



Observer

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Weather in its
EXTREME



Observer

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A snapshot of Air Force Special Operations Command's Technical and Tactical Training Exercise held recently at Ft. Campbell, Ky. designed to help meet the extensive training requirements for AFSOC's Special Operations Weather Teams.

12 It was a dark and stormy night. . .

This year at Thule the sun will set at 1:51 p.m. on Oct. 29 and won't rise again until 12:45 p.m. on Feb.13, 2007. These dark nights can get stormy with regular storms producing 100 to 200 mph winds lasting several hours. The Guinness Book of World Records credits Thule for recording "the fastest surface wind speed at a low-altitude on Earth."



14 Monsoons in America?

Summer thunderstorms in Arizona are known as the North American Monsoon. Flooding in the typically dry riverbeds is common but lasts only a short time. Forecasters at the 25th Operational Weather Squadron watch the monsoon season and learn from their opportunity to forecast it.



17 Ioke

On Aug. 31, a Category 5 Super Typhoon passed over Wake Island. The 17th Operational Weather Squadron and Hickam Weather Flights watched the storm and provided updates to Air Force leaders ensuring the safe evacuation of Wake Island residents and proper timing to begin recovery operations.



22 Sparring with Ernesto

Always Alert, the 9th Operational Weather Squadron communicates with Weather Flights along the east coast to ensure people and assets are safely evacuated from areas forecast to be affected by the storm.

28 Weather Recon still kickin

Members of the Air Weather Reconnaissance Association held their annual reunion of former pilots, navigators, weather officers and drop-sonde operators in Dayton, Ohio, Sept. 28 through Oct. 1.



On the Cover

Air Force weather forecasters around the world watch weather in all its extremes; dust storms, snow storms, heavy rain, heavy wind, hurricanes, fog, floods and more. This issue focuses on the extremes of Air Force weather around the globe.

The photo illustration on the cover is a colorized satellite image of Super Typhoon Ioke as it passed over Wake Island Aug. 31. Superimposed into the image are weather extremes such as snow storms, dust storms, and floods. Ioke satellite image provided by NASA from the Moderate Resolution Imaging Spectroradiometer on the Aqua satellite. Photo illustration by Mrs. Eileen Williamson.

A Note to the Weather Warriors

You get it! We're Airmen and warriors first. I must say I'm extremely impressed with the way weather Airmen identify a problem and work to fix it at a full sprint. In my 4 months as Director of Weather, I've found that, far from having to jump in and direct a solution, I have to jump out of the way so you don't run me over!

When more than 40 of our AEF deployments were extended to 179 days. I was very concerned. But as it turns out, you were already on it! Before I said a word, weather folks at AFWA, the MAJCOMs, and individuals all the way down to the flight/detachment level were already working the problem. With lots of hard work at every level of our functional community, you took a hard look at each of our "non-deployable" manpower positions and asked yourselves if the mission would truly fail if certain individuals deployed.

The results speak for themselves. We made more than half of our formerly "non-deployable" positions available to the AEF. All 179-day tours have been rolled back to 120 days. You have all shown you have a warrior mentality, dedicated to bringing your expertise to the fight, be it from a forward-deployed base or via reachback from home station. Superb job!

Of course, our Army and Special Operations Forces support folks still routinely deploy on 179-day tours or longer. There will still be times when we will have to send people to far away places for six months, or even a year. But I give you my word that my staff and I will do our utmost to keep the deployment load fair. You deserve no less. You have shown yourselves to be Airmen and warriors first, as it should be.

Keep up your mach,



Air Force Weather Agency team members applaud during a coin presentation ceremony held when Brig. Gen. Lawrence A. Stutzheim visited the Agency July 26th and 27th.

179-day deployments supporting Air Force operations?

Air Combat Command, Director of Weather Staff Report
Langley AFB, Va.

You're tagged and ready to deploy for a 120-day AEF 3/4 rotation supporting Air Force operations when suddenly, about six weeks before departure, your tour length is extended to 179 days. Wouldn't happen to you? Think again. This actually occurred this summer. Although Army weather support forces have been pulling 179-day rotations for years, up to this point, those supporting Air Force operations had been largely immune. The good news is the tour lengths supporting Air Force operations were recently restored to 120 days. The bad news is few of us understood why it happened. In this case, the cause stemmed from how weather forces supporting Air Force operations were postured in the AEF. Posturing is a poorly understood yet vitally important component of the AEF construct.

Knowing what Unit Type Code you are in, how that UTC is postured in the AEF, and what posturing code is associated with that UTC is important.

A UTC is what the AEF Center actually tasks for deployment. It is a code that defines a required capability and can consist of one or more people and/or equipment. For example, an XWQA1 is a 1-person UTC requiring a 5-skill level. Posturing aligns these UTCs with one of the ten AEFs. Your unit deployment manager should tell you the specific UTC and AEF you are assigned to soon after your arrival at a new duty station.

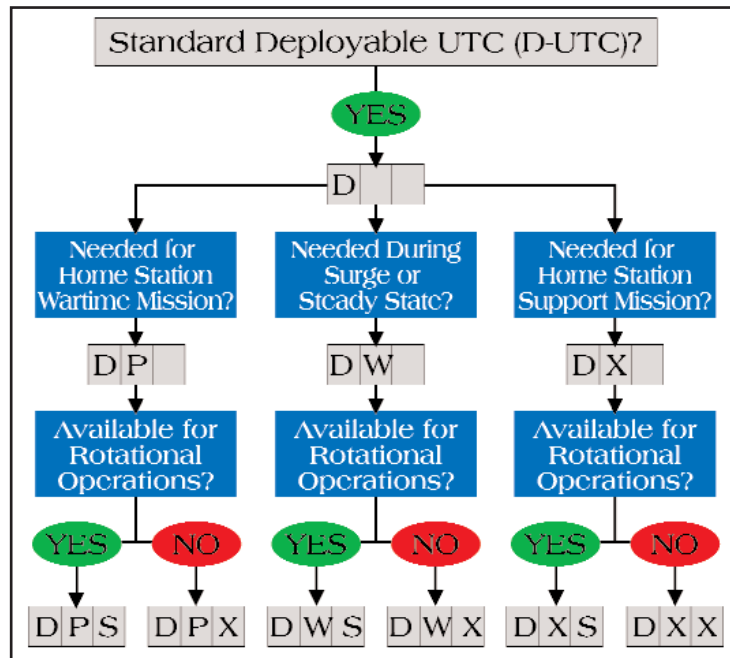
Once postured, the UTC is assigned a Posturing code. This P-code was a major factor behind the increased tour length mentioned before. P-codes indicate the UTCs availability for deployment during either normal "steady state" rotational operations or during surge operations such as those driven by a major war or multiple contingencies. Each P-code contains three digits.

Given these choices of P-code, most UTCs within an operations support squadron's weather flight are coded DWS or DXS; in other words, they are available to deploy for wartime or rotational, steady state, requirements. In contrast, operational weather squadron UTCs are more likely to be coded DPS or DPX, that is, supporting a combatant command requirement from home station. A limited number of OWS UTCs will be coded DPS and made available to deploy during a standard AEF rotation. The remainder will likely be coded DPX, indicating they are needed to sustain reachback capability and not available for deployment.

If we poorly posture and P-code UTCs, the AEF Center may task deployments in a way that unfairly burdens select individuals. That happened this summer because not all UTCs were postured and coded equivalently in each AEF pair. This created an artificial shortfall in 5-skill level forecasters, XWQA1, available for AEF 5/6. This forced the AEF Center to extend AEF 3/4 deployments for all XWQA1s

from 120 to 179 days to meet the first half of AEF 5/6 requirements. That would have caused a domino effect in future AEF rotations as well. The inequity of having only 5-skill levels deploying with extended tour lengths not only strained morale but altered AEF predictability. In response, we revamped posturing and coding of UTCs Air Force wide. As a result, enough XWQA1s became available for the AEF Center to restore 120-day tour lengths for AEF 3/4.

Six month rotations can't always be avoided – just ask one of your friends supporting deployed Army operations. However, if we properly posture and code our forces, we can minimize 179-day rotations as much as possible. Furthermore, we can increase predictability by better understanding how we're postured and coded since the AEF Center uses this information to determine who goes first, for how long, and who must remain at home station. However, make no mistake, you must be ready when your AEF bucket is called regardless of how you're coded – if the need is great enough, you'll deploy!



The logic tree used to determine proper coding for a D-UTC. The first digit of a P-code will be either a "D" for a standard deployable UTC or an "A" for an associate UTC. A-UTCs are not aligned with a standard UTC and typically apply to 3-skill level Airmen, Chief Master Sergeants, and Colonels. D-UTCs are the type normally tagged for deployment.

The next character of a P-code is either P, W, or X. A "P" indicates the UTC provides direct support to a combatant command from home station; such as the 28th Operational Weather Squadron's support to U.S. Central Command. A "W" indicates the UTC is available for tasking during all conditions such as all out war or a short-term crisis. Most commonly, this applies to a portion of the UTCs in an operations support squadron's weather flight. Finally, an "X" is used to define the minimum home station requirement of the unit; however, as long as sufficient manpower remains behind to sustain the home station mission, the UTC may be deployed. Those operations support squadron weather flight UTCs not coded with a "W" are normally coded with an X.

The last character of the P-code is either S or X. An "S" indicates the UTC is available for deployment. An "X" denotes UTCs that are not normally available for deployment during an AEF rotation without exceeding the unit's capability to sustain critical home station operations. While a UTC ending in "S" is more likely to be deployed before one ending in "X," all UTCs, regardless of P-code, can be deployed during any AEF rotation.

U.S. Air Forces in Europe, a command in transformation

by Col. Ralph O. Stoffer
USAFE, A3W
Ramstein AB, Germany

Nearly 26 years ago to the day I arrived at Rhein Main AB, Germany, "The Gateway to Europe" as 2nd Lt. Ralph Stoffer, enroute to my first duty station, Feucht Army Airfield in Nuernberg, Germany. Rhein Main was a sprawling Air Base collocated with even busier Frankfurt International Airport. In Nuernberg I found a large U.S. community with eight major posts and nearly 50,000 personnel. Our mission was to monitor and protect the border between the West and the East.

Weather folks at Det 1, 7th Weather Squadron just as our brethren Army warriors, the 2nd Armored Cavalry Regiment were "Toujours prêt," Always Ready, to defend our freedom. Our mini-tank, an M577A2 Command Post Carrier, housed our radio teletype system or RATT-RIGG and our tactical weather station. This WWII vintage antiquated equipment was often supplemented with the latest gear we bought from the local Post Exchange with our coke fund money. I will never forget when I briefed the 7th Corps Operations Group with weather charts intercepted from Radio Moscow with a PX bought High Frequency receiver. Certainly then; I would never have believed that "Iron Curtain" would raise itself anytime soon.

Did it change! Today Rhein Main AB is gone. The Frankfurt Airport has absorbed the base completely. The C-5s and C-17s now share our new runway and ramp with A-10s and F-16s at Spangdahlem AB. The fighters left Ramstein AB and it has assumed the mantle of "The Gateway to Europe." Feucht AAF is now a German industrial complex, the eight posts in Nuernberg are gone and the housing areas are luxury condominiums. When you drive on the new six-lane Autobahn from Nuernberg to Berlin you can't tell where the old border was. It isn't over yet.

Over the last three years as the U.S. Air Forces in Europe A3W, I have presided over the latest European transformation. Our last two Army divisions are pulling up stakes and moving home. The first new expeditionary Stryker Brigade has arrived at Vilseck, parts of USAFE's Warrior Preparation Center are preparing for move to Grafenwoehr training area; we are reducing to one Numbered Air Force and the command itself is preparing for CONUS reachback.

Even as we are transforming, NATO is transforming with us. A new facility recently opened on Ramstein to house a new NATO headquarters; CC-Air Ramstein. Gone are the geographical commands that protected the West from the Warsaw Pact. Today, NATO forces are deployed in Bosnia, Africa, Afghanistan, Pakistan and many other locations. The United States has integrated into the new NATO Response Force deployment cycle and we are ready to work with NATO on a moment's notice anywhere in the world. Today U.S. Meteorological and Oceanographic products support NATO operations in Afghanistan as the United States has become one of the first nations to provide weather support in NATO's new Lead Nation concept. Only cooperation between NATO, Air Combat Command, USAFE, Central Command and European Command weather staffs allow this mission to move down a successful path.

Besides being the USAFE A3W, I am also the Senior Meteorological Officer to U.S. European Command. And, EUCOM is transforming as well. Now, instead of focusing on the East and the Soviet threat, U.S. Marine Corps General James Jones, Commander, USEUCOM says the command spends 65 to 70 percent of its time issues in Africa.

The USAFE Operational Weather Squadron at Sembach has become the 21st OWS and as you walk the operations floor you run across more Navy personnel. The 21st OWS is now a joint center for all meteorological operations in EUCOM. Resource protection products, TAFs and transient aircrew briefings for all Army, Navy, and Air Force locations in EUCOM are now supported by one joint center. The 21st OWS continues to amend TAFs for all local specification criteria allowing our Weather Flights to fully focus on integration with their combat operators.

The RATT-RIGGS of old are long gone. Our CWTs are equipped with lightweight RBGAN communication systems that provide internet connectivity anywhere in our area of responsibility. By the end of this year the Global Broadcast System will have replaced VSAT and TVSAT. The latest version of our NATO Automated Meteorological Information System will provide the entire 26 European nation OPERA radar network to our CWTs allowing us to finally shut down the tactical weather radars in the theater. Iridium technology is sending observations automatically from Bosnia to the Air Force Weather Agency at Offutt AFB, Neb.

Over the next few months we are moving to another great milestone. As I type this article, the legacy observing systems on our fixed Army and Air Force installations are being removed. Automated observing is coming.

Without a doubt, many will smirk with concern and disbelief that we could automate observing. This is one thing we have done right for 40 years. Why change now?

Change, folks, is inevitable. Nothing remains forever. We must transform and use and apply our precious remaining resources where they are needed most. Where we can impact the mission most? We can now realize the final tenant of reengineering. Home station support is handled by the OWS, allowing smaller CWTs to shut down for training and deployments. The pressure of trying to man two locations at once while in a high ops tempo can be alleviated.

Too often in our career field we inject massive organizational changes or multi-million dollar system upgrades only to return to business as usual. This isn't just an Air Force weather thing, it is common to weather people world wide. I travel much in this job and have seen weather operations in almost every nation in Europe. Many, like us, have invested millions in technology and training, yet many of their business practices are just like they were 20 years ago.

I challenge you to look at your jobs and functions and ask, "Do you know why you are doing what you are doing?" Too often, the answer is: "We have always done it that way." No one really asks if a service is still needed or could we do it more efficiently or effectively. We hate change and prefer our comfort zone.

My message is that guided change is necessary to keep our operations viable within the resource constraints that we operate in today. We need to look at our task and processes and we need to leverage the entire DoD team. Be an active and positive player in our change process. Make transformation a part of your daily operations.

