



Nevada Floodplain Management News

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2019 Arid Regions Conference

By Bunny Bishop, State Floodplain Manager, Nevada Division of Water Resources

In April, the 2019 Arid Regions Conference was held in Albuquerque, NM sponsored by the New Mexico Floodplain Managers Association (NMFMA), Arizona Floodplain Managers Association (AFMA), and the Association of State Floodplain Managers (ASFPM). An Arid Regions Conference is held once every three years with a focus on issues particular to the arid regions of the southwest. This year's theme was Water Issues in the Arid Southwest. I was honored to participate in the Arid Regions Issues Panel Discussion as a panelist and provide an update on the arid region issues in Nevada. I served on this panel along with representatives from Arizona, Utah, Colorado, and New Mexico.

Since Nevada is an arid state, in fact the most arid state in the country, there were a variety of sessions and panels offered during the conference that might be of interest to a floodplain manager in Nevada. I would like to highlight a few presentations some of you might find of interest.

The *Programmatic Implications for a Naturalistic Approach to Flood Mitigation* presentation outlined the Santa Clara Pueblo's journey using naturalistic techniques for their flood-after-fire mitigation endeavors. If you would like to know more, you can visit a story map created by Santa Clara Pueblo Forestry called [A Tribe's Collaborative Journey Toward Establishing Forest Resiliency](#).

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Arid Regions Issues Panel Discussion



Photo courtesy of Nicole Goehring, NDWR



Continued from page 1 A presentation by Van Clothier called Urban Water Stormwater Harvesting presented many examples of unconventional approaches to mitigating urban flooding issues. To address the urban flooding issues, Mr. Clothier reconnected the natural drainages to their watersheds by doing simple projects like curb cuts that allow water to flow through a backyard rather than the street. If you want to know more, Mr. Clothier suggested looking at *Rainwater Harvesting for Drylands* by Brad Lancaster.

Lastly, the Raven Pond Tour was an excursion to view a portion of the Southwest Valley Flood Reduction Project that addresses flooding in the South Valley area of Albuquerque, NM. Raven Pond is the backbone of the system and makes possible other projects that are currently being designed and built utilizing the pond. This project was a team effort by Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), Bernalillo County, and the US Army Corps of Engineers. For more information, you can visit a news article on the [Bernalillo County Website](#).



Photo courtesy of Nicole Goehring, NDWR

It was informative, interesting, and beneficial to hear what our neighbors in the arid southwest are doing to mitigate their flooding issues. There were many other sessions that were very relevant and hit home because these floodplain managers are dealing with the same issues we deal with here in Nevada including alluvial fans, stream bank erosion, flood-after-fire, and flash flooding to name a few. I will be sure to spread the news when they announce when and where the next Arid Regions Conference will be held. It was certainly a worthwhile event to attend. That's all for now. Have a great summer!

A banner with a wood-grain border. The top half features a photograph of a house partially submerged in floodwater. Overlaid on the photo is the text "NEVADA FLOODS. Are you prepared?". Below the photo, the text "Visit NevadaFloods.org" is displayed in large, bold letters. To the right of this text are social media icons for Facebook and Twitter, and a logo for "NEVADA FLOODS .ORG" which includes a map of Nevada. Further right is the logo for "CONSERVATION NATURAL RESOURCES".

Nevada Division of Water Resources Floodplain Management

“Celebrating Nevada’s Commitment to Community and Public Safety”

SAVE THE DATE!

**NEVADA DIVISION OF
WATER RESOURCES IS
HOSTING THE 2019**

FLOODPLAIN MANAGERS WORKSHOP

Come gather with your fellow community floodplain managers for training; updates from FEMA, NDWR, and other partners and colleagues; and networking.

**TUESDAY, SEPTEMBER 17 &
WEDNESDAY, SEPTEMBER 18**

Location: Carson City, Room TBD

No cost

CFM CECs available





Ruhenstroth Area Drainage Master Plan and Floodplain Re-mapping

By Courtney Walker, Stormwater Program Manager, Douglas County Public Works

The Ruhenstroth community in Gardnerville, Nevada developed over many years using the provisions allowed under *Nevada Revised Statutes 278.461*. The statute allowed newly created parcels greater than one acre in size to require infrastructure consistent with other parcels within 660 feet of the new parcel. This provision allowed for parcels to be created without a comprehensive drainage plan or integrated storm drain network.

