

# Forecasting Desert Dust

*Southwest Asia is one of the most difficult areas in the world for weather forecasting, largely because of air masses from five regions surrounding the area*

This satellite photo shows how extensive dust storms can be.

WEATHER

By Capt. James H. Glass, USMC

**D**ust storms in Southwest Asia, which includes the Middle East and Afghanistan, often cause problems for air operations and degrade laser-guided weaponry.

The dust typically consists of fine particles easily picked up and held aloft by the wind. In Iraq, the dust originates in areas such as the Tigris-Euphrates River valley, Syria and Jordan. Sources in Afghanistan include an area once known as the Hamoun wetlands, where a combination of expanded irrigation and severe drought caused the region to dry up.

Besides frequent dust storms, the region has high levels of air pollution, which also contribute to visibility problems.

Southwest Asia is one of the most difficult areas

in the world for weather forecasting, largely because of air masses from five regions that surround it: Central-North Africa, Europe, Arabian Peninsula, Central Asia, and the Indian subcontinent. The complexity of the weather patterns further is compounded by extremely hot deserts, mountain ranges, and very warm waters. Also, the region has a lack of meteorological sensing systems to collect the data to populate the computer models.

Two types of dust events are common in the region:

A “shamal,” a term from the Arabic word for “north,” normally blows persistently during the summer months over Iraq and the Arabian Gulf. The shamal sets up when a strong cold front, cooler than the surrounding air mass, passes over the mountains of Turkey and



Lt. Marne Balolong aboard USS *Gunston Hall* (LSD-44) experiences dust storm at sea during Operation Iraqi Freedom.

Kurdistan. This system kicks up sand and dust that can remain aloft for several days.

The second type of dust event is known as a “haboob,” from the Arabic word for “phenomena.” The haboob results from the collapse of thunderstorms. When this happens, precipitation is released, and the winds begin gusting outward from the thunderstorm. These gusts are generally strongest in the direction the storm is moving. When the downburst of air reaches the ground, it blows the fine dust and sand into the air, creating a wall of sand, which has been known to reach 60 miles in width and several thousand feet in height.

Forecasters have two major tools to predict and track these events. The first is a dust model, which

incorporates a dust-region database derived from topography and known dust-source regions. The information is used to formulate a 72-hour forecast.

The second tool is an enhancement of satellite imagery, using a combination of infrared and visual elements to interpret fine-scale features of dust.

These products and more can be found on the Naval Central Meteorology and Oceanography Center (NCMOC), Bahrain website at: SIPRNET:<http://www.ncmoc.navy.smil.mil>, or by calling DSN 318-439-4083, comm. 973-72-4083, and on the Marine Corps Tactical METOC Fusion Cell website at: SIPRNET: <http://metoc.mnf-wiraq.usmc.smil.mil>. 

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