

Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?

Community Rating System



OMB No. 1660-0022
Expires: March 31, 2020

National Flood Insurance Program
Community Rating System

Coordinator's Manual

FIA-15/2017



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TABLE 3. COMMUNITY RATING SYSTEM ELIGIBLE COMMUNITIES
EFFECTIVE MAY 1, 2018 (continued)

| STATE | COMMUNITY NUMBER | COMMUNITY NAME | CRS ENTRY DATE | CURRENT EFFECTIVE DATE | CURRENT CLASS | % DISCOUNT FOR SFHA ¹ | % DISCOUNT FOR NON-SFHA | STATUS ² |
|-------|------------------|---------------------------|----------------|------------------------|---------------|----------------------------------|-------------------------|---------------------|
| WA | 530102 | Lewis County | 10/1/94 | 05/1/14 | 6 | 20 | 10 | C |
| WA | 530316 | Lower Elwha/Klallam Tribe | 10/1/00 | 10/1/16 | 10 | 0 | 0 | R |
| WA | 530331 | Lummi Nation | 05/1/10 | 10/1/14 | 7 | 15 | 5 | C |
| WA | 530169 | Monroe, City of | 10/1/91 | 05/1/06 | 5 | 25 | 10 | C |
| WA | 530158 | Mount Vernon, City of | 05/1/97 | 10/1/12 | 6 | 20 | 10 | C |
| WA | 530085 | North Bend, City of | 10/1/95 | 05/1/17 | 5 | 25 | 10 | C |
| WA | 530143 | Orting, City of | 05/1/08 | 10/1/17 | 6 | 20 | 10 | C |
| WA | 530138 | Pierce County | 10/1/95 | 05/1/12 | 2 | 40 | 10 | C |
| WA | 530087 | Redmond, City of | 05/1/16 | 05/1/16 | 5 | 25 | 10 | C |

| | | | | | | | | |
|----|--------|----------------------|---------|---------|---|----|----|---|
| WV | 540282 | Berkeley County | 10/1/11 | 10/1/11 | 7 | 15 | 5 | C |
| WV | 540199 | Buckhannon, City of | 05/1/07 | 05/1/07 | 8 | 10 | 5 | C |
| WV | 540073 | Charleston, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WV | 540226 | Hampshire County | 10/1/13 | 10/1/13 | 8 | 10 | 5 | C |
| WV | 540065 | Jefferson County | 10/1/06 | 10/1/17 | 6 | 20 | 10 | C |
| WV | 540006 | Martinsburg, City of | 05/1/16 | 05/1/16 | 8 | 10 | 5 | C |
| WV | 540144 | Morgan County | 10/1/13 | 10/1/13 | 9 | 5 | 5 | C |
| WV | 540194 | Parsons, City of | 05/1/16 | 05/1/16 | 8 | 10 | 5 | C |
| WV | 540004 | Philippi, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WV | 540164 | Putnam County | 10/1/13 | 10/1/13 | 8 | 10 | 5 | C |

| | | | | | | | | |
|----|--------|-----------------------|---------|---------|---|----|---|---|
| WI | 550523 | Kenosha County | 10/1/11 | 10/1/11 | 7 | 15 | 5 | C |
| WI | 555862 | La Crosse, City of | 05/1/07 | 05/1/07 | 8 | 10 | 5 | C |
| WI | 550085 | Mazomanie, Village of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550487 | New Berlin, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550310 | Ozaukee County | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550402 | Reedsburg, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550660 | Suamico, Village of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550107 | Watertown, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |
| WI | 550108 | Waupun, City of | 10/1/11 | 10/1/11 | 9 | 5 | 5 | C |

1. For the purpose of determining CRS discounts, a
2. Status: C = Current, R = Rescinded.

Recommended for
October 1, 2018:
Fayette County, WV
Greenbrier County, WV
Kanawha County, WV

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Application CRS Coord. 2ndPOC Activity Points Chronology Comments What If GIA

Community: KANAWHA COUNTY * State: WEST VIRGINIA
 County: KANAWHA COUNTY ▼ CID: 540070

Current CRS Class = 10

[\[Printable Version\]](#)

| | | TOTAL | SFHA * | X-STD/AR/A99 ** | PRP *** |
|-----------------|---------------|-------------|-------------|-----------------|----------|
| PIF | | 1,657 | 1,299 | 95 | 263 |
| PREMIUM | | \$1,497,495 | \$1,294,885 | \$104,779 | \$97,831 |
| AVERAGE PREMIUM | | \$904 | \$997 | \$1,103 | \$372 |
| CRS Class | | | | | |
| 09 | Per Policy | \$42 | \$50 | \$55 | \$0 |
| | Per Community | \$69,984 | \$64,745 | \$5,239 | \$0 |
| 08 | Per Policy | \$81 | \$100 | \$55 | \$0 |
| | Per Community | \$134,727 | \$129,488 | \$5,239 | \$0 |
| 07 | Per Policy | \$120 | \$150 | \$55 | \$0 |
| | Per Community | \$199,472 | \$194,233 | \$5,239 | \$0 |
| 06 | Per Policy | \$163 | \$199 | \$110 | \$0 |
| | Per Community | \$269,454 | \$258,976 | \$10,478 | \$0 |
| 05 | Per Policy | \$202 | \$249 | \$110 | \$0 |
| | Per Community | \$334,199 | \$323,721 | \$10,478 | \$0 |
| 04 | Per Policy | \$241 | \$299 | \$110 | \$0 |
| | Per Community | \$398,943 | \$388,465 | \$10,478 | \$0 |
| 03 | Per Policy | \$280 | \$349 | \$110 | \$0 |
| | Per Community | \$463,687 | \$453,209 | \$10,478 | \$0 |
| 02 | Per Policy | \$319 | \$399 | \$110 | \$0 |
| | Per Community | \$528,431 | \$517,953 | \$10,478 | \$0 |
| 01 | Per Policy | \$358 | \$449 | \$110 | \$0 |
| | Per Community | \$593,176 | \$582,698 | \$10,478 | \$0 |



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| | | | |
|---|--|--|-----|
| Community: <u>Greenbrier County, West Virginia</u> CID: <u>540040</u> | | | |
| 1. Number of buildings affected by map revisions since last report (+ or -) | | | |
| 5. Number of buildings affected by corporate limits changes (+ or -) | | | |
| 6. Current total number of buildings in the SFHA (bSF) (total lines 1-5) | | | 985 |
| 4. Number of buildings affected by map revisions since last report (+ or -) | | | |

| | | | |
|--|--|--------------------------------------|-----------|
| 12. Acreage of area(s) affected by corporate limits changes (+ or -) | | | |
| 13. Current acreage of the SFHA (aSFHA) (total lines 10-12) | | | 18,652.00 |
| 14. Primary source for building data: <i>WV GIS Technical Center</i> | | | |
| 15. Primary source for area data: <i>WV GIS Technical Center</i> | | | |
| 16. Period covered: <i>As of 5/21/18</i> | | Current FIRM date: <i>10/16/2012</i> | |

| | | | |
|--|-----------|--------------------------------------|--|
| 13. Current acreage of the SFHA (aSFHA) (total lines 10-12) | 18,652.00 | | |
| 14. Primary source for building data: <i>WV GIS Technical Center</i> | | | |
| 15. Primary source for area data: <i>WV GIS Technical Center</i> | | | |
| 16. Period covered: <i>As of 5/21/18</i> | | Current FIRM date: <i>10/16/2012</i> | |
| If available, the following data would be useful: | | | |
| 17. Number of new manufactured homes installed since last report | | | |
| 18. Number of other new 1-4 family buildings constructed since last report | | | |
| 19. Number of all other buildings constructed/installed since last report | | | |



Comments: (Please note the number of the line to which the comment refers.)

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Credit is assigned for providing inquirers information from the community's Flood Insurance Rate Map.

Additional credit for additional map information

320 – Map Information Service



FEMA's National Flood Insurance Program's Community Rating System?

320 MAP INFORMATION SERVICE—Summary

Maximum credit: 90 points

322 Elements

- a. **Basic FIRM information (MI1):** 30 points for providing basic information found on a Flood Insurance Rate Map (FIRM) that is needed to accurately rate a flood insurance policy.
- b. **Additional FIRM information (MI2):** 20 points for providing information that is shown on most FIRMs, such as protected coastal barriers, floodways, or lines demarcating wave action.
- c. **Problems not shown on the FIRM (MI3):** Up to 20 points for providing information about flood problems other than those shown on the FIRM.
- d. **Flood depth data (MI4):** Up to 20 points for providing information about flood depths.
- e. **Special flood-related hazards (MI5):** Up to 20 points for providing information about special flood-related hazards, such as erosion, ice jams, or tsunamis.
- f. **Historical flood information (MI6):** Up to 20 points for providing information about past flooding at or near the site in question.
- g. **Natural floodplain functions (MI7):** Up to 20 points for providing information about areas that should be protected because of their natural floodplain functions.

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321.b Activity Credit Criteria

To receive the credit the community must

- 1) Receive credit for reading the FIRM for inquirers (MI1)
- 2) **Locate a property based on a street address**
- 3) Volunteer the information to the inquirer
- 4) Provide an opportunity to ask questions
- 5) **Respond in a reasonable amount of time**
- 6) Publicize the service at least annually
- 7) **Update the base FIRM at least annually**
- 8) **Keep all earlier FIRMs**
- 9) Keep a record of the service



320 MAP INFORMATION SERVICE—Summary

Maximum credit: 90 points

322 Elements

- a. **Basic FIRM information (MI1):** 30 points for providing basic information found on a Flood Insurance Rate Map (FIRM) that is needed to accurately rate a flood insurance policy.
- b. **Additional FIRM information (MI2):** 20 points for providing information that is shown on most FIRMs, such as protected coastal barriers, floodways, or lines demarcating wave action.
- c. **Problems not shown on the FIRM (MI3):** Up to 20 points for providing information about flood problems other than those shown on the FIRM.
- d. **Flood depth data (MI4):** Up to 20 points for providing information about flood depths.
- e. **Special flood-related hazards (MI5):** Up to 20 points for providing information about special flood-related hazards, such as erosion, ice jams, or tsunamis.
- f. **Historical flood information (MI6):** Up to 20 points for providing information about past flooding at or near the site in question.
- g. **Natural floodplain functions (MI7):** Up to 20 points for providing information about areas that should be protected because of their natural floodplain functions.

MI1 Basic FIRM Information



Credit Criteria

- 1) Meet the activity credit criteria (Section 321.b)
- 2) If requested, provide information from the FIRM needed to write a flood insurance policy
- 3) Provide the information requested
- 4) If too close to call, giving a map is OK
- 5) Only need to provide what's on the FIRM
- 6) If in SFHA, tell about the mandatory purchase requirement

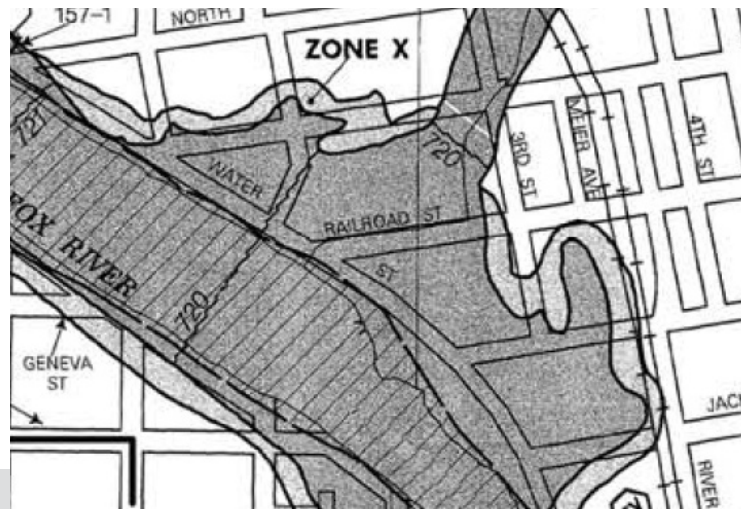
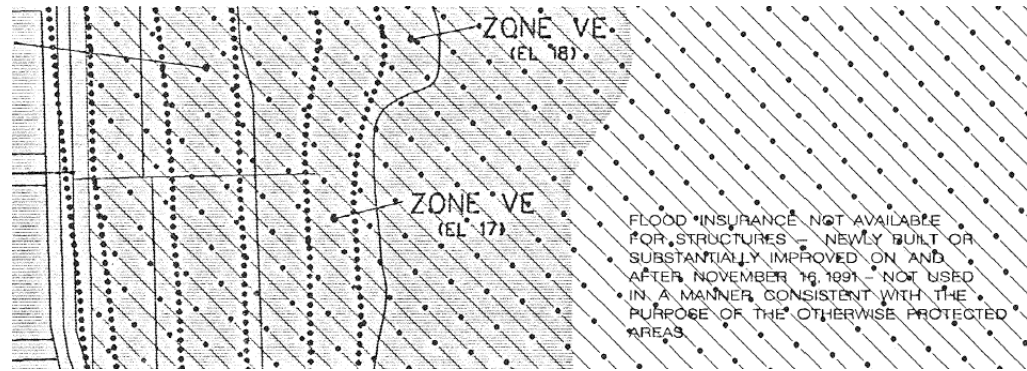
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MI2 Additional FIRM Information

Credit Criteria

- 1) Coastal A Zone or Coastal Barrier Resource System
- 2) LiMWA
- 3) Floodway



MI3 Other problems not on the FIRM

Credit Criteria

Examples:

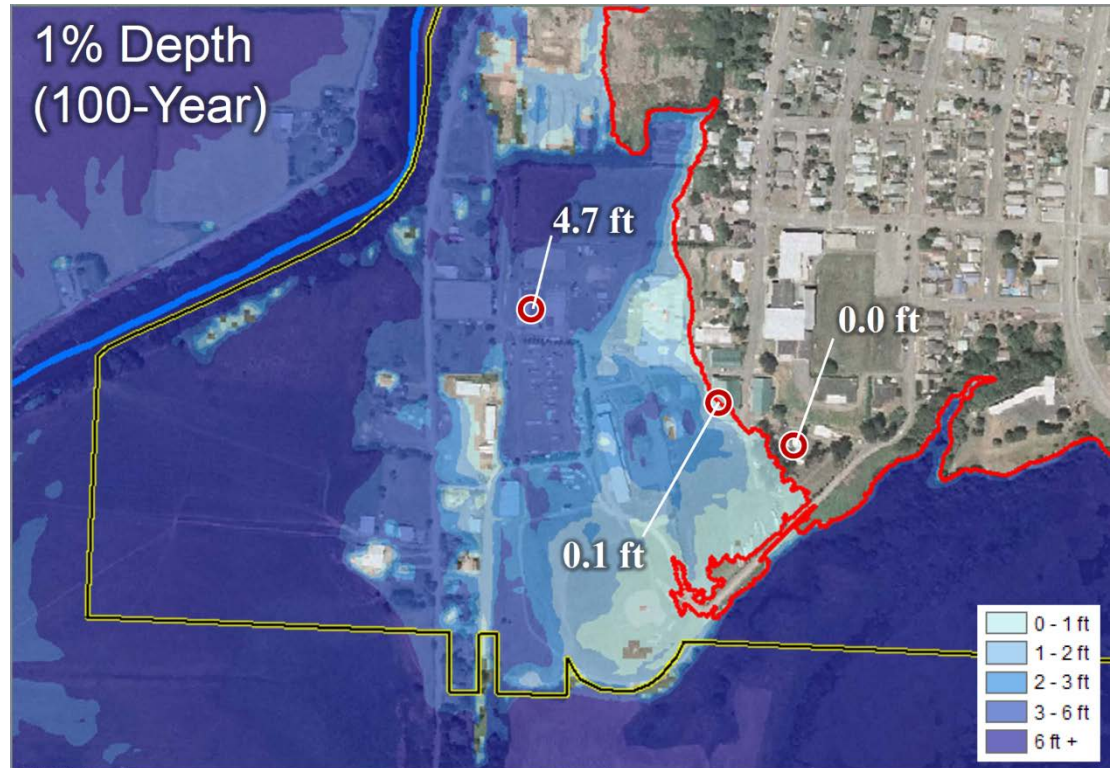
- ✓ Areas predicted to flood in the future
- ✓ Local drainage problems
- ✓ Areas mapped outside the SFHA
- ✓ A levee or dam failure inundation zone



MI4 Flood depth data

Credit Criteria

- 1) Map showing depths
- 2) Flood and ground elevation data

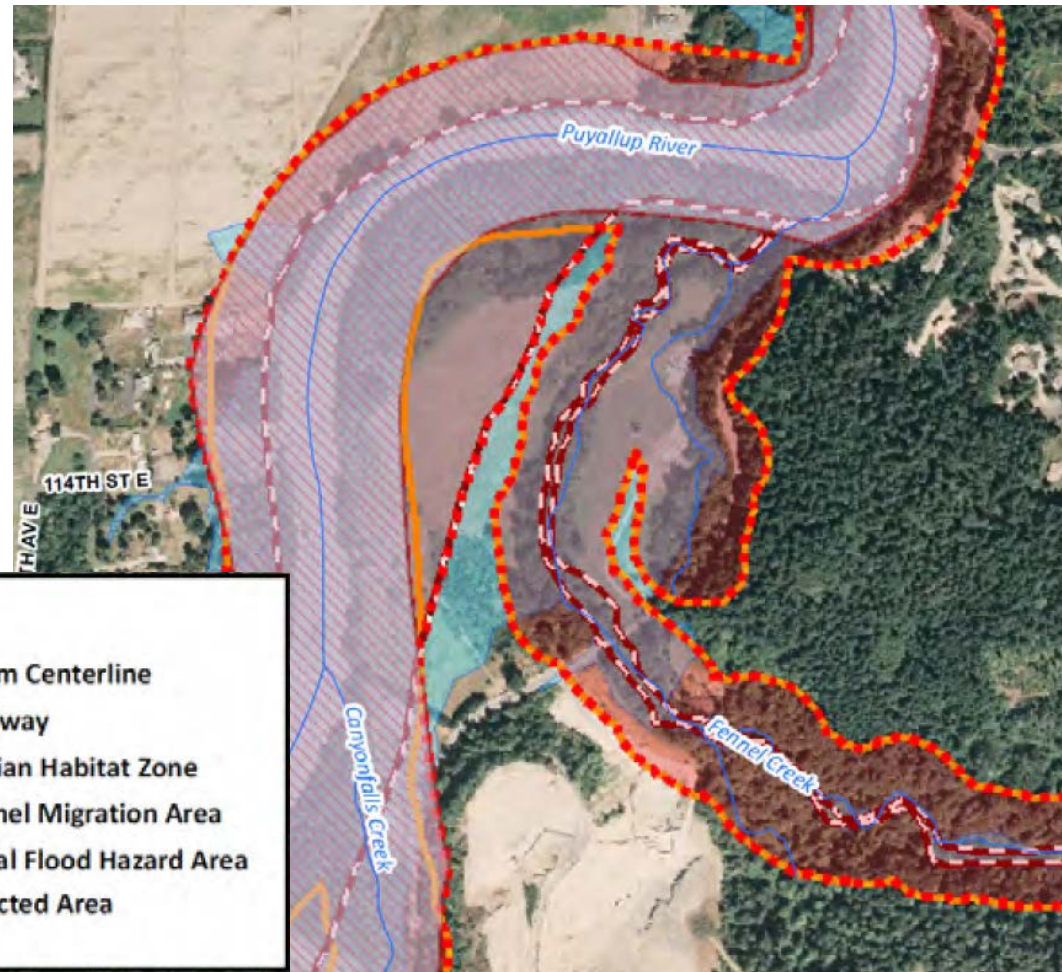


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MI5 Special flood-related hazards

Credit Criteria

- ✓ Uncertain flow path
- ✓ Closed basin lakes
- ✓ Ice jams
- ✓ Land subsidence
- ✓ Mudflow
- ✓ Coastal erosion
- ✓ Tsunami
- ✓ Coastal A Zone



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MI6 Historical flood information

Credit Criteria

Examples:

- ✓ Map
- ✓ High water marks
- ✓ Repetitive loss area
- ✓ Photographs



■ AE Zone (base floodplain shown on the FIRM)

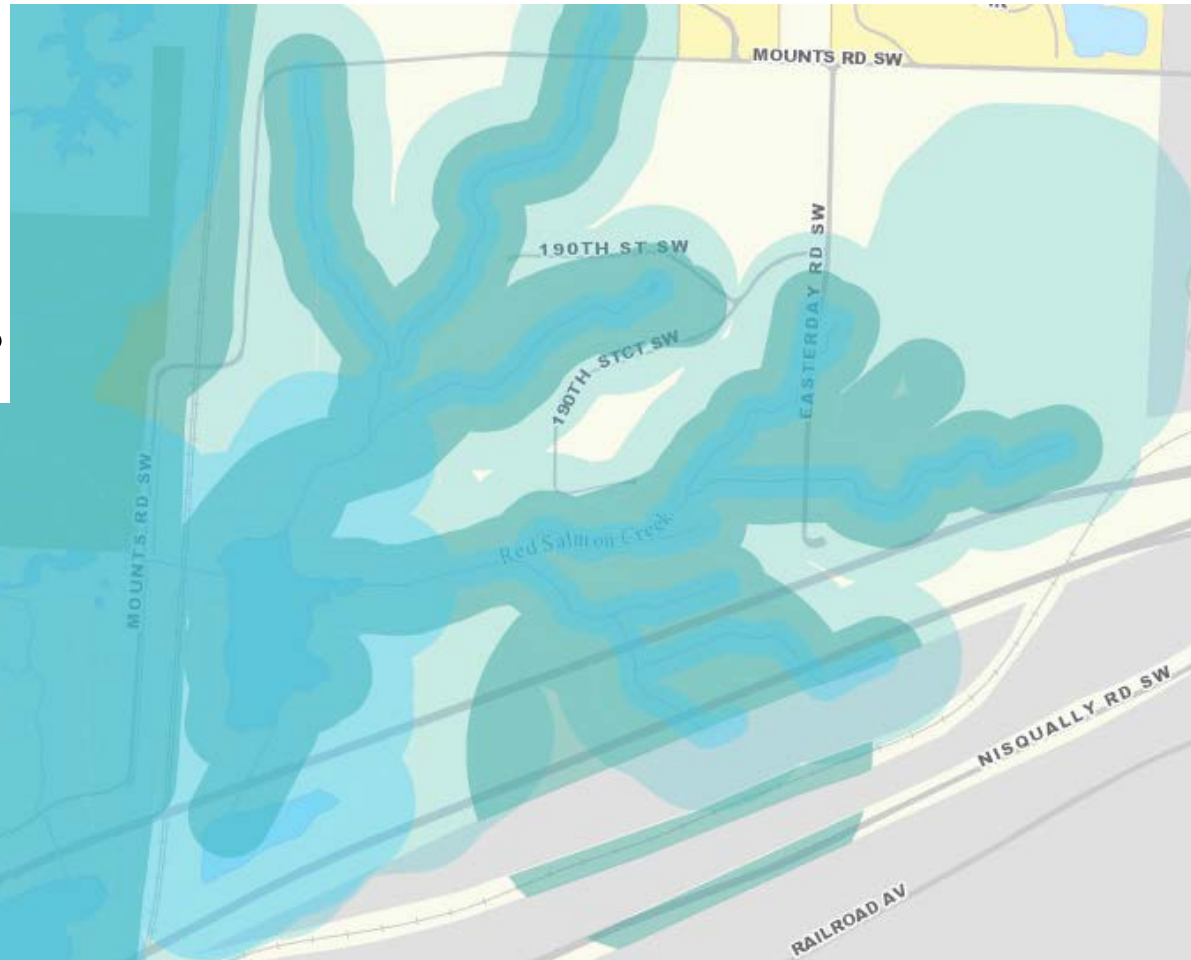
* Property where the 1999 flood was over two feet on the outside wall of the building.

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MI7 Natural floodplain functions

Credit Criteria

- ✓ Wetlands
- ✓ Habitat
- ✓ Conservation plans



Possible Site Constraints - 2 of 9

- Erosion Hazard
- Fish and Wildlife Habitat
- Flood Hazard
- Landslide Hazard
- Mine Hazard Areas
- Mine Hazards, Tunnels, etc
- Potential Wetland Review
- Seismic Hazard
- Volcanic Hazard

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325 Documentation

- 1) Publicity
- 2) How FIRM is kept updated
- 3) Copies of old FIRMs
- 4) Record of the service
- 5) How areas were calculated (for the impact adjustment)
- 6) ~~Agreement with other agency that provides the service~~

The Village Building Department, in Village Hall (349-4887), provides the following:

- Information on whether a property is in a mapped floodplain and related Flood Insurance Rate Map data

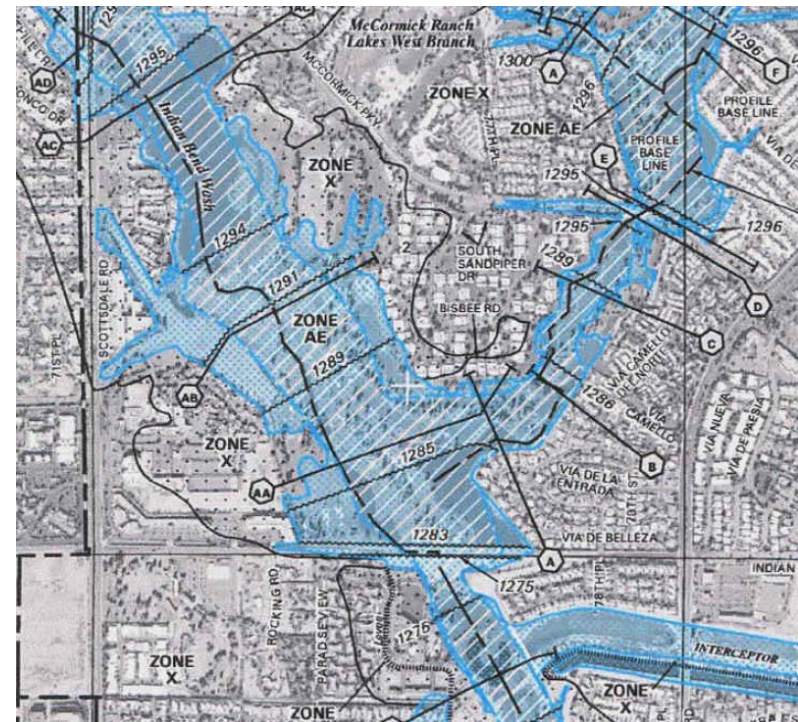
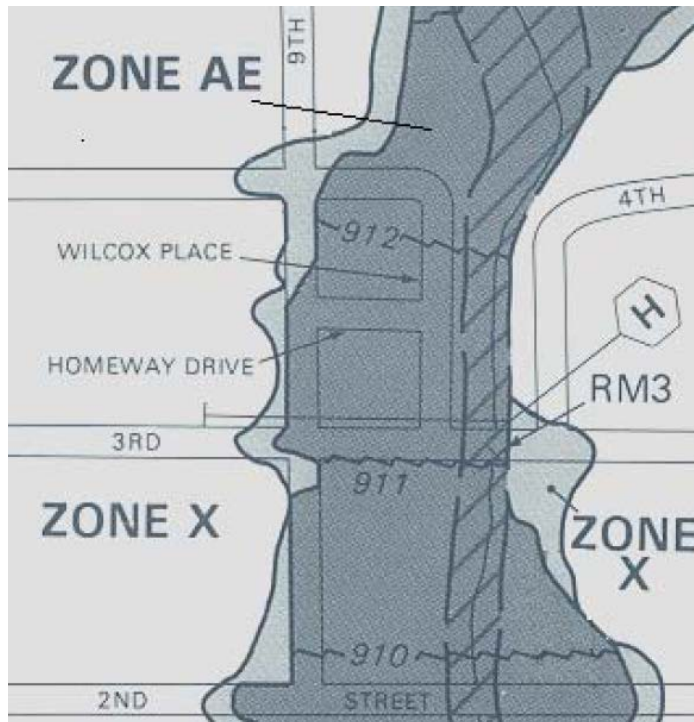
At recertification:

- 1) That year's publicity
- 2) Copy of a record of service

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FEMA's National Flood Insurance Program's Community Rating System?

