



# The NHWC Transmission

December 2018

## CONTENTS

Non-Dam-Failure Impacts .....	1
US Hydrologic Conditions .....	3
Calendar of Events .....	4
January Focus .....	4
Parting Shot .....	4

Click on hyperlinks located throughout this newsletter for more information.

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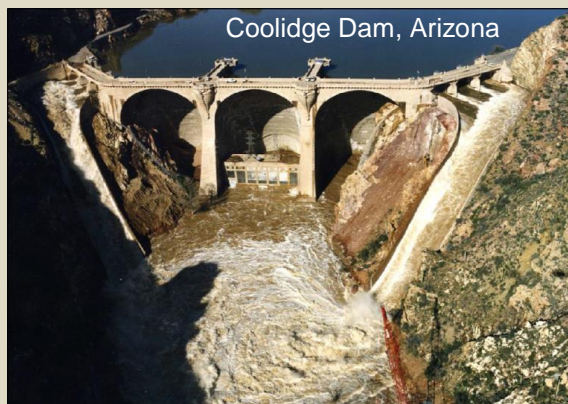
## FLOOD RISKS FROM SPILLWAYS: MODELING AND COMMUNICATING NON-DAM-FAILURE IMPACTS TO NATIVE AMERICAN TRIBES

Rinda Tisdale, Matthew Young - Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA) Safety of Dams (SOD) Program endeavors to reduce the loss of life and property damage caused by dam failure by making BIA dams as safe as practicably possible. The SOD Program currently administers 139 high- or significant-hazard dams. These dams comprise a significant part of the water resources infrastructure and trust assets for 41 Indian reservations and tribes. Benefits from the dams include irrigation water storage, recreation, flood control, conservation, and power generation.

The Indian Dam Safety Act of 1994 stipulates that BIA has a responsibility to protect and alert communities with respect to dam safety incidents on Indian lands. The goal of the BIA SOD Emergency Management Program is to prepare key personnel and emergency responders for dam safety emergencies, increasing the likelihood that lives can be saved and damage to property minimized in the event of a dam failure or incident. The Emergency Management Program focuses on preparedness and response to incidents at BIA dams through the preparation and exercising of Emergency Action Plans (EAPs). These plans outline procedures for notifying downstream jurisdictions in the event of a potential dam failure, such that warning and evacuation can be effectively performed to minimize loss of life and property. Emergency Action Plans are required for all high- and significant-hazard potential dams in the SOD Program.

Conventionally, dam failure inundation maps contained within BIA EAPs have depicted probable maximum flood (PMF) boundaries associated with the uncontrolled release of maximum water storage following a hydrologic dam failure. While this information is valuable to first responders in preparing for worst-case dam failure flood events, these scenarios are not representative of the range of flood risks that can affect communities located downstream of dams. To better communicate these

