

Your Magazine for Air Force Weather

OBSERVER

1999 SPECIAL EDITION



KOSOVO
AFW Looks Back at Success

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OBSERVER

AIR FORCE DIRECTOR OF WEATHER

Brig. Gen. Fred P. Lewis

AIR FORCE WEATHER AGENCY, COMMANDER
Col. Charles W. French

PUBLIC AFFAIRS, DIRECTOR
Ms. Paige D. Rowland

PUBLIC AFFAIRS, EDITOR
TSgt. Michael L. Jones

PUBLIC AFFAIRS SPECIALIST
Ms. Jodie A. Grigsby

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106 Peacekeeper Dr., Ste. 2N3
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Please call (402) 294-3115, or DSN: 271-3115, for more information about this publication. Electronic mail should be addressed to:

"Observer@afwa.af.mil"

AFW's current and future successes are dependent upon **TEAMWORK**

By Brig. Gen. Fred P. Lewis
Air Force Director of Weather

If you take a step back and look at where we are today, you'll see that there are many encouraging things happening in Air Force Weather. Weather support has never been so dynamic – and so accurate. Five AORs: the Balkans, Southwest Asia, Korea, Alaska, and now SOUTHCOM, have Operational Weather Squadrons providing on-target support that would have been considered nearly impossible just a few years ago. In Alaska we've essentially implemented our reengineering CONOPS and our people there are providing fine-scale, accurate, and relevant weather support.

In Korea we have implemented our new CONOPS and again our folks are doing great. And in support of CONUS operations, our weather units are continuing to do well during the transition to our new structure. As far as resource protection goes, severe weather warning times have been phenomenal this year ("knock on wood" when you read this).

Finally, the AF Weather Agency is fully engaged producing a myriad of new, useful, fine-scale, and accurate products that are setting new standards – from severe weather point weather warnings, to target forecasts, to MM5 forecasts, to exciting new visualizations. What great results; and what **great teamwork** across all of AF Weather! But as good as we are doing, and as hard as we are working, the reengineering road has not been without its share of chal-

lenges.

Reengineering when manning is low is tough. Reengineering when manning is low and ops (workload) tempos are up is even tougher. And when a regional crisis erupts like Kosovo...

But, is there a bright side? YES there is! **YOU** – the Total Force people (officer, enlisted, guard, reserve, active, civilian) of Air Force Weather — are the bright side. You are staying the course and leading the way to the future; and you are making all of us — and AF senior leaders — proud of what you have accomplished. Look at what has been done in USAFE for just one example.

Despite some concerns that we were moving too fast in Europe, we're glad we moved as fast as we did. The USAFE OWS made a tremendous difference in operational support to flying ops across the Balkans during Operation ALLIED FORCE.



This is a threat matrix graph showing hour-by-hour weather impacts to various military operations. It gave warfighters a quick graphic translation of weather forecast conditions.

Our folks in Europe and those who deployed forward proved that reach-back weather support works and it works well – and they proved this during a major conflict, and in some of the toughest weather possible. There are many such successes – look at weather support for: CENTCOM, SOUTHCOM, Alaska,



mobility operations around the world, operations in Korea, resource protection in the CONUS, and much much more. **YOU**, the people of AF Weather, have made this happen, you have done what others would call impossible. But for you, it's all in a day's work – and often a 12-hour day's work!

What has made this possible is **TEAMWORK**. There is a new level of teamwork happening out there. AFW forecasters and observers and leadership from many locations are working as a team, like never before. This reach-back-teamwork extends from the weather flight/dets to the OWSs to the AFWA. The weather flights/dets are providing mission specific weather calls for each and every sortie – totally integrated into the mission of the day, often right in the squadrons or in the field with the operators.

It extends through the new OWSs who are providing fine-scale, accurate, relevant weather products – on demand and “7 by 24” – for the Combat Weather Teams at home station and forward. This reach-back also extends back to AFWA where we're gathering the worldwide weather data, running the forecast models, visualizing the results, and adding value with people in the loop for strategic, target, and severe weather products.

It is truly amazing what you have done as a team – truly amazing! With the Combat Weather Teams, the OWSs, and the AFWA all working as a **TEAM**, we are validating that re-engineering, your re-engineering effort, can and does work and, in fact, you are finding ways to make it work even better almost every day. So what do we need to do now? I say that we need to stay the course, and in fact we need to accelerate the implementation of our re-engineering plans.

It may seem that the toughest thing to do right now is to stay the course — but that's absolutely what we have

to do. The key to solving our manning problems goes hand in hand with solving the very problems we're re-engineering to fix.

The schoolhouse has started the new pipeline of Initial Skills Course Graduates. This is by no means the solution, but it is the start of the real fix. Yes the new “pipeliners” will be young and inexperienced, but I think we will be proud of what they will be capable of doing with training

and the influence of our experienced forecasters. That's right, we're returning to the way we used to train our people – a time when we learned the “ropes” of weather forecasting and observing from our experienced NCOs. Those stripes our NCOs wear so proudly mean many things to me – they mean experience, leadership, commitment, and a very special know-how when it comes to bringing our newest people into the fold.

I for one am extremely proud of the work everyone did to get our new initial skills training course on line – the first class came on line the 26th of July and the new course graduates started arriving at our OWSs in late December 1999. The work the folks at the schoolhouse did along with our folks at the AFWA is nothing short of outstanding and gives me a great sense of pride.

