Reducing Flood Risk and Maintaining Historic Character

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Why NPS?

Sandy by the numbers:
- $47.5 million
- 12 SHPOs
- 2 THPOs
- 111 subgrants to date

Katrina by the numbers:
- $53 million
- 3 SHPOs
- 858 subgrants
- 3,168 applications received
National Disaster Framework

NPS is part of a Joint Field Office working on the Natural and Cultural Resources Recovery Support Function
Identified Needs

- Existing plans, partnerships and procedures
- Risk & Vulnerability assessments
- What is occurring at the National, State, Tribal, and Local levels?
- Disaster Planning, Response, and Recovery in Statewide HP Plan
The Disaster Checklist

1. Know Your Partners
2. Get into the Hazard Mitigation Plan
3. Local Level Planning
4. Property Owner Resources
Technical Resources

• Resilient Heritage booklet (NCPTT) -- safeguard historic buildings & help prevent repetitive property loss

Coming Soon!
• TPS Preservation Brief “Addressing the Threat of Floods and Rising Water to Historic Buildings”
NPS “Property Manager”

Pillars of Climate Change Response

Science

Working w. data, trends, observations:

- Climate Projections/Modeling
- Inventory/Monitoring

Adaptation

What to do with data – decisions, planning:

- Natural Resources & Cultural Resources Management
- Scenario Planning
- Facilities Management

Mitigation

Reducing NPS environmental footprint:

- Reducing C Emissions
- Improving Sustainability

Communication

Sharing, learning, and engaging NPS and public w. Science, Adaptation, and Mitigation:

- Interpreter Training
- New Exhibits
- Intern & Fellowship Programs
• Do your state agencies and your local land use officials (code departments, historic commissions, planning commissions, etc.) know about the historic properties exclusion?

• Implications of taking the exclusion (insurance rate increase, future loss, community rating, etc.)

• Biggert Waters (now Homeowner Flood Insurance Affordability Act) delay/changes
Local Level Planning

- Temporary Housing and Infill
- Mitigation Alterations: elevations, utility elevation, storm shutters, safe rooms, tie downs, elevators, etc.
- Demolitions and salvage protocols
- Debris sites and staging areas
Expedited Review Process

- ID types of stabilization and repair that can be done without review
- Authorize architectural review board staff for certain types of review – if applicable
- Accept 106 review in lieu of local review
Site Specific Emergency Response Plans

- Help the property owner think beyond just museums, public records, etc.
- Identifying repairable material, education
- Linking owners with the right skills and support
- The Disaster Wheel & App
The National Register of Historic Places:
The official list of the Nation’s historic places worthy of preservation

How are properties evaluated?

1. **Age**, in general 50 years or older

2. **Integrity**, does it still look the way it did in the past?

3. **Significance**, is it associated with historic...
   - **Events**, activities, or developments (Criteria A)
   - **People** (Criteria B)
   - **Architectural**, landscape or engineering achievements (Criteria C)
   - **Potential to yield** archeological information (Criteria D)

Types of resources listed:

- Buildings
- Districts
- Structures
- Objects
Preservation Briefs
Addressing the Threat of Floods and Rising Water to Historic Buildings

Preservation Brief XX
Preservation Brief: Floods and Rising Water

Scope:

• Historic Buildings
• Traditional flooding & Sea level rise
• Structural Adaptations
• NOT disaster response or recovery
Where to Begin?

**Determine Risk Level**

- **Type of flood(s)**
  - Direction
  - Warning time
  - Expected frequency

- **Map projections**
  - FIRM (by FEMA)
  - Storm Surge
  - Sea Level Rise
Assess the Property

- Well maintained?
- Floor height v. BFE
- Historic significance and character-defining features
- Applicable codes
Adaptation Options

- District-level interventions
- Elevate
- Move
- Dry Floodproofing
- Wet Floodproofing
- Temporary Measures
- Out-of-the-Box Solutions
Preservation Lens

Retain and preserve historic materials

Use visual match if repair is not possible

Secretary’s Standards for Rehabilitation
Preservation Lens

New features or systems should be compatible

Secretary’s Standards for Rehabilitation
Preservation Lens

Alterations should be reversible

Secretary’s Standards for Rehabilitation

National Trust for Historic Preservation
Additional Considerations

• Context
• No adaptation = destroyed
  – Do something
  – Plan in phases if risk is uncertain
• All work taken into account
Historic Districts

