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5-3-2006

# The Comparison of Leonard Washburn Brook and Poquoy Brook

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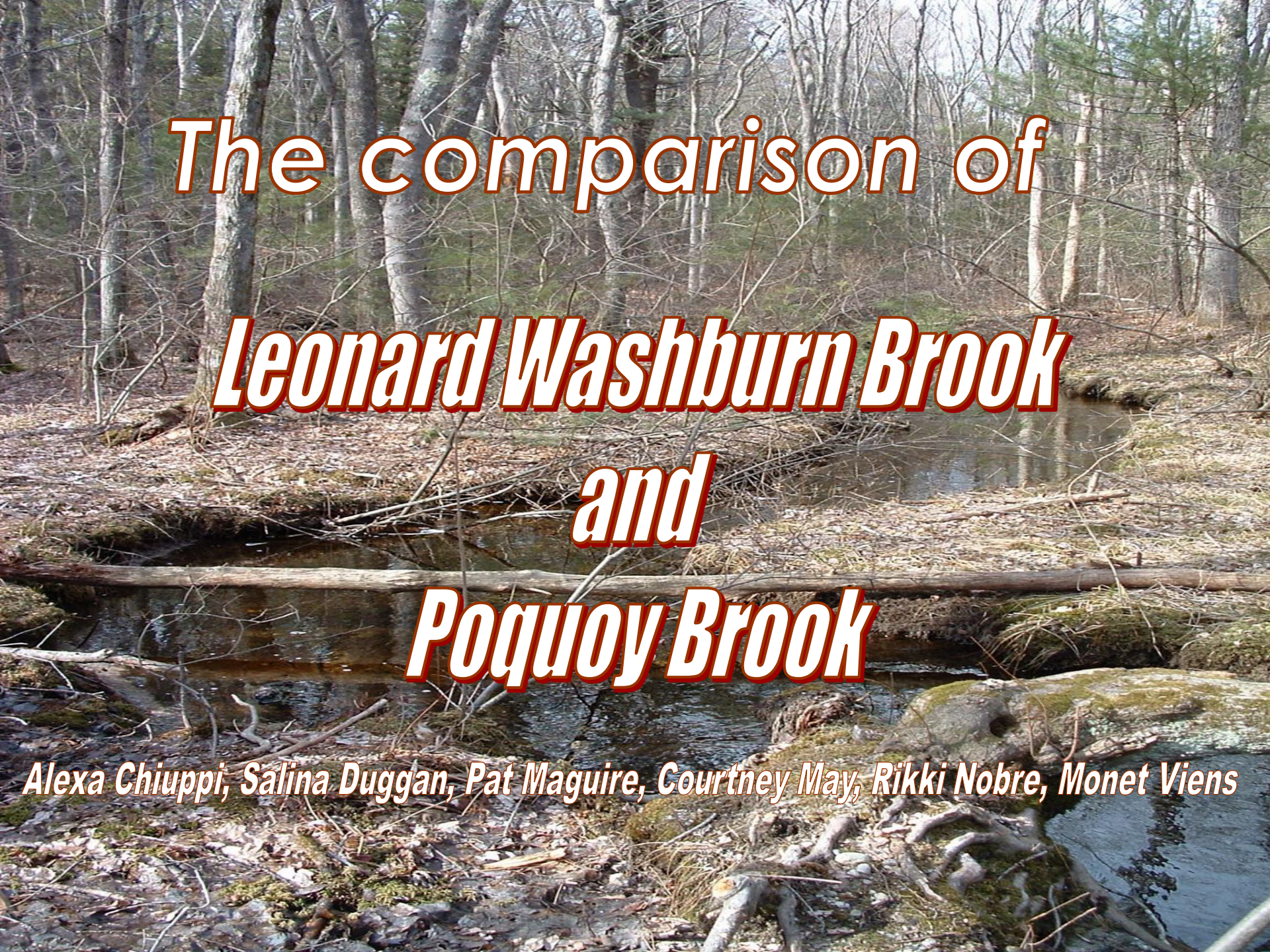


# The comparison of

# Leonard Washburn Brook and Poquoy Brook

Alexa Chiuppi, Salina Duggan, Pat Maguire, Courtney May, Rikki Nobre, Monet Viens

