Observer

The Magazine for Air Force Weather

Nov/Dec '03
Vol. 49, No. 7

Joint Wx Ops:
A closer look

RED FLAG
"On Target" weather intelligence

15th ASOS
Riding the whirlwind... Directing the storm

Observer

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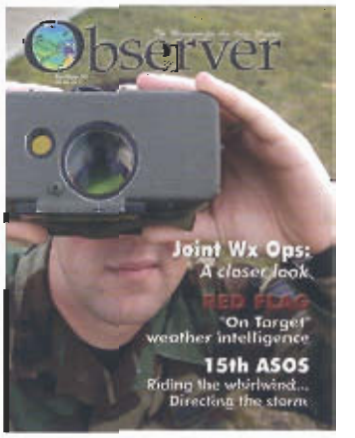
What's Inside:

Editorials

On the Cover

Senior Airman James Dziedzina, a weather technician with the 48th OSS/OSW, RAF Lakenheath, UK, uses a tactical cloud laser range finder to determine if the clouds are too low for aircraft to safely take off and land. This is one of many pieces of equipment that help provide direct force-enhancement to the 48th wing. *Photo by Airman Basic Stacey Jeanpaul*



PACAF Percpective: Overcoming Challenges in the Pacific

By Col. Robert L. Hamilton Jr.
PACAF Director of Weather

We have heard that weather is a force multiplier. From intelligence preparation for the battlespace to time sensitive strike; from home airfield to target; from current surface analysis to target-scale model forecast, the warfighter requires an accurate assessment of the environment.

To apply this knowledge of the environment to the mission, we must understand, anticipate, and exploit the impacts of weather on different friendly and enemy capabilities. The warfighter doesn't need us to tell them they can't accomplish the mission.

Instead, we need to help them plan when, where, and how the mission can be accomplished given the current and/or expected conditions, and the weapon systems being employed. In a data sparse Area of Responsibility, like that of the Pacific Air Forces', this is a huge challenge that requires a robust theater weather sensing strategy.

We're faced with a number of data sensing challenges in our command. For starters, the 17th Operational Weather Squadron has the largest AOR with huge expanses of ocean and very few island upper air and surface reporting stations. The 20th Operational Weather Squadron contends with limited upstream data from China, Russia and Mongolia. The 11th OWS must wrestle with an AOR nearly the twice the size of Texas with an aging network of sensors hundreds of miles apart. With these challenges, it's no surprise that weather collection is a top functional priority.

Major pieces of the PACAF sensing plan are the standard Air Force Weather, Navy, and National Weather Service systems that provide surface, upper air, radar, lightning, and satellite images and derived data. Also, foreign observations collected and disseminated by the Air Force Weather Agency play a significant role.

However, despite these sources of data, PACAF remains data sparse with large distances between reporting stations and with major sources of foreign national data remaining untapped. Our strategy focuses on acquiring the data to fill these voids.

Exploitation of Data

In order to provide the best environmental situational awareness possible to the warfighter, no data source can be ignored in PACAF. In some parts of PACAF, such as Korea and Japan, copious amounts of indigenous data exist to include surface mesoscale networks, as well as lightning and radar data. In the past we relied heavily on many costly dedicated circuits direct from our allies into the Automated Weather Network.

To save on circuit leasing costs and to make use of Internet protocols, the push is to utilize Defense Information Systems Agency provided common-user communications to move data from the sources to our Air Force standard systems. Though technically straightforward, network security complications arise when passing data over common-user communications from foreign nations, which mandate navigating lengthy approval and accreditation processes.

Additionally, nation-to-nation data sharing agreements must be worked to ensure the foreign data sources aren't just temporary. These are complicated and difficult obstacles to success, but PACAF weather warriors, along with the AFWA and communications community, are working to obtain the technology, approvals, and agreements to ensure foreign data sources are available and reliable.

When a failing Japanese satellite threatened our ability to provide accurate tropical cyclone forecasts, the Commander, U.S. Pacific Forces made the decision and requested the services of WC-130s to provide tropical cyclone reconnaissance capabilities in WESTPAC, where an average of 32 tropical cyclones occur per year. The WC-130 missions provided reconnaissance data to AFWA and the Navy's Fleet Meteorological Numerical and Oceanography Center as inputs to the meteorological model used by the Air Force, the MM5, and the Navy Operational Global Atmospheric Prediction System models. Additionally,

Pacific Air Forces at a glance

Mission – PACAF's primary mission is to provide ready air and space power to promote U.S. interests in the Asia-Pacific region during peacetime, through crisis, and in war.

Area of Responsibility – More than 100 million square miles; home to nearly two billion people, in 44 countries.

The Numbers – Approximately 45,000 military and civilian personnel; Nine major locations and numerous smaller facilities, primarily in Hawaii, Alaska, Japan, Guam and South Korea.

Approximately 300 fighter and attack aircraft are assigned to the command.

PACAF Aircraft –
A-10/OA-10 Thunderbolt II
C-21A
C-130 Hercules
E-3 Sentry (AWACS)
F-15 Eagle
F-15E Strike Eagle
F-16 Fighting Falcon
HH-60G Pave Hawk
KC-135 Stratotanker
UH-1N Huey

the data provided the Joint Typhoon Warning Center "ground truth" input for the tropical cyclone fixing and forecasting processes.

The Mark IV-B network with downlink sites at Kadena, Andersen, Hickam, and Elmendorf is an essential part of the sensing strategy in PACAF. With the fielding of the Mark IV-B client and the GIDS viewer, high resolution GOES and DMSP satellite data is now available to any unit with NIPRNET connectivity. The Mark IV-B satellite data now used by every Combat Weather Team and OWS in PACAF, is a core capability for tropical cyclone fixing at the Joint Typhoon Warning Center, and has an ever-increasing user base.

To meet PACOM sensing requirements in data-denied and data sparse areas, we've attempted to obtain testing funds from both the Advanced Concept Technology Demonstration and Foreign Comparative Testing programs. The commercial-off-the-shelf capability we're advocating is the Weather Scout Unmanned Aerial Vehicle, which is a low-cost, long range, stealthy platform.

The WSUAV can provide weather reconnaissance data in PACAF's extensive training ranges, potential target and operations areas, as well as the AOR's frequent tropical storms. Contractor flown and maintained, this directed data service is much more flexible than fixed or tactical observing systems and is orders of magnitude less expensive than manned weather reconnaissance. We plan on continuing to pursue testing funds and work to assess the WSUAV capabilities verses our theater sensing requirements.

Other sources need to be exploited to include classified imagery available from satellites and the Predator, Shadow, and Hunter UAVs. These platforms can provide detailed and timely observations of areas and points having operational significance. Plus, we plan to work with XOW and AFWA on a worldwide sensing strategy as part of the overall AFW Strategic Vision.

A superior theater weather sensing strategy is required to provide timely and accurate observations of the battlespace that can be used to impact everything from the planning to the execution of the full spectrum of weapons systems used to protect our freedoms.

In PACAF, we've concentrated on a strategy to fill our data void areas with quality, reliable observation data. It's of the utmost importance in our command since there is currently limited weather data to enhance our varied and widespread mission requirements.

Like Sun Tzu, we believe we must "*know the ground, know the weather...*". Here in PACAF, we've tried to think "out-of-the box" and find ways to exploit indigenous, foreign national data sources and new technology for remote directed sensing. We realize that we must know the weather, that we must fully understand the impact weather has on weapon systems, and communicate the weather and weather effects to the warfighter!

Working together with our allies and our friends at AFWA and in the comm community, we're confident we'll meet with success!

Chief's Mentoring: True Leadership

By Chief Master Sgt.
Penny Braverman
Enlisted Matters Chief

I recently had the privilege to sit on a Senior NCO panel for a group of young supervisors and answer their questions, provide mentoring, and listen to their concerns and issues. These young NCOs expressed concerns about teamwork in their workplace and how we support each other to accomplish the job or mission. The discussion ranged from today's work environment to how supervisor and commanders support and listen to them. I saw an eagerness to do well as supervisors, but I also saw frustration in dealing with people and the relentless struggle most have faced at some point in their careers.

Part of teamwork is pulling together and we usually start this process with strong communication. We must be able to provide guidance both verbally and written, up and down the formal and informal channels. This was one area that these young supervisors saw as a major problem. Some felt their supervisors did not understand the process and were not listening to their suggestions to improve practices.

As a supervisor, when was the last time you visited or went to a work center? I don't mean just a grip and grin, but really get in and see the work and see each shift working. As a supervisor, I found out more when I worked a mid or swing shift with the troops than coming in on a day shift. By coming in on their time, the troops see you are concerned about the job and what they accomplish as part of the team. Listen to the troops, take and consider their ideas and opinions, and then provide them feedback on why you used or did not use their suggestions. You gain respect and buy in by involving them in the decision making process.

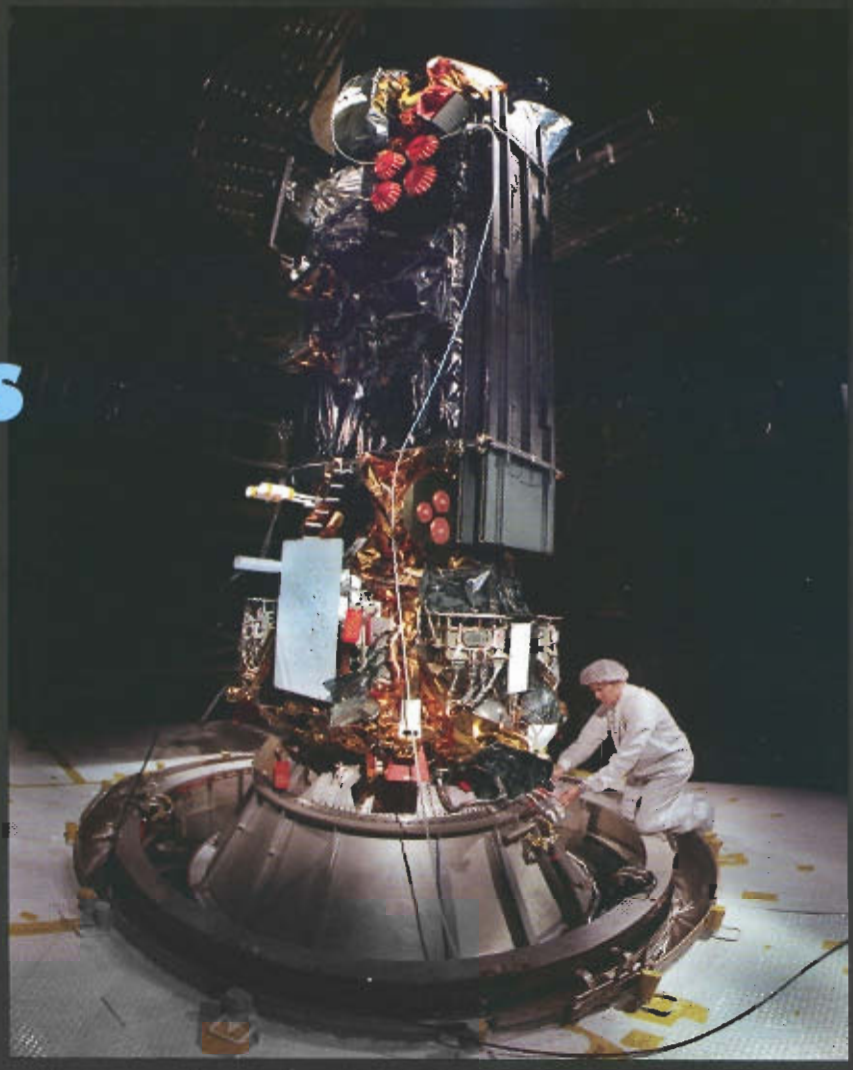
The second part of this equation is the troops themselves doing what must be accomplished. Once a decision is made, we must accomplish the task without grumbling about the work. Some supervisors, young and old, tend to grumble in front of the troops about that "stupid idea" or the head office not "having a clue" about the mission or slowing down work. This type of incident usually occurs in a work center where all the troops from the youngest to the most experience are well within earshot. Think about it. What message are we sending to the people who work for us and with us? I can tell you it is not a good one and we are laying the groundwork for the subordinates to do the same thing – maybe to you.

So how do we get communication lines open again? As a supervisor, you start by setting expectations for yourself and the troops – be sure to include your people when setting their expectations. Next, provide continual feedback and get in with the workers to see how things operate and where to tweak the system. Finally, if you have a suggestion or issue, use the chain of command to work the problem first. You should come in to your supervisor with the problem or issue identified and some possible solutions or recommendations with pros and cons. Note I said solutions or recommendations with pros and cons. You want to give your supervisors and commander more to consider and show that you thought the problem or issue through. Be realistic. Don't expect things to change over night. Give leadership a chance to work the change or explain why things cannot be done your way. You may not be seeing the big picture and your change might greatly degrade another operation or the mission. As the supervisor or worker, once leadership makes a decision, you must complete the mission – unless it is immoral or unethical.

I know we all feel we know and listen to our troops, but do you really understand what they say and provide them feedback so they understand how to accomplish the mission. As a supervisor how do you think your troops rate you? Think about it.

New Satellite, Enhanced Capabilities

By Master Sgt. Miles Brown
AFWA Public Affairs



Lockheed Martin Defense Meteorological Satellite sits atop a Titan II launch vehicle, Vandenberg AFB, Calif. The DMSP satellite was launched into a polar orbit Sep. 18, 2003, from Vandenberg's Space Launch Complex 4 West at 9:17 PST. *Photo by Russ Underwood.*

The Air Force Weather community has a new Defense Meteorological Satellite Program spacecraft in orbit around the earth. A $200-million DMSP satellite was launched into a near-polar orbit from Vandenberg AFB, Calif., Oct. 18, 2003.

The new satellite brings much to DoD meteorologists in terms of improved capabilities. Fitted with three new sensors, meteorologists see improvements in both terrestrial and space weather capabilities. The data and images retrieved from these sensors provide weather technicians with even more precise looks at weather systems, which in turn ensures both U.S. land and sea forces are armed with the best weather intelligence available.

"This is a great day to see this program lift off," said Col. Charles L. Benson Jr., Air Force Weather Agency commander. "This satellite has been long anticipated and will be exploited to the fullest by Air Force Weather specialists worldwide."

One of the new sensors will relay more detailed estimates of precipitation, ocean surface wind speeds, atmospheric temperatures, and soil moisture. This capability allows military meteorologists to characterize the operational environment in the air, on land, and at sea.

Additionally, the space weather community will benefit from two new sensors capable of measuring particle densities, which affect satellite flight paths, and improved detection of geomagnetic storms, which may impact communications or, in extreme cases, entire power grids.

"With the new upgrades included in this satellite technology, we will have increased capability to track and classify hurricanes and typhoons. Also, we will be able to better assess snow depth and soil moisture in remote regions of the world, where conventional weather data is not observed and recorded," said Paul McCrone, Chief Forecaster, Meteorological Satellite Operations Branch, AFWA.

DMSP now has five operational satellites in sun-synchronous orbit at an altitude of approximately 500 miles. The new satellite and one existing spacecraft are the primary meteorological orbiters crossing the equator at sunrise and in mid-morning respectively.

The launch is the first DMSP launch in four years and the satellite reached its 500-mile high orbit in six-and-a half minutes aboard a Titan II rocket. The Titan II vehicles are decommissioned intercontinental ballistic missiles that have been refurbished and equipped with hardware required for use as space launch vehicles. This was also the last satellite to be launched using the circa 1950s Titan IIs.

Riding the Whirlwind... Directing the Storm

By Maj. Robert Coxwell
15th ASOS Commander

Within hours of the first bombs dropping in Iraq, weather specialists from the 15th Air Support Operations Squadron assigned to the Army's 3rd Infantry Division, the 3ID Aviation Brigade, and the 3rd Squadron, 7th Cavalry Regiment, crossed the Iraq-Kuwait border as part of Operation IRAQI FREEDOM. Their mission was to integrate "Mud to Sun" weather intelligence with Army operations. A simple enough objective, but one made extraordinarily difficult by sand, heat, sleep deprivation, rough terrain, hostile forces and convoy operations. As is military tradition, the weather professionals overcame these problems and delivered the most advanced weather intelligence ever fielded.

During convoy operations, weather technicians worked out of everything from the cabs of their HUMVEEs to the Army's Intergrated Meteorological System shelters. Some smaller teams, like the two-man team assigned to provide weather intelligence for the 3/7 Cav, didn't even have a vehicle of their own and had nothing more than a Kestrel 4000, a laptop computer, and an Iridium phone.

According to Staff Sgt. Gerry Thompson, "most of the time we would just find a generator and sit next to it to get our products done." In all instances, dust and dirt were everywhere. Even with shelters, the dust and dirt still permeated everything.

Some of the sandstorms experienced were nothing less than biblical. The largest one literally turned day into night and halted the majority of military operations.

"The sandstorms drained the strength and vitality out of us," said Tech. Sgt. Craig Clark. "It was like working underwater."

Smaller sandstorms just made life miserable. "Morale hit rock bottom during all the sandstorms, especially the big one," said Staff Sgt. Brock Taylor Furman. "But you could see spirits lift when people saw the blue skies the next morning."

Specific customer impacts centered largely around visibility, which was zero during the peaks of the storms. Aircraft couldn't fly and the occurrences of friendly fire increased dramatically. "We actually received fire from Air Force troops chasing some enemy combatants less than 1/8 of a mile from us," recalls Tech. Sgt. Scotty Claar.

Living conditions were extraordinarily primitive from March 6 until April 15. Often times, personnel slept by their vehicles without shelters. Without toilets or running water, personnel were forced to relieve themselves at the side of the road or between vehicles. Without showers, baby wipes became priceless and, at times of water rationing, the only way to stay clean.

Besides the relatively routine business of assisting the warfighter, all personnel cited specific events that were memorable. For Master Sgt. David Ogurski, "the experience of helping the Iraqi meteorologists establish basic weather operations again was rewarding. They lost 100 years of weather history and all of their equipment. This flight's helping to lay the foundation for a new Iraqi Meteorological Organization."

Others, like Staff Sgt. Brad Giese, will always remember being one of the tiny handful of Air Force personnel, not just weather personnel, to invade Iraq. "This was our chance to be at the tip of the spear."

