NCAR
National Center for Atmospheric Research
P.O. Box 3000 Boulder, CO 80307 (303)494-5151

NEWS RELEASE

JAWS News Release

For Release
May 9, 1982

MAJOR RESEARCH EXPERIMENT ON AIRPORT WIND SHEAR LAUNCHED

DENVER--Wind shear near the ground, the cause of several commercial airline crashes and many near-crashes within the past few years, is the focus of a major research experiment which will take place this summer in the Denver vicinity from May 15 to August 15.

Termed JAWS for Joint Airport Weather Studies, the program will investigate the meteorological conditions that emanate from thunderstorms, creating hazards for aircraft during takeoffs and landings, as well as for the public.

A joint effort managed by the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, and the University of Chicago, with funds from and sponsorship by the National Science Foundation, JAWS is aimed at understanding "microbursts"--small regions of intense downflows and outflows of air often associated with thunderstorms. Additional funds or support will come from the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA) and the Federal Aviation Administration (FAA). Over 100 scientists, engineers, and technicians from 10 research groups in the United States and Great Britain are participating in the 2.2 million dollar project.

Dr. John McCarthy and James Wilson of NCAR's Atmospheric Technology Division, and Dr. Theodore Fujita of the University of Chicago are the experiment's principal investigators.

While JAWS will concentrate on basic research, McCarthy says, a major effort will be directed to applied research results. These center on the downburst and outflows of winds that occasionally emanate from thunderstorms and even innocuous-looking clouds. Because these events sometimes occur in clear air, pilots landing or taking off can encounter unexpected downdrafts or sudden tailwinds or headwinds that abruptly change air speed, possibly inducing stalls and sometimes crashes. The most notable of such crashes occurred at Kennedy Airport in New York in 1975, an event in which 113 people lost their lives. A similar event occurred at Denver's Stapleton Airport six weeks later, when 15 persons received injuries.

The principal aim of JAWS is to understand the conditions which give rise to such events, to predict them, and to detect them as they occur so that pilots can be prepared for or avoid them. The experiment is also designed to further our understanding of thunderstorms and how they produce various other kinds of severe weather.

"Thunderstorms unleash awesome power," McCarthy adds. "Much is yet to be learned about how they develop and why they occur where they do, how to predict when and where they will happen, and most importantly, how to warn the public of accompanying severe weather in sufficient time to take necessary action.

"Denver is an ideal location to study downbursts," he explains. "This vicinity has one of the highest frequencies of thunderstorms in the United States, moreover, Denver's airport is the fourth busiest commerical airport in the United States, and a detailed understanding of the downburst environment will be of great value to all aircraft operations here, as well as in other regions.

In addition to the basic studies of low-level convective storm winds, JAWS will test seven wind-shear detection and warning systems to evaluate and intercompare their performance. JAWS will also study aircraft performance in wind-shear conditions and the usefulness of Doppler radars for detecting conditions which may spawn wind shear.

Using JAWS results, scientists can then make recommendations to private and commercial pilots, the aviation industry, and other interested groups about how the specific conditions that cause wind shear can be better detected and avoided.

The JAWS research area encompasses a 5,000-square mile area that includes Denver in its southwest corner and extends north, east and west of the city. NOAA and FAA operational and experimental observatory systems in the area will complement the JAWS observing network.

Researchers will coordinate field operations from three Doppler radar sites using a sophisticated communications system to change radar scanning strategies and to guide seven different research aircraft into or around storms of interest.

-more-

These include a NASA B57B Canberra twin jet and a Lockheed P-3 turboprop, a Hawker-Siddeley twin jet from the Royal Aircraft Establishment in Great Britain and a Beechcraft Super King Air 200 from the University of Wyoming.

To complement the aircraft measuring systems, JAWS scientists will make meteorological measurements from the ground with three NCAR Doppler microwave radars, as well as NASA and NOAA Doppler laser radars, which can detect wind shear and turbulence in clear air.

