

# Floodplain Mapping in New Jersey

Joseph Ruggeri, P.E.

Supervising Engineer

NJ DEP, Bureau of Dam Safety & Flood Control



# WHAT IS A FLOOD

GENERAL AND TEMPORARY CONDITION

OVERFLOW OF INLAND OR TIDAL WATERS

SURFACE WATERS

MUDFLOW

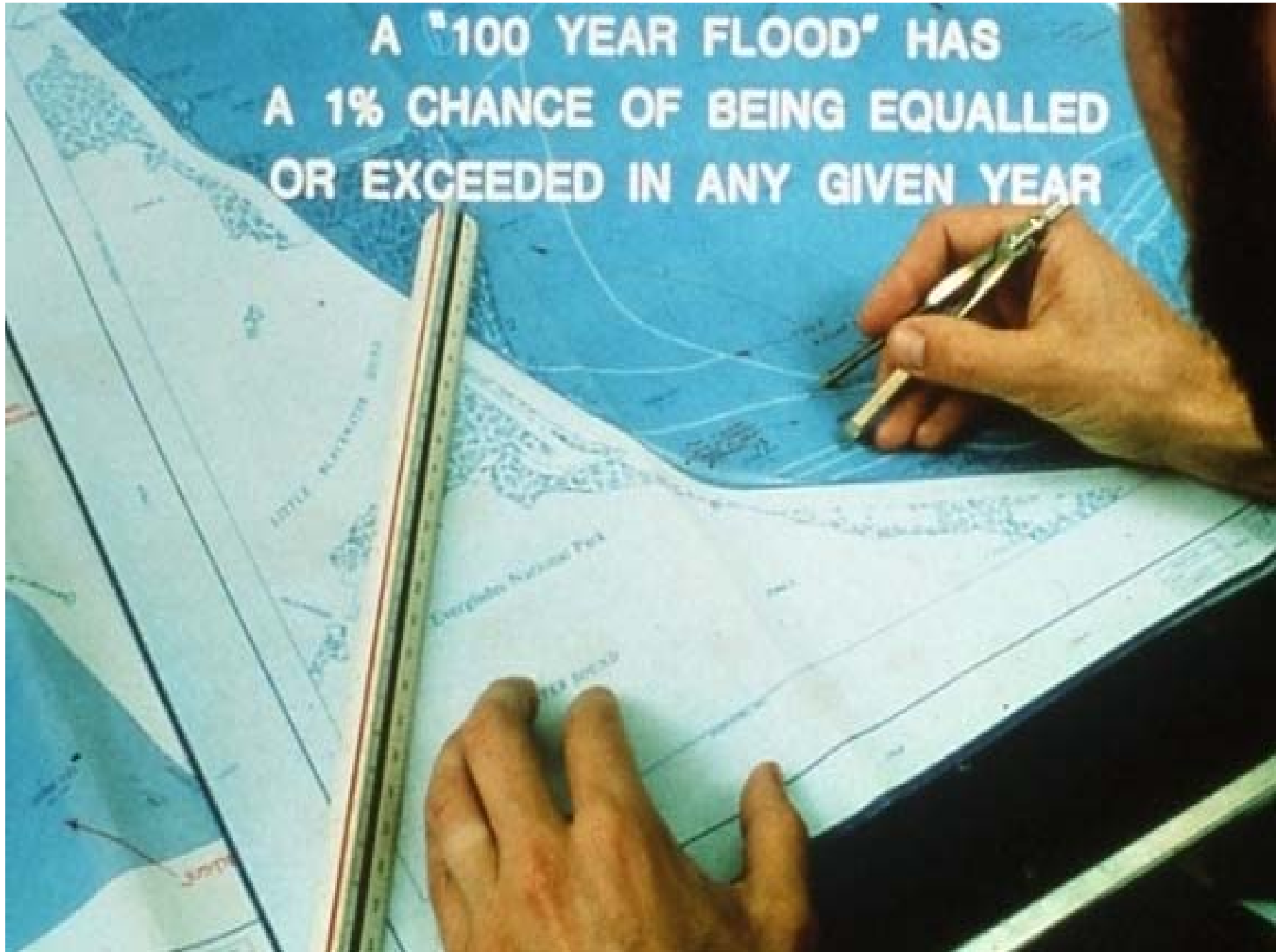
ACCELERATED EROSION

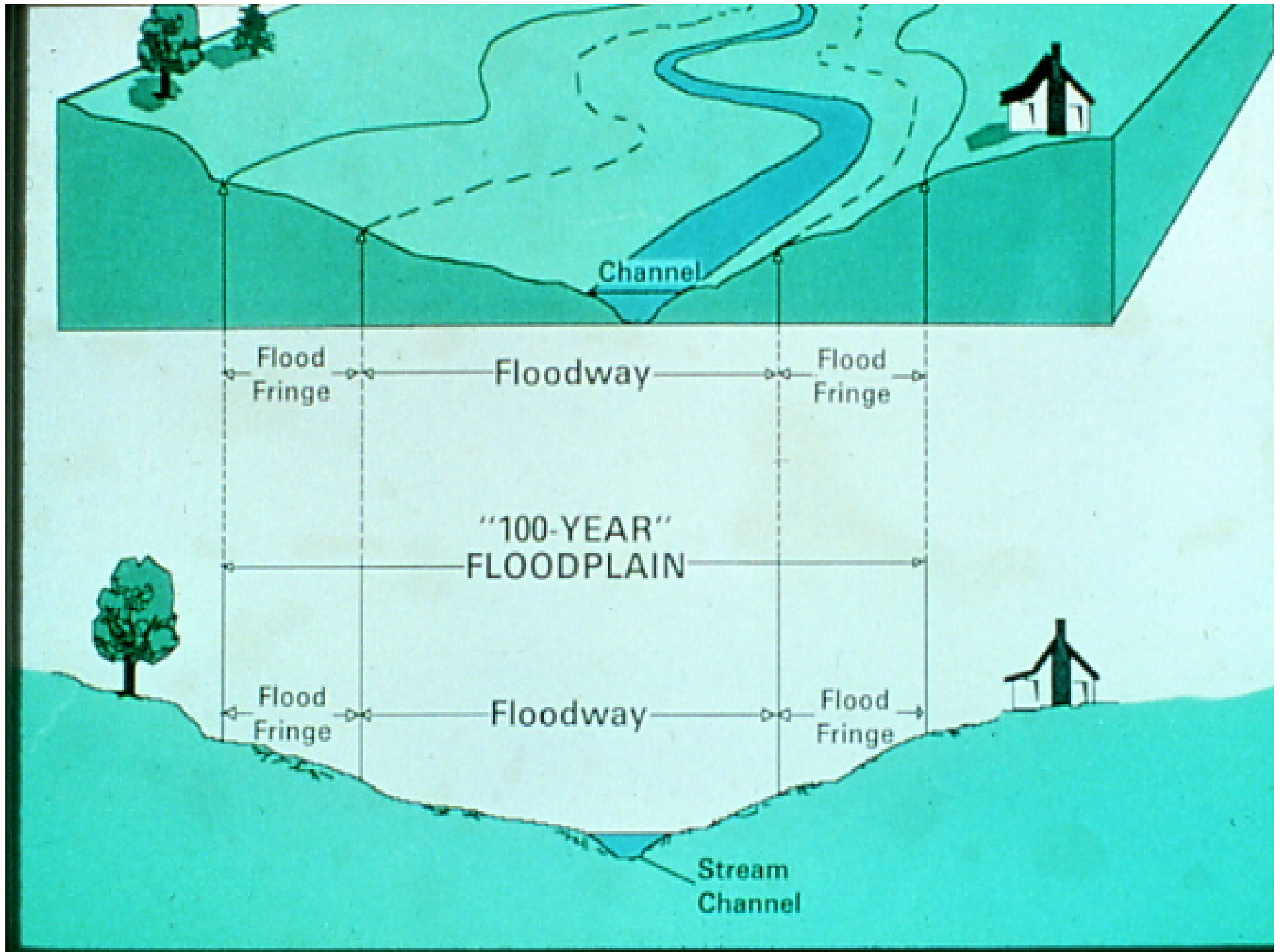
# **FACTORS CONTRIBUTING TO FLOOD DAMAGE**

