Watershed & Flood Protection Section

FLOODSTAGE

MARCH 2018

Colorado Water Conservation Board (CWCB)

FLOODING

is the most frequent severe weather threat and the costliest natural disaster facing the nation.

90%

OF ALL NATURAL DISASTERS IN THE U.S. INVOLVE FLOODING.

High-risk flood areas are not the only ones at risk: about 20 percent of flood insurance claims come from moderate-to low-risk areas.

Flood Threat is More Than Just Snowpack

With this edition of the Floodstage Newsletter the CWCB wishes you a happy March! This means that we are entering the season when all eyes are on Colorado's snowpack and how it might impact the coming runoff season. Previously, in anticipation of possible runoff flooding, a great deal of attention has been placed on high levels of snowpack. This year is the opposite – not a single watershed in the State of Colorado has above average snowpack, and the climate forecasts are suggesting a warm, dry spring moving forward. Does this mean the threat of flooding is gone?

The answer is multi-tiered. To be sure, the threat of snowmelt runoff flooding is certainly reduced, although it is never fully eliminated. However, a look at Colorado's flood history indicates that the vast majority of floods, in both number and total damages, are rainfall related and often have no relationship to snowpack whatsoever. Due to wise floodplain management throughout the state as well as Colorado's climate tendencies, widespread snowmelt runoff flooding is actually a relatively rare event.

Rainfall-induced flooding is another story. As mentioned above, the vast majority of Colorado floods have been caused by heavy rainfall, either through isolated, very intense thunderstorms (such as the Big Thompson flood of 1976) or widespread, sustained general rainfall (such as the Northern Colorado 2013 floods). Even with large advances in our forecasting capabilities, flood like these are not forecastable more than a few days in advance. And it is important to remember that except for occasional situations that have a rain-on-snow component, there is no connection whatsoever to the snowpack for these floods. In fact, many of these floods have occurred during times of drought.

It is a simple tendency to dismiss the threat of flooding during low-snowpack drought years such as this one. However, history indicates that floods can occur in any given year regardless of the climatological context. This is why floodplain management and flood mitigation processes remain important, even during dry times.

CAUSES OF FLOODING

Spring Thaw

During the spring, frozen land prevents melting snow or rainfall from seeping into the ground. When the snow does melt, it can overflow streams, rivers and lakes. Add spring storms, and the result is often severe spring flooding.

Heavy Rains

All areas of the country are at heightened risk for flooding due to heavy rains. This excessive rainfall can happen during any season, putting property at risk year round.

Levees & Dams

The US has thousands of miles of levees and dams that are designed to protect against a certain level of flooding. These structures can erode and weaken over time, and they can also be overtopped – or even fail – during large flood events.

Flash Floods

A flash flood is a phenomenon that occurs within 6 hours of an event that generates significant flood waters, such as a thunderstorm, the collapse of a man made structure or an ice break. Flash floods are the most deadly weather-related event in the US.

Colorado Flood History

Many major floods have occurred throughout the state and have caused loss of life and damage to public and private property. Floodplain management programs have been implemented to reduce these losses, but the dangers from flooding are still significant. To get a clearer picture of our risk, we must look back at the history of flooding in Colorado. The following is a summary of some of the notable federally declared flood disasters that have taken place.

Historic Colorado Floods with Federal Disaster Declarations

Year	Location	Deaths	Damages (2017$)
1965	South Platte River (Denver)	8	$3,071,134,793
1969	South Platte River Basin	0	$33,073,758
1970	Southwest Colorado	0	$20,080,497
1973	South Platte River (Denver)	10	$596,508,872
1976	Big Thompson River (Larimer)	144	$129,932,625
1982	Fall River (Estes Park)	3	$75,597,163
1984	West & Northwest Counties	2	$72,053,546
1997	Fort Collins & 13 East Counties	6	$479,439,739
1999	Colorado Springs & 12 East Counties	0	$153,556,739
2013	Front Range and Northeast Counties	9	$704,996,000
2015	Central to Eastern Colorado	0	$9,053,369
Totals		**182**	**$5,345,427,101**

