

Meeting Minutes

Partnership Meeting

September 19, 2019 - 10 am

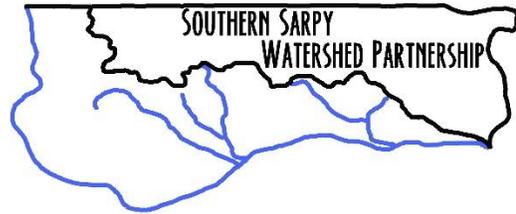
Papio - Missouri River NRD

1. Meeting began at 10:17 am. See attached sign in sheet for attendees.

2. Sanitary Sewer Update
 - a. Art Beccard – The project is moving forward quickly. Currently the Agency is focusing on funding completion (maybe \$30 million). May come from big data centers. Soft market test to explain project to potential private partners to get feedback (45-60 days). The agency is also discussing potential regional wastewater treatment plant locations – on or adjacent to Springfield plant site.
 - b. Kathleen Gottsch – Cooling/blowdown water from data centers could be routed into a separate line that would go to a lagoon at the plant site. Line would be parallel to sanitary line. Soft market test will start discussion of alternative financing options rather than the traditional model of connection fees/taxes.
 - c. Next agency board meeting next week.

3. Progress Report – FYRA
 - a. Bob Gregalunas – starting to look at alternatives to meet the goals the group wants based on results of the survey. Will look at the protection downstream from each project to determine a project/alternative ranking.

4. Initial Goals Survey – FYRA
 - a. Mike Sotak – reviewed summary graphs of the surveys completed by the partners. 9 surveys were returned to FYRA as of the date of this meeting. Can still add to survey results.
 - b. Will take the survey results to start to develop projects/policies to address these goals and to develop metrics to determine if a project/policy is a good value. Looking at plans from other cities within the Midwest to see what other projects/policies have worked well in those cities. Will need to keep meeting monthly for the next few months to make sure everyone is in agreement with the next steps.



5. South Sarpy Mapping Considerations

a. Dam/Pond Breach Hazard Class

- i. Many small watersheds in the Southern Sarpy area. Potential of building lower hazard class grade control structures at a lower cost, but would need to have an easement to make sure that new habitable structures aren't built in a breach area that would then require the structures to be upgraded to high hazard standards at a much higher costs. Would Partners be willing to adopt a zoning regulation that would treat breach areas from future residential development.
- ii. FYRA will look into the benefits vs. cost savings for medium hazard dams within the study area and provide that for review.
- iii. Could look into retrofitting existing farm ponds in the area to increase their benefit.

b. Fluvial Hazard Mapping

- i. Pilot projects in 5 states are looking to complete fluvial hazard mapping to include erosion and other flood-related hazards into their FEMA maps.

6. Construction Site Inspections

- a. Omaha is currently providing construction site inspections in the Southern Sarpy area. There are currently 30 projects and they cannot continue to provide that level of service. The Partnership will need to hire a consultant to provide the inspection and reporting requirements. They will allow use of the Permix system for tracking.
- b. Will send RFP in October, Selection for interviews November, Interviews in December, Sign contract in January (board meeting January 10).

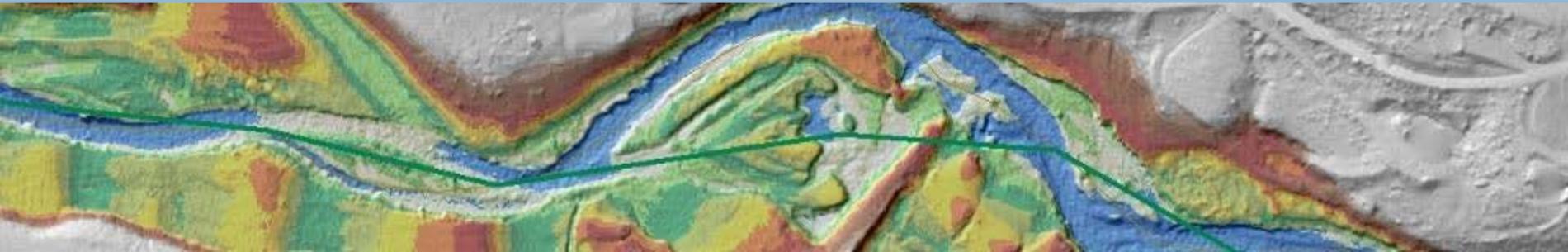
7. Meeting adjourned at 11:53 am.

Fluvial Hazard Zone (FHZ) Mapping Pilot Program

June 2017- June 2018

Stephanie DiBettito, CFM
Colorado Water Conservation Board

Katie Jagt, PE, CFM
Watershed Science and Design, PLLC



Introduction and Demonstrated Need

“Planning for erosion hazards is an essential component of effective river corridor management and the prevention of future flood damages.”

Nationally, nearly 25% of flood insurance claims come from areas outside of the 100-year floodplain.

In Colorado, the figure is approximate 51% from the 2013 event alone, and 57% cumulatively, since 1978.

Erosion Hazards

Definition of Fluvial Hazard Zone:

“The Fluvial Hazard Zone (FHZ) is the area a stream has occupied in recent history, could occupy, or could physically influence as it stores and transports sediment and debris during flood events. The objective of a mapped FHZ is to identify lands most vulnerable to fluvial hazards in the near term.”

Colorado
Senate Bill
15-245
“Natural hazard
mapping fund”



SENATE BILL 15-245

BY SENATOR(S) Grantham, Steadman, Lambert, Cooke, Garcia, Heath, Jones, Kefalas, Kerr, Martinez Humenik, Merrifield, Newell, Roberts, Todd, Cadman;
also REPRESENTATIVE(S) Young, Hamner, Rankin, Becker K., DelGrosso, Fields, Foote, Garnett, Ginal, Kraft-Tharp, Lontine, Melton, Mitsch Bush, Pettersen, Rosenthal, Ryden, Singer, Williams, Hullinghorst.

