

In Progress:

Restoring the Urban Water Environment



Charles River Watershed Association



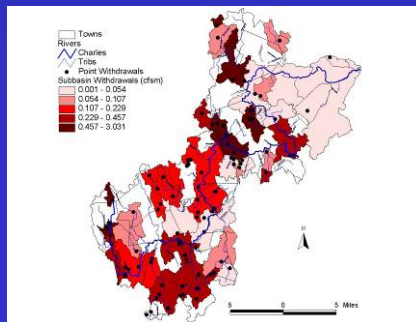
Charles River Watershed Association

- Environmental Science and Advocacy Organization founded in 1965
- Mission: To use science, advocacy, planning and the law to protect, preserve and enhance the Charles River and its watershed

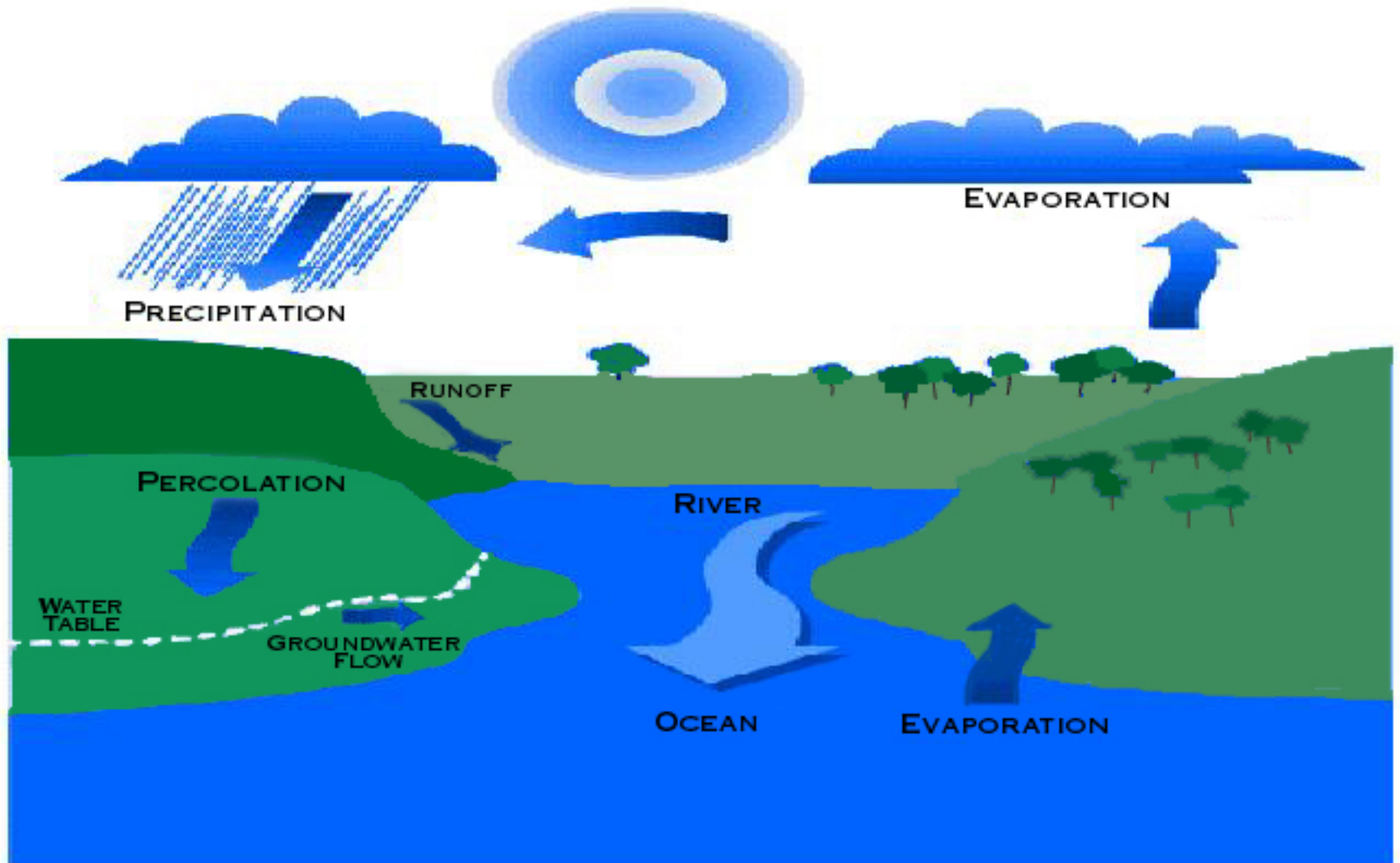


CRWA's Approach

- Technical studies
- Policy and legal analyses
- Advocacy
- Public education and outreach
- Public events