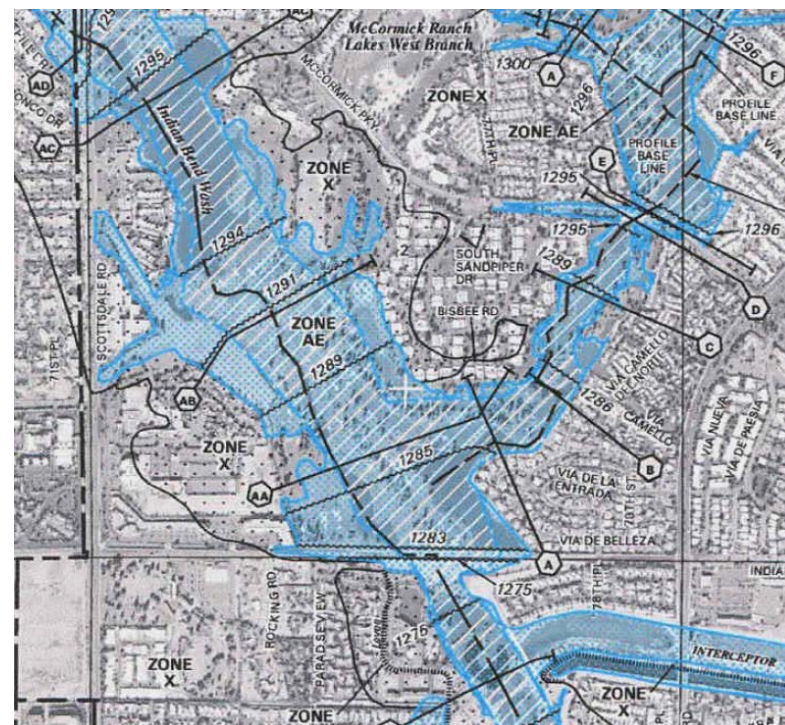
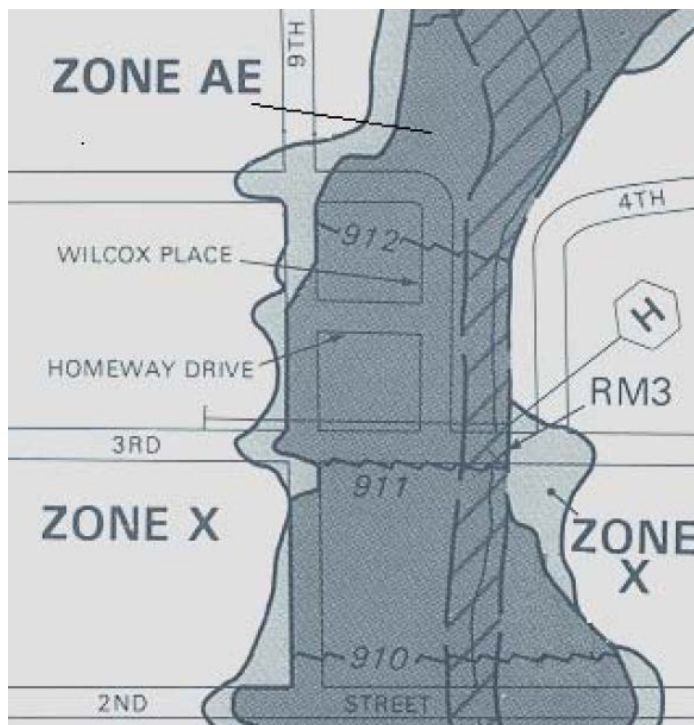
410 Floodplain Mapping



FEMA's National Flood Insurance Program's Community Rating System?

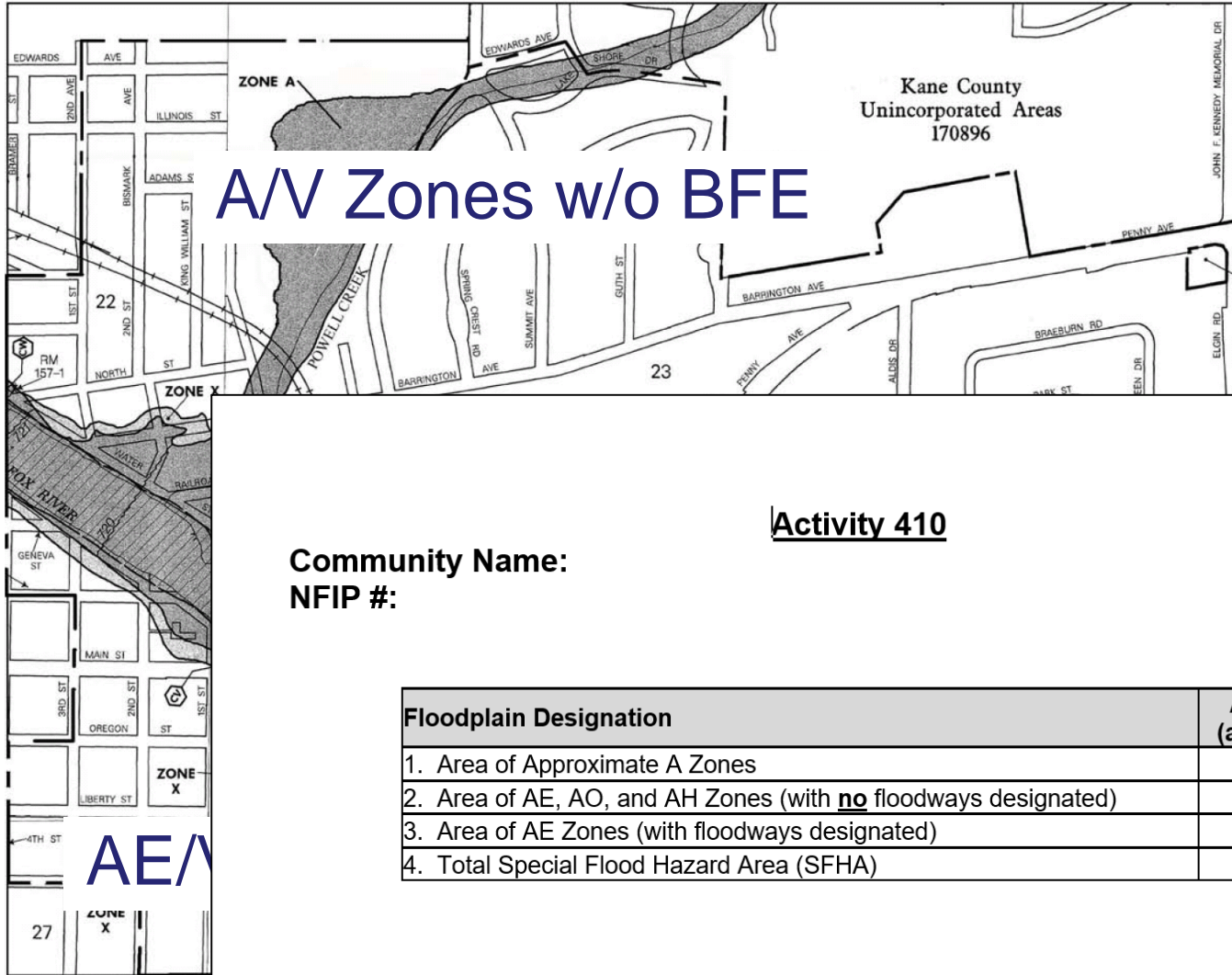
410 Floodplain Mapping

Objective: improve the quality of the mapping used to regulate floodplain development



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Activity 410

Community Name:
NFIP #:

| Floodplain Designation | Area (acres) |
|---|--------------|
| 1. Area of Approximate A Zones | |
| 2. Area of AE, AO, and AH Zones (with no floodways designated) | |
| 3. Area of AE Zones (with floodways designated) | |
| 4. Total Special Flood Hazard Area (SFHA) | |



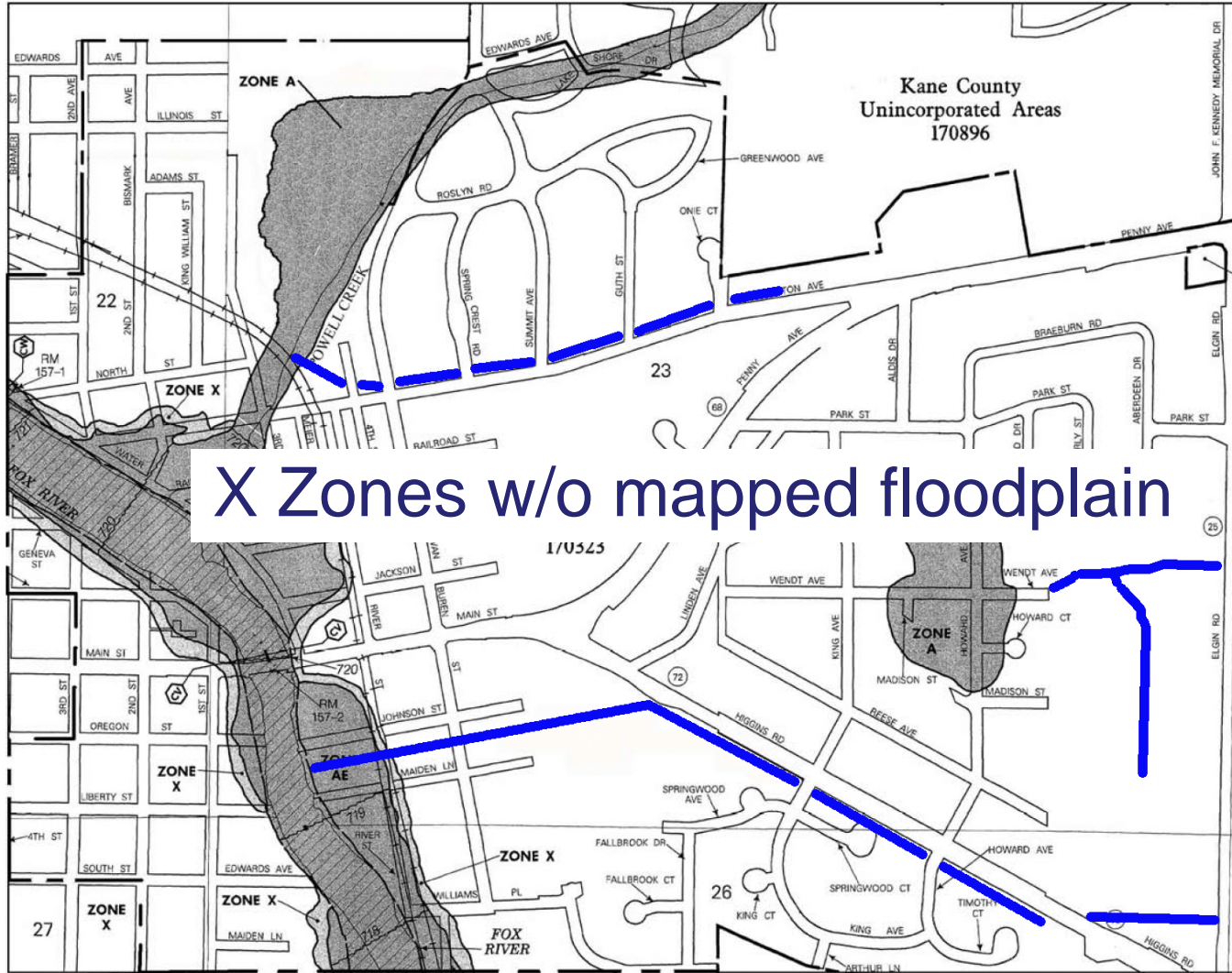
FEMA



NFIP/CRS

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Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?

412.f Mapping for special flood-related hazards (MAPSH)

Uncertain flow paths

Closed basin lakes

Mudflow hazards

Coastal erosion

Ice jams

Land subsidence

Sinkholes



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420 – Open Space Preservation Objectives:

- (1) Prevent flood damage by keeping floodprone lands free of development, and
- (2) Protect and enhance the natural functions of floodplains.



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422.a Open space preservation (OSP)

Credit criteria

- (1) Parcel must be in the regulatory floodplain
SFHA + areas regulated in the X Zone



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“Open space” does not include

- (a) Parcels not counted in the impact adjustment map
(open bodies of water, federal land, etc..)



FEMA's National Flood Insurance Program's Community Rating System?

“Open space” does not include

(b) Areas with impervious surfaces



FEMA's National Flood Insurance Program's Community Rating System?

(3) Parcel must be preserved as “open space”

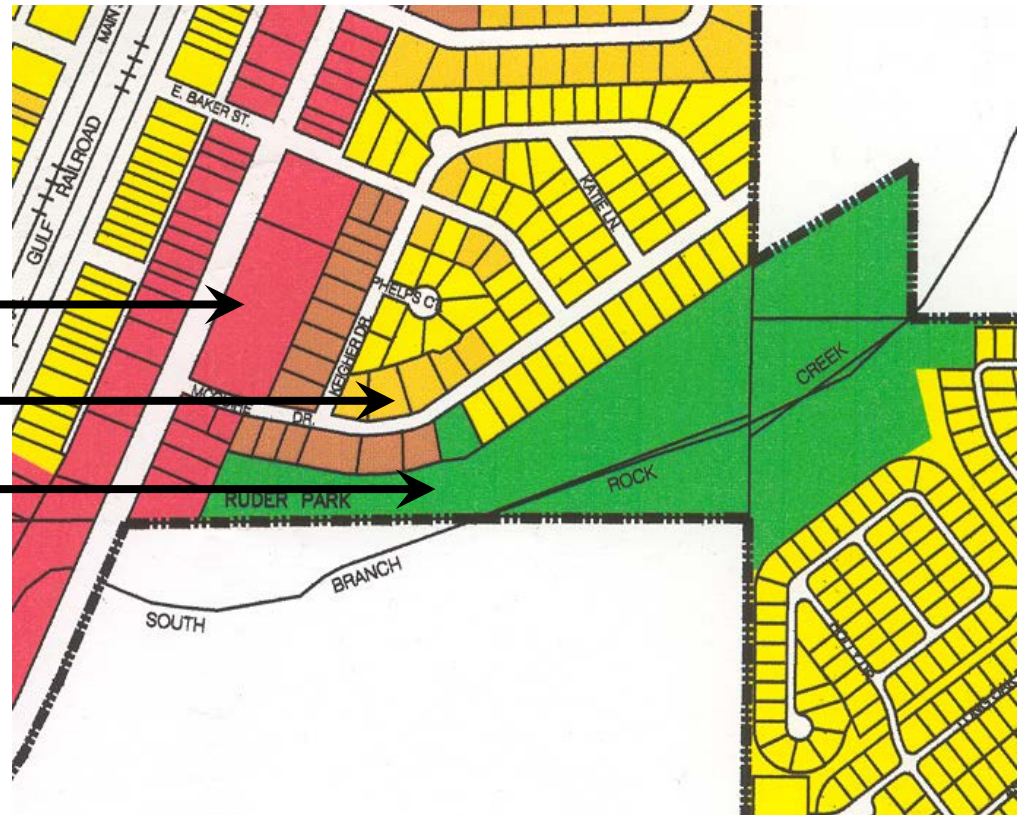
(c) Prohibitory development regulations (no buildings, filling or storage)

Zoning Districts

Commercial

Single Family Res.

Conservation



FEMA's National Flood Insurance Program's Community Rating System?

Credit Points

OSP = 1,450 points, based on the amount of the SFHA that is preserved as open space

Impact Adjustment

OSP credit is adjusted based on the ratio of preserved open space areas in the regulatory floodplain to the area of the SFHA. Section 403 has additional information on impact adjustments for areas. The areas qualifying for OSP need to be marked on an impact adjustment map.