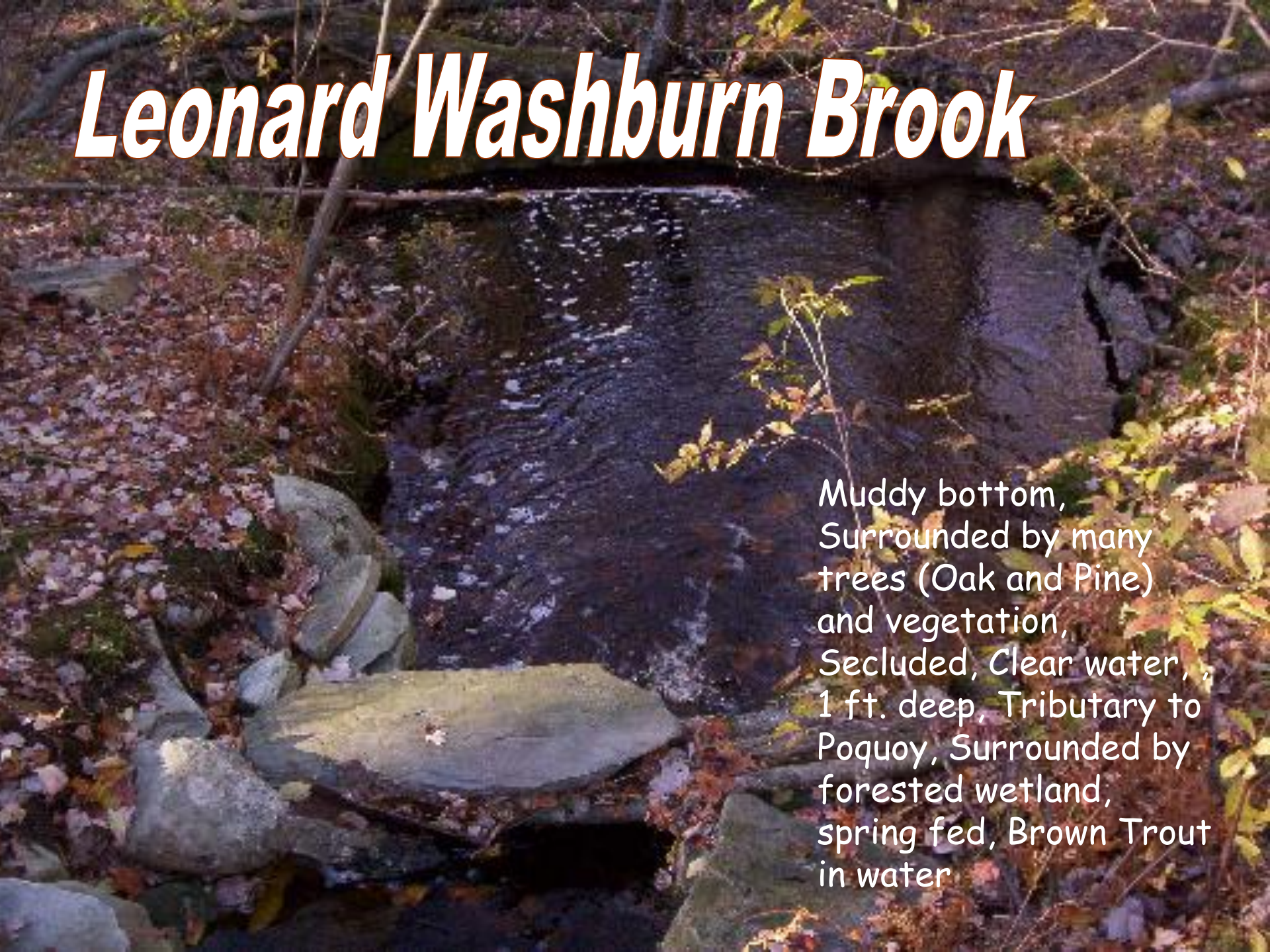
# What is the difference between

## Water of a pristine river