NATURAL WATER CYCLE



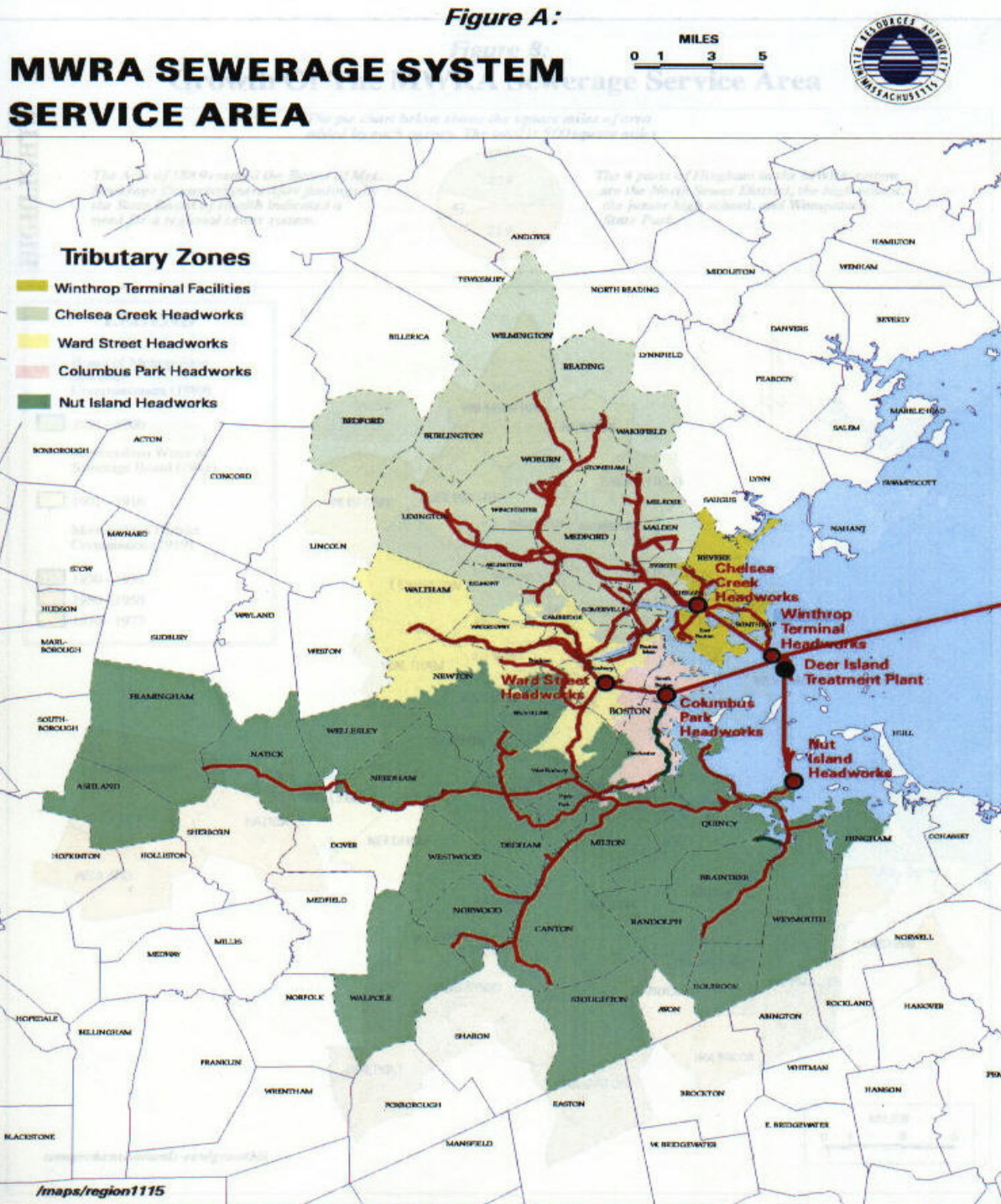


Engineered Water Cycle

The Problem: Rainwater and Groundwater are Thrown Away