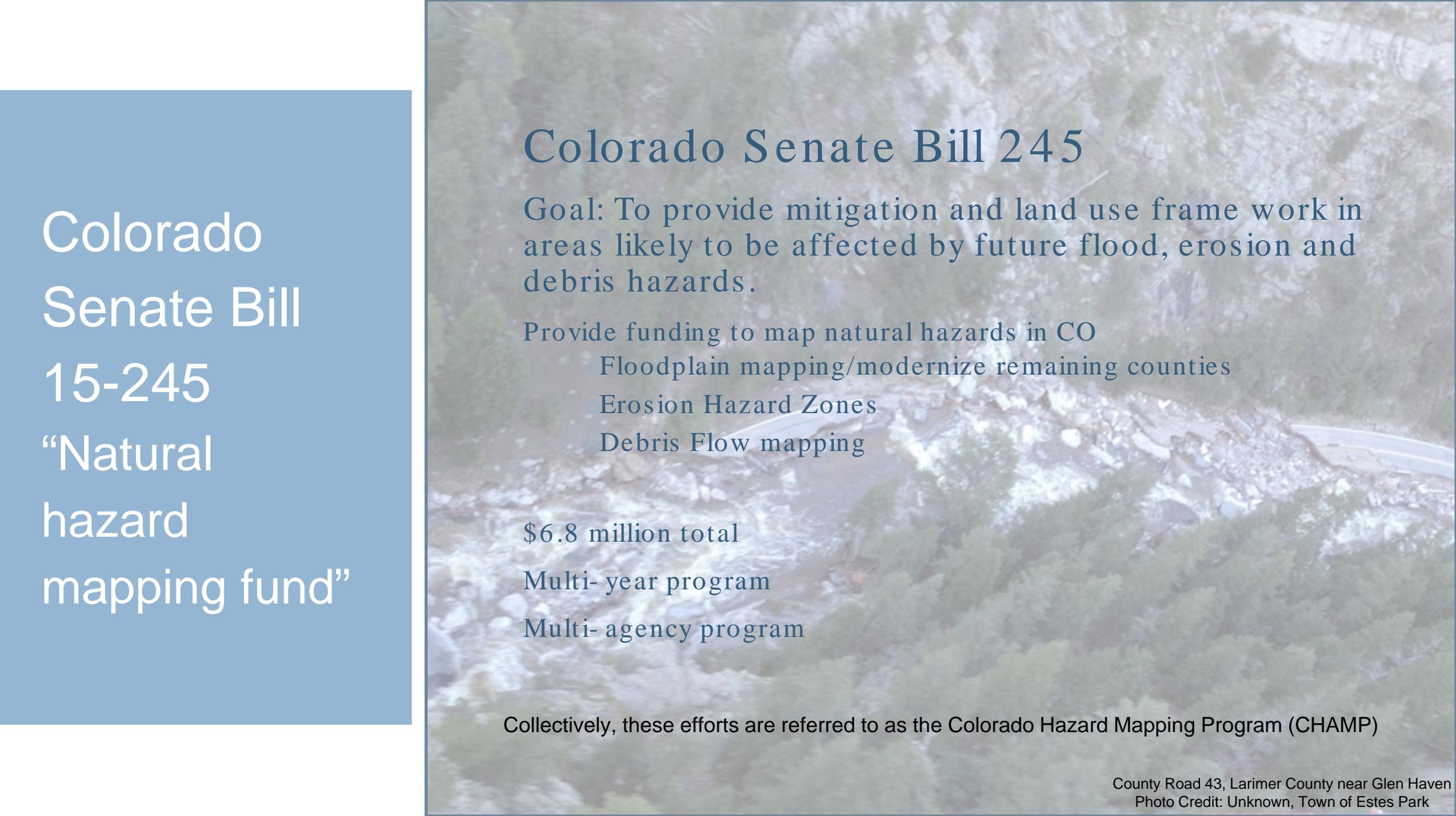
CONCERNING THE PROVISION OF STATE FUNDING FOR NATURAL HAZARD MAPPING.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. In Colorado Revised Statutes, **add** 37-60-131 as follows:

37-60-131. Natural hazard mapping - fund - repeal.
(1) (a) THERE IS HEREBY CREATED IN THE STATE TREASURY THE NATURAL HAZARD MAPPING FUND, REFERRED TO IN THIS SECTION AS THE "MAPPING FUND", WHICH CONSISTS OF THE FOLLOWING REVENUES:

(1) GIFTS, GRANTS, AND DONATIONS FROM PRIVATE OR PUBLIC SOURCES FOR THE PURPOSES OF THIS SECTION; EXCEPT THAT THE BOARD SHALL NOT ACCEPT A GIFT, GRANT, OR DONATION THAT IS SUBJECT TO A



Colorado
Senate Bill
15-245
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hazard
mapping fund”

Colorado Senate Bill 245

Goal: To provide mitigation and land use frame work in areas likely to be affected by future flood, erosion and debris hazards.

Provide funding to map natural hazards in CO

- oFloodplain mapping/modernize remaining counties
- oErosion Hazard Zones
- oDebris Flow mapping

\$6.8 million total

Multi- year program

Multi- agency program

Collectively, these efforts are referred to as the Colorado Hazard Mapping Program (CHAMP)

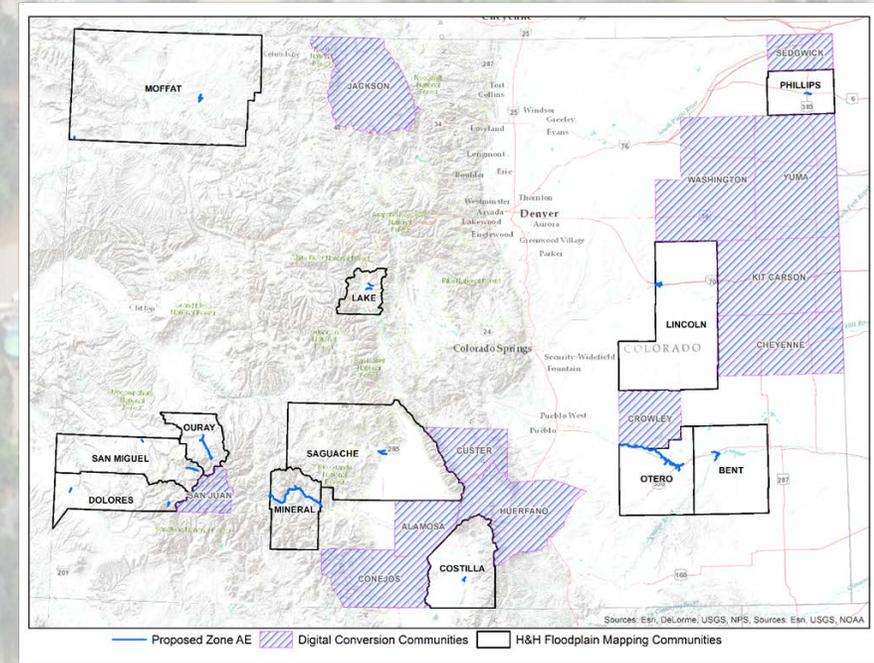
Floodplain
mapping/
modernize
remaining
counties

Floodplain Mapping

Mapping of inundation hazards in CO

- St. Vrain and Big Thompson Watersheds July 2015- July 2016
- South Platte River Ft. Lupton to NE State Line June 2016- July 2018
- Map Modernization June 2017- July 2018

