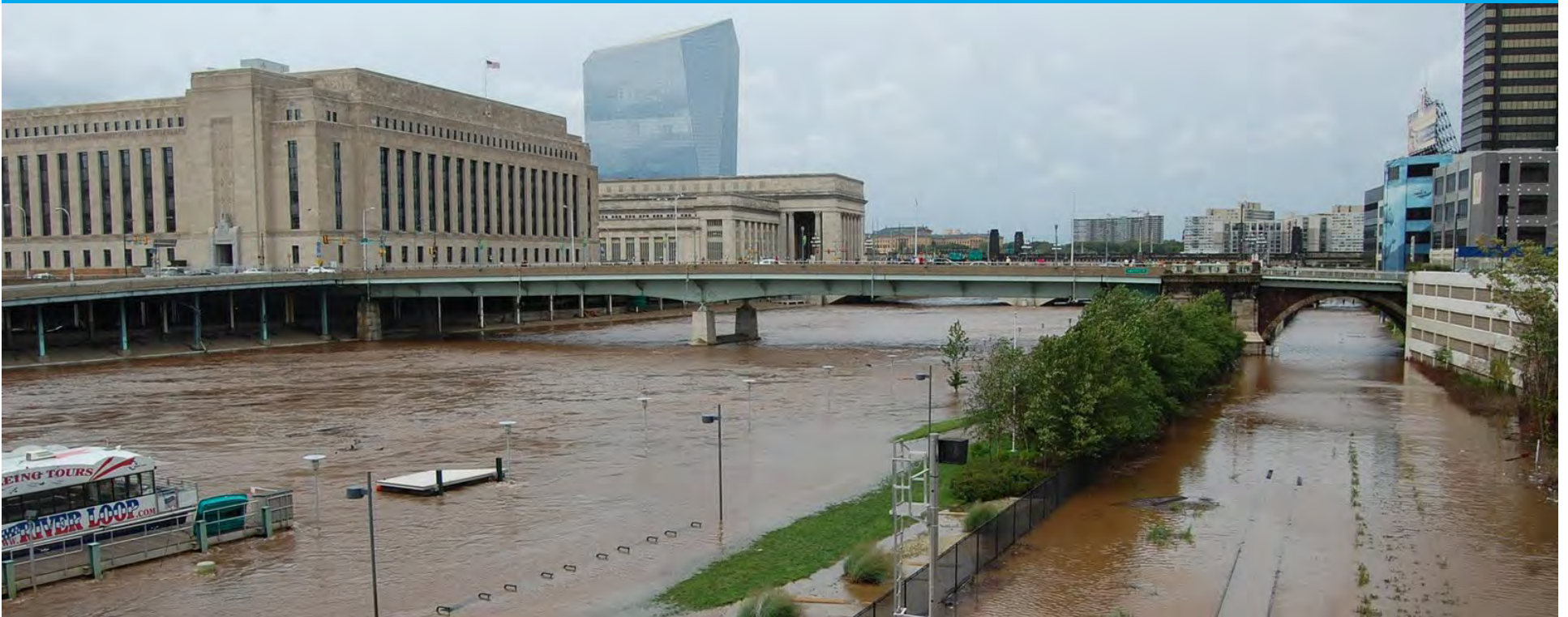


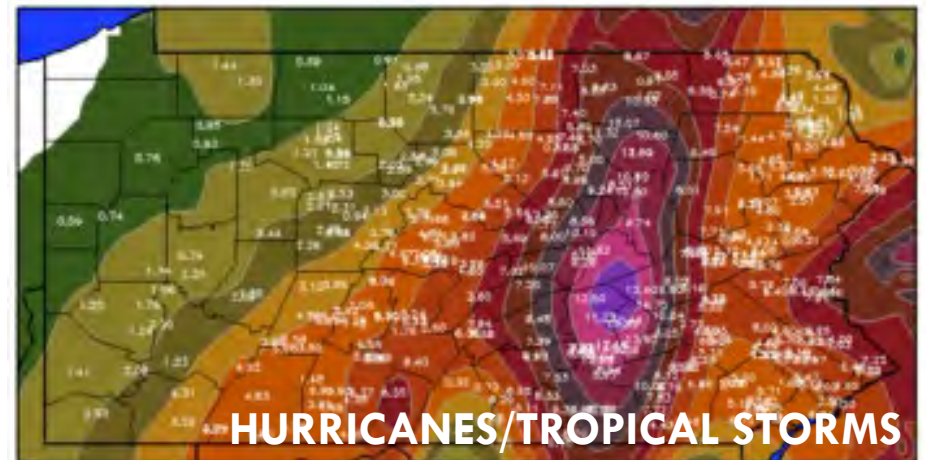
FLOODPLAIN MANAGEMENT



JOSH LIPPERT, CFM
FLOODPLAIN MANAGER
JOSHUA.LIPPERT@PHILA.GOV

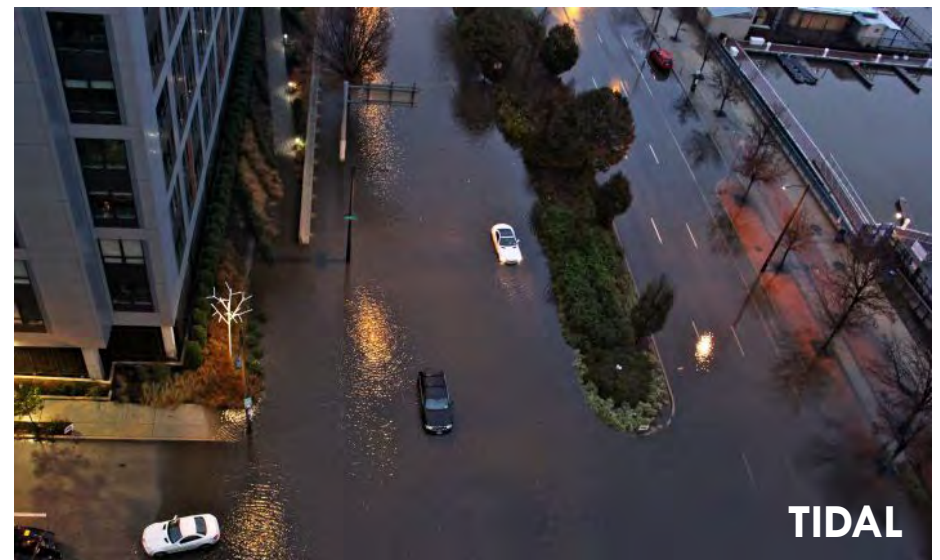
TYPES OF FLOODING

In Pennsylvania



TYPES OF FLOODING

In Pennsylvania

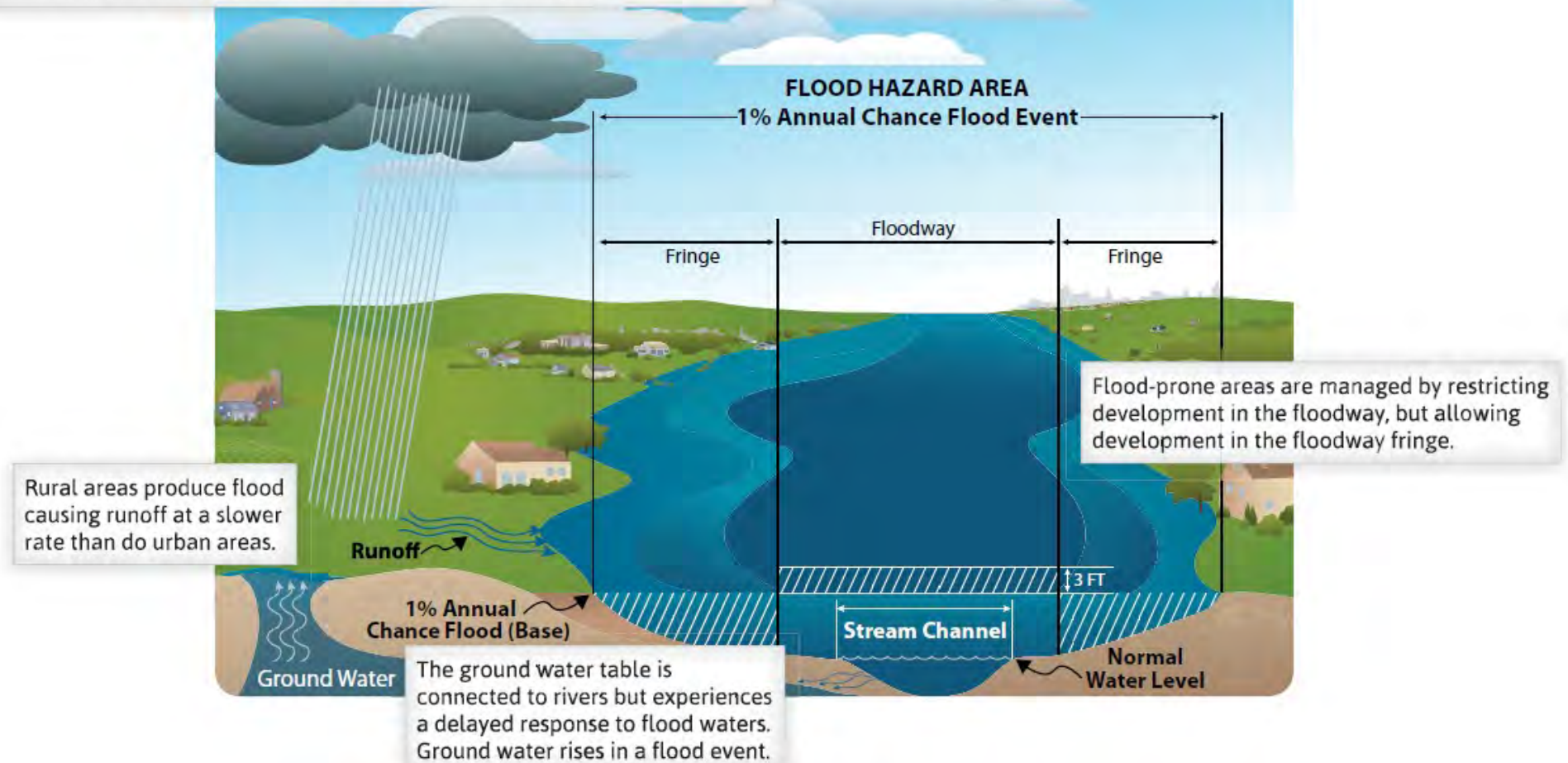


WHAT IS A FLOODPLAIN?

Typical Section

"Living with floods involves two broad activities: better managing the risks