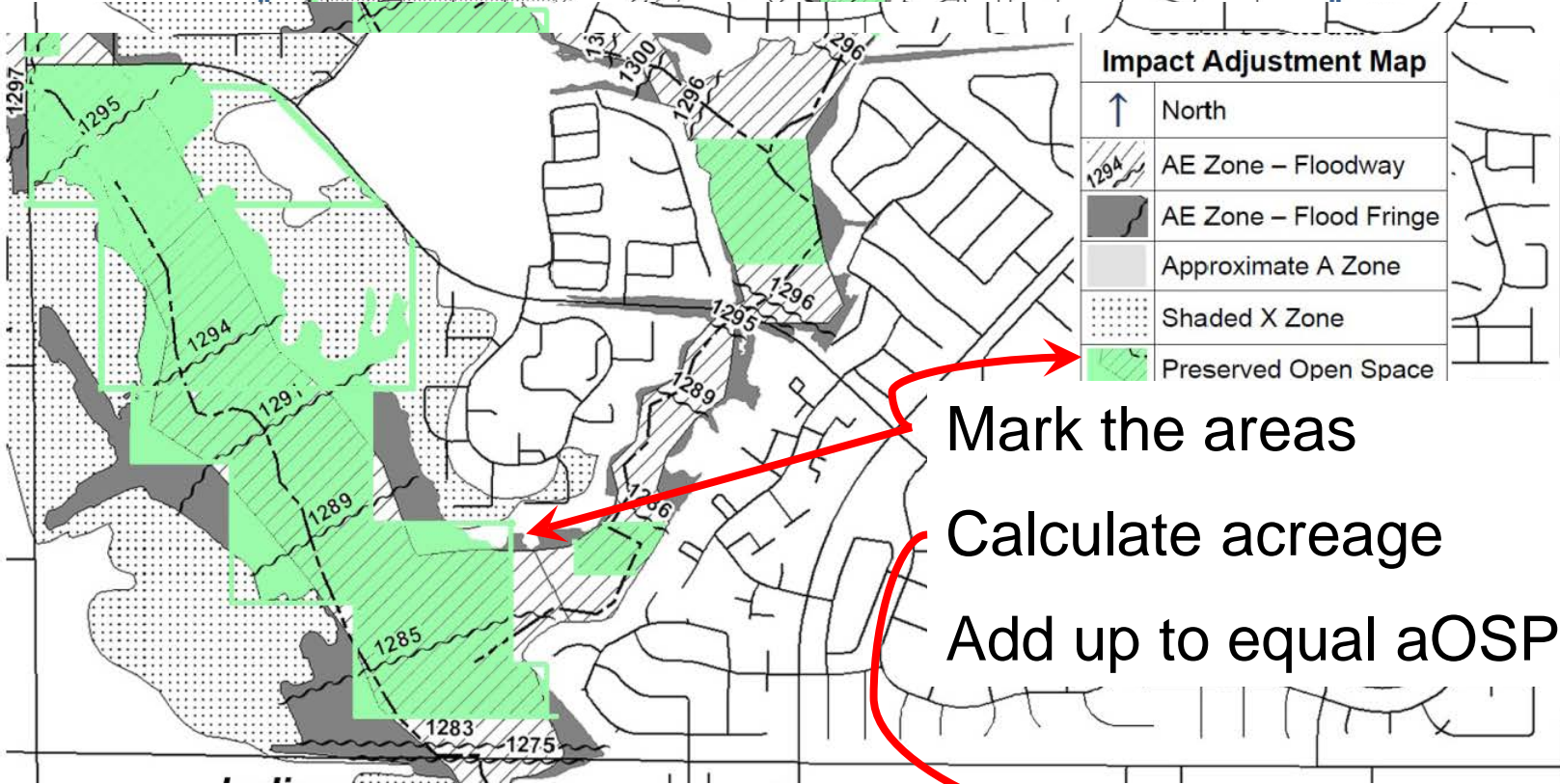
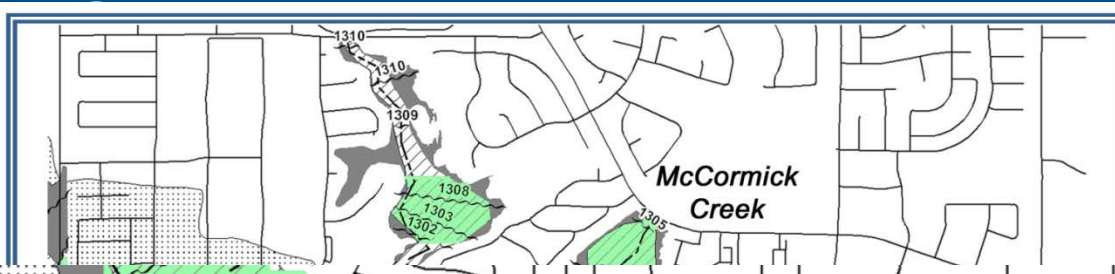
$$rOSP = \frac{aOSP}{aSFHA}, \text{ where}$$

aOSP = the size of the area(s) preserved as open space (OSP) in the regulatory floodplain, and

aSFHA = the size of the community's SFHA shown on its FIRM

Why use

Annual Page 420-9 Program's g System?



Mark the areas

Calculate acreage

Add up to equal aOSP

Preserved Open Spaces

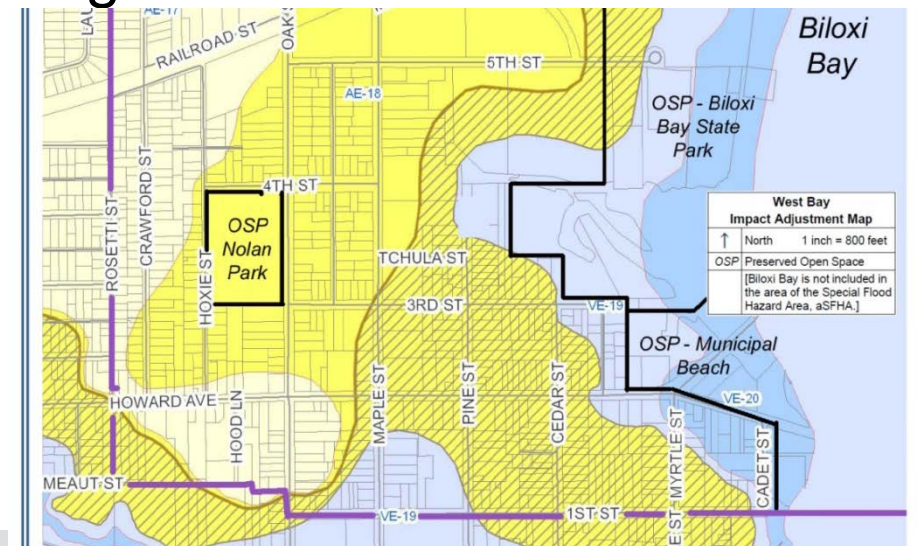
Indian Bend Wash Parks
 South Scottsdale Country Club
 Undeveloped floodway parcels
 Total areas preserved as open space
 Vacant areas subject to incentives

| Credit | Size (acres) |
|------------|--------------|
| OSP | 143.2 |
| OSP, DR | 55.3 |
| OSP | <u>44.4</u> |
| aOSP | 242.9 |
| OSI4, OSI5 | 88.7 |

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Documentation

- (a) Map or list of all parcels to be credited
- (b) Documentation that each parcel will be preserved
- (c) If credit for prohibitory regulations – the regulations
- (d) If outside the SFHA – the regulations for the area
- (e) Impact adjustment map



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422.c Natural functions open space (NFOS)

Open space in its natural state provides more benefits:

- Flood storage
- Reduced sedimentation
- Water quality
- Aquifer recharge
- Richer soils
- Biodiversity
- Habitat



FEMA's National Flood Insurance Program's Community Rating System?

422.c Natural functions open space (NFOS)

Credit criteria:

1. All NFOS(1 – 5)
 - (a) OSP credit
 - (b) NFOS1 is a prerequisite for the others
 - (c) Is managed to stay in its natural state
 - (d) Plot on impact adjustment map



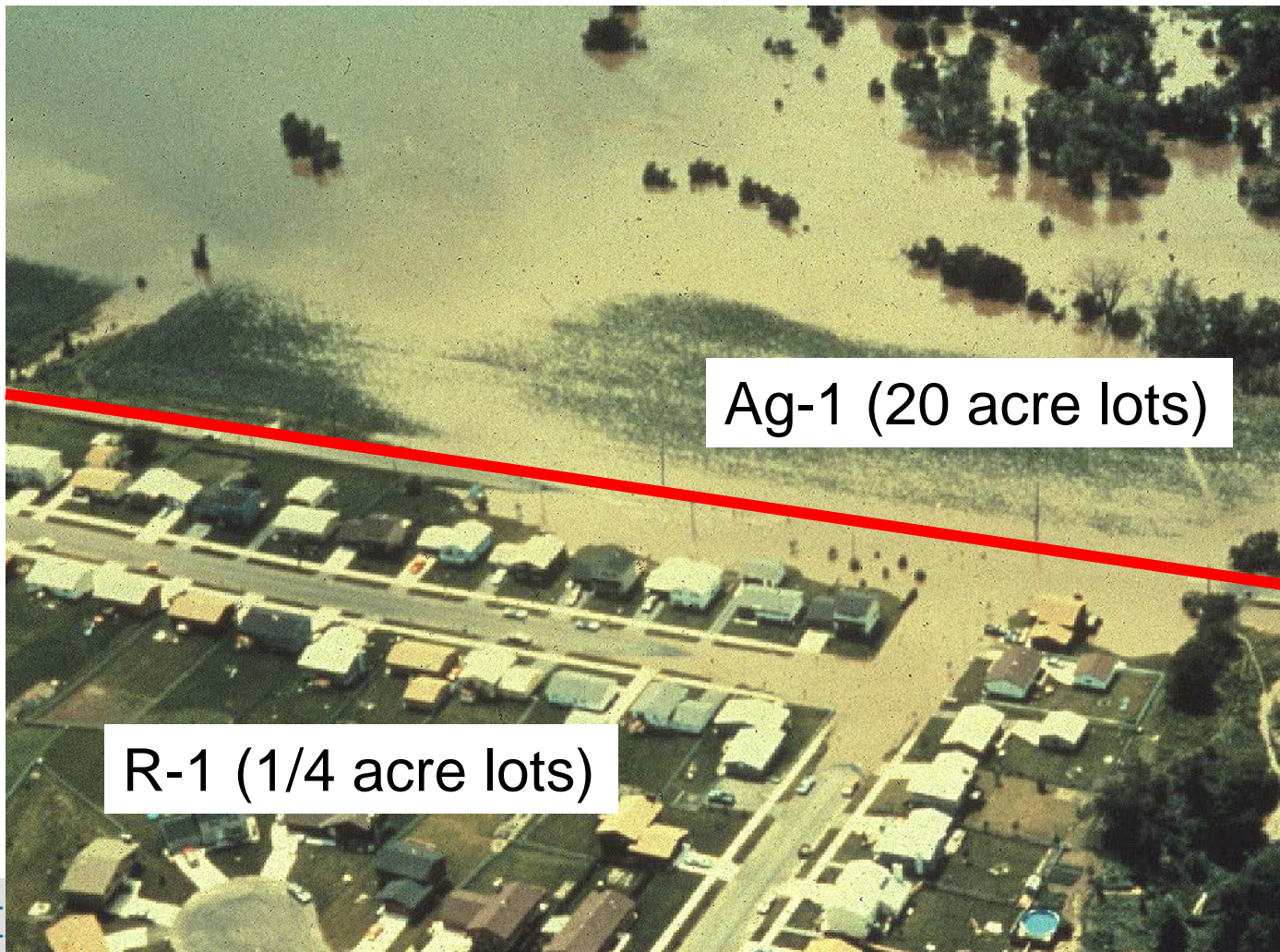
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NFOS4 – Parcel in a designated open space corridor



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422.f Low density zoning (LZ)



Ag-1 (20 acre lots)

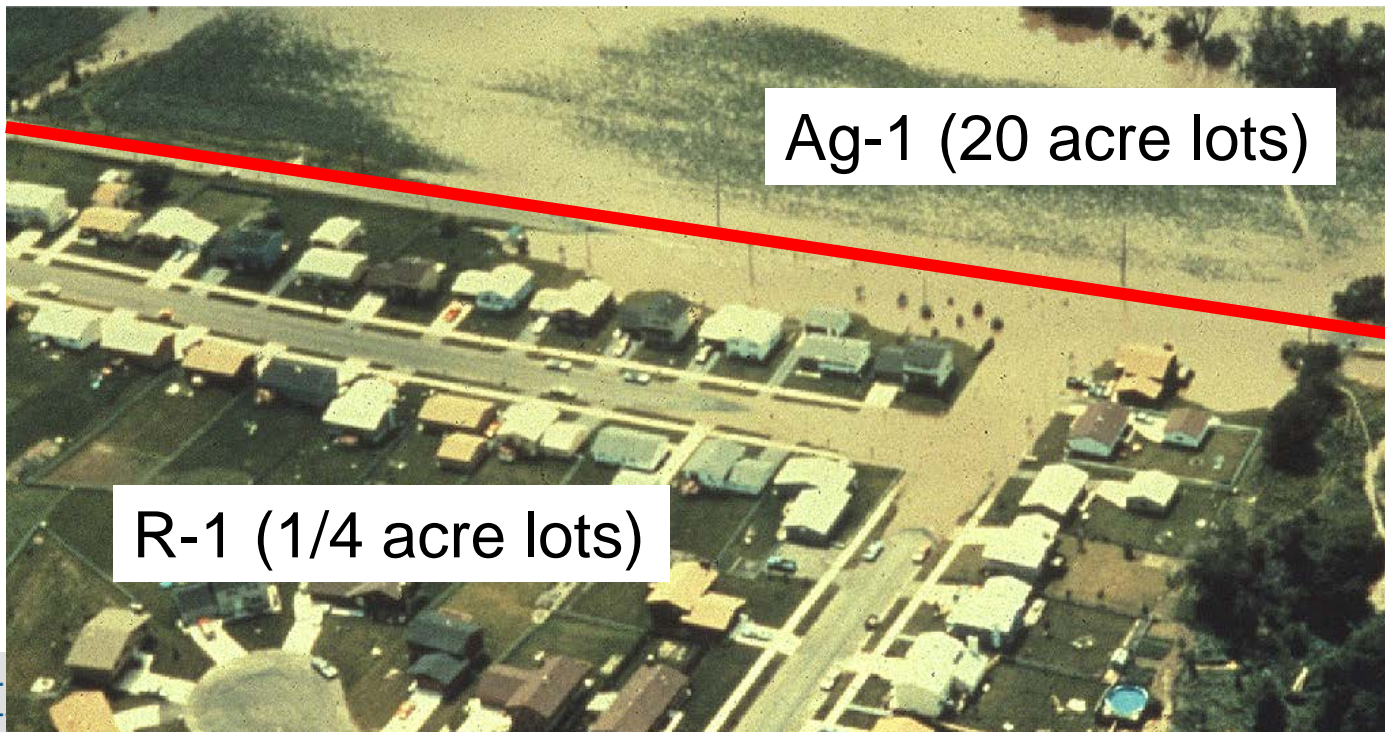
R-1 (1/4 acre lots)

FEMA's National Flood Insurance Program's Community Rating System?