\$5.2 million total
July 2015- July 2018



St. Vrain River, Longmont, Colorado
Photo Credit: AP Photo/John Wark

Debris Flow Mapping Program

Debris Flow Mapping

CGS Mapping of Debris Flow prone areas in Colorado
oBoulder, Larimer, Jefferson, Douglas, and El Paso Counties

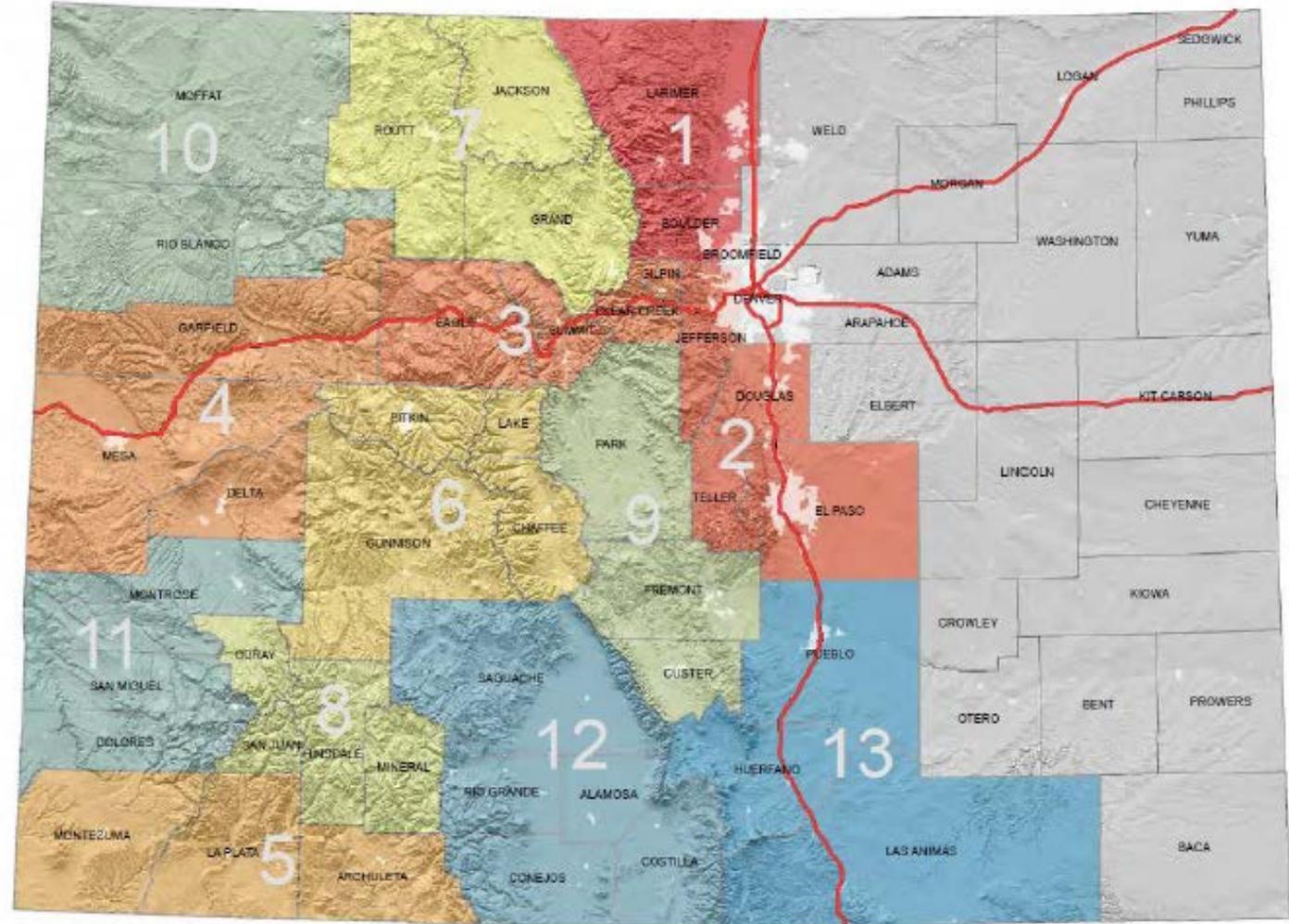
\$ 550,000 total

July 2015 - July 2018

Twin Sisters Debris Flows, Estes Park, Colorado
Photo Credit: Unknown, Town of Estes Park

Debris Flow Mapping Program

Debris Flow Hazard Mapping Priority Areas



Erosion Hazard Mapping Program

Erosion Hazard Mapping

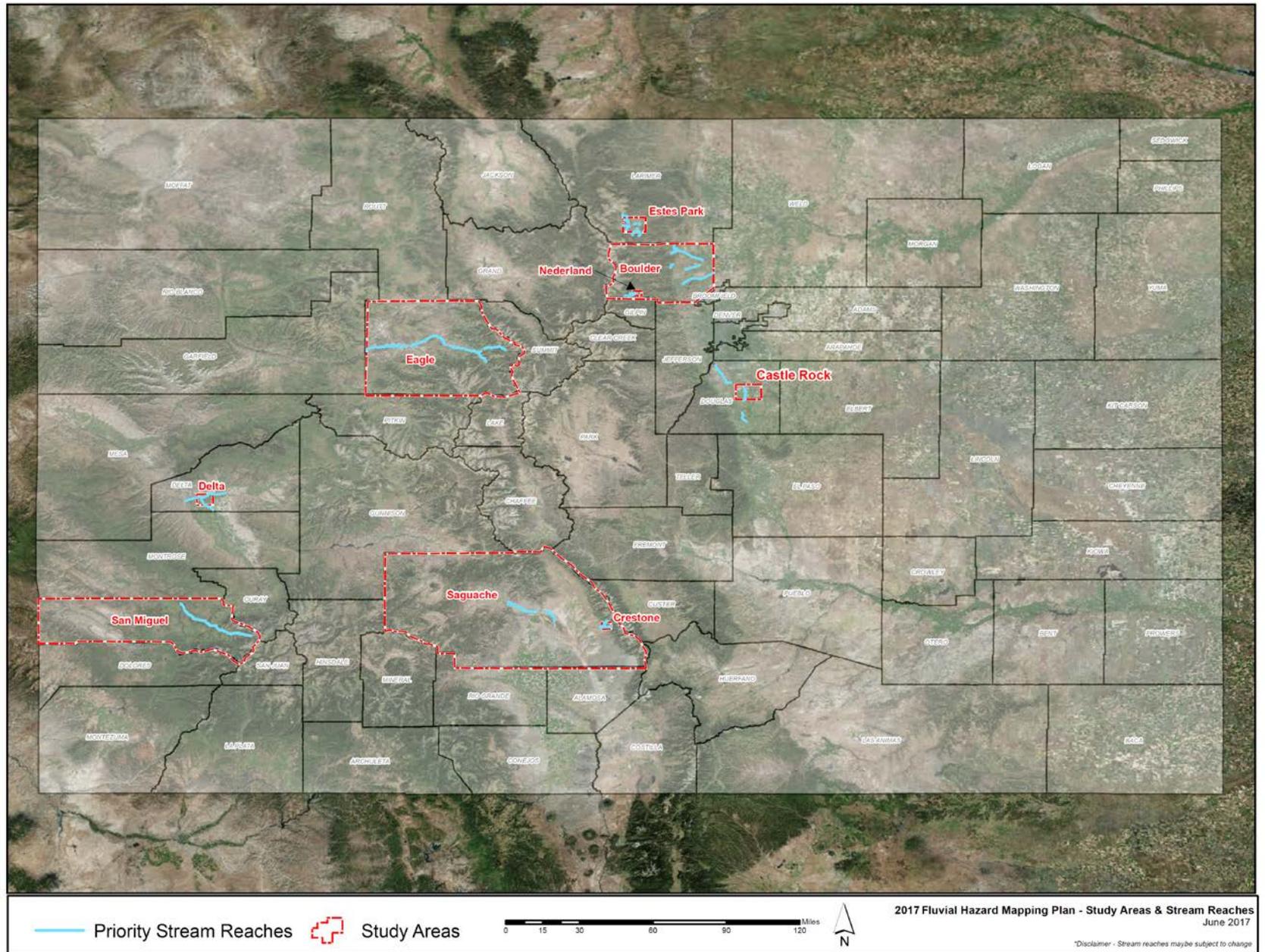
Provide funding to map erosion hazards in CO

