Technical Support Document For the Multiple High Wind Events of May and June 2002



Colorado Department of Public Health and Environment

Prepared by the Technical Services Program Air Pollution Control Division November 20, 2002

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1.0 Introduction

PM₁₀ Standards

In July 1987, EPA promulgated National Ambient Air Quality Standards for Particulates with an aerodynamic diameter of 10 microns or less (PM_{10}). This is a size that can be inhaled into the alveolar regions of the lungs. The standard has two forms, a 24-hour standard of 150 ug/m³ and an annual arithmetic mean standard of 50 ug/m³. The 24-hour standard is attained when the expected number of exceedances for each calendar year, averaged over three years, is less than or equal to one. The estimated number of exceedances is computed quarterly using available data and adjusting for missing sample days. The annual arithmetic mean standard. Each annual mean, averaged over three years is less than or equal to the level of the standard. Each annual mean is computed from the average of each quarter in the year, with adjustments made for missing sample days. In both cases, a data recovery of 75 percent is needed for each calendar quarter to be considered a valid quarter of data. This standard was modified in by EPA in July 1997, but was subsequently nullified back to this form in May 1999.

PM₁₀ exceedances were monitored on May 21, 2002 (160 ug/m³ at Alamosa; 196 ug/m³ at the Lamar Power Plant site; 183 ug/m³ at the Lamar Municipal Complex site). In addition, an elevated level of 134 ug/m³ was recorded at the Alamosa Municipal Building site. On June 20, 2002, exceedances were monitored at the Lamar Power Plant site (181 ug/m³) and the Lamar Municipal Complex site (162 ug/m³). The elevated levels coincided with successive low pressure systems and widespread high winds and gusty conditions that moved across the state.

EPA's Natural Events Policy enables states to demonstrate that PM_{10} exceedances were caused by natural events (volcanic and seismic activities, wildland fires, or high winds) and therefore are not to be taken into account in determining compliance with National Ambient Air Quality Standards (NAAQS). The Natural Events Policy requires that sufficient documentation be submitted to EPA to demonstrate:

- 1. That an event occurred that meets the definition of a natural event. This can include monitored particulate data, videos and photographs of the event, eyewitness accounts, and news accounts.
- 2. That there is a cause and effect relationship between the event and the exceedance. This can include meteorological data, receptor analyses, dispersion modeling, etc.
- 3. Should a PM₁₀ NAAQS violation occur due to a natural event, a Natural Events Action Plan (NEAP) should be implemented. Due to past PM₁₀ violations, NEAPs are in place for Lamar and Alamosa.

In this report, the Air Pollution Control Division (APCD) provides documentation to support that PM_{10} exceedances monitored on May 21, 2002, and June 20, 2002 were caused by a natural event.

2.0 Meteorological Data for the May 21, 2002 Event

On Tuesday May 21, 2002, Alamosa and Lamar recorded exceedances of the twenty-four-hour PM10 standard with readings of 160 ug/m3 at Alamosa (Adams State College), 196 ug/m3 at the Lamar Power Plant, and 183 ug/m3 at the Lamar Municipal Building. In addition, the Alamosa Municipal Building had an elevated value of 134 ug/m3. An intense upper level low moved northeast from Utah towards Montana on May 21. Figure 1 shows the 700 millibars (mb) or 10,000-foot level features including a packed gradient over Colorado and winds of 45 knots. The surface weather map for 19Z May 21 (1:00 PM MST on May 21) in Figure 2 shows a storm system with a central pressure of 986 mb in north-central Colorado. The central pressure of the storm is significant since storms of about 1000 mb or lower were identified as a typical precondition for significant blowing dust in eastern Colorado at the end of this document).

The intense surface and upper level low pressure systems generated widespread high winds and blowing dust in Utah, New Mexico, Colorado, Kansas, Nebraska, and Wyoming. Figures 3 and 4 show surface weather conditions for 20Z and 22Z (2:00 PM and 4:00 PM), respectively, on May 21. Wind symbols point in the direction that the wind was blowing. Each full barb or flag represents 10 miles per hour (mph) of wind speed. Each half barb represents 5 mph of speed. Winds of 30 to 45 mph were common across the entire multi-state region. Red infinity signs and modified dollar signs represent haze or blowing dust. The small red numbers in front of these symbols show the visual range in miles at the time. Visibilities of 1 to 9 miles in haze or blowing dust were common across the region. At 2:00 PM, for example, the visibility at Trinidad, Colorado, (TAD) was 2 miles in haze or blowing dust with a wind speed of 40 mph.

Sustained winds and gusts in Colorado exceeded blowing dust criteria in most areas of Colorado. A majority of stations recorded wind speeds in excess of 30 mph and gusts in excess of 40 mph. These are the speed and gust thresholds for blowing dust that apply in southeastern Colorado when surface soils are dry (see reference for the *Natural Events Action Plan for High Wind Events – Lamar, Colorado* at the end of this document). Tables 1 and 2 below lists wind speeds and gusts for Lamar and Alamosa, respectively, on May 21. The 30 mph blowing dust threshold applies to hourly average winds. Wind speed observations at stations like Lamar and Alamosa are made just prior to the reported hour of observation. In most cases, these recorded speeds are not hourly average speeds but represent a several-minute average. If these spot observations show that speeds are above the 30 mph threshold for successive hours, then it can be reasonably assumed that hourly average winds are also above 30 mph. During the late morning, afternoon, and evening hours of May 21, winds at Lamar exceeded the blowing dust thresholds for thirteen consecutive hours. The highest gust during this period was 59 mph. During the same period, winds at Alamosa exceeded blowing dust thresholds for eleven consecutive hours. The highest gust during the period was 55 mph

Strong winds were the norm across much of Colorado on May 21, 2002. Many stations recorded winds of 40 to 50 mph with gusts of 45 to 74 mph for several hours of the day. Detailed weather observations for sites in Colorado on May 21 have been included in Attachment A. Reports of haze or blowing dust were common. At the height of the dust storm, visibility at Lamar dropped to one mile at 7:00 PM (see Attachment A) and 1.75 miles at 7:53 PM (see Table 1).

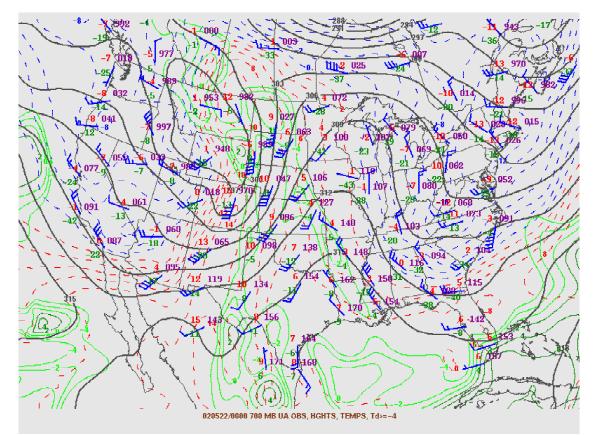


Figure 1. Upper level (700 mb or about 10,000 feet above sea level) weather map for 00Z May 22, 2002, or *6 PM MST May 21, 2002*.

Figure 5(a) shows the March 2002 precipitation for Lamar, Alamosa, Saguache, Salida, Colorado Springs, Rocky Ford, and Pueblo. Figure 5(b) shows the April 2002 precipitation at these stations, and Figure 5(c) shows the May 1 through 20, 2002, precipitation at these sites. Precipitation amounts were low at most sites.

Figure 6 shows that the U.S. Drought Monitor had declared that an *extreme* drought was underway in most of Colorado including the area around Lamar and Alamosa. This designation was made on May 23 and was representative of conditions in place on May 21.

Figure 7 shows images of blowing dust at Denver and Colorado Springs in the late afternoon/early evening of May 21, 2002. Cloud cover in many areas of the state precluded good satellite imagery of the dust storm.

Reference

Colorado Department of Public Health and Environment, City of Lamar, Prowers County Commissioners, *Natural Events Action Plan for High Wind Events – Lamar, Colorado*, April 1998.

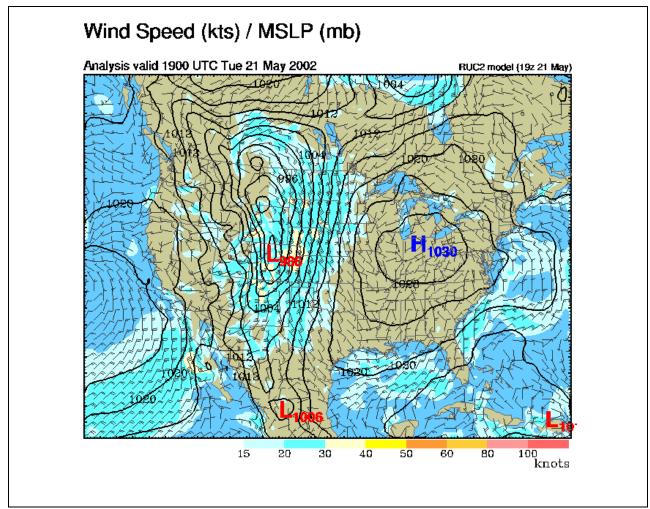


Figure 2. Surface weather map for 19Z May 21, 2002, or *1 PM MST May 21, 2002*.

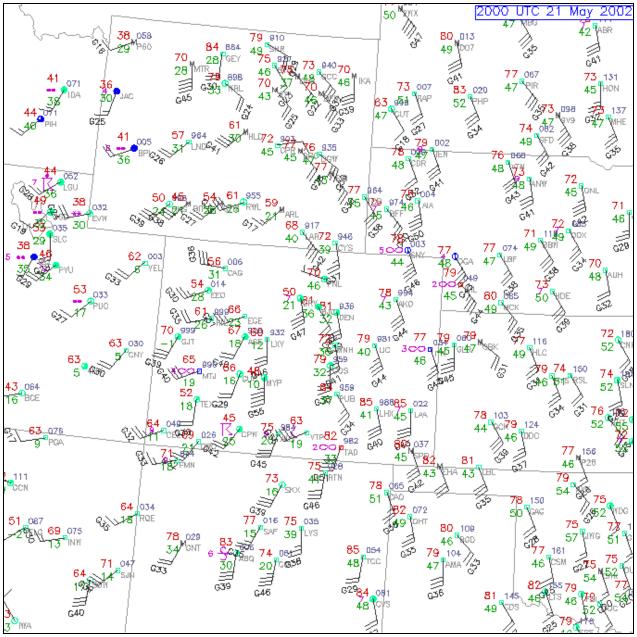


Figure 3. Surface weather map for 2000Z or 2 PM on May 21, 2002, centered on Colorado (see text of report for explanation of symbols).

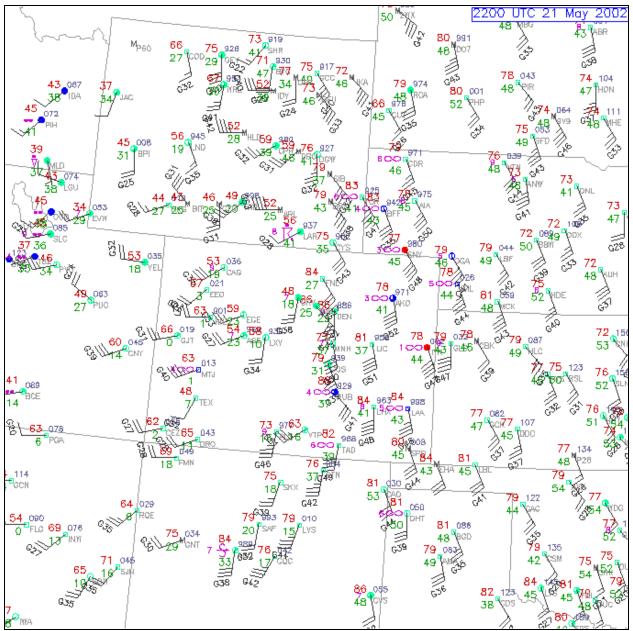


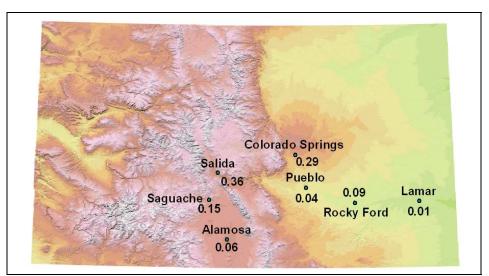
Figure 4. Surface weather map for 2200Z or *4 PM on May 21, 2002*, centered on Colorado (see text of report for explanation of symbols).

Day of Month during	Time (Mountain		Wind Speed in	Gust Speed in	Visibility	
May	Daylight)	Wind Direction	mph	mph	2	Comments
22	12:53AM	Southerly	<mark>36</mark>	<mark>56</mark>	9	
21	11:53PM	Southerly	<mark>38</mark>	<mark>59</mark>	6	HAZE
21	10:53PM	Southerly	<mark>40</mark>	<mark>55</mark>	6	HAZE
21	09:53PM	Southerly	<mark>43</mark>	55 55 52 56	4	HAZE
21	08:53PM	South-southeasterly	<mark>41</mark>	<mark>52</mark>	6	HAZE
21	07:53PM	South-southeasterly	<mark>37</mark>	<mark>56</mark>	3	HAZE
21	05:53PM	Southerly	<mark>36</mark>	<mark>51</mark>	1 3/4	HAZE
21	04:53PM	Southerly	<mark>32</mark>	<mark>51</mark>	6	HAZE
21	03:53PM	Southerly	<mark>38</mark>	<mark>53</mark>	5	HAZE
21	02:53PM	Southerly	<mark>39</mark>	<mark>54</mark> 52	4	HAZE
21	01:53PM	Southerly	<mark>36</mark>	<mark>52</mark>	7	
21	01:01PM	Southerly	<mark>37</mark>	<mark>47</mark>	2	HAZE
21	11:53AM	Southerly	<mark>38</mark>	<mark>52</mark>	7	
21	10:53AM	Southerly	<mark>35</mark>	<mark>49</mark>	8	
21	09:53AM	Southerly	28	35	10	
21	08:53AM	Southerly	17	30	10	
21	07:53AM	Southerly	25	33	10	
21	06:53AM	Southeasterly	9	0	10	
21	05:53AM	Southeasterly	12	0	10	

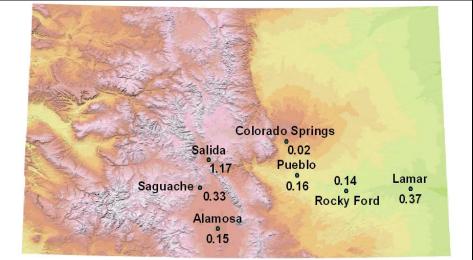
 Table 1. Wind observations for Lamar reported by the National Weather Service on May 21, 2002. Wind speeds or gusts at or above the blowing dust threshold are highlighted in bold and yellow.