Inflow and Infiltration

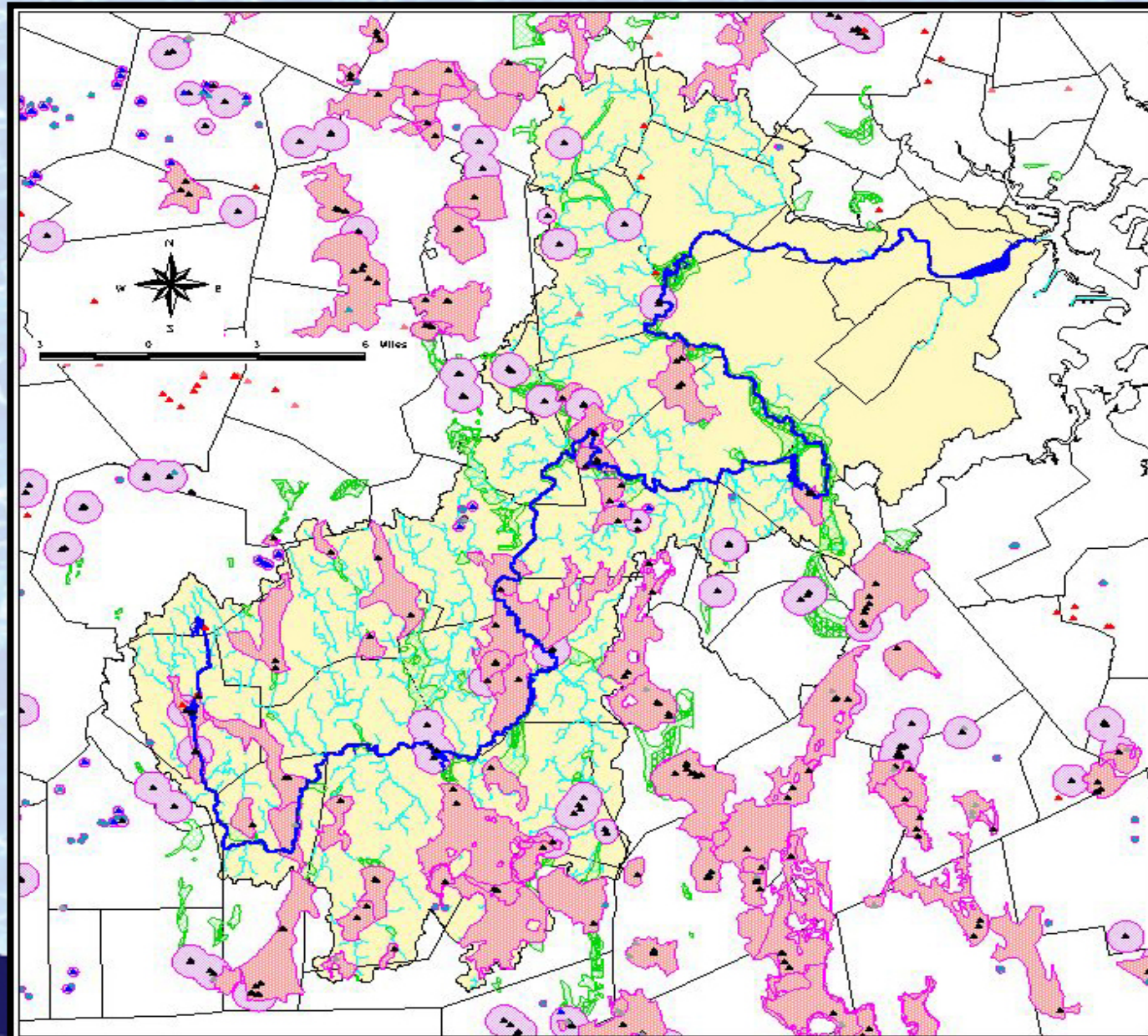


PUBLIC GROUNDWATER SUPPLY WELLS

AQUIFERS

CHARLES RIVER

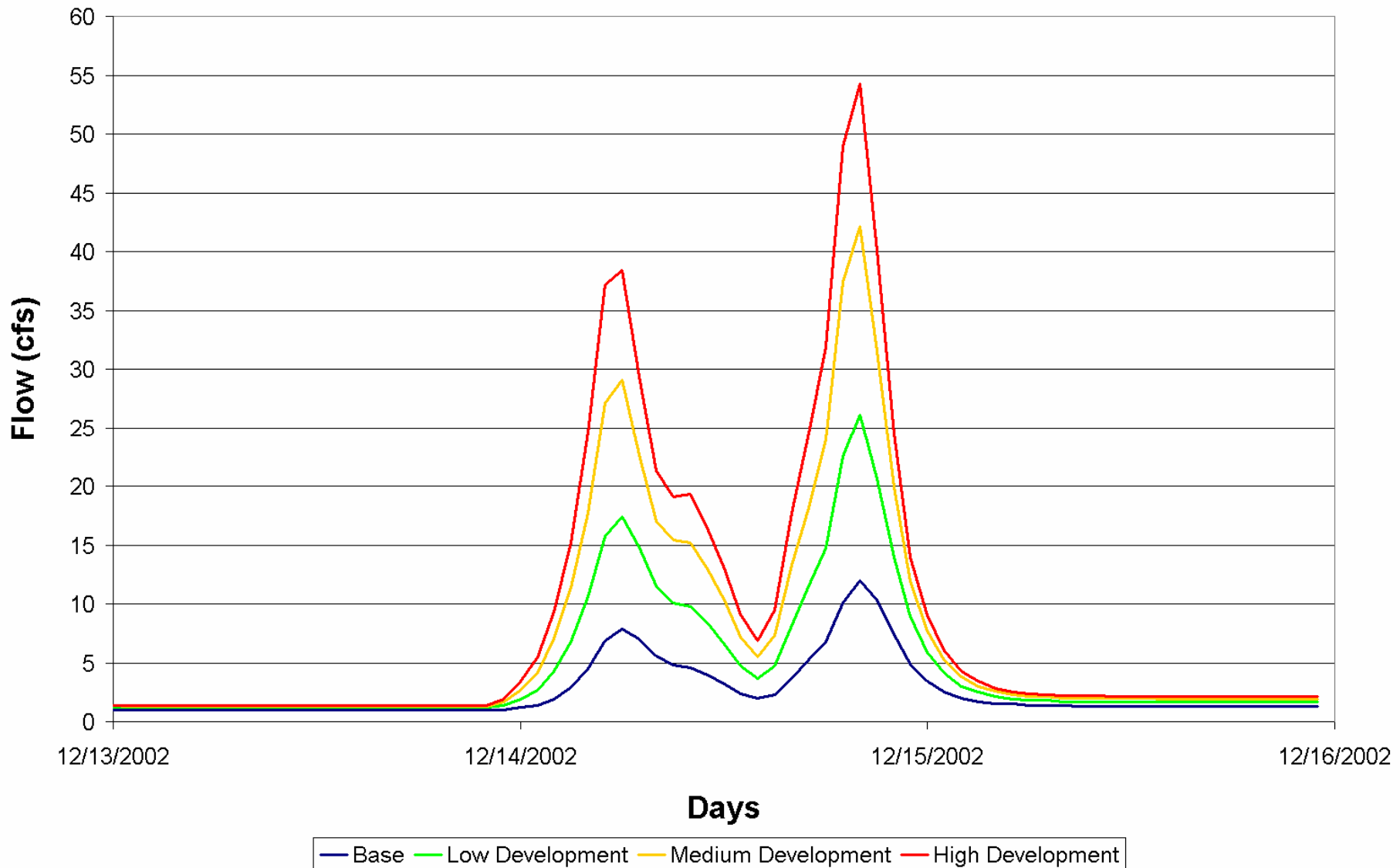