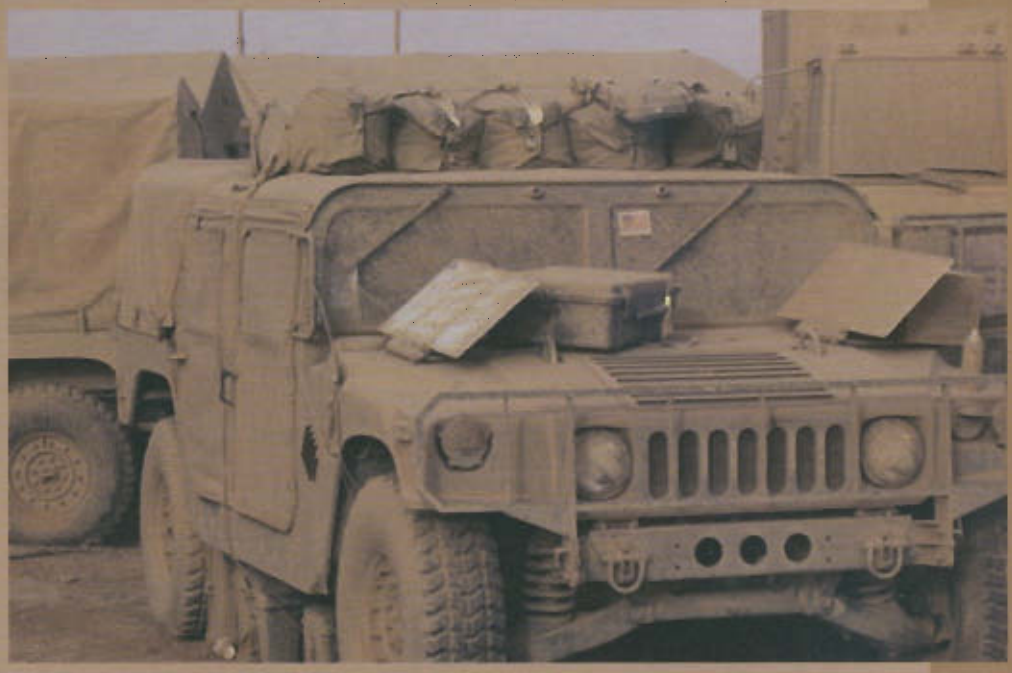
Weather specialists working with the aviation brigade like Staff Sgts. Jason Hawley and Melanie Horst, and Senior Airman Brian Nolan had the unique opportunity to set-up a triage facility and even moved MEDEVAC patients back and forth to aircraft concurrent with their other duties.

The impact of seeing the carnage of war impacted personnel differently. For Senior Airman Deniece Palmer, the site and smell of dead and rotting bodies will always be most memorable and disturbing. Others, like Staff Sgt. Julie Moretto, will remember the friends lost during the course of the conflict. Close relationships develop between weather technicians and their customers, and when an aircraft goes down, as was the case several times during this war, the weather team likely lost a friend.

Flight personnel encountered a variety of dangerous situations, from being in the middle of dropping bombs, as was the case with Tech. Sgt. Claar and Staff Sgt. Thompson, to having an Apache experiencing trouble drop its ordinance within feet of Tech. Sgt. Clark. Even the simple act of driving through a small town was dangerous as the convoy stopped and thousands of local citizens swarmed the vehicles out of curiosity. There was nothing keeping any one of them from killing a large number of personnel before they could be stopped.

"I could not be more proud of this flight," said 1st Lt. Chad Little, assistant weather flight commander. "We've been preparing for this war since Sep. 11, 2001. We knew we'd be first in, and for most of us this is the second deployment in the past year. But despite the Ops tempo and miserable conditions, these professionals responded with honor and determination. I'm confident that there's never been a better performance by any combat weather team – period."

It's hard to argue with the results.



Equipment from the 3rd Infantry Division (Mechanized) after the dust storm at objective RAMS in Southern Iraq on March 25, 2003. This HMVEE with two Inmarsat phones on top of the hood belongs to Army Combat Camera Team from Fort Meade, Md. The Division was deployed for Operation IRAQI FREEDOM. U.S. Army photo by Sgt. Igor Paustovski.

Mission Accomplished with First Class Firsts

Among the firsts achieved by the 3ID's Combat Weather Teams was the successful deployment and integration of the Integrated Meteorological System with other systems, including SIPRNET, Trojan Spirit and T-VSAT. The IMETS proved to be an invaluable platform from which to conduct weather operations. With the IMETS, both CWTs had the ability to stop whenever their convoy stopped and within 5 minutes begin receiving data via T-VSAT. The IMETS suite of software also proved crucial. Customer adopted such capabilities as the Integrated Weather Effects Decision Aid and the IMETS web server as tools for capitalizing on weather intelligence.

The CWTs also leveraged off-the-shelf technology like Iridium satellite phones to augment thinly stretched customer communications. During the initial 96-hour convoy from Kuwait to their first objective, the only available two-way communications were Iridium phones. Weather technicians used the Iridium's modem capability to send text messages such as Chemical Downwind Messages, warnings and forecasts to dozens of 3ID units scattered across the entire country of Iraq. Frequent calls were made to the 28th Operational Weather Squadron to pass along GROUNDREPS and observations from both ALO and weather specialists during the chaos of movement.

Operation IRAQI FREEDOM saw the first deployment of tactical space weather equipment. As a proof of concept between Air Force Research Labs, the IMETS program office, 3ID and the 15 ASOS Weather Flight, a tactical version of AFWA's Space Environment Network Display was developed, called TacSEND. The SEND products have been around for years and have been used to help the warfighter maximize High Frequency radio and Ultra-High Frequency satellite communication circuits. Now with TacSEND, which made its first appearance in Operation IRAQI FREEDOM, CWTs have the ability to produce the same tactical decision aids locally and tailor them to specific customer missions.

Lastly, a new space weather sensor and corresponding tactical decision aid for Global Positioning Satellite dual frequency errors were deployed for the first time. While it has been known for years that the ionosphere introduces errors in single frequency GPS receivers, this is the first attempt to quantify the magnitude of the errors experienced by the more robust dual frequency receivers. The ability to tell the warfighter when periods of lowest and highest errors will occur could translate into less collateral damage to civilian infrastructure. Some additional firsts for the 3ID team included:

- First conventional weather personnel in Iraq
- First observations from Baghdad International Airport
- First use of IMETS during deployment/war
- First integration of IMETS with T-VSAT, SIPRNET and Trojan Spirit
- First battlefield use of Iridium
- First site survey of the BIAP weather station
- Secured 30 years of weather data, only known surviving archive of data in Iraq
- First official contact with Iraqi Meteorological Organization
- First use of a tactical space weather system

JOINT OPERATIONS

halfway around the world

By Jodie Grigsby
AFWA Public Affairs

"Joint" It's a word that the men and women of Air Force Weather take to heart. Many weather technicians work in a joint environment everyday – peacetime and in war – routinely providing complete situational and environmental awareness.

With adverse weather conditions plaguing Operations IRAQI FREEDOM and ENDURING FREEDOM, it became evident that the success of any military operation would be tied to successfully getting vital weather information to military commanders. Operations in both Afghanistan and Iraq were textbook cases of the important role weather has in all phases of joint operations.

"Weather does not discriminate against a particular service. We are all affected," said Capt. John Roberts, who was a meteorologist assigned with 173rd Separate Infantry Brigade during OIF.

Roberts knows first hand the important role weather can play in a military operation. The 173rd's combat jump into Northern Iraqi was the first wave of conventional American forces into the area. However, the weather was bad when the planes took off for the jump and the weather continued to be bad hours out from the jump as the C-17s approached the jump site. But the team knew that calling the mission off wasn't an option.

"There was a tremendous amount of pressure on myself and the rest of the weather community to give them the optimal window of when they could jump," Roberts said.

Despite surveillance teams on the ground questioning whether the weather would clear, Roberts stuck to his forecast – he was adamant the weather would clear. There would be a window of clear weather, the 173rd just had to trust him. The 173rd would jump.

Roberts was right. The weather cleared and when jump time came, only scattered skies remained. The 173rd jumped from an altitude of about 500 ft, and hit the ground...right on target.

This wasn't the only example of heroic actions by weather warriors during OIF. Staff Sgt. Dave Mack, Special Tactics Weather Technician, Detachment 2, 10th Combat Weather Squadron, also knows first hand about weather's role in recent joint operations.

During Operation IRAQI FREEDOM Mack was attached with an Army Special Forces ground team and flew into south central Iraq and then traveled across the country with the team. Mack was one of the only forward weather technicians providing weather observations in the initial phases of the war. When Mack's team moved toward Baghdad, he would eventually provide weather observations for Baghdad Airport until conventional forces arrived.

"The importance of his mission was stressed upon him before going in," said Maj. Randall Kallenbach, Commander Detachment 2, 10th Combat Weather Squadron and Staff Weather Officer for the Combined Joint Special Operations Task Force in western Iraq during the start of the war.

Mack provided observations back to Kallenbach via satellite phone every three hours. The forecasts were so important that four weather technicians were solely devoted to getting Mack's observations to those who needed them. After taking an observation, it would be in the hands of a weather technician to brief decision makers often within five minutes.

"In the world of special operations and in the joint world, weather is absolutely crucial. When you operate on the edge of the envelope, and weather starts to interfere, the result can be catastrophic."

Kallenbach said.

Mack said having AFW technicians forward deployed is important because it allows decisions makers to have complete situational awareness.

"It can give them a view of the battle field," Mack said.

And what a view it was. On April 7, 2003, Mack was with the 3rd infantry division's 2nd Brigade Combat Team, just south of Baghdad, when the lead element of his unit came under fire. After the fight they began moving the wounded back to the field hospital when an incoming Iraqi missile landed less then 75 meters away from the rest of the team. Mack said the team watched fragments of vehicles, generators, and ammunition fly by as they secured the perimeter. Adding to the confusion were reports of 200 plus enemy infantry moving into the rear of the area.

"No one was standing around thinking about what needed to be done, we just reacted to what was given. We were taking care of what needed to be taken care of," Mack said.

The wounded needed to be evacuated. But a dust storm was pushing into the area and visibility was decreasing by the second. The conditions were well below minimum requirements. Going on 32 hours of continuous observations, Mack warned command of the degraded conditions and what they could expect. Visibility was less half a mile, and worsening. Evacuation became the only course of action after failed attempts to stabilize the wounded. Two MH-60 Blackhawks evacuated the wounded shortly before sunrise.

Mack said that it felt good "knowing I had an impact on the mission. Doing the job I was trained to do."

Mack said that he felt he proved to the team the importance weather plays in all operations, joint or otherwise.

"Once they realized I was not a liability but an asset, we worked well together," Mack said.

When pressed, Mack will begrudgingly admit that he had a lot of responsibility and played a key role in operations in Iraq. But he quickly caveats it with, "I was just doing my job."

And what an important job it is.

Above, Headquarters of the 4th Air Operations Support Group in northern Iraq.
Left, Staff Sgt. Joel Decker, a combat weather technician, runs communication lines from the top of their headquarters.
Below, Sergeant Decker downloads the latest weather products for the 173rd Separate Infantry Brigade during Operation IRAQI FREEDOM. For left, the 173rd arrives at Vicenva AB, Italy, in preparation for their combat jump into Northern Iraqi.

20th OWS

Yokota's joint, combined and bilateral operation experts

By Capt. Michael Mills
20th OWS

The 20th Operational Weather Squadron deals in joint, combined and bilateral operations. Most operations and exercises conducted in today's Air Force are accomplished either in a joint or combined environment. As stated in the DoD Dictionary of Military Terms; **joint** connotes activities, operations, organizations, etc., in which elements of two or more Military Departments participate. Similarly, **combined** activities are those between two or more forces or agencies of two or more allies. We further specify our unique relationship with the Japanese by referring to our activities as **bilateral**. Bilateral is not a coalition or an alliance but rather a working relationship; the parties involved work side-by-side. However, neither has a command relationship over the other.

In Japan, operations and exercises are conducted in a bilateral environment. When operations or exercises commence, the heart of the relationship between the U.S. Air Force and the Japan Air Self-Defense Force, also know as the JASDF, is the Bilateral Air Operations Coordination Center, or BAOCC, located at HQ Fifth Air Force, Fuchu AB, Japan. The working relationship between U.S. Air Force and JASDF weather specialists is an extremely important function in the larger bilateral agreement between the United States and Japan.

When exercises and operations are conducted in the Republic of Korea, the 20th OWS operations workcenter becomes a joint/combined environment and the working relationship with the 607th Weather Squadron is just as tight in providing weather intelligence for Army and Air Force operations. Another facet of our operations is typhoon weather forecasting for USFJ/USFK. Our typhoon operations run the gamut from collaboration with the Joint Typhoon Warning Center on storm tracks, to individual coordination with CWTs concerning the impacts to advising the USFJ/CC on tropical cyclone condition of readiness decisions.

Weather situational awareness to the BAOCC is provided by the 20th OWS Contingency Plans Flight with augmentation from other 20th OWS flights, the U.S. Navy, and other units. 20 OWS/WXX and their augmentation make up the BAOCC Weather Operations Branch. The branch consists of a Joint Meteorology/Oceanography officer, a Joint Forces Air Component commander or Air Force Forces staff weather officer, and several enlisted weather technicians, depending on the size of the operation. When the JFACC is collocated with the AFFOR, a U.S. Navy oceanographer and/or aerographers mates may augment the branch. The WOB collects, tailors, and reports weather information to meet the short, medium, and long-range mission needs of the BAOCC. It evaluates the impact of terrestrial, oceanographic, and space weather on weapons, weapons systems, and operations to US, JASDF, and enemy forces. While there are no JASDF personnel assigned to the BAOCC, there is a liaison officer from Fuchu AB (JASDF Air Weather Group) who is assigned to the 20th OWS and assists in forecast coordination and other bilateral weather operations.

One of the many exercises that the U.S. Air Force and JASDF weather personnel participate in is Exercise FUJI-YAMA SAKURA, which is an annual command post (CPX) exercise involving forces from US Army Japan (USARJ) and the Japanese Ground Self-Defense Force (JGSDF) as well as US Air Force Japan (USAFJ) and the JASDF. The CPX goal is to enhance bilateral contingency planning. For this year's exercise, the scenario involved a fictitious country, which invaded Japan by way of an amphibious and air assault on the northern island of Hokkaido. The scenario allowed for the opposing force to gain a foothold on the island, as well as air interdiction flights into the main island of Honshu. Within a few days, ground forces of US and Japan were able to repel the invasion and were also able to establish air superiority. Even though the weather was scripted, it still offered the opportunity for the U.S. Air Force and JASDF weather specialists to work closely together and learn about each other's procedures and operations as well as integrate weather operations into the daily operations cycle.

In the joint arena, the annual RECEPTION, STAGING, ONWARD MOVEMENT and INTEGRATION (RSO&I) exercise is a Republic of Korea/US Combined Forces CPX. While the 607th Weather Squadron is actually the lead in the ROK portion of this exercise, the 20th OWS also plays a large part. For RSO&I, the 20th OWS operates in a joint environment with aerographers mates from Yokosuka Naval Station augmenting the operations floor. The naval augmentation

liaisons with Yokosuka weather technicians, provide METOC forecasts, and train Ops personnel on METOC impacts. The 607th Weather Squadron focuses on USFK staff weather intellegence and MEF-type weather for the Korean Peninsula, while the 20th OWS focuses on the overall operational level for the seaports and airfields throughout both Japan and Korea. One of the key objectives of RSO&I is to practice our ability to relocate and evacuate up to 75,000 non-combatants to safe havens off the Korean peninsula. This exercise allows us to join with our sister service in an operational environment.

Typhoon and tropical cyclone weather operations are additional arenas where we work bilateral, joint and combined. These operations start with JTWC forecast track guidance and coordination. We then coordinate with Air Force and Army CWTs to generate a detailed forecast across Japan and South Korea, as required. We depict conditions on our standard OWS graphics products in addition to providing WDPN bulletins for Japan, WHKO bulletins for South Korea, and Area Weather Advisories for Eighth Army units in South Korea. All these products are continually updated to ensure accuracy and consistency despite overlapping boundaries and forecast conditions. All forecasts are focused on mission-limiting conditions and serve U.S. Military personnel along with host nation nationals. For example, Typhoon Maemi, the most powerful typhoon to strike Korea since records started being kept in 1904, was a perfect example of this coordination. The coordination for Typhoon Maemi might have been the smoothest cooperative effort since the 20th OWS starting providing typhoon forecasts to Korea.

The outstanding coordination associated with Typhoon Maemi and the Korea weather units was due in large part to the superior forecast track provided by JTWC. About 48 hours prior to the storm making landfall, JTWC forecasts were spot-on and varied very little until the storm made landfall. With a very accurate forecast in hand, the coordination effort with the Korea CWTs was straight forward and nearly perfect. Each CWT provided their inputs along with their experiences from past storms and that went into making a detailed forecast for each USFK location and area. With an accurate and detailed forecast available to the commanders, each commander had ample time to safeguard property and personnel resulting in minimal damage to US military personnel and resources. Meanwhile, Typhoon Maemi killed 140 people and resulted in $4.1 billion worth of damage across South Korea.

Whether working in a bilateral, joint or combined environment, the 20th OWS stands ready to take care of the warfighter's weather intelligence needs in any way necessary. You can rest assured between meeting our daily requirements and surging for exercises/contingencies, the 20th OWS is ready to provide the most accurate products available to the CWTs in our AOR and to the warfighter. "Between routine operations, exercises and tropical cyclones, we work daily at building strong relationships with our functional partners – and this is the true secret to our success," said Lt. Col. Kim Waldron, 20th OWS Commander.

Operation IRAQI FREEDOM: A personal account

By 2nd Lt. Melissa Williams
15th ASOS / Air Force Weather

This was the scariest time for me personally. Our convoy was stopped in the middle of this town for about 20 minutes. There were Iraqis lining both sides of the street, just a few days after the war started. We sat in our HMMWVs with only a piece of canvas on the door protecting us from whatever the Iraqis had to offer – rocket propelled grenades, small arms fire, you name it. My passenger had been driving through the night before, so she sat beside me with her M-16 pointed out the window as she tried to keep her eyes open. The sunglasses we always wore served a few different purposes – they helped hide the fact that we were both female and that the passenger was barely awake. The crowd included children of all ages. Some were wearing new tennis shoes. Some were dressed in their very best outfits, begging for food. Although we were forbidden to give them anything for fear of a child running into the street, my heart went out to them. In the back of my mind, though, I remembered stories of other war zones. I was just praying for the convoy to start moving. This picture was taken as we entered the town. After we passed this point, I know my hand was on my loaded M9, which was sitting on my lap. I wouldn't risk letting it go to hold the camera.

Commodore Charles Stevenson (center), United Kingdom's Ministry of Defence, receives a meteorological satellite briefing at the Air Force Weather Agency Sep. 30. *Photo by Airman 1st Class Daniel Condit.*

U.S. Air Force and Royal Navy working together

By MSgt Miles Brown
AFWA Public Affairs

When the United Kingdom's Ministry of Defense was looking for high-resolution satellite imagery to aid in forecasting for their military operations around the world, they took a leap across the pond – to the U.S. Air Force Weather Agency.

With a formal dedication ceremony Sep. 30 at HQ AFWA, Offutt AFB, Neb., a memorandum of agreement between the agency and the Royal Navy's Fleet Weather and Oceanography Center was officially in place.

"The cooperation between our two centers could not have come at a better time," said Commodore Charles B. H. Stevenson, Director of Naval Surveying, Oceanography and Meteorology, United Kingdom's Ministry of Defense. "With both of our services so heavily involved in OIF [Operations IRAQI FREEDOM]."