**Table does not include non-Federally declared flood disasters*

Sources: Colorado Flood Hazard Mitigation Plan, SHELDUS, NOAA

Insured Flood Losses 1975 to 2017

Year	Total Insured Payouts
1975-1979	$168,739
1980-1989	$2,741,694
1990-1999	$4,063,191
2000-2009	$2,733,170
2010-2017	$76,294,063*

**Includes ~$71.7M from 2013 event*

Source: Draft Enhanced State Hazard Mitigation Plan

Emergency Supply Kit Checklist

After getting flood insurance there are several things you can do to minimize losses in your home and ensure your family's safety. It is good practice to have an emergency supply kit that has enough food, water and medicine to last 3 days. Here are a few recommended items to keep in your kit:

- ❒ Water: one gallon per person per day, for drinking and sanitation.
- ❒ Non-perishable food: at least a three-day supply.
- ❒ Manual can opener: if kit contains canned food.
- ❒ Battery-powered or hand-crank radio.
- ❒ A NOAA weather radio with tone alert and extra batteries.
- ❒ Flashlight and extra batteries.
- ❒ First aid kit.
- ❒ Moist towelettes, garbage bags, and plastic ties for personal sanitation.
- ❒ Whistle to signal for help.
- ❒ Plastic sheeting and duct tape to shelter-in-place.
- ❒ Important family documents like birth certificates, insurance papers, photos, etc.
- ❒ Items for unique family needs such as prescription medications, infant formula or diapers.

Flood Safety Tips and Resources:
For more information on how to be prepared before, during and after a flood, check out the National Weather Service National Oceanic and Atmospheric Administration's Flood Safety page: http://www.floodsafety.noaa.gov/

Are You Ready for Spring Flooding?

FLOOD INSURANCE

Purchasing flood insurance is one of the easiest things you can do get ready for flood season as most homeowner's policies do not cover flood damage. The time to act is now because there is a 30-day wait before coverage takes effect. Talk to your insurance agent about pricing and coverage or visit www.floodsmart.gov but don't wait until it is too late!

Prepare for Flooding Before it Happens

- Are you located in a flood plain?
- What is the fastest way to higher ground?
- What roads nearby are most likely to flood?

weather.gov/flood

How communities can help keep residents safe

It is not entirely possible to make general statements regarding all local actions since the stages of risk and preparedness vary throughout the State every year. However, local communities should generally consider the following:

- Participate in the NFIP. Participation makes federally-backed flood insurance available to residents.
- Promote the purchase of flood insurance for those at risk. It is critical to convey the fact that a 30-day waiting period is required for flood insurance. It is impossible to time or fully predict the occurrence of a flood, so the purchase of flood insurance policies is recommended as soon as possible, especially for those located in high risk areas.
- Be aware of flood threats. The most basic level of awareness is familiarity with the floodplain maps supplied by the Federal Emergency Management Agency (FEMA), the CWCB, or other sources. However, because a stream is not shown on a floodplain map does not mean that a flood threat does not exist. Flood threats should be evaluated based on all known local conditions, whether or not they correspond precisely with a regulatory flood map. Communities are also encouraged to remind their residents that floodplain maps generally portray a 1% chance flood, which can be exceeded.
- Develop an emergency action plan. Snowmelt flooding allows for some amount of warning time. This allows for some level or preparation activities to take place. It should be clearly stated in this emergency plan what the specific roles and responsibilities are, and what protocol is used for communications. It is also recommended that activities identified in this plan be exercised and practiced prior to the actual event. If supplies are needed, such as sandbags, these should be stockpiled well before the event occurs.
- Maintain contact with the CWCB, FEMA, USGS, DHSEM, and other agencies that are monitoring the flood threat so that current information can be obtained.
- Evaluate the effectiveness of infrastructure that is specifically designed to enhance flood conveyance and/or protect lives and property. For example, a maintenance plan for clearing debris from bridges and culverts should be identified. Other possible actions include thinning heavy vegetation from waterways and evaluating the condition of levees, flumes, and other facilities. Be aware of the level of protection that is theoretically provided by flood protection infrastructure in your community, and keep in mind that there is always the potential for overtopping or failure of those structures as has been demonstrated in the past throughout the nation.

