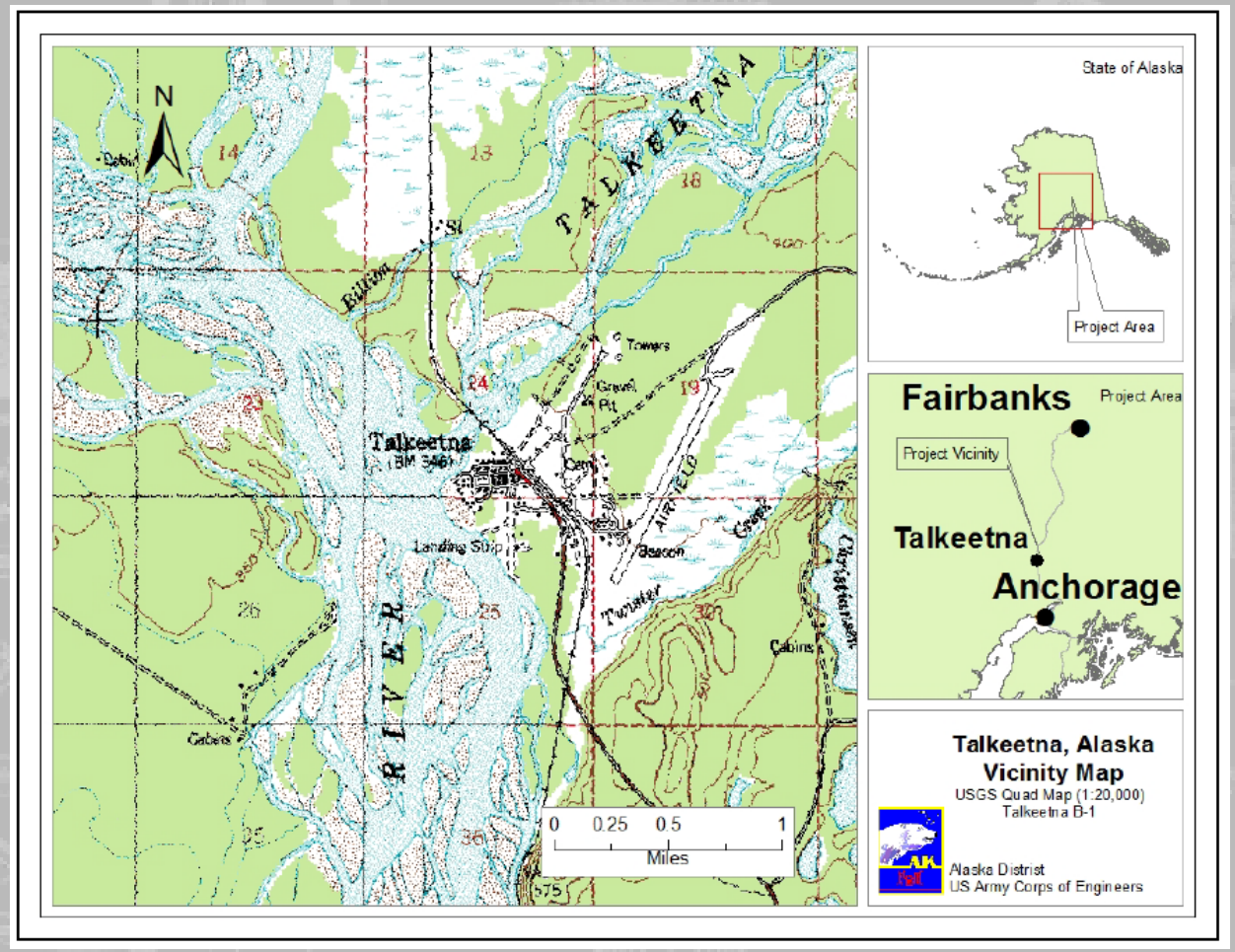
CONTINUING AUTHORITIES PROGRAM SECTION 205 TALKEETNA FLOOD RISK MANAGEMENT TALKEETNA, ALASKA

Public Participation – Session 2
Review of Progress and Status of Alternatives
Date: September 22, 2021
Time: 6:00 PM – 8:00 PM



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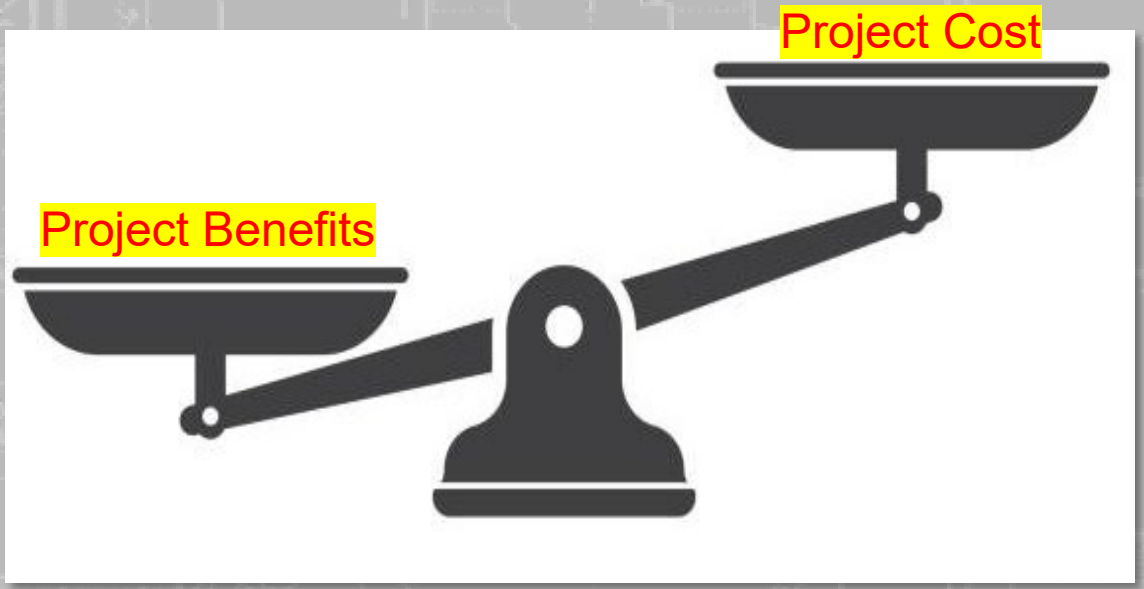
AUTHORITY AND LIMITS

- This study uses Section 205 of the Flood Control Act of 1948 as amended (33 U.S.C. 701s)
  - Maximum Federal Funds at any one locality are $10 million – so normally maximum Project + Design cost is $15 million
  - Total Project costs must be less than total project benefits for the economic life of the project.
  - Benefits come from flood risk reduction. Erosion protection is only allowed if it reduces the total cost of putting in and maintaining flood protection.



