

# **Why Floodplains Matter and How To Live With Them**

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The background of the slide features a dark blue gradient with several faint, concentric circular ripples in a lighter shade of blue, resembling water ripples, positioned in the lower right and bottom center areas.

**Is this a floodplain?**



**Is this a floodplain?**



**Is this a floodplain?**



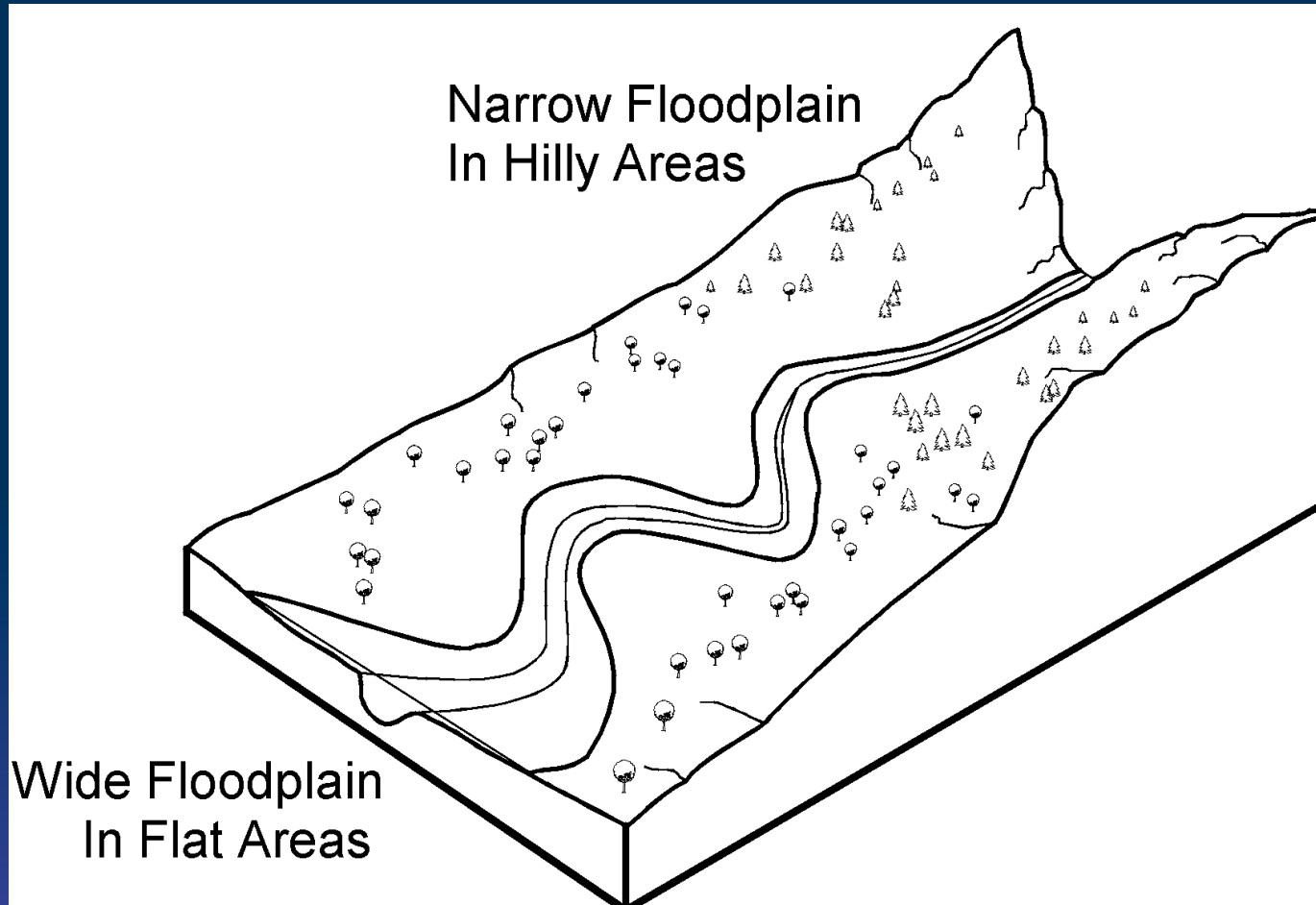
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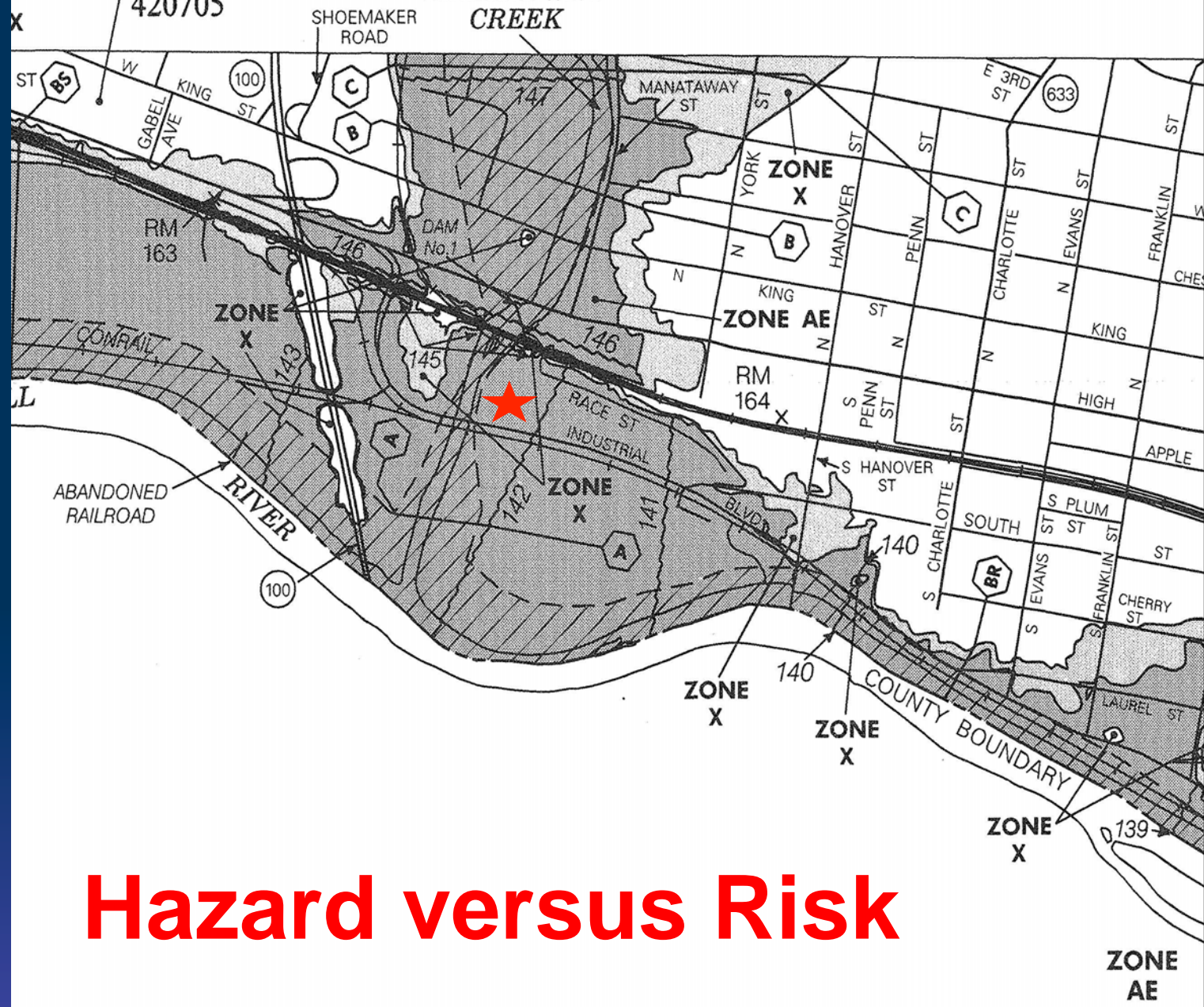


