



HOT SPOTS

Rules of Thumb for Dust Storms

The impact of dust and sandstorms on military operations have become all too familiar. However, as we move into the most active season for dust and sandstorms, we wanted to provide a refresher.

The average height of a dust storm is 3,000-6,000 feet and stronger storms have dust to 8,000-10,000 feet. Dust haze associated with extreme storms, however, have been documented as high as 35,000-40,000 feet.

Spring dust storms can persist for days with stalled or cut-off lows. These storm systems generally move northeastward across and then out of the area but a few move east-southeastward before recurving northeastward.

Spring blowing dust occurs in a zone of maximum winds in the lower atmosphere with converging jets at 200-250 mb. The converged jets are typically in the southeastern or southern quadrants of a low. The strongest winds and the most dust will occur in the cooler air.

Summer dust has a greater vertical motion due to higher temperatures and resultant convective currents, but it is more limited in areal coverage than in spring. Dust storms generally subside at the source by midnight.

On the edges of blowing dust and within 150 NM downstream, visibility is 1/2-3 miles (800-4,800 meters). Beyond that, and as dust settles, visibility improves to 2-5 miles (3,200-8,000 meters) fairly quickly. Visibility will often remain at 4-6 miles (5,000-9,000 meters) in dust haze for days after a dust storm. In summer, dust haze persists nearly constantly. Intense dust storms reduce visibility to near zero in and near source regions. Dust will settle when the winds die down to below the speed necessary to carry the particles.

(continued on page 2).

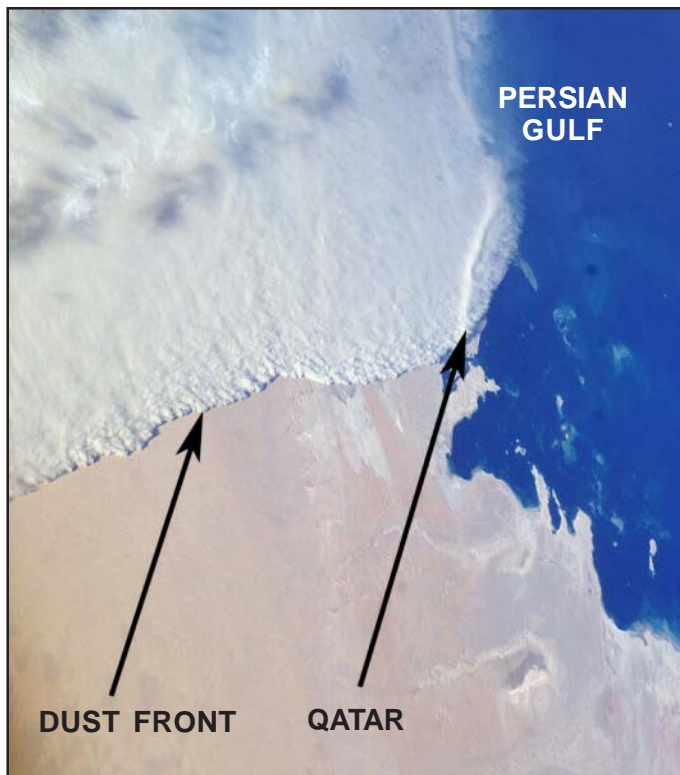


Figure 1. Massive Sandstorm in Qatar (15 Feb 2004).
NASA astronaut photo ISS008-E-16355.



Figure 2. Same Storm as seen from the ground.
Photo courtesy of the CWT at Al Udeid AB.

2004 DoD Climo Workshop

The Commander, Air Force Combat Climatology Center (AFCCC) will host the 2004 DoD Climatology Workshop 28-30 April 2004 in Asheville, NC. In addition to highlighting AFCCC's and the national climate community's capabilities and goals, the conference invites Operational Weather Squadron staffs to share their operational forecast and climatology-related challenges for discussion with climatology experts from AFCCC and the NOAA National Climatic Data Center. MAJCOM staffs, METOC operations staffs, staff meteorologists, and others from the METOC and operations communities will share their operational climo requirements and learn about the climatological capabilities and leading-edge DoD and non-DoD research applications at the AFCCC and in the national climatology community. *(continued on page 2)*

Hot Spots Continued:

In general, the worst visibility occurs within 20 feet (6 meters) of the surface and above that, particles begin to settle out into layers (by particle size) of progressively better visibility conditions.

Slant range visibility is typically worse than straight-line visibility.

Below is a general breakdown of wind speeds required to lift particles of varying sizes.

Fine to medium sand in dune covered areas	10-15 MPH (8.7-13 knots)
Sandy Areas with poorly developed desert pavement	20 MPH (17.4 knots)
Fine material, desert flats	20-25 MPH (17.4-21.7 knots)
Alluvial fans and crusted sabkhas (playas)	30-35 MPH (26.1-30.4 knots)
Well developed desert pavement	40 MPH (36.8 knots)

Note: Desert pavement is a thin veneer of rock and gravel that armors the surface of many desert soils. A sabkha (also spelled sabka) is an area of crusted-over sand and dirt, generally found in wadis. Once the crust is disturbed, dust is easily lifted from these sabkhas.