- o San Miguel County, Saguache County, Eagle County, Town of Estes Park, City of Delta, City of Castle Rock, Town of Nederland, Boulder County

\$700,000 total

January 2017- July 2018

FHZ Pilot Program Communities



State of Colorado's Perspective

The Colorado Water Conservation Board (CWCB) is the state coordinating agency for the National Flood Insurance Program (NFIP). Floodplains are a matter of statewide importance and the CWCB has been given the authority to prevent flood damages, regulate and designate floodplains, and ensure proper regulation of floodplains. The CWCB has Rules and Regulations for regulatory floodplains that set higher standards for floodplain management for communities in the state.

The FHZ program will develop capability at the State and local levels for planning and mapping for this river hazard. The CWCB will provide technical standards, conduct studies for communities requesting mapping, and provide regulatory guidance for communities interested in voluntarily adopting map products.

Pilot Program Partners



COLORADO

**Colorado Water
Conservation Board**

Department of Natural Resources



COLORADO

Department of Local Affairs



COLORADO

Resiliency & Recovery Office



ROUND
RIVER
DESIGN

Pilot Program Goals and Objectives

1. Develop a scientifically defensible set of standards for Colorado.
2. Implement fluvial hazard mapping throughout Colorado.
3. Reduce damage from future flood events by increasing awareness of fluvial (river-related) erosion and deposition hazards thereby leading to better land use decisions.
4. Produce additional information including but not limited to: scenarios for mitigation, resources for how and when to implement, an outline of roles and responsibilities of how communities can incorporate mapping into local planning and regulations, and model land use code(s) for voluntary local adoption.

Products

The State will Produce:

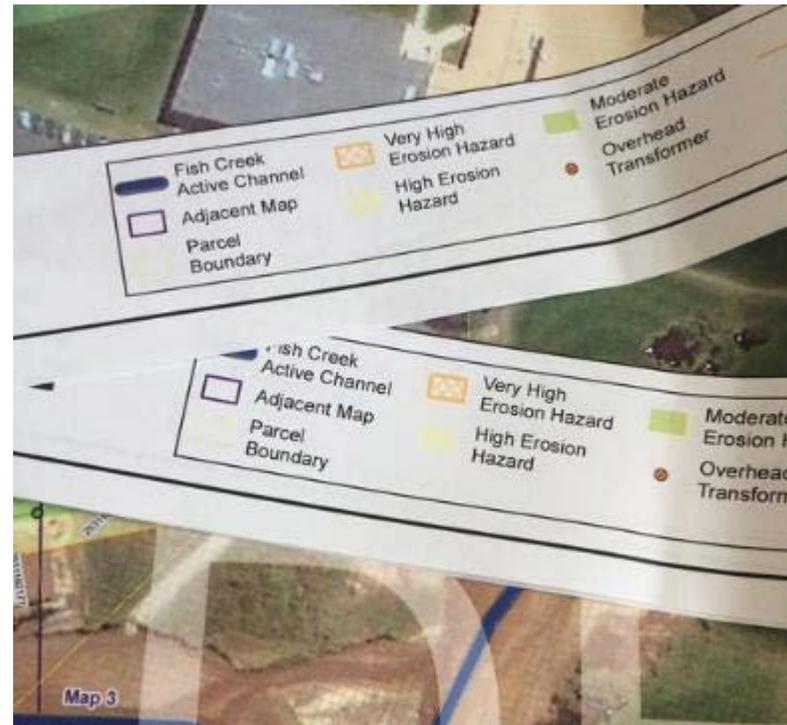
- Finalized FHZ mapping protocol document
- Training and supporting materials including powerpoint presentation and handout(s) for community engagement
- Model land use code(s)
- Recommendation of incentives structure for local adoption

Each Participating Community will be Provided:

- FHZ maps and supporting documentation of prioritized reaches
- Database of spatial information used in the mapping

FHZ Map Applications

- Prevent community from investing services (e.g., schools, fire/rescue stations, water sanitation, etc.) in critical vulnerable areas.
- Provide information to landowners about existing risk
- Assist in transportation decisions where roads/rivers interact
- Inform land conservation planning
- Overlay in land use or zoning



