Boston University Initiative on Cities + Pardee Center
Sea Level Rise and the Future of Coastal Cities

Cities
People
Vulnerabilities
Strategies

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CEDAR RAPIDS, IOWA
SEA CHANGE BOSTON examines the city’s vulnerabilities to sea level rise and demonstrates design strategies for resilience.

An exhibition curated by Sasaki Associates in partnership with the Boston Architectural College

On view at District Hall
75 Northern Avenue
Boston, MA 02210

April 7 – June 13 2014
BOSTON HARBOR HAS EVOLVED SINCE THE ICE AGES

9,000 YEARS AGO

6,000 YEARS AGO

3,000 YEARS AGO

1630 1795 1852 1934 TODAY 2050 2100

1630 1795 1852 1934 toDa Y 2050: 2 FT OF SEA LEVEL RISE

2100: 6 FT OF SEA LEVEL RISE

SASAKI
Floodings from a major storm in 2100

Sea Level Rise + Storm Surge Projections

Floodings from a major storm in 2050

Map Sources: Sea level rise projections for the region are based on contours from Massachusetts Office of Geographic Information and 3Di Technologies / Spectrum Mapping LLC LiDAR dataset (2002); Sea level rise projections for Boston are based on contours from City of Boston, Boston Redevelopment Authority, and Sanborn Map Company LiDAR dataset (2009).
We need to design for rising seas at multiple scales. From floating apartment buildings to floodable parks, designers and engineers around the world are imagining and constructing resilient solutions to rising sea levels. Flexability and adaptability are at the core of resilient design. This thinking will allow our buildings and infrastructure to bounce back from a storm or adjust to rising tides.

Boston is home to several examples of resilient design in anticipation of sea level rise, including the Deer Island Waste Water Treatment Plant, Spaulding Rehabilitation Hospital, and the Boston Architectural College’s “green alley.”

But our city and region are still vulnerable. The strategies and case studies exhibited here illustrate an array of tangible solutions for how the Boston region can protect its edge while introducing greater vibrancy, connectivity, and economic opportunities along the water. Layered together, all of these strategies provide more holistic opportunities for protection.
Flooding during a major storm in 2050
Residential parcels at risk

RESIDENTIAL POPULATIONS AT RISK

INDUSTRIAL, COMMERCIAL, & INSTITUTIONAL PROPERTIES AT RISK

Flooding during a major storm in 2050

PARCELS AT RISK
- Industrial
- Commercial
- Institutional

Flooding during a major storm in 2050

- 11 tunnel entrances
- 50 MBTA stations
- 7 major train stations

TRANSPORTATION AT RISK

- MBTA stations
- Rail stations
- Tunnel entrances

Map Sources: Major roads: Massachusetts Department of Transportation (2012), accessed at MassGIS; train lines and stations: Central Transportation Planning Staff (2013), accessed at MassGIS.
CRITICAL SYSTEMS AT RISK

- 8 POWER PLANTS
- 6 FUEL TERMINALS
- 9 HOSPITALS

Map Sources: Police Stations: Massachusetts Emergency Management Agency (2009); Hospitals: Massachusetts Department of Public Health (2009); Power Plants: Municipal Assessors, various (2013); City of Boston Assessors Office (2013)

Facilities at Risk

- Flooding during a major storm in 2050
- 8 Power Plants
- 6 Fuel Terminals
- 9 Hospitals
- Substation
- Other Critical Facility
WHAT ARE THE OPTIONS?

1. FORTIFY (KEEP WATER OUT)

2. RETREAT (MOVE TO HIGHER GROUND)

3. ADAPT (LIVE WITH WATER)
CATALOG OF DESIGN STRATEGIES

- Living Shoreline
- Floodable Park
- Dune Restoration
- Temporary Floodwall
- Canal Street
- Absorbent Street
- Multi-Purpose Levee

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BUILDING A NEW STANDARD IN BOSTON

- Dry Flood-Proofing
- Temporary Floodwall
- Wet Flood-Proofing
- Elevated Building
- Floating Building

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MAKING ROOM FOR WATER IN THE CITY

PUBLIC SPACE

- Canal Street
- Absorbent Street
- Floodable Park
- Underground Cistern
Rethinking the Boston Harbor Edge

COAST

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- Storm Surge Barrier
- Multi-Purpose Levee
- Raised Bulkhead
- Living Shoreline
- Dune Restoration
SEA LEVEL RISE CROSSES POLITICAL BOUNDARIES, SO SHOULD OUR PLAN

- Bring multiple agencies and cities together
- Complex issues and long time frames
- Regional impacts
- Watershed and landscape issues cross city boundaries
- Broadened public participation in key decisions
- Cost effectiveness
- Enhanced collaboration and coordination; the whole is more than the sum of the parts

REASONS TO THINK REGIONALLY
DESIGNING WITH WATER
CREATIVE SOLUTIONS FROM AROUND THE GLOBE

PREPARING FOR THE RISING TIDE SERIES
VOLUME 2 | AUGUST 2014
SHORE IS AT RISK
VARIED DYNAMICS OF SEA LEVEL RISE AND LAND VALUE

INLAND BAY
MOST VALUABLE LAND LOSS BETWEEN 3-4’ $725 MILLION

HEADLANDS
MOST VALUABLE LAND LOSS BETWEEN 2-3’ $768 MILLION

BARRIER ISLAND
MOST VALUABLE LAND LOSS BETWEEN 1-2’ $4.75 BILLION

SEA LEVEL RISE

MILLIONS OF NEW JERSEY TAX DOLLARS LOST TO SEA LEVEL RISE

$526.6 MILLION
A RESILIENT JERSEY SHORE
THREE CATALYSTS TO DRIVE INNOVATION IN RESILIENCY

INLAND BAY

HEADLANDS

BARRIER ISLAND
THANK YOU!

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