This relationship is something we could only wish for several years ago. Now it's reality, and it's working. To me, the start-up of the new schoolhouse pipeline was the “hump.” Assigning new 3-levels to the OWSs essentially turns the corner on re-engineering. In addition, we also plan to accelerate into 2000 the procurement of the comms, computers, and software needed by the OWSs to do their jobs.

The bottom line is that what we're doing is not easy, but it is the right thing to do, it has been proven in combat, and it works! We need to stay the course and be confident that our hard work will realize great benefits for the Air Force, the Army, and our many other customers. Most importantly, we must all make sure our absolutely outstanding people know that despite the fact that we are few in numbers, we are making a big difference – each and every day! **YOU** are the best in the world at what you do and our Nation needs you now more than ever. **Thanks to each and every one of you for staying with us! WEATHER ON TARGET – OPS NORMAL!**

HOW DO THEY DO THAT?

Networked capabilities detail forecast delivery

Throughout the years, military planners strategically planned campaigns around weather conditions. Military operations in the Balkan region and Kosovo remind us how knowledge of weather conditions contribute to mission success.

Air Force Weather is responsible for providing weather support to military operations around the world. "The very nature of delivering weather products to warfighters is the driving force behind the re-engineering of Air Force Weather," said Col. Charles French, commander of Air Force Weather Agency.

"Of course in this information age there's weather information available from multiple sources, but we have the capability to tailor forecasts for specific areas worldwide depending on their mission objectives."

A network of highly experienced weather forecasters and observers compile a database of weather conditions from points around the globe. That information becomes the essential ingredient for tailored forecasts requested by regional military commanders. Part of the overall forecasting process occurs at AFWA.

"As an example, if over the past years, our data confirms frequently cloudy conditions in the Balkan region from March through May, we have a general idea of what we presently expect in a similar timeframe. These historical generalities, then, assist us in making forecasts by 'bounding' the problem in terms of what has happened in the past over the same region. Our business is to make sure military strategists, commanders, and field units have the most accurate depiction of current weather conditions at

their disposal," said Miller.

The next link in providing accurate weather information to the warfighter is an innovation from AFW re-engineering, the theater Operational Weather Squadron, or OWS. What made Kosovo the test for re-engineering was the sustaining force of the theater forecast unit for the operation...the USAFE OWS at Sembach, Germany. The USAFE OWS produced theater-wide, mission specific products aimed at providing the most accurate weather information to military planners and decision-makers.

Whether it's Kuwait, Iraq, Kosovo, or the next military involvement, weather will always influence military operations. Employing weather specialists to improve both operational planning and execution based on their weather expertise is a proven necessity.

WEATHER: Key to strategic planning

The Weather Operations Division of the Air Force Operations Group at the Pentagon supported the National Command Authorities, Joint Chiefs of Staff, Headquarters Air Force, and other agencies during operations in Kosovo. The weather data and forecast products used to inform these key leaders were obtained from the USAFE Operational Weather Squadron at Sembach, Germany and the Air Force Weather Agency at Offutt AFB, Nebraska.

By using the principles of Air Force Weather reengineering, the Weather Operations Division served as the "Chief's Own Combat Weather Team." The unit

tailored the information acquired from the USAFE OWS and AFWA to the customer's specific requirements regarding weather impacts on critical weapons systems and military operations. The primary focus was long range planning for Air Force operations, to include logistics and acquisition factors. Precise forecasts also kept the leadership informed when the number of cancelled missions would increase due to unfavorable weather conditions. The "fine scale, highly accurate" support provided by Air Force Weather was critical to the decisions made in strategic planning for operations in Kosovo.



KOSOVO and AIR FORCE WEATHER

By Lt. Col. Mark Weadon

Operation Allied Force, including both the air war over Serbia as well as humanitarian sea, air, and land lift into Albania, was the first real test of a key principle of weather reengineering: deployed units reaching back for operational forecast products from a regional Operational Weather Squadron. With the USAFE OWS, located at Sembach AB, Germany, providing key

"Times like this you find out just how important you [weather guys] are to the war. You just earned an Air Medal!"

Brig. Gen. Randy Gelwix
Deputy JFACC

forecasts, AFW units were able to deploy quickly with far leaner weather support forces than ever before—always easier to move information than people and equipment. Good teamwork emerged!

At the height of the war, the OWS was providing TAFs, resource protection, and 5-day planning forecasts to over 20 bases, as well as two-a-day Joint Operational Area Forecasts for the target area. This was the "one theater one forecast" ideal, triumphantly affirmed in the heat of battle. As the proverbial "single sheet of music," the OWS JOAF provided a consistent atmospheric picture of the target area out to five days to all levels of command, from SACEUR, through the JTF Commander, to the JFACC and CAOC, to USAFE, down to actual launch bases. The OWS built threat matrices extracted from JOAF forecasts to actual operational thresholds. The JOAF was the thread of

consistency through a complex and layered command and control structure.

In the air...

Operation ALLIED FORCE, the NATO air campaign to force Serbian Forces from Kosovo and bring an end to ethnic cleansing, was a military operation of staggering complexity, fought with the most advanced weapons, airframes, and C2 systems yet used in combat. But through it all (24 Mar to 10 Jun) poor weather, the age-old nemesis of military planners, hampered the coalition's efforts. In the first month alone, almost half the planned strike missions had to be cancelled due to weather, either over the target area, in refueling tracks, or at launch bases. Clouds over Serbia and Kosovo weren't just hampering the bombing missions, but were also degrading the information on enemy positions and battle assessments.

