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The Ten Mile River Study

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North Attleborough High School, North Attleborough, Massachusetts (2005). *The Ten Mile River Study*. In Watershed Access Lab Projects. Project 25.
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The Ten Mile River Study

North Attleboro High School

North Attleboro, MA



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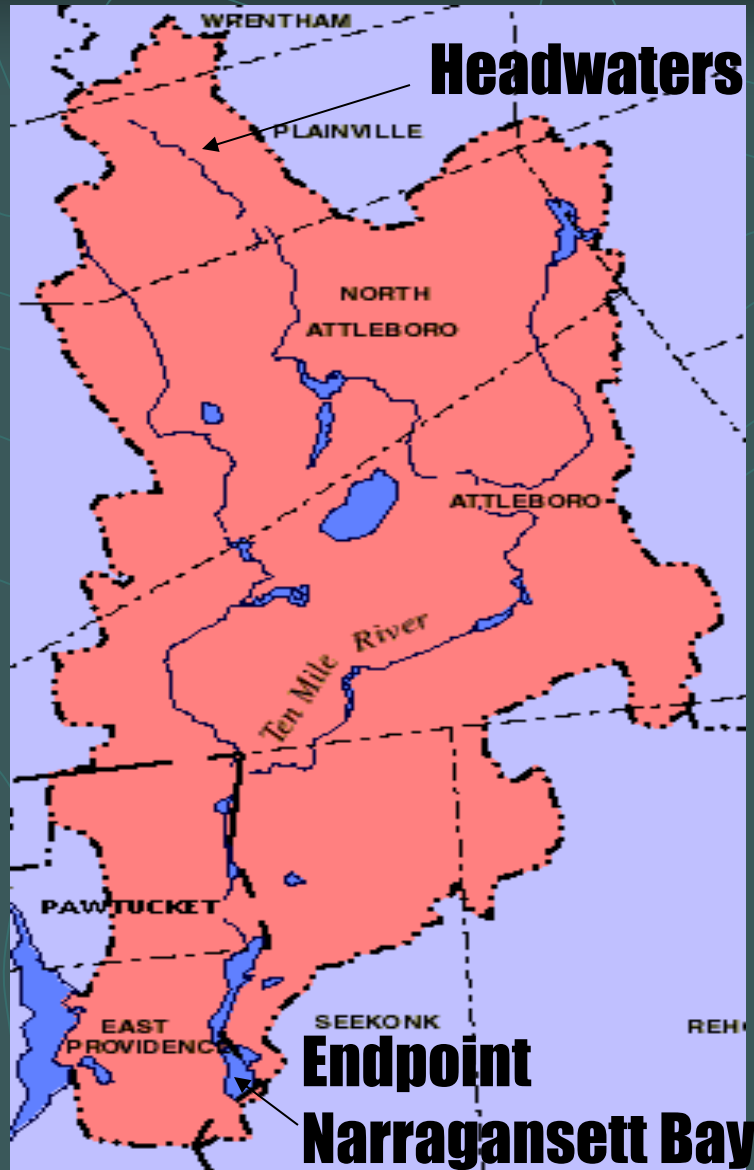
Robyn Gimler

**** PowerPoint Editor**

A vertical strip on the left side of the slide shows a topographic map of the Ten Mile River area. It features contour lines, a river channel, and some infrastructure like roads and bridges.

Purpose of the Study

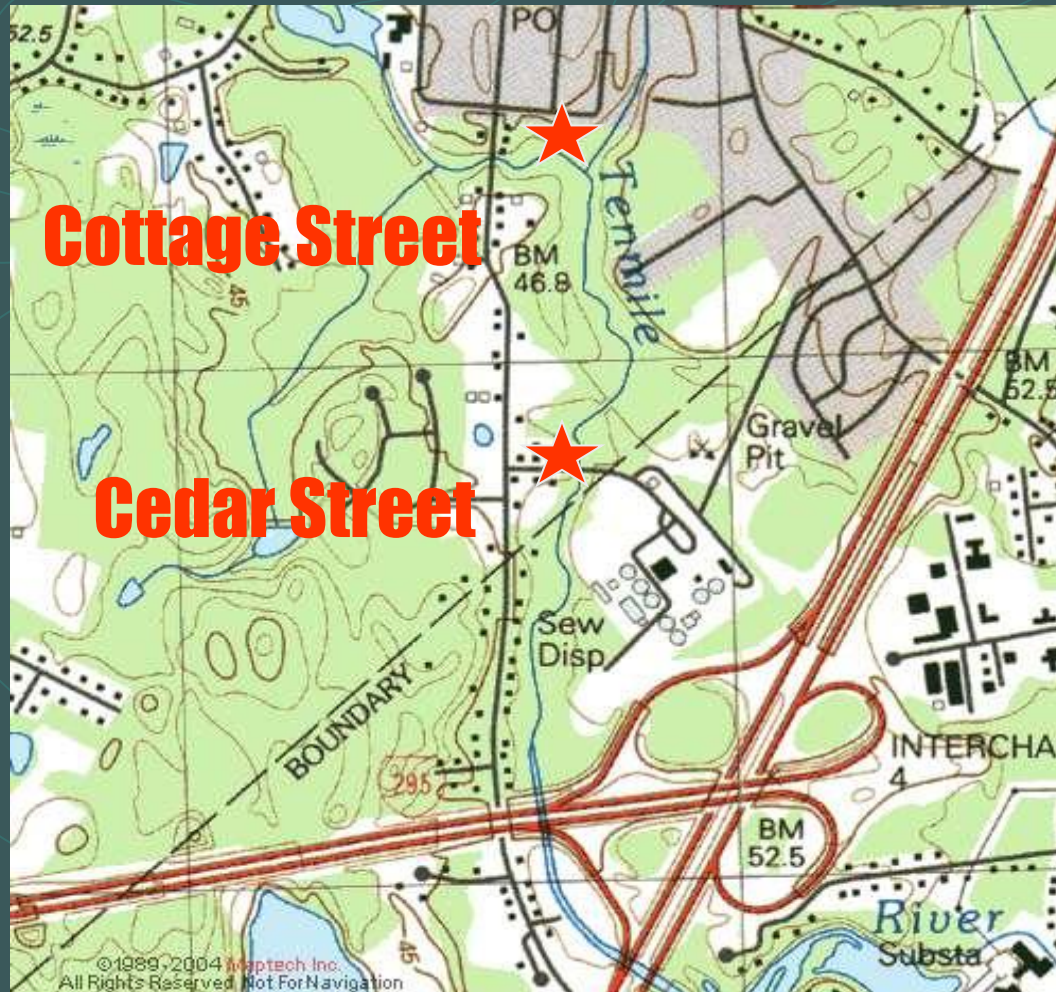
This study was done to test the Ten Mile River. A series of chemical, physical, and biological tests were performed at two different sites along the river to see if the Ten Mile River fits the Class B Warm Water Standards as set forth by the State of Massachusetts.