Roads in the area have dip sections across washes that residents have to drive through to access their homes. The dip that crosses Smelter Creek in Ruhenstroth fills with sediment every time it rains, and Douglas County Public Works has been out numerous times to clear the dip section so residents can leave and come home. Often this occurs during time periods when staff must be called in after hours. The County has made several attempts to clean out the downstream portion of the channel to create more capacity.



However, the wash runs through private property, so it is difficult for the County to access the channel from top to bottom to clean it out. Once maintenance and access agreements are in place, the County intends to complete this large scale maintenance project.

In order to guarantee access during the spring runoff period, Douglas County installed two temporary four-foot culverts in the dip section and placed pit material over the top. Now residents are able to drive over the wash so it's not an issue when it runs. However, this is a temporary fix. The long-term plan is to create an Area Drainage Master Plan (ADMP) for the Ruhestroth area to design long-term road improvements and flood control.

The Ruhestroth ADMP will identify and quantify the stormwater flows and sediment hazards in the community. These hazards include impacts from Smelter Creek as well as from smaller drainages that have not been identified on FEMA floodplain maps.



After the hazards are identified, the ADMP will develop prioritized drainage and road improvements necessary to convey the floodwaters through the developed area to ensure access during 100-year flood events. The comprehensive list of improvements will make best use of existing drainage infrastructure, appropriately-size culvert crossings, and identify local and regional flood control improvements.

Another related project in the Ruhestroth area is the floodplain remapping project to restudy the Smelter Creek floodplain. There are many properties that are mapped in unnumbered A-flood zones and could likely be removed through a detailed study. Many of these properties in A-zones in Ruhestroth are several feet above the base flood elevation of Smelter Creek when a detailed study is produced for a building permit and elevation certificate. Conducting the ADMP and remapping projects either concurrently or consecutively would be beneficial so that the hydrology and LiDAR data acquisition can be used for both objectives.

The Muddy River: Where Vitality Meets Flood Risk

By Patricia Fontanet Rodríguez,
United States Army Corps of Engineers, Sacramento District

“The power of water is awesome and not to be trifled with.”

This is the message Tim Sutko, who worked as an Environmental Mitigation Manager at the Clark County Regional Flood District for 29 years, would like everybody in Southern Nevada to understand.

Residents in Clark County know that floods are common. In fact, the Muddy River, located approximately 60 miles northeast of Las Vegas, floods almost every year. The river, only 32 miles long, is considered an important, if not essential, economic driver for nearby communities. For generations, many communities have depended on the broad, low-lying fertile lands along the Muddy for their livelihoods, despite harsh flood events. Settling along the Muddy was a logical choice for Native Americans and early settlers who wished to farm the area.

Today, alfalfa and sudan grass are the primary crops grown during the summer, meanwhile oats and barley for pasture are harvested during the winter. Diversions from the Muddy are also primarily used to irrigate nearby farm land and to supply water for the Reid Gardner Power Generating Station and Moapa Valley Dairy. Undiverted flows continue toward the Overton Arm of Lake Mead.

The importance of the Muddy cannot be overstated, but neither can its flood risk.

Since the Muddy is surrounded by flat lands, when floodwaters overtop the river they spill into the floodplain and travel long distances reaching homes and farms. Sometimes these floods can be unforgiving.

The largest recorded flood, known as the California Wash Flood, occurred in 1981 and led to millions of dollars' worth of damages. A huge storm caused six and a half inches of rain to fall in under an hour. Over 200 residences were damaged, railroads and roads became inaccessible, and over 500 dairy cows died in the event. Although no human deaths were reported, Kelly Booth, a long-time resident of Moapa, was dangerously close to witnessing a tragic accident.

After the rain started to pour, Booth and his boss headed over to the California Wash, where they say water was about 13 feet deep. Booth could see mobile homes starting to become submerged. Booth noticed one of the mobile homes still had a family inside. He and a few others got on a boat and made their way to the trailer, which was almost totally submerged by the time they reached it. The family of six, including a two-year old baby, were trapped inside and only had about six inches of air left to breathe. Booth and the others kicked the window open and rescued everybody.