The nerve center for the entire air war was the Combined Air Operations Center in Vicenza, Italy. The JFACC, Lt. Gen. Mike Short, orchestrated the air war through a daily Air Tasking Order, the master plan that tied together all coalition air assets into one integrated effort against an ever-evolving list of targets. Timely, accurate weather forecasts were absolutely crucial to the process of flying the ATO as planned and putting iron on target. Capt. Gary Kubat, an augmentee at the CAOC when the war commenced, recalls how important weather information was to Lt. Gen. Short, and his deputy, Brig. Gen. Randy Gelwix. The modern high-tech air war was characterized by extreme fluidity of the

situation: accurate target-scale forecasts were required both for long-range planning, and to seize fleeting opportunities for 'dynamic retargeting.'

Case in point...

27 March: Recovery of downed F-117 pilot hampered by marginal weather. Minute-by-minute weather updates provided by CAOC weather officer

Capt. Gary Kubat's journal entry, 27 March:

2000: Aircraft down, unknown cause, beacon detected, CSAR activated. Provided drift winds to CSAR.

2100: Enemy helo detected, F-15 engaging. Continuous updates of flight level winds, clouds, weather conditions, etc., for rescue area. Used limited available data, MM5 products, and observations from Belgrade, Tuzla, and STT satellite imagery, giving best info for that area. Clouds building in quickly.

2345: Authenticated comm with survivor.

0115: Survivor reports enemy in vicinity.

0222: Reports came in that FRY ground troops have captured survivor.

0225: Our folks report they've been authenticating

for a tense six hours until pilot was recovered.

2 April: SWO recommended canceling ATO-planned missions due to rapid TS buildup over the Kosovo Engagement Zone, visible on DMSP.

18 May: An attack aircraft reported an area within the KEZ as "unworkable due to weather." As aircraft were about to depart the target area with unused munitions, a small "sucker hole" appeared on metsat; the on-site SWO convinced the Battle Staff Director to redirect planes into KEZ. Result: three Serbian aircraft destroyed on the ground. Now that's dynamic retargeting!

At one point, an office restructuring

"These forecasts have been really good, really helping us out in performing our mission."

"You called it right when you briefed it."

Cervia F-15 pilots

was going to move the weather station to a different location within the CAOC. Gelwix blocked the move, saying "my weather guys stay with me!" Literally at the JFACC's elbow throughout the war, the SWO developed tremendous synergy with the air war planners: weather had implications for almost every decision made within the CAOC.

While persistent bad weather frustrated the planners and often put CAOC weather briefers in the unenviable position of the ill-fated messenger bearing the bad news, the battle directors found their inputs indispensable. The big break came late in May when, after weeks of poor to marginal weather, the models, and the JOAF, pointed to an extended period of settled weather. This clearing period would allow the allies to put together the most devastating bombing of the war.

Maj. Ted Melton, CAOC SWO, recalls: "The good-weather forecast was briefed consistently days ahead of the fact. The battle planners took notice in creating the mother of all ATOs. A spot-on forecast took the sortie



count over 1000 for the first time, spelling the beginning of the end for Milosovic.”

At the Tip of the Spear...

While the OWS generated forecasts, and CAOC directed the air war, aircrews launched on what they were told by their on-site Combat Weather Teams, stationed at beddown bases from Fairford, England, to Bandirma Turkey, to Whiteman AFB, Mo. Cervia Air

“The OWS assumed full weather support responsibility for this complex military operation [OAF]—its superb target area and launch base forecasts allowed our allied warfighters to operate safely and effectively in very poor weather conditions over the Balkans.”

Maj. Gen. Tom Hobbins
USAFE/DO

Base in Italy, with its contingent of F-15Cs from RAF Lakenheath, was one of the busiest launch points throughout the war. Capt. Bob Kraetsch, OIC of the Cervia weather team, gained a healthy appreciation for what the OWS could do for his weather team at the end of the spear: “Over 90 percent of our forecasts have been dead on...the crews are happy, there are no surprises for them.”

Once NATO authorities decided to step up the intensity of the bombardment in the second month of the war, many new beddown bases were established as