and taking steps to reduce our vulnerability, and better managing the landscape to reduce the magnitude of destructive power of floods."

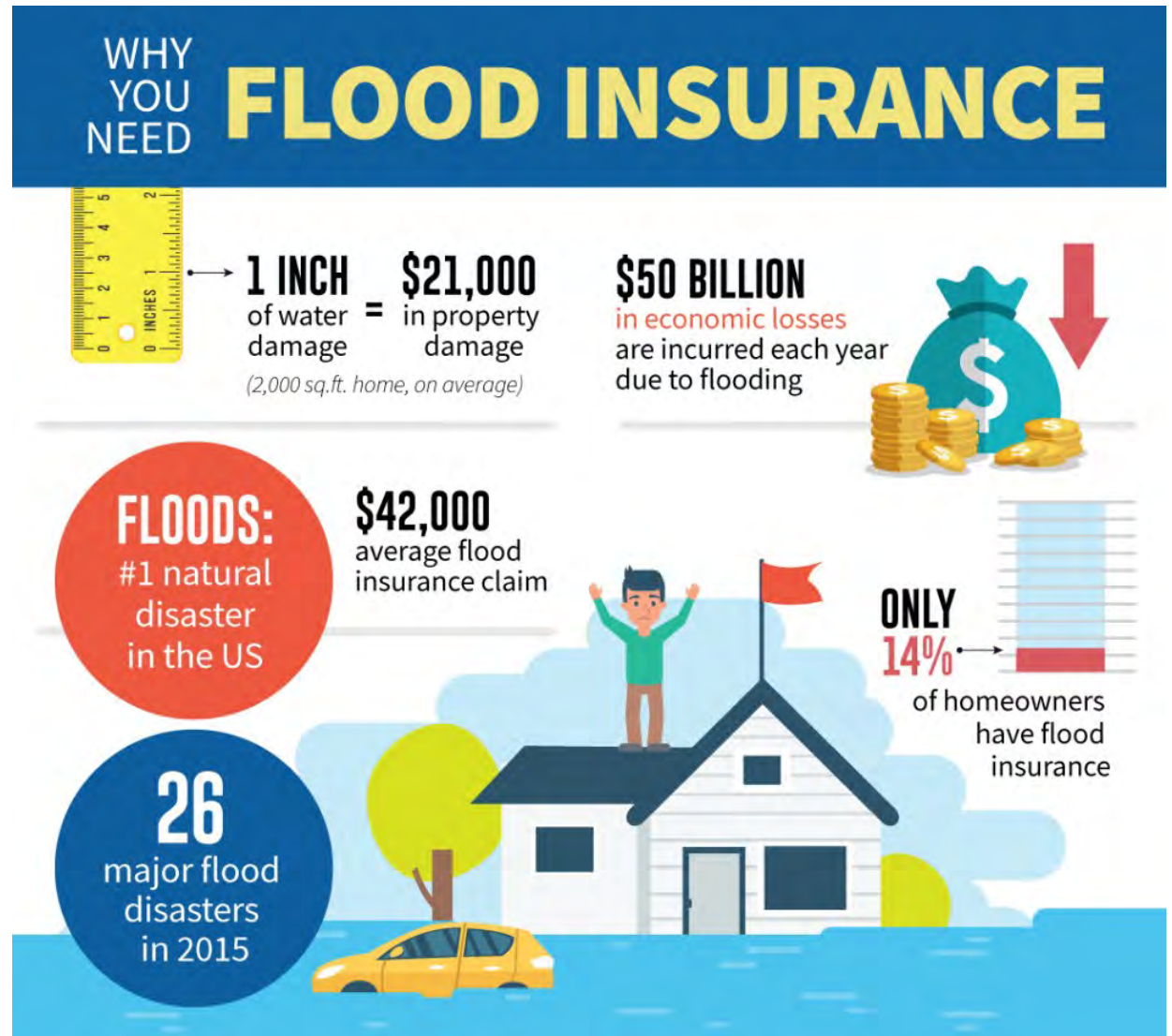
--Connie Mutel, *A Watershed Year: Anatomy of Iowa Floods of 2008*



BACKGROUND

National Flood Insurance Program [NFIP]

- Risk Identification (mapping)
- Management (regulations)
- Mitigation (insurance)



BACKGROUND

National Flood Insurance Program [NFIP]