# Riverine Watershed and Floodplain



Borough of Pottstown  
420705

MANATAWNY  
CREEK



# Hazard versus Risk

ZONE  
AE



# Base Flood

***Base flood*** means the flood having a one percent chance of being equaled or exceeded in any given year.

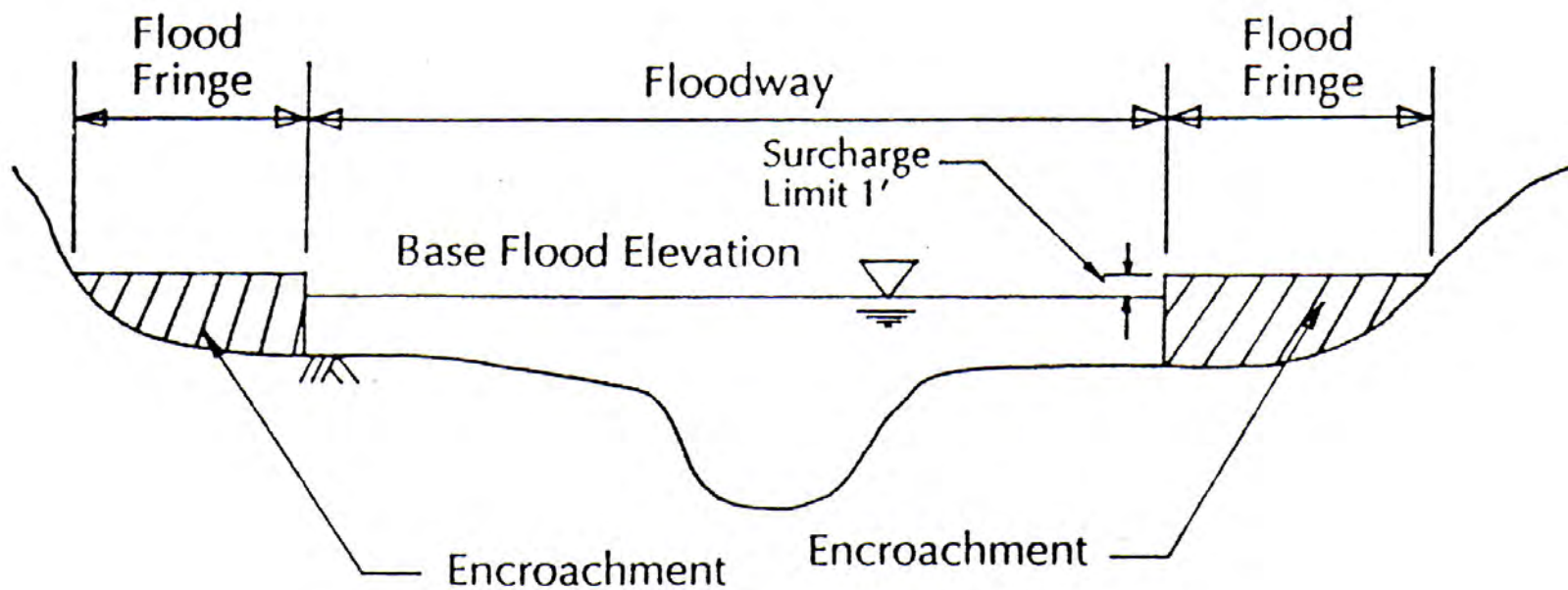
*(44 CFR 59.1)*

# NFIP Zones: 44 CFR 64.3

- Zone A
- Zone A1 through A30, Zone AE
- Zone AO, Zone AH
- Zone A99, Zone AR
- Zone B, Shaded Zone X
- Zone C, Unshaded Zone X
- Zone D