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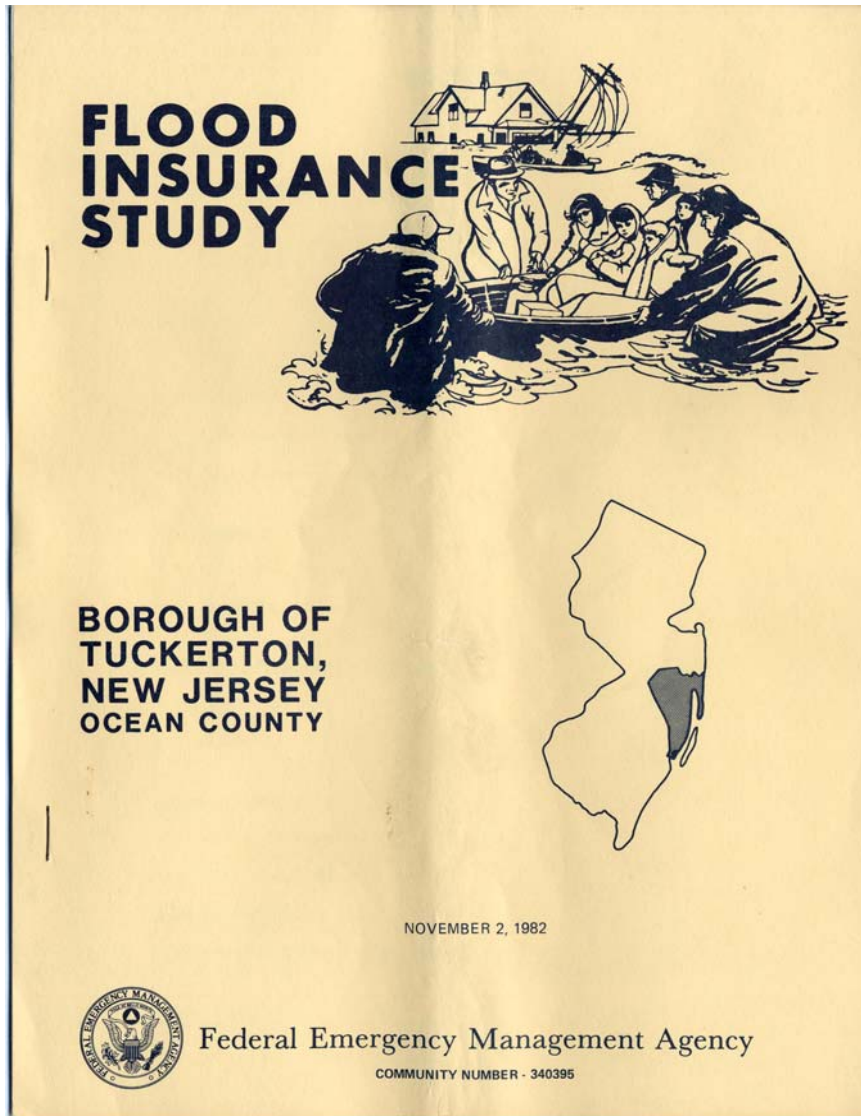
- **Flood depth, velocity, and duration**
  - **Amount and kind of debris**
  - **Integrity of flood control structures**
  - **Watershed and floodplain land uses**
  - **Quality of building construction**
-

