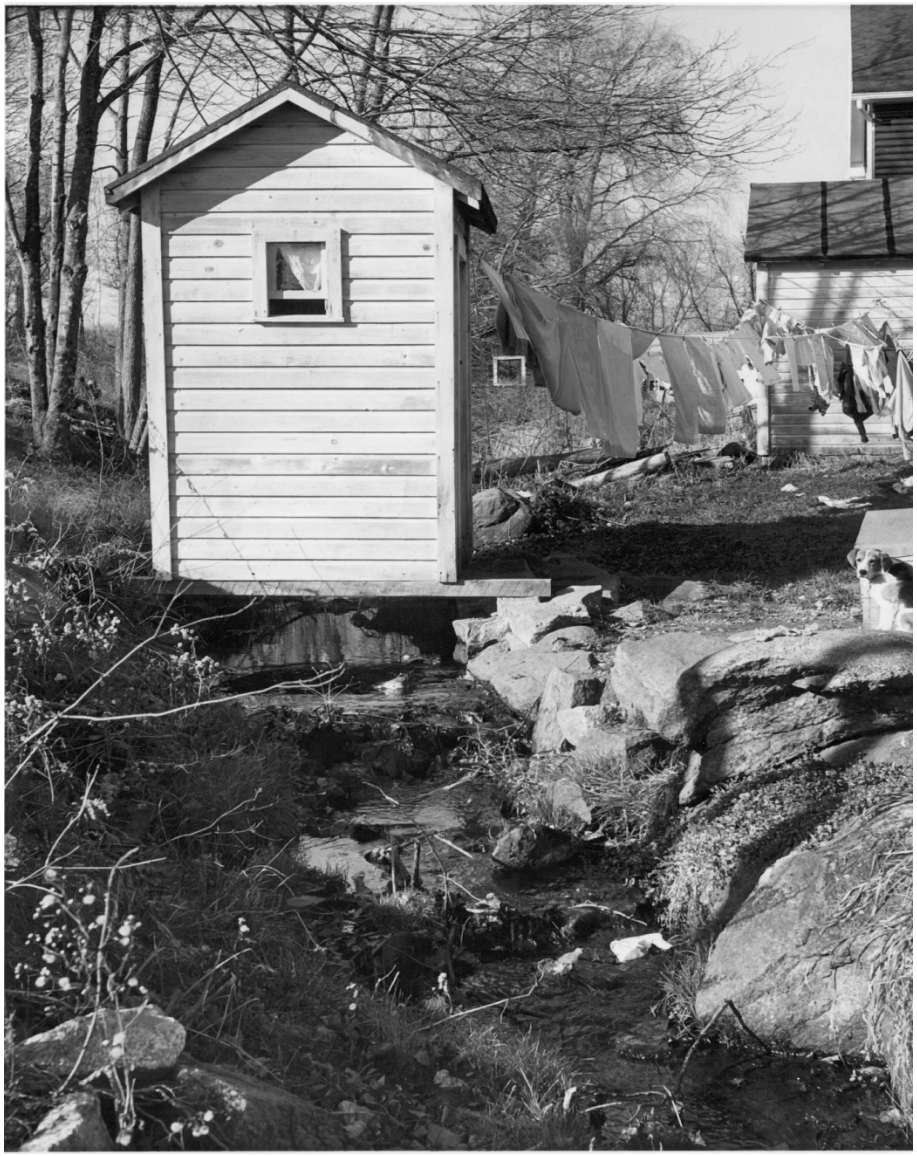
# Cess of the D'Urbervilles

Case Study of Branch River Watershed

Eugenia Marks, Policy, Audubon

# Manure Management



# Cess Pool v. Septic System

## What is a Cesspool?

- A cesspool is any buried chamber that receives sewage from a building for disposal directly into the ground.
- Could be a metal tank, a perforated concrete vault, a “beehive,” or even just a covered hollow or excavation.