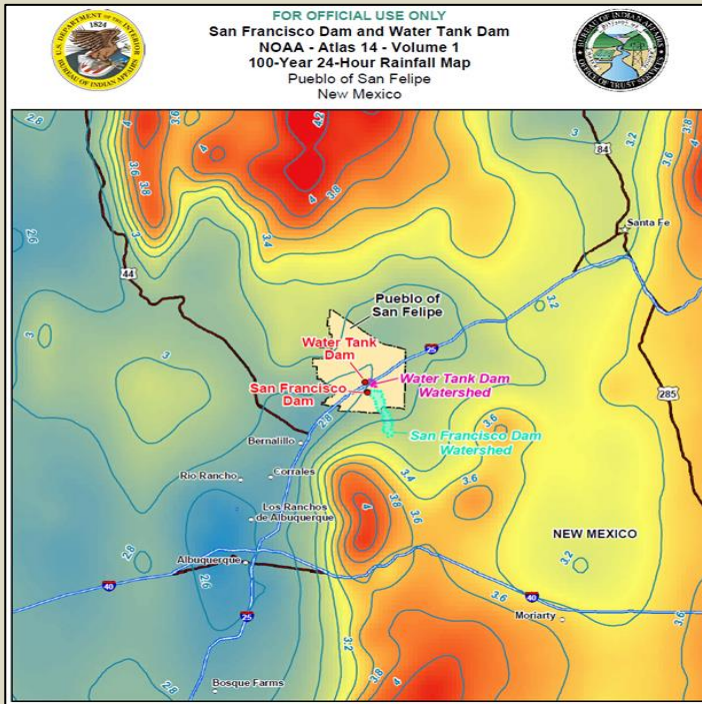


more common flood risks, the SOD Program has developed a number of supplementary planning and preparedness tools that include rainfall maps, Rate of Rise graphs, and Spillway Discharge Curves.

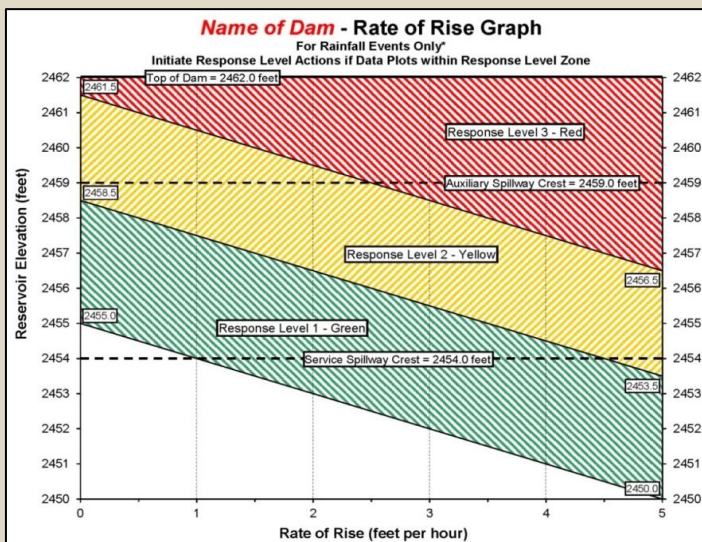
Rainfall maps depict watershed-specific precipitation-frequency data in a geospatial format over



multiple storm durations. These maps are included in SOD Program EAPs with the intent of giving responders an accessible means of relating rainfall intensity to mapped flooding events in near real-time.

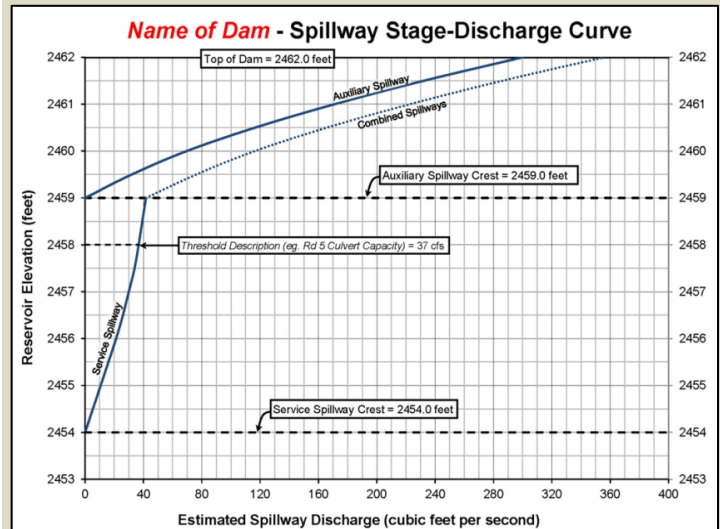


Rate of Rise Graphs provide a tool to predict the approximate timing of dam overtopping during a steady rainfall event.



Spillway Discharge Curves correlate the reservoir elevation with the total discharge through the dam spillway. These curves are included in SOD Program EAPs to better communicate the magnitude of non-dam-failure floodwater releases to downstream communities.

Additionally, tribes have repeatedly requested supplementary inundation maps that are more useful for their emergency and flood preparedness



needs. In response, the SOD Program has attempted to support tribal understanding of flood risks through the development of Non-Dam-Failure Advisory Flood Maps. These maps have been created with tribal community input to depict flooding scenarios downstream of BIA dams to help increase public awareness of natural flood risks.