# Floodway / Flood Fringe

Cross Section A



# Why floodplains matter

- Natural flood and erosion control



# Why floodplains matter

- Water quality maintenance
- Maintain groundwater supply and balance



# Why floodplains matter

- Support flora
- Provide fish and wildlife habitat
- Agriculture and silvaculture areas
- Provide recreational opportunities



# Presidential Directives

- EO 11988 – Floodplain Management
  - “... restore and preserve the natural beneficial values served by floodplains ...”
- EO 11990 – Protection of Wetlands
  - 44 CFR Part 9 – Floodplain Management and Protection of Wetlands

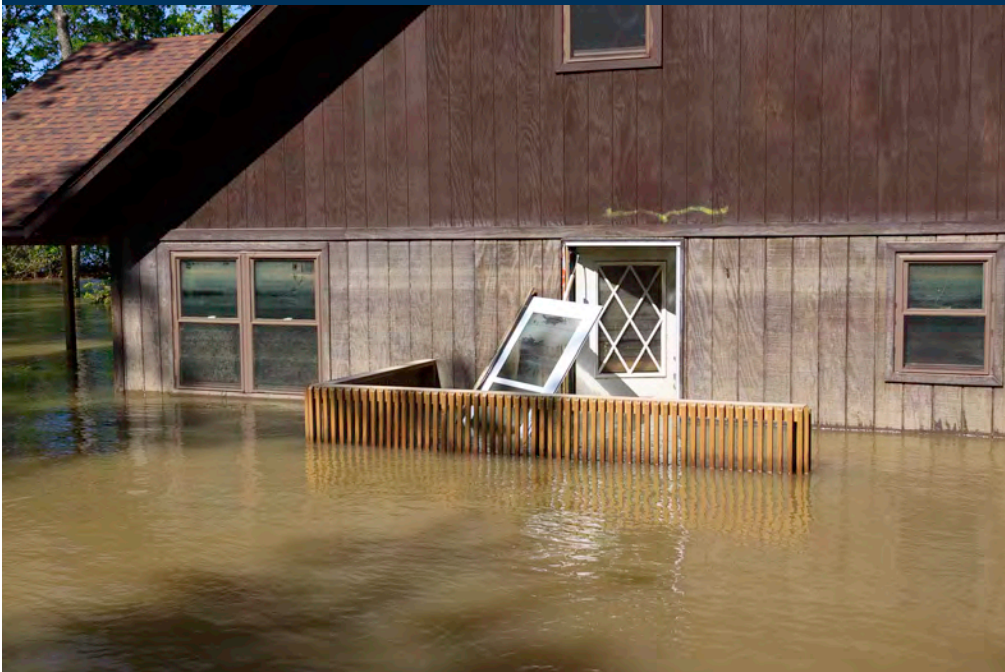
# Presidential Directives

- EO 13653 (11/01/2013) – Preparing the US for the Impacts of Climate Change
  - “... improve climate preparedness and resilience; help safeguard our economy, infrastructure, environment, and natural resources ...”



# Living with floodplains

➤ Flood insurance



➤ Community Rating System

# Base Flood Elevation

- “... the height of the base flood, usually in feet, in relation to the National Geodetic Vertical Datum of 1929, the North American Vertical Datum of 1988, or other datum referenced in the Flood Insurance Study report, or average depth of the base flood, usually in feet, above the ground surface.”

*(FAQ on fema.gov)*

# Definition of Lowest Floor

“... the lowest floor of the lowest enclosed area, including basement. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building’s lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3.”

*(44 CFR 59.1)*

# Why Lowest Floor Elevation Matters

FIRM ZONES AE, A1-A30 – BUILDING RATES

Elevation of Lowest Floor Above or Below BFE <sup>1</sup>	One Floor, No Basement/Encl		More than One Floor, No Basement/Encl		More than One Floor, With Basement/Encl		Manufactured (Mobile) Home	
	1-4 Family	Other Residential & Non-Residential	1-4 Family	Other Residential & Non-Residential	1-4 Family	Other Residential & Non-Residential	Single Family	Non-Residential
+4	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08
+3	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.16 / .08	.17 / .08	.18 / .08
+2	.22 / .08	.22 / .08	.17 / .08	.17 / .08	.16 / .08	.16 / .08	.22 / .08	.21 / .08
+1	.43 / .08	.39 / .10	.27 / .08	.23 / .08	.17 / .08	.17 / .08	.47 / .09	.65 / .08
0	.74 / .08	.81 / .20	.55 / .08	.47 / .18	.37 / .08	.39 / .16	1.18 / .09	1.42 / .08
-1 <sup>2</sup>	1.88 / .90	2.83 / 1.29	1.72 / .82	2.44 / .73	.91 / .47	1.06 / .66	***	***
-2	***	***	***	***	***	***	***	***

<sup>1</sup> If Lowest Floor is -1 because of attached garage, submit application for special consideration. Rate may be lower.

<sup>2</sup> Use Submit-for-Rate guidelines if the enclosure below the lowest elevated floor of an elevated building or if the crawl space (under-floor space) that has its interior floor 1 to 2 feet below grade on all sides, which is used for rating, is 1 or more feet below BFE.

