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### Long Pond Study 2000-2001

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# Long Pond Study 2000-2001

## Mrs. McNally's Environmental Research Class

Matt Keenan, Troy Annichiarico, Martine Rousseau, Lindsey Nickerson, Rebecca Orrall, Kristine Mandeville, Stacy Rousseau, Kerie Annichiarico, and Felicia Porawski

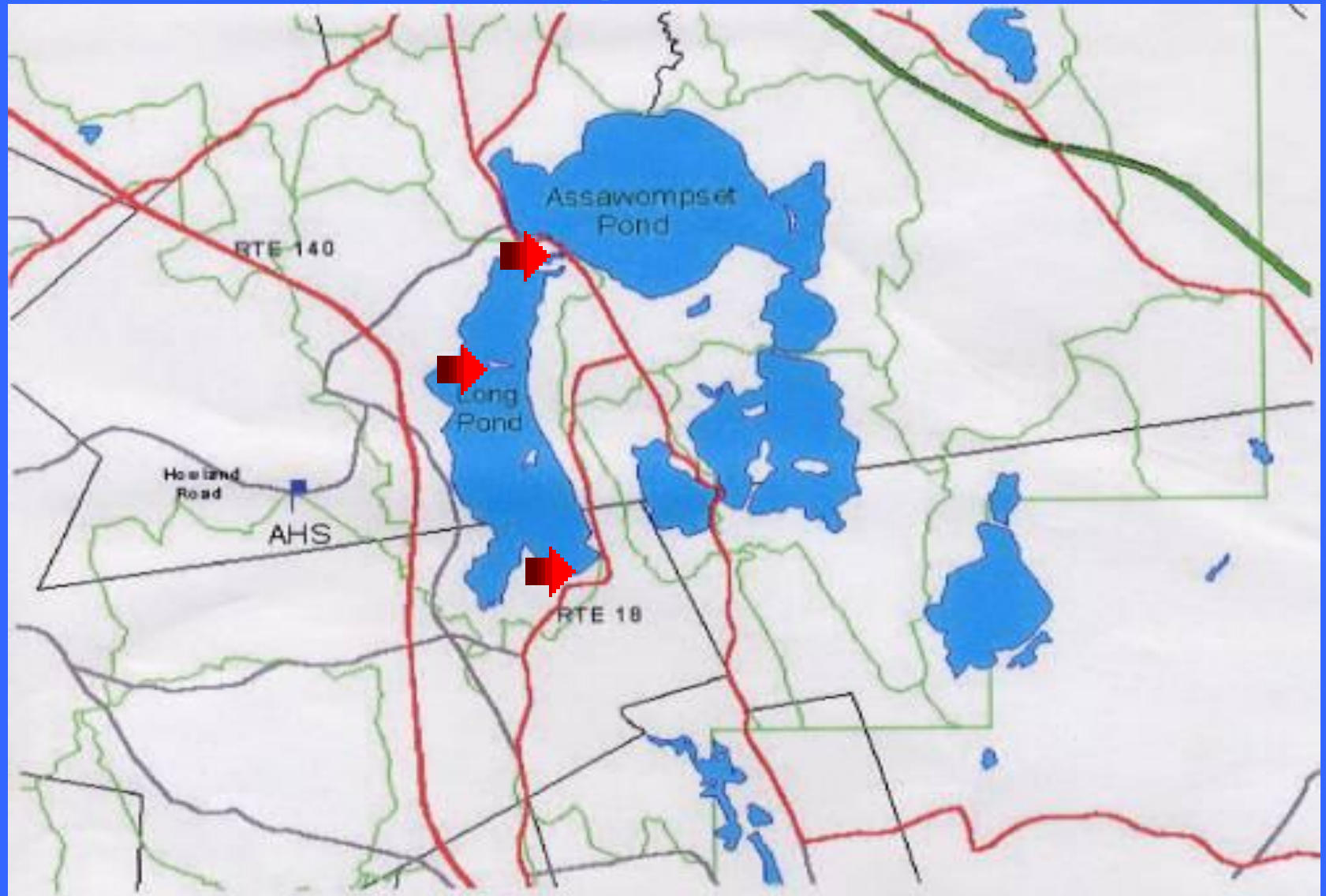
# Historical Facts



- Wamponog Indians had villages surrounding the five pond complex.
- Nelson island was used for mining iron ore between 1820-1847.
- In 1880 there was a trolley route that would transfer people to and from cathedral camp.