Created by the National Flood Insurance Act of 1968

- Participation is **mandatory** in Pennsylvania

(Pennsylvania Act 166 of 1978, the [Pennsylvania Floodplain Management Act](#))

- Adopt and enforce regulations
- Benefits of participation:
 - Flood insurance
 - Grants and loans
 - Disaster assistance
 - Federally-backed mortgages



FLOODPLAIN MANAGER

Role

- Administer floodplain codes/regulations
- Training/education
- State and Federal agency coordination
- Land-use planning
- Flood mitigation
- Flood preparedness, response, and recovery



FLOODPLAIN MANAGER

Contacts

https://munstats.pa.gov/Reports/ReportInformation2.aspx?report=LocalOfficial_Excel

Local Government Official Information

[Click here to download the State-wide report](#)

[Unsure of county? Click here.](#)

| | | | |
|---------------------|--|-----------------------|---|
| County: | <input type="text" value="ADAMS"/> | Municipality: | <input type="text" value="[All Municipi"/> |
| Municipality Class: | <input type="text" value="Boroughs"/> | PoliticalAffiliation: | <input type="text" value="All Affiliatio"/> |
| YearTermEnds: | <input type="text" value="[All Years]"/> | Sex: | <input type="text" value="All Sexes"/> |
| OfficialCode: | <div><div><div>76 - Building Code Official</div><div>77 - Zoning Officer</div><div>78 - Chair, Environmental Advisory Council</div><div>79 - Local Ordinance Enforcement Officer</div><div>80 - Agency Open Records Officer</div><div>81 - Flood Plain Administrator</div></div><div><div>Select</div><div>Select All</div><div>Remove</div><div>Remove All</div></div><div><div>01 - May</div><div>02 - Pre</div><div>03 - Cor</div><div>04 - Cor</div><div>05 - Cor</div><div>06 - Cor</div></div></div> | | |

Display Report

KNOW YOUR FLOOD RISK

Mapping/Science

FLOOD HAZARD INFORMATION

FEMA FLOOD MAP SERVICE CENTER

msc.fema.gov

FEMA Flood Map Service Center: Search By Address

Enter an address, place, or coordinates: [?](#)


philadelphia pa [Search](#)


Whether you are in a high risk zone or not, you may need [flood insurance](#) because most homeowners insurance doesn't cover flood damage. If you live in an area with low or moderate flood risk, you are 5 times more likely to experience flood than a fire in your home over the next 30 years. For many, a National Flood Insurance Program's flood insurance policy could cost less than \$400 per year. Call your insurance agent today and protect what you've built.

Learn more about [steps you can take](#) to reduce the risk flood damage.

Search Results—Products for PHILADELPHIA, CITY OF [Show ALL Products »](#)

The flood map for the selected area is number **4207570183G** effective on **01/17/2007**

DYNAMIC MAP  PRINT MAP / FIRMette

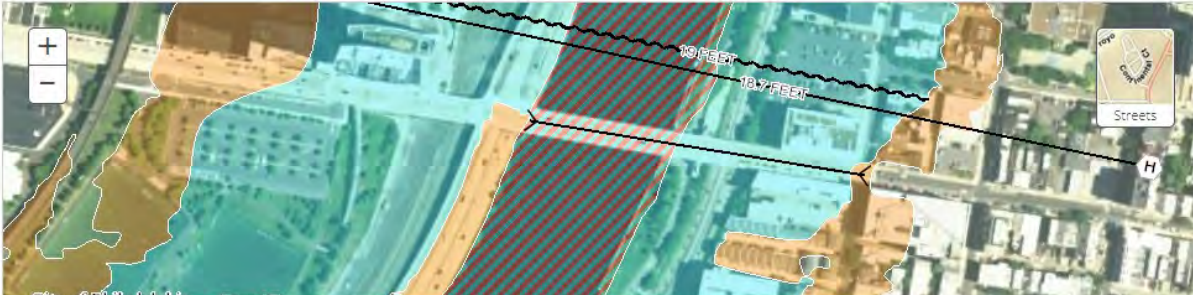
MAP IMAGE  DOWNLOAD FIRM PANEL

Changes to this FIRM [?](#)

- Revisions (0)
- Amendments (15)
- Revalidations (0)

You can choose a new flood map or move the location pin by selecting a different location on the locator map below or by entering a new location in the search field above. It may take a minute or more during peak hours to generate a dynamic FIRMette.

[Go To NFHL Viewer »](#)



→ ADDRESS

→ CREATE FIRMette-
8.5x11" Print of
property on FIRM Map

→ FIRM DATE

→ FIRM PANEL #

FIRMette with mapped floodway

National Flood Hazard Layer FIRMette



Legend

SEE FIRM REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

| | |
|----------------------------|--|
| SPECIAL FLOOD HAZARD AREAS | Without Base Flood Elevation (BFE) Zone A, V, AO, X |
| | With BFE or Depth |
| | Regulatory Floodway Zone AE, AO, AH, VE, AR |

| | |
|-----------------------------|---|
| OTHER AREAS OF FLOOD HAZARD | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | Area with Flood Risk due to Levee Zone D |

| | |
|--------------------|--|
| OTHER AREAS | Area of Minimal Flood Hazard Zone X |
| | Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | Channel, Culvert, or Storm Sewer |
| | Levee, Dike, or Floodwall |

| | |
|----------------|--|
| OTHER FEATURES | Cross Sections with 1% Annual Chance Water Surface Elevation |
| | Coastal Transect |
| OTHER FEATURES | Base Flood Elevation Line (BFE) |
| | Limit of Study |
| OTHER FEATURES | Jurisdiction Boundary |
| | Coastal Transect Baseline |
| OTHER FEATURES | Profile Baseline |
| | Hydrographic Profile |

| | |
|------------|---------------------------|
| MAP PANELS | Digital Data Available |
| | No Digital Data Available |
| | Unmapped |

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below.

accuracy standards
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/9/2018 at 9:08:42 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