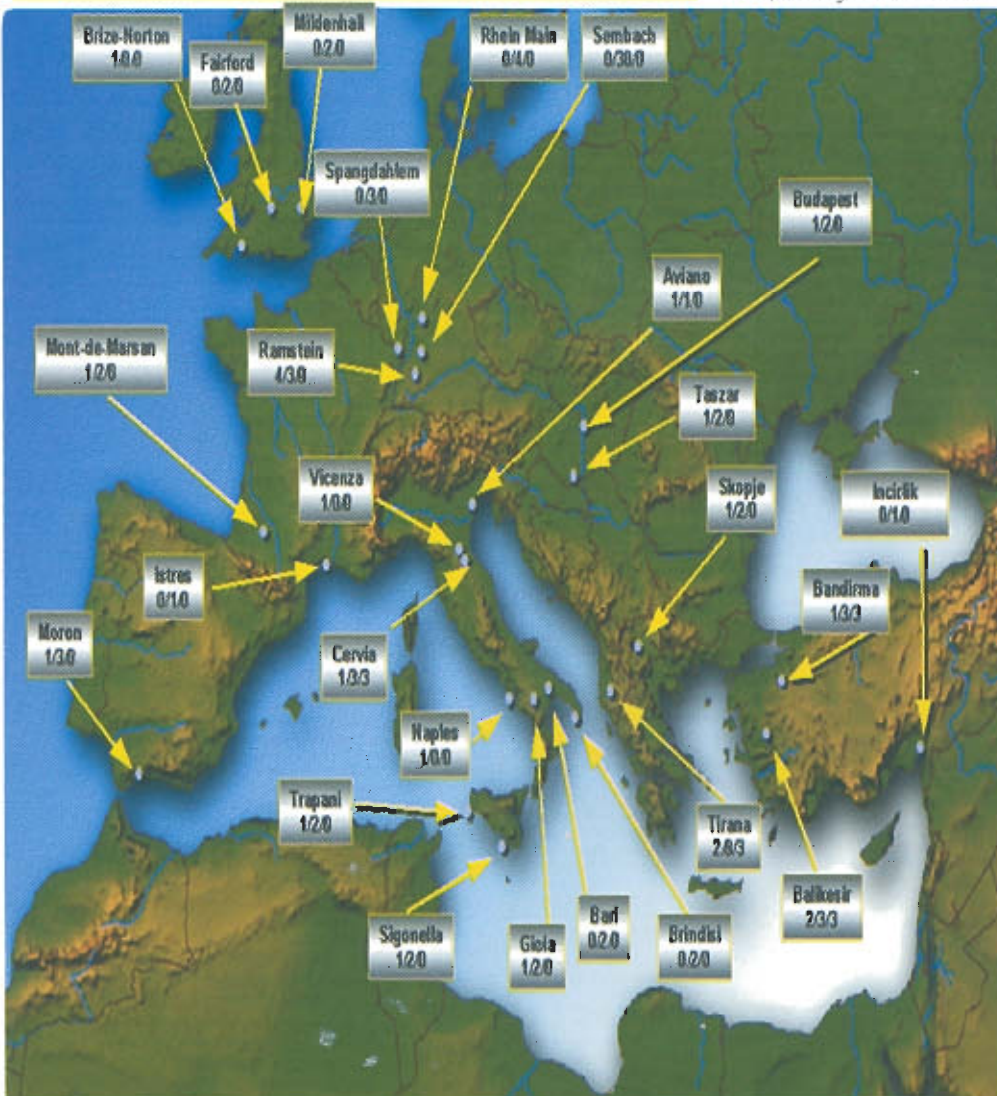
“The OWS saved our bacon when we first got to the deployed location...without that level of support, our customers would not have gotten sufficient execution forecasts.”

Capt. Crook,
OIC Budapest CWT

launch points for the big “Pappa Bear” campaign. AFW’s ability to provide on-site weather support quickly was put to the test, as the number of launch bases increased rapidly from just a few to over twenty. Most of these were limited, occasionally non-military airports, with minimal indigenous weather support. AFW’s lean, agile weather cadres, generated observations and mission-tailored briefings at each location, whether A/R, airlift, strike, or intelligence collection.

By establishing NIPRNET and satellite communication links with the OWS, CWTs were able to begin producing airfield observations and MEFs for missions within a day, sometimes hours, of arrival. AFW proved itself “Expeditionary” with a capital “E.”

It is very likely that the Air War Over Serbia will set the pattern for future air wars:



This map depicts the numbers and location of deployed personnel during OPERATION ALLIED FORCE. The first number accounts for weather officers assigned, followed by forecasters and observers.

at night, joint and probably coalition, with extremely restrictive ROE, intended to reduce danger to our airmen, and minimize risk of collateral damage. Stealth, precision in weapons employment, and expeditionary capability will also figure largely in future air wars. In supporting this war, and future similar campaigns, the TEAM approach of reengineered AFW proved itself up to task. Learn from what we did: practice and institutionalize what worked, fix what didn't.

In the Mud...

While the air war got most of the press, and finally forced Milosovic's hand, other AFW support capability worked closer to the ground. For Operation SHINING HOPE, huge amounts of airlift converged on Tirana bringing humanitarian supplies and construction equipment.

TF Hawk, though not employed in combat, also set up at Tirana and trained out of that airport along the mountainous Albanian-Kosovar border. A cadre from 7th Weather Squadron accompanied TF Hawk. This is the same group that evolved into Joint Guardian, the United States standing peacekeeping force assigned to one of the five Kosovo sectors.

TF Hawk SWO's go/no go inputs to Apache training flights were phenomenal: 39 hits/1 miss. Lt. Gen. Hendrix, TF Hawk/V Corp commander gave the most ringing endorsement: "In all honesty, these guys are the best I've seen."

Technology...

One of the first casualties of the air war was reliable surface weather observations from the target area. While high-resolution satellite data filled some of the gap, it was not a substitute for in situ surface data. USSOCOM's Remote Miniature Weather System provided promising technology to take observations in data-sparse areas and send them out via SATCOM. RMWS was one of two weather Combat Mission Need Statements that made COMUSAFE's final list during the war. (See RMWS story on page 14)

The Weather Systems Support Cadre deployed to set up a JTFST at the CAOC. They were instrumental in providing round-the-clock high-resolution weather

satellite data (both polar orbiter and geo-stationary coverage) which proved indispensable.

Establishing and maintaining those communication links dramatically improved offensive capabilities. The high resolution satellite data from NIPRNET, NATO VSAT and STT was absolutely crucial as warplanners formulated and implemented effective strategies. WSSC team members were indispensable as they assisted in setup, directed visits, and staffed the telephone helpdesk.

One deployed weather officer to the CAOC remarked: "Support from the WSSC was awesome—you don't have time to muddle with equipment in the heat of battle; having a team of experts at our beck and call saved us countless times.

In the end, successful weather support to Operation ALLIED FORCE—as well as to its sister Operation SHINING HOPE—was a combination of old-fashioned AFW professionalism, combined with a newly reengineered support structure utilizing modern satcom links and web-based technology.

