

Environment Cleo Paskal

People evacuating the Superdome and surrounding areas in New Orleans.

Risk assessments are supposed to lead to decisions that provide more security. However, after a series of tragic failures such as the meltdown at the Fukushima nuclear plant, the deadly blowout on BP's Deepwater Horizon rig, and the destruction caused to New Orleans following Hurricane Katrina, it is becoming increasingly clear that there are serious problems with our ability, or willingness, to accurately evaluate and mitigate risk. The question is, why? And what can be done about it?

Rebuilding Sandcastles

aN AREA THAT ENCAPSULATES MANY OF THE myriad facets of the challenge is the issue of what to do about United States (US) military installations put at risk by environmental change. The US Department of Defense's (DoD) 2010 Quadrennial Defense Review Report explained that: "In 2008, the National Intelligence Council (NIC) judged that more than thirty US military installations were already facing elevated levels of risk from rising sea levels. DoD's operational readiness hinges on continued access to land, air, and sea training and test space. Consequently, the Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required."

Sounds logical, and forward thinking, and the US military certainly has the expertise and funding to do a proper job of it. However, there are multiple systemic barriers standing in the way of accomplishing the essential goal of 'climate proofing' those critical installations.

The first issue is technical. Predicting the behaviour of the physical world is an increasingly complex challenge. The science is good, and getting better, but already it is often marginalised in calculations. Add in the new variables caused by environmental change and it gets even more complicated. Does one plan coastal infrastructure for a 15cm or 50m total sea level rise by 2050? It depends not only on how local hydrology affects sea level rise, but also if there is regional subsidence, seismic uplift, siltation,

and other factors. Then there is the question of how that rise could affect storm surges and other forms of flooding. With environmental change, past indices are no longer reliable guideposts for future events.

The year 2050 may seem far in the future, but it is well within the lifetime of new infrastructure builds. And what happens after then? Additionally, there is a tendency to look at environmental factors in isolation; in this case, the NIC looked mostly just at sea level rise. This highly focused approach is endemic, and often the result of the limited scope of the orders given. For example, after 9/11, expert teams were sent around US nuclear installations to assess their vulnerability to terrorist threats. That would have been an ideal opportunity to also assess their vulnerability to environmental threats. An opportunity missed, not because the experts weren't qualified to do the assessment, but because it was remitted of the operation.

The NIC's 2008 focus was sea level rise. However, considering water-related threats alone, coastal sites may be affected by sea level rise, but also subsidence, river flooding, unusually heavy rainfall, and dam bursts. Also, as seen with the recent Mississippi floods, affected areas may be hundreds of miles from the initial impact site, making the catchment area of a true risk assessment much larger than normally used. Of course, this approach also leaves out problems caused by other environmental variables, such as the sort of heat waves recently experienced in the US. Heat waves can affect infrastructure, but also energy usage and manpower, which in turn can have an impact on readiness.



However, even if we were to assume that all the environmental variables had been taken into account, and a true assessment of risk to readiness had been made - something completely within the technical scope of the US military - adaptation could prove even more difficult.

Say, for example, a base is deemed to be in a highly vulnerable location. There are concerns that in a hurricane, for example, its critical installations could be damaged. Additionally, due to the need to evacuate personnel and safeguard strategic assets, it is likely that rather than being of assistance to the local region, the crisis at the base would draw away key personnel and gear and put pressure on unaffected regional bases as evacuees are relocated there. And so a risk assessment finds that, from the point of view of US national security, it would be logical to move the base to a more secure location.

This is not completely hypothetical. In 1992, Florida's Homestead Air Force Base was virtually destroyed by Hurricane Andrew. In 2005, Mississippi's Keesler Air Force Base was hit by Katrina, flooding around 50 percent of the base, and triggering an evacuation operation of the same men and women one would have hoped would have been available to help a region in peril. The base's Hurricane Hunter airplanes had already been flown to safety.

What has since happened to those bases is instructive. Over 100 million dollars was poured into the reconstruction of Homestead, in the politically important state of Florida. In spite of the regional, political and economic importance of the base, in 1995 the Base Realignment and Closure Committee recommended closing the base. State and federal level politicians successfully fought for it to stay open. Keesler, for its part, suffered 950 million dollars in damages, and was quickly rebuilt in the same location.

Homestead and Keesler demonstrate why it will be extremely difficult for the US military to engage in real adaptation. Bases are key regional economic anchors, bringing in jobs, infrastructure and investment. No elected official or influential local lobby will let one move out of their district without an enormous fight. As seen above, even nearly destroyed bases in vulnerable locations are being rebuilt. It would be difficult to muster the political will necessary to move one preemptively, especially as one of the two main political parties is already officially skeptical of the impacts of a changing environment.

Another issue is potential government liability. If somehow the military managed to move a base due to concerns over flooding caused by environmental change factors, would that give neighbouring communities the right to ask for similar relocation funds?

Similarly, say a base moves, yet the federal government still provides flood insurance to the region through the National Flood Insurance Program. Then a flood hits and there is loss of life. Would the government be liable for the deaths because one branch, the military, has said this location is too dangerous to stay in, while another branch is subsidising people through federally backed insurance to stay there? Dismantling, or even limiting, the National Flood Insurance Program would be even more politically difficult than moving a base because it is a key generator of political funding through property taxes and

developers.


Ultimately, when it comes to moving US bases out of harm's way, the very real risk to national security caused by the potential loss of critical installations is likely to be repeatedly outweighed by the seemingly more immediate political and economic risk of losing a key regional economic driver. Given the political and economic realities, for national security to win out, it might be necessary to pit the interests that would gain from the new location against those who would be losing from the decampment.

As this relatively limited case study shows, there are challenges in assessing the real physical risk to an installation in a time of environmental change. However, those challenges can be overcome. The real problems come when political and economic risk assessments take precedence over the physical realities.

Building a nuclear power plant in an earthquake and tsunami zone makes no sense from a physical reality perspective. In fact, the recent quake in Japan was even predicted in advance by a team of mathematical geophysicists working with Dr. Vladimir Keilis-Borok. However, that risk assessment was trumped by Japan's perceived domestic, economic and political imperatives. Similarly, draining swampland in a hurricane zone like New Orleans to put up housing might make sense to developers and to the city officials that approve the plans for reasons of their own, but from a physical reality perspective, it is nonsensical. As was allowing BP to self-insure the Deepwater Horizon when insurance companies - some of the best in the world at assessing real physical risk - would not insure it, as well as approving the building of houses on flood plains in Britain.

All throughout our systems, real risk is being distorted, discounted and disguised. Potential market-based safety mechanisms, like insurance, are being subverted by politically motivated initiatives like the bankrupt National Flood Insurance Program, and caps on liability, which essentially offset the risk from the individual region or sector onto the population as a whole.

The problem is, those costs are adding up, and the public purse is increasingly light. As the environment changes, it will seem like we are building, and rebuilding, and rerebuilding, sandcastles below the high tide mark. Already, some houses in Alabama have been hit six times by hurricanes and rebuilt each time in part with federal money. Given the system in place now, there is no incentive for them to move, as they know they will be at least partially bailed out.

Truly addressing the real challenges to our national security and economic stability will take political will, long term economic planning and sound science. It won't be easy, but it is a risk we have to take. 

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