environment

## and

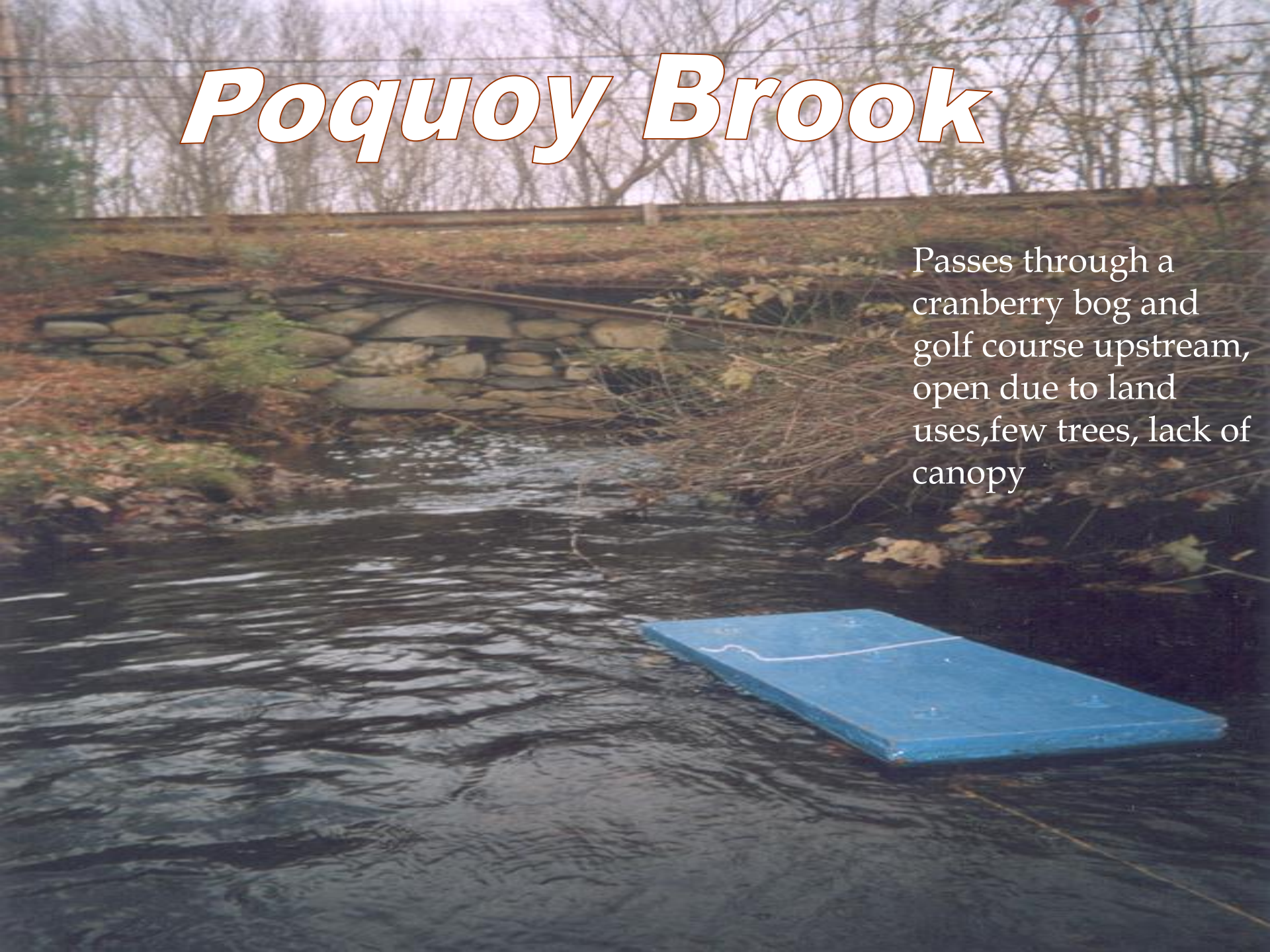
## Water of a river with many land uses?