As I close, I will tell you that fast change can often leave much broken glass. We want to avoid the broken glass by making smart decisions with inputs from the field. We don't want to break anything but we must move forward.

Thankfully for those of us in USAFE, there is one constant. The glasses in Germany have gotten smaller and more expensive, but the beer tastes just as good as it did 26 years ago.

Aviano forecasts protect people, assets



by Senior Airman Aaron Chandler
21st Operational Weather Squadron
Sembach AB, Germany

Scattered skies were forecast throughout the morning, with a forecast high temperature of 93 F for June 29 at Aviano AB, Italy. Thunderstorms were expected mid-afternoon, typical summer weather for Aviano. However, the day would be a true test of Operational Weather Squadron and Weather Flight interaction.

The synoptic situation on this day was complicated. The three-hundred millibar flow was from the west southwest over northern Italy, with a shortwave trough approaching from the Gulf of Lyon, off the French southern coast. In the low levels, a weak dissipating frontal boundary lay just north of the Alps. Throughout the morning, significant diffluence developed at 300 millibars, with the shortwave rapidly approaching the Aviano area. A mesoscale low developed west of Aviano, near Milan which pumped an abundance of low level warm, humid air from the Adriatic Sea into the Aviano area.

As the day progressed, the 21st OWS at Sembach AB, Germany and the 31st Weather Flight at Aviano saw the possibility of severe weather development, and discussed the situation in-depth. Satellite data indicated a mesoscale convective complex developing in north central Italy. By noon, the consensus was that 50 knot winds and large hail were likely. The OWS issued a weather watch for hail greater than one-half inch and winds greater than 45 knots meeting severe criteria in U.S. Air Forces Europe. The flight initiated Severe Weather Action Procedures and notified the 31st Fighter Wing that the weather situation was deteriorating. The wing initiated Weather recall for all airborne F-16s, and postponed afternoon flights. The 1:00 p.m. TAF called for thunderstorms in the area after 2:00 p.m., with severe thunderstorms from 3 p.m. to 6 p.m.

As the storm passed Ghedi in north central Italy, winds reached 37 knots, with one-half inch, to three-quarter inch hail. After more dis-

cussion with the flight, the OWS issued a weather warning for 50 knots and one-half inch hail, valid at 3 p.m. Satellite imagery showed cloud top temperatures colder than -76 F, well above the tropopause. Radar images showed a well organized line of thunderstorms, with tops above 40,000 feet.

The arrival of the storm at Aviano was spectacular. The onset was accompanied by an initial gust of 37 knots. However, a lightning strike caused a power outage on the airfield, knocking out all of the U.S. Air Force weather equipment. The peak gust occurred at 2:50 p.m., recorded by the Italian Air Force weather station, at 82 knots, which exceeded the highest wind ever recorded at Aviano by 24 knots. Small hail was recorded by the U.S. Air Force weather station, although an obvious hail shaft passed just north of the airfield.

The main storm passed quickly, moving northeast at 35 knots. However, it left a path of destruction in its wake. Nine people sustained injuries; although none were life-threatening, two required hospitalization. Most of the injuries occurred when the storm blew the roof off the Health and Wellness Center, trapping some people inside. On the flightline, a clamshell hangar was blown over, upending a UH-60 helicopter and breaking its tail boom. Around the base, significant damage was apparent. Scores of trees were uprooted, fences flattened, and roof tiles were missing from many facilities. Near the weather station, the Styrofoam insulation from the roof of the Precision Measurement Equipment Laboratory was completely stripped. Styrofoam blanketed the northeast corner of the base like snow. Cars were damaged from flying debris, and some were buried when a concrete carport collapsed onto them. Excluding the damage to the helicopter, financial damage from the storm totaled nearly \$3.5 million.

While this storm was potentially devastating, close communication between the OWS and the flight is credited with the prevention of more significant injuries or loss of life. The 31st FW benefited from three hours lead time. Aircraft were recalled, flightline operations were suspended, and the base was prepared.

Severe thunderstorms, with wind gusts measuring up to 82 knots, tore through Aviano AB, Italy, June 29, causing base wide damage estimated at \$3.5 million. Photo by Airman First Class Nathan Doza.



A line of severe thunderstorms approaches the perimeter of Aviano. The storm tops reached more than 40,000 feet during this severe thunderstorm outbreak. U.S. Air Force Photo.



Service members stabilize an aircraft at Aviano July 6. The aircraft suffered damage after a severe thunderstorm June 29. Photo by Airman Liliana Moreno.

THE FOG OF WAR

by Capt. Ryan J. Harris, USAF
52 OSS/OSW Deputy Weather Flight Commander
Spangdahlem AB, Germany

“Forecasting thunderstorms is easy. It’s simply the right ingredients making a weather cake. But fog? You’d be a fool to think you’ll nail it every time. Sometimes... you can’t forecast it, you follow it.”

- Senior Airman Craig Shetterly
(pictured below)

Visibility at Spangdahlem AB, Germany dropped to 100 meters for over six hours the morning of Aug. 26. The station can have below airfield-minimum conditions for days, even weeks in the winter. Photos by Capt. Ryan Harris.

Fog is certainly not the most glamorous of weather topics. Unlike the media-drenched coverage of natural disasters like hurricanes crashing against our coastlines, tornadic outbreaks ravaging the Great Plains, or massive winter storms dumping snow and ice, this type of “extreme” weather will often go unreported. Bring up fog to those involved in military operations, and they’ll be the first to cringe and tell you it’s a phenomenon that deserves just as much attention.

Carl von Clausewitz, in his classic philosophical work *On War*, described the “fog of war” as those intangible things that obscure clear thought processes and limit a commander’s handling of the battlefield. Who better to make this analogy in the 1800’s than Clausewitz, living in a part of Germany some consider the fog capital of the world. Military

commanders in nearly all theaters of the globe often deal

with the tangible type of fog that hinders their operational timelines. Fighter squadrons at Spangdahlem Air Base in Germany, set deep in the fog-prone Eifel Region of southwestern Germany, know full-well the impacts of this beast and plan for a 15-30 percent sortie attrition rate due to imminent fog and low clouds during the fall, winter and early spring months.

“We have a limited number of Operational and Maintenance days that we can fly here in central Europe,” states Lt Col. Daniel “Digger” Hawkins, Director of Operations for the 81st Fighter Squadron. He says that with additional predetermined obstacles like “flying hour restrictions, the fixed number of pilots, jets, and turn times between sorties...any attrition negatively affects our flying training, as it is nearly impossible to add sorties in to make up for the losses.”

Historically, fog has been a significant player in deciding the fate or timing of battles. In the days leading up to the historic D-Day Invasion, Army Air Corps, Naval, and British weather forecasters wrangled with the timing of when the fog and low clouds, among other weather thresholds, would begin to clear off in order for pre-invasion bombing missions to see their coastal targets. Pilots and artillery units during the bitter cold winter of 1944-45 continued to cope with target obscuration due to foggy conditions as they marched toward Germany. The most successful fog forecasts these days still include using rudimentary, yet accurate World War II era processes like Rules of Thumb, Forecast Reference Notebooks, and good ol’ Conditional

Climatology Tables. Forecasting fog has improved somewhat since those days, thanks mostly to vast technological advances in numerical modeling, but it still remains quite a challenge.

Four straight days of fog with one-half mile visibility or less at Spangdahlem earlier this year stopped all flying operations, including airlift missions supporting the Global War on Terror. Hundreds of fighter sorties were cancelled, and all in-bound Air Mobility Command aircraft were forced to divert to other locations. If mission-halting fog were to set in with sorties already airborne, Spangdahlem’s A-10 and F-16 squadrons plan to spend anywhere from \$1,000-3,000 per diverted aircraft and much more if nearby Ramstein AB is unavailable. Additionally, almost half of all of AMC’s annual delays attributable to weather – globally, can be blamed on poor take-off and landing conditions, including thick fog.

In the 1960’s, Major Thomas A. Studer claimed, “Reduced visibility in airfield-approach zones and over tactical battle areas interferes far more with Air Force operations than does turbulence, hail, or other commonly recognized hazards to flight; and reduced visibility outranks winds and high seas as a hindrance to naval operations.” Forecasting fog is a serious business, monetarily and, more importantly, in the light of keeping our fellow comrades in arms safe in such adverse conditions.

So, break out those Conditional Climatology tables and brush up on local Forecast Reference Notebooks...’tis the season yet again for weather forecasters’ war on the beast known as fog.

Aircraft squeeze into hangars; Guam faces off with Tropical Storm Saomai

by Staff Sgt. Robert Rath
36 OSS/OSW,
Andersen AFB, Guam

Saturday, Aug. 5, started like any other day in Guam. While the people of Guam went about their daily lives; Capt. Paul Lee, 1st. Lt. James Caron, Master Sgt. James Darlow, Tech Sgt. Misty York and Staff Sgt. George Silva, on duty weather personnel at the 36th Operations Support Squadron, were preparing for Tropical Storm Saomai. Saomai is the Vietnamese word for the planet Venus.

The storm, which originally was only expected to produce winds up to 30 knots, had begun to rapidly intensify; becoming a Tropical Storm by that afternoon.

By 4:00 p.m., Andersen AFB entered into Typhoon Condition (T-COR) 2, meaning a Tropical Storm was due to affect the base within 24 hours.

As people flocked to the Andersen Commissary and Base Exchange to gather typhoon supplies, Andersen Airmen began typhoon preparation, which included everything from filling sandbags to the repositioning of aircraft in hangers.

In a matter of a few hours, the base was prepared for the now forecast 50 knot or higher winds that would pound the base Sunday afternoon and evening. As for the forecasters at the 36th OSS, they were prepared to monitor the storm's movement and intensity; providing any updates to its path and strength to the Wing leadership.

At 1:00 a.m. Sunday, Saomai was 155 miles southeast of Guam, moving northwest at 13 mph with sustained winds of 40 mph and gusts of up to 52 mph at its center.

Andersen had entered into T-COR 1 at 12:00 a.m. Sunday, indicating that the storm was expected to affect Andersen within the next 12 hours. The forecast originally showed Saomai passing south of Andersen by 4:00 p.m. Sunday, however, the rapidly developing storm accelerated and was upon the base by 4:00 a.m.

The strongest wind gust, 38 mph, was felt at 5:12 a.m. Andersen received just over four inches of rain and although they received only 33 knot winds instead of the forecast 50 knots, the Airman illustrated their personal readiness and teamwork skills assuring that military assets, big and small, remained safe and mission ready.



Two B-2 Spirit bombers and four F-15E Strike Eagles are parked inside Hangar 1 at Andersen Air Force Base, Guam, Aug. 6. The aircraft were moved into the hangar in preparation for a tropical storm that was expected to reach Guam that day. This was the first time the six aircraft had been parked in the hangar, proving to base officials that the hangar could accommodate the aircraft, and aiding in future tropical storm and typhoon planning. The two bombers are deployed to the 13th Expeditionary Bomb Squadron from the 509th Bomb Wing at Whiteman AFB, Mo. The fighters are deployed to the 90th Expeditionary Fighter Squadron from the 3rd Wing at Elmendorf AFB, Alaska. Photo illustration by Tech. Sgt. Mikal Canfield.

Extreme training for ex

by Master Sgt. Brady Armistead
720th OSS/OSW, Weather Superintendent
Hurlburt Field, Fla.

Lightning flashed 20 miles northwest of the pickup zone, or PZ, the sky was pitch black. The sound of a fast moving helicopter grew in intensity as the blacked out MH-47E Chinook approached. Over the secure radio net, Tech Sgt. Steve Adams received the "1 minute out" call from the aircraft, and approved it onto the PZ. Through his night vision goggles, he could see the helicopter on its low, final approach to the fast rope site. It flared at the last second, the sound of rotors biting into the air as the helicopter slowed to a hover thirty feet off the ground. Within seconds, the fast rope was kicked from the aircraft and the first man, wearing load carrying equipment, a forty five pound rucksack, and a M4 rifle came down the rope like a fireman on a fire pole. Eleven other team members quickly followed him. As the men hit the ground, they quickly assumed a security circle under the aircraft, facing out ready for any enemy. As soon as the last man was on the ground, the helicopter released the fast rope, tilted forward sharply and disappeared just above the tree tops to the west. From flare to departure, the MH-47E had been over the PZ for less than two minutes.

This is a snapshot of day nine of Air Force Special Operations Command's Technical and Tactical Training Exercise 06-02, or TTTX, held recently at Fort



An MH-47E Chinook arrives and prepares for day and night iterations of Fast Rope and air-land operations. U.S. Air Force photos.

Campbell, Ky. This 36-day training event was designed to help meet the extensive training requirements of AFSOC's Special Operations Weather Teams. Areas of training included combat swimmer operations, advanced land navigation; Survival, Evasion, Resistance, and Escape refresher; live-fire small unit tactics; and tactical communications just to mention a few. For some of the participants, this was refresher training, but for newly-assigned personnel like Senior Airmen Sean Cory, Kenneth Malawey, and Bradley Johnson, it was all new. These Airmen are recent arrivals at three of the

AFSOC Special Operations Weather Team members and members of the 19th ASOS Weather Fight learn to operate the MW-31 Upper Air System.



Combat Weather Center personnel provided extensive training on the TMQ-53 TMOS to students of AFSOC's Technical and Tactical Training Exercise.

xtreme meteorologists

five detachments under the 10th Combat Weather Squadron. This TTTX trained 20 students, including personnel from Air Combat Command and the Air National Guard.

The training wasn't all about combat tactics, parachute, or helicopter assault operations. Trainees received detailed training on the new MW-31 Upper Air Sounder, the TMQ-53 Tactical Meteorological Observing Set, the MOD III High Resolution Satellite receiver, the Davis Weather Advantage Pro II Weather Station and other unique weather equipment and software. They also received enhanced training on Self Aid and Buddy Care, and briefings on CENTCOM theater weather processes and sensing strategy. They learned the phases of military operations, how to apply weather thresholds and impacts to operations, and about planning weather sensing missions.

Throughout the exercise, trainees were faced with challenges called "monster mashes." During these monster mashes, students were physically and mentally tested on tasks they had recently received during training. Their first monster mash had them running more than six miles, stopping periodically to perform radio programming, encryption, and checks, while at other times they stopped to perform physical feats, such as carrying full five gallon water cans up and back down a steep hill, or crossing a rope bridge stretched across a river. The mash also included obstacle course stations and an event called "Kim's Game," a memory game meant to challenge an individual's recall ability. TTTX 06-02 culminated with a 3-day field training exercise in which the students executed an Environmental Reconnaissance mission deep in "enemy" territory. The field training exercise scenario had the trainees carrying their weapons, load carrying equipment and fifty pound rucksacks, covering nearly 20 kilometers over the jungle-like terrain of Fort Campbell's training ranges. Special Operations Weather Team personnel are the operationally focused weather "eyes forward" in enemy territory for theater Special Operations Forces, and this field training exercise provided these students the opportunity to perform these critical skills in a realistic setting.

