Observer

The Magazine for Air Force Weather

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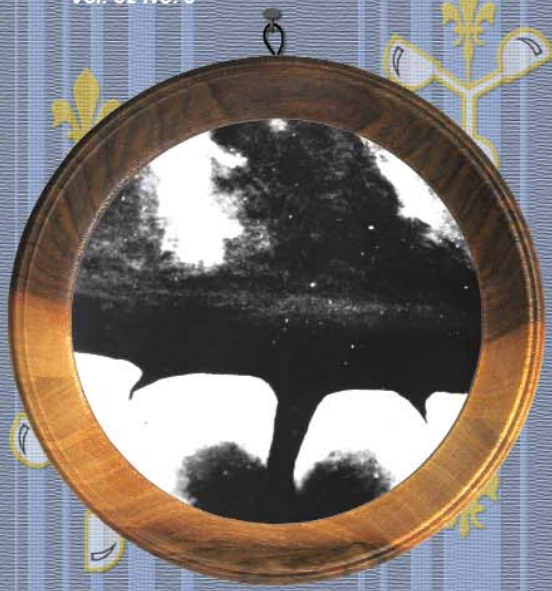

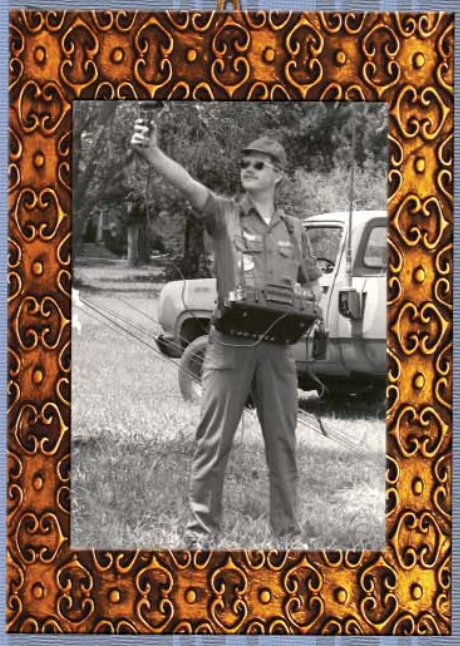

Observer
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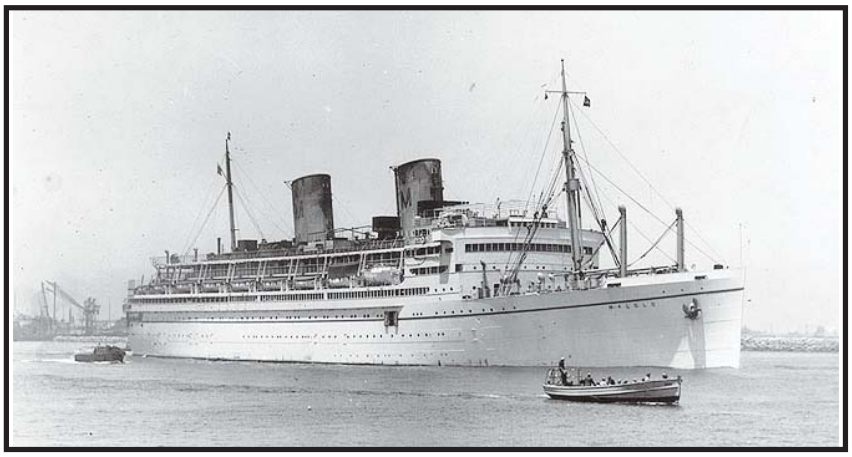
What's inside:



The S.S. *Matsonia*, a passenger liner that was converted to a troopship in early 1942.

A long journey 12

And you thought the trip to Grandma's with your kids was long? The beginnings of the 15th Weather Squadron and the challenges of travelling across Australia during World War II were daunting.

Delta rocket launch carrying Tiros III satellite payload 15

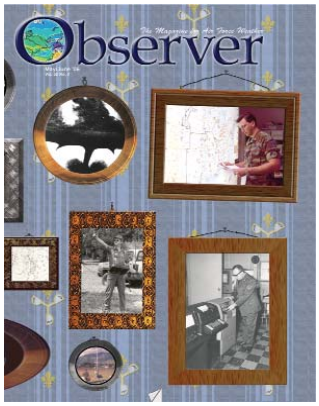
Step back in time with this article from July 12, 1961, detailing the launch of the Tiros III weather satellite.

Columbia takes giant step 16

It was 25 years ago when the first space shuttle successfully rocketed into the clear skies. Air Force forecasters were essential in the launch mission's success

On the Cover

Air Force weather has a rich history that can be traced back to the early 1800's. As Air Force weather constantly evolves to meet the ever changing needs of the warfighter, this issue features a look back at some significant milestones of the men and women who made weather history. This photo illustration captures moments throughout Air Force weather history as a "portrait of the past." *Photo illustration by Ms. Jodie Edwards and Mrs. Eileen Williamson.*



Get Published!

We welcome story ideas. Please email submissions and ideas to Observer@afwa.af.mil. Here are a few ideas to help you discover the news within your unit:

- Major projects or implementations headed by your unit
- Deployment stories
- First or last-time events
- Major command-level awards
- Unit success or failure stories that affect the unit or organization as a whole (and how you grew from them)

If you're unsure about topics, keep an eye on the base newspaper. You'll see many stories have common themes. However, the stories should be of interest to the Air Force or Air Force weather.

Feel free to write the story yourself. Don't be self conscious; your story will go through an editorial chain. AFWA Public Affairs will ensure your unit receives the best publicity. Your story may be reformatted to fit the Observer, your local base paper, or other media outlets.

Submitting Photographs

- Use at least a 3.2 megapixel camera on the highest quality settings.
- Include information about what the photo depicts, names and ranks of people in the photos, and of the photographer.
- Send as many photos as possible to tell your story.
- Staged photos are less effective for telling your story.
- Multiple, candid, action shots provide the best result.

Questions?
Submissions?
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Past leaders shape future success

by Col. Michael Bedard
45th Weather Squadron
Patrick AFB, Fla.

As professionals in Air Force weather, we tend to focus on the technology and techniques of our trade. However, as important as these tools are, the most important factors are the people who develop and use them.

Yes, people really are our most valuable resources. Without people doing the mission day-in and day-out, no leader can accomplish the duty of leading units to organizational and mission success. We've seen many changes in technology over the years, all of which have helped us move forward in one way or another.

As technological leaders, we can't stand still if we want to improve how we provide relevant weather operations to our warfighters. Past leaders realized a complete effort required going "beyond the wall" presented by a challenge.

Leadership inspires people, at all levels of responsibility, to perform their daily duties and empowers them to take the next step to improve their processes for the future.

Without past leadership, we would not have received the improved technology we use today. The obvious follow-on statement is: we need continued leadership to meet the challenges we will see tomorrow. You can be a leader at any level. We even see that in the Air Force core value of 'Excellence In All We Do.' It applies to everyone. I have seen flight commanders jump in and "take the bull by the horns," and forecasters leading by example; both stepping up to help another team member get the job done. We must all remember to do the right thing.

Doing what's right usually means putting the needs of the organization ahead of individual needs and desires. This invokes another core value of 'Service Before Self.' Air Force weather team members are not only technical leaders but also operational leaders. At the 45th Weather Squadron, our vital mission is providing weather support to America's space program at Cape Canaveral Air Force Station and Kennedy Space Center.

Space shuttle launch and recovery is arguably the most weather-sensitive mission in the Department of Defense. Therefore, we must always strive to perform our operations perfectly today and do even better tomorrow. Fortunately, we have been blessed with some of the most talented and motivated meteorologists in Air Force weather.

> *"Without past leadership, we would not have received the improved technology we use today."*

Some recent examples of our contributions have included helping the 45th Space Wing launch an improved GPS satellite to provide better positioning data to all warfighters. As part of the larger wing team, each squadron member has their job to do. While that seems like a very basic statement, it is a reminder to know our job and don't wait around for someone else to do it. "Make it happen," as my Squadron Officer School instructor often said.

The 45th WS also helped NASA return to space with the Space Shuttle Discovery "Return to Flight" STS-114, the first of two RTF missions. Because the shuttle landed at Edwards AFB CA, four of our team members put aside personal needs and worked diligently, excitedly, and willingly, to bring Discovery back to KSC safely.

Doing the right thing may sometimes mean going on a short notice deployment to help the space shuttle or perhaps deploying and fighting the War on Terrorism. This time, their efforts received praise from the long-time shuttle ferry flight pilots as providing "the best ferry flight weather support ever seen!" Great teamwork and unity paid off again. Regardless of any "walls" they faced, the team persevered and completed the mission.

The unit developed this tremendous team work-ethic over many years, individually with personal pride, but also together in preparing for the 45th Space Wing Operational Readiness Inspection in May 2005. Knowing how each member fits into the mission is a great help to us and to the customer in accomplishing that mission.

Everyone has to be a team player. If not, leaders need to lead and coach them into that mindset. Everyone is an essential part of a successful mission. But, what works today may not always work for the increased technology of tomorrow. We must continuously strive to improve our operations and support to each mission. To do this, we should honor our past, be truthful with our capabilities today, and chart an honest course to make tomorrow even better. The words honor, truth, and honesty summon another core value of 'Integrity First.' It is the glue, which has helped warriors of yesterday and today attain excellence and put service before self.

You might be tired of reading about the Air Force core values. But, no apologies here. Those values are tried and true, and will help us perform the mission today, and should certainly guide our actions in all of our tomorrows. May you always give it your best, do the right thing, and remember, "100 percent effort is beyond the wall."

AFWA gets new commander

by Tech. Sgt. Claudette Hutchinson
HQ Air Force Weather Agency
Public Affairs
Offutt AFB, Neb.

Col. Patrick M. "Mike" Condray assumed command of the Air Force Weather Agency from Col. John M. Lanicci, at a ceremony on Offutt AFB, Neb. June 9.

Col. John D. Murphy, Acting Director of Weather, Washington D.C., presided over the ceremony.

During his speech, Colonel Murphy said he was proud of Col. Lanicci's accomplishments during his tenure and has no doubt Colonel Condray will be able to follow in his footsteps.

"I know of no one more qualified than Colonel Condray to take on this role. He will bring his own brand of leadership to AFWA. Make us all proud we know you will. It is a truly great day for AFWA, Air Force weather and the Air Force," said Colonel Murphy.

"I am greatly encouraged by the tremendous work that has been done to lay the foundation for us to build on," Colonel Condray said.

Colonel Condray comes to AFWA from Langley AFB, Va., where he served as the Chief, Weather Operations Division, Directorate of Aerospace Operations, Air Combat Command.

According to Colonel Condray, his immediate goal is to quickly learn everything about the multiple ways AFWA directly and indirectly impacts military decision making.

"This will be critical to the ultimate goal of helping AFWA focus our expertise and resources on where Air Force weather operations add the most value for our supported Air Force, Army, and Joint warfighters," he said.

The Colonel has been at the forefront of the weather community for more than two decades. He began his career in 1983 through the Reserve Officer Training Corps at Texas A&M as a weather officer. Colonel Condray has led teams and commanded weather detachments around the world, providing critical weather information for everything from combat missions to humanitarian relief efforts. He has served in numerous staff and scientific positions, including a position as an environmental analyst specializing in weather impacts on precision munitions employment.

"I have been involved in diverse missions in multiple theaters and in both weather and non-weather positions. This perspective, plus the unmatched knowledge found here in the halls of AFWA, will make for a great team!" he said.

AFWA's unique pool of subject matter experts provides a crucial foundation for Air Force weather operations worldwide.

"With his [Colonel Condray's] leadership [experience] he is well-postured to lead AFWA," said Colonel Murphy.

"This is a crucial moment in history. Our nation is grappling with the challenge of transforming to fight what some call "The Long War," said Colonel Condray.

Col. Patrick M. Condray, Air Force Weather Agency commander, addresses the crowd during his acceptance speech as the new commander of AFWA. Photos courtesy 55th Wing Multimedia Center.

"We can not afford to lose - and to win this war we must use all our resources both effectively and efficiently."

"My family and I are excited to be a part of Team AFWA and Team Offutt. As we move forward, we look forward to a bright future for AFWA. Let's make it happen!" said Colonel Condray.

(Left to right) Col. John D. Murphy, Acting Director of Weather, Col. John M. Lanicci, former AFWA commander and Col. Patrick M. Condray, new AFWA commander. Holding the flag is Chief Master Sgt. William Johnson, AFWA first sergeant. Photos courtesy 55th Wing Multimedia Center.

Col. Patrick M. Condray (right), new AFWA commander assumes command. Col. John D. Murphy, Acting Director of Weather (left) presided over the ceremony. Holding the flag is Chief Master Sgt. William Johnson, AFWA first sergeant. Photos courtesy 55th Wing Multimedia Center.

by Capt. Jeffrey Gipson
509th OSS/OSW
Whiteman AFB, Mo.

"Are you all okay up there, sir?"

"I don't know. We'll call you when this thing gets past us. We're taking shelter."

This is a conversation between an operational weather squadron and a combat weather team, no one in tornado alley wants to hear.

