – included Susan Hassol, director of Climate Communication; Michael Mann, who as director of the Earth Systems Science Center in the Department of Meteorology at Penn State University is a heavyweight in the study of climate change; Tom Peterson, president of the World Meteorological Organization's Commission for Climatology and former principal scientist for NOAA's National Climatic Data Center in Asheville; Ryan Broyles, North Carolina's state meteorologist; and Greg Fishel, chief meteorologist at WRAL-TV in Raleigh. Participating media came from all around North Carolina.

The focus of the trip on the Lady Swan, a Swansboro-based ferry, was to see some of the more effective means being used to combat the effects of rising sea level and other impacts of climate change.

Peterson, whose work involves research and teaching grad students in paleoecology, invertebrate fisheries management, estuarine habitat evaluation and barrier island ecology, said that it's fairly easy to see the effects on local waters and fish.

For example, he said, a thermometer hung for decades in the water off the bridge to Pivers Island – home of NOAA's Beaufort Lab and the Duke Lab – clearly shows a 1.8-degree Fahrenheit rise in water temperatures in the past two decades.

At the same time, Peterson said, there's been an equally clear shift in the composition of fish stocks in

some locations. The NOAA lab, he said, has for decades sampled reef fish, and has found that over the past four decades, there's been a marked decrease in the number of northern, temperate species, and a corresponding dramatic increase in the number of tropical species.

Greg "Rudi" Rudolph, left, and Charles "Pete" Peterson talk about the effects of rising seas. Photo: Brad Rich, Tideland News

Peterson, Miller and Lexia Weaver, a federation scientist, also led extensive discussions of the use of natural, or "living," shorelines as an alternative to combat erosion that has always occurred and is almost sure to accelerate as sea level rises in response to warming water temperatures.

They pointed out the success of some of those projects at Hammocks Beach State Park, both on the mainland, at the ferry dock, and at Jones Island. In both cases, the projects, which use oyster shells and marsh grass, have stabilized shorelines.

A major benefit in a time of rising sea levels, Miller said, is that the living shorelines allow the marsh to migrate inland as the sea level rises. Bulkheads, the more common method of erosion control, don't. As the sea rises, the marsh in front of the wall is overcome along with everything else. The wall itself will eventually need major repairs or complete replacement.

Peterson said one of his former graduate students, Rachel Gittman, did an extensive study of living shorelines and bulkheads after Hurricane Irene, a large and destructive Category One storm that severely affected Carteret and other coastal counties in 2011. While seawalls and bulkheads might look "massive and permanent," Peterson said, the study showed that they fared far worse – with some over-wash, some breaches and some complete failures – than the living shorelines, which generally were unscathed.

This section of shoreline at Jones Island was created by volunteers using bags of oyster shells and grass seedlings. Photo: Brad Rich, Tideland News

And that doesn't even take into consideration the significant "ecosystem services" provided by living shorelines, Peterson added. The oyster shells attract baby oysters, or spat, and eventually become living reefs that filter water and attract a variety of marine life.

As climate change helps to produce stronger storms and more wave energy, along with sea-level rise, it will be increasingly important to use erosion control methods that not only are effective, but also preserve as much of the natural habitat as possible, Peterson and the others said, because that habitat is the engine for reproduction of fish and shellfish that are so valuable to the state's coastal economy and way of life.

Living shorelines, Miller said, are gaining in acceptance, because of their effectiveness and low long-term cost, but “a lot of education is still necessary” in order for them to gain more widespread use and provide the “resiliency” needed as climate change impacts increase in severity.

He also said he believes that beach re-nourishment – if done properly, using the proper materials, with those who benefit bearing most of the cost – helps buy time and provides good short-term protection of the ocean beaches that are so crucial to the coastal tourism economy.

The group gathers on Jones Island in the mouth of the White Oak River. Photo: Mark Hibbs, Coastal Review Online

Miller, however, cautioned that as the effects of climate change become more pronounced, even living shorelines probably won’t be enough.

“My opinion is that for now, we need to do the things that do the least harm,” he said. “Sooner or later, living shorelines are not going to be able to stop (erosion and habitat loss), but probably nothing else will, either.”

The goal, Miller said, should be to try to ensure that as much of the crucial habitat as possible survives.

Rudolph spent much of his time talking about the practicality of making policy decisions for dealing with climate change. Market incentives – providing cost breaks for insurance for property owners who elevate structures above expected flood levels, for example – are probably doing more than anything else to help address current and future impacts of climate change, he said.

Join the conversation on our Facebook Page

Like This Story?

It costs about $200 to produce this and all other stories on *CRO*. You can help pay some of the cost by sponsoring a day on *CRO* for as little as $100 or by donating any amount you're comfortable with. All sponsorships and donations are tax-deductible.