WELL ZONE II_s



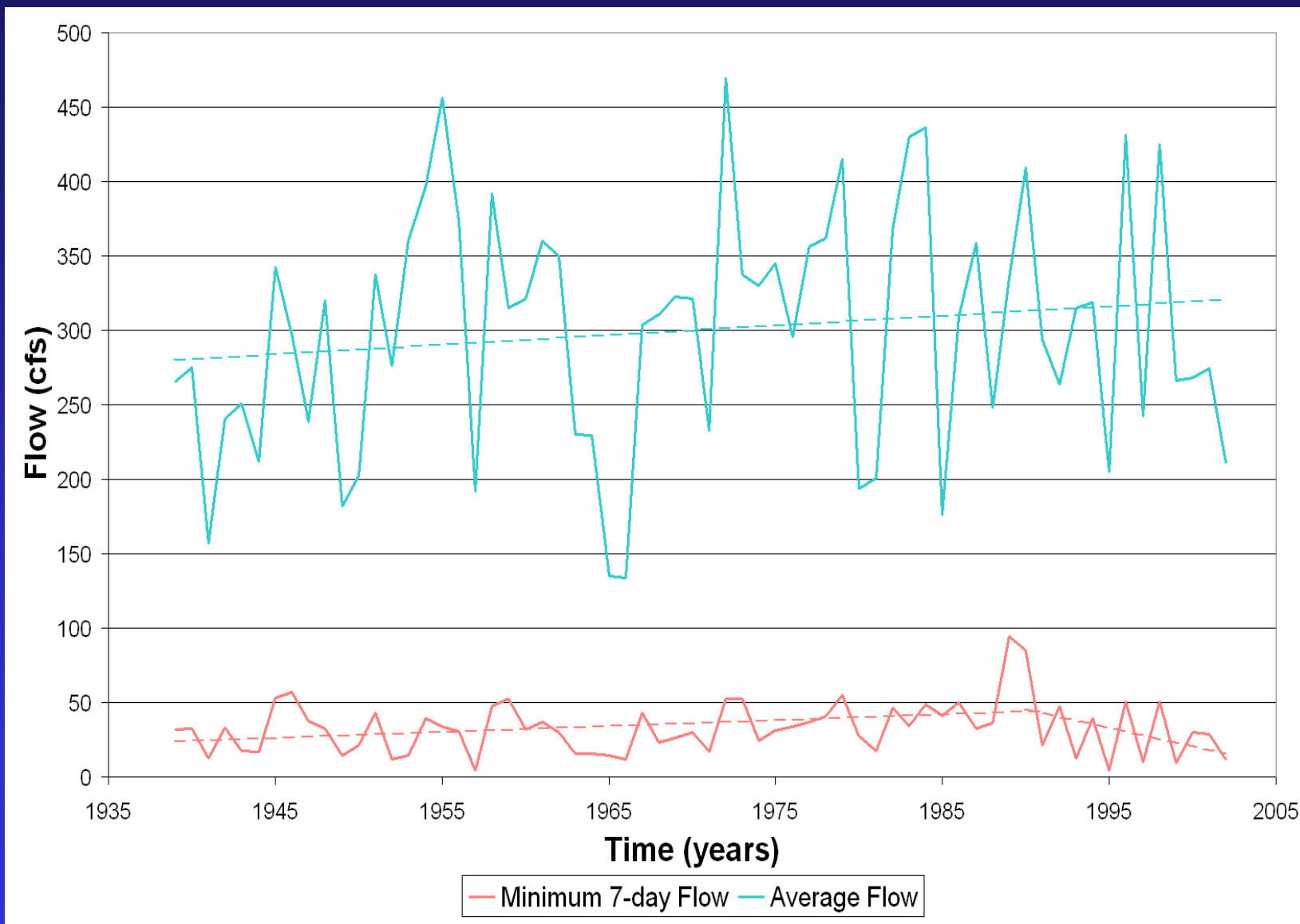
The Impact of Suburban Growth

- Growth causes:
 - increased withdrawals (more out)
 - increased sewerage (more out)
 - increased impervious surface (less in)
- Impacts are:
 - lower water tables
 - lower summertime streamflows during peak demand