The severe weather season started with a low roar at Whiteman AFB, Mo., on March 12, 2006. Four confirmed tornadoes touched down over a period of five hours and within 10 miles of America's renowned stealth bomber fleet. Then the "bang" came. However, this was not from the tornado, but from the outstanding performance of the 509th OSS/OSW combat weather team at Whiteman AFB, Mo. and the 26th OWS, Barksdale AFB, La. This turned out to be one of the most concentrated and relentless severe tornado outbreaks for the midwest in recent memory.

The beginning; Saturday, March 11

5 p.m. CST

From the Whiteman CWT, forecaster Senior Airman Scott Etheridge and from the 26th Operational Weather Squadron, Senior Airman Stephen Patterson agreed about the threat of impending tornadoes for the following day and planned to issue a tornado watch the following morning.

6 p.m. CST (0000 Zulu Time)

Model data brought more concern as it showed further destabilization of the atmosphere into the afternoon and evening. With the permission of his lead forecaster, Senior Airman Robert Royals, 26th OWS forecaster, called the National Weather Service office at Pleasant Hill, Mo. to get their assessment of the situation. They were also anticipating an exceptional weather day.

Sunday, March 12

7 a.m. CST

The CWT's overnight 0600 Zulu model runs clearly showed no reprieve from their bleak assessments.

7:13 a.m. CST

The 26th OWS issued a Tornado Watch with complete concurrence of the CWT.

12 p.m. CST

A surface dryline was stretching southward through eastern Kansas and slowly pushing eastward with the approaching low. As the dryline became more pronounced over the next hour, supercell thunderstorms began to erupt along this boundary and push northeast toward Missouri.

1 p.m. CST

The morning's upper-air soundings, in conjunction with surface temperatures, verified the model forecast, Missouri was under an unstable atmosphere for severe weather, and these supercells were moving directly into the heart of this instability. Over the next few hours, they ripped across eastern Kansas and into western Missouri developing distinct hook echoes as they traveled the 160 miles to Whiteman AFB.

2:30 p.m. CST

It was clear one of those well-defined hook echoes was zeroed in on the base. Focused on their Open Systems Principal User Processor radars, CWT Deputy Flight Commander Capt. Jeffrey Gipson and OWS Regional Manager Tech. Sgt. Davie Lewis agreed on the tornado warning.

3:29 p.m. CST

From the tower cab, Senior Airman Dan Endris observed a funnel cloud skirting the northwest corner of the base, verifying the warning with 32 minutes of lead-time.

This first round of storms had the unfortunate effect of clearing the atmosphere of clouds, increasing surface heating and providing even more instabil-

3:29 p.m. CST, Sunday, March 12, 2006, looking to the northwest over the 509th Wing Headquarters, Whiteman AFB, Mo., a wall cloud with rotation prepares to form the first tornado of the day. Photo by Senior Airman Dan Endris

ity for the next batch of storms forming on the dryline still lagging to the west. By twilight, it became clear the day was not even close to being over.

6:30 p.m. CST

A particularly strong storm started to show signs of splitting 35 miles west of the base. After three volume scans, the two distinct convection cores became clear and the classically tornadic, right-moving storm was coming down U.S. Highway 50 toward Whiteman AFB with its hook echo growing more defined as it approached.

The CWT and the OWS agreed to issue the tornado warning as the slow-moving storm crept toward base. Shortly after hanging up phones, the OWS called back asking Whiteman to issue the warning - the OWS's dissemination tool had jammed and life-saving minutes of lead time would be lost during troubleshooting without immediate action. The transition was seamless and the warning was issued by CWT forecaster Staff Sgt. Kevin Mattingly.

Eight miles west of the base, the storm became caught up in the southwesterly steering flow and began to drift just north of base. NWS's post-storm assessments later showed it had a clear touchdown only five miles north of base, ultimately causing F3 damage on the Fujita scale.

The adrenaline high from this near miss quickly subsided as everyone realized the next hook echo was inbound and on pace for arrival in less than an hour. After discussion with Tech. Sgt. Lewis, Capt. Gipson updated 509th Bomb Wing Commander, Brig. Gen. Christopher Miller, on the situation. On the CWT's recommendation Brig. Gen. Miller ordered the warning remain active with the sirens sounding to avoid confusion on the base by sounding an all clear 20 minutes before another warning would be issued.

As the last supercell approached, it threw down two-inch hail and a 52-knot wind gust. Then, after a stroke of lightning, Master Sgt. S. Todd Simmons, CWT Non-Comissioned Officer in Charge asked Capt. Gipson , "Does that look like a rain shaft to you?"

As they ran back to the CWT counter Capt. Gipson had Staff Sgt. Mattingly transmit the tornado observation, Capt. Gipson picked up the OWS hotline as it rang. "Are you all okay up there, sir?" asked Senior Airman Royals.

"I don't know. We'll call you when this thing gets past us. We're taking shelter," the Capt. answered.

Once the winds calmed down, CWT leadership went to the flightline to check on the B-2 hangars; all were intact. This potential multi-billion dollar disaster had luckily been avoided. The assessment later revealed F2 damage barely two miles south of base. This second warning was out for just over an hour and verified two separate tornadoes.

In the aftermath of this event, the reason for success clearly stood out: communication between the OWS and CWT was seamless and fostered good coordination between both parties in their responsibilities.

Ultimately the investment made in team building through face-to-face interaction during OWS/CWT visits and Regional Weather Conferences paid huge dividends through the outbreak. The teamwork between 26th OWS and the Whiteman CWT provided full desired lead times during four separate tornadoes in close proximity to more than 7,500 base personnel and family members, as well as over $46 billion in taxpayer assets.

All were given ample time to seek shelter and there were no injuries on base or aircraft left exposed to the hail and high winds. At the end of a very long day, the OWS/CWT team were able to chalk up a victory.

Airman fights battle close to home

By Capt. Noel Keene
1st Weather Squadron
Fort Lewis AIN, Wash.

This Airman has been deployed throughout the world to fight the enemy and defend the United States; however, his biggest challenge came when he had to fight his fiercest enemy closer to home; he was diagnosed with cancer.

He is Senior Airman Lawton Echeverri, 1st Weather Squadron forecaster at Fort Lewis, Wash. Airman Echeverri's journey in the Air Force began in 2001 when he left Costa Rica and began basic training at Lackland AFB, Texas. His intentions were pure: serve the United States honorably as many others before him have, including his grandfather who was a B-17 bombardier in World War II. His first duty station was Davis Monthan AFB, Ariz., where he served as a weather forecaster in the 25th Operational Weather Squadron. Hoping for a little more excitement as an Army support weather forecaster, he moved to Fort Lewis, Wash., in the beautiful Pacific Northwest, home of the I Corps and the first two operational Stryker Brigade Combat Teams. Shortly after arrival, Airman Echeverri, known to most as "Ech," volunteered to deploy to Bagram AB, Afghanistan in support of Operation Enduring Freedom. While there, he was forward deployed to Forward Operating Base, Salerno, and got his first taste of the expeditionary Air Force. As a weather forecaster, he briefed Army and Marine pilots around-the-clock in surroundings that were less comfortable than many of the larger bases.

Within months of redeployment to Fort Lewis, Wash., Ech volunteered to deploy again, this time for eight months in support of the 1st Brigade, 25th Infantry Division Stryker Brigade Combat Team, Mosul, Iraq. The mission in Mosul differed from Bagram in that Ech would be briefing ground forces commanders and UAV crews with occasional helicopter support, instead of primarily aviation support like Afghanistan. An uncharacteristicly active dust storm season, along with high insurgent activity, prompted Army and Air Force commanders to align Ech with a separate brigade element in a remote location. Working one month in austere conditions, Ech briefed Army pilots and increased situational awareness in a locale where typical Army support personnel don't venture.

Everyone has their own war account in the post-9/11 military, and while Ech's 365 days of deployment were challenging in a unique way, the challenge took a turn after Ech redeployed back to the states. After enjoying some leave in his native Costa Rica and returning to Washington with some unfamiliar pain, doctors at Madigan Army Medical Center delivered a phrase more frightening than incoming mortars - "you have cancer." Within one week of the diagnosis, he was subject to the initial surgery. Afterward, Ech began the long road of treatment including CAT scans and exhausting chemotherapy. A side effect of the chemo is hair loss, a path which members of Ech's unit and friends chose to take with him. Some people in the unit were fortunate, or maybe unfortunate, because they already had no hair. Therefore, they were able to relate to Ech. Those with locks intact, including a 1st WS wife and some Army cohorts, decided to shave their heads in solidarity. Ech had the honor of shearing each person, and the joy on his face was contagious throughout the entire unit.

Although his cancer is now under control and his chemotherapy treatments have ended, he still has a large operation pending to remove any remaining traces of the disease. In the meantime, he is on limited duty status, but for Ech that means helping the unit during a week-long move of operations and equipment to a new building. He wouldn't have it any other way, and it's a privilege to serve with an Airman like Ech. The 1st Weather Squadron is closer than ever, and the reason for that is not Ech's cancer, but his dedication and fierce upholding of the Air Force Core Values.

Senior Airman Lawton "Ech" Echeverri, seated in the center of the photo, is surrounded by members of the 1st Weather Squadron, a 1st WS wife and some Army cohorts who all shaved their heads in support of Ech's battle. Courtesy photo.

Looking Back:

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

Although the Army Air Corps Weather Service didn't exist until July 1, 1937, the military can trace its roots much deeper. The Surgeon General of the U.S. Army in 1814 directed hospital surgeons to keep records of the weather, a tradition that continued and expanded with his successors. During those early days, the observers' only instruments were thermometers, wind vanes and determination. The medics were ordered to keep weather diaries for use in establishing the relationship between weather and disease and the effects of climate on troop health and morale.

Prior to that, from 1803-1805, Captains Meriwether Lewis and William Clark included thermometers among their equipment for their westward journey. While they relied on different tribes to help them endure the extreme weather, they also collected climate information in their journals until the last thermometer broke near Oregon.

The weather observations collected under the direction of the Surgeon General of the U.S. Army led to Congress establishing the position of "Meteorologist to the U.S. Government" in 1842 and assigning the position to the Surgeon General's office.

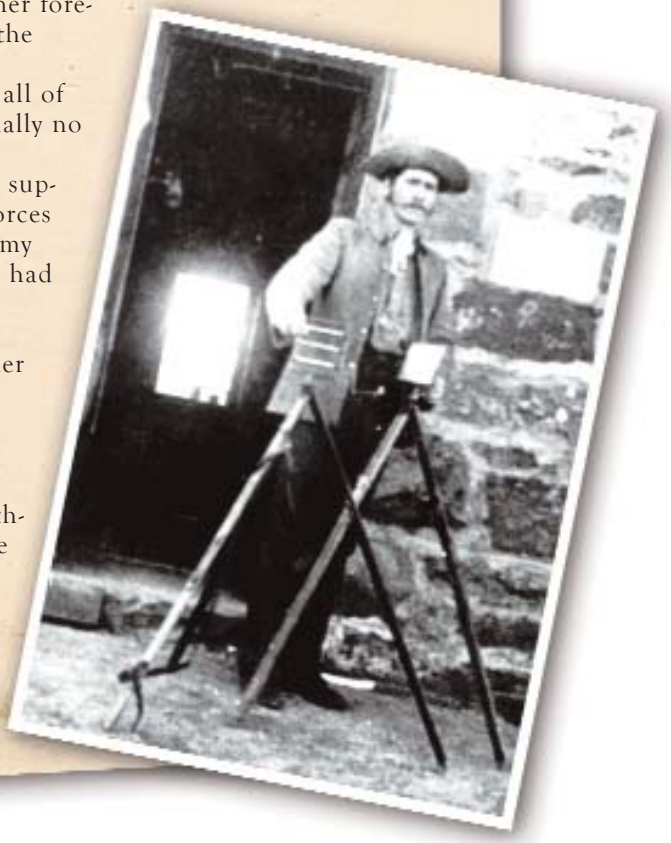
In 1870 the forecasting service began when President Ulysses S. Grant directed his Secretary of War to establish a national weather service. Congress formally tasked the War Department to take meteorological observations at military stations to warn of approaching storms on the northern lakes and seacoasts. Using a relatively new instrument, the telegraph, the Army Signal Service began operating a service to make weather observations and transmit storm signals. On Nov. 1, 1870 the Observer-sergeants of the Army Signal Service took and dispatched telegraph to Washington, D.C., the first simultaneous American weather observations at 22 cities from Cheyenne in Wyoming Territory to Boston, Mass., and from Key West, Fla., to Duluth, Minn., and on Feb. 24, 1871, the first published weather forecast, called a "probability," was issued by the Signal Service for use by the nation's newspapers.

In 1890, Congress established the U.S. Weather Bureau transferring all of the military equipment and personnel to the agency. As a result, vitrually no American military weather service existed from 1891 to 1917.