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AUTHORITY AND LIMITS

- To have a “justified” project that the federal government would be willing to fund, total benefits must be greater than or equal to total costs. This results in a Benefit-Cost Ratio greater than 1.
- The plan with the highest Net Benefits is considered the National Economic Development plan.

Total Benefits - **Total Costs** = **Net Benefits**

Total Benefits ÷ **Total Costs** = **Benefit-Cost Ratio**

Damages Without the Project - **Damages With the Project** = **Benefits**

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DECIDING ON THE PROJECT THE GOVERNMENT WILL SUPPORT

- Maximize net benefits within the authority (National Economic Development)
- Also includes assessment of non-monetary benefits
- Project must be supported by the local sponsor – but Federal dollars for a locally- preferred project will be limited to the amount the Federally-defined best-value project would cost

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PROBLEM AND OBJECTIVES

Fluvial flooding in Talkeetna threatens critical infrastructure including the railroad bridges, public businesses, private residences, electrical facilities and other utilities, and historic properties, and creates hazards including impassable roads and the inability for emergency services to reach residents, placing the health and safety of the community in jeopardy within the 1% annual exceedance probability flood zone (100-year flood zone.)

Study Objectives:

- Reduce flood risk to health and safety for the community of Talkeetna for residents and tourists over the 50-year period of analysis.
- Reduce flood risk to critical infrastructure, private residences, and historic properties in the community of Talkeetna over the 50-year period of analysis.

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STUDY TIMELINE

Agreement Signed	July 2020 ✓
Scoping Meetings	Sep – Nov 2020 ✓
Initial Measures and Alternatives	Nov – Dec 2020 ✓
Model Results with Existing Data	February 2021 ✓
1st Public Participation Meeting	March 2021 ✓
Detail and Assess Alternatives	April – July 2021 ✓
Obtain new Survey and Data	July - Aug 2021 ✓
Relook at Model and Alternatives	Aug – October 2021 ✓
Review New Survey and Data	September 2021 ●
2nd Public Participation Meeting	September 2021
I.D. Tentatively Selected Plan	Nov - Dec 2021
3rd Public Participation Meeting	December 2021
Corps' Approval of "TSP"	January 2022
Draft Report for Review	Feb – Mar 2022
4th Public Participation Meeting	April 2022
Rewrite Report	April 2022 – June 2022
5th Public Participation Meeting	June 2022
Final Report Corps Approved	September 2022

Next: To get to Design and Implementation

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WHAT HAVE WE LEARNED

Based on preliminary modeling and cost estimates, none of the alternatives that we have analyzed so far have had more benefits than costs over a 50-year time of analysis. This means that the flood related damages that are mitigated by each alternative have been less than the estimated costs to install and maintain the alternative.

The new river cross-section data shows that the Talkeetna and Susitna Rivers have changed substantially since the 2011 LiDAR. This means that the model we are using to estimate damages must be adjusted to account for the rapidly changing channel configurations, so we will have present day information to verify the benefits from reduced flooding for each alternative

Our requirement is for benefits to be equal or greater than the estimated cost (Benefits/Costs > 1.0).

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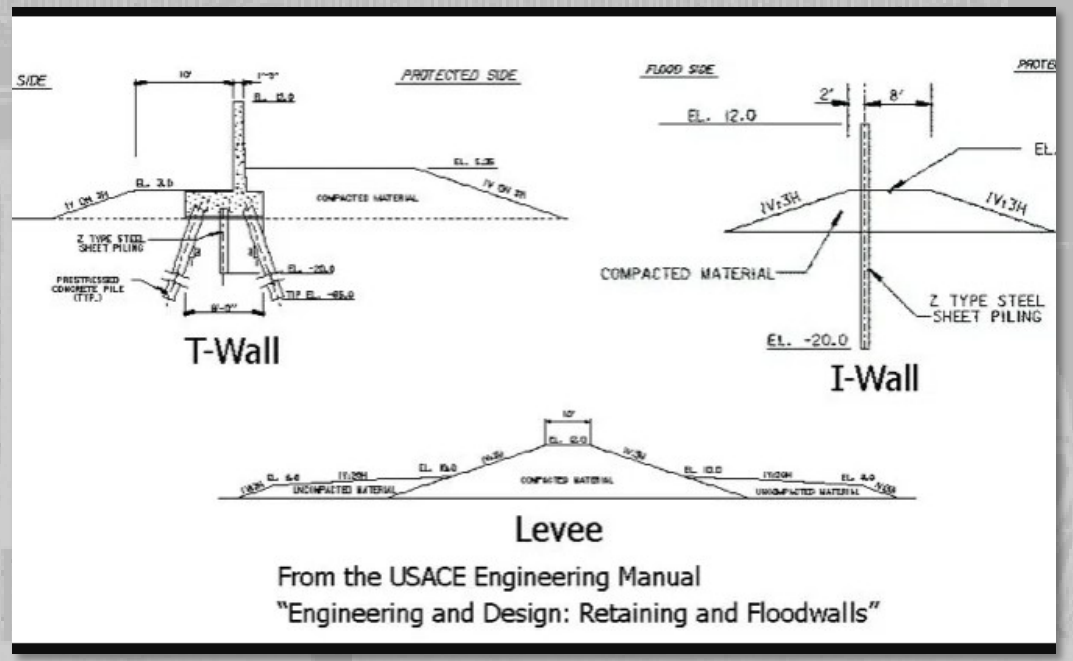
DESIGN OF PROTECTIVE WORKS

- Levees or dikes may be protected against erosion on the side that has the river flooding against it and may be protected on the inside also to prevent erosion from torrential rains or overtopping during floods.
- Floodwalls also need to be protected against erosion on the river side to prevent erosion from removing the soils that allow it to stand up against the pressure of the floodwater. They also need a splash pad on the inside in case of overtopping to prevent the falling water from excavating a hole on the inside and letting the wall collapse.
- All protective works need access for flood fighting and repairs.



