

**P1.50 JETSTREAM - A NATIONAL WEATHER SERVICE SOUTHERN REGION
WEATHER SCHOOL**
<http://www.srh.weather.gov/jetstream/>

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1. INTRODUCTION

Many school systems throughout the country are beginning to reemphasize the basics in their classroom instruction, with one of those basics being the physical sciences. Additionally, more sophisticated weather information is available to emergency management officials, decision makers, and the general public than ever before. Thus, there is an increasing need for instructional material on meteorology that is easily accessible and tailored to a user community with varied backgrounds.

The basis of JetStream began as many other outreach programs do. In this case a teacher of a student whose parent worked for the National Weather Service (NWS) asked for a presentation for her science class. This prompted a few meteorologists from Southern Region Headquarters and the Fort Worth/Dallas Weather Forecast Office (WFO) to begin a brainstorming session for an online weather school that could be utilized by educators, emergency managers/officials, or anyone interested in learning about the weather. The result was JetStream- A National Weather Service Southern Region Weather School.

2. WEBSITE CONTENTS

JetStream is a web based learning system developed to increase the knowledge of its users on a wide variety of weather topics. Each section or "module" is designed with both text and graphical displays and includes learning lessons. These lessons are essentially lab experiments that can be conducted in the classroom. Review questions are also included at the end of each module. The modules are designed to be completed either individually or sequentially for maximum flexibility.

There are eight modules on JetStream. Material is arranged by subject; beginning with modules on the atmosphere and global weather followed by lessons on air masses, wind patterns, cloud formations, thunderstorms, tropical meteorology, and remote sensing. JetStream also provides a tutorial entitled "Weather on the Web" which contains step-by-step instructions on how to retrieve weather information from the internet. Additionally, there is a section for those interested in careers in the NWS and in meteorology with graphical links to various universities offering degree programs in the atmospheric sciences.

2.1 A Module Example- Thunderstorms

The Thunderstorm module begins with an overview of the annual frequency of thunderstorms nationwide (Fig 1.), followed by a discussion on how thunderstorms form. The concepts of moisture, instability, and lift are explained in detail. The thunderstorm life cycle is presented next with illustrations and accompanying photographs of the towering cumulus, mature, and dissipating stages of a single cell thunderstorm. Figure 2 is the mature stage graphic depicted on the website.

The lesson then continues with a presentation of the different types of thunderstorms- multi-cells, supercells, and squall lines. Figure 3 depicts the multi-cell graphic used in the module. The next section of the module discusses thunderstorm hazards- lightning, large hail, damaging winds, tornadoes, and flash flooding. The process of how lightning forms is described from the separation of charge in the cloud to the step leader process. A learning lesson is included on determining the distance to a lightning bolt. Lightning safety rules are also presented.

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The theory on large hail formation is explained with both graphics and text emphasizing updraft strength as a means to increase hail size. The development

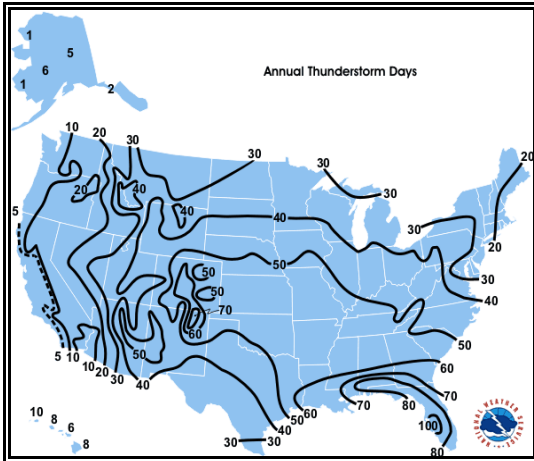


Figure 1. Average annual number of thunderstorm days.

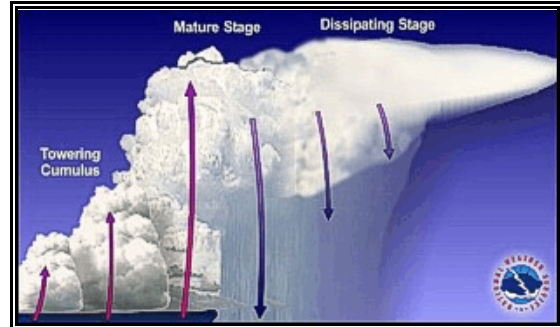


Figure 3. Multi-cell graphic used in Thunderstorm module.