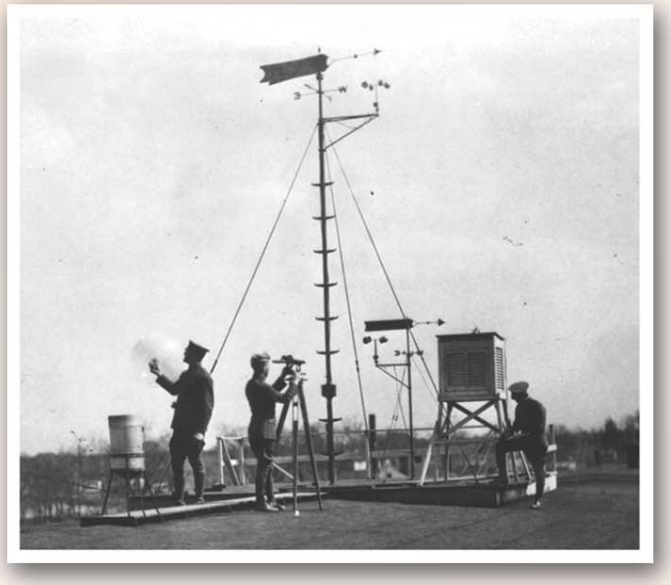
As America became involved in World War I, a request for weather support from the Chief Signal Officer of the American Expeditionary Forces in France led to the creation of the Meteorological Section in the Army Signal Corps. By the end of the war, approximately 500 weathermen had been trained by the Army.

As the number of trained individuals dwindled, Capt. Randolph P. "Pinkie" Williams worked to emphasize the need for a military weather service.

The Chief Signal Officer of the Army expanded the Signal Corps' Meteorological section in 1935 as a result of the many studies and reports provided by Capt. Williams. A committee chaired by the Secretary of War recommended that the Air Corps operate the weather service during times of war. This recommendation resulted in the forthcoming transfer of the Meteorological Section of the Signal Corps to the Army Air Corps. *(AFWA History Office contributed to this article.)*



Early Weather Observer - a U.S. Army Signal Service soldier of the later 1880s transmits the latest weather data by heliograph. (US National Archives Photo)



The photos on these pages represent Army Air Corps Weather Service (later Army Air Force Weather Service, and Air Weather Service) history during World War II. Detailed information about each photo is not available.

Photos Circa 1941-1946, courtesy Air Force Weather Agency History Office.

Above: Gen Haywood Hansell and Col. Curtis LeMay in front of a B-17 "Dry Martini."

To the Right: The photo to the right shows the weather forecasters from the 18th and 21st Weather Squadrons in England. Their forecast determined June 6, 1944 as the date for "Operation Overlord," D-Day Allied invasion of France.

1930's 1937 - Military Weather service transferred from Chief Signal Officer to the Chief Army Air Corps July 1, birthdate of the Air Weather Service. Activation of the 1st, 2nd, and 3rd Weather Squadrons, respectively, at March Field, Calif., Langley Field, Va., and Barksdale Field, La. More than 300 officers and enlisted members of the Army Air Corps and the Army Signal Corps formed the Army Air Corps Weather Service. They manned 40 weather stations – 35 stateside and five overseas - two in Hawaii, two in the Panama Canal Zone, and one in the Philippines.

1939 - The first class of seven enlisted men enter the first formal Army Air Corps weather observer school at Scott Field, Ill. Course duration was twelve weeks but later shortened to ten.

1940's 1940 - Captain Robert M. Losey was the first officer killed by hostile action while in the service of the U.S. during World War II. He was killed in Norway during a German air raid while acting as a military observer.

1941 - June 20, The Army Air Forces was established. The Weather Section, responsible for managing Army Air Corps Weather Service became part of the Training and Operations Division, Air Corps.

1941 - Oct. 20, First official Army Air Corps Weather Service long-range forecast, and long range forecast verification attempts.

1941 - Dec. 7, Five 7th Weather Squadron enlisted men were killed during the Japanese attack on Pearl Harbor and Hickam Field, Hawaii

1942 - Army Air Corps Weather Service began using map typing technique in preparing long-range forecasts for Allied invasion forces. Weather installations established at all U.S. overseas possessions in support of World War II operations.

1942 - August 21, First weather reconnaissance unit established.

1943 - First radiosondes installed at Army Air Force Weather Service units. In April, short-range forecast verification program was inaugurated by the AAF Weather Service.

1943 - July 27, Colonel Joseph B. Duckworth

The "father" of Air Weather Service, Capt. Randolph P. "Pinkie" Williams (right) talks to his ground crew while in a balloon basket at Scott Field, Ill. in April 1935. Also in the basket is Capt. Orvil A. Anderson.

and First Lieutenant Ralph O'Hair flew an A T-6 Texas trainer from Bryan, Texas, into the eye of a hurricane between Galveston and Houston. It was commonly recognized as first premeditated flight into a hurricane's eye.

1943 - Approximately 50 volunteer weathermen, officer and enlisted, completed an intensive combat training course in secret in Utah. Shipped to Austrailia in early 1944, they were assigned to the 15th Weather Squadron to form a nucleus of weather teams going ashore during initial assaults on Japanese-held islands in the southwest Pacific. *(Read "A Long Journey" on Page 13 to learn about the route followed by some of these men.)*

1944 - Weather forecasts determine June 6 for D-Day, Allied invasion of France.

1945 - AAF Weather Service given responsibility for Army weather support. AAF Weather Service forecasts determine Aug. 6 for drop of first atomic bomb on Hiroshima.

1945 - Sept. 2, Japan formally surrendered ending World Ward II.

1946 - AAF Weather Service units received first B-29s for weather reconnaissance mission.

1946 - March 13, Newly designated Air Weather Service is assigned to Air Transport Command.

1946 - June 30, AWS forecasts and B-29 weather reconnaissance determine June 30 for first atomic bomb test (Project Crossroads) at Bikini.

1947 - July 26, National Security Act establishes Air Force as a separate branch of service and makes it responsible through the AWS for the "provision of meteorological service to the Army, except Army meteorological ballistic data."

1947 - Oct.19, First low-level penertration of a hurricane by AWS WB-29 aircraft.

1948 - AWS assigned to Military Air Transport Service.

1948 - First tornado forecast by AWS forecasters Major Ernest J. Fawbush and Capt. Robert C. Miller in March at Tinker AFB.

1949 - Global Weather Central organized at Offutt AFB, Neb., under AWS supporting Strategic Air Command.

A LONG JO

By Ms. Evelyn J. Dole
HQ Air Force Weather Agency
History Office

In the early months of World War II, weather support was unorganized and consisted of small groups of forecasters and observers attached to bombardment groups. In order to provide organization and centralization of weather services, the 15th Weather Squadron was created. The 15th Weather Squadron was established April 10, 1942, and activated at McClellan Field, Calif., April 22. With approximately 235 men, the squadron moved from McClelland Field to a staging area in the International Harvester Building in Oakland, Calif., June 16. Thus began the 15th Weather Squadron's long journey to the South Pacific. The following chronicles the journey of some of those men.

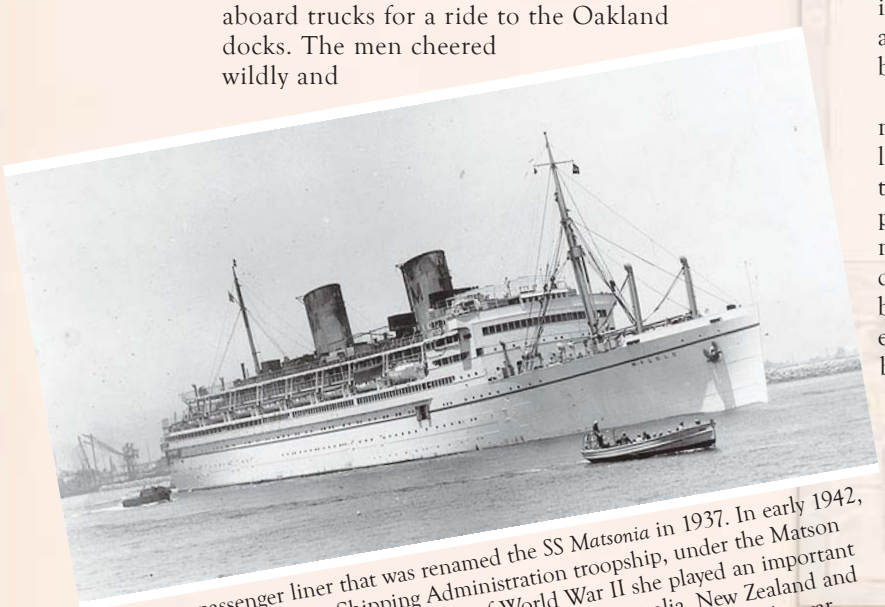
The evening of June 21, 1942, the men were loaded aboard trucks for a ride to the Oakland docks. The men cheered wildly and sang as they crossed the San Francisco Bay Bridge. After arriving at the pier, they lined up to await their orders to board the Matson liner *SS Matsonia*, a luxury cruiser that had been converted into a troop ship. They sailed just to the west of the Panama Canal Zone, joined a convoy of eight other vessels and proceeded southwestward for what was to be almost a month-long voyage. Because regular sea-lanes at this early period of the war were unsafe, the voyage took the convoy as far south as New Zealand where all of the convoy except the *SS Matsonia* and one escort vessel put into harbor at Auckland, New Zealand. The *SS Matsonia* with the 15th Weather Squadron continued across the Tasman Sea alone to Melbourne, Australia.

During the trip over, there were the usual rumors of submarines sightings, men falling overboard, and other unwarranted tall tales. The men raced atop deck to their assigned abandon ship stations for the lifeboat drill each day. Midway in the voyage, as they crossed the equator, the traditional "high jinks" occurred and a ceremony held by King Neptune's Court initiated the "rites of the deep" changing the landlubbers aboard from gollywogs to honored "shellbacks."

Staff Sgt. Chester T. Langan recalled during the voyage the men were using water faster than the evaporators could make fresh water from ocean water. Since the 15th WS was the only organized unit aboard, the men guarded all of the water taps to ensure no one was wasting water. Staff Sgt. Langan's duty station was the water taps in the officers' mess. Several of his fellow weathermen tried to buy his station assignment because, while everyone else was standing in line eating G.I. chow, he was eating at tables with tablecloths and silverware and ordered real dinners, lunches and breakfasts from the menu.

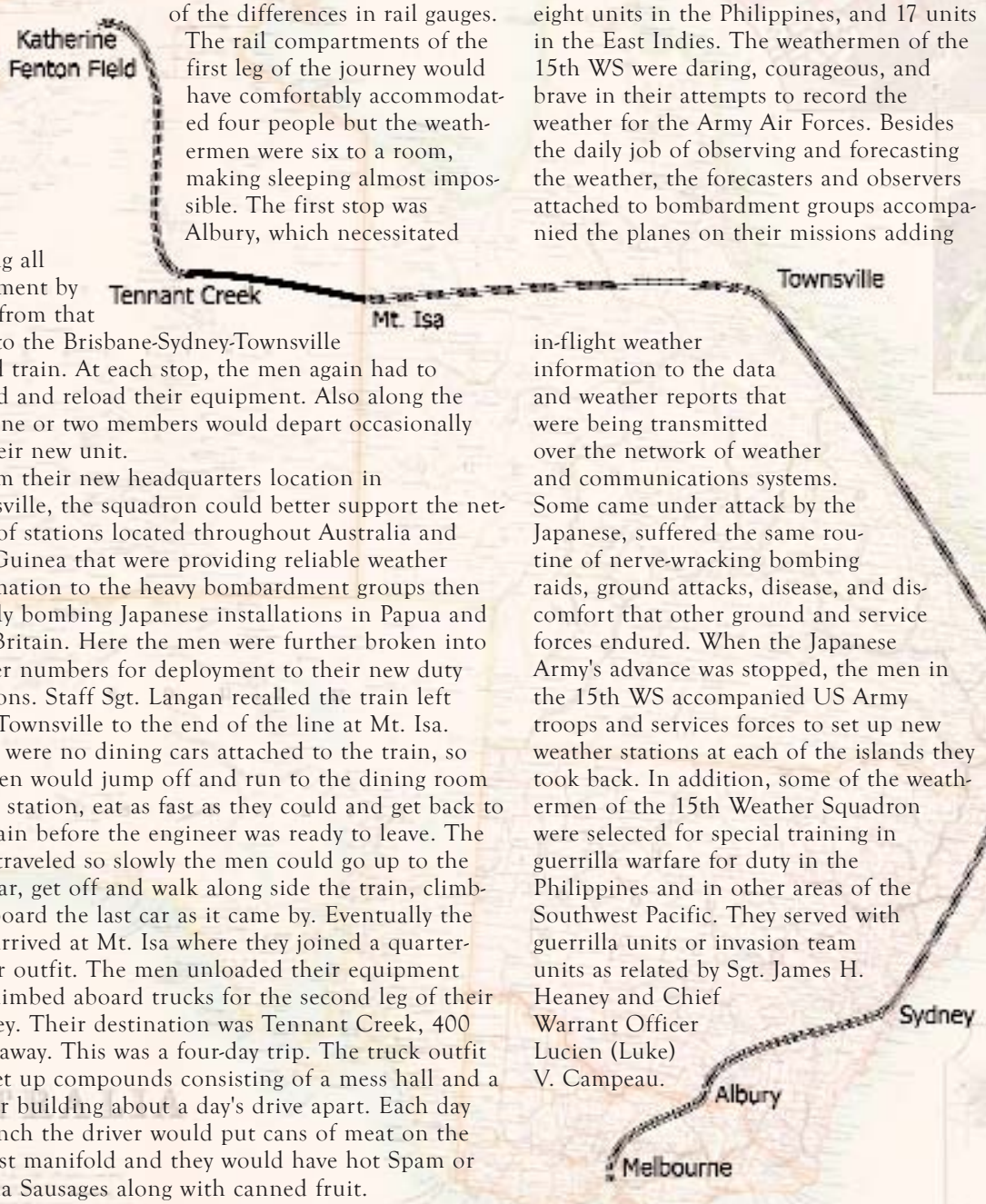
On July 16, 1942, the *SS Matsonia* docked and the men disembarked in Melbourne, Australia, two days later. After marching through the cobble stone streets, they arrived at the Melbourne Cricket Grounds and proceeded to set up camp in the stands. This was the middle of the Australian winter and it was cold bedding down. The men used newspapers as a lining between the blankets for insulation to stay warm, related Staff Sgt. John F. Whittemore. The 15th WS men began the last leg of their journey to their new duty stations after two weeks at the University of Melbourne where they had classes in Austrian history, geography, terrain, vegetation, climate, weather, and weather codes.

