



Boise Watershed Flood Risk Review

January 15, 2015



FEMA

Meeting Objectives

Flood Risk Review

- ▶ Project Background
- ▶ Flood Study Methodologies
- ▶ Review of Data / Changes
- ▶ Discuss Next Steps
- ▶ Obtain Feedback



Why Are We Here?

RiskMAP
Increasing Resilience Together

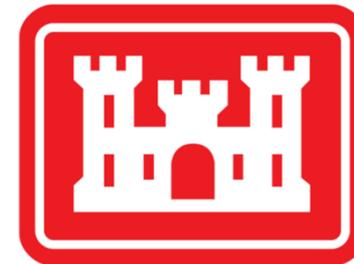


DisasterAssistance.gov
ACCESS TO DISASTER HELP AND RESOURCES



Project Team

- ▶ FEMA Region X
- ▶ Idaho Bureau of Homeland Security and Department of Water Resources
- ▶ STARR
- ▶ USACE, Walla Walla District
- ▶ University of Idaho
- ▶ Local Jurisdictions

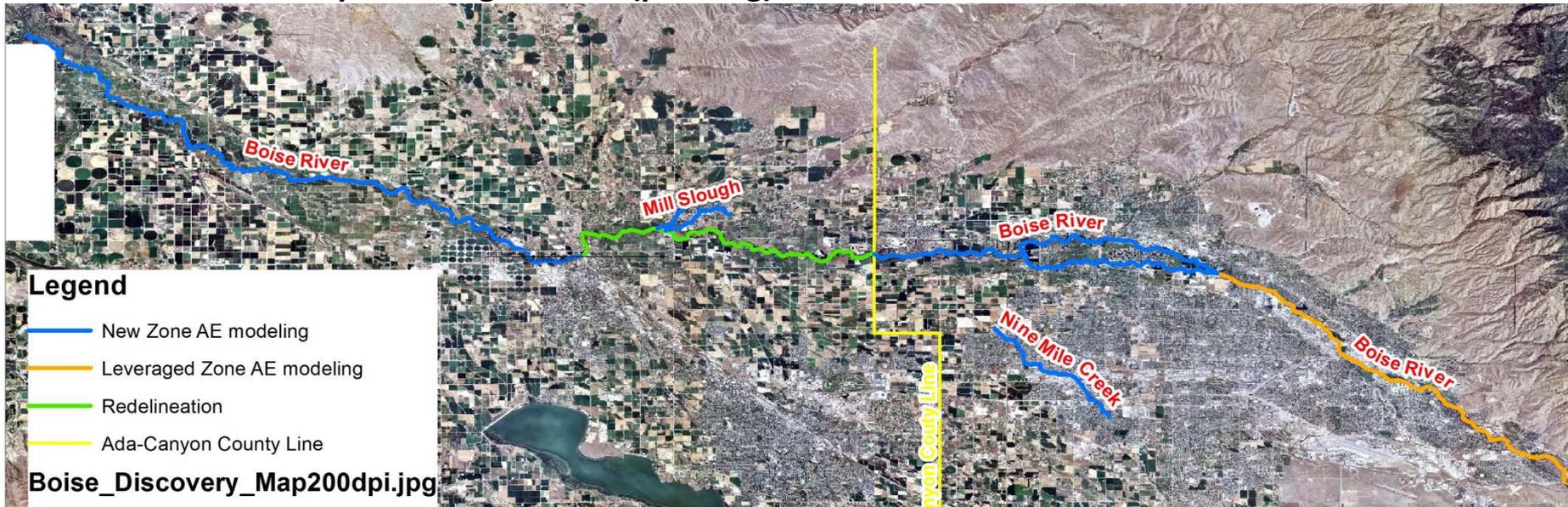


University of Idaho



USACE SCOPE OF WORK

- **Surveys** - New bathymetry and structure
- **Hydrology**
 - Developed flood frequencies for Willow Creek, Mill Slough, Ninemile Creek and regulated and unregulated flood frequencies for the Lower Boise
- **Hydraulics**
 - Detailed analysis of 74 miles on two reaches of the Boise river and three tributaries
- **Work Maps**
- **Changes Since Last FIRM Maps**
- **Shaded Depth Mapping**
- **Extreme Flow Split on Eagle Island (pending)**

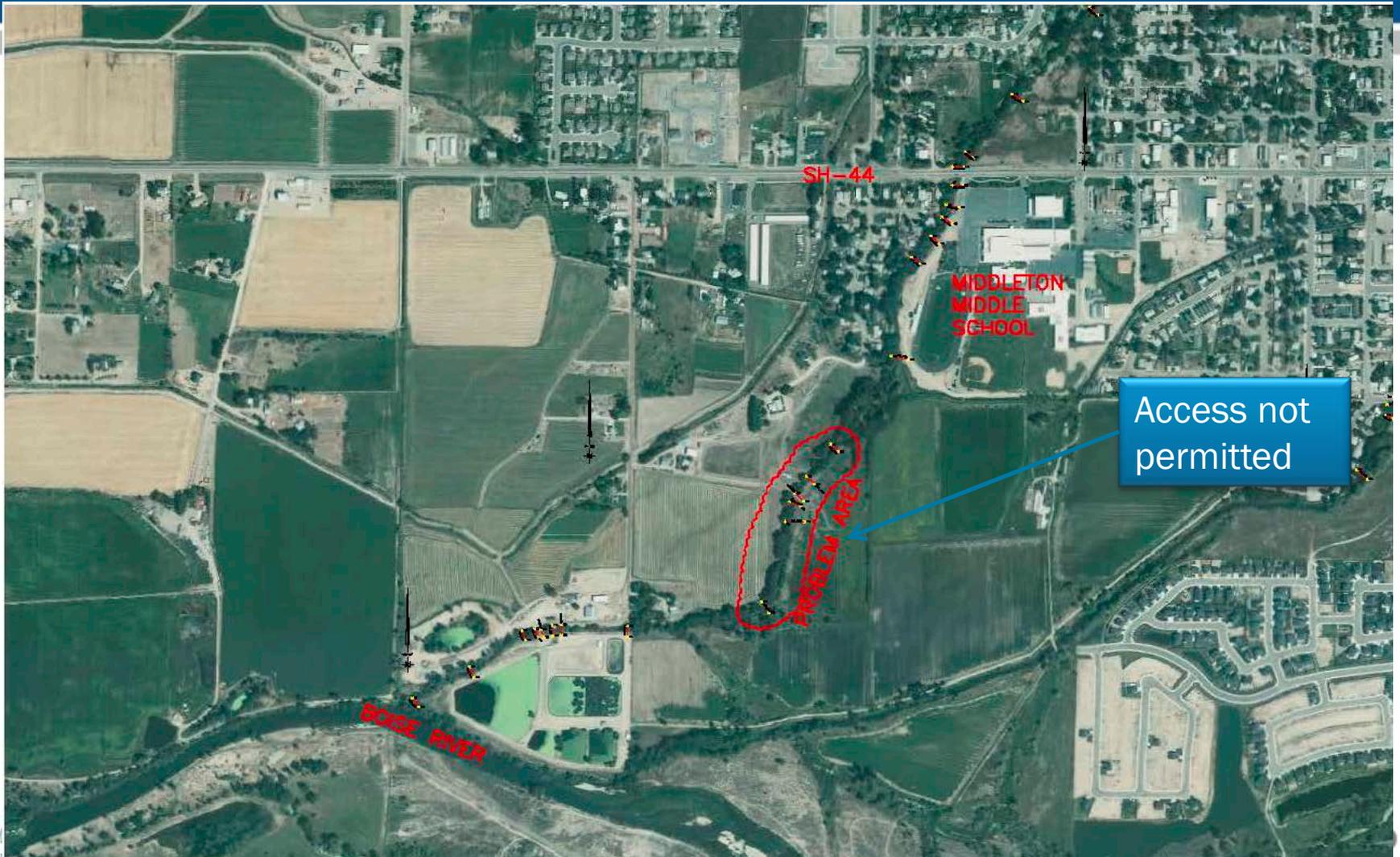


Field Survey Collection

- Collected by Rogers Surveying, Inc. in the fall of 2012, under contract with USACE.
- Structure Survey on the Boise River, Ninemile Creek, Willow Creek and Mill Slough
- Channel cross sections survey on Ninemile Creek, Willow Creek and Mill Slough
- Cross Section Spacing less than 1,500 ft average



Field Survey Access Issues



Hydrologic Methods

Watercourse	Methods Investigated	Selected Method
<p>Willow Creek Mill Slough Ninemile Creek</p>	<p>1. Gage Translation 2. Regression</p> <ul style="list-style-type: none"> ➤ USGS Open File Report 93-419 ➤ USGS Water Resources Investigations Report 02-4170 ➤ USACE Site Specific Regional Regression Analysis 	<p>Willow Creek USACE Site Specific Mill Slough Results supported retaining effective FIS frequency data Ninemile Creek USGS OFR 93-419</p>
<p>Lower Boise River</p>		<p>Regulated Boise River Analysis Generalized frequency curve with Regulated historic and synthetic events Unregulated Boise River Analysis Bulletin 17B with unregulated inflows</p>