A "100 YEAR FLOOD" HAS  
A 1% CHANCE OF BEING EQUALLED  
OR EXCEEDED IN ANY GIVEN YEAR

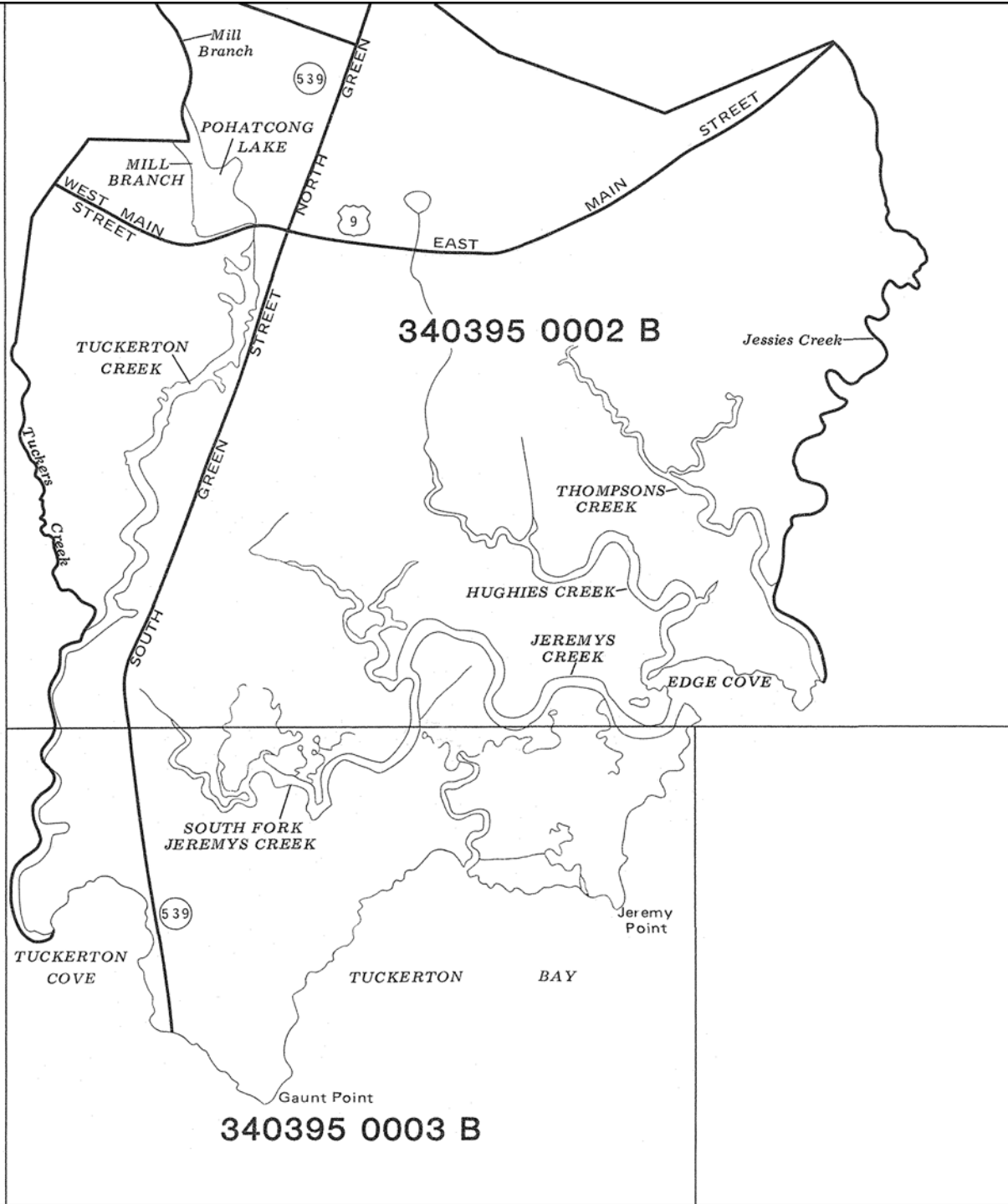




# FEMA Flood Insurance Studies (FIS)



- Provides Floodway Data In Tabular Format
- Provides Flood Profiles As Elevation Graphed Over Stream Distance From Known Points



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

BOROUGH OF  
TUCKERTON,  
NEW JERSEY  
OCEAN COUNTY

**MAP INDEX**  
PANELS PRINTED: 2, 3

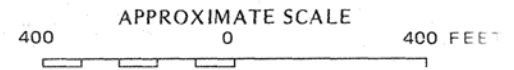
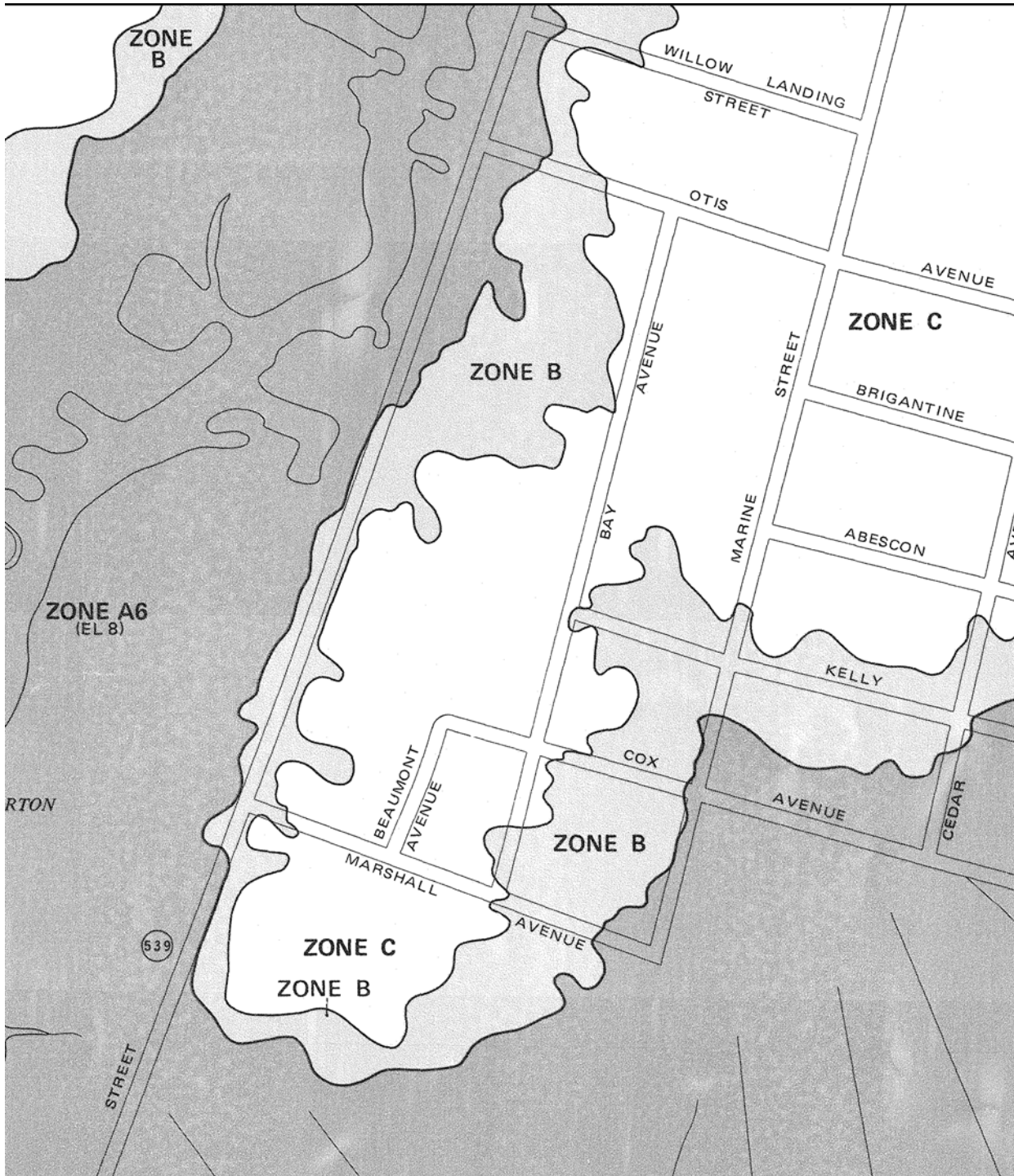
COMMUNITY-PANEL NUMBERS  
340395 0001-0003