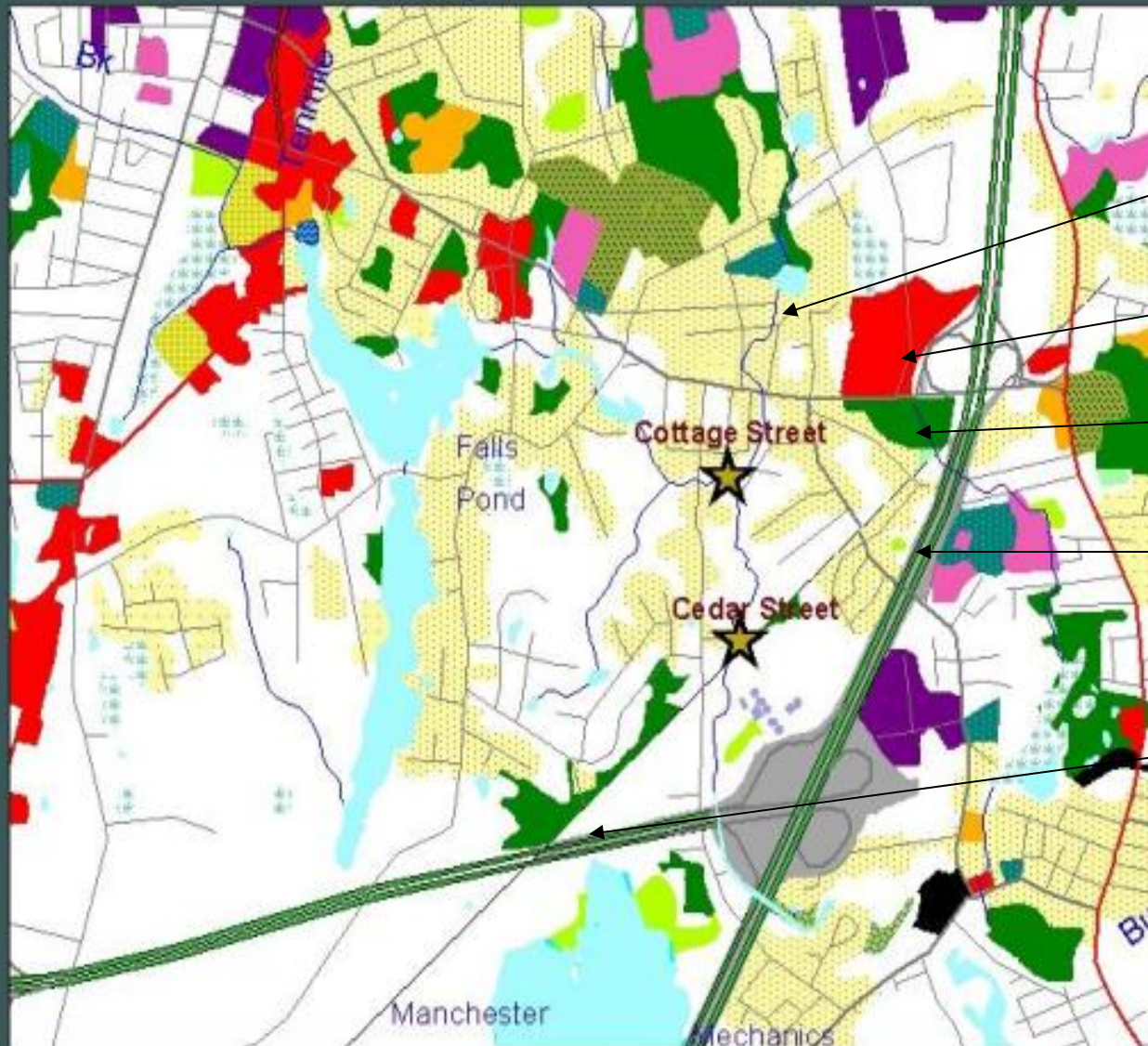
Ten Mile River Watershed



Sites of Cedar St. & Cottage St. 10/20/04 – 10/21/04



GIS Mapping of the Test Sites



High Density
Residential

Commercial

Forest

Route 95
Highway

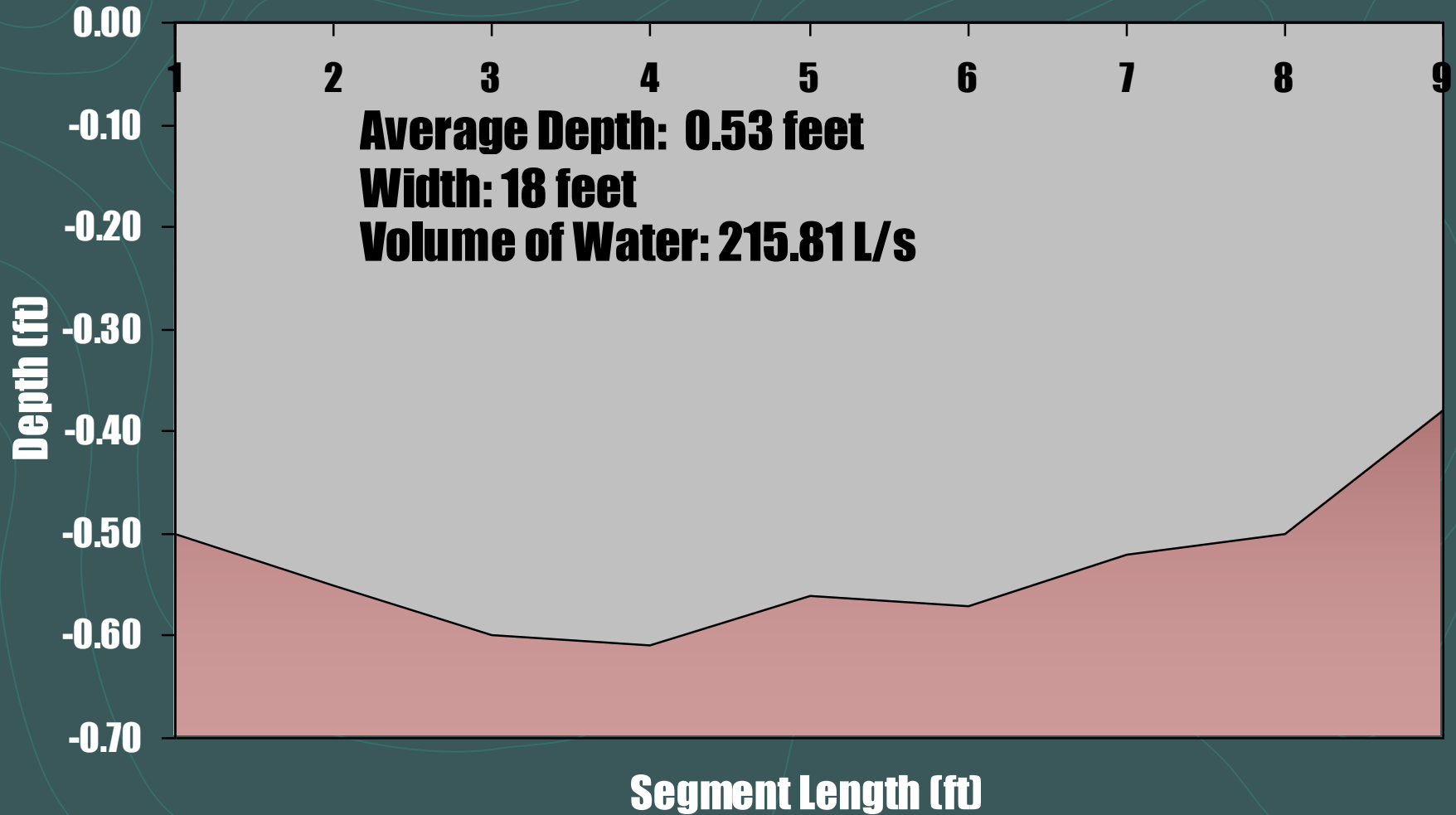
Route 295
Highway



0.7 0 0.7 1.4 Miles

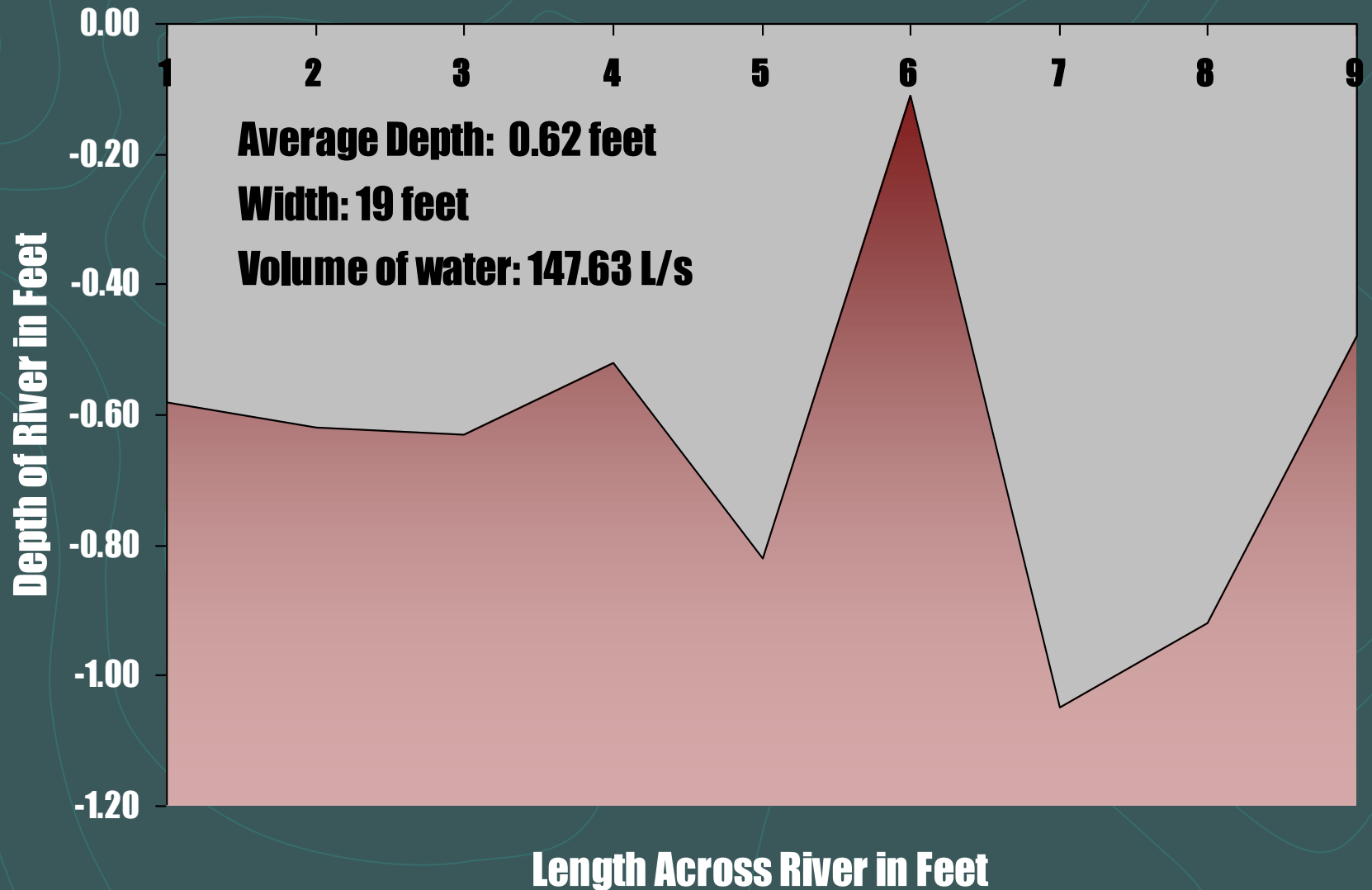
Cottage Street Stream Profile

10/20/04

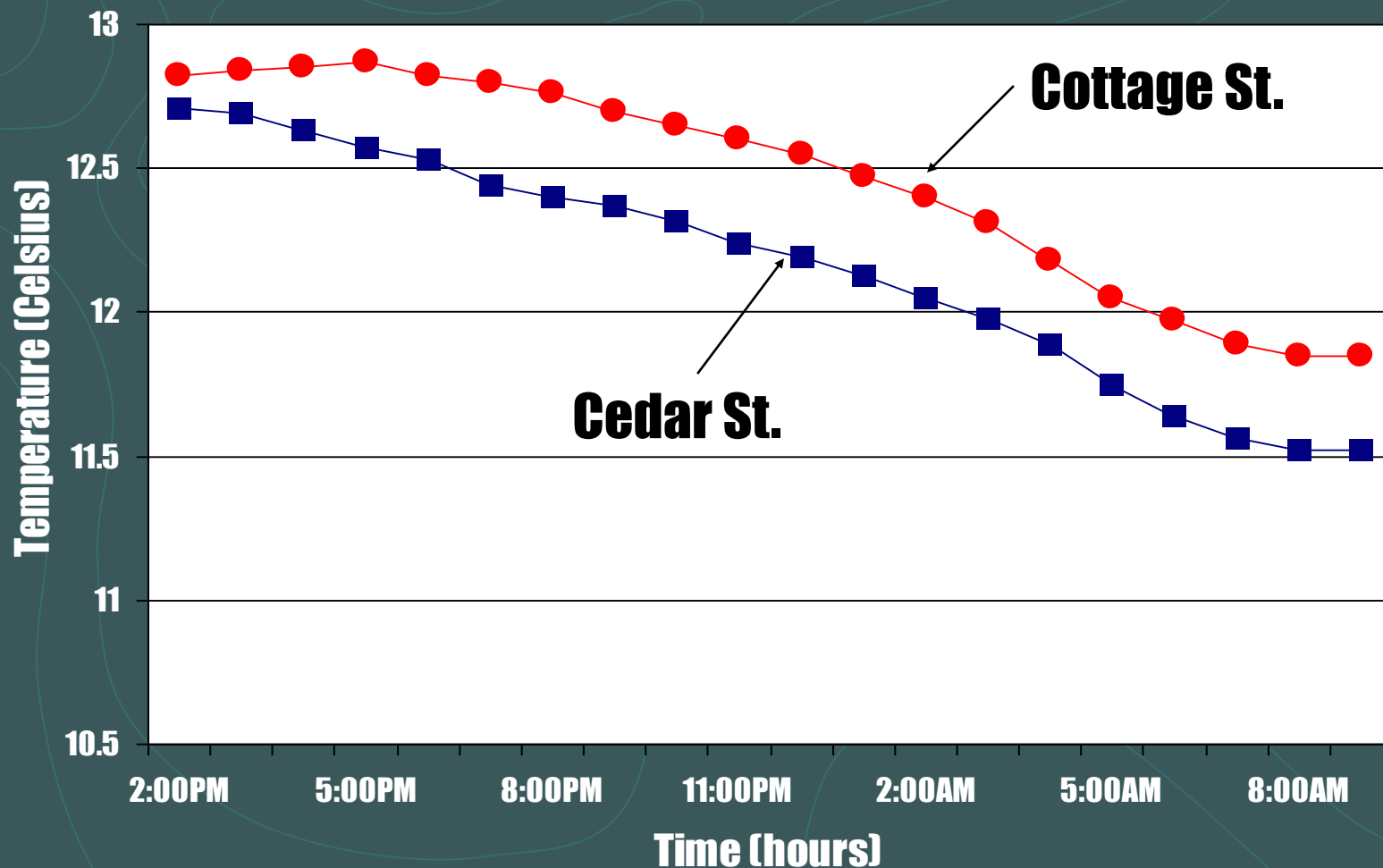


Cedar Street Stream Profile