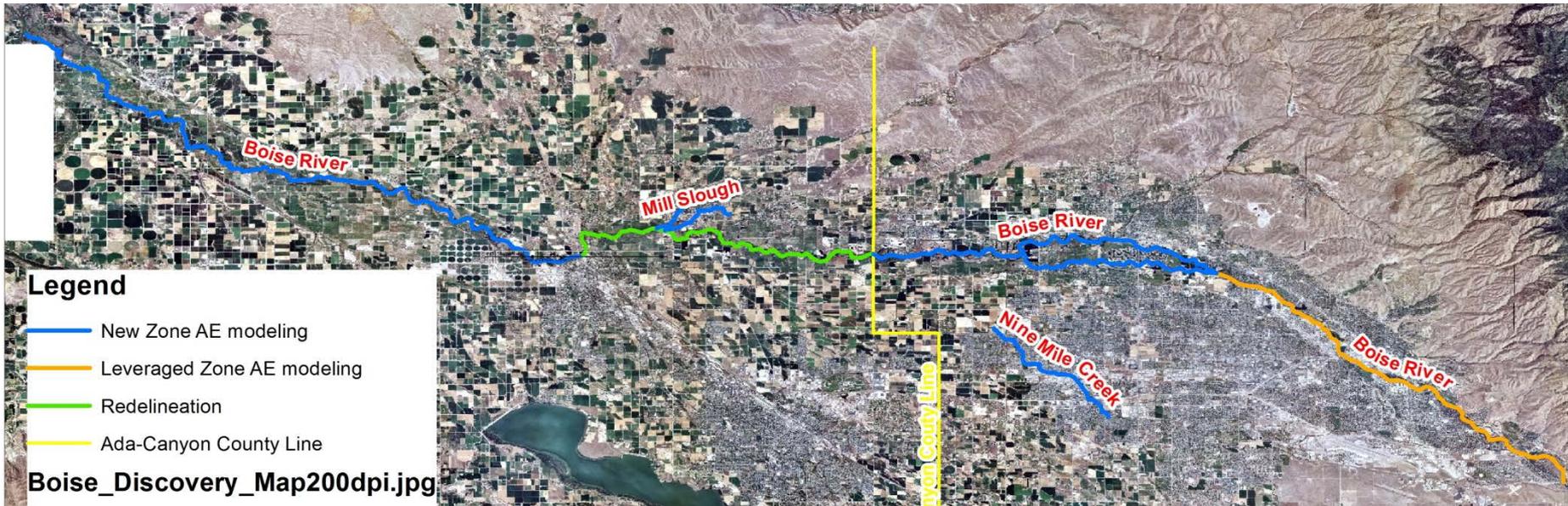
Hydrology Results

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second)				
		10-Percent- Annual-Chance	4-Percent- Annual-Chance	2-Percent- Annual-Chance	1-Percent- Annual-Chance	0.2-Percent- Annual-Chance
Boise River						
Downstream Lucky Peak Dam	2,650	7,500	7,900	11,000	16,600	34,800
Ninemile Creek						
At confluence with Fivemile Creek	3.3	95	135	170	209	319
Downstream Ten Mile Road	3	89	126	158	194	295
Downstream Linder Road	1.9	63	88	111	136	209
Downstream Central Drive	0.9	38	53	66	80	119
Downstream Locust Grove Road	0.5	22	31	38	46	66
Willow Creek						
Downstream Highway 44	84.6	1,221	1,815	2,349	2,963	4,747
Mill Slough						
Downstream Boise Street	10.7	339	479	598	804	1,174

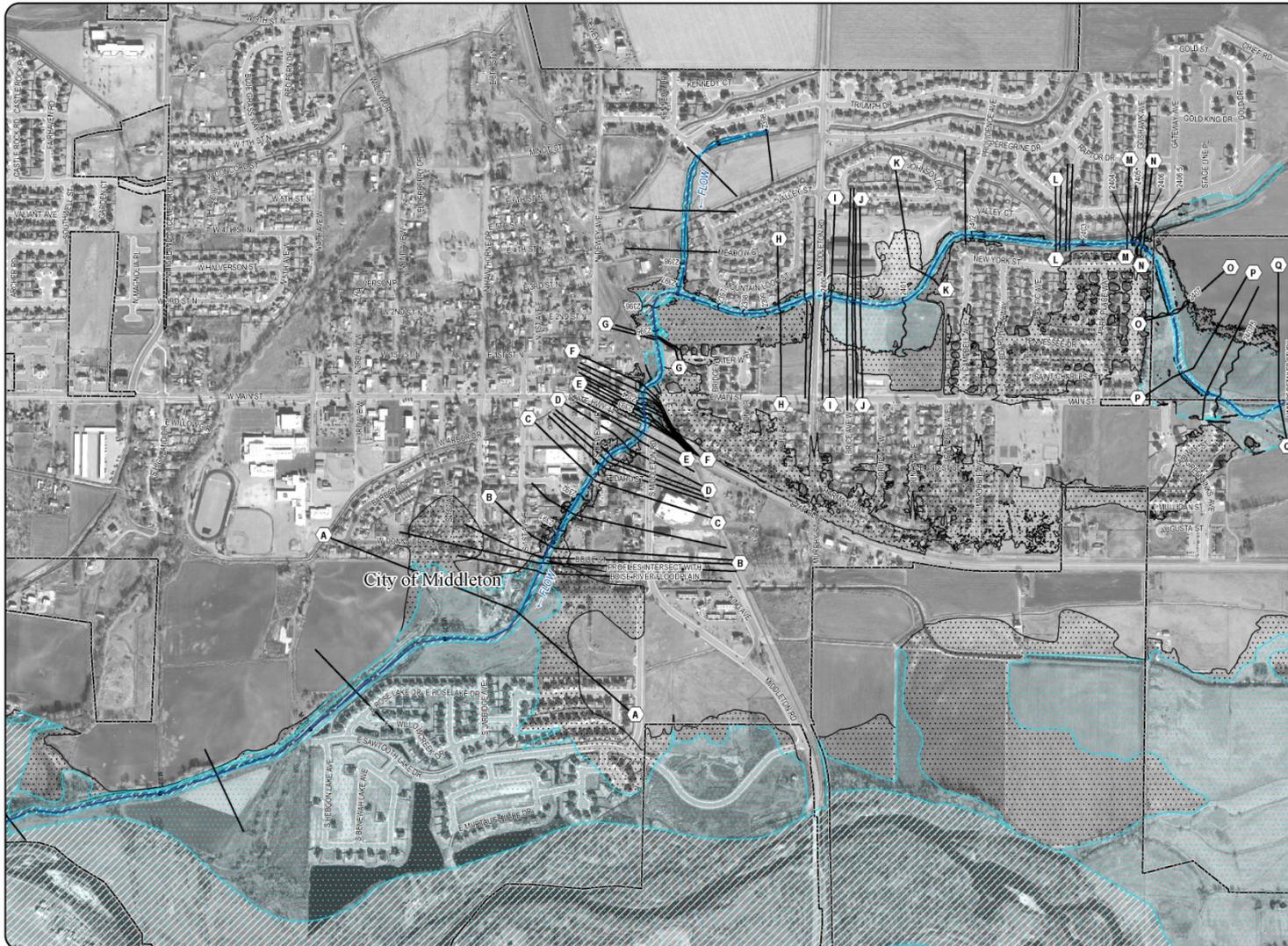
Hydraulic Methods

Method	Description
Approximate (Zone A)	<ul style="list-style-type: none">• Steady State HEC-RAS model• Based on LiDAR Topography• Structures are not modeled
Detailed (Zone AE)	<ul style="list-style-type: none">• Steady State HEC-RAS model• Roughness is examined closely• Based on LiDAR Topography• Channel is field surveyed or taken from Green LiDAR• Structures are modeled

Hydraulic Scope



Floodplain Workmap



Legend

- River Centerline
- ← FLOW Flow Direction
- M 25 Stationing (Miles)
- ⊠ Cross Section
- ~ 513 Base Flood Elevations
- ▨ Floodway
- ▨ 1% Chance (100 Year)
- ▨ 0.2% Chance (500 year)
- - - City Limits

