

Studying Sandy and climate change

J. Marshall Shepherd and John Knox

In the waning weeks of the North American hurricane season — a time when a superstorm is not expected to cause widespread damage to the eastern coast of the US — Hurricane Sandy is a grim reminder of the menace of extreme weather events.

Sandy interacted with a weather system moving toward it from the east, posing difficult challenges for forecasters and nearly unprecedented weather conditions for the region. A similar storm hit New England 20 years ago. But Sandy was worse.

Some people will, of course, try to link Sandy with climate change. A similar rush to judgment occurred in the wake of massive tornado outbreaks in the US in recent years, even though the scientific literature does not offer strong support for such a connection.

Measured view

So, from the perspective of climate change, it is best to take a measured view of Sandy, lest hasty reaction harm scientific credibility. But that is little cause for comfort. According to the giant insurance company Munich Re, weather and climate disasters contributed to more than one-third of a trillion dollars in damage worldwide in 2011, and this year's total may rival that amount.

There is growing evidence of links between climate change

and sea-level rise, heat waves, droughts, and rainfall intensity, and, although scientific research on hurricanes and tornadoes is not as conclusive, that may be changing.

Indeed, recent reports by the United Nations' Intergovernmental Panel on Climate Change and other scientific literature suggest that the intensity of tropical cyclones (that is, hurricanes) will increase as a result of warmer waters.

And our atmosphere and oceans are, indeed, warming, with substantial residual heat stored in the ocean, to be released at some future time.

A few studies have even suggested that tropical cyclones may be "wetter." It is quite certain that sea levels have risen over the last century, and continue to rise, in response to changing climate. And storm surges now ride on these elevated sea levels, amplifying flooding losses where they strike.

Sea surface temperatures along the US northeast coast are about five degrees Fahrenheit above average, which helped to intensify Sandy just prior to landfall. At this point, it is premature to link the storm's severity to warmer sea-surface temperatures, because regional variability is known to occur. But the link certainly is plausible.

Moreover, sea levels along the US northeast coast are rising up to four times faster than the global average, making the region more vulnerable



John Knox



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to storm surges and flooding. And here the bottom line is that any coastal storm system will produce more flooding because of sea level rise.

It should also be noted that an atmospheric weather pattern known as a "block," a persistent area of high pressure that may have led to record melting in Greenland, was most likely the reason that Sandy moved inland rather than out to sea. It is too early to tell whether this blocking pattern is a manifestation of weather variability, a short-term climate variation, or the result of climate change.

Advances in numerical weather forecasting during the past several decades have extended our ability to "see" into the future. In September 1938, before all of these advances, a hurricane devastated much of New England. No warnings were issued prior to its arrival.

Today, thanks to satellites, weather balloons, supercomputers, and skilled forecasters, we can anticipate hazardous weather up to a week in advance. Similar advances in climate modeling are occurring, thanks to methodological improvements and better data.

At a minimum, we must

ensure that world-class weather and climate-modeling centers have the necessary funding and manpower to implement the most advanced forecasting techniques. The world will need more cooperation in the coming years, as climate change begins to interact with and exacerbate extreme weather events.

It is reasonable to ask how well we would be able to predict or assess a storm like Sandy without the knowledge and capacity gained through such international collaboration.

We do not know whether superstorms like Sandy are harbingers of a "new normal" in the uneasy and unpredictable relationship between climate change and extreme weather events.

That does not mean that there is not or cannot be such a connection, but rather that the scientific research needed to prove (or disprove) it must still be conducted. That is how good science works. Sandy has provided a powerful demonstration of the need to support it.

J. Marshall Shepherd, director of the Atmospheric Sciences Program at the University of Georgia, is president-elect of the American Meteorological Society. John Knox, a professor of geography at the University of Georgia, received the National Weather Association's highest research award, the T. Theodore Fujita Research Achievement Award. Copyright: Project Syndicate, 2012. www.project-syndicate.org. Shanghai Daily condensed the article.

Sound economic policies outweigh big gold reserves

Editor's note:

Does China have sufficient gold reserves? Campbell Harvey, a professor at Duke University's Fuqua School of Business, and Claude Erb, an investment professional, have done research that sheds lights on this questions. They provided analysis for Shanghai Daily in the following Q and A interview.

Q: Why does China hold so little gold compared to countries like the US and Germany?

A: China's historically low level of gold reserves made sense for an emerging market that had trust in the way that its trading partners managed their economic affairs.

But given the economic troubles in America and Europe, China has every reason to question its trust in the value of the dollar and the euro.

Q: China's gold storage is about one-eighth of the US. Do you think China's gold holding is enough for its economy?

A: Yes, China's central bank holds about 1,100 metric tons of gold. (Ed: the World Gold Council's number for China is 1,054.1 tons.) A popular gold investment fund holds 1,200 metric tons.

As long as China follows prudent economic policies then it has enough gold for the orderly operation of its

economy. In fact, a healthy economy that follows prudent economic policies may not even need any gold reserves.

Q: What is the impact of gold holdings on a country's economy? Is a higher amount better?

A: It is hard to find any connection between the size of a country's gold reserves and the health of that country's economy. What matters for the health of an economy is that a country follows prudent economic policies. For some, a gold standard is a sound economic policy.

Q: China holds a lot of dollars and euros. Is that imprudent considering the economic risks in the US and Europe?

A: China has at least three choices to consider: 1) continue to accumulate reserves in the currencies of trading partners that it is increasingly concerned about, 2) convert some of its reserves into holdings of gold or other real assets, or 3) start conducting trade in yuan.

Is there reason to believe that the value of the dollar and the Euro will decline in the future? Yes. It is simply common sense to be prepared for unpleasant outcomes.

Is it a foregone conclusion that the value of the dollar and the Euro will plunge to zero? No. The search for economic security requires greater diversification

of the tools of economic trade.

What would happen to the price of gold if China reallocated some of its existing foreign reserves to gold?

The greater the Chinese reserve allocation to gold the higher the price of gold will soar.

This is because all the gold in the world is already owned by someone.

Large scale Chinese purchases of gold will primarily benefit gold owners outside of China.

In the past the German mark was viewed as a sound currency because German monetary policy was essentially the same thing as a gold standard. It was viewed as a sound currency because the Germans followed sound economic policies.

These policies favored economic growth through exports, low inflation and a culture that encouraged both citizens and the government, on average, to live within their means.

Buying gold might be a psychologically rewarding way for China to reduce its exposure to the dollar and the Euro.

However, moving into gold, and away

from the dollar and the Euro, is likely to be very expensive.

Though there may be many reasons against pursuing the Chinese equivalent of the German mark, a Chinese "gold standard" would probably benefit China more than the purchase of gold. A Chinese "gold standard" would be like the German mark "gold standard". Not an actual currency convertible into gold but a currency in which the growth of the money supply is perceived to be low.

What does this mean for China?

Gold might be a barometer of failed economic policies. Investing in barometers is not the answer; responsible economic policies are the answer.

Q: You mentioned "prudent economic policies" several times. Can you be more specific?

A: Here are a few specific policies:

1. Moderate amount of debt taken on by government, businesses, and households;
2. Balanced government spending (no persistent deficits);
3. Running a moderate trade surplus.

Shanghai Daily condensed the article. The authors' recent paper, "The Golden Dilemma" is available for free download at <http://ssrn.com/abstract=2078535>



Campbell Harvey