L2 AF/A9 - LESSONS LEARNED BULLETIN
SPECIAL

Lessons From Today's Airmen, Learning For Tomorrow's Air Force

Vol. 4 No. 8 **Hurricane Special** **June 2010**

Issue Highlights

- Effects of a Hurricane on the Oil Spill 1
- HA/DR Lessons Identified 1
- Atlantic Basin Forecast 3
- How to Speak Hurricane 5
- Lessons From 2004 Tsunami 6
- Hurricane 101 7
- Key Publications.....7

Deputy Director's Column

By Mr. Paul McVinney, AF/A9L

Greetings from Rosslyn! The 2010 hurricane season is upon us. It commenced June 1 and lasts through November 30, with most hurricanes tending to occur mid-August to late October. We here at AF/A9L want to help prepare you for this season by providing relevant and up-to-date information. Being informed is especially important this year because forecasters predict a particularly active season. The greater likelihood of storms not only increases the risk of landfall in the United States, but we must also be aware of the effects hurricanes will have on the recent oil spill and recovery efforts in Haiti. This special edition bulletin is filled with knowledge and lessons learned from sources across government, civilian agencies and the Department of Defense. Also included are links to important reports, stories and data. Help us and your fellow Airmen by applying past lessons learned, gathering new observations, validating existing ones, and adding to the ever growing JLLIS database.

The USAF *L2 Bulletin* is a monthly publication to highlight USAF Lessons Learned activities within the USAF and with DoD/U.S. Governmental partners. The appearance of hyperlinked text in the *L2 Bulletin* does not constitute an endorsement of the author's position by the Office of Lessons Learned, the United States Air Force, or the Department of Defense.

EFFECTS OF A HURRICANE ON THE OIL SPILL

The National Oceanic and Atmospheric Administration's (NOAA) Oil Spill Response

What will happen to a hurricane that runs through this oil slick? In fact, because most hurricanes' environment and size span an enormous area of the ocean (approximately 200-300 miles), the anticipated impact should be minimal. The oil is not expected to appreciably affect either the intensity or the track of a fully developed tropical storm or hurricane. Likewise, the oil slick should have little effect on the storm surge or near-short wave heights.

That said, the hurricane's high winds and seas will mix and "weather" the oil, which actually can help accelerate the biodegradation process. The high winds, however, may also distribute oil over a wider area, but it is difficult to model exactly where the oil may be transported since movement of oil would depend greatly on the track of the hurricane. Keeping such unpredictability in mind, storm surges may carry oil into the coastline and inland as far as the surge reaches. Similarly, debris resulting from the hurricane may be contaminated by oil from the Deepwater Horizon incident, but also from other oil releases that may occur during the storm. Keeping in mind that a hurricane's winds rotate counter-

(Continued on page 2)

HA/DR LESSONS IDENTIFIED

Compiled from USAF publications and observations

Humanitarian Assistance/Disaster Response (HA/DR) events and the USAF's response to those events, which include Hurricane Katrina, the 2004 tsunami, the Pakistan and Haitian earthquakes and the recent Gulf oil spill, offer the L2 community a host of valuable lessons about what works and does not work well in HA/DR operations. These lessons should be applied during the next crisis so that the AF's response achieves an even higher degree of success. Five key lessons in particular are highlighted.

The first lesson is that executing the Request for Forces (RFF) process has not been responsive enough for the rapid requirements of an HA/DR event. Many RFFs have invalid unit line numbers (ULN) and they are vague or incorrectly submitted. Also, specific forces are requested versus capabilities. Duplicate RFFs have been submitted to functional area managers (FAM), the ACC Crisis Action Team (CAT), AEF cell and HQ USAF. As a result, in the aftermath of the 2004 Indonesia tsunami for example, forces trickled in, taking Airmen three weeks to get to a location as opposed to the three day time period requested. Likewise, operations during Hurricane Gustav showed that RFF checklists are vague. Exercise AUSTERE CHALLENGE 2009 revealed that personnel did not understand the RFF process. The preponderance of issues seem to be caused by a lack of training and attempts to circumvent the process. To mitigate these challenges, Air Force staffs should consider mandatory initial and recurring training on RFF-related processes and systems.