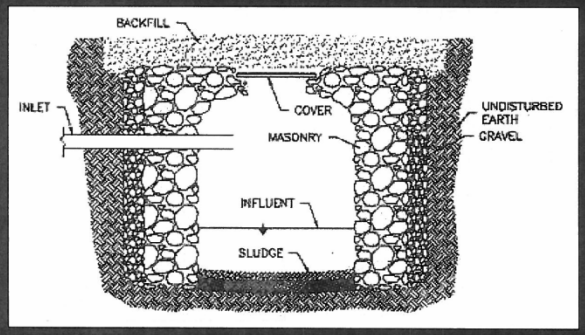
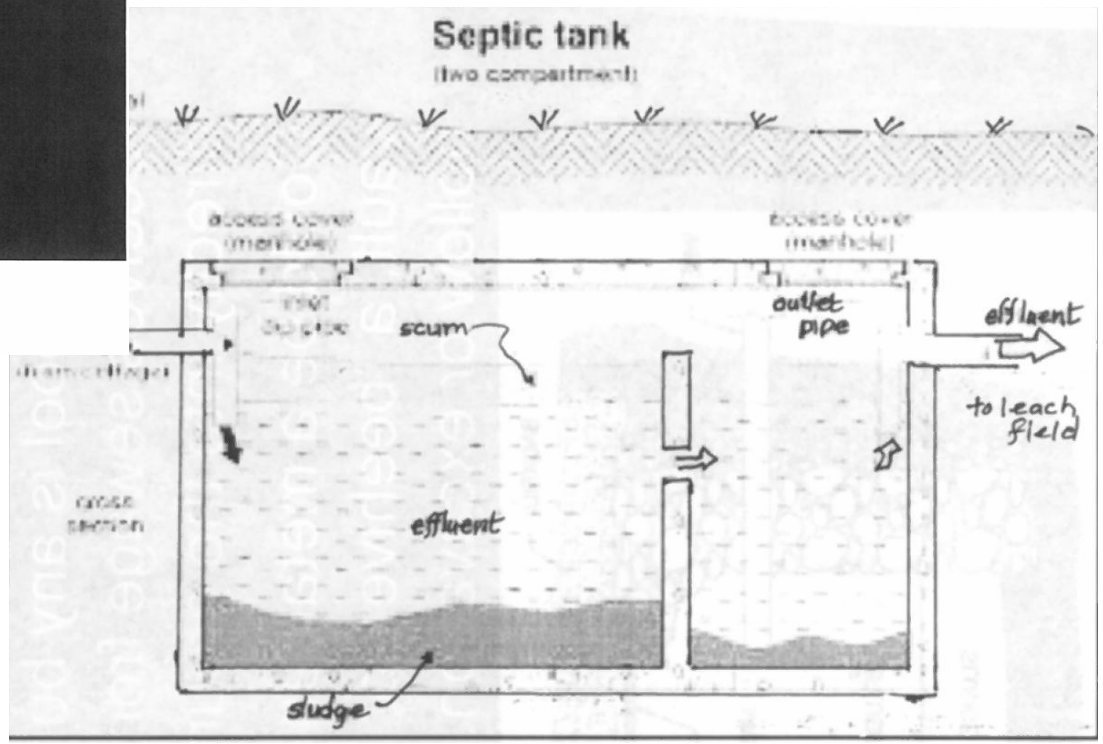