SUPPORT US

We Still Have Time, Climate Scientist Says

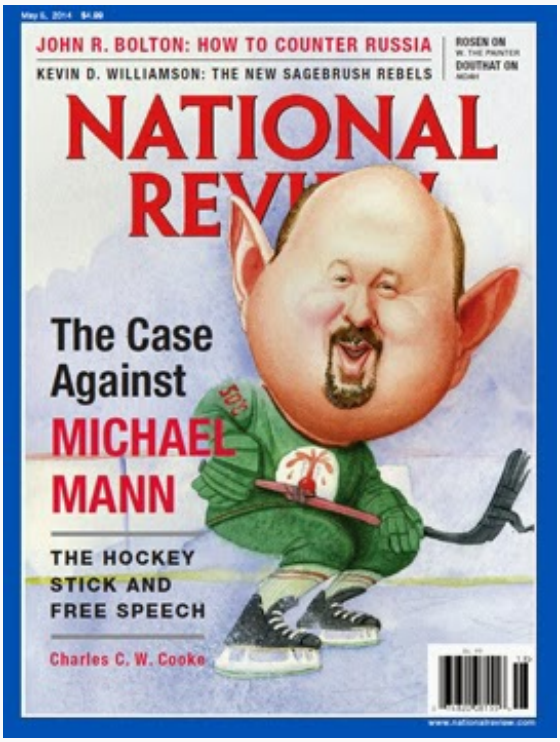
www.coastalreview.org/2015/10/11463/

Kirk Ross

Michael Mann, director of Penn State University's Earth Systems Science Center, has long been at the forefront of scientific research into climate change and its causes, putting him squarely at the center of debate that has swirled around the issue.

His work has been heavily praised by colleagues and attacked by politicians. His studies on human's influence on greenhouse gasses resulted in the now infamous "hockey stick" graph, which raised alarms about the unchecked emissions that release those gasses in the atmosphere.

In his most-recent book *The Hockey Stick and the Climate Wars: Dispatches from the Front Lines* (2012, Columbia University Press), Mann looked at the growth of consensus on climate change and human activity and the politics and special interests that drive attempts to disprove it.



Michael Mann has been at the center of the ginned up debate about climate change. Caricatures of him ended up on the cover of conservative magazines like this in in 2014.

At a recent workshop on climate change in Beaufort, Mann talked with *Coastal Review Online* about the potential effects of climate change on the N.C. coast, arguing that it is time to get past debating long-settled science and focus on solutions, especially ways to be more resilient in the face of the changes ahead.

When it comes to climate change and sea-level rise what do you see as the big overarching issues on the N.C. coast? What's really jumped out at you at this conference and during your other visits to the state?

Mann: Just the vulnerability, the very large amount of coastline here, where there are large populations of people who have lived here for several generations. It's part of their history. It's part of their culture and that's fundamentally threatened now by sea-level rise, by the increasing intensity of hurricanes that strike our coastlines. It really sort of brings it home. This is where the rubber meets the road. I'm a climate scientist. I go around talking about the science, I talk about the impacts often in a theoretical framework, but here is where you really see it playing out.

At the workshop, we've looked at living shorelines and other mitigation strategies for sea-level rise. Do you see some rays of hope that there are ways North Carolina can cope with sea level rise?

Mann: Yeah. I think it's still quite clear that if you look at the best science we have now about the climate changes that have happened, the sea-level rise that has taken place and the sea- level rise that may continue to take place in response to the greenhouse gasses that we've already put into the atmosphere, we're going to be dealing with a certain amount of climate change, we're going to be dealing with a certain

amount of global warming and a certain amount of additional sea-level rise.

Right now, the projected changes that we are committed to still fall within the range of what we can view as our ability to cope, our adaptive capacity. We have a certain level of resilience and there are ways, [such as] living coastlines, that we can manage our coastlines to increase our resiliency and provide some degree of protection against the changes that we're already committed to.

The real problem is if we don't do something about the problem, if we don't do something to stem the tide and lower our carbon emissions and turn the corner. Then, if you look at the projections of several feet of sea-level rise, that starts to take us outside of that range of adaptation, the range of what we can adapt to and what other living things and what the ecosystem can adapt to.

So we face a critical decision now. Our future is still in our hands. Our destiny is in our hands. Are we going to embrace a renewable energy future, where we keep climate change, global warming and sea-level rise within a copable range or do we exceed that range? It's up to us.

When you think about this state and some of its challenges — hurricanes, storm surge — and the change in policy direction from an emphasis on renewables to an emphasis on fossil fuels and potential offshore drilling what goes through your mind?

Mann: Well, naturally it's disappointing. There's been a remarkable transition underway around the rest of the globe. You see counties like China and India embracing the renewable energy future. The rest of the world has recognized that this is the direction. The growth industry of the 21st Century is going to be green energy and the rest of the world is moving in that direction. It's unfortunate that in some places here in the U.S., we're moving in the wrong direction and we're falling behind in terms of our competitiveness.

Just a few years ago, North Carolina was a leader in solar and the development of wind. My understanding is that the majority of folks in North Carolina are not happy with that change in direction. Those decisions have been made at the highest levels of state government, but my understanding is that change in direction isn't popular with the citizens of North Carolina. My hope is that that means we'll see a shift in the wind, so to speak, in the near future and a return to embracing the direction the rest of the world is moving in terms of renewable energy.

Michael Mann discusses climate change's effects now and in the future.

You have taken a lot of hits. There's been a lot of blowback on your work. Is there still room for questioning the science on climate change or do we now have enough information to get beyond that?

Mann: The world's scientists have spoken on this. The U.S. National Academy of Sciences — founded in the 1800s by Republican president Abraham Lincoln — and every scientific society in the U.S. and around the world has weighed in on this. There is an overwhelming scientific consensus that the globe is warming, our climate is changing, and it's due to human activity, fossil-fuel burning and other activities, that are increasing the concentrations of greenhouse gasses in the atmosphere; and that the impacts are already threatening us and our environment and that the threat will be far greater if we don't do something about it. That is literally the consensus of the world scientists. That isn't being debated.

