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October 28, 2012, 8:17 PM ET

Why America Has Fallen Behind the World in Storm Forecasting

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COMMENTARY By [KERRY EMANUEL](#)



Reuters

Beachgoers along the oceanfront get soaked by an incoming wave as Hurricane Sandy begins to arrive in Virginia Beach, Virginia, October 28, 2012.

As Hurricane Sandy (or "Frankenstorm") pummels the mid-Atlantic and Northeast, we are reminded that our technological advancement has not altogether spared us the tragic side of our relationship to nature. Yet we should be thankful that much has changed for the better since the Northeast was devastated by the "Long Island Express" hurricane of 1938. That storm hit with no warning at all, with the U.S. Weather Bureau confidently predicting that the storm would stay out at sea just hours before it struck. The lack of warning led to over 600 deaths.

As early as a week ago, some computer models were predicting that a strong and unusual storm would develop and bring dangerous weather to our area. Other models predicted that a storm might develop but would head out to sea and spare us. Then, as time went by, these various models gradually came to agree that the storm would pose great risks to the region extending from the Chesapeake to New England. The advanced information provided by computer models ingesting data from satellites, aircraft, weather balloons, and other platforms gave residents and governments time to prepare, and key businesses time to rush needed supplies to our region, sparing many lives and saving millions of dollars.

Americans should take great pride in the fact that computer weather modeling was

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invented here, along with weather satellites and other scientific and technological marvels. Sadly, the skill of our computer models fell substantially behind that of other nations some decades ago, and by many measures we are in third or even fourth place today. The overall star performer is a computer model operated by a consortium of European nations; that model accurately predicted Sandy's track and evolution well before U.S. models caught up later last week.

Why have we fallen so far behind? While there are many nuances to this answer, the basic reason is a failure of political will. The Europeans spend somewhat more on numerical weather prediction and run their models on larger and faster computers; they have also been more effective that we have in involving academic researchers in the development and improvement of their models. They appear to recognize that the monetary savings of skillful weather forecasts far outstrip what governments spend on the weather enterprise.

Still, weather forecasting in the U.S. has much going for it. We have a weather research enterprise second to none, and our researchers are eager to contribute to better operational weather forecasts. Unlike the Europeans, we recognize that environmental information is a public good, and as its acquisition is funded largely by the taxpayer, it should be made freely available to the public. (Ironically, some European businesses prefer to use U.S. forecasts because they are free, while some U.S. businesses spend large sums for European forecasts because they are better.) We have a vital private sector weather enterprise that partners effectively with academia and government. And we have a dedicated pool of scientists and computer engineers who heroically continue to advance numerical weather prediction in the face of small budgets and inadequate computers. In short, we have almost all the components needed to regain our place as the world leader in weather forecasting skill.

What we need is a dedicated effort to create a numerical weather prediction enterprise second to none. Our current effort takes up about 3% of the overall budget of its parent organization, the National Oceanic and Atmospheric Administration (NOAA). In my view, we should double this to 6%. But money alone will not put us on top; we need to shake up NOAA's dysfunctional organizational structure and create, perhaps with our neighbors Canada and Mexico, a center for numerical weather prediction that routinely taps into the enormous pool of talent across our government, academic, and private sectors, and that welcomes innovation. We are a country that suffers disproportionate economic losses from natural disasters, and we should create and operate the world's finest weather prediction models. Not only would we be able to take pride in this accomplishment, but the benefits we would reap would greatly exceed what it would cost to get there. It is a win-win proposition.

Kerry Emanuel is a professor at the Massachusetts Institute of Technology's Program in Atmospheres, Oceans, and Climate and the author of "[Divine Wind: The History and Science of Hurricanes](#)."

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12:05 am October 29, 2012

James wrote:

Because we have unfortunately become a nation obsessed with money, and this isn't a field brimming with those who choose to go into the field. They don't even tell you about jobs like this in school anymore. God forbid you go into a field that doesn't bring a top income. Where as Europe is much less money driven. They still push children to go into the sciences to better man, not their wallets.

And to Matthew Hall... a lot of good defense does if your family gets washed away. We spend over 10x as much as the rest of the world and still can't protect our people? I'd rather we concentrate on things that really matter, like protecting America from ALL forms of danger... we don't spend money on defense, we spend it on offense. We must be a lot dumber than the rest of the world if we aren't 30 years ahead of the rest of the world militarily after spending what we do on the military budget year after year. So let the roads crumble, let the bridges fall, and lets throw weather and storm casting out the side window because why would we want to better and protect the country when we can protect everyone else overseas.

11:21 pm October 28, 2012

Matthew Hall wrote:

I suppose \$1.50 a year on their defense does leave more time and money to predict the weather.

11:17 pm October 28, 2012

The Limiting Factor wrote:

Priority-based budgeting would allow essential life-saving governmental functions to improve.

Not every government function is vital. Art? Big Bird? Limiting soda amounts? All not necessary.

Stop base-year budgeting procedures and we can spend precious government funds wisely, not wildly.

10:46 pm October 28, 2012

GPFR wrote:

To Smilesdl:

I don't think the post from "Tea Party" was written by a person from the Tea Party. I think it was a satire written by a liberal.

10:42 pm October 28, 2012

Biffle French wrote:

This is terribly sad. Weather prediction, like everything else in a progressive society should be instant, perfect and free.



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