# Five Pond Complex

## Long Pond



# General Info on Long Pond

- Formed by glaciers
- Sub-basin area is 2.79 square miles
- Pond 7 miles long
- Largest naturally formed pond in MA
- Contains 3 islands
- Part of a 5 pond system
- North flow
- Snake river connects long pond and Assawompset pond

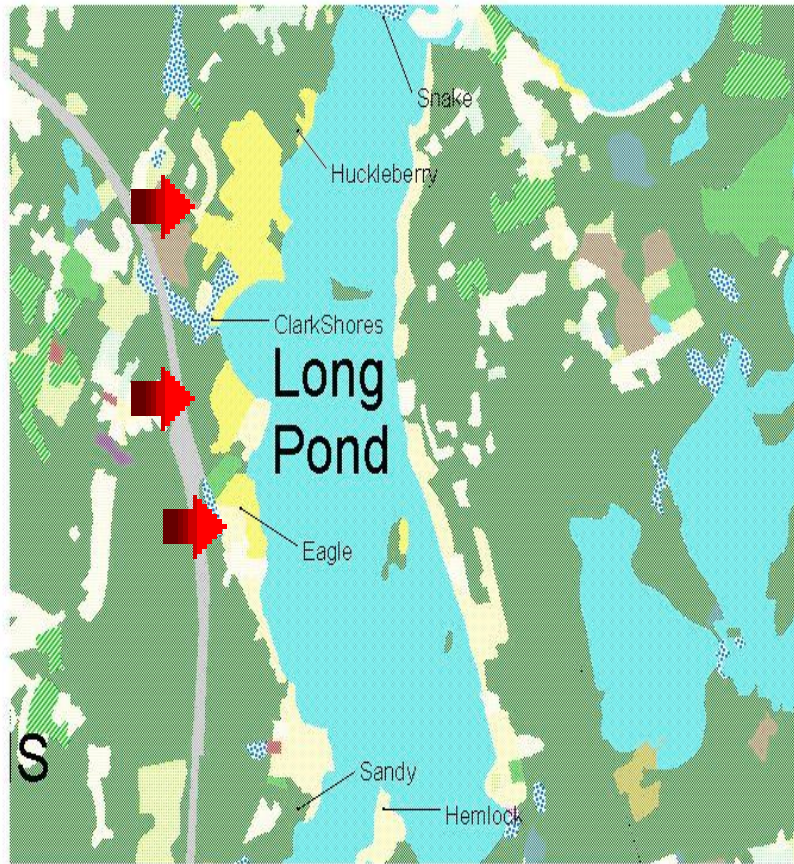


# ?Question?

What Is the Water Quality of  
Long Pond

# Land Uses

## Long Pond



- *Farmlands*
- *Residential areas*
- *Wetlands*
- *Gravel pits*
- *Commercial industry*
- *Recreation*
  - *Boating, fishing, swimming*
- *Cathedral camp-day camp*

# Snake River

- A main river leading from long pond into Assawompset pond.
- North end of the river easily accessible off road.
- Southside is covered by wetlands.





# Huckleberry & Clark Shores



- **Converted summer cottages**
- **Houses located close to shore**
- **Elevation decreases towards pond**

# Nelson Island

- Chosen because of water depth and lack of habitation.
- The island is found on the northern side of the pond.
- Can be reached by a sandbar on one side of the island or by canoe.



