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### The Runnins Report

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## **Objectives of Study**

- **To collect preliminary data for further studies of the Runnins River and Burr's Pond in Seekonk**
- **To evaluate various methods of analyzing watershed health for application in different classroom contexts**
- **To expand the existing ecological studies**
- **To determine a comprehensive, hands-on, reproducible field experience that is feasible for students to accomplish**

## Location Map



Burr's Pond located in South Central Seekonk. Site A is downstream of the pond. There is a dam/waterfall. There is a pipe which discharges into the river ( storm drains?). 1998 list of impaired waters for DO, nutrients, pathogens. Class B waterway. The pond is on the EPA list of impaired waters for Mercury contam.



## Burr's Pond Dam, Site A



## Runnins River, Site B



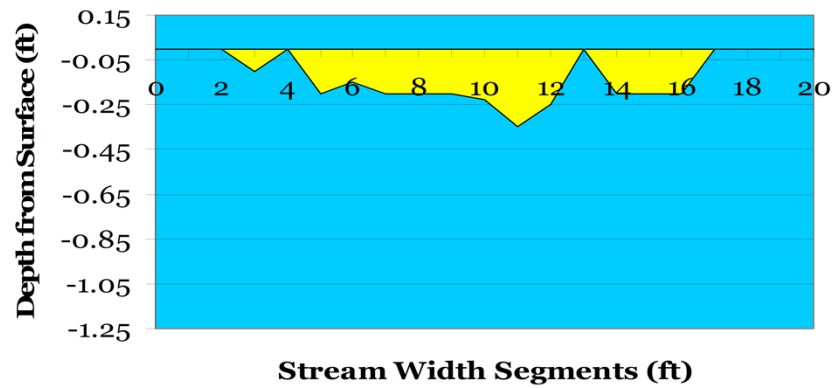
Note how still the water is. In the background can see the roadway going over the river. Just upstream is Grist Mill Pond & Golf Course.