\*\*\* SUBMIT FOR RATING

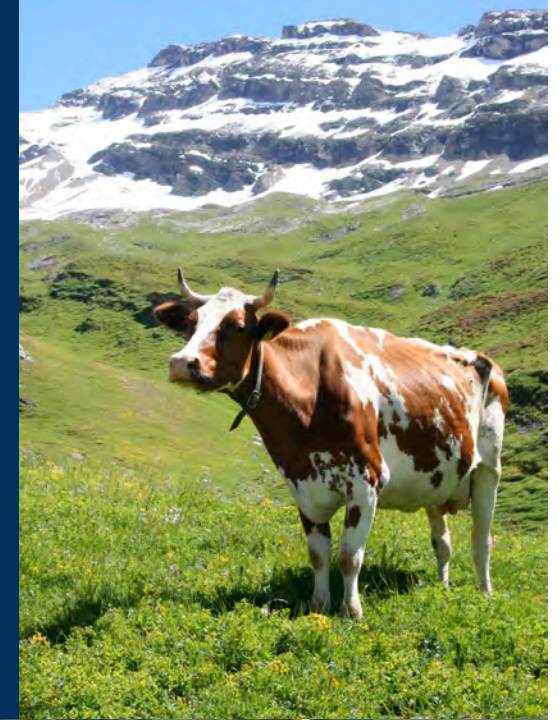
NOTE: The definition of Manufactured (Mobile) Home includes travel trailers.

# Living with floodplains

- Consistent and responsible regulation, nationwide
- **Title 44 CFR, Parts 59 et seq.**
- In particular, **44 CFR 60.3**
- **Biggert Waters Act of 2012**

# Living with floodplains

## ➤ Health & safety considerations



# Living with floodplains

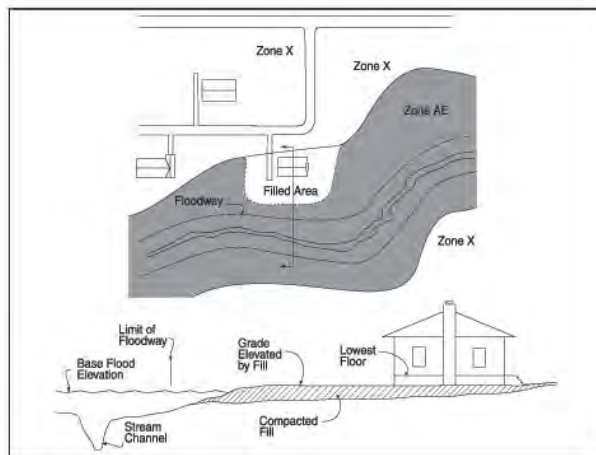
- Land use decisions



# 44 CFR 65.2(c)



**Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding**  
in accordance with the  
National Flood Insurance Program



FEDERAL EMERGENCY MANAGEMENT AGENCY  
MITIGATION DIRECTORATE

FIA-TB-10  
(5/01)

“Reasonably safe from flooding’ means base flood waters will not inundate the land or damage structures to be removed from the SFHA and that any subsurface waters related to the base flood will not damage existing or *proposed* buildings.”