# Sandy Point & Marina

- Permanent housing
- Marina next to the Eagle's Club
- Marina on border of Freetown and Lakeville



# HEMLOCK POINT & CATHEDRAL CAMP



- Permanent housing
- Located at the south end of pond
- Summer activities

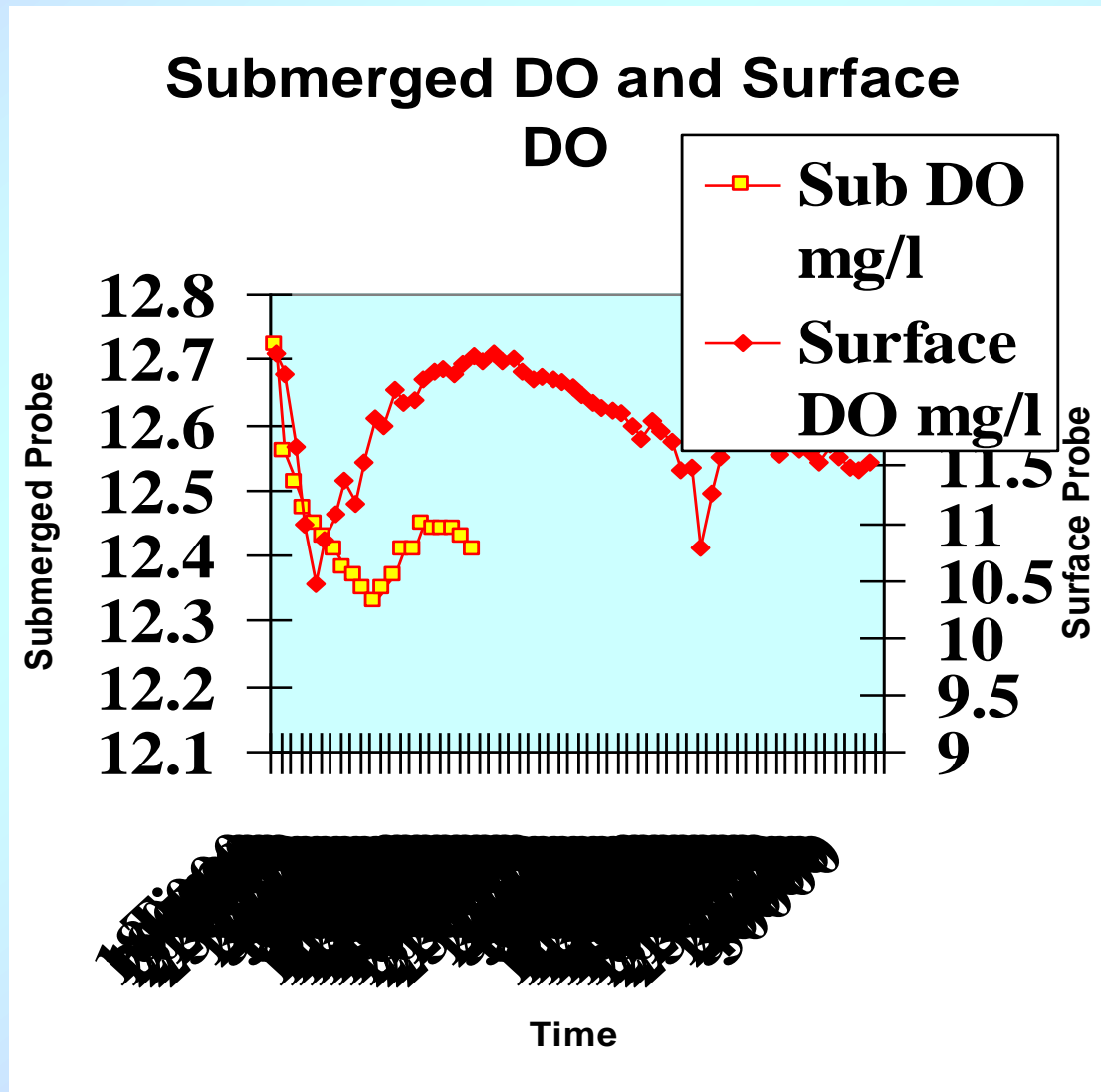


# Chemical Parameters

- pH
- Dissolved oxygen
  - Temperature
- Reactive phosphorus
- Nitrogen/nitrates (N/  $\text{NO}_3$ )