TTTX introduced and reinforced local unit training and prepares SOWT personnel to attend the Special Tactics Advanced Skills Training, or AST Course run at Hurlburt Field, Fla. SOWT students attending AST and continue building employment techniques, such as helicopter casting (jumping from a low-hovering helicopter into open water) parachuting, small boat operations, and armed vehicle convoy procedures. This phase of AST training is called Operational Readiness Training. SOWT trainees integrate with Combat Control and Pararescue trainees to form into a special

tactics team. At the end of ORT, the trainees execute a Full Mission Profile, in which they are alerted, plan, and execute a reconnaissance mission, airfield seizure, and personnel recovery operation as a team. AST offers these Battlefield Airmen specialties the chance to operate together in a dynamic team environment, developing esprit-de-corps and an understanding of what each brings to the current fight in the Global War on Terror.

At the end of TTTX 06-02, some of the personnel attended the U.S. Army's Air Assault School at Fort Campbell, Ky., where they continued their training in fast rope and rappel operations, and learned to rig and inspect sling load equipment for helicopter movement. Other TTTX students went to the U.S. Army's Military Free Fall Parachutist course in Yuma, Az. There, SOWT members learned to use high performance parachutes, nighttime jumping, and high altitude employment to infiltrate enemy territory. Each of these schools brings a unique skill set to the SOWT community, providing another tool in the tactical tool box for infiltration or extraction from enemy territory. These tools permit SOWT personnel to get into austere, hostile, data denied, or data sparse regions, and provide weather data to fill critical information gaps on the battlefield.

This is some of the extreme training for the nation's most extreme meteorologists. TTTX along with AST and other formal schools put SOWT personnel on similar footing as their Combat Control and Pararescue brethren, and their Army Special Forces and Navy SEAL team counterparts. For more information about Special Operations Weather Teams, please contact AFSOC/A3W at DSN 579-2145, or email AFSOC.A3W@hurlburt.af.mil.



AFSOC Airmen participating in the TTTX took three Special Tactics Standards and Evaluation physical assessments during the 36 day training. The Special Tactics Stan/Eval physical assessment includes pull-ups, sit-ups, push-ups, a 3 mile run and a 1500 meter swim.

It was a dark and stormy night... Oh, no - a really boring horror story

by Mr. Phillip Eddy
Chief, Weather Station Operations
Thule AB, Greenland

Imagine that night is 2,880 hours long! And imagine the “stormy” part of it is a full-bore blizzard for 168 hours with peak winds of 207 mph and average visibility of 6 to 12 inches. Thule Air Base in Northern Greenland is located at 76 N, 68 W on the globe and that dark and stormy night earned its listing in the Guinness Book of World Records for “The fastest surface wind speed at a low altitude” on March 8, 1972. The actual wind speed is unknown as the anemometer was broken and blown off at the 207 mark; it is estimated that if the equipment survived the storm, the true amount would have been higher.

“Dark and Stormy Nights” are ordeals Thuleites have learned to deal

with, on a regular and safe basis. Thule forecasters classify their storms, or blizzards, a little differently than most locations and it’s a system that’s been refined over 50 years. For Thule, a Winter Storm is one of 3 levels with the main one being winds greater than 35 knots and visibility less than one-half mile, usually in blowing snow. Thule is divided into two main working areas: On-base - the airfield, housing and infrastructure, and Off-base which consists of the 12th Space Warning Squadron, Ballistic Missile Early Warning System and the Thule Tracking Station, home of Det. 3 of the 22nd Space Operations Squadron. In an average year, Thule will experience 12 to 15 Storms on- and off-base with an average duration of 18-30 hours. Many will have peak winds of more than 100 mph.

Of course, it isn’t always “Dark and Stormy” at Thule. After a long, cold winter, with February average high temperatures around -25 F, the spring thaw in May feels like tropical weather to Thuleites. Thule has 24-hour sunlight from April 20 to Aug. 18 and it’s common to see locals walking around base in shorts, sandals, and t-shirts - even when the outside temperatures are barely above freezing.

During the high summer period, which occurs from late June through late August, temperatures will soar to 45 to 50 F. A Thule heat wave! During this period most people will take treks around the region to see some spectacular scenery including glaciers, icebergs, ice-caves and waterfalls. Thule hosts several annual events including a Polar Bear Swim that usually lasts around 15 seconds because the water temperature is around 30 F; a golf tournament atop nearby Mt. Dundas consisting of 9 holes, 1 club, 3 balls and a patch of Astroturf; and July 4 celebrations with no fireworks because it’s still light at midnight. Additional Thule Tripping activities include picnics, bike rides, and camping during high summer.

With a permanent base population of around 600, including U.S. Air Force; Canadian Air Force; Danish Navy; and U.S., Danish and Greenlandic civilians, it’s a very enriching experience, indoors or out. Everything one needs is available on-base because there is no nearby town - the closest village is 65 miles north. There is a base gym, a bowling alley, recreation center, library, skills development center, an all-ranks club, and a dining facility. There’s also a large AAFES Shopette and an APO and



Winter storm from February 2005. Massive snow drifts can block doors requiring the people inside to dig out. U.S. Air Force Photos.



The February storm had 190 - 200 mph winds or higher. Roofs were peeled away and in one building, something pierced through the wall. The doors in are huge industrial garage doors, so the drift in that picture is immense.



During the storm, many vehicles were damaged.

Late winter 2004. The last few years Thule has experienced an increase in the amount of snowfall. Coupled with the intense winds, large snow drifts form.



Greenlandic Post Office. The people who live and work at Thule are a special group – crime is extremely rare, and the old-time-small-town feeling is pervasive and comforting, they're all in it together making Team Thule one of the Air Force's best-kept secrets.

The people living at Thule learned long-ago how to cope with the storms. During storms, a person might not be allowed outside for up to three to four days. Every building that could be occupied during a storm is stocked with a supply of Meals Ready to Eat. Most residents learn quickly to stock up on items from the BX that will make the locked-down time more comfortable – favorite soft drinks, snacks, T.V. dinners, bread, etc. and to keep these items rotated on a monthly basis. Along the 12-mile-long road to BMEWS, there are storm shelters approximately every mile, with bunk beds, a heater, and MREs.

Making forecasting and weather observation extremely important, Thule can experience a "Winter Storm" any time with snow recorded every month of the year. Storms can occur very rapidly, and occasionally with little warning due to sparse data coverage and limited satellite coverage.



During the storm, vehicle windows were blown out and many were filled with snow. The wind also completely packed the interior full of snow.

TWO OF THULE'S EXTREME STORMS

DEC. 27, 1957

The Ballistic Missile Early Warning Site dispatcher to the system controller reported the winds on site were 26 mph and at Shelter 7 they were 23 to 25 mph. At 6:50 p.m. a shuttle bus was dispatched to BMEWS. Shortly after, a Phase Alert was declared. The winds jumped to 68 to 70 mph and Phase II was declared at 6:55 p.m. The winds at Shelter 7 had risen to 78 to 80 mph, hurricane velocity. An attempt to return the shuttle bus to BMEWS was made, however the bus stopped because visibility was so poor and the exact location was not clear to personnel in the bus.

At 7:30 p.m. BMEWS was upgraded to a Phase III condition with winds of 70-80 mph on site. Shelter 7 had 115 mph winds, while Shelters 4 and 1 were calm. Winds on Thule Defense Area began to pick up. On base Phase II was declared at 7:51 p.m., and Phase III at 8:00 p.m. People were caught in the theater, education center, BX, gym, and the clubs.

At 7:55 p.m. an operation to rescue people in vehicles caught in various locations on base began. The winds at BMEWS were 80 to 108 mph, while at Shelter 7 they were 114 to 140 mph.

At 10:19 p.m. the shuttle bus reported that the windows, which had cracked earlier, were broken. The wind was a steady 140 mph, with gusts of 160 mph at Shelter 7.

At 10:20 p.m. the system controller was instructed to dispatch a trackmaster in an attempt to shuttle personnel from the stranded bus to the nearest shelter. At 1:13 a.m. the shuttle bus advised that five windows were gone. At 2:30 a.m. two trackmasters departed the base heading towards BMEWS. At 2:42 a.m. some of personnel had been picked up, after almost seven hours without heat. They were okay, and the two trackmasters proceeded towards BMEWS.

At 3:10 a.m. the trackmasters were reported stopped again because of high winds and zero visibility. Winds at Shelter 7 were 69 to 92 mph. At 3:52 a.m. a snowplow dispatched to rescue the stranded bus headed down the hill with winds at Shelter 7 reaching 92 to 104 mph. A stranded trackmaster was located in the middle of the road, near the airstrip. The passengers were picked up and the bus was located at 4:25 a.m. At 5:00 a.m. all personnel from the shuttle bus were safely inside Shelter 9. The trackmaster driver volunteered to stay in the shelter until the passengers could be picked up ensuring an Arctic trained person would be available if the storm were to worsen.

Although still in Phase III, on base and at BMEWS, a bus and snowplow were dispatched toward Shelter 9 and arrived back on base with all personnel at 8:45 a.m.; 12 hours after the busses' initial departure from BMEWS.

During cleanup and recovery operations, 92 vehicles were processed through the Motor Pool for snow removal, drying and servicing. There was only one injury: a broken arm suffered by a Danish Arctic Contractors employee.

MARCH 8, 1972

The storm, perhaps the worst ever to hit the Thule Defense Area, was so severe that it set a meteorological record for the highest low altitude winds observed on the earth's surface: 207 mph. The actual wind speed is unknown as the anemometer was broken and blown off at the 207 mark; it is estimated that if the equipment would have been able to survive the storm, the true amount would have been higher. At 9:55 p.m. two J-Site dispatchers, Mr. Wayne Whaley and Mr. John Kurasiwicz, reported 207 mph winds were buffeting Shelter 7. The shelter is about three miles from J-Site. Both men were part of a team employed by ITT/Arctic Services Inc. at J-Site who constantly monitor a remote wind speed indicator for Shelter 7. By comparison, the highest wind speed ever noted on earth was 231 mph on top of Mount Washington in New Hampshire in April 1934.

The Thule storm originated over the central United States and moved north along the west coast of Greenland. For more than 15 hours - from 4:55 p.m., March 8, to 8:05 a.m. March 9, the storm battered Thule and its vicinity producing one of the longest Phase III conditions ever. Thule Air Base experienced the second highest winds ever seen on the base - 110 mph at 11:55 p.m., March 8. As with most storms, off base locations were subjected to far worse wind and temperature conditions. P-Mountain experienced winds of 115 mph or greater for seven and a half hours from 7:30 p.m. to 1:00 a.m. and during three of those hours had winds of 140 mph or greater. J-Site reported winds of 115 mph or greater between 10:00 p.m. and 1:00 a.m. with a peak gust of 146 mph. "Honors" for the highest winds went to Shelter 7 which experienced winds of 120 knots or greater between 9:00 p.m. and 1:00 a.m. The average temperature at all off-base locations was -15 F, giving an equivalent chill factor of -75 F. Winds off-base were so strong that they hurled rocks the size of baseballs for considerable distances. Jack Stephens, heating plant operator and weather observer at P-Mountain, has been in the Thule area since 1965 and gave this account: "This has to be the worst storm I've ever seen here. At the worst point, the sides of the building where I work were constantly being pelted by huge rocks and chunks of ice. And for the first time I can remember, even the roof really took a beating."

Monsoons in America?

by 2nd Lt. Tyler Brock
25th OWS, Operational Meteorologist
Davis-Monthan AFB, Ariz.

On the evening of July 17, a massive thunderstorm ripped through the Marana-Silverbell Army Helicopter Support Facility complex which lies approximately 15 miles north of Tucson, Ariz. wreaking havoc on operations base-wide.

Regional forecasters at the 25th Operational Weather Squadron, Davis-Monthan AFB, Ariz. first spotted the cell on radar as it built along an outflow boundary on the northern fringe of Tucson. The thunderstorm became severe within a matter of minutes with radar revealing extremely high reflectivity, (75 DbZ) reaching up to 25,000 feet, in the core of the storm. Without hesitation, Airman First Class Jessica-Nicole Peterson, a 25th OWS weather forecaster, issued a warning for winds greater than 50 knots for Marana because it was directly in the path of this monstrous storm.

At 7:52 p.m., base operations at Marana called to inform the 25th OWS forecaster that the cell collapsed directly overhead with sustained winds of 52 knots and a one time gust of 75 knots. Wind damage was reported across the complex as several roofs were torn off buildings and more than 25 trees ranging from two to three feet in diameter were completely uprooted. Heavy rainfall also accompanied this storm with rainfall rates estimated at 2 inches per hour on radar. At storms end, nearly \$330,000 in damage was reported.

Typically a storm of this caliber would frequent the southern plains during spring and forecasters might consider such a storm to be an ordinary run of the mill supercell. The rarity is that this storm occurred over an Arizona desert in the middle of July. The culprit: The North American Monsoon.

When most meteorologists see the word, 'Monsoon', they almost always associate it with the Indian Ocean Summer Monsoon, which accounts for more than 90 percent of total annual precipitation in central and western India, with Calcutta's annual mean precipitation hovering near the 100-inch mark. A common misconception is that the United States is not directly influenced by a monsoonal regime like those seen in the Eastern Hemisphere. This is far from the truth.

In fact, the North American Monsoon's impacts are felt across seven states with Arizona receiving the brunt of the activity. Forecasters at the 25th OWS are aware of the auspicious months of June through September when the North American Monsoon creeps slowly northward from the Sierra Madre Occidental and hinders flying and ground operations in Arizona, Nevada, and southern California. Because of the dramatic change in weather that is associated with the monsoon, forecasters are concerned with its onset; however, there is an ongoing debate about when the monsoon officially begins in the southwestern United States.

As a general guideline the National Weather Service codifies the start of the monsoon season when the average daily dew-point hits 54 degrees

October 2006, the Rillito River Wash at Catalina State Park in Tucson, Ariz. looking west. The riverbed is dry most of the year. Summer thunderstorms in its watershed may cause it to run modestly, or flood, but it soon reverts to a dry desert wash.

Photo by 2nd Lt. Tyler Brock.

(Inset) July 31, 2006 flash floods during the summer monsoon months quickly fill the riverbed. During this flooding, The river's flow rate was 35,000 cubic feet per second, twice the

average flow rate of the Colorado River.

Photo by Arturo Baez, University of Arizona.



The Rillito River in Tucson, Ariz. looking east July 31, 2006 during flash flooding. During the previous week, an upper-level area of low pressure centered near Albuquerque, N.M. generated widespread heavy rainfall in southern Arizona. Photo by Arturo Baez, University of Arizona.

(Inset) October 2006, north side of the Rillito River Wash in Tucson, Ariz. looking east. The Rillito River flows from east to west along the south face of the Catalina Mountains, and is tributary to the Santa Cruz River. Photo by 2nd Lt. Tyler Brock.