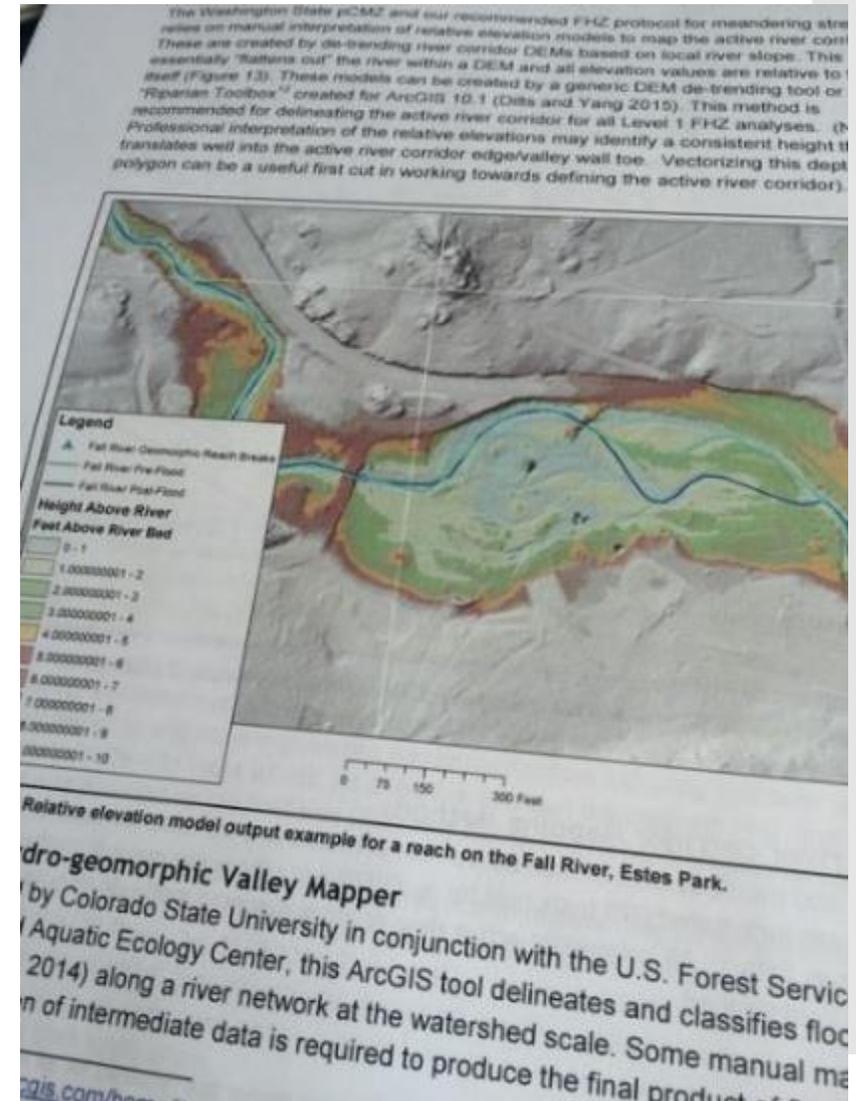
Partner Participation & Local Community Involvement

- Data sharing and collection
- Facilitate access for fieldwork (Fall 2017, Spring 2018)
- Attend webinars and stay update by reading quarterly newsletters (Summer 2017- Summer 2018)
- Facilitate meetings and workshops with community staff (Fall, Winter 2017/2018).
- Good faith effort to implementing an erosion hazard recognition program within the local jurisdiction.
- Recognition that this is not a grant program and no funds will be given to participating communities for participation, review, or the above involvement.

- Partnership agreement being drafted

National Precedence for FHZ

- 1994 National Flood Insurance Reform Act
 - 1999 Mapping Feasibility Study (Riverine Erosion Hazard)
- State Programs
 - Vermont
 - Indiana
 - New Hampshire
 - Washington State
- Southwest Cities and Counties
 - Austin, TX
 - Dallas, TX
 - Albuquerque, NM
 - Maricopa County, AZ
 - St. George, UT
 - El Paso County, CO



Federal Regulatory Support for FHZ

Highlights of National Legislation and Actions

1964 National Flood Insurance Program

Flood Disaster Protection Act of 1973

1994 National Flood Insurance Reform act, technology for and feasibility of mapping request

FEMA 1999 Mapping Feasibility Study, fulfills 1994 technology of mapping requirement

ASFPM Arid Regions Riverine Erosion Hazard Discussion Paper (2010) and Revision (2015)

NFIP Regulations

44CFR § 60.5 Floodplain management criteria for flood-related erosion-prone areas. Manage erosion prone areas, permits for building in erosion prone- areas.

44CFR § 60.24 Planning considerations for flood-related erosion-prone areas.

(a) The importance of directing future developments to areas not exposed to flood-related erosion; (b) The possibility of reserving flood related erosion-prone areas for open space purposes;

Technical Standards

- Scientifically supported and reviewed
- Ability to scale in size, implement cost-effectively on a large scale
- Applicable to any stream, perennial or ephemeral, in the state of Colorado
- Ability to refine in detailed study based on presence of debris flow potential, burn scars, hazardous/critical infrastructure, and/or delineation disputes.



Big Thompson River, Larimer County, Colorado
Photo Credit: Katie Jagt

Technical Standards— Driving Factors

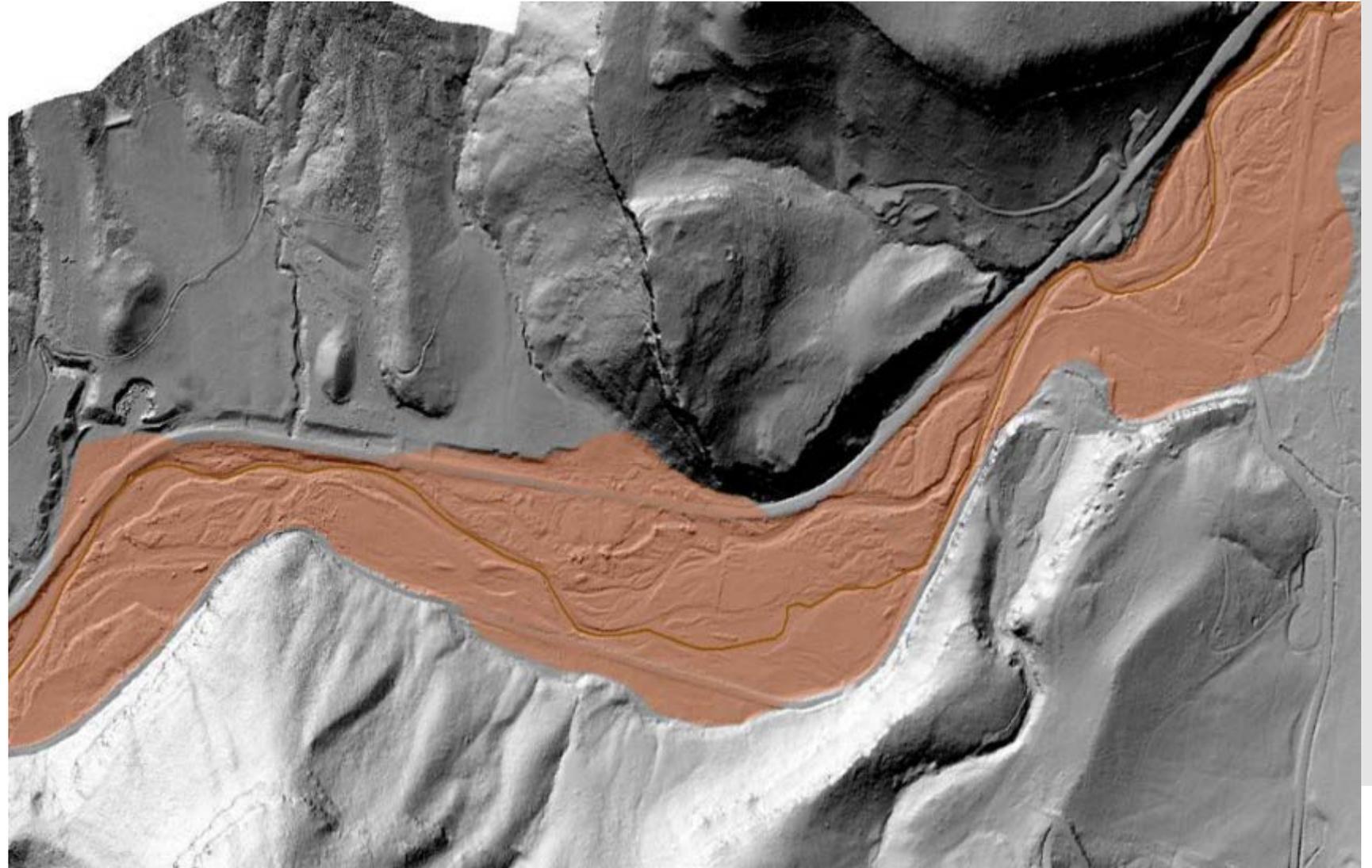
Four primary types of fluvial processes:

- 1) Lateral Migration and Widening
- 2) Downstream Meander Migration
- 3) Avulsion (local, reach, and regional)
- 4) Slope failures due to toe erosion

Mapping protocol built on identifying the locations where each can occur; the combination of the areas defines the fluvial hazard zone.

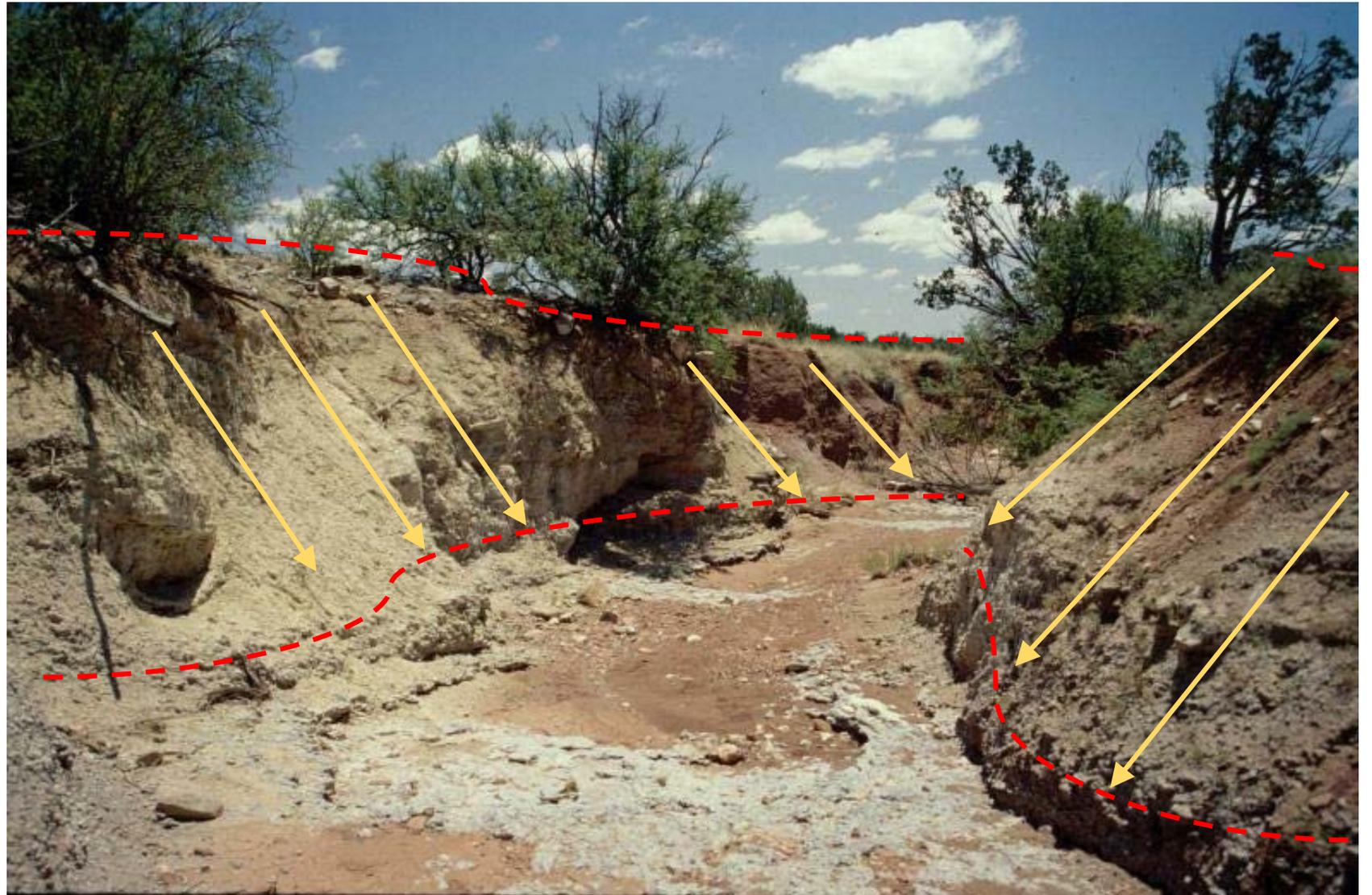
FHZ Components

The *active river valley*, where the river has occupied in the past and is likely to occupy again in the future



FHZ Components

The *erosion hazard buffer* that generalizes the slope areas prone to erosion as a result of river lateral migration or toe erosion.