In the later part of July and first part of August, the Headquarters in Melbourne were busy sending men to different weather locations in Australia stretching from Melbourne to Cape York. About half went on a long rail trip north to Townsville, Queensland (approximately 1,000 miles). The trip these men and the other groups that traveled along the seacoast of this continent was as follows: At 1500 hours, the group assembled, loaded themselves



SS Malolo, a passenger liner that was renamed the SS *Matsonia* in 1937. In early 1942, she began service as a War Shipping Administration troopship, under the Matson Company's management. During the rest of World War II she played an important role in Pacific conflict's logistics effort, making trips to Australia, New Zealand and elsewhere in the southern Pacific, as well as to Hawaii, Guam and, after the war ended, to Japan. Photo courtesy of U.S. Naval Historical Center.

OURNEY



aboard trucks, and departed to the railway station. This trip lasted six days in three distinct laps, due to the changes in trains at the border of every Australian State because of the differences in rail gauges.

The rail compartments of the first leg of the journey would have comfortably accommodated four people but the weathermen were six to a room, making sleeping almost impossible. The first stop was Albury, which necessitated moving all equipment by hand from that train to the Brisbane-Sydney-Townsville bound train. At each stop, the men again had to unload and reload their equipment. Also along the way, one or two members would depart occasionally for their new unit.

From their new headquarters location in Townsville, the squadron could better support the network of stations located throughout Australia and New Guinea that were providing reliable weather information to the heavy bombardment groups then actively bombing Japanese installations in Papua and New Britain. Here the men were further broken into smaller numbers for deployment to their new duty locations. Staff Sgt. Langan recalled the train left from Townsville to the end of the line at Mt. Isa. There were no dining cars attached to the train, so the men would jump off and run to the dining room in the station, eat as fast as they could and get back to the train before the engineer was ready to leave. The train traveled so slowly the men could go up to the first car, get off and walk along side the train, climbing aboard the last car as it came by. Eventually the men arrived at Mt. Isa where they joined a quartermaster outfit. The men unloaded their equipment and climbed aboard trucks for the second leg of their journey. Their destination was Tennant Creek, 400 miles away. This was a four-day trip. The truck outfit had set up compounds consisting of a mess hall and a shower building about a day's drive apart. Each day for lunch the driver would put cans of meat on the exhaust manifold and they would have hot Spam or Vienna Sausages along with canned fruit.

After arriving at Tennant Creek, they boarded a narrow gauge train to Darwin. It resembled a toy tin-plated train with each car having only four wheels. The seats were metal benches running the length of the car. When the train reach a hill it would stop and unhitch half of the cars so the engine could make two smaller trips up the hill. Upon reaching Katherine, the men were met by a driver who took them to their final destination of Fenton Field. The 15th WS would have many more weathermen make much of the same journey before the war would end.

By the end of World War II, more than 719 weathermen were assigned to 21 units in Australia, 23 units in New Guinea, eight units in the Philippines, and 17 units in the East Indies. The weathermen of the 15th WS were daring, courageous, and brave in their attempts to record the weather for the Army Air Forces. Besides the daily job of observing and forecasting the weather, the forecasters and observers attached to bombardment groups accompanied the planes on their missions adding in-flight weather information to the data and weather reports that were being transmitted over the network of weather and communications systems. Some came under attack by the Japanese, suffered the same routine of nerve-wracking bombing raids, ground attacks, disease, and discomfort that other ground and service forces endured. When the Japanese Army's advance was stopped, the men in the 15th WS accompanied US Army troops and services forces to set up new weather stations at each of the islands they took back. In addition, some of the weathermen of the 15th Weather Squadron were selected for special training in guerrilla warfare for duty in the Philippines and in other areas of the Southwest Pacific. They served with guerrilla units or invasion team units as related by Sgt. James H. Heaney and Chief Warrant Officer Lucien (Luke) V. Campeau.

Information gathered for this article came from the following sources: Memoirs of CWO Lucien (Luke) V. Campeau, Sgt James H. Heaney, SSgt Chester T. Langan, CWO Alford L. Rushing, Staff Sgt. John F. Whittemore, and from the History of the 15th Weather Squadron, April 22, 1942-September 24, 1945.

15th Weather Squadron Locations in Australia

By June 14, 1942, the U.S. Army Air Forces had weather presonnel at the following Australian locations, all earmarked for assignment to the 15th Weather Squadron.

Observing Stations:
Alice Springs
Bankston
Birdum
Brisbane
Broome
Cairns
Ceduna
Charleville
Coen
Cooktown
Cunderdin
Darwin
Daly Waters
Hughes Field
Kalagoorlie
Oodnadatta
Rockhampton
Sidney
Tocumwal

Forecasting Stations:
Batchelor Field
Charters Towers
Cloncurry
Garbutt Field
Horn Island
Longbeack
Mareeba

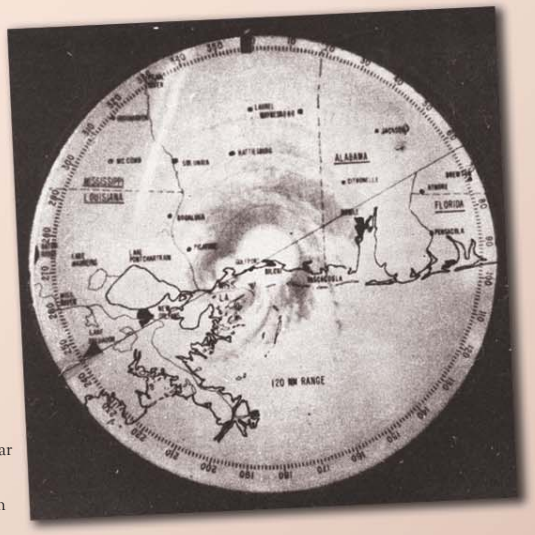
Forecasting Station in New Guinea:
Seven-Mile (Port Moresby)

By 1945, members of the 15th Weather Squadron were located at over 65 locations in Australia, New Guinea, Netherlands East Indies, New Britain, Trobriand, Admiralty Islands, and the Phillippine Islands.

January 1959: SERVICE INVENTOR Staff Sgt. Wilburn A. Rice, Det. 24 4th Weather Group, demonstrates the operation of an analog computer he designed at the White Sands Missile Range, N.M. Bothered by the time-wasting tedious mechanical computer used for low-level wind data collecting, he built this cheap, efficient and simple computer which has been accepted for use at the missile base. U.S. Air Force photo.

November 1963: Satellite tracking antenna is checked by installation specialists of the 1936th Communications Squadron and the 2861st Ground Electronics Engineering Installation Agency (GEEIA). The unit was recently installed at Lajes Field, Azores and represents what weather forecasters hope will be a significant advancement in weather forecasting. (L to R) Staff Sgt. Luther B. Sutton, 1936th , Mr. Robert Maulding, Burroughs Corp., technical representative, A2C Charles T. Roten, 2861st, and Staff Sgt. Richard A. Hardesty, team chief, 2861st. U.S. Air Force photo.

June 1970: Weather in the Apollo 13 recovery area is being shown to Brig. Gen. William H. Best, Jr., Air Weather Service vice commander, by Lt. Col. Robert H. Dowd, (center) assistant for meteorology to the Department of Defense Manager Space flight, and Col. Kenneth Mask (left), director DDMS. General Best visited the Manned Space-flight Center in Houston during the Apollo 13 mission. U.S. Air Force photo



October 1969: Hurricane Camille on the weather radar scope of Det. 22, 24th Weather Squadron, Keesler AFB, Miss., shows the storm extending as far east as Mobile, Ala., and as far west as Bogalusa, La. At the time of this photograph, the storm had stretched as far northward as Waynesboro, Miss., with the southern portion of Camille still in the Gulf of Mexico. The eye of the killer lady is just southwest of Gulfport, Miss. U.S. Air Force Photo

1950's 1950 - June 25, Beginning of hostilities in Korea. Within 24 hours, weather reconnaissance missions flew over Korea.

1950 - Fletcher's Ice Island discovered in Arctic by Ptarmigan weather reconnaissance flight.

1951 - Severe Weather Warning Center formally established at Tinker AFB, Okla.

1952 - Air Weather Service units reorganized to provide functional support according to needs to various major commands.

1954 - Joint (Air Force-Navy-Weather Bureau) Numerical Weather Prediction Unit begins operations at Suitland, Md.

1955 - VHF pilot-to-forecaster network established providing in-flight weather information.

1956 - First Weathervision (closed circuit TV) became operational. Weather balloon developed to extend AWS upper air probes to 100,000 feet.

1958 - Received first jet engine aircraft (B-47)

1958 - Headquarters AWS moves from Andrews AFB, M.D. to Scott AFB, Ill.

1959 - First extensive nationwide weather facsimile network inaugurated.

1960's 1962 - First simultaneous firings of meteorological rockets by AWS-operated U.S. Air Force rocketsonde network from four stations in the United States, Canada and Atlantic Ocean.

1963 - Installed first operationally-ready U.S. Air Force Automatic Picture Transmission at 3rd Weather Wing to receive local readout of cloud pictures taken by weather satellites.

1965 - Automated Weather Network operational.

1967 - AWS-operated magnetometer network operational – enhances Nation's space effort.

1967 - Newly designated National Weather Service, under Environmental Science Services Administration, is responsible for issuing air pollution advisories assigned to the Service's National Meteorological Center; fire weather forecasts extended to cover contiguous United States.

1968 - AWS provides support for Apollo VII and VIII, first manned Apollo space flights

1969 - AWS cited for support to Apollo moonshots including warnings of solar events, solar flare particle data, projections of event size and daily status.

1969 - New automatic digital weather switch activated at Carswell AFB, Texas.

1970's 1971 - Air Force Global Weather Central's Univac 418 computers phased out for disposition by Air Force Communications Service.

1973 - Direct drive facsimile from AFGWC to Pacific and European theaters fully operational.

1973 - National Weather Service purchases second generation radar (WSR-74).

1975 - The first "hurricane hunter" Geostationary Operational Environmental Satellite launched into orbit; early and close tracking of hurricanes reduces loss of life from such storms.

1976 - Real-time operational forecasts and warnings using Doppler radar evaluated by the Joint Doppler Operational Project, spawning third Generation Weather Radar (WSR 88).

1977 - Success of weather satellites causes elimination of last U.S. weather observation ship; real time access to satellite data by national centers advances hurricane, marine and coastal storm forecasts.

1979 - Nested Grid Model becomes operational; Global Data Assimilation System developed; Second Univac 1100/10 system deployed, connecting all Weather Service forecast offices.

Direct from the Archives: July 12, 1961

Delta rocket launch carrying Tiros III satellite payload

A21AX BJT
AMS BUDGET (600)
NIGHT LEAD SATELLITE
BY HOWARD BENEDICT

CAPE CANAVERAL, FLA., JULY 12 (AP)-A HURRICANE-HUNTER WEATHER SATELLITE WHIRLED INTO ORBIT TODAY TO PHOTOGRAPH AND PERHAPS LEARN THE CAUSE OF GIANT TROPICAL STORMS WHICH BREW IN THE 1961 SEASON.

THE NEW SATELLITE, TIROS III, WAS FIRED INTO A NEARLY PERFECT CIRCULAR ORBIT FROM CAPE CANAVERAL AND TRANSMITTED A SET OF 35 CLOUD PICTURES ON ITS INITIAL CIRCUIT OF THE GLOBE.

FIVE HOURS LATER, MISSILEMEN AT POINT ARGUELLO, CALIF., SUCCESSFULLY LAUNCHED THE FIRST MISSILE ALARM SATELLITE TO PASS OVER RUSSIA. CALLED MIDAS III, THE 3,500-POUND SPACE PACKAGE CARRIES INFRA-RED SENSORS TO DETECT THE EXHAUST OF A MISSILE THE INSTANT IT IS FIRED.

THE TWO SUCCESSES RAISED TO 45 THE NUMBER OF SATELLITES PLACED IN ORBIT BY THE UNITED STATES SINCE THE FIRST WENT ALOFT 42 MONTHS AGO.