# Leonard Washburn Brook



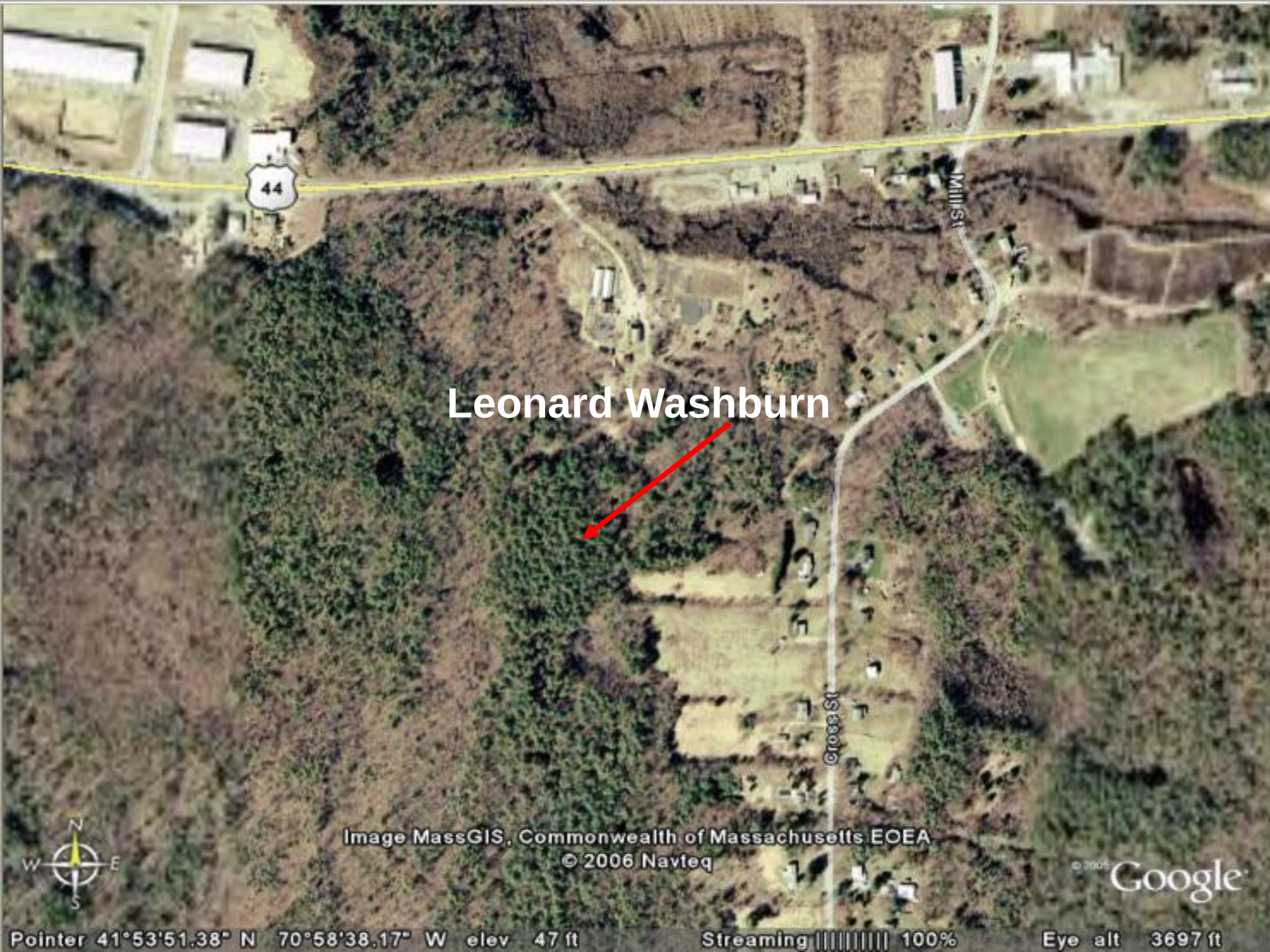
Muddy bottom, Surrounded by many trees (Oak and Pine) and vegetation, Secluded, Clear water, , 1 ft. deep, Tributary to Poquoy, Surrounded by forested wetland, spring fed, Brown Trout in water