Mill Slough
Middleton, Idaho
Floodplain and Floodway Boundaries

↑

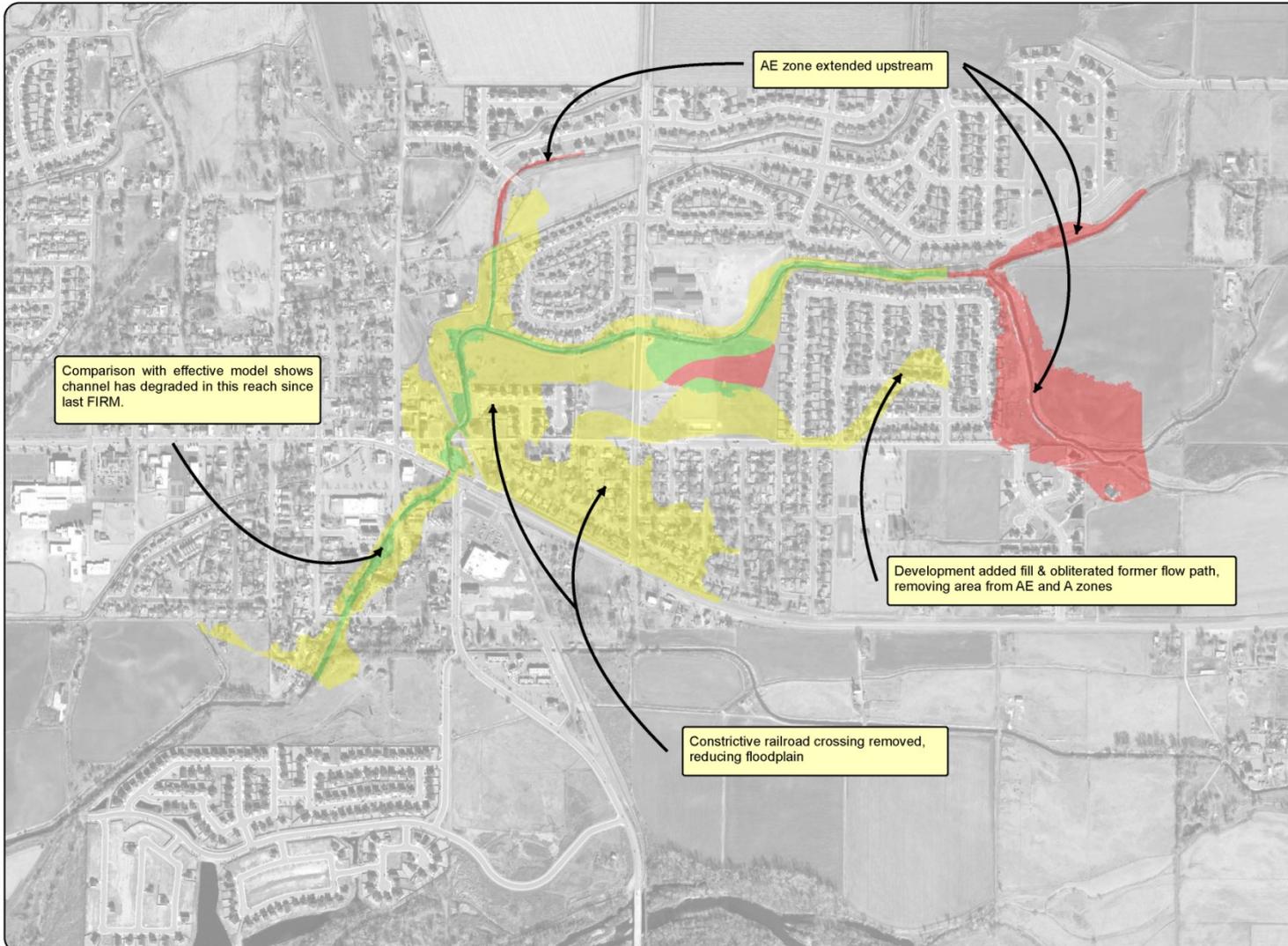
1 inch = 783 feet

0 500 1000 Feet
0 500 1000 Meters

DATE	12/17/2014
DESIGNED	SCHWARZ
DRAWN	REDAR
CHECKED	SCHWARZ

U.S. Army Corps of Engineers
Northwest Division
Walla Walla District

Changes Since Last FIRM



Legend

- No Change
- 100 year areas to be added to FIRM
- Effective FIRM 100 year areas to be removed

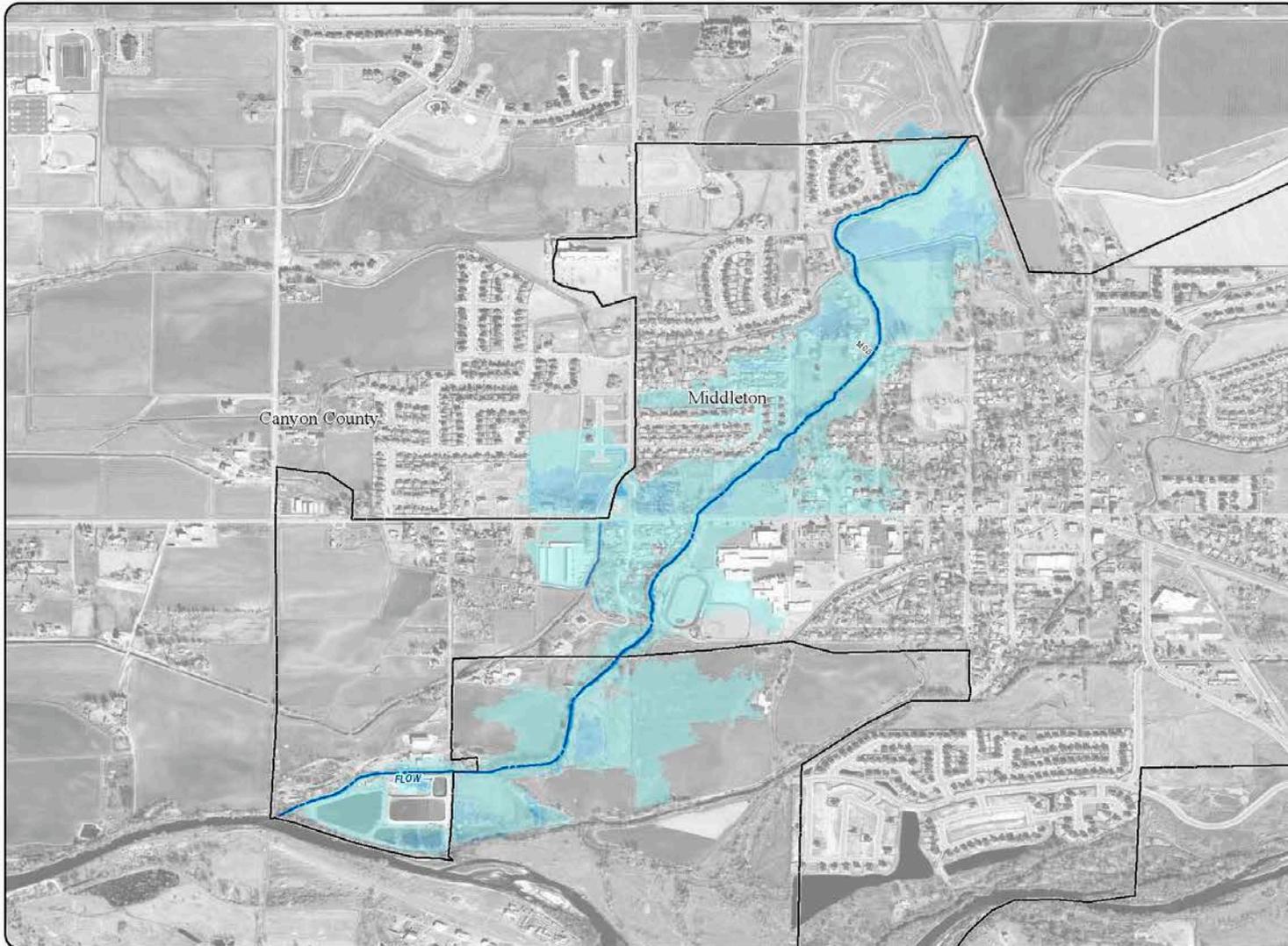
Note: No Floodway existed in the effective FIRM, so its addition has no comparison.

Mill Slough
Middleton, Idaho
Changes in Base Flood since last FIRM

DATE	11/24/2014
DESIGNED	SCHWARZ
DRAWN	SCHWICK
CHECKED	SCHWARZ

U.S. Army Corps of Engineers
Northwest Division
Walla Walla District

Depth Grids



Legend

Water Depth (ft)

- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- > 12

— River Centerline

— FLOW Flow Direction

— City Limits

Shaded depth mapping generated from lidar. Inaccuracies may exist due to failed water penetration or dense vegetation.