SPECIAL FLOOD HAZARD AREA - regulated by City of Philadelphia

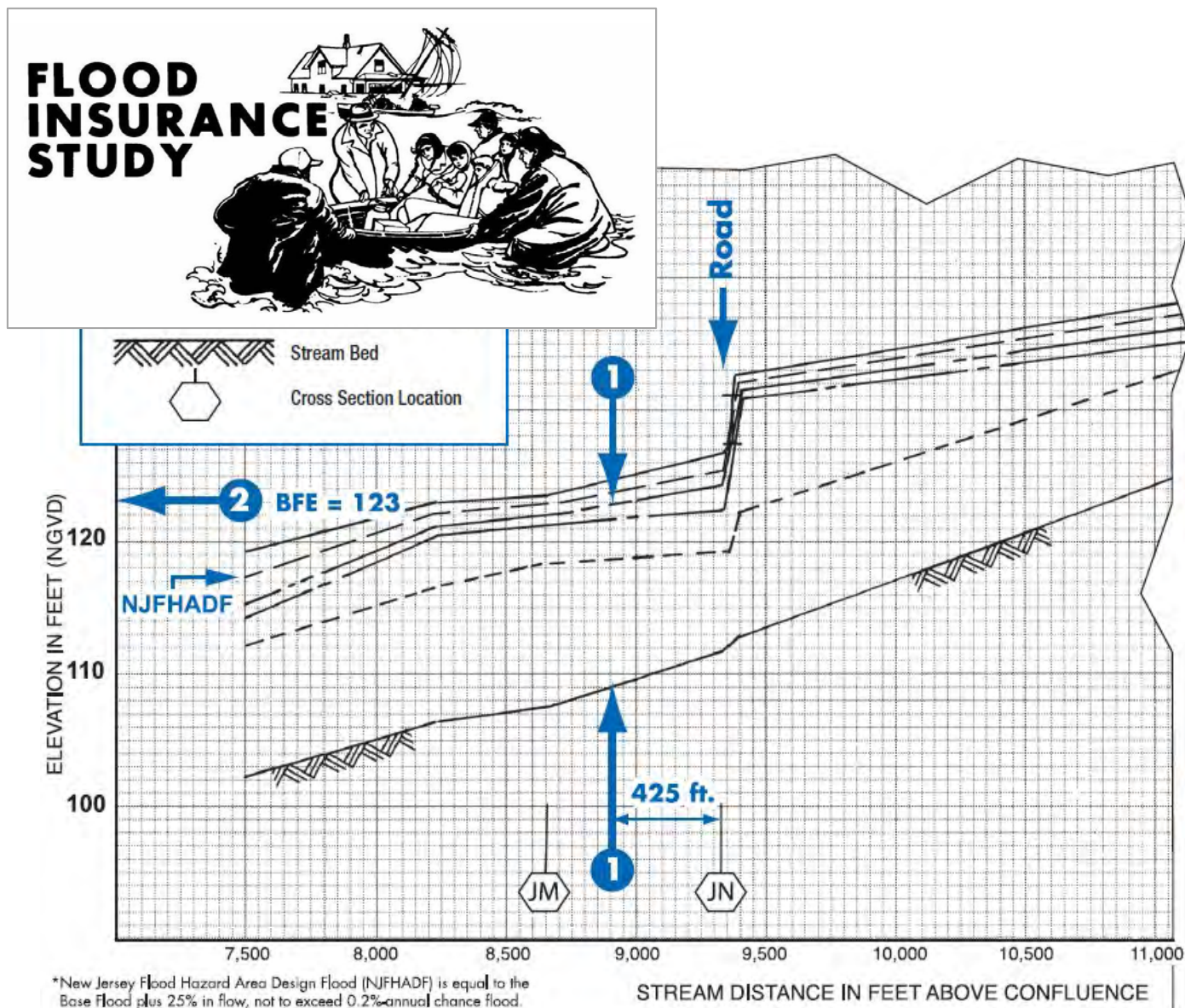
CROSS SECTION - w/BFE

**ZONE AE - FLOODWAY
ZONE AE**

0.2% (not regulated)

FLOOD INSURANCE STUDY [FIS]

Riverine flood profile to determine BFE



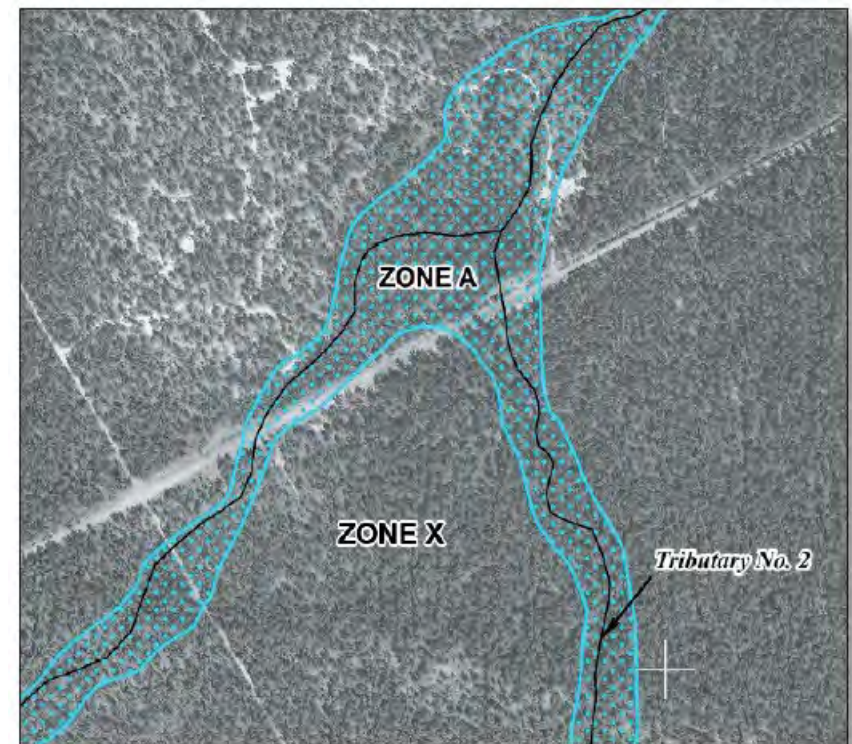
Flood Profiles from Flood Insurance Study reports can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood (100-year).

- 1** On the effective flood map, locate your site by measuring the distance, along the profile baseline of the stream channel, from a known point such as a road or cross section, for example, JM or JN.
- 2** Scale that distance on the Flood Profile and read up to the profile of interest, then across to determine the BFE, to the nearest 1/10 of a foot. (Answer: 123 feet).

FIRMette

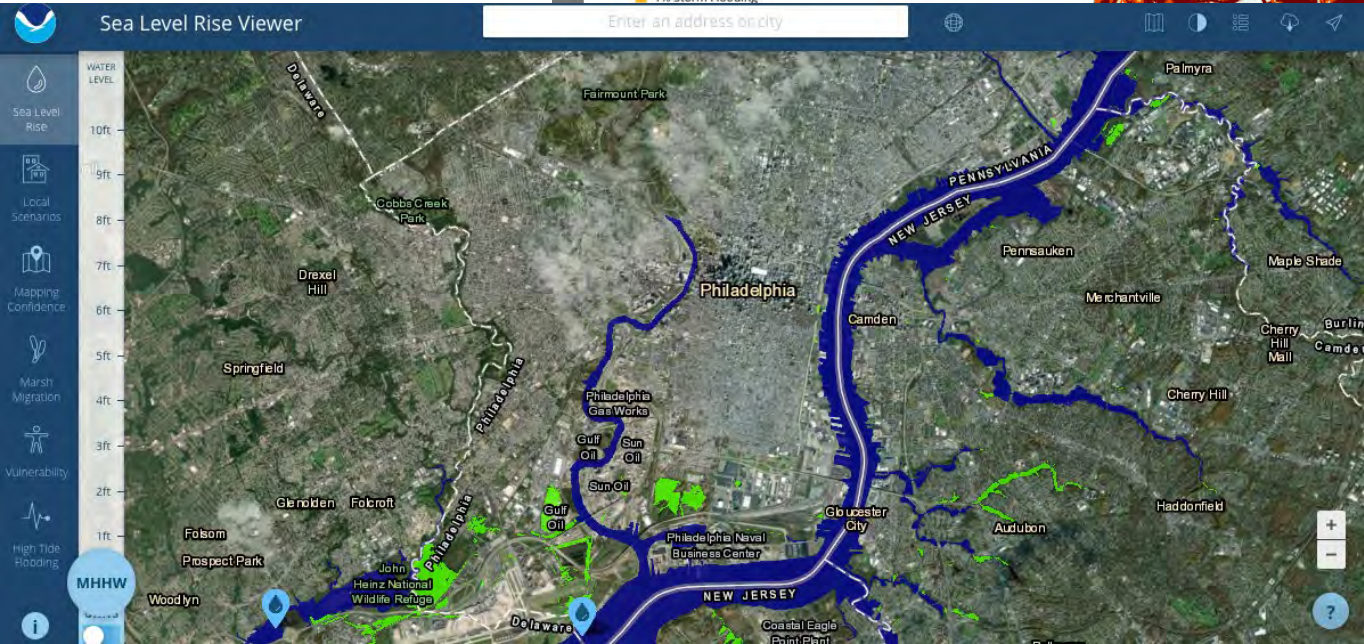
A Zone

- FEMA uses existing information - not engineering studies - to draw Approximate Zone A boundaries. Information may have been provided by the USACE, other federal agencies, State and local agencies, and historic records.
- For existing single family residential and accessory structures, the City may specify the BFE through contour interpolation, for all other development a Hydrologic and Hydraulic Study must be completed to determine a BFE