The Clark County Regional Flood Control District categorized the California Wash Flood as a 500-year flood event, meaning a storm that has a 0.2 percent chance of occurring in a given year.

Flood control projects have been completed and are ongoing in the Moapa Valley area to help manage flood waters. These projects include levees, diversion structures, and concrete culverts designed to protect against 100-year flood events or lower. Should another 500-year event occur, like the one in 1981, residents of Moapa Valley remain unprotected.

"The standard for the design of flood control facilities is the 100-year event. That's the storm that has a one percent chance of occurring in any given year," says Sutko. "You can always have a bigger storm. It's rare. But it can happen. And it does happen."

Ultimately, it is up to individuals to understand their flood risk and to take measures to prepare in case of a flood event. Flood control structures offer some protection, but are only part of the flood preparedness equation. Residents who have lived in the Moapa Valley for generations understand the Muddy River better than anyone else. They know how to use the river for irrigation, cultivation, and recreation. In turn, residents who share a livelihood with the river also share the responsibility to recognize flood hazards.

Background:
Muddy River
flood damage on
Interstate-15 near
mile marker 92, NV.
September, 2014



Left: Muddy River flood aftermath
in Hidden Valley, NV. September, 2014

The Virgin River spends most of its time as a tame stream, lazily slinking its way through the Colorado Plateau and Mohave Desert. In these harsh environments, the river's corridor provides for life. The Virgin River is a sanctuary where mature cottonwoods, agricultural fields, and even invasive species like tamarisk create a verdant vein piercing through this heartland of the desert southwest.

But the lurking power of the river also cannot be denied, especially when one looks upon the majesty of a place like the Virgin River Gorge, a visually striking canyon bound to impress just about anyone travelling the stretch of Interstate 15 between St. George, Utah, and Beaver Dam, Arizona. Or one notes the ancient strength of the Virgin when taking in the splendor of Zion National Park, where some would say that the signature hike actually isn't Angel's Landing but rather the trek through the famous Zion Narrows, where hikers tread carefully over the slick and smooth cobble lining the riverbed at the bottom of a slot canyon thirty feet wide and nearly two thousand feet deep.

Meek and Mighty: The Virgin River

by Darin L. Rummel, USACE Sacramento District

“People put their lives in danger because they don't understand the power of moving water”



Visitors to the area who happen upon the Virgin might be tempted to think that the river no longer rages like it once did. Visitors who are lucky enough to safely see the Virgin River during a flash flood event, however, are no doubt impressed by its power. The people who live along the Virgin either have immense respect for the river, or quickly attain it.

“People put their lives in danger because they don’t understand the power of moving water,” says Tim Sutko, a man who became very familiar with the Virgin River during his 30-year career at the Clark County Regional Flood Control District (CCRFCD), where he worked from 1988 to 2017. Regarding people who have newly moved to the area, Sutko remarks, “a lot of times, they are moving from other parts of the country and they believe that they are moving to a desert, and deserts don’t rain [or] flood,” so people often build without realizing they could be in a location with high flood risk. One of the problems with such development is that it often doesn’t become apparent until a disaster is already in progress. Sutko says that the CCRFCD has participated in a number of outreach and education programs, including working with schools and the Department of Motor Vehicles to incorporate flood safety into relevant curricula. Every year, the District reaches out to grade schools to provide children with education and tips about the dangers of flooding and how to stay safe. The CCRFCD also participates in an annual flood awareness campaign which aims to raise awareness among Nevadans that serious flooding occurs regularly in the state, and that there are steps residents can take to mitigate the risk.

Sometimes it takes a while for people to understand what they are up against when it comes to the Virgin River. Take the town of Mesquite, Nevada, a place that was resettled three times because it had essentially been abandoned twice. In 1880, people settled near modern-day Mesquite, building a diversion dam and canals to supply water for the town and agriculture. But just two years later, a flood came and destroyed the water projects, along with much of the town and crops. It was only three years later before another settlement attempt was made in Mesquite. That is, until another flood came and, again, destroyed the town. Finally, in 1894, some young families from nearby Bunkerville decided to try once more. This time, they succeeded, and by 1900 nearly 20 families lived in the town. “The third time was the charm,” says Geraldine White Zarate, chair of the Virgin Valley Historical Committee and author of the book *Mesquite and the Virgin Valley*, a book that details the history of the area with accompanying vintage photographs.