From the USACE Engineering Manual
"Engineering and Design: Retaining and Floodwalls"

- Erosion protection is very expensive, and in places where it is required, it can increase the cost of the project to more than the benefits coming from the flood mitigation.
- Scattered damages or small areas of high damage are often mitigated with "non-structural solutions"

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WHAT HAVE WE FOUND

- There are structural solutions to prevent flooding
  - We have costs for each alternative
  - Talkeetna River Subdivision - $10.2 M
  - East Talkeetna - $5.3 M
  - Downtown - $17.1 M
- Benefits do not exceed costs on any alternative.

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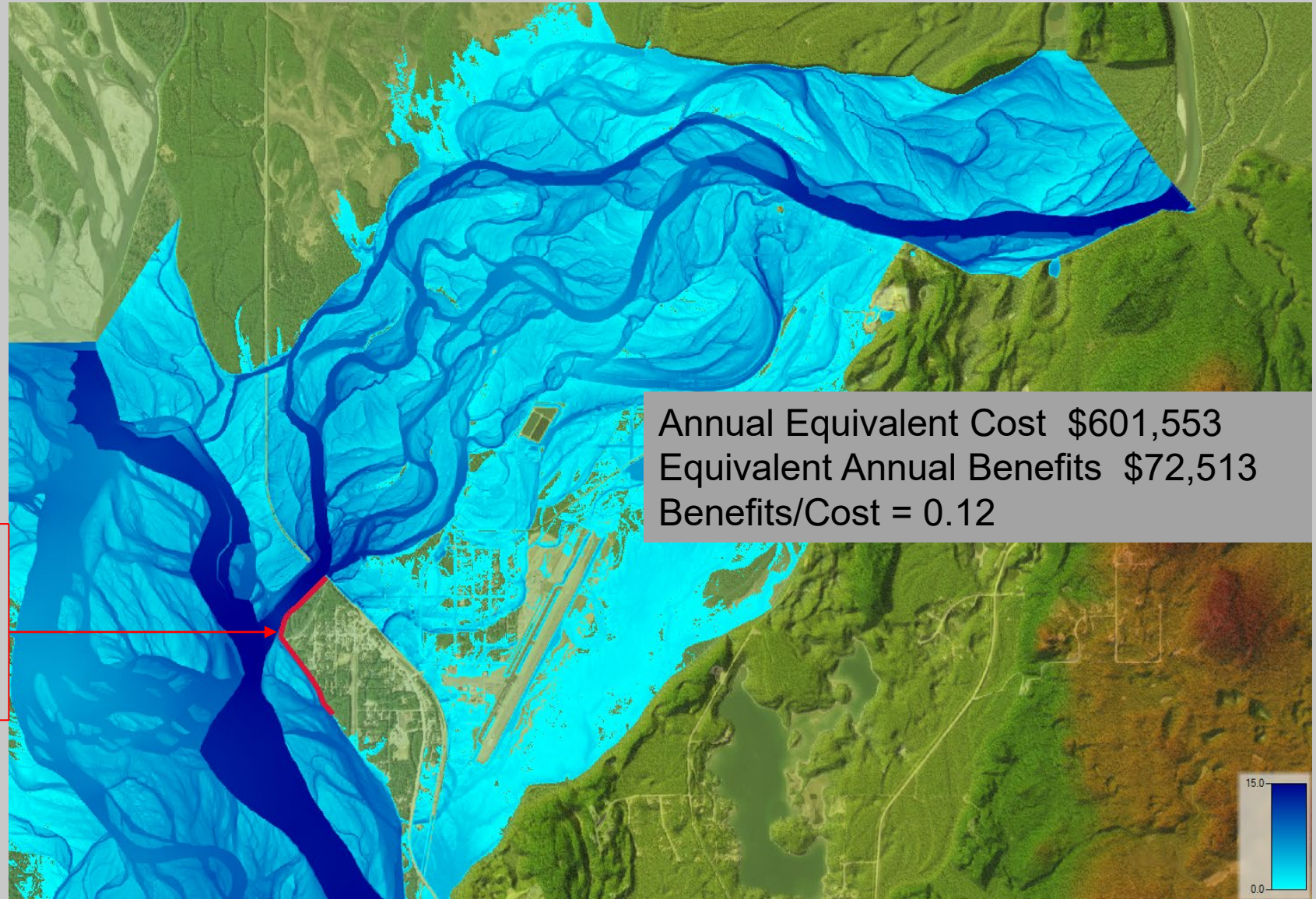
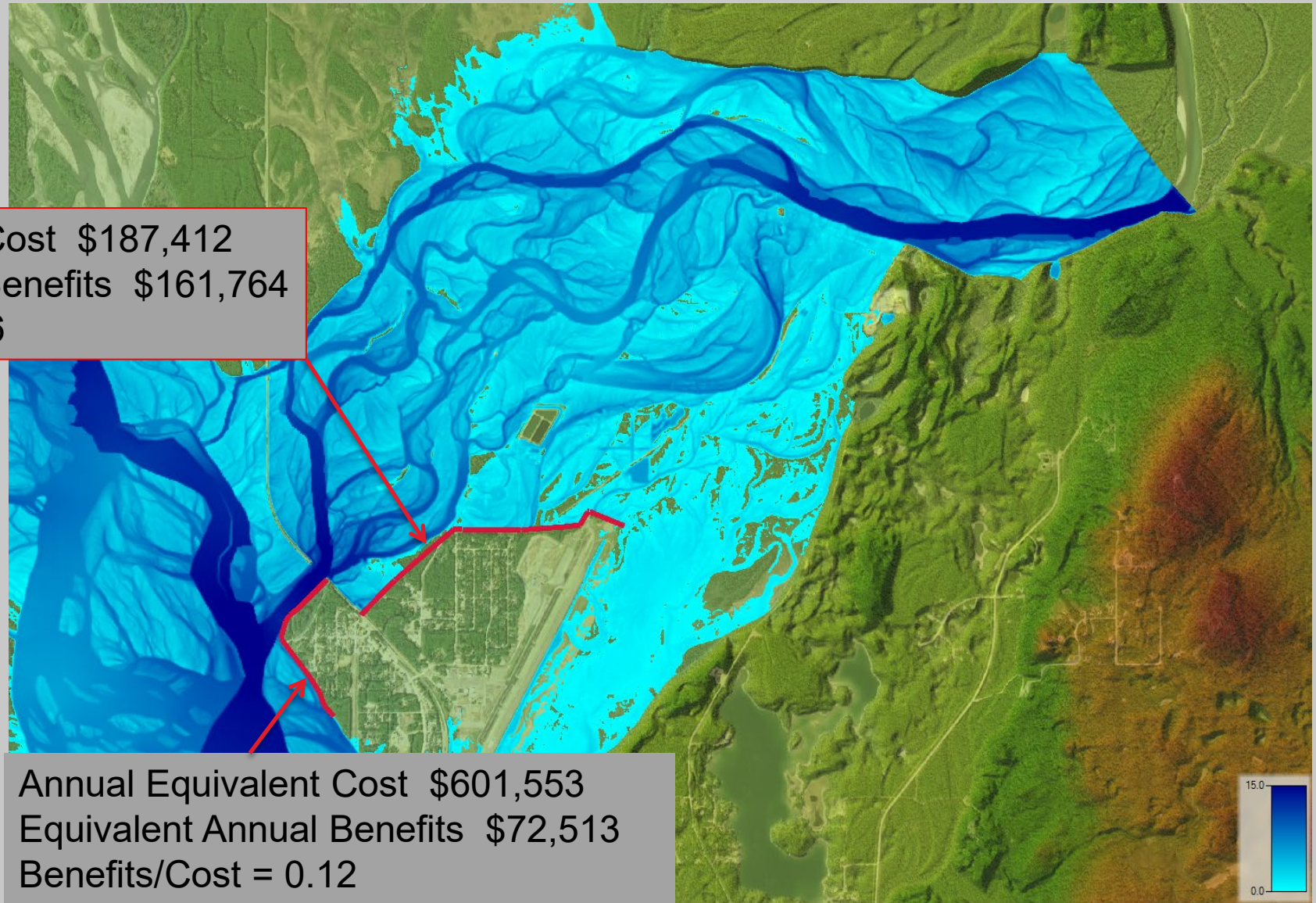
FLOOD INUNDATION IN TALKEETNA
1% ANNUAL EXCEEDANCE PROBABILITY
DOWNTOWN LEVEE