(Continued on page 4)

OIL SPILL *(Continued from page 1)*

clockwise, in very general terms it is likely that a hurricane passing to the west of the oil slick could drive oil to the coast whereas a hurricane passing to the east of the slick could drive the oil away from the coast. Nevertheless, the details of the evolution of the storm, the track, the wind speed, the size, the forward motion and the intensity are all unknowns at this point and may alter such a general statement.

So, will the oil slick help or hurt a storm from developing in the Gulf? Evaporation from the sea surface fuels tropical storms and hurricanes. Over relatively calm water (such as for a developing tropical depression or disturbance), in theory, an oil slick could suppress evaporation if the layer is thick enough, by not allowing contact of the water to the air. With less evaporation one might assume there would be less moisture available to fuel the hurricane and thus reduce its strength. However, except for immediately near the source, the slick is very patchy. At moderate wind speeds, such as those found in approaching tropical storms and hurricanes, a thin layer of oil such as is the case with the current slick (except in very limited areas near the well) would likely break into pools on the surface or mix as drops in the upper layers of the ocean. (The heaviest surface slicks, however, could re-coalesce at the surface after the storm passes). This would allow much of the water to remain in touch with the overlying air and greatly reduce any effect the oil may have on evaporation. In the end, then, the oil slick is not likely to have a significant impact on the hurricane.

All of the sampling to date shows that except near the leaking well, the subsurface dispersed oil is in parts per million levels or less. This means that a hurricane will mix the waters of the Gulf and disperse the oil even further. It should be remembered that hurricanes encountering oil spills is not a new phenomenon. However, experience has been primarily with oil spills that occurred because of the storm, not from an existing oil slick and an ongoing release of oil from the seafloor. The experience from hurricanes Katrina and Rita, both occurring in 2005, was that oil released during the storms became very widely dispersed. Dozens of significant spills and hundreds of small spills occurred as a result of these storms from offshore facilities, shoreside facilities, vessel sinkings, etc. Fortunately, there will not be oil in the rain related to a hurricane. Hurricanes draw water vapor from a large area, much larger than the area covered by oil, and rain is produced in clouds circulating the hurricane.

Learn more about NOAA's response to the BP oil spill at http://response.restoration.noaa.gov/deepwaterhorizon.

Region	Tropical Storms	Category 1-2 HUR	Category 3-4-5 HUR	All HUR	Named Storms
Entire U.S.	95% (79%)	89% (68%)	76% (52%)	97% (84%)	99% (97%)
Gulf Coast	82% (59%)	66% (42%)	50% (30%)	83% (60%)	97% (83%)
Florida plus East Coast	74% (50%)	68% (44%)	51% (31%)	84% (61%)	96% (81%)
Caribbean (10-20N, 60-88N)	97% (82%)	81% (57%)	65% (42%)	93% (75%)	99% (96%)

Table 1: Estimated probability of one or more land-falling tropical storms, category 1-2 hurricanes, category 3-4-5 hurricanes, total hurricanes and named storms along the entire U.S. coastline, along the Gulf Coast, and along the Florida Peninsula and the East Coast for 2010. Probabilities of a tropical storm, hurricane and major hurricane tracking into the Caribbean are also provided. The long-term mean annual probability of one or more land-falling systems during the last 100 years is given in parentheses.

DEVELOP AN EMERGENCY PLAN

Prepare in advance for what you will do in an emergency. The reality is that you will not have access to everyday conveniences. Think through the details of what you use during your everyday life (...prescriptions, orthotics and medical supplies, childcare accessories)

Consider the impact on the entire household. Your family may not be together when disaster strikes, so plan how you will contact one another and review what you will do in different situations.

Consider a plan where each family member calls, or e-mails, the same friend or relative in the event of an emergency. It may be easier to make a long-distance phone call than to call across town, so an out-of-town contact may be in a better position to communicate among separated family members. Depending on your circumstances and the nature of the emergency, the first important decision is whether you stay put or get away. You should understand and plan for both possibilities.