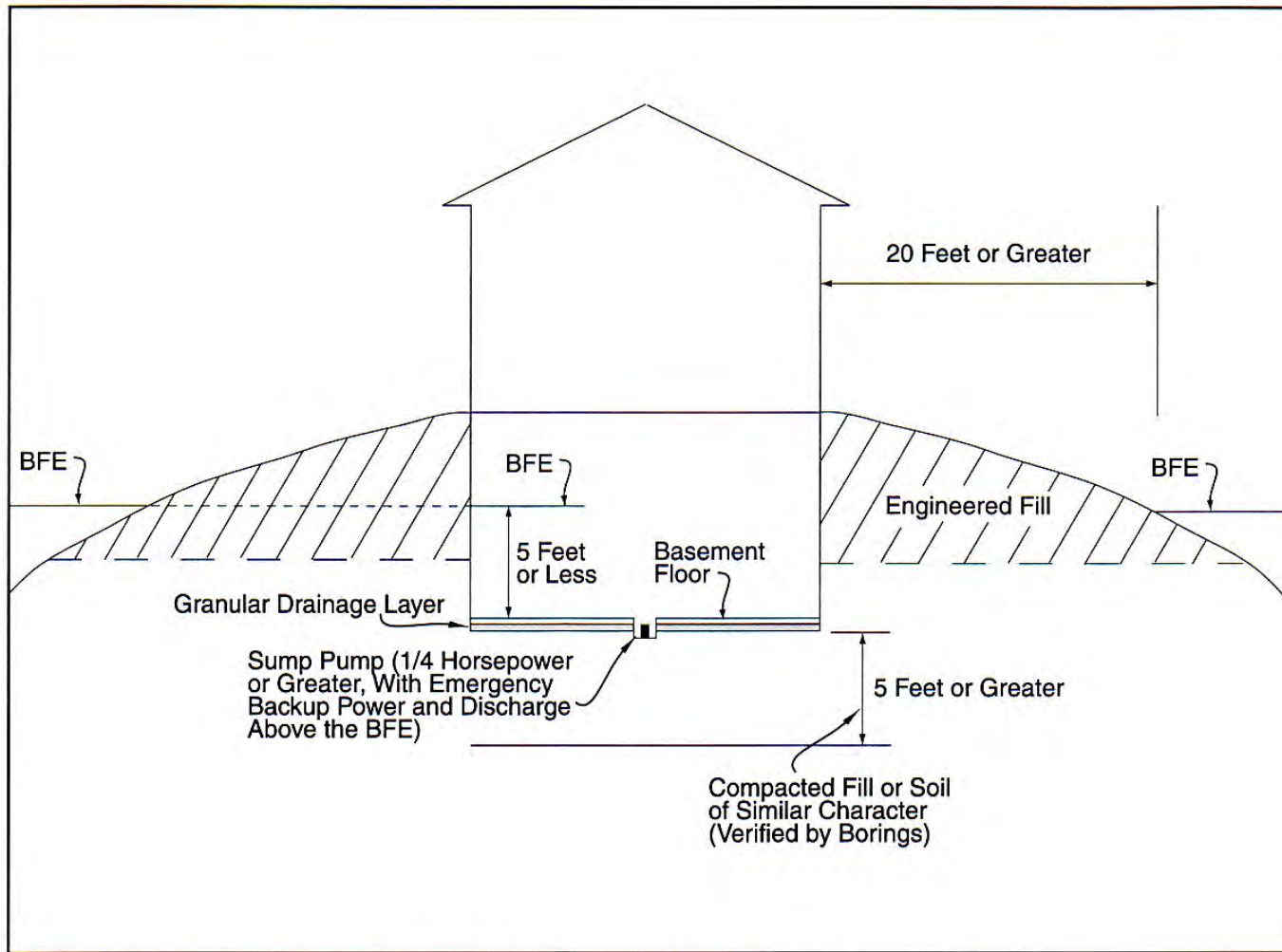



Figure 10 Requirements for use of the simplified approach to basement construction.

# Land use decisions

- 44 CFR 60.6 - Variances and exceptions
  - Floodplain easements
  - Buyouts of structures
  - Preserving vegetation to reduce erosion
  - Controlling runoff (and its content)
- 

# Living with floodplains

- Building and construction codes



## 44 CFR 60.3 - Flood plain management criteria for flood-prone areas

- Minimum standards for communities
- Requirements for Zone A1-A30, AE, AH:
  - (c)(2) Residential structures
  - (c)(3) Non-residential structures
  - “lowest floor (including basement) elevated to or above the base flood level”

## 44 CFR 60.3 - Flood plain management criteria for flood-prone areas

- Requirements for Zone AO:
- (c)(7) Residential structures
- (c)(8) Non-residential structures
- “lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified)”

# Definition of Basement

- “**Basement** means any area of the building having its floor subgrade (below ground level) on all sides”. (44 CFR 59.1)
- “Any area of the building, including any sunken room or sunken portion of a room, having its floor below ground level (subgrade) on all sides.” (NFIP Insurance Agent’s Manual, DEFINITIONS 1)

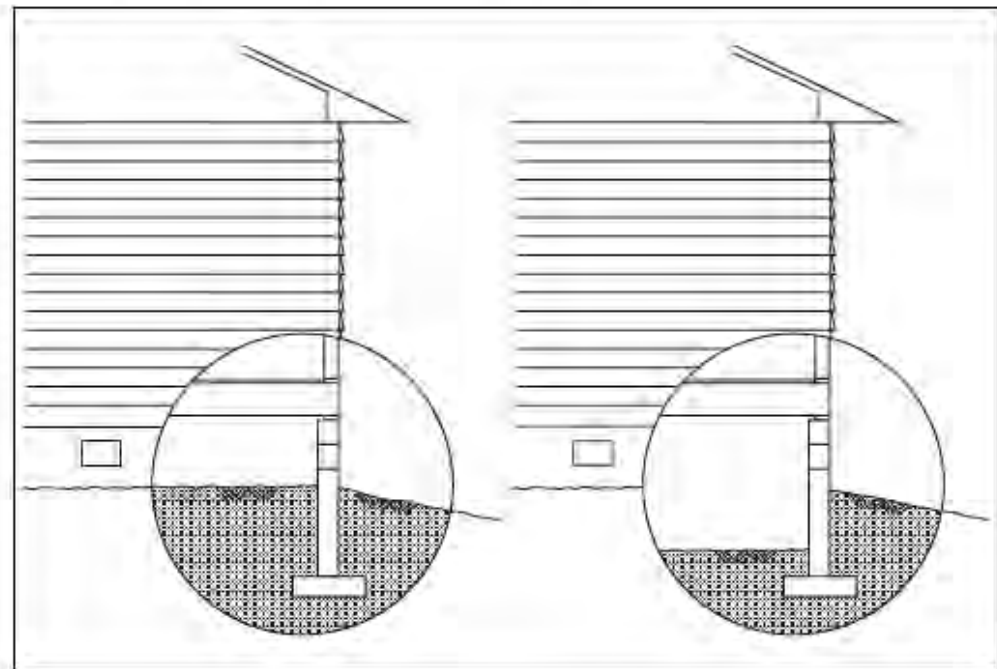
# Crawlspace

Relation to LAG  
and BFE affects  
insurance and  
structural integrity



## Crawlspace Construction for Buildings Located in Special Flood Hazard Areas

National Flood Insurance Program Interim Guidance



FEDERAL EMERGENCY MANAGEMENT AGENCY  
FEDERAL INSURANCE AND MITIGATION ADMINISTRATION

FIA-TB-11  
(11/01)

# Flood openings

- Water flows both ways
- No human intervention
- Ratio to enclosure
- Height above ground



## Openings in Foundation Walls and Walls of Enclosures

Below Elevated Buildings in Special Flood Hazard Areas  
in accordance with the National Flood Insurance Program