Now, the Royal Navy's FWOC meteorologists have access to worldwide Defense Meteorological Satellite Program data through a suite of servers owned by the Royal Navy but residing with the HQ AFWA building.

"This gives them [FWOC] the ability to download satellite imagery with resolution down to .3 kilometers," said Lt. Col. (ret) Robert Allen, former AFWA division chief. While Allen was on active duty, he was the main AFWA project coordinator working with the Royal Navy's FWOC project officers right up to his retirement this summer.

These weather satellites, orbiting 500 miles above the earth, offer meteorologists real-time views of events like dust storms, oil-fire smoke plumes, and volcanic eruptions. The high-resolution images are critical in mission planning in regions like Southeast Asia were visibility can be drastically reduced by dust storms with little notice.

Visual images are not the only product DMSP satellites offer. Weather specialists also use microwave imagery that offer views of surface features used to determine snow depth, soil moisture levels, and estimate tropical storm intensity. U.S. military meteorologists have used these satellites for more than 30 years, but until this agreement was finalized, the Royal Navy's weather specialists had limited weather satellite intelligence.

This agreement has been a long time coming according to Allen. "The UK Ministry of Defense has been working with AFWA on this program for about 15 years. I have been involved with this for about 3 years, and Commodore Stevenson has worked it for more than 10 years," added Allen.

The memorandum of agreement between the two services is by no means a one-way street. Future projects include FWOC providing products to AFWA to facilitate coalition weather intelligence. Additionally, AFWA will have another source of critical weather data for catastrophic backup and continuity of operations, said Allen.

Joint Operations; Business as Usual

By Melody Higdon
AFCCC

These days, it saves dollars and makes plenty of sense to make military operations as joint service oriented as possible. Combining assets, capability and knowledge saves the services time and money by eliminating redundant functions and giving access to specialized units to all.

Sharing resources has become the standard way of doing business in many facets of the military. The Air Force Combat Climatology Center in Asheville, N.C., is a great example of that principle at work.

"Triple C," a geographically separated unit of the Air Force Weather Agency, may look like an ordinary blue-suit outfit, but it is far more than that. We work for and with every branch of the service, and every branch of the government. U.S. Army, Marine Corps, Navy, and Coast Guard – they all routinely come to AFCCC for strategic and operational planning information.

Over the past two years, AFCCC and the Navy's Fleet Numerical Meteorology and Oceanography Detachment located in Asheville, have worked closely to give warfighters easy access to products and services available from both agencies. The two organizations are on the same floor of the Federal Building in downtown Asheville and this makes coordination between them smoother than in most joint operations.

In the past, the segregation of the AFCCC and FNMOD web sites made it difficult to find all the climatology available for a given region. Now, through integration of the two internet/NIPRNET websites and the creation of a "joint climatology" webpage, warfighters have convenient one stop shopping by simply

visiting one of the two homepages.

Not only do AFCCC and the local Navy detachment share data, they also share technique development. Working together, we improved the interface and capability of interactive displays of gridded data. AFCCC is now working to apply this technique for future displays of ACMES data. For example, this new display system will give users the flexibility to define the color palette and contour ranges.

The two agencies also collaborate on numerous products for the global war on terrorism. Regional "deployment" CD ROMs containing Air Force and Navy climatology products were constructed for units preparing to fight in Afghanistan and Iraq. Tailored slide presentations were built for several "hot spots" around the globe. The briefs contain a mixture of the Navy maritime and Air Force modeled climatology products. AFCCC and FNMOD continue to look for new and better ways to bring a single "joint answer" to the planners and warfighters from all the services.

In a situation typical of the cooperation between AFCCC and our Navy counterparts, a full country study of Liberia, written by AFCCC, was widely disseminated by both units to provide climatology data to the Marine contingency group staging into the area.

Written and published in just four frantic days, the Asheville Navy detachment grabbed it and built a brief around it. They managed to put it in the hands of weather teams aboard the Iwo Jima, an amphibious assault ship that carries Marine Corps ground troops, in another three days. Barely a week from the beginning of the process, shipboard weather technicians had a vital tool they used heavily enroute and on-station.

Projects that are entirely in-house at AFCCC also have a major impact on joint operations. Anticipating the need for climate weather data for contingency operations in the Iraq theatre (Southwest Asia), the Climatic Modeling Team initiated a climate model simulation under the ACMES program. ACMES is a joint program designed to provide climatic information for places that have little or no data available. For this project, the team generated more than 28,000 products, which were available to all branches of the Armed Services via our website. Although routine products are used equally by all the services, the Army and Navy are typically the biggest users of specialized products. Both used them extensively while planning weapon/troop deployments in the Operation IRAQI FREEDOM theatre.

ACMES output also went to the Air and Space Natural Environment labs for their Environmental Simulations Generator and Weather Effects programs. In addition, ACMES output went to the U.S. Army Cold Regions Research Engineering Lab. This agency used the data for research to improve the Army's ability to conduct combat engineering in a cold environment.

Because heat stress is a major factor when planning any military operation in SW Asia, AFCCC developed a product for the Army that quantifies heat stress impacts. We developed software to extract a wet bulb global temperature parameter from the raw model output plus specialized software to automate the visualization of this gridded field in a Geographic Information System. The GIS allowed the terrain data to be combined with the WBGT gridded field. The products let battlefield commanders determine when heat stress would most likely impact operations.

Our Climatic Modeling Team also helped the Navy determine potential icing impacts on weapon systems that might be used in SW Asia. They developed unique software and produced a first-of-its-kind 3-D icing package for the theatre. Combining the data in a 3-D environment allowed us to generate vertical cross sections of icing climatology for various flight paths that may be used to deliver munitions. Terrain data was added to create a more useful product. The team developed a customized web interface that allowed the customer to easily view these products. The Navy reported the products were instrumental to their operations in SW Asia.

The potential threat chemical weapons represent to homeland defense prompted AFCCC to create products specifically developed to help determine the impacts of nuclear, biological or chemical releases in the OIF theater. We developed code to produce specific parameters from ACMES data and visualize them using GIS mapping software. The products helped decision makers to determine when and where potential NBC releases could impact the theatre the most.

Triple C's Climate Analysis Team makes a unique contribution to joint ops. They research climate data and synthesize it into coherent narratives for customers in every branch of the service. From the most complex operational environment to the simplest, this team offers insight on the "consequences" of weather. They do more than just help operational weather specialists understand the mechanisms of weather in any given location, they look at aspects of weather that the specialists in the field might not have considered.

For instance, they wrote about dust/sand and warned of the hazard of its infiltration into every conceivable nook and cranny. Besides explaining sandstorm and dust storm forecasting techniques, the discussions described about how dust and sand moves, and warned that static electrical discharges could knock a man off his feet and damage or destroy electronic equipment. This information rocketed through channels and out into the field in every service and was repeatedly proven all too accurate in the OIF theatre.

Forensic investigations, weapons research/development, structural and aerospace engineering, bed-down planning/execution are all examples of areas that require the help AFCCC provides to all the services. We work closely with the Army in their missile defense research, help all the services with aircraft development, and contribute to investigations of everything ranging from aircraft incidents to civil suits and contractor liability incidents.

From Special Ops to Civil Engineering, they all come to AFCCC for weather intelligence and, every day, we strive to improve our products to better serve our customers regardless of the uniforms they wear. Y

Joint Typhoon Warning Center "Tropical Ohana"

By Capt. Robert Mozany
17th OWS Joint Typhoon Warning Center

On a compound near Pearl Harbor, the flag of the Commander of the Pacific Fleet gently sways in the trade winds blowing over Oahu. Fifteen Air Force personnel pass the Admiral's flag daily toward a non-descript building with satellite dishes attached, to one of the world's best tropical forecasting units – the Joint Typhoon Warning Center.

The Air Force weather personnel assigned to the JTWC experience not only the great weather of the Hawaiian Islands, but also a joint tour of duty with their Navy counterparts. In 1959, the USCINCPAC directed the standup of a joint forecast agency responsible for issuing tropical storm advisories for the Pacific Ocean for the DoD and Department of State. The outstanding men and women of the Air Force and Navy meteorological/oceanographic services have accomplished the JTWC mission with distinction ever since.

The Air Force and Navy personnel at JTWC follow U.S. Pacific Command Instruction 3140.1, which designates the roles and responsibilities of the services. While the Commander, Pacific Fleet has the primary responsibility for providing or arranging for tropical cyclone warnings, the Commander, Pacific Air Forces has the primary responsibility for providing tropical cyclone reconnaissance.

The Air Force-directed Satellite Operations section of JTWC executes the reconnaissance responsibility. In fact, 11 of the 15 Air Force positions for weather operations for tropical cyclone reconnaissance are in direct support of JTWC's 95-million square mile area of responsibility. This AOR includes the entire Pacific and Indian Oceans where approximately 90% of the world's tropical storms originate. Key to SatOps is the Satellite Analyst, typically an experienced enlisted weather specialist, who is directly responsible for 24/7 surveillance and "metwatching" of the AOR. The majority of metwatching is accomplished via geostationary satellites using Visible, Infra-Red, Water Vapor and Multi-Spectral images obtained from the Pacific Tropical Cyclone Reconnaissance Network. The TCRN is a network of sites, Kadena, Hickam, Andersen, and Elmendorf AFBs, that employ the MARK IVB, a system that ingests geostationary as well as polar orbiting imagery. The TCRN currently ingests data from GOES-9 and 10, Metsat-5 and 7, and Feng-Yun 2B, giving full coverage of JTWC's AOR.

The Satellite Analyst also has an ever-expanding arsenal of tools provided by low-earth orbiting satellites such as polar orbiting NOAA and DMSP satellites, as well as near-equatorial orbiting satellites that give 25 percent more opportunities to view tropical systems. These near-equatorial orbiting satellites are equipped with microwave sensors that enable the analyst to "see" through the clouds of tropical systems and determine the location of the low-level circulation center of developing tropical systems, a critical component of tropical cyclone forecasting.

Once a tropical disturbance has been identified through the use of the TCRN or microwave data, and the storm is mature enough in its development to determine a position, the analyst provides a "fix" or position at least every three hours and intensity estimate every six hours. The Dvorak technique is used to fix storms and leverages the use of Visible and IR imagery. In 2002, SatOps achieved a record year with over 5,412 fixes on tropical systems, 15 percent more than the previous year. Typhoon Duty Officers use fixes produced by the Satellite Analyst and other meteorological agencies to determine the initial position of the storm prior to issuing the forecast.

Working at JTWC is similar to working at other large weather centers but the mission is more specialized.

"The differences between the two services are fairly transparent. Everyone here is professional and works together as one team, disregarding the uniforms we wear," said Tech. Sgt. Dwayne Klinzmann, the newest JTWC satellite analyst. "The mix of services is a good fit due to the assets and people they help protect."

The TDO position is really a unique opportunity for AFW company grade officers. To become a TDO, the first requirement is to successfully complete a master's degree in Tropical or Satellite Meteorology. Second, candidates must complete a rigorous six-month training program. The most interesting and challenging portion of the certification

program is that the candidates have to qualify for duty formally through the Navy "board" process. At each stage of the board process, up to the final certification, the candidates face their peers – other TDOs and supervisors. Each board is a formal interview of the whole person concept-knowledge, skills, and professional demeanor. Only after the candidate has passed peer review is he/she allowed to appear before the Air Force Director of JTWC and the Navy Commanding Officer to become a certified TDO.

This rigorous program is essential because of the complexities in tropical meteorology and the fact that these forecasts are used to plan aircraft evacuations, personnel and resource protection postures, and ship routing all of which involve a substantial amount of money to execute. Accuracy and timeliness are critical. The officers that meet the challenge fill a TDO position on one of the four watch teams enabling 24/7 operations. Because of the 12-hour shifts, an Air Force TDO is usually directly paired with a Navy TDO. This teaming enables JTWC to serve all DoD/DoS customers with service or mission-specific questions. It also serves as a career broadening experience as each side learns more about the other's missions.

Along side the TDOs are competitively selected junior enlisted personnel who assist in the preparation and dissemination of all the products JTWC produces. Known as the Typhoon Duty Assistant, these junior E-3/E-4s undergo a rigorous four to six-week training program that culminates in a face-to-face Navy review board used to select TDOs. The trust that is bestowed is well earned because of the significant responsibility of getting JTWC's warnings and information disseminated to numerous DoD/DoS customers. If they don't do their job, all the work of the TDO and the Satellite Analyst is for naught.

Finally, the bluesuiters in Technique Development are responsible for developing techniques to further improve tropical cyclone analysis and forecasting as well as maintaining the historical data archive. TechDev closely collaborates with AFWA, the Naval Research Laboratory, our civilian counterparts at the Central Pacific Hurricane Center and the National Hurricane Center, and other educational and governmental institutions to further improve tropical cyclone detection and forecasting. TechDev provides storm reviews, model performance and bias studies, and individual TDO feedback to the personnel at JTWC. The results from these studies, along with new software and programs developed at NRL, the Naval Post-Graduate School, and numerous other universities and institutions, have been used to refine the forecast process and has helped JTWC remain the best tropical cyclone warning agency in the world. JTWC's forecast error is now 163 nm at 72 hours, an amazing improvement of more than 31 percent over the last three years and reflects the significant contributions of the people in TechDev.

"The amount of interaction between the Navy and other agencies, civilian and military, in this job sets it apart and is the most unique job I have had in my 18-year career," said Master Sgt. Don LaFramboise, TechDev NCOIC.

The high-level visibility and interaction with other agencies has resulted in numerous accolades. TechDev has won the PACAF Merewether Award three years running, an award reserved for the "best technical contribution to weather support operations."

Although JTWC is hidden on the tropical island of Oahu, the Air Force personnel assigned to SatOps and TechDev, along with the TDOs, maintain a 24/7 watch for tropical storm development and work to improve the tropical cyclone warning and forecasting process. A major milestone occurred on June 1, 2003, when improvement in forecasting skill enabled issuance of five-day track and intensity forecasts for the first time in JTWC's history. In recognition of its accomplishments, the unit was recently awarded the Navy Meritorious Unit Commendation, an award these bluesuiters will wear with pride.

For 44 years the men and women of JTWC have kept a vigilant watch over millions of square miles of vast ocean stretches. Their diligence has been key to making it possible for millions of people to prepare for one of nature's most awesome displays of power – Tropical Cyclones. Rest assured they continue to improve techniques and processes enabling JTWC to remain the best tropical forecast agency in the world.

MARK IVB satellite image of Typhoon Parma over open seas Oct. 29, 2003.

Canadian Hurricane?

By Master Sgt. Miles Brown
AFWA Public Affairs

Hurricanes in Canada you say? You betcha! Late Sunday evening, Sep. 28, 2003, Hurricane Juan visited the maritime coast of Halifax, Nova Scotia killing two people, uprooting trees, and causing extensive structural damage. The number of casualties could have been much higher – especially if no weather satellites or weather satellite-derived intensity estimates were available.

Hurricanes like Juan can now be tracked and intensities derived through the use of satellite sensing. Since 1998, the Department of Physics at the U.S. Air Force Academy has been involved in satellite-based remote sensing of tropical cyclones. Through a joint research initiative, the department, also known as DFP, has sponsored weather officers in AFIT graduate programs at the University of Wisconsin-Madison Cooperative Institute for Meteorological Satellite Studies.

Maj. Kurt Brueske, currently an Associate Professor with DFP, received his doctorate through the program in 2001. Building on that research, Capt. Brian Kabat, Meteorological Satellite Applications Branch requirements officer, Air Force Weather Agency, adapted Brueske's algorithm to incorporate additional information in his research.

Capt. Bob Wacker, UW-CIMSS, is continuing the research while pursuing his doctorate degree. His goal is to refine the technique and remove remaining inaccuracies due to heavy precipitation. Both Kabat and Wacker will serve on the DFP faculty following their current tours.

Major Brueske's original research culminated in a new intensity estimation technique based on accurate measurement of the thermal structure of the tropical cyclone eye.

"It's a fairly simple concept," according Brueske, "sinking air within the eye is compressed and warmed and the magnitude of warming characterizes the vigor of the storm. If you design a space-based sensor that is sensitive to microwave radiation emitted by atmospheric oxygen, you can measure this heat signature and determine intensity quantitatively."

The latest generation of National Oceanic and Atmospheric Administration polar orbiting weather satellites have just the right sensor to accomplish this task – the Advanced Microwave Sounding Unit.

In addition to intensity estimates, some of the most valuable information on tropical cyclone structure and intensity are the cross sections of the warm core available to forecasters at the National Hurricane Center Tropical Prediction Branch in near real-time.

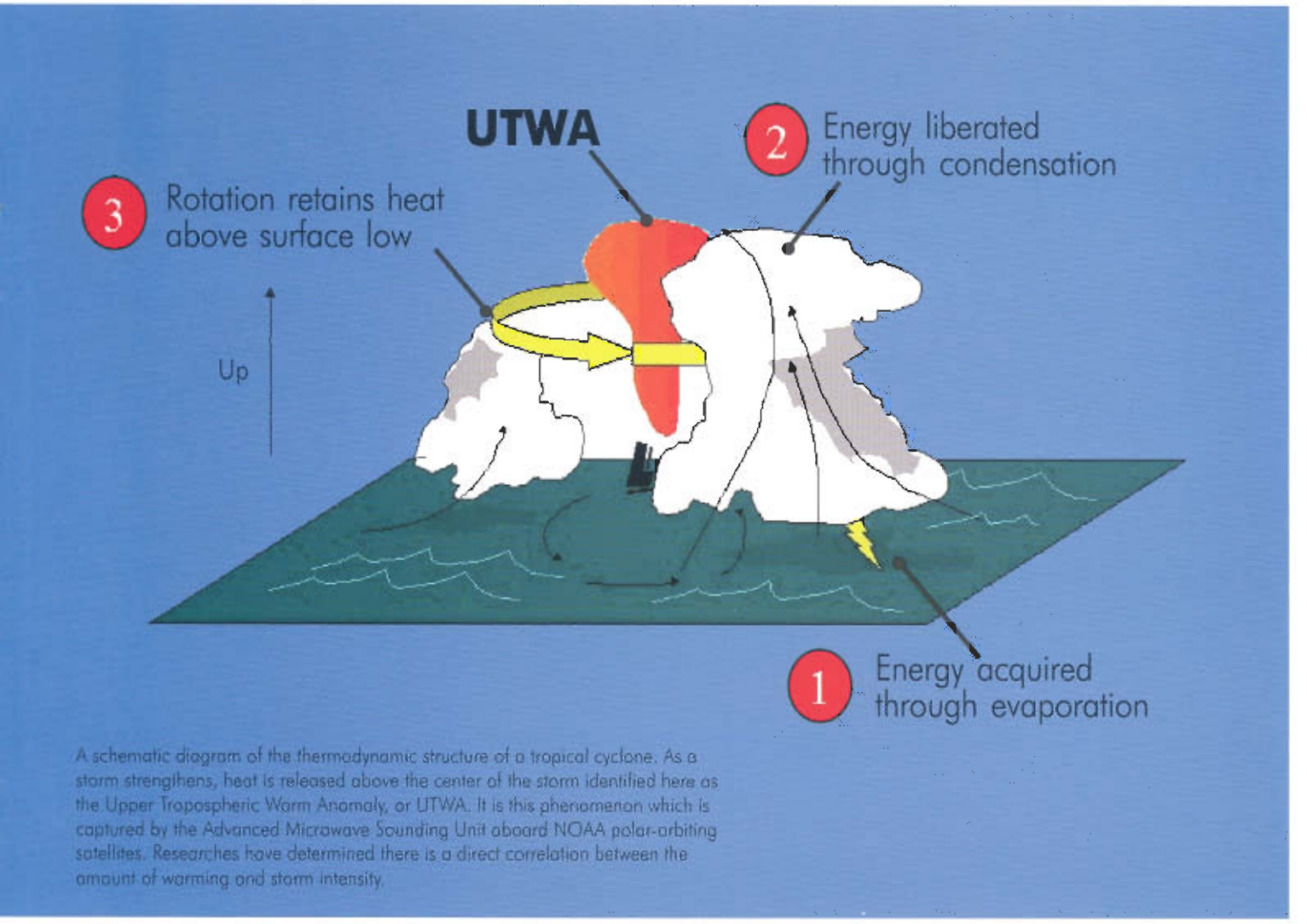
"For the first time ever, analysts at TPC can use AMSU data to discriminate whether a system is truly tropical by the presence [or lack] of a vertically-developed warm core," said Brueske.