Day of Month	Time		Wind	Gust	V /:-:1:1:4	
during May	(Mountain Daylight)	Wind Direction	Speed in mph	Speed in mph	Visibility in Miles	Comments
21	11:52PM	Southwesterly	18	0	10	
21	10:52PM	Southwesterly	13	0	10	
21	09:52PM	Variable	6	31	10	
21	08:52PM	West-southwesterly	23	37	10	
21	07:52PM	Southwesterly	26	<mark>43</mark>	10	
21	06:52PM	Southwesterly	<mark>30</mark>	<mark>46</mark>	10	
21	05:52PM	Southwesterly	<mark>32</mark>	<mark>44</mark>	10	
21	04:52PM	Southwesterly	<mark>32</mark>	<mark>48</mark>	10	
21	03:52PM	Southerly	<mark>39</mark>	<mark>53</mark>	9	
21	02:52PM	South-southwesterly	<mark>31</mark>	<mark>51</mark> 55	10	
21	01:52PM	South-southwesterly	<mark>33</mark>	<mark>55</mark>	9	
21	12:52PM	Southerly	<mark>38</mark>	<mark>51</mark>	10	
21	11:52AM	Southerly	<mark>38</mark>	<mark>52</mark>	10	
21	10:52AM	Southerly	<mark>39</mark>	<mark>55</mark>	8	
21	09:52AM	Southerly	<mark>35</mark>	<mark>40</mark>	10	
21	08:52AM	Southerly	28	36	10	
21	07:52AM	Southerly	25	30	10	
21	06:52AM	Southerly	16	0	10	
21	05:52AM	Southerly	10	0	10	

Table 2. Wind observations for Alamosa reported by the National Weather Service on May 21, 2002.Wind speeds or gusts at or above the blowing dust threshold are highlighted in bold and yellow.







(b)

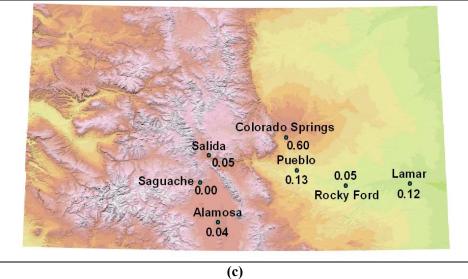


Figure 5. Total precipitation (inches of water): (a) March, (b) April, and (c) May 1-20, 2002.

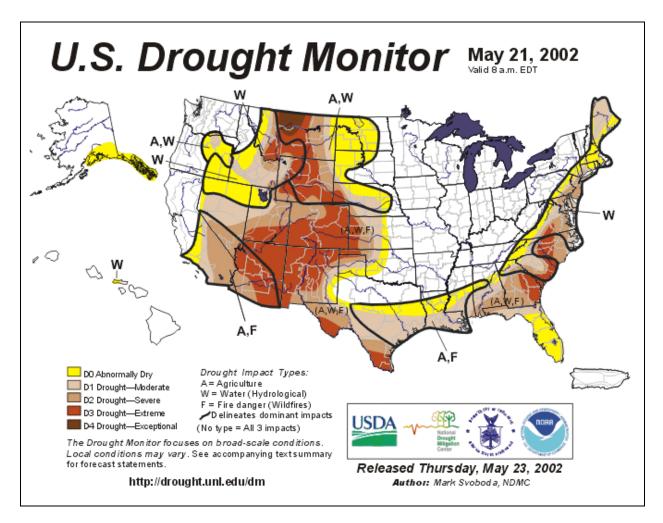
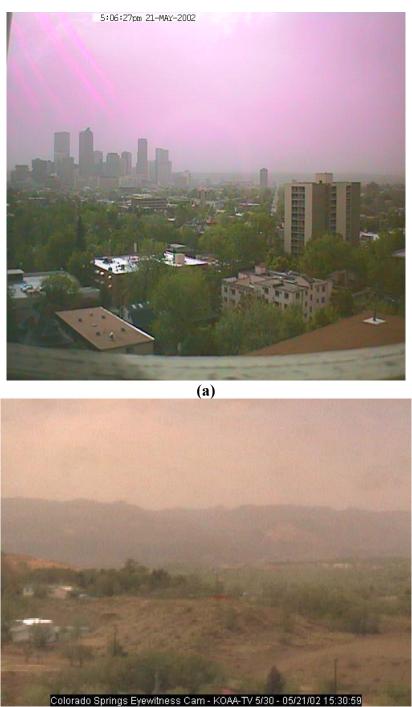


Figure 6. Drought status for the United States on May 21, 2002 (source: the USDA, NOAA, and the National Drought Mitigation Center at: <u>http://drought.unl.edu/monitor/monitor.html</u>, released on May 23, 2002).



(b) Figure 7. Images of blowing dust in the afternoon/early evening hours in (a) Denver and (b) Colorado Springs on May 21, 2002.

Attachment A Colorado Surface Weather Observations for May 21, 2002, Reported by the National Weather Service

COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 600 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211300-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS CRAIG CLEAR 53 33 46 SE14 29.75F HAYDEN CLEAR 48 37 66 MISG 29.79F MEEKER PTCLDY 40 28 62 CALM 29.75S \$\$ COZ006>008-011-211300-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS 63 20 19 SE8 29.69S GRAND JUNCTION CLEAR MONTROSE CLEAR 52 24 33 E6 29.77F EAGLE PTCLDY 43 32 65 SE3 29.85F PTCLDY 58 22 24 S10 RIFLE 29.73S \$\$ COZ017>023-211300-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS DURANGO CLOUDY 44 24 45 E6 29.95F 61 19 19 S23G30 CORTEZ CLOUDY 29.86R 50 16 26 S23 TELLURIDE FAIR 29.98S 36 32 87 SW21G29 30.19S WOLF CREEK PAS FAIR ŚŚ COZ009-010-012-014-032-033-034-037-058-059-069-211300-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX REMARKS PRES 56 27 32 SE12 29.86F ASPEN PTCLDY 37 23 56 SE22G39 30.13F COPPER MTN FAIR PTCLDY 52 27 37 SE13 29.95F GUNNISON 30.05F CLOUDY 37 36 96 N3 LEADVILLE MONARCH PASS FAIR 36 27 69 S17G25 30.32S 41 23 48 S24G33 NIWOT RIDGE FAIR 30.15F \$\$ COZ060>066-211300-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS PTCLDY 48 36 63 S10 ALAMOSA 30.03S LA VETA PASS FAIR 46 30 53 S29G44 30.16F \$\$ COZ035-036-038>040-211300-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP MOCLDY 53 45 74 S22 29.84F AURORA MOCLDY 54 46 76 S16 29.85F CLOUDY 53 44 71 SE16G24 ENGLEWOOD 29.87F

MOCLDY 46 46 100 NW6 29.87 FOG BROOMFTELD 45 41 87 N9 29.85S LOVELAND FAIR \$\$ COZ041-046-047-067-068-070>072-074-075-211300-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CTTY SKY/WX TMP DP RH WIND PRES REMARKS COLO. SPRINGS CLOUDY 48 44 86 E8 29.965 A. F. ACADEMY MOCLDY 46 43 87 S8 29.94S 46 45 93 NW8 FORT CARSON MOCLDY 29.94F CLOUDY 48 40 73 SE17 29.96F T.TMON MONUMENT HILL FAIR 45 45 100 SE18G24 29.94S MOCLDY 55 46 71 W17G24 TRINIDAD 29.95F \$\$ COZ042>045-048>051-090-091-211300-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 50 43 76 SE14G20 29.84F GREELEY ARPT FAIR AKRON CLOUDY 51 40 65 SE22 29.92F MOCLDY 50 42 74 SE23G30 29.98F BURLINGTON \$\$ COZ073-076>081-092-211300-SOUTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS PUEBLO CLOUDY 46 41 82 NE3 29.89F LA JUNTA MOCLDY 54 49 83 SE10 29.92F 29.99S CLOUDY 56 42 59 SE12 LAMAR 51 43 74 S12 SPRINGFIELD N/A 30.01S COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 700 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211400-NORTHWEST COLORADO TMP DP RH WIND PRES REMARKS CITY SKY/WX CRAIG MOSUNNY 50 37 61 W7 29.75S 52 37 58 MISG 29.77F HAYDEN MOSUNNY 44 28 53 E7 MEEKER SUNNY 29.74F \$\$ COZ006>008-011-211400-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION PTSUNNY 67 20 16 SE13 29.68F 59 25 27 SE6 MONTROSE MOSUNNY 29.75F EAGLE PTSUNNY 43 34 70 SE3 29.84F SUNNY 57 23 26 S6 RIFLE 29.71F \$\$

COZ017>023-211400-SOUTHWEST COLORADO

SKY/WX TMP DP RH WIND CITY PRES REMARKS CLOUDY 48 28 46 E8 29.94F DURANGO CLOUDY 61 20 20 S18 CORTEZ 29.86S FAIR 52 16 24 SE24G43 29.96F TELLURIDE 36 27 69 S15G29 30.20R WOLF CREEK PAS FAIR \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-211400-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS ASPEN MOSUNNY 58 26 29 SE10 29.86S COPPER MTN FAIR 37 23 56 SE39G46 30.06F GUNNISON CLOUDY 52 25 35 S7 29.95F LEADVILLE PTSUNNY 40 36 86 CALM 30.02F MONARCH PASS FAIR 37 25 60 S26G35 30.30F FAIR 41 23 48 S17 NIWOT RIDGE 30.15R \$\$ COZ060>066-211400-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS ALAMOSA MOSUNNY 52 37 56 S16 30.02F 46 27 46 S26G44 30.15F LA VETA PASS FAIR ŚŚ COZ035-036-038>040-211400-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS 54 45 71 S12 29.84S DENVER INTL AP CLOUDY PTSUNNY 55 46 71 S16 29.84F AURORA 53 44 71 S20 ENGLEWOOD CLOUDY 29.86F PTSUNNY 48 46 93 NW7 29.86F FOG BROOMFIELD FAIR 48 43 81 N7 LOVELAND 29.83F \$\$ COZ041-046-047-067-068-070>072-074-075-211400-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND CITY PRES REMARKS 49 45 86 VRB6 COLO. SPRINGS CLOUDY 29.96S A. F. ACADEMY PTSUNNY 46 45 93 S7 29.94S FORT CARSON NOT AVBL 49 40 71 SE16 LIMON CLOUDY 29.95F MONUMENT HILL FAIR 46 46 100 S21G26 29.93S PTSUNNY 56 47 71 W20G25 TRINIDAD 29.95S \$\$ COZ042>045-048>051-090-091-211400-NORTHEAST COLORADO SKY/WX TMP DP RH WIND PRES CITY REMARKS 54 43 66 SE14 29.83S GREELEY ARPT FAIR 52 41 66 SE24G29 29.90F AKRON CLOUDY BURLINGTON CLOUDY 51 43 74 SE25G35 29.97F \$\$ COZ073-076>081-092-211400-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND PRES REMARKS CITY

CLOUDY 50 44 80 CALM PUEBLO 29.89S PTSUNNY 62 48 60 SE15 LA JUNTA 29.91F 57 43 59 SE9 LAMAR CLOUDY 29.98F 53 42 66 S20 SPRINGFIELD N/A 30.00F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 800 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211500-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 58 39 49 E3 29.72F CRAIG MOSUNNY HAYDEN MOSUNNY 55 39 54 MISG 29.75F MEEKER SUNNY 58 31 35 VRB6 29.71F \$\$ COZ006>008-011-211500-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION MOSUNNY 67 23 19 SW8 29.68S SUNNY MONTROSE 63 24 22 SE3 29.74F PTSUNNY 48 34 57 CALM 29.81F EAGLE RIFLE SUNNY 63 35 35 NE6 29.69F ŚŚ COZ017>023-211500-SOUTHWEST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 56 34 43 SE16 29.94S DURANGO CLOUDY CORTEZ MOSUNNY 64 22 20 S16G28 29.86S 52 19 28 S30G41 TELLURIDE FAIR 29.93F \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-211500-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS MOSUNNY 59 22 24 SE12 29.83F ASPEN COPPER MTN 39 19 45 SE22G40 30.10R FAIR 57 28 33 SE15 29.92F GUNNISON PTSUNNY 47 27 45 S13G23 LEADVILLE PTSUNNY 29.99F MONARCH PASS FAIR 39 21 48 S22G35 30.28F 37 27 65 S21 NIWOT RIDGE FAIR 30.12F \$\$ COZ060>066-211500-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS ALAMOSA PTSUNNY 56 36 47 S25G30 30.01F 48 28 46 SW14G23 LA VETA PASS FATR 30.14F \$\$ COZ035-036-038>040-211500-

NORTHERN COLORADO FRONT RANGE

SKY/WX TMP DP RH WIND CITY PRES REMARKS DENVER INTL AP CLOUDY 58 46 64 S22G29 29.82F PTSUNNY 57 46 67 S18 29.82F AURORA 55 45 68 SE18 ENGLEWOOD CLOUDY 29.84F PTSUNNY 52 48 87 NW7 29.84F BROOMFIELD 29.81F LOVELAND FAIR 52 43 71 N12 \$\$ COZ041-046-047-067-068-070>072-074-075-211500-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CITY SKY/WX TMP DP RH WIND PRES REMARKS COLO. SPRINGS CLOUDY 51 46 83 SE10 29.94F A. F. ACADEMY CLOUDY 50 45 81 S12 29.91F FORT CARSON PTSUNNY 50 45 81 N5 29.92 T.TMON CLOUDY 53 42 66 S23G30 29.93F MONUMENT HILL FAIR 52 48 87 SE15G22 29.91F TRINIDAD MOSUNNY 61 46 57 VRB7 29.95S \$\$ COZ042>045-048>051-090-091-211500-NORTHEAST COLORADO SKY/WX TMP DP RH WIND PRES CITY REMARKS 55 45 67 SE10 29.80F GREELEY ARPT FAIR CLOUDY 55 42 61 S24G36 29.87F AKRON BURLINGTON PTSUNNY 55 43 63 S28G37 29.95F \$\$ COZ073-076>081-092-211500-SOUTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS CLOUDY 29.87F 55 45 68 CALM PUEBLO 29.89F PTSUNNY 66 48 52 SE18 LA JUNTA PTSUNNY 63 42 46 S25G33 29.96F LAMAR SPRINGFIELD N/A 60 42 51 S24 29.99F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 900 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211600-NORTHWEST COLORADO PRES CITY SKY/WX TMP DP RH WIND REMARKS CRAIG MOSUNNY 65 39 38 NE9 29.68F PTSUNNY 64 39 39 MISG 29.71F HAYDEN SUNNY 67 20 16 S23G28 MEEKER 29.68F ŚŚ COZ006>008-011-211600-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION PTSUNNY 69 20 15 SW17G29 29.66F MONTROSE MOSUNNY 73 20 13 S30G45 29.70F HAZE MOSUNNY 54 34 47 W6 EAGLE 29.75F 73 19 13 S9 29.64F RIFLE SUNNY