10/20/04



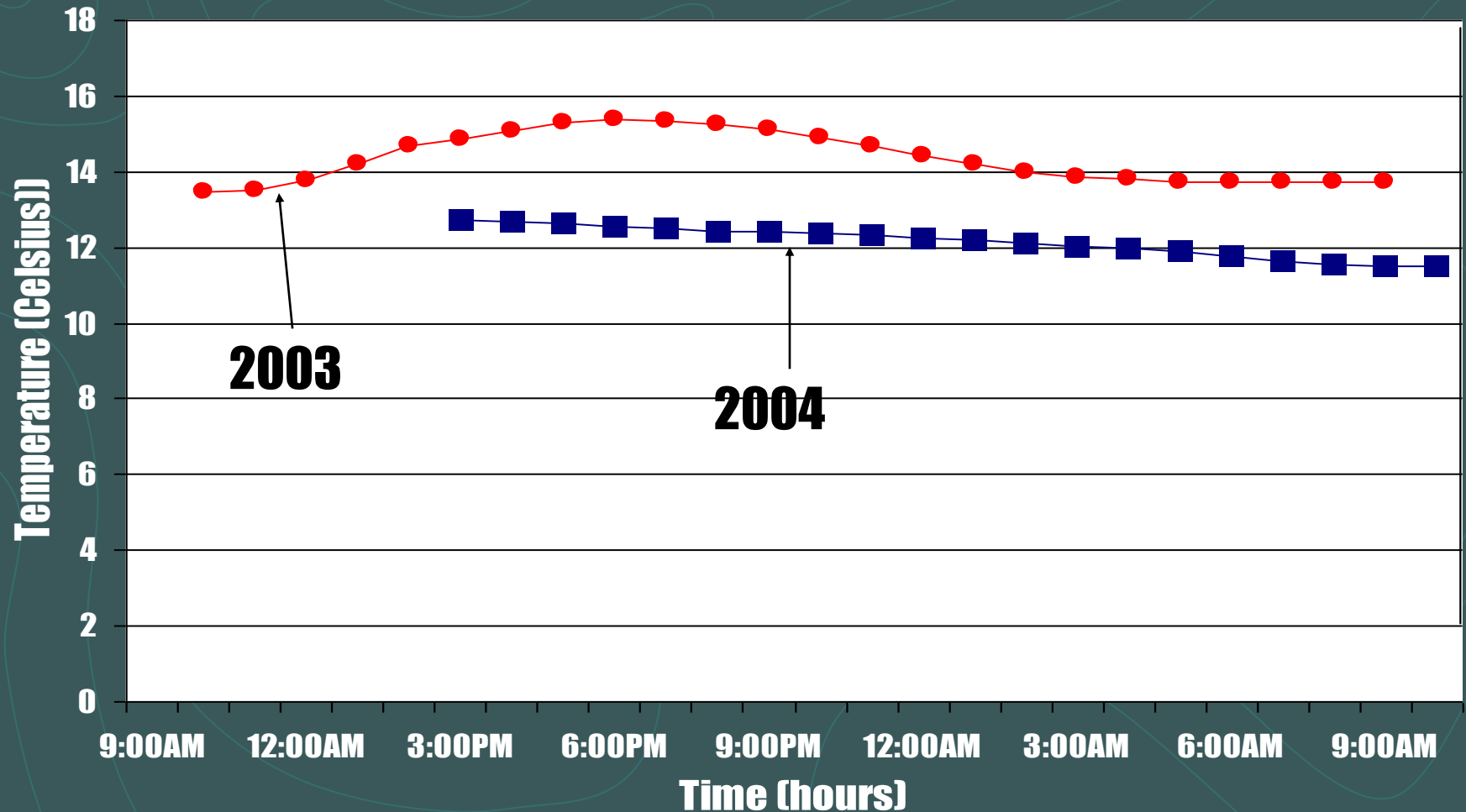
Comparison of Temperature Cottage St. and Cedar St. 10/20/04-10/21/04



***MA Class B Standards state that the temperature shall not exceed 28.3°C**

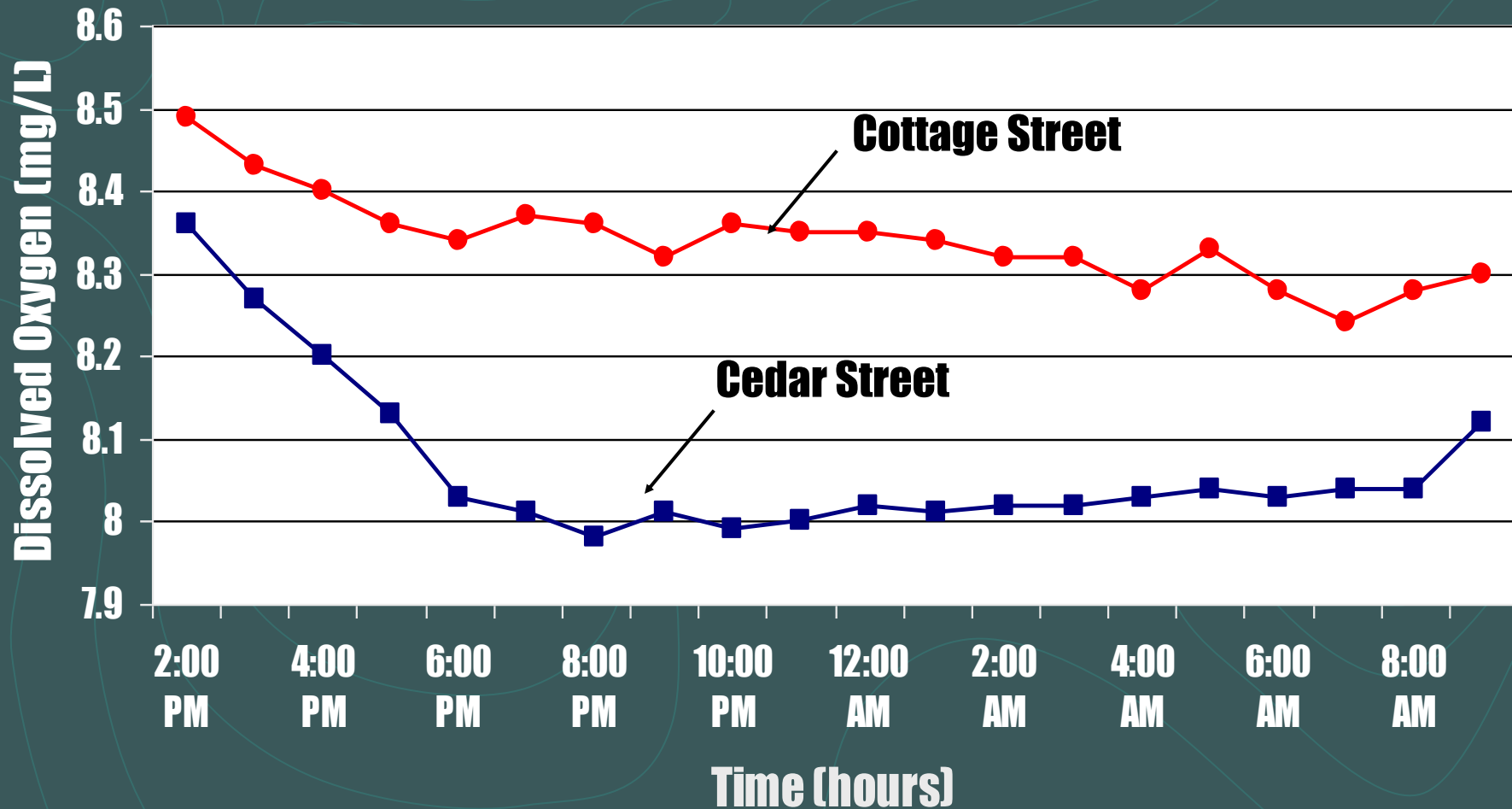
Comparison of Temperature Cedar St.

10/9/03-10/10/03 and 10/20/04-10/21/04



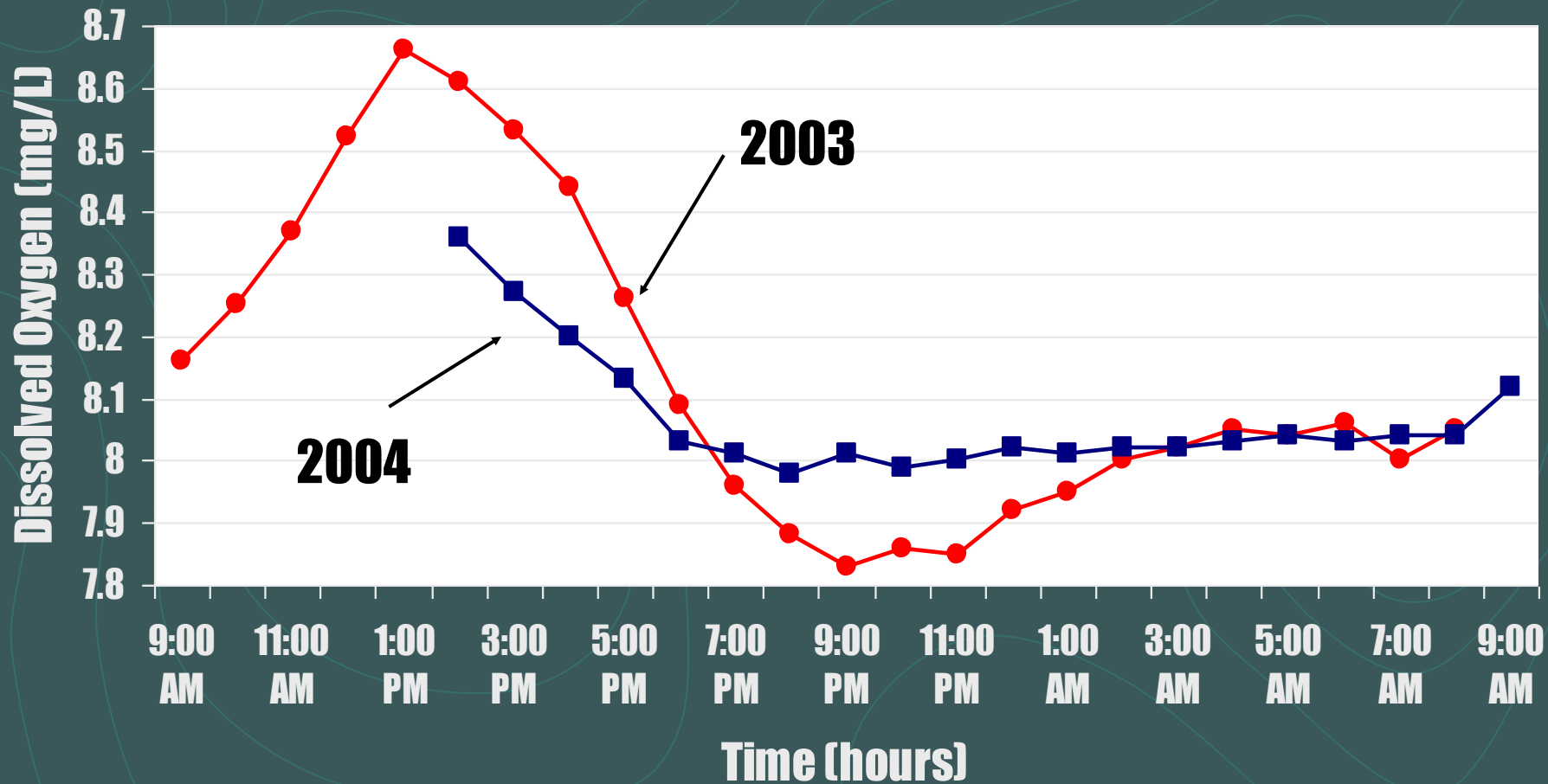
***MA Class B Standards state that the temperature shall not exceed 28.3°C**