Technical Bulletin 1 / August 2008





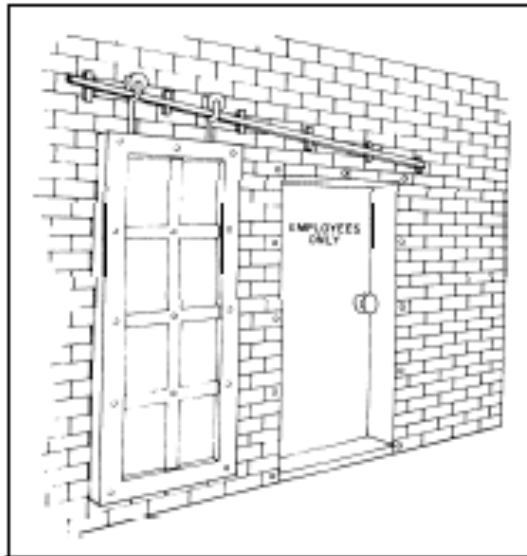
# Dry Floodproofing



## Non-Residential Floodproofing — Requirements and Certification

for Buildings Located in Special Flood Hazard Areas

In accordance with the  
National Flood Insurance Program



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FEDERAL INSURANCE ADMINISTRATION

FIA-TD-3  
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## Protecting Your Business From Flooding

FEDERAL EMERGENCY MANAGEMENT AGENCY

### ARE YOU AT RISK?

If you aren't sure whether your business is at risk from flooding, check with your local floodplain manager, building official, city engineer, or planning and zoning administrator. They can tell you whether you are in a flood hazard area, and they can also tell you how to protect your business from flooding.

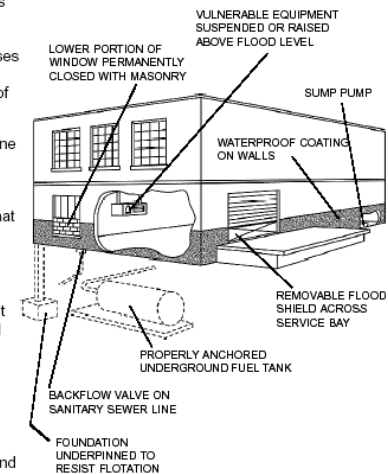
### WHAT YOU CAN DO

Protecting your business from flooding can involve a variety of actions, from inspecting and maintaining your buildings to installing protective devices. Most of these actions, especially those that affect the structure of your buildings or their utility systems, should be carried out by qualified maintenance staff or professional contractors licensed to work in your state, county, or city. One example of flood protection is using dry floodproofing techniques to protect buildings in flood hazard areas.

## DRY FLOODPROOF YOUR BUILDING

One way to protect a building and its contents from flood damage is to seal the building so that flood waters cannot enter. This method, referred to as "dry floodproofing," encompasses a variety of measures (some of which are covered by separate fact sheets — see back of this sheet):

- applying a waterproof coating or membrane to the exterior walls of the building
- installing watertight shields over doors, windows, and other openings
- anchoring the building as necessary so that it can resist flotation
- installing backflow valves in sanitary and storm sewer lines
- raising utility system components, machinery, and other pieces of equipment so that they are above the expected flood level
- anchoring fuel tanks and other storage tanks to prevent flotation
- installing a sump pump and foundation drain system
- strengthening walls so that they can withstand the pressures of flood waters and the impacts of floodborne debris



# Freeboard

- “Design flood elevation” for safer buildings
- Established by community

Under the Flood Insurance Reform Act of 2012, You Could Save More than \$90,000 over 10 Years if You Build 3 Feet above Base Flood Elevation\*