As part of BIA's EAP development and exercise process, the BIA SOD Program has developed a Non-Dam-Failure Advisory Flood (Advisory Flood) map standard that is included as an appendix to the EAP and presented in detail during Tabletop Exercises. This Advisory Flood scenario depicts flood risks associated with select hydrologic loadings, whereby the dam operates as designed to allow floods up to the Inflow Design Flood (IDF) to bypass the facility through its spillway(s). The hydrologic scenario selected as the Advisory Flood typically varies within a range of flood magnitudes from the safe-channel capacity as a lower limit, to a full spillway release flood as an upper limit. In most cases, these floods will be related to a statistical return period to further enhance usability to end users. All of these communication tools (rainfall maps, Rate of Rise Graphs, Spillway Discharge Curves, and Non-Dam-Failure Advisory Flood inundation maps) have proven to be useful and highly desirable among many tribal communities. While not specifically dam-failure preparedness tools, the inclusion of these products within SOD Program EAPs has shown great potential to enhance community understanding of risks associated with natural flooding downstream of dams, while acting to greatly improve coordination and collaboration between dam owners and affected downstream communities.

## 2019 Conference Update

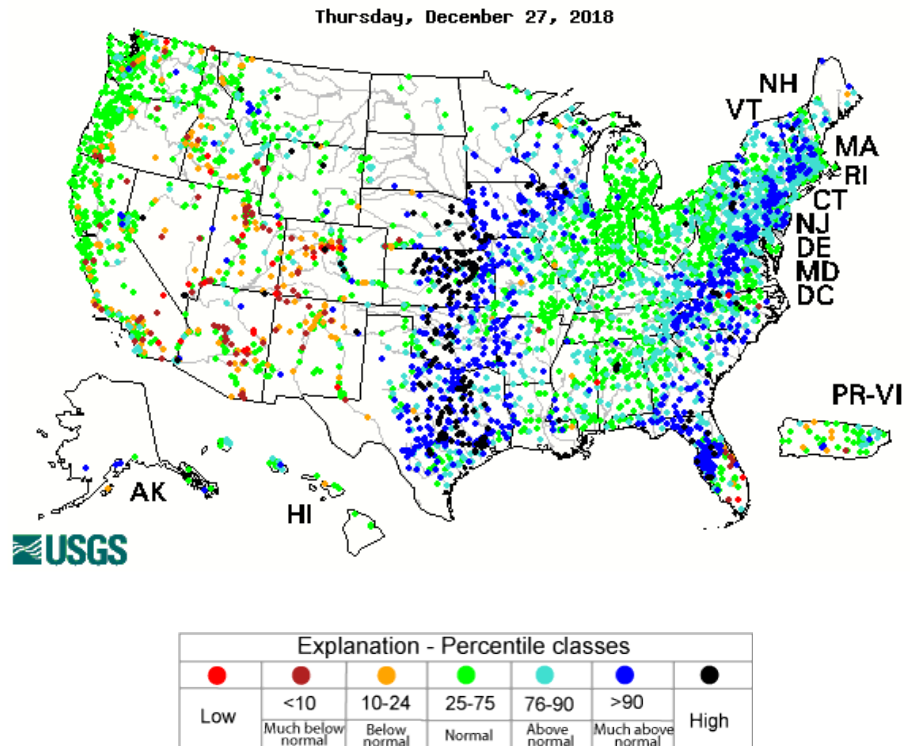
The agenda is nearly complete for the 2019 NHWC 13th Biennial Training Conference and Exposition. This year's program will include presentations from federal, state, and local agencies involved in flood warning, including lessons learned from Hurricane Maria in Puerto Rico, Hurricane Florence in Florida, and Hurricane Harvey in Texas.

With a range of topics spanning the latest technological advancements, "the internet of things", ALERT2, meteorology, and system resiliency, the program will definitely have something for everyone.