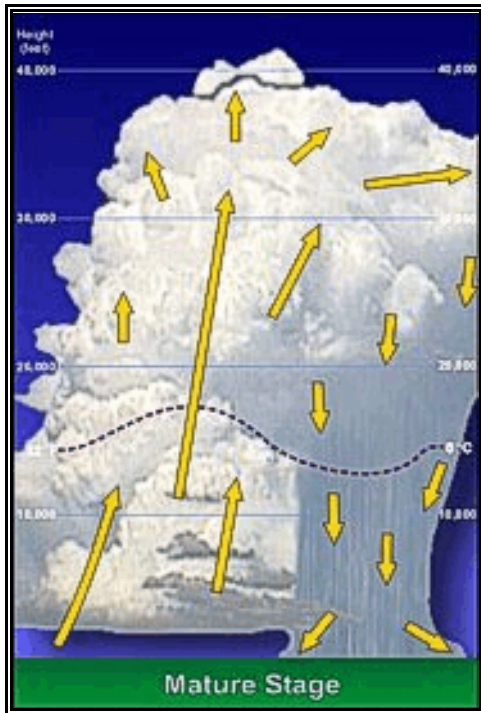


Figure 2. Mature stage of thunderstorm life cycle.

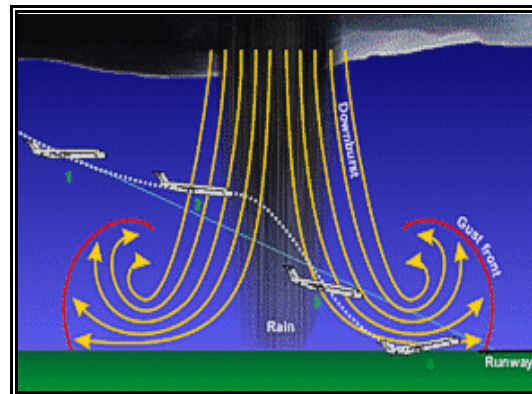


Figure 4. Schematic of an airplane encountering a downburst.

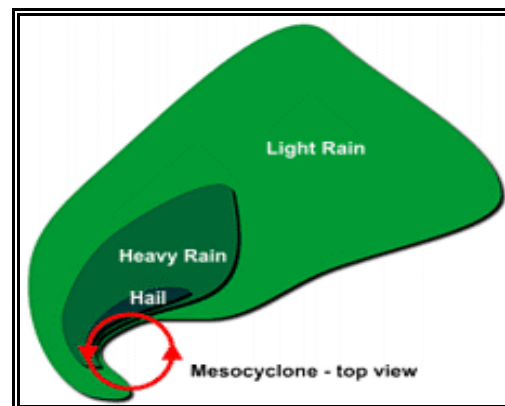


Figure 5. Schematic of supercell and mesocyclone.

of damaging outflow winds is discussed with a graphic also depicting the dangers of downbursts to aircraft in flight (Fig 4.). Detailed information is available on tornadoes from: where they are most likely to occur, the conditions necessary for the development of the parent supercell (mesocyclone; Fig 5.), to the Fujita scale of damage classification.

The final hazard discussed is flash flooding. Emphasis is placed on the fact that more people are killed annually on average from flash floods than the other thunderstorm related hazards. Safety

rules are provided along with an introduction to the “Turn Around Don’t Drown” campaign initiated in the Southern Region of the National Weather Service. The module concludes with 20 review questions that can easily be converted to a quiz or short exam.

3. RESULTS AND THE FUTURE

The authors have received numerous positive comments on the value of JetStream. Known Users of the JetStream website include the U.S. Coast Guard, several Independent School Districts, several colleges, home school programs, and emergency management officials/planners. Based on feedback from the users, the plans are to expand topics of JetStream and to modify the materials for different age levels. Plans are also to continue JetStream as a web-based training system. This will allow for quick updates and also allow for almost anyone to download the zip files available on the site.