Decision Support Services and Impacts of the Flash Flood and Debris Flow in Mount Charleston, Nevada, 28 July 2014

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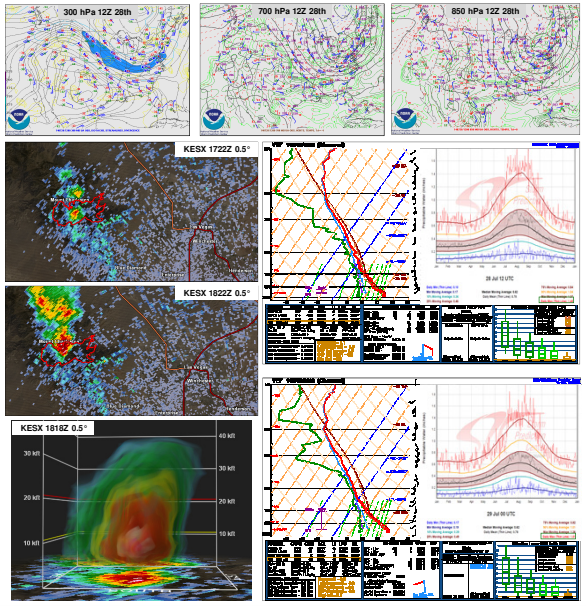
Overview

A destructive flash flood and debris flow occurred on 28 July 2014 within the town of Mount Charleston, Nevada. Mount Charleston is located in the Spring Mountains approximately 25 miles northwest of Las Vegas and at an elevation of approximately 7,500 feet. Heavy rain of two inches fell within two hours on the Carpenter 1 wildfire burn scar. A flash flood and debris flow developed and plowed through portions of Mount Charleston resulting in more than $2 million in damages to Clark County infrastructure and residential property in the Rainbow Canyon Subdivision.

An assessment revealed that the heavy rainfall developed under the following conditions:

- Several days of increasing monsoonal moisture.
- Within a region of enhanced upper-level forcing associated with an inverted trough.
- Strong diurnal heating increased instability.
- Antecedent ground conditions were practically impermeable as the area was a burn scar from the Carpenter 1 wildfire which occurred July 2013.
- Radar imagery clearly depicted convection was nearly stationary or continued to redevelop over the same area.

Atmospheric Conditions



Impacts and Damage

The resultant flash flood and debris flow caused the following impacts and damage:

- More than $2 million in damages to Clark County infrastructure and residential property.
- Power was lost at a nearby substation, affecting 402 customers.
- Deep erosion caused substantial damage to area roadways, including Rainbow Canyon Blvd., which is the main street through the subdivision.
- The deep erosion also substantially damaged water supply and waste water lines to many of the homes. Nearly 900 gallons of bottled water were made available for residence.
- Landline telephone service was lost during the event, restored the following day.
- Numerous propane tanks and connections were inspected and fixed where necessary.
- Approximately 12 homes were damaged, with 2 containing severe damage and are not inhabitable.
- Shelters were established by the American Red Cross at a nearby hotel and school for impacted residents.
- Within 48 hours, tons of debris were cleared and water, power, fuel, and telephone service were restored.

Damage Survey Pictures

Contact Information

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Diversion Channel and Berm

Decision Support Services

Below are some key decision support services the Las Vegas Weather Forecast Office provided before, during, and after the event:

- Email briefings to core partners started 25 July 2014 and contained the locally developed Flash Flood Threat Index specific for burn scars.

FLASH FLOOD THREAT INDEX

	Burn Scar	Mon 7/28	Tue 7/29	Wed 7/30	Thu 7/31	Fri 8/1	Sat 8/2	Sun 8/3
T-storm/Flash Flood Threat Index	Carpenter 1	60	20	20	10	10	40	50
	Dean Peak	60	30	30	20	20	40	40

*Index numbers represent the threat of flash flooding over the burn area. Numbers run from 0-100. Values over 50 indicate that a Flash Flood Watch is possible, while lower numbers mean conditions are marginal. These numbers DO NOT indicate flash flood severity.

- Utilized social media several days in advance to highlight heavy rain potential.
- Issued a Flash Flood Watch the morning of 28 July 2014.
- Issued a Flash Flood Warning (10:46 AM PDT) then upgraded to a Flash Flood Emergency (11:30 AM PDT).
- Provided talking points to Clark County officials the day of the event and conducted a damage survey the following day.
- Assisted United States Army Corp of Engineers with weather specifics while they designed the berm and diversion channel.

The Las Vegas Office of the National Weather Service provided efficient, timely, and valuable weather updates throughout the course of the incident which greatly assisted with preparation, response, and recovery efforts of affected agencies and the public.

-Clark County Office of Emergency Management and Homeland Security