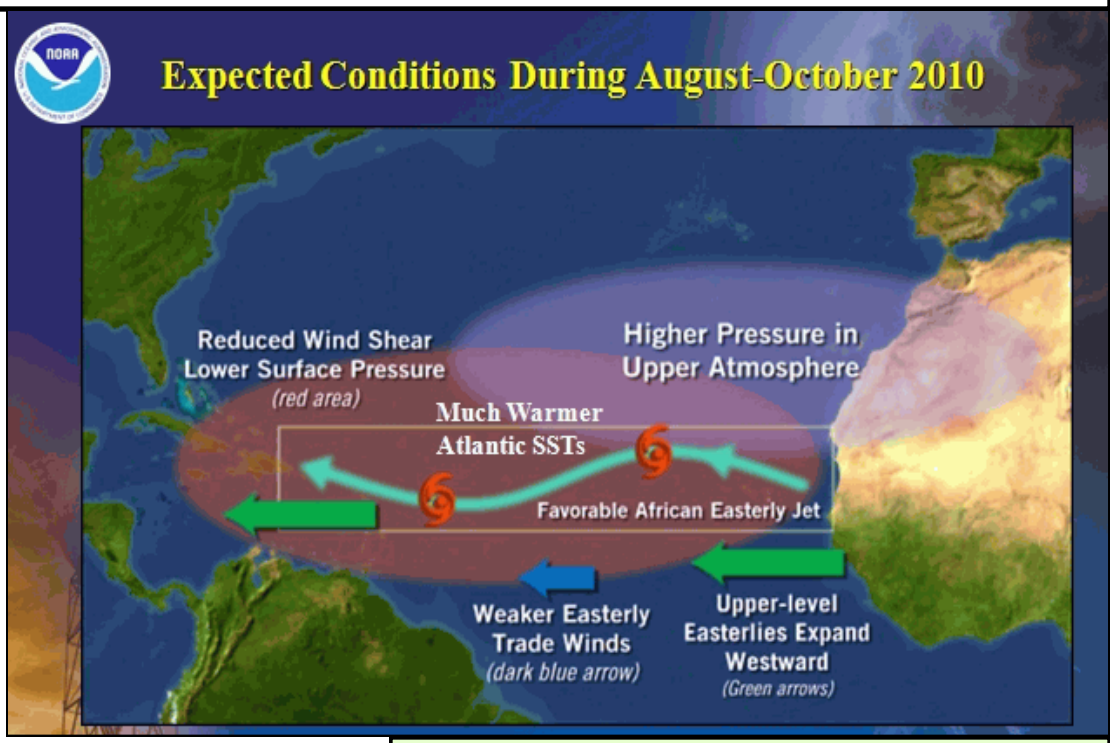
Monitor electronic media (TV, radio, online advisories) and listen for official instructions from government leaders as advisories are updated.

(Note - A major benefit is that the plan can be used for many different types of emergencies)

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2010

Philip J. Klotzbach and William M. Gary, Department of Atmospheric Science, Colorado State University

The 2010 Atlantic hurricane season is predicted to be much more active than the average 1950-2000 season. It is estimated that 2010 will have about 10 hurricanes (average is 5.9), 18 named storms (average is 9.6), 90 named storm days (average is 49.1), 40 hurricane days (average is 24.5), 5 major Category 3-4-5 hurricanes (average is 2.3) and 13 major hurricane days (average is 5.0). The probability of U.S. major hurricane landfall and Caribbean major hurricane activity is estimated to be well above its long-period average. We expect Atlantic basin Net Tropical Cyclone (NTC) activity in 2010 to be approximately 195 percent of the long-term average. We have increased our seasonal forecast from early April. This forecast is based on an extended-range early June statistical prediction scheme that utilizes 58 years of past data. Analog predictors are also utilized. The influence of El Nino conditions is implicit in these predictor fields, and therefore we do not utilize a specific El Niño Southern Oscillation forecast as a predictor.



The predicted set of conditions for August-October 2010 mainly reflects the expected continuation of the tropical multi-decadal signal, above-average Atlantic Ocean temperatures, and a possible La Niña-related reduction in vertical wind shear

The current trend from El Niño to neutral conditions will persist and that weak La Niña conditions will develop by the most active portion of this year's hurricane season (August-October). The expected trend towards weak La Niña conditions should lead to reduced levels of vertical wind shear compared with what was witnessed in 2009. Another reason for our forecast increase is due to the persistence of anomalously warm sea surface temperatures in both the tropical and North Atlantic. Current sea surface temperature anomalies are running at near-record warm levels. These very warm waters are associated with dynamic and thermodynamic factors that are very conducive for an active Atlantic hurricane season. Another factor in the forecast increase is the weaker-than-normal Azores High that prevailed during April-May. Weaker high pressure typically results in weaker trade winds that are commonly associated with more active hurricane seasons. Another important factor is that we are in the midst of a multi-decadal era of more major hurricane activity. Major hurricanes cause 80-85 percent of normalized hurricane damage.