THE 285-POUND TIROS III RODE SKYWARD IN THE NOSE OF A 92-FOOT THOR-DELTA ROCKET AND WITHIN TWO HOURS SETTLED INTO A TIGHT ORBIT RANGING FROM 425 TO 450 MILES ABOVE THE EARTH.

THE DRUM-SHAPED WEATHER-EYE DEMONSTRATED ALMOST IMMEDIATELY THAT IT IS READY TO TAKE PICTURES OF ANNA--THE NAME SELECTED FOR THE SEASON'S FIRST HURRICANE--WHEN, AND IF, SHE APPEARS.

SIGNALS FROM A STATION AT WALLOPS ISLAND, VA., TRIGGERED TWO TELEVISION CAMERAS IN THE SATELLITE AND THEY RELAYED PICTURES SHOWING CLOUD COVER FORMATION OVER NEWFOUNDLAND, THE GULF OF ST. LAWRENCE AND THE ST. LAWRENCE VALLEY REGION.

THOUSANDS OF SIMILAR PHOTOS TAKEN BY TWO EARLIER TIROS VEHICLES PROVED THE FEASIBILITY OF USING SATELLITES IN WEATHER FORECASTING. THE UNITED STATES HOPES TO HAVE AN OPERATION NETWORK OF ROBOT WEATHERMEN SPINNING THROUGH SPACE WITHIN TWO YEARS.

THE TIROS III LAUNCHING WAS PLANNED TO COINCIDE WITH THE SEASON DURING WHICH HURRICANES MOST FREQUENTLY FORM IN THE ATLANTIC AND CARIBBEAN. BECAUSE ITS INTENDED COURSE WILL VARY, THE SATELLITE WILL SNOOP ON THE HURRICANE BREEDING GROUND FOR ONLY ABOUT SIX WEEKS OF ITS EXPECTED THREE-MONTH LIFE.

THIS WILL COVER TWO PERIODS--THE FIRST TWO WEEKS OF OPERATION AND THE ENTIRE MONTH OF SEPTEMBER, USUALLY THE PEAK HURRICANE TIME.

THE CAMERAS ALSO WILL PHOTOGRAPH OTHER AREAS OF THE GLOBE DURING THESE WEEKS AND THROUGHOUT AUGUST. DR. F.W. REICHELDERFER, CHIEF OF THE U.S. WEATHER BUREAU, SAID USEFUL INFORMATION RECEIVE FROM THE ELECTRONIC WEATHERMAN CAN BE FUNNELED TO OPERATION WEATHER CHANNELS WITHIN THREE OR FOUR HOURS FOR USE IN PREDICTIONS.

A22AX

CLOUD COVER PICTURES SNAPPED OVER SOME FOREIGN COUNTRIES WILL BE FORWARDED TO PARTICIPATING WEATHER AGENCIES THERE FOR COMPARISON WITH GROUND OBSERVATIONS.

EACH WATER-GLASS-SIZE CAMERA IS DESIGNED TO TAKE 32 PICTURES ON EVERY 98-MINUTE ORBIT. STATIONS AT WALLOPS ISLAND AND SAN NICHOLAS, CALIF., COMMAND THE CAMERAS WHEN TO OPERATE--SO PROJECT OFFICIALS WILL BE ABLE TO OBTAIN PUNCTURE OF DESIRED WEATHER SYSTEMS IF THE SATELLITES IS SCHEDULE TO PASS OVER THEM.

PICTURES TAKEN IN REMOTE AREAS OF THE GLOBE WILL BE STORED ON MAGNETIC TAPE AND RELAYED WHEN THE SATELLITE IS NEAR ONE OF THE TWO PRINCIPAL GROUND STATIONS.

WILLIAM G. STROUD OF THE NATIONAL AERONAUTIC AND SPACE ADMINISTRATION STRESSED THAT HE MISSION OF TIROS III IS NOT TO DETECT A HURRICANE.

"IF WE FIND THE ANSWER, LATER WEATHER SATELLITES WILL BE ABLE TO SPOT THESE CONDITIONS AND LOCATE A HURRICANE BEFORE IT STARTS."

THE EXPERIMENT CONTINUES THE NEVER-ENDING SEARCH FOR BETTER DETECTION AND PERHAPS CONTROL OF THE DESTRUCTIVE STORMS. LAST YEAR'S HURRICANE DONNA CLAIMED 164 LIVES AND CAUSED DAMAGE IN EXCESS OF $400 MILLION.

TIROS, WHICH STANDS FOR TELEVISION AND INFRA-RED OBSERVATION SATELLITE, ALSO IS EQUIPPED WITH SEVERAL DEVICES FOR MAKING INFRA-RED OR HEAT-DETECTING STUDIES. THESE WILL CHECK THE AMOUNT OF HEAT THE EARTH RECEIVES FROM THE SUN AND THE AMOUNT IT RETURNS TO THE ATMOSPHERE. THIS HEAT EXCHANGE IS THE PRIME FORCE WHICH MAKES THE ATMOSPHERE CIRCULATE, CAUSING OUR WEATHER.

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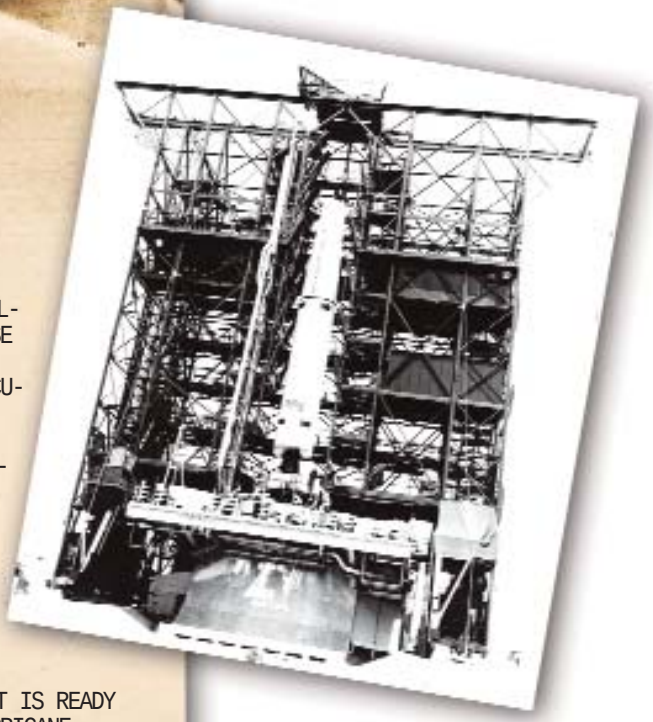
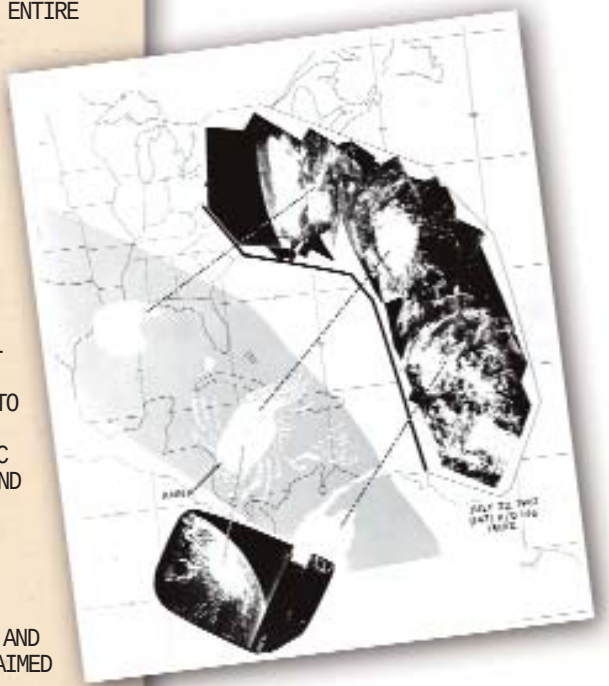


July 9, 1961: The first stage, a Thor booster, of a three stage Thor Delta launch vehicle for launching another satellite in the Tiros series is shown being lifted into the gantry at Cape Canaveral, Fla. Tiros is a weather observation satellite developed by RCA under contract for NASA. Photo courtesy of NASA.



Satellite imagery illustration from Tiros III in July 1961 shows the storm path of Hurricane Anna. Photo courtesy of the Air Force Weather Agency History Office.

From the Archives, May 1981: Columbia takes giant step

By Capt. N.R. Carron
Air Weather Service

From April 12-14, 1981, the United States' space program took a very large step. The Space Shuttle, Columbia, launched from Kennedy Space Center, Fla., and landed 54 hours later on the dry lake bed at Edwards AFB, Calif.

Prominent among those who played a key role in the mission were the many Air Weather Service members who planned for and provided operational support for that memorable first orbital flight test.

Operational weather support

Operational weather support began five days before launch when Air Force Global Weather Central began issuing surface and upper air planning forecasts for the Kennedy Space Center launch site.

Staff meteorologists from Det. 11, 2nd Weather Squadron, Patrick AFB, Fla., and OLA Det. 50, 2 WS, Johnson Space Center, Texas, began monitoring weather conditions around-the-clock for launch, landing, and emergency landing sites. Launch and mission directors received briefings twice daily increasing frequency as the launch date approached.

The five-day outlook from AFGWC called for scattered skies, light winds, with patchy fog for the launch. There was some concern that if the launch was delayed for any reason, thunderstorms would move into the area later in the day.

Good weather forecast

Weather criteria for this first launch were critical. Directors essentially wanted cloud-free conditions and no precipitation.

At launch minus 48 hours, AFGWC began a worldwide met-watch, and initiated planning forecasts (24-48 hours) for Edwards AFB, Northrup Strip, N.M., and the Kennedy Space Center. Forecasts remained essentially the same for launch, and the outlook for Edwards called for good weather as well.

AFGWC and staff meteorologists were a part of the pre-launch weather support machine. At Boulder, Colo., the Joint Space Environmental Services Center, comprised of National Oceanic and Atmospheric Administration and AWS personnel, received and processed data from AWS solar and geophysical observatories around the world. Tailored data and forecasts were relayed from the JSESC to the mission director at Johnson Space Center.

Launch minus 24

Environmental support activity peaked at launch minus 24 hours AFGWC continued its planning forecasts for the landing and contingency landing sites; NOAA and AFGWC continued space environment surveillance; staff meteorologists briefed terminal forecasts for launch, landing, and contin-

The mission patch for STS-1, the first Shuttle mission to fly in space.

At 3 seconds past 7 a.m. Eastern Standard Time, America's first Space Shuttle rose swiftly away from the Florida coast. Despite flying slightly higher than its planned trajectory, the vehicle performed up to expectations, with a flawless separation of the Shuttle's solid rocket boosters and external tank. After about 10 minutes of ascent, Columbia became the heaviest spacecraft and first winged craft to reach orbit. NASA photo

gency landing sites at the Kennedy and Johnson Space Centers; Patrick, Edwards and Northrup Strip began issuing plain-language bulletins forecasting weather conditions for critical time frames during the mission.

Det 21, 2nd WS, Edwards AFB, normally a limited duty station, increased to 24-hour operations, set up observations from the lakebed, and increased upper-air observations threefold.

The 24-hour forecast for Kennedy still called for good weather, and the further outlook for Edwards also called for good weather. However, not all weather was forecast to be favorable. Outlooks for Northrup Strip, the primary alternate to Edwards, was forecast not suitable for a shuttle landing; Kadena's outlook called for marginal conditions, thus eliminating Kadena as a contingency landing site in the event of an early deorbit.

The shuttle experienced computer problems on the original launch day, delaying the launch until April 12. Weather support did not slow down with all activities remaining in high gear.

Significant event

On April 10. At 4:34 Greenwich Mean Time, an exceptionally large solar flare began. The flare produced strong x-ray flux increases. The solar magnetic field near the site of the flare accelerated charged particles (protons and electrons) toward the earth at speeds approaching 40 percent the speed of light.

These potentially lethal particles began arriving at the earth before 5:30 GMT reaching a peak level at approximately 8:30 GMT. During the next 36 hours, the energy particle fluxes gradually decreased. The high energy fluxes were near background levels by 3 a.m. GMT April 12, nine hours before launch. Less energetic protons continued to be observed at launch time.

When the launch director at Kennedy Space Center gave thumbs-up, and Columbia launched at 12 p.m. GMT, April 12, launch weather was as forecast, scattered skies, no precipitation, light winds with patches of fog in the area. As soon as the shuttle launched, command and control shifted to the Johnson Space Center.

Although the launch went smoothly, and orbit was attained on schedule, problems were encountered in orbit because of the solar flare observed two days earlier. The large flux of charged particles from the solar flare produced an intense magnetic disturbance.

This disturbance reached the earth at approximately 4 a.m. GMT, April 13 (16 hours after launch), producing an intense magnetic storm. The magnetic storm, in turn, destabilized charged particles trapped in the earth's magnetic field, forcing them to dissipate their energy in the polar regions.

At 7 a.m. GMT, April 13, the participating charged particles seen by the NOAA-6 weather satellite were depositing energy into the earth's atmosphere. The high disposition rate of energy was accompanied by a bright aurora, which was visible as far south as Oklahoma and Louisiana in the continental United States.