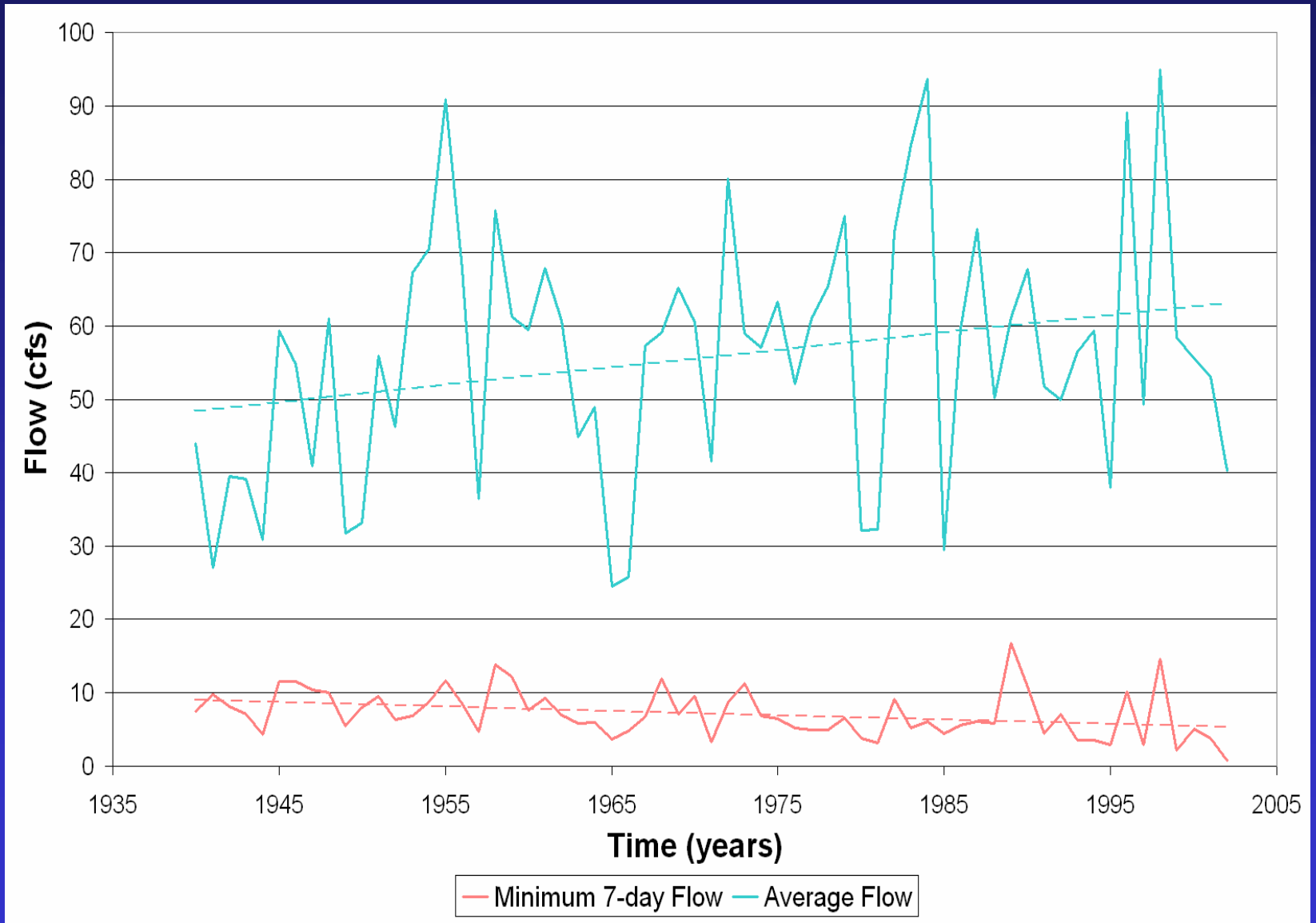
Hourly Flow for 12/2002 Storm



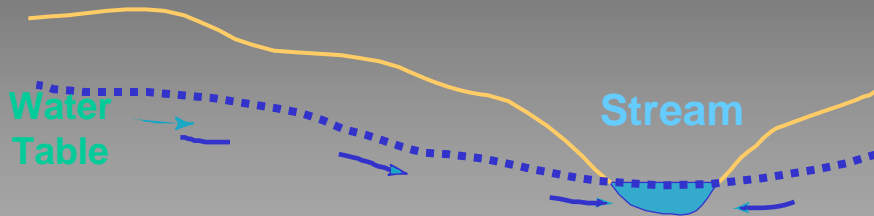
Flow Response to Growth – Charles River at Dover