Hurricane Center forecasters used AMSU warm core observations to initially diagnose Juan as tropical, thereby initiating the forecast and warning process to include public advisories, track forecasting and an analysis of future intensification potential. AMSU-based intensity estimates are also competitive with – and in some circumstances superior – to other techniques using geostationary weather satellites.

Christopher Velden, head of the Tropical Cyclones group at CIMSS notes, "The partnership between the Air Force Institute of Technology's Academy Faculty Preparation Program and UW-CIMSS is yielding significant benefits to the research and understanding of tropical cyclone behavior."

Top Air Force candidates have successfully conducted research in satellite applications to tropical cyclones under the guidance and expertise at CIMSS. The results of this collaboration have advanced the research program here, while providing the Air Force with additional scientific background to further operational programs, said Velden.

Major Brueske is currently the co-project investigator responsible for transitioning the AMSU-based tropical cyclone intensity estimation technique into operations at the National Hurricane Center as part of the U.S. Weather Research Program Joint Hurricane Testbed in 2003. The Air Force Weather Agency also recently identified the technique for transition into operations. For more information on this AMSU technique, visit their website at http://amsu.cira.colostate.edu.



A schematic diagram of the thermodynamic structure of a tropical cyclone. As a storm strengthens, heat is released above the center of the storm identified here as the Upper Tropospheric Warm Anomaly, or UTWA. It is this phenomenon which is captured by the Advanced Microwave Sounding Unit aboard NOAA polar-orbiting satellites. Researches have determined there is a direct correlation between the amount of warming and storm intensity.

FNMOC Commander visits AFWA

U.S. Navy Capt. Chris Gunderson, Fleet Numerical Meteorology and Oceanography Center commander, receives a briefing from Charles Holliday, Meteorological Satellite Applications Branch chief, during a visit to HQ Air Force Weather Agency, Offutt AFB, Neb. *Photo by Master Sgt. Miles Brown*

One Island, One Team, One Mission

By 1st Lt. Richard Stedronsky
and
Tech. Sgt. Rob Lenahan
40th EOSS/OSW

The 40th Expeditionary Operations Support Squadron Combat Weather Team, located at Diego Garcia, and the Naval Central Meteorology and Oceanography Detachment Diego Garcia, made history with their unique integration of services and forces. By consolidating into the same building early in 2003, using the same equipment, and focusing on a joint mission, the Air Force and Navy weather units embody Diego Garcia's motto of "One Island, One Team, One Mission."

The two services' missions are dramatically different on the island. The Air Force has deployed at various times to Diego Garcia since 1988, but was permanently based there in September 2001. The CWT technicians provide weather situational awareness for the deployed Air Expeditionary Wing consisting of air refueling aircraft and B-1 or B-52 Bombers, and even the first ever deployment of B-2 Spirit aircraft. The flying mission currently is involved in Operations ENDURING FREEDOM and IRAQI FREEDOM.

The primary mission of the Navy weather specialists is island resource protection, briefing the permanently assigned Patrol and Reconnaissance Wing P-3 Aircraft, and issuing daily Operation Open Ocean Forecasts for the Indian Ocean within 100 miles of the island.

Throughout numerous Air

Left, Diego Garcia is in the Chagos Archipelago, south of the equator in the Indian Ocean. It sits on the same submarine ridge as the Maldives and the Laccadives. The atoll is totally different in structure from others in the northern Indian Ocean. The structure is closer to Pacific Ocean atolls. Adjacent to the Chagos Archipelago is a deep-sea trench that gives their underlying platform a completely different oceancrust structure from that of the ridge to the north of the equator. It is this structural contrast that has aided the formation of Diego Garcia into an outline that seems alien to the Indian Ocean.
Below, an Air Force B-52 bomber from the 28th Air Expeditionary Wing takes off from Diego Garcia for a combat mission Oct. 22, 2001, in support of Operation Enduring Freedom. Air Force B-2, B-1 and B-52 bombers have expended more than 80 percent of the tonnage dropped on combat missions over Afghanistan. Targets included early-warning radars, ground forces, command-and-control facilities, Al Qaeda infrastructure, airfields and aircraft. *Photo by Staff Sgt. Shane Cuomo.*

Expeditionary Force rotations on Diego, the idea of combining operations was never seriously considered. Prior to this joint service venture, spearheaded by Navy Lt. Charlotte Welsch, 1st Lt. Richard Stedronsky, Tech. Sgt. Robert Lenahan, and Navy Aerographers mate James Derrick, the deployed CWT's biggest issues revolved around manning shortages, limited resources, and aged equipment. The CWT consisted of three or four Air Force Weather specialists, three dated laptop computers, a small office space, and no access to real-time weather data. Weather service provided to the deployed AEF customer was often sub-par, due to its foundation of hours old data and model guidance.

NCMOD, the permanent-party Navy weather facility on Diego Garcia, was experiencing some of the same issues as the AEF CWT, especially concerning manning shortfalls. With three qualified weather specialists running the only fully operational 24/7 weather detachment on island, year-long Navy tours, and extensive shift work quickly led to burnout.

On the bright side, NCMOD housed real-time weather radar data, current airfield conditions via ASOS, and rapidly updating meteorological satellite imagery inside a facility with plenty of office space and advanced computer

resources – all things the AEF team needed.

Not only did NCMOD have the tools to get the job done, but they also recognized the apparent duplication of effort, having two weather shops providing weather intelligence for the same area of responsibility but different branches of the military. The logical solution was to merge into a joint service weather detachment; combining personnel, technology, and operations.

The Air Force and Navy weather units now truly stand as one team. Instead of "Air Force" or "Navy" products and services, a joint effort with the best resources and knowledge, producing the highest quality weather products for the joint warfighter, is in place. The joint detachment brings continuity, stability, technology, and assets to its customers and the overall Air Force and Navy missions. The Diego Garcia weather customer, be they Air Force war planes flying 11,000 mile mission to Afghanistan or Iraq, Navy P-3's patrolling the Indian Ocean, or transient planes on long range missions to Australia or Asia have obviously benefited from the merger.

Not only has the operational value of forecasts increased, but many of the processes in place to deliver these products have been streamlined, reducing duplication of effort and ensuring customers get the most up to date forecast possible. Morale has also greatly increased, as duty hours of the joint detachment personnel, both AEF and permanent-party, have stabilized, giving them much needed time for exercise and personal development. More predictable and consistent duty schedules now exist, minimizing unneeded stress in a remote duty station.

An added benefit to the joint effort is that the new detachment can also concentrate on cross training. This training includes Air Force service members learning professional Qualification Standards for Navy functions, and the Navy learning/performing the required Air Force mission tasks. The service members rotating through Diego Garcia now get first hand knowledge on how the other service operates and what their mission entails. This gives all weather troops working at the detachment an advantage in today's ever-growing joint service environment.

After eight months of combined Air Force and Navy weather operations, the two services have become transparent. Whether the customer is flying bombing missions over Iraq, parking aircraft on the ramp, or moving ammunition from ship to shore in the harbor, the accuracy of the information is what is important and earns the customers trust, not the uniform of the person giving the information. The combined detachment has brought value added manpower and knowledge in weather operations for the overall joint missions of Diego Garcia, Operation ENDURING FREEDOM, and Operation IRAQI FREEDOM.

The Diego Garcia joint weather team outside their facility. *Photo courtesy of 40th EOSS/OSW.*

RED FLAG

"On Target" weather intelligence

By Paige Hughes
AFWA Public Affairs

Red Flag, the Air Force's premier air combat training event, was held Oct. 19 to 31 at Nellis AFB, Nev. More than 1,000 personnel and over 100 aircraft deployed to Nellis for Red Flag, including two weather technicians.

Technical Sgt. Richard Lopes and Senior Airman Donald Johnson, both from the 27th OSS/OSW, Cannon AFB, N.M., augmented weather operations for the Nellis Combat Weather Team, the 57th OSS/OSW. During the two-week exercise, 22 different units flew 956 sorties.

Red Flag is a realistic combat training exercise involving all services of the United States and our allies. The exercise simulates a "real world" Aerospace Expeditionary Force, with the opportunity to work with all types of platforms and their Electro-Optic Sensors. Red Flag trains combat aircrews in the most realistic simulated war environment possible. Weather personnel are embedded in the exercise as a force multiplier.

"We primarily get exposure to briefing large audiences, typically 50 to 75 people in the Red Flag briefings," said Lopes, a first time Red Flag participant. "I basically help pilots do their training," he added.

The exercises consist of two missions a day. For each mission, there are initial and final coordination briefs and a mass briefing for all participants.

"Information provided includes takeoff, mission, landing, divert weather,

Senior Airman Don Johnson, 27th OSS/OSW weather technician, briefs Lt. Col. Glenn Roberts, an F-117A pilot from the 49th FW, Holloman AFB, N.M., about the weather conditions, before his Red Flag flight. Photo by Senior Airman Chrissy Fitzgerald.

An F-16 just before take-off during a Red Flag exercise at Nellis AFB, Nev.

solar/lunar data, and tactical decision aids," said 2nd Lt. Tiffany Bendorf, 57th OSS/OSW weather officer and Red Flag trainer.

The Nellis CWT is the augmentees' reporting office. When the augmentees arrive for the exercise, they spend several days training in local weather conditions, the latest version in Target Acquisition Weather Software, and Red Flag weather operations.

"Even if they are fluent in TAWS back at their home station, they need to be able to run Tactical Decision Aids for all types of sensors like IR, Laser, TV and NVG," said Bendorf. "They tailor our operational product to the specific range time and produce the Red Flag Mission Execution Forecast," said Bendorf.

During the exercise, the Nellis CWT is also responsible for disseminating watches, warnings and advisories to the augmentees. "Once the augmentees are comfortable with their support we turn them loose," she added.

For Lopes and Johnson, a daily routine becomes a way of life during the exercise.

"My day begins at 0500, when I put together the slides for the mass briefing, at the same time I build a spreadsheet for the next day flying operations," said Lopes.

The weather portion of the mission briefing contains satellite images from the Joint Air Force and Army Weather Information Network, 25th Operational Weather Squadron products, local and range forecasts, and outputs derived from TAWS. "If there isn't any significant weather, briefings last about 15 minutes, but if we've got serious weather conditions the briefings can last over an hour," said Lopes.

According to Bendorf, weather is immersed in operations, especially when conditions are poor. The weather augmentees are in constant contact with the mission commanders and the Air Boss regarding any changes in weather or issued watches, warnings, and advisories.

Aside from the weather briefs, the weather augmentees provide individually requested TDA information, air-refueling weather upon requests, drop zone conditions, and other special requests. Augmentees learn quickly about tailwind, crosswind and other weather limitations to U.S. and allied aircraft that may affect the mission.

The purpose of augmenting Red Flag weather operations is two-fold: to train under deployment conditions and to alleviate the sole responsibility falling to the Nellis CWT.

"There have been times when we get no augmentees, and we have to cover the entire exercise. That stretches us thin," said Benforf.

Before this Red Flag ended, high winds from a large low-pressure system and poor visibility due to the smoke caused by wildfires in California impacted operations. Lopes and Johnson were undaunted by the challenging weather conditions and created decisive forecasts for the impending missions.

"Our two augmentees had their hands full the last two days," said Bendorf. "Two missions were cancelled due to poor weather conditions," she said. Johnson received a "superior performer award" for his efforts in Red Flag.

For more information on Red Flag, visit http://www.nellis.af.mil/red_flag/index.htm on the Internet.

Red Flag Fast Facts

- A realistic combat training exercise involving the air forces of the United States and its allies is conducted on the vast bombing and gunnery ranges at Nellis AFB, Nev.
- Established in 1975
- Conducted by the 414th Combat Training Squadron
- Three two-week Red Flag exercises run concurrently each quarter
- More than 5,000 personnel and over 100 aircraft deploy to Nellis AFB during the quarterly exercises
- Typical aircraft involved – F-14s, F-15s, F-16s, A-10s, B-1s, B-52s, RQ-1 Predator, EC-130s, EA-6Bs, C-130s, C-141s, C-17s, HH-60s, HC-130s, KC-130s, KC-135s, KC-10s, E-3B/Cs, AWACS, E-8Cs, and allies' aircraft
- Restricted airspace ranges – about 5,000 square miles with an additional 7,700 square miles north and east of the restricted ranges

Weather Center Tests New Facility

By Paige Hughes
AFWA Public Affairs

The Air Force Combat Weather Center opened a new 8,235 sq. ft. facility on Hurlburt Field, Fla., Sep. 23 with a ribbon cutting ceremony officiated by Brig. Gen. Thomas Stickford, Air Force director of weather.

The new facility incorporates office space, warehouse facility and training rooms into a single structure, providing substantially more workspace for the 32 members assigned to the unit. For more than 20 years, AFCWC has been involved in examining emerging technologies, innovative ideas, and warfighter weather requirements to determine the most promising improvements for Air Force Weather operations.

"This is a great organization, filled with unsung heroes who impact and influence our warfighters every day. Their impact is global, providing weather operations across the Department of Defense and in particular, the Army," said General Stickford.

The 59,000 sq. ft. equipment yard provides adequate space for tactical and fixed equipment to be set up simultaneously, with plenty of room to replicate 'true' field conditions for testing, training and evaluation.

"I have a great appreciation for what Air Force Weather contributes to the warfighter. I want the field - those using the equipment - to feel confident that the equipment will work the way they need it to work, " said Lt. Col. John Shattuck, commander, AFCWC.

AFCWC is credited with providing "Just-In-Time-Training" on tactical equipment for 150 Air National Guard and Reserve members deploying to Operations ENDURING FREEDOM and IRAQI FREEDOM. Additionally, they tested equipment and software and created a user set-up guide, assisting in the successful fielding of a First-In Weather System to 75 deployed combat weather teams for the global war on terrorism.

The efforts of the men and women at AFCWC translate into cost savings for the Air Force. One recent test of tactical weather equipment has the potential of saving nearly $750,000. Additional savings add up by ensuring software and hardware perform correctly the first time out, avoiding costly corrections to redistribute systems that were deployed with problems.

The success of the unit is greatly reliant on the ability to adequately conduct their mission. For this reason, previous AFCWC commanders worked with base leaders to construct a larger facility. "It is impossible for a project of this size to work without the help and support of the Hurlburt Field community," said Lt. Col. Shattuck. Col. Frank Kisner, commander, 16th Special Operations Wing backed building the new facility and attended the ribbon cutting ceremony. AFCWC is a subordinate unit of Air Force Weather Agency, Offutt AFB, Neb.

"This new building will provide the combat weather center the means to continue their outstanding contributions to improving the weather warfighting capabilities of the Air Force combat weather teams," said General Stickford.

Brig. Gen. Thomas Stickford, AF Director of Weather, receives a weather system overview from Staff Sgt. Tim Dixon, a weather technician at Air Force Combat Weather Center.

Joint Training's New Course

By Garey Simants
335th Training Squadron

March 24, 2003, marked the end of a 63-year history of enlisted weather training. Class 020930, the last class of the Weather Forecaster Course graduated, closing for good one of the last bastions of the pre-reengineered Air Force Weather. In fact, every significant change in Air Force Weather since its beginning caused dramatic change in the way we train our airmen.

Enlisted weather forecaster training can trace its roots back to America's entry into WWI with the activation of the Army Signal Corps Meteorological Service. The first weather course started in April 1918 at Camp McArthur, near Waco, Texas. A month later, the training center moved to Texas A&M at College Station, Texas. At the time, enlisted weather personnel held degrees or had practical experience in scientific or weather technical fields.

On July 1, 1937, the weather service transferred to the Air Corps and training moved to Patterson Field, Ohio, and again in April 1940, moved to Chanute AFB, Ill. In September 1940, 7 years before the establishment of the Air Force as a separate military organization, the first 22-week weather forecasting course was established. Weather training would continue to reside at Chanute until 1993, when the training center would move to its current location, Keesler AFB, Miss.

The period between the end of WWII and today marked changes in the forecaster course to accommodate rapid changes in technology (e.g., the advent of meteorological satellite, weather radar, numerical models and advancements in weather communications and product generation) and weather operations in the Korean, Vietnam, and Persian Gulf war. In a move to coordinate training among the services, and to increase cost efficiency, weather training was consolidated between the Air Force, Navy and Marines on Feb. 1, 1978. Also in the late 1970s, the two separate weather specialties, the observer and forecaster positions, merged into one career ladder of observer 3- and 5-levels and forecaster 7-levels. On Dec. 14, 1979, the forecaster course graduated the last of the former chief observers. The class, consisting of all senior NCO students was known as the "Zebra" class and culminated the career field consolidation. In the early 1990s the Coast Guard began sending personnel for weather training.

Six days after the last forecaster course graduation, a markedly improved initial skills course started its first class. The "new" initial skills course increased in length from 19.5 weeks to 30 weeks. The course increased the level of difficulty in some areas, added more in-depth training in physics and dynamics, improved Skew-T instruction, modified radar instruction to include OPUP and added other topics such as tropical forecasting. The last class of the old apprentice course graduated August 11, 2003, again marking significant changes and improvements in enlisted weather training.

Today, with the graduation of the last forecaster class and the new 30-week initial skills course, enlisted weather personnel are no longer observers becoming forecasters. Students attending the weather initial skills course are graduating as forecaster apprentices, marking a complete transition to a new career ladder. Like the career field consolidation in the 70s, this event was driven by a significant career ladder modification. Weather forecaster training will continue, not as a second step in the weather career ladder, but as the first step in an Air Force weather career.