Did you know?

1,368 communities participate in the CRS nationwide and account for 68% of all policy holders.

Does joining the CRS make sense for your community? To find out how much your community could save on flood insurance policies contact Stephanie DiBetitto: Stephanie.dibetitto@state.co.us

PLANNING FOR HAZARDS

Actions should be taken at many levels of government to address potential flood and natural hazard related threats. Through collaborative State, Federal and Local efforts, resilient actions are being taken to make Colorado safer and stronger in the guise of a changing climate. These efforts include but are not limited to:

Enhanced State Hazard Mitigation Plan

The Colorado Division of Homeland Security & Emergency Management (DHSEM) is working to update Colorado's State Hazard Mitigation Plan (SHMP) as well as request FEMA Enhanced Plan status with this required five-year update. FEMA Enhanced State Hazard Mitigation Plan (E-SHMP) elements must demonstrate a sustained, proven commitment to mitigation and results in eligibility for increased funding to Colorado under the Hazard Mitigation Grant Program (HMGP) following a presidential disaster declaration. To receive FEMA approval of an Enhanced Plan, the State must implement a comprehensive statewide mitigation program, effectively use available mitigation funding, be capable of managing increased funding to achieve its mitigation goals, and provide annual certification to FEMA as a part of ongoing requirements to maintain Enhanced Plan status. For more information, please contact Patricia Gavelda: patricia.gavelda@state.co.us

State Flood Hazard Mitigation Plan

The CWCB is working to update the Colorado Flood Mitigation Plan, which was last updated in 2013. The Plan will reassess the State's flood risk and mitigation strategies. The Flood Mitigation Plan will be incorporated into the E-SHMP as an appendix. Multiple state agencies are included in the plan preparation process. The plan will undergo a 30-day public comment period in summer before going on for approval by the CWCB board. Ultimately the plan will be incorporated into the E-SHMP and approved by the Governor before being submitted to FEMA.

State Drought Plan

The States Drought Mitigation and Response Plan will be updated over the course of the next 7 months to incorporate the requirements for FEMA's E-SHMP and coordinate with broader all hazards planning. The CWCB has awarded the contract to AMEC Foster Wheeler and will focus on both mitigation as well as response. Since 2010 the plan has examined the impact of a warming climate on the frequency and intensity of drought in Colorado and will again incorporate a climate analysis into the plan as well as updating and enhancing the qualitative and quantitative vulnerability assessment. The plan will undergo a 30-day public comment period in summer before going on for approval by the CWCB board. Ultimately the plan will be incorporated into the state's hazard mitigation plan and approved by the Governor before being submitted to FEMA.

Mitigating Hazards through Land Use Solutions Workshop

The Department of Local Affairs (DOLA), the Division of Homeland Security & Emergency Management (DHSEM), and the Federal Emergency Management Agency (FEMA) want to continue to support communities to put land use solutions that save lives and money in place. This group is collaborating to prepare a one-day workshop to kick-off implementation of land use solutions that can reduce the impacts of hazards in Colorado to communities. Utilizing the Planning for Hazards: Land Use Solutions guide (www.planningforhazards.com) and supplemental materials, the workshop will focus on updating land use and development codes to reduce the impact of natural disasters, and create incentive programs to promote development in safer areas. The workshop will draw on lessons from communities that have successfully implemented a variety of tools and strategies. Applications to participate were due in January and the workshops are set to take place June 2018.