422.f Low density zoning (LZ)

Credit criteria

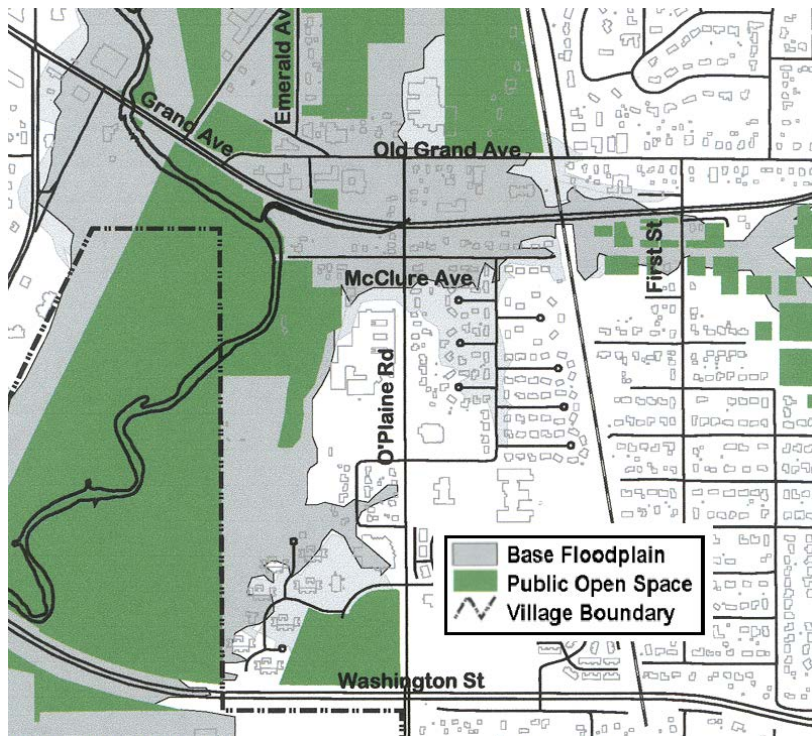
- (1) Zoning ordinance with densities for different zones
- (2) Area affected not receiving OSP credit



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Activity 440 – Flood Data Maintenance



FEMA's National Flood Insurance Program's Community Rating System?

Objective: make community floodplain data more accessible, current, useful, and/or accurate

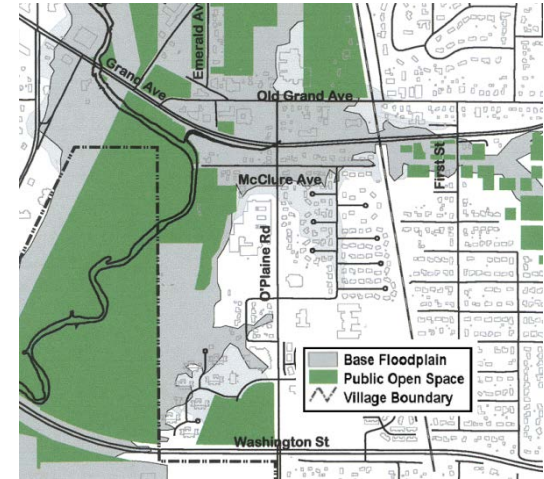


FEMA's National Flood Insurance Program's Community Rating System?

442.a Additional Map Data (AMD)

Systems credited:

- ✓ GIS or other digital mapping
- ✓ Database management program
- ✓ Map overlays



956 El Cajon Way

Floodzone: AE10.5 (NAVD88)

Panel: 0010H

Updated: 7/23/2010 10:56:40 AM

Notes and Comments: LOMRADD mferrar

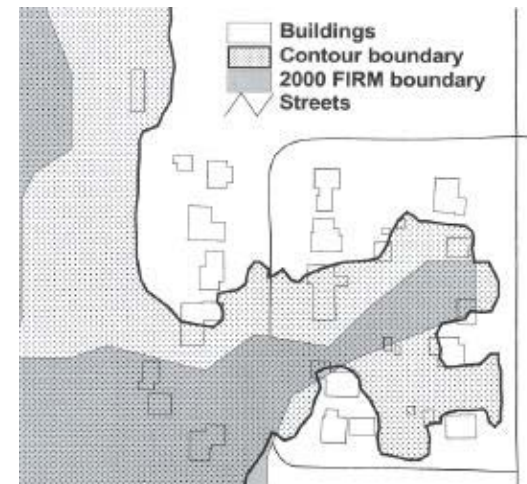
962 El Cajon Way

Floodzone: AE10.5 (NAVD88)

Panel: 0010H

Updated: 7/23/2010 10:56:40 AM

Notes and Comments: mferrar



FEMA's National Flood Insurance Program's Community Rating System?

Additional Map Data (AMD)

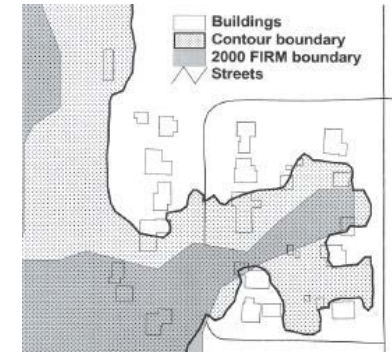
Credit criteria

- 1) AMD1 is a prerequisite for all other AMD credit
- 2) System is used regularly by regulatory staff
- 3) Updated annually for new data and changes
- 4) Digitized data made available to FEMA if requested



956 El Caion Way
Floodzone: AE10.5 (NAVD88)
Panel: 0010H
Updated: 7/23/2010 10:56:40 AM
Notes and Comments: LOMRADD mferrar

962 El Caion Way
Floodzone: AE10.5 (NAVD88)
Panel: 0010H
Updated: 7/23/2010 10:56:40 AM
Notes and Comments: mferrar



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AMD1 = 20 for showing:

1. SFHA boundaries
2. Corporate limits
3. Streets
4. Parcel or lot boundaries

Prerequisite for the rest
of the AMD credits



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- AMD2 = 26 for showing buildings or building footprints
- AMD3: floodways or coastal high hazard areas
- AMD4: base flood elevations
- AMD5: FIRM zone names
- AMD6: 500-year flood data
- AMD7: other natural hazards
- AMD8: topographic information
- AMD9: flood data in tax data base
- AMD10: old FIRM layers



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AMD11: regulation/mitigation data

AMD12: natural floodplain functions

AMD13: building elevation data

| Street Number | Street Name | FIRM zone | 10-year | 50-year | 500-year | BFE 100-year | Lowest Floor Elevation (1929 Datum) | BFE Minus Lowest Floor | 10-year Minus First Floor | LAG (1929 Datum) | BFE Minus LAG = Flood Depth | 10-year Minus LAG = depth of 10-year flood |
|---------------|------------------|-----------|---------|---------|----------|--------------|-------------------------------------|------------------------|---------------------------|------------------|-----------------------------|--|
| 15N302 | Camp Flint Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 714.2 | 2.5 | 0.9 | 712.2 | 4.5 | 2.9 |
| 15N325 | Camp Flint Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 716.0 | 0.7 | -0.9 | 713.0 | 3.7 | 2.1 |
| 15N384 | Richardson Drive | AE | 715.1 | 715.8 | 717.8 | 716.8 | 716.4 | 0.4 | -1.3 | 715.3 | 1.5 | -0.2 |
| 33W878 | Richardson Drive | AE | 715.1 | 715.8 | 717.8 | 716.8 | 717.3 | -0.5 | -2.2 | 715.2 | 1.6 | -0.1 |
| 33W886 | Richardson Drive | AE | 715.1 | 715.8 | 717.8 | 716.8 | 717.0 | -0.2 | -1.9 | 715.2 | 1.6 | -0.1 |
| 33W908 | Richardson Drive | AE | 715.1 | 715.8 | 717.8 | 716.8 | 717.7 | -0.9 | -2.6 | 714.4 | 2.4 | 0.7 |
| 33W942 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.8 | 715.9 | 0.9 | -0.8 | 714.8 | 2.0 | 0.3 |
| 33W970 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 714.7 | 2.0 | 0.4 | 712.0 | 4.7 | 3.1 |
| 33W980 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 715.9 | 0.8 | -0.8 | 712.4 | 4.3 | 2.7 |
| 34W014 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 715.4 | 1.3 | -0.3 | 714.2 | 2.5 | 0.9 |
| 34W049 | Fox River Drive | AE | 715.0 | 715.8 | 717.8 | 716.5 | 715.6 | 0.9 | -0.6 | 713.5 | 3.0 | 1.5 |
| 34W050 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 716.7 | 0.0 | -1.6 | 714.0 | 2.7 | 1.1 |
| 34W062 | Fox River Drive | AE | 715.0 | 715.8 | 717.8 | 716.5 | 715.7 | 0.8 | -0.7 | 713.6 | 2.9 | 1.4 |
| 34W065 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.6 | 715.9 | 0.7 | -0.8 | 712.7 | 3.9 | 2.4 |
| 34W066 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 716.6 | 0.1 | -1.5 | 712.7 | 4.0 | 2.4 |
| 34W067 | Fox River Drive | AE | 715.0 | 715.8 | 717.8 | 716.5 | 718.4 | -1.9 | -3.4 | 713.5 | 3.0 | 1.5 |
| 34W070 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.7 | 715.3 | 1.4 | -0.2 | 712.4 | 4.3 | 2.7 |
| 34W075 | Fox River Drive | AE | 715.1 | 715.8 | 717.8 | 716.6 | 715.7 | 0.9 | -0.6 | 712.9 | 3.7 | 2.2 |

FEMA's National Flood Insurance Program's Community Rating System?

Additional Map Data (AMD)

Impact adjustment: $rAMD = \frac{aAMD}{aSFHA}$

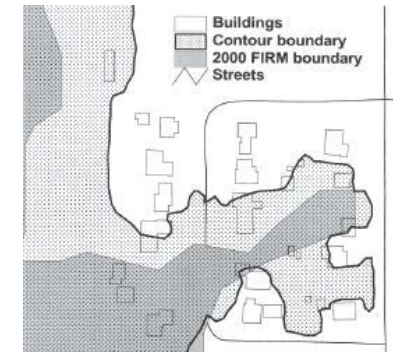
Documentation:

- a) **Printouts of the maps or database**
- b) Impact adjustment map



956 El Caion Way
Floodzone: AE10.5 (NAVD88)
Panel: 0010H
Updated: 7/23/2010 10:56:40 AM
Notes and Comments: LOMRADD mferrar

962 El Caion Way
Floodzone: AE10.5 (NAVD88)
Panel: 0010H
Updated: 7/23/2010 10:56:40 AM
Notes and Comments: mferrar



FEMA's National Flood Insurance Program's Community Rating System?

442.c Benchmark maintenance (BMM)

ERM



BMM



FEMA's National Flood Insurance Program's Community Rating System?

442.c Benchmark maintenance (BMM)

BMM 1: a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate



FEMA's National Flood Insurance Program's Community Rating System?

442.c Benchmark maintenance (BMM)

BMM 2: Continuously Operating Reference Stations (CORS)



www.ngs.noaa.gov/CORS

FEMA's National Flood Insurance Program's Community Rating System?

Benchmark maintenance (BMM)

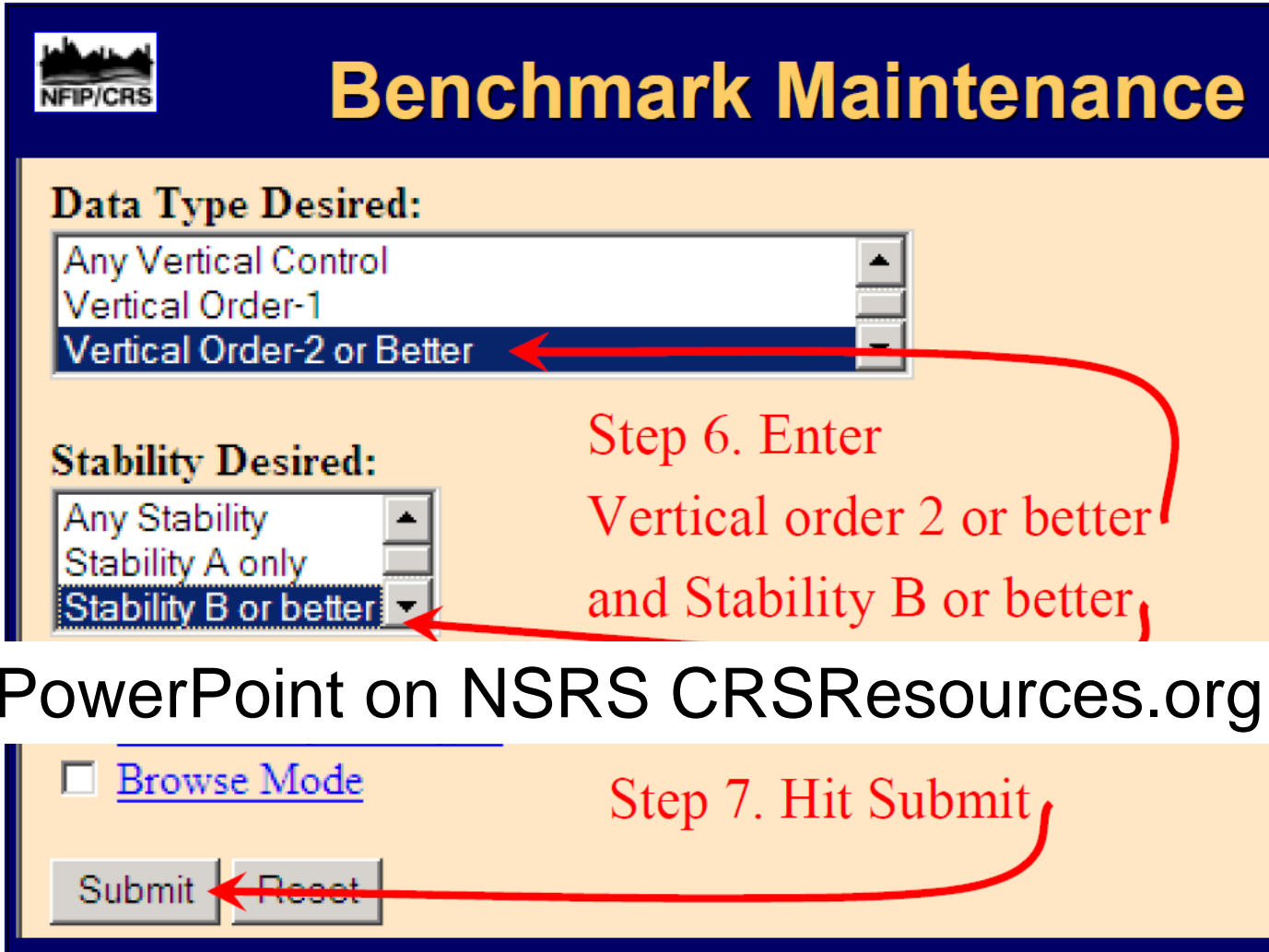
Credit criteria:

- (1) Must be a list of benchmarks or CORS
- (2) Benchmarks
 - a) In NSRS or a permanent monument
 - b) Recovered in last 5 years
 - c) 1st or 2nd order vertical control
 - d) Stability rating of A or B, *and*
 - e) Within 1 mile of regulatory floodplain



Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?