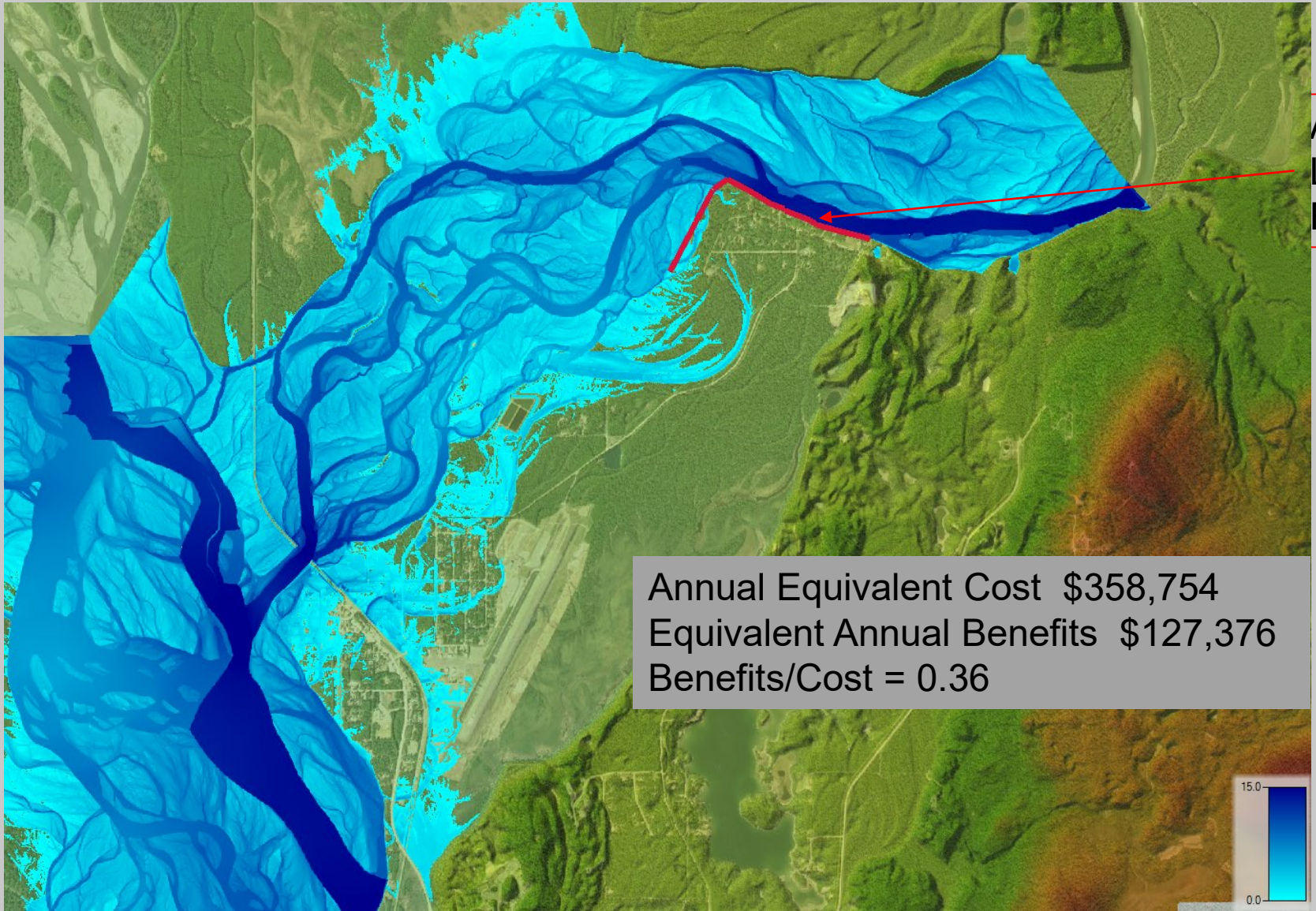
FLOOD INUNDATION IN TALKEETNA
1% ANNUAL EXCEEDANCE PROBABILITY
RING LEVEE

Annual Equivalent Cost $187,412
Equivalent Annual Benefits $161,764
Benefits/Cost = 0.86

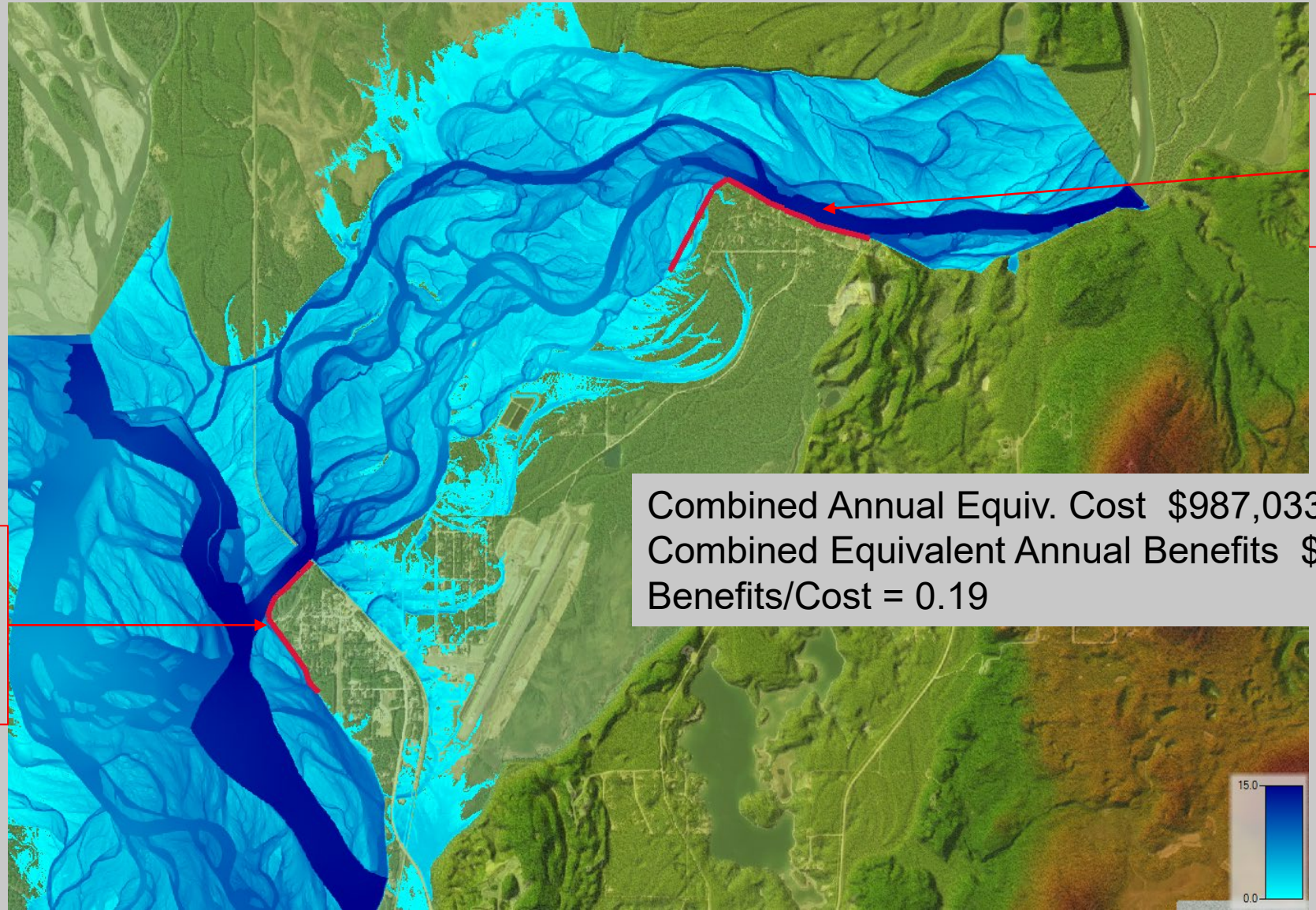


Annual Equivalent Cost $601,553
Equivalent Annual Benefits $72,513
Benefits/Cost = 0.12