High Hazard Dam Release Impacts Database and Tools

The Colorado Division of Water Resources, Dam Safety Branch completed an inventory of high hazard dams throughout the state. A study was conducted to compare the conveyance capacity of the downstream channel below high hazard dams to examine the full range of controlled spillway and outlet releases. A database was created and provides an assessment of where the potential for dangerous conditions may exist and where mitigation action may be warranted. Colorado Dam Safety is the first state dam safety program in the nation to systematically evaluate their portfolio of High Hazard dams related to operational and flood release capabilities. This database and ranking tool provides a screening level assessment of the potential for hazardous conditions downstream of high hazard dams throughout the state. For more information contact Bill McCormick at bill.mccormick@state.co.us and/or Kallie Bauer at kallie.bauer@state.co.us.

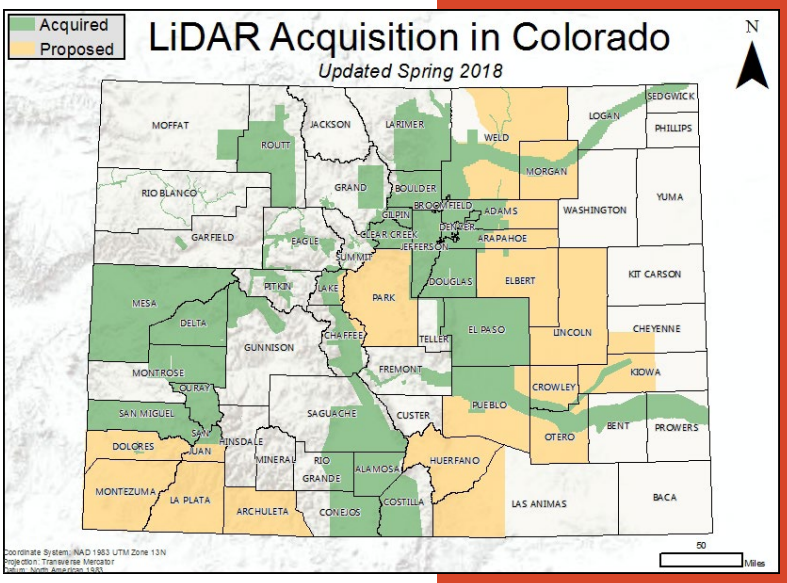
Resiliency in Colorado:

Through the Colorado Department of Local Affairs Resiliency and Recovery Office interactive story map, you can explore Colorado's resiliency story in a multi-part series that examines the challenges we face in our path towards a more resilient future, what the State and communities across Colorado are doing to tackle these challenges head on, and what resources are available for communities to act on their resiliency today.

Flood and Watershed Protection at the CWCB

The CWCB is the state agency in charge of managing flood threats- before, during, and after flood events. The CWCB actively monitors potential flooding, with special attention paid to available snowpack data and seasonal climate forecasts. Specific activities already underway that are being performed by the CWCB include:

- Development of maps portraying snowpack and locations where potential flood threats exist. These maps show both snow-water equivalent in absolute terms (i.e. SWE in inches) and percentage measurements from SNOTEL sites. These maps are very useful for zeroing in on specific watersheds and communities that have the highest flood potential from snowmelt.
- The CWCB continues to operate the Community Assistance Program - State Support Services Element (CAP-SSSE) partnership with FEMA. This program encourages responsible development in floodprone communities, encourages the purchase of flood insurance, and is a mechanism for the State to maintain contact with communities regarding flood threats and other relevant issues.
- The CWCB continues to operate the Cooperating Technical Partnership (CTP) with FEMA. The program maintains up-to-date flood hazard maps and other flood hazard information, helping communities to make risk informed decisions.
- The CWCB is involved in the Colorado Flood Technical Assistance Partnership, which works to identify flood threats, assist affected jurisdictions, and cooperate with relevant agencies.
- The CWCB is working to increase participation in the Community Rating System (CRS), which is a voluntary incentive program recognizing communities implementing floodplain management practices exceeding the minimum requirements of the NFIP to provide protection from flooding. A website focused on the CRS in Colorado has been created to serve as a "one-stop-shop" aiding communities interested in or already a part of the program. The website is currently being updated to reflect updates to the CRS Coordinator's Manual in 2017.