Without question, the Serbian air war put the basic

principles of weather re-engineering to a stern test—and the AFW team passed the test with high honors. OAF gave us a foretaste of what future air wars will be like, just as SHINING HOPE pushed the limits of rapid flexible airlift for humanitarian aid. As a result, we now have a far clearer idea of what

weather support will need to be in the expeditionary Air Force of the 21st Century.

Reachback, information technology, and lean deploying weather teams relying on the regional weather expertise of the USAFE hub made all the difference. Our combat weather teams hit the ground running—forecasts were being issued by the USAFE OWS even before units touched down at unfamiliar expeditionary beddown bases.

Setting up quickly, and getting bombs on target—that's what it's all about, and the AFW team rose to the challenge in a weather environment that was far from benign. From beginning to end, this was a team effort to make us all proud!

"NAMIS is fast; in war seconds count; we don't have time to wait for a slow NIPRNET connection to call up a vital observation, or METSAT"

**Capt. Kubat
SWO at CAOC**

BUILDING A REMOTE

By Staff Sgt. Victoria White and Maj. Michael Dwyer

In early July, nine members of the 7th Weather Squadron deployed to Task Force Falcon, Camp Bondsteel in support of peace-keeping operations in the U.S. sector of Kosovo. The group founded the 7th Expeditionary Weather Squadron and was tasked with setting up a weather station in a desperately remote area. Regular "field training" helped the team prepare for the conditions they faced in Kosovo.

7th WS detachments in Europe participate in frequent field training exercises with their Army customers. Emphasis is put on real world operations, which means constant practice at setting up and using tactical equipment and living and working in tents. The more practice, the better. During an actual deployment, there is little room for error.

"You can't run over to the (store) and pick up a printer cable or phone lines. That's why it's critical to remember to bring everything you need. You have to train like you fight," said 7th EWS commander, Maj. Michael Dwyer.

During their journey to Camp Bondsteel, the members encountered

refugees leaving the area. "It made me feel proud that we came here to help them," said weather observer Airman First Class Jennie Ravitch who also visited schools in Kosovo during her deployment to help bring supplies and clothing to the children and teachers.

The 7th EWS established weather operations in a 5-ton "expando van" within six hours of site selection. This included setting up the Lightweight, Enhanced Small Tactical Terminal, the NATO Meteorological Information System, NAMIS, and running LAN and tactical phone cables for Internet and Sipernet which allowed them to connect with the USAFE Operational Weather Squadron.

The Tactical VSAT proved to be another milestone of the deployment. "The system is truly tactical - it fits inside a very small box and does not rely on the Internet or customer provided communications systems," said a member of the deployed team. The 7th EWS was able to retrieve a wealth of AFWA-provided data such as MM5 model outputs, satellite data, and text

products using the system.

Other equipment also proved to be invaluable. When Secretary of State Madeleine Albright visited Camp Bondsteel, the 7th EWS briefed the Task Force Falcon Chief of Staff and suggested that Albright depart thirty minutes early due to radar detected thunderstorms near the camp. The advice was heeded and a portion of the visit was cut short to avert weather hazards. The storms hit as forecast and remained on station for over an hour.

The 7th EWS provided weather to all members of Task Force Falcon which included weather briefings to the commanding general and his staff; flight weather briefings for a variety of aircraft; forecast in daily fragmentary orders; publishing weather information a electronic Task Force newsletter.

Challenges during the deployment included discerning snowfall and winter temperatures. The weather team gathered traditional weather information from the Air Force Combat Climatology Center,

WEATHER STATION

the Headquarters KFOR Environmental team, and the Task Force Falcon Military Intelligence. Less traditional weather information came from the Task Force Falcon Psychological Operations team who asked nearly a hundred local residents about the Kosovar winter. Using a combination of these sources, the weather team produced a "US Sector Snowfall" report for Task Force Falcon. These investigative efforts allowed the Engineer unit to deploy the correct number of snow removal equipment and the Civil Affairs team was able to identify towns that had the most critical need to be "winterized."

Life in combat was all work for the weather team. A lot of man-hours were spent constructing needed furnishings from plywood as well as repairing and maintaining the generators. The squadron had three generators and twenty-four hour

operations were pushing them to the limit.

Field training was the teams "key to success" in aiding the peacekeeping mission in Kosovo. "You're here to bring freedom, choices and peace to this region.... The 7th Weather Squadron is the tip of the spear, leading the way for Air Force

Weather and doing an outstanding job of it," said Lt. Col. Mark Welshinger, commander of the 7th WS. The initial team deployed from three different 7th WS detachments. The members were Maj. Michael Dwyer, Technical Sgts. John Morris, Daniel Radebaugh, Technical Sgt.(S) Richard McCarthy, Staff

Sgts. Victoria White and James Darlow, Airmen First Class Daniel Bigley, Jennie Ravitch and Todd Petty. In addition, Petty Officer First Class Ralph Styer deployed from the Navy's Mobile Environmental Team located in Rota, Spain.



7thWS Commander Lt. Col. Mark Welshinger (left), First Sergeant Prowell (center) and Capt. Trayers (seated) chat during a visit they made to Camp Bondsteel.



