

Miami Herald

Posted on Wed, May. 21, 2014

Coral reefs first line of defense in a hurricane

BY MICHAEL BECK

mbeck@tnc.org



BECK

At a recent gathering in Orlando, meteorologists predicted a quiet hurricane season this year. Let's hope so. Our coastal development choices, combined with changing storms and sea levels, have greatly increased the risks to our communities of coastal erosion and flooding.

Further compounding these risks is the loss of coastal habitats, such as reefs and wetlands — our first lines of coastal defense. Case in point — the power of healthy coral reefs, [which can reduce a full 97 percent of the wave energy](#) that would otherwise hit coastlines — reducing risk to roughly 200 million people around the world,

according to a [new study in the journal Nature Communications](#).

In fact, in one of many studies, coral reefs in Mexico provided this measured level of benefit during Hurricane Wilma in 2005. Without the reefs absorbing significant wave energy, the coastal damage would have been much worse.

This protective power is a big reason why coral reef degradation, particularly the kind that we have seen across southeast Florida and the Caribbean, is having particularly devastating effects on people and nature. Even small reductions in the height of reefs at their highest point — where most wave breaking occurs — allow significantly more wave energy to pass through and hit coastlines with greater force.

This is basic coastal engineering; if you reduce the height of a breakwater that runs the length of your coast by a foot (and the loss has sometimes been much more) then you will see major new impacts.

While there have been a lot of gloom-and-doom predictions about the future of reefs — and yes, acidification and warming of the ocean are hurting our corals — studies show that healthy, well-managed coral reefs can recover and adapt. We are probably underestimating that resilient quality.

Herein lies cause for optimism. Investing in coral reef protection and restoration can not only help bring these first lines of defense back to better health, but can also help many communities reduce the overall costs of their coastal infrastructure mix.

In fact, we've found that reef restoration for coastal defense can be less than one-tenth the cost of building similar breakwaters — echoing similar findings by reinsurance industry leaders. And, that's not even considering the other co-benefits of reefs to fishing and tourism industries, for example.

Recognizing that reefs provide coastal defense should provide many new opportunities to invest in this “natural sea wall” as part of a blend of risk-reduction strategies. Indeed, hazard mitigation grants from FEMA and investments to protect infrastructure by departments of transportation or ports should also go in to reef conservation and restoration.

At the very least, taxpayers ought to demand that government consider the defense benefits of coastal habitat restoration when examining the costs and benefits of other infrastructure options. Both the Army Corp of Engineers and FEMA are developing approaches for such nature-based accounting. Coral reefs won't do the job on their own, but they should be seen as a critical, cost-effective part of the mix.

As we approach June 1, the opening of hurricane season for the Atlantic coast, let's remember that coral reefs are our first line of defense.

Michael Beck is the lead marine scientist for The Nature Conservancy.

© 2014 Miami Herald Media Company. All Rights Reserved.
<http://www.miamiherald.com>