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COZ017>023-211600-SOUTHWEST COLORADO TMP DP RH WIND CTTY SKY/WX PRES REMARKS DURANGO CLOUDY 60 33 36 SE8G17 29.93F CORTEZ PTSUNNY 65 21 18 SW30G36 29.85F WOLF CREEK PAS FAIR 39 25 56 S16G29 30.19F ŚŚ COZ009-010-012-014-032-033-034-037-058-059-069-211600-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS ASPEN MOSUNNY 63 21 20 S13G24 29.80F COPPER MTN 37 18 44 SE29G55 30.04F FATR 61 25 25 E18 MOSUNNY 29.88F GUNNISON LEADVILLE PTSUNNY 51 24 34 S17G24 29.95F NIWOT RIDGE FAIR 39 25 56 S30G36 30.08F \$\$ COZ060>066-211600-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS SKY/WX TMP DP RH WIND PRES REMARKS CITY 60 34 PTSUNNY 37 S28G36 29.98F ALAMOSA LA VETA PASS FAIR 52 28 40 SW15G30 30.12F \$\$ COZ035-036-038>040-211600-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP CLOUDY 62 47 57 S17 29.79F 29.80F PTSUNNY 66 45 45 S21 AURORA CLOUDY 61 47 59 SE18G24 29.81F ENGLEWOOD BROOMFIELD PTSUNNY 55 48 76 N5 29.81F LOVELAND FAIR 55 43 62 N1O 29.78F \$\$ COZ041-046-047-067-068-070>072-074-075-211600-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND CITY PRES REMARKS COLO. SPRINGS CLOUDY 56 46 69 SE12 29.91F A. F. ACADEMY PTSUNNY 52 46 82 S10 29.89F FORT CARSON 71 VRB3 29.90F 55 46 PTSUNNY 59 44 57 S23G31 29.90F LIMON CLOUDY 55 50 82 SE24G36 29.89S MONUMENT HILL FAIR TRINIDAD MOSUNNY 64 46 52 W16 29.93F \$\$ COZ042>045-048>051-090-091-211600-NORTHEAST COLORADO PRES CITY SKY/WX TMP DP RH WIND REMARKS GREELEY ARPT FAIR 63 46 55 S13 29.78F 29.86F 59 44 57 S24G33 AKRON CLOUDY BURLINGTON CLOUDY 60 44 55 S31G39 29.94F ŚŚ COZ073-076>081-092-211600-

SOUTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 29.85F 61 47 PUEBLO CLOUDY 59 NE5 70 48 LA JUNTA CLOUDY 45 S17 29.87F PTSUNNY 68 44 42 S17G26 29.95F T,AMAR SPRINGFIELD N/A 65 44 46 S25G38 29.97F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1000 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211700-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 71 27 19 S17G25 CRAIG SUNNY 29.63F 68 30 24 MISG MOSUNNY 29.66F HAYDEN SUNNY 68 20 16 SW22G30 29.65F MEEKER \$\$ COZ006>008-011-211700-WEST CENTRAL VALLEYS SKY/WX PRES CTTY TMP DP RH WIND REMARKS GRAND JUNCTION PTSUNNY 69 20 15 SW26G47 29.66S PTSUNNY 73 19 13 S32G44 MONTROSE 29.68F HAZE EAGLE SUNNY 70 28 21 S21G32 29.70F 76 19 11 S16G30 RIFLE MOSUNNY 29.61F \$\$ COZ017>023-211700-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS DURANGO PTSUNNY 64 30 27 S13 29.91F 63 18 17 SW28G39 29.85S CLOUDY CORTEZ 52 19 28 S14 PTSUNNY 29.88F TELLURIDE 39 27 60 S18G47 WOLF CREEK PAS FAIR 30.13F ŚŚ COZ009-010-012-014-032-033-034-037-058-059-069-211700-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 67 23 19 S18G22 29.75F ASPEN MOSUNNY COPPER MTN FAIR 39 21 48 SE36G48 30.00F 29.83F GUNNISON SUNNY 64 18 16 S22G31 MOSUNNY 53 22 29 S23G36 29.92F LEADVILLE 43 19 39 S26G41 MONARCH PASS FAIR 30.21F 41 25 52 S22G31 30.08S NIWOT RIDGE FAIR \$\$ COZ060>066-211700-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS SKY/WX TMP DP RH WIND CITY PRES REMARKS ALAMOSA PTSUNNY 64 30 27 S35G40 29.92F LA VETA PASS FAIR 55 23 28 S32G55 30.06F ŚŚ

COZ035-036-038>040-211700-NORTHERN COLORADO FRONT RANGE SKY/WX TMP DP RH WIND CITY PRES REMARKS DENVER INTL AP CLOUDY 67 47 48 S22G25 29.76F AURORA NOT AVBL ENGLEWOOD CLOUDY 67 45 45 S23G31 29.77F BROOMFIELD CLOUDY 59 48 67 N3 29.78F FOG 57 43 58 NE3 LOVELAND FAIR 29.75F ŚŚ COZ041-046-047-067-068-070>072-074-075-211700-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CITY SKY/WX TMP DP RH WIND PRES REMARKS COLO. SPRINGS CLOUDY 61 45 55 S16 29.88F A. F. ACADEMY PTSUNNY 55 46 71 S17 29.85F PTSUNNY 63 48 59 Wl FORT CARSON 29.86F CLOUDY 65 45 48 S28G35 LIMON 29.87F CLOUDY 65 43 44 SW22 TRINIDAD 29.91F \$\$ COZ042>045-048>051-090-091-211700-NORTHEAST COLORADO SKY/WX TMP DP RH WIND PRES CITY REMARKS FAIR 66 48 52 S10G16 29.74F GREELEY ARPT CLOUDY 66 45 46 S32G43 29.82F AKRON BURLINGTON CLOUDY 63 44 50 S35G40 29.91F ŚŚ COZ073-076>081-092-211700-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND CTTY PRES REMARKS CLOUDY 66 46 48 E5 29.82F PUEBLO la junta CLOUDY 76 48 37 S24G30 29.84F LAMAR CLOUDY 74 46 36 S28G35 29.90F 68 45 43 S31G38 SPRINGFIELD N/A 29.94F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1100 AM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211800-NORTHWEST COLORADO TMP DP RH WIND PRES REMARKS CITY SKY/WX MOSUNNY 70 24 17 SW24G29 29.60F CRAIG MOSUNNY 66 28 24 MISG 29.63F HAYDEN PTSUNNY 68 21 16 SW18G29 29.64F MEEKER \$\$ COZ006>008-011-211800-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS GRAND JUNCTION CLOUDY 68 21 16 SW39G49 29.67R MONTROSE PTSUNNY 71 22 15 SW28G37 29.68S

73 25 16 SW16G31 29.65F EAGLE SUNNY PTSUNNY 74 21 13 W16G25 29.60F RIFLE \$\$ COZ017>023-211800-SOUTHWEST COLORADO CTTY SKY/WX TMP DP RH WIND PRES REMARKS CLOUDY DURANGO 66 24 20 SW20G29 29.89F 65 23 20 SW30G40 29.84F CORTEZ PTSUNNY WOLF CREEK PAS PTSUNNY 43 25 49 S23G37 30.07F ŚŚ COZ009-010-012-014-032-033-034-037-058-059-069-211800-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS ASPEN 68 22 17 S18G26 29.72F SUNNY GUNNISON MOSUNNY 66 18 15 S28G36 29.80F LEADVILLE SUNNY 56 23 27 SE18G36 29.87F 45 25 45 S32G41 30.18F MONARCH PASS PTSUNNY NIWOT RIDGE FAIR 43 23 45 S28G44 30.03F \$\$ COZ060>066-211800-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS PRES REMARKS CTTY SKY/WX TMP DP RH WIND PTSUNNY 69 21 16 S39G52 ALAMOSA 29.89F \$\$ COZ035-036-038>040-211800-NORTHERN COLORADO FRONT RANGE SKY/WX TMP DP RH WIND CITY PRES REMARKS DENVER INTL AP CLOUDY 73 43 33 S29G32 29.71F 72 37 28 S30G36 PTSUNNY 29.71F AURORA ENGLEWOOD CLOUDY 70 42 36 S30G37 29.73F BROOMFIELD PTSUNNY 61 50 67 N6 29.73F FOG 59 45 58 E5 29.70F LOVELAND FAIR \$\$ COZ041-046-047-067-068-070>072-074-075-211800-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS PRES SKY/WX TMP DP RH WIND REMARKS CITY COLO. SPRINGS CLOUDY 66 43 43 S20 29.84F 63 45 51 S22G28 A. F. ACADEMY PTSUNNY 29.81F FORT CARSON NOT AVBL LIMON CLOUDY 68 45 43 S31G38 29.84F MONUMENT HILL FAIR 63 46 55 SE26G33 29.83F TRINIDAD PTSUNNY 69 41 36 S30 29.88F \$\$ COZ042>045-048>051-090-091-211800-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 70 50 49 SE8 GREELEY ARPT FAIR 29.68F AKRON CLOUDY 70 45 40 S30G43 29.79F BURLINGTON CLOUDY 68 45 43 S29G43 29.88F \$\$

COZ073-076>081-092-211800-SOUTHEAST COLORADO SKY/WX CITY TMP DP RH WIND PRES REMARKS 77 46 33 SE15G21 PUEBLO PTSUNNY 29.75F 78 46 32 S28G37 29.80F LA JUNTA PTSUNNY LAMAR CLOUDY 78 45 30 S35G48 29.84F SPRINGFIELD N/A 71 46 40 S30G37 29.93F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1200 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-211900-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 70 25 18 SW30G36 29.59F CRAIG PTSUNNY MOSUNNY 66 27 22 MISG 29.60F HAYDEN PTSUNNY 66 21 18 SW25G32 29.64S MEEKER \$\$ COZ006>008-011-211900-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION CLOUDY 60 32 34 W31G39 29.73R PTSUNNY MONTROSE 71 19 14 SW30G39 29.68S 75 21 13 SW41G49 29.62F EAGLE MOSUNNY 72 20 14 SW26G35 RIFLE CLOUDY 29.60S ŚŚ COZ017>023-211900-SOUTHWEST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS DURANGO 67 22 18 SW21G30 29.86F PTSUNNY 66 21 18 SW36G44 29.86R HAZE CORTEZ PTSUNNY 52 18 25 S8G39 TELLURIDE FAIR 29.90R WOLF CREEK PAS PTSUNNY 45 25 45 S23G55 30.03S \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-211900-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS ASPEN MOSUNNY 69 19 15 S25G40 29.70F COPPER MTN FAIR 45 19 36 SE31G55 29.94F PTSUNNY 66 16 14 SW26G52 29.78F GUNNISON 58 19 22 SE18G36 29.83F LEADVILLE MOSUNNY 46 14 27 SE31G52 30.10F MONARCH PASS FAIR 46 25 42 S25G36 NIWOT RIDGE FAIR 30.00F \$\$ COZ060>066-211900-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CTTY SKY/WX TMP DP RH WIND PRES REMARKS 70 17 13 S38G47 29.87F ALAMOSA MOSUNNY FAIR 61 23 23 SW36G58 30.01F LA VETA PASS

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COZ035-036-038 NORTHERN COLOR CITY DENVER INTL AF AURORA ENGLEWOOD BROOMFIELD LOVELAND \$\$	ADO FRONT SKY/WX		DP 38 39	23 25 31 59	WIND S32G39 S37G46 SE33G43 N15 NW5	29.68F	REMARKS FOG
COZ041-046-047 PIKES PEAK/PAL CITY COLO. SPRINGS A. F. ACADEMY FORT CARSON	MER DIVIDE SKY/WX CLOUDY	AND TMP 71	SOU DP 43	THE RH 36 39			REMARKS
LIMON MONUMENT HILL TRINIDAD \$\$	CLOUDY FAIR CLOUDY	75 68 74	45	34 42	S32G40 S29G39 S29G35	29.79F 29.79F 29.85F	
COZ042>045-048 NORTHEAST COLC CITY GREELEY ARPT AKRON BURLINGTON \$\$		91-2: TMP 77 74 72	DP 48 44	RH 36 34	WIND SE25G32 S32G43 S36G47	PRES 29.63F 29.76F 29.84F	REMARKS
COZ073-076>081 SOUTHEAST COLC CITY PUEBLO LA JUNTA LAMAR SPRINGFIELD		0- TMP 84 80 82 75	36 46 46	18 30 28	WIND SE24G32 SE33G41 S38G46 S31G44	PRES 29.68F 29.75F 29.80F 29.90F	REMARKS
COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 100 PM MDT TUE MAY 21 2002							
NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY.							
COZ001>005-013 NORTHWEST COLC CITY CRAIG HAYDEN MEEKER \$\$		TMP 68 68	DP 26 27	20 21	WIND W25G38 MISG W29G41	29.61R	REMARKS
COZ006>008-011 WEST CENTRAL V CITY		TMP	DP	RH	WIND	PRES	REMARKS

GRAND JUNCTION CLOUDY 64 25 22 W23G33 29 72F 68 20 16 W25G41 29.70R MONTROSE PTSUNNY 70 23 17 W33G41 EAGLE PTSUNNY 29.64R 66 27 23 W39G51 RIFLE CLOUDY 29.63R \$\$ COZ017>023-212000-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS DURANGO MOSUNNY 68 21 16 SW32G43 29.86S CORTEZ PTSUNNY 65 15 14 SW26G40 29.87R TELLURIDE FAIR 51 16 25 SE28G53 29.85F \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-212000-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS ASPEN PTSUNNY 67 18 15 S35G41 29.68F 48 16 27 SE53G68 29.82F PTSUNNY COPPER MTN GUNNISON PTSUNNY 66 16 14 SW30G46 29.76F 60 13 15 S25G35 LEADVILLE PTSUNNY 29.80F 52 10 19 S45G59 30.09F MONARCH PASS FAIR PTSUNNY 50 25 37 S32G41 29.95F NIWOT RIDGE \$\$ COZ060>066-212000-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS SKY/WX CITY TMP DP RH WIND PRES REMARKS 73 21 14 S38G51 29.82F ALAMOSA PTSUNNY 61 19 20 SW38G58 29.99S LA VETA PASS FAIR \$\$ COZ035-036-038>040-212000-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP CLOUDY 77 37 23 S33G45 29.61F 77 32 19 S37G43 29.61F AURORA PTSUNNY 75 35 23 SE29G38 ENGLEWOOD CLOUDY 29.63F PTSUNNY 66 50 55 NW12 BROOMFIELD 29.63F 64 45 48 CALM 29.60F LOVELAND FAIR ŚŚ COZ041-046-047-067-068-070>072-074-075-212000-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CITY SKY/WX TMP DP RH WIND PRES REMARKS 29.70F COLO. SPRINGS CLOUDY 77 29 17 S32G41 A. F. ACADEMY PTSUNNY 70 41 35 SE18G29 29.69F FORT CARSON 81 27 13 S29G36 29.67F PTSUNNY 78 41 26 S32G41 29.75F T, TMON CLOUDY 72 39 30 S29G40 29.73F MONUMENT HILL FAIR 77 37 23 S32G45 PTSUNNY TRINIDAD 29.80F \$\$ COZ042>045-048>051-090-091-212000-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 81 46 30 SE29G40 29.58F GREELEY ARPT FAIR