FHZ Components

Channel avulsion zones are those where the channel can dramatically change its position on the valley floor



Pre-Flood Channel
Location, Regulatory
Floodway and 100-
year Floodplain

Post-Flood Channel
Location

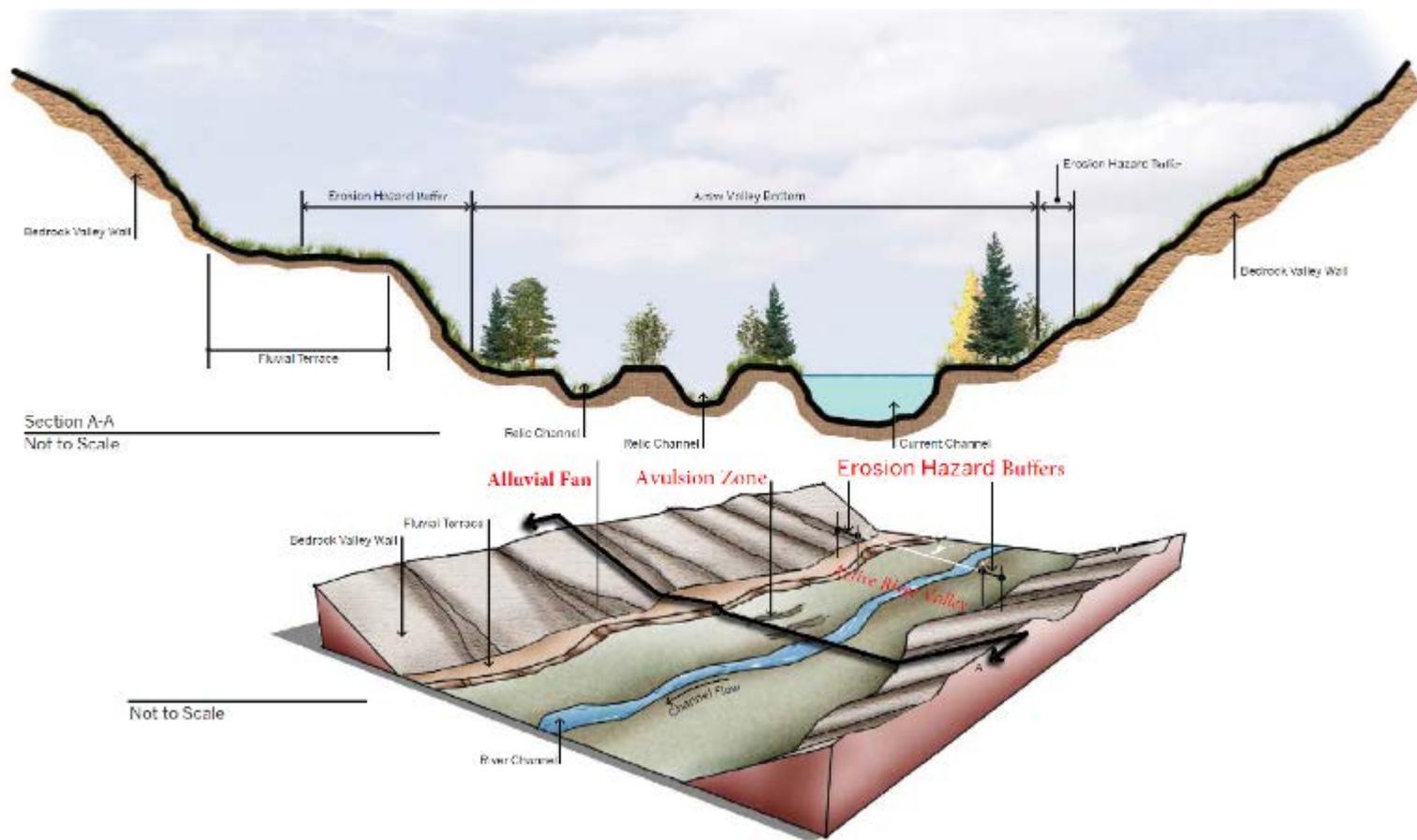
Home completely
missed by regulatory
floodplain mapping

FHZ Components

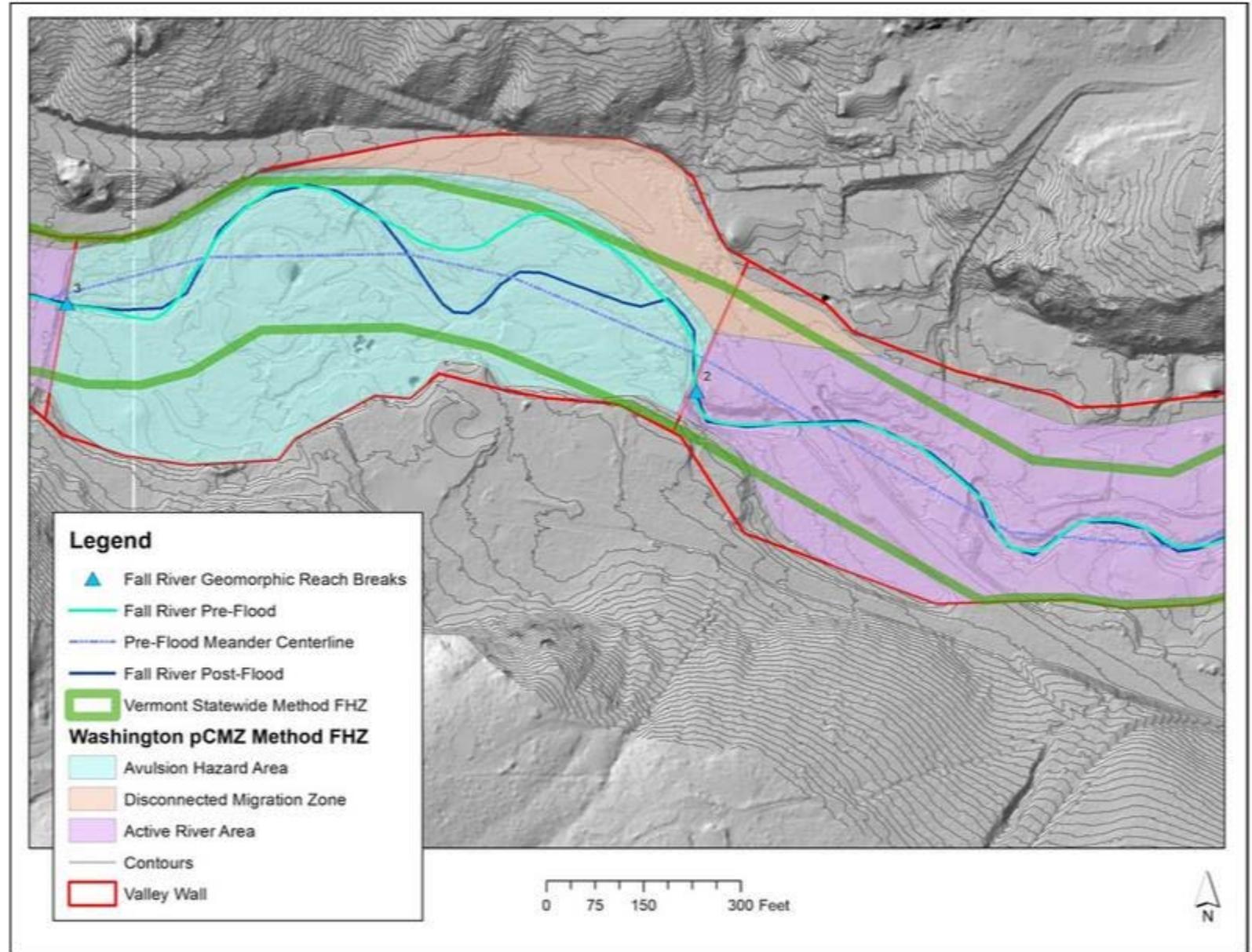
Alluvial fans are depositional features that generally form at the transition from confined to unconfined reaches. An alluvial fan is highly susceptible to avulsion and bank erosion during all moderate to high flow events.