Comparison of Dissolved Oxygen Cottage St. and Cedar St. 10/20/04 - 10/21/04



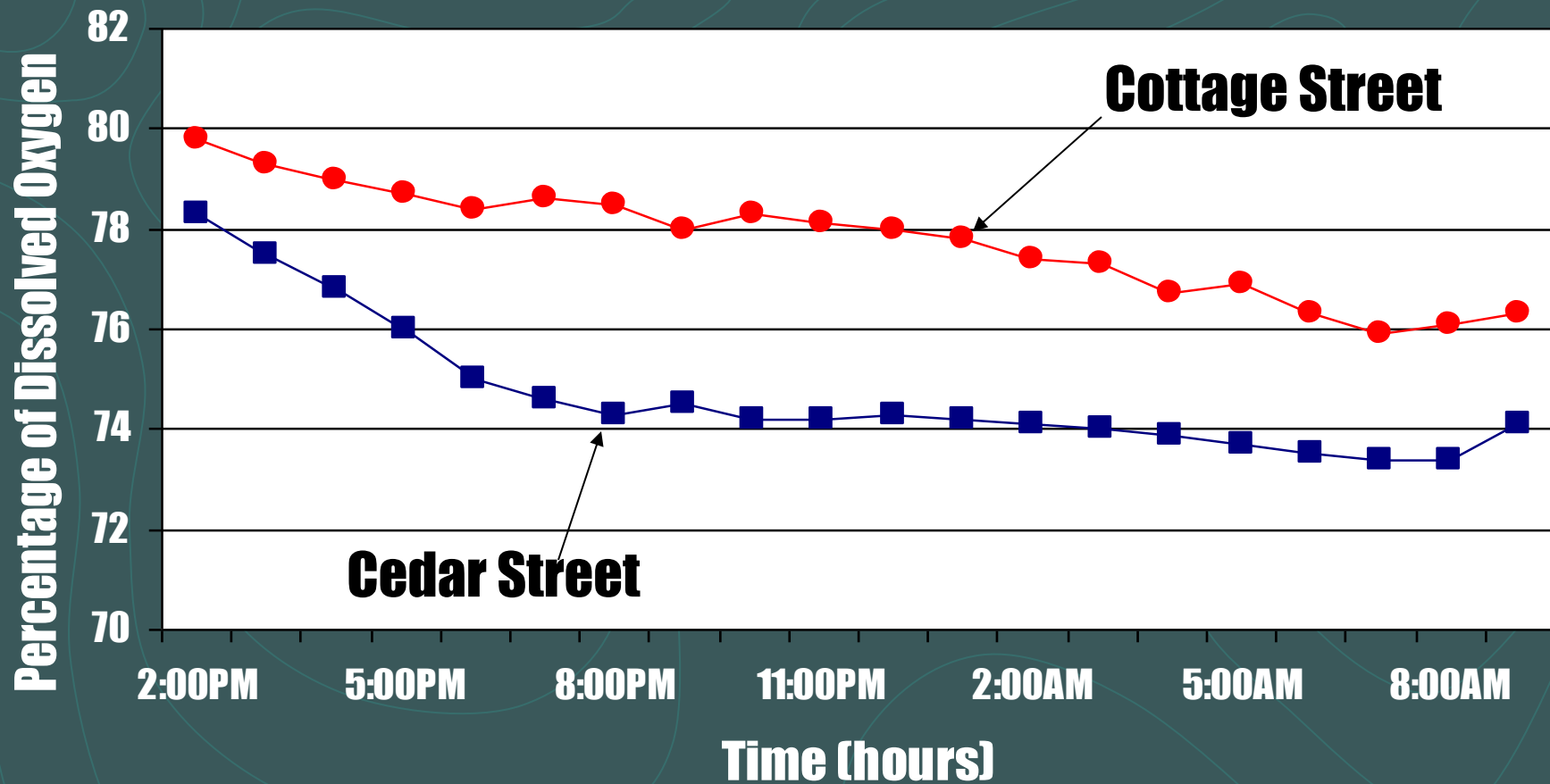
***MA Class B Standards require Dissolved Oxygen to be 5.0 mg/L or higher**

Comparison of Dissolved Oxygen Cedar St. 10/9/03 - 10/10/03 and 10/20/04 - 10/21/04



***MA Class B Standards require Dissolved Oxygen to be 5.0 mg/L or higher**

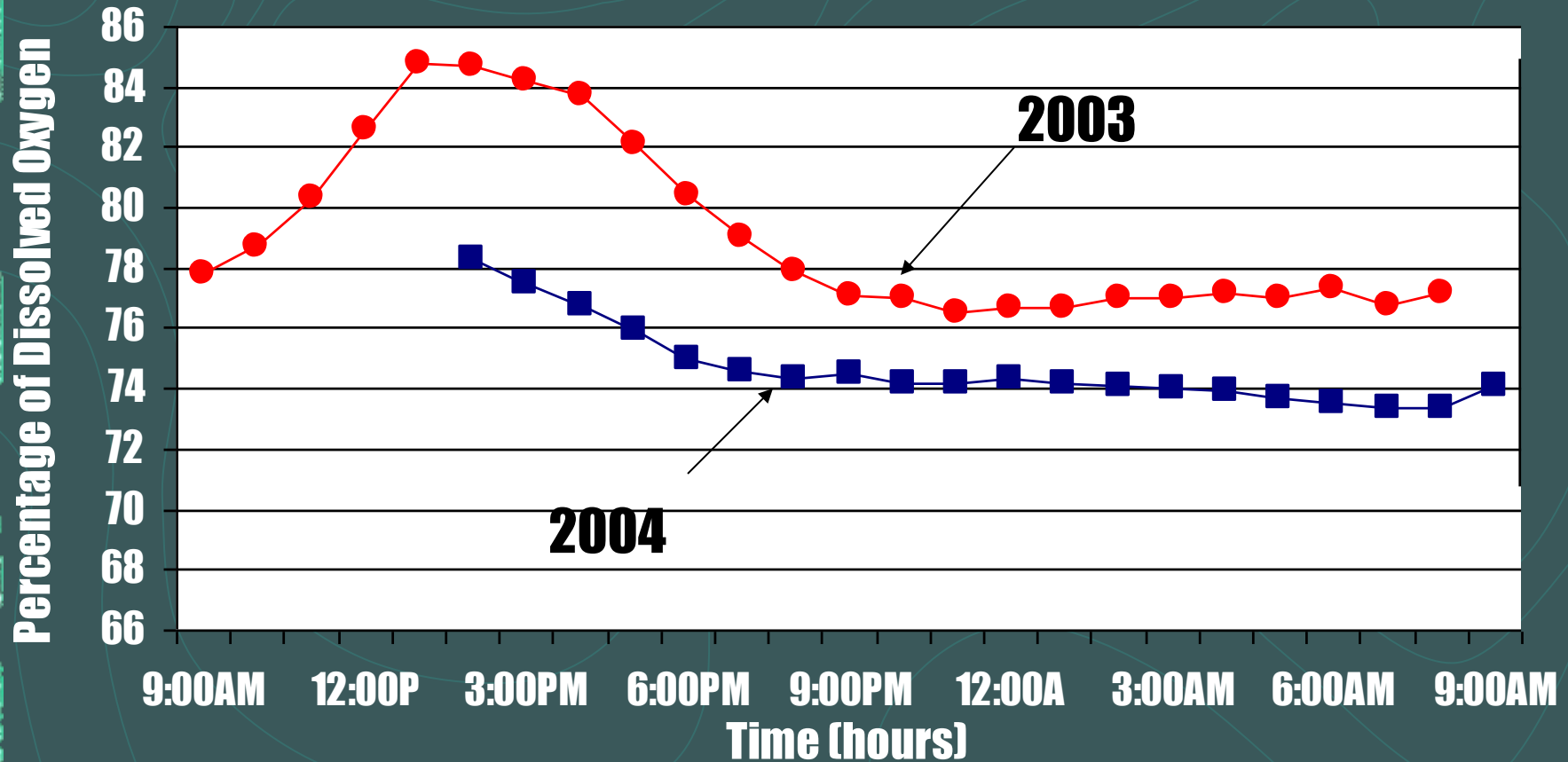
Comparison of the Percentage of Dissolved Oxygen Cottage St. and Cedar St. 10/20/04 – 10/21/04