Fahrenheit for three consecutive days. Applying this rule, the average start date for the North American Monsoon is July 3 and this year's monsoon season start date was June 28. While this method of determining the onset of the monsoon may be "the standard," many meteorologists believe that synoptic scale circulation is the best indicator.

To help settle this debate and to better prepare 25th OWS forecasters for the monsoon season, the squadron enlists the help of Mr. Erik Pytlak, the Science and Operations Officer of the Tucson National Weather Service Office. Considered by many to be the North American Monsoon expert within the NOAA organization, Mr. Pytlak firmly believes in the notion that the synoptics pattern is the best indicator of the onset of the monsoon, and he has no problem stating this during the annual North American Monsoon Seminar that he conducts at the 25th OWS each May.

Southwest regional operations Non-Comissioned Officer in Charge, Master Sergeant Rubi Tornero has experienced numerous monsoon seasons and knows first hand the importance of recognizing this circulation when it develops.

"The training given by Mr. Pytlak prior to the onset of the monsoon is invaluable," said Sergeant Tornero, "It is imperative that our forecasters understand the impact of the monsoon circulation and its interaction with the local terrain. Failure to do so could severely impact flying and ground operations in our area of responsibility."

While the southwestern United States is typically considered an ideal location for military operations and training, the North American Monsoon serves to counter that assumption. During the eight months preceding the onset of the monsoon, October through May, weather remains fairly quiet. During this period squadron forecasters supporting locations in southern Arizona issue approximately

According to Mr. Erik Pytlak, the Science and Operations Officer of the Tucson National Weather Service Office the monsoon season begins once the mid-level flow shifts from westerly to easterly and the mean diurnal low-level flow transitions from offshore to onshore in the Gulf of Mexico.

This summertime transition occurs as the subtropical ridge undergoes a seasonal shift in the mid-levels of the atmosphere as the continent heats up.

By July, the Atlantic mid-level, subtropical high extends so far west and north that a well defined circulation is seen over the four corners region from 700 millibars to 500 millibars.

This is crucial for the increase in convective activity associated with the monsoon. The flow on the southern periphery of the subtropical high helps establish monsoonal moisture over the desert southwest as strong easterlies carry mid-level moisture from the Gulf of Mexico across the Sonoran Plateau.

This influx of moisture increases the likelihood of convection over Arizona where a warm, unstable continental tropical air mass lingers in the summer.

70-100 watches, warnings, and advisories per month. This number increases nearly five-fold during the monsoon to approximately 400-500 per month in June through September. This summer was no exception as Tucson saw one of the most active monsoon seasons on record.

Through Sept. 18, Tucson International Airport recorded 10.20 inches of precipitation ranking this season as the sixth wettest monsoon season on record. The highest occurred back in 1964 when an astonishing 13.84 inches of rain fell at Tucson International Airport in a 90 day period. Tucson's unique topography makes forecasting extremely difficult during the monsoon season as seen by the large disparity in precipitation between the valley floor and higher elevations. The city is surrounded by four mountain chains with the largest being the Santa Catalina Mountains to the north and the Rincon Mountains outlining the eastern edge of the city. These mountains have a significant impact on the development and movement of thunderstorms in the region since they often serve to prevent thunderstorms from moving into the valley. For example: Mount Lemmon which sits at 8,940 ft near the top of the Santa Catalina's received an incredible 24.57 inches of rain during the monsoon while the airport in the valley below received only 10.20 inches during the same three month period. Considering that the average annual rainfall for the airport is 12.17 inches; it is easy to see why flooding is a major concern for forecasters in southern Arizona.

Along with the destruction seen at Marana-Silverbell AHSE, two major storms impacted Davis-Monthan in July, bringing about a base-wide power outage, damage to a "tent-city" and damage to three sunshades covering A-10 aircraft on the flight line. In both cases OWS - Weather

Flight teamwork was extraordinary and decision makers on base were provided ample lead-time to protect aircraft and other valuable assets. In both situations the extent of the damage was less than \$20,000, but these events serve as a reminder of how important coordination is between the OWS and supported units to better prepare the base for rapidly changing conditions.

"Increased vigilance is an absolute necessity when dealing with convection in a desert climate due to the potentially severe effects associated with downbursts. Destructive winds can have a relentless effect on operations; therefore, coordination with our Weather Flights must be timely and accurate in order to enable our supported units to effectively protect their assets," said Sergeant Tornero.

With such an expansive area of responsibility, the monsoon presents unique and difficult forecast challenges every year for both seasoned and new forecasters at the 25th OWS. A desert climate hardly seems like it would present such difficult forecasting challenges, but in such an unstable environment, conditions can change from tranquil to severe in a matter of minutes. The key to staying on top of the situation is to understand every aspect of the monsoon from its signature synoptic circulation, to its interaction with the local terrain, to its impact on flying and ground operations. There is no doubt that the North American Monsoon will continue to be one of the most operationally significant weather phenomena affecting the United States. With the hard work of the 25th OWS and its supported Weather Flights, military installations across the southwestern US can rest assured they are receiving the best weather support possible.

Senior Airman Javier Acosta forecasting in the Southwest Regional Operations Zone at the 25th Operational Weather Squadron at Davis-Monthan AFB, Ariz. in June at the beginning of the monsoon season.

(Inset) Heavy rains fall over Davis-Monthan during late July thunderstorm. U.S. Air Force photo.



NOKE

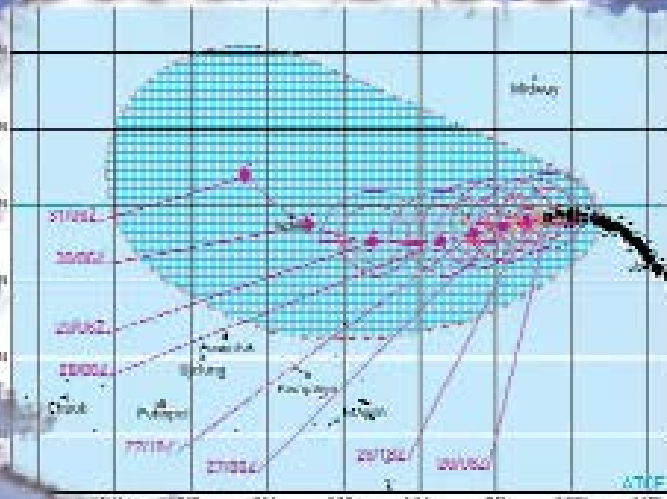
◦ [Wake Island] took a pounding with
winds up to **150 mph** ...
there was total sea water and sand infiltration
(combined with heavy rains)
in all the low areas and
low lying infrastructure systems ...

**roofs and walls on
pre-engineered buildings
were peeled off ...**

the interiors were inundated with
multi-feet of rain,
as over two feet of standing water
was found in some areas
days after the storm passed.

Col. John J. Torres
15th Airlift Wing Commander

The storm before t



1. ILLUSTRATION OF CIRCULAR WIND SPEEDS
 MOVING 200 DEGREES TRUE AT 80 MPH
 MAXIMUM WIND SPEEDS IN MPH ARE SHOWN
 2000, 1800, 1600, 1400, 1200, 1000, 800, 600, 400, 200, 100
 2. ILLUSTRATION OF CIRCULAR WIND SPEEDS
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The Aug. 26 bulletin from the Central Pacific Hurricane Center in coordination with the Joint Typhoon Warning Center shows the forecast path bringing Ioke's closest point of approach to within 4 nautical miles of Wake Island. Joint Typhoon Warning Center image.

by Master Sgt. Rob Tebben
 17th OWS, Lead Meteorologist
 Hickam AFB, Hawaii

On Aug. 19, a tropical depression formed in the Central Pacific Ocean. The depression was numbered 01C, and its name eventually designated as Ioke. Although forecast storm development was initially moderate with maximum wind speeds less 115 mph with no hint of impact to Wake Island, this system would turn into the strongest Central Pacific tropical cyclone in 41 years. Ioke increased to Category Five/Super Typhoon, with sustained winds equal to or greater than 146 mph, strengthened three times resulting in the highest sustained wind speeds greater than 160 mph. As with any tropical cyclone forming in the 17th Operational Weather Squadron area of responsibility, the lead meteorologist created a presentation summarizing the storm and its potential effects. This briefing was then forwarded to the Pacific Operations Support Center Director, Air Mobility Division operators, US Army Pacific Staff Weather Officer as well as many other agencies.

The POSC Director incorporated the weather effects to a larger briefing presented to Kenny Headquarters Commander, Maj. Gen. Edward A. Rice Jr. While the storm was impressive, its current path did not require activity other than AMD re-routing certain flights.

Initially, Ioke was forecast to track toward Midway Island, located about one-third of the way between Honolulu and Tokyo. This information was briefed to General Rice and his staff. Although the storm was potentially dangerous to Midway, keeping the forecast track in the area of uncertainty, any impact was still at least 96 hours away. AMD's only concern at this time was flight routing, therefore interactions with the lead meteorologist would increase because both offices are co-located in the POSC.

As the weekend approached, Ioke was still forecast to move between Midway and Wake Island with no major impacts upon either island.

On Aug. 26 at 2:00 a.m., the newest bulletin came out from the Central Pacific Hurricane Center in coordination with the Joint Typhoon Warning Center. There was a marked change in the forecast path. The track now brought Ioke's closest point of approach, or CPA, to within four nautical miles of Wake Island. This CPA was forecast to occur on Aug. 30 at 2:00 a.m. Even though CPA was 96 hours out, the winds, which are generally the greatest concern, were about 72 hours out due to the extent of the 40 mph wind radii.

Tech Sgt. Toby Helton, the Tropics Zone Boss, saw that even though the winds were strong and that Wake Island's runway is only 12 feet above mean sea level, the deciding factor on severe damage would be the sea height coupled with wave heights. The runway would no longer be usable due to flooding as the waves/surge was forecasted to arrive within 48 hours, even earlier than the winds. Sergeant Helton conferred with the Lead Meteorologist, Tech Sgt. Dave Doler and noted conditions warranted activating the severe weather action plan as well as alerting the AMD and the POSC Director. The Air Mobility Division immediately began identifying the air assets needed as well as putting crews on alert. The POSC Director contacted Wake Island, alerting them to the potential need for possible evacuation of all 188 personnel assigned to Wake Island.

Once all agencies were alerted to the special circumstances, a 15th Airlift Wing Battle Staff was conducted on the Aug. 26 at 5:30 a.m. to determine potential courses of action. The Hickam Weather Flight NCOIC, Tech Sgt. Rodney Jacobs, and 17th OWS Commander, Lt. Col. Stephen Romolo, attended the Battle Staff. Potential impacts of Super Typhoon Ioke were briefed to 15th AW leadership. At 9:00 a.m., a Kenny

The Storm



Some of the 188 Wake Island evacuees take their seats on a C-17 Globemaster III, from Hickam AFB, Hawaii, Aug. 28. The 735th Air Mobility Squadron received and processed the evacuees through customs and immigration before they went to area hotels. U.S. Air Force photo. Photo by Tech. Sgt. Andrew Leonhard.

(Above) Evacuees from Wake Island arrive at Hickam AFB, Hawaii, Aug. 28. The 735th Air Mobility Squadron received and processed the evacuees through customs and immigration before they went to area hotels. U.S. Air Force photo.

Headquarters working group stood up to ascertain their involvement.

Because Wake Island is a 15th AW asset and aircraft are under control of the 15th AW commander, the group decided that the Wing would handle the evacuation. At this same meeting, recovery operations were also discussed. Colonel Romolo indicated that conditions looked favorable on Sept. 3 to conduct initial surveys of the damage such as fly over, satellite recon, and hazardous materials assessment. Initial damage assessment was conducted by the U.S. Coast Guard and an Air Force Crisis Response Team stationed at Andersen AFB, Guam. Follow on assessments were conducted by members of Team Hickam who provided pictures that subjectively verified forecasts of super typhoon wind speeds before the NOAA weather sensors failed on Aug. 31st.

The Hickam AFB Weather Flight took the lead in providing the 15th AW Commander needed information as well as briefing the flights that evacuated the 188 people on Wake Island. Sergeant Jacobs briefed updates to the wing battle staff concerning evacuation efforts. Colonel Romolo attended daily Kenney Headquarters Operations Planning Group meetings in order to provide updates on when the storm would pass the island and recovery operations could commence. Kenney Headquarters was the lead agency in charge of coordinating recovery activities.

According to Col Jeffery Stephenson, 15 AW Vice Commander, "The timely and accurate information provided by the 17th OWS in response to Super Typhoon Ioke was critical to Team Hickam's success during the Wake Island evacuation. Their support was key to ensur-

(Below) Maj. Joseph Golovach checks out the runway during a flyby of Wake Island before landing Sept. 12. Major Golovach is a pilot from the 535th Airlift Squadron at Hickam AFB, Hawaii. Photo by Tech. Sgt. Shane A. Cuomo.



ing the mission was conducted ahead of the typhoon's impact."

Two organizations administratively controlled by the 17th OWS, the Hickam Weather Flight and the Joint Typhoon Warning Center, as well as the squadron operations floor worked in synergy to provide weather data for numerous agencies charged with the safe evacuation of 188 people and recovery efforts. By using all possible resources, the OWS stayed "ahead of the weather."

Forecasts are

by Mrs. Eileen L. Williamson
HQ Air Force Weather Agency Public Affairs
Offutt AFB, Neb.

For Wake Island, the forecast for a fast-approaching Super Typhoon was just the beginning.

On Aug. 19, forecasters were watching a fast growing tropical depression in the central Pacific Ocean. The depression quickly grew to tropical storm status and earned the name, Ioke. When it crossed the International Date Line Aug. 27, Hurricane Ioke became Super Typhoon Ioke and continued churning with the small atoll of Wake Island in its immediate path. Wake Island lies 2,300 miles west of Hawaii and 1,500 miles east of Guam and serves as a scientific outpost and midpoint air base for Air Force planes flying across the Pacific Ocean.

The Air Force evacuated all 188 residents from Wake Island to Hickam AFB, Hawaii on two C-17 Globemaster III aircraft from the 15th Airlift Wing Aug. 28, before Super Typhoon Ioke arrived. The residents included Airmen, Department of Defense employees and Defense contractors. The 735th Air Mobility Squadron received and processed the evacuees through customs and immigration before they went to hotels in the Hickam area.

"We went ahead and prepared all the facilities as best we could," said

Capt. Nate Harris, Wake Island commander, before Ioke hit. "Now all we can do is sit, wait and see what damage occurs."

The Category 5 storm passed almost directly over the 2.5-square mile atoll Aug. 31 with sustained winds of up to 155 miles per hour and gusts of up to 190 mph.