- Since 2013, the CWCB has become more actively involved in leading the Light Detection and Ranging (LiDAR) acquisition efforts in Colorado. Obtaining high quality topography data is important for various purposes including developing high quality, accurate floodplain maps. Providing accurate flood risk maps help local communities to rebuild wisely and avoid future flood losses. FEMA recognizes Colorado's need for high quality LiDAR data and in 2016, awarded the CWCB with a grant specifically for acquiring LiDAR data in Colorado. If you have any interest in partnering with the CWCB on future LiDAR acquisition projects or would like to obtain our current LiDAR inventory, please visit ww.coloradohazardmapping.com or email Thuy Patton at thuy.patton@state.co.us.
- In 2015, the Colorado Legislature provided funding for the remapping of 2013 flood impacted floodplains, in addition to erosion and debris flow hazard mapping. The CWCB and the Colorado Geological Survey are leading these efforts. The Colorado Hazard Mapping Program aims to provide mitigation and land use frameworks in areas likely to be affected by future flooding, erosion and debris flow events. Projects are currently underway.
- Emergency Watershed Protection (EWP) projects are being implemented throughout 2013 flood impacted communities through a partnership between the CWCB and the USDA NRCS. The program provides financial and technical assistance to local project sponsors to reduce erosion and threats from future flooding, protect streambanks, repair conservation practices, remove debris, and more. The program is geared towards implementing watershed recovery projects that reduce risk to life and property, enhance riparian ecosystems, and generate long-term stream system resilience through a collaborative, watershed-based approach that incorporates diverse stakeholder needs. Most of the projects are complete or under active construction at this time. A detailed description of all projects and many images of the work can be found at the website for the Colorado Emergency Watershed Protection Plan, www.coloradoewp.com. The public can also follow progress on Twitter by following @ColoradoEWP.

may

FLOODPLAIN MANAGEMENT WORKSHOP!

CWCB in partnership with FEMA, DHSEM, CASFM and NHMA will be providing two, one-day workshops focusing on the legal aspects of the NFIP, mitigation practices, and emerging flood risks. A workshop will be held on the western slope on May 15th and the northern Front Range on May 17th. More information will be sent to floodplain administrators in the upcoming weeks.

Floodplain Managers and Emergency Mangers: Different Duties, Shared Responsibilities

Who Are Floodplain Managers?

The objective of floodplain management or flood mitigation planning is to provide a program of activities that will best tackle a community's vulnerability to flooding and meet other community needs. Beyond protecting people and property, these needs may include sustainable future development; parks and open space; wildlife habitat preservation; preservation or restoration of the natural and beneficial functions of floodplains; and promotion of recreational activities.

The responsibility of a floodplain manager is fundamental to the effective management of floodplain resources and flood mitigation. The floodplain manager is the principal community administrator for the implementation of flood loss reduction activities, including community participation in the National Flood Insurance Program, enforcing floodplain regulations, maintaining flood maps and studies, coordinating flood hazard mitigation projects, and educating the public and local officials about flood hazards and the value of floodplains as a resource.

Organizationally, floodplain management responsibilities often are housed in public works, engineering, building and zoning, or planning agencies. In some state and local government structures floodplain management programs fall within the emergency management organization.

Who Are Emergency Managers?

Emergency management is the umbrella term used to describe the culmination of activities necessary to develop, sustain, and improve upon the capability to prepare for, protect against, respond to, recover from, or mitigate against harmful events. These harmful events, known as hazards, may be naturally occurring, such as floods and tornadoes, or human caused, such as hazardous materials spills or terrorism.

