



Massachusetts Water Resources Authority



Protecting Our Critical Infrastructure

***MWRA's Pragmatic Approach
to Climate Change***

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Drinking Water System Is In Good Shape

- Quabbin Reservoir, Belchertown
 - 65 miles west of Boston
 - Elevation 528 feet
- Wachusett Reservoir, Clinton
 - 35 miles west of Boston
 - Elevation 395 feet
- Water treatment plant is in Marlborough
- 85% of water delivered by gravity
- Lowest elevation of a water tank is 192 feet above sea level





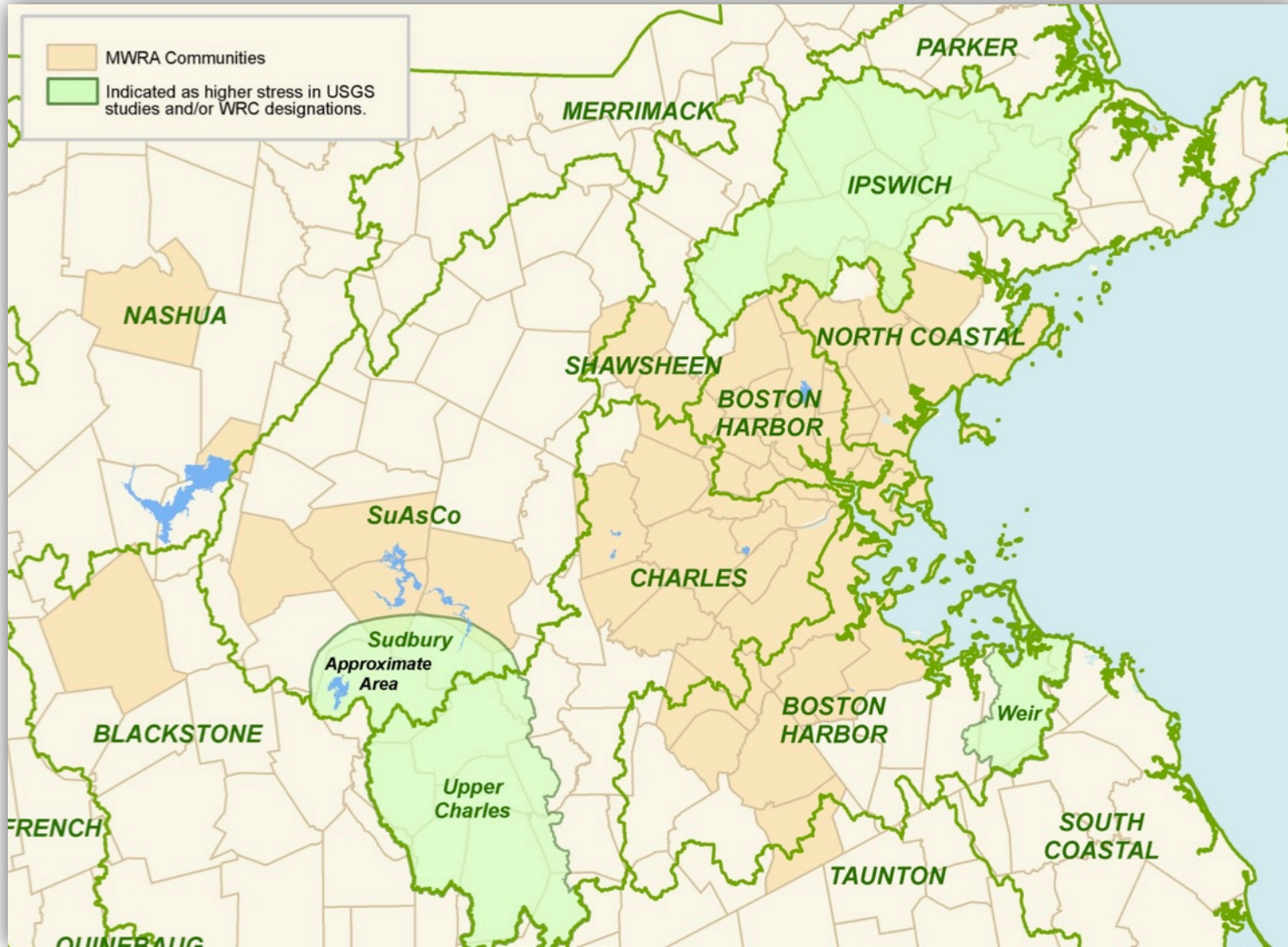
Significant Investment in Dams: Able to Handle Expected Probable Maximum Flood