Technology OPERA ALLIED

By Mr. Tom Gosetti and
Capt. Fritz VanWijngaarden

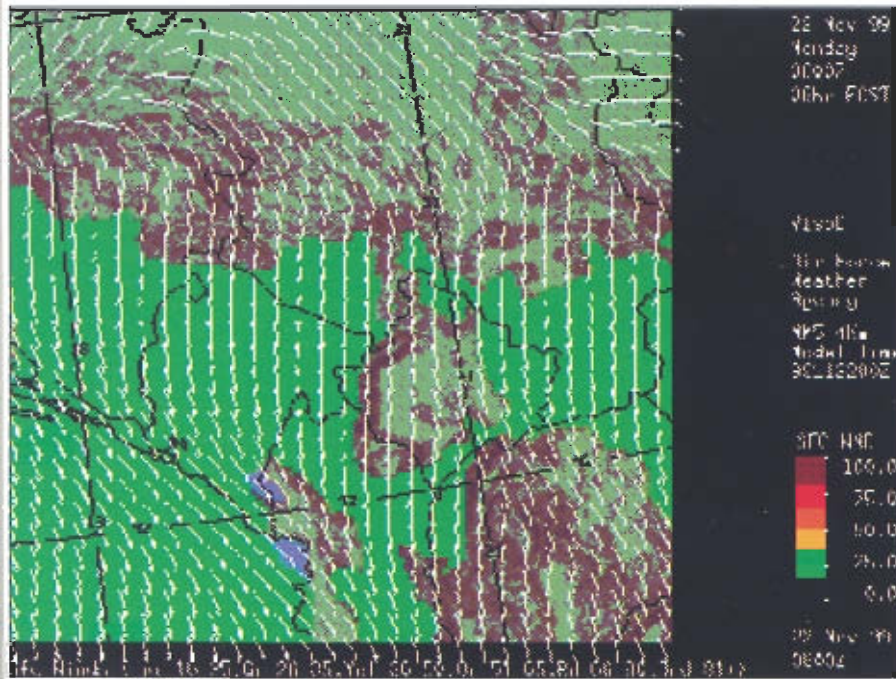


Figure 1. MM5 4 kilometer window over Bosnia

Accelerating two existing weather modeling programs at Air Force Weather Agency significantly enhanced precision engagement of our combat air forces during OPERATION ALLIED FORCE.

During the onset of the Kosovo Air Campaign, a common concern among aircrews was the availability of data at a scale fine enough to make go/no-go decisions for strikes against specific targets. With this concern in mind, AFWA set out to find a better way of providing data to support the aircrews.

The current Mesoscale Model 5 (MM5) models, like the 36 kilometer resolution, needed to be even better to be useful in the field. A 4km resolution product (figure 1) was created for the flight mission planners, and the length of the forecast on the lower resolution MM5 product was expanded out to seven days to aid in developing the Air Tasking Order.

This fine-tuning of the existing model was not done without a cost. The existing computers could not perform the 1 trillion calculations per day to generate all this data, so the system was tripled in size and capability.

Air Force leadership, happy with the 4 km results, pushed for more accurate cloud information. They wanted and needed to know the horizontal and vertical distribution of clouds, when they

would be there, and how long they would remain over a target. The Cloud Depiction and Forecasting System II, still in development, was the program that Air Force Weather had to answer these questions. At the time, the program was producing 25x25km grids for cloud amount and altitude. Mission planners requested finer scale cloud information, so the CDFS II grids had to get much smaller. In the course of eight weeks, using new and existing technology, the grid spacing was reduced to 5x5km (figure 2).

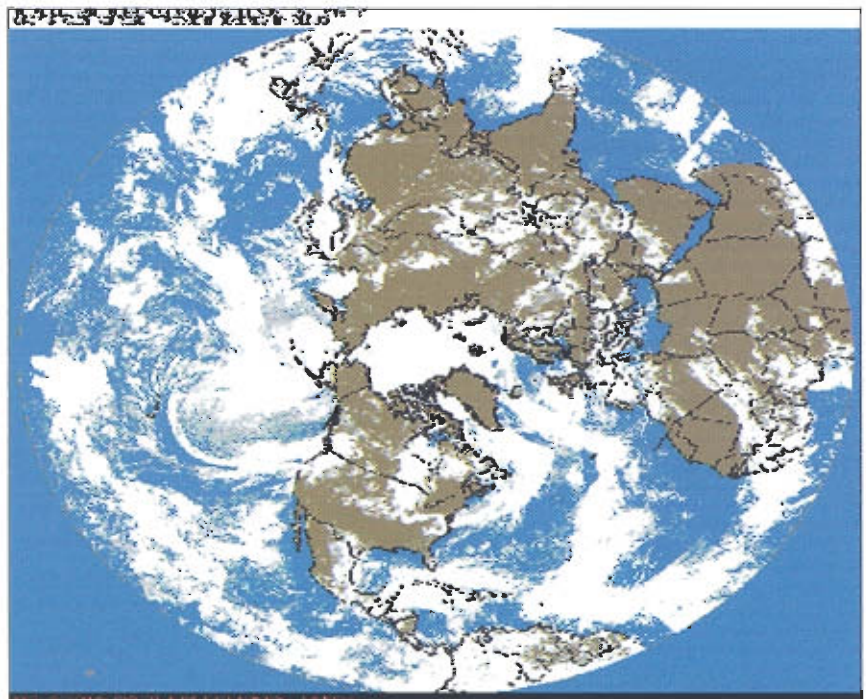


Figure 2. 1/64th mesh satellite image of southern Europe.

Supports TION FORCE

The new cloud analysis algorithms merged data from four DMSP and two NOAA satellites resulting in cloud forecasts out to 30 hours with 5x5km grid spacing. Since this effort was designed for operations in Kosovo, the work was geared toward building cloud products of use in southern Europe.

“In support of the Kosovo mission, the combined AFWA/contractor team accelerated their efforts and brought a great capability online 2 years early”

Col. Al Shaffer
AFWA Director,
Plans and Programs

Follow on work will add geostationary satellite information that will be merged into a worldwide cloud analysis and forecast. The success

came from combining the resources and talent to execute new technology in just two months.