Willow Creek
Middleton, Idaho

Inundated Areas at 1% chance flood

↑

1 inch = 1,000 Feet

0 1,000 2,000 Feet

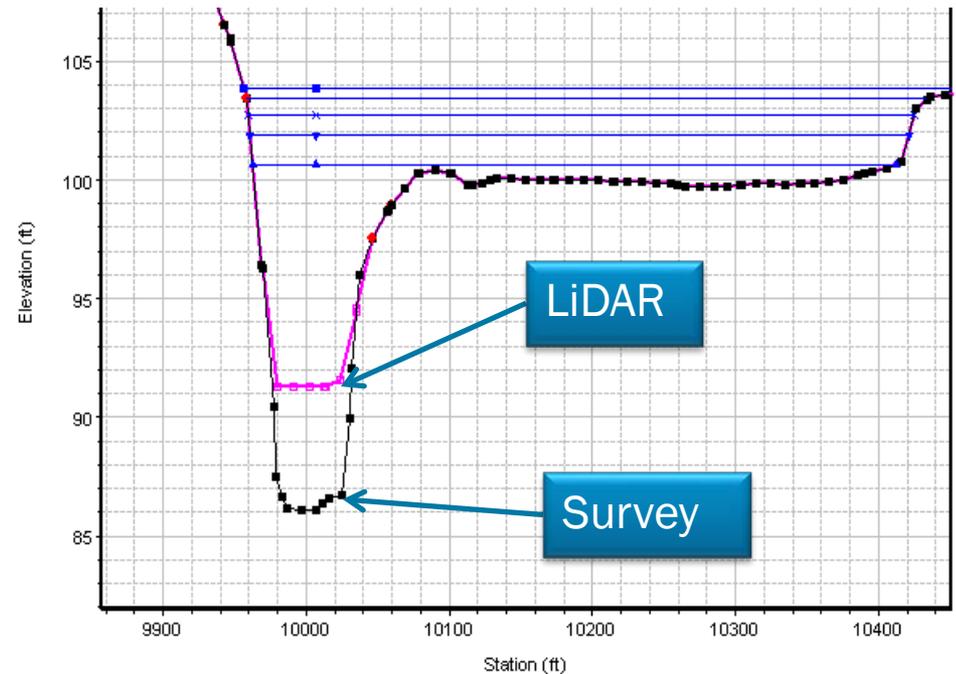
DATE	11/6/2014
DESIGNED	SCHWARZ
DRAWN	SCHNICK
CHECKED	SCHWARZ

U.S. Army Corps of Engineers
Northwest Division
Walla Walla District

Special Cases – Boise River

Green LiDAR water penetration

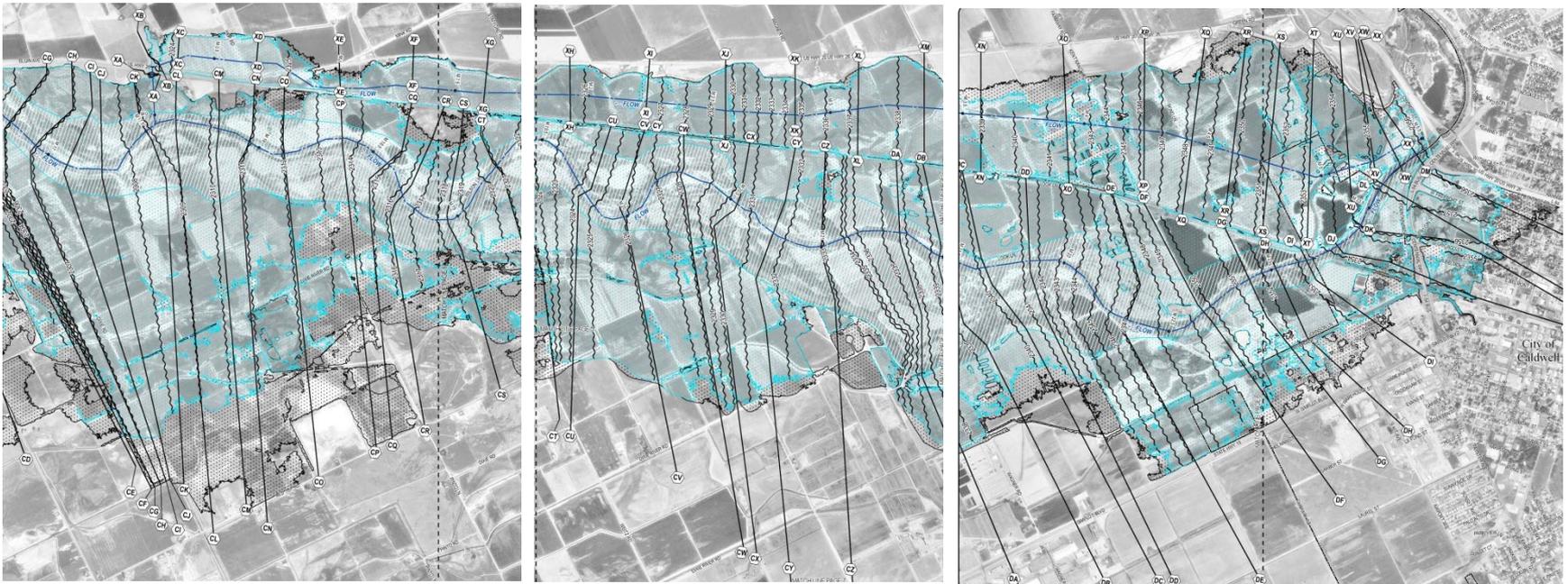
- The Boise River modeling utilized Green LiDAR (water penetrating) rather than new bathymetric surveys
- Green LiDAR failed to penetrate the water in the locations of some cross sections.
- In those areas bathymetry from the effective model was utilized, or interpolated from near by areas where good water penetration could be obtained.



Special Cases – Canyon County

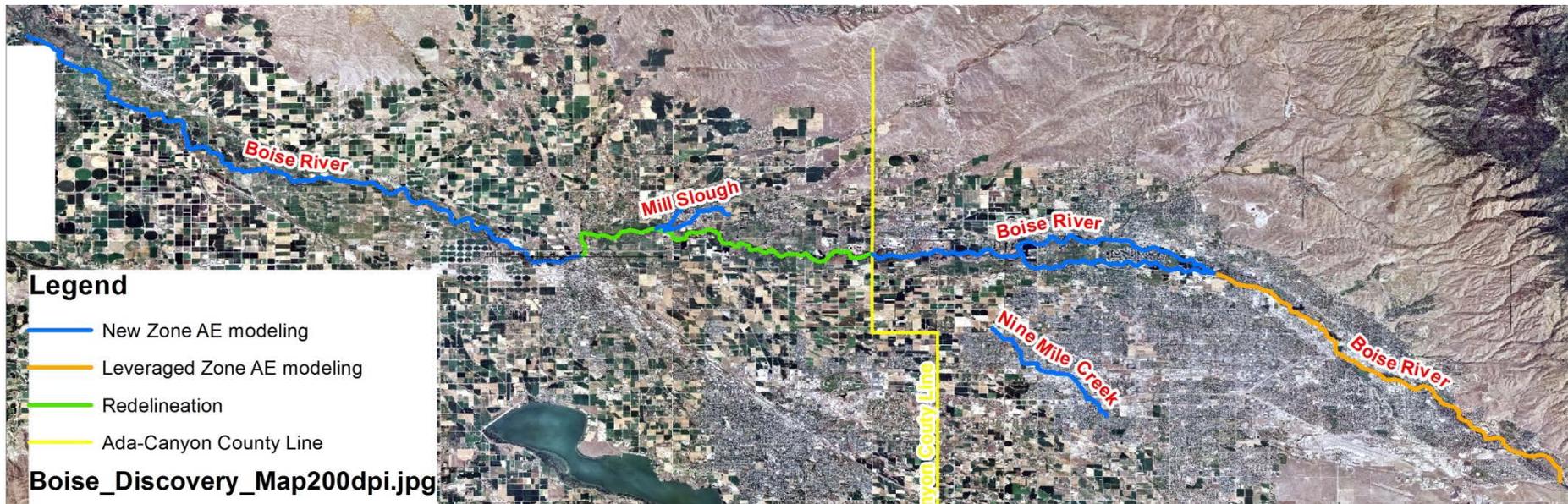
Boise River - Railroad Split Flow

- Overbank former AO zone replaced with a AE zone.

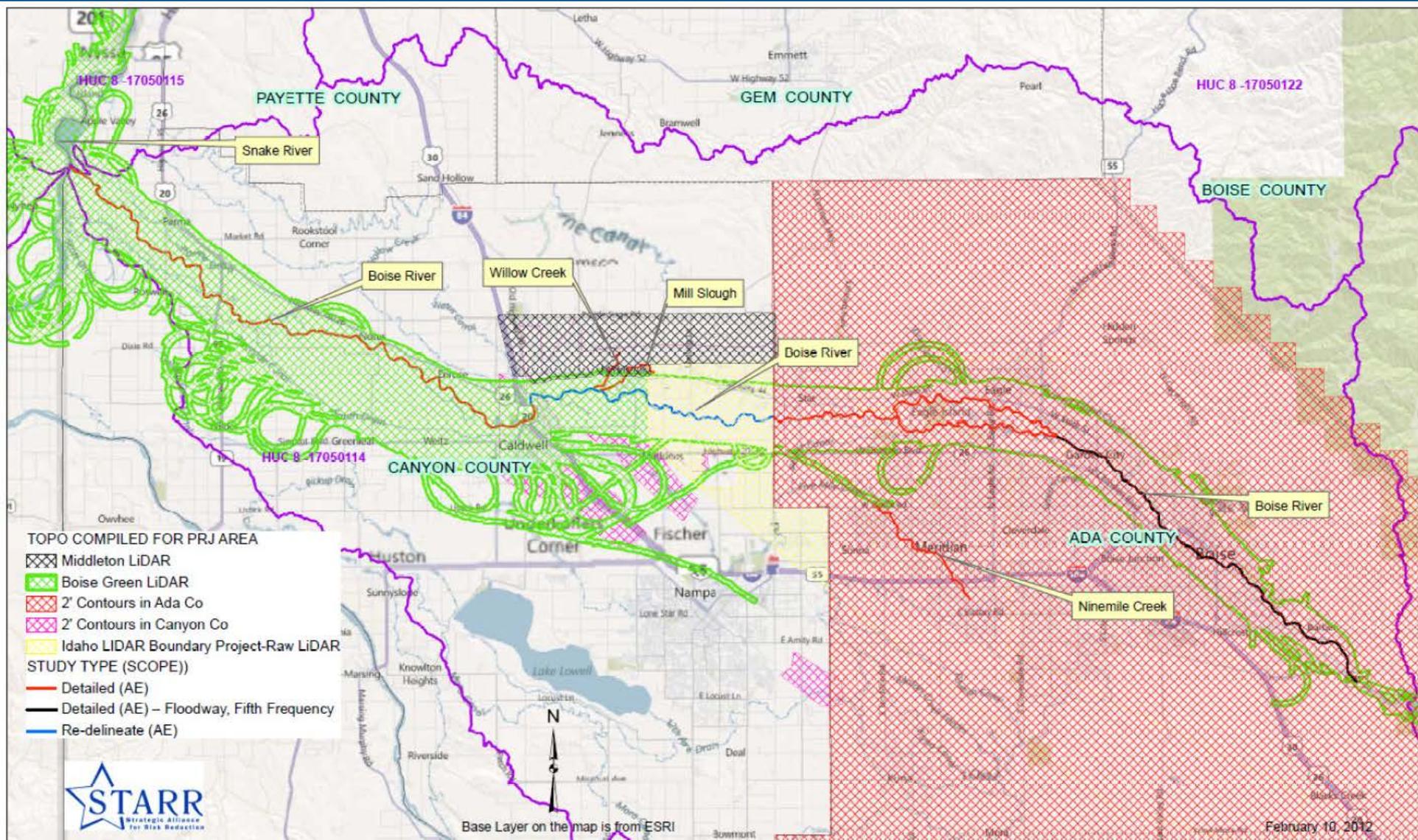


STARR SCOPE OF WORK

- Topographic Data
- Redelineation
- QA/QC of USACE work



Topographic Data Available



Topographic Data Issues

Boise Green LiDAR, updated by Tetra Tech – Building foot prints were removed. For channel areas it is considered a supplementary source next to survey. Complete SVA and CVA could not be fully documented