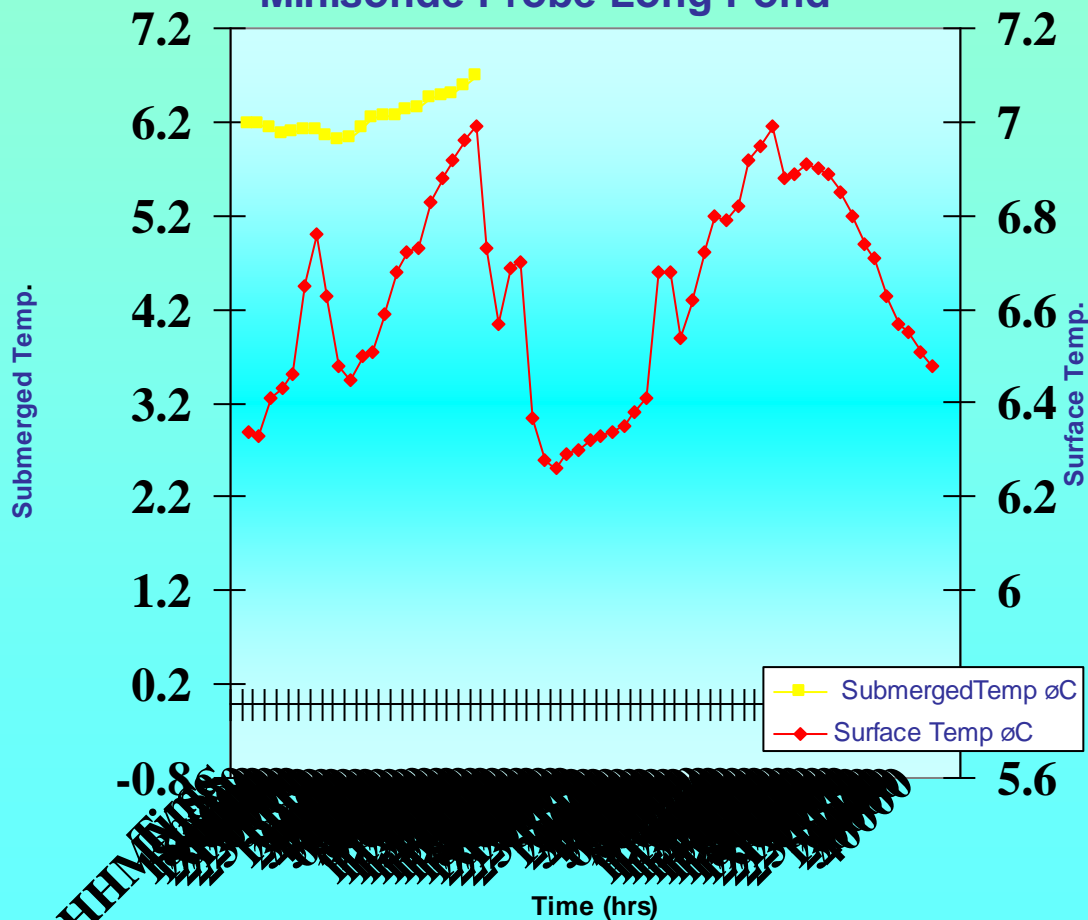
# Dissolved Oxygen

- Normal Values: 5 ppm.
- Optimal % Saturation Levels: 85%.
- Diurnal Changes: peak at noon, ultimate low after midnight.
- On 3/21 there was a disturbance in the diurnal cycle due to heavy rainfall possibly caused by a temp. spike.