## Measuring Depth & Flow



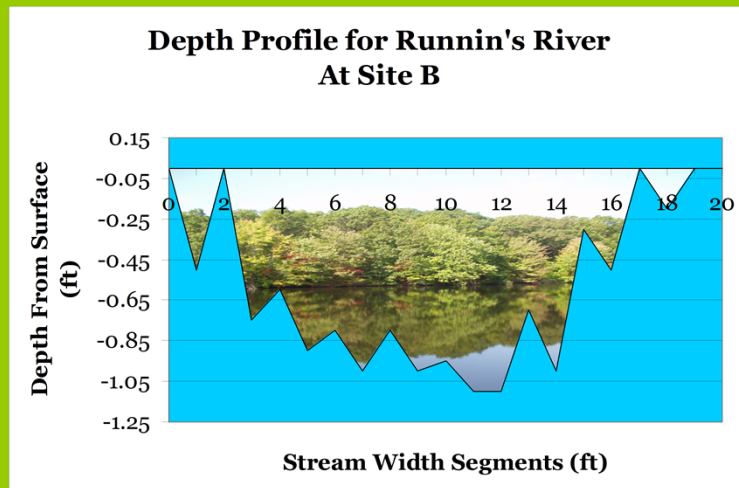
## Site A Depth Profile

**Depth Profile of Site A on Runnin's River**



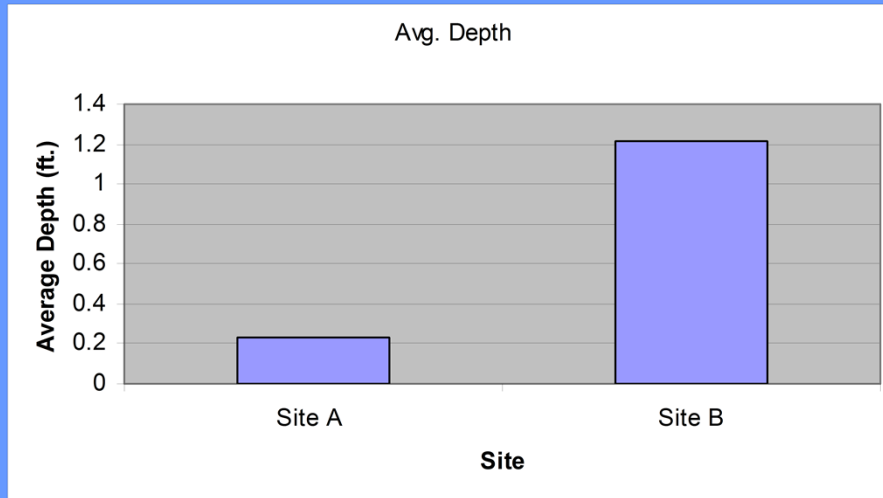
max 3 ft. depth

## Site B Depth Profile



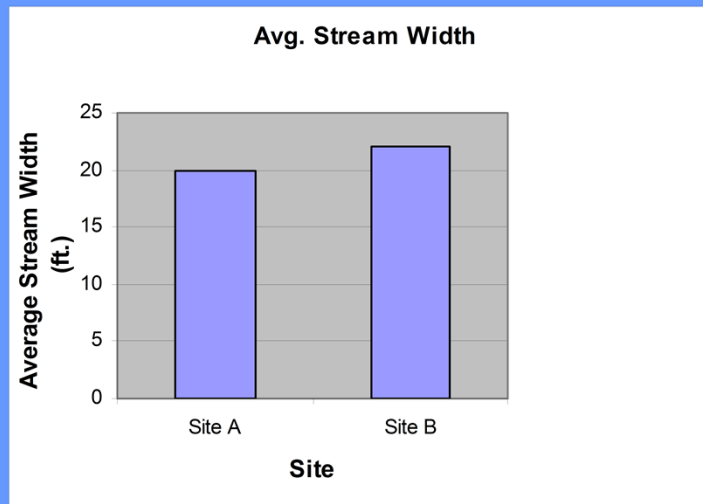
Site B is deeper. max 1.1 ft deep

## Comparison of Average Depth of Runnins River at Sites A & B, October



Avg Depth of site B is much greater

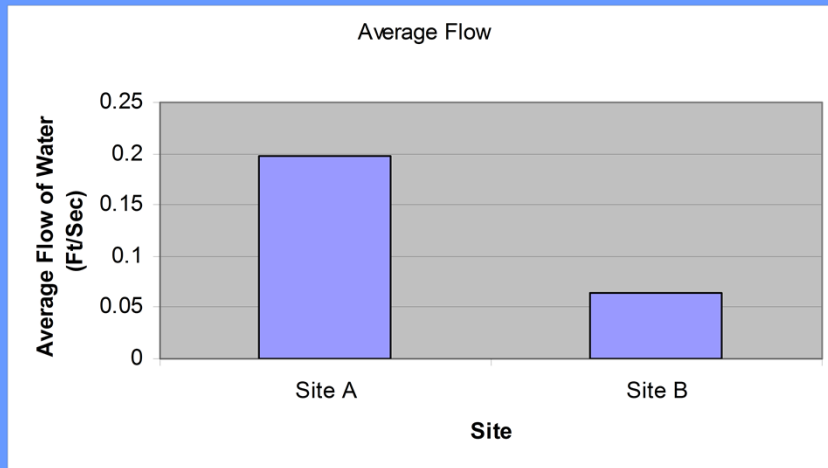
## Comparison of Average Width of Runnins River at Sites A & B, October



Average stream width is comparable for both sites.