***MA Class B Standards state that the percentage of Dissolved Oxygen should not be lower than 60%.**

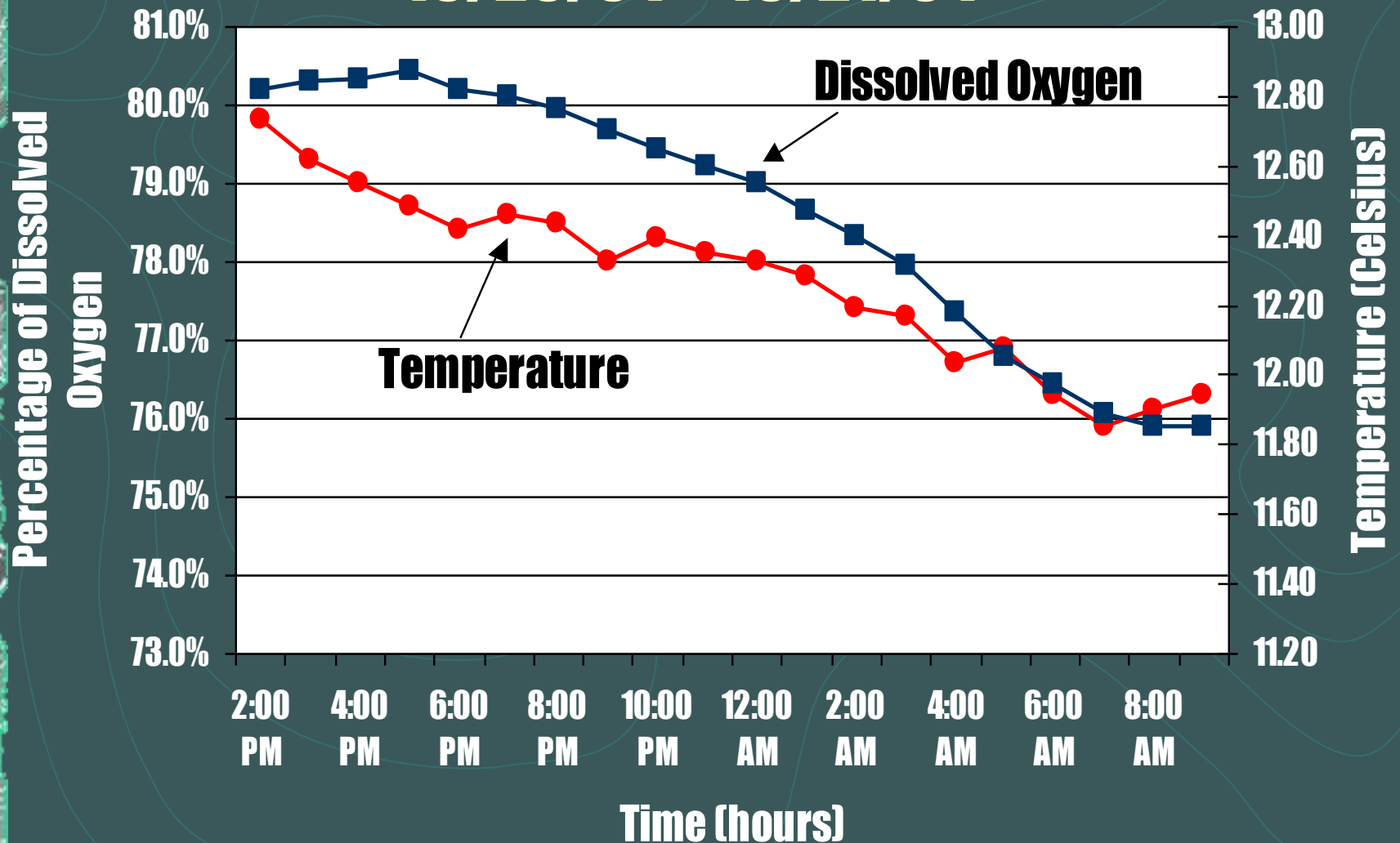
Comparison of the Percentage of Dissolved Oxygen Cedar St.

10/9/03 – 10/10/03 and 10/20/04 – 10/21/04

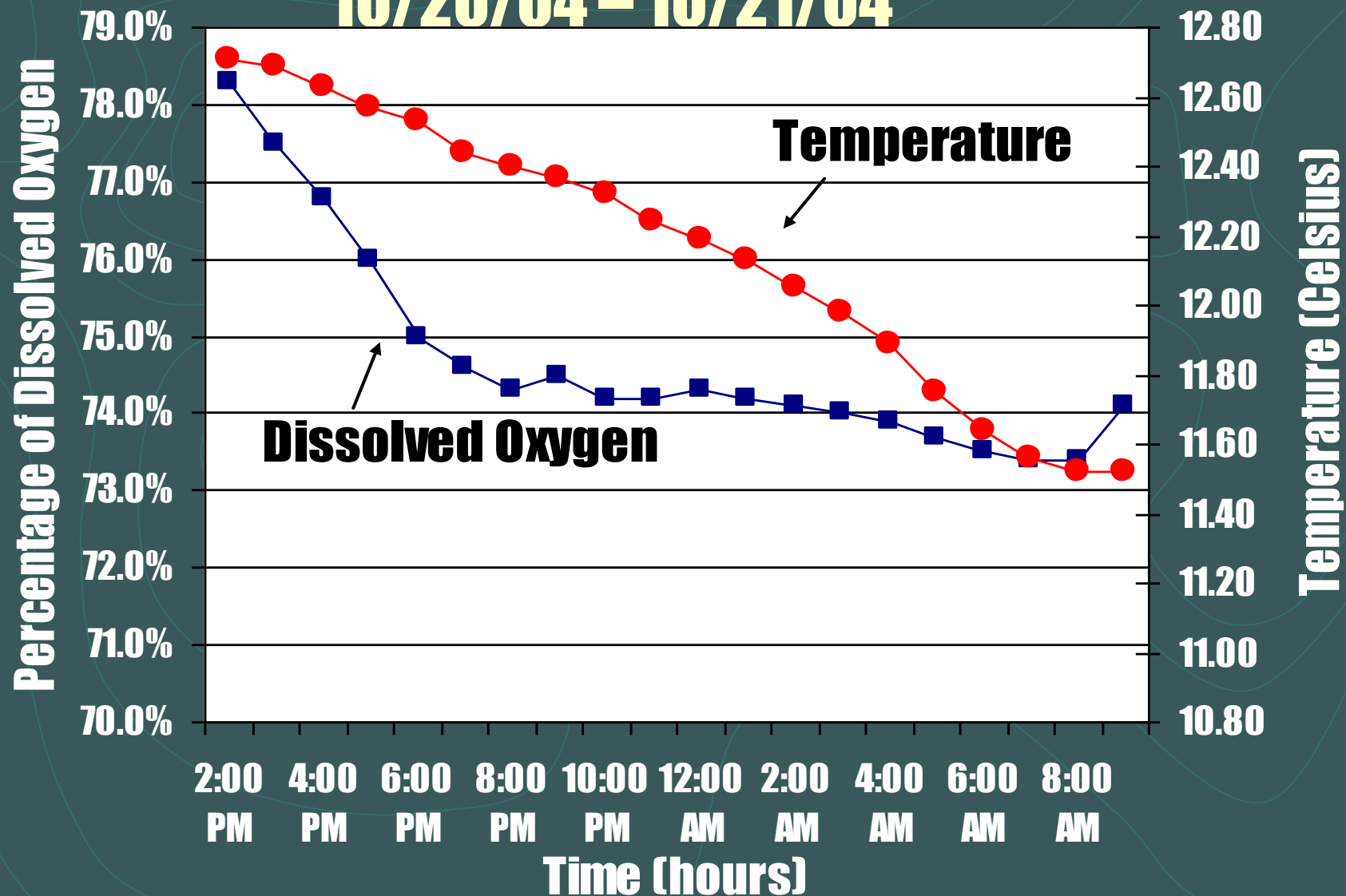


*MA Class B Standards state that the percentage of Dissolved Oxygen should not be lower than 60%.

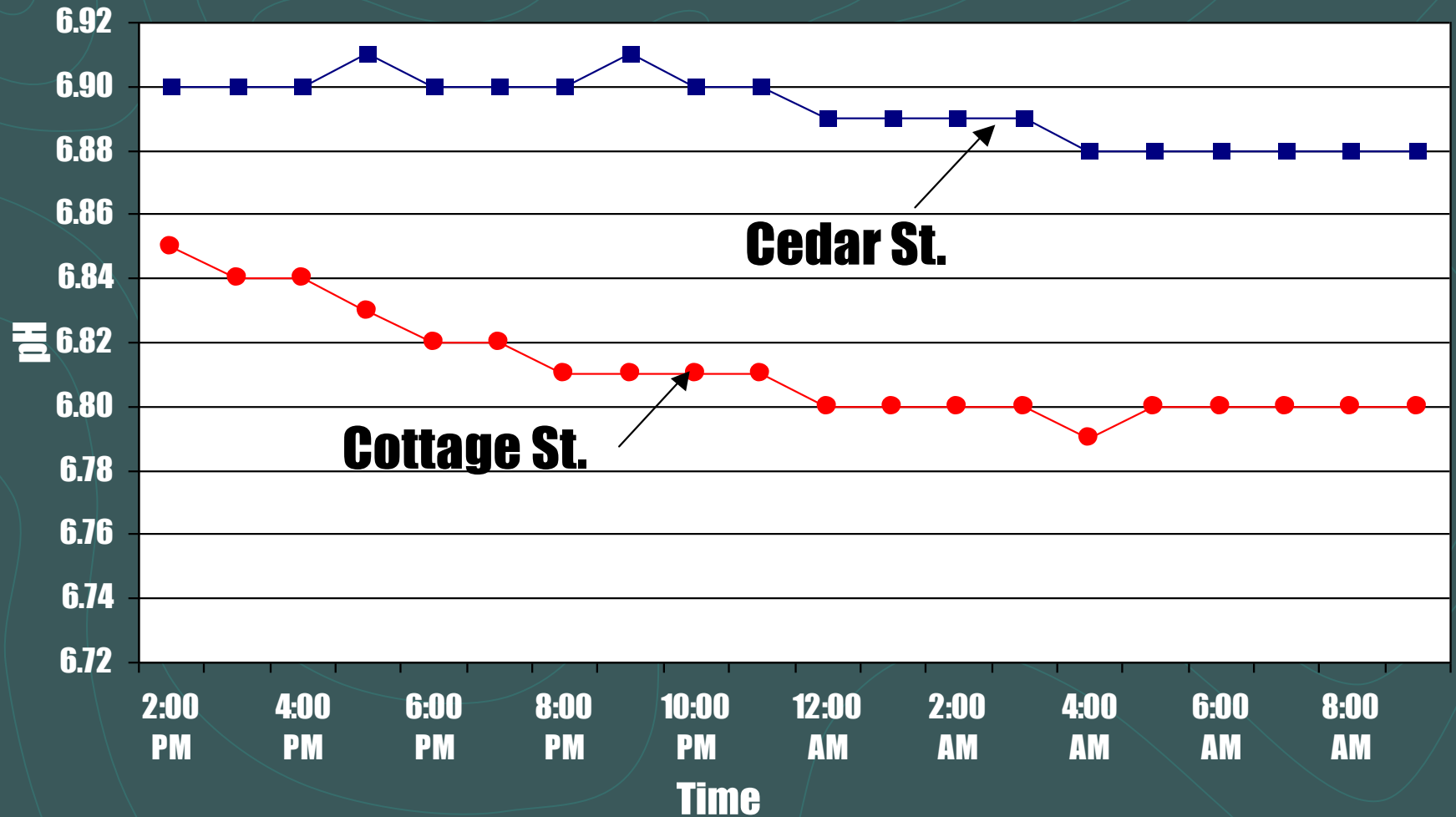
Comparison of Temperature and Percentage of Dissolved Oxygen at Cottage Street 10/20/04 – 10/21/04



Comparison of Temperature and Percentage of Dissolved Oxygen at Cedar Street 10/20/04 – 10/21/04