The U. S. Air Force will operate a lightning tracking and positioning network in the Denver area during the experiment.

In addition, 48 automated ground stations, 27 of them solar-powered, will record information on air temperature, pressure, wind speed and direction, and rainfall at the earth's surface. Four times each day weather balloons will be released to gather upper air meteorological information.

In a central control room, located 20 miles north of Denver, project managers will monitor radar measurements on TV-style screens so they can direct aircraft and radars to critical locations as thunderstorms develop and mature. The Multiple Aircraft Positioning System (MAPS), developed by NCAR's Convective Storms Division, will provide continuous altitude and position information and recording for the aircraft coordinator.

Following the JAWS field experiment, the participating scientists will spend the next two years analyzing the voluminous data the field experiment will have generated.

"This will be the most complete set of data yet gathered on downbursts," McCarthy says, "and it will take a great deal of work to unravel all the puzzles the data will reveal. In the end, we can expect to have results of great scientific interest as well as practical value."

-The End-

Joan Vandiver Frisch
Information Officer
National Center for Atmospheric Research
P.O. Box 3000
Boulder, CO 80307
(303) 494-5151, Ext. 261
or (303) 443-5011

See Note to Editors on next page.

NOTE TO EDITORS: Arrangements can be made for visits to the JAWS field sites by contacting Joan Vandiver Frisch at NCAR, (303) 494-5151, Ext. 261. Here is a time schedule of events which will take place seven days a week between May 15 and August 15. Since the operational spaces are cramped, visiting journalists can best be accommodated if detailed arrangements are made in advance.

Daily Operational Schedule during JAWS

On a typical research day, you can expect the following activities:

10:00 a.m. - Daily JAWS coordination meeting in Rm. A345 at 3100 Marine St., Boulder

10:30 a.m. - All three Doppler microwave and two Doppler lidars (laser radars) will be fully operational. The JAWS Operations Director will coordinate the radars from the JAWS CP-2 Control Room (at the intersection of I-25 and Colorado 7) where TV-type consoles will graphically display the real-time monitoring of storms.

11:00 a.m. - All research aircraft will be on "standby." In the case of the NOAA Lockheed P-3 and NASA's B57B Canberra, the aircraft will be ready for takeoff by noon or 1 p.m., depending upon the previous evening's weather forecast. (Some aircraft will depart from Stapleton Airport in Denver, others from the Jefferson County Airport in Broomfield or Buckley Air National Guard Base in Denver.) All flights will be monitored from the CP-2 radar control room north of Denver.

12:00 noon: A meteorologist will come on duty at NOAA's Prototype Operational Forecasting Service (PROFS) control room at 3100 Marine Street in Boulder to obtain weather updates. The meteorologist will give the JAWS operations director at the I-25 and Colorado 7 site a larger perspective on approaching "fronts" based on satellite, radar, radiosonde, and the automated ground station meteorological network.

12:00 noon to 7:00 p.m. If a storm is approaching, the JAWS research aircraft will be dispatched to penetrate the thunderstorm clouds at different altitudes to determine where the thunderstorm hazards actually exist with respect to the observation of the hazards by conventional and Doppler weather radars. Outfitted with instruments to measure temperature, dew point, pressure, cloud water content, and wind speed direction and turbulence, some of the instrumented aircraft will obtain detailed low-level observations associated with convective storm clouds.

Aircraft also will fly around the perimeter of the convective clouds and thunderstorms in clear air, at various altitudes, to determine the extent of turbulence in the areas.

NCAR's Sabreliner also will fly into or near areas forecast to be of moderate or greater turbulence, but within safe operational limits. At the same time NASA's high-flying U-2 may be dispatched to conduct lightning detection research at altitudes around 60,000 feet.

7:30 p.m. - JAWS operations directors will make a decision to close down for the day or continue operating until 10 p.m., depending upon the weather conditions. No aircraft operations are planned after dark.

# # #