There is still a worthy debate to be had about what we do about that, how we meet that challenge. That's

the debate we ought to be having — what sort of policies can we put in place both to increase our resilience with respect to the changes that are already going to take place, that we're already committed to and can't stop, and to make sure we can prevent those additional changes that we still can. That is worthy of debate, and there's room at the table for people of all political persuasions. I think some of the more positive developments recently are conservative Republicans who have come to the table and said "Look, the science is clear, climate change is a problem, let's make sure our principles, our free market principles, are part of this discussion."

That's the debate we've need to have.

Some people in this state still say there isn't a problem or that we can't do anything about it. Are we in a situation where doing nothing — riding it out — is even a choice?

Mann: No, it's not. First of all, we're going to have to adapt. There's a certain amount of sea-level rise that's baked in. It's going to happen. We're going to have to adapt to that. We're going to need to take all sorts of measures, such as living coastlines and other thing, to increase our resiliency to those changes.

But more than that, if we continue with business as usual with burning fossil fuels through the decades ahead and through the next century we will create a fundamentally different planet, a degraded planet. We'll see that in our lifetime. But more than that, we'll be leaving behind a fundamentally degraded planet for our children and grandchildren, and that's just wrong.

Join the conversation on our Facebook Page

Like This Story?

It costs about $200 to produce this and all other stories on *CRO*. You can help pay some of the cost by sponsoring a day on *CRO* for as little as $100 or by donating any amount you're comfortable with. All sponsorships and donations are tax-deductible.

SUPPORT US

INDY week
raleigh • cary
10|21|15

CHANGING FORECAST

Greg Fishel, the Triangle's favorite meteorologist, was a LIMBAUGH-LOVING CLIMATE SKEPTIC. Now, he's fighting global warming.

By Tina Haver Currin

p. 12

Greg Fishel was once a Limbaugh-loving climate skeptic. Now he’s fighting global warming.

www.indyweek.com/indyweek/greg-fishel-was-once-a-limbaugh-loving-climate-skeptic-now-hes-fighting-global-warming/Content

Tina Haver Currin
By Tina Haver Currin

Photo by Jeremy M. Lange

Greg Fishel

You might assume that your local meteorologist believes in climate change.

Certainly if he graduated with a Bachelor of Science in Meteorology from Penn State in 1979 and began working at WRAL-TV as the station's first meteorologist in 1981. Especially if he was promoted to chief meteorologist in 1989, a post he has held ever since. And without a doubt, if your local weatherman was the first American Meteorological Society-certified broadcast meteorologist in the United States, who then chaired the board that developed the 100-question exam used for broadcast certifications, he'd have to embrace the overwhelming scientific consensus. *Right?*

For Greg Fishel, accepting that reality took time. An avid churchgoer and Rush subscriber (that's Limbaugh, not the band), Fishel has been slower than most scientists to recognize the fact that the planet is warming and we're to blame. Last week, the meteorologist penned a blog post titled, "Choose science, stewardship in understanding climate change," a public admission of his previous ignorance and a plea for

people like him—Republicans, churchgoers, Fox News fanatics—to approach the topic scientifically rather than ideologically.

Fishel's essay, which derides blind party and religious loyalty as "unadulterated bunk," was inspired by a climate workshop he attended in Beaufort this month, plus research from his trip to Alaska's Barrow Observatory in March. The post originally appeared on the WRAL Weathercenter blog on Oct. 12, but when *The Washington Post* picked it up that same day, our snow-loving weatherman was catapulted to the front lines of a national debate.

The essay might be the first time people outside of North Carolina are hearing of Fishel, but back home, a list of local celebrities could easily begin with college basketball coaches and then progress to the lovable, nerdy meteorologist. Fishel has seen both the coldest (-9 degrees on Jan. 21, 1985) and hottest (110 degrees on Aug. 21, 1983) days on record at RDU, covered Hurricane Fran in 1996 and the tornadoes that ripped through downtown Raleigh in 2011, and is always on deck for a good snowstorm. He plays the tuba, sometimes at local football games, and has won an Emmy for his hurricane coverage. In times of trouble and uncertainty, people turn to Fishel to tell them where to go, what to wear and how it might feel outside.

This week, as though working on premonition, attendants in the WRAL booth at the N.C. State Fair punched holes through the eyes of thousands of Greg Fishel masks, a strangely progressive attempt at "viral marketing" by the TV station. The masks proliferated throughout the fairgrounds, with people of all stripes happy to play Greg. And now, with national attention on his public admission and call for change, our local weatherman has the chance to become the face of something even greater.

The *INDY* spoke with Greg Fishel last week about climate change, politics and how humbling—and liberating—it can be to admit you're wrong.

INDY Week*:*

For you to become a face and a representative for what I think is a really important thing to talk about—climate change—it's great. It's very brave.

Greg Fishel: I gotta be honest with you. We've done a lot of stuff on climate this year, going back to when I went to Alaska back in March. So I've been posting a lot of stuff that has gotten a decent reaction. But when the former head of the American Meteorological Society contacted me and said I think we gotta have this be a guest commentary for the Capital Weather Gang on *The Washington Post*, I was stunned.

And when it hit up there, it just went crazy. I started hearing from people all over the country. The day the pope released his encyclical about climate change, I posted something that day that reached about 50,000 people. And I was like, That's going to be the best one. That's the most people I'll ever reach. And this one, on Sunday when last I checked, is now up over 200,000.

There's a pastor that I really like a lot down at First Presbyterian Church back in the 1980s. He had a sermon one time that I've never forgotten, and the title was, "If Not Me, Who? If Not Now, When?" And I figured, you know, if I'd only come to work here six months ago, doing something like this would have been suicide. But if there's ever a time when I could be honest with people and hope that they would at least consider it, after being here 34-plus years, this was probably the time to try.