NFIP/CRS

Benchmark Maintenance

Data Type Desired:

Any Vertical Control
Vertical Order-1
Vertical Order-2 or Better

Stability Desired:

Any Stability
Stability A only
Stability B or better

[Browse Mode](#)

Submit Reset

Step 6. Enter Vertical order 2 or better and Stability B or better,

Step 7. Hit Submit

PowerPoint on NSRS CRSResources.org

FEMA's National Flood Insurance Program's Community Rating System?

Benchmark maintenance (BMM)

Credit criteria:

(3) CORS: Alternative to benchmarks

✓ No double credit in the same area

✓ Have ≥ 3 CORS within 30 miles

(4) Impact adjustment



FEMA's National Flood Insurance Program's Community Rating System?

Benchmark maintenance (BMM)

Impact adjustment

$$\text{rBMM} = \frac{\text{aBMM 1 or aBMM 2}}{\text{aSFHA}}$$

aBMM 1 = area of SFHA within 1 mile of benchmarks

aBMM 2 = area of SFHA within 30 miles of ≥ 3 CORS stations

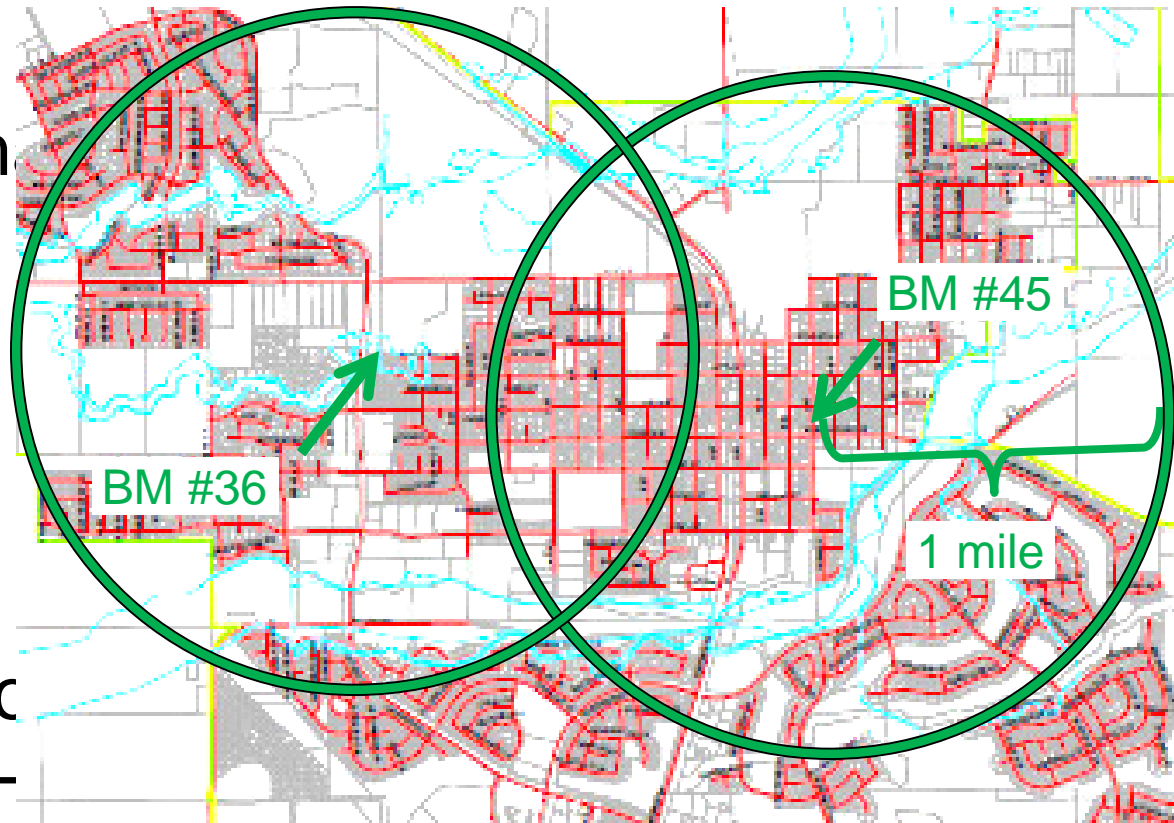


FEMA's National Flood Insurance Program's Community Rating System?

Benchmark maintenance (BMM)

Impact adjustment

1. Plot the benchmark
2. Draw 1 mile radius circle
3. Repeat for each benchmark
4. Total the areas covered by the affected SFT = aBMM

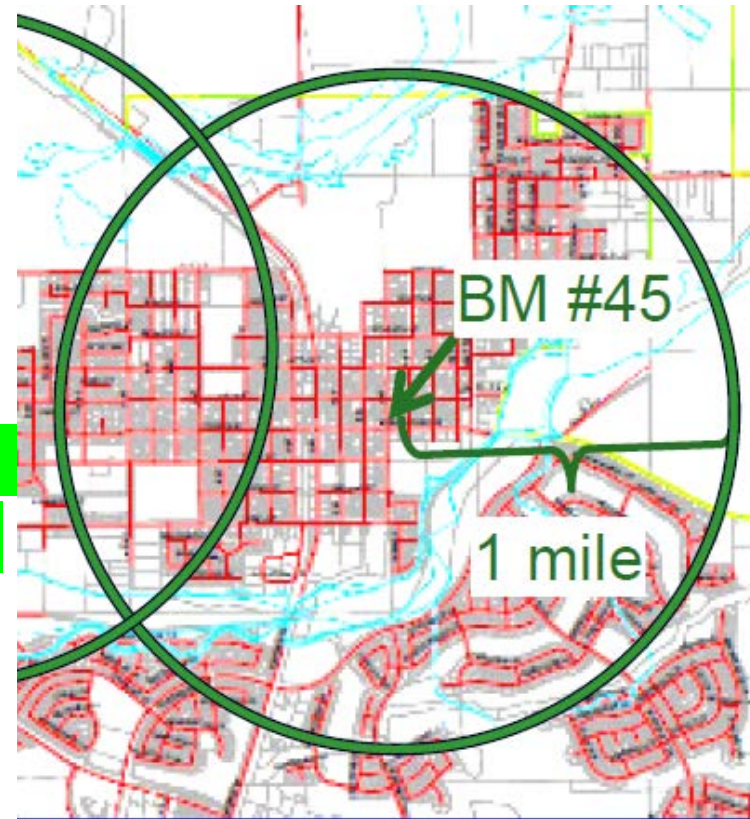


FEMA's National Flood Insurance Program's Community Rating System?

Benchmark maintenance (BMM)

Documentation

- a) List of benchmarks and/or CORS stations
- b) Key benchmark data (location, order, stability)
- c) Impact adjustment map showing benchmarks within 1 mile of SFHA



Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?

450 Stormwater Management



FEMA



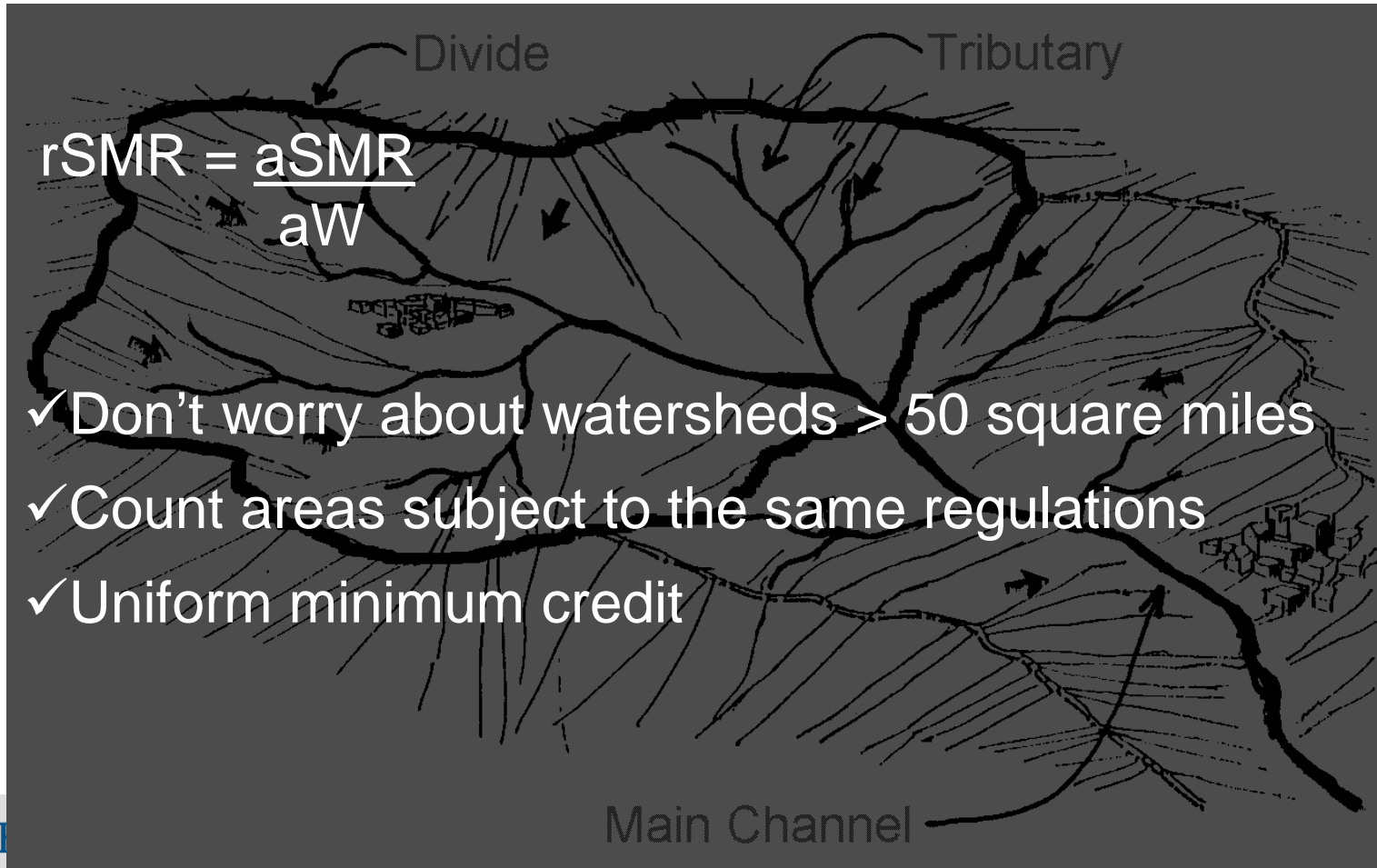
FEMA's National Flood Insurance Program's Community Rating System?

Impact Adjustment for SMR

Think watershed

$$rSMR = \frac{aSMR}{aW}$$

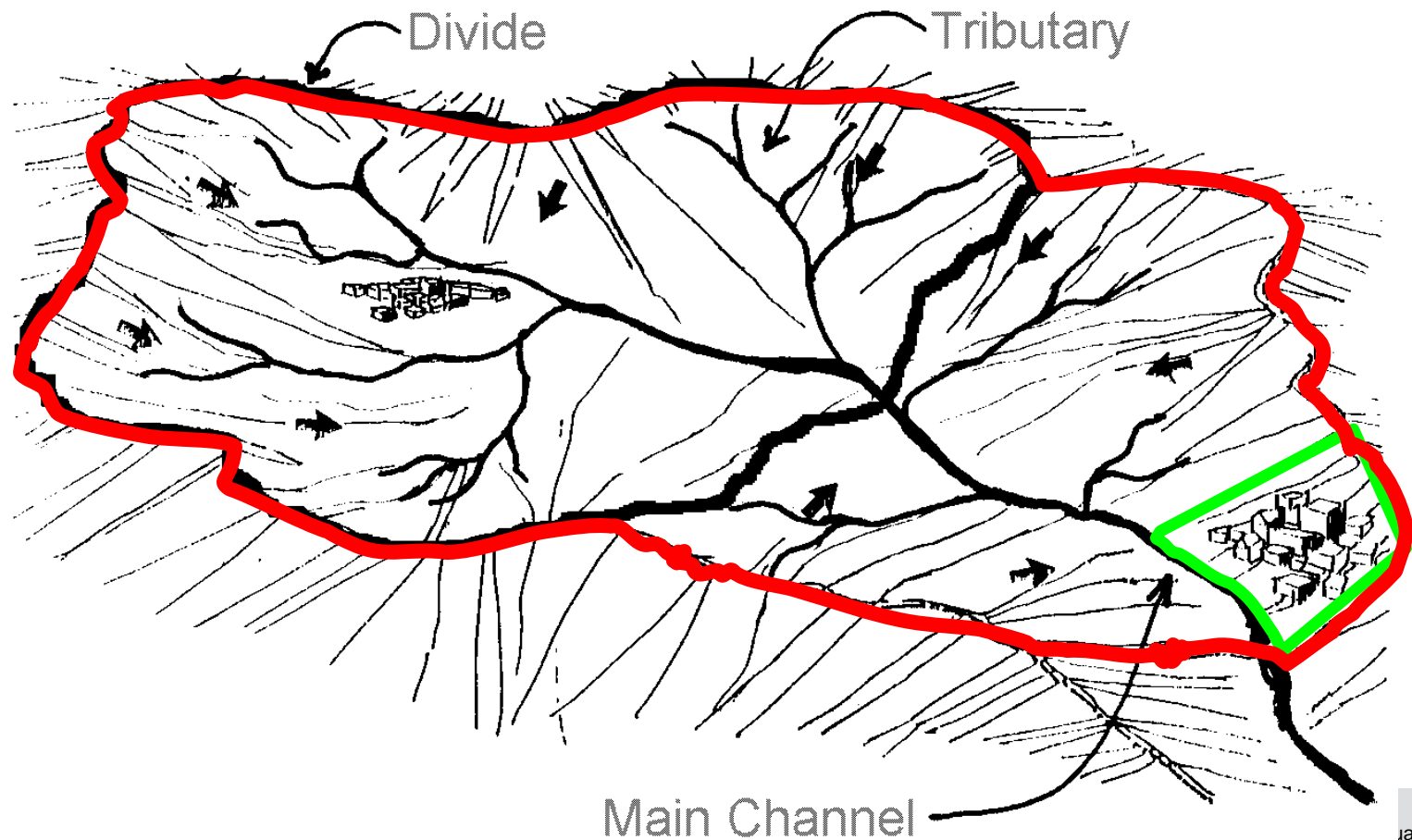
- ✓ Don't worry about watersheds > 50 square miles
- ✓ Count areas subject to the same regulations
- ✓ Uniform minimum credit



FEMA's National Flood Insurance Program's Community Rating System?