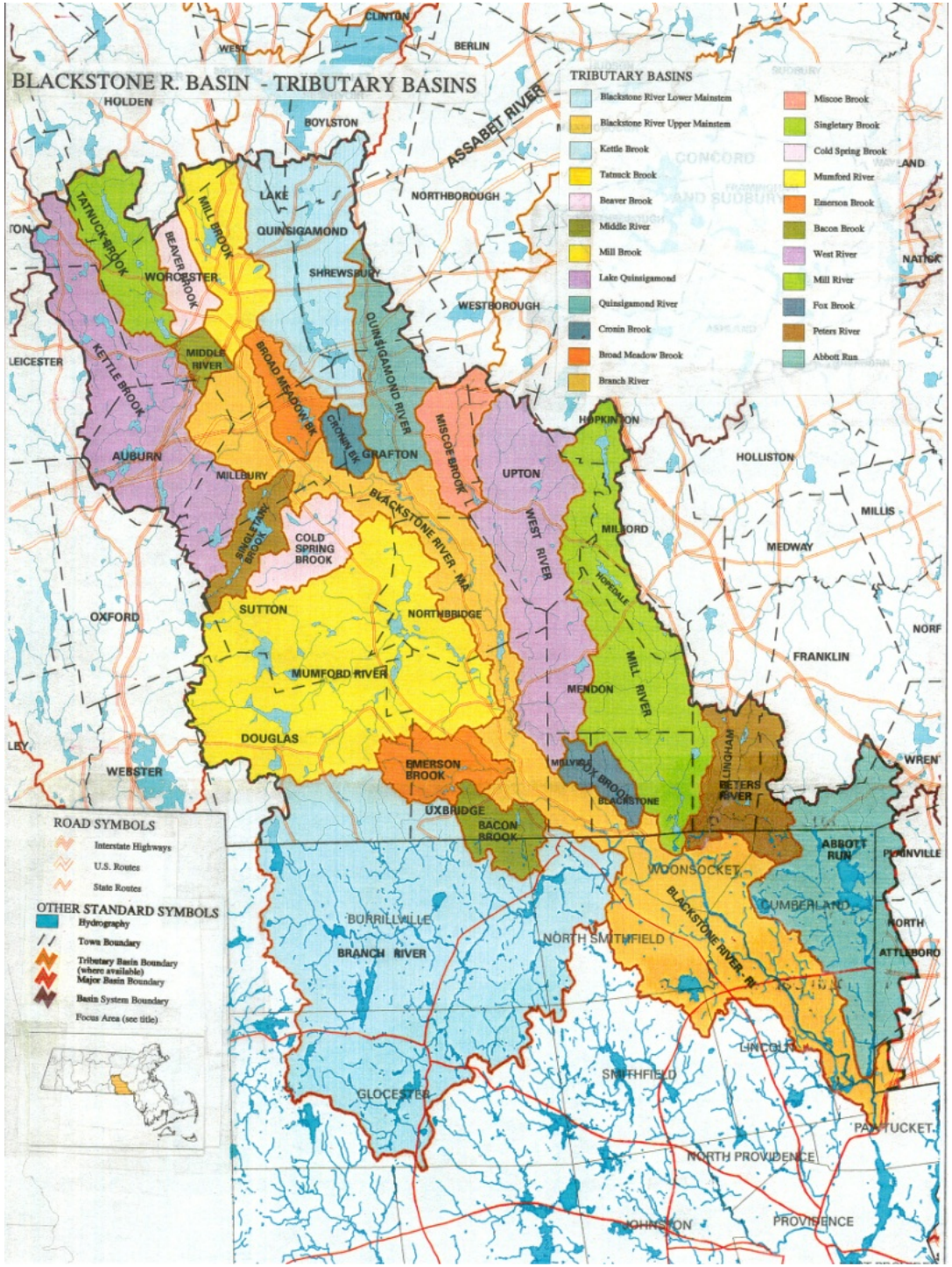