And time will tell whether it has any positive effect, but there was something inside of me that was saying, This is the time to try, and if you don't try now, 10 years from now, you might look back and wonder, why didn't I?

How has the reaction been?

Well, it's funny. The initial stuff I saw, the comments, were pretty positive. But as it started reaching more and more people, the missiles started coming down. In fact, this issue has made me worry about this country way beyond just climate. The vitriol, the binary nature on a number of issues.

I have a little theory. I don't know if it's right or not, but between talk radio, social media, Internet blogs and 24-hour news channels, we've basically divided the country. We provide a support group for whatever one believes, that they can run to and hear whatever they want to hear and see whatever they want to see.

It's like we're picking and choosing what science we want to accept based on whether it helps us or not. I mean, all of us benefit from science every day, with all the conveniences we enjoy—technology—and yet in this one area, because people have decided that it's going to hurt developing countries or it's going to destroy our economy or whatever it is, all of a sudden, basic chemistry and physics don't work anymore. Which is just, I'll be honest with you, it's stupid. Maybe *ignorant* would be the better word. I always like to draw a distinction between those two words, because there are a lot of smart people who aren't aware of the truth, who are ignorant. We're all ignorant in certain ways.

If you start throwing around personal insults, it makes it a lot harder to listen to a different point of view. So I respect that nuance.

I'll give you [a name]: Congressman—*former* congressman—Bob Inglis [who represented South Carolina's 4th District from 1993–99 and 2005–11]. He has been quoted as saying that until 2008, the only thing that he knew about climate change was that, if Al Gore supported it, he was against it. And then he went to Antarctica and interviewed a bunch of scientists and came back with a changed mind. When he made that public, the tea party went after him. He didn't even get to the general election, and we're talking about a six-term congressman here. He got annihilated in the primary.

And the thing about it is, if you talk to him, he is still as conservative as he's ever been. His faith is still as important to him as it's ever been. But he is of the attitude that this is something that he can no longer deny. The interesting thing is that some of us have the answer to this. We're all about free market and free enterprise. If we take the lead on developing new technologies for alternative and renewable energy, then there are entrepreneurial opportunities, which then create jobs, which stimulate the economy. We have the answer, and why our party doesn't realize it is beyond me.

Especially with climate change, it seems that people always talk in extremes, that it's very black and white. What are some reasonable ways we could approach this?

The development of the technology is not my area of expertise, of course, but from what I understand, China, even though they're still emitting a lot of bad stuff, is moving aggressively forward in the area of solar. Way further than the United States.

I think it's reframing the issue, in the sense that, Let's not look at this as restriction and regulation, let's think about this as something that's enterprising, that's freeing. In 20 years, this is something that the rest of the world would be coming to the United States to say thanks for taking the lead. We would not only be respected, but we could economically benefit from that. As opposed to, Are we going to look back in 20 years and say, darn it, we did it again? We're dependent on other foreign countries for a different type of energy, and we missed our chance?

How would you say that climate forecasting and weather forecasting are related? There's the common refrain that "you can't even predict whether it will rain tomorrow, so how do you know climate change is real?"

That's a very valid question. The simplest way to explain it is that when it comes to day-to-day weather forecasts, we're trying to see all of the minute details, some of which we still don't completely understand

or aren't able to measure. That's simply an impossible task. But when you look at things that dictate climate, a lot of those things are easier to measure, because they're operating on a much larger scale. There's a guy named Kerry Emanuel at MIT, a world-renowned scientist, and I love the way he framed this. He was in a debate in Huntsville, Alabama, with one of the few remaining science skeptics. And he turned to the moderator in the middle of the debate, and he said, "Is there a chance that John's right and I'm wrong? Yes, there is. But I look at this as risk assessment, just like you would with insurance. If there's a 20 percent chance that your 2-year-old daughter will get run over if you don't walk with her across the street, would you let her do it?" Let's suppose that a bunch of stuff comes along to cancel all [the climate-related dangers] out. What are we left with? A cleaner atmosphere, cheaper energy. What are the downsides to that?

There are a lot of good questions from people who are skeptical. I guess the big question after that is, are they willing to accept the answer? Or are they so deep in their ideological trench that they're not willing to listen to the answer after they ask a question?

The thing about it is it's hard to admit that you're wrong. I had to do that. I've never really felt ashamed about it, because I just grew as a person. That's a good thing. If none of us ever made mistakes, we'd never learn anything.

That's being a human being, isn't it?

Right! It took me a long time. I changed my registration from Democrat to Republican in '84, and I think every president except the last one that I voted for since then was Republican. I listened to Rush [Limbaugh] every day and I believed everything he said. Then, one day, it hit me that I have a four-year science degree through an institution of higher learning, but I'm approaching this issue from an ideological standpoint instead of a scientific standpoint. And that's wrong.

That had to be foundation-shaking.

Yes. I have people in my own family, my extended family, who have accused me of caving. They believe everything that Fox News says, and that's all they want. And I told them, look, I was willing to be wrong once, of course, and I've got to be willing to be wrong a second time, third time and a fourth time. I'm not saying that this is the end of the road on learning. But this is the best science that we have available to us right now, and what else can you base it on? The thing about the higher power in control, if you believe in a superior being and the whole idea of stewardship, is that he gave us the knowledge to learn from our mistakes. Why wouldn't we want to put that knowledge to use?