The auroral activity heated the upper atmosphere producing increased atmospheric drag on the shuttle. During April 13th's high magnetic activity, the Flight Planning and Analysis Group at the Johnson Space Center observed tracking error rates amounting to over 400 meters per orbit. The cumulative error rate reached 25 kilometers before corrective action could be initiated.

Corrective Action

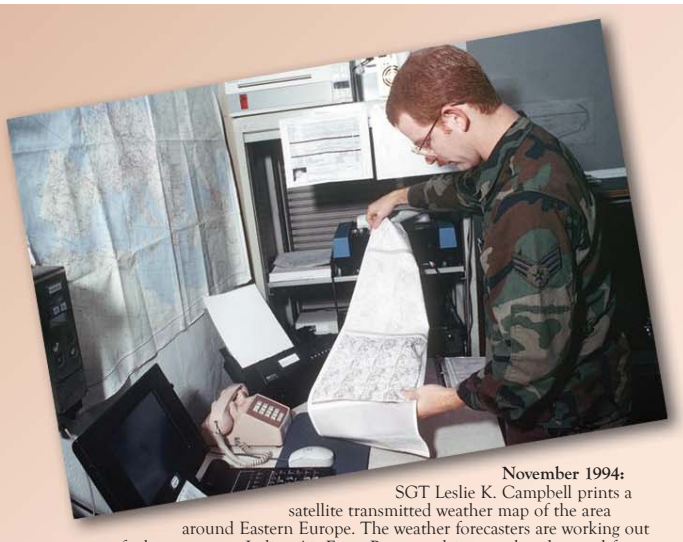
NASA chose corrective action including abandoning original plans to use climatological space data and contacting the JSESC for the additional real-time data necessary to update their atmospheric model. The data provided by the JSESC and AFGWC immediately reduced tracing errors to nominal limits.

Fortunately, the programmed flight profile carried Columbia into a low inclination circular orbit, and did not require extravehicular activity or spacewalking. At this orbit, the shuttle did not pass through the precipitation proton and electron sheets in the Polar Regions.

Had the shuttle been in a high-inclination polar orbit, the crew would have experienced hazardous doses of radiation, which would have been lethal if the crew had walked in space. Some future missions will use a high-inclination orbit.

Aside from the minor radiation hazard for the low inclination orbit and the drag problem, the rest of the orbit, deorbit and landing went smoothly. The landing weather was as forecast, and the lakebed was dry enough to sustain the shuttle's landing.

KENNEDY SPACE CENTER, FLA. – Making history with the first-ever launch on Independence Day, Space Shuttle Discovery rockets off the mobile launcher platform on Launch Pad 39B on mission STS-121. Continuing the tradition which began with Columbia in 1981, the 45th Weather Squadron provides weather support to America's space program including the Space Shuttle program. Photo by NASA Regina Mitchell-Ryall & Don Kight.



November 1994: SGT Leslie K. Campbell prints a satellite transmitted weather map of the area around Eastern Europe. The weather forecasters are working out of a hangar on an Italian Air Force Base supplying weather data and forecasts to flight crews in support of operations over Bosnia-Herzegovina. Photo by Sgt. Angela Stafford, U.S. Army

February 1990: Master Sgt. Stephen Lord provides lighting assistance as Staff Sgt. Ronald Kellerman checks weather conditions at a drop zone. Both men are members of Det. 3, 5th Weather Squadron, an Air Force unit which provides airborne weather teams to support the Army's XVIII Airborne Corps and subordinate units, including the 82nd Airborne Division, 1st Special Operations Command and the 7th Special Forces Group. Photo by Tech. Sgt. Hans Defner

August 1992: Damaged control tower and welcome sign at Homestead AFB, Fla. Hurricane Andrew drove through the air base damaging every building on the base. Photo by Master Sgt. James Ferguson

April 2003: US Navy, Aerographers Mate First Class Jenny Dowling and US Air Force First Lieutenant Richard Stedronski, a Weather Forecaster, jointly keep coalition aircraft crews updated on flying conditions, in support of operation IRAQI FREEDOM. Photo by Tech. Sgt. Janice H. Cannon, U.S. Air Force

1980's 1980 - Air Weather Service assigned responsibility for supporting U.S. Rapid Deployment Joint Task Force.

1980 - May 20, Mt. St. Helens volcano in Washington state erupts; weather satellites spot eruption; Federal Aviation Administration alerted.

1982 - March 29, El Chicon erupts in Mexico; NOAA polar weather satellites track its cloud movement as a possible global climate impact.

1983 - June 15, Sacramento Air Logistics Center signed a contract for the AN/FMQ-8 temperature-dew point set to replace the AN/TMQ-11.

1984 - Sep. 11-13, first official Air Transportable Mobile Unit dispatches to the Shasta-Trinity National Forest wildfire.

1985 - Air Force Global Weather Central's Satellite Data Handling System achieved Initial Operating Capability.

1986 - Air Force Global Weather Central implemented the Global Spectral Model on the Cray supercomputer.

1989 - U.S. assists clean-up efforts in San Francisco Earthquake area with mobile forecast unit.

1990's 1990 - AWS provided weather support to Operation DESERT SHIELD and subsequently Operation DESERT STORM in January 1991 – deploying approximately 475 people for weather support.

1990 - August 29, three AWS members were killed and one was seriously injured in a C-5 Galaxy crash at Ramstein AB, Germany.

1991 - April 1, AWS is designated as a field operating agency of the Air Force reporting directly to the Directorate of Weather in the Office of the Deputy Chief of Staff for Plans and Operations.

1992 - August 10-26, Homestead AFB, Weather Flight works around the clock providing forecasts of Hurricane Andrew to ensure personnel and aircraft safety.

1996 - Air Force Weather Information Network goes online allowing customers to download visualizations, charts, and meteorological satellite products.

1997 - Oct. 15, AWS re-engineers; redesignated Air Force Weather Agency and relocated from Scott AFB, Ill. to Offutt AFB, Neb.; Air Force Global Weather center inactivated.

1999 - Long hours of hard work and dedication by AFWA computer personnel lead to critical rollover dates such as September 9, 1999, October 1, 1999, January 1, 2000 and February 29, 2000 passing with little incident.

2000's 2000 - First TMQ-53 Tactical Meteorological Observing System sent to the field.

2000 - October, AFWIN is re-designed as the Joint Air Force and Army Weather Information Network.

2001 - Special Operations Forces Combat Weathermen deploy to Afghanistan in support of the Global War on Terrorism.

2003 - Special Operations Forces Combat Weather Center, 28th Operational Weather Squadron, and forecasters on the ground in Iraq provide critical battlespace awareness in support of one of the largest combat airdrops in history; more than 900 paratroopers jumped from 16 C-17 Globemaster III in to northern Iraq.

2006 - May 25, 1st Weather Group is reactivated at Offutt AFB, Neb.; Four CONUS operational weather squadrons re-aligned under 1st WXG by July.

Weather Warrior

Staff Sgt. Michael Humphreys
21st OSS/OSW, Peterson AFB, Colo.
Weather Technician
Years in Service: 6 ½ years
Hometown: Hopewell Junction, N.Y.
Role Model / Why? My grandfather; he worked hard his whole life with no regrets. He was a second father to me. He went to every baseball game I had, and took me to Yankee stadium for the first time. He was very influential in getting me to join the military to better myself. He also served in the army during WW2.
Hobbies: Snowboarding, mountain biking, and baseball
Most Memorable Air Force Weather Experience: My most memorable Air Force Weather experience was giving a no notice weather briefing to Air Force One. The president came to Colorado to supervise the response to Hurricane Rita at the NORTHCOM headquarters. It was really interesting to see how many people get involved when the president travels and how chaotic it can get.

Tech. Sgt. Toby Grubbs
341st OSS/OSW, Malmstrom AFB, Mont.
Assistant NCOIC
Years In Service: 16 years
Hometown: Colorado Springs, Colo.
Role Model / Why? My Air Force weather role model is my first station chief. He was a bit crusty, but he taught me fairness, justice, and to fight for your troops. I watched him choose his troops over career advancement. To me he was the ultimate SNCO, and a role model for me to follow in my career.
Hobbies: Hunting, fishing, skiing, camping, reading, religion and politics
Most Memorable Air Force Weather Experience: My most memorable experience happened in the summer of 2001 at Prince Sultan AB, Saudi Arabia. I was forecasting a severe dust storm that would endanger the recovery of the combat air patrol package deployed that day in support of Operation Southern Watch. I saw the beginnings of the storm on several satellite images, but the operational weather squadron and Joint Task Force South West Asia did not agree with my forecast. All the feelings that we have as weather forecasters went through my head at that moment as the Operations Group commander stood in front of me demanding an answer; I made the only choice I could. He recalled the mission, and cancelled all Southern Watch missions based on my forecast. I was now sweating blood, but was relieved when soon after the last aircraft landed the visibility went to nil. I won the operations group Sharp Saber award for my actions and was never more proud to be an Air Force weather forecaster.

Promotions

Promotion to lieutenant colonel:

Bryan Adams, 15th OWS, Scott AFB, Ill.
Kurt Brueske, HQ AFWA, Offutt AFB, Neb.
Steven Dickey, FAA, Washington, D.C.
Christopher Finta, 17th OWS, Hickam AFB, Hawaii
Mark Fitzgerald, 30th WS, Vandenberg AFB, Calif.
Scott Hausman, Det. 3 AFWA, Wright-Patterson AFB, Ohio
John Hennessey, Jr., 16th AF, Ramstein AB, Germany
Ronnie King, USSTRATCOM, Offutt AFB, Neb.
Shannon Klug, HQ USAF, Pentagon, D.C.
Mark Lajoie, 1st WS, Fort Lewis, Wash.
Scott Magnan, 11th OWS, Elmendorf AFB, Alaska
Mark Mesenbrink, 28th OWS, Maxwell AFB, Ala.
James Parsons, AFCWC, Hurlburt Field, Fla.
Paul Roelle, 7th WS Det. 11, Heidelberg, Germany
David Runge, HQ ACC, Langley AFB, Va.
David Schiffert, HQ PACAF, Hickam AFB, Hawaii
Donald Shannon, 10th CWS, Hurlburt Field, Fla.
Jeffrey Shull, HQ ACC, Langley AFB, Va.
Christopher Smithtro, AFIT, Wright-Patterson AFB, Ohio
Robert Swanson, Jr., USAFA, Colorado Springs, Colo.
Sabrina Taijeron, 25th OWS, Davis-Monthan AFB, Ariz.
Douglas Tunney, 88th OSS, Wright-Patterson AFB, Ohio
Richard Wagner, 18th AF, Scott AFB, Ill.
Shannon Walker, HQ USAF, Pentagon, D.C.
Derek West, MSD/AOW, Maxwell AFB, Ala.
Mark Yeisley, ACSC, Maxwell AFB, Ala.

Promotion to master sergeant:

Lois Anderson, 21st OSS, Peterson AFB, Colo.
Kenneth Asbell, 18th WS, Fort Bragg, N.C.
Mark Ayres, 86th OSS, Ramstein AB, Germany
Amado Azua Jr., 21st OWS, Sembach AB, Germany
Steven Babe, 28th OWS, Shaw AFB, S.C.
Steven Baldinger, 26th OWS, Barksdale AFB, La.
Glen Bordelon, 757th OSS, Creech AFB, Nev.
Connie Caldwell, 43rd OSS, Pope AFB, N.C.
Jessika Clarke, HQ AFWA, Offutt AFB, Neb.
David Doler, 17th OWS, Hickam AFB, Hawaii
Robert Easley, 28th OWS, Shaw AFB, S.C.
Thomas Erhart, Jr., HQ AFWA, Offutt AFB, Neb.
Steven Forshee, 28th OWS, Shaw AFB, S.C.
James Gibson, 1st ASOG, Fort Lewis, Wash.
David Granniss, 21st OWS, Sembach AB, Germany
Brian Hearn, 37th OSS, Lackland AFB, Texas
Martha Horner, 757th OSS, Creech AFB, Nev.
David Ivey, Det. 3, Illesheim, Germany
Timothy Legg, AFCCC, Asheville, N.C.
Robert Lenahan, 447th EOSS, Andersen AFB, Guam
Mark Millen, 607th WS, Camp Humphreys, Korea
Douglas Neal, HQ AFWA, Offutt AFB, Neb.
Vincent Petrasek, AFCCC, Asheville, N.C.
Terry Prime, 21st OWS, Sembach AB, Germany
Clarence Rice, 509th OSS, Whiteman AFB, Mo.
Jason Ronsse, 25th OWS, Davis-Monthan AFB, Ariz.
John Sanders, HQ AFWA, Offutt AFB, Neb.
Charles Schmidt, Det. 11, Heidelberg, Germany
Larry Shelvy, AFCWC, Hurlburt Field, Fla.
Chad Smith, 436th OSS, Dover AFB, Del.
Bennie Solberg, 28th OWS, Shaw AFB, S.C.
Brady Spiczka, 21st OWS, Sembach AB, Germany
Aaron Thomas, 45th WS, Patrick AFB, Fla.
Brian Thompson, 607th WS, Yongsan AB, Korea
Jeffrey Thurman, 89th OSS, Andrews AFB, Md.
Matthew Timmermann, 45th WS, Patrick AFB, Fla.
Chad Trausch, 15th OWS, Scott AFB, Ill.
Tracey Ulanski, HQ AFWA, Offutt AFB, Neb.
Shane Wagner, 18th WS, Fort Bragg, N.C.
Paul Walker, Jr, 25th OWS, Davis-Monthan AFB, Ariz.
Johnny Whitehead, 26th OWS, Barksdale AFB, La.
Scott Wilkins, AFCCC, Asheville, N.C.
Stephen Williams, 9th OSS, Beale AFB, Calif.
Musette Willis, 17th OWS, Hickam AFB, Hawaii
Yasmeen Wilson, 325th OSS, Tyndall AFB, Fla.
Carter Wirtz, 10th CWS, Fort Campbell, Ky.
Ralph Wright, AFCWC, Hurlburt Field, Fla.