State	HURRICANES	MAJOR	State	HURRICANES	MAJOR
TX	63	19	DE	2	0
LA	55	20	NJ	2	0
MS	16	9	PA	1	0
AL	26	6	NY	12	5
GA	23	3	CN	11	3
FL	113	37	RI	9	4
SC	30	6	MA	11	3
NC	50	12	NH	2	0
VA	10	1	ME	6	0
MD	2	0			

Table 2: Number of Hurricanes Making Landfall on U.S. Mainland: 1851—2009

LESSONS IDENTIFIED *(Continued from page 1)*

Secondly, complete personnel accountability is essential. PERSCO teams are not given top priority to deploy as part of the first elements of the time-phased force deployment data (TPFDD) flow. As the operation proceeds, no consolidated PERSCO is established to manage the accountability of deployed AF personnel. For example, during Hurricane Gustav, personnel moved on verbal orders of their commanders (VOCO) and no PERSCO team was deployed for accountability. Accountability is also problematic for evacuees. The Lebanon Evacuation in 2006 showed the value of employing in-transit visibility (ITV) bracelets in noncombatant evacuation operations (NEO) that involve significant movement of personnel. A difference was certainly noted between real world operations and practices used in competition at Air Mobility RODEO 2009. As a result of these difficulties with accountability, a warning order should initiate the personnel accountability processes and the emphasis should continue throughout the operation. It should be noted that AMC has a specific ability to track personnel and equipment deploying without DCAPES by having them report to a tanker airlift control center (TACC) cell manned by a personnel specialist.

A third lesson area that has been identified is the flow of forces. In the early stages of the crisis, an abundance of personnel are directed through the use of VOCO. Many times, there is no established TPFDD. These two shortcomings combine to adversely impact the prioritization of forces. Commonly, even after they are developed, TPFDD is not transmitted in a timely manner and is not always complete or accurate. VOCOs add to the sense of urgency, but do nothing to identify personnel or equipment prioritization. For future events, supported Component Commands might consider creating and publishing formal force modules for HA/DR. Also, early in crisis operations Airmen should be identified to go forward with the joint task force (JTF) commander to present Air and Space forces.

Fourth, a lack of USAF personnel on the JTF staff contributes to an inefficient use of AF capabilities at the beginning of HA/DR operations. As Maj Gen Jouas commented on the tsunami aftermath, "Despite the contingency being an airlift operation, Airmen were often left out of the coordination process." It is best to identify airmen early in crisis operations to fill positions on joint task force (JTF) staffs to ensure Air Force representation and expertise. Likewise, it is most effective if COCOM service components preplan a command and control (C2) structure for HA/DR, which maximizes the time at the onset of a rapid response operation. Further, developing an adequate, deployable, scalable C2 package to support a deployed commander, negating reliance on the AOC, would be a sound idea.

> *"Absence of Time-Phased Force Deployment Data (TPFDD) from plans caused ad hoc force presentation."*
>
> *— Hurricane Katrina Report*

> *"Up to 90% of the problems encountered in identifying and sourcing forces could have been avoided had all parties adhered to established processes."*
>
> *— ACC's Operation UNIFIED RESPONSE After Action Report*

A fifth lesson is that there are substantive complexities, both unique and predictable, to establishing air flow control early in HA/DR. A degree of sensitivity to sovereignty issues must be applied and there must be an awareness that the AF does not have Senior Airfield Authority (SAA). In Indonesia in 2005, Maj Gen Jouas noted that there were many airplanes flying into a limited number of airfields, including the only one that was usable in the most heavily devastated area. A lesson to take away is to document tactics, techniques, and procedures (TTP) from regional air movement coordination center (RAMCC) operations during OUR to institutionalize as a best practice for future HA/DR. Using memorandums of Agreement (MOA) to leverage other commands for function and personnel also can be helpful.