“In support of the Kosovo mission, the combined AFWA/contractor team accelerated their efforts and brought a great capability online 2 years early,” said Col. Al Shaffer, director of plans and programs at AFWA. These added capabilities provided mission planners with critical environmental information that enabled them to choose the correct weapon system for success.

With the added capabilities in place, weather planners were able to glimpse the future of weather. During the next year, cloud analysis and forecasts for the entire world will be available at 25km resolution (figure3) with windows of 5km by combining informa-

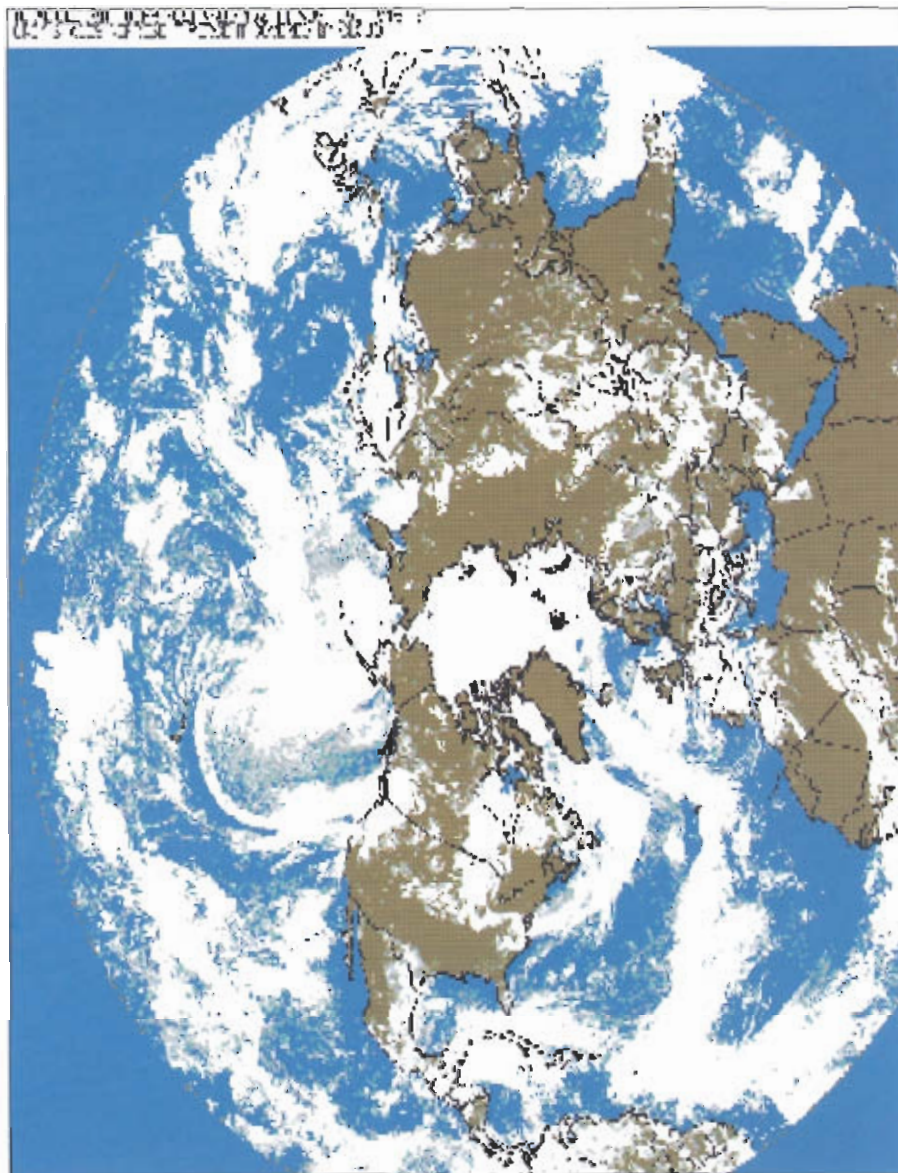


Figure 3. Upcoming Geostationary and DMSP merged mosaic satellite picture of the northern hemisphere.

tion from polar orbiting and geostationary satellites.

This will enable operational weather squadrons and combat weather teams to provide value added products to all facets of DoD operations. Forecasting initiatives will continue to improve the ability to provide the most up-to-date capabilities for mesoscale and cloud models. Data can be accessed on the AFWIN homepage at <http://afwin.afwa.af.mil>. To access MM5 data click on any theater, click on Model Charts and then you have your choice of MM5 Fine Scale Model Output or Meteograms.

The fine scale cloud data derived from CDFS II can be accessed on the European theater under Model Charts by clicking on Advect Cloud Model. Look for a CDFS II selection item on the AFWIN homepage menu coming in the next year.

New technology increases weather forecaster capabilities in Kosovo

By Technical Sgt. Michael Jones
AFWA Public Affairs

Many variables impacted the operations tempo in Kosovo, but none more persistently than the weather. Planning teams repeatedly crafted work-arounds to reduce the weather's influence on day-to-day operations.

One of those creative

solutions accelerated into deployment was the Remote Miniature Weather System. Known as RMWS, the technology's primary purpose is to collect and relay weather observations from remote regions near the battlefield. The unit is programmable, compact and easily installed by one person.

"Weather conditions were obviously at the forefront of the majority of mission decisions, and the vastness of the area of operations made it difficult to meet constant stream of forecasting requirements," said Col. Paul Harris, USAFE OWS commander.