Middleton LiDAR – Acquired in 2011. Meets standards and should be used for mapping in Middleton

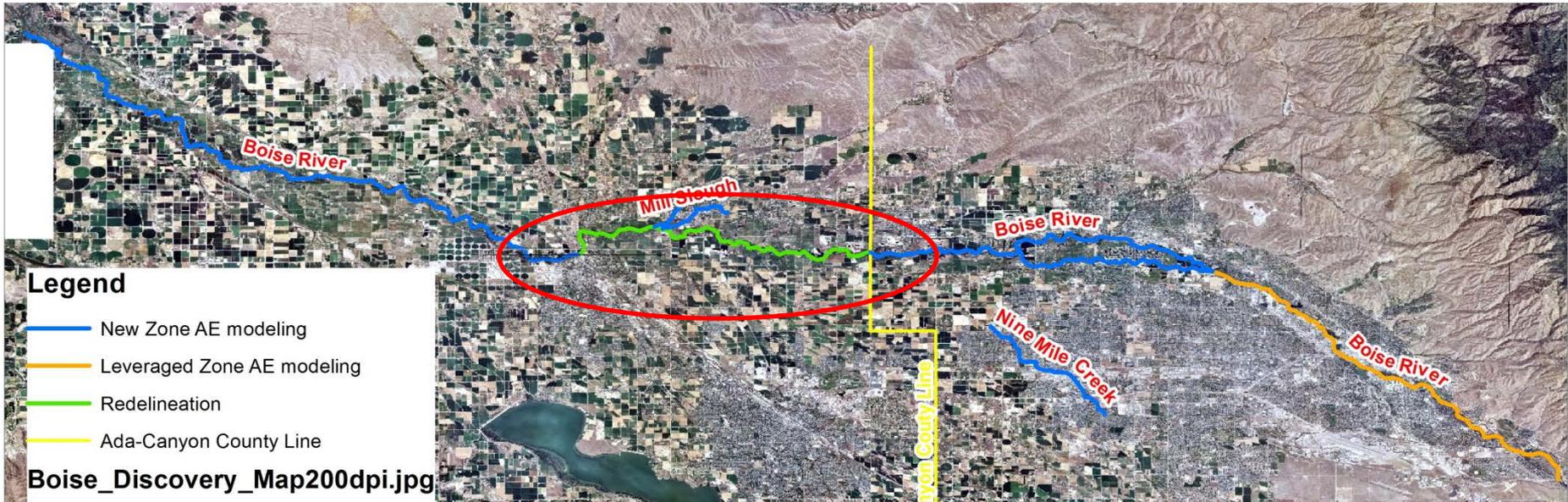
Idaho LiDAR Boundary Project – Acquired in 2003. Non-bare earth points were included. Limited usefulness to the project

Ada County Two Foot Contours – Acquired in 2000. Meets National Map Accuracy Standards at 1" = 100' scale.

Canyon County Two Foot Contours – Acquired in 2004. To be used in as supplementary data along with Boise Green LiDAR.

Redelineation

Reach	Length	Reach Description
Boise River	11.3 Miles	Inline Structure, I-84 to Ada/Canyon County Line



Redelineation Method

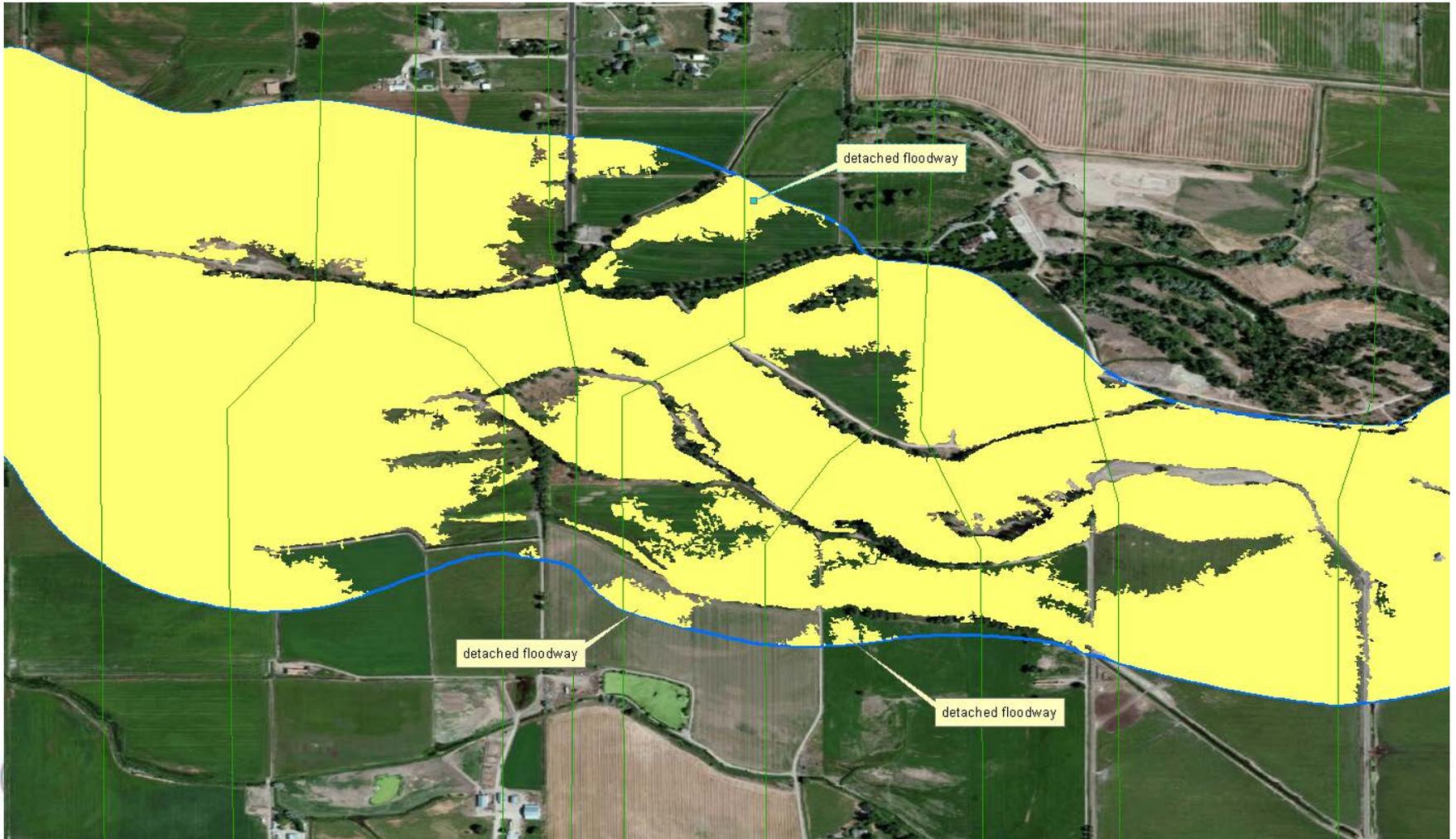
Redelineation is typically performed by mapping the Effective BFEs to best available terrain.