Overall, the AF has done an outstanding job responding to the natural and man-made disasters of the past few years. As AF Secretary Michael B. Donley said, "Whether helping to ensure planes carrying much-needed supplies and personnel get into Port-au-Prince around-the-clock, repatriating U.S. citizens out of Haiti, or assisting with desperately needed medical care, the contributions made by the men and women of the Air Force... have been integral to overall relief efforts." As always, however, there are still lessons to learn and integrate into future operations so that we may continue to improve. It is our hope that these lessons with be acted upon by air component staffs around the world. If they are not, they will continue to serve as those "Lessons Predicted" and will have to be re-learned.

HOW TO SPEAK HURRICANE — Definitions and Acronyms

Philip J. Klotzbach and William M. Gary, Department of Atmospheric Science, Colorado State University

Accumulated Cyclone Energy (ACE) - A measure of a named storm's potential for wind and storm surge destruction defined as the sum of the square of a named storm's maximum wind speed (in 104 knots2) for each 6-hour period of its existence. The 1950-2000 average value of this parameter is 96.

Atlantic Multi-Decadal Oscillation (AMO) – A mode of natural variability that occurs in the North Atlantic Ocean and evidencing itself in fluctuations in both sea surface temperature and sea level pressure fields. The AMO is likely related to fluctuations in the strength of the thermohaline circulation. Although several definitions of the AMO are currently used in the literature, we define the AMO based on North Atlantic sea surface temperatures from 50-60°N, 10-50°W.

Atlantic Basin – The area including the entire North Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico.

El Niño – A 12-18 month period during which anomalously warm sea surface temperatures occur in the eastern half of the equatorial Pacific. Moderate or strong El Niño events occur irregularly, about once every 3-7 years on average.

Hurricane (H) - A tropical cyclone with sustained low-level winds of 74 miles per hour (33 ms-1 or 64 knots) or greater.

Hurricane Day (HD) - A measure of hurricane activity, one unit of which occurs as four 6-hour periods during which a tropical cyclone is observed or is estimated to have hurricane-force winds.

Madden Julian Oscillation (MJO) – A globally propagating mode of tropical atmospheric intra-seasonal variability. The wave tends to propagate eastward at approximately 5 ms-1, circling the globe in approximately 40-50 days.

Main Development Region (MDR) – An area in the tropical Atlantic where a majority of major hurricanes form, defined as 10-20°N, 20-70°W.

Major Hurricane (MH) - A hurricane which reaches a sustained low-level wind of at least 111 mph (96 knots or 50 ms-1) at some point in its lifetime. This constitutes a category 3 or higher on the Saffir/Simpson scale.

Major Hurricane Day (MHD) - Four 6-hour periods during which a hurricane has an intensity of Saffir/Simpson category 3 or higher.

Multivariate ENSO Index (MEI) – An index defining ENSO that takes into account tropical Pacific sea surface temperatures, sea level pressures, zonal and meridional winds and cloudiness.

Named Storm (NS) - A hurricane, a tropical storm or a sub-tropical storm.

Named Storm Day (NSD) - As in HD but for four 6-hour periods during which a tropical or sub-tropical cyclone is observed (or is estimated) to have attained tropical storm-force winds.

Net Tropical Cyclone (NTC) Activity –Average seasonal percentage mean of NS, NSD, H, HD, MH, MHD. Gives overall indication of Atlantic basin seasonal hurricane activity. The 1950-2000 average value of this parameter is 100.

Saffir/Simpson Scale – A measurement scale ranging from 1 to 5 of hurricane wind and ocean surge intensity. One is a weak hurricane; whereas, five is the most intense hurricane.

Southern Oscillation Index (SOI) – A normalized measure of the surface pressure difference between Tahiti and Darwin.

Sea Surface Temperature – SST

Sea Surface Temperature Anomaly – SSTA

Thermohaline Circulation (THC) – A large-scale circulation in the Atlantic Ocean that is driven by fluctuations in salinity and temperature. When the THC is stronger than normal, the AMO tends to be in its warm (or positive) phase.