PREMIUM AT 4 FEET BELOW  
BASE FLOOD ELEVATION

\$9,500/year  
\$95,000/10 years



BFE

PREMIUM AT  
BASE FLOOD ELEVATION

\$1,410/year  
\$14,100/10 years



BFE

PREMIUM AT 3 FEET ABOVE  
BASE FLOOD ELEVATION

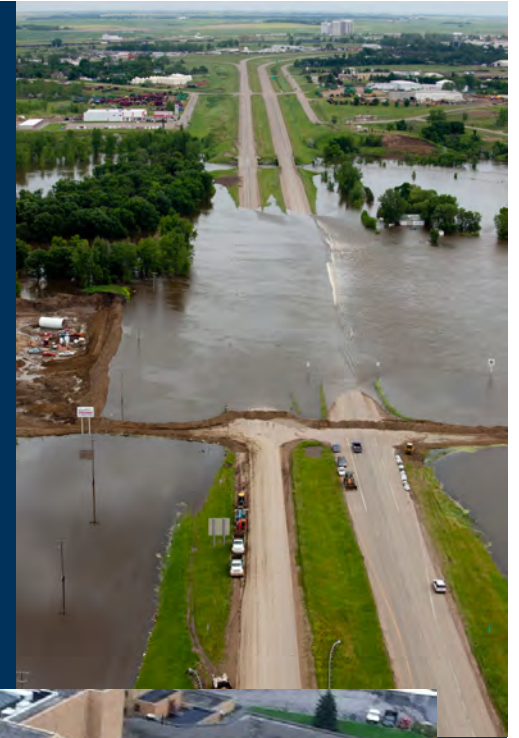
\$427/year  
\$4,270/10 years



BFE



# Living with floodplains



➤ **Emergency response planning**

# Living with floodplains

- Keeping maps truthful and current

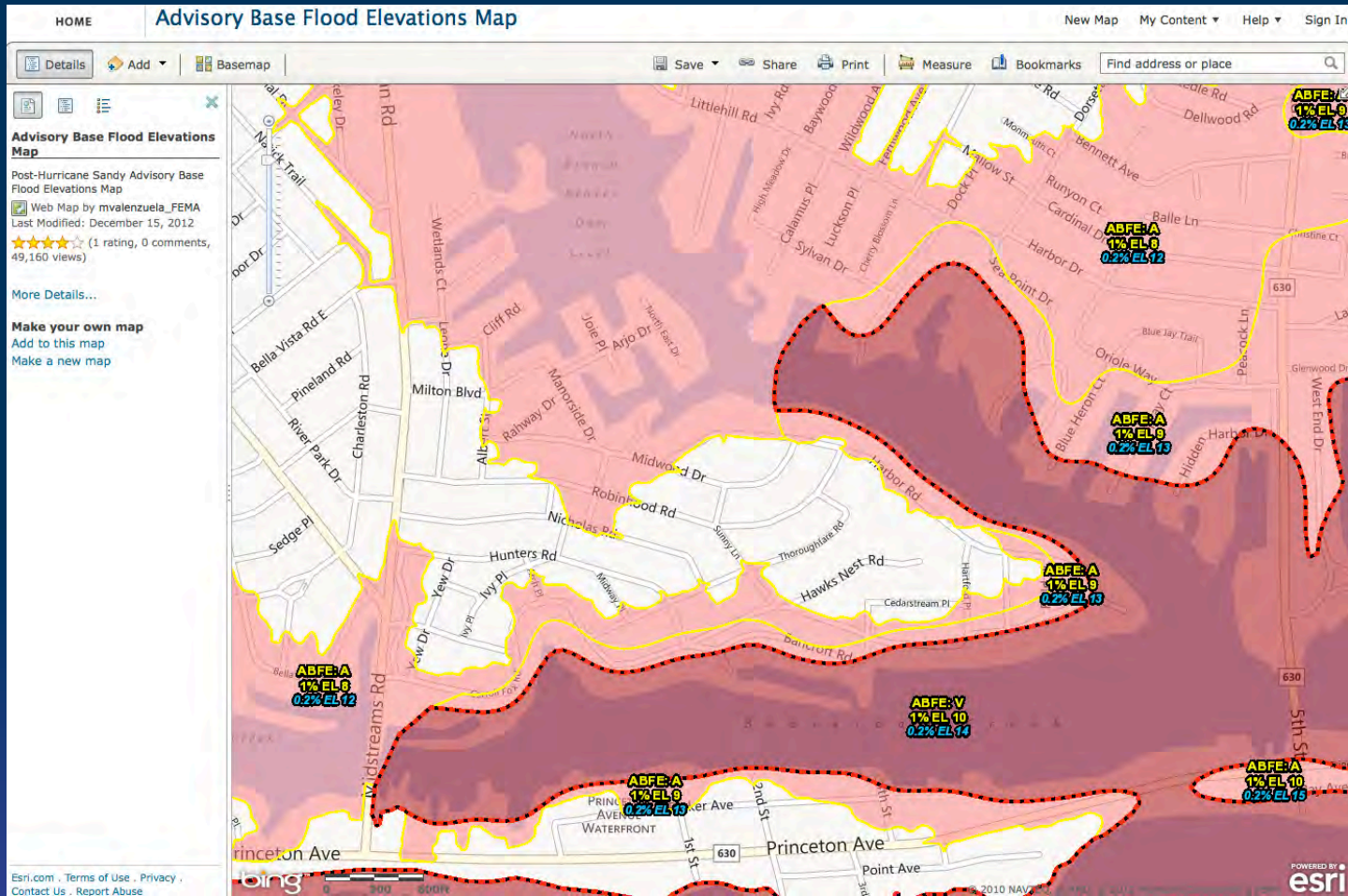


# Good elevation data matters!

- Elevation of predicted water elevation
- Elevation of ground surface
- Elevation of structures
- Elevation of floodproofing measures
- Elevation after development (“no rise”)