Promotion to technical sergeant:

Gregory Adams, Det. 4, Holloman AFB, N.M.
Michael Anderson, 8th OSS, Kunsan AB, Korea
Eric Andrews, Det. 3, Illesheim, Germany
Stoney Bair, 325th OSS, Tyndall AFB, Fla.
Angela Banks, 10th CWS, Fort Campbell, Ky.
David Blankenship, 335th TRS, Keesler AFB, Miss.
Brian Bridges, 17th OWS, Hickam AFB, Hawaii
Christopher Bridgham, Det. 1, Camp Red Cloud, Korea
James Brown, 75th OSS, Hill AFB, Utah
Nicky Brown, 335th TRS, Keesler AFB, Miss.
Joshua Buck, 7th OSS, Dyess AFB, Texas
Ian Byczkowski, 17th OWS, Hickam AFB, Hawaii
Raymond Decker, 10th CWS, Fort Benning, Ga.
John Delaney, 51st OSS, Osan AB, Korea
Jared Dube, 15th OWS, Scott AFB, Ill.
Tyler Ericksen, HQ AFWA, Offutt AFB, Neb.
Jorge Evans, 90th OSS, F.E. Warren AFB, Wyo.
Raymond Ford, 21st OWS, Sembach AB, Germany
Nigel Fredericks, 17th OWS, Hickam AFB, Hawaii
Jennifer Grega, 607th WS, Camp Humphreys, Korea
Joseph Harbin, 36th OSS, Andersen AFB, Guam
Jeremy Henderson, HQ AFWA, Offutt AFB, Neb.
Mark Hendrickson, 319th OSS, Grand Forks AFB, N.D.
Duane Holt, HQ AFWA, Offutt AFB, Neb.
Nysheema Jackson, 31st CCS, Tinker AFB, Okla.
Janelle Jacobson, HQ AFWA, Offutt AFB, Neb.
Christopher Jones, 86th OSS, Ramstein AB, Germany
Najimah Jones, 31st CCS, Tinker AFB, Okla.
Harry Keiber, AFCCC, Asheville, N.C.
Stephen Krieger, 15th ASOS, Hunter AAF, Ga.
Brian Landrum, 607th COS/DOW, Osan AB, Korea
James Lopez, 25th OWS, Davis-Monthan AFB, Ariz.
Tobias Manzanares, 13th ASOP, Fort Carson, Colo.
Roxanne Marsh, HQ AFWA, Offutt AFB, Neb.
Jennifer Martin, 21st OWS, Sembach AB, Germany
Kevin Mattingly, 509th OSS, Whiteman AFB, Mo.
Steven McConnell, 21st OWS, Sembach AB, Germany
Kevin McEnhill, HQ AFWA, Offutt AFB, Neb.
Eric McGee, 10th CWS, Fort Campbell, Ky.
Jason Mcgimsey, AFCWC, Hurlburt Field, Fla.
Jeremy Montgomery, Det. 6, Wiesbaden, Germany
Jennifer Nuy, 43rd OSS, Pope AFB, N.C.
David Olds, HQ AFWA, Offutt AFB, Neb.
Brandon Orr, HQ ACC, Langley AFB, Va.
Andrea Patterson, Det.6, Wiesbaden, Germany
Steven Perez, 7th OSS, Dyess AFB, Texas
Robert Pickering, HQ AFWA, Offutt AFB, Neb.
Ranata Pottard, 15th OWS, Scott AFB, Ill.
Dominic Reed, HQ AFWA, Offutt AFB, Neb.
Jeffrey Roach, 17th OWS, Hickam AFB, Hawaii
Nelson Guerrero Rodriguez, HQ AFWA, Offutt AFB, Neb.
Michael Rosales, 335 TRS/UOA, Keesler AFB, Miss.
Joshua Roznowski, 614th SOPS/DOW, Vandenberg AFB, Calif.
Eric Shafer, 17th OWS, Hickam AFB, Hawaii
Sean Shuman, 51st CBCS, Robins AFB, Ga.
Anthony Slaughter, 347th OSS, Moody AFB, Ga.
Mark Sterling, 7th OSS, Dyess AFB, Texas
Daniel Sullivan, 28th OWS, Shaw AFB, S.C.
David Tischhauser, 100th OSS, RAF Mildenhall, United Kingdom
Michael Tomes, 12th CTS, Fort Irwin, Calif.
Michael Torres, HQ AFWA, Offutt AFB, Neb.
Charles Vankleek, 21st OWS, Sembach AB, Germany
Travis Wooten, Det. 1, Wuerzburg, Germany
Corey Worster, 81st OSF, Keesler AFB, Miss.

Where in the weather orld is ...

By Senior Airman Randall A. Jennings
HQ Air Force Weather Agency Public Affairs
Offutt AFB, Neb.

Before he was Vice President and Senior Research Physicist with Exploration Physics International, Inc., Dr. Craig D. "Ghee" Fry began his career studying physics in Hawaii. He was in the Air Force Reserve Officer Training Corps., Detachment 175 in 1971, and graduated as a 2nd Lt. in May, 1973.

"I loved astronomy and wanted to pursue a career supporting the space program, so I applied for a meteorology position." After attending the Air Force Institute of Technology Basic Meteorology Program at San Jose State University, San Jose, Calif., Lt. Fry was assigned to Air Force Global Weather Central, Offutt AFB, Neb., just out of "Basic Met."

"At AFGWC, I was thrilled to be assigned to the Space Environmental Support Branch, 'the SESS Pool'. I worked the space weather forecast desk. In my first month on the job, the sun produced a record number of solar flares and significant impacts on space systems." He adds, "At GWC, I learned the important role that space weather observing and forecasting played in protecting our space assets."

His experiences at AFGWC set him on a career goal to implement and improve the tools needed to support space weather operations.

In 1979, he earned an AFIT master's degree of Astrogeophysics at the University of Colorado, Boulder, where he studied ionospheric storms affecting space weather.

From 1979-1981, Mr. Fry served as Squadron Space Environment Officer at the High Latitude Monitoring Station in Anchorage, Alaska, at Elmendorf AFB as the liaison between Air Weather Service and the National Oceanic and Atmospheric Administration.

He continued his education by attending the AFIT Ph.D. program at the University of Alaska, Fairbanks, and was selected as the Outstanding Graduate Student in Space Physics and Atmospheric Sciences for the academic years of 1984 and 1985. He earned his Ph.D. in Space Physics in the spring of 1985.

Mr. Fry reflects on those times fondly. "My family and I really enjoyed our two Alaska assignments in Anchorage and Fairbanks. Alaska was a great place to raise our kids and enjoy the outdoors."

He assumed command of Detachment 1, HQ Air Weather Service at the Pentagon in 1990.

In 1992, he became the Deputy for Environmental Programs in the Office of the Assistant Secretary of the Air Force serving as advisor to senior Department of Defense leaders on the impacts of weather and the space environment on operational and future space systems.

The summer of 1993 concluded his active duty career, retiring as a Lieutenant Colonel.

Reflecting back, Mr. Fry recalls some memorable situations and people.

"While at the 11th WS, I remember providing direct space environment support to the first Space Shuttle mission, STS-1/Columbia, in the spring of 1981."

(Read: A Giant Step, page 16 chronicling AWS support for the first space shuttle launch.)

One of his most challenging assignments, 1988-1990, was in traditional meteorology. As Commander, Det. 6, 26th Weather Squadron, Pease AFB, N.H.

"When Desert Shield kicked off that summer leading up to the first Gulf War, our weather support to the Tanker Task Force's transatlantic refueling mission escalated exponentially. Our detachment was stretched to the limit. We pulled together and accomplished the mission as the base was closing."

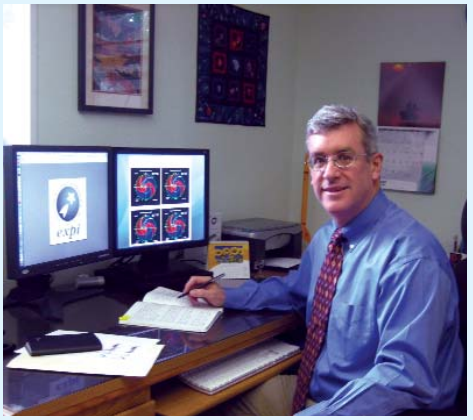
"My NOAA counterpart at [High Latitude Monitoring Station], Mr. Paul Jones, was a prisoner of war for two years during World War II. He taught me a lot about handling adversity."

Mr. Fry and his wife continue to support Air Force weather.

His wife, Susan Fry, is the President of EXPI, and they recently celebrated ten successful years in business. EXPI is working with [Air Force Weather Agency] and [Air Force Research Laboratory] to transition the next generation of space weather models into operations. Their HAFv.2 solar wind model (Hakamada-Akasofu-Fry model, described in the November/December 2004 issue of the Observer) is being implemented into the AFWA Space Weather Operations Center now. They are also working with AFWA's Battlespace Environments Institute to enable space weather models to harness the power of Department of Defense's supercomputers.

"It is very rewarding to return to AFWA at Offutt AFB and apply what I learned throughout my Air Force career. I have come full circle living my Air Force career dreams, continuing to support the warfighter by transitioning space weather tools into operations," said Mr. Fry.

Maj. Craig D. "Ghee" Fry, 26th Weather Squadron detachment commander, left, briefs a 509th Air Refueling Squadron flight crew heading for Mighty Warrior conditions in and around Nebraska. Crew members from the left are: Capts. Gregory Barron, Peter Rooney, Kevin Cross and Donald Carr. U.S. Air Force Photo



Dr. Craig D. Fry is currently Vice President and Senior Research Physicist with Exploration Physics International, Inc. (EXPI) providing dedicated support to space weather operations. Photo courtesy of Dr. Craig D. Fry.

Salutes

RETIREMENTS

Col. John Lanicci, HQ AFWA, Offutt AFB, Neb.

AWARDS AND DECORATIONS

LEGION OF MERIT

Col. John Lanicci, HQ AFWA, Offutt AFB, Neb.

MERITORIOUS SERVICE MEDAL

Lt. Col. David Easley, HQ AFWA, Offutt AFB, Neb.
Lt. Col. James Mitchell, HQ AFWA, Offutt AFB, Neb.
Maj. Kenneth Cloys, AFCCC, Asheville, N.C.
Maj. David Beberwyk, HQ AFWA, Offutt AFB, Neb.
Maj. Scott Emert, HQ AFWA, Offutt AFB, Neb.
Maj. Jose Harris, HQ AFWA, Offutt AFB, Neb.
Maj. James Jones, HQ AFWA, Offutt AFB, Neb.
Maj. Del. Leon Narcisse, Det. 3, Wright-Patterson AFB, Ohio
Maj. Malcolm Walker, AFCCC, Asheville, N.C.
Chief Master Sgt. Daniel Cummins, HQ AFWA, Offutt AFB, Neb.
Chief Master Sgt. Jeffrey Fries, HQ AFWA, Offutt AFB, Neb.
Master Sgt. William Courtney, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Mario Franklin, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Myrna Lackey, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Kevin Wendt, AFCCC, Asheville, N.C.
Tech. Sgt. Benjamin Wretlind, AFCCC, Asheville, N.C.

MERITORIOUS CIVILIAN SERVICE MEDAL

Ms. Jodie A. Edwards, HQ AFWA, Offutt AFB, Neb.

JOINT SERVICE COMMENDATION MEDAL

Senior Master Sgt. Michael Carmody, AFCWC, Hurlburt Field, Fla.

AIR FORCE COMMENDATION MEDAL

Capt. James Bono, Det 2, Sagamore Hill, Mass.
Capt. Michael Buchanan, 51st OSS, Osan, Korea
1st Lt. Joseph III Reich, AFIT, Wright Patterson AFB, Ohio
2nd Lt. Gregory Strong, 45th WS, Keesler AFB, Miss.
Master Sgt. Dennis Anglin II, HQ AMC, Scott AFB, Ill.
Tech. Sgt. David Adams, SMC, Los Angeles, Calif.
Tech. Sgt. Matthew Dearinger, 75th OSS/OSW, Hill AFB, Utah
Tech. Sgt. Eric Dixon, AFCWC, Hurlburt Field, Fla.
Tech. Sgt. William Grissom, 45th WS, Patrick AFB, Fla.
Tech. Sgt. David Johnson, USAFE CSS, Ramstein, Germany
Tech. Sgt. Fred King III, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Ramah Billings, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Jacqulyn Bills, 45th WS, Patrick AFB, Fla.
Staff Sgt. Michael Delgado, 81st OSF, Keesler AFB, Miss.
Staff Sgt. Christopher Lozzi, 8th OSS, Patrick AFB, Fla.