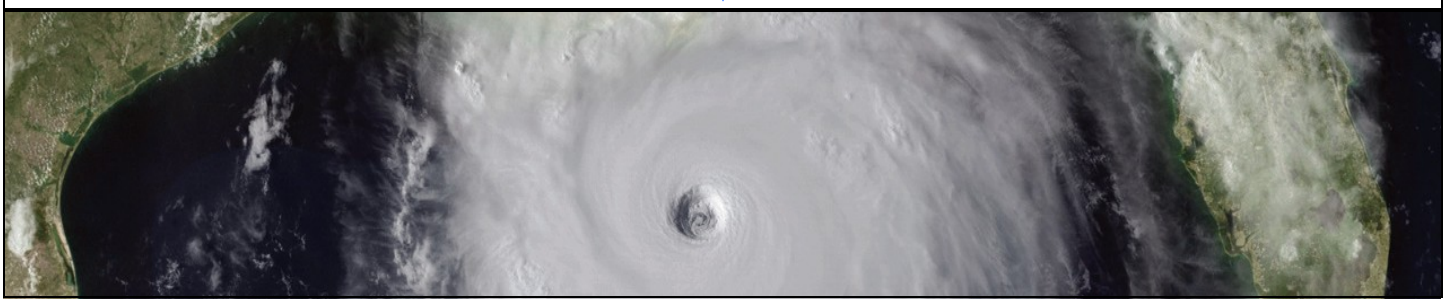
Tropical Cyclone (TC) - A large-scale circular flow occurring within the tropics and subtropics which has its strongest winds at low levels; including hurricanes, tropical storms and other weaker rotating vortices.

Tropical North Atlantic (TNA) index – A measure of sea surface temperatures in the area from 5.5-23.5°N, 15-57.5°W.

Tropical Storm (TS) - A tropical cyclone with maximum sustained winds between 39 (18 ms-1 or 34 knots) and 73 (32 ms-1 or 63 knots) miles per hour.

Vertical Wind Shear – The difference in horizontal wind between 200 mb (approximately 40000 feet or 12 km) and 850 mb (approximately 5000 feet or 1.6 km).

(1 knot = 1.15 miles per hour = 0.515 meters per second)



LESSONS FROM 2004 TSUNAMI CAN GUIDE REDEVELOPMENT OF HAITI

Compiled from news articles including CNN, BBC, NYTIMES

Many lessons learned during the reconstruction efforts from the December 26, 2004 tsunami, which killed an estimated 228,000 people and left 2.5 million others homeless throughout 14 different countries, can be applied to reconstruction efforts in Haiti. True, there are many differences between the two situations. While the tsunami destroyed the coastlines of Indonesia and Thailand, the interior regions and government were left largely unaffected and intact. In comparison, many of Haiti's government offices were destroyed and its government was weak and disorganized even before the quake. Also, with a different culture, history and political realities, Haiti may not be suited for the practices that proved successful in the tsunami recovery. Nevertheless, reconstruction efforts in both cases require a high level of organization and coordination between hundreds of separate NGOs and government aid agencies. New housing and infrastructure projects will also need to meet the environmental risk factors so that buildings are sound for future disasters.

Pictures of a road just off Patong beach in Phuket, Thailand. The one on the left is two days after the tsunami hit; the picture on the right is the street today. (Source: news.bbc.co.uk/2/…/hi/...tsunami0_then_and_now/…/1.stm)

First of all, experts can look to the post-tsunami fundraising efforts for ideas as to how to proceed in Haiti. After the tsunami, the World Bank organized a multi-donor fund to pool international financing so that affected governments could tap into and pay for individual reconstruction programs. Another example is Indonesia's creation of the Aceh-Nias Rehabilitation and Reconstruction Agency (BRR), a government body that was given generous power to make decisions quickly. Likewise, competing UN agencies, such as UNDP and UNICEF, formed a UN Office for Recovery Coordination to make sure all Indonesia staff had visibility of funding and reconstruction projects. Furthermore, the United Nations created a program known as the "Cluster System" to coordinate and reduce duplicated relief efforts of aid agencies and non-governmental agencies (NGOs). All of these ideas could work well in Haiti since charity agencies, NGOs, the UN, and states will be operating in a similar way, meaning there will be the same need for coordination and oversight. The approaches mentioned above that were used in the tsunami aftermath surely can be applied to the rebuilding efforts in Haiti, particularly because cash and actors involved will be of similar magnitudes.