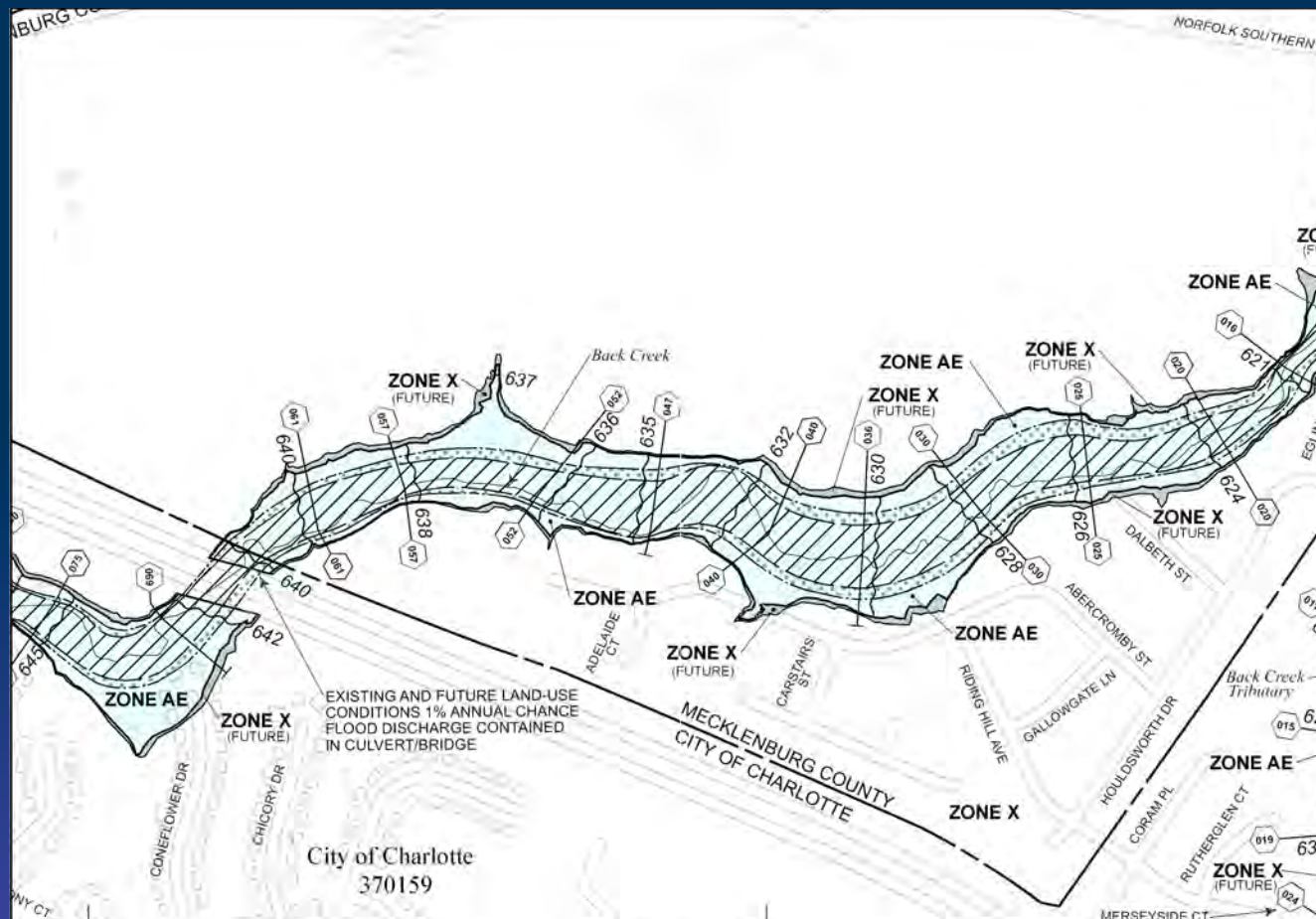


# Advisory Base Flood Elevations



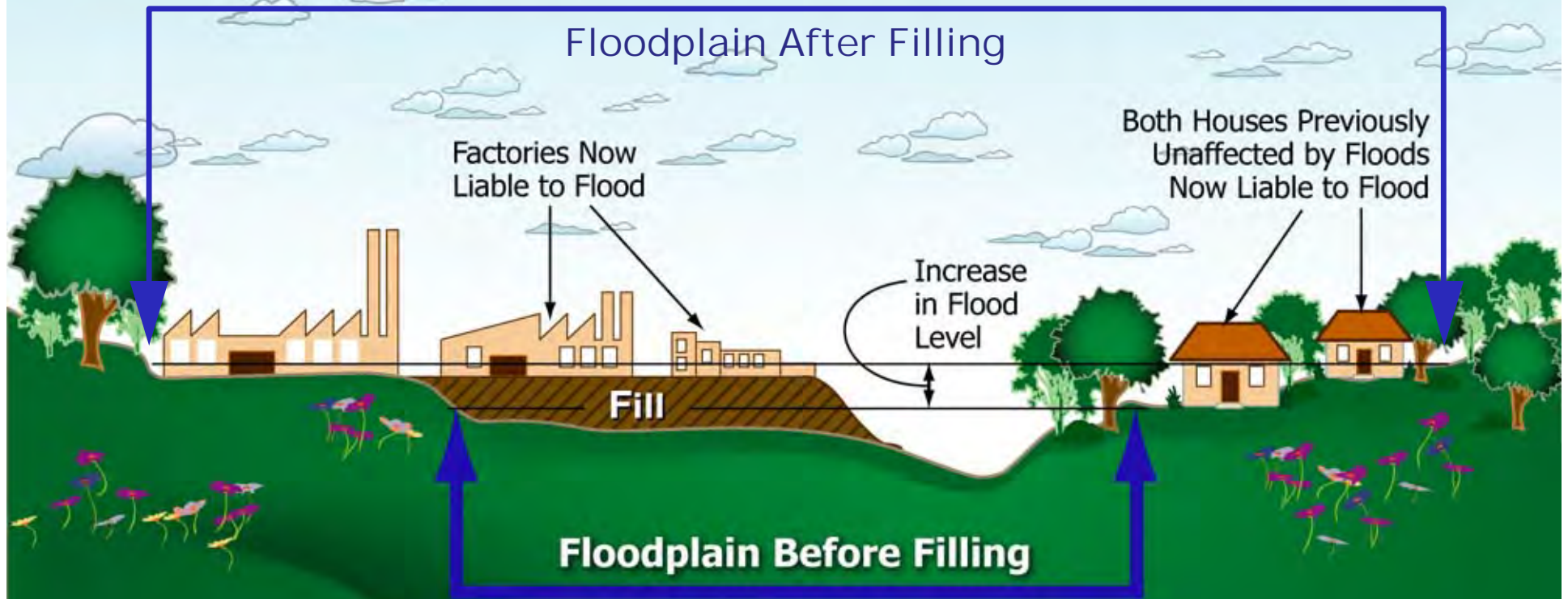
# Living with floodplains

## ➤ Awareness of cumulative effects



(from ASFPM)

# Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



**If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters.  
This means your home or business may be impacted.**



# Living with floodplains

## ➤ Outreach and education



# Questions?

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[www.geo-learn.com](http://www.geo-learn.com)