CLIMATE SCIENCE

Future Conditions



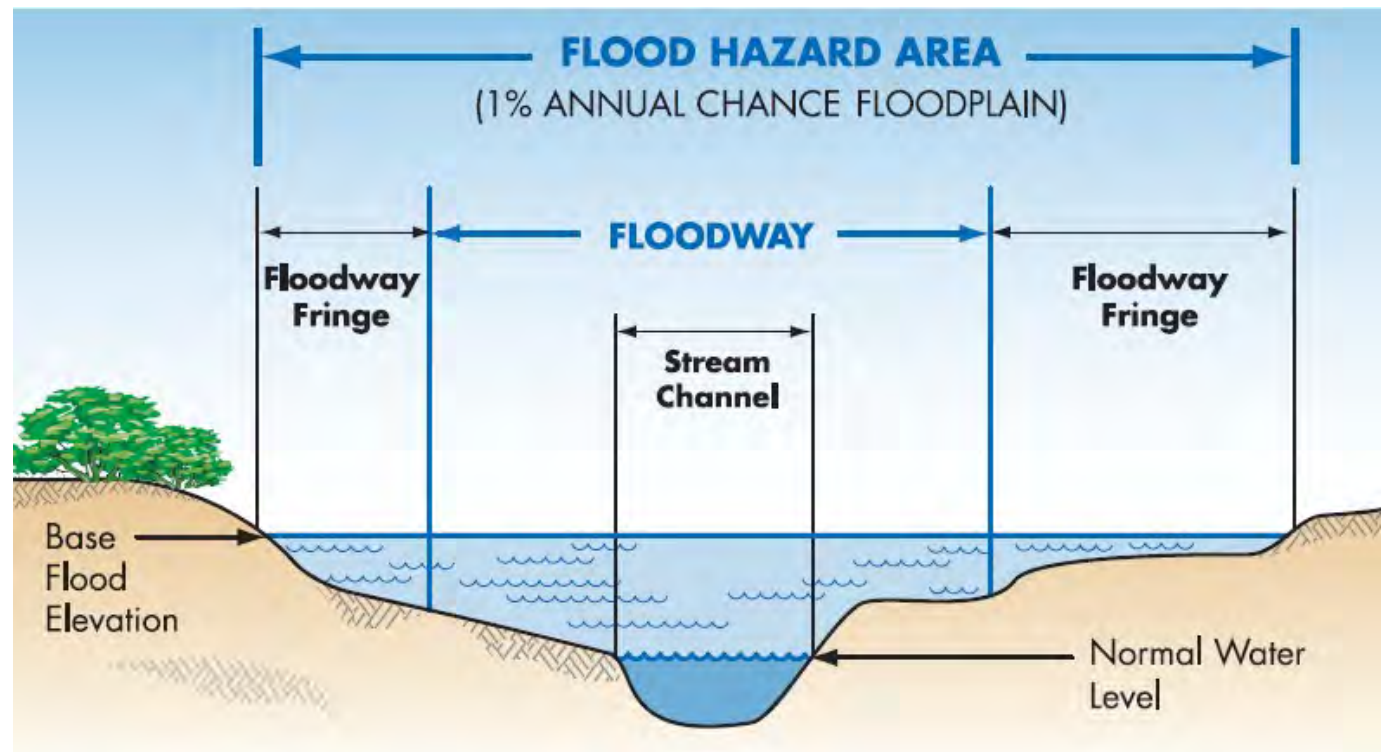
PERMITTING YOUR PROJECT

Regulations

REGULATIONS

Development Definition

- development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage;
temporary structures and temporary or permanent storage; utility and miscellaneous buildings and structures



REGULATIONS

NFIP + Local Codes + Building Codes



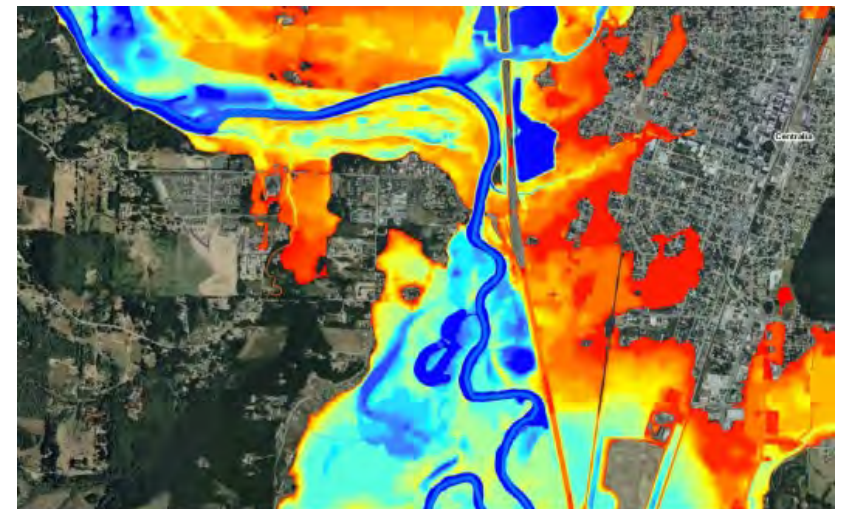
* NFIP-consistent administrative provisions, community-specific adoption of Flood Insurance Studies and maps, and technical requirements for development outside the scope of the building code (and higher standards, in some communities).

Figure 1-1: Relationship of NFIP regulations to building code flood provisions

REGULATIONS

In, near, or adjacent to a waterway

- Federal/State permits
- Local floodplain permitting
- Hydrologic and Hydraulic Analysis or Coastal Analysis
- FEMA Letter of Map Change
 - Change to:
 - Floodplain boundary
 - Base Flood Elevations [BFE]
 - Flood hazard zone
 - Flood Insurance Study [FIS]
 - New data
- Specifically for:
 - Fill, Culverts, Bridges, or any other Permanent encroachments