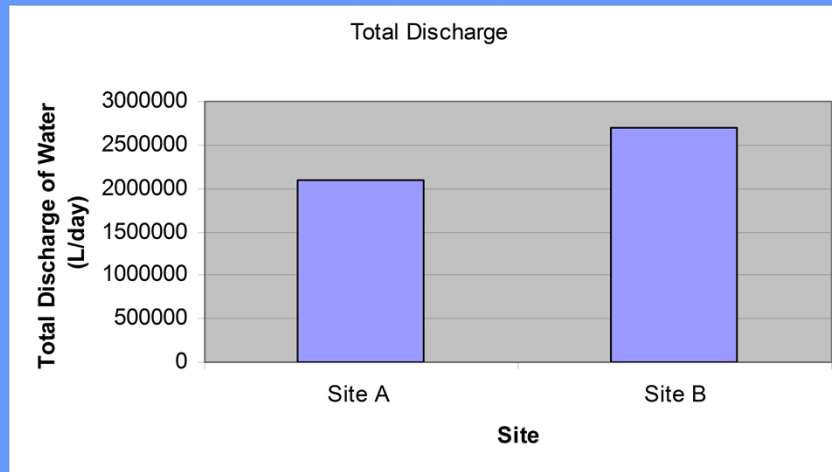


## Comparison of Average Flow of Runnins River at Sites A & B, October

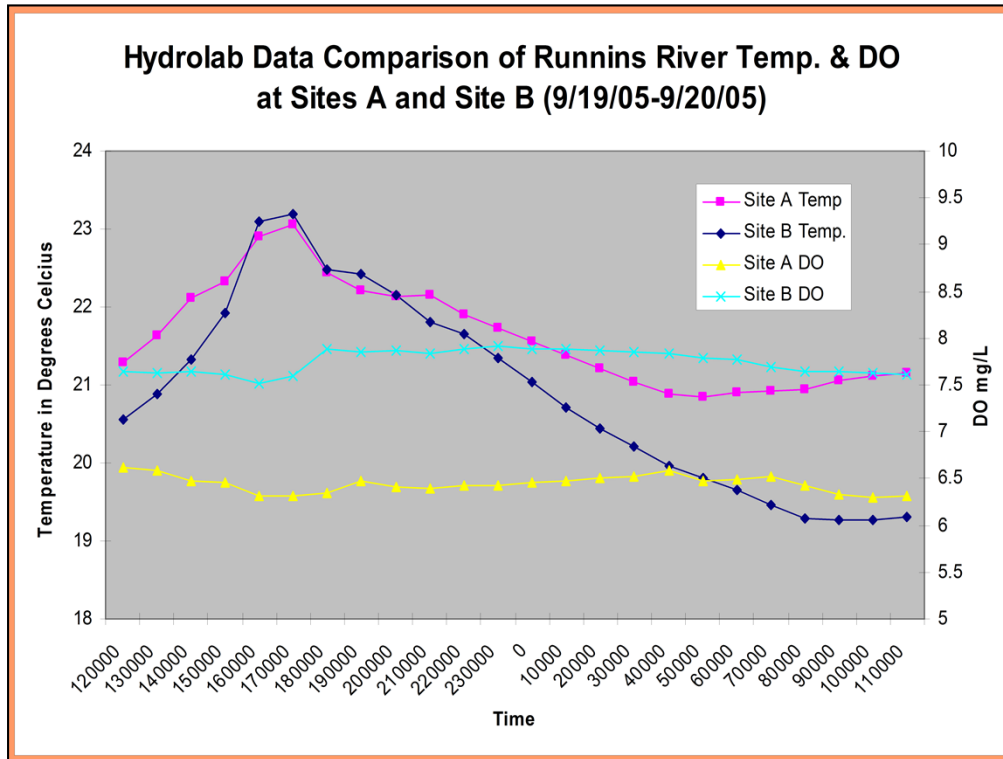


Average flow is approximately 4 times greater at site A.

## Comparison of Total Discharge of Runnins River at Sites A & B, October

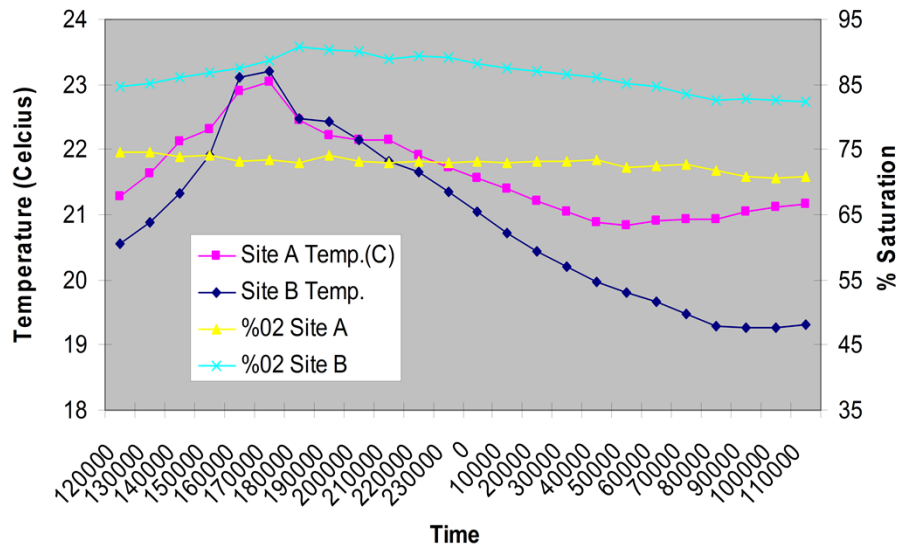


Total discharge differs by about 50,000 L per day.