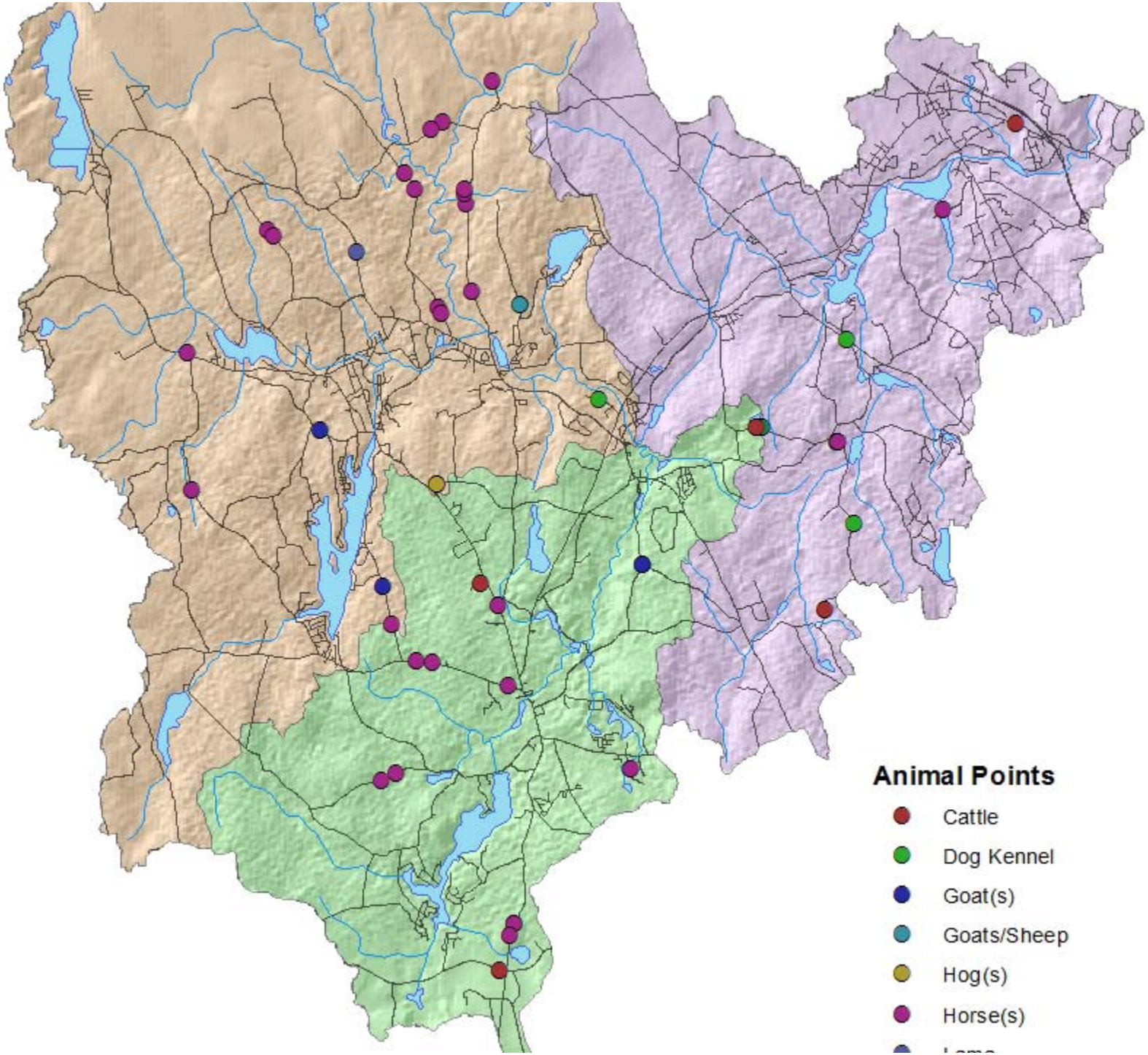
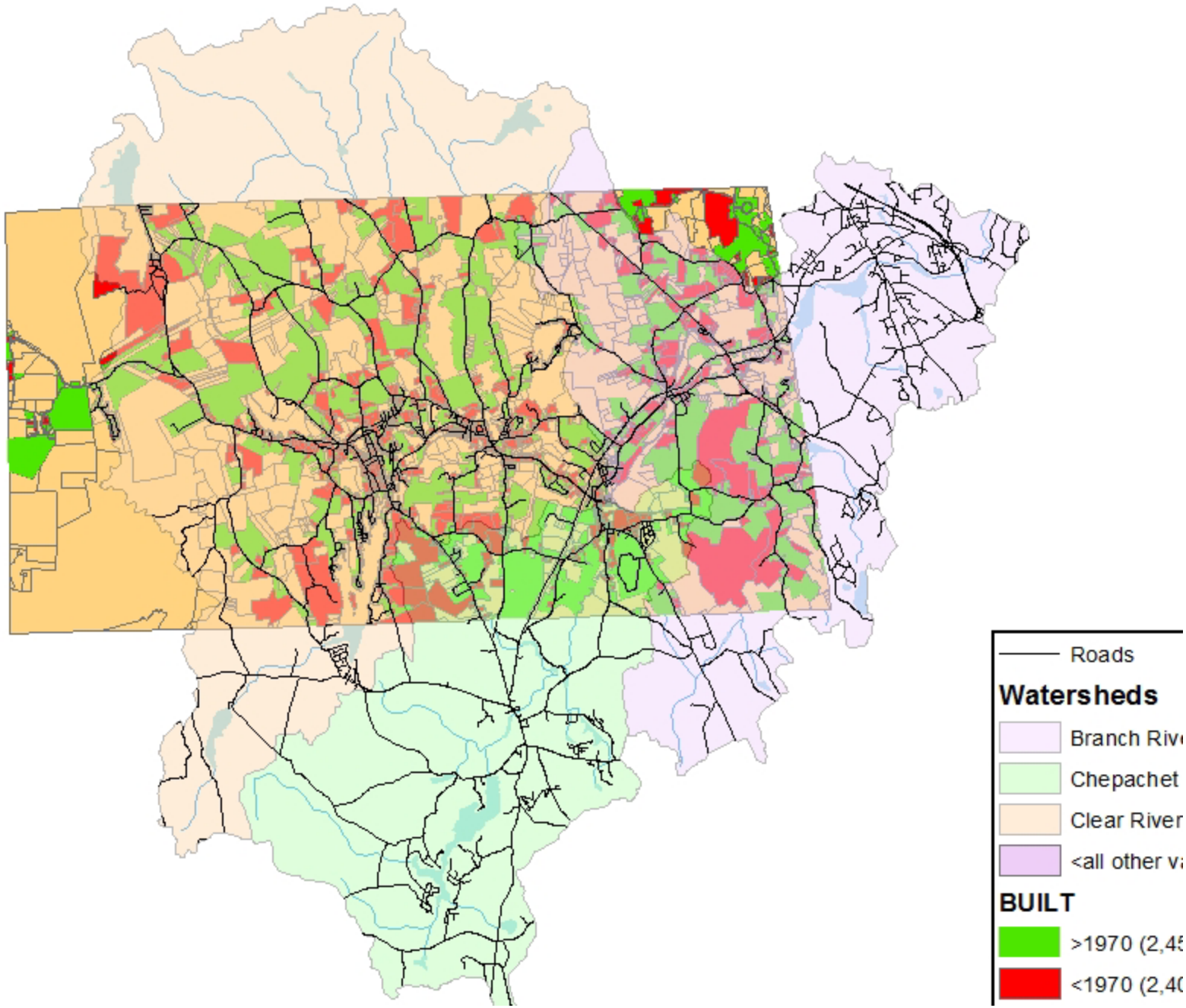


