

## **AWOC Winter Weather Track FY09**

### **Uncompahgre Gorge Winter Storms**

IC4.3 Microclimate Exercise  
Megan Schwitzer – NWS GJT  
22 March 2010

**Overview:** The Uncompahgre Gorge is a deep and narrow gorge located on the northern side of the San Juan Mountains in southwest Colorado, as shown below in Figure 1. The Gorge begins in the Uncompahgre River basin near the town of Colona, and extends southward into the northern side of the San Juan Mountain range. The elevation near Colona at the base of the Gorge is roughly 6,500 ft., while the elevation at the summit of the Gorge over Red Mountain Pass is roughly 11,000 ft. This feature causes localized heavy snowfall events that can extend from the base of the Gorge southward through Ridgway, Ouray, and upward towards Red Mountain Pass. This particular portion of the San Juan Mountains often experiences a weather pattern more reminiscent of the northern Colorado Mountains, rather than the rest of the San Juan Mountain region that it lies within. Certain wind flow patterns interact with the terrain of the Gorge to produce significant snowfall events that forecasters in the office refer to as “Gorge Storms”.

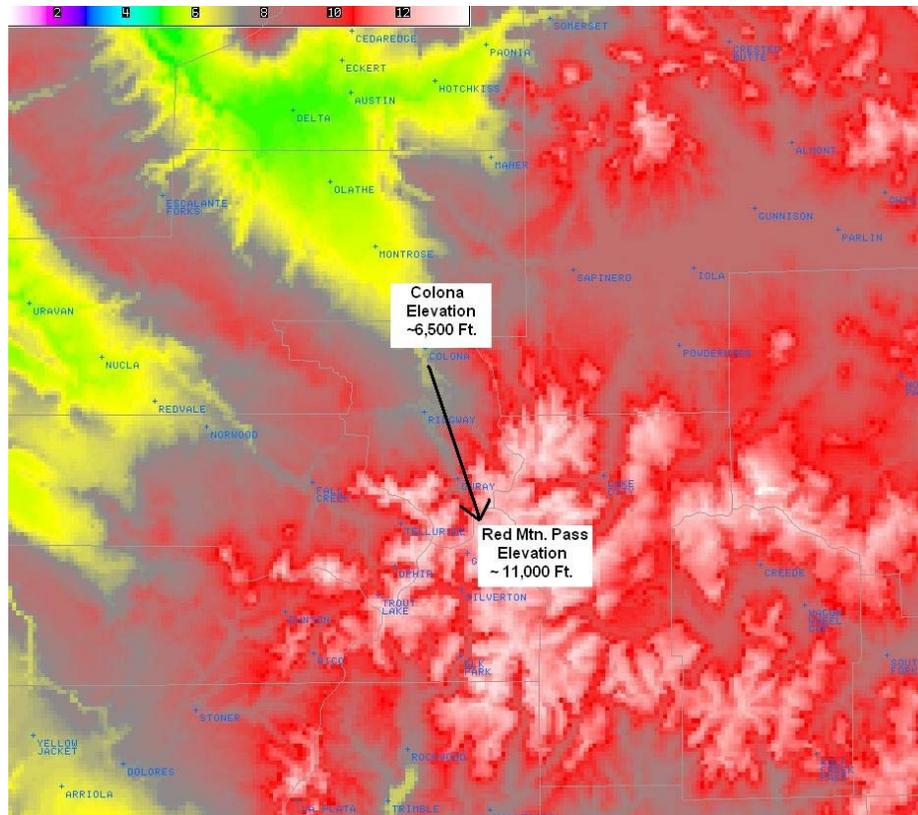


Figure 1 Topographic image of the San Juan Mountain range with the Uncompahgre Gorge indicated by the black arrow.

**Weather Pattern:** The San Juan mountain region is generally favored for wintertime precipitation under a south to southwest flow regime because of the orientation of the mountain range. However, since the Uncompahgre Gorge lies on the northern side of this mountain range, it tends to favor a northerly flow pattern. This allows the air to be channeled deep into the Gorge, forcing it upward and generating a source of atmospheric lift. Gorge Storms usually occur after cold frontal passages when the flow aloft has shifted to the north, and plenty of moisture and instability are present in the low to mid levels. Deeper low level moisture and instability will result in significant lifting and more intense snowfall production. The best low level moisture and northerly flow are often found on the northern side of closed low pressure systems that form over southern Colorado. This allows wrap-around moisture to feed directly into the Gorge.

The Gorge can also be favored for precipitation on the backside of open-wave troughs that track across northern and central Colorado. These systems typically favor the northern and central Colorado mountains, but with enough moisture and northerly flow the Gorge can pick up several inches of snow while the remainder of the San Juan Mountains see little to no snowfall. In extreme cases, the Gorge can see up to 2 feet of snow while the southern side of the San Juan Mountains will receive only 1 to 2 inches.

The intensity of a Gorge Storm can last up to several days, and primarily depends on the magnitude and specific direction of the wind flow. A northwest to north wind direction (typically 330 to 015 degrees) is

preferred for producing the best lift, while the magnitude of the wind determines the extent of the orographic lifting.

**Operational Impacts:** Operational forecast models usually do not recognize when a Gorge Storm will occur, and there is no MOS guidance available for this region. Since the area is somewhat remote, timely spotter reports and observations are often very sparse during a Gorge Storm and sometimes the roads to access these areas are closed. Enhanced radar and satellite images can be helpful tools to indicate the presence of a Gorge Storm, but they have their limitations as the radar is located about 75 miles north of the Gorge. All of these limiting factors make Gorge Storms very difficult to forecast, so forecasters must rely heavily on their local knowledge and experience.