

INTEGRATED APPROACHES: FLOODPLAIN MANAGEMENT

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THIS PRESENTATION

- How can communities in New York become more flood resilient?
- What do integrated approaches have to offer?

INTEGRATED APPROACHES:

MULTIPLE GOALS:

- REDUCE FLOOD LOSSES
- PROTECT FLOODPLAIN, WETLAND, RIPARIAN AREA, AQUATIC ECOSYSTEM NATURAL AND BENEFICIAL FUNCTIONS
- FOSTER ECONOMIC GROWTH AND SAFE, LIVABLE COMMUNITIES--JOBS, HOUSING, TAX BASE, TRANSPORTATION, ETC.

INTEGRATED APPROACHES

KNOWN BY A NUMBER OF NAMES:

- “LOW IMPACT” FLOODPLAIN MANAGEMENT
- “MULTIOBJECTIVE FLOODPLAIN MANAGEMENT
- MULTIOBJECTIVE “RIVER CORRIDOR” MANAGEMENT

OFTEN PART OF BROADER INITIATIVES:

- “SMART GROWTH”,
- “GREEN INFRASTRUCTURE”
- “SUSTAINABLE” CITY
- “HUMANE” CITY

INTEGRATED APPROACHES: EXAMPLES

- Cluster development on uplands to reduce flood losses and protect natural and beneficial functions,**
- Adopt no adverse flood loss and ecosystem impact infrastructure and regulatory policies,**
- Create/require river, stream buffers,**
- Zone floodplains for open space or low intensity uses,**
- Create greenways,**
- Utilize floodplain, wetland, and riparian natural flood storage and conveyance in floodplain and stormwater management,**
- Regulate and protect wetlands,**
- Adopt multiobjective stormwater management policies, and**
- Integrate wetland and riparian protection and restoration measures into flood loss reduction measures**

INTEGRATED APPROACHES

Require:

- Creative “out of the box” thinking
- Willingness to go beyond FEMA minimum standards
- A “vision” for community floodplains
- Multiobjective planning and management
- Building upon and utilizing floodplain and wetland natural and beneficial functions
- Multi-agency and multi-group involvement
- Communication and cooperation

WHY DIFFICULT?

- Statutes, regulations often focus on a single topic—e.g. flood plain regulation, wetland regulation, disaster assistance
- Each agency has its “territory”,
- Cooperation and coordination is a pain....,
- Agency staff lack expertise in more than one subject.

FLOODPLAIN AND WETLAND MANAGEMENT: NEVER THE TWAIN SHALL MEET?

- Wetlands, riparian areas, aquatic ecosystems are commonly contained within floodplains, but floodplain managers and ecosystem managers often do not coordinate efforts.
- Floodplain managers are typically engineers and water resource planners; wetland managers are biologists and botanists. The two groups have different vocabularies, interests, and drinking habits.

- Management practices sometimes conflict. For example, fill is often used in floodplains to reduce flood losses by elevating houses, roads, other activities. But fill also destroys wetlands and broader aquatic ecosystems.

BUT, TIMES ARE CHANGING

Many factors now favor multiobjective, more integrated approaches:

- **Fiscal meltdown**. Multiobjective approaches make financial sense. Gotta do more with less.
- Multiobjective approaches have (in some instances) **political acceptability** where single objective approaches do not (e.g., a greenway rather than a levee).
- The **public is increasingly aware** of the interrelationships between wetlands and flood hazards (e.g., the Louisiana Governor's and New Orleans Mayor's statements after Katrina). Public awareness means political interest.

- **Federal, state, and local agencies have widely adopted no net loss wetland, riparian, and aquatic ecosystem regulations. Floodplain managers must apply these regulations in their projects. They must compensate for the loss of natural and beneficial functions of floodplains, riparian areas, aquatic ecosystems.**
- **Floodplain managers are increasingly interested in watershed management and the natural and beneficial functions and values of wetlands and floodplains; wetland managers are increasingly interested in watershed management and natural hazards.**
- **States and local governments are being held legally liable for flood losses associated with traditional flood control works such as dams and levees. Governments are looking for new ways to protect flood storage and conveyance and prevent increases in flooding and erosion.**



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What is Needed to Implement Integrated Approaches?

1. Informed decision-making. Reflect the full range of natural hazard risk factors in planning, regulation, plan implementation
2. Adopt clear multiobjective goals for planning, infrastructure construction, regulation.
3. Better protect wetlands.
4. Integrate wetland and floodplain natural and beneficial functions into floodplain management planning.

1. Make informed decisions. Reflect the full range of natural hazard risk factors in planning, regulation, plan implementation:

- Consider not just depth of inundation but
 - Waves
 - Velocity
 - Erosion potential
 - Other hazards (where appropriate)
- Reasonably anticipate future development
- Consider residual risks
 - Levees versus natural channels
 - Elevation on fill versus floodproofing
- Reflect climate change (“low risk” adjustments)
 - Natural channels
 - Setbacks
 - Extra freeboard