CLOUDY 78 43 28 S39G54 AKRON 29.72F CLOUDY 76 46 34 S37G49 29.80F BURLINGTON \$\$ COZ073-076>081-092-212000-SOUTHEAST COLORADO CTTY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO CLOUDY 85 34 16 SE22G31 29.64F 85 42 22 S35G40 LA JUNTA CLOUDY 29.71F T.AMAR CLOUDY 82 46 28 S35G47 29.78F SPRINGFIELD N/A 77 44 30 S33G48 29.85F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 200 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-212100-NORTHWEST COLORADO CITY TMP DP RH WIND SKY/WX PRES REMARKS 56 31 38 W32G41 29.71R CRAIG CLOUDY 55 28 PTSUNNY 35 MISG 29.69R HAYDEN MEEKER CLOUDY 54 28 36 W26G35 29.73R \$\$ COZ006>008-011-212100-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS GRAND JUNCTION PTSUNNY 70 -1 6 SW32G45 29.73R 65 19 17 W37G46 29.73R HAZE MONTROSE PTSUNNY PTSUNNY 66 23 19 W30G36 29.65S EAGLE RIFLE PTSUNNY 61 26 26 W23G40 29.70R \$\$ COZ017>023-212100-SOUTHWEST COLORADO PRES TMP DP RH WIND CITY SKY/WX REMARKS MOSUNNY 69 21 16 SW29G37 29.84F DURANGO 64 11 12 W26G37 29.88R CORTEZ MOSUNNY 52 18 25 S21G41 29.86S TELLURIDE FAIR 45 25 45 SW28G48 29.98F THUNDER WOLF CREEK PAS PTSUNNY \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-212100-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 67 18 15 SW21G46 29.67F ASPEN PTSUNNY 48 10 21 CALM COPPER MTN PTSUNNY 29.88S 66 16 14 S22G33 GUNNISON PTSUNNY 29.76S 29.79F 60 12 15 S32G53 LEADVILLE PTSUNNY MONARCH PASS PTSUNNY 48 10 21 S49G63 30.07F NIWOT RIDGE PTSUNNY 50 21 32 S43G54 29.92F ŚŚ

COZ060>066-212100-

SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS TMP DP RH WIND PRES CITY SKY/WX REMARKS 29.80F 75 20 12 S33G52 ALAMOSA MOSUNNY 63 19 19 W43G64 LA VETA PASS FAIR 29.95F \$\$ COZ035-036-038>040-212100-NORTHERN COLORADO FRONT RANGE TMP DP RH WIND CITY SKY/WX PRES REMARKS DENVER INTL AP CLOUDY 81 32 17 S33G45 29.56F 29.55F AURORA PTSUNNY 81 21 11 S35G48 ENGLEWOOD CLOUDY 81 32 17 S31G40 29.58F BROOMFIELD CLOUDY 81 36 19 SE23G37 29.54F LOVELAND FAIR 70 46 43 W5 29.53F \$\$ COZ041-046-047-067-068-070>072-074-075-212100-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND PRES CITY REMARKS COLO. SPRINGS CLOUDY 79 32 18 S35G44 29.65F 81 28 15 S35G46 FORT CARSON PTSUNNY 29.63F CLOUDY 79 40 24 S40G51 29.69F LIMON MONUMENT HILL FAIR 72 36 26 S31G47 29.67F TRINIDAD CLOUDY 82 33 17 S48G59 29.72F HAZE ŚŚ COZ042>045-048>051-090-091-212100-NORTHEAST COLORADO TMP DP RH WIND SKY/WX PRES CITY REMARKS GREELEY ARPT FAIR 84 43 23 SE40G49 29.53F 29.67F 78 43 28 S37G51 AKRON CLOUDY CLOUDY 77 46 33 S31G49 29.76F HAZE BURLINGTON \$\$ COZ073-076>081-092-212100-SOUTHEAST COLORADO TMP DP RH WIND CTTY SKY/WX PRES REMARKS 84 37 18 SE28G39 29.60F PUEBLO CLOUDY 29.68F PTSUNNY 85 41 21 S36G46 LA JUNTA CLOUDY 85 45 24 S36G49 LAMAR 29.74F SPRINGFIELD N/A 80 45 28 S35G48 29.82F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 300 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-212200-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS LGT RAIN 53 30 41 SW33G45 29.75R CRATG HAYDEN PTSUNNY 54 30 40 MISG 29.75R MEEKER PTSUNNY 56 16 20 SW18G30 29.74R \$\$

COZ006>008-011-212200-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS 67 0 7 W32G40 29.75R GRAND JUNCTION PTSUNNY 64 8 11 SW35G55 29.73S HAZE PTSUNNY MONTROSE EAGLE CLOUDY 63 23 22 W28G45 29.71R RIFLE CLOUDY 63 14 15 SW24G33 29.70S ŚŚ COZ017>023-212200-SOUTHWEST COLORADO SKY/WX TMP DP RH WIND PRES CITY REMARKS DURANGO MOSUNNY 67 18 15 W24G33 29.85R CORTEZ MOSUNNY 63 3 9 SW24G31 29.89R TELLURIDE FAIR 52 16 24 SW24G38 29.89R \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-212200-CENTRAL COLORADO SKY/WX TMP DP RH WIND PRES CITY REMARKS PTSUNNY 59 21 23 SW20G30 29.71R ASPEN 45 10 24 CALM 29.89R COPPER MTN PTSUNNY 64 12 13 S26G46 29.75S GUNNISON PTSUNNY PTSUNNY 59 12 15 SW31G43 29.78F LEADVILLE 30.05F MONARCH PASS PTSUNNY 46 10 23 S48G60 54 19 26 S33G45 NIWOT RIDGE 29.89F FAIR \$\$ COZ060>066-212200-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS TMP DP RH WIND CITY SKY/WX PRES REMARKS 29.78F MOSUNNY 74 14 10 S31G46 ALAMOSA FAIR 61 18 18 W48G63 LA VETA PASS 29.93F \$\$ COZ035-036-038>040-212200-NORTHERN COLORADO FRONT RANGE TMP DP RH WIND CITY SKY/WX PRES REMARKS 29.49F 84 29 13 S32G52 DENVER INTL AP CLOUDY MOSUNNY 84 19 29.49F 9 S37G49 AURORA 83 24 11 S30G40 29.51F ENGLEWOOD CLOUDY BROOMFIELD CLOUDY 82 30 15 SE29G37 29.46F 84 30 14 S31G45 29.42F LOVELAND FAIR \$\$ COZ041-046-047-067-068-070>072-074-075-212200-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS TMP DP RH WIND CITY SKY/WX PRES REMARKS COLO. SPRINGS CLOUDY 79 33 19 S39G53 29.62F 81 23 12 S40G59 A. F. ACADEMY PTSUNNY 29.56F 81 32 17 S35G40 FORT CARSON PTSUNNY 29.60F 80 34 19 S38G53 LIMON CLOUDY 29.64F 77 37 24 S41G52 MONUMENT HILL FAIR 29.64S TRINIDAD NOT AVBL ŚŚ

NORTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 29.46F 88 37 16 S24G51 GREELEY ARPT FAIR 79 43 27 S45G54 AKRON CLOUDY 29.62F HAZE CLOUDY 77 45 32 S43G54 BURLINGTON 29.72F HAZE \$\$ COZ073-076>081-092-212200-SOUTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO CLOUDY 88 35 15 SE30G40 29.55F LA JUNTA CLOUDY 84 39 20 S38G51 29.64F LAMAR CLOUDY 84 44 24 S39G49 29.70F HAZE SPRINGFIELD N/A 80 44 27 S36G48 29.76F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 400 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-212300-NORTHWEST COLORADO SKY/WX PRES CITY TMP DP RH WIND REMARKS 53 19 26 SW36G40 29.75S CLOUDY CRAIG PTSUNNY 50 27 40 MISG HAYDEN 29.80R MEEKER CLOUDY 57 3 11 SW21G30 29.75R \$\$ COZ006>008-011-212300-WEST CENTRAL VALLEYS TMP DP RH WIND PRES REMARKS CTTY SKY/WX GRAND JUNCTION MOSUNNY 66 0 7 W29G36 29.76R MONTROSE PTSUNNY 63 1 8 W38G46 29.75R HAZE PTSUNNY 59 23 25 W29G38 EAGLE 29.77R RIFLE CLOUDY 63 1 8 W22G31 29.72R ŚŚ COZ017>023-212300-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 65 11 12 W22G32 29.85S DURANGO SUNNY 62 2 CORTEZ SUNNY 9 W23G31 29.89S TELLURIDE FAIR 48 7 19 SW14G37 29.90R ŚŚ COZ009-010-012-014-032-033-034-037-058-059-069-212300-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS ASPEN PTSUNNY 54 23 30 W22G31 29.75R COPPER MTN PTSUNNY 43 7 22 CALM 29.85F GUNNISON NOT AVBL LEADVILLE PTSUNNY 58 10 15 S23G39 29.77F NIWOT RIDGE CLOUDY 48 18 29 S31G44 29.85F \$\$

COZ060>066-212300-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS 73 15 11 S39G53 29.74F ALAMOSA MOSUNNY FAIR 63 16 16 SW41G59 29.91F LA VETA PASS \$\$ COZ035-036-038>040-212300-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP PTSUNNY 86 29 12 S39G53 29.44F MOSUNNY 86 18 8 S37G49 29.45F BLWGDUST AURORA ENGLEWOOD MOSUNNY 84 23 10 S37G45 29.47F BROOMFIELD CLOUDY 86 25 10 SE23G37 29.42F LOVELAND FAIR 84 27 12 SE33G43 29.35F \$\$ COZ041-046-047-067-068-070>072-074-075-212300-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND CITY PRES REMARKS 79 31 17 S38G45 COLO. SPRINGS PTSUNNY 29.59F A. F. ACADEMY PTSUNNY 81 19 10 S33G45 29.55F PTSUNNY 82 19 9 S30G46 FORT CARSON 29.56F 81 37 20 S44G59 CLOUDY T,TMON 29.62F 29.60F MONUMENT HILL FAIR 77 37 24 S45G58 TRINIDAD PTSUNNY 82 39 21 S44G56 29.68 \$\$ COZ042>045-048>051-090-091-212300-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 29.40F 90 32 12 SE32G54 GREELEY ARPT FAIR 78 41 26 S45G60 29.60F HAZE AKRON CLOUDY BURLINGTON CLOUDY 78 44 29 S44G54 29.67F HAZE \$\$ COZ073-076>081-092-212300-SOUTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS PTSUNNY 88 37 16 SE36G47 29.50F HAZE PUEBLO 84 41 21 S44G55 29.60F LA JUNTA CLOUDY CLOUDY 84 43 23 S38G53 29.67F HAZE LAMAR 80 45 28 S36G51 29.72F N/A SPRINGFIELD COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 500 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220000-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS CRATG PTSUNNY 57 13 17 SW22G28 29.73F PTSUNNY 52 16 24 MISG HAYDEN 29.79S PTSUNNY 58 1 10 SW22G36 29.76R MEEKER

\$\$

COZ006>008-011 WEST CENTRAL V CITY GRAND JUNCTION MONTROSE EAGLE RIFLE \$\$	ALLEYS SKY/WX	TMP 65 63 57 64	DP -2 -1 12 1	7 7 17	WIND SW23G26 W25G40 SW26G41 W23G38	PRES 29.78R 29.80R 29.78R 29.73R	REMARKS
COZ017>023-220 SOUTHWEST COLC CITY DURANGO CORTEZ TELLURIDE WOLF CREEK PAS \$\$	RADO SKY/WX MOSUNNY SUNNY FAIR	TMP 63 62 46 39	DP 5 1 1 21	10 8 15	WIND W26G36 W22G33 SW10G24 SW29G56	PRES 29.85S 29.88F 29.92R 29.96S	REMARKS
COZ009-010-012 CENTRAL COLORA CITY ASPEN COPPER MTN GUNNISON LEADVILLE NIWOT RIDGE \$\$		33-0 TMP 54 41 54 39		RH 22 24 18	058-059-00 WIND SW14G23 CALM S31G40 W25G31	59-220000 PRES 29.78R 29.90R 29.77S 29.89S)- REMARKS
COZ060>066-220 SAN LUIS VALLE CITY ALAMOSA LA VETA PASS \$\$		E CR TMP 73 61		RH 11	UNTAINS WIND SW32G45 W44G58	PRES 29.73F 29.90F	REMARKS
COZ035-036-038 NORTHERN COLOR CITY DENVER INTL AP AURORA ENGLEWOOD BROOMFIELD LOVELAND \$\$	ADO FRONT SKY/WX	-		13 12 11 11	WIND S43G56 S45G54 S35G43 S28G35 S25G33	PRES 29.42F 29.44F 29.46F 29.43R 29.34S	REMARKS BLWGDUST
COZ041-046-047 PIKES PEAK/PAL CITY COLO. SPRINGS A. F. ACADEMY FORT CARSON LIMON MONUMENT HILL TRINIDAD \$\$	MER DIVIDE SKY/WX MOSUNNY PTSUNNY PTSUNNY PTSUNNY		SOU	THE RH 14 8 22 27		LLS PRES 29.56F 29.52F 29.53F 29.59F 29.57F	REMARKS HAZE

COZ042>045-048>051-090-091-220000-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 88 32 13 S31G43 GREELEY ARPT FAIR 29.36F AKRON CLOUDY 79 40 24 S44G59 29.57F HAZE BURLINGTON CLOUDY 76 44 32 S39G53 29.66F HAZE ŚŚ COZ073-076>081-092-220000-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND PRES REMARKS CITY PUEBLO MOSUNNY 90 27 10 S29G43 29.49F LA JUNTA CLOUDY 87 41 19 S44G53 29.56F 82 45 27 S32G47 LAMAR CLOUDY 29.64F 79 46 31 S36G49 SPRINGFIELD N/A 29.71F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 600 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220100-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS CRATG PTSUNNY 54 3 12 SW22G35 29.75R 54 9 16 MISG 29.77S PTSUNNY HAYDEN 56 1 10 SW23G35 29.78R MEEKER MOSUNNY ŚŚ COZ006>008-011-220100-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION MOSUNNY 62 11 13 W24G32 29.81R 8 SW21G29 29.84R MONTROSE MOSUNNY 61 -2 57 9 14 SW30G40 29.79R EAGLE CLOUDY PTSUNNY 62 0 8 SW22G35 RIFLE 29.76R ŚŚ COZ017>023-220100-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS SUNNY 9 W21G33 DURANGO 61 2 29.85S SUNNY 0 CORTEZ 61 8 SW15G28 29.89R WOLF CREEK PAS FAIR 37 18 44 SW36G52 29.98R \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-220100-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PTSUNNY 53 7 15 SW12G21 29.81R ASPEN 29.89F COPPER MTN PTSUNNY 30 18 59 CALM GUNNTSON N/A 55 12 18 W21G29 29.82 PTSUNNY 49 17 28 W17G29 29.80R LEADVILLE MONARCH PASS PTSUNNY 43 7 22 SW63G74 29.97F