# Temperature

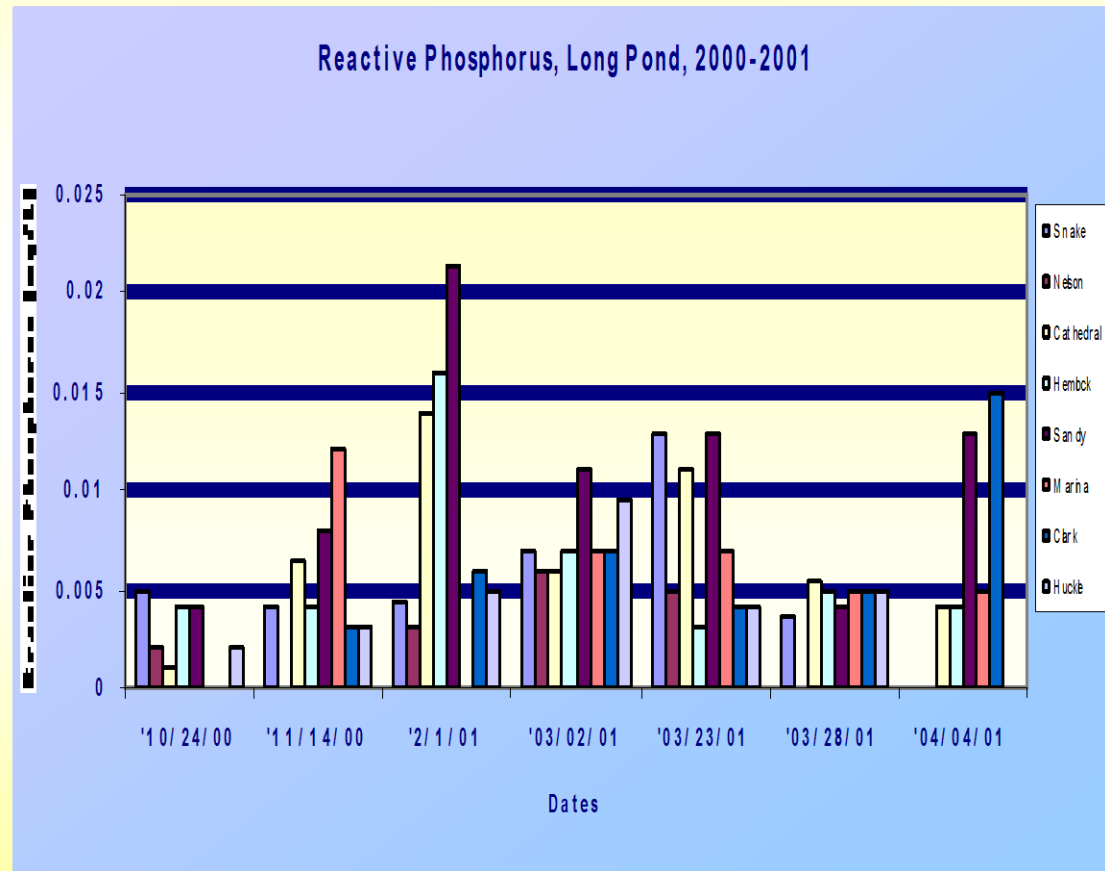
Temperature Submerged vs. Surface  
Minisonde Probe Long Pond



- No stratification (which would indicate spring turn-over) was recorded with the Minisonde probe
- Submerged probe was recovered after 18 hours
- Samples taken 3/20/01-3/23/01