Just because Mesquite has persevered since 1894 doesn’t mean it hasn’t had some recent battles with the Virgin River. In the early hours of 1989, the Quail Creek Dam in upstream Hurricane, Utah, broke, liberating 25,000 acre-feet of water – a volume that increased the Virgin River’s flow in Hurricane from about 100 cubic feet per second (CFS) to 66,000 CFS. By the time the flood hit Mesquite, the Virgin was flowing at about 43,000 CFS. Zarate calls the flood the “high water mark,” but says that flood control measures taken and structures built since then have helped to reduce the community’s flood risk. Projects in Mesquite include several large detention basins along washes that drain into the river. There were other memorable flood events in 2005 and 2010, but Zarate says that even since those floods, “there has been a lot of work done on the river.” The community has also worked to discourage private development in the floodplain near the river, building recreational sites like ball parks and golf courses there instead.

The Virgin River is essential for the communities that lay along its length. It is also one of the most destructive forces that those communities can face. Communities that learn to live with and mitigate their flood risk can see it pay off. Zarate says she can’t recall a flood fatality in Mesquite – perhaps that’s because they’ve learned a lesson that Sutko is happy to preach: “The power of moving water is awesome and not to be trifled with.”

Nevada Flood Risk Awareness Education & Outreach

Outreach Events in 2019

Outdoor Events: Paiute-Shoshone Tribe Earth Day, Fallon - Renown Earth Day, Reno - University Nevada, Reno Earth Day - Truckee Meadows Earth Day, Reno - Reno Aces Education Days - Take Pride Clean Up/Green Up, Elko Oodles of Noodles Festival, Dayton - BioBlitz at the Walker River State Recreation Area, Yerington

In-class Presentations: Silver Stage Middle School - Empire Elementary School - Flagview Intermediate School

Workdays with River Wranglers: Scarselli Elementary School - Mark Twain Elementary School

Field presentations: Truckee River field trip with Swope Middle School

STEM Events: Carson Middle School STEM Night - Fernley STEM Festival

Northern Nevada Science and Technology Festival at the Discovery Museum, Reno

You can catch us next at:

July 8: Clark County Regional Flood Control District - Flash Flood News Conference, Las Vegas

July 26: Great Basin Institute Summer Camp presentations, Reno

July 27: Progressive Agriculture Safety Day, Carson City

Aug. 6: National Night Out, Carson City

Aug. 6: National Night Out, Elko

Aug. 9: Movies in the Park, Gardnerville

Aug. 23-25: Cantaloupe Festival & Country Fair, Fallon

Sept. 21: Keep Truckee Meadows Beautiful Teacher Training

Sept. 22: Dayton Valley Days

Oct. 5: Smith Valley Rotary Fun Days, Wellington

Nov. 16 - 22: Flood Awareness Week



Our sincerest gratitude to our partners for your exceptional expertise and outstanding dedication!



Upcoming Training and Conference Announcements

- ◆ September 3-6, 2019: Floodplain Management Association (FMA) Annual Conference, San Diego, CA
- ◆ September 17-18, 2019: Nevada Floodplain Managers Workshop, Carson City, NV

Nevada Floodplain Management News is a Publication of the Nevada Floodplain Management Program.

The Nevada Floodplain Management Program was established in the Department of Conservation and Natural Resources, Division of Water Planning by the 1997 Nevada State Legislature after the need for a statewide flood management program became apparent when damages from the 1997 New Years Flood on the Truckee River were assessed.

In the Spring of 2001, the Nevada Floodplain Management Program was transferred within the Department of Conservation and Natural Resources and was later confirmed by Governor's Executive Order, dated April 10, 2003, to its current residence within the Division of Water Resources (NDWR) under the direction of the Nevada State Engineer.

Questions?

If you have any questions regarding the content of this newsletter or are interested in contributing articles to future issues, please contact NDWR's Public Outreach Manager, Carlos Rendo at