FLOOD INUNDATION IN TALKEETNA
1% ANNUAL EXCEEDANCE PROBABILITY
TALKEETNA RIVER SUBDIVISION (TRS) FLOODWALL



FLOOD INUNDATION IN TALKEETNA
1% ANNUAL EXCEEDANCE PROBABILITY
DOWNTOWN LEVEE AND TRS FLOODWALL



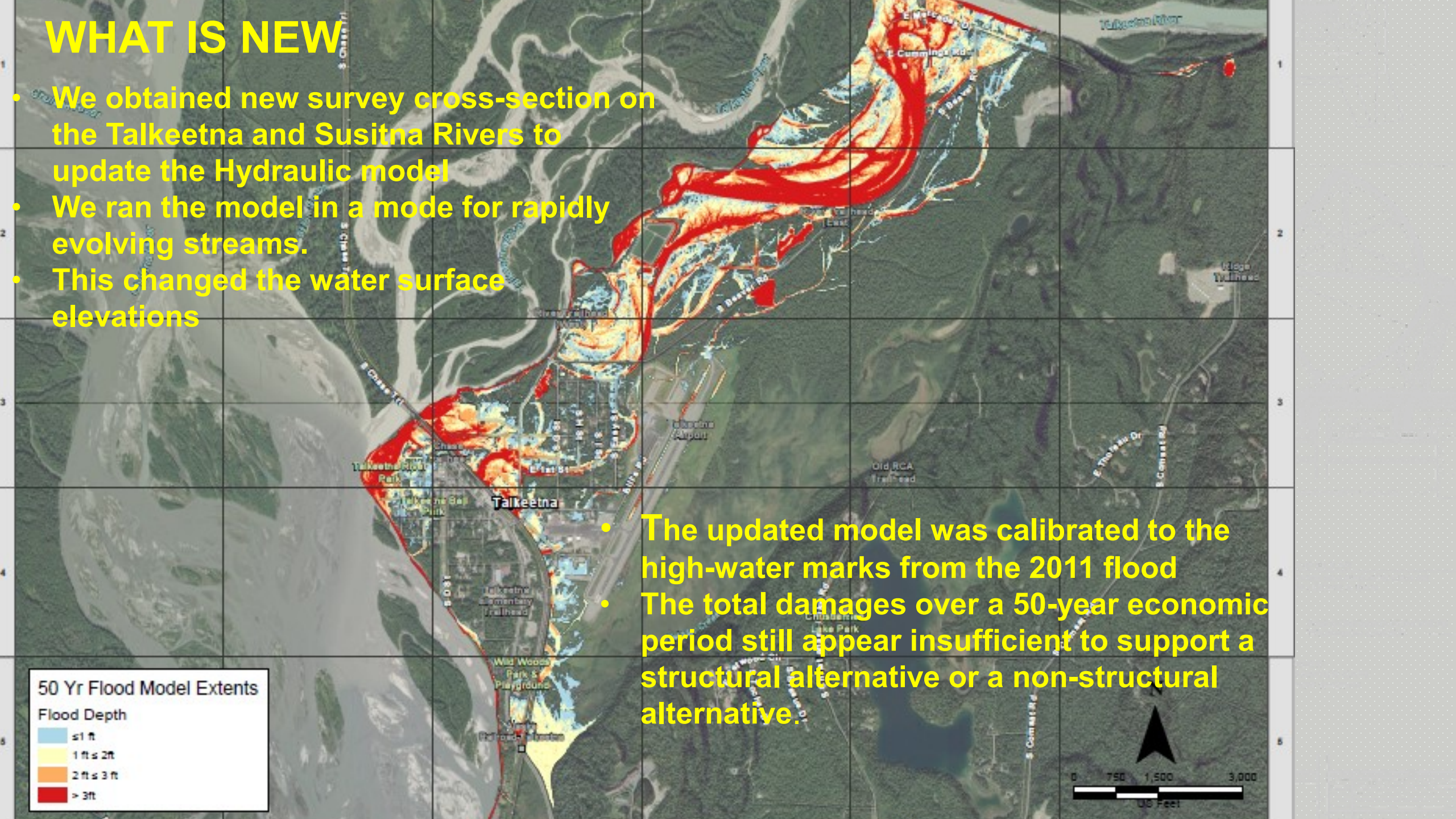
Approximate Location of Floodwall

Approximate Location of Downtown Levee

Combined Annual Equiv. Cost $987,033
Combined Equivalent Annual Benefits $183,786
Benefits/Cost = 0.19

WHAT IS NEW

- We obtained new survey cross-section on the Talkeetna and Susitna Rivers to update the Hydraulic model
- We ran the model in a mode for rapidly evolving streams.
- This changed the water surface elevations