# Reactive Phosphorus

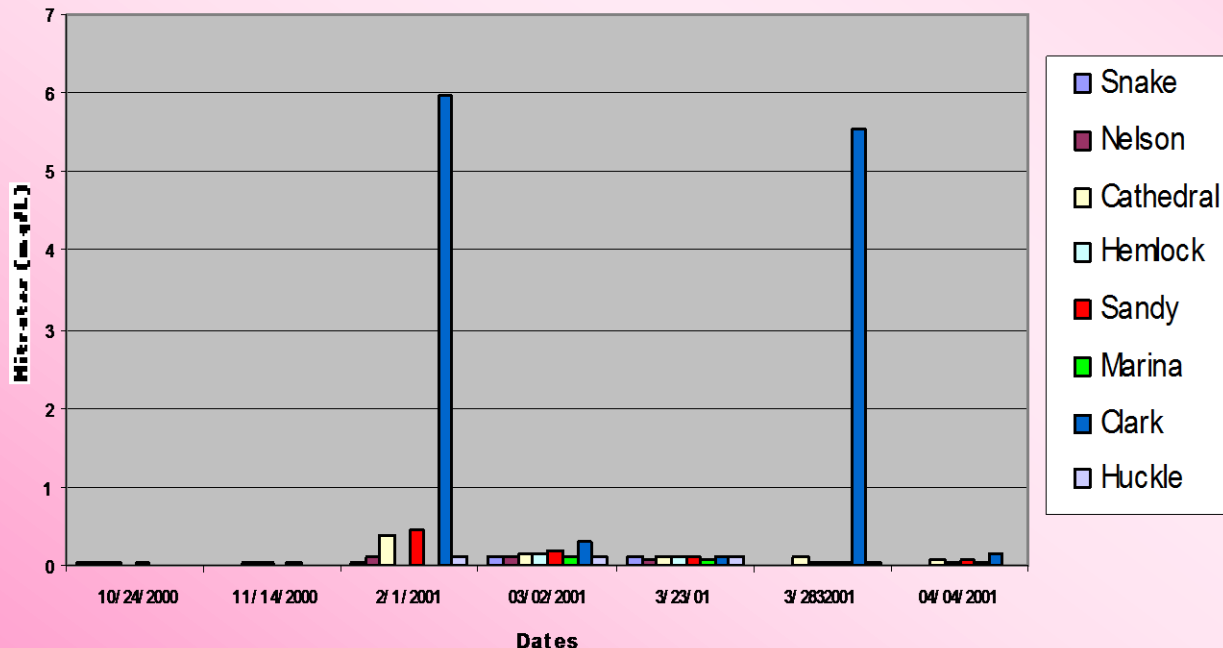
- Normal range: .01- .05 mg/L
- Results are all within normal range
- Consistently low values on 3/28 due to lag-time present after 4 inch rainstorm on 3/21/01-3/22/01





# Nitrogen/Nitrates

Nitrogen/Nitrates, Long Pond Subbasin, 2000-2001



- Normal concentrations: 0.1-2.0 mg/L
- Spikes occur only at Clark Shores
- Possible Title V problems
- Same dilution effect as RP due to rain