- All MWRA dams, dikes, spillways and appurtenances are inspected routinely by licensed dam safety engineers and are in good condition
- Since 2006, MWRA has spent over \$21 million on dam safety projects bringing us into full compliance with new dam safety regulations





Stressed Basins Adjacent To MWRA Service May Need Water





Adaptation For Sea Level Rise In The Design of Deer Island

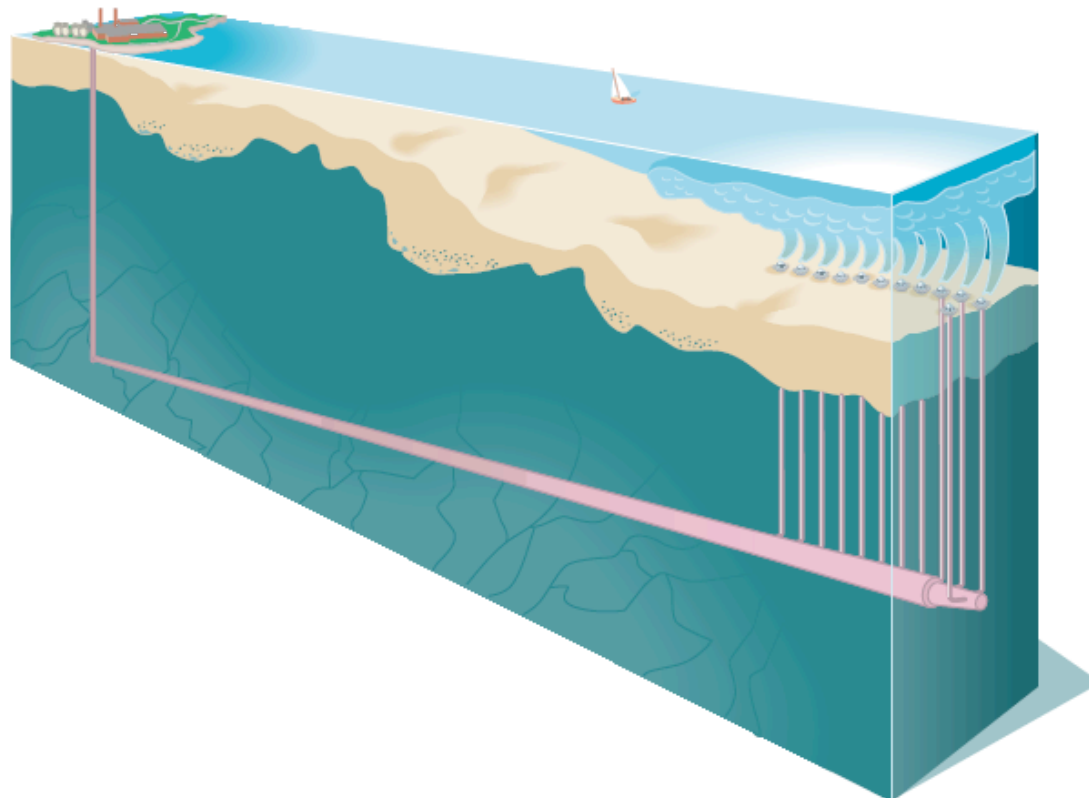
- Deer Island plant fully protected
 - 100-year flood
 - 1.9-foot sea level rise
 - Wave run-up of 14 feet on east side and 2 feet on west side
- On-site power plant ensures uninterrupted power supply
- Nut Island headworks in Quincy similarly designed for sea level rise





A Rising Sea Impacts The Hydraulics Of The Outfall Tunnel

- The effluent from the sewage treatment plant is discharged through a gravity fed downhill pipe
- To maintain hydraulic capacity, tunnel diameter was up-sized from 24 feet to 24.25 feet