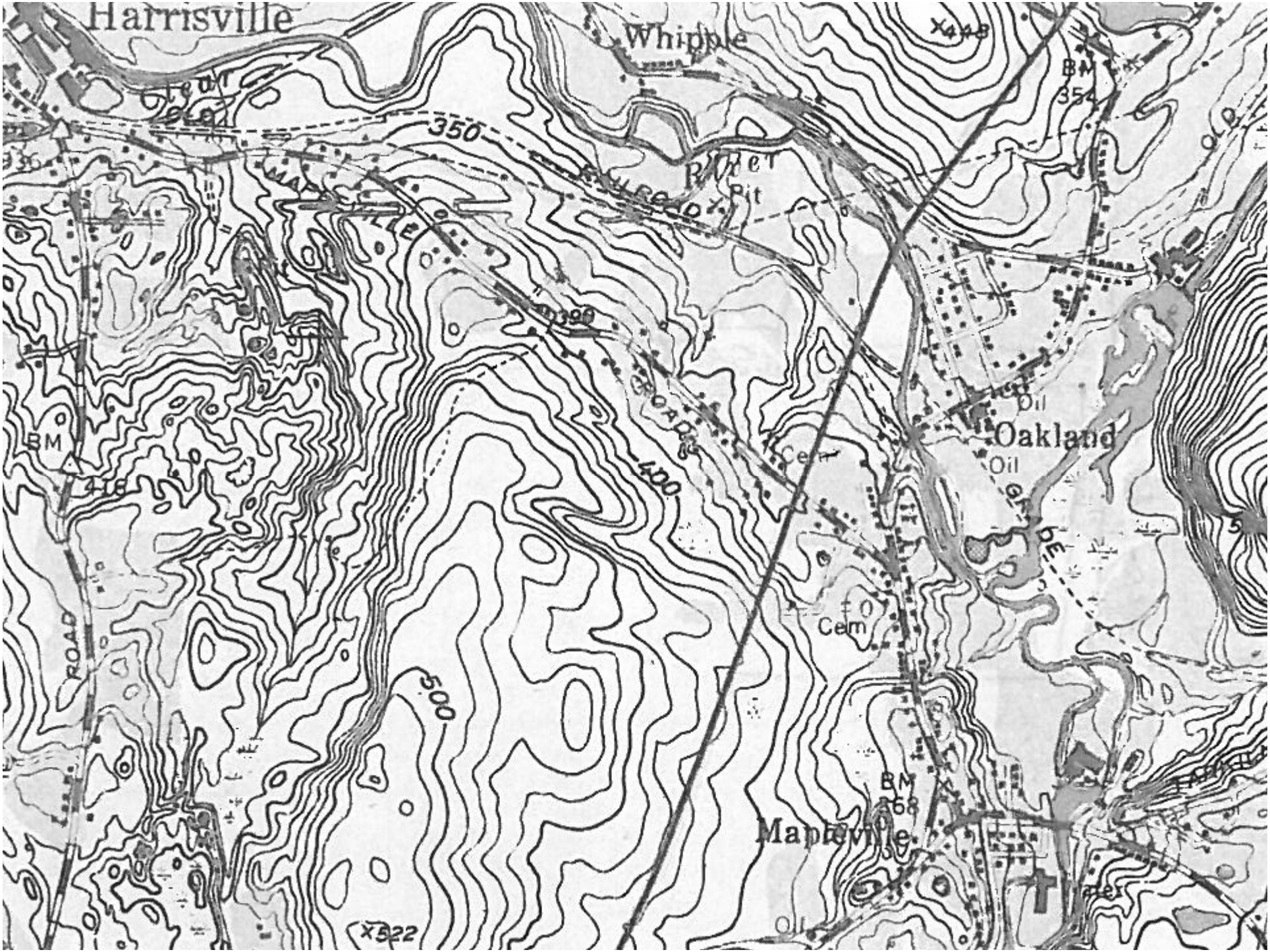

Image: http://www.cefns.nau.edu/Projects/WDP/resources/treatmentsyst/Cesspool.htm




BLACKSTONE R. BASIN - TRIBUTARY BASINS
TRIBUTARY BASINS
Blackstone River Lower Mainstem
Blackstone River Upper Mainstem
Kettle Brook
Tatnuck Brook
Beaver Brook
Middle River
Mill Brook
Lake Quinsigamond
Quinsigamond River
Cronin Brook
Broad Meadow Brook
Branch River
Miscoe Brook
Singletary Brook
Cold Spring Brook
Mumford River
Emerson Brook
Bacon Brook
West River
Mill River
Fox Brook
Peters River
Abbott Run
ROAD SYMBOLS
Interstate Highways
U.S. Routes
State Routes
OTHER STANDARD SYMBOLS
Hydrography
Town Boundary
Tributary Basin Boundary (where available)
Major Basin Boundary
Basin System Boundary
Focus Area (see title)
CLINTON
BERLIN
HOLDEN
BOYLSTON
ASSABET RIVER
NORTHBOROUGH
LAKE QUINSIGAMOND
SHREWSBURY
WESTBOROUGH
WORCESTER
TATNUCK BROOK
BEAVER BROOK
MILL BROOK
LEICESTER
KETTLE BROOK
MIDDLE RIVER
BROAD MEADOW BR
CRONIN BK
QUINSIGAMOND RIVER
GRAFTON
MISCOE BROOK
UPTON
HOPKINTON
HOLLISTON
AUBURN
MILLBURY
SINGLETARY BROOK
COLD SPRING BROOK
BLACKSTONE RIVER - MA
WEST RIVER
MILFORD
MILLIS
MEDWAY
OXFORD
SUTTON
NORTHBRIDGE
HOPEDALE
MILL RIVER
FRANKLIN
MUMFORD RIVER
MENDON
DOUGLAS
WEBSTER
EMERSON BROOK
UXBRIDGE
BACON BROOK
FOX BROOK
BLACKSTONE
LINGHAM
PETERS RIVER
WRENTHAM
ABBOTT RUN
PLAINVILLE
WOONSOCKET
CUMBERLAND
NORTH ATTLEBORO
BURRILLVILLE
BRANCH RIVER
NORTH SMITHFIELD
BLACKSTONE RIVER - RI
LINCOLN
SMITHFIELD
GLOCESTER
PAWTUCKET
NORTH PROVIDENCE
JOHNSTON
PROVIDENCE


Animal Points
Cattle
Dog Kennel
Goat(s)
Goats/Sheep
Hog(s)
Horse(s)