EFFECTIVE DATE:  
MAY 2, 1983



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

BOROUGH OF  
TUCKERTON,  
NEW JERSEY  
OCEAN COUNTY

PANEL 2 OF 3  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
340395 0002 B

EFFECTIVE DATE:  
MAY 2, 1983



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



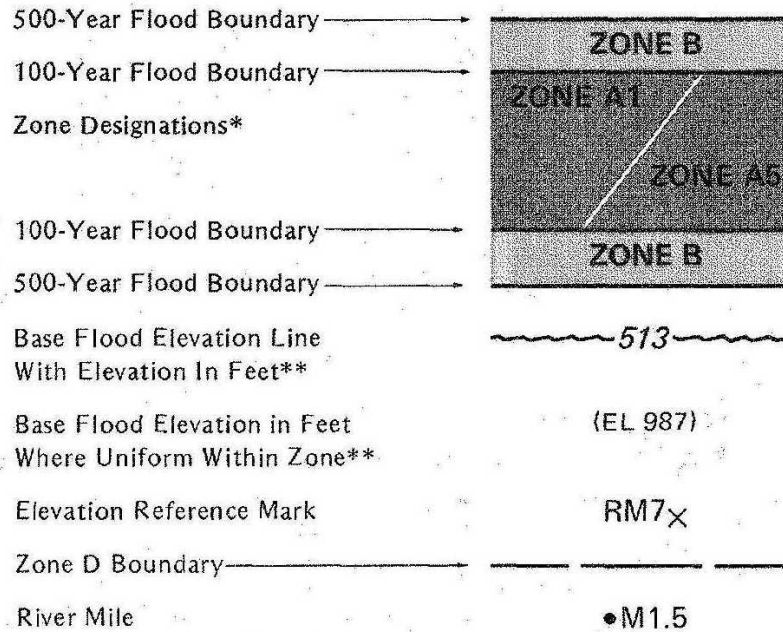
## **Special Flood Hazard Area (SFHA)**

**The SFHA is the darkly shaded area on the Flood Insurance Rate Map, commonly known as the 100-year flood plain, but more accurately thought of as the area that has a 1% chance or greater of experiencing a flood in any given year. This flood is called the “base flood.”**

## \*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

### KEY TO MAP

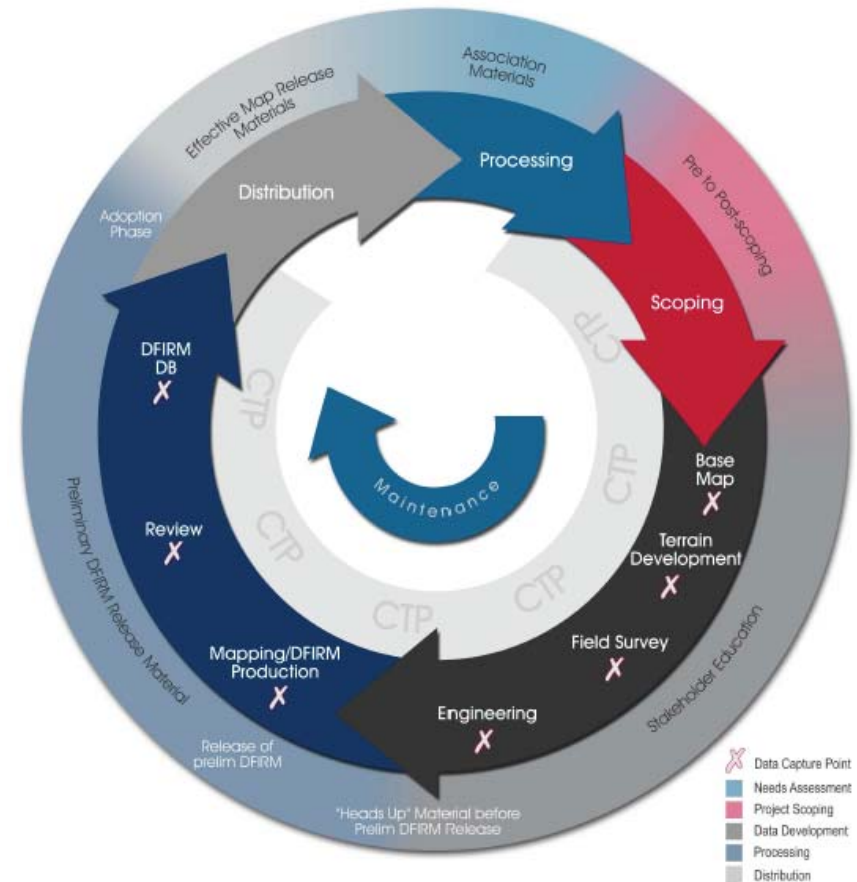


\*\*Referenced to the National Geodetic Vertical Datum of 1929

# FEMA MAP MODERNIZATION PROGRAM

## Overview of Flood Mapping Process

- Project Scoping
  - Scoping Meeting
- Topographic Data Acquisition
- Flood Hazard Data/Flood Insurance Study Report Development
- DFIRM Map Production
- **Preliminary & Post-Preliminary Processing**
- Distribution