For this project:

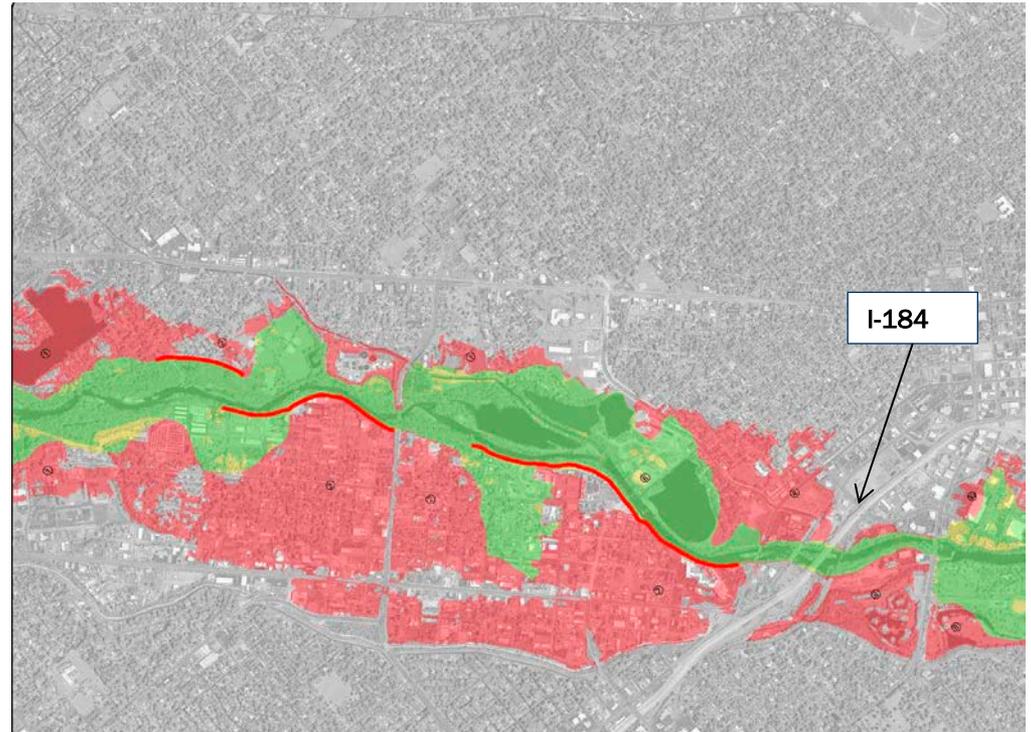
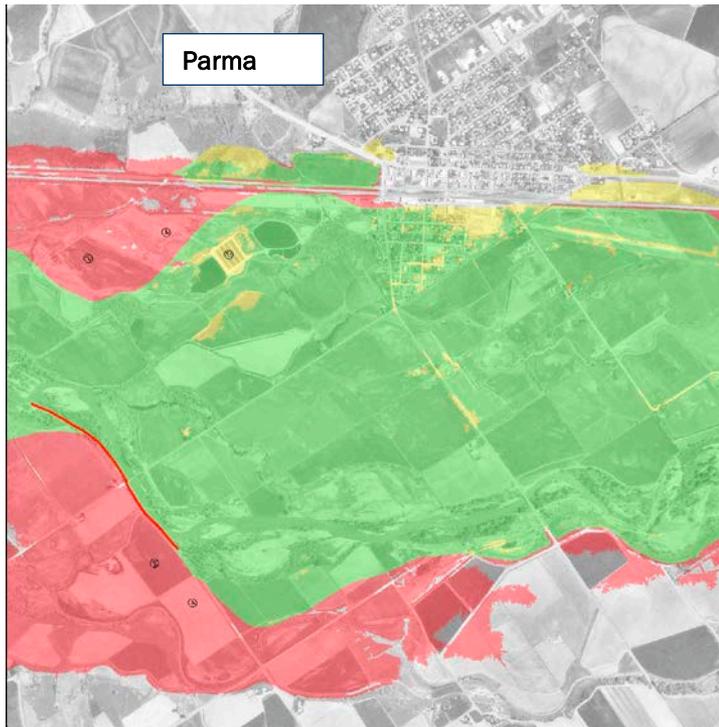
- Instead of Effective BFEs, Water surface elevations from the USACE revised model were used
- Small holes, where the maximum width was less than 0.1-inch on the printed FIRM, were removed.
- The effective maps included some large areas of high ground in the floodplain/floodway. Areas above the new BFEs were not included in the floodplain or floodway.

Redelineation Issues

High Ground in the Floodway causes detached areas



Boise River Levees



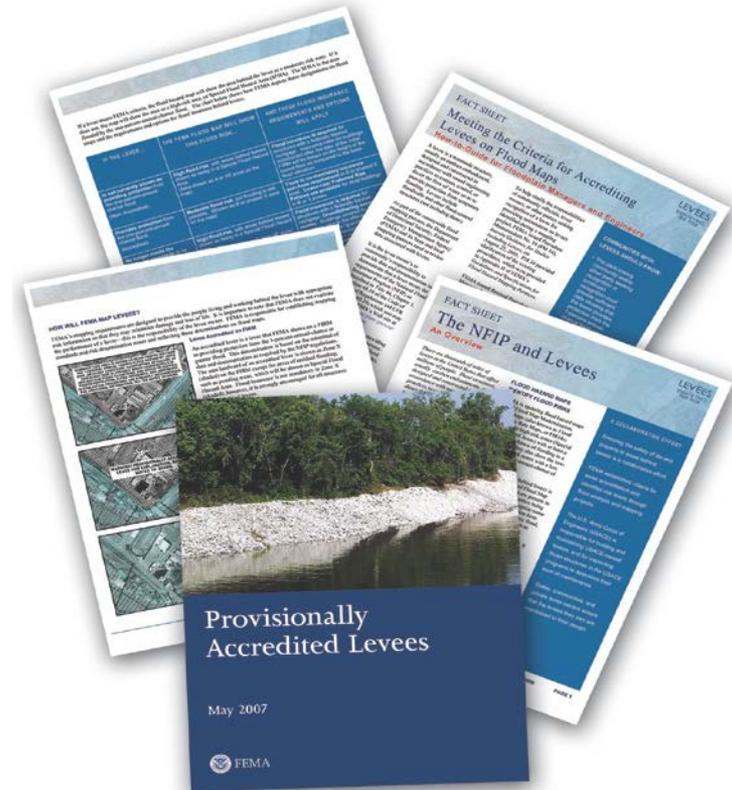
FEMA's Role - Levees

Map levee-related flood risk and “accredits” levees for mapping purposes only.

Accredit levees based on the *certification documentation provided by the community or another interested party.*

FEMA does not own, operate, maintain, inspect, or certify levees or flood control systems.

Produce and/or distribute outreach and communication materials.



Analysis and Mapping of Non-Accredited Levees



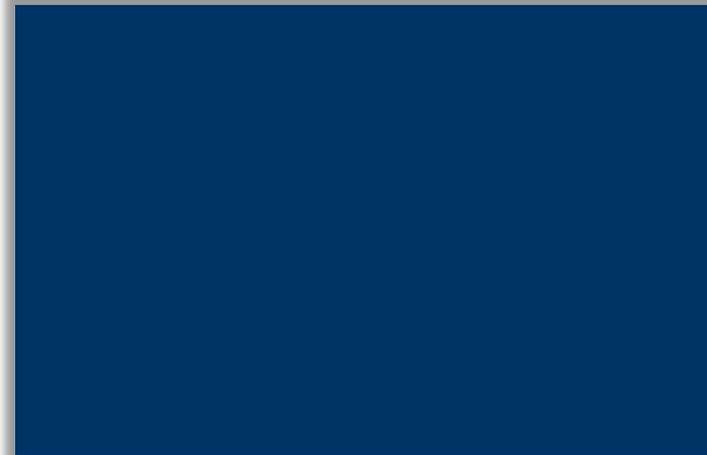
Analysis and Mapping Procedures for Non-Accredited Levee Systems

New Approach

July 2013

RiskMAP
Increasing Resilience Together

www.fema.gov/plan/prevent/fhm/rm_main.shtml - 1-877-FEMA MAP



Operating Guidance 12-13 Non-Accredited Levee Analysis and Mapping Guidance

September 2013



FEMA Levee Status: Accredited vs. Non-Accredited

- ▶ **Accreditation** – FEMA’s process to review and accept certification data and documentation and to update the Flood Insurance Study
- ▶ **To be accredited by FEMA, a levee must meet ALL Section 65.10 requirements, including**
 - General Requirements—65.10(a)
 - Design Criteria—65.10(b)
 - Operation Plans and Criteria—65.10(c)
 - Maintenance Plans and Criteria—65.10(d)
 - Certification Requirements—65.10(e)
- ▶ **Non-accredited levee** – any levee that does not meet certification requirements or the definition of a levee.

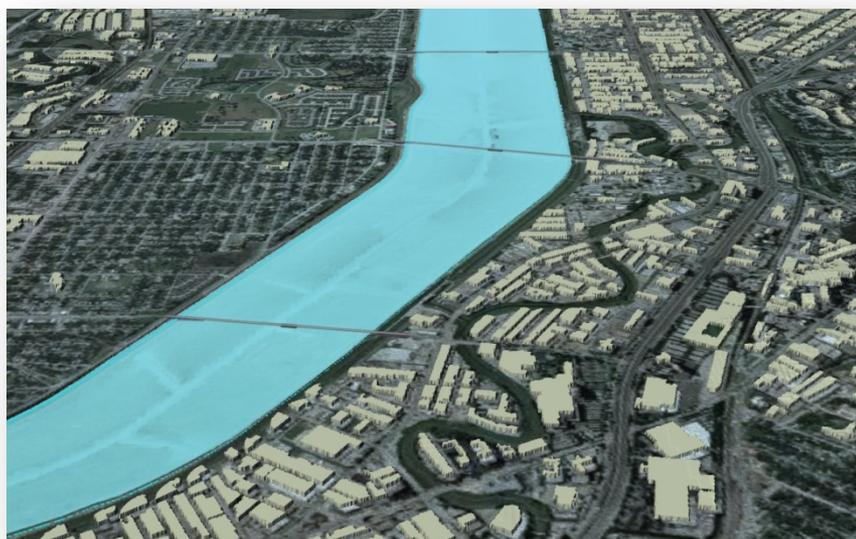
Non-Levee Embankment

- any manmade topographic feature that does not meet the definition of a levee, e.g. highway embankment (**FHWA Policy**) or railroad grade



Old Method - *Mapping Flood Hazards*

- Complete certification of system submitted to FEMA
- Mapped as contained within levee system boundaries



- Certification submittal *not received* or *incomplete*
- Traditionally mapped as if the levee did not provide a reduction in flood risk



Your role...