# Fecal Coliform Bacteria

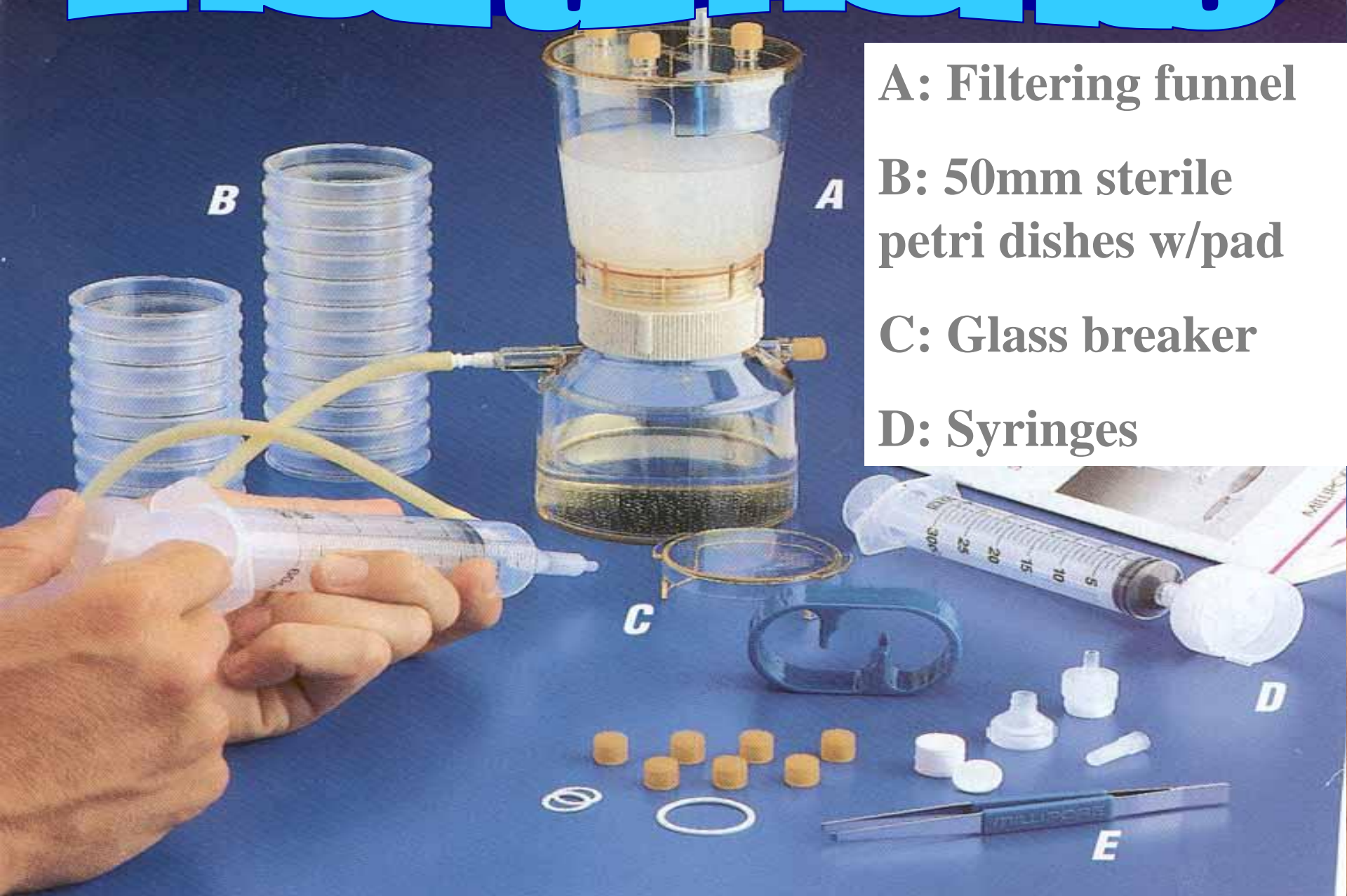


**Known as Microscopic organisms that live in waste materials or the intestines of warm-blooded animals**

- \* Able to multiply rapidly**
- \* In winter months fecals are dormant**
- \* Can die in extreme temperatures**
- \* Counts cannot be predicted**



