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# FLOOD RESILIENCE ON THE RARITAN: BOUNCE BACK BETTER

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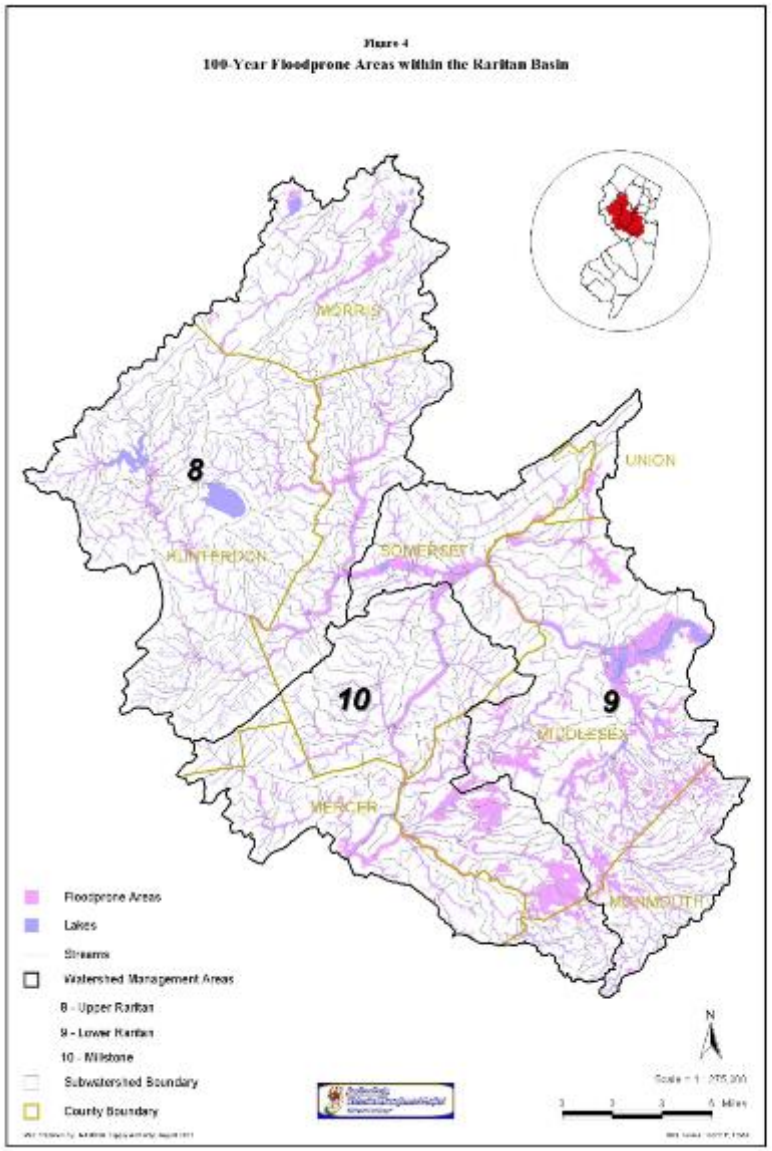
# DEFINITIONS

**Flood Resilience**

- **Ability of a system or society exposed to floods to resist, absorb, accommodate, recover from the effects of a flood in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. (UNISDR 2007)**

**Mitigation: an essential component of resilience**

- **Avoid recreating the potential for a future disaster by incorporating "sustainable hazard mitigation" measures that prevent, avoid or reduce future losses (Mileti 1999)**




**Raritan:** Name derived from Lenape language meaning "stream overflows" or "destroyed place"

**Floodplain area:** 94,000 acres (13% of basin)

- 52% wetlands
- 13% urban
- 13% water
- 13% forest cover
- 8% agriculture & barren

**Populated areas prone to flooding:** Manville, Bridgewater, Bound Brook, New Brunswick & some tidal portions of the river (e.g. Sayreville)

# FLOOD HISTORY OF RARITAN RIVER

- 3 centuries of recorded flooding
  - 1733, 1737, 1739, 1753, 1754, 1762, 1764, 1783, 1786, 1790
  - 1810, 1865, 1882, 1896
  - 1903, 1916, 1938, 1971, 1996, 1999 (Floyd)
  - 2007, 2011 (Irene, Lee), 2012 (Sandy)

- Are floods becoming worse?
  - Record peak floods in Raritan Basin
    - Pre Floyd – 11.5’ above flood stage at Bound Brook
    - Floyd (Sep. 1999) - 16’ above flood stage at Bound Brook
    - Irene (August 2011) – 8 of 23 long term gages at highest levels ever recorded

# THREE CENTURIES OF ADJUSTMENTS TO FLOODS IN NEW BRUNSWICK

**1741 - Cornelius Low relocates to bluff near Raritan Landing**

**1797 - Wm. Foreman designs elaborate drainage system to return flood water from basement of 12 Water Street to Raritan**