# FEMA Map Modernization Program Schedule

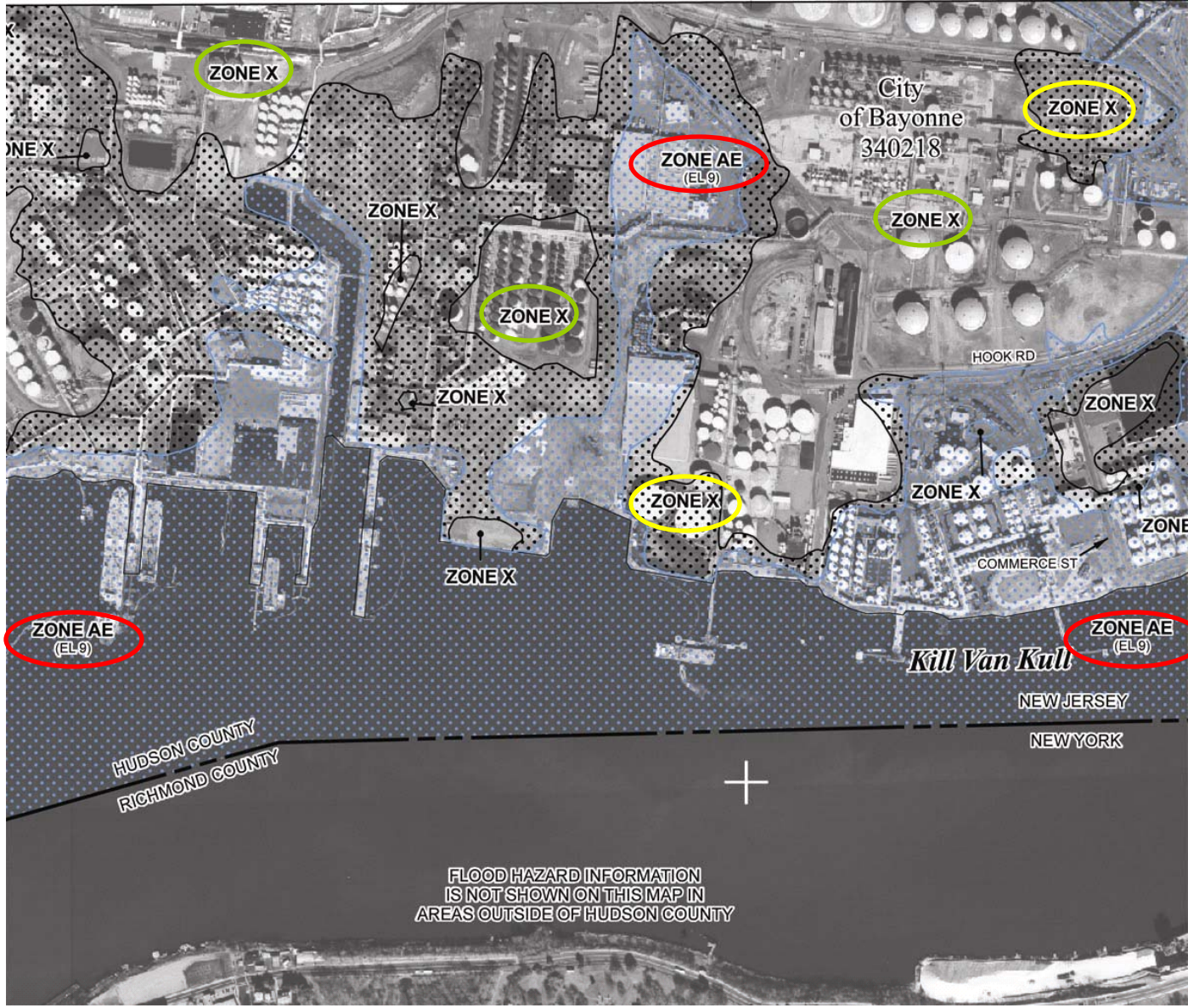
## NFIP Map Modernization Data: Projected Availability

(As of April 2006. Data subject to protests and appeals. Includes maps, existing reports, storm history, and flood elevations. Data available from Community Map Repository and NJDEP)

Location			Prescoping Report (Identify waterbodies and inventory existing flood info)	Preliminary Maps to the Field (Includes preliminary maps and text report of pre-scoping, community input and engineering studies)							FIRM and DFIRM Available (Adopted FIRM (print) and DFIRM database (GIS format) that have been through public comment process)								
State	County	FIPS	Completed: Prescoping package complete and available Fall 2008: Prescoping planned for Fall, 2008 Not Completed: Study underway, prescoping not performed	DFIRM_03 AND PRIOR	DFIRM_04	DFIRM_05	DFIRM_06	DFIRM_07	DFIRM_08	DFIRM_09	DFIRM_10	ADOPTED_03 AND PRIOR	ADOPTED_04	ADOPTED_05	ADOPTED_06	ADOPTED_07	ADOPTED_08	ADOPTED_09	ADOPTED_10
NJ	Atlantic	34001	Fall 2008							X									X
NJ	Bergen	34003	Not Completed		X									X					
NJ	Burlington	34005	Fall 2006					X									X		
NJ	Camden	34007	Not Completed				X									X			
NJ	Cape May	34009	Fall 2008							X									X
NJ	Cumberland	34011	Fall 2008							X									X
NJ	Essex	34013	Not Completed			X								X					
NJ	Gloucester	34015	Fall 2007							X									X
NJ	Hudson	34017	Completed			X								X					
NJ	Hunterdon	34019	Completed				X									X			
NJ	Mercer	34021	Completed					X									X		
NJ	Middlesex	34023	Completed					X									X		
NJ	Monmouth	34025	Completed					X									X		
NJ	Morris	34027	Fall 2006						X									X	
NJ	Ocean	34029	Completed			X								X					
NJ	Passaic	34031	Not Completed				X									X			
NJ	Salem	34033	Fall 2006						X									X	
NJ	Somerset	34035	Not Completed			X										X			
NJ	Sussex	34037	Fall 2007							X									X
NJ	Union	34039	Not Completed		X									X					
NJ	Warren	34041	Fall 2007							X									X

Note 1: Q3 Data for the State on NJ contained on Flood Data Disc 18, dated September 1996





FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF HUDSON COUNTY

**LEGEND**

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AP9, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently declassified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AP9** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AF**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

**ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet\* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet\*

- \* Referenced to the North American Vertical Datum of 1988
- ⊕ Cross section line
- ⊖ Transsect line
- 87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°N 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT 5000-foot grid ticks: New Jersey State Plane coordinate system, FIPSZONE 2900, Transverse Mercator projection
- DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