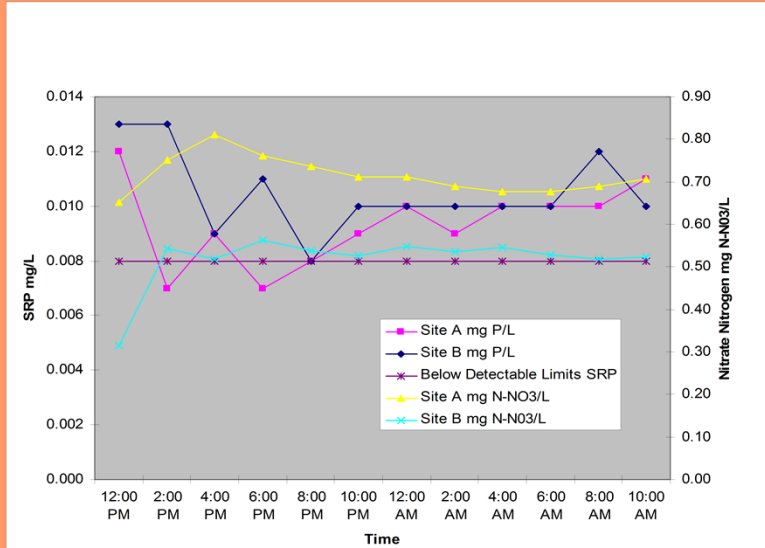


Greater DO at site B, more aquatic plant life & less canopy overhead. However, DO doesn't seem to vary with time of day. Greater loss of temp at site B at night due to depth?

### Hydrolab Comparison of Runnins River %O2 Saturation at Site A and Site B (9/19/05-9/20/05)



## Lachat Data Comparison for Runnins River SRP & Nitrate Nitrogen at Site A & Site B (9/19/05-9/20/05)



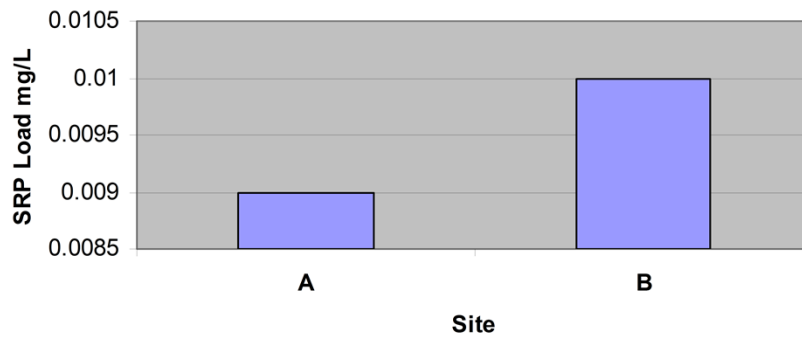
Both sites are below the concentrations considered to be polluted. For the most part, they are however above detectable limits.

## Nitrate Nitrogen Load Comparison for Runnins River at Site A and Site B (9/19/05- 9/20/05)



Load comparison is based on total nitrate due to flow/discharge per day. The concentrations of nitrate plus nitrogen at the three stations ranged from 0.048 to 1.108 mg/L with a mean of 0.77 mg/L (n=11). (RIDEM 1999)

## SRP Load Comparison for Runnins River at Site A and Site B (9/19/05-9/20/05)

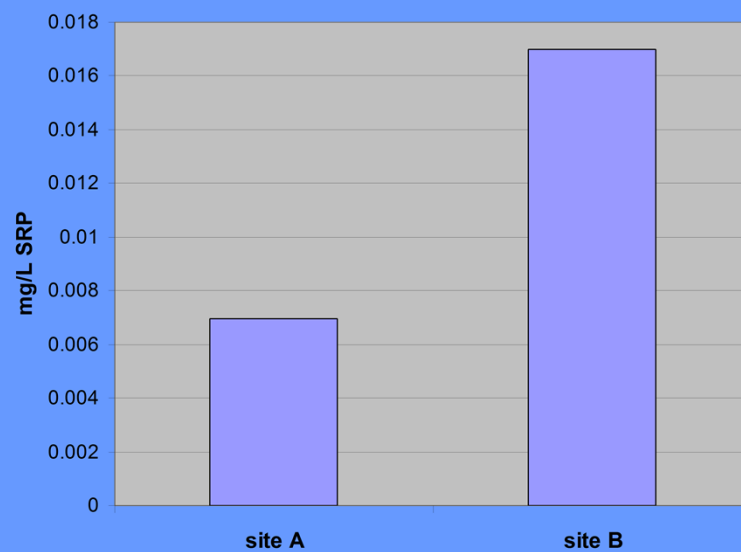




## SRP Field Sample Analysis



## Phosphorous Field Sample Analysis, SRP Method 8048, October 4, 2005



Hach 890 results were not reportable: Absorbance readings were .06 for site A & 0 for site B

## Macroinvertebrate Sampling



Organisms were collected at both sites and preserved(1 site per day). 2 fast current & 2 slow current sites were selected for each site.