Class 020930, the last class of the Weather Forecaster Course at Keesler AFB, Miss., graduated March 24, 2003. *Photo courtesy of 335th Training Squadron.*

AFWA Comm: Doing Business

By Maj. Michael Petrocco
AFWA Information Systems Division
Deputy Chief

October 1, 2003 marked another milestone at the Headquarters Air Force Weather Agency, Offutt AFB, Neb., – the reorganization of the Information Systems Division. Why is this important to the members of Air Force Weather you may ask?

The Information Systems Division is the largest software engineering division in AFWA and is the focal point for all data processing, validation, verification and management of global environmental information. They are responsible for literally millions of daily weather observations, thousands of satellite images, space sensor data, and other atmospheric products – more than 5 Gigabytes of data daily.

With the final deactivation of AFWA's mainframe computers in FY2002, and the increased operations tempo resulting from Operations ENDURING and IRAQI FREEDOM, it was time for the division to realign its processes with AFWA's core pillars and posture itself to meet the growing demands of today's warfighter.

The Division's reorganization plan fosters the basic premise that all environmental intelligence comes into AFWA, gets stored to a database, and is applied to daily operations. As such, SCS's new structure consists of a Data Collections Branch, a Database Administration Branch, an Operational Applications Branch, and a new Branch called Software Engineering Services. This new Branch will guarantee software requirements for the warfighter, such as Chemical Downwind Messages, Dust Transport Application, Meteograms, etc., are well defined prior to implementation. Additionally, they will provide an impartial eye to testing over two million lines of complex computer code, employing 15 computer languages and maintaining more than 80 software programs that directly enhance our warfighters efforts.

The new structure of the Information Systems Division provides a solid foundation for about 100 of AFWA's computer programming and database experts to rapidly respond to increased operational requirements and meet the growing demands of today's warfighter. SCS is committed to ensuring a steady flow of raw and processed data – both to our warfighters on the frontlines and our Joint and Combined customers worldwide.

Dishing-out compassion

Barbara Green, Air Force Combat Climatology Center member, prepares fruit cups for a homeless shelter lunch. Since April 2001, members of AFCCC participate monthly in the Asheville Buncombe Community Christian Ministry Homeless Shelter lunch program. The ABCCM operates two shelters, both located in Asheville, N.C., for homeless individuals and their families. The Shelter Ministry's goal is "...to help each homeless person regain their independence through work and a faith understanding of life."

On the first Thursday of each month, volunteers from AFCCC plan, purchase, prepare, and serve a hot lunch to the shelters' residents. Alternating each month, lunch is provided at the ABCCM's Men's Shelter, housing up to 75 men, and at the Women/Children's Shelter which provides shelter for as many as 43 women and children.

During the last week of each month, the group of 24, actively participate in planning the following month's menu. The goal is to provide a well-balanced, home-cooked meal every month. *Photo courtesy of AFCCC.*

Enhanced Opportunities for Officer Education

By Carlyle H. Wash
Chairman, Department of Meteorology
Naval Postgraduate School

The Secretaries of the Air Force and Navy ordered a review of residence graduate education programs at Air Force Institute of Technology, Wright-Patterson AFB, Ohio and the Naval Postgraduate School, Monterey, Calif., in 2002. The goals of this review were three fold. First, to ensure officers continue to receive high-quality, relevant and responsive graduate education aligned to defense needs. Secondly, to eliminate unnecessary duplication, while sustaining excellence at NPS and AFIT. Finally, to ensure efficient operation of both institutions while maintaining each as "world class" higher education institution.

One of the results of this review was the transfer of the residence Master of Science Meteorology program from AFIT to NPS. Additionally, NPS was to be used for the entry level Basic Meteorological Program. This change offers exciting opportunities for Air Force officer graduate education and research in meteorology at NPS – an institution with a long and prestigious history.

The Department of Meteorology's history dates back to the 1930's when it was part of the Postgraduate Department at the U.S. Naval Academy. As the demands for graduate education in science and engineering grew within DoD, the Naval Postgraduate School moved to its own campus at Monterey in 1951. Later, the Navy's operational numerical weather prediction unit (now the Fleet Numerical Meteorology and Oceanography Center) and atmospheric research lab (now Naval Research Laboratory) also relocated to the NPS campus. As part of the National Weather Service modernization, the local NWS office in San Francisco moved to the NPS campus as well.

Because of these organizations, the Monterey area is recognized internationally for its programs in graduate education, global, regional and local modeling, and military meteorology research. In acknowledgment of the outstanding NPS research and graduate degree programs, the NPS Departments of Meteorology and Oceanography were invited to join the University Corporation for Atmospheric Research in 1991. The Department is an active participant in the many UCAR organizations such as Unidata, Cooperative program for Operational Meteorological Education and Training, and the National Center for Atmospheric Research. Currently, the department has 74 students enrolled in its graduate programs, which are supported by 28 faculty and staff members.

In the early years, the department's faculty expertise was especially strong in dynamic meteorology, numerical weather prediction, and synoptic meteorology. Since that time, the department's expertise has expanded to include all areas of meteorology that have significant impact on DoD operations.

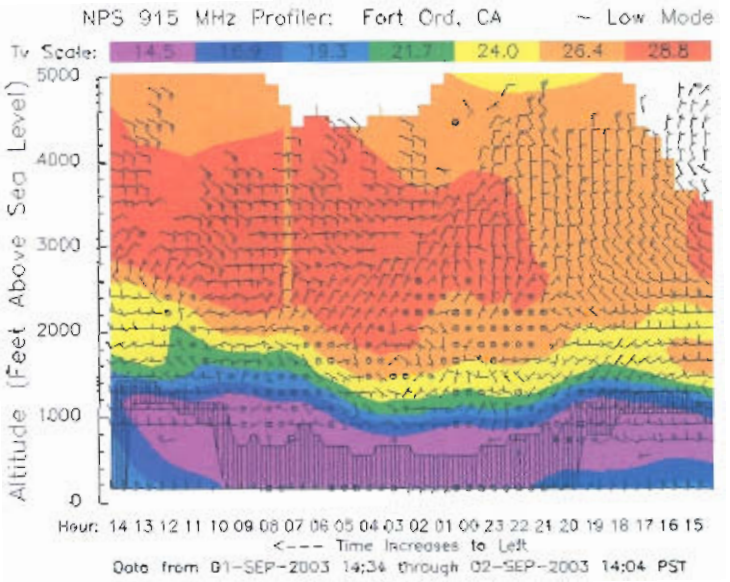
In addition to the continued strength in synoptics, dynamics and NWP, department faculty are nationally recognized for their expertise in tropical meteorology, coastal and mesoscale meteorology, boundary layer meteorology, air-sea and air-land interaction, remote sensing/satellite meteorology and atmospheric impacts on electromagnetic and optical propagation. As a result, NPS Air Force and Navy students have access, both in the classroom and when conducting their thesis/dissertation research, to the very latest knowledge and research in the areas of atmospheric science that most directly impact military operations.

The courses and thesis research that comprise the meteorology curriculum strive to prepare the officer to provide high quality environmental situational awareness to all aspects of military operations. An additional goal of this educational program is preparing the officer student for continued learning in their field and for application of rapidly emerging knowledge and technology to improving the combat effectiveness of the DoD.

The Department of Meteorology has a broad, high quality program in basic research, coupled with applied research efforts that address scientific questions important for tactical operations of both operational commanders and individual forces on land or at sea. To maintain their expertise and bring the latest advances in atmospheric sciences and technology into the classroom, the faculty perform research in DoD relevant areas of weather analysis and forecasting, satellite and surface-based remote sensing, numerical weather prediction, tropical cyclones and monsoon circulations, mesoscale and coastal meteorology and boundary layer meteorology. The National Science Foundation, Office of Naval Research, U.S. Air Force, Navy labs and systems commands, National Aeronautics and Space Administration, National Weather Service and many other sponsors support this research.

Mesoscale modeling research addressing the predictability of optical turbulence is presently being performed specifically for the U.S. Air Force. NPS Meteorology is the only department that uses both the mesoscale model used by the Air Force, MM5, and the Navy's Coupled Ocean/Atmospheric Mesoscale Prediction Systems in a variety of mesoscale forecast studies.

NPS research on tropical cyclone motion has led to sophisticated forecast aids for typhoon/hurricane forecasters that have significantly improved track forecasts. Departmental surface layer



Continuous Wind and Temperature Data from the Naval Postgraduate School, Monterey, Calif., Radar Wind Profiler located at Marina Airport, near NPS.

measurements for numerous military exercises have produced new understandings of the impact of the atmosphere on electrooptical and electromagnetic wave propagation and resulted in improvements in EM/EO analysis programs such as Target Acquisition Weapons Software for the military weather specialists. Additionally, the department interacts closely with the NPS Center for Interdisciplinary Remotely-Piloted Aircraft Studies, which has two Predator aircraft, a Twin Otter, X-band mobile Doppler radar and other platforms used for environmental measurements.

An excellent set of laboratories support the students in their classroom and research efforts. The Interactive Digital Environmental Analysis Laboratory provides real-time acquisition and analysis of wide variety of conventional and remotely-sensed data and access to numerous operational NWP global and mesoscale forecasts. New high performance LINUX workstations are currently being installed accessing five terabytes of disk storage.

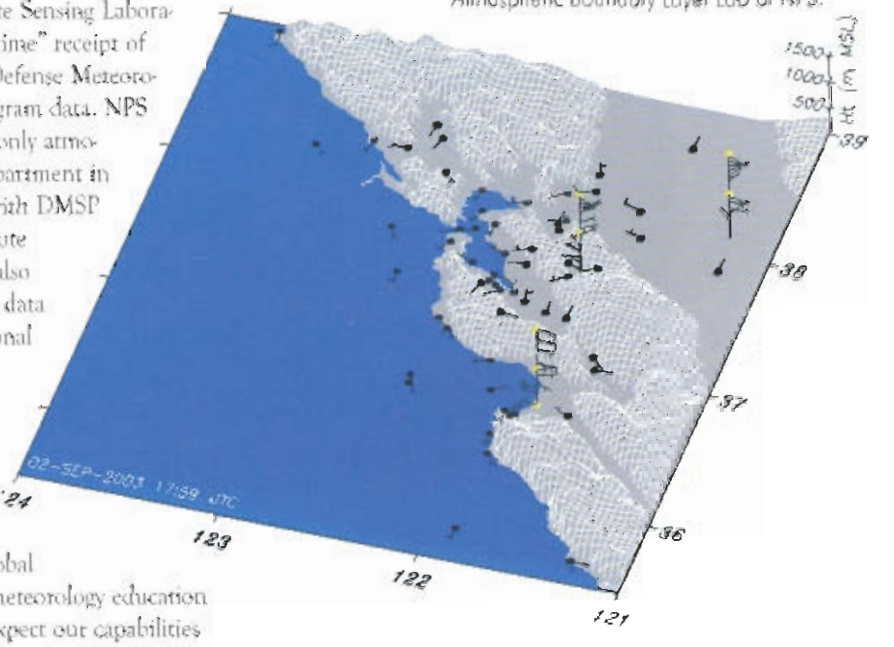
A modern Synoptic and Mesoscale Analysis and Forecasting Laboratory and Briefing Room is linked to the IDEA Lab and is used for instruction on preparation of real-time weather analyses and forecasts and operational atmospheric prediction. This laboratory has multiple software capabilities for displaying, animating, fusing and visualizing weather observations, satellite and radar data, and numerical model products from Air Force Weather Agency, National Centers for Environmental Prediction and FNMOC, as well as other major weather centers.

The Atmospheric Boundary Layer Measurements Laboratory utilizes surface, aircraft and remote sensing instrumentation systems for both teaching and research. Instrumentation at a near-coastal observation site includes: 405 and 915 MHz Doppler radar wind profilers with radio acoustic sounding system, rawinsonde systems with GPS, a laser ceilometer and several fully instrumented automated surface weather systems.

Access to other instrumentation measurement platforms (research vessels, buoys, and aircraft (including some remotely piloted) and data from a variety of networked local measurements sites enables the laboratory to provide near "real-time" data for the coastal region. The Satellite Remote Sensing Laboratory provides "real time" receipt of the polar-orbiting Defense Meteorological Satellite Program data. NPS Meteorology is the only atmospheric sciences department in the United States with DMSP capability. The remote sensing laboratory also supports work with data from other operational geostationary and polar-orbiting satellites as well as classified systems.

The NPS Department of Meteorology is a global leader in military meteorology education and research. We expect our capabilities to grow in the future as we address battlespace environment problems for both the U.S. Air Force and Navy. Furthermore, the Air Force, Navy, and foreign students forge strong friendships and trust during the challenges of graduate education that will serve them well in future joint operations and activities. Those interested in more information can access the NPS Department of Meteorology web site www.weather.nps.navy.mil or to contact the department directly. ▼

Below, Real-time Local Mesoscale Surface, Buoy and Profiler Data along the Central California coast from the Atmospheric Boundary Layer Lab at NPS.



How to write right:
An Observer author's guide

By Master Sgt. Miles Brown
AFWA Public Affairs

The *Observer* is truly your magazine for Air Force Weather. This bimonthly publication is intended for the professional weather specialists of the U.S. Air Force. However, the magazine often ends up in the hands of a much bigger audience – anyone interested in reading about AFW's biggest successes and latest achievements.

The overall readership is comprised of active-duty, Air National Guard and Air Force Reserve, civilian and contractor, meteorology students, and retired weather warriors. In addition to these regular readers, the magazine is given to AFW visitors and guests, and ROTC and Junior ROTC students.

The purpose of the *Observer* is to inform, educate, and entertain the worldwide readership with leadership editorials, news and technical updates, personal weather stories, historical accounts, and award and decoration acknowledgments. Notification of themes and deadlines are sent to the weather community through the MAJCOMs and OWSs.

However, this does not limit submissions to those requested by your higher headquarters. If you would like to submit an article to the *Observer*, or suggest an article or topic, please coordinate approval though your chain of command and send it to the magazine staff. All submissions may be e-mailed to observer@afwa.af.mil or mailed to AFWA/PA, 106 Peacekeeper Dr., Ste. 2N3, Offutt AFB, NE, 68113-4039.

When writing articles for the magazine, please remember your audience. Your first sentence or lead must hook the reader and invite them to read your story. Additionally, you should answer a few question right from the start of your article: Who, What, When, Where, and Why or How. After your brief lead, you can transition to the main body of your article. This is where you should logically support the opening statements and paint the complete picture for the reader.

Direct quotes from subject matter experts are desired throughout all articles. They add support and validity to stated

2004 Observer Themes and deadlines:

Issue	Theme	Possible stories	Deadline
Mar/Apr 04	PACAF	Human interest stories from across the command; stories from 11th OWS and their AOR; JTWC and forecasting/tracking typhoons; Stan/Eval efforts.	Jan. 16, 2004
May/Jun 04	Heritage	First in military weather; Women in weather; Weather in WWI and weather accomplishments in WWII; Stories from past CCs or WX professionals.	March 5, 2004
Jul/Aug 04	Weather Transformation	UAV weather sensor technology; Latest from AFCWC; Army transformation efforts; New programs.	May 7, 2004
Sep/Oct 04	Space Weather	New products; Stories on NORAD, USSPACECOM, and AFSPC; An SXI update; Agency relationships - NOAA, Navy, SEC, and the Air Force.	July 9, 2004
Nov/Dec 04	Training	Air Force Academy; Keesler update; AFWA's DNT branch; Career broadening positions outside of weather; Ft. Huchuca's course.	Sep. 3, 2004
Jan/Feb 05	ALMANAC	MAJCOM and unit updates.	Nov. 5, 2004

facts in any article. On that note, please keep in mind that your submissions need to be written in third person. The only first-person articles that are appropriate for the magazine are editorials and feature stories recounting personal weather experiences. Quoting yourself within an article you wrote, does not add support to your story.

The final part of your article should be a strong conclusion that again answers the big five Ws - Who, What, When, Where, and Why or How. As for total length of submissions, please try to keep all articles to less than 1,500 words. That is about two pages single spaced text. This may seem like a long article, but once you get started, the pages fill very quickly. If you have are having problems with your creative flow, you can call or e-mail the *Observer* staff for guidance. The staff can help with every area of your story, from leads to transitions, and help you paint the picture and convey your meaning to the widest audience possible.

This is not all you need to have a great article in the *Observer*. High quality photos or images are crucial to draw the reader to your story. Photos for the magazine need to show action and have eye appeal. The goal is to capture a moment that readers will relate to the accompanying story and add to the overall story layout and look. Most important is taking photos of a person or people directly involved with the article's main subject. Whenever photos include people, be sure the people's faces can be seen and identified. A good guide is to have faces as large as a dime when printed. Additionally, every military member in a photo must meet all military standards as directed in Air Force Instruction 36-2903.

Once you have a good photo in mind, be sure to capture the image in the highest resolution possible – one to two mega pixels minimum. All photos may be sent to the *Observer* staff via e-mail as an attachment. Please do not cut and paste into PowerPoint slides or Word documents. If the image is too large to send via e-mail, you can copy the file to CD and mail the CD to the staff. Images may also be developed from film and mailed to our staff, but the original may not be returned. Be sure to include a complete description of the action and identify all people in photos. The photographer's name and rank is also required for publication. Keep in mind that the *Observer* staff is always looking for any good AFW action or people photos for use in public affairs promotional products.

If weather products are used to complement your article, be sure the image is not enhanced with text overlays. Supply the images in the raw form and the magazine staff will prepare it for inclusion. Remember, the *Observer* is a full color publication and all images and photos should be color if possible.

If you follow these submission guidelines, your article and accompanying photos will jump off the pages of your Air Force Weather magazine and provide our readership with a magazine that both informs and entertains. Our goal is to keep the *Observer* as current as possible, and with your help, take it to the highest level of quality possible.

JAAWIN - It's worth a closer look

By Tech. Sgt. Ray Nawrocki
AFWA Current Operations Branch

One of the most popular features on JAAWIN is the Lightning Applet. The Lightning Applet has proven to be an extremely valuable "Metwatch" tool for Combat Weather Teams, Operational Weather Squadrons and other DoD agencies. The Applet allows users to see near real-time lightning strikes anywhere within the CONUS. This useful tool typically generates more than 1.2 million web hits per month.

The Lightning Applet allows users to control several different scaled maps. Options include a full CONUS image to zoomed in images from a 500 to 10-mile radius of a selected point. Click anywhere on the map or enter an International Civil Aviation Organization site code and that point will become the new center point. State counties can also be displayed at 200-mile zoom or less.

Users can control the displayed history and refresh times of lightning strikes by simply selecting pre-designated choices. Another unique feature of the Lightning Applet is the capability to center on multiple ICAOs by entering them in the appropriate box. By simply clicking the Next button, the displayed map will switch to the entered ICAOs allowing for a distinctive and easy way to "Metwatch" multiple locations.