Do you agree with the work maps in areas affected by levees?

YES, then we need written request from local elected officials to proceed with the map update.

NO, or you cannot provide written request to proceed, FEMA will further assess eligibility under the new policy based on available data.

Eligibility requirements:

1. Responsive owner
2. Design intent
3. Operation and Maintenance Plans
4. Hydraulically significant

If eligible, then FEMA secludes the area affected by the levee for this map update and starts planning for a future update to apply the new procedures.

Seclusion



ATTENTION: The levee, dike, or other structure inside this boundary does not comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure. The flood hazard data shown inside this boundary (which have been re-published from the May 5, 2004 FIRM for the City of Floodville), should continue to be used until this FIRM panel is revised to update the flood hazard information in this area.

FIRM note for seclusion area

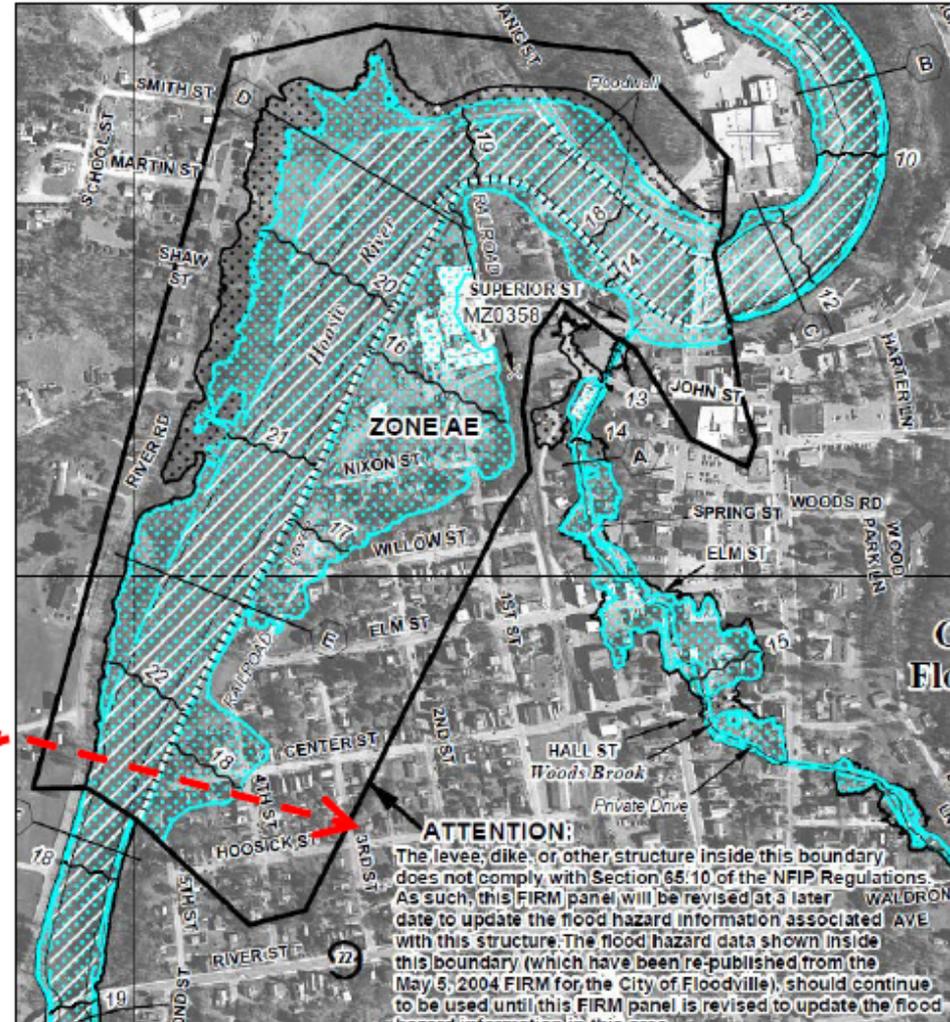


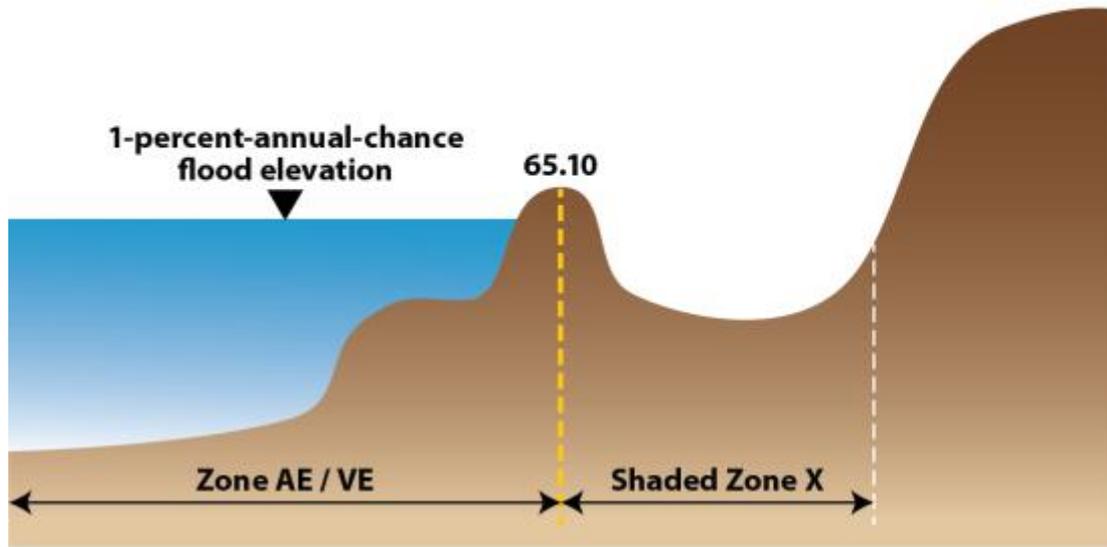
Figure 1 - Fencing off effective levee-based flood hazard data

What's New?

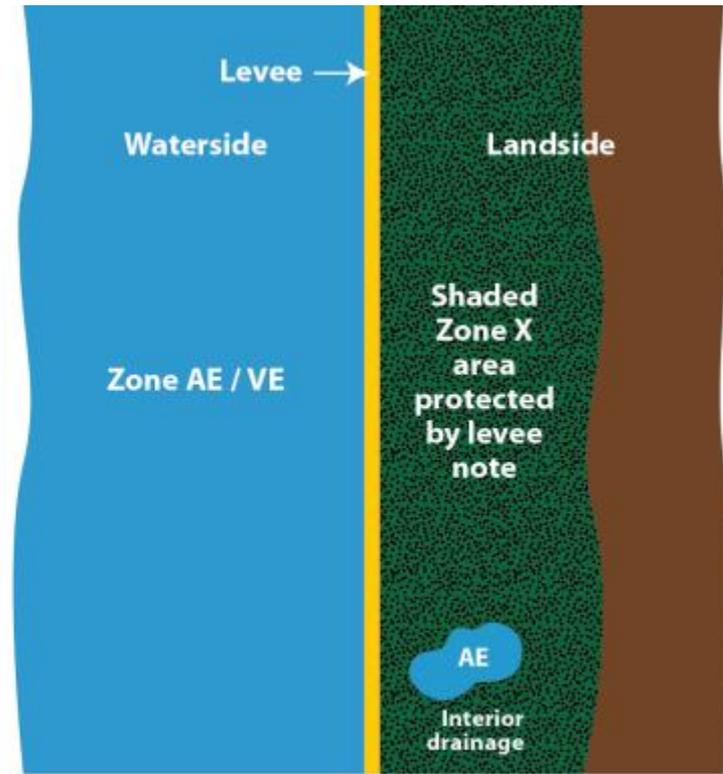
- ▶ **Interactive stakeholder engagement** throughout the analysis and mapping process:
 - FEMA will engage community officials and decision makers in a collaborative discussion
- ▶ A **suite of analysis and mapping procedures** of the hazard associated with levees will be reviewed with the interested parties
 - Intention is to recognize of the uncertainty associated with hazard identification behind levees.
 - New Development – Allows communities to **split a levee system into distinct reaches** that are analyzed based on the attributes of the specific reach.