ARMY COMMENDATION MEDAL

Staff Sgt. Christopher Lozzi, 8th OSS, Patrick AFB, Fla.

JOINT SERVICE ACHIEVEMENT MEDAL

Tech. Sgt. Owen Shockley, 18th WS, Fort Bragg, N.C.

AIR FORCE ACHIEVEMENT MEDAL

Staff Sgt. Tabitha Davis, AFCCC, Asheville, N.C.
Staff Sgt. Christopher Lozzi, 8th OSS, Patrick AFB, Fla.
Staff Sgt. Rodman Souchek, HQ AFWA, Offutt AFB, Neb.
Senior Airman Marvin Morgan, HQ AFWA, Offutt AFB, Neb.
Airman 1st Class Caleb Balduff, HQ AFWA, Offutt AFB, Neb.

ANGEL AWARD FOR MAKING A SIGNIFICANT CONTRIBUTION TO THE LOCAL COMMUNITY THROUGH VOLUNTARY SERVICE

Mr. Kirk Lehneis, Det. 3, AFWA, Wright-Patterson AFB, Ohio

FEDERAL EXECUTIVE BOARD EMPLOYEE OF THE YEAR AWARD IN THE SUPERVISORY-DOD CATEGORY

Lt. Col. Randy George, OL-K, AFWA, Norman, Okla.

57TH ANNUAL ARTHUR FLEMMING AWARDS RECOGNIZING OUTSTANDING FEDERAL GOVERNMENT SERVICE

Maj. Paul Roelle, commander, Det. 11, 7th Weather Squadron.

Major Roelle served as the first Meteorological and Oceanographic Officer in the Iraq War, where he analyzed battlefield weather conditions. His scientific research has focused on identifying the sources of trace gases in the atmosphere that reduce battlefield visibility and cause health problems. The Department of Defense has recognized his work in the community by awarding Major Roelle the Volunteer Service Medal and also his heroism for risking his life to help others during the Olympic Park bombing in Atlanta in 1996.

EDUCATION

NCO ACADEMY

Tech. Sgt. John Lawless, AFCWC, Hurlburt Field, Fla.

ADVANCED COMMUNICATIONS COMPUTER SYSTEMS PLANNING AND IMPLEMENTATION MANAGEMENT SPECIALIST COURSE

Tech. Sgt. Randy Albert, AFCWC, Hurlburt Field, Fla.

PERSONNEL CRAFTSMAN COURSE

Staff Sgt. Sakari Lacy, AFCWC, Hurlburt Field, Fla.

COMMUNICATIONS-ELECTRONIC CAREER ADVANCEMENT COURSE

Staff Sgt. Terrence Steimle, AFCWC, Hurlburt Field, Fla.

AIRMAN LEADERSHIP SCHOOL

Senior Airman Nathalie Chasse, HQ AFWA, Offutt AFB, Neb.
Senior Airman Michael Eudy, HQ AFWA, Offutt AFB, Neb. *(Distinguished Graduate)*
Senior Airman Eliott Peyton, HQ AFWA, Offutt AFB, Neb.
Senior Airman Travis Rieken, 45th WS, Patrick AFB, Fla. *(Academic Achievement Award)*

WEATHER FORECASTER APPRENTICE

Tech. Sgt. Sam Nguyen, 17th OWS, Hickam AFB, Hawaii
Staff Sgt. Jonathan Liska, 607th WS, Yong San AIN, Korea
Staff Sgt. Jennifer Williamson, Det. 1, 18th WS, Fort Eustis, Va.
Senior Airman Javier Acosta, 25th OWS, Davis-Monthan AFB, Ariz.
Senior Airman Christopgher Gauss, 607th WS, Yong San AIN, Korea
Senior Airman Wesley Green, 8th MXS, Kunsan AB, Korea
Senior Airman Justin Kuiper, 122nd FW, Fort Wayne, Ind.
Senior Airman Nicholas Omay, 62nd OSS, McChord AFB, Wash.
Senior Airman Tricia Williamson, 25th OWS, Davis-Monthan AFB, Ariz.
Airman 1st Class Ashley Adcock, 26th OWS, Barksdale AFB, La.
Airman 1st Class Nathan Bezner, 26th OWS, Barksdale AFB, La.
Airman 1st Class Donald Chappotin, 26th OWS, Barksdale AFB, La.
Airman 1st Class Danielle Duvall, 15th OWS, Scott, AFB, Ill.
Airman 1st Class Kate Goddard, ASOS, Fort Campbell, Ky.
Airman 1st Class Christopher Guyne, 26th OWS, Barksdale AFB, La.
Airman 1st Class Eric Huff, 11th OWS, Elmendorf AFB, Alaska
Airman 1st Class Jessica Isom, 26th OWS, Barksdale AFB, La.
Airman 1st Class Thomas Jenkins, 62nd OSS, McChord AFB, Wash.
Airman 1st Class Brandon Knight, 26th OWS, Barksdale AFB, La.
Airman 1st Class Mellisa Perry, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Jonathan Mays, 21st OWS, Sembach AB, Germany
Airman 1st Class David Pennington, 26th OWS, Barksdale AFB, La.
Airman 1st Class Hilary Porter, 145th OSF, Channel Island Ang, Calif.
Airman 1st Class Eric Poynter, 15th OWS, Scott AFB, Ill.
Airman 1st Class Christopher Ramos, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Trisha Smeenk, 114th FW, South Dakota ANG
Airman 1st Class Jessica Smialek, 21st OWS, Sembach AB, Germany
Airman 1st Class Thomas Spencer, 28th OWS, Shaw AFB, S.C.
Airman 1st Class Ashley Whalum, 28th OWS, Shaw AFB, S.C.
Airman Rebecca Kinsman, 11th OWS, Elmendorf AFB, Alaska
Airman Erin Kirkpatrick, 26th OWS, Barksdale AFB, La.
Airman Renee Mcnally, 26th OWS, Barksdale AFB, La.
Airman Andrew Tolson, 26th OWS, Barksdale AFB, La.
Airman Rachael Wilt, 26th OWS, Barksdale AFB, La.
Airman Kyle Gossen, 28th OWS, Shaw AFB, S.C.
Airman Robbie Nicpon, 26th OWS, Barksdale AFB, La.
Airman Joseph Solis, 28th OWS, Shaw AFB, S.C.

COMBAT WEATHER TEAM OFFICER COURSE

1st Lt. Randy Clark, 26th OWS, Barksdale AFB, La. *(Distinguished Graduate)*
1st Lt. David Finlay, 28th OWS, Shaw AFB, S.C. *(Distinguished Graduate)*
1st Lt. Paul Koecher, 71st OSS, Vance AFB, Okla. *(Top Graduate)*
1st Lt. Kevin Quinn, 21st OWS, Camp Red Cloud, Korea
2nd Lt. Samuel Jones, 4th OSS, Seymour Johnson AFB, N.C. *(Distinguished Graduate)*

COMBAT WEATHER TEAM OPERATIONS COURSE

Tech. Sgt. David Ivey, Det. 3, 7th WS, Illesheim, Germany
Tech. Sgt. Joseph Stackhouse, 8th OSS, Kunsan AB, Korea
Staff Sgt. John Delaney, 51th OSS, Shaw AFB
Staff Sgt. Shannon Linderman, 7th OSS, Dyess AFB
Staff Sgt. Jonathan Liska, 607th WS, Yong San AB Korea
Staff Sgt. Michael Sallustio, 39th OSS, Incirlik AB, Turkey
Staff Sgt. Krystal Shon, 8th OSS, Kunsan AB, Korea
Staff Sgt. Ryan Trickey, 16th OSS, Hurlburt Field, Fla.
Staff Sgt. Jennifer Williamson, 25th OWS, Davis-Monthan AFB Ariz.
Senior Airman Javier Acosta, 25th OWS, Davis-Monthan AFB Ariz.
Senior Airman Sarah Cole, 12th OSS, Randolph AFB, Texas
Senior Airman Audrey Davidson, 80th OSS, Sheppard AFB, Texas
Senior Airman Stephen Doiron, Det. 2, 607th WS Camp Humphreys, Korea
Senior Airman James Foutz, 352nd SOG, RAF Mildenhall, United Kingdom
Senior Airman Christopher Gauss, 607th WS, Yong San AB, Korea
Senior Airman Wesley Green, 21st OWS, Sembach AB Germany
Senior Airman Jessika Hill, 21st OWS, Sembach AB, Germany
Senior Airman Jeffrey Houser, 75th OSS, Hill AFB, Utah
Senior Airman Arjuna Hutchins, 78th OSS, Robins AFB, Ga. *(Distinguished Graduate)*
Senior Airman Bradley Johnson, Det. 1, 10th Combat WS, Fort Lewis, Wash.
Senior Airman Michael King, 6th OSS, MacDill AFB, Fla.
Senior Airman Yvette McQuern, 757th OSS, Nellis AFB, Nev.
Senior Airman David Ninesling, 2nd OSS, Barksdale AFB, La. *(Distinguished Graduate)*
Senior Airman Nicholas Omay, 62nd OSS, McChord AFB, Wash.
Senior Airman Steven Sauermann, 100th OSS, RAF Mildenhall, United Kingdom
Senior Airman Anthony Taylor, 60th OSS, Travis AFB, Calif.
Senior Airman Callie Watts, 37th OSS, Lackland AFB, Texas
Senior Airman Tricia Williamson, 25th OWS, Davis-Monthan AFB Ariz.
Airman 1st Class Kate Goddard, Fort Campbell, Ky.
Airman 1st Class Thomas Jenkins, 62nd OSS, McChord AFB, Wash.
Airman 1st Class Steven Stolze, 51st OSS, Camp Humphreys, Korea

CONTINGENCY WARTIME PLANNING COURSE

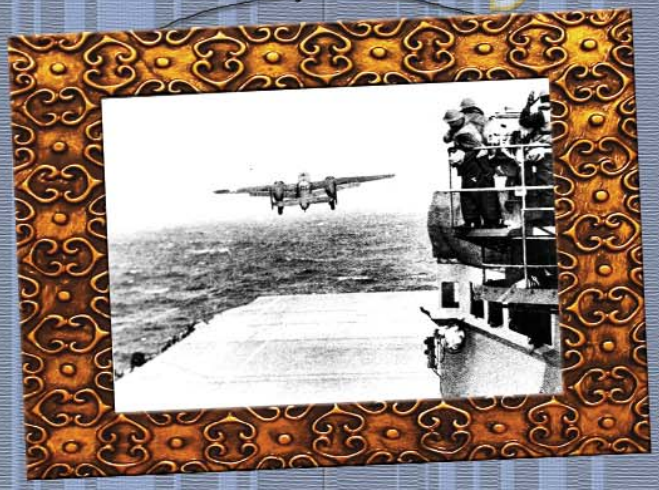
Maj. Paul Niesen, HQ AMC, Scott AFB, Ill.

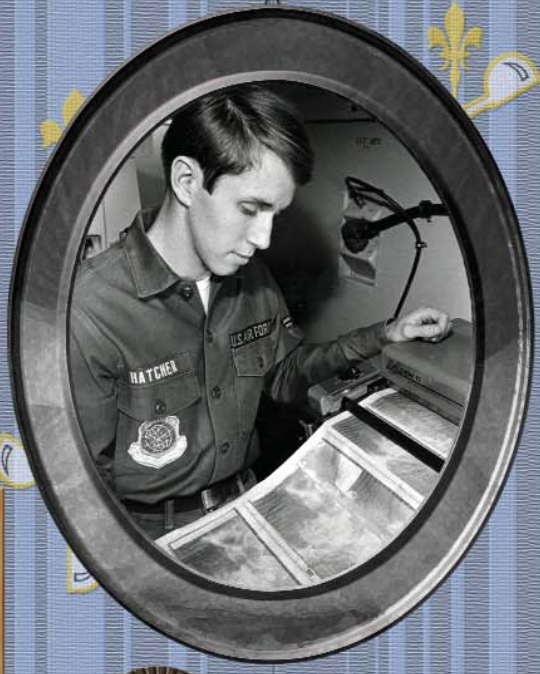
TROPICAL ANALYSIS AND FORECASTING

Senior Airman Carrie Volpe, 8th OSS, Patrick AFB, Fla.

GRADUATION FROM OPUP MANAGER'S COURSE

Mr. Todd McNamara, 8th OSS, Patrick AFB, Fla. *(Distinguished Graduate)*

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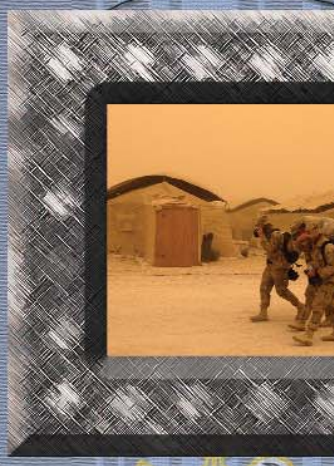


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