"RMWS actually augmented our forecasting capability without endangering

the lives of observers."

Harris said he saw RMWS demonstrated during a briefing he attended and instantly saw an opportunity to use the technology in USAFE's forecasting operations. When operations in Kosovo revved up, I simply asked whether the technology was something we had access to. Within days Master Sgt. Knowles, USSOCOM METOC branch superintendent, was on a plane to deploy several units at specified locations."

Knowles described RMWS as advanced technology that was part of a developmental program. The program's purpose was to demonstrate RMWS' capabilities and utility. RMWS research and testing activity increased considerably during the last 24 months.

Knowles said a laptop computer drives RMWS and programs two different types of data collection sensors, one that measures temperatures, humidity, pressure, winds and visibility while the other measures cloud heights. This unit provides the same raw data that area forecasters use to develop projected weather conditions. Kosovo was RMWS's first operational deployment, and judging

from the feedback about its operational performance it was a definite success.

Bringing RMWS into the fray proved no easy matter. "We worked the Army's 5th Corps in Albania," said Knowles. "Using their helicopters, we were able to get into rugged areas along the border and place units in locations that would ordinarily be inaccessible.

RWMS performed as advertised, collecting weather data closer to targeted areas and forwarding it to waiting forecasters who incorporated the information into their weather briefings and forecasts."

Operationally deploying any new technology always identifies modifications that will improve its performance during its next usage. Weather conditions at RWMS deployment sites accelerated the drain on its battery power. Immediate work-arounds included piggybacking several batteries to each unit to increase operating time.

"We're working on lengthening RWMS's field lifespan by reworking prototypes with solar panels to provide unlimited power to keep the system

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RMWS Locations*

Wx Sta--1200 ft elevation
Ceilometer
--4600 ft elevation

Tirana--Manned AF weather observation site

*EUCOM requested ISO JTF-NA, replaced by TF Hawk and MSGT Knowles (SOOP-OM)

(Top photo) Master Sgt. Corey Knowles, USSOCOM METOC branch superintendent, stands next to a newly erected RMWS unit. (Inset) Components of a RMWS unit. (Above) the map identifies the approximate locations of RMWS units near Kosovo.

Go for snake's head first

By Linda D. Kozaryn

American Forces Press Service

WASHINGTON (AFPN) — If it had been solely up to U.S. military chiefs, the lights in Belgrade would have gone out a lot sooner, according to top Operation Allied Force field commanders. "I'd have gone for the head of the snake on the first night," Air Force Lt. Gen. Michael Short said in an Oct. 21 Senate Armed Services Committee hearing. The air chief during NATO's air campaign against Yugoslav President Slobodan Milosevic's military, Short appeared with Army Gen. Wesley Clark, overall operational commander, and Adm. James Ellis, commander of NATO forces in Southern Europe.

U.S. military and political leaders are studying Operation Allied Force, NATO's first large-scale conflict, for ways to improve the security alliance and to ensure future success. The recent Senate hearing was one of several to review U.S. lessons learned and prepare a record for future military strategists.

"I'd have turned the lights out," Short said. "I'd have dropped the bridges across the Danube. I'd have hit five or six political-military headquarters in downtown Belgrade. Milosevic and his cronies would have woken up the first morning asking what the hell was going on."

According to the general, a combat aviator himself, the way to

stop ethnic cleansing would have been to put a dagger in the Serb leadership's heart "as rapidly and as decisively as possible." Based on his personal experience with Milosevic, Short said, "If you hit that man hard — slapped him up side the head — he'd pay attention."

Clark said, "Once the threshold is crossed and you are going to use force, that force has to be as decisive as possible in attaining your military objectives." In the case of Kosovo, however, he said, the consensus of 19 nations was required to approve action, and many countries had preconceptions about how to apply force.

"The fundamental lesson of the campaign is that the alliance worked," Clark said. "The procedures that were honed and developed over 50 years, the mechanism of consultation, the trust, the interoperability that we'd exercised time and again in preparation for missions, they all came together."

Clark stressed NATO's conditions were met — the cease-fire, the removal of Serb military forces, the placement of a NATO-led peace-keeping force in Kosovo and the return of refugees.

Yet, there is room for improvement, the three field commanders agreed. They highlighted the need to address the growing gap between U.S. and NATO allies' military capabilities. "This operation had a remarkable effect in spurring European determination and resolve to

pick up a greater burden within the alliance," he said. "They really want to strengthen the European pillar of NATO."

Allied Force naval chief Ellis called for improved secure communications among the allies and streamlined NATO procedures enabling timely political and military action. The admiral also stressed the need to recognize the complexities that emerged during the conflict.

Short noted that Serb air defenses proved to be far less competent than U.S. and NATO officials expected. "Their MiG-29 drivers turned out to be incompetent at best. And their surface-to-air missile system operators chose to survive as opposed to fight."

All three senior leaders' opening remarks praised the professionalism of the U.S. and allied troops who conducted the 78-day operation. More than 900 aircraft — two-thirds American — flew more than 14,000 strike and 24,000 support sorties.

Allied crews delivered more than 23,000 bombs and other munitions with less than 20 incidents of collateral damage. "That's an incident rate of less than one-tenth of 1 percent," Clark said.

"There's never been anything like it in the history of a military campaign, and I think it's a real tribute to the skill and proficiency of the men and women who flew and executed this campaign, to achieve that kind of precision."

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running continually," said Knowles. "Everyone we heard from was thoroughly

pleased with the information these units provided. Pushing a capability like

this from research to actual application is another example of how America's

military forces exercise flexibility to get the job done."

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