Roads
Watersheds
Branch Riv
Chepachet
Clear River
<all other v
BUILT
>1970 (2,45
<1970 (2,40


Harrisville
Whipple
Pit
350
400
500
Oakland
Oil
Cem
Mapleville
BM
416
354
368
ROAD
X822

# Enterococcus
# TMDL from RI DEM Assessment

- **Watershed Planning Area 8: Branch - Blackstone Rivers**
- **Branch River (RI0001002R-01A) Enterococci Burrillville**
- **Branch River (RI0001002R-01B) Enterococci North Smithfield**
- **Chepachet River (RI0001002R-03) Enterococci Burrillville, Glocester**
- **Clear River (RI0001002R-05C) Enterococci Burrillville**
- **Clear River (RI0001002R-05D) Enterococci Burrillville**
- **Pascoag River (RI0001002R-09) Enterococci Burrillville**
- **Tarkiln Brook (RI0001002R-13B) Enterococci Burrillville, N. Smithf'd**
- **Crookfall Brook (RI0001004R-01) Enterococci Lincoln, N.Smithfd, Smithfield**
- **Long Brook (RI0001006R-02) Enterococci Cumberland**
- **East Sneech Brook (RI0001006R-03) Enterococci Cumberland**
- **Burnt Swamp Brook (RI0001006R-06) Enterococci Cumberland**

Associated with 80 to 90 percent of human enterococcal infections. Enterococcus faecalis, as the name implies, is found normally in the intestines of humans, animals and birds. It is also found in soil and water in nature. Enterococcus faecalis has been implicated in a wide variety of human infections and is a notorious problem in hospital-acquired infections.

# Indicator Bacteria

- Selected for ease of collecting and culturing
- Indicators -- former standards
  - "total fecals:" fecal coliforms , *Escherichia coli*, fecal streptococci, and enterococci.
  - "fecal coliforms:" may contain some non-fecal bacteria
  - "E. coli:" from humans and other warm-blooded anmials

# Indicator Bacteria

**Enterococci** are a subgroup within the fecal streptococcus group.

Enterococci are distinguished by their ability to survive in salt water, and in this respect they more closely mimic many pathogens than do the other indicators.

Enterococci are typically more human-specific than the larger fecal streptococcus group.

EPA recommends enterococci as the best indicator of health risk in salt water used for recreation and as a useful indicator in fresh water as well.