The Lightning Applet also allows users to control the display of "range rings." For example, the rings can be set based on parameters dictated by your flying or ground based customers. These rings are only visible while zooming. The audible alert function will signal the desktop when lightning strikes are detected. The alerts will continue until the acknowledge button is clicked

Through the hard work of many AFWA blue-suitors and contractors, we have created one of the most distinctive and beneficial weather applications available on the Internet today. Please contact AFWA/XORC at xorc@afwa.af.mil if you have any feedback and watch for continued JAAWIN updates in future *Observer* issues.

Air Mobility Command's culinary delights

The former Director of Weather for HQ AMC, Col. Carl Daubach, hopes all of Air Force Weather delights in these high-flying dishes. *Bon Appetite!*

AIRLIFTER Loaf

1 pound ground beef
3 slices American cheese
2 eggs
1 package very thinly sliced ham
Celery salt, parsley, and garlic salt to taste

Preheat oven to 375 degrees F. Mix ground beef, eggs, parsley, and salts in bowl. Place meat mixture on wax paper and flatten with your hands to resemble pizza dough. Layer ham and cheese slices across the center of meat mixture. Then roll the mixture like a jellyroll so that the ham/cheese is well sealed in center of the meat. Bake in preheated oven for 45 minutes.

MOBILITY Spaghetti and Meatballs

Tomato Sauce:
Saute':
3 tablespoons olive oil
1/2 cup chopped onions
1 minced clove garlic
Add:
2 – 29 ounce cans tomatoes, rubbed through strainer
8 ounce can tomato sauce
6 ounce can tomato paste
1 cup water
1 teaspoon basil
2 teaspoons salt
1/4 teaspoon pepper
2 tablespoons minced parsley

Meatballs Mix:
3/4 pound ground beef
1/4 pound ground pork
1 cup dry bread crumbs
1 clove garlic, cut fine
1 tablespoon minced parsley
1/2-cup grated Parmesan cheese
1/2-cup milk
2 eggs, beaten
1/2 teaspoon salt
1/8 teaspoon pepper

Combine all ingredients, roll into ball shape, brown meatballs on all sides in a skillet, and add to sauce. Simmer over low heat for 1 hour.

EXPEDITIONARY MOBILITY TASK FORCE Broccoli Salad

1 head broccoli finely chopped
1/2 pound fried bacon, drained, broken up
1/4 cup red onion diced
1/2 cup sunflower seeds
1 cup mayo
3 tablespoons sugar
2 tablespoons vinegar

Throw all together and mix well. Best if prepared in advance.

TANKER Cobbler

Fruit - peaches, apples,
blueberries, blackberries
2 eggs
1 cup sugar
1 teaspoon baking powder
1 cup flour
1 stick margarine

Preheat oven to 350 degrees F. Place any kind of fruit in bottom of 9x13-inch or 9x9-inch pan. In a large bowl, add sugar, baking powder and flour. Cut together until fine. Sprinkle over top of fruit. Beat 2 eggs well and pour evenly over top. Bake in preheated oven for 25-30 minutes. May be served warm.

CHOCOLATE THUNDER Cookies

1 cup softened butter
3/4 cup chunky peanut butter
3/4 cup white sugar
3/4 cup packed brown sugar
2 eggs
1 teaspoon vanilla extract
2 1/3 cups all-purpose flour
1/3 cup cocoa powder
1 teaspoon baking soda
1 cup semi-sweet chocolate chips
1 cup peanut butter chips
1 cup white chocolate chips

Preheat oven to 350 degrees F. In large bowl, cream together the butter, peanut butter, white sugar, and brown sugar until smooth. Beat in eggs one at a time, then stir in vanilla. Combine flour, cocoa, and baking soda; stir into the peanut butter mixture. Mix in chocolate chips, peanut butter chips, and white chocolate chips. Drop by tablespoonfuls onto ungreased cookie sheets. Bake 8 to 10 minutes in preheated oven. Let cool 1 or 2 minutes on sheet before removing, or they will fall apart.

AFW Airmen make jump to NCO ranks

The following Air Force Weather Senior Airmen were selected for promotion to Staff Sergent this year:

Michael Adcock, HQ AFWA, Offutt AFB, Neb.
James Ahern, 65th OSS/OSW, Lajes AB Azores, Portugal
MaryJo Albright, 335th TRS, Keesler AFB, Miss.
Mario Alcala, 97th OSS/OSW, Altus AFB, Okla.
Brady Anderson, Det. 2nd AGOS, Ft. Irwin, Calif.
Carlos Austin, 26th OWS, Barksdale AFB, La.
Robert Baldi, HQ AFWA, Offutt AFB, Neb.
Jason Barlow, 335th TRS, Keesler AFB, Miss.
Nicholas Bassett, 374th OSS/OSW, Yokota AB, Japan
Sonia Bassett, 374th OSS/OSW, Yokota AB, Japan
Hope Bazin, 9th OSS/OSW, Beale AFB, Calif.
Jameel Beasley, 17th OWS, Hickam AFB, Hawaii
Jade Bell, 17th OWS, Hickam AFB, Hawaii
Ramah Billings, HQ AFWA, Offutt AFB, Neb.
Levy Bland, 28th OWS, Shaw AFB, S.C.
Michael Bliss, 150th WS, Scott AFB, Ill.
Benjamin Borden, Det. 10, 7th WS, Giebelstadt, Germany
Brian Bridges, USAFE OWS, Sembach AB, Germany
Wesley Brogan, 39th OSS/OSW, Incirlik AB, Turkey
Alfred Brooks, III, 15th OWS, Scott AFB, Ill.
Joshua Buck, Det. 2, 607th WS, Camp Humphreys, Korea
Karin Burke, 614th SOPG/AWT, Vandenberg AFB, Calif.
Jason Burkley, 607th AGOMS, Osan AB, Korea
Amanda Burrows, USAFE OWS, Sembach AB, Germany
Ian Byczkowski, 15th OWS, Scott AFB, Ill.
Shannon Byers, 28th OWS, Shaw AFB, S.C.
Eric Cameron, HQ AFWA, Offutt AFB, Neb.
Richard Cawell, 89th OSS, Andrews AFB, Md.
James Clanahan, 51st OSS/OSW, Osan AB, Korea
Keith Coleman, 20th OWS, Yokota AB, Japan
Patrick Conklin, 20th OWS, Yokota AB, Japan
Heather Cooper, 18th OSS/OSW, Kadena AB, Japan
Stephen Cox, USAFE OWS, Sembach AB, Germany
Brandin Cox, USAFE OWS, Sembach AB, Germany
Gretchen Craine, 8th OSS/OSW, Kunsan AB, Korea
Sonya Crocker, 81st OSF/OSW, Keesler AFB, Miss.
Amy Cunningham, 366th OSS/OSW, Mountain Home AFB, Idaho
Jackie Dalzell, 28th OWS, Shaw AFB, S.C.
James Davison, 354th OSS/OSW, Eielson AB, Alaska
Bo Deaton, 11th OWS, Elmendorf AFB, Alaska
Rafael Delgadotelasquez, 49th OSS/OSW, Holloman AFB, N.M.
Carl Densford, USAFE OWS, Sembach AB, Germany
Zane Dooley, 1st WS, Ft. Lewis, Wash.
Joeben Dorbandt, 92nd OSS/OSW, Fairchild AFB, Wash.
Shannon Durham, AFCCC, AFWA, Asheville, N.C.
Myria Edwards, 65th OSS/OSW, Lajes Field, Azores, Portugal
Rachael Eichelberger, 25th ASOS/DOW, Hickam AFB, Hawaii
Justin Falcon, 509th OSS/OSW, Whiteman AFB, Mo.
Alecia Fay, HQ AFWA, Offutt AFB, Neb.
Terrance Feagin, 15th OWS, Scott AFB, Ill.
Rosalie Fearing, 354th OSS/OSW, Eielson AB, Alaska
Christopher Fidler, HQ AFWA, Offutt AFB, Neb.
Adam Finley, HQ AFWA, Offutt AFB, Neb.
Tony Flores, 355th OSS/OSW, Davis-Monthan AFB, Ariz.
Jeremy Friedrichsen, AFCCC, AFWA, Asheville, N.C.
Michael Garrett, 15th OWS, Scott AFB, Ill.
Adam Garrison, 52nd OSS/OSW, Spangdahlem AB, Germany
William Garrison, 17th OWS, Hickam AFB, Hawaii
Christopher Gates, 62nd OSS/OSW, McChord AFB, Wash.
Sheridean Guthrie, 354th OSS/OSW, Eielson AB, Alaska
William Guthrie, 3rd ASOS/WE, Ft. Wainwright, Alaska
Thomas Guinn, OL-B, Det. 1, 607th WS, Camp Page, Korea
Cameron Haberlein, HQ AFWA, Offutt AFB, Neb.
Jeremiah Hamilton, 27th OSS/OSW, Cannon AFB, N.M.
Stefanie Harshaw, 3rd WS, Ft. Hood, Texas
Kimberly Hawn, 36th OSS/OSW, Andersen AB, Guam
Spencer Hedine, 25th OWS, Davis-Monthan AFB, Ariz.
Mark Hendrickson, 319th OSS/OSW, Grand Forks AFB, N.D.
Teresa Hernandez, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Anthony Hill, 28th OWS, Shaw AFB, S.C.
Trinidad Hinojos, 355th OSS/OSW, Davis-Monthan AFB, N.M.
Michael Humphreys, USAFE OWS, Sembach AB, Germany
Celena Jones, 26th OWS, Barksdale AFB, La.
John Kalu, 11th OWS, Elmendorf AFB, Alaska
April Kendall, 354th OSS/OSW, Eielson AB, Alaska
Kalen Knippling, 51st OSS/OSW, Osan AB, Korea
Lori Lacoste, 25th OWS, Davis-Monthan AFB, Ariz.
Alisha Lawson, 86th OSS/OSW, Ramstein AB, Germany
Andrea Leblo, 3rd OSS/OSW, Elmendorf AFB, Alaska
Christopher Leblo, 3rd OSS/OSW, Elmendorf AFB, Alaska
Jason Lesch, 28th OWS, Shaw AFB, S.C.
Shannon Linderman, 17th OWS, Hickam AFB, Hawaii
Carl Long, 335th TRS, Keesler AFB, Miss.
Gerber Lopez, 46 OSS/OSW, Hurlburt Field, Fla.
Brandi Lorenzen, Det. 2, AFWA, Sagmore Hill, Ma.
Michelle Lucas, 26th OWS, Barksdale AFB, La.
Jason Mai, 28th OWS, Shaw AFB, S.C.
Charles Malone Jr., 366th CMS, Mountain Home AFB, Idaho
Jack Manigold, II, 25th OWS, Davis-Monthan AFB, Ariz.
Scott Manning, 36th OSS/OSW, Anderson AB, Guam
Anthony Marks, USAFE OWS, Sembach AB, Germany
James McDaniel, HQ AFWA, Offutt AFB, Neb.
Lucas Menebroker, 17th OWS, Hickam AFB, Hawaii
Randy Messer, 28th OWS, Shaw AFB, S.C.
Michael Michaels, 25th OWS, Shaw AFB, S.C.
Timothy Minkler, 325th OSS/OSW, Tyndall AFB, Fla.
Johnathan Mitchell, 36th OSS/OSW, Anderson AB, Guam
Jeremy Montgomery, Det. 6, 7th WS, Wiesbaden AB, Germany
Christopher Morales, 7th WS, Sandhofen AB, Germany
Paul Morrow, Det. 2, AFWA, Sagmore Hill, Ma.
Noel Navarro, 355th OSS/OSW, Davis-Monthan AFB, Ariz.
Matthew Orderitt, HQ AFWA, Offutt AFB, Neb.
Terri Palmer, 15th ASOS, Hunter AAF, Ga.
Don Pascual, Det. 2, 10th CWS, Ft. Campbell, Ky.
Michael Passananti, Det. 11, 7th WS, Heidelberg AB, Germany
Christopher Patterson, 3rd ASOS/WE, Ft. Wainwright, Alaska
Tiffany Perone, Det. 2, 607th WS, Camp Humphreys, Korea
Ryan Pittenger, Det. 2, 607th WS, Camp Humphreys, Korea
John Platt, 81st OSF/OSW, Keesler AFB, Miss.
Judd Porter, OL-A, Det. 1, 607th WS, Camp Stanley, Korea
Robert Quinn, 335th TRS, Keesler AFB, Miss.
Jennifer Ramsey, 36th OSS/OSW, Anderson AB, Guam
Andrew Rau, 60th OSS/OSW, Travis AFB, Calif.
Dominic Reed, HQ AFWA, Offutt AFB, Neb.
Cynthia Reeves, 354th OSS/OSW, Eielson AB, Alaska
Amanda Regler, HQ AFWA, Offutt AFB, Neb.
Sean Reynolds, 25th OWS, Davis-Monthan AFB, Ariz.
Preston Rice, Det. 2, 607th WS, Camp Humphreys, Korea
Jacob Richmond, USAFE OWS, Sembach AB, Germany
Andrew Riker, USAFE OWS, Sembach AB, Germany
Michelle Robertson, HQ AFWA, Offutt AFB, Neb.
Yaphet Rodriguez, Det. 1, 18th WS, Ft. Eustis Va.
Guilleermo Rosas, HQ AFWA, Offutt AFB, Neb.
Michael Rudd, 353rd OSS/OSW, Kadena AB, Japan
Nicholas Ruiz, 75th OSS/OSW, Hill AFB, Utah
Randolph Rundio Jr., HQ AFWA, Offutt AFB, Neb.
Sarah Salazar, 100th OSS/OSW, Mildenhall RAF, U.K.
Jennifer Salter, OL-B, Det. 1, 607th WS, Camp Page, Korea
Brooke Saleeman, 17th OWS, Hickam AFB, Hawaii
Kari Shannonhouse, 347th OSS/OSW, Moody AFB, Ga.
Christopher Shipman, 412th OSS/OSW, Edwards AFB, Calif.
Krystal Shon, 15th OWS, Scott AFB, Ill.
Corey Simonson, 48th OSS/OSW, Lakenheath RAF, U.K.
Dianna Smith, 47th OSS/OSW, Laughlin AFB, Texas
Michael Stark, USAFE OWS, Sembach AB, Germany
Joshua Tafova, 25th ASOS, Wheeler AFB, Hawaii
Tommy Tam, 355th OSS/OSW, Davis-Monthan AFB, Ariz.
Brenda Tillman, 18th OSS/OSW, Kadena AB, Japan.
Melanie Tinoco, 49th OSS/OSW, Holloman AFB, N.M.
Ryan Trickey, 17th OWS, Hickam AFB, Hawaii
April Van Loan, 17th OWS, Hickam AFB, Hawaii
Kevin Vanderwa, Det. 5, 7th WS, Katterbach AB, Germany
Brandie Vanslandvat, 20th OWS, Yokota AB, Japan
Daniel Vanmeter, 18th WS, Ft. Bragg, N.C.
Noah Vaughan, USAFE OWS, Sembach AB, Germany
Israel Velez, 11th OWS, Elmendorf AFB, Alaska
Stephen Vogel, 25th OWS, Davis-Monthan AFB, Ariz.
Darroll Walsh, 305th OSS/OSW, McGuire AFB, N.J.
Stephen White, 11th OWS, Elmendorf AFB, Alaska
Amber Wilkinson, USAFE OWS, Sembach AB, Germany
Kathleen Williams, 457th OSS/OSW, Laughlin AFB, Texas
Jennifer Williamson, 25th OWS, Davis-Monthan AFB, Ariz.

Officers hit their mark

The following Air Force Weather officers were selected for promotion to Lieutenant Colonel by Promotion Board P0503A:

Christopher Bjorkman, 607th WS, Yongsan AIN, Korea
William Cade III, HQ AFWA, Offutt AFB, Neb.
James Cotturone Jr., 15th OWS, Scott AFB, Ill.
Michael Dennis, 10th CWS, Hurlburt Field, Fla.
Jay Desjardins Jr., Det. 11, 7th WS, Heidelberg, Germany
Steven Desordi, ACSC, Maxwell AFB, Ala.
Keith Duffy, USAFE OWS, Sembach, Germany
Steven Fiorino, AFIT, Wright-Patterson AFB, Ohio
Jeffrey Frye, HQ AFWA, Offutt AFB, Neb.
Charles Harris, ACSC, Maxwell AFB, Ala.
Eugene Layeski, HQ AFWA,Offutt AFB, Neb.
Thomas Moore, USAFE DOW, Ramstein, Germany
Kay Munoz, ACSC, Maxwell AFB, Ala.
Scott Nelson, USAFA, Colo.
Julie Ann Noto, HQ USAF, Washington, D.C.
Stephen Romolo, 18th ASOG/DOW, Pope AFB, N.C.
Peter Roohr, 88th WS, Wright-Patterson AFB, Ohio
Elia Sanjume, HQ USAF/XOW, Washington, D.C.
John Shepley, ACSC, Maxwell AFB, Ala.
Leanne Siedlarz, AFCWC, Hurlburt Field, Fla.
Marvin Treu, 46th WS, Eglin AFB, Fla.

The following Air Force Weather officers were selected for promotion to Captain by Promotion Board CY03B:

Jennifer Bailey, 28th OWS, Shaw AFB, S.C.
Jonathan Dea, 52nd OSS/OSW, Spangdahlem AB, Germany
Daniel Fisher, 25th OWS, Davis Monthan AFB, Ariz.
Andrew Geyer, 18th WS, Ft. Bragg, N.C.
Donald Godbey II, 335th TRS/UOA, Keesler AFB, Miss.
Dawn Golding, 16th OSS/OSW, Hurlburt Field, Fla.
Jennifer Hettinga, 39th OSS/OSW, Incirlick AB, Turkey
Breea Lemm, 30th WS, Vandenberg AFB, Calif.
Douglass Macpherson, 607th WS, Yongson AIN, Korea
Stephen Maile, 16th OSS/OSW, Hurlburt Field, Fla.
John Mcmillen, 3rd ASOS/WE, Ft. Wainwright, Alaska
Earl Nast, 21st OSS/OSW,Peterson AFB, Colo.
Justin Palmer, USAFE OWS, Sembach AB, Germany
Kathryn Payne, 20th OWS, Yakota AB, Japan
James Ray, 3rd ASOS/WE, Ft. Wainwright, Alaska
Richard Stedronsky, 36th OSS/OSW, Andersen AB, Guam
Robert Tournay, 347th OSS/OSW, Moody AFB, Ga.
Cassandra Troup, 86th OSS/OSW, Ramstein AB, Germany
Wesley Twohig, 7th WS, Heidelburg Germany
Damon Vorhees, 48th OSS/OSW, Lakenheath RAF, UK
Sinclair Wong, HQ AFWA, Offutt AFB, Neb.

Staff Sgt. Ian Byczkowski
15th OWS, Scott AFB, Ill
Weather apprentice
Years in service: 5
Hometown: Fairborn, Ohio
Role model / Why? Arnold Schwarzenegger. He is always 100% dedicated to his goals.
Hobbies: Weight lifting, and spending time with my wife and kids
Most Memorable Air Force Weather Experience: It had to be when Hurricane Isabel hit the East Coast. It amazed me how efficiently we were able to forecast this historic event. From the 50+ knot wind warnings to the incredible volume of 175-1s that were required by the evacuating aircraft, this event truly demonstrated the versatility and meteorological expertise of the 15th OWS.