I never thought there would be anything that would replace the awesomeness of trying to forecast the weather every day. But this has been a new passion that's come along in my life, and it's really consumed me in a way that I did not anticipate. Who knows? Maybe [climate change] will be the focus of my life from here on, as opposed to what I've been doing for all these years. You just never know what's around the next corner.

More News Feature »

All News »

Latest in News Feature

More by Tina Haver Currin

Permitted HTML:

- To create paragraphs in your comment, type at the start of a paragraph and at the end of each paragraph.
- To create bold text, type **bolded text** (please note the closing tag,).
- To create italicized text, type *italicized text* (please note the closing tag,).
- Proper web addresses will **automatically become links**.

N&R greensboro.com
Published by the News & Record

Susan Ladd: Living shorelines a healthier approach to waterfront erosion

10/20/15

By Susan Ladd susan.ladd@greensboro.com | Posted 2 days ago

Oysters are more valuable left in their natural habitats than they are on your plate.

Chew on that for a moment.

As North Carolina's coastal residents deal with erosion and rising sea levels, the gnarly oyster is a formidable ally.

They are one of the key components of living shorelines, a back-to-nature solution that not only prevents erosion but also cleans the water.

"Oysters live on the backs of their grandfathers," said Pete Peterson, alumni distinguished professor at UNC-Chapel Hill. "The oyster reef serves as a breakwater for wave energy."

Peterson and Lexia Weaver, a coastal scientist with the N.C. Coastal Federation, gave a tour of living shoreline projects in the Swansboro area as part of the Climate Change and Coastal Impacts workshop Oct. 9-10 in Beaufort.

Reefs reduce the amount of shore erosion by absorbing energy from waves. Seawater washes over oyster reefs, feeding the marsh grass and depositing sand on the other side. Before people began harvesting oysters commercially, reefs grew much higher.

The living shoreline program restores this natural ecosystem by placing a border of mesh bags of oyster shells a few feet from the shoreline and planting marsh grass behind them at the water's edge. Living oysters build on the shells, increasing the size of the reef and building up the shoreline. Instead of being harvested, these oysters are left in place.

An even bigger benefit of living shorelines is to improve water quality. Oysters are filter feeders. As they draw phytoplankton from seawater, they clean the water and remove nitrogen, one of the key causes of algae blooms. This makes the living shoreline a huge asset in estuaries, which serve as the nurseries for many fish and shellfish, including most commercially harvested seafood.

On a trip to Hammocks Beach State Park, Weaver pulled up a bag of oyster shells that had been placed around an eroding point as part of the living shoreline project there. The bleached white shells are now gray with mud and covered with small oysters, mussels and tiny crabs.

In areas where oysters don't colonize, a border of riprap (large rocks) can be used as a breakwater.

Installing a living shoreline may cost more upfront, depending on the materials used, but the natural systems outperform bulkheads (man-made retaining walls), in storms, Weaver said. When a bulkhead collapses in a storm, there can be significant land loss in addition to the cost of replacement. Marsh habitats also are more aesthetically pleasing than bulkheads.

So why isn't everyone doing this?

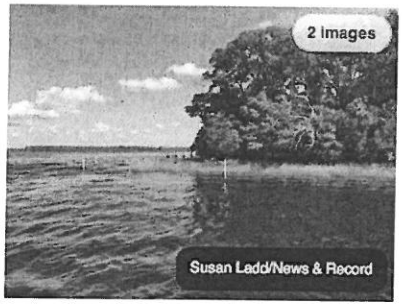
Many people don't know it's an option, and others are put off by the permitting process. Eighty-seven percent of shoreline permits are for bulkheads, Weaver said.

You can get a permit to build a bulkhead in one or two days, but it can take months to get a permit for a living shoreline. Weaver said that took 11 months to get the permit for the living shoreline project at Hammocks Beach.

Hmm. Sounds like an opportunity for regulatory reform.

If you have property at the coast or just want to learn more about living shorelines, the N.C. Division of Coastal Management is sponsoring two workshops in December.

There will be a technical workshop for Marine Contractors, Engineers, Landscape Architects, Land Use Planners,



The white poles mark the oyster beds of the living shoreline project at Hammocks Beach State Park in Swansboro. The oyster beds provide a breakwater for wave energy and help marsh grass fill in behind them to prevent erosion.

Floodplain Managers, and other technical professionals, from 8:45 a.m. to 5 p.m. Dec. 2, at Pocosin Arts, 201 Main Street in Columbia, N.C.

Participants will learn about:

- The benefits and limitations of using living shorelines for erosion control;
- Living shorelines design standards based on site conditions;
- Living shoreline projects in North Carolina;
- Best practices for living shoreline construction and use of marsh plants;
- The permitting process for living shorelines.

A workshop for realtors will be held from 9 a.m. to 1 p.m. Dec. 3 at the same location. This also would be the most appropriate workshop for property owners. Both workshops offer continuing-education credits for professionals, and both are free. To get more information or register, visit nccoastaltraining.net.

The state should work to simplify the permitting process and to set the example by replacing bulkheads with living shorelines wherever possible on state-owned property.

Sometimes nature's way is the best way.

Contact Susan Ladd at (336) 373-7006

and susan.ladd@greensboro.com, and follow her on Facebook at facebook.com/susankladd and on Twitter at @susanladdNR.

- The Progressive Pulse - http://pulse.ncpolicywatch.org -

New evidence that climate change is making North Carolina more like Florida

Posted By *Rob Schofield* On October 15, 2015 @ 7:19 am In Commentary,News | No Comments

---

A lot of deniers will never be convinced, even when the water is lapping at their ankles, but for anyone interested in scientific facts, this article on the NC Coastal Review ("Climate Change Evidence All Around" [1]) is worth a read this morning.