Impact Adjustment for SMR

Think watershed

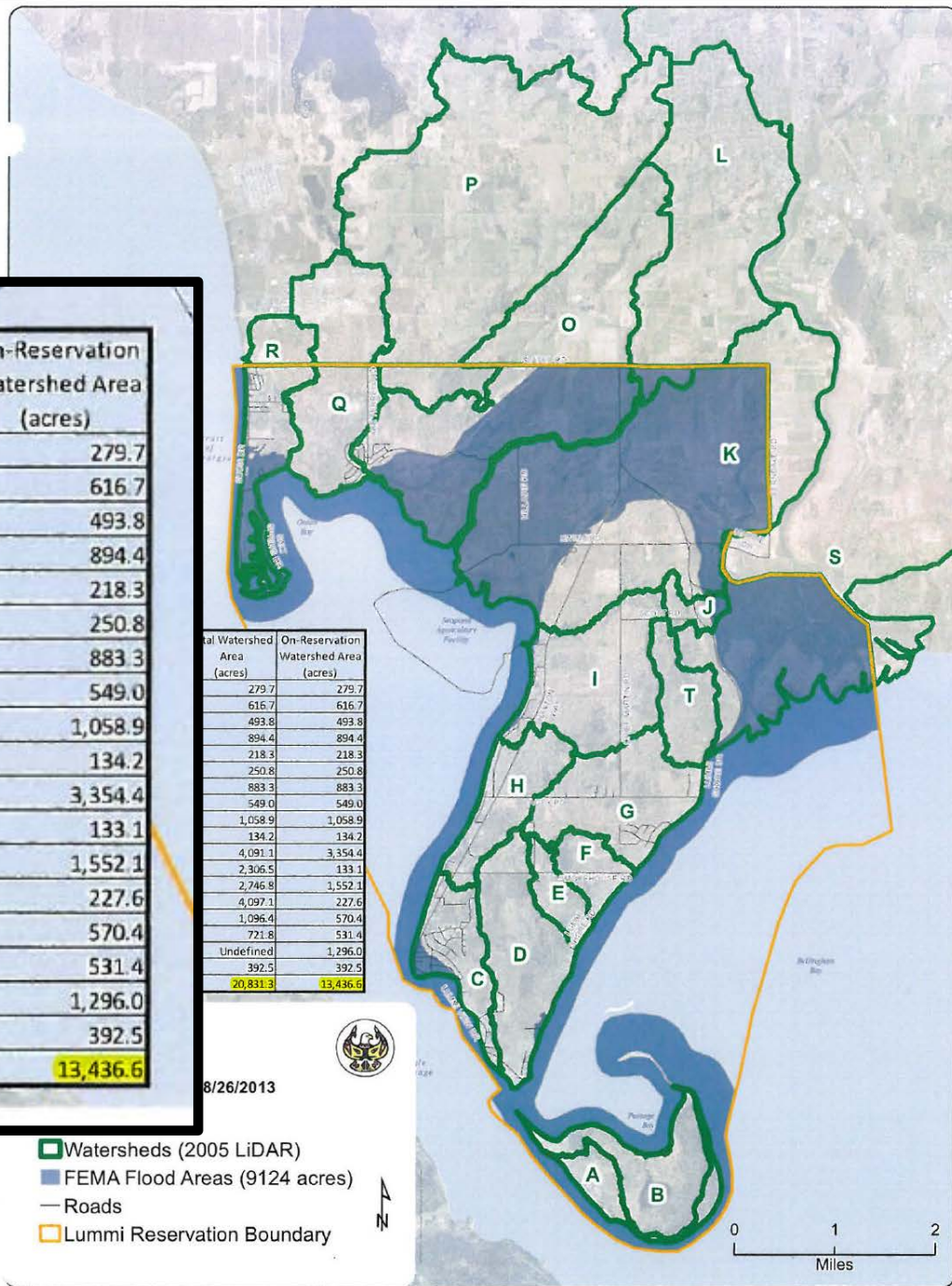


Why use GIS in FEM

Program's System?

| Watershed | Total Watershed Area (acres) | On-Reservation Watershed Area (acres) |
|--------------|------------------------------|---------------------------------------|
| A | 279.7 | 279.7 |
| B | 616.7 | 616.7 |
| C | 493.8 | 493.8 |
| D | 894.4 | 894.4 |
| E | 218.3 | 218.3 |
| F | 250.8 | 250.8 |
| G | 883.3 | 883.3 |
| H | 549.0 | 549.0 |
| I | 1,058.9 | 1,058.9 |
| J | 134.2 | 134.2 |
| K | 4,091.1 | 3,354.4 |
| L | 2,306.5 | 133.1 |
| O | 2,746.8 | 1,552.1 |
| P | 4,097.1 | 227.6 |
| Q | 1,096.4 | 570.4 |
| R | 721.8 | 531.4 |
| S | Undefined | 1,296.0 |
| T | 392.5 | 392.5 |
| Total | 20,831.3 | 13,436.6 |

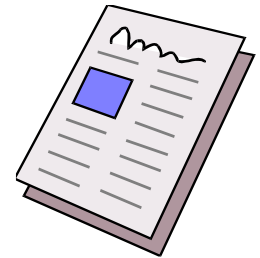
| Total Watershed Area (acres) | On-Reservation Watershed Area (acres) |
|------------------------------|---------------------------------------|
| 279.7 | 279.7 |
| 616.7 | 616.7 |
| 493.8 | 493.8 |
| 894.4 | 894.4 |
| 218.3 | 218.3 |
| 250.8 | 250.8 |
| 883.3 | 883.3 |
| 549.0 | 549.0 |
| 1,058.9 | 1,058.9 |
| 134.2 | 134.2 |
| 4,091.1 | 3,354.4 |
| 2,306.5 | 133.1 |
| 2,746.8 | 1,552.1 |
| 4,097.1 | 227.6 |
| 1,096.4 | 570.4 |
| 721.8 | 531.4 |
| Undefined | 1,296.0 |
| 392.5 | 392.5 |
| 20,831.3 | 13,436.6 |



FEMA's National Flood Insurance Program's Community Rating System?

Documentation

- (1) Technical reviewer's documentation checklist
- (2) Ordinance or legal language
- (3) Five new development drainage plans
- (4) [If applicable] regulations for others in watershed
- (5) **Impact adjustment map**



Stormwater Management Requirements

Section V-1. Post-development stormwater discharges from any development shall be detained or retained such that pre-development discharges are not exceeded.

SMR

Community Rating System Overview

References and Resources

- ✓ ISO/CRS Specialist
- ✓ State NFIP Coordinator
- ✓ FEMA Regional Office
- ✓ Websites
- ✓ Publications
- ✓ Other CRS communities
- ✓ CRS users groups

“HELP”

FEMA's National Flood Insurance Program's Community Rating System?

503 Repetitive loss areas

At each visit, a category B or C community must submit:

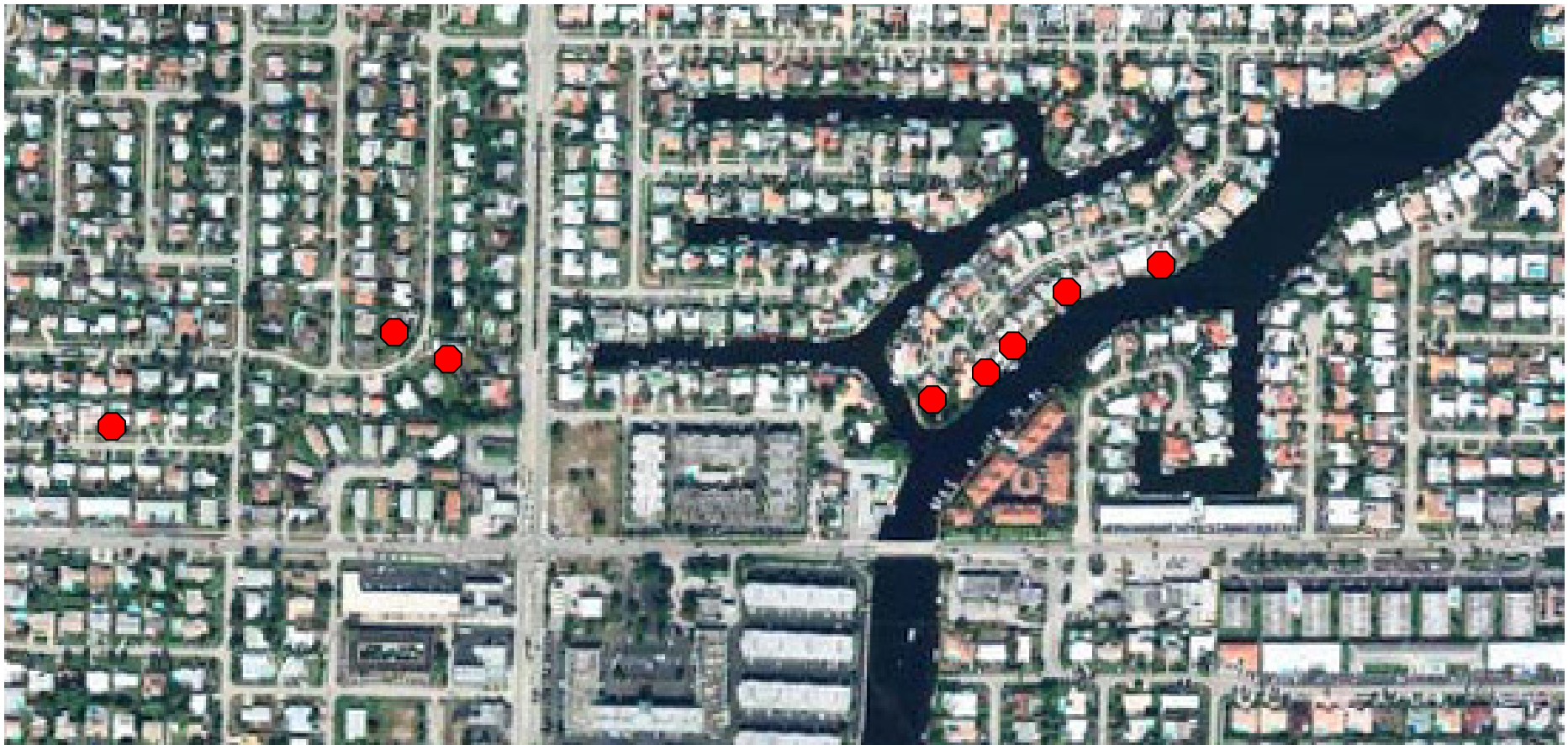
- (1) AW-501s (if needed)
- (2) Signed CC-RL
- (3) Map of repetitive loss areas
- (4) Describe the cause of the repetitive flooding
- (5) List of addresses and the number of buildings in the mapped areas



FEMA's National Flood Insurance Program's Community Rating System?



1. Plot the *updated* list of repetitive loss properties



FEMA's National Flood Insurance Program's Community Rating System?



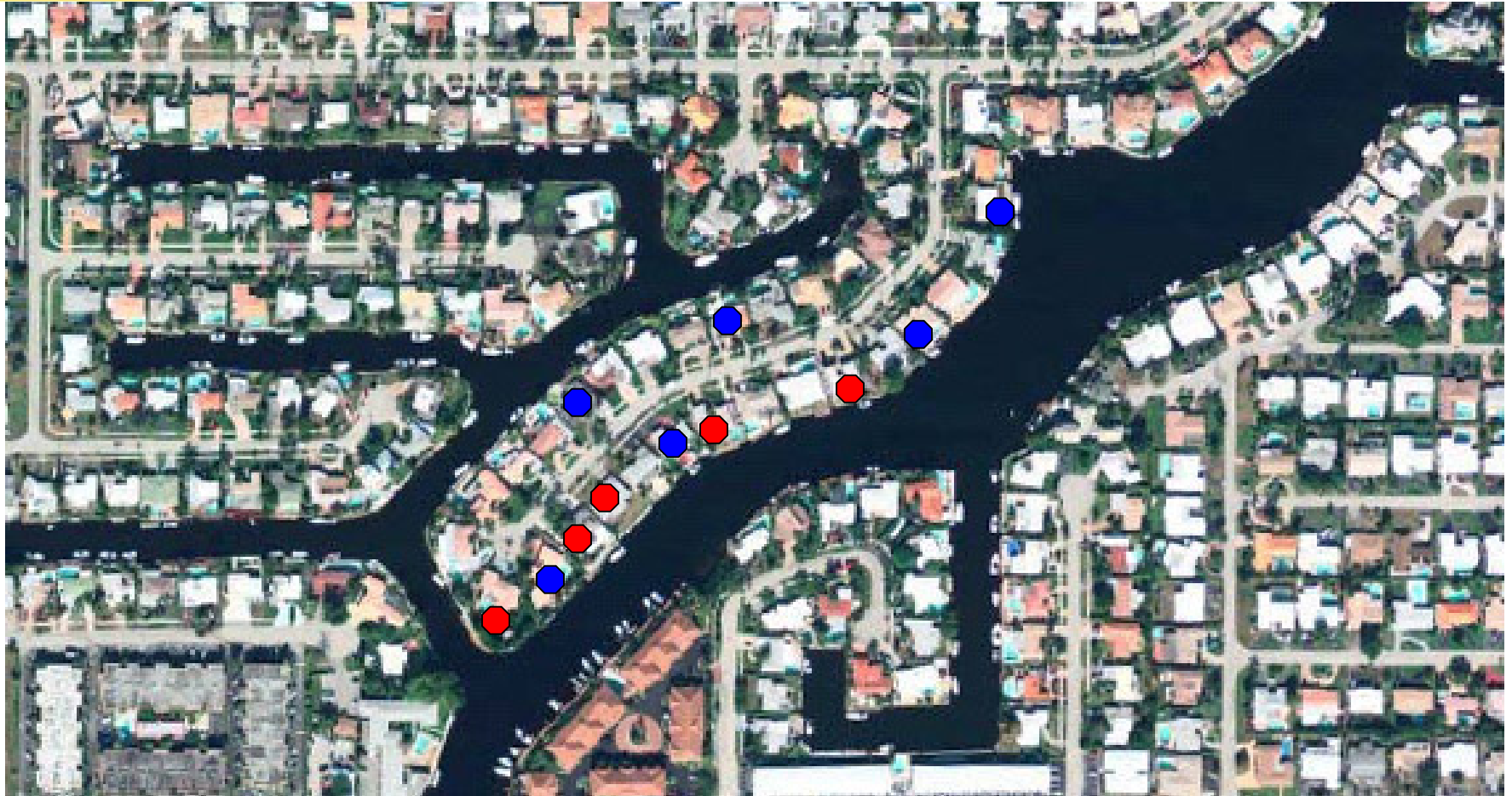
2. Plot nearby properties that received 1 insurance claim
 - These are listed in the “historical claims” Excel file