NIWOT RIDGE CLOUDY 34 23 64 W33G40 29.87F HAZE WCI 19 \$\$ COZ060>066-220100-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CTTY SKY/WX TMP DP RH WIND PRES REMARKS ALAMOSA MOSUNNY 69 16 13 SW32G39 29.74R LA VETA PASS FAIR 55 18 22 SW30G51 29.90F ŚŚ COZ035-036-038>040-220100-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP PTSUNNY 83 17 8 SW37G52 29.41F BLWGDUST AURORA PTSUNNY 82 9 6 S36G46 29.43F BLWGDUST 29.46S 78 18 10 S31G49 PTSUNNY ENGLEWOOD 79 19 11 S25G35 BROOMFIELD PTSUNNY 29.43S LOVELAND FAIR 81 27 13 W16G22 29.39R \$\$ COZ041-046-047-067-068-070>072-074-075-220100-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND PRES REMARKS CITY COLO. SPRINGS MOSUNNY 77 23 13 SW33G47 29.56S A. F. ACADEMY PTSUNNY 75 16 10 S23G36 29.52S FORT CARSON NOT AVBL 79 35 20 S40G54 LIMON SUNNY 29.56F 73 27 17 S37G49 29.57S MONUMENT HILL FAIR SUNNY 82 40 22 S41G55 29.62F TRINIDAD \$\$ COZ042>045-048>051-090-091-220100-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS GREELEY ARPT FAIR 84 30 14 S30G45 29.36R CLOUDY 79 41 25 S39G53 29.54F HAZE AKRON CLOUDY 76 45 33 S48G59 29.64F HAZE BURLINGTON ŚŚ COZ073-076>081-092-220100-SOUTHEAST COLORADO SKY/WX CITY TMP DP RH WIND PRES REMARKS 88 26 10 S31G43 29.48F PUEBLO SUNNY PTSUNNY 86 41 20 S37G49 29.55F LA JUNTA PTSUNNY 83 47 28 S36G47 LAMAR 29.62F HAZE SPRINGFIELD N/A 79 47 32 S37G55 29.68F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 700 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220200-NORTHWEST COLORADO SKY/WX TMP DP RH WIND PRES REMARKS CITY

53 5 14 SW26G39 CRAIG PTSUNNY 29.78R 5 15 MISG 52 29.78R HAYDEN PTSUNNY 6 15 SW28G37 29.81R 53 MEEKER MOSUNNY \$\$ COZ006>008-011-220200-WEST CENTRAL VALLEYS SKY/WX CITY TMP DP RH WIND PRES REMARKS GRAND JUNCTION MOSUNNY 60 11 14 W22G33 29.83R MONTROSE MOSUNNY 59 -1 9 SW17G28 29.85R 5 13 SW22G35 29.81R 55 EAGLE PTSUNNY 60 2 9 W20G32 RIFLE PTSUNNY 29.80R \$\$ COZ017>023-220200-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS DURANGO SUNNY 57 1 10 W17G26 29.86R 59 3 10 W18G26 CORTEZ 29.89S SUNNY FAIR 43 -6 13 SW16G30 29.96R TELLURIDE 34 12 40 SW24G41 29.99R WCI 21 WOLF CREEK PAS FAIR \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-220200-CENTRAL COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS PTSUNNY 50 3 14 SW13G26 29.83R ASPEN 28 12 50 CALM 29.94R COPPER MTN CLOUDY 1 12 W22G31 54 29.86R GUNNISON MOSUNNY 6 23 NW17G25 29.85R 41 LEADVILLE PTSUNNY 3 36 25 SW45G55 30.04R MONARCH PASS FAIR NIWOT RIDGE FAIR 32 19 59 W36G47 29.87S HAZE WCI 16 \$\$ COZ060>066-220200-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS SKY/WX TMP DP RH WIND CTTY PRES REMARKS 64 11 12 SW30G44 29.76R ALAMOSA SUNNY LA VETA PASS PTSUNNY 55 19 24 W35G49 29.90S ŚŚ COZ035-036-038>040-220200-NORTHERN COLORADO FRONT RANGE TMP DP RH WIND CITY SKY/WX PRES REMARKS 9 S26G38 DENVER INTL AP PTSUNNY 80 16 29.42R 9 81 AURORA PTSUNNY 6 SW36G46 29.45R BLWGDUST 79 17 10 S30G46 29.47R ENGLEWOOD PTSUNNY PTSUNNY 72 27 18 W17 29.46R BROOMFIELD 75 27 16 W13G18 29.42R LOVELAND FAIR \$\$ COZ041-046-047-067-068-070>072-074-075-220200-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CITY SKY/WX TMP DP RH WIND PRES REMARKS COLO. SPRINGS MOSUNNY 74 25 16 S31G41 29.57R FORT CARSON NOT AVBL SUNNY 79 33 19 S36G47 29.56S LIMON

29.59s MONUMENT HILL FAIR 72 28 20 S36G41 MOSUNNY 78 35 21 S29G47 29.63R TRINIDAD \$\$ COZ042>045-048>051-090-091-220200-NORTHEAST COLORADO CTTY SKY/WX TMP DP RH WIND PRES REMARKS FAIR GREELEY ARPT 75 34 22 N25G31 29.40R 77 42 28 S44G55 AKRON PTSUNNY 29.52F HAZE 74 45 35 S41G58 BURLINGTON CLOUDY 29.63F HAZE ŚŚ COZ073-076>081-092-220200-SOUTHEAST COLORADO PRES CITY SKY/WX TMP DP RH WIND REMARKS 85 22 10 S30G37 29.48S PUEBLO SUNNY LA JUNTA SUNNY 84 45 25 SE32G41 29.53F 81 48 31 S36G58 LAMAR HAZE 29.60F VSB 1 75 48 38 SE36G53 29.68S SPRINGFIELD N/A COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 800 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220300-NORTHWEST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 50 14 23 W24G32 29.82R CRAIG PTCLDY 48 7 18 MISG 29.82R HAYDEN MOCLDY 50 8 18 W23G29 MEEKER PTCLDY 29.84R \$\$ COZ006>008-011-220300-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS 57 14 18 W17G23 29.85R GRAND JUNCTION PTCLDY 29.87R 56 2 11 W16G22 MONTROSE CLEAR MOCLDY 52 1 12 W25G32 29.84R EAGLE PTCLDY 55 6 14 W18G25 RIFLE 29.83R \$\$ COZ017>023-220300-SOUTHWEST COLORADO CITY TMP DP RH WIND PRES SKY/WX REMARKS 53 3 13 W12G25 29.88R DURANGO CLEAR 56 3 11 W15 29.91R CORTEZ CLEAR 40 -5 15 SW13 FAIR 29.98R TELLURIDE 9 40 SW24G43 30.00R WCI 16 WOLF CREEK PAS FAIR 30 \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-220300-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PTCLDY 47 1 15 VRB7G21 29.86R ASPEN

FAIR27539CALMCLEAR48-212W14G2 29.94S COPPER MTN 48 -2 12 W14G24 GUNNISON 29.88R 3 23 W18G22 LEADVILLE PTCLDY 38 29.88R FAIR 30 -2 24 W38G48 30.08R WCI 14 MONARCH PASS 28 7 40 W40G52 NIWOT RIDGE FAIR 29.885 WCI 11 \$\$ COZO60 > 066 - 220300 -SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS CLEAR 59 9 13 SW26G37 29.77R ALAMOSA LA VETA PASS FAIR 48 12 23 SW31G49 29.91R \$\$ COZ035-036-038>040-220300-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP MOCLDY 78 15 9 SW26G45 29.48R 77 7 6 SW31G44 29.49R BLWGDUST MOCLDY AURORA 75 14 10 SW33G43 29.50R ENGLEWOOD MOCLDY PTCLDY 64 19 17 W28G35 29.50R BROOMFIELD 66 23 19 W18G28 29.45R LOVELAND FAIR \$\$ COZ041-046-047-067-068-070>072-074-075-220300-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS CITY SKY/WX TMP DP RH WIND PRES REMARKS COLO. SPRINGS MOCLDY 73 22 14 SW23G30 29.58R FORT CARSON 75 18 11 SW22G39 29.56 MOCLDY 74 44 34 SE39G52 29.56S LIMON CLEAR 29.59S MONUMENT HILL FAIR 70 28 21 S28G44 PTCLDY 77 33 20 S35G45 29.63S TRINIDAD \$\$ COZ042>045-048>051-090-091-220300-NORTHEAST COLORADO SKY/WX TMP DP RH WIND PRES REMARKS CITY 70 34 26 N21G26 29.46R GREELEY ARPT FAIR 74 44 34 S37G52 CLOUDY 29.52S HAZE AKRON CLOUDY 71 47 42 S37G52 29.62F HAZE BURLINGTON ŚŚ COZ073-076>081-092-220300-SOUTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO MOCLDY 82 21 10 S30G36 29.49R 29.52F 80 48 32 S40G49 LA JUNTA CLEAR 76 48 37 S37G49 29.60S HAZE LAMAR PTCLDY 72 48 42 S40G52 29.69R SPRINGFIELD N/A NATIONAL WEATHER SERVICE DENVER CO 900 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO

SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY.

COZ001>005-013-030-031-220400-

NORTHWEST COLO	RADO						
CITY	SKY/WX	TMP	DP	RH	WIND	PRES	REMARKS
CRAIG	CLEAR	46	18	32	W21G28	29.85R	
HAYDEN	PTCLDY	45	14	29	MISG	29.86R	
MEEKER	CLEAR	45	20	36	W22G35	29.88R	
\$\$							
COZ006>008-011	-220400-						
WEST CENTRAL V	ALLEYS						
CITY	SKY/WX	TMP	DP	RH	WIND	PRES	REMARKS
GRAND JUNCTION	PTCLDY	51	18	27	N5	29.87R	
MONTROSE	CLEAR	52	2	13	W9	29.90R	
EAGLE	PTCLDY	48	3	15	W20G24	29.88R	
RIFLE	PTCLDY	53	7	15	SW18G28	29.85R	
\$\$							
COZ017>023-220							
SOUTHWEST COLO	-						
CITY	SKY/WX	TMP			WIND	PRES	REMARKS
DURANGO	CLEAR	51	1	-	W14	29.91R	
CORTEZ	CLEAR	52	3		NW12	29.93R	
TELLURIDE	FAIR	37	-2		VRB5	29.99R	
WOLF CREEK PAS	FAIR	27	7	43	S20G33	30.01S	WCI 13
\$\$							
COZ009-010-012	-01/-032-0	33-0	31-0	37-	058-059-06	SA-220400)_
CENTRAL COLORA		55 0	0 -0	57		55 220400)
CITY	SKY/WX	TMP	סח	םם	WIND	PRES	REMARKS
ASPEN	PTCLDY	44	-1		WIND W7	29.88R	REMARNS
COPPER MTN	FAIR	25	0	-	CALM	29.95R	
GUNNISON	CLEAR	46	-2		W10G18	29.90R	
LEADVILLE	PTCLDY	36	0		W10010 W12G21	29.90R	
MONARCH PASS	FAIR	27	-6		W12021 W36G45	30.09S	WCI 9
NIWOT RIDGE	FAIR	27	3		W33G51	29.91R	
\$\$		27	5	50	W00001	29.911	WC1 J
COZ060>066-220							
SAN LUIS VALLE	Y/SANGRE D	E CR	ISTO	MO	UNTAINS		
CITY	SKY/WX	TMP			WIND	PRES	REMARKS
ALAMOSA	CLEAR	53	5	14	W23G31	29.81R	
LA VETA PASS	FAIR	46	10	23	SW30G47	29.93R	
\$ <i>\$</i>							
	> 0 4 0 0 0 0 4 0	~					
COZ035-036-038		-					
NORTHERN COLOR				דות	MIND	DDEC	DEMADYO
CITY	SKY/WX	TMP				PRES	REMARKS
DENVER INTL AP			18		NW21		
AURORA	PTCLDY				NW8G23		
ENGLEWOOD		68			SW23G29	29.57R	
		63			W24G32	29.54R	
LOVELAND	FAIR	64	16	т2	E13G16	29.52R	
\$\$							
COZ041-046-047	-067-068-0	70>0	72-0	74-	075-220400) —	
PIKES PEAK/PAL							
CITY	SKY/WX		DP		WIND	PRES	REMARKS
COLO. SPRINGS					SW28G39		
		_					

FORT CARSON PTCLDY 72 12 10 SW26G36 29.61R PTCLDY 71 46 40 SE43G48 29.58R LIMON 66 25 20 S24G32 MONUMENT HILL FAIR 29.63R 75 32 20 S30G43 TRINIDAD CLEAR 29.64R \$\$ COZ042>045-048>051-090-091-220400-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS GREELEY ARPT FAIR 63 30 29 NE12 29.53R 29.53R AKRON CLOUDY 70 45 40 S38G46 BURLINGTON CLOUDY 68 47 46 S45G56 29.63R HAZE \$\$ COZ073-076>081-092-220400-SOUTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO PTCLDY 77 17 10 SW18 29.54R 77 49 37 S37G55 29.54R PTCLDY LA JUNTA CLEAR 72 47 40 S41G49 29.60S LAMAR 69 49 48 S40G48 SPRINGFIELD N/A 29.71R COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1000 PM MDT TUE MAY 21 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220500-NORTHWEST COLORADO SKY/WX TMP DP RH WIND CITY PRES REMARKS 43 18 36 SW12 29.86R CRAIG CLEAR HAYDEN CLEAR 41 18 38 MISG 29.87R MEEKER CLEAR 40 18 41 CALM 29.88S \$\$ COZ006>008-011-220500-WEST CENTRAL VALLEYS TMP DP RH WIND CITY SKY/WX PRES REMARKS GRAND JUNCTION PTCLDY 51 18 27 NW14 29.88R MONTROSE 50 4 15 W7 29.92R CLEAR 7 18 SW12G18 PTCLDY 48 29.91R EAGLE PTCLDY 51 12 21 W17G23 RIFLE 29.87R \$\$ COZ017>023-220500-SOUTHWEST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 47 4 17 W8 29.92R DURANGO CLEAR 4 16 W7 CORTEZ CLEAR 49 29.95R 0 21 W5 TELLURIDE FAIR 36 30.01R 27 5 39 SW24G30 WOLF CREEK PAS FAIR 30.02S WCI 12 \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-220500-

CENTRAL COLORADO

TMP DP RH WIND CITY SKY/WX PRES REMARKS 29.90R 41 2 19 CALM ASPEN PTCLDY 21 -2 35 CALM 29.95R COPPER MTN FAIR 45 -2 14 W10 GUNNISON CLEAR 29.93R 29.905 WCI 24 34 -1 22 W16 LEADVILLE PTCLDY MONARCH PASS FAIR 25 -8 24 W40G52 30.09R WCI 6 \$\$ COZ060>066-220500-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS 29.86R CLEAR ALAMOSA 48 1 14 VRB6 LA VETA PASS FAIR 41 7 24 SW22G32 29.97R \$\$ COZ035-036-038>040-220500-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS 61 17 18 NW10 DENVER INTL AP MOCLDY 29.63R CLEAR 64 14 14 W15 29.62R AURORA PTCLDY 62 11 13 SW24G33 29.63R ENGLEWOOD PTCLDY 59 10 14 W24G32 29.63R BROOMFIELD 61 10 13 SW15G20 29.58R LOVELAND FAIR ŚŚ COZ041-046-047-067-068-070>072-074-075-220500-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS SKY/WX TMP DP RH WIND PRES CITY REMARKS 9 10 W31G44 COLO. SPRINGS CLEAR 66 29.66R PTCLDY 9 29.64R FORT CARSON 66 10 W32G39 PTCLDY 29.62R 69 47 45 S35G54 LIMON MONUMENT HILL FAIR 55 19 24 W17G23 29.71R 72 28 19 SW18G29 29.68R TRINIDAD CLEAR \$\$ COZ042>045-048>051-090-091-220500-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 59 28 31 NE6 29.59R GREELEY ARPT FAIR CLOUDY 69 46 43 S38G48 AKRON 29.56R 29.64R BURLINGTON PTCLDY 66 46 48 S39G51 ŚŚ COZ073-076>081-092-220500-SOUTHEAST COLORADO PRES CTTY SKY/WX TMP DP RH WIND REMARKS PUEBLO 73 12 9 SW24G37 29.60R CLEAR 75 50 41 S41G49 29.56R LA JUNTA PTCLDY 72 50 45 S43G55 29.62R HAZE LAMAR PTCLDY 67 49 52 S32G47 SPRINGFIELD N/A 29.74R COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO

NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO

1100 PM MDT TUE MAY 21 2002

40

SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY.