"Despite what you might hear, there's strong evidence that climate change is having an impact on North Carolina: Look carefully at the fish.

That was one of the messages from Pete Peterson, a researcher and professor at the University of North Carolina's Institute of Marine Sciences in Morehead City. He was among the scientists, TV weathermen and journalists on the boat Friday touring the marshes of the White Oak River. The boat trip was part of a workshop on climate change's effects on coastal habitats organized by the N.C. Coastal Federation….

Peterson, whose work involves research and teaching grad students in paleoecology, invertebrate fisheries management, estuarine habitat evaluation and barrier island ecology, said that it's fairly easy to see the effects on local waters and fish.

For example, he said, a thermometer hung for decades in the water off the bridge to Pivers Island – home of NOAA's Beaufort Lab and the Duke Lab – clearly shows a 1.8-degree Fahrenheit rise in water temperatures in the past two decades.

At the same time, Peterson said, there's been an equally clear shift in the composition of fish stocks in some locations. The NOAA lab, he said, has for decades sampled reef fish, and has found that over the past four decades, there's been a marked decrease in the number of northern, temperate species, and a corresponding dramatic increase in the number of tropical species."

In other words and in lay people's terms, North Carolina is slowly but surely starting to look more like Florida. And anyone (i.e. the Koch-funded groups on the right) who denies this plain reality and helps stymie the efforts to address it is contributing to this potentially

catastrophic problem.

Possibly related posts:

Let's see the climate change deniers deny this [2]
Republicans admit it's time to get on with addressing climate change [3]
A small sign of hope: Charles Koch admits CO2 is warming the planet [4]
Latest Duke coal ash news is a powerful Earth Day reminder [5]
Wilmington City Council votes unanimously to oppose McCrory's offshore oil drilling plan [6]

Article printed from The Progressive Pulse: **http://pulse.ncpolicywatch.org**

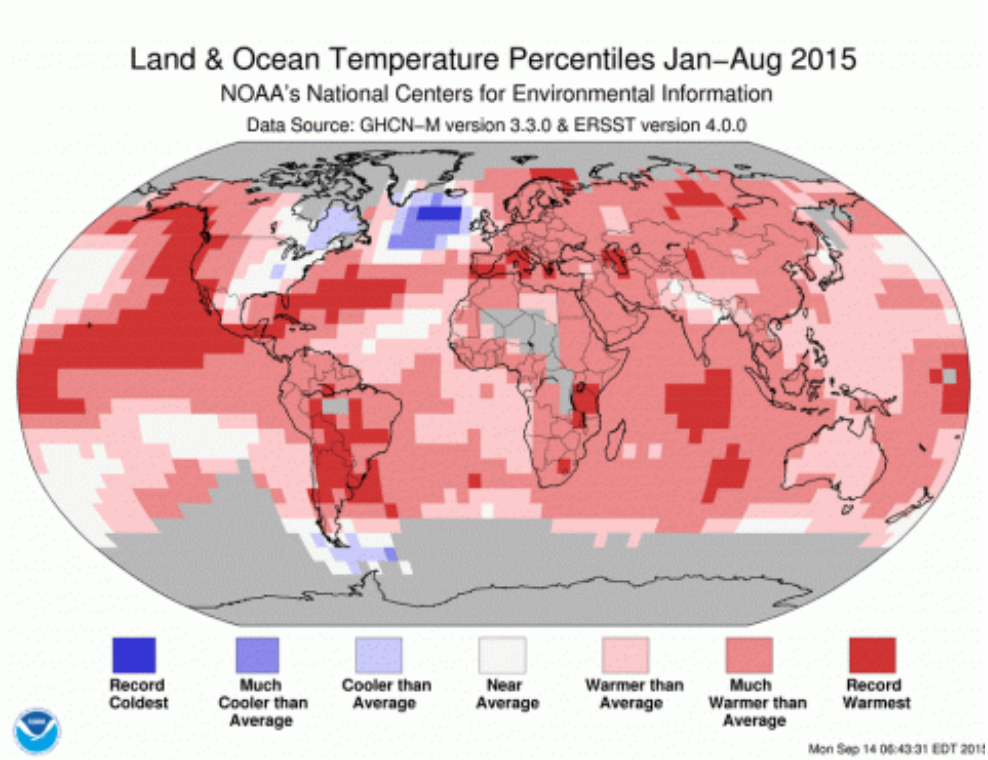
URL to article: **http://pulse.ncpolicywatch.org/2015/10/15/new-evidence-that-climate-change-is-making-north-carolina-more-like-florida/**

URLs in this post:

[1] "Climate Change Evidence All Around": **http://www.coastalreview.org/2015/10/11237/**
[2] Let's see the climate change deniers deny this : **http://pulse.ncpolicywatch.org/2015/06/23/lets-see-the-climate-change-deniers-deny-this/**
[3] Republicans admit it's time to get on with addressing climate change : **http://pulse.ncpolicywatch.org/2015/06/10/republicans-time-to-get-on-with-addressing-climate-change/**
[4] A small sign of hope: Charles Koch admits CO2 is warming the planet : **http://pulse.ncpolicywatch.org/2015/08/07/a-small-sign-of-hope-charles-koch-admits-co2-is-warming-the-planet/**
[5] Latest Duke coal ash news is a powerful Earth Day reminder : **http://pulse.ncpolicywatch.org/2015/04/22/latest-duke-coal-ash-news-is-a-powerful-earth-day-reminder/**
[6] Wilmington City Council votes unanimously to oppose McCrory's offshore oil drilling plan : **http://pulse.ncpolicywatch.org/2015/07/22/wilmington-city-council-votes-unanimously-to-oppose-mccrorys-offshore-oil-drilling-plan/**

Ex-Republican meteorologist calls for end to partisan divide over climate science

www.washingtonpost.com/blogs/capital-weather-gang/wp/2015/10/12/ex-republican-meteorologist-calls-for-end-to-partisan-divide-over-climate-science/



(NOAA)

There is overwhelming agreement within the scientific community, backed by multiple lines of evidence, that human activities are causing the climate to warm. Yet only 27 percent of Republicans agree, according to a July survey from the Pew Research Center.