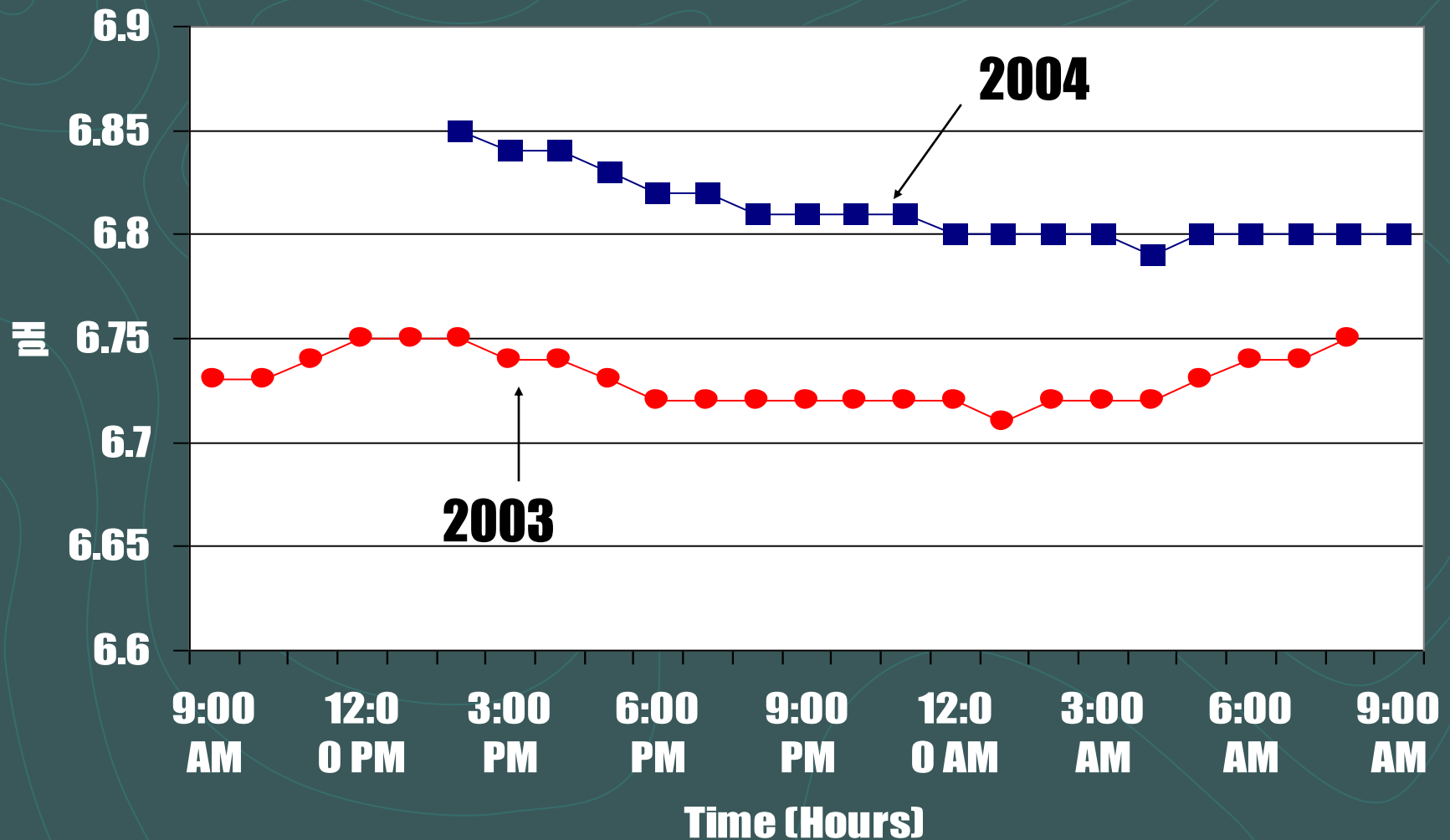


Comparison of pH Cedar St. and Cottage St 10/20/04 - 10/21/04




***MA Class B Standards require pH values to be between 6.5 and 8.3**

Comparison of the pH Cedar Street 10/9/03-10/10/03 and 10/20/04-10/21/04



***MA Class B Standards require pH values to be between 6.5 and 8.3**



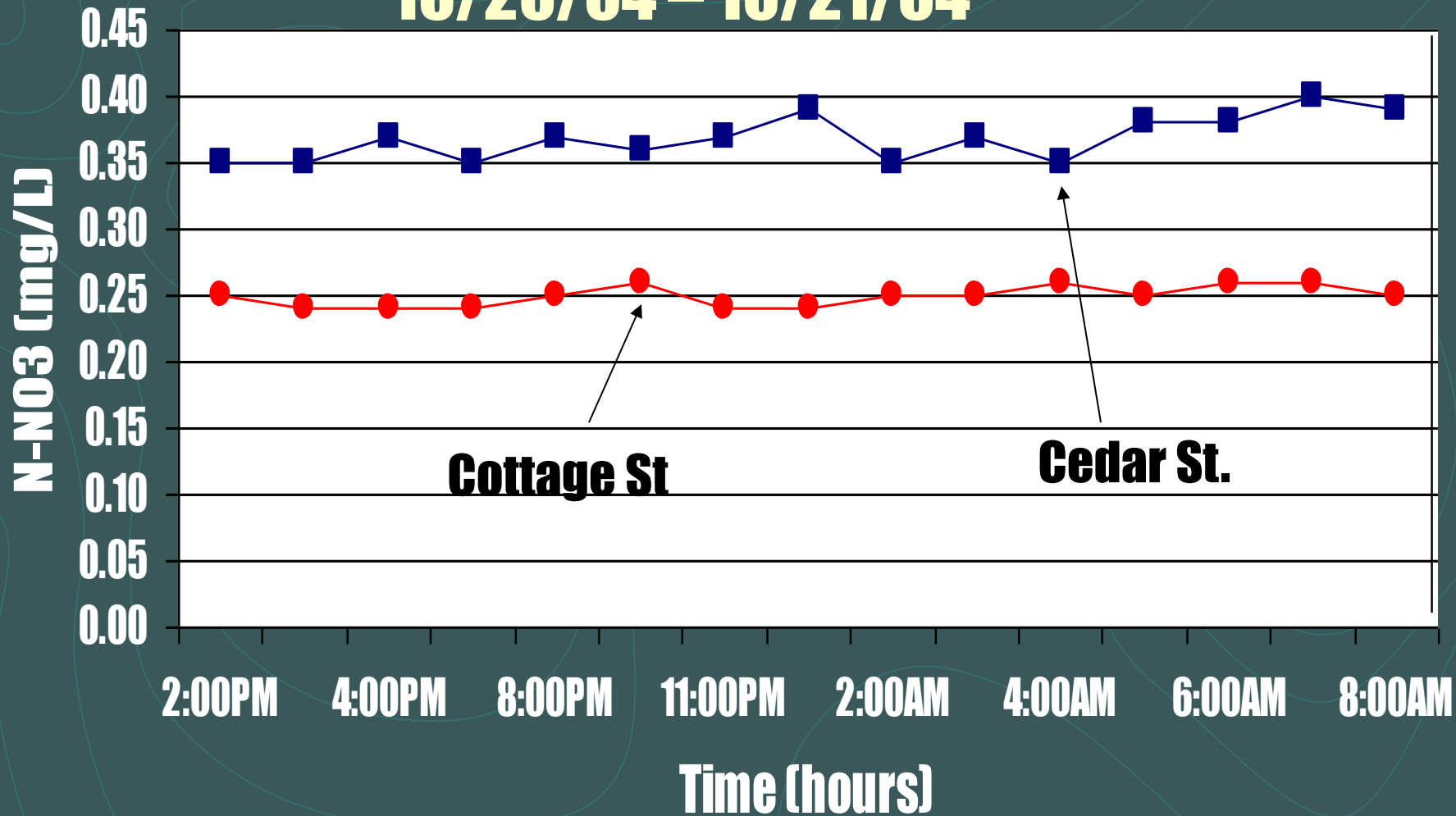
Comparison of Temperature, pH, Dissolved Oxygen, and the Percentage of Dissolved Oxygen Cottage St. and Cedar St. 10/20/04 – 10/21/04

Ten Mile River	Temperature °C		pH		Dissolved Oxygen		% Dissolved Oxygen	
	Range	Average	Range	Average	Range	Average	Range	Average
Cottage Street	11.85-12.87	12.46	6.88-6.91	6.89	8.24-8.49	8.34	5.90-79.8	77.77
Cedar Street	11.52-12.71	12.16	6.79-6.85	6.81	7.98-8.36	8.07	3.40-78.3	74.70

Nitrogen-Nitrate Comparison

Cottage St. and Cedar St.