Accredited System

- ▶ Criteria: **Entire** Levee System or Flood Control Structure meets (or exceeds) 44 CFR 65.10 Criteria
- ▶ Mapping Approach: Mapping as Fully Accredited; Natural Valley Floodplain Analysis to Map Shaded Zone X and Levee Protection Note

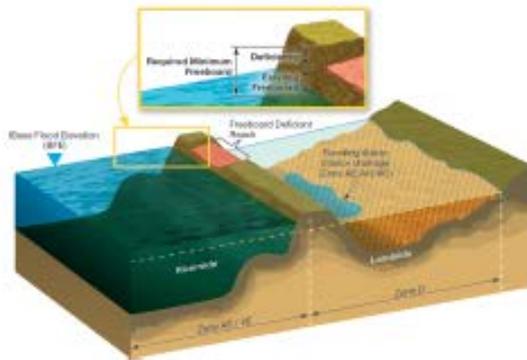


CROSS SECTION VIEW

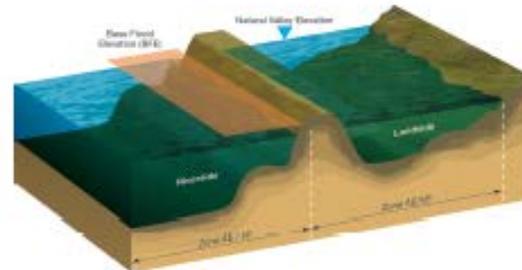


PLAN VIEW

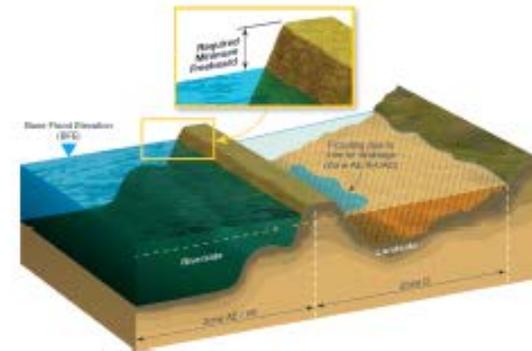
Non-Accredited Levee Flood Hazards



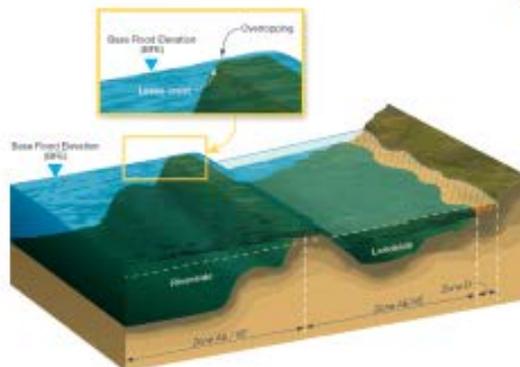
Freeboard Deficient Procedure



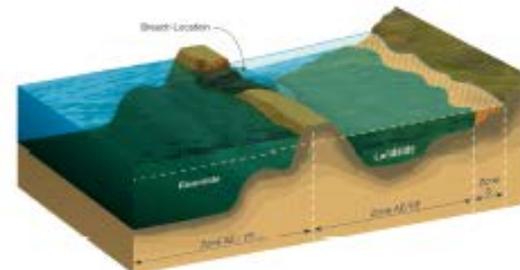
Natural Valley Procedure



Sound Reach Procedure



Overtopping Procedure



Structural-Based Inundation Procedure

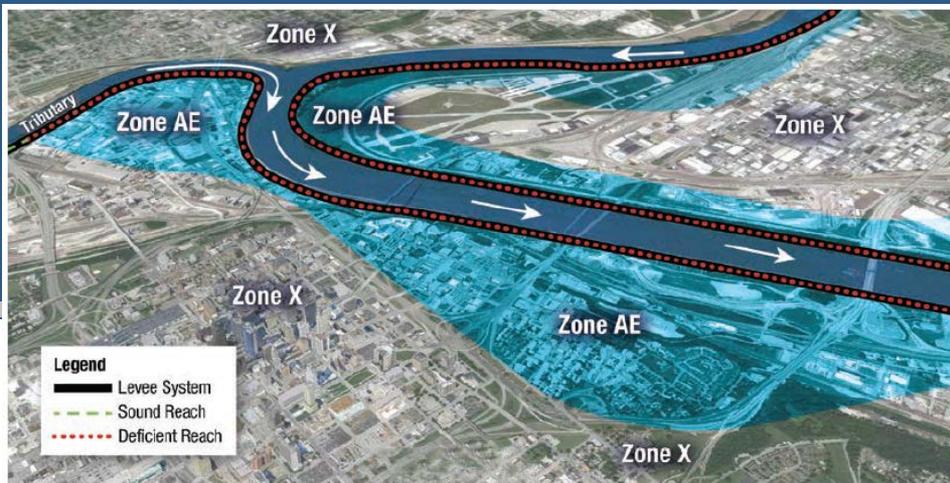


Figure 2: Example of an area mapped using the *Natural Valley* procedure



Figure 2: Mapped flood zones behind a Sound Reach



Figure 2: A levee reach mapped using the *Overtopping* procedure



Figure 2: Example of mapped flood zones behind structural breach areas



Figure 2: Example of new Zone D flood hazard areas behind a freeboard deficient reach

Feedback Needed

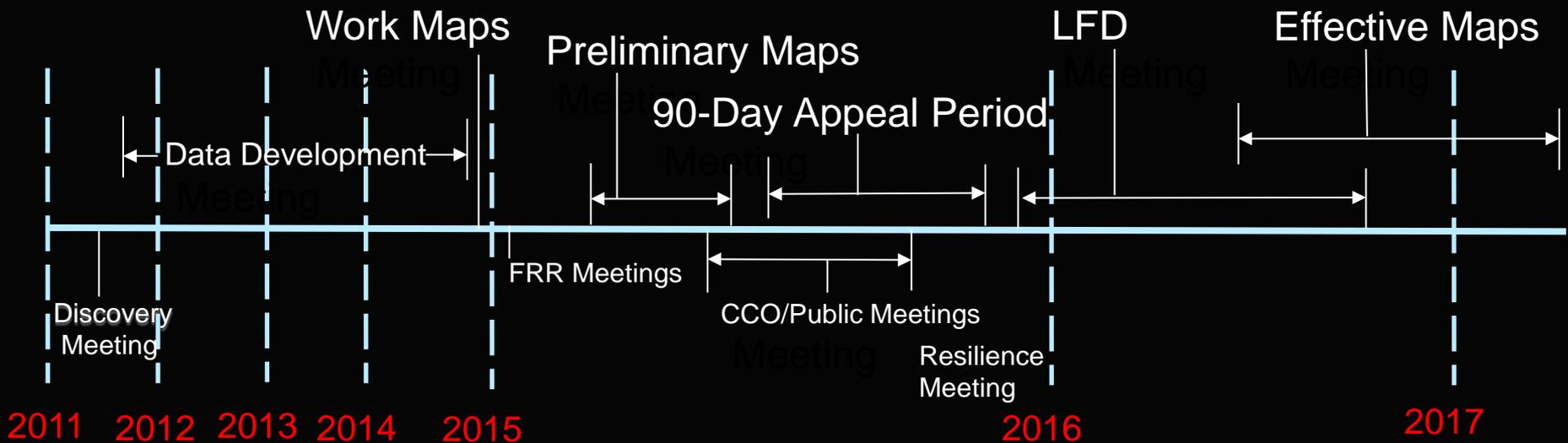
Within 30 days, notify us on the following:

- 1. Are you in agreement with the work maps in the leveed areas?
- 1a. If yes, will you provide written request to proceed with the map update?
- 1b. If no, provide feedback/info on the levees (ownership, design reports, operation and maintenance plans and reports, hydraulic significance).
- 2. Do you need more information on the new policy or more time to coordinate internally. How much more time?

Next Milestones*

*Subject to coordination and funding

- ▶ Flood Risk Review Meeting for Community Staff**January 14th/15th, 2015**
- ▶ Issue preliminary maps**Spring/Summer, 2015**
- ▶ Coordination and Public Meetings.....**approximately 1-2 months after issuance of preliminaries [Summer/Fall 2015]**
- ▶ 90-Day Appeal Period.....**starts shortly after the public meeting**
- ▶ FEMA issues Letter of Final Determination (LFD)**3-6 months following the end of the appeal period depending on comments and appeals received [between late 2015 and Fall 2016]**
- ▶ Effective date**6 months after LFD [between Mid 2016 and Spring 2017]**



Next Steps ...Your roles

- ▶ **Review Draft Flood Hazard Products**
 - Provide comments
 - Attend upcoming meetings
- ▶ **Attend the CCO Meeting and Coordinate a Public Meeting as desired**
 - Provide comments
 - Proactive outreach
- ▶ **Be aware of the appeal period**
 - Appeals must go through the community
- ▶ **Attend the Resilience Meeting**
- ▶ **Ordinance Adoption**

Review Comments

Review of Draft Flood Hazard Products

- Submit comments by February 17, 2015
- Send to:

Tracy Schwarz

Tracy.Schwarz@usace.army.mil

509-527-7522

Letters of Map Change (LOMC) (ways to appeal at any time)

- ▶ **LOMA** - for property owners who believe a property was incorrectly included in a SFHA. An elevation certificate supports a LOMA, but by itself, does not remove the insurance requirement.
- ▶ **LOMR** – removes land that has been graded or filled (physical changes) since the date of the map. A LOMR can waive flood insurance requirements.
- ▶ [\(LOMA\) Hotline - 1-877-FEMA-MAP](https://www.fema.gov/loca-hotline)

Contacts

FEMA:		
Regional Engineer:	David Ratté	(425) 487-4657
Risk Analyst/GIS Specialist:	Amanda Siok	(425) 487-4626
Mitigation Planner:	Brett Holt	(425) 487-4553
USACE:		
Floodplain Management:	Tracy Schwarz	(509) 527-7522
STARR:		
Project Manager:	Ferrin Affleck	(702) 551-0289
State of Idaho:		
Floodplain Coordinator:	Keri Sigman	(208) 287-4928
RiskMap Coordinator:	Ryan McDaniel	(208) 258-6593
Region X Service Center:	http://www.starr-team.com/	
Flood Insurance Information:	www.floodsmart.gov	



Questions, Answers, and Discussion

Hydrology Results

Optional Slide for Discussion