Weather Warriors

Staff Sgt. Christopher Dunstone
8th OSS/OSW, Kunsan AB, Korea
Weather Specialist
Years In Service: 8
Hometown: Cannon AFB, Clovis, N.M.
Role Model / Why? My Dad is my role model. He served in the Air Force for 22 years. He pretty much taught me the values I have today. He had me already prepared for my military career.
Hobbies: First and foremost, family time, fantasy sports, sports, reading, and music
Most Memorable Air Force Weather Experience: Deploying with the US Army's 10th Mountain Division, during Operation ENDURING FREEDOM and being at the point of the weather spear during Operation ANACONDA.

Salutes

Retirements

Maj. Robert Hauser, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Carol Andersen, AFCWC, AFWA, Hurlburt Field, Fla.
Master Sgt. Bruce Bellairs, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Steven Brown, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Edward Coleman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Charles Elford, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Donald Jeter, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Carl Johnson, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Harry Lind, 28th OSS/OSW, Ellsworth AFB, S.D.
Master Sgt. Timothy Lowman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Armando Molina, 54st CBCS, WSSC-East, Robins AFB, Ga.
Master Sgt. Tammy Newman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Ronald Sharp, HQ AFWA, Offutt AFB, Neb.
Master Sgt. William Tesebaugh, HQ AFWA, Offutt AFB, Neb.
Master Sgt. John Thor, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Dean Westover, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Richard Koch, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Gregory Spurck, HQ AFWA, Offutt AFB, Neb.

Awards and Decorations

BRONZE STAR

Maj. Tom Blasek, Det. 3, 7th WS, Illesheim, Germany
Maj. Jay Dejardins, Det. 11, 7th WS, Heidelberg, Germany
Maj. Patrick Rothbauer, Det. 10, 7th WS, Giebelstadt, Germany
Chief Master Sgt. Freddy Proctor, 181st WF, Carswell ARB, Texas (ANG)
Senior Master Sgt. Bruce Perkins, 7th WS, Campbell Barracks, Heidelberg, Germany
Senior Master Sgt. Allen Williams, 181st WF, Carswell ARB, Texas (ANG)
Master Sgt. J.T. Boss, Det. 3, 7th WS, Illesheim, Germany
Master Sgt. Randy Elie, Det. 11, 7th WS, Heidelberg, Germany
Master Sgt. David Jarvis, Det. 10, 7th WS, Giebelstadt, Germany
Master Sgt. Clifford Walton, 51st CBCS, WSSC-East, Robins AFB, Ga.
Staff Sgt. Davie Lewis, Det. 11, 7th WS, Heidelberg, Germany

DEFENSE MERITORIOUS SERVICE MEDAL

Lt. Col. Frederick Fahlbusch, 28th OWS, Shaw AFB, S.C.
Lt. Col. William Spendley Jr., 17th OWS, Hickam AFB, Hawaii

MERITORIOUS SERVICE MEDAL

Lt. Col. Robert Allen Jr., HQ AFWA, Offutt AFB, Neb. (3 OLC)
Lt. Col. Robert Falvey, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Lt. Col. Thomas Gunn, AFCCC, AFWA, Asheville, N.C. (3 OLC)
Lt. Col. Michael Hemler, AFCWC, AFWA, Hurlburt Field, Fla. (4 OLC)
Lt. Col. Chan Keith, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Lt. Col. Susan Lindsey, Head Quarters, Florida ANG, Fla. (ANG)
Lt. Col. Eric McKinley, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Lt. Col. Mark Zettlemoyer, 17 OWS, Hickam AFB, Hawaii (2 OLC)
Maj. Jeffery Cox, HQ AFWA, Offutt AFB, Neb.
Maj. Barry Crook, HQ AFWA, Offutt AFB, Neb.
Maj. Troy Dunn, HQ AFWA, Offutt AFB, Neb.
Maj. Robert Hauser, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Maj. Scott Hausman, HQ AFWA, Offutt AFB, Neb.
Maj. Karen Morris, 151st WF, Barnes ANGB, Mass. (ANG)
Maj. Karl Pfeiffer, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Maj. Robert Schacht, 2076th WF, Indianapolis, Ind. (ANG)
Maj. Mark Schrader, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Maj. Christopher Stock, 4th OSS/OSW, Seymour Johnson AFB, N.C. (1 OLC)
Maj. Shannon Walker, Det. 4, AFWA, Holloman AFB, N.M.
Maj. David Wood, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Capt. Wayne Boline, HQ AFWA, Offutt AFB, Neb.
Capt. Steve Gruber, 17th OWS, Hickam AFB, Hawaii
Capt. Morgan Mackey, HQ AFWA, Offutt AFB, Neb.
Capt. Michael Scott, HQ AFWA, Offutt AFB, Neb.
Capt. Frank Tersigni, Det. 3, AFWA, Ramey, Puerto Rico
Chief Master Sgt. Adolph Flores Jr., HQ AFWA, Offutt AFB, Neb. (3 OLC)
Chief Master Sgt. Forrest Hendricks, 146th WF, Coraopolis, Pa. (ANG)
Senior Master Sgt. Ricky Keil, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Senior Master Sgt. Lorne McClard, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Senior Master Sgt. Gary Mercer, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Senior Master Sgt. Thomas Simon, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Senior Master Sgt. Douglas Stewart, 181st WF, Carswell ARB, Texas (ANG)
Senior Master Sgt. Allen Williams, 181st WF, Carswell ARB, Texas (ANG)
Master Sgt. William Anders, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Carol Andersen, AFCWC, AFWA, Hurlburt Field, Fla.
Master Sgt. Stephen Aull, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Master Sgt. Bruce Bellairs, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Michael Brooks, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Master Sgt. Kelly Courtney, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Charles Elford, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Glenn Harris, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. David Jarvis, Det. 10, 7th WS, Giebelstadt, Germany
Master Sgt. Donald Jeter, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Carl Johnson, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Timothy Lowman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Dennis Ohm, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Larry Pitsenbarger, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Master Sgt. Troy Rames, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Kent Schupp, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Ronald Sharp, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Robert Silvernail, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sergeant John Stevens, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Master Sgt. Lawrence Zielasko, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. William Cowgill, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Raymond Gascon, Det. 2, AFWA, Sugarmore Hill, Mass. (Portsmouth)
Tech. Sgt. Ronald Richards Jr., HQ AFWA, Offutt AFB, Neb.

JOINT SERVICE COMMENDATION MEDAL

Maj. Kenneth Browning, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Dan Bigley, 20th ASOS, Ft. Drum, N.Y.
Staff Sgt. Patrick Gray, 55th OSS/OSW, Misawa AB, Japan
Staff Sgt. Joshua Murray, Det. 5, 10th CWS, Fort Bragg, N.C.
Staff Sgt. Charles Rushing, Det. 5, 10th CWS, Fort Bragg, N.C.

AIR FORCE COMMENDATION MEDAL

Capt. Brandon Alexander, 20th OWS, Yokota AB, Japan
Capt. Kelli Bruckner, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Capt. Michael Hunter, HQ AFWA, Offutt AFB, Neb.
Capt. Julius Kinkle, HQ AFWA, Offutt AFB, Neb.
Capt. Jennifer Meadows, 20th OWS, Yokota AB, Japan
Capt. Thomas Renwick, HQ AFWA, Offutt AFB, Neb.
Capt. Charlynn Scheuermann, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Capt. Corey Wilson, 17th OWS, Hickam AFB, Hawaii
1st Lt. David Budzko, 17th OWS, Hickam AFB, Hawaii
1st Lt. Whitney Heyward, 17th OWS, Hickam AFB, Hawaii
1st Lt. Kathryn Payne, 20th OWS, Yokota AB, Japan
Master Sgt. Todd Allen, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Master Sgt. Larry Beck, 181st WF, Carswell ARB, Texas (ANG)
Master Sgt. Edward Coleman, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Gary Hall, HQ AFWA, Offutt AFB, Neb. (4 OLC)
Master Sgt. David Haney, 28th OWS, Shaw AFB, S.C.
Master Sgt. Robert Henry Jr., 156th WF, Charlotte, N.C. (ANG)
Master Sgt. Tammy Newman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Randy Nielsen, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Master Sgt. Kelly Williams, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Tech. Sgt. Adam Christian, 17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Curtis Garner, 181st WF, Carswell ARB, Texas (ANG)
Tech. Sgt. Samuel Pugh, 332nd Expeditionary, Misawa AB, Japan
Tech. Sgt. John Reinier, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Robert Sugden, 28th OSS/OSW, Ellsworth AFB, S.D.
Staff Sgt. Brian Aragon, 17th OWS, Hickam AFB, Hawaii
Staff Sgt. Jeremie Collins, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Staff Sgt. Megan Egnew, 17th OWS, Hickam AFB, Hawaii
Staff Sgt. Carl Garcia, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Staff Sgt. Matthew Gladue, 51st CBCS, WSSC-East, Robins AFB, Ga.
Staff Sgt. Brenda Graves, 28th OSS/OSW, Ellsworth AFB, S.D.
Staff Sgt. Charles Hall, 51st CBCS, WSSC-East, Robins AFB, Ga.
Staff Sgt. Vincent Heath, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Steven Johnson, 51st CBCS, WSSC-East, Robins AFB, Ga.
Staff Sgt. Latoya Lee, 20th OWS, Yokota AB, Japan
Staff Sgt. Michael Lee, 20th OWS, Yokota AB, Japan
Staff Sgt. Jason McGinnsey, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Mark Pietrykowski, 113th WF, Terre Haute, Ind. (ANG)
Staff Sgt. Scott Youtz, Det. 5, 10th CWS, Fort Bragg, N.C.
Senior Airman Philip Beda, 181st WF, Carswell ARB, Texas (ANG)
Senior Airman Chad Lee, 51st CBCS, WSSC-East, Robins AFB, Ga.
Senior Airman Derrick Sochez, HQ AFWA, Offutt AFB, Neb.

ARMY COMMENDATION MEDAL

Lt. Col. Joseph McCormack, 181st WF, Carswell ARB, Texas (ANG)
Chief Master Sgt. Freddy Proctor, 181st WF, Carswell ARB, Texas (ANG)

Salutes

Senior Master Sgt. Allen Williams, 181st WF, Carswell ARB, Texas (ANG)
Tech. Sgt. David Jordan, Det. 10, 7th WS, Giebelstadt, Germany
Tech. Sgt. Dwayne Klinzman, 17th OWS, Hickam AFB, Hawaii
Tech. Sgt. David Lomack, Det. 10, 7th WS, Giebelstadt, Germany
Staff Sgt. Staci Coleman, Det. 10, 7th WS, Giebelstadt, Germany
Staff Sgt. Brad Giese, 15th ASOS/OSW, Fort Stewart, Ga.
Staff Sgt. Julie Moretto, 15th ASOS, Hunter AAF, Ga.
Staff Sgt. Robert Patterson, 181st WF, Carswell ARB, Texas (ANG)
Staff Sgt. Terri Pugh, 15th ASOS/ASWB, Hunter AAF, Ga.
Staff Sgt. Misty York, Det. 10, 7th WS, Giebelstadt, Germany
Senior Airman Matthew McClellan, 181st WF, Carswell ARB, Texas (ANG)
Senior Airman Douglas Nickerson, 181st WF, Carswell ARB, Texas (ANG)

JOINT SERVICE ACHIEVEMENT MEDAL

Senior Airman Charles Allen, Det. 5, 10th CWS, Fort Bragg, N.C.
Senior Airman Erik Gilliand, Det. 5, 10th CWS, Fort Bragg, N.C.

AIR FORCE ACHIEVEMENT MEDAL

1st Lt. Whitney Heyward, 17th OWS, Hickam AFB, Hawaii
2nd Lt. Michael Connelly, HQ AFWA, Offutt AFB, Neb.
2nd Lt. Lowell Marinas, 28th OWS, Shaw AFB, S.C.
Master Sgt.Carol Andersen, AFCWC, AFWA, Hurlburt Field, Neb. (3 OLC)
Master Sgt. Miles Brown, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Wyan Dunn, 28th OWS, Shaw AFB, S.C.
Maser Sgt. Richard Furman, 165th WF, Louisville, Ky. (ANG)
Master Sgt. Terese Gibson, WRTC, Camp Blanding, Fla.
Master Sgt. Dennis Rice, 28th OWS, Shaw AFB, S.C.
Master Sgt. Ronald Sharp, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Master Sgt. Robert Simpkins, 208th WF, St. Paul, Minn. (ANG)
Tech. Sgt. Glen Bordelon, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Frank Cortes, 210th WF, March ARB, Calif. (ANG) (1 OLC)
Tech. Sgt. John Dick, 4th OSS/OSW, Seymour Johnson AFB, N.C. (1 OLC)
Tech. Sgt. Bryan Harder, HQ AFWA, Offutt AFB, Neb. (4 OLC)
Tech. Sgt. Bert Kelley, 51st CBCS, Robins AFB, Ga.
Tech. Sgt. David Naros, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Willis Nelson, 436th OSS/OSW, Dover AFB, Del.
Tech. Sgt. John Reinier, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Michael Sadovsky, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Tech. Sgt. Susan Secora, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Tech. Sgt. Mark Sheldon, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Laura Stiverson, 28th OWS, Shaw AFB, S.C.
Tech. Sgt. Steven Wyatt, HQ AFWA, Offutt AFB, Neb. (3 OLC)
Staff Sgt. Eric Andreas, 20th OWS, Yokota AB, Japan
Staff Sgt. Bryan Bell, 436th OSS/OSW, Dover AFB, Del. (with Valor)
Staff Sgt. James Brown, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Carl Christianson, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Jessida Clarke, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Staff Sgt. Kevin Goff Jr., 436th OSS/OSW, Dover AFB, Del.
Staff Sgt. Joseph Harbin, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Timothy Legg, HQ AFWA, Offutt AFB, Neb. (2 OLC)
Staff Sgt. Bradley McCullough, 105th WF, Nashville, Tenn. (ANG)
Staff Sgt. Elizabeth McNulty, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Casey Mitchell, 105th WF, Nashville, Tenn. (ANG)
Staff Sgt. Beth Page, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Todd Preimesberg, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Wanda Ranos-Robles, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Jason Ranee, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Staff Sgt. Michael Ross II, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Ernie Ruiz, 20th ASOS, Ft. Drum, N.Y.
Staff Sgt. Jason Stewart, 28th OWS, Shaw AFB, S.C.
Staff Sgt. David Tischhauser, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Shaun Wallace, 97th OSS/OSW, Altus AFB, Okla. (1 OLC)
Staff Sgt. Misty York, Det. 10, 7th WS, Giebelstadt, Germany
Senior Airman Laura Baker, 28th OWS, Shaw AFB, S.C.
Senior Airman David Bauer, 208th WF, St. Paul, Minn. (ANG)
Senior Airman Jameel Beasley, 17th OWS, Hickam AFB, Hawaii
Senior Airman Benjamin Borden, 28th OWS, Shaw AFB, S.C.
Senior Airman Benjamin Chernicoff, HQ AFWA, Offutt AFB, Neb.
Senior Airman Gretchen Craine, 8th OSS/OSW, Kunsan AB, Korea
Senior Airman Adese Davis-Colon, 28th OWS, Shaw AFB, S.C.
Senior Airman Heinz Disch, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Senior Airman Christopher Fidler, HQ AFWA, Offutt AFB, Neb. (1 OLC)
Senior Airman Chad Gawel, 28th OWS, Shaw AFB, S.C.
Senior Airman Nathan Gillock, 125th WF, Tulsa, Okla. (ANG)
Senior Airman Anthony Gionto, 146th WF, Coraopolis, Pa. (ANG)
Senior Airman June Green, HQ AFWA, Offutt AFB, Neb.
Senior Airman Jessica Hawthorne, 104th WF, Camp Fretterd, Md. (ANG)
Senior Airman Jaime Howlett, 28th OWS, Shaw AFB, S.C.
Senior Airman Lucas Menebroker, 17th OWS, Hickam AFB, Hawaii
Senior Airman Christopher Mullen, 97th OSS/OSW, Altus AFB, Okla.
Senior Airman Douglas Nickerson, 181st WF, Carswell ARB, Texas (ANG)
Senior Airman Amanda O'Hara, 28th OWS, Shaw AFB, S.C.
Senior Airman Matthew Pogreba, 28th OWS, Shaw AFB, S.C.
Senior Airman Brooke Saltsman, 17th OWS, Hickam AFB, Hawaii
Senior Airman Ryan Tricker, 17th OWS, Hickam AFB, Hawaii
Airman 1st Class Samuel Adams, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Micah Bennett, 20th ASOS, Fort Drum, N.Y.
Airman 1st Class Timothy Blake, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Michael Campbell, 28th OWS, Shaw AFB, S.C.
Airman 1st Class James Dziedzina, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Christopher Ernst, HQ AFWA, Offutt AFB, Neb.
Airman 1st Class Sarah Evans, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Joshua Finkelstein, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Trad Leavitt, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Anita Longton, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Jason Perry, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Kevin Strattan, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Brian Thompkins, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Chad Walker, 28th OWS, Shaw AFB, S.C.

ARMY ACHIEVEMENT MEDAL

Master Sgt. David Cornelius, 209th WF, Camp Murray, Wash. (ANG)
Staff Sgt. Joshua Rosenberg, 20th ASOS, Fort Drum, N.Y.