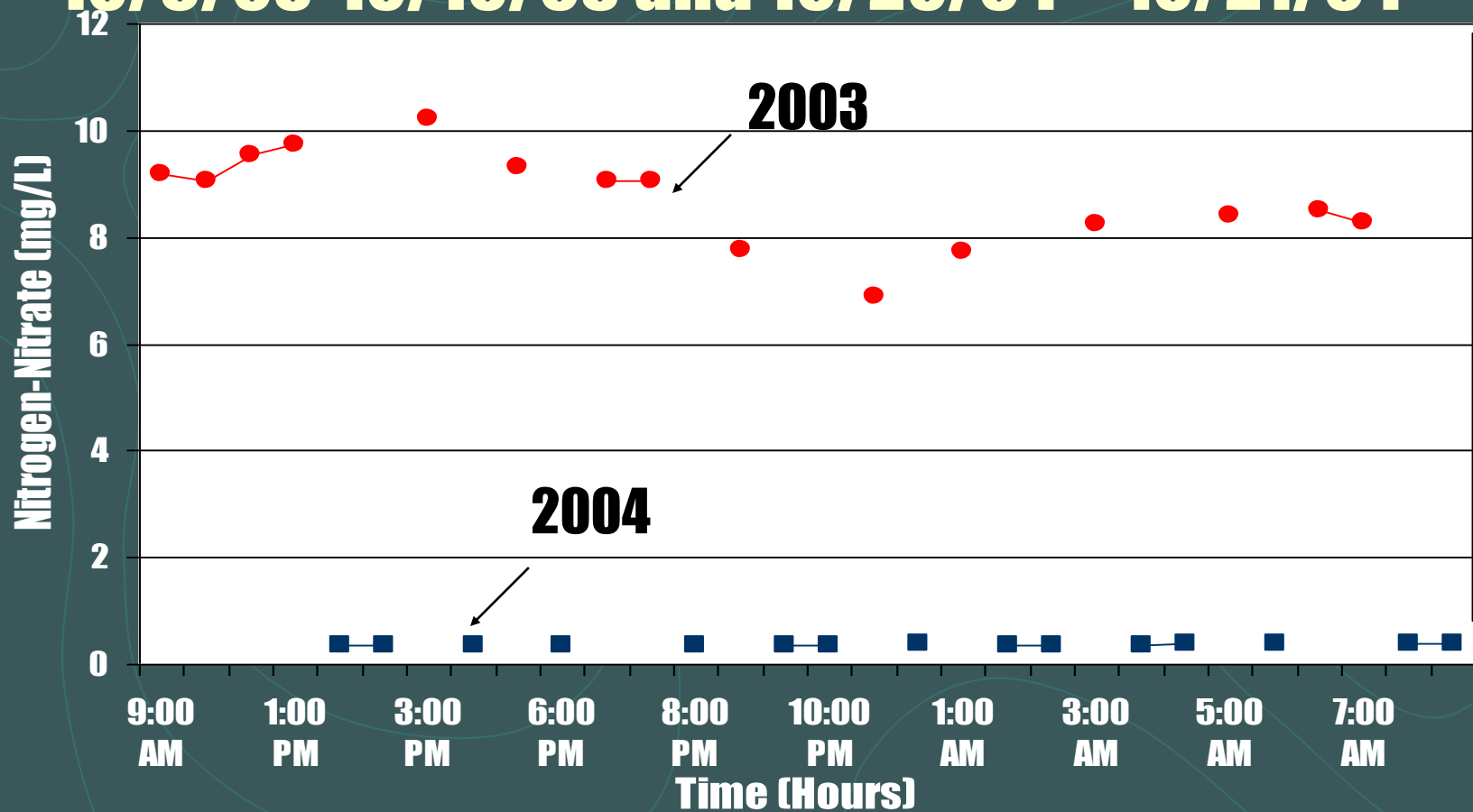
10/20/04 – 10/21/04



***MA Class B Values require N-NO₃ values to be less than 1 mg/L**
The detection limit is 0.01 mg/L

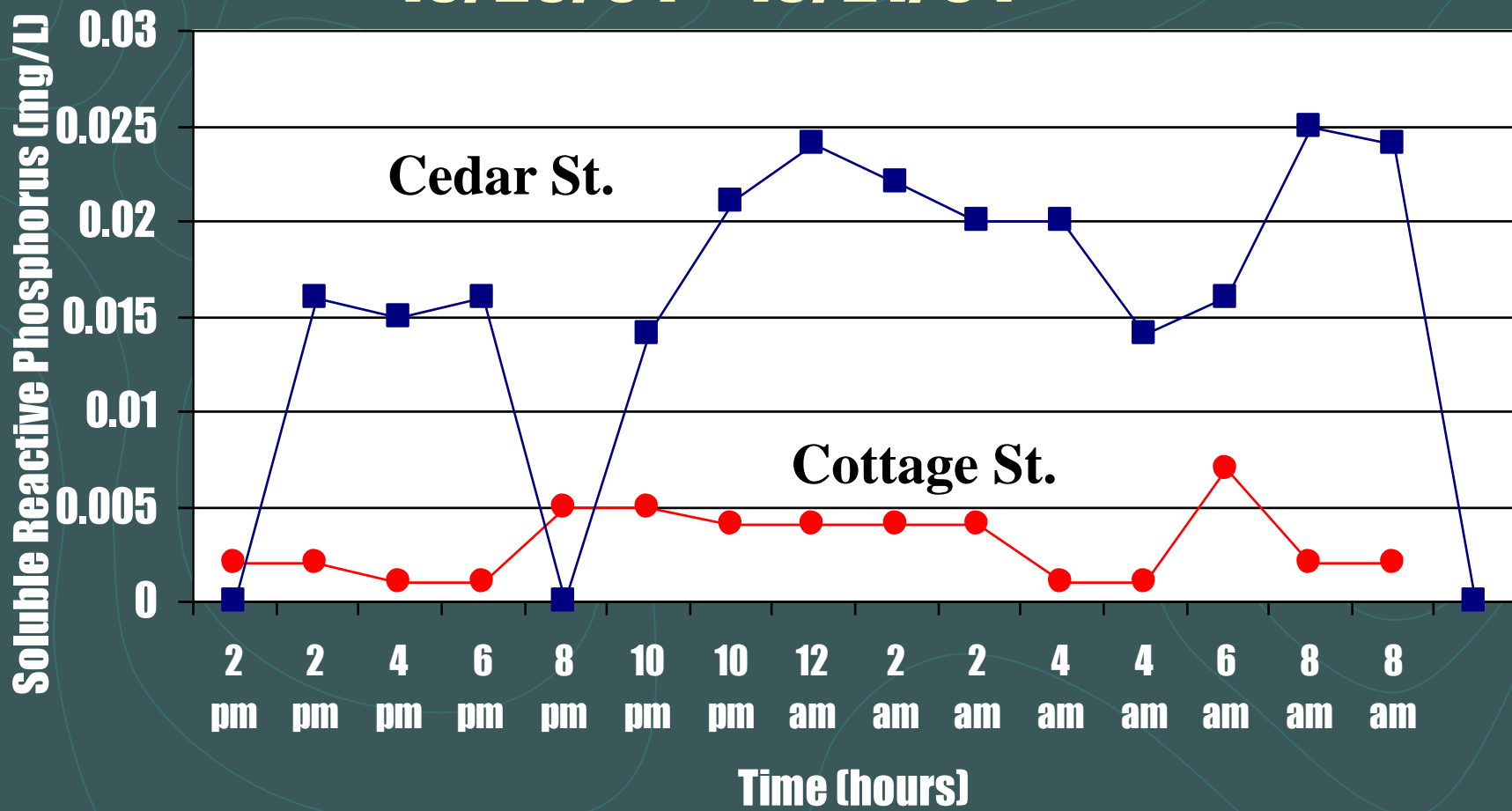
Comparison of Nitrogen-Nitrate Cedar Street

10/9/03-10/10/03 and 10/20/04 – 10/21/04



***MA Class B Values require N-NO₃ values to be less than 1.0 mg/L**
The detection limit is 0.1 mg/L

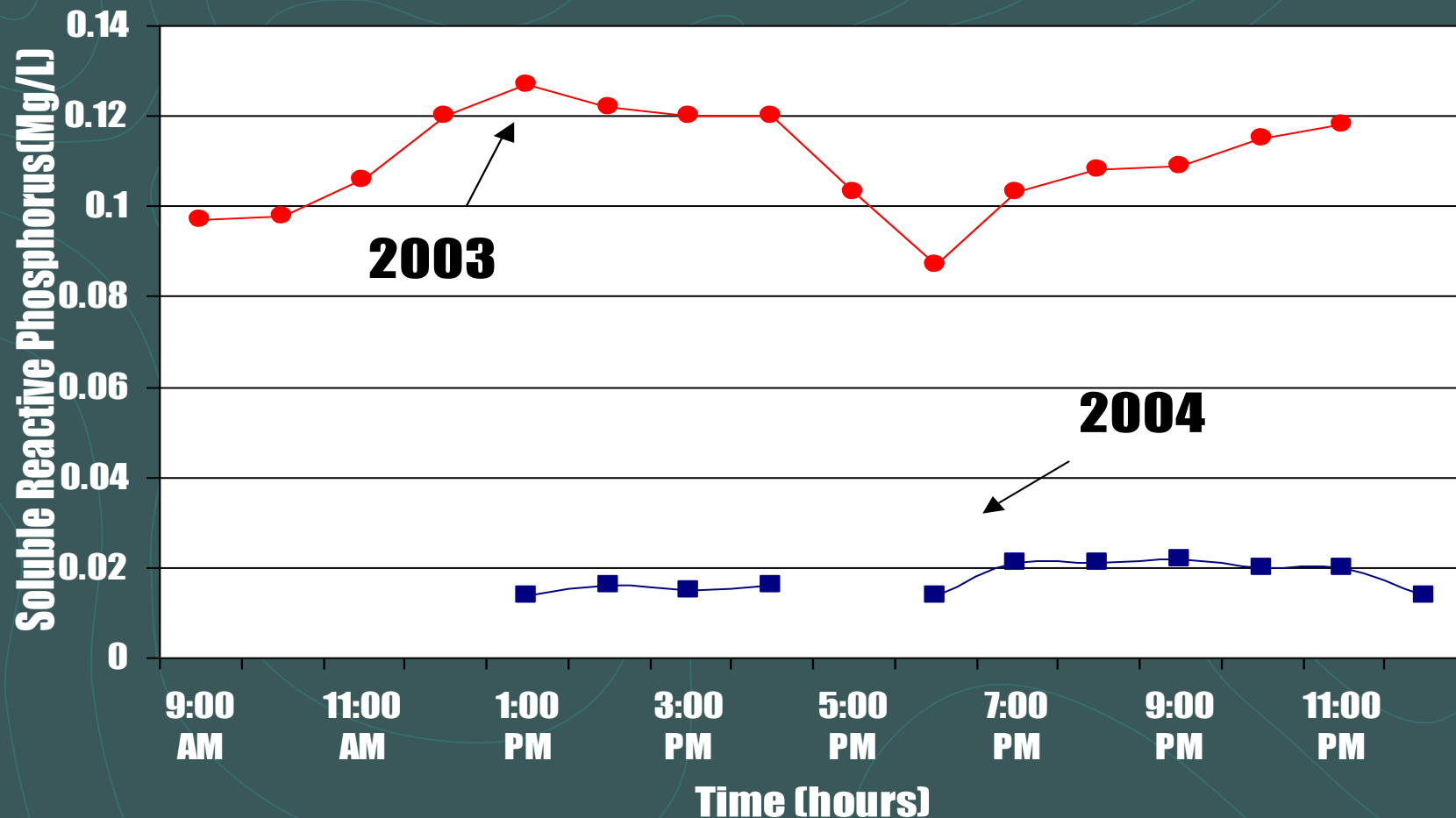
Comparison of Soluble Reactive Phosphorus Cottage St. and Cedar St 10/20/04 – 10/21/04



***MA Class B Standards require SRP levels to be under 0.1 mg/L
The detection limit is 0.008 mg/L**

Comparison of Soluble Reactive Phosphorus Cedar St.

10/09/03-10/10/03 and 10/20/04-10/21/04

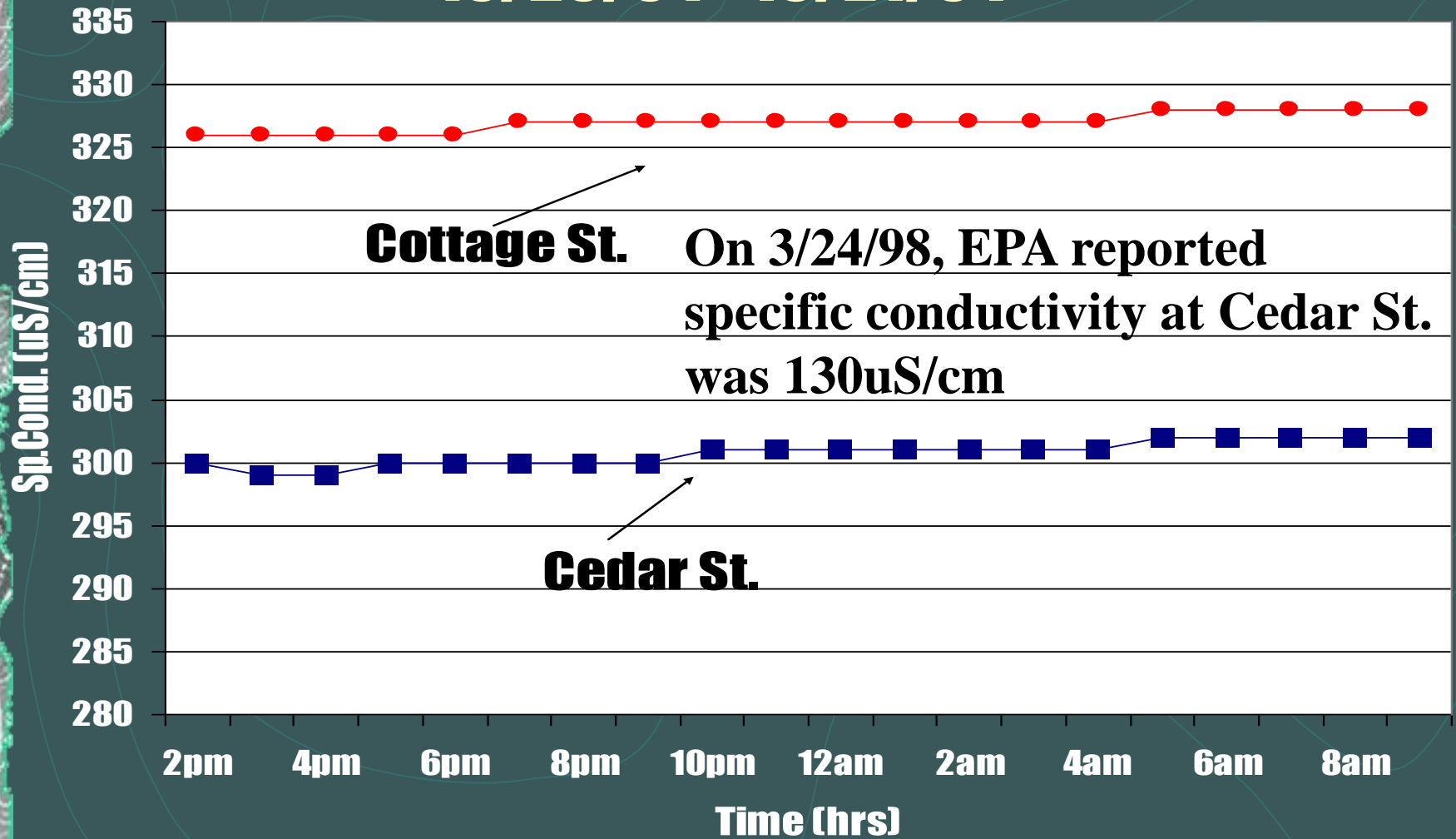


*MA Class B Standards require SRP levels to be under 0.1 mg/L
The detection limit is 0.008 mg/L

