

## Boston Harbor

### I. Water Supply

Quabbin Reservoir—Protected Watershed, 4 yr residence time  
Aqueducts, chlorination, fluorination, buffering (pH control)

### II.) Boston Harbor Intro

#### A.) Estuarine circulation

seawater underneath freshwater  
Freshwater behind dams in Charles  
Average depth 7.28m

#### B.) Tidal Flushing (<http://crusty.er.usgs.gov/>)

3m tides (41% of volume)  
~96 km<sup>2</sup> area

#### C.) Freshwater sources

Charles River	8.6 m <sup>3</sup> /s [78%] (1983 range was 0.7-77.7)
Neponset River	1.6 m <sup>3</sup> /s [15%]
Mystic River	0.8 m <sup>3</sup> /s [7%]
Total	11.0 m <sup>3</sup> /s

Deer Island	15.4 m <sup>3</sup> /s
Nut Island	6.6 m <sup>3</sup> /s
CSOs	1.7
Total	23.7

<http://woodshole.er.usgs.gov/>

### II.) History

<http://www.mwra.com/sewer/html/sewhist.htm>

### III.) MWRA—Harbor Cleanup

Sludge dumping

Deer Island Sewage Treatment Plant—Secondary Treatment

<http://www.mwra.com/harbor/html/fqa3.pdf> (what the plant removes)

New Outfall—Sept, 2000.

Outfall models

[http://www.mwra.com/harbor/html/outfall\\_update.htm](http://www.mwra.com/harbor/html/outfall_update.htm)

Metals in sediments

<http://pubs.usgs.gov/factsheet/fs78-99/>

Contaminants in organisms

<http://www.mwra.com/harbor/html/soth98.pdf>

Swimming at Boston Harbor beaches

<http://www.mwra.com/harbor/html/bhbeaches.htm>

National Park Area

### C.) Outfall Pipe

#### 1.) Siting

9.5 miles offshore in Massachusetts Bay  
<1 to 50 dilution  
no particle transport to shore on incoming tide  
no impact on unique resources  
24' diameter, .05% slope (freshwater rises)

#### 2.) Cleaner Effluent

Source reduction  
Improved Treatment  
85% (1° is 50-60%) reduction in TSS  
85% (1° is 40%) reduction in BOD  
90% (1° is 50%) reduction in toxics  
fewer solids-->fewer pathogens, less chlorine needed (longer residence time)

#### 3.) Better Dilution

440 difuser ports over 1.25 miles in 100 feet of water  
1:200 dilution modelled  
below thermocline in summer, no nutrient effect on production

#### 4.) Monitoring

5 years of baseline data  
Scientific Advisory Panel

#### 5.) Contingency Plan