NORTH CAROLINA ACHIEVEMENT MEDAL

Senior Airman Damon Garland, 156th WF, Charlotte, N.C. (ANG)
Senior Airman Garrett Palmer, 156th WF, Charlotte, N.C. (ANG)

Education

WEATHER OFFICER'S COURSE

Capt. Norikazu Ikai, Japanese Aerospace Defense Force, Fuchu, Japan
Capt. Robert Pulliam, 20th OWS, Yokota AB, Japan
Capt. Yoshihide Takasezawa, Japanese Aerospace Defense Force, Fuchu, Japan
1st Lt. Shawn Beskar, 28th OWS, Shaw AFB, S.C. (Distinguished Grad)
1st Lt. Cristoval Castillo, 20th OWS, Yokota AB, Japan
1st Lt. Kristopher Kripchak, 11th OWS, Elmendorf AFB, Alaska
2nd Lt. Ericka Carey, 15th OWS, Scott AFB, Ill.
2nd Lt. Alan Goddard, 20th OWS, Yokota AB, Japan
2nd Lt. Jeremy Hymel, 125th WF, Tulsa, Okla. (ANG)
2nd Lt. Michal Kistner, 17th OWS, Hickam AFB, Hawaii
2nd Lt. Liam Lynam, 11th OWS, Elmendorf AFB, Alaska
2nd Lt. Victor Marichal, USAFE OWS, Sembach AB, Germany (Distinguished Grad)
2nd Lt. Eric Metzger, 15th OWS, Scott AFB, Ill.
2nd Lt. Kaleb Nordgren, 28th OWS, Shaw AFB, S.C.
2nd Lt. Kevin Quinn, USAFE OWS, Sembach AB, Germany
2nd Lt. Lance Ratterman, USAFE OWS, Sembach AB, Germany
2nd Lt. Edward Rozak, 11th OWS, Elmendorf AFB, Alaska
2nd Lt. Jonathan Sawtelle, USAFE OWS, Sembach AB, Germany
2nd Lt. Ryan Stallsworth, 15th OWS, Scott AFB, Ill. (Distinguished Grad)

WEATHER CRAFTMAN'S COURSE

Tech. Sgt. Willis Nelson, 436th OSS, Dover AFB, Del.
Staff Sgt. James Bills, 45th WS, Patrick AFB, Fla.
Staff Sgt. Adam Bolen, AFCCC, AFWA, Asheville, N.C.
Staff Sgt. Larry Brooks, 7th WS, Heidelberg, Germany
Staff Sgt. Stephanie Brooks, 145th Airlift Wing, Charlotte, N.C. (ANG)
Staff Sgt. John Delaney, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Austin Fernandes, 305th OSS/OSW, McGuire AFB, N.J.
Staff Sgt. John Gass, 335th TRS, Keesler AFB, Miss.
Staff Sgt. Sean Goldstein, 20th OWS, Yokota AB, Japan
Staff Sgt. Joseph Harbin, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Matthew Isako, 28th OSS/OSW, Ellsworth AFB, S.D.
Staff Sgt. Daniel Kern, 45th WS, Patrick AFB, Fla.
Staff Sgt. Richard Kienzle III, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Rory Kling, 57th OSS/OSW, Nellis AFB, Nev.
Staff Sgt. Corey Latiolais, 335th TRS, Keesler AFB, Miss.
Staff Sgt. Alison Long, 25th ASOS, Wheeler AAF, Hawaii
Staff Sgt. Christopher Lozzi, 45th WS, Patrick AFB, Fla.
Staff Sgt. Lakeitha Luster, 12th OSS/OSW, Randolph AFB, Texas
Staff Sgt. Brian Malone, 11th OWS, Elmendorf AFB, Alaska
Staff Sgt. Eric McGee, Det. 2, 10th CWS, Ft. Campbell, Ky.
Staff Sgt. Brad Miller, 50th OSS/OSW, Schriever AFB, Colo.
Staff Sgt. Philip Mohr, 56th OSS/OSW, Luke AFB, Ariz.
Staff Sgt. Eric Moore, 181st WF, Carswell ARB, Texas (ANG)

Staff Sgt. Scot Moore, 16th OSS/OSW, Hurlburt Field, Fla.
Staff Sgt. Molly Myers, 25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. Donna Nowalski, 20th OWS, Yokota AB, Japan
Staff Sgt. Clint Perrone, Det. 1, 10th OWS, Fort Lewis AJN, Wash.
Staff Sgt. Mark Pietrykowski, 113th WF, Terre Haute, Ind. (ANG)
Staff Sgt. Todd Preimesberger, 28th OWS, Shaw AB, S.C.
Staff Sgt. James Rafiner, 56th OSS/OSW, Luke AFB, Ariz.
Staff Sgt. Martha Ray, 60th OSS/OSW, Travis AFB, Calif.
Staff Sgt. Christopher Reddington, 314th OSS, Little Rock AFB, Ark.
Staff Sgt. Nicklaus Reed, 26th OWS, Barksdale AFB, La.
Staff Sgt. John Rivera, 47th OSS/OSW, Laughlin AFB, Texas
Staff Sgt. Barney Roberts, 26th OWS, Barksdale AFB, La.
Staff Sgt. Timothy Roser, 7th OSS, Dyess AFB, Texas
Staff Sgt. Amber Ruiz, 20th ASOS, Ft. Drum, N.Y.
Staff Sgt. John Sheedy, AFELM/JSOC, Pope AFB, N.C.
Staff Sgt. Jennifer Silveira, 50th OSS/OSW, Schriever AFB, Colo.
Staff Sgt. Bradley Snyder, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Jason Stewart, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Deanna Stoddard, 26th OWS, Barksdale AFB, La.
Staff Sgt. Randy Sunga, 1st OSS/OSW, Langley AFB, Va.
Staff Sgt. John Tarver, 25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. Tonya Trythall, 97th OSS, Altus AFB, Okla.
Staff Sgt. Jonathan White, 26th OWS, Barksdale AFB, La.
Staff Sgt. Robert Yeas, 26th OWS, Barksdale AFB, La.

WEATHER FORECASTER APPRENTICE COURSE
Staff Sgt. Christopher Bridgham, 25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. James Lopez, 25th OWS, Davis-Monthan AFB, Ariz.
Staff Sgt. Steven McConnell, USAFE OWS, Sembach AB, Germany
Staff Sgt. Richard Wolk, 127th WF, Forbes Field, Kan. (ANG)
Staff Sgt. Clinton Woodford, 181st WF, Carswell Field, Texas (ANG)
Senior Airman Peggy Meeks, 195th WF, Channel Islands, Calif. (ANG)
Airman 1st Class Mandi Bell, 159th WF, Camp Blanding, Fla. (ANG)
Airman 1st Class Yvette Benavides, USAFE OWS, Sembach AB, Germany
Airman 1st Class Elisa Bengoa, 15th OWS, Scott AFB, Ill.
Airman 1st Class Nicole DeMarco, 140th WF, Willow Grove ARS, (ANG)
Airman 1st Class Laura Fairbanks, 26th OWS, Barksdale AFB, La.
Airman 1st Class Christa Gidderis, 202nd WF, Otis ANGB, Mass. (ANG)
Airman 1st Class Justin Hallen, 208th WF, St. Paul, Minn. (ANG)
Airman 1st Class Charles Higgins, USAFE OWS, Sembach AB, Germany
Airman 1st Class Tom Lloyd, 195th WF, Channel Islands ANGS, S.C. (ANG)
Airman 1st Class Donald Moore Jr., 110th WF, Bridgetown, Mo. (ANG)
Airman 1st Class Megan Murphy, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Armando Muscaritolo, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Kristin Noll, 203rd WF, Ft. Indiantown Gap, Pa. (ANG)
Airman 1st Class Adam Preston, 164th WF, Rickenbacker, Ohio (ANG)
Airman 1st Class Neel Rodgers, 26th OWS, Barksdale AFB, La.
Airman 1st Class Therese Schmidt, 26th OWS, Barksdale AFB, La.
Airman 1st Class Anna Soliz, 195th WF, Channel Islands, Calif. (ANG)
Airman 1st Class Nathan White, 200th WF, Sandston, Va. (ANG)
Airman 1st Class Caroline Williams, 127th WF, Forbes Field, Kan. (ANG)
Airman Douglas McQuern Jr., USAFE OWS, Sembach AB, Germany
Airman Matthew Richey, 28th OWS, Shaw AFB, S.C.

JUMPMASTER QUALIFICATION
Staff Sgt. John Hawkins, 181st WF, Carswell ARB, Texas (ANG)

DOPPLER RADAR COURSE
Staff Sgt. John Bathon, USMC Cherry Point MCAS, N.C.
Staff Sgt. John Bondi, 28th OWS, Shaw AFB, S.C.
Staff Sgt. Jennifer Chance, 22nd OSS/OSW, McConnell AFB, Kan. (Distinguished Graduate)
Staff Sgt. Alec Ferguson, 21st OSS/OSW, Peterson AFB, Colo.
Staff Sgt. James Lumpkin, 97th OSS/OSW, Altus AFB, Okla.
Staff Sgt. Anthony Roles, 314th OSS/OSW, Little Rock AFB, Ark.
Staff Sgt. Troy Walker, 78th OSS/OSW, Robins AFB, Ga.
Senior Airman Bobby Baum, 46th WS, Eglin AFB, Fla.
Senior Airman Donald Johnson, 27th OSS/OSW, Cannon AFB, N.M.

NTFS MANAGERS COURSE
Tech. Sgt. John Carroll, 1st OSS/OSW, Langley AFB, Va.
Tech. Sgt. Brian Hearn, 37th OSS/OSW, Lackland AFB, Va.
Staff Sgt. Christopher Dunstone, 8th OSS/OSW, Kunsan AB, Korea
Staff Sgt. Thomas Hauser, 436th OSS, Dover AFB, Del.
Staff Sgt. Andrew Kowal, 436th OSS/OSW, Dover AFB, Del.
Staff Sgt. Catherine Lee, 305th OSS/OSW, McGuire AFB, N.J.

AIR WAR COLLEGE
Lt. Col. William George, USAF Academy, Colo. (non-resident program)

AIR COMMAND AND STAFF COLLEGE
Maj. Kurt Brueske, USAF Academy, Colo. (non-resident program)

NCO ACADEMY
Tech. Sgt. Roberto Diaz Jr., 51st CBCS, WSSC-East, Robins AFB, Ga.
Tech. Sgt. Kevin Josephson, 17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Bert Kelley, 51st CBCS, WSSC-East Robins AFB, Ga.
Tech. Sgt. Willis Nelson, 436th OSS, Dover AFB, Del.
Tech. Sgt. Huy Vu, 17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Erik Waugaman, 17th OWS, Hickam AFB, Hawaii
Tech. Sgt. Kevin Wendt, AFCCC, AFWA, Asheville, N.C. (Distinguished Graduate)

AIRMAN LEADERSHIP SCHOOL
Staff Sgt. Jeremy Green, 51st CBCS, WSSC-East, Robins AFB, Ga.
Staff Sgt. Steven Johnsen, 51st CBCS, WSSC-East Robins AFB, Ga.
Staff Sgt. April Owens, 97th OSS/OSW, Altus AFB, Okla.
Senior Airman Eric Cameron, HQ AFWA, Offutt AFB, Neb.
Senior Airman Heinz Disch, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Senior Airman Jennifer Dowell, Det.1, 18th WS, Fort Eustis, Va. (with honors)
Senior Airman Robert Lee, HQ AFWA, Offutt AFB, Neb.
Senior Airman Trotijoseph Lee, 436th OSS/OSW, Dover AFB, Del.
Senior Airman Michelle Robertson, HQ AFWA, Offutt AFB, Neb.
Senior Airman Yaphet Rodriguez, Det. 1, 18th WS, Fort Eustis, Va.

ANG Promotions

Promotion to Lieutenant Colonel:
Timothy Schott, 121st WF, Andrews AFB, Md.

Promotion to Major:
Kenneth Campbell, 105th WF, Nashville, Tenn.
Anthony Watkins, 105th WF, Nashville, Tenn.

Promotion to Captain:
Roderick Coronel, 210th WF, March ARB, Calif.

Promotion to Senior Master Sergeant:
Greg Culp, 113th WF, Terre Haute, Ind.

Promotion to Master Sergeant:
Marvin Akers, 181st WF, Carswell ARB, Texas
Curtis Garner, 181st WF, Carswell ARB, Texas
Richard Webb, 126th WF, Milwaukee, Wis.

Promotion to Technical Sergeant:
Mark Blevins, 165th WF, Louisville, Ky.
Carlos Coronado, 210th WF, March ARB, Calif.
Anthony Gomez, 116th WF, Camp Murray, Wash.
John Steele, 131st WF, Barnes ANGB, Mass.

Coins

General's Coins
Steve Long, 11th OWS, Elmendorf AFB, Alaska
Roy Metcalf, 3rd ASOS/WE, Ft. Wainwright, Alaska
Maj. Richard Benz, 30th WS, Vandenberg AFB, Calif.
1st Lt. Melissa Parry, 11th OWS, Elmendorf AFB, Alaska
Tech. Sgt. Don Gossel, 354th OSS/OSW, Eielson AFB, Alaska
Tech. Sgt. Scott Nyeh, 11th OWS, Elmendorf AFB, Alaska
Tech. Sgt. Carter Wirtz, 3rd ASOS/WE, Ft. Wainwright, Alaska
Tech. Sgt. Todd Thurman, 354th OSS/OSW, Eielson AFB, Alaska
Staff Sgt. Dana Baucom, 354th OSS/OSW, Eielson AFB, Alaska
Staff Sgt. Aaron Downing, 3rd ASOS/WE, Ft. Wainwright, Alaska
Staff Sgt. Ed Jackowski, 11th OWS, Elmendorf AFB, Alaska
Senior Airman Darryl Ford, 354th OSS/OSW, Eielson AFB, Alaska
Senior Airman Brian Kendall, 3rd ASOS/WE, Ft. Wainwright, Alaska
Airman 1st Class Ariana Wallace, 11th OWS, Elmendorf AFB, Alaska
Airman 1st Class Emily Williams, 30th WS, Vandenberg AFB, Calif.

Chief's Coins
Master Sgt. Stephen LeBrun, 30th WS, Vandenberg AFB, Calif.
Master Sgt. James Williams Jr., 3rd ASOS/WE, Ft. Wainwright, Alaska
Tech. Sgt. Robbie Ellis, 614th SOPG, Vandenberg AFB, Calif.
Tech. Sgt. Dan Gossell, 354th OSS/OSW, Eielson AFB, Alaska
Airman 1st Class Sara Klobucar, 11th OWS, Elmendorf AFB, Alaska
Airman 1st Class Emily Williams, 30th WS, Vandenberg AFB, Calif.

Pentagon Coins:
Lt. Col. Keith Chan, 30th WS, Vandenberg AFB, Calif.
Lt. Col. Jay Fitzgerald, 11th OWS, Elmendorf AFB, Alaska
Maj. Scott Saul, 30th WS, Vandenberg AFB, Calif.
1st Lt. James Ray, 3rd ASOS/WE, Ft. Wainwright, Alaska
2nd Lt. Pedro Gonzalas, 354th OSS/OSW, Eielson AFB, Alaska
Tech. Sgt. Allen Souders, 3rd OSS/OSW, Elmendorf AFB, Alaska
Senior Airman Chris Leblo, 3rd OSS/OSW, Elmendorf AFB, Alaska

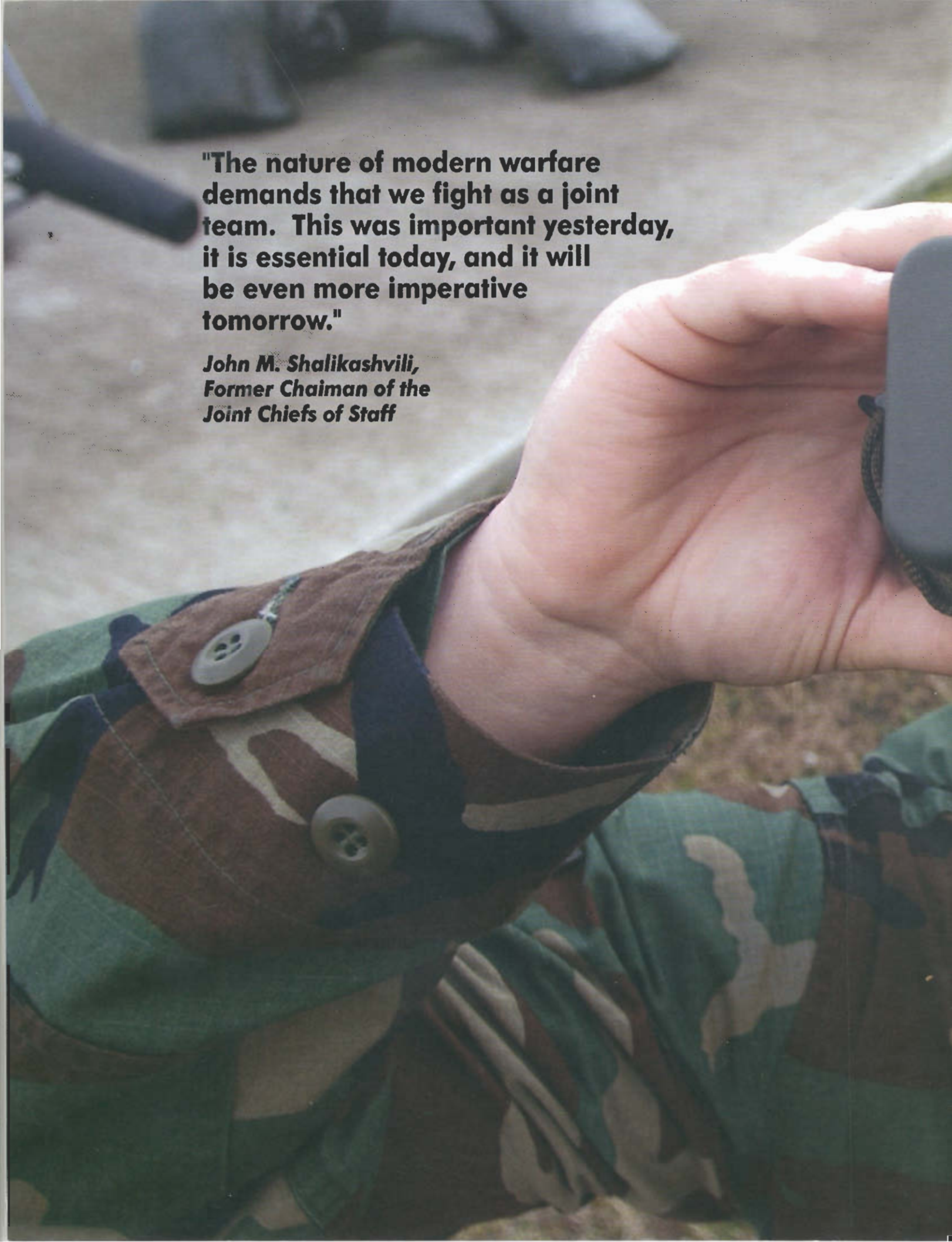
IMA Vacancies at AFWA

The Air Force Weather Agency has three Individual Augmentee vacancies for officers at the Captain or Major level. All three are major (O-4) positions.

If you like challenges, want to broaden your background providing weather information for the warfighter, master operational backup of NCEP centers, and desire a reserve assignment where you can grow beyond major, AFWA is the place for you! You need experience in one or more of the following to qualify:

Weather operations (space or terrestrial)
Numerical modeling
Training development – especially distance learning
Advanced Academic Degree in Atmospheric Science (synoptic or dynamic meteorology, space physics, or numerical meteorological modeling)

To view vacancies for AFWA, please log in to the vMPF, AFPC Secure site and go to "Reserve Vacancies." For more information, contact Col. Beth McNulty at beth.mcnulty@afwa.af.mil or beth.mcnulty@noaa.gov. Or you may contact Tech. Sgt. Cynthia Farmer (cynthia.farmer@afwa.af.mil) at DSN 272-8279 CMCL 402-292-8279 or Master Sgt. Rachel Cox (rachel.cox@afwa.af.mil) at DSN 272-8280 CMCL 402-292-8280.



"The nature of modern warfare demands that we fight as a joint team. This was important yesterday, it is essential today, and it will be even more imperative tomorrow."

John M. Shalikashvili,
Former Chaiman of the
Joint Chiefs of Staff