Comparison of Soluble Reactive Phosphorus and Nitrogen-Nitrate at Cottage St. and Cedar St. 10/20/04 – 10/21/04

Ten Mile River	N-NO3		SRP		Load	
	Range	Average	Range	Average	N Load g/day	P Load g/day
Cottage St.	0.20/0.30	0.8	0.001/0.010	0.0055	4661.45	55.94
Cedar St.	0.40/0.40	0.4	0.010/0.030	0.0065	4719.54	242.35

Comparison of Conductivity Cottage St. and Cedar St. 10/20/04 - 10/21/04



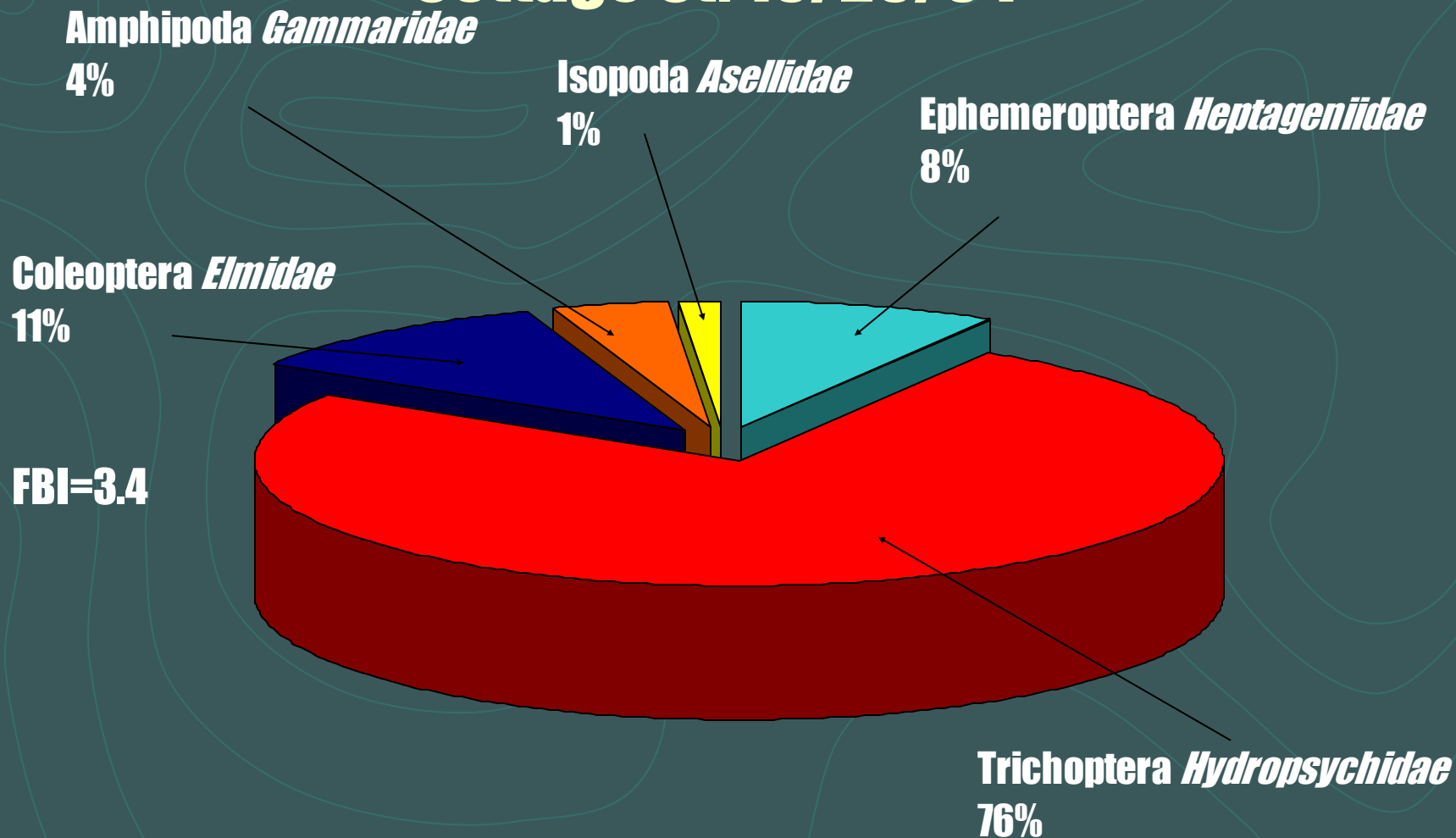
Fecal Coliform Chart

Cottage Street and Cedar St.

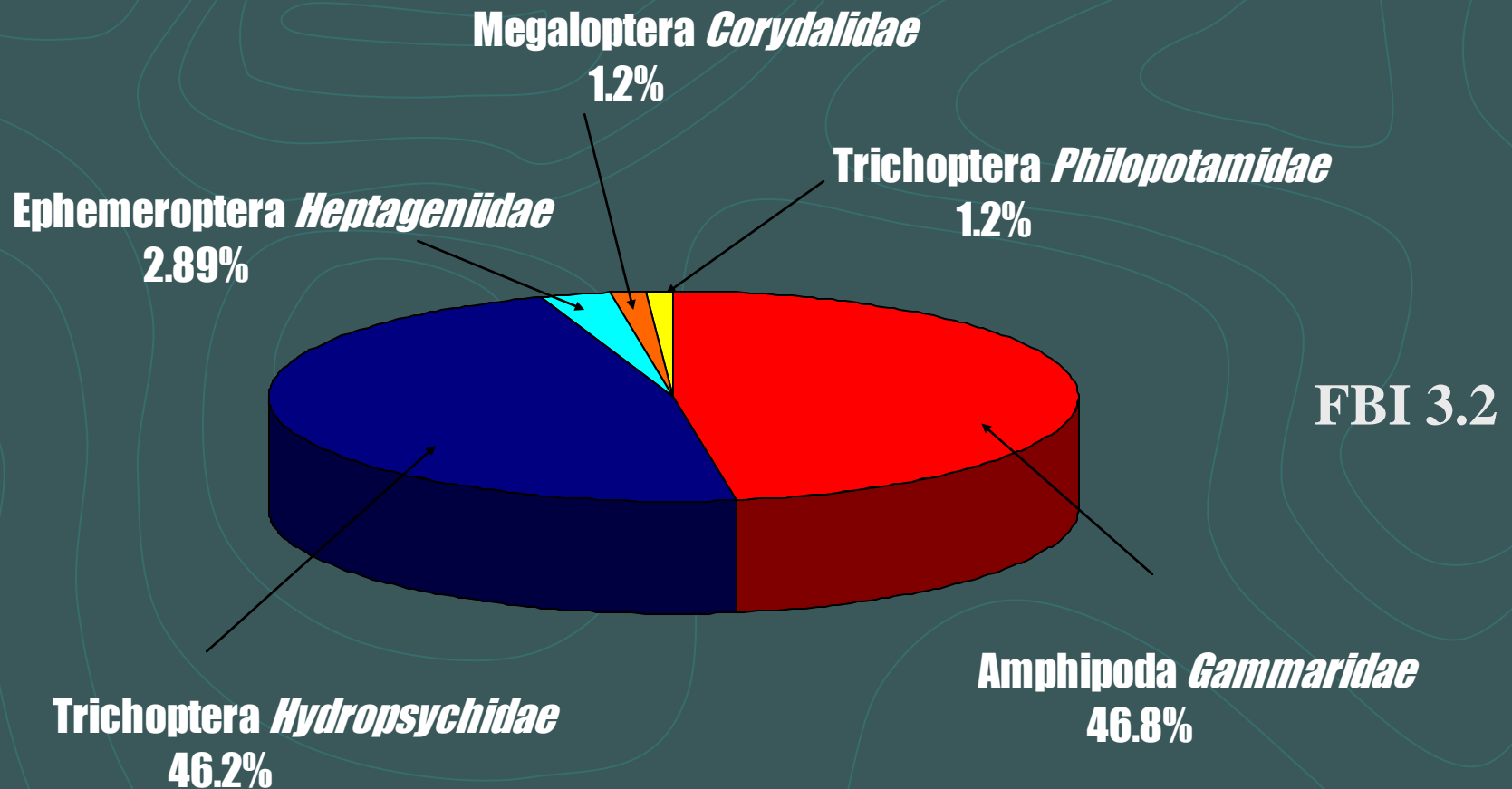
10/20/04 – 10/21/04

Site Name	ml Filtered	FC Filter Count	FC colonies per 100 ml
Cottage St.	100 ml	23	23
Class B	100 ml	23	23
Fecal levels should not exceed 200 Colonies per 100 mL	10 ml	2	20
	10 ml	0	0
	1 ml	0	0
	1 ml	0	0
Cedar St.	100 ml	32	32
Class B	100 ml	28	28
Fecal levels should not exceed 200 Colonies per 100 mL	10 ml	3	30
	10 ml	3	30
	1 ml	0	0
	1 ml	0	0

Percentage of Macro-Invertebrate Abundance Cottage St. 10/20/04



Percentage of Macro-Invertebrate Abundance Cedar St. 10/20/04



A vertical strip on the left side of the slide shows a topographic map of a river area. It features contour lines, a river channel, and some urban areas. The map is oriented vertically, with the river flowing from top to bottom.

Possible Reasons for the Results

- **There were 1.11 inches of rain in the days prior to our study.**
- **There are bridges located near our two sites and runoff from those bridges flows into the river.**
- **The rivers banks are highly urbanized, meaning that there are many houses and buildings surrounding the river.**
- **Cottage St. site had trees on one side, grass on the other.**
- **Cottage St. site was channelized with concrete that was eroding.**
- **Cottage St. site was missing a riparian zone to stop any fertilizers from entering the river.**
- **Geese populations are a large problem in North Attleboro at Falls Pond, upstream from Cottage St.**