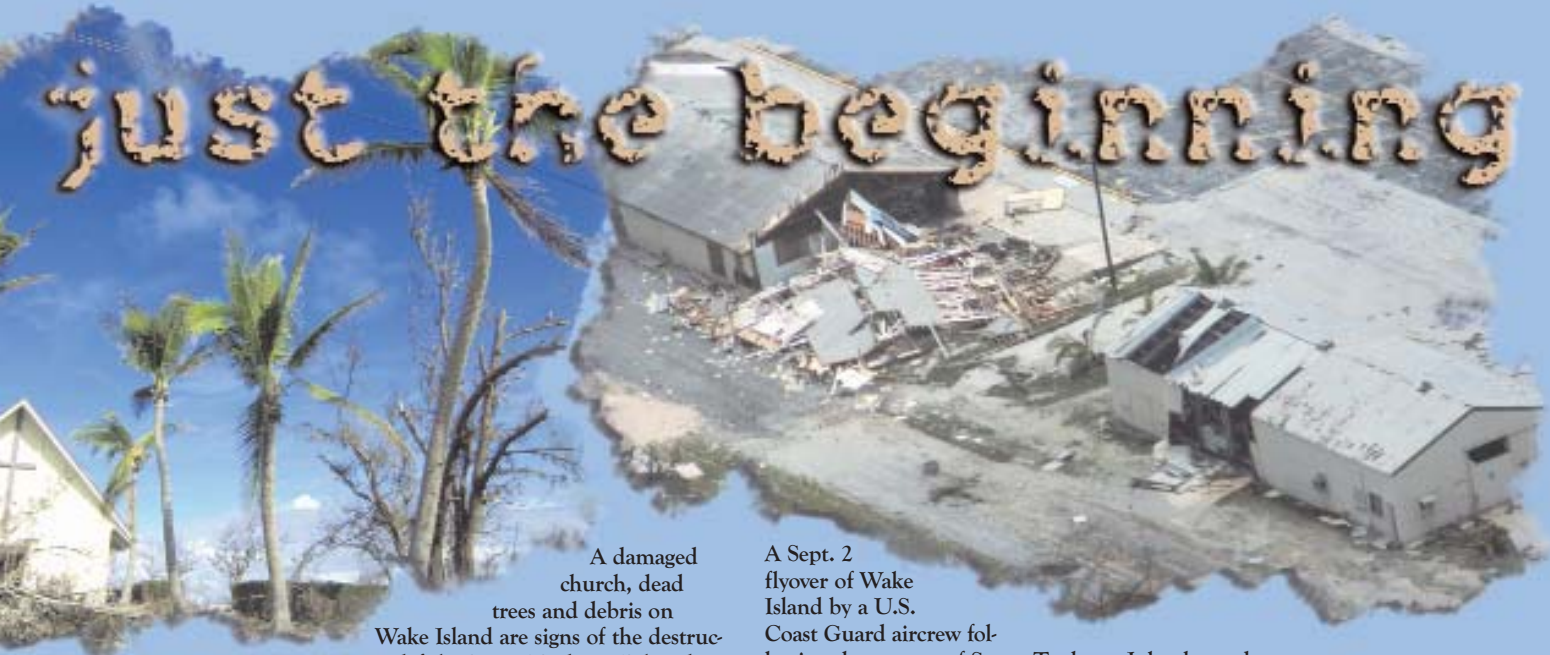
Ioke was the first Category 5 storm to develop in the central Pacific since record keeping began in the early 1960s. It was also the most powerful storm in the region since hurricanes Emilia and Gilma, which hit in July 1994.

The U.S. Coast Guard flew an aerial assessment mission of Wake Island Sept. 2 to check for pollution releases. A Coast Guard HC-130 Hercules from Coast Guard Air Station Barbers Point in Kapolei, Hawaii took footage and pictures on the mission to be reviewed by Coast Guard and Air Force officials. The images didn't show any oil spills or hazardous-material releases, and less destruction than expected from Super Typhoon Ioke, but the Air Force needed people on the ground at Wake to determine the full extent of damage.

Members of the 36th Contingency Response Group, 36th Civil Engineer Squadron from Andersen AFB, Guam and U.S. Naval Base Guam's Helicopter Sea Combat Squadron 25 set sail Sept. 4th from U.S. Naval Base Guam on a four-day trip to the island.

Trees located near the airfield caught sheets of metal that were blown from nearby rooftops when Super Typhoon Ioke hit the island Aug. 31. U.S. Air Force Photo.

just the beginning



A damaged church, dead trees and debris on Wake Island are signs of the destruction left by Super Typhoon Ioke when it hit the island Aug. 31. Photo by Tech. Sgt. Shane Cuomo.

A Sept. 2 flyover of Wake Island by a U.S. Coast Guard aircrew following the passage of Super Typhoon Ioke shows damage to two buildings. U.S. Coast Guard photo.

According to Maj. Patrick Poon, a 36th Mission Response Squadron member and team commander, "Our mission is to safely and efficiently assess the airfield and then provide information so our higher headquarters can determine the future use of Wake. We hope we can eventually ready the base for follow-on forces to come in and make any needed repairs."

An 18-foot storm surge and 40-foot waves were expected to hit the tiny island where the runway lies only 14 feet above sea level.

The U.S. Coast Guard Cutter Sherman from Alameda, Calif., arrived Sept. 7 with members of the Coast Guard Pacific Strike Team which responds to potential oil and hazardous-material spills. The team conducted a detailed survey of the island to check the integrity of island structures.

Members of the 36th CRG, completed their initial assessment of Wake Island Sept. 11, finding the island's runway intact and operational with fuel tanks secure, but runway lights were missing and there was minor damage to the fuels transfer system.

Only three of the 31 transportation and fuels vehicles weren't operational; another nine needed minor maintenance, officials said. The power grid

sustained extensive damage to switches and transformers, and power lines to most buildings and backup generators were damaged.

The Andersen team cleared the runway and repaired a generator to provide power in billeting facilities for the follow-on 53-person assessment team of civil engineers and communications experts from the 15th Airlift Wing at Hickam, which flew into Wake Island Sept. 13 to assess damage.

"Our job is to figure out the price tag on the damage," said Maj. Ron Pieri, 15th Civil Engineer Squadron operations officer.

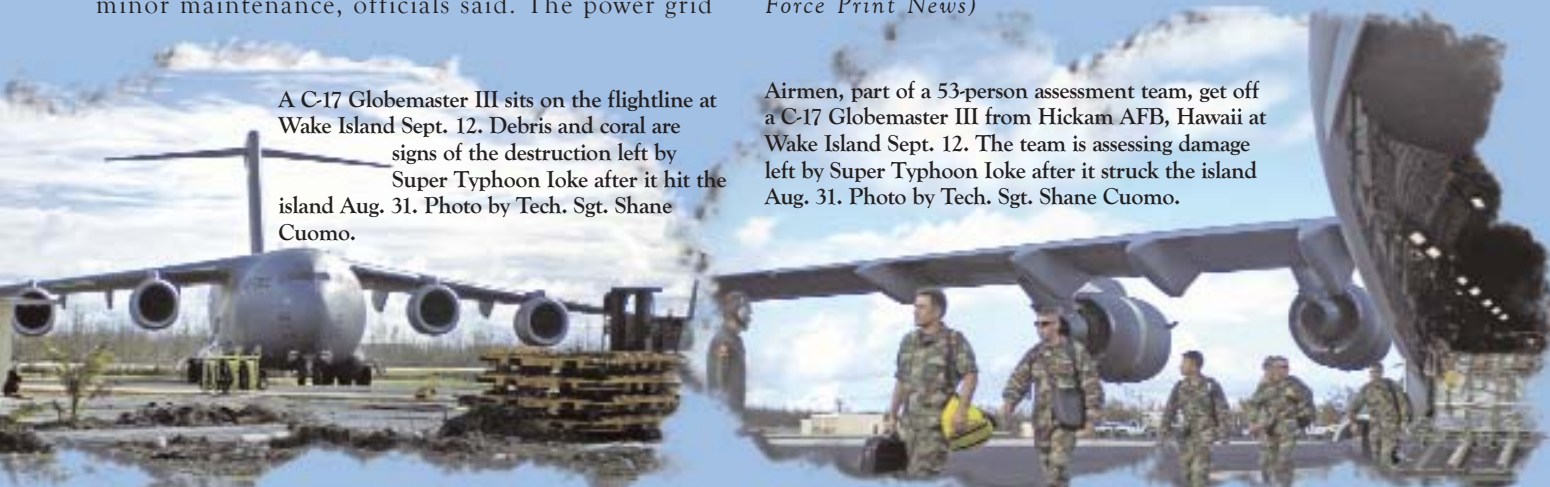
The storm damaged 70 percent of the buildings on Wake Island leaving water marks a foot high on their interior walls with large parts of their rooftops on the ground. While there was no running water, the response team found a water plant with about eight thousand gallons of water that could be purified.

The Hickam AFB team will further assess Wake Island and provide PACAF leaders with information needed to decide its future, officials said.

(Information provided by 36th Wing Public Affairs, 15th Airlift Wing Public Affairs, and Air Force Print News)

A C-17 Globemaster III sits on the flightline at Wake Island Sept. 12. Debris and coral are signs of the destruction left by Super Typhoon Ioke after it hit the island Aug. 31. Photo by Tech. Sgt. Shane Cuomo.

Airmen, part of a 53-person assessment team, get off a C-17 Globemaster III from Hickam AFB, Hawaii at Wake Island Sept. 12. The team is assessing damage left by Super Typhoon Ioke after it struck the island Aug. 31. Photo by Tech. Sgt. Shane Cuomo.



SPARRING WITH ERNESTO

by Master Sgt. Rob Easley
9th OWS, Graphics NCOIC
Shaw AFB, S.C.



Master Sgts. Stephen Babe (standing) and Robert Easley, 9th OWS forecasters, evaluate Ernesto's possible impacts to South Flight's AOR. South Flight's AOR include Florida, Alabama, and most of Georgia. Tropical Storm Ernesto made landfall both in Florida Aug. 30 and in North Carolina Sept. 1, causing torrential rainfall and high winds at many military bases across the southeast United States. Photo by Maj. David Runge.

Always Alert! That is the motto of the 9th Operational Weather Squadron at Shaw AFB, S.C. Along the Atlantic coast they always have an eye on the tropics so that long before a tropical storm slams into the southeastern United States, 9th OWS forecasters are already hard at work preparing for impact. After all, the 9th OWS provides Lt. Gen. Gary L. North, Commander Ninth Air Force and United States Central Command Air Forces, and other commanders across the southeast, up-to-the-minute information on any tropical system that could impact operations.

To accomplish this major undertaking, it takes a highly effective OWS weather team working in tandem with Weather Flights to craft top-notch weather products used for key operational decisions. Ever vigilant, 9th OWS synopticians constantly monitor National Hurricane Center conference calls for updates about storm development, movement, and strength. If the NHC determines that a system will affect the southeast United States, 9th OWS synopticians and zone forecasters tailor the forecast to meet operational needs.

The first product 9th OWS forecasters build and post is a computer-generated map showing the forecast track of the storm. The second is known as the Tropical Cyclone-Threat Assessment Product, or TC-TAP, and is developed when zone bosses, after intense discussion with weather flights and synopticians, input expected weather into a spreadsheet listing all affected military installations. It details wind speed and duration, 72 hour rainfall totals, and the storm's closest point of approach to installations.

Forecasting for Tropical Storm Ernesto demonstrated the outstanding teamwork both inside the OWS and between the OWS and weather flights. Operational Weather Squadron synopticians had been tracking Tropical Storm Ernesto and providing graphics products for a week before he approached the coast. Well before Ernesto made landfall in the early hours of Aug. 30, the OWS zone bosses and site forecasters coordinated with weather flights in Florida and Georgia and developed and issued TAFs, weather watches, warnings, and advisories for dangerous lightning, strong winds, and tornadoes.

South Flight Zone Boss, Master Sgt. Stephen Babe, said, "Our team really pulled together—the coordination with affected weather flights was a key factor in protecting equipment and personnel."

When Ernesto moved back over the Atlantic Aug. 31, OWS synopticians and weather flight technicians updated critical data in the TC-TAP. As a result of this guidance, Charleston AFB, S.C. safely relocated its aircraft to Wright Patterson AFB, Ohio, far away from the path of the storm.

Tech Sgt. Gerald McPherson from the 437th OSS/OSW said, "The 9 OWS did an outstanding job coordinating with us to ensure we were on the same page." After a near miss at Charleston, Ernesto quickly set his sights on bases in North Carolina as it chugged slowly up the coast.

Before the storm made landfall again in North Carolina Sept. 1, zone bosses again worked closely with weather flights to provide coordinated inputs to TC-TAP, resulting in a more accurate depiction of forecast weather. OWS site forecasters provided bases with weather updates of forecasted conditions, and all remained engaged as the Carolinas and Virginia saw the brunt of Ernesto's fury with 55 to 60 knot wind gusts and five to 10 inches of rain.

The 9th OWS graphics section was also hard at work during the storm. Skilled weather technicians produced crucial aviation hazard charts used by flight weather briefers to alert aircrews to areas of hazardous turbulence and thunderstorms.

As a result of the teamwork between the OWS and the Weather Flights, assets worth more than 18 billion dollars and 48,199 people were safeguarded with no losses to life or property. Ron Smith, Chief of Weather Operations at Homestead AFB appreciated the long hours worked by 9th OWS forecasters said he was, "Quite satisfied with the entire coordination process—precise and timely weather forecasts are critical to downrange operations." No need to worry, the 9th OWS is "Always Alert!"



Tech Sgt. Brent Harsch, a 9th OWS forecaster, uses HURRTRAK to determine expected winds gusts at inland bases across the squadron's AOR. HURRTRAK is a windows based software product that allows for a more advance analysis of Atlantic tropical systems as well as potential impacts to land/sea areas. It ingests data from the National Hurricane Center to produce site specific information such as max winds, duration of 35 and 50 knot winds and closest point of approach of the storm to an affected base or location. Photo by Maj. David Runge.



Senior Airman Marcus Lusk taxis out a C-17 Globemaster III Aug. 30 from Charleston AFB, S.C. Airmen from Charleston AFB were in the process of evacuating all operational C-17 aircraft on station due to impending severe weather expected from Tropical Storm Ernesto. Airman Lusk is from the 437th Aircraft Maintenance Squadron. Photo by Airman 1st Class Nicholas Pilch.

Shanshan preparations test Kadena's readiness

by Tech Sgt. Amy Craine
18th OSS/OSW, Assistant NCOIC
Kadena AFB, Okinawa, Japan

Kadena AB spent most of the week of Sept. 11 in Mission-Oriented Protective Posture gear, preparing for an upcoming Operational Readiness Inspection. The exercise began late Monday evening and was scheduled to continue through the rest of the week. At the same time, exercise evaluators were beginning to buzz about the impending weather the base might get during the latter half of the week.

The Joint Typhoon Warning Center was forecasting for Tropical Storm Shanshan, forecast to become a Typhoon, to come within 50 nautical miles of Okinawa to the east. Winds near the center of the storm were forecast to be sustained at 100 knots with gusts to 125 knots at that time. Although a good distance away, forecasters were already starting to field questions asking, "What's really going to happen?"