## Counting & Identifying Organisms



After collecting the organisms, we spent days identifying & counting organisms from both sites.

## Comparison of Macroinvertebrate Composition of Runnins River

Major Group	% composition, Site A	% composition, Site B
Ephemeroptera	0	0
Plecoptera	0	0
Trichoptera	15.6	11
Diptera:Chironomidae	2.1	19
Diptera:Other	0	0
Odonata	0.7	5
Megaloptera	0	0
Coleoptera	57	41
Hemiptera	0	0
Amphipoda	7.8	15
Isopoda	5.7	2
Decapoda	0	0
Gastropoda	0.7	2
Pelecypoda	0.7	0
Oligochaeta	2.8	0
Hirudinea	1.4	1
Tubellaria	5	0

## Comparison of MGBI for Runnins River at Sites A & B

Site	MGBI	Interpretation
A	4.64	Moderate impairment
B	5.59	Moderate impairment

Rough estimate of pollution tolerance of the community.

## Examples of Macroinvertebrates Found in the Runnins River





## Examples of Macroinvertebrates Found in the Runnins River

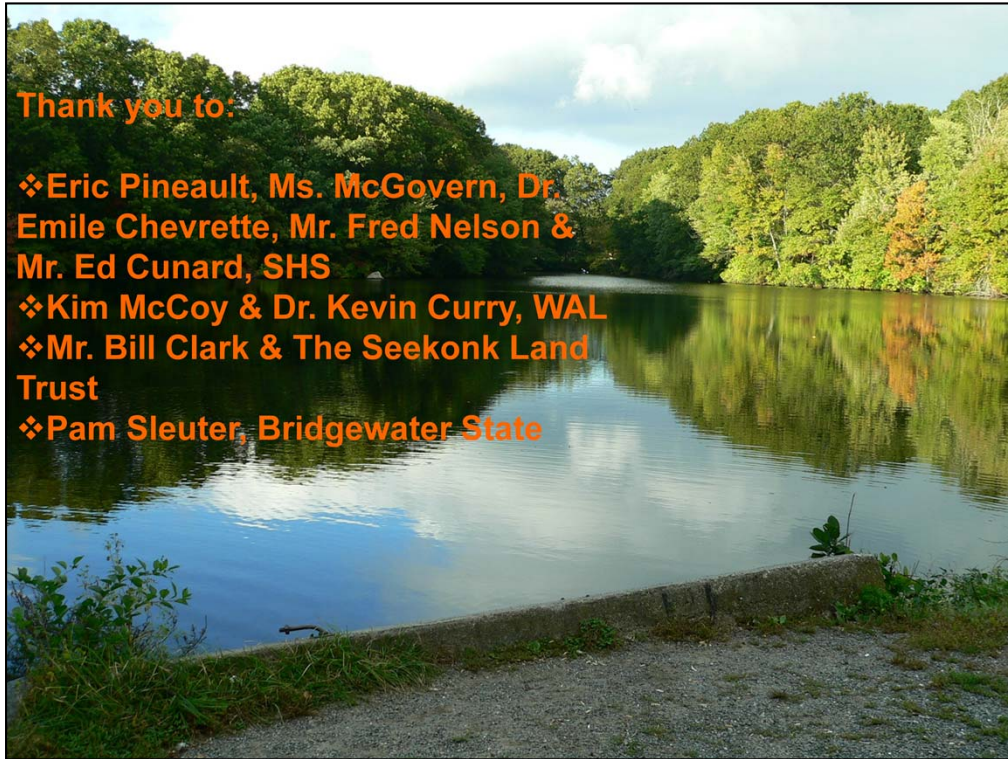


## Outcomes of Study

- ✓ AP Biology Students should be able to successfully collect & analyze Hydrolab Data as part of Summer Research Study
- ✓ General Biology Students may be able to measure flow, etc. and take water samples for 1 site during 1 class period
- ✓ General Biology Students may be able to collect macroinvertebrate samples at 1 site during 1 class period

## Outcomes of Study

- ✓ General Biology Students could identify & count macroinvertebrates (would enjoy!)
- ✓ Numerous classes (AP Biology, Honors & General Biology, Environmental & Marine Science) could collaborate to compile a profile of the Runnins River at numerous sites



Thank you to:

- ❖ Eric Pineault, Ms. McGovern, Dr. Emile Chevrette, Mr. Fred Nelson & Mr. Ed Cunard, SHS
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- ❖ Mr. Bill Clark & The Seekonk Land Trust
- ❖ Pam Sleuter, Bridgewater State