21 Of MWRA Coastal Sewer Facilities Are Within 15 Feet Of Mean Sea Level





Chelsea Administration And Maintenance Facilities Flood Inundation





Areas Potentially Affected By Loss Of Coastal Pump Stations





Past Practice

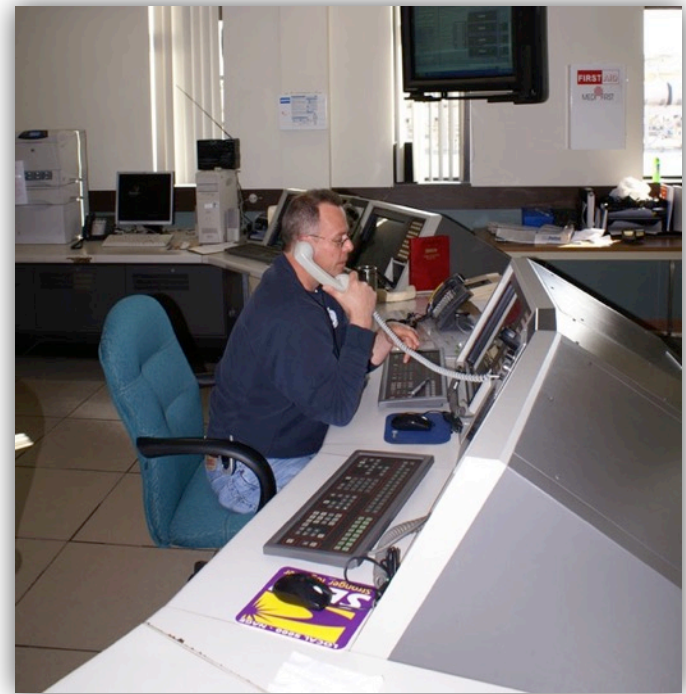
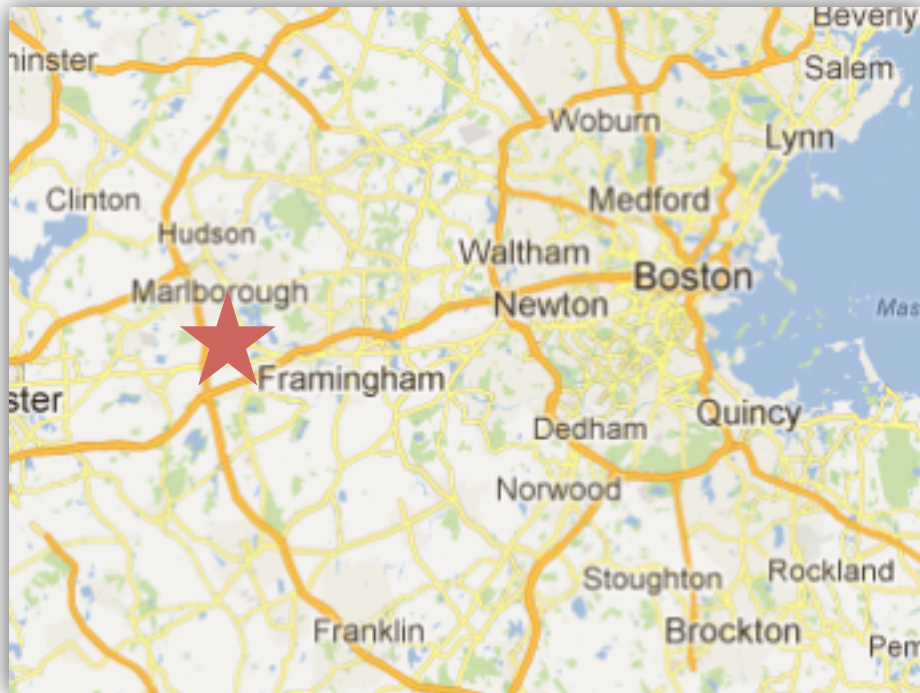
- Low-lying facilities are protected with sandbags and pumps
- Mobile generators are deployed in advance of storms
- Increased staffing





Created SOPs To Redeploy Staff And Equipment To Higher Ground

- Staff and equipment redeployed to pre-determined locations in advance of storms
- Back-up water and wastewater operations control center created at Carroll Treatment Plant in Marlborough





MWRA Approach Going Forward – Short Term

- At-risk buildings fitted with temporary flood barriers
- Move electrical/computer equipment off the floor