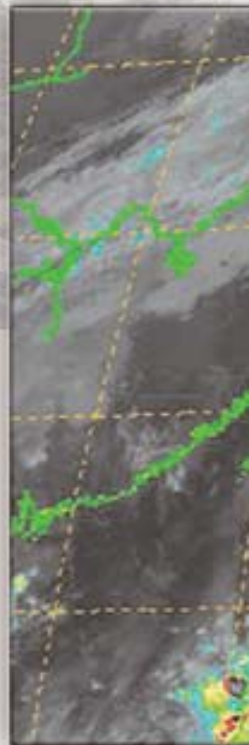
The Operational Readiness Exercise continued with the weather forecasters keeping a watchful eye on what Shanshan was going to do next. By Sept. 13, a Typhoon strike meeting was called. Leadership from all branches of the military stationed on Okinawa attended the strike meeting. Master Sgt. Brian McDonald, NCOIC of the Kadena Weather Flight, fielded questions about when Shanshan would possibly strike the island; what crosswinds would be encountered; and when it would be best to start evacuating aircraft, if necessary. The latest track had the typhoon forecast 32 miles south-southeast of Kadena by Sept. 17 and winds were increasing with gusts as high as 140 knots near the center of the storm. However, things were about to change.

By early Thursday morning, Sept. 14, JTWC had the new track available. Instead of the easterly track which had previously been forecast, the storm was now moving west of Okinawa with the closest point of approach 92 nautical miles away. That afternoon, the weather flight recommended to the Wing Commander that Kadena AB be alerted to Typhoon

Condition of Readiness 3. TCCOR 3 indicates to on-base personnel and the general populace that destructive winds were possible within 48 hours. TCCOR 3 also gives everyone advance warning to start cleaning up work areas and homes to ensure any unsecured outdoor items are put away.

The Operational Readiness Exercise ended by late afternoon Thursday and on Friday morning, Sept. 15, people were back at work getting 33 of the aircraft stationed on Kadena ready for evacuation. The Joint Typhoon Warning Center continued to move Shanshan farther away from Okinawa throughout the evening of Sept. 14 and into the day Sept. 15 but the crosswinds were still going to create problems for the heavier aircraft. The fighter aircraft were all sheltered and the "heavy" aircraft evacuated to safe havens at other Pacific bases. At 5 p.m., Kadena AB was under TCCOR 2. People were to police their homes and yards again and also restock any items missing from their typhoon kits. The strongest winds expected to occur were between 50 and 60 knots on Saturday afternoon, Sept. 16. The closest point of approach was forecast at 119 nautical miles. The forecasters from the Weather Flight were put on typhoon duty crew and everyone else was sent home to prepare for the storm. On typhoon duty crew, personnel report for duty and do not leave until TCCOR All Clear is issued.

Overnight, rain bands made their way onto the island from the outermost portions of Shanshan. Showers were occurring off and on throughout the night until late in the day Saturday, Sept. 16. That morning, at approximately 5 a.m., all military



installations entered TCCOR 1. Winds of 50 knots or greater were anticipated within the next 12 hours. Forecasters fielded phone calls, made live AFN radio reports and continued to watch Typhoon Shanshan as it approached the island. By 2 p.m. Japan Standard time, TCCOR 1 Caution was issued and all outdoor activity was halted. Winds were already reaching 35-49 knots and continued to increase. By 5:25 p.m. Sept. 16th, all military installations entered TCCOR 1 Emergency, indicating that all personnel should remain indoors and away from windows due to 50 knot winds occurring on station.

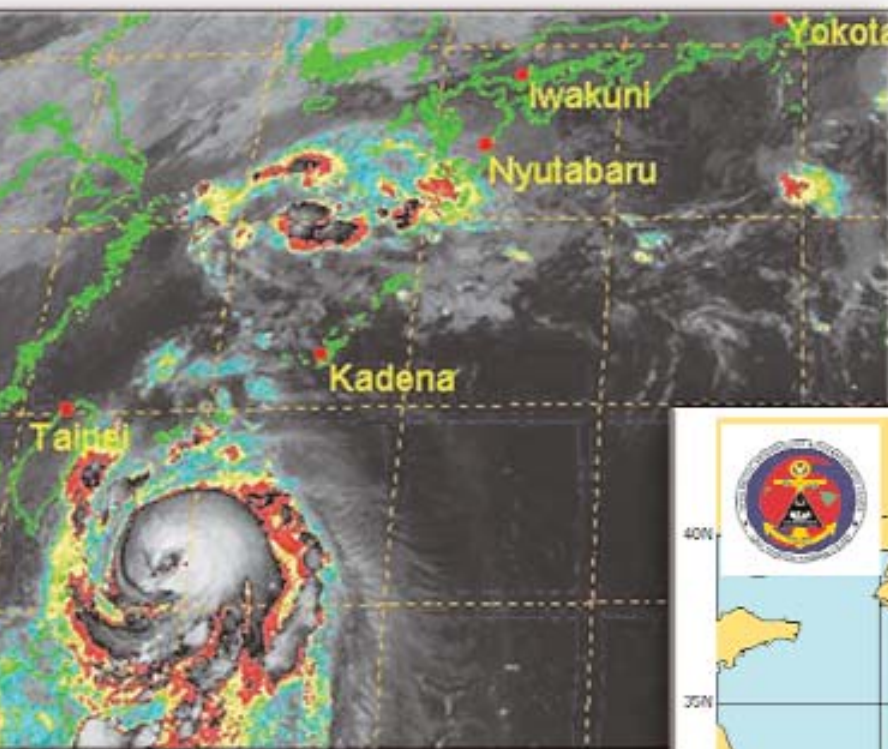
The maximum gust recorded by Kadena Weather Flight was 55 knots at 10:12 p.m. Saturday, Sept. 16. Sustained winds reached as high as 38 knots

and rainfall totaled 1.51 inches, ending by 3 a.m. Sunday, Sept. 17. Naha International Airport recorded maximum sustained winds of 41 knots and wind gusts at 61 knots. Marine Corps Air Station Futenma recorded maximum sustained winds of 30 knots and wind gusts at 50 knots. Futenma NAS also recorded 2.21 inches of rainfall.

Although a mild typhoon by most people's standards on Okinawa, Shanshan caused immeasurable damage to nearby smaller islands in the direct path of the storm. Had Shanshan been a direct hit to Okinawa, the damage it could have caused may have been devastating to the 16 U.S. Military Installations located on the island as well as the 30,000 personnel and dependents located there.

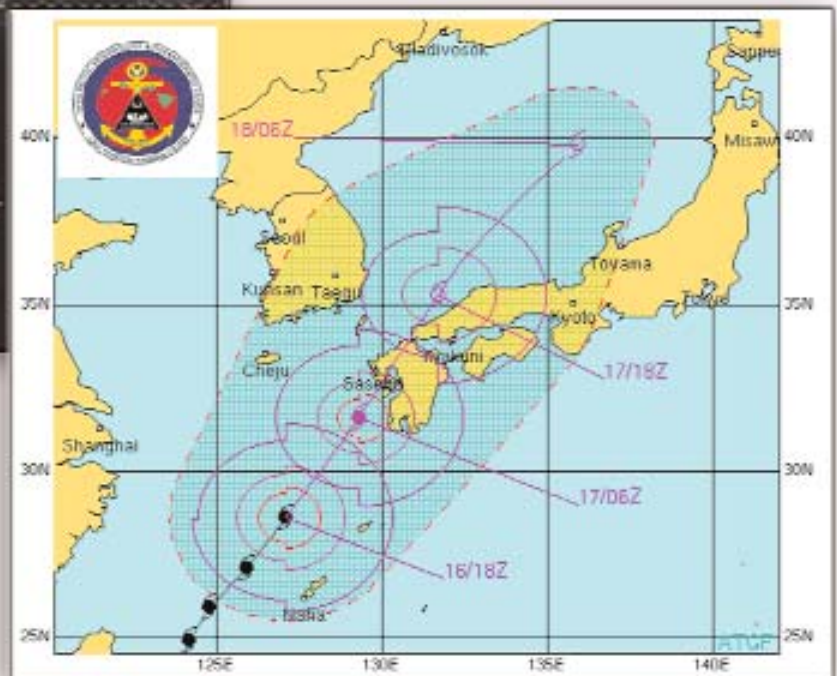
In addition to the Operational Readiness

Exercise, the storm preparation gave the base a good test their emergency procedures' effectiveness. The successful preparation for the storm helped increase the base's confidence in its emergency plans and procedures. Kadena worked together to make sure that the facilities, assets, personnel and dependents took the precautions needed to be ready for Shanshan.



(Above) An Infrared Satellite picture from the Mark IVB satellite receiver system showing Typhoon Shanshan just as it started to make its turn to the north toward the Okinawa. The typhoon moved directly west until it reached the point where it is just east of Taiwan then it moved north-northeast.

(Right) Typhoon track issued Sept. 16 at 3:00 a.m. by the Joint Typhoon Warning Center just after the closest point of approach to Okinawa. The typhoon continued to move to the northeast after effects were felt on island.



Weather squadron volunteers continue Hurricane Katrina clean-up

by Ms. Maranda Rimes
96th ABW, Public Affairs
Eglin AFB, Fla.

After visiting the Bay St. Louis, Miss., area, the commander of the 46th Weather Squadron helped organize a team of volunteers to assist with the on-going Hurricane Katrina cleanup effort.

Lt. Col. Julie Noto and Senior Master Sgt. Peter Buzynski of the 46th WS organized eight volunteers, rented camping trailers from outdoor recreation and set out on the four-hour trip May 12.

"We [the volunteer group] spent Saturday and Sunday helping the area's families cut wood, pile up garbage, tear down sheds, clean up beaches, repair houses and build fences, among other things," Sergeant Buzynski said.

"If you visit the Bay St. Louis area, you will find people in high spirits,"

he said. "This is really amazing to me because these people are still living without gas in their stoves and taking cold showers."

"The area is still devastated," Colonel Noto said. "People live in FEMA trailers usually not far from their homes."

What some used to call their home may now consist of only a foundation or a structure with no windows.

"If you can imagine the entire contents of your house being thrown outside, that is what people are dealing with," she said.

"Bay St. Louis seems somewhat abandoned," said Staff Sgt. Mitchell Westland, 46th WS weather forecaster. "When talking to the locals, they said some of their neighbors left and were never heard from again. No one knows if they plan to return."

Neighbors were not the only ones unaccounted for. Sergeant Westland saw a black lab walking on the beach alone as he was doing some clean up.

Sergeant Buzynski said the group's main focus was to help out one house at a time, doing the types of manual labor the homeowners could

not manage themselves. He said one of the issues locals had to deal with was ensuring debris piles were large enough for the designated relief pick up. Volunteers spent much of their time putting smaller piles together.

"The people who still live in Bay St. Louis see it as it was before the hurricane," said Sergeant Buzynski. "They see it as they want it to be again."

He said members of the squadron are ready to help out again as soon as they can. Colonel Noto and Sergeant Buzynski split the cost of the trailer rentals and gas but said it was worth every penny to see the Bay St. Louis local's grateful faces.

Colonel Noto has challenged other squadrons to continue the support of neighbors who were hit by Hurricane Katrina. She said there is no way they will be finished with the clean-up before the next hurricane season starts, and there is still much to be done.

Members of the volunteer group also included Senior Airman Nathan Hutchings, Staff Sgt. David Bond, Senior Airman Melit Laurry, Tech. Sgt. Christopher Dunstone and retired Col. Vinnie Noto.



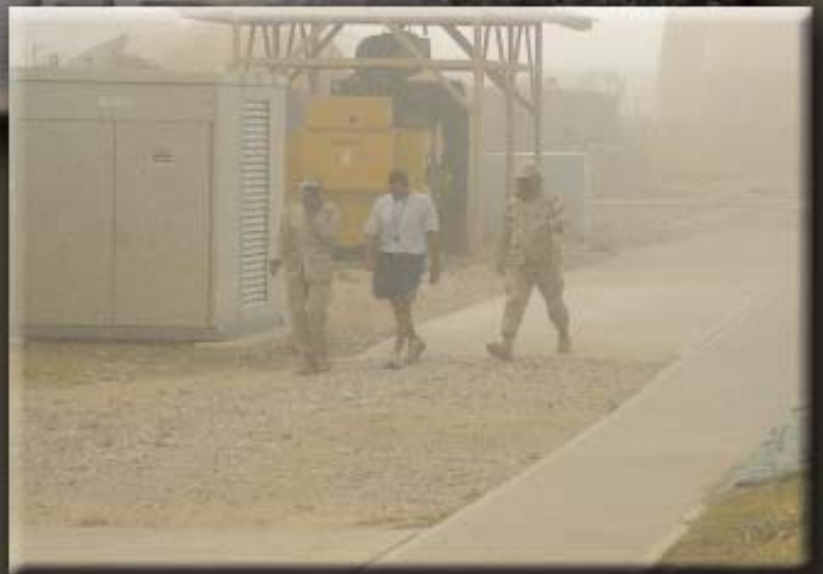
Volunteers from the 46th Weather Squadron experienced firsthand the work that remains in hurricane-ravaged Bay St. Louis, Miss. Photos by Lt. Col. Julie Noto

Today's weather: Gritty



A C-17 Globemaster III moves into position for take-off on the flightline Kirkuk AB, Iraq as a shamal, or sandstorm, blows in and obscures the flightline with sand. The shamal is a prevailing northwesterly wind that blows over Iraq and the Persian Gulf during the from mid-June to mid-September. Photos by Staff Sgt. Stacy Fowler.

Information courtesy U.S. Air Force Combat Climatology Center, Asheville, N.C.



Airmen make their way to the dining facility at Kirkuk AB through 50 knot wind gusts caused by the mis-August shamal. Average wind speeds are 10-15 knots with periods when winds persist above 25 knots. The 24- to 36-hour shamals can occur with deep polar air surges. The shamal winds typically create large sandstorms that impact Iraq, although most sand is picked up from Jordan and Syria.

Weather Recon still kickin



Members of the Air Weather Reconnaissance Association gather in front of a WB-50 Superfortress on display at the Air Force Museum on Wright-Patterson AFB, Ohio. The men and women of AWRA meet annually for a reunion. This year's reunion was held in Dayton, Ohio, where more than 50 former pilots, navigators, weather officers and dropsonde operators gathered in September to reminisce about their flying days. The long and proud tradition of weather recon is continued today by the 53rd Weather Reconnaissance Squadron, known as the Hurricane Hunters, based at Keesler AFB, Miss. Photo by Mr. Jeff Fisher.

by Mr. Miles Brown
Air Force Weather Agency Public Affairs
Offutt AFB, Neb.

For more than 60 years, brave Air Force weather men and women have flown on routine, and not-so-routine weather reconnaissance missions to protect the people of our nation from the ravages of tropical cyclones – wherever these storms form. That is just the tip of the iceberg when it comes to the varied missions of Air Weather Reconnaissance. Weather Recon has a long and varied past from around the world.