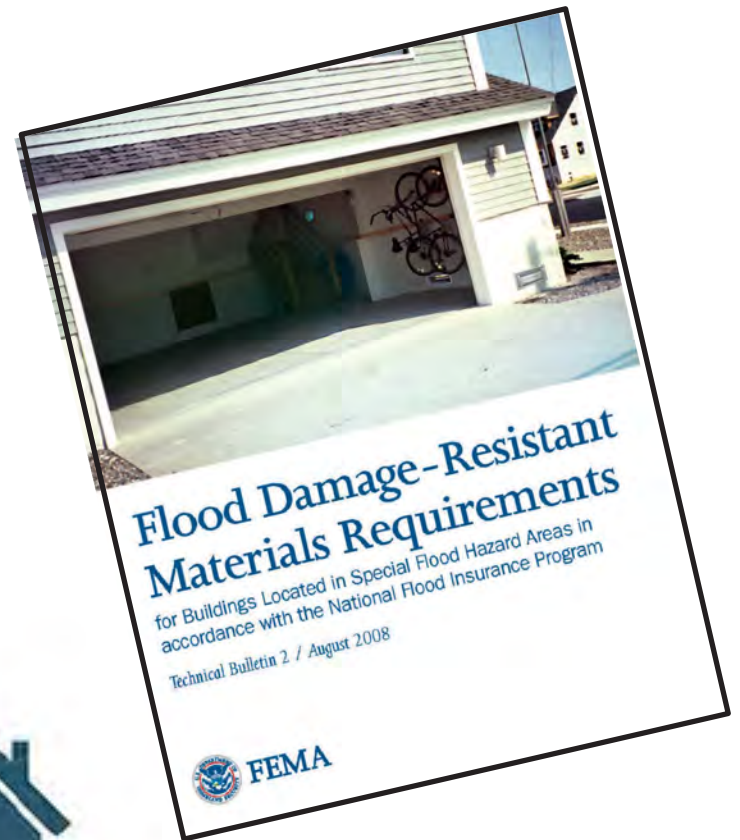
Regional Guidance for Hydrologic and Hydraulic Studies

In support of the Model Ordinance for
Floodplain Management and the Endangered Species Act

REGULATIONS

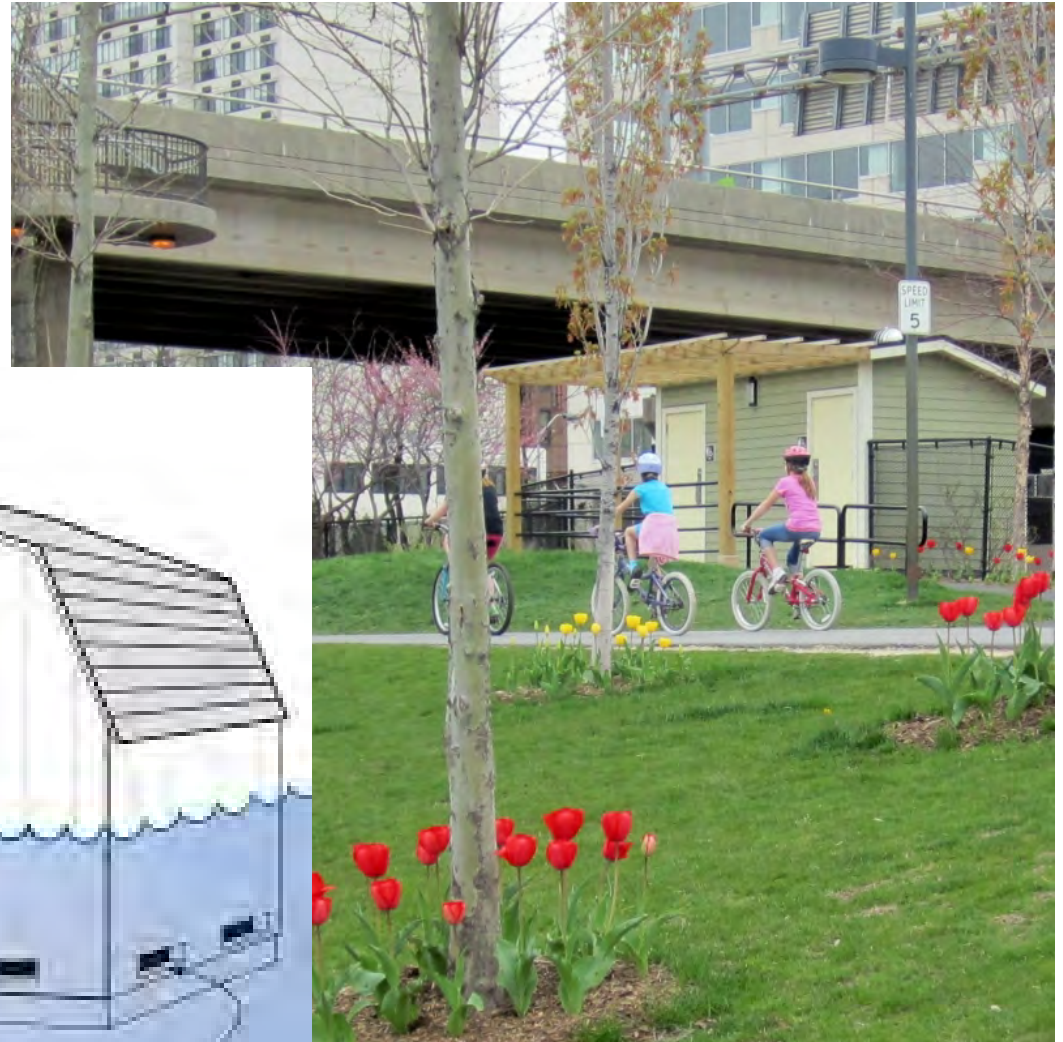
General concepts

- Elevate (BFE + 18")
- Wet vs. dry floodproofing
- Flood damage resistant materials



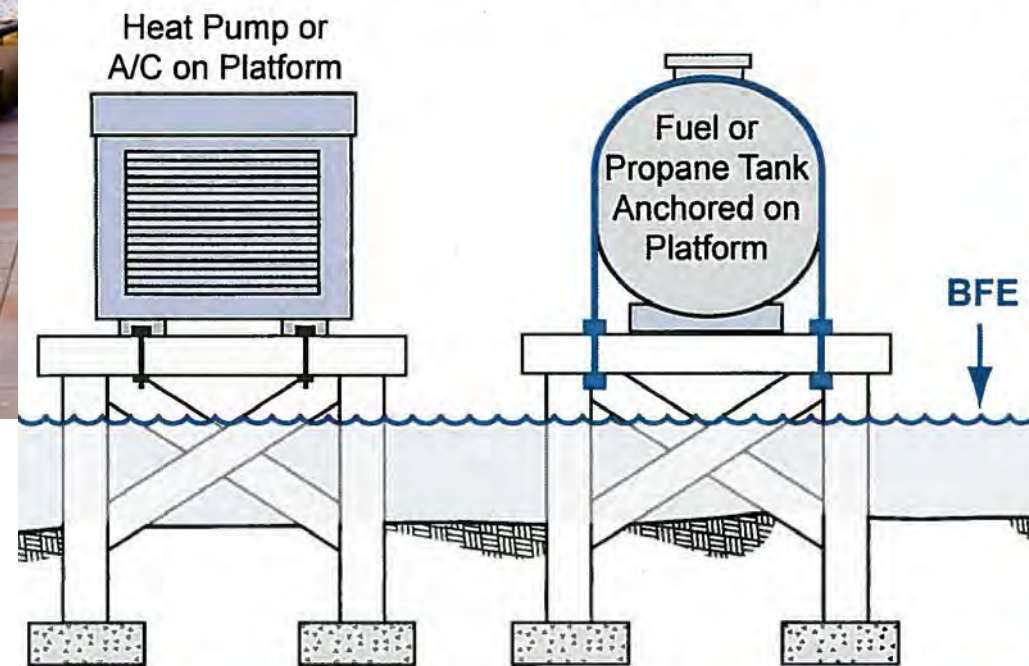
REGULATIONS

Accessory structures



REGULATIONS

Machinery/equipment



REGULATIONS

Storage



REGULATIONS

Temporary structures



REGULATIONS

Shipping containers/Trailers

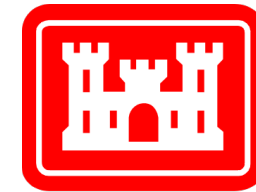


BEST PRACTICES

Coordination



Goal to provide “one-stop shopping” for information about waterfront development permits in the Delaware River Estuary.