Building versus district:
How will character and integrity be affected?
Community Level Adaptations: Holding Water Back

- Levees, Embankments, Floodwalls (permanent or temporary)
- Seawalls (Bulkhead, Riprap, Revetments)
- Vertical
- Curved
- Mounded
Galveston: Curved 1903

September 8, 1900

Seawall and Elevation of Infrastructure (community)

Elevation of Property (individuals)
Living With Water

Catchbasins/Cisterns

Drainage Canals
Community Level Elevations: Wheeling, WV
Individual Elevations: There is more than one way...

To Elevate a Building

1. Lifting and separating from the foundation, new taller foundation
2. New floor level within the building, change the internal configuration
3. If there is a basement fill it in, your first floor is now your lowest floor
Things to Consider

• **Historic Integrity**: significance, is it in a district, individual listing, character.
• **Feasibility**: what can practically be done and what can I afford to do?
• **Threat**: frequency, projections, amounts, etc.
• **Access**: how will this change and how will I get in and out?
• **End Goal**: what am I saving?
• **Design and Performance**: what does it look like and how does it function?
If all you has is a hammer everything looks like a nail
Preservation Considerations

- Context: where is it located
- Style/Type: materials, form, method of construction, regional character
- Size, scale, and proportions
Preservation Considerations

Ways to minimize impact:

• Retaining scale, type, massing, materials, and form
• Landscaping and Grading
• Screening
• Density of materials—think about proportions
• Create a visual line, reference original materials above elevation
• Entry treatment—orientation, style, stairs, porches, terraces, elevator placement, etc.
• Use the vernacular vocabulary
Charles Marks House
Perdido, Alabama
Preservation Not Considered

Orientation issues, significant alteration of character, material choices, screening, referencing the vernacular, etc.
MOVE THE BUILDING
Move the Building

Follow National Register regulations

Site Selection
• Orientation
• Immediate setting
• General environment
• Not located within an area expected to flood

Contact SHPO & NPS prior to move
Dry Floodproofing

Keeps water out, mostly

May require engineer’s services

Deeper expected flood waters = stronger walls

Certification for NFIP if lowest floor below BFE

Dan Becker /USGS via flickr
## Dry Floodproofing

### Components
- Continuous impermeable walls
- Sealants
- Flood shields
- Backflow valves
- Anchoring
- Internal drainage system (sump pump)

### Preservation Concerns
- Applying impervious coatings
- Compatibility of permanent stanchions for flood shields
Remember to provide safe exits!
WET FLOODPROOF

“Selecting Appropriate Mitigation Measures for Floodprone Structures” / FEMA
Wet Floodproofing

**Components**
- Strengthen & anchor
- Flood openings
- Elevate utilities
- Water-resistant materials
- Move valuable and hazardous items
- Use pumps and fans after flood (and disinfect!)

**Preservation Concerns**
- Replacement of historic features
- Compatible location for elevated equipment
It is the one-year anniversary of Super Storm Sandy. We marked the occasion with a gathering of friends and family at a "Stronger than the Storm" party. The best part of the party was that it took place in the same cottage that was in such a sorry state last year at this time. (If you are new to this story, the first chapters of this saga can be found in Part 1 and Part 2 of this series.)
Traditional Materials

Masonry
- Glazed Brick
- Concrete
- Glass Block
- Stone

Metals
- Steel panels
- Steel beams
- Hardware

Wood
- Natural decay resistant lumber

Tile
TEMPORARY PROTECTION
OUT-OF-THE-BOX SOLUTIONS
Farnsworth House

National Trust for Historic Preservation owned property

Several options under study, including hydraulic lifts
Which One to Pick?

- District-level interventions
- Elevate
- Move
- Dry Floodproofing
- Wet Floodproofing
- Temporary Measures
- Out-of-the-Box Solutions

“C’mon, c’mon—it’s either one or the other.”
Reduce Flood Risk

Lower Insurance Premiums

Maintain Historic Character

Feasible and Affordable