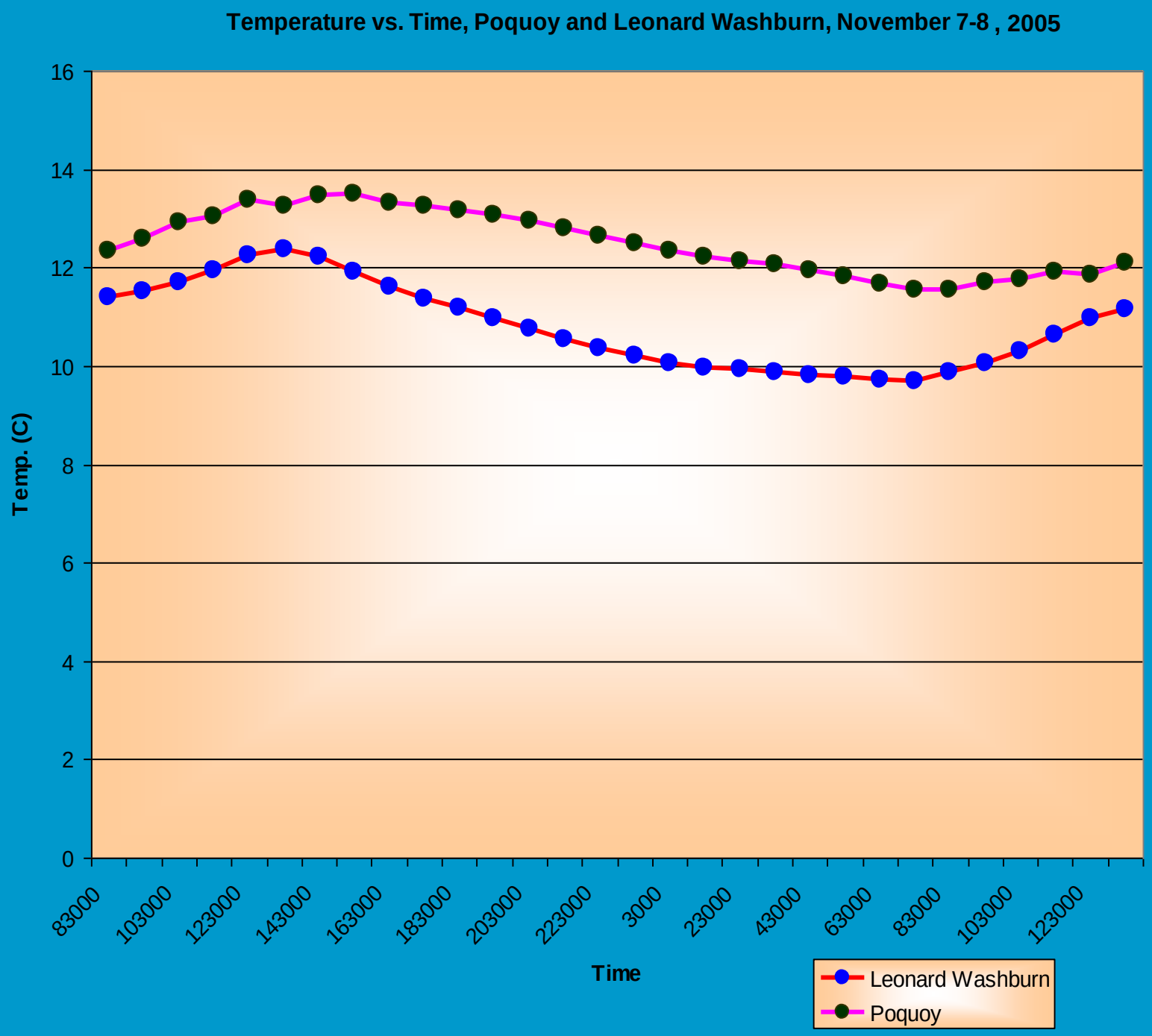
# Poquoy Brook

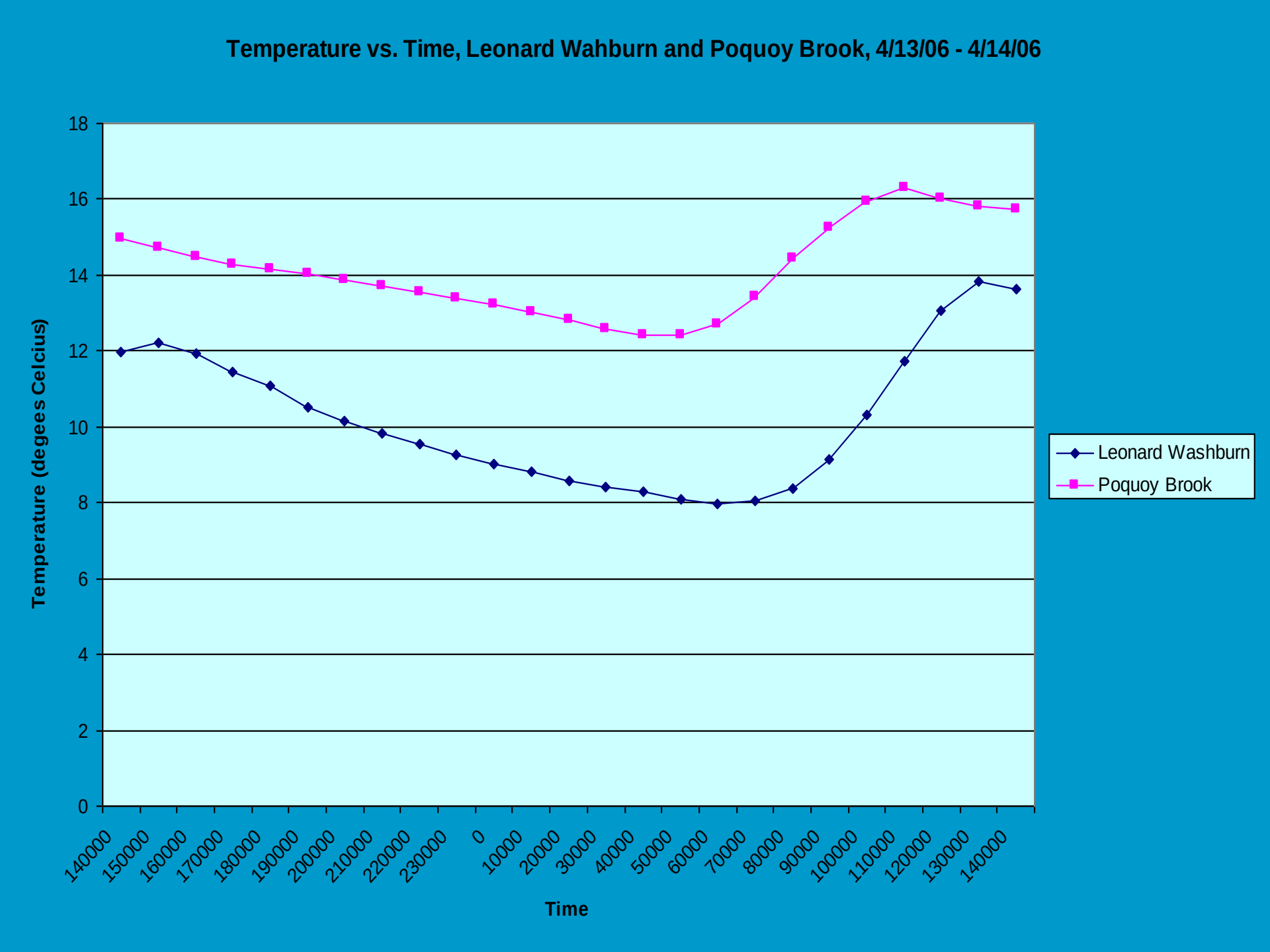


Passes through a cranberry bog and golf course upstream, open due to land uses,few trees, lack of canopy

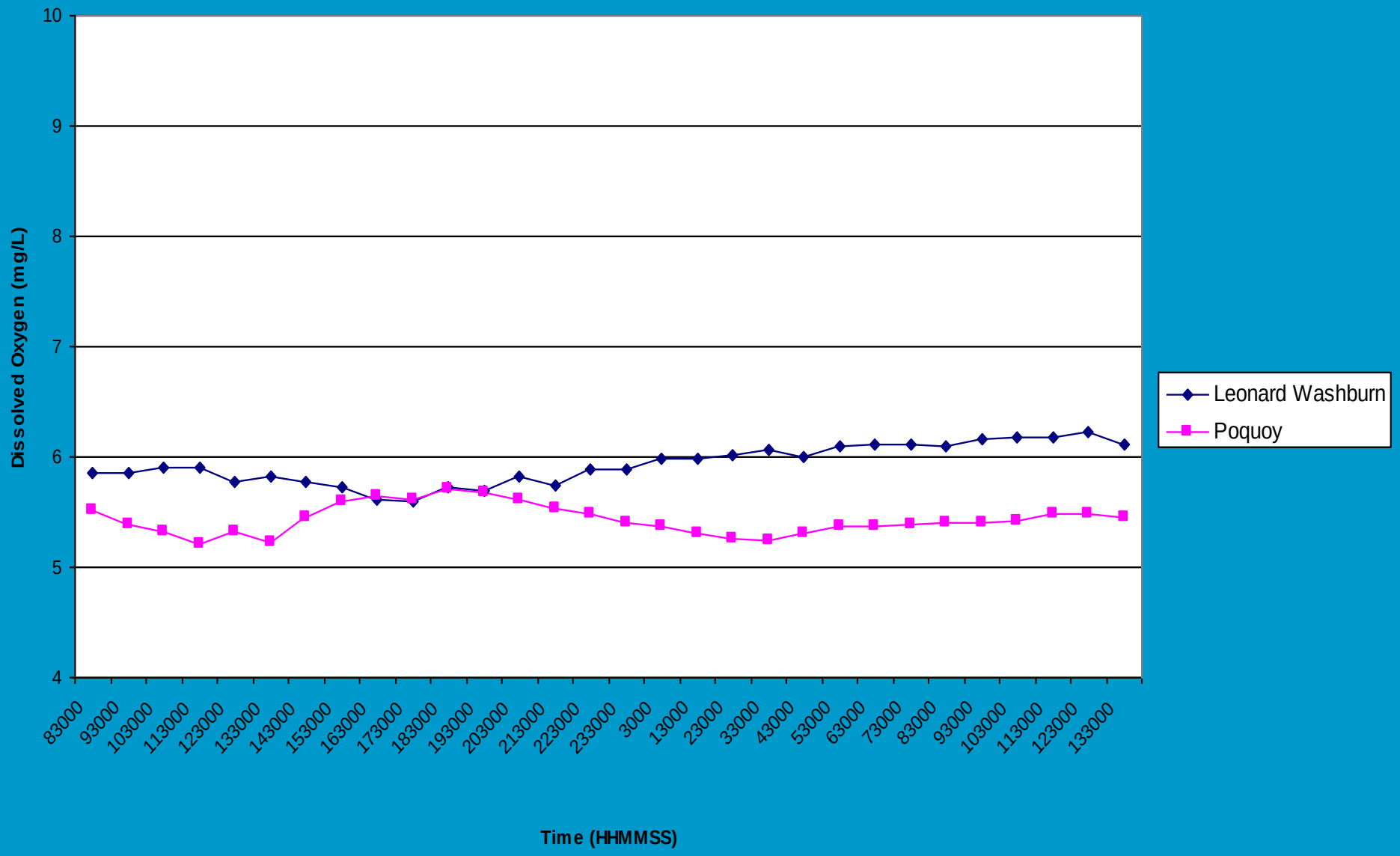
Poquoy
Cross St
Taunton St
Crystal Waters Reservoir
taunton Street, Lakeville Massachusetts
Leonard St
Image MassGIS, Commonwealth of Massachusetts EOEA
© 2006 Navteq
Google
Pointer 41°53'13.64" N 70°58'16.52" W elev 67 ft
Streaming 100%
Eye alt 4474 ft