**1810 - 18 year old Rachael van Dyke records flood evacuation from 5 Albany Street**

**1890 - John D. Watson fills in basement of 12 Water Street to elevate house above flood level**

**1999 - Floodplain occupance & use changes**

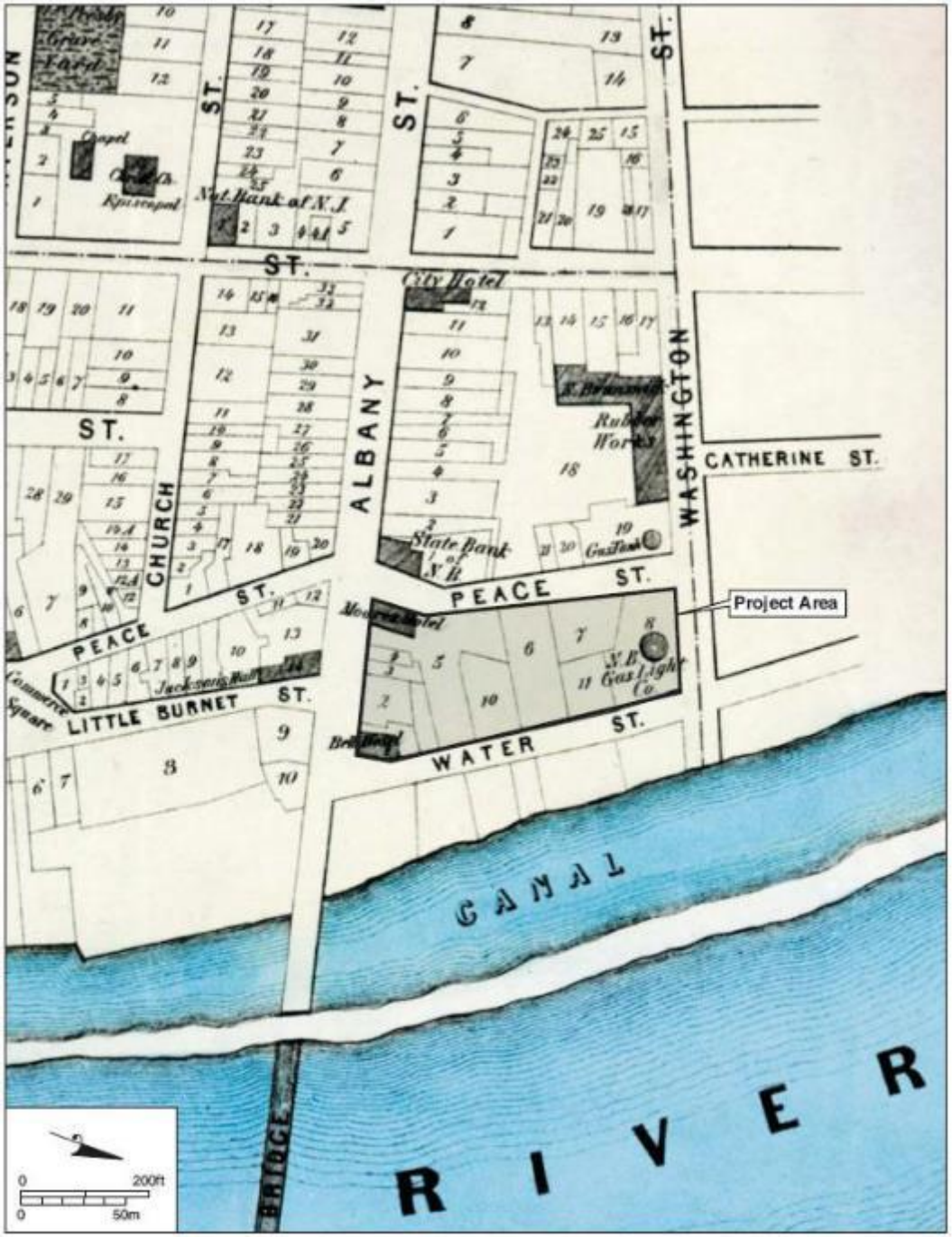



Figure 25. Detail, Everts and Stewart Map of New Brunswick City: Third & Fourth Wards. From *Combination Atlas Map of Middlesex County, New Jersey*, 1876. Vol. 1, pg. 206.

**BOUNCE BACK BETTER**



# New Brunswick 2010

**Waterfront** structures removed

**Downtown** commercial district cleared and redeveloped at higher density; high-rises outside floodplain

Rt. 18 widened through floodplain

# CYCLES OF RESILIENT ADJUSTMENT

## Eras of Floodplain Use

**Colonial+:** 1680-1820 – Retreat (lessons forgotten?)

**Industrial:** 19/20th century - Invasion & intensification

**Recent:** Post-Floyd (1999) - Retreat/elevation dominant (with some notable exceptions)

**More Resilient:**

Relocation; change of land uses; "green" engineering; prediction, warning & evacuation; elevation of land and structures

**Less Resilient:**

Structural engineering works; channel improvements; flood proofing; flood-fighting; post-disaster relief

**Potentially Resilient:**

Flood insurance (linkage to incentives); risk & vulnerability - assessment, awareness and education (wider range of impacts and public participation needed)

# RARITAN FLOOD RESILIENCE: THE MOST COMPELLING NEED

## HOLISTIC FLOOD IMPACT & RESPONSE ASSESSMENT TOOLS

- Inclusive of neglected variables (nearby structures; long-term health)
- Applied to responses as well as risks (e.g. recovery programs)
- Co-produced by laypersons as well as experts
- The promise of Health Impact Assessments (HIA)

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