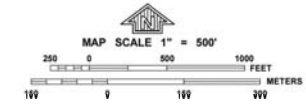
**MAP REPOSITORY**  
Refer to listing of Map Repositories on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**

**EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



# NOTES TO USERS

## NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources or small levees. The community may request that it be updated for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **Roomways** have been determined, users are directed to the **Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations** tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only to landward of 0.9 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **protection** used in the preparation of this map was New Jersey State Plane NAD 83/Zone 18. The **horizontal datum** was NAD 83 (GRS80) spheroid. Differences in datum, spheroid projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Oceanic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

National Geodetic Survey  
National Oceanic and Atmospheric Administration  
Center for Earth and Oceanographic Applications  
1315 East-West Highway  
Silver Spring, Maryland 20910  
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

**Base map** information shown on the FIRM was provided in digital format by the State of New Jersey Office of Information Technology. This information was derived from digital orthophotos produced at a scale of 1:24,000 with 1-foot pixel resolution from photography dated April 2002.

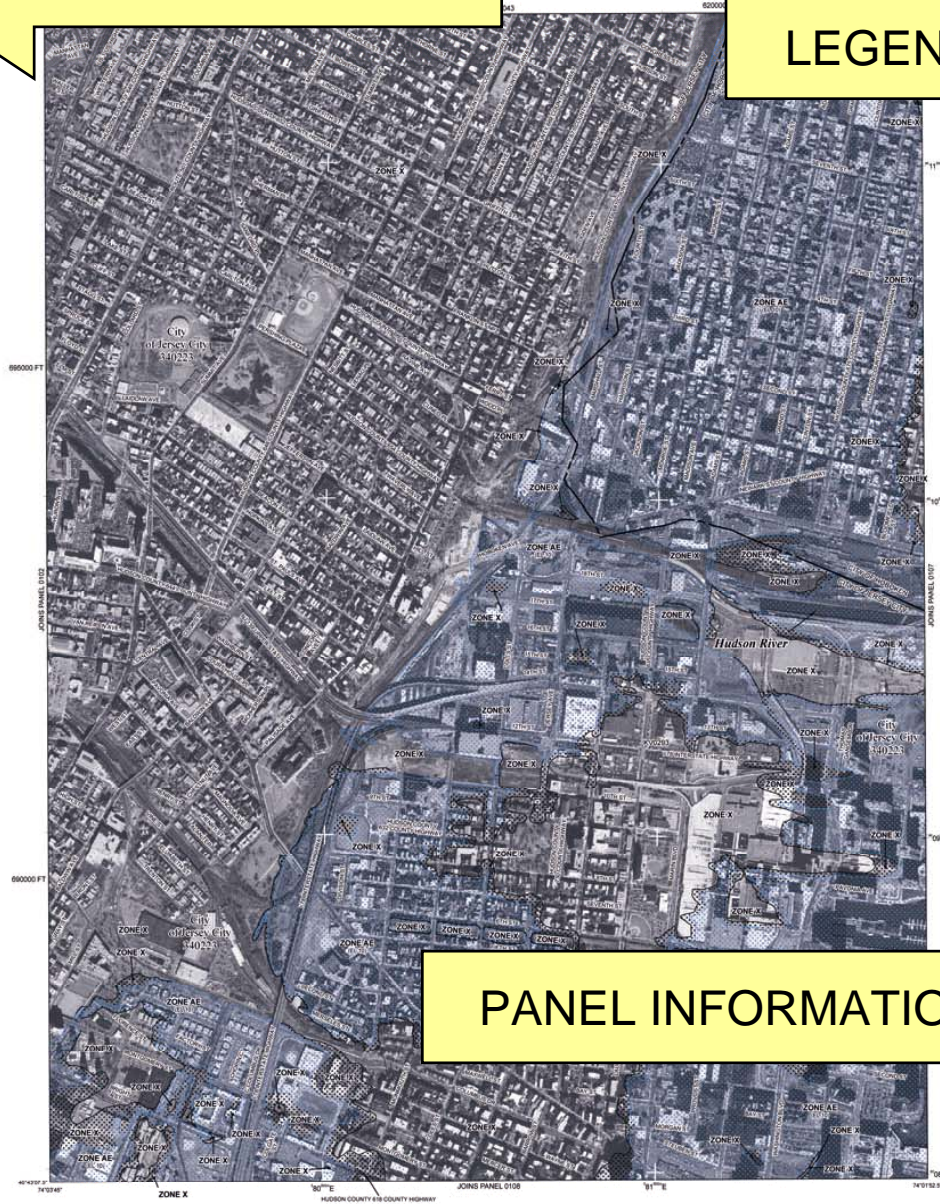
**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limits locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a listing of Communities tables containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-6616 for information on available products associated with the FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-6600 and by website at <http://www.fema.gov>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-436-6277) or visit the FEMA website at <http://www.fema.gov>.

Black Meadowslands Co.  
(Area Not Included)



# LEGEND

## LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance (100-year) flood, also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. Areas of Special Flood Hazard include Zone A, Zone AE, Zone AH, Zone X, and Zone VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

**ZONE A** No Base Flood Elevations determined.

**ZONE AE** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be ineffective.

**ZONE AH** Flood depths of 1 to 3 feet (localities areas of ponds), Base Flood Elevation determined. For areas of unusual flow flooding, vehicles also determined.

**ZONE AO** Flood depths of 1 to 3 feet (locality areas from on-going levees), average depths determined. For areas of unusual flow flooding, vehicles also determined.

**ZONE A99** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be ineffective. Zone A99 indicates that the former flood control system is being retained to provide credit for the 1% annual chance of greater flood.

**ZONE AV** Areas to be protected from 1% annual chance flood by a Federal flood protection system under construction - no Base Flood Elevation determined.