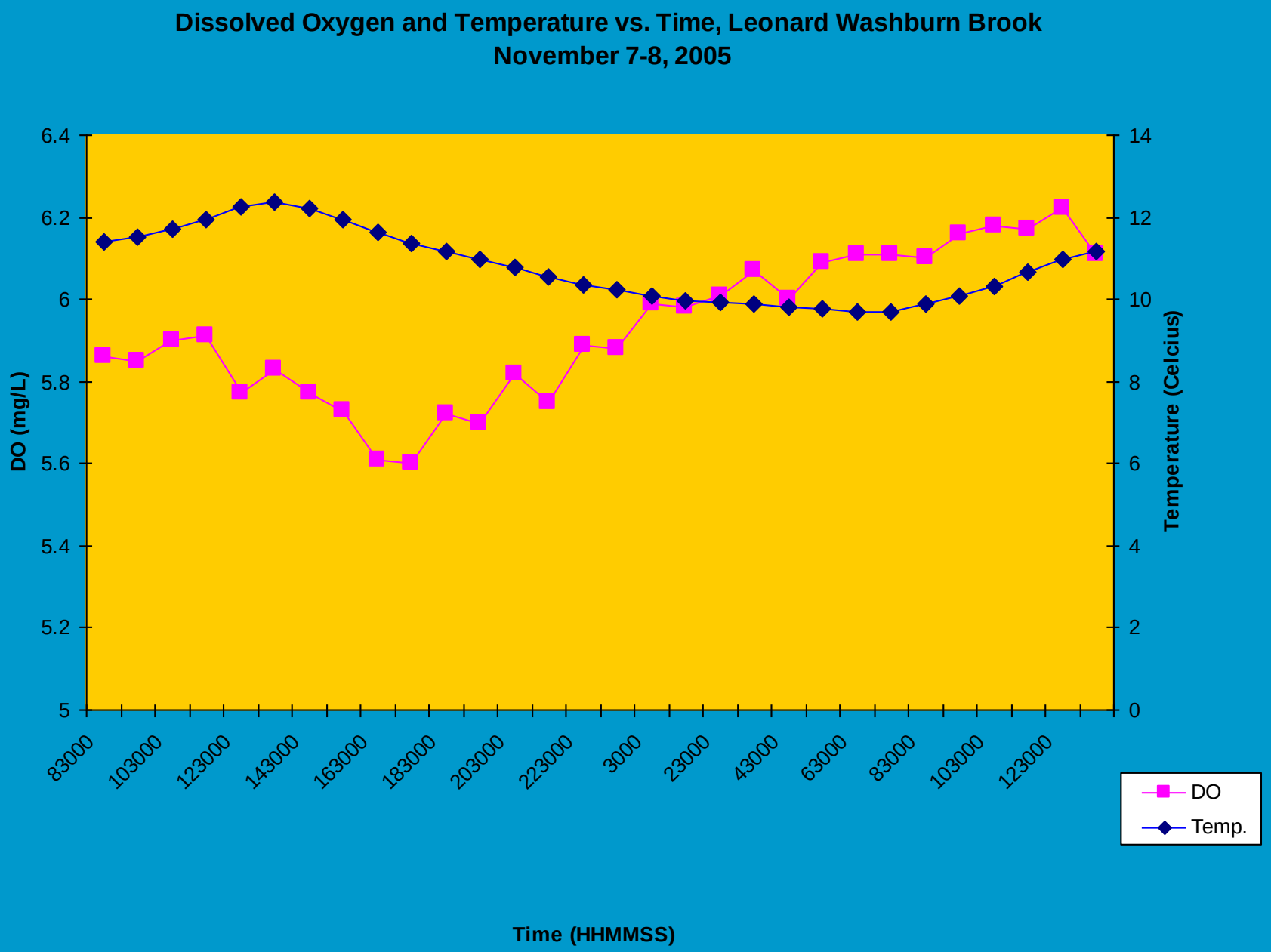

Leonard Washburn
44
Mill St
Cross St
Image MassGIS, Commonwealth of Massachusetts EOEA
© 2006 Navteq
Google
Pointer 41°53'51.38" N 70°58'38.17" W elev 47 ft
Streaming 100%
Eye alt 3697 ft