Contact Mrs. Higdon at DSN 673-9001/COMM (828) 271-4218 or melody.higdon@afccc.af.mil.

Branch Spotlight

Tailored Climatology Products Team

Space Shuttle Bailout Support

NASA plans for bailout scenarios where astronauts could escape the Space Shuttle right after a launch and before the ship enters orbit. The AFCCC Tailored Climatology Products section gave the 45 WS wind statistics derived from thousands of ship observations along a launch trajectory from Kennedy Space Center to Northern Atlantic orbit. The statistics help determine cost/weight trade-offs in design and construction of future bailout capabilities. Potential savings include astronaut lives and millions of dollars by balancing capsule weight/durability to extreme sea state conditions.

Working with the customer step-by-step to develop the best possible technical solution, Mr. Jeff Zautner, our senior technical expert on our Tailored Climatology Products Team, received glowing praise from the 45th: "...after many years of frequent support from AFCCC, including many unusual projects supporting America's space program, this is arguably the very best support

Workshop Continued:

When: 28-30 April 2004

Where: Federal Climate Complex, Downtown Asheville, NC

Workshop Goals:

- Address OWS forecast challenges and their relationships to operational climatology.
- Discuss and document operational requirements for climatology services support.
- Present AFCCC's organization, capabilities, and future goals to the DoD community.
- Teach staff meteorologists and others about the climatological tools available from AFCCC.

For more information or suggestions, look for the "2004 DoD Workshop" button on the AFCCC web < <http://www.afccc.af.mil/> or send e-mail to hugh.freestrom@afccc.af.mil.

Ops Impacts

PACAF – NVG Training. Night vision goggles have been introduced throughout the airlift community. Aircrew training now includes learning to land aircraft, load and unload cargo and troops, and take off, all under the cover of darkness.

The 374th Airlift Wing and its 36th Airlift Squadron at Yokota AB, Japan had some difficulties maintaining mission-ready C-130 crews due to bad weather. AFCCC advised the wing on NVG training conditions at other PACAF bases to justify, plan and execute NVG training for a 16,000 hour/\$18M flying program and maintain readiness for the wing.



Figure 3. Space Shuttle Launch Track

I've ever received from AFCCC." Contact Mr. Zautner at DSN 673-9005/(828) 271-4407 or email at jeffrey.zautner@afccc.af.mil.

Impacts Continued:

AFSPC – Evolved Expendable Launch Vehicle (EELV). The EELV is the new launch vehicle representing DOD's primary spacelift capability to put satellites in orbit. It replaces Delta II, Delta III, Atlas II, Titan II, and Titan IV rockets. AFCCC provided 30 WS and 30th Space Wing with custom databases supporting analysis of key thresholds and operating requirements for EELV "go/no-go" decisions to help determine rocket launch probabilities at various times of year.



Figure 4. Vandenberg Delta IV Launch Facility Space Launch Complex 6, Vandenberg AFB, California (Photo courtesy of Boeing).

Library Corner



Many Air Force Weather technical documents (AFWA, AWS, AFCCC (previously USAFETAC), AFGWC, or old 1st, 2nd, 3rd, 4th, 5th, 7th Weather Wings) are available for download through the AFCCC web site (https://www.afccc.af.mil/cgi-bin_mil/index_mil.pl). To download these

documents, click on the AF WX LIBRARY link. Then scroll down to the Catalog of AF Weather Technical Documents link. Technical document numbers that are located inside a red box are available in portable document file (.pdf) format. Click on the document number to download the required document.

Documents that are not available in portable document file format can be requested in paper format from the library as a technical information request. If you have a requirement to convert an existing paper technical document to electronic format also contact us. Contact the AF Weather Library customer services team via the library web page, or e-mail directly to dorsvc@afccc.af.mil or by phone at DSN 673-9019 or Commercial (828) 271-4270.

Climo Tidbits

Winds of Afghanistan

The *Winds of 120 Days* in western Afghanistan are well known. They result directly from thermal low pressure in southern Asia. The winds blow persistently from the north quarter down the corridor between the mountains of Iran and Afghanistan. They blow May to September and reach peak intensity in the basin at the southern end of the corridor. They are strongest during the day and weaken considerably at night. They are hot, dry winds filled with dust and sand and violent gusts are common.



The Asheville Navy detachment is available to serve your marine climatology needs. Our web sites host a wide variety of marine, upper air, tropical and historical products for the world. Our sites

also offer twenty-seven of our regional and basin climate atlases as .pdfs. Our newest line of products is our collection of climatology Power Point Briefs. These briefs are targeted at deployment areas and selected "hot spots" around the world. They contain charts and tables for the marine environment as well as specific sites or geographic regions. The briefs are intended for METOC personnel. They are not designed to be "one size fits all" for every echelon. Feel free to download the

briefs and tailor them to your specific requirements. The most recent additions to our growing list of over 100 briefs are: the Adriatic, Albania, Greece, Onslow Bay, Djibouti and the JTFEX LANT oparea. Note: For OPSEC reasons, these briefs are available only via our SIPRNET web site. If you need climatology for the marine environment, make us your first stop. If you've got to go, "Know what to expect before you get there!"

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