**ZONE VE** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.

**ZONE VE** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain area that must be kept free of encroachment so that the 1% annual chance flood can be passed without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**ZONE D** Areas of the 1% annual chance flood zone of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

**ZONE S** Areas determined to be suitable for the 0.2% annual chance floodplain.

**ZONE O** Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

OPAs areas and other areas normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPAs boundary

Boundary showing Special Flood Hazard Area Zones and Flood Elevations, Flood depths or Flood velocities

Base Flood Elevation line and value; elevation in feet

(EL: 8FT)

Base Flood Elevation value where uniform water stage, elevation in feet

Referenced to the North American Vertical Datum of 1988

Cross section line

Traverse line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone 18

5000-foot grid grid; New Jersey State Plane coordinate system, PROJECTION: NAD\_83, Transverse Mercator projection

Beach mark line explanation in Notes to Users section of this FIRM

• M1.5

• M1.5

• M1.5

• M1.5

MAP REPOSITORY  
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTY-WIDE FLOOD INSURANCE RATE MAP

EFFECTIVE DATES OF REVISIONS TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance Agent or call the National Flood Insurance Program at 1-800-638-6622.

MAP SCALE 1" = 500'

0 500 1000 FEET

0 500 1000 METERS

# PANEL INFORMATION

**NATIONAL FLOOD INSURANCE PROGRAM**

PANEL 0106D

**FIRM**  
FLOOD INSURANCE RATE MAP

HUDSON COUNTY,  
NEW JERSEY  
(ALL JURISDICTIONS)

PANEL 106 OF 118  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	DOES	DATE
BLACK MEADOWS	0106	0	0
HUDSON COUNTY	0106	0	0
HUDSON COUNTY	0106	0	0
HUDSON COUNTY	0106	0	0

PRELIMINARY  
SEPTEMBER 23, 2005

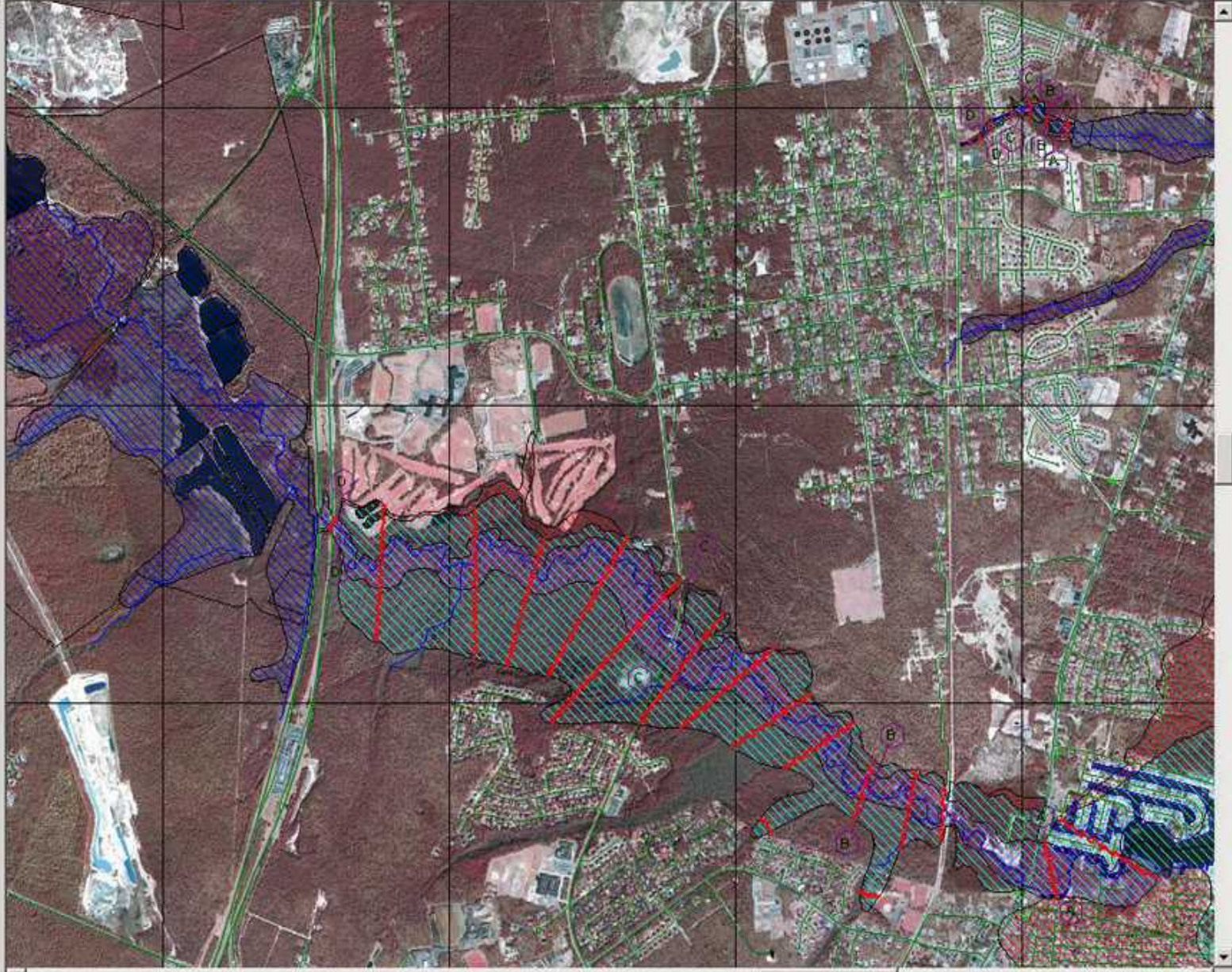
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34017C0106D