Flow Response to Growth - Neponset R at Norwood

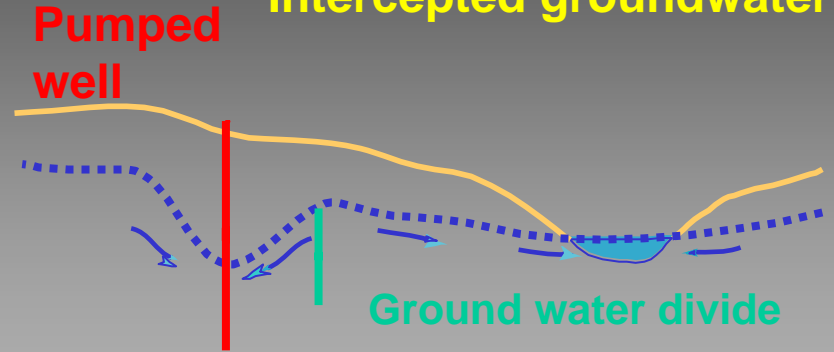


Natural condition



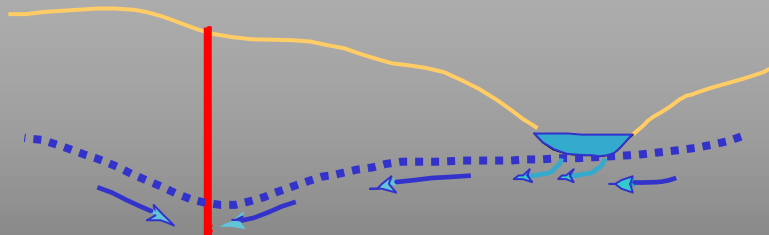
Ground water baseflow to stream

Intercepted groundwater



Well intercepts ground water that would have discharged to the stream

Induced infiltration



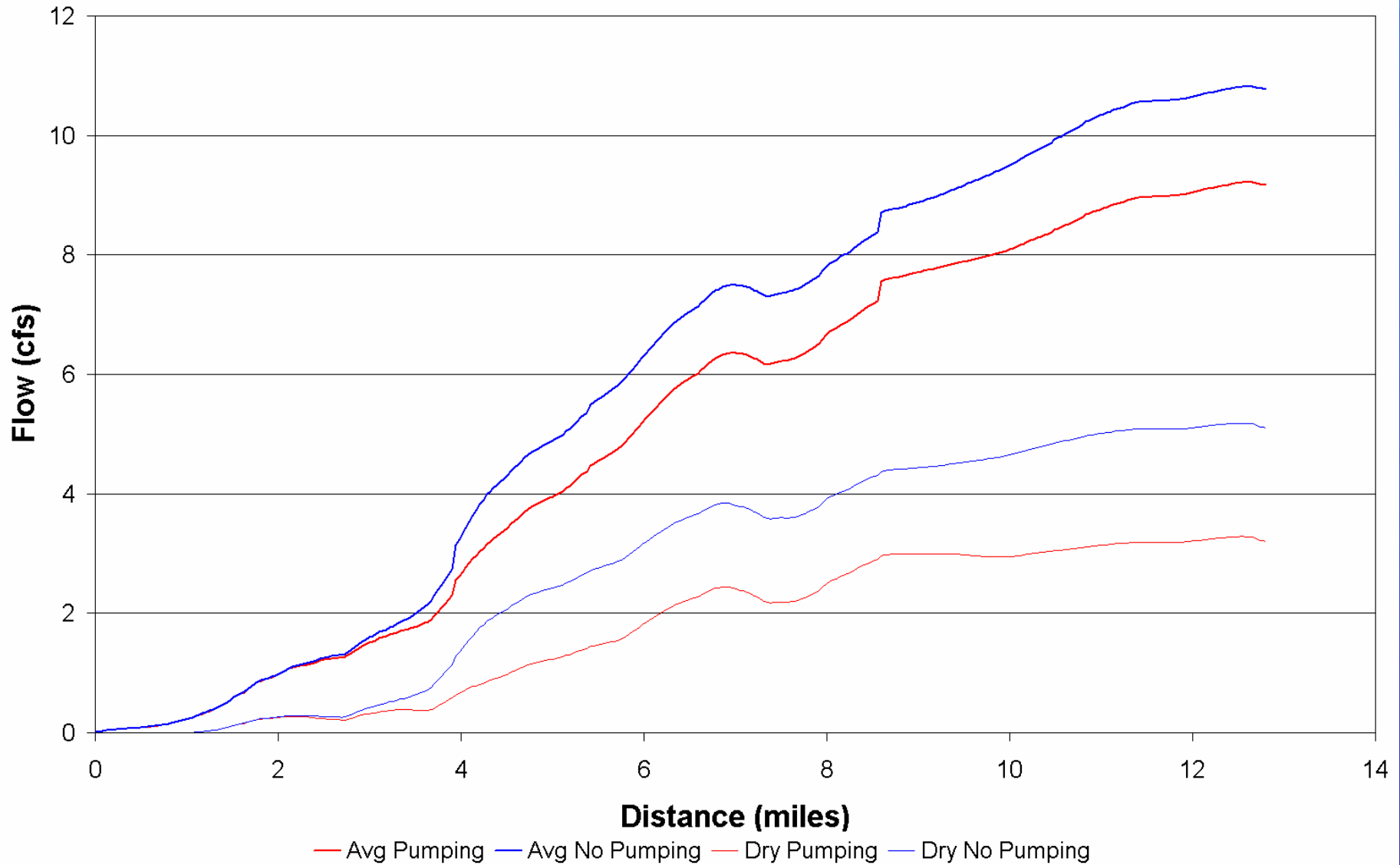
Well intercepts ground water and induces infiltration from the stream

Low recharge & dry stream



Well intercepts ground water, but also takes water from storage to satisfy demands

September Baseflow – Mine Brook









THE PROBLEM

- **Standard Municipal Engineering**
 - Rainwater treated as a liability
 - Impervious surfaces/accelerated runoff, reduce groundwater recharge
 - Bigger always better
 - Pipes
 - Pumps
 - Demand



Reversing the Infrastructure Curse

**Breaking Away from Large Centralized
Water Systems**

Coordinated Land and Water Systems



Mitigation/Restoration

- conserve water
 - reduce indoor & outdoor water demand
- improve water management
 - improve withdrawal location
 - optimize withdrawal timing
- decentralize wastewater treatment
 - limit regional sewerage
- promote recharge
 - limit impervious area (e.g. LID)
 - promote recharge

Rain Gardens and Rain Barrels/ Cisterns



MAY 18 2001

Buckman Heights courtyard with infiltration garden

CRWA Projects

- Restoring the Urban Water Environment
- *Environmentally Sensitive Urban Development*
- Flow Trading
- Developing Statewide Water Budgets
- TMDL development
- Volunteer water quality monitoring
- “Find It and Fix It”
- Stormwater Utility development