# Indications of What?

**Other sewage pathogens**

Other virulent bacteria  Viruses

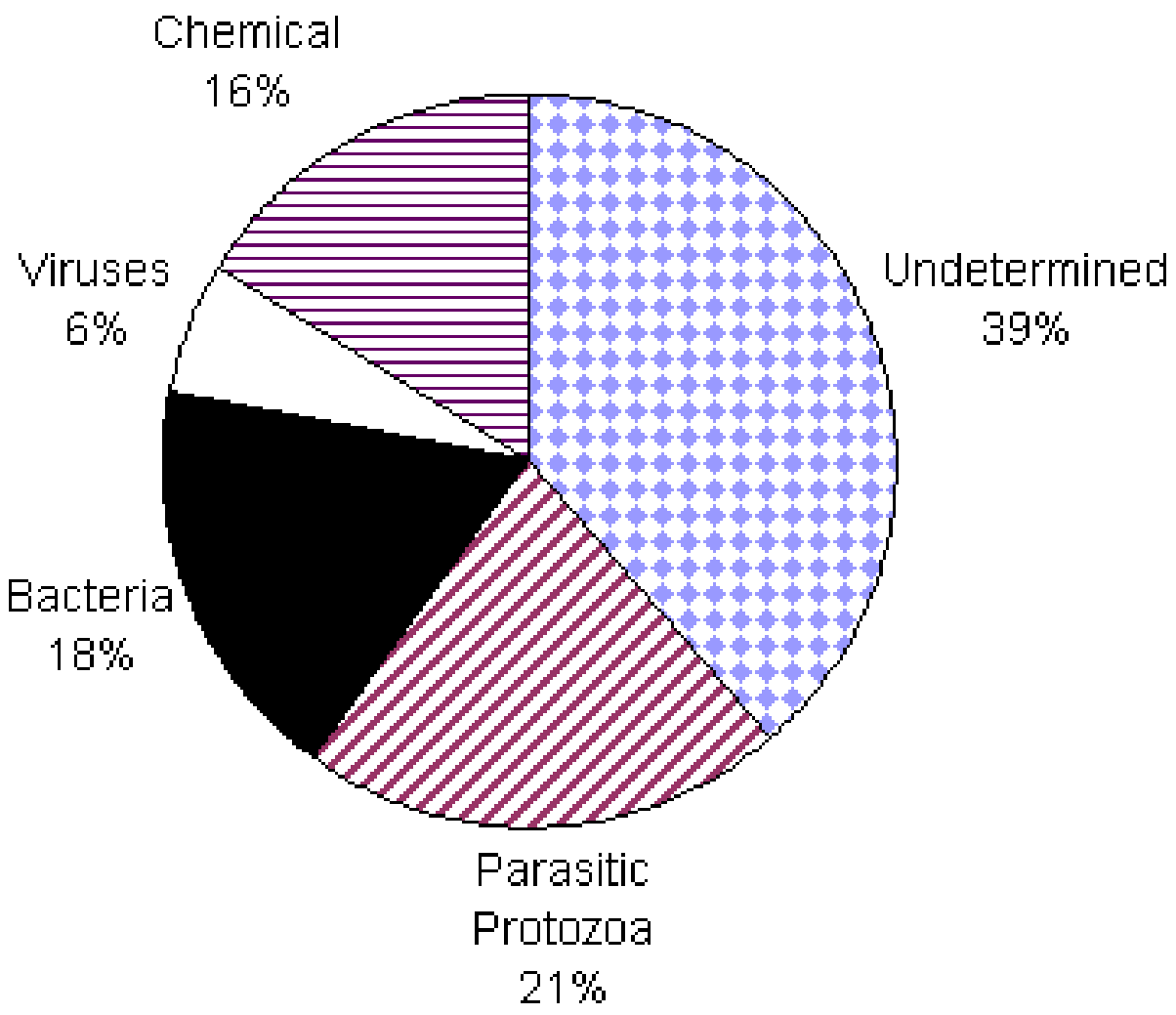
Cyto-chemicals  Pharmaceuticals

**Other pollutants**

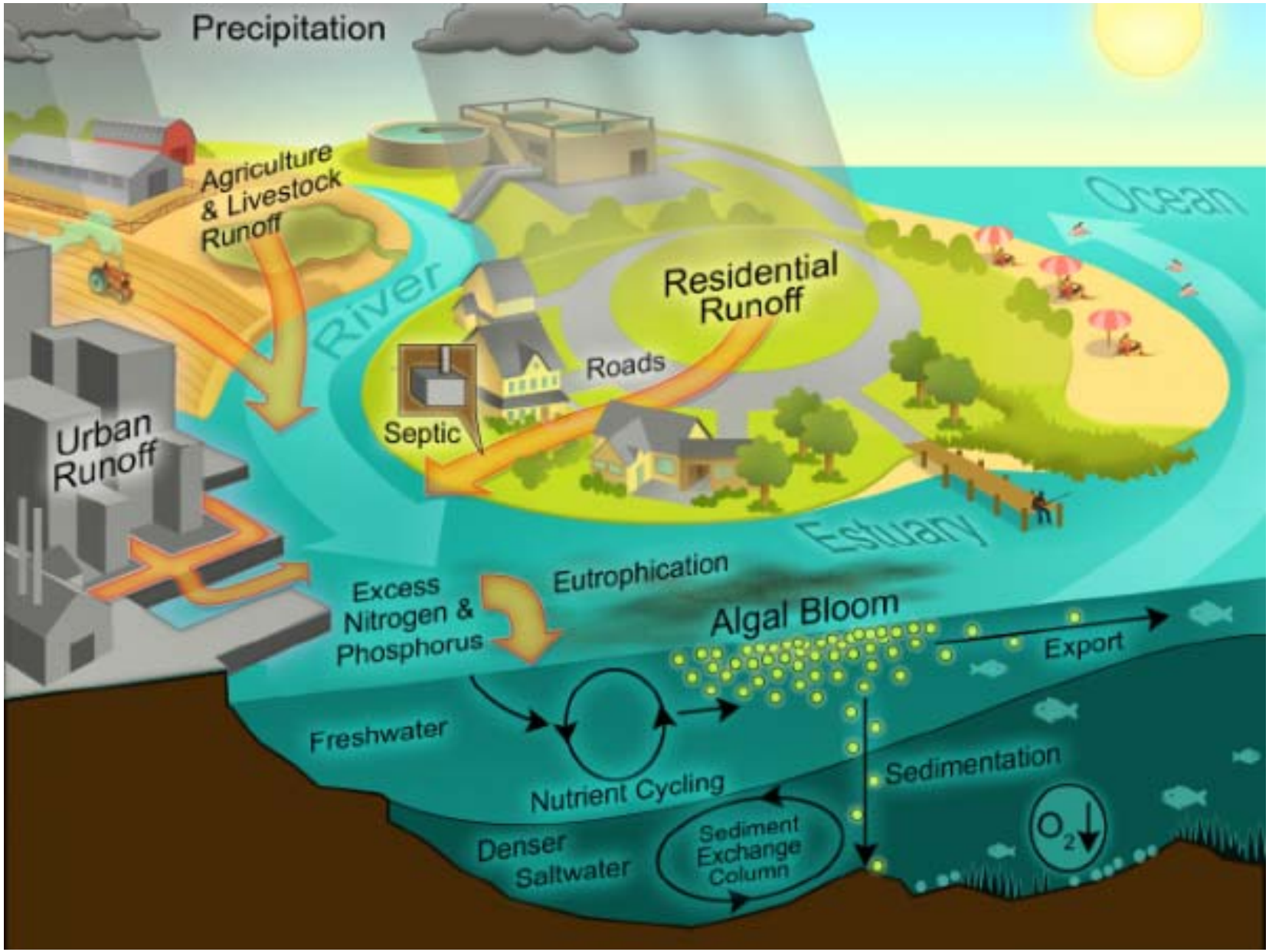
Nitrogen  Phosphorus  Lead  Copper

# Human Health

# Causes of Waterborne Disease Outbreaks in the USA, 1991-2000



# Ecosystem health

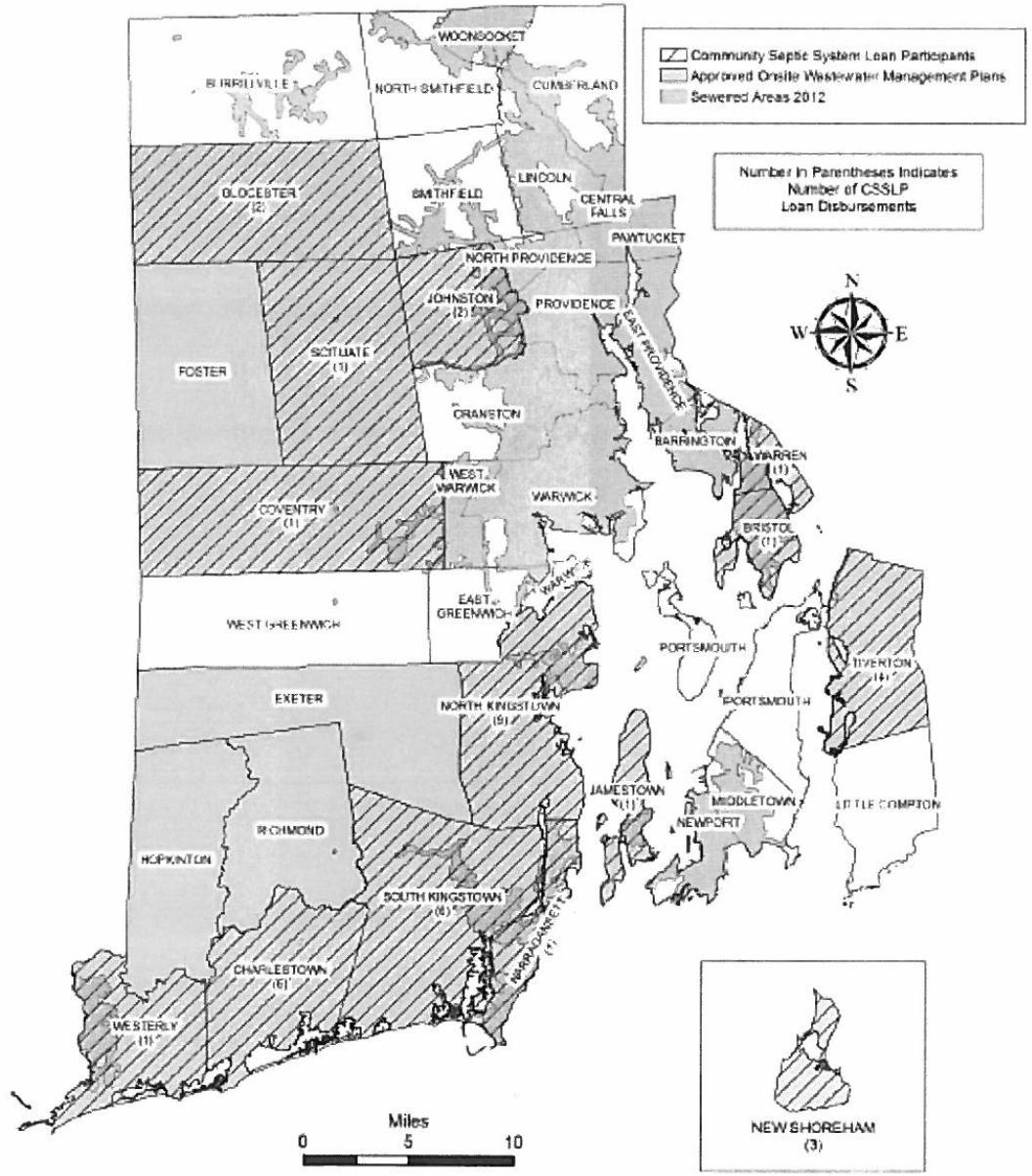

Precipitation
Agriculture & Livestock Runoff
River
Residential Runoff
Ocean
Roads
Septic
Urban Runoff
Estuary
Excess Nitrogen & Phosphorus
Eutrophication
Algal Bloom
Export
Freshwater
Nutrient Cycling
Sedimentation
Denser Saltwater
Sediment Exchange Column
$O_2$

# What shall we do?

- Municipal
  - Waste Water Management Districts  RIGL 45-24.5
  - Stormwater Regs – MS-4
  - Zoning and Development
- State
  - Support $ for sampling; monitoring, enforcement
  - Support  2015 bill H-5668 and S-369
- Home
  - Waste management

# Onsite Wastewater Management Plans

## Status as of July 1, 2014



# Cess-pool Phase-out Legislation

Don’t flush old medications, cleaners or hobby chemicals to OWTS or sewer
If you have OWTS, manage; beware of chemical “fixes”
Consult URI Coop Extension for OWTS care