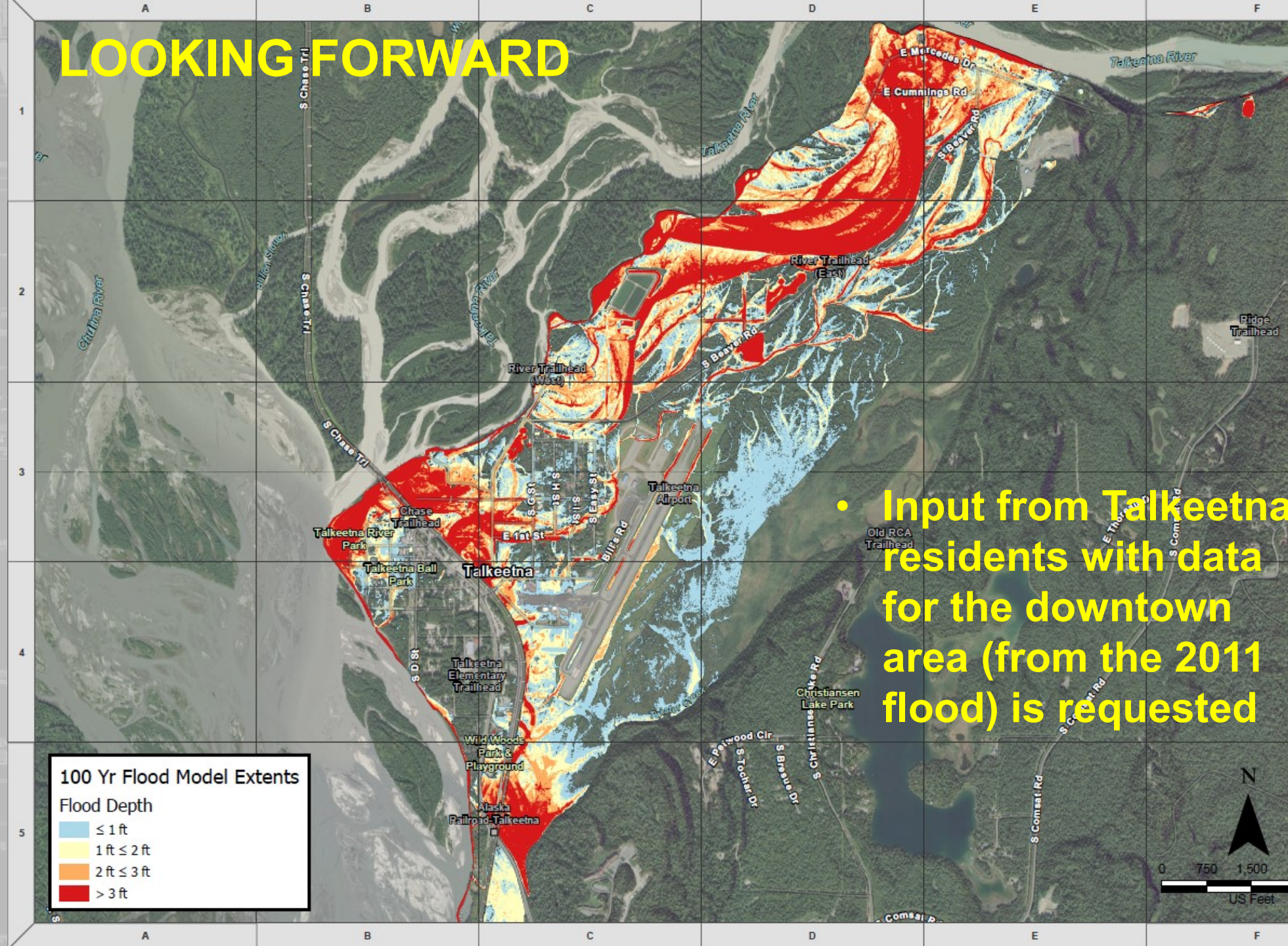


- The updated model was calibrated to the high-water marks from the 2011 flood
- The total damages over a 50-year economic period still appear insufficient to support a structural alternative or a non-structural alternative.

LOOKING FORWARD

- The high-water marks used to calibrate the model are all upstream of the Rail-Road bridge across the Talkeetna River