Other lessons learned from the 2004 tsunami are highlighted in a report released by Britain's Disaster Emergency Committee (DEC). This report, actually released only a week before the earthquake hit the island nation, specifically reviews housing reconstruction in the Indonesian region of Aceh. The "Lessons from Aceh" report highlights the complex process of construction in post-disaster areas and the need for experts to be brought in during the early part of the planning process, so that structures are built to meet the environmental conditions and potential risks, such as designing buildings to withstand earthquakes in high-risk areas. In Indonesia, much of the reconstruction was completed quickly by charities and non-government organizations, but many of these structures had to be knocked down and rebuilt later because of a lack of planning and expert skills involved. Given the pressure to return things to normal, the high-profile task, and the size of the recovery area and community, strategic planning often can be overlooked. This is more so the case because charities and NGOs tend to be quick on the scene of major disasters and can lack the expertise to build sound infrastructure and houses. Officials should be aware of past mistakes and fits-and-starts that plagued some recovery efforts in Indonesia and could do the same in Haiti.

As much as can be learned from the tsunami, however, Haiti recovery efforts face additional havoc with the risk of hurricanes this summer, particularly because forecasters predict an extreme hurricane season with an above average number of powerful storms. More than 1.5 million quake survivors are still living in over 1,000 fragile, crowded tent camps in and around the wrecked capital. These survivors are vulnerable to landslides and flooding, which have killed thousands of Haitians in the past even without the vulnerable situation the country now finds itself in.

HURRICANE 101: HOW TO WEATHER THE STORM — Ready Campaign Fact Sheet

Know Your Risk and What To Do

- Contact your local emergency management office to learn about evacuation routes and emergency plans for home, work and schools
- For additional information visit: fema.gov, ready.gov, citizencorps.gov, redcross.org and nhc.noaa.gov
- Make a family disaster plan
- Assemble a disaster supplies kit with food, water, medical supplies, battery-powered radio, batteries and flashlights
- Gather important documents such as social security cards, wills, insurance records, etc and store in a fire/flood safe location
- Buy flood insurance. There is a 30-day waiting period before activation of flood insurance policies.

Prepare Your Home

- Install wooden or metal storm shutters or board up windows with 5/8" marine plywood
- Install metal straps or hurricane clips to fasten roof to the frame structure
- Trim trees and clear rain gutters and downspouts
- Plan ahead for protection of pets and livestock

As the Storm Approaches

- *Hurricane Watch* means the onset of hurricane conditions is possible within 36hrs; *Hurricane Warning* means the onset of hurricane conditions is likely within 24hrs
- Have a full tank of gas, cash, and disaster supplies kit ready to go
- Have family members carry ID
- Turn refrigerator/freezer to maximum cold and keep cold
- Fill the bathtub with water for bathing, flushing toilets, and cleaning
- Turn off propane tanks
- Secure or bring inside outdoor items like patio furniture

Evacuate

- If you are directed by local authorities or if you live in a: mobile home, high-rise building, on the coast, a floodplain, near a river, or an inland waterway
- Stick to marked evacuation routes

After the Storm

- Use caution going outdoors and watch for closed roads
- Stay on firm ground
- Do not drink tap water until you know it is safe

KEY PUBLICATIONS

Editor's Note: If you have a paper copy of this Bulletin, please go to the HAF/A9L CoP at: https://afkm.wpafb.af.mil/ASPs/CoP/ClosedCoP.asp?Filter=OO-OT-AF-07 **or the AF Lessons Learned page on JLLIS** https://www.jllis.mil/USAF/?HAF **to access an electronic copy of this L2 Bulletin with active links.**

General Knowledge

Robert T. Stafford Disaster Relief and Emergency Assistance Act: Legal Requirements for Federal and State Roles in Declarations of an Emergency or a Major Disaster

How Should Air Force Expeditionary Medical Capabilities Be Expressed?