COZ001>005-013-030-031-220600-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS CRAIG CLEAR 41 18 39 SW15 29.85F HAYDEN CLEAR 39 16 38 MISG 29.87F MEEKER MOCLDY 43 17 35 SW8 29.885 ŚŚ COZ006>008-011-220600-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS GRAND JUNCTION PTCLDY 45 18 34 NW3 29.90R MONTROSE PTCLDY 46 7 20 SW3 29.94R PTCLDY 46 10 23 SW12G20 29.92S EAGLE RIFLE PTCLDY 50 12 21 SW12 29.87S \$\$ COZ017>023-220600-SOUTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 45 4 18 W8 29.93R DURANGO CLEAR CLEAR 40 8 26 CALM 29.96R CORTEZ FAIR 30.025 WCI 28 TELLURIDE 34 0 23 VRB7 25 5 42 SW21G31 30.03R WCI 10 WOLF CREEK PAS FAIR \$\$ COZ009-010-012-014-032-033-034-037-058-059-069-220600-CENTRAL COLORADO SKY/WX TMP DP RH WIND CITY PRES REMARKS MOCLDY 40 9 28 VRB5 29.92R ASPEN 19 -4 35 CALM COPPER MTN 29.94F FAIR GUNNISON CLEAR 43 1 17 SW7 29.95R LEADVILLE CLEAR 32 -1 24 W15G21 29.91R WCI 22 MONARCH PASS FAIR NIWOT RIDGE FAIR 25 -6 26 W39G51 30.09S WCI 23 1 39 W44G61 29.81F WCI ŚŚ COZ060>066-220600-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS 47 -1 13 SW13 29.88R ALAMOSA CLEAR 37 1 22 SW20G25 29.98R LA VETA PASS FAIR \$\$ COZ035-036-038>040-220600-NORTHERN COLORADO FRONT RANGE SKY/WX TMP DP RH WIND CITY PRES REMARKS DENVER INTL AP PTCLDY 58 13 17 NW12 29.67R AURORA CLEAR 61 9 12 W2O 29.66R 8 14 SW15 57 ENGLEWOOD PTCLDY 29.67R 9 14 NE7 LOVELAND FAIR 57 29.63R

COZ041-046-047-067-068-070>072-074-075-220600-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS

\$\$

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3

SKY/WX TMP DP RH WIND CITY 29.69R PRES REMARKS COLO. SPRINGSCLEAR61510W29G37FORT CARSONCLEAR64710W22LIMONPTCLDY674748\$23G38 29.67R 29.65R MONUMENT HILL FAIR 52 16 24 W22 29.73R TRINIDAD CLEAR 67 21 17 W22 29.71R \$\$ COZ042>045-048>051-090-091-220600-NORTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 29.64R GREELEY ARPT FAIR 54 27 35 SE6 AKRON MOCLDY 68 47 46 S30G40 29.58R BURLINGTON CLEAR 64 43 46 S39G49 29.62F \$\$ COZ073-076>081-092-220600-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND CITY PRES REMARKS PUEBLO CLEAR 70 9 9 SW22G29 29.64R 72 50 45 S24G36 LA JUNTA PTCLDY 29.60R 70 50 49 S40G53 29.62S LAMAR CLEAR 65 50 58 S40G48 SPRINGFIELD 29.73F N/A COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1200 AM MDT WED MAY 22 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ001>005-013-030-031-220700-NORTHWEST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS CRAIG PTCLDY 39 19 44 SW8 29.86R 39 16 38 MISG 29.87S CLEAR HAYDEN PTCLDY 44 15 31 SW8 29.88S MEEKER \$\$ COZ006>008-011-220700-WEST CENTRAL VALLEYS CITY SKY/WX TMP DP RH WIND PRES REMARKS 42 16 34 E3 29.90S GRAND JUNCTION PTCLDY 41 11 29 VRB6 MONTROSE MOCLDY 29.95R MOCLDY 46 12 25 SW12 EAGLE 29.92S RIFLE PTCLDY 45 14 28 NE6 29.88R \$\$ COZ017>023-220700-SOUTHWEST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS 44 5 20 W10 29.94R DURANGO CLEAR CLEAR 35 9 33 NE7 29.97R WCI 29 CORTEZ 34 -2 21 VRB6 TELLURIDE FAIR 30.02R WCI 29 WOLF CREEK PAS FAIR 21 3 45 SW18G29 30.03R WCI 6 \$\$

COZ009-010-012-014-032-033-034-037-058-059-069-220700-CENTRAL COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS 40 11 30 CALM 29.92S ASPEN CLOUDY 29.94S 19 0 42 CALM COPPER MTN FAIR GUNNISON PTCLDY 39 1 20 CALM 29.96R LEADVILLE CLEAR 30 3 31 NW10 29.93R WCI 21 21 -4 33 SW40G49 30.08S WCI MONARCH PASS FAIR 1 FAIR 21 3 45 W40G60 NIWOT RIDGE 29.79S WCI 1 ŚŚ COZ060>066-220700-SAN LUIS VALLEY/SANGRE DE CRISTO MOUNTAINS CITY SKY/WX TMP DP RH WIND PRES REMARKS AT.AMOSA CLEAR 46 -2 13 SW18 29.90R 36 0 21 SW30G40 LA VETA PASS FAIR 29.98S \$\$ COZ035-036-038>040-220700-NORTHERN COLORADO FRONT RANGE CITY SKY/WX TMP DP RH WIND PRES REMARKS DENVER INTL AP PTCLDY 56 9 15 NW16G21 29.71R 29.70R 55 10 16 W9 AURORA CLEAR 7 14 W14G20 ENGLEWOOD CLEAR 56 29.71R 52 10 19 W6 LOVELAND FATR 29.68R \$\$ COZ041-046-047-067-068-070>072-074-075-220700-PIKES PEAK/PALMER DIVIDE AND SOUTHERN FOOTHILLS TMP DP RH WIND CITY SKY/WX PRES REMARKS 6 COLO. SPRINGS CLEAR 59 12 W23G29 29.70R 29.67S FORT CARSON 59 3 10 W26G36 CLEAR 57 30 35 NW13 MOCLDY 29.70R LIMON MONUMENT HILL FAIR 52 14 22 W17G22 29.74R TRINIDAD CLEAR 63 18 17 SW15 29.73R \$\$ COZ042>045-048>051-090-091-220700-NORTHEAST COLORADO SKY/WX TMP DP RH WIND PRES REMARKS CITY GREELEY ARPT 52 25 35 S9 29.69R FAIR 56 31 38 N26G38 29.67R AKRON CLOUDY 62 44 51 S30G38 BURLINGTON PTCLDY 29.65R \$\$ COZ073-076>081-092-220700-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND CITY PRES REMARKS 62 10 13 W14 PUEBLO CLEAR 29.68R 73 50 44 SW20 LA JUNTA PTCLDY 29.66R 69 51 52 S38G52 29.61F LAMAR CLEAR SPRINGFIELD 64 51 62 S33G45 N/A 29.73S

3.0 Meteorological Data for the June 20, 2002 Event

On Thursday June 20, 2002, Lamar recorded exceedances of the twenty-four-hour PM10 standard with readings of 181 ug/m3 at the Power Plant site and 162 ug/m3 at the Municipal Building site. This is, perhaps, the first blowing dust exceedance in Colorado caused by outflow winds from a severe thunderstorm complex. As such, the meteorology of the episode does not have all of the characteristics commonly associated with blowing dust exceedances in Colorado.

Figure 1 shows the surface weather conditions in Colorado at 00Z on June 21 (6 PM MDT on June 20, 2002). This map shows that there were no well-organized surface low-pressure systems in or around Colorado. Such well-organized systems are usually present during a sustained period of blowing dust. The map, however, does show a line of strong thunderstorms from southeastern Colorado through New Mexico. The strongest storms are indicated by red markings. Severe thunderstorm warnings were issued for extreme southeastern Colorado during the evening of June 20. The storm which prompted this warning was located in Baca County near Springfield. Later in the evening, the Pueblo National Weather Service Forecast Office issued a high wind warning for southeastern Colorado. This was in response to very strong outflow winds from the storms in southeastern Colorado. The text of this warning is presented in Table 1.

While the warning addressed the possibility of high winds and blowing dust in Crowley, Bent, Otero, and Las Animas Counties, it did not mention neighboring Lamar in Prowers County. Strong winds from these storms, however, did affect Lamar. Table 2 shows wind and gust speeds for Lamar during the evening of June 20, 2002.

Sustained winds and gusts in Lamar exceeded blowing dust criteria. Wind speeds in excess of 30 mph and gusts in excess of 40 mph were recorded for several hours. These are the speed and gust thresholds for blowing dust that apply in southeastern Colorado when surface soils are dry (see reference for the *Natural Events Action Plan for High Wind Events – Lamar, Colorado* at the end of this document). The 30 mph blowing dust threshold applies to hourly average winds. Wind speed observations at stations like Lamar are made just prior to the reported hour of observation. In most cases, these recorded speeds are not hourly average speeds but represent a several-minute average. If these spot observations show that speeds are above the 30 mph threshold for successive hours, then it can be reasonably assumed that hourly average winds are also above 30 mph. Gusts of 47 to 56 mph were recorded for four of the observations during the evening. Nearby La Junta recorded wind speeds as high as 54 mph and gusts to 76 mph. Haze was also reported at La Junta, and this was probably associated with blowing dust.

Figure 2(a) shows the April 2002 precipitation for Lamar, Alamosa, Saguache, Salida, Colorado Springs, Rocky Ford, and Pueblo. Figure 2(b) shows the May 2002 precipitation at these stations, and Figure 2(c) shows the June 1 through 20, 2002, precipitation at these sites. Precipitation amounts were low to moderate at most sites. Lamar, however, received 1.42 inches between June 1 and June 20.

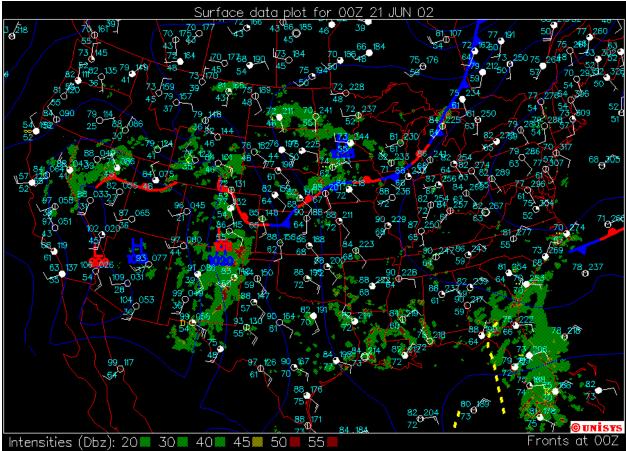


Figure 1. Surface weather features for 00Z June 21, 2002, or 6 PM MDT JUNE 20, 2002.

Tables 3 through 5 show daily temperatures and precipitation for Lamar, Rocky Ford, and Holly for June 1 through 20. (No rain fell at these three sites on June 20.) These data show two things. The first is that localized storms dropped significant rains on some areas and little rain on others. Parched soils probably remained dry in much of the region. The second is that daily maximum temperatures were 100 degrees Fahrenheit or higher on eight days during the period. Many of the remaining days saw maximum temperatures in the nineties. It was hot enough for rapid drying of soils.

In addition, the area continued to be under the influence of a long-term drought. Figure 3 shows that the U.S. Drought Monitor had declared that an *extreme* drought was underway in much of southern Colorado including the area around Lamar. This designation was made on June 18 and was representative of conditions in place on June 20. Drought conditions can contribute to rapid runoff of storm water on some soils and effective dispersion of absorbed water into a deep layer of soil. The net result is that soils may be dryer after significant rains than they would be under non-drought conditions.

Reference

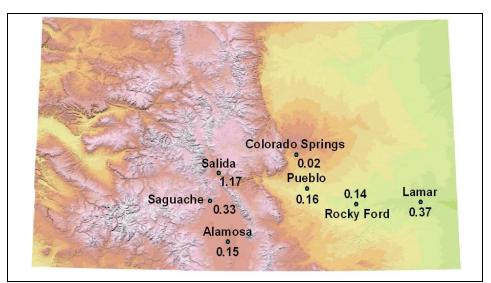
Colorado Department of Public Health and Environment, City of Lamar, Prowers County Commissioners, *Natural Events Action Plan for High Wind Events – Lamar, Colorado*, April 1998.

Table 1. High Wind Warning for Southeast Colorado on the Evening of June 20, 2002.