Republican presidential candidates are decidedly mixed on their acceptance of the link between warming and human activities.

Greg Fishel, chief meteorologist for the CBS affiliate in Raleigh in N.C., is sickened by this state of affairs.

Over the weekend he penned a stirring commentary railing against the partisan divisiveness in climate change discussions and disregard for the science.

Greg Fishel (WRAL)

Fishel said in an email message that due to overall state of party politics, after 30 years, he is no longer a Republican and considers himself unaffiliated.

“I hate agendas, and there are agendas on both sides of the climate change debate which I abhor and have no time for,” Fishel’s essay begins. “But once you cut through all of that, much of which is ideological and political, you are left with hard science.”

Fishel’s essay lays out the scientific case for manmade warming, starting by debunking one of the most oft-repeated myths that the sun is behind the recent warming trend:

> *If it were the sun, the entire atmosphere would be warming, but it’s not. The troposphere, where most of the weather occurs, is warming up, and the stratosphere is cooling. This is all part of the radiative adjustments that are taking place because of what man is doing to the composition of our atmosphere.*

He pleads with readers to set aside their biases and swallow their pride in scientific discussions.

“We live in a country now where we embrace division for the sake of division,” he says. “It’s about winning and being right as opposed to doing what’s best for the country and the world.”

Fishel specifically appeals to conservatives and people of faith to open their minds:

> *I believe science is a gift from God. We benefit from science in our daily lives 1,000 times over through all the conveniences we enjoy. Why have we chosen to turn our back on science when it comes to basic chemistry and physics? It is time to stop listening to the disingenuous cherry-pickers and start taking responsibility for learning the truth about climate change.*

Fishel was once skeptical of manmade contributions to warming himself. But after after spending many hours reading scientific papers and talking to climate scientists, changed positions.

“I have gone through the entire process,” Fishel writes. “But in my mind, I didn’t make a mistake, I simply grew as a human being. There aren’t too many experiences in life that can top that.”

Fishel’s entire essay can be read on the WRAL Web site. It was also posted to Facebook where it has been liked over 1,400 times and received glowing endorsements.

“Your unique perspective as a well-known, widely respected meteorologist, a Christian, and a curious skeptic, positions you well to convince a lot of fence-sitters of the need to make meaningful and substantive changes in government policy, as well as in our lifestyle choices,” writes reader David Brackins.

His words and themes echo those made by another Republican meteorologist, Paul Douglas of Minneapolis. In 2012, Douglas wrote:

> *I'm going to tell you something that my Republican friends are loath to admit out loud: climate change is real. I am a moderate Republican, fiscally conservative; a fan of small government, accountability, self-empowerment, and sound science. I am not a climate scientist. I'm a meteorologist, and the weather maps I'm staring at are making me uncomfortable.*

[Republican meteorologist Paul Douglas: conservatives should embrace climate science]

Jason is currently the Washington Post's weather editor. A native Washingtonian, Jason has been a weather enthusiast since age 10.

Choose science, stewardship in understanding climate change

www.wral.com/choose-science-stewardship-in-understanding-climate-change/14964318/

By Greg Fishel

More on this

- Fishel: Climate change discussion requires an open mind
- Greg Fishel: Exploring Climate Change

By Greg Fishel

After attending a Climate Change and Coastal Impact workshop in Beaufort, N.C., this past weekend, I think it is about time to call a spade a spade. As I have stated, I hate agendas, and there are agendas on both sides of the climate change debate which I abhor and have no time for.

But once you cut through all of that, much of which is ideological and political, you are left with hard science.

We have known for almost 200 years what gases make up our atmosphere, and what the radiative properties of those gases are. We know for a fact that the pre-industrial revolution levels of carbon dioxide and other greenhouse gases are the difference between life and death on this planet. In other words, without the natural levels of these gases, the earth would be an iceball and uninhabitable. That is fact, not

conjecture.

We know for a fact that the earth's temperature is rising, and that it's not the sun. If it were the sun, the entire atmosphere would be warming, but it's not. The troposphere, where most of the weather occurs, is warming up, and the stratosphere is cooling. This is all part of the radiative adjustments that are taking place because of what man is doing to the composition of our atmosphere.

Satellites confirm that the amount of long-wave radiation leaving the earth is decreasing and is emanating from a higher and higher altitude. Again, the exact response one would expect from human forces.

We know for a fact that the lifetime of carbon dioxide molecules is on the order of hundreds and even thousands of years, unlike water vapor molecules whose lifetime in the atmosphere is just shy of two weeks.

And on top of all of this, we hear the argument that it is economic suicide for the U.S. to act alone, and that we need the cooperation of China and India. Did you know both of those countries are leaving us in the dust when it comes to pursuing new technologies relating to energy production? Those countries see the economic opportunity and are going after it while we sit around and have politically partisan arguments.