An emergency manager has the day-to-day responsibility for emergency management programs and activities. The role is one of coordinating all aspects of a community's mitigation, preparedness, response, and recovery capabilities. The emergency manager takes an all-hazard approach to protecting the community, and typically some hazards are of higher priority than others. Flood events are often one of the emergency manager's greatest concerns for the community.

Emergency management functions within a community are likely to be housed in a stand-alone office, division, department or fall under fire and/or law enforcement authorities. Some communities have full-time emergency management positions, where in others the role may be part-time and just one of many hats the emergency manager wears.

How Can Floodplain Managers and Emergency Managers Help Each Other?

There are many ways floodplain managers and emergency managers can help each other out. Serving on the other's boards or committees as active participants or advisors, providing expert review on plans, reports, or public information materials, and watching each other's backs during an incident are just a few ways these professions can team up to achieve a safer community.

What Actions Can You Take?

If you are a floodplain manager or emergency manager, do you know your counterpart? If so, please continue working together and strengthening you relationship to safeguard your community. If you do not know your colleague, or feel you should know them more, please make it a priority to visit with them and share how each of you are responsible for keeping your community safe from floods and explore partnership opportunities.

To find contact information for your local emergency manager, please visit coemergency.com and click the Local Info Sources tab.

For local floodplain manager contact information, please contact Stephanie DiBetitto with the Colorado Water Conservation Board.

Please feel free to contact the following personnel for questions, comments, or additional information:

State Floodplain Management and National Flood Insurance Program Contacts:

- Stephanie DiBetitto, Community Assistance Program Coordinator, Colorado Water Conservation Board, (303)866-3441 ext. 3221, stephanie.dibetitto@state.co.us
- Matthew Buddie, National Flood Insurance Specialist, (303)235-4730, matthew.buddie@fema.dhs.gov

State Emergency Management/Mitigation Contacts:

- Scott Baldwin, Mitigation Team Supervisor, Colorado Division of Homeland Security & Emergency Management (DHSEM), (720)852-6696, scott.baldwin@state.co.us
- Matt Arsenault, Mitigation Project Specialist (Northeast Colorado), DHSEM, (720)708-8358, matt.arsenault@state.co.us
- Deanna Butterbaugh, Mitigation Project Specialist (Northwest Colorado), DHSEM, (720)512-0275, deanna.butterbaugh@state.co.us
- Patricia Gavelda, State & Local Hazard Mitigation Planning Program Manager, DHSEM, (970)247-6560, patricia.gavelda@state.co.us
- Mark Thompson, Mitigation Planning Specialist (Local), DHSEM, (720)749-8280, markw.thompson@state.co.us

For more information about Colorado Mitigation Specialists by Region visit DHSEM's Mitigation page.

Watershed & Flood Protection Section

Kevin Houck – (303) 866-3441 ext 3219
Section Chief, Oversees all program areas including: flood risk identification, designation of floodplains, flood risk reduction and mitigation, response and recovery, watershed restoration, and weather modification.

Joe Busto - (303) 866-3441 ext 3209
Weather Modification, Permitting, compliance, and grants; South Platte flood channel management; snow science; and applied research projects.

Thuy Patton – (303) 866-3441 ext 3230
Floodplain Mapping Coordinator, manages the FEMA Floodplain Map Modernization and the Risk Map Program for the State, development of scopes of work, acts as liaison between FEMA and local governments.

Chris Sturm – (303) 866-3441 ext 3236
Stream Restoration Coordinator, responsible for implementing the goals and objectives of the Watershed Protection Program. Duties include leading department in watershed health planning and implementation.

Stephanie DiBetitto – (303) 866-3441 ext 3221
Community Assistance Program Coordinator for the NFIP, performs community assistance visits, conducts public outreach and training, coordinates with FEMA and other State Programs, and provides technical assistance to communities.

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FEMA

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

OUR MISSION:

To Conserve, Develop, Protect and Manage Colorado Water for Present and Future Generations.

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