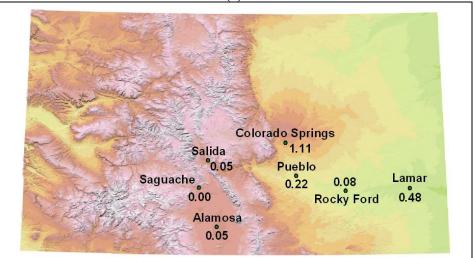
URGENT - WEATHER MESSAGE	
NATIONAL WEATHER SERVICE PUEBLO CO	
859 PM MDT THU JUN 20 2002	
STRONG WINDS EXPECTED OVER PORTIONS OF THE SOUTHEAST PLAINS	
STRONG OUTFLOW FROM THUNDERSTORMS OVER THE SOUTHEAST COLORADO	
PLAINSHAS BROUGHT VERY STRONG WINDS TO OTERO COUNTYAND MAY	
ALSO BRING STRONG WINDS TO CROWLEY AND BENT COUNTIES.	
COZ076-079-210457-	
BENT COUNTY/LAS ANIMAS AND VICINITY-	
CROWLEY AND OTERO COUNTIES/LA JUNTA AND VICINITY-	
INCLUDINGTIMPASSWINKSUGAR CITYROCKY FORDORDWAY	
OLNEY SPRINGSMCCLAVEMANZANOLALAS ANIMAS	
JOHN MARTIN RESERVOIRHASTYFOWLERFORT LYON	
CROWLEY AND CHERAW	
859 PM MDT THU JUN 20 2002	
HIGH WIND WARNING UNTIL 1100 PM	
WIND GUSTS TO BETWEEN 65 AND 75 MPH CAN BE EXPECTEDWITH SUSTAINED	
WINDS OF 45 TO 55 MPH.	
STRONG WINDS CAN CAUSE POWER DISRUPTIONS AND HAZARDS TO MOBILE	
HOMESHIGH PROFILE VEHICLESAND VEHICLES PULLING TRAILERS.	
BLOWING DUST CAN QUICKLY REDUCE VISIBILITY TO NEAR ZERO NEAR OPEN OR	
PLOWED LANDWHICH CAN CAUSE VEHICLES TO SLOW DOWN AND CAUSE	
CHAIN-REACTION ACCIDENTS, BLOWING DUST OR SAND CAN ALSO BE A HEALTH	
HAZARD FOR THOSE WITH RESPIRATORY PROBLEMS, STAY INDOORS IF THERE IS	
BLOWING DUST OR SAND IN YOUR AREAIF AT ALL POSSIBLE.	

Table 2. Wind observations for Lamar reported by the National Weather Service on June 20, 2002. Wind speeds or gusts at or above the blowing dust threshold are highlighted in bold and yellow.

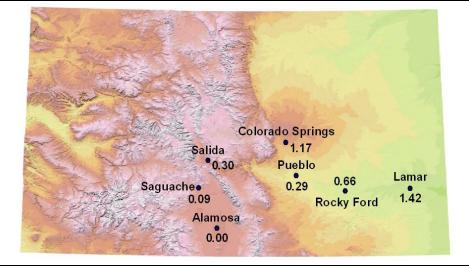
Day of Month during June	Time (Mountain Daylight)	Wind Direction	Wind Speed in mph	Gust Speed in mph
20	7:00 PM	Southerly	<mark>30</mark>	36
20	8:00 PM	Southwesterly	<mark>33</mark>	<mark>47</mark>
20	9:00 PM	Easterly	9	
20	10:00 PM	Southwesterly	<mark>41</mark>	<mark>49</mark>
20	11:00 PM	Southwesterly	<mark>44</mark>	<mark>52</mark>
21	12:00 AM	Southerly	<mark>43</mark>	<mark>56</mark>



(a)



(b)



(c) Figure 2. Total precipitation (inches of water): (a) April, (b) May, and (c) June 1-20, 2002.

uore .	Day of the Month Maximum Temperature Minimum Temperature									
	in June 2002	in Degrees F	in Degrees F	Precipitation in Inches						
	1	106	67	0						
	2	106	68	0						
	3	106	64	0						
	4	87	55	0.03						
	5	67	55	0.15						
	6	73	54	0.38						
	7	93	62	0						
	8	100	65	0						
	9	100	69	0						
	10	101	71	0						
	11	93	60	0						
	12	94	60	0						
	13	91	59	0.11						
	14	75	51	0						
	15	83	57	0.75						
	16	89	50	0						
	17	84	58	0						
	18	100	66	0						
	19	102	74	0						
	20	99	65	0						

Table 3. Daily Temperature and Precipitation Data for Lamar, Colorado, for June 1-20, 2002.

Table	4. Daily	⁷ Temp	erature and	Precipi	itation 1	Data f	or Roc	cy Ford,	Colorad	do, for June	1-20, 2002.

ž 1	Maximum Temperature		
in June 2002	in Degrees F	in Degrees F	Precipitation in Inches
1	103	57	0
2	102	69	0
3	97	65	0
4	86	54	0.49
5	75	52	0.13
6	93	55	0
7	100	56	0
8	99	59	0
9	103	69	0
10	98	68	0
11	93	56	0
12	92	63	0
13	90	54	0.02
14	87	54	0
15	90	56	0.02
16	85	49	0
17	101	53	0
18	102	61	0
19	102	62	0
20	99	65	0

л I	hear the Kansas and C	/		
	Day of the Month in June 2002	Maximum Temperature in Degrees F	Minimum Temperature in Degrees F	Precipitation in Inches
	1	105	62	0
	2	105	62	0
	3	103	65	0
	4	87	59	0.1
	5	72	57	0.13
	6	75	53	0.09
	7	93	57	0
	8	98	57	0
	9	98	68	0
	10	100	71	0
	11	96	64	0
	12	95	67	0
	13	93	62	0.21
	14	73	48	0
	15	83	54	0.04
	16	92	49	0.01
	17	84	54	0
	18	102	62	0
	19	101	72	0

Table 5. Daily Temperature and Precipitation Data for Holly, Colorado, for June 1-20, 2002. (Holly is east of Lamar near the Kansas and Colorado borders.)

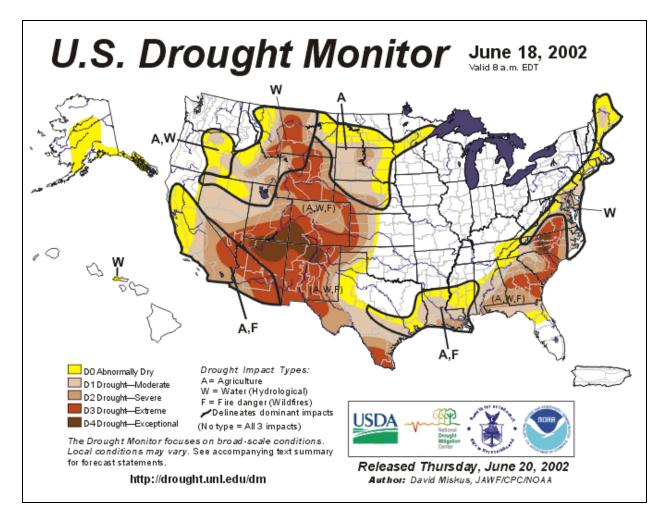


Figure 3. Drought status for the United States on June 18, 2002 (source: the USDA, NOAA, and the National Drought Mitigation Center at: <u>http://drought.unl.edu/monitor/monitor.html</u>, released on June 20, 2002).

Attachment B Southeast Colorado Surface Weather Observations for The Evening Hours of June 20, 2002, Reported by the National Weather Service

COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 700 PM MDT THU JUN 20 2002 NOTE: "FAIR" INDICATES FEW OR NO CLOUDS BELOW 12000 FEET WITH NO SIGNIFICANT WEATHER AND/OR OBSTRUCTIONS TO VISIBILITY. COZ073-076>081-092-210200-SOUTHEAST COLORADO CITY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO CLOUDY 83 55 38 E9 30.06F la junta CLOUDY 86 56 35 SE12 30.06F LAMAR CLOUDY 87 56 34 S30G36 30.07R SPRINGFIELD N/A 81 56 42 S26G41 30.18R COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 800 PM MDT THU JUN 20 2002 COZ073-076>081-092-210300-SOUTHEAST COLORADO TMP DP RH WIND CITY SKY/WX PRES REMARKS PUEBLO 78 48 34 SE9 30.12R CLOUDY 75 50 41 S43G58 30.09R HAZE LA JUNTA CLOUDY CLOUDY 80 56 43 SW33G47 30.13R T,AMAR SPRINGFIELD N/A 67 52 58 SW17G30 30.25R COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 900 PM MDT THU JUN 20 2002 COZ073-076>081-092-210400-SOUTHEAST COLORADO SKY/WX TMP DP RH WIND CITY PRES REMARKS PUEBLO CLOUDY 77 46 33 SE31G37 30.14R LA JUNTA LGT RAIN 77 47 34 SE54G76 30.08F VSB 3/4 79 49 34 E9 30.09F LAMAR CLOUDY 65 55 70 SW24G32 SPRINGFIELD N/A 30.21F COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1000 PM MDT THU JUN 20 2002 COZ073-076>081-092-210500-SOUTHEAST COLORADO CTTY SKY/WX TMP DP RH WIND PRES REMARKS PUEBLO CLOUDY 74 47 38 SE23G38 30.17R 75 47 36 SE40G48 30.09R LA JUNTA CLOUDY LAMAR CLOUDY 80 46 30 SW41G49 30.08F 67 53 61 W13G23 SPRINGFIELD N/A 30.24R

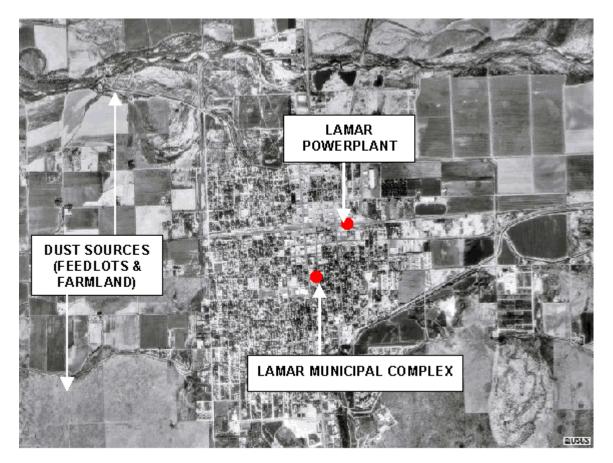
COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1100 PM MDT THU JUN 20 2002 COZ073-076>081-092-210600-SOUTHEAST COLORADO TMP DP RH WIND PRES REMARKS CITY SKY/WX
 CLOUDY
 74
 48
 39
 SE28G37
 30.23R

 CLOUDY
 78
 44
 29
 S32G47
 30.10R
 30.23R PUEBLO LA JUNTA CLOUDY 82 43 25 SW44G52 30.03F LAMAR 68 52 56 S49G58 30.11F SPRINGFIELD N/A COLORADO STATE WEATHER ROUNDUP NATIONAL WEATHER SERVICE DENVER CO 1200 AM MDT FRI JUN 21 2002 COZ073-076>081-092-210700-

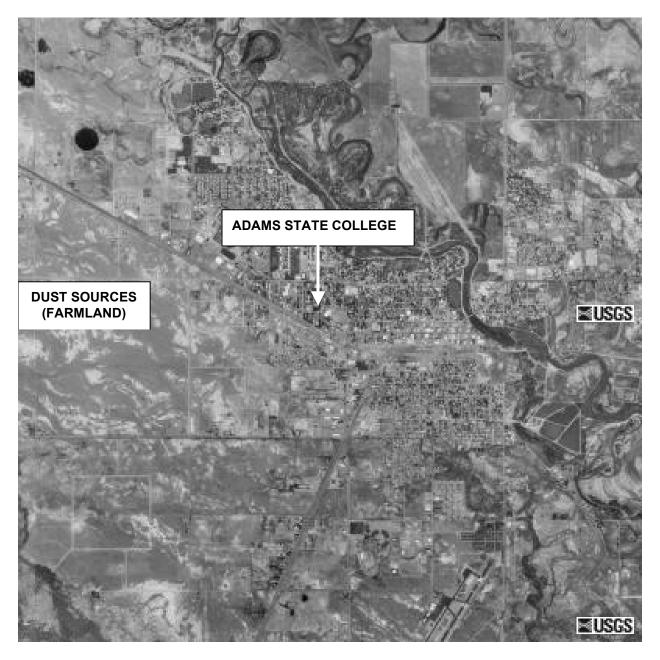
SOUTHEAST COL	ORADO					
CITY	SKY/WX	TMP	DP	RH WIND	PRES	REMARKS
PUEBLO	CLOUDY	74	47	38 SE17G31	30.20F	
LA JUNTA	CLOUDY	72	50	45 SW26G35	30.17R	
LAMAR	CLOUDY	76	50	40 S43G56	30.02F	
SPRINGFIELD	N/A	70	50	49 SW31G40	30.11S	

4.0 Aerial Views of the Sites

Lamar



Alamosa



5.0 Other Accounts of Conditions and Events

Dry High Plain Are Blowing Away, Again

Timothy Egan

This article was published in New York Times, May 3, 2002.

LAMAR, Colo. - A hypnotist was the featured guest at the soil conservation district's annual meeting here a few weeks ago, a fitting diversion for a place where it has not rained for nearly a year and the land seems to be in a hard trance.

Across the state line from this southeastern Colorado town, in Syracuse, Kan., a crowd packed into the school gym to hear Dusty Dowd, a cropduster, lead a prayer for rain. "Lord, we ask that you might again bless us with the general, beneficial rains that are so vital to our crops and our lives," the prayer went.

The soil is on the move again in the High Plains, drifting over a swath of the American midsection calcified by drought. For some, it is reviving memories of a time when the world seemed to blow away. There have been serious droughts here before, some as fierce as the dry spells of the 1930's. But this drought is among the worst, and in some counties, particularly in the northern plains, it is the most devastating in more than a century.

In eastern Montana, more than a thousand wheat farmers have called it quits rather than try to coax another crop out of ground that has received less rain over the last 12 months than many deserts get in a year. Blinding dust storms have forced drivers off the road, dozens of businesses have folded in withered communities, and the entire state has been declared a federal disaster area for farmers.

Wyoming is much the same. Here in southeastern Colorado, in the heart of the old Dust Bowl, the ground is so dry that agriculture officials say most of this state will not even produce a wheat crop.

"We've had severe drought before, but never four years in a row of terrible drought," said Jesse Aber, who directs Montana's drought task force.

John Stulp, a farmer from this flat, wind-chipped corner of Colorado, added: "It's drier around here than it has been for a hundred years. We've chiseled up the ground on land where we usually have wheat coming up, just to bring dirt clods up to hold the soil down."

http://www.ranchwest.com/egan.html

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Dry High Plains Are Blowing Away, Again by Timothy Egan /font>

Drought is no stranger to much of the country this year, with 29 states suffering through a prolonged dry spell. The East, from Maine to Georgia, has been particularly hard hit.

But what makes the drought stand out in the western Plains is the blowing dust, a haunt of the Dirty Thirties when brown blizzards carried sand all the way to the Atlantic Ocean and prompted more than three million people to leave their homes.

While the storms this year have not been nearly as epic or debilitating as the brown clouds that rolled over the flatlands during the Depression, they have been fierce - and they have come as something of a surprise for people who believed the land had been stabilized.

Two weeks ago, Herb Homsher pulled his car over by the side of the road in the midst of a dust storm near the Colorado-Oklahoma border. It was the kind of duster Mr. Homsher had not experienced in years. "You couldn't see the end of your car," he said.