- Getting high-water marks for the 2011 flood downstream of the RR bridge could improve the accuracy of the model



- Input from Talkeetna residents with data for the downtown area (from the 2011 flood) is requested

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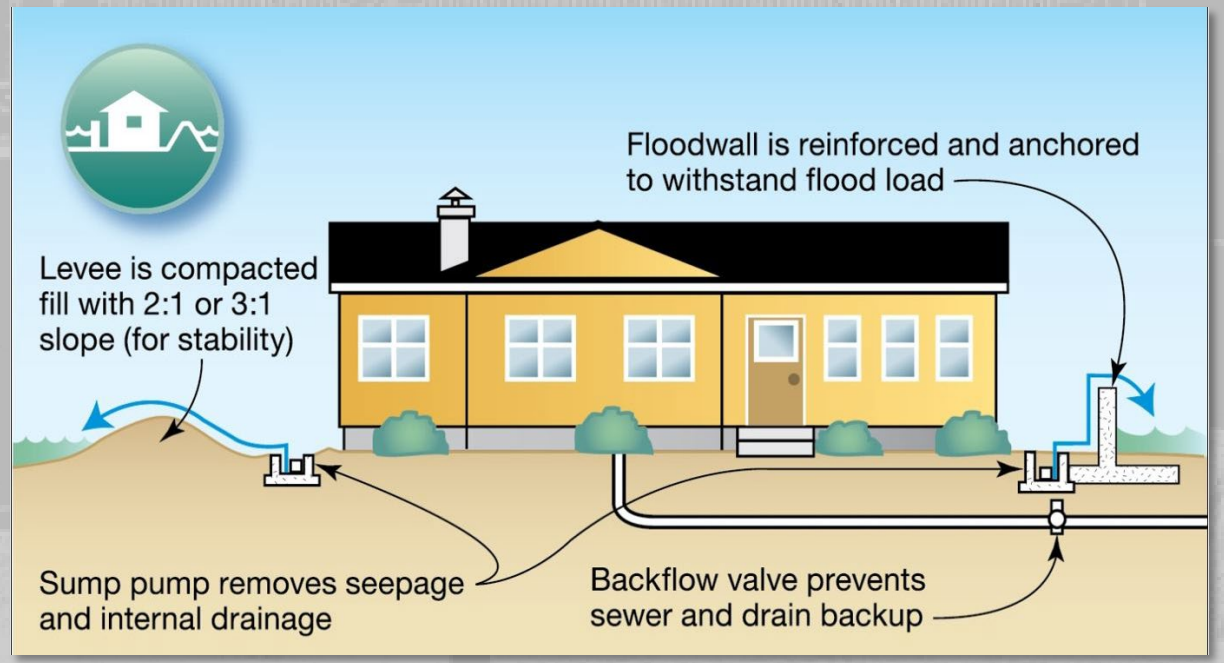
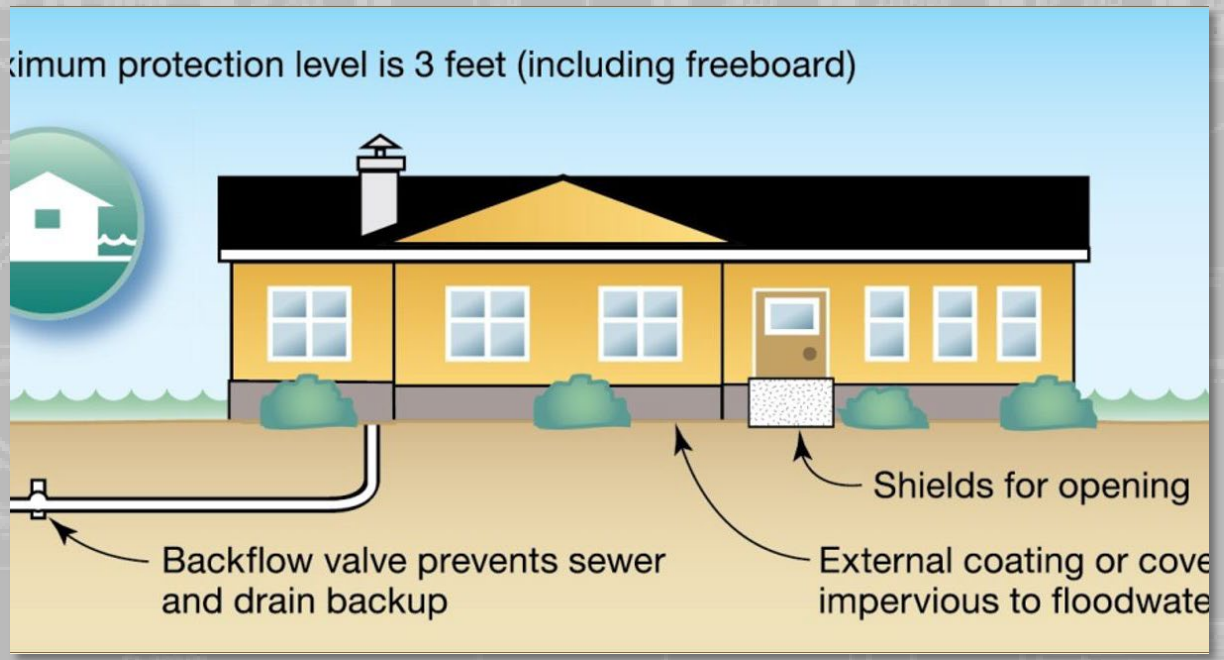
NON-STRUCTURAL SOLUTIONS