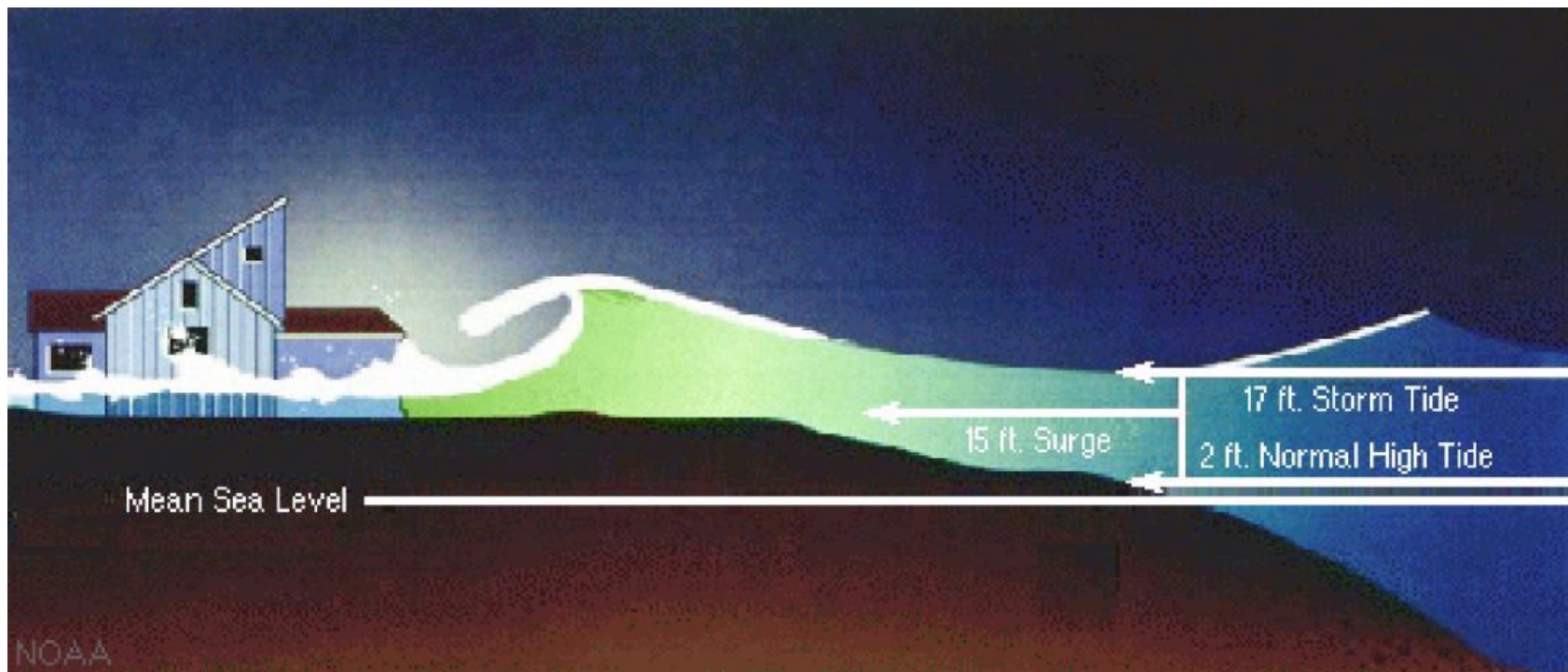
Flood Heights: Coastal Storm Surge, Inland Runoff



Flood Velocities



Waves



Hurricane Camille, 1969

22-25 Foot Storm Surge and Waves





December, 2004 South Asian Tsunami



Hydrostatic Pressures In Saturated Soils And Flooding “Floated” This Tank



Organic, Saturated Soils



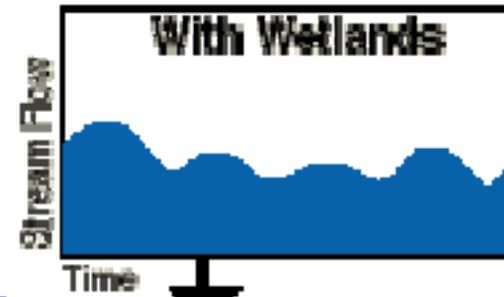
2. Adopt clear multiobjective goals for planning, infrastructure construction, regulation.

- Flood loss reduction,
- Protection of natural and beneficial functions, and
- Safe and economically sound development.

A no adverse impact standard can both reduce flood losses and better protect ecosystems. A no adverse impact goal makes legal, fiscal, and comprehensive planning sense.

3. Better protect wetlands: wetlands “buffer” watersheds

Hydrologic Buffering



Diminished
Peaks
Consistent
Baseflow



Exaggerated
Peaks (Floods)
Inconsistent
Baseflow
(Drought)

Based on BSC Group

Wetlands Are Often Subject to Deep Inundation and, In Some Instances, High Velocity Flows In a 100-year Flood

- **Coastal wetlands are typically flooded (flood heights plus waves) to depths of 14 to 26 feet by a 100-year storm or hurricane.**
- **Inland riverine wetlands along major rivers are typically flooded (flood height plus waves) to depths of 8 to 12 feet by a 100-year flood.**
- **Lake fringe wetlands and depressional wetlands are often subject to long term, cyclic water levels of 6 feet or more which flood structures constructed during dry periods.**

- Even highly altered wetlands with limited habitat values may be subject to severe natural hazards and may play hazard reduction roles for other lands (flood storage, flood conveyance).
- Based upon natural hazards, “sequencing” involving the location of development on alternative upland sites and compensation for loss of hazard-related functions if development must occur makes sense even where wetlands have limited habitat functions and values.

4. Integrate the protection and restoration of floodplain and wetland natural and beneficial functions into comprehensive land use planning, watershed planning, floodplain management planning.

Protect Floodplain and Wetland Vegetation to Reduce Wave Heights and Erosion. This is particularly important for high velocity areas.