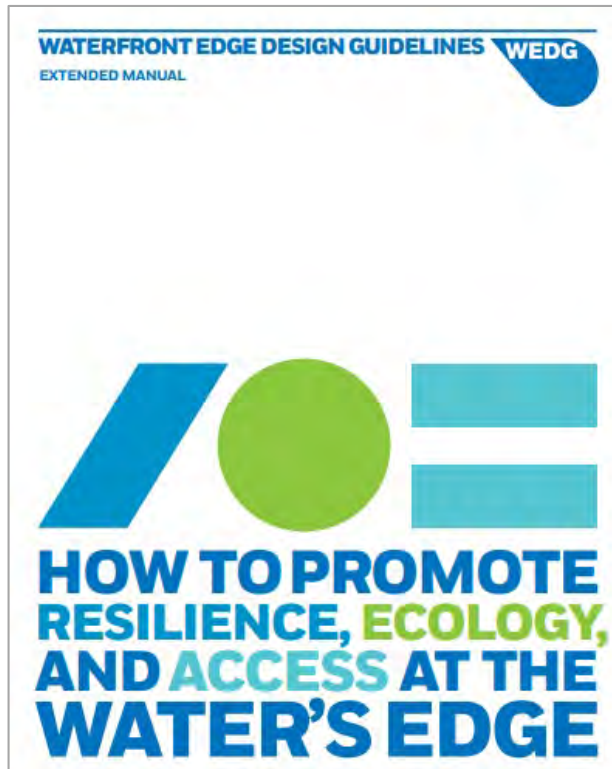


**US Army Corps
of Engineers®**



BEST PRACTICES

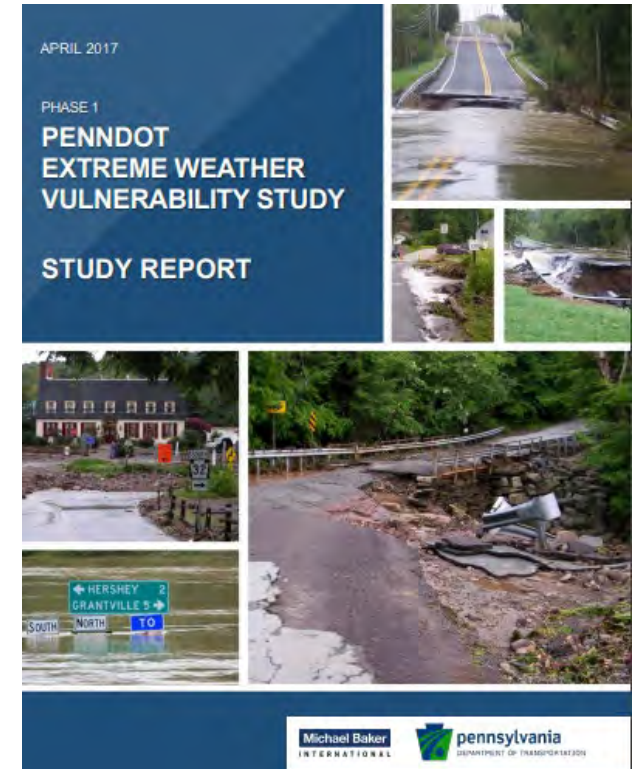
Waterfronts, Parks, Roadways



**WATERFRONT EDGE DESIGN
GUIDELINES**
WATERFRONT ALLIANCE



**DESIGN AND PLANNING
FOR FLOOD RESILIENCY**
NYC PARKS DEPARTMENT



**EXTREME WEATHER
VULNERABILITY STUDY**
PENNDOT

PROJECT EXAMPLES

Precedents

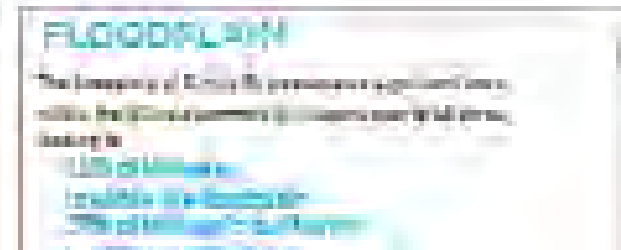
Millvale, PA



WATER Pivot 1.0

Large storm events resulting in severe flooding have been an impediment to Millvale's aspirations and vision. Even though Millvale is in the midst of redevelopment, this effort is challenged by restrictions from recent floodplain ordinances.

Over the past few decades, big box development in upstream communities along the Girty's Run watershed have increased impermeable surface area, therefore increasing runoff water that contributes to Girty's Run. Unfortunately, Millvale is at the end of this watershed and suffers the consequences of increased



PROJECT EXAMPLES

Precedents



Saw Mill Run
Pittsburgh, Pa.



PROJECT EXAMPLES

Precedents

**Ansonia Place
Pittsburgh, PA**

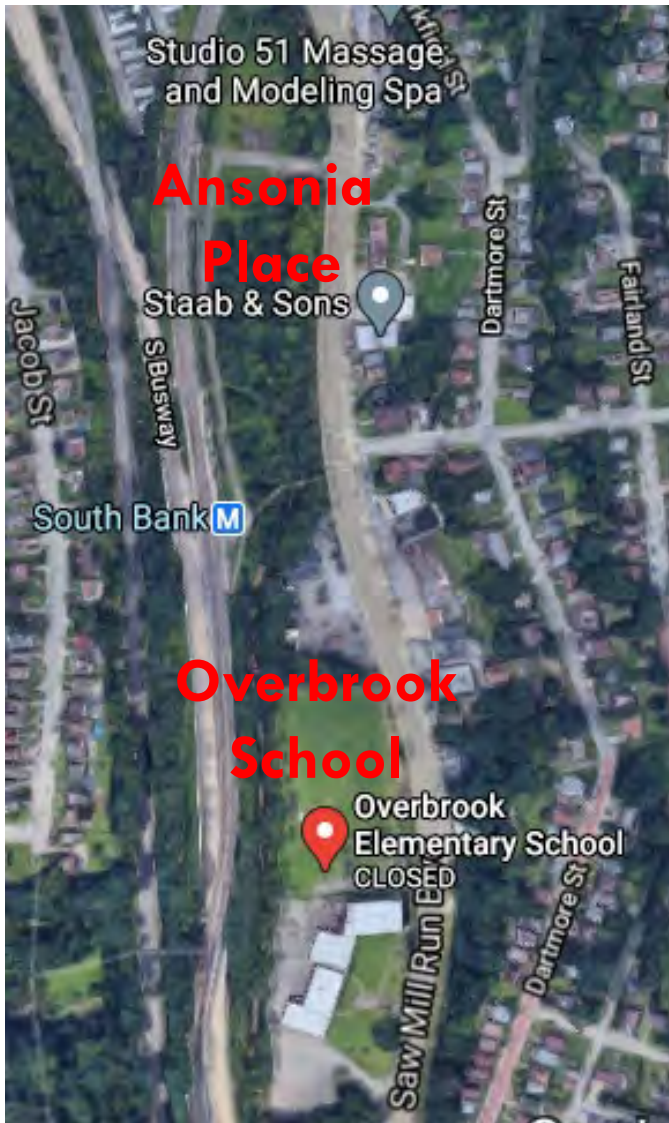


Ansonia Place is 5 acres of gravel and brush that could be turned into a floodplain off of Saw Mill Run Creek in Pittsburgh. (Photo by Jay Manning/PublicSource)