| Address Line 2 | City | ST | Pol Eff Dt | Pol Exp Dt | Dt of Loss | Cmpy Nbr | Policy Nbr | Total Paid |
|--------------------|-----------|----|------------|------------|------------|----------|------------|------------|
| 112 SUNNYSIDE WAY | SUNNYSIDE | FL | 03/20/1989 | 03/20/1990 | 08/17/1998 | 25143 | 0901D00575 | 4,237 |
| 112 SUNNYSIDE WAY | SUNNYSIDE | FL | 05/20/2000 | 05/20/2001 | 09/01/2000 | 25143 | 0901RA0444 | 18,100 |
| 114 SUNNYSIDE WAY | SUNNYSIDE | FL | 06/07/2000 | 06/07/2001 | 09/01/2000 | 21660 | 0650015360 | 11,445 |
| 116 SUNNYSIDE WAY | SUNNYSIDE | FL | 03/12/2000 | 03/12/2001 | 09/01/2000 | 25143 | 0901RA9079 | 1,408 |
| 118 SUNNYSIDE WAY | SUNNYSIDE | FL | 01/25/1999 | 01/25/2000 | 03/16/1990 | 14168 | 9218267000 | 1,050 |
| 118 SUNNYSIDE WAY | SUNNYSIDE | FL | 01/25/1995 | 01/25/1996 | 08/17/1998 | 14168 | 9218267000 | 1,024 |
| 118 SUNNYSIDE WAY | SUNNYSIDE | FL | 01/25/2000 | 01/25/2001 | 09/01/2000 | 14168 | 9218267000 | 16,923 |
| 122 SUNNYSIDE WAY | SUNNYSIDE | FL | 01/25/1990 | 01/25/1991 | 03/16/1990 | 14168 | 9218267000 | 3,104 |
| 122 SUNNYSIDE WAY | SUNNYSIDE | FL | 01/25/1991 | 01/25/1992 | 09/2/2000 | 14168 | 9218267000 | 4,504 |
| 124 SUNNYSIDE WAY | SUNNYSIDE | FL | 06/30/2000 | 06/30/2001 | 09/01/2000 | 02003 | 032714690F | 17,333 |
| 126 SUNNYSIDE WAY | SUNNYSIDE | FL | 06/30/2000 | 06/30/2001 | 08/17/1998 | 14168 | 9218267000 | 2,369 |
| 126 SUNNYSIDE WAY | SUNNYSIDE | FL | 12/22/1999 | 12/22/2000 | 09/01/2000 | 02003 | 032714690F | 22,351 |
| 126 SUNNYSIDE WAY | SUNNYSIDE | FL | 06/05/2005 | 06/05/2006 | 08/29/2005 | 19682 | 9901728328 | 0 |
| 126 SUNNYSIDE WAY | SUNNYSIDE | FL | 05/09/1979 | 05/09/1980 | 03/31/1980 | 99999 | 1936664463 | 162 |
| 127 SUNNYSIDE WAY | SUNNYSIDE | FL | 09/16/1999 | 09/16/2000 | 09/01/2000 | 28401 | 0134544599 | 22,903 |
| 166 W MAIN ST | SUNNYSIDE | FL | 08/14/1998 | 08/14/1999 | 06/15/1999 | 16578 | 0019541298 | 9,105 |
| 166 W MAIN ST | SUNNYSIDE | FL | 08/14/2000 | 08/14/2001 | 09/01/2000 | 16578 | 0019541298 | 54,582 |
| 1676 S MEMORIAL DR | SUNNYSIDE | FL | 01/09/1990 | 01/09/1991 | 03/16/1990 | 18988 | 4000359382 | 7,181 |
| 1676 S MEMORIAL DR | SUNNYSIDE | FL | 07/13/1998 | 07/13/1999 | 06/15/1999 | 23841 | 0102682097 | 38,252 |
| 1676 S MEMORIAL DR | SUNNYSIDE | FL | 07/13/2000 | 07/13/2001 | 09/01/2000 | 23841 | 0102682097 | 148,831 |

Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?

2. Plot nearby properties that received 1 insurance claim





FEMA's National Flood Insurance Program's Community Rating System?

3. If you have the capability, overlay a topographic map (GIS) layer to identify low areas
4. Draw lines around those areas with similarly situated properties:
 - Same low elevation
 - History of flood insurance claims

FEMA's National Flood Insurance Program's Community Rating System?

4. Draw lines around those areas with similarly situated properties



FEMA's National Flood Insurance Program's Community Rating System?



4. Draw lines around those areas with similarly situated properties



FEMA's National Flood Insurance Program's Community Rating System?

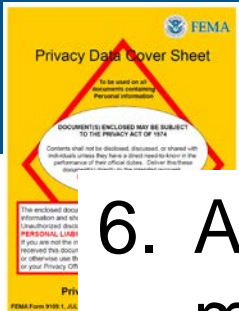


5. Check the area in the field

See if the buildings on FEMA's list are unique (e.g., only one(s) on slab at grade)



FEMA's National Flood Insurance Program's Community Rating System?



6. A visit to the site helps confirm that the boundary makes sense




Why use GIS in...

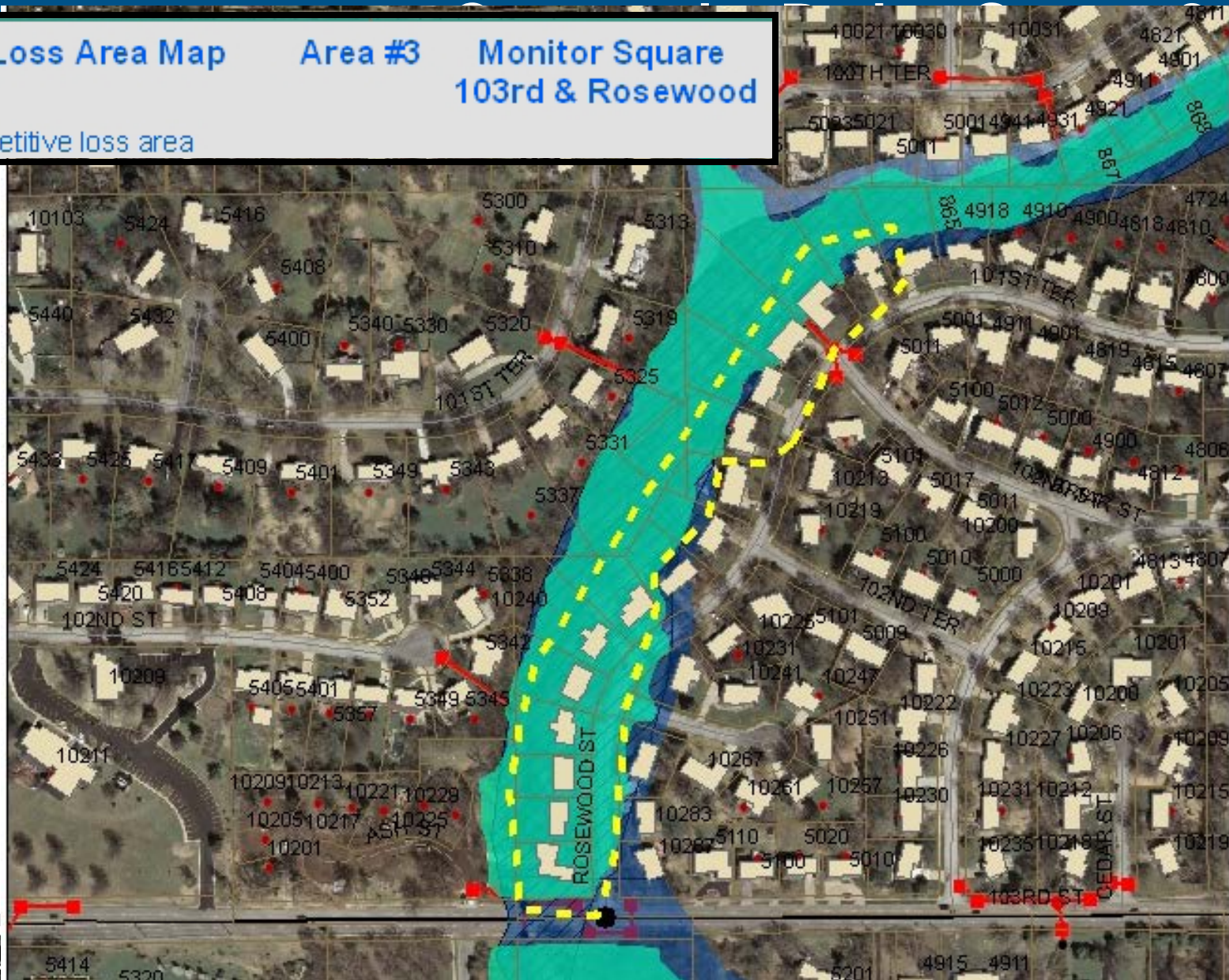
FEMA's National Flood Insurance Program's

Repetitive Loss Area Map

Area #3

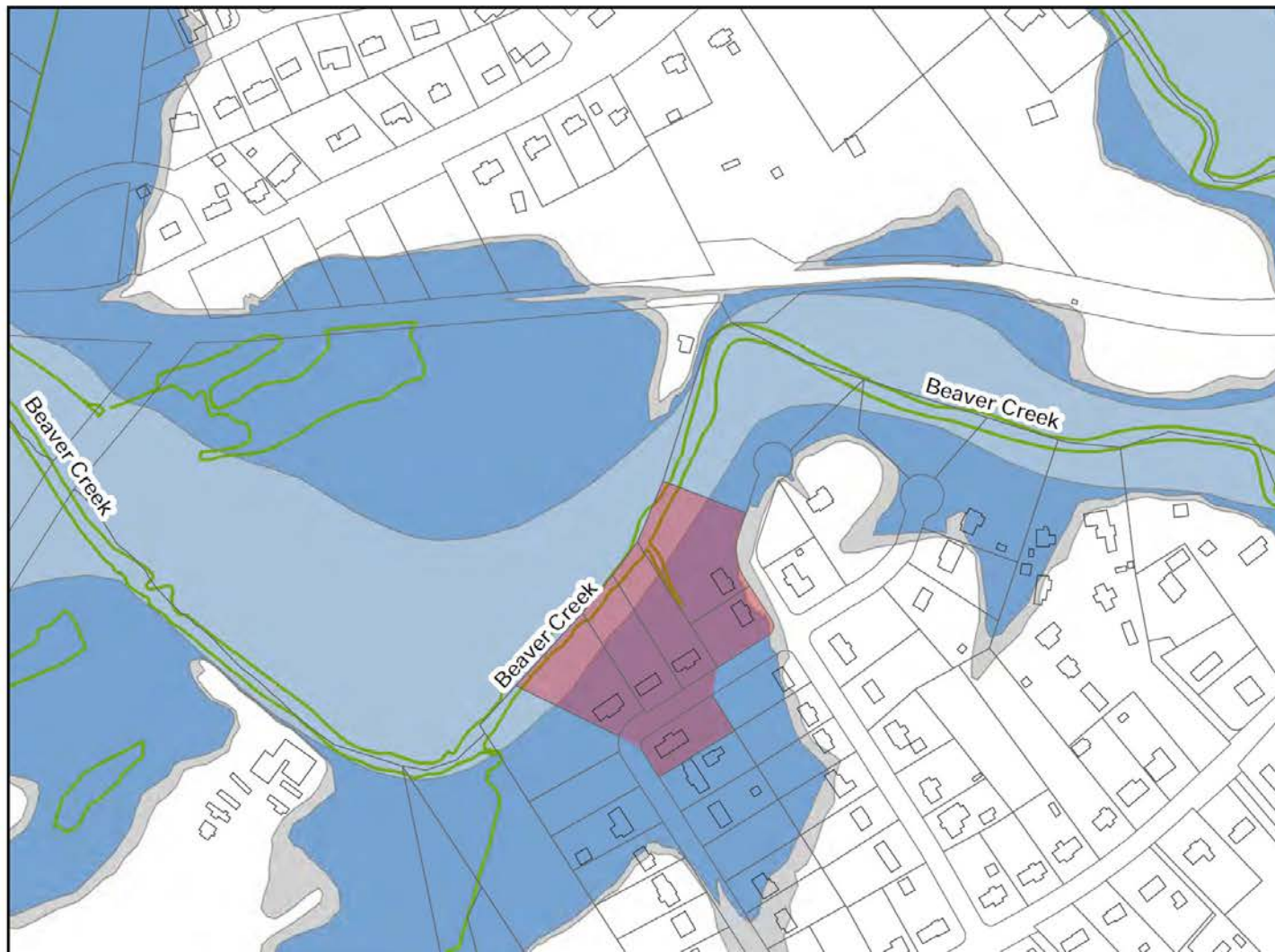
Monitor Square
103rd & Rosewood

 = Repetitive loss area



Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?



Repetitive Loss
Area 2



- Streams
- Buildings
- Parcels
- Repetitive Loss Area
- Floodway
- 100-Year Floodplain
- 500-Year Floodplain



FEMA



Community Rating System Overview



CRS Resources Home

This is the temporary location of the CRS Resources webpage. This website is provided for webinar participants, users groups, and CRS coordinators to obtain reference materials related to ongoing refinements of the CRS. Here you will find CRS guidance documents, worksheets, and tools relevant to the activities to be credited under the New CRS Coordinator's Manual.

Use the menu above to find resources organized by CRS Activity.

[Download the 2013 CRS Coordinator's Manual](#)

New communities can [click here](#) to find the CRS application and Quick Check.

Why use GIS in...

FEMA's National Flood Insurance Program's Community Rating System?

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