Models of Relief: Learning from Exemplary Practices in International Disaster Management

Humanitarian Assistance/Disaster Relief (HA/DR) Operations Planning

Crisis Communication and Emergency Risk Communication Guide

Lessons Learned: Evacuations Management of Hurricane Gustav

USAF Publications

AFH10-416, ***PERSONNEL READINESS AND MOBILIZATION***

AFI 10-206, ***OPERATIONAL REPORTING***

AFI 10-213, ***COMPTROLLER OPERATIONS UNDER EMERGENCY CONDITIONS***

AFI 10-216, ***EVACUATING AND REPATRIATING AIRFORCE FAMILY MEMBERS AND OTHER US NONCOMBATANTS***

AFI 10-218, ***PERSONNEL ACCOUNTABILITY IN CONJUNCTION With NATURAL DISASTERS/NATIONAL EMERGENCIES***

AFI 10-801, ***ASSISTANCE TO CIVILIAN LAW ENFORCEMENT AGENCIES***

AFI 10-802, ***MILITARY SUPPORT TO CIVIL AUTHORITIES***

AFI 10-2501, ***AIR FORCE EMERGENCY MANAGEMENT PROGRAM PLANNING AND OPERATIONS***

AFI 10-2603, ***EMERGENCY HEALTH POWERS ON AIR FORCE INSTALLATIONS***

AFI 10-2604, ***DISEASE CONTAINMENT PLANNING GUIDANCE*** **(RESTRICTED)**

AFI 10-2909, ***AEROMEDICAL EVACUATION EQUIPMENT***

HELPFUL WEBSITES

Editor's Note: If you have a paper copy of this Bulletin, please go to the HAF/A9L CoP at: https://afkm.wpafb.af.mil/ASPs/CoP/ClosedCoP.asp?Filter=OO-OT-AF-07 **or the AF Lessons Learned page on JLLIS** https://www.jllis.mil/USAF/?HAF **to access an electronic copy of this L2 Bulletin with active links.**

USNORTHCOM Crises, Contingencies, Operations & Exercises Portal Note: You may need to register for full access: **https://registration.NORADNORTHCOM.mil/gateway/default.aspx**

1AF/AFNORTH

The Tropical Meteorology Project (Forecasts)

National Hurricane Center

NOAA Hurricane Website

NASA Hurricane Website

NOAA Pacific Tsunami Warning Center

U.S. Geological Survey (USGS)

FEMA

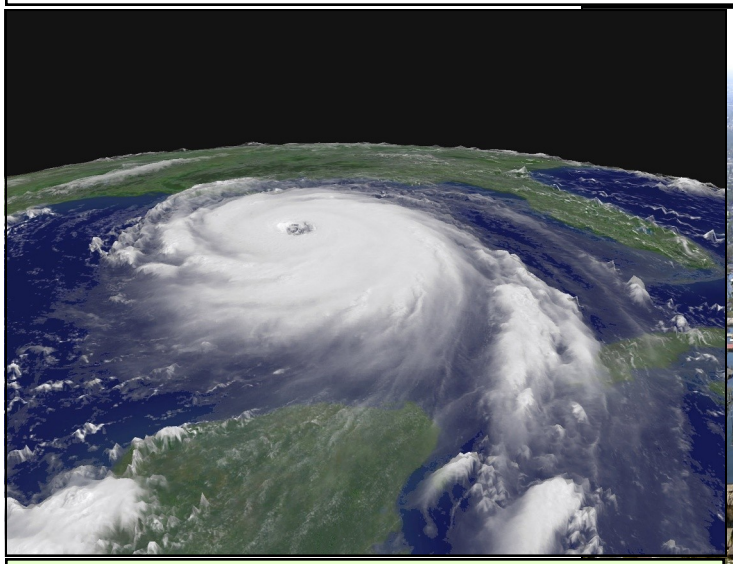
NOAA Emergency Response Imagery Server

NOAA GOES Satellite Imagery Server

NASA Earth Observatory Imagery Server

NRL Monterey Tropical Cyclone Imagery Server

U.S. Office of Personnel Management Emergency Guidance Memoranda



If You Evacuate due to HA/DR Incident, Don't Forget to Report Your Status !

Air Force Personnel Accountability and Assessment System (AFAAS)

All articles and web sites to which these pages cross-link are included as a service for readers. Cross-links to non-governmental sites do not constitute an endorsement or approval of their content, or of the organizations responsible for that content by the Office of Air Force Lessons Learned, the United States Air Force, The United States Army, the Department of Defense, or the United States Government.

Questions or Comments?

Please contact: AF/A9LG
afa9lg.workflow@pentagon.af.mil

Lt Col Timothy Penn, ANG Liaison to AF/A9L
(703) 588-6944
Ms. Charlotte Lynch, Program Analyst, AF/A9L
(703) 696-3179