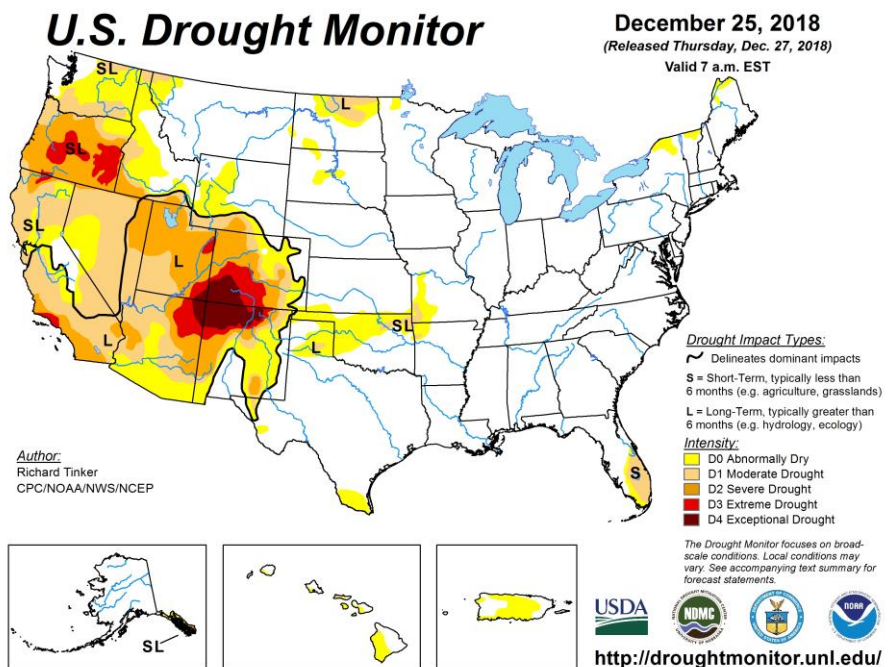
Keep an eye on your email, as primary speakers will receive notification letters within the next two weeks.

See the conference [website](#) for all conference information.

## Hydrologic Conditions in the United States Through December 25, 2018



Latest stream flow conditions in the United States. (courtesy USGS)



Latest drought conditions in the United States.  
(courtesy National Drought Mitigation Center)



## January Newsletter Articles Focus: Modeling & Analysis

The NHWC is requesting articles that focus on practices, technologies and tools used to model, predict and analyze hydro-meteorological events and to support decision making for emergency response and floodplain management.

Submit your article to:

[editor@hydrologicwarning.org](mailto:editor@hydrologicwarning.org)

January 11<sup>th</sup> is the deadline for inclusion in the January issue.

## Future Newsletter Articles Focus

To give you more time to prepare articles, below is the article focus schedule for the next four months:

**Jan - Modeling/Analysis**  
**Feb - Data Collection**  
**Mar - Hydrology**  
**Apr - Hazard**  
**Communication &  
Public Awareness**

## NHWC Calendar

June 17-20, 2019 – [The NHWC 13<sup>th</sup> Biennial Training Conference and Exposition](#), Louisville, Kentucky

## General Interest Calendar

January 6-10, 2019 – [American Meteorological Society 99<sup>th</sup> Annual Meeting](#), Phoenix, Arizona

May 19-23, 2019 – [ASFPM 2019](#), Cleveland, Ohio

September 8-12, 2019 – [ASDSO Dam Safety 2019](#), Orlando, Florida

(See the [event calendar](#) on the NHWC website for more information.)

## Parting Shot

New ALERT2 Stations in the Holy Fire Burn Area, California.



The Riverside County Horsethief Canyon ALERT2 Precipitation Station was recently installed to help provide advanced notice of conditions leading to post-fire debris flows and flooding.

Photo by **Robert Laag**,  
Riverside County Flood Control and Water Conservation District

## National Hydrologic Warning Council

*Providing Timely, Quality Hydrologic Information to Protect Lives,  
Property, and the Environment*

<http://www.hydrologicwarning.org>