Before the day's of satellite and radar images, weather professionals climbed into long-range bombers specially equipped to monitor atmospheric conditions and radio weather reports to coastal bases and ships at sea anytime severe storms were looming just over the horizon.

“Back when I started flying in Weather Recon, we flew in a WB-29,” said Richard Hall, a dropsonde operator from 1956 to 1975. “We would fly daily routine weather recon tracks to cover as much area as possible. We were looking for any type of weather that might impact military operations in the area – tropical cyclones, ice storms, dense fog, etc.”

According to Mr. Hall, the routine recon missions were not the best part of the job. It was the unique or special missions that really interested him, and kept him coming back for more.

Weather crews flew weather research missions at high altitude

and gathered data on icing, lightning or whatever other weather related issues needed to be evaluated. But the best and most exciting flights were, and probably still are today, flying into tropical cyclones.

“I was in one of the last recon aircraft to take-off and fly into Hurricane Camille in 1969,” Mr. Hall recounts. “We made the final location fixes and intensity measurements just before that storm made landfall.”

They measured a barometric pressure of 905 mb. This was one of the lowest barometric pressure readings ever measured by aircraft up to that time. Only two super-typhoons in the Pacific - Ida in 1958 (873 mb), and Marge in 1951 (895 mb), had lower barometric pressure reading measured by aircraft. Sustained winds of Camille were 190 mph as the storm approached the Mississippi coast.

In the case of Camille, as with many of the hurricanes before 1970, residents of the mainland United States would have little idea where, and with what intensity these storms would strike the coast if it were not for weather recon missions flying directly into the brunt of these monstrous cyclones.

“When I started tracking and measuring hurricanes, there weren’t a lot of satellite images - and none were used to measure intensity or estimate the track of the storms,” said Bill Davis, a dropsonde operator from 1965 to 1977. “Most of the satellite images would just give us a good idea where the storms were and which angle to fly in and make our measurements.”

The aircraft have been updated from the WB-29s to today’s work horse, the WC-130J. The mission may have evolved over the years; weather recon crews are prepared to fly an average of 11 hours crisscrossing storms and penetrating powerful eyewalls several times each mission. The aerial reconnaissance weather officer and weather reconnaissance loadmaster use computers to gather data. Sensors on the aircraft and dropsondes collect wind speed, temperature, humidity, barometric pressure and other information forecasters use to determine the path and strength of a hurricane. The critical mission of today’s weather recon teams is still the same - protecting lives and assets anytime anywhere.

55th Weather Reconnaissance Squadron, McClellan AFB, Calif., circa 1951. Crew Number Three in front of their WB-29. left to right Capt Robert Gormly, Lt. Martin Scheinkman, Lt. Gerald Couture, Tech Sgt. Frank Chartrand, Master Sgt. Frankovitch, Sgt. Marvin Post, Staff Sgt. Charles Helmer, Master Sgt. Henry Kozlowski, Tech Sgt. John Priestle, Tech Sgt. Roane, Tech Sgt. Spofford, Sgt. Richard Wyatt.



Army Air Corps weatherman honored for D-Day contributions

by Staff Sgt. C. Todd Lopez
Air Force Print News
Washington D.C.

A former member of the Army Air Corps was honored here Oct. 6 by members of the Air Force weather community for his contributions to the World War II D-Day invasion.

Dr. Eugene Levine was 18 years old when he was drafted into the Army. During his time with the Army, Dr. Levine served as a combat weather observer for the 82nd Airborne Division and crewmember aboard glider aircraft.

Dr. Levine was also instrumental in delivering communications equipment to the 82nd Airborne Division during the D-Day invasion of France, June 6, 1944.

During the ceremony, Brig. Gen. Lawrence Stutzriem, the Air Force Director of Weather, addressed Dr. Levine's family, speaking highly of the former Army corporal.

"Your husband and your father, to the Air Force weather community, is a hero," General Stutzriem said. "You need to know that."

During the ceremony, Dr. Levine was presented with an American flag, a shadow box, an assortment of military coins and a 60th anniversary D-Day medallion.

Dr. Levine said he was honored by the attention given by members of the Air Force weather community.

"It means a tremendous amount, because it's an occasion that only comes once, once in my lifetime," he said. "And to have



Dr. Eugene Levine speaks at an Oct. 6 ceremony in Arlington, Va., honoring his support of D-Day during World War II as a weather forecaster. Dr. Levine was presented with an American flag, a shadow box, an assortment of military coins and a 60th anniversary D-Day medallion during the ceremony, officiated by Brig. Gen. Lawrence Stutzriem, director of Air Force weather operations. Photo by Tech. Sgt. Cohen A. Young.

all these feelings of appreciation for what I did, I have to think back and appreciate everyone coming here and listening to me and my history during WWII. It has just been a marvelous occasion. It couldn't be better."

Dr. Levine also said he is impressed with today's technical advancements made in weather forecasting and the professionalism and dedication of today's Air Force weather community.

The presentation of mementos and honor bestowed upon him came more than two years late. Originally, the doctor was going to be honored at an international commemoration of D-Day in Europe.

In 2004, some 60 years after the Allied invasion of France, the U.S. Army Europe served as host to the 60th Anniversary of D-Day

Commemoration Ceremony. Many military units, including the Air Force's 7th Weather Squadron, participated in the event.

As part of the 7th WS's contribution, Staff Sgts. John Lee and Joel Decker participated in a re-enactment of the D-Day airborne assault. The two sergeants parachuted into St. Mere Eglise, France.

During the jump, Sergeant Lee carried a U.S. flag, a 60th anniversary D-Day medallion and an assortment of coins and memorabilia. The flag and medallion were intended to be presented to Dr. Levine, but he was unable to attend the event.

Sergeant Lee and Sergeant Decker, both members of the Air Force weather community, were instrumental in rescheduling the ceremony for the "hero."

Weather in the weather world is ...



Mr. Jamie Minyon instructs Airman First Class Jowanna Young on the terrain effects of Norway's Kjolen Mountains on icing as she begins hazards forecasting. U. S. Air Force Photo.

by Airman 1st Class Thomas Rauch
21st OSS/OSW
Sembach, Germany

Some who retire from an Air Force weather career become weather personalities on television, others continue their pursuit of scientific knowledge as meteorological professors, or make the move into the private sector where they perform everything from space weather to local effects of seasonal rains on crops. The paths may differ, but that of the trainer's is one with an eternal effect on our career field.

Pittsburgh native Jamie Minyon has a long history in weather. Having entered the Air Force in 1981, he remembers when weather still consisted of hand-plotted Skew-*t*'s, charts pushing off the AFDIGS machine faster than they could be analyzed; when there was less science and more art to the job - or so it seemed. As times changed, he learned new techniques, adapted the old to the new, and always kept up with the newest ways to keep our pilots, grounds crews, and family members safe.

His first stop was Fort Lewis AIN, in Washington.

"I didn't know if I would be in the Air Force for one month or twenty years. The initial shock of leaving everything I knew in Pittsburgh is one everyone in the military has to deal with. Now after 21 years of active-duty service my wife, Weiyin, finds she has married a true 'weather geek'.

From there Mr. Minyon went from station to station learning everything he could wherever the Air Force assigned him. Starting as an observer at Fort Lewis, Ky. and moving up the ladder to Station Chief at Dyess AFB, Texas and also at Osan AB, Korea. After finishing his Air Force career as a trainer and on the STAN/EVAL team at Air Force Space Command headquarters Peterson AFB, Colo. he moved into the private sector and forecast weather for U.S. Northern Command/North American Aerospace Defense Command Headquarters also at Peterson AFB. The entire time he watched the face of meteorology change.

From local effects to new models, as old machines were replaced with faster, better ones, skew-*t*'s became automated and the reduction in manual work allowed the career field to advance at an accelerated rate.

Here I teach the weather everyday, and yet every day I learn something from my students.

Jamie Minyon

"The technology is fantastic these days," he says with a smile "I have gone from the days of not having enough information to a time when there almost seems to be too much information. Now you must learn to weed through the mass of information available. The evolution of meteorological science appears to be endless."

After retiring as a Senior Master Sgt, Mr. Minyon began to enjoy the civilian life but sometimes weather draws you back into its ever-evolving arms. The opportunity to become a trainer and guide young Airmen who were just entering his beloved career field was one he could not pass up. So he packed up, and moved, from Colorado Springs,

Colo., to Germany providing him with a chance to see more of the world, and to help bring up the newest troops in the European theater.

Having never forecast in Europe, one would think he would have had a hard time with teaching classes on the different regimes, local effects, and what to expect. But his experiences across the United States have proved invaluable.

"Weather here seems different to what you are probably used to back home," he explained "but the atmosphere is fluid, what happens there will eventually happen here, it's the small things that you have to adjust for."

Anyone who knows Mr. Minyon will say he is "down to earth, very intelligent, and an excellent teacher." The day he finished his first training course, he took a moment to speak to his class. They had learned a lot from him and his long history in Air Force weather. He gave one final piece of advice before sending them off to forecast for areas like Germany, Italy, Iceland, Turkey and The Balkans. "Remember weather is a science, but it is also an art. After all my years at it I still don't know everything. Try hard and learn as much as you can and you will be fine."

Another generation of Air Force weather forecasters was unleashed from his tutelage that day and he was already preparing for the next batch to fly in from Keesler. The glory of his career is not in endorsements, local television spots, or tenure at an Ivy League school. Instead he takes solace in knowing that what he has to offer will be passed on. That long after his students have moved to other bases he will have affected them, keeping his wisdom from fading and ensuring his own form of immortality.

WEATHER WARRIOR

Master Sgt. Rubi Tornero

25th Operational Weather Squadron,
Davis-Monthan AFB, Ariz.

Job title: NCOIC, Southwest Region Operations

Years in service: 14 years

Hometown: Houston, Texas

Role model: My older sister who raised me from the time I was 8 years old. She is a successful business-woman who is charismatic, fun, loyal, and humble. She always does what is right and cares deeply for her family. she has been married for 31 years, has four children and supports our mother. She taught me values and morals through her actions and forever leads by example. She is my mentor and role model not only because of the influence she has on our family, but also because of her professionalism, ability to reach people, and genuine display of selflessness. She is my best friend.

Hobbies: My hobbies include reading, working out, investing, and traveling.

Most memorable Air Force weather experience: My most memorable weather experience was forecasting thunderstorms and sandstorms in Africa in 2002. Visibility dropped to zero miles and you could see the sand on satellite extending as far north as Germany as it crossed the Mediterranean Sea. The following day in Germany, there was sand on our vehicles.



Staff Sgt. Howard L. Cordingley,
OL-A, 7th Weather SQ Coleman Barracks,
Germany

Years in service: 5 years

Hometown: Logan, Utah

Role model: Lance Armstrong because of his attitude and strength to beat cancer and then to win seven Tour de Frances all while dealing with doping scrutiny.

Hobbies: Running, snowboarding, hiking, kayaking, photography, music

Reason joined the Air Force: Receive a better education, leave home and travel

Personal Motto: Moderation in all things. I believe if I focus too much on one thing, other parts of my life will suffer.

Most memorable Air Force weather experience: Supporting a Secretary of Defense/NATO defense minister meeting in Slovenia September 2006. I was part of this mission from the planning stages all the way through the final movement. I was impressed how it all came together in Slovenia. I was proud to see Secretary Rumsfeld and many other defense ministers step out of my aircraft. When it was over I clearly understood how my decisions can impact important missions like this.

Congratulations

Selected for promotion to Colonel

Jay Fitzgerald, Univ. of Massachusetts, Mass.
Timothy Hutchison, Pentagon, Washington D.C.
William Spendley, Ft. McNair, Washington D.C.
Louis Zuccarello, Pentagon, Washington D.C.



Staff Sergeant-selects from the 2006 Supplemental Enlisted Promotion Board

Nova Anthony, HQ AFWA, Offutt AFB, Neb.
James Dunn, AFCCC, Asheville, N.C.

Results of the 2007 Air Force Weather Squadron, and Recruiting and Training Squadron Command Candidate Selection Board.



Lt. Col. David Andrus, Weather Squadron, Recruiting and Training Squadron
Lt. Col. Marvin Treu, Weather Squadron, Recruiting and Training Squadron
Lt. Col. Jimmie Trigg, Recruiting and Training Squadron
Lt. Col. Frederick Williams, Weather Squadron
Lt. Col. Charles Harris, Recruiting and Training Squadron
Maj. Kurt Brueske, Weather Squadron, Recruiting and Training Squadron
Maj. Christopher Cantrell, Recruiting and Training Squadron
Maj. Diana Hajek, Weather Squadron, Recruiting and Training Squadron
Maj. Scott Hausman, Weather Squadron, Recruiting and Training Squadron
Maj. Shannon Klug, Weather Squadron, Recruiting and Training Squadron
Maj. Gary Kubat, Weather Squadron, Recruiting and Training Squadron
Maj. Mark LaJoie, Weather Squadron, Recruiting and Training Squadron
Maj. James Mackey, Weather Squadron, Recruiting and Training Squadron
Maj. Scott Magnan, Weather Squadron, Recruiting and Training Squadron
Maj. Mark Mesenbrink, Weather Squadron, Recruiting and Training Squadron
Maj. James Parsons, Weather Squadron, Recruiting and Training Squadron
Maj. Leon Perkowski, Recruiting and Training Squadron
Maj. Michael Petrocco, Weather Squadron, Recruiting and Training Squadron
Maj. Brian Pukall, Weather Squadron, Recruiting and Training Squadron
Maj. Donald Shannon, Weather Squadron, Recruiting and Training Squadron
Maj. Travis Steen, Recruiting and Training Squadron
Maj. Robert Swanson, Weather Squadron
Maj. Richard Wagner, Weather Squadron
Capt. Carl Johnson, Recruiting and Training Squadron

Salutes

RETIREMENT

Chief Master Sgt. Thomas Simon,
HQ AMC/A3W, Scott AFB, Ill.
Master Sgt. Mark Russell,
AFCWC, Hurlburt Field, Fla.