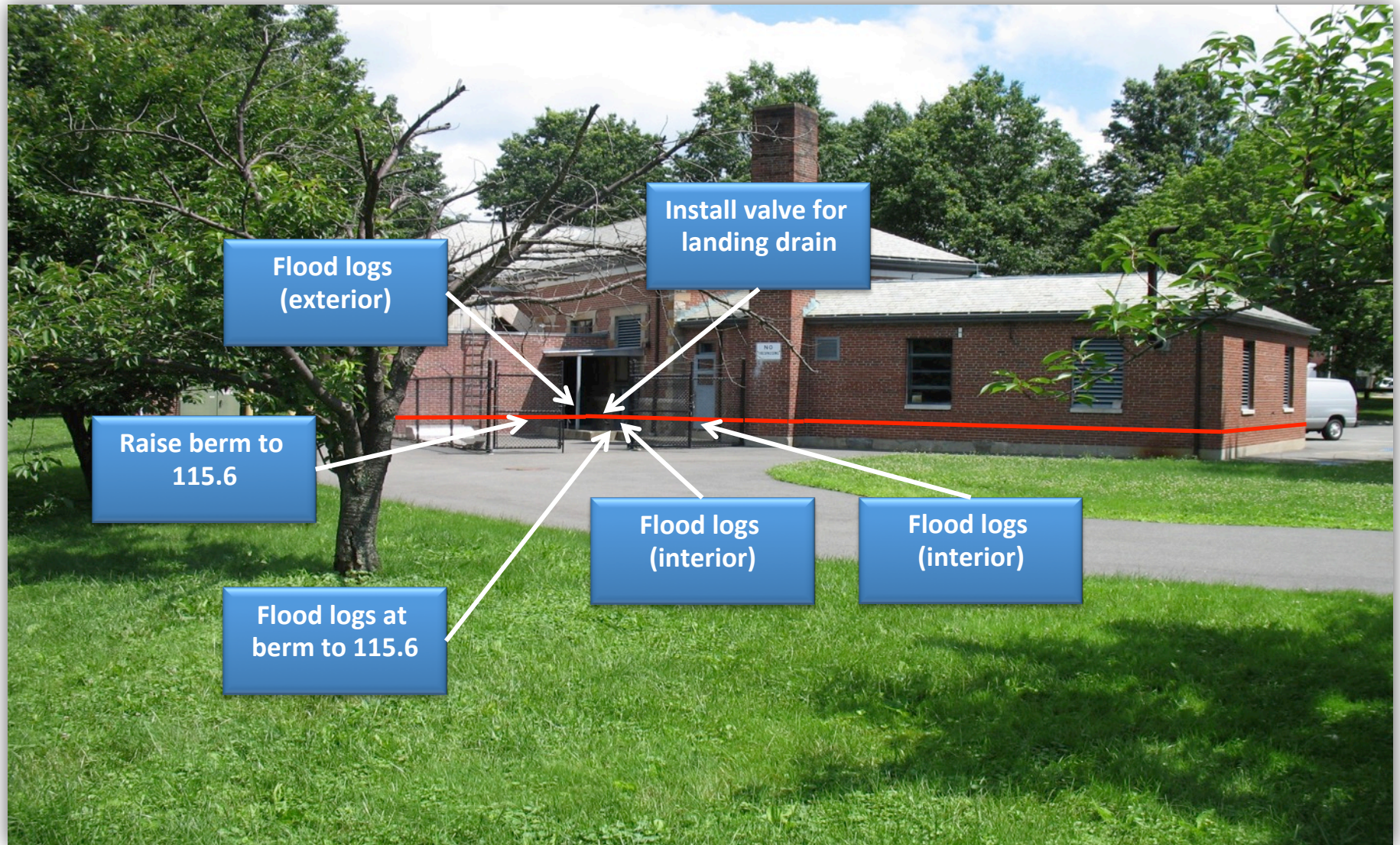


MWRA Approach Going Forward – Long Term

- Will continue to monitor the latest science and predictions
- On average, we rehabilitate our facilities every 15 or 20 years
- Every future rehabilitation contract will take sea level rise into account
- Three significant rehabilitation projects were under design
 - Alewife Brook Pump Station
 - Chelsea Creek Headworks
 - Chelsea Screenhouse
- Amended each design to account for 2.5 feet of sea level rise



Alewife Brook Pump Station – Envelope Flood Protection Measures





Our Goals

- Protect our staff
- Protect our facilities
- Protect the 2 million people that depend on us
- Recover quickly
- Better to have an environmental disaster that lasts a few hours – not weeks or months



Questions?