PROJECT EXAMPLES

Precedents

Overbrook School Pittsburgh, PA

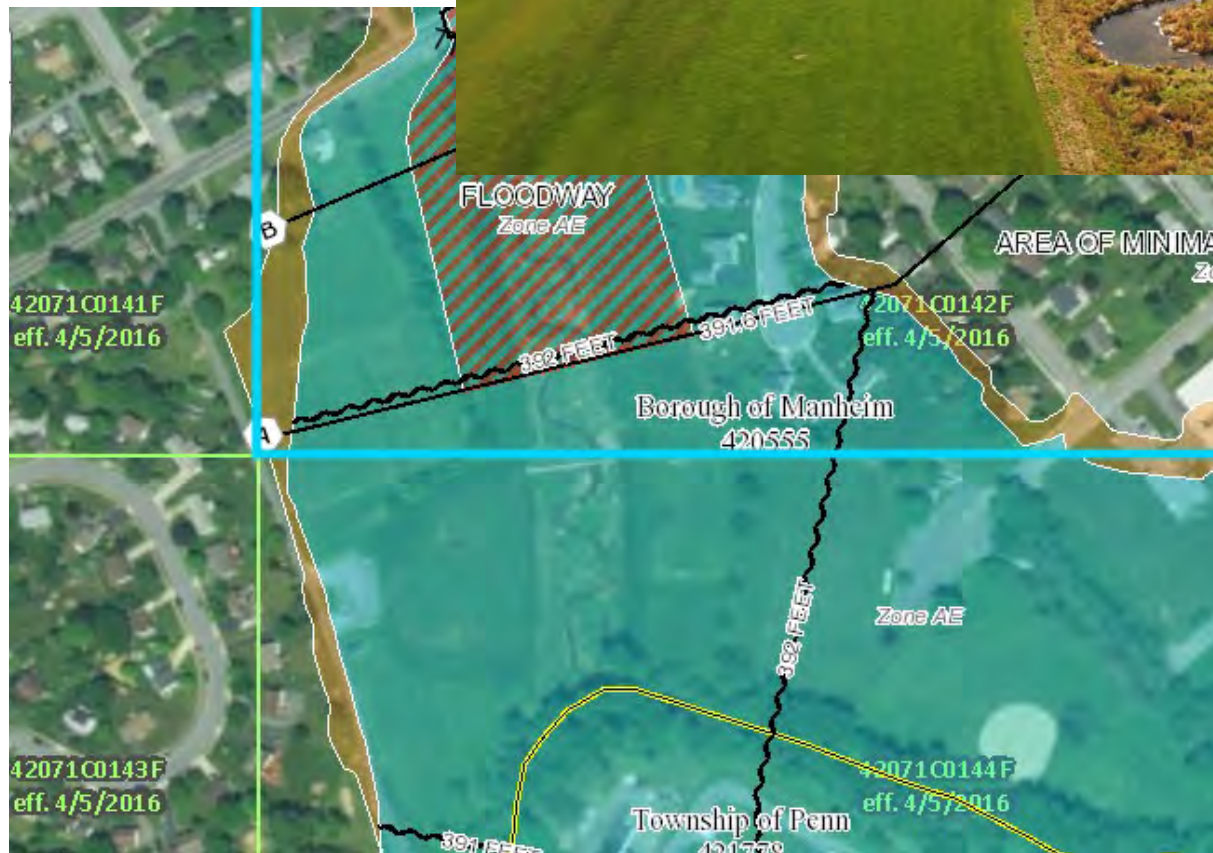


PROJECT EXAMPLES

Precedents



**Logan Park
Manheim, Pa.**



PROJECT EXAMPLES

Precedents



**Brubaker Run
Floodplain Restoration
Lancaster County, Pa.**

Floodplain Management

Tips/Considerations

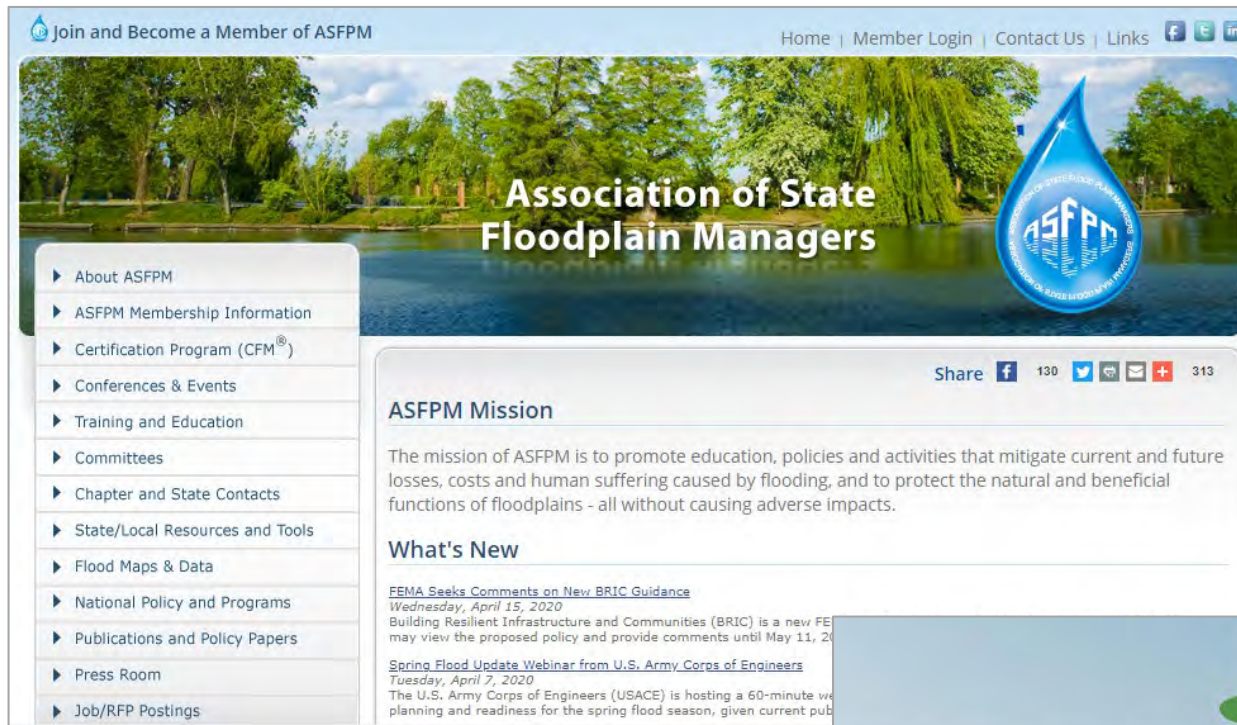
Josh's tips on what things to consider:

- **Develop** a watershed plan with a floodplain management component
- **Hire** a design professional knowledgeable of floodplain regulations
- **Analyze** floodplain maps, climate science, historic flooding, etc.
- **Review** local floodplain regulations, specially for higher standards
- **Communicate** with the local floodplain manager
- **Coordinate** with federal and state agencies
- **Obtain** floodplain permits prior to construction
- **Prepare** a flood emergency operations plan
- **Maintain** projects before and after flood events



RESOURCES

Professional Organizations



National Organization

- Annual Conference
- Training/CEU resources
- Professional certification program (Certified Floodplain Manager)

Pennsylvania Organization

- Annual Conference
- Newsletters
- CFM Exam Offering (Proctor)
- Webinars
- State floodplain training calendar
- Mentorship program (coming soon)