AWARDS AND DECORATIONS

MERITORIOUS SERVICE MEDAL

Maj. David Biggar,
26th OWS, Barksdale AFB, La.
Maj. Chris Finta,
17th OWS, Hickam AFB, Hawaii
Maj. Paul Gehred,
Det. 3, Wright-Patterson AFB, Ohio
Maj. Sabrina Taijeron,
25th OWS, Davis-Monthan AFB, Ariz.
Maj. Henry Voegtle,
25th OWS, Davis-Monthan AFB, Ariz.
Chief Master Sgt. Thomas Simon,
HQ AMC/A3W, Scott AFB, Ill.
Senior Master Sgt. Lorne McClard,
26th OWS, Barksdale AFB, La.
Master Sgt. Shannon Barker,
AFCCC, Asheville, N.C.
Master Sgt. Daniel Colwell,
USAF, Colorado Springs, Colo.
Master Sgt. James Fashing,
25th OWS, Davis-Monthan AFB, Ariz.
Master Sgt. Dennis Flanagan,
HQ AFWA, Offutt AFB, Neb.
Master Sgt. David Jones,
28th OWS, Shaw AFB, S.C.
Master Sgt. Clark Lind,
HQ AFWA, Offutt AFB, Neb.
Master Sgt. John Lindfors,
AFCCC, Asheville, N.C.
Master Sgt. Tony Southerland,
15th OWS, Scott AFB, Ill.
Master Sgt. Huy Vu,
17th OWS, Hickam AFB, Hawaii
Master Sgt. Todd Winters,
17th OWS, Hickam AFB, Hawaii

JOINT COMMENDATION MEDAL

Capt. Jonathan Leffler,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Gary Lam,
17th OWS, Hickam AFB, Hawaii

Tech. Sgt. Jason Ronsse,
17th OWS, Hickam AFB, Hawaii

AIR FORCE COMMENDATION MEDAL

Capt. Jason Kollars,
HQ AFWA, Offutt AFB, Neb.
Capt. Nichole Mayo,
25th OWS, Davis-Monthan AFB, Ariz.
1st Lt. Lindsay Bloch,
17th OWS, Hickam AFB, Hawaii
1st Lt. Steve Lipinski,
17th OWS, Hickam AFB, Hawaii
1st Lt. Tara Lipinski,
17th OWS, Hickam AFB, Hawaii
1st Lt. Perry Sweat,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Gheri Daly,
AFCCC, Asheville, N.C.
Tech. Sgt. Marcia Gomez,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. John Harrison,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Claudette Hutchinson,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Landon King,
15th OWS, Scott AFB, Ill.
Tech. Sgt. John Lawless,
AFCWC, Hurlburt Field, Fla.
Tech. Sgt. Joseph LoCasto,
305th OSS/OSW, McGuire AFB, N.J.
Tech. Sgt. Bobby Madison,
15th OWS, Scott AFB, Ill.
Tech. Sgt. Daniel Rawls,
Det. 2, Sagamore Hill, Mass.
Tech. Sgt. Kathryn Stewart,
HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Gregory Adams,
Det. 4, Holloman AFB, N.M.
Staff Sgt. Jameel Beasley,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Jade Bell,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Veronica Bird,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Timothy Brace,
9th OWS, Shaw AFB, S.C.
Staff Sgt. Jeremy Coleman,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Keith Kaminski,
HQ AFWA, Offutt AFB, Neb.
Staff Sgt. James Lopez,
25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. Brandi Lorenzen,
HQ AFWA, Offutt AFB, Neb.

Staff Sgt. Kelly Miller,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Martha Mitchell,
Det. 2, Sagamore Hill, Mass.
Staff Sgt. Joshua Moore,
26th OWS, Barksdale AFB, La.
Staff Sgt. Jozsef Nagy,
HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Matthew Pierce,
HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Brooke Saltsman,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Scott Seeley,
25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. Jason Stewart,
37th OSS/OSW, Lackland AFB, Texas
Staff Sgt. April Van Loan,
17th OWS, Hickam AFB, Hawaii
Senior Airman Arjuna Hutchins,
17th OWS, Hickam AFB, Hawaii
Senior Airman Sylvester Richard,
AFCCC, Asheville, N.C.

ARMY COMMENDATION MEDAL

Master Sgt. Cliff Lucente,
17th OWS, Hickam AFB, Hawaii

JOINT SERVICE ACHIEVEMENT MEDAL

1st Lt. Kevin Clegg,
17th OWS, Hickam AFB, Hawaii
Master Sgt. Brian Martin,
127th WF, Forbes Field, Topeka, Kan.
Staff Sgt. Mike Funk,
17th OWS, Hickam AFB, Hawaii

AIR FORCE ACHIEVEMENT MEDAL

Maj. James Parsons,
AFCWC, Hurlburt Field, Fla.
1st Lt. Kevin Blumberg,
9th OWS, Shaw AFB, S.C.
1st Lt. Jonathan Brady,
HQ AFWA, Offutt AFB, Neb.
1st Lt. Randy Clark,
26th OWS, Barksdale AFB, La.
1st Lt. Jennifer Cundiff,
9th OWS, Shaw AFB, S.C.

1st Lt. Jeffrey Johnson,
HQ AFWA, Offutt AFB, Neb.
1st Lt. Brian Koeneke,
9th OWS, Shaw AFB, S.C.
1st Lt. Clint Montgomery,
9th OWS, Shaw AFB, S.C.
1st Lt. Martine Morris,
26th OWS, Barksdale AFB, La.
1st Lt. Keelin O'Keefe,
17th OWS, Hickam AFB, Hawaii
1st Lt. Charles Phillips,
25th OWS, Davis-Monthan AFB, Ariz.
1st Lt. Noah Rich,
15th OWS, Scott AFB, Ill.
1st Lt. Shane Rueber,
17th OWS, Hickam AFB, Hawaii
1st Lt. Kimberly Stephens,
HQ AFWA, Offutt AFB, Neb.
1st Lt. Nicole Wells,
17th OWS, Hickam AFB, Hawaii
2nd Lt. Ashley Lovett,
17th OWS, Hickam AFB, Hawaii
Master Sgt. Donald Kusz,
AFCCC, Asheville, N.C.
Master Sgt. John Lindfors,
AFCCC, Asheville, N.C.
Tech. Sgt. Rashid Lamb,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Dave Mayer,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Kelvin Ruizno,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Patricia Ford,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Jason Stockslager,
AFCCC, Asheville, N.C.
Staff Sgt. Ryan Trickey,
17th OWS, Hickam AFB, Hawaii
Senior Airman Vincent Aleandri,
HQ AFWA, Offutt AFB, Neb.
Senior Airman Christian Boehm,
26th OWS, Barksdale AFB, La.
Senior Airman Katherine Caputo,
HQ AFWA, Offutt AFB, Neb.
Senior Airman Summer Covington,
15th OWS, Scott AFB, Ill.
Senior Airman Zachary Grandin,
26th OWS, Barksdale AFB, La.
Senior Airman Hayley Lewis,
17th OWS, Hickam AFB, Hawaii
Senior Airman Tabitha Post,
28th OWS, Shaw AFB, S.C.
Senior Airman Robert Royals,
26th OWS, Barksdale AFB, La.
Senior Airman Troy Tiers,
HQ AFWA, Offutt AFB, Neb.

ARMY ACHIEVEMENT MEDAL

1st Lt. Shane Rueber,
17th OWS, Hickam AFB, Hawaii

NAVY ACHIEVEMENT MEDAL

Master Sgt. Adam Christian,
17th OWS, Hickam AFB, Hawaii
Staff Sgt. Jillian Jaykoski,
17th OWS, Hickam AFB, Hawaii
Senior Airmen Julie Rhoades,
17th OWS, Hickam AFB, Hawaii

EDUCATION

SENIOR NCO ACADEMY

Master Sgt. Daniel Colwell,
Distinguished Graduate, USAFA,
Colorado Springs, Colo.
Master Sgt. Gerald Cordova
HQ AFWA, Offutt AFB, Neb.

NCO ACADEMY

Tech. Sgt. Christine Cardenas,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. John Harrison,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Jon Hoagboon,
Distinguished Graduate,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Rod Jacobs,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Gary Lam,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Jason Miller,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Bernard Moyer,
17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Gregory Parker,
AFCWC, Hurlburt Field, Fla.
Tech. Sgt. Shane Siebert,
HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Scott Williams,
AFCWC, Hurlburt Field, Fla.
Tech. Sgt. Bradley Youngquist,
HQ AFWA, Offutt AFB, Neb.

AIRMAN LEADERSHIP SCHOOL

Staff Sgt. Howard Cordingley,
Academic Achievement Award,
OL-A, Coleman AAF, Germany
Staff Sgt. Christopher Willett,
Distinguished Graduate and
Academic Achievement Award,
AFCWC, Hurlburt Field, Fla.
Senior Airman Arjuna Hutchins,
17th OWS, Hickam AFB, Hawaii
Senior Airman Tim Scanlin,
Distinguished Graduate,
17th OWS, Hickam AFB, Hawaii

WEATHER FORECASTER APPRENTICE

Tech Sgt. Vector Byrd,
15th OWS, Scott AFB, Ill.
Tech Sgt. Bryan Drake,
25th OWS, Davis-Monthan
AFB, Ariz.
Tech Sgt. Michael Hanks,
26th OWS, Barksdale AFB, La.
Tech Sgt. Omar Lopez,
123rd WF, Portland, Ore.
Tech Sgt. Ernesto Moreno,
26th OWS, Barksdale AFB, La.
Tech Sgt. William Smith,
154th WF, Little Rock AFB, Ark.
Staff Sgt. Roy Bock,
207th WF, Indianapolis, Ind.
Staff Sgt. David Crabtree,
113th CWF, Terre Haute, Ind.
Petty Officer 2nd, Navy, Class
Matthew Corder,
Airsta, Kodiak, Alaska
Senior Airman Jay Carls,
HQ AFWA, Offutt AFB, Neb.
Senior Airman Michael Eilly,
102nd FW, Otis ANGB, Mass.
Senior Airman Fred Horner,
207th WF, Indianapolis, Ind.
Senior Airman Kelley Leonard,
HQ AFWA, Offutt AFB, Neb.
Senior Airman Brad Ritenour,
177th FW, Egg Harbor
Township, N.J.
Senior Airman Dwight Upton,
187th FW, Montgomery, Ala.
Airman 1st Class Shatayne Acevedo,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Thomas Allender,
15th OWS, Scott AFB, Ill.
Airman 1st Class Jason
Balanzategui,
21st OWS, Sembach AB,
Germany
Airman 1st Class Bobbi Jo Barnes,
21st OWS, Sembach AB,
Germany
Airman 1st Class Blake Cook,
21st OWS, Sembach AB,
Germany
Airman 1st Class Brittaney
St. Dennis,
17th OWS, Hickam AFB, Hawaii
Airman 1st Class Casey Fletcher,
26th OWS, Barksdale AFB, La.
Airman 1st Class John R. Gaston,
15th OWS, Scott AFB, Ill.
Airman 1st Class Steven Gentry,
15th OWS, Scott AFB, Ill.
Airman 1st Class Brandon Gilliland,
28th OWS, Shaw AFB, S.C.
Airman 1st Class James Gragg,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Laura Groh,
15th OWS, Scott AFB, Ill.
Airman 1st Class Courtney Johnson,
25th OWS, Davis-Monthan
AFB, Ariz.
Airman 1st Class Matthew Johnson,
169th FW, Eastover, S.C.

Airman 1st Class Keith Medina,
21st OWS, Sembach AB,
Germany
Airman 1st Class Jessica Larson,
25th OWS, Davis-Monthan
AFB, Ariz.
Airman 1st Class James Pann,
21 OWS, Sembach AB,
Germany
Airman 1st Class James Pomar,
21st OWS, Sembach AB,
Germany
Airman 1st Class Richard
Psculkowski,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Alexandria Reyes,
21st OWS, Sembach AB,
Germany
Airman 1st Class Angela Roper,
Distinguished Graduate,
208th WF, St. Paul, Minn.
Airman 1st Class Charles Roper,
Distinguished Graduate,
15th OWS, Scott AFB, Ill.
Airman 1st Class Amanda Schubach,
25th OWS, Davis-Monthan
AFB, Ariz.
Airman 1st Class Sabrina Slagle,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Lance Stewman,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Kelsey Vanderhoef,
21st OWS, Sembach AB,
Germany
Airman 1st Class Sarah Walsh,
17th OWS, Hickam AFB, Hawaii
Airman 1st Class Sara Wauer,
15th OWS, Scott AFB, Ill.
Airman 1st Class Philip Woodson,
28th OWS, Shaw AFB, S.C.
Airman Jacob Callahan,
21st OWS, Sembach AB,
Germany
Airman Weston Dahl,
15th OWS, Scott AFB, Ill.
Airman Ryan Felicilda,
21st OWS, Sembach AB,
Germany
Airman Robert Kroupa,
21st OWS, Sembach AB,
Germany
Airman Francisco Machado,
21st OWS, Sembach AB,
Germany
Airman Clifton Mitchell,
21st OWS, Sembach AB,
Germany
Airman Daniel Pipkin,
21st OWS, Sembach AB,
Germany
Airman John Porter,
21st OWS, Sembach AB,
Germany
Airman Nina Valentine,
28th OWS, Shaw AFB, S.C.
Airman, Navy, Leana Casulla,
21st OWS, Sembach AB,
Germany
Airman Appentice, Navy,
Nikolas Endicott,
21st OWS, Sembach AB,
Germany

COMBAT WEATHER TEAM OFFICER

Capt. Richard Engle,
352nd OSS/OSW, RAF
Mildenhall, UK
1st Lt. Michael Kistner,
354th OSS/OSW, Eielson AFB,
Alaska
1st Lt. Lynnam Liam,
39th OSS/OSW, Incirlik AB,
Turkey
1st Lt. Richard Monson,
15th ASOS, Ft Stewart, Ga.

COMBAT WEATHER TEAM OPERATIONS

Staff Sgt. Megan Bohun,
9th OWS, Shaw AFB, S.C.
Staff Sgt. Timoty Brace,
86th OSS/OSW, Ramstein AB,
Germany
Staff Sgt. Patrick Brodigan,
26th OWS, Barksdale, La.
Staff Sgt. Bryan Fewell,
3rd OSS/OSW, Elmendorf
AFB, Alaska
Staff Sgt. Heath Minnick,
9th OSS/OSW, Beale AFB, Calif.
Senior Airman Chad Brink,
27th OSS/OSQW Cannon
AFB, N.M.
Senior Airman Michael
Farnsworth,
26th OWS, Barksdale, La.
Senior Airman Marquita Gaines,
28th OWS, Shaw AFB, S.C.
Senior Airman Renee Grobe,
14th OSS/OSW, Columbus
AFB, Miss.
Senior Airman Scott Horn,
3rd WS, Ft Hood, Texas
Senior Airman Eric Jaeger,
3rd WS, Ft Hood, Texas
Senior Airman Joshua Leggit,
26th OWS, Barksdale, La.
Senior Airman David Logie,
8th OSS/OSW, Kunsan AB,
Korea
Senior Airman Steven Lowry,
509th OSS/OSW, Whiteman
AFB, Mo.
Senior Airman Amanda Peterson,
52nd OSS/OSW, Spangdahlem
AB, Germany
Senior Airman Corey Reimer,
375th OSS/OSW, Scott AFB, Ill.
Senior Airman Billy Tate,
28th OWS, Shaw AFB, S.C.
Airman 1st Class Ginger Gerhard,
15th OWS, Scott AFB, Ill.
Airman 1st Class Sarah Kagg,
43rd OSS/OSW, Pope AFB, N.C.
Airman 1st Class Sheri Lowry,
509th OSS/OSW, Whiteman
AFB, Mo.
Airman 1st Class Tia Pickett,
3rd WS, Ft Hood, Texas