- Floodproofing: These are house by house solutions to flooding. The actions can include raising the elevation of the first floor, protecting the structure by a floodwall or dike around the house, or making the lower walls of the house waterproof and making sure they are strong enough for the anticipated flood levels
- Relocation: This is moving the structure to a new locations that is not subject to flooding. This is difficult in a community that is built on a flood plain





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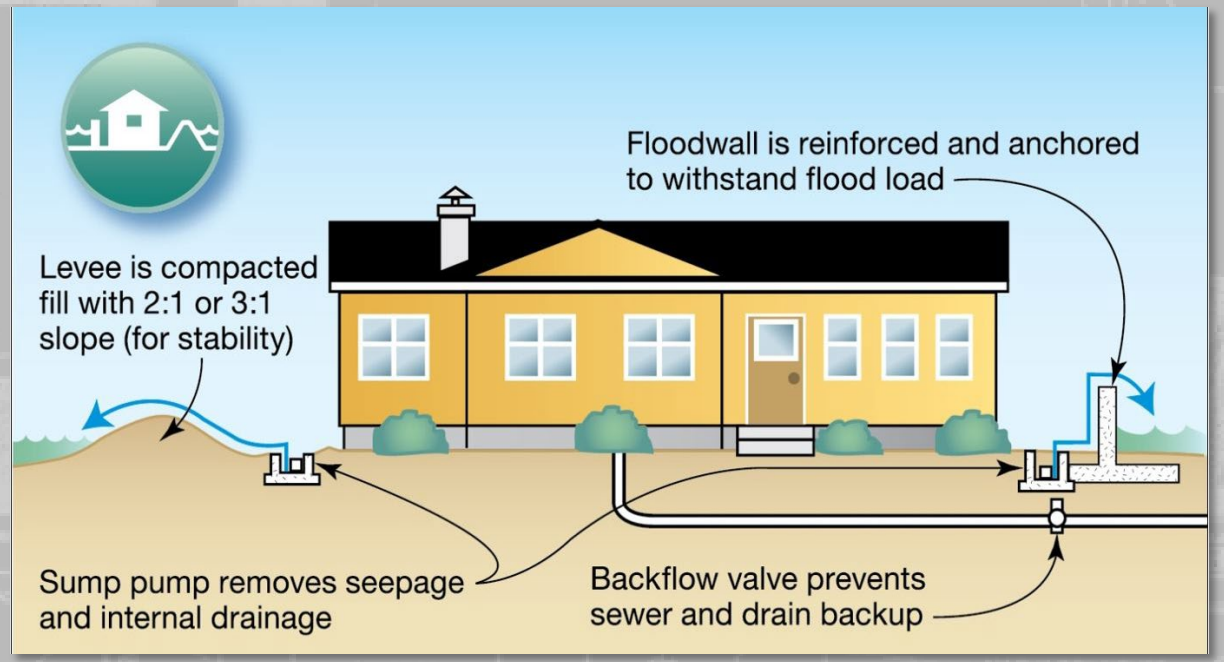
NON-STRUCTURAL SOLUTIONS

- Floodproofing and raising a house to prevent floodwaters from getting inside of it are two of the more common “non-structural solutions”.
- These work best when houses are flooded relatively often at low depths (less damage, but more often.)
- The model is not supporting candidates for non-structural solutions as we thought it would.
- If you know of areas where the houses are commonly flooded, please let us know, as the model as calibrated now is not showing that.



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PUBLIC INPUT/QUESTIONS

The next slide will provide contact information:

We would like input on:

- ✓ Areas where buildings often get flooded
- ✓ Information on historical flood depths in Downtown Talkeetna
- ✓ Areas where the most damages from floods seem to happen
- ✓ Recurring damages to public property with each flood (description and contact person for details)
- ✓ Losses of artifacts or historical structures (specifics, and contact person for details)
- ✓ Potential recreational benefits that could occur with the East Talkeetna levee, with minor increases in cost.

We will also answer questions about this study.

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QUESTIONS / COMMENTS

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