EFFECTIVE DATE

Federal Emergency Management Agency

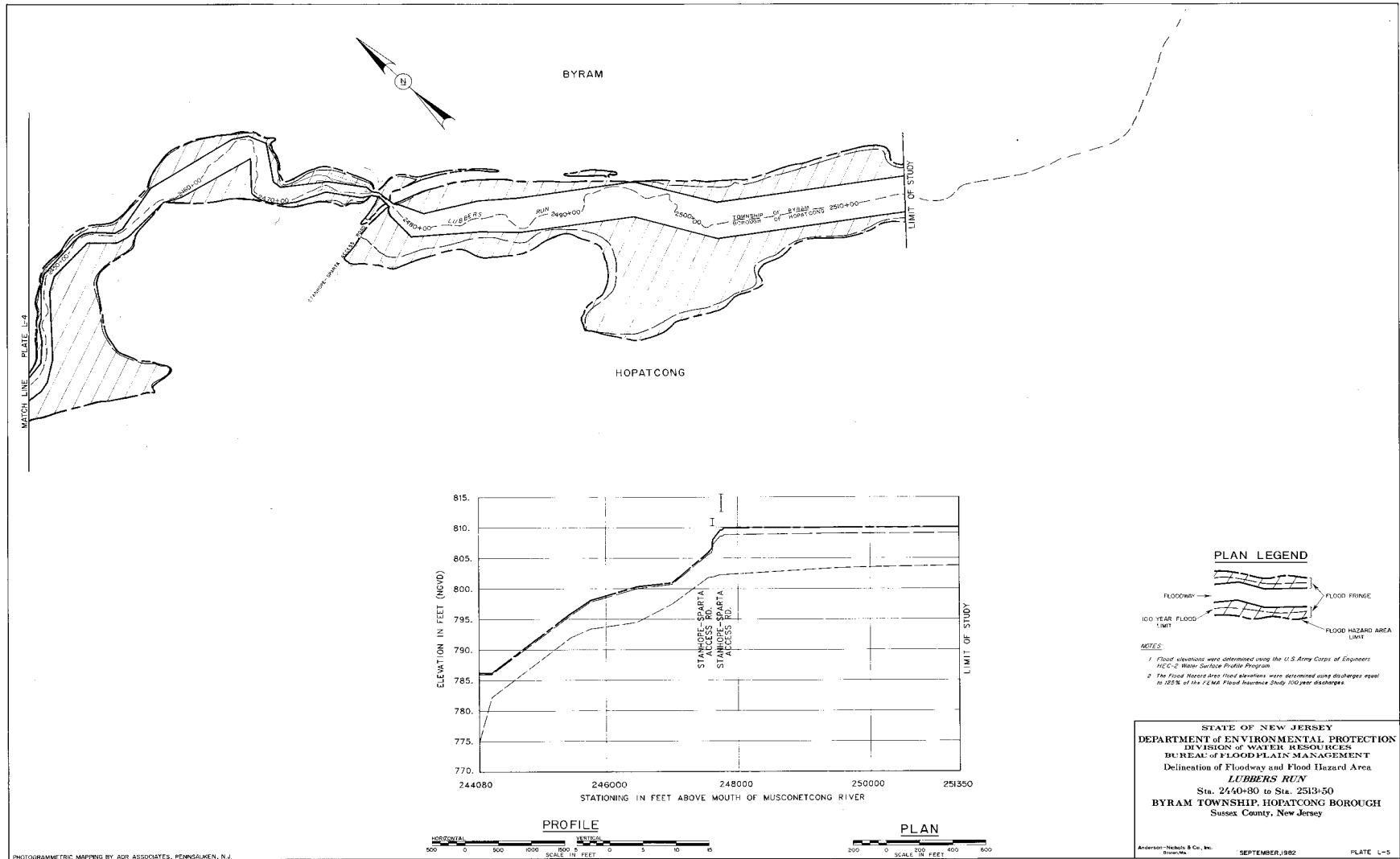


- Base flood elevations
- Cross sections
- Surface water lines
- Surface water areas
- Transportation
- USGS quadrangles
- Political boundaries
- Political areas
- Bench marks
- Hydraulic structures
- Flood hazard boundaries
- Flood hazard areas (FL)
  - X
  - AE
  - 0.2 PCT ANNUAL
  - VE
  - A
  - AD
  - D
  - OPEN WATER
  - FLOODWAY
- FIRM panels
- Orthophoto tiles
- Coastal transects
- Coastal Barrier Resources
- J14A9.sid (Image)

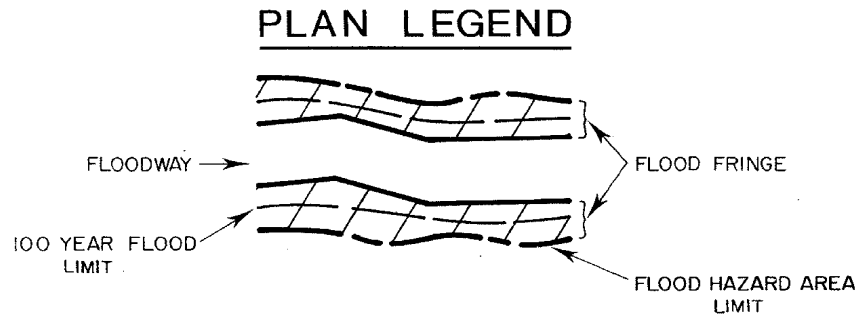




# State Flood Hazard Area Maps in New Jersey



# State Flood Hazard Area Maps in New Jersey



**NOTES:**

1. Flood elevations were determined using the U.S. Army Corps of Engineers HEC-2 Water Surface Profile Program.
2. The Flood Hazard Area flood elevations were determined using discharges equal to 125% of the FEMA Flood Insurance Study 100 year discharges.

State Flood Hazard Area flood elevations are determined using discharges equal to 125% of the FEMA FIS 100-year discharge

**STATE OF NEW JERSEY**  
**DEPARTMENT of ENVIRONMENTAL PROTECTION**  
**DIVISION of WATER RESOURCES**  
**BUREAU of FLOODPLAIN MANAGEMENT**  
Delineation of Floodway and Flood Hazard Area  
**LUBBERS RUN**  
Sta. 2440+80 to Sta. 2513+50  
**BYRAM TOWNSHIP, HOPATCONG BOROUGH**  
Sussex County, New Jersey

# Need Additional Information?

## FEMA Map Modernization Program

Paul Weberg

DHS/EP&R/FEMA, Region II

26 Federal Plaza, New York, NY 10278

212-680-3638

[Paul.Weberg@dhs.gov](mailto:Paul.Weberg@dhs.gov)

## NJDEP Floodplain Mapping

John Scordato

NJDEP, Bureau of Dam Safety & Flood Control

P.O. Box 419

501 East State Street

Trenton, NJ 08625

Phone: (609) 292-2296, Fax: (609) 984-1908

John.Scordato@dep.state.nj.us



# QUESTIONS?

Joseph Ruggeri, P.E.

NJDEP, Bureau of Dam Safety & Flood Control

P.O. Box 419, 501 East State Street

Trenton, NJ 08625

Phone: (609) 292-2296, Fax: (609) 984-1908

e-mail: [Joseph.Ruggeri@dep.state.nj.us](mailto:Joseph.Ruggeri@dep.state.nj.us)

[www.state.nj.us/dep/damsafety](http://www.state.nj.us/dep/damsafety)