FHZ Components



FHZ Components



FHZ Complicating Components

- Undersized Bridges and Culverts
- Fire- affected watersheds
- Road Infrastructure
- Diversion Infrastructure and
- Off- Channel Storage Facilities
- Fill and Development
- Altered Hydrologic Regime
- Channelization, Armoring, and Floodplain Disconnections



Pilot Program and Study Reaches



Big Thompson River, Larimer County, Colorado
Photo Credit: Reuters/Capt. Darin Overstreet/U.S. Air National Guard

Secondary Benefits of Erosion Hazard Mapping

Protection of a river corridor for open space and possible recreation, wildlife habitat, flood control, water quality.



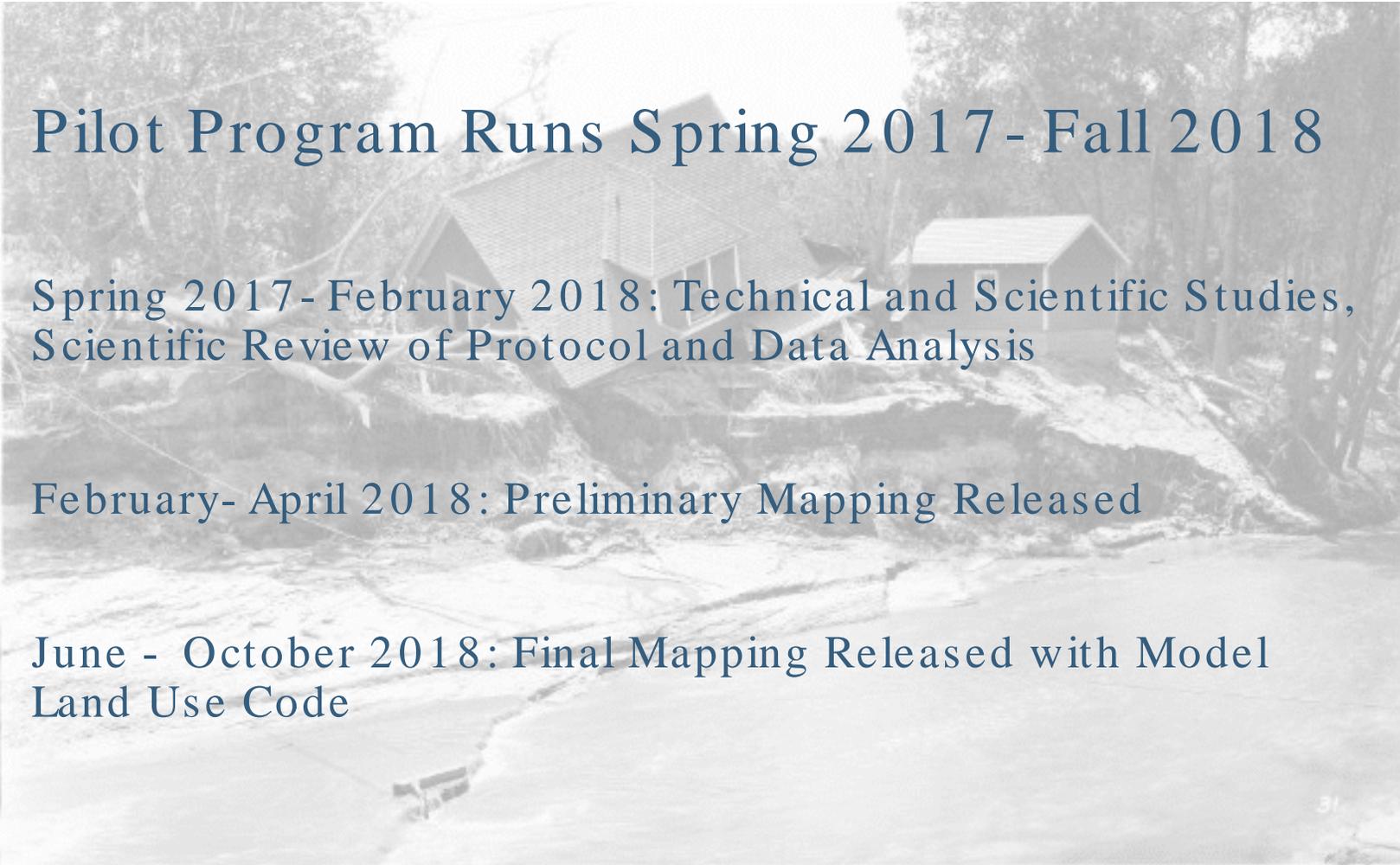
Limitations

Though this process constitutes a significant improvement to understanding fluvial hazards, it is understood the program does not and will not provide absolute safety or encompass all flood, geomorphic, and river-related hazards. Complicating factors include the influence of crossings and roadways, hillslope failures, future development and wildfires. Many opportunities to improve resiliency in Colorado's river corridors are addressed by this project, and many still remain.



Big Thompson River at Loveland Water Storage Reservoir,
Larimer County, Colorado
Photo Credit: AP Photo/Colorado Heli-Ops, Dennis Pierce

Timeline



Pilot Program Runs Spring 2017- Fall 2018

Spring 2017- February 2018: Technical and Scientific Studies,
Scientific Review of Protocol and Data Analysis

February- April 2018: Preliminary Mapping Released

June - October 2018: Final Mapping Released with Model
Land Use Code

Community Discussion

What is your community's motivation for participating in the pilot program?

How many have conducted an erosion mapping study? What were your experiences? How did it help you? What were the pitfalls?

How would erosion mapping fit into a community's floodplain mapping and other water-related management/regulatory programs?

What are some of the challenges and considerations in talking to the community and affected property owners about the potential for erosion on their property - particularly those that are outside/above the mapped floodplain?