In Montana, heavy dust this year caused a similar brownout, resulting in a traffic pileup that killed two television reporters.

According to the latest assessment by federal officials, half of Montana, all of Wyoming, nearly two-thirds of Colorado, half of Kansas, a third of Texas and most of New Mexico are in the midst of a drought labeled severe to extreme. Wildfires are racing through the eastern front of Colorado. With 280 fires already this year, Colorado has had four times as many fires as normal.

On much of the High Plains, the prairie grass was long ago plowed under to grow dry land wheat, a grain that depends entirely on what falls from the sky, with no help from irrigation.

"My father was born in 1918 and all my life he's been talking about how we should be careful, we could have another 1930's," said Lochiel Edwards, a wheat farmer from near Havre, Mont. "Well, now it's as dire as I've seen in my life, and my father just the other day said it's as bad as 1936."

The aridity may be worse than it was in the 1930's, but the dust storms do not compare. Up to 10 million acres lost at least the upper five inches of topsoil in those years, according to federal surveys. During one storm in 1934, more than 350 tons of airborne dust was galloping across the prairie. Wheat was never replanted on much of the land, which was reseeded with native prairie grass. Now the government pays thousands of farmers to keep the ground untilled, as part of the conservation reserve program.

http://www.ranchwest.com/egan.html

Without the last half-century of federally directed soil conservation, much of the old Dust Bowl would be windblown again, many officials and farmers say. Even so, Mr. Edwards said, many of his neighbors have lost topsoil to the new dust storms. "Their land has gotten away from them, and I don't think it's their fault," he said. "This drought is just a killer."

To counties already hit by declining population and depressed farm prices, the days without rain are just one more piece of bad luck. In much of eastern Montana, Wyoming and Colorado, less than an inch of rain has fallen since last June. The soil is dry down to two feet in some areas.

"It's a cumulative thing," Mr. Aber of Montana's task force said. "Four years without much rain at all. Even during the 30's, there were some fairly normal rainfall years, so this is almost unprecedented."

Bridges cross over dry beds labeled rivers. Fields that usually turn green with the first spring rains are as brown as the skin of a baked potato. Rivers that drain snowmelt from the Rockies and flow east - like the Platte and the Arkansas - are running thin, and are so overtaxed that in some places only people with water rights dating to the 19th century are likely to get their regular share.

Some small towns, like Melstone, Mont., have lost their municipal water supplies, the first time anyone can remember this happening. River rafting companies on the Front Range, where the prairie meets the mountains, talk about "what water" instead of white water. Fishing guides worry that the winter's snow will not bring nearly enough water to make for a successful year on the region's trout streams.

"Everyone knows it's dry here, but it is the extreme, prolonged dry times that makes this such a disaster," said Jeff Tranel, an agronomist with Colorado State University.

Prowers County, where Lamar is, is already a federal disaster area, making farmers eligible for subsidized loans because of the weather. This week, Gov. Bill Owens of Colorado asked the federal government to declare the entire state a disaster area. But few people want to take on more debt.

"We're in trouble," said Steve Wertz, who has 3,000 acres in wheat and corn near this town on the old Santa Fe wagon trail. "I've been farming for 25 years and never seen it like this."

The quirks of global agriculture are such that even though dry land wheat, the crop that first brought white settlers here to break the prairie sod, is in trouble, grain prices remain depressed because of a worldwide

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Dry High Plains Are Blowing Away, Again by Timothy Egan /font>

glut. Senators from the region are pressing for \$2.4 billion in disaster payments for farmers who will not be able to grow a crop this year. But with so many subsidies already directed at failing agricultural operations, a new payment for drought-related losses faces stiff opposition in Congress.

Looking to the white sky, farmers shrug and wonder if a new Dust Bowl will soon be upon them.

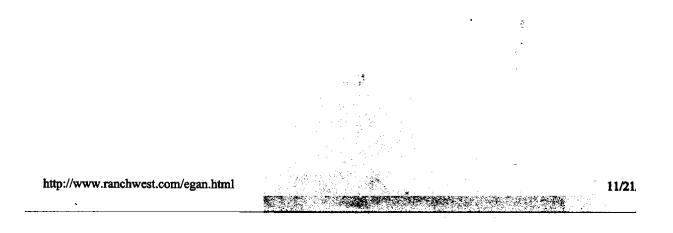
"The attitude out here is bad," said Mr. Edwards, the third-generation Montana wheat farmer. "It's just a depressing time to be on the prairie."

A joke making the rounds has it that the ducks who live in the cottonmouthed counties in eastern Montana have yet to learn to swim. Most people say the line with a straight face.



Back to recommended reading

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NWS Goodland, Kansas

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www.nws.noaa.j National Weather Service Forecast Office 5 Å T A Goodland, KS Site Map Search All NWS search News Organization Home **Current Hazards** Watch/Warn/Advise Weather Data Windy Conditions 21 May 2002 Hazard Assessment **Current Conditions** Local Observations Satellite Images Lakes & Rivers An unusual weather pattern for mid May produced extremely windy conditions across the northwest Kansas, Radar Imagery eastern Colorado, and southwest Nebraska Tuesday afternoon and early evening (May 21, 2002). The strong Goodland ĆWA winds produced wind gusts to 70 mph and property damage. Nationwide Forecasts A strong high pressure center was anchored over the central east coast of the United States Tuesday. At the Goodland CWA same time an unusually strong low pressure center moved across the Continental Divide. The pressure Aviation difference between these two weather features produced extremely windy conditions across the plains states **Fire Weather** including the Tri-State area. Climate GLD Climatology A Wind Advisory was in effect Tuesday and Tuesday evening. South winds of 30 to 40 mph with gusts to 55 **Climate Prediction** mph developed quickly after sunrise. At 324 PM MDT (424 PM CDT) a High Wind Warning was issued for Weather Safety locations west of a line from Palisade Nebraska south to Russell Springs Kansas. Storm Ready Preparedness At 345 PM MDT (445 PM CDT) a weather spotter in Flagler, Colorado, reported 65 mph winds uprooted 35 foo Specialized Programs plne trees. Winds gusted to 70 mph north of Arapahoe, Colorado, which produced near zero visibilities due to Aviation blowing dust. Tree limbs were broken and shingles were blown off houses at Norcatur and Colby, Kansas. Coop Program **Outreach/Education** Although the peak wind gust at the Goodland Airport was only 60 mph, the average wind speed for the entire Local StormReady day was the 6th windiest day in Goodland since weather records have been kept. Weather Radio EMWIN The following is a list of wind gusts reported to the National Weather Service in Goodland Education Skywarn Safety Location Wind gust Time MDT (CDT) Image Gallery Miscellaneous About Our Office McCook, Nebraska 54 MPH 334 PM MDT (434 PM CDT Office News 65 MPH (near zero Diversity Flagler, Colorado 345 PM MDT (545 PM CDT visibility) Feedback Hydrology Weskan, Kansas 61 MPH 400 PM MDT (500 PM CDT Send Us a Report 58 MPH (near zero Storm Watch 9 NNE Kit Carson, Colorado 400 PM MDT (500 PM CDT visibility) Contact Us W-GLD.Webmaster 70 MPH (near zero 14 N Arapahoe, Colorado 400 PM MDT (500 PM CDT @noaa.gov visibility) Idalia, Colorado **58 MPH** 402 PM MDT (502 PM CDT Hill City, Kansas 46 MPH 408 PM MDT (508 PM CDT Burlington, Colorado **59 MPH** 444 PM MDT (544 PM CDT Goodland, Kansas 60 MPH 505 PM MDT (605 PM CDT 70 MPH (near zero 14 N Arapahoe, Colorado 526 PM MDT (626 PM CDT visibility) 13 W Goodland Kansas 68 MPH 538 PM MDT (638 PM CDT

http://www.crh.noaa.gov/gld/news/windy_conditions.htm

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USDA Update







Beauty and the Beast

Barbie as Rapunzel Owen Hurley

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USDA Update

by Rod Johnec

May 24, 200

Areas of Kiowa County received up to .3 inches of precipitation on Mar 16 but wind plaqued the county for the next several days and eliminated any benefit of the precipitation. Average precipitation for the month o May in Kiowa County is 2.41 inches so we are still only about 12% o average. Due to the wind, erosion intensified on several field: throughout the county.

CRP Grazing Approved

Agriculture Secretary Ann Veneman has announced the approval o emergency grazing on CRP acreage for several counties. Senato Wayne Allard's office has announced that Kiowa County along with several other southeast Colorado counties are included in the approval Annual rental payments on CRP will be reduced 25% and producers must leave 25% of the acreage ungrazed in the same or adjoining fields or reduce stocking levels by 25%. CRP grazing is currently approved through August 31 or until the Colorado State or County FSA Committee determines the emergency grazing is no longer warranted. Producers interested in emergency grazing of CRP should contact the FSA Office.

Offices Closed

The USDA Service Center along with other Federal and State agencies will be closed on Monday, May 27 in observance of the Memorial Day Holiday.

FSA Assisting Crop Insurance

The Agricultural Risk Protection Act requires FSA to assist the Risk Management Agency (RMA) improve the integrity of the crop insurance program. We have been asked to monitor the program, report problems to RMA and assist RMA and insurance providers when auditing certain claims. FSA will refer all suspected cases of fraud, waste and abuse to RMA. You are encouraged to report suspected cases of fraud or abuse to the FSA Office. We are not involved with the decision making process. We are merely assisting RMA by gathering facts and reporting

http://www.plainsnews.com/2002-05/05-24/USDA%20Update.htm

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observations as they pertain to weather and crop plantings, maintenance and harvest.



EQIP Sign-up

As a result of the 2002 Farm Bill, Colorado will receive supplemental Environmental Quality Incentives Program (EQIP) funds for 2002. The NRCS office will be taking applications for this supplemental 2002 EQIP until June 28, 2002. Cost shares may be available for such things as terracing, livestock water facilities and other conservation practices. The EQIP contracts will be from one to ten years. All funds will be distributed to the five priority issues of soil erosion, water quality, grazing lands, wildlife, and animal waste facilities.

WHIP Program

The final date for signup for the Wildlife Habitat Incentive Program (WHIP) for 2002 is June 28, 2002. WHIP is a program that provides technical and financial assistance to landowners and others to develop upland, wetland, riparian and aquatic habitat areas on their property. This program places special emphasis on habitats for wildlife species experiencing declining or reduced populations. Applications are ranked using criteria of proximity to protected wildlife areas, benefited species, planned practices, contributing partners, proximity to occupied dwellings, and resource management systems. Contract approvals will be based on the highest ranking points. Applications are available at the NRCS office.

Loan/LDP Deadline

May 31 is the final date to obtain loans and Loan Deficiency Payments (LDP's) on 2001 production of grain sorghum, corn, sunflower seed and http://www.plainsnews.com/2002-05/05-24/USDA%20Update.htm 11/21/02

USDA Update

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soybeans. Producers with outstanding 2001 crop loans may still repay the loan at the posted county price through maturity of the loan.

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Chase Log 2002

Distance Traveled: 6176 Miles

Lots of Thunderstorms, Six Supercell Days Several Weak Tornadoes, One "Possible" Wedge

Last Updated 6/24/02

May 18					
May 24					
May 30	May 31	June 1	June 2	June 3	June 4

May 18

We (yours truly, John Monteverdi, and Thom Trimble) arrived at Denver International Airpo on Friday evening, May 17. We decided to spend the night in Boulder since it is picturesque town and the running is great there.

We got a free upgrade on our vehicle...which got us a <u>Nissan Maxima</u> with GPS Navigatior for the price of a Taurus. And, 250 horsepower....

On May 18 we hoped that a Denver Convergence Zone would develop and that dew points would recover sufficiently to allow for storms with low bases and rooted in the boundary layer. Instead, although the DVCZ did indeed develop, the dew points brought northward were low, and all we got were elevated storms drifting off of the Rockies.

Well, we got a great run in up the trail along Boulder Canyon...very scenic with lots of shee canyon walls around. (Note rock climbers on the top of the cliffs in the background).

We took the opportunity to visit the National Center for Atmospheric Research and take in the displays.

We are spending the night in the Colorado Springs area (Manitou Springs). The progs are encouraging for the early part of the week, perhaps Tuesday, though whether we will be heading north or south is a question now.

Meanwhile, we are hoping to get some lightning shots over the next several days, since a little bit of buoyancy will allow for mountain thunderstorms to develop each day.

May 19

http://tornado.sfsu.edu/geosciences/StormChasing/cases/ChaseLogs/2002/Chase2002.html

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Chase 2002 Log

We awoke in Manitou Springs to the second consecutive Denver cyclone...but working with very low dewpoints. Once again, we took the opportunity to get another great run in...this time in Garden of the Gods. Afterwards, in Colorado Springs, we decided to head southeas to Lamar, Colorado, hoping to get a lightning show tonight....so we will see about that.

With meager buoyancy to work with, an incoming short wave passing over SW Colorado stimulated many, but mostly weak, thunderstorms (with a few exceptions). However, the coverage and intensity of storms was greater than that of yesterday....several storms nearly became severe. This storm developed a microburst and spread dust upwards and outward

Over the next 48 hours, shear profiles become better....so we are looking to the Gulf of Mexico, hoping that moist air works its way northward.

May 20 and 21

That darn low in the Gulf of Mexico is <u>mucking up the moisture return</u>. So even though somewhat favorable shear profiles returned to the Plains, there were no storms on the 20th We holed up in Lamar, Colorado that night

The next day, shear profiles in eastern Wyoming were expected to be dynamite, ahead of a ejecting short wave that had clobbered California. Unfortunately, an otherwise tornadic pattern was moistureless. The result was a series of storms that developed in the Wyoming Rockies and drifted eastward. We targeted the area north of Cheyenne and saw some high based storms with a large shelf extending outward to the east, but no structure to speak of.

We drifted east into Nebraska that evening and got pummelled by 50-70 mph winds in the Nebraska Panhandle. These winds were southeasterly winds rushing into the monster low our north....but with no moisture, only weak thunderstorms resulted. The strong winds lifted the moulding on our windshield. Eventually, we had to have the care replaced.

May 22

After spending the night in Kearney, Nebraska, we drove southward to get south of the cold front that had advanced into the western part of Nebraska and advanced, eventually, into north-central KS. Finally, high 50 dew points had worked their way northward from the Gulf But would it be enough to initiate storms in the area of favorable shear for tornadic superce in the area between Pratt and Wichita? Nope!

But enough moisture had pooled ahead of the cold front to generate some weakly rotating storms. We saw the first north of Russell, KS. Later, we chased a couple of storms north of Hays that exploded in the late afternoon. These storms had some weakly developed structure...a couple of developing wall clouds that had some rotation and a nice base, albei with weak rotation. However, there were some great downbursts and ominous lowerings. There was also one radar-indicated tornado that stimulated a warning for a storm north of u

We are in Russell KS tonight, and are aiming for the Oklahoma border area north of Enid

http://tornado.sfsu.edu/geosciences/StormChasing/cases/ChaseLogs/2002/Chase2002.html

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