And oh by the way, I am not for a one-world government. I love capitalism, but how 'bout we pursue something I like to call 'capitalism with ethics?' Let's not legislate morality, but rather enact it voluntarily through our actions. For people of faith, stewardship is more than the money drive in the fall. It's about taking care of things entrusted to you. For Christians, are we really followers of Christ, or just like the Pharisees 2,000 years ago who were so misguided they totally missed the point of Christ's teachings? I know I am more the latter than the former, and it's about time I wake up and smell the coffee.

We live in a country now where we embrace division for the sake of division. Oh, we disguise it as loyalty to principles and to God, but I suggest to you that this is unadulterated bunk. It's about winning and being right as opposed to doing what's best for the country and the world.

We need to stop hiding behind our computers and iPhones, in order to launch verbal missiles at those we disagree with and have no intention of getting to know or trying to understand. We have no interest in even considering the possibility of being wrong about anything. Oh, what shame that would bring upon us. Really? Being wrong is a blessing and an opportunity to learn. It is something to embrace!

Bob Inglis, former congressman from South Carolina and a conservative Republican, knows what it is to think outside the box. When it comes to climate change, he had to admit he was wrong, and that he was coming at this issue in a purely partisan manner. He now is trying to engage other conservatives to look at this in a different way and to sit down with members of the other party and say, "Hey you have some good ideas and we have some good ideas. Let's take the best of the best and do something good for our country."

If I could "copy and paste" Bob's mindset 536 times, one for each member of our Congress and our President, I would do it in a heartbeat. Then it would no longer matter what the makeup of Congress was because everyone would be there for all the right reasons.

In closing, I believe science is a gift from God. We benefit from science in our daily lives 1,000 times over through all the conveniences we enjoy. Why have we chosen to turn our back on science when it comes to basic chemistry and physics? It is time to stop listening to the disingenuous cherry-pickers and start taking responsibility for learning the truth about climate change.

For those of you who are ardent skeptics, it's going to be uncomfortable. I know, I have gone through the entire process. But in my mind, I didn't make a mistake, I simply grew as a human being. There aren't too many experiences in life that can top that.

A Meteorolgist's View On Climate Change

wunc.org/post/meteorolgists-view-climate-change

Dave DeWitt

Dave DeWitt reports on a North Carolina meteorologist taking up the the mantle of a climate change educator.

Broadcast meteorologists on local television have one job. It's simple to express but difficult to do well. Predict the future, a few days at a time.

To be an effective forecaster, a broadcast meteorologist has to be a scientist. And because it's TV, she or he also has to be likable and trustworthy.

Greg Fishel of WRAL is all of those things. He also used to be a global warming denier. Now, he admits he was wrong.

"I don't see being wrong as being a scarlet letter," Fishel says. "I think all of us have experiences in our life where we are wrong and we realize it was a good thing and we learn something from it."

Fishel changed his mind about climate change after putting aside his politics and examining the science. Now, he's an equally passionate convert, and recently expressed it again on Facebook.

Fishel is in a unique position among his colleagues in the weather forecasting business. He was one of the first broadcast meteorologists to push for certification in his profession. He's also wildly popular and has worked for arguably the most successful family-owned local TV station in the country since 1981.

And that matters in the so-called climate change "debate."

"Any time you have someone of high stature, high standing in the market, with a lot of credibility, it does speak volumes and it shows how important that the topic is," says Sean Sublette, a former TV meteorologist in Roanoke who currently works for Climate Central in Princeton, New Jersey.

Not all broadcast meteorologists are in the same position—or think the same way.

WUNC Radio surveyed TV meteorologists in North Carolina. About three-quarters of those who responded agree or strongly agree that the planet is warming due to human activity. But fewer than half agreed it was part of their job to inform viewers about climate change.

Several expressed that the political debate was too heated or that corporate ownership of stations didn't want to deal with the controversy.

Sublette says those results are not surprising.

"I know some that are very interested in the science, and I know some that are just not," says Sublette. "They are just not as interested in talking about it, for whatever reason they may have."

One of Climate Central's missions is to provide research and graphics that local TV meteorologists can use in broadcasts.

Even with the help, it can be very difficult to get climate information into a forecast. Lee Ringer at Time

Warner Cable News does “Weather On The Ones,” so, six weathercasts an hour.

“And even though it seems like a lot of time, it’s limited what we can talk about,” Ringer says. “So our traditional weathercasts are really just going to be limited to the forecast for today and up through the next week.”

Ringer does do climate change stories online. And he says he has another important, if unseen role.

“I’m the scientist here at the station, along with our other team of meteorologists,” he says. “So we’re the folks a lot of our news reporters come to when there’s some type of science story, whether it’s directly related to the weather, whether it’s related to the environment, or related to meteorology.”

At WRAL, Fishel has taken that role as station scientist to a higher level. Earlier this year, he traveled to Alaska and Colorado to produce special climate change reports and has brought leading scientists to town for discussions.

The other night, he says he got a call from a longtime friend and die-hard conservative. That friend said he is re-thinking his position on climate change because of Fishel’s reporting and social media outreach.

“If I had done this six months after I moved here and I was 22 years old and wet behind the ears, then people would have said ‘get that liberal out of here’,” says Fishel, laughing. “So it gets back to the whole thing, if there was ever a time when I could engage in this discussion, I feel like this is it.”

Fishel says he’ll keep engaging in that discussion—on-air and online—in the hope he can lead the conversation for viewers and fellow weather professionals.