# Instruments



**A:** Filtering funnel

**B:** 50mm sterile petri dishes w/pad

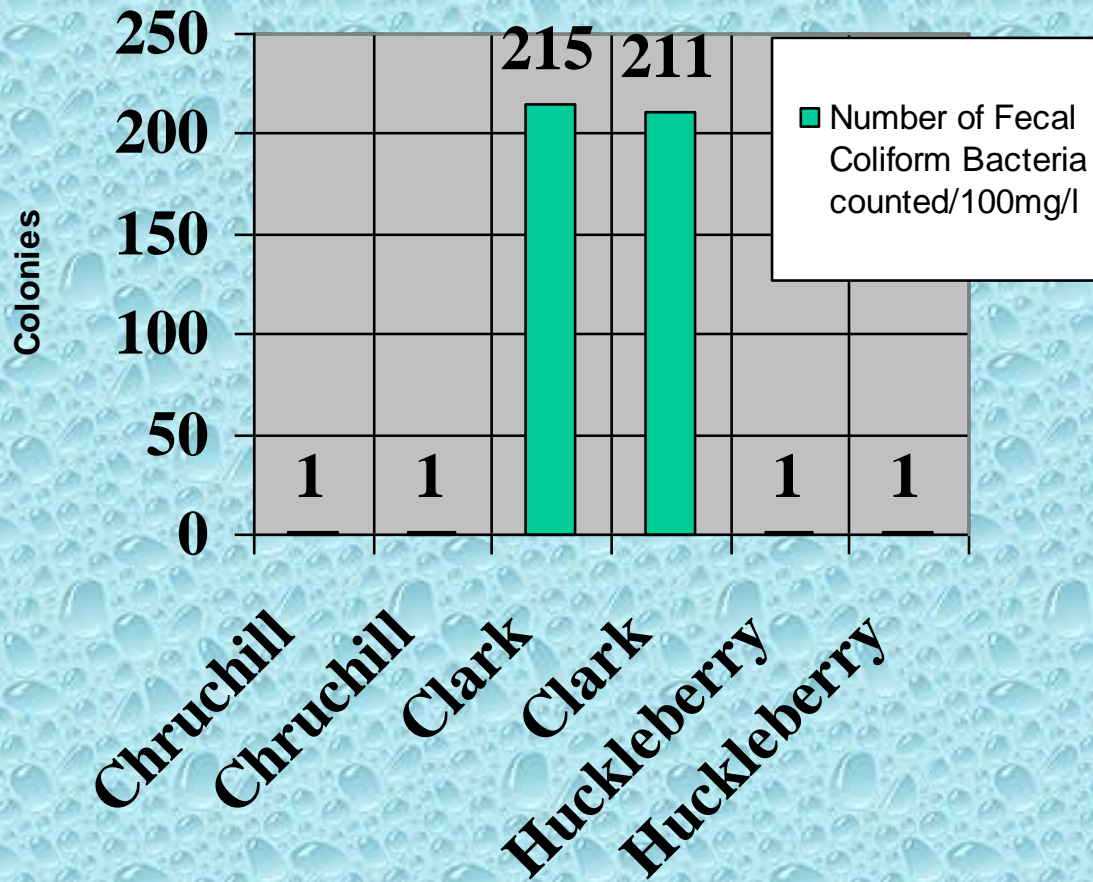
**C:** Glass breaker

**D:** Syringes

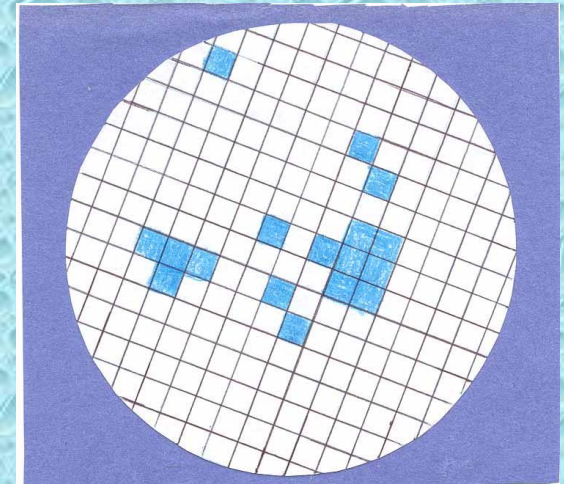
**E**

# Results For Fecals

Fecal Coliform Analysis 4/18/01



- ~ Drinking water must contain no colonies
- ~ Swimming or Recreation can contain up to 200 colonies
- ~ Boating or Fishing can contain up to 1000 colonies

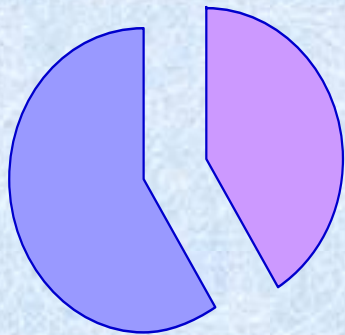




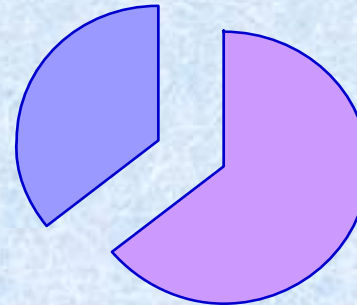
# Occupancy Characteristics

## Clark Shores

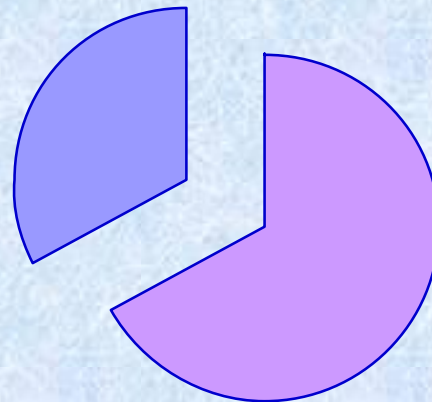
1977



1988



2000



# **Conclusion:**

**Overall parameter levels are consistent with normal values**

**No evidence of spring turnover**

**Very high nitrate and fecal coliform counts in the Clark Shores area.**

**Special thanks to: Kim McCoy, Dr. Curry and Bridgewater State College. And also the Lakeville Fire Department.**