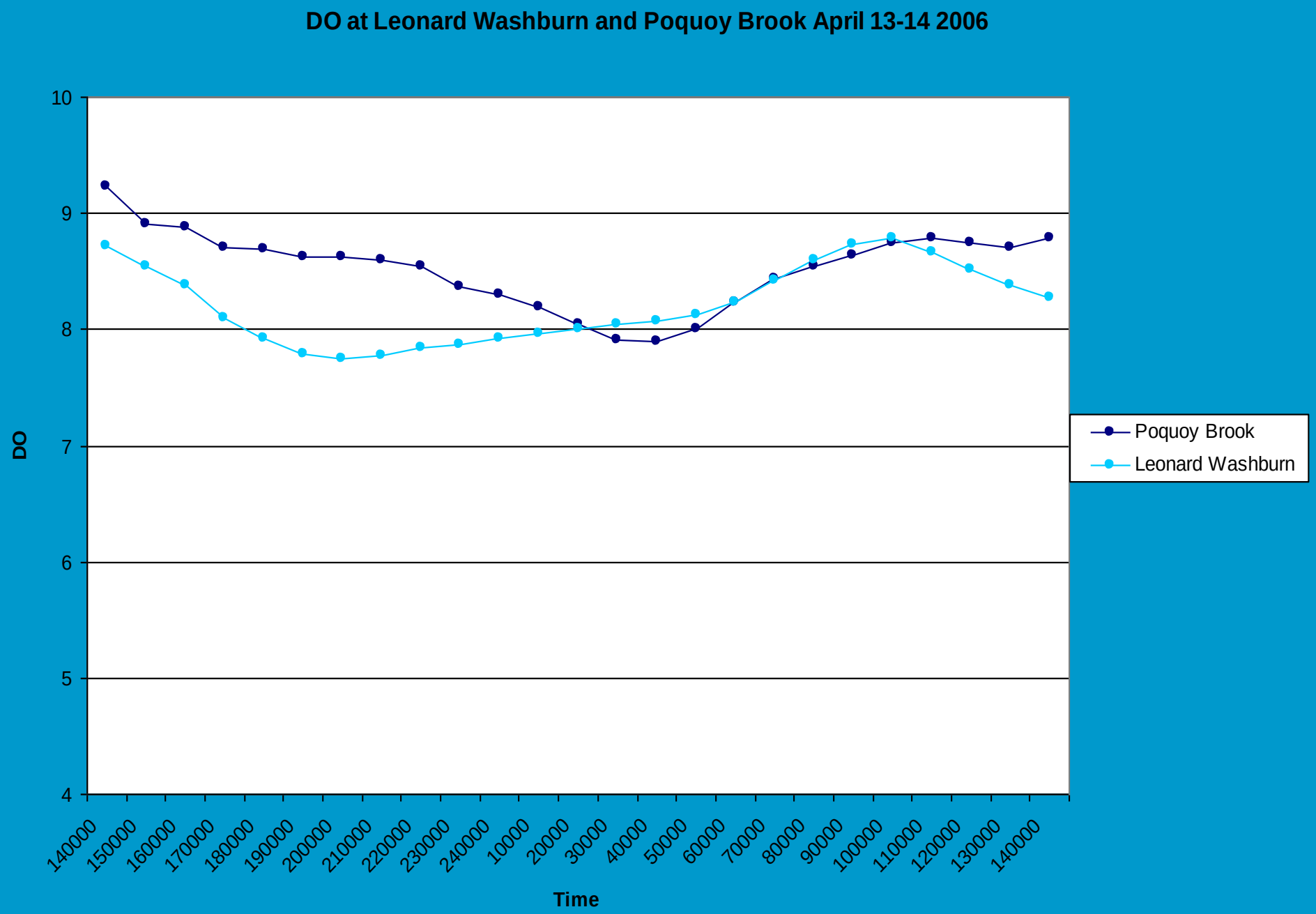

Temperature vs. Time, Poquoy and Leonard Washburn, November 7-8 , 2005
Temp. (C)
16
14
12
10
8
6
4
2
0
83000
103000
123000
143000
163000
183000
203000
223000
3000
23000
43000
63000
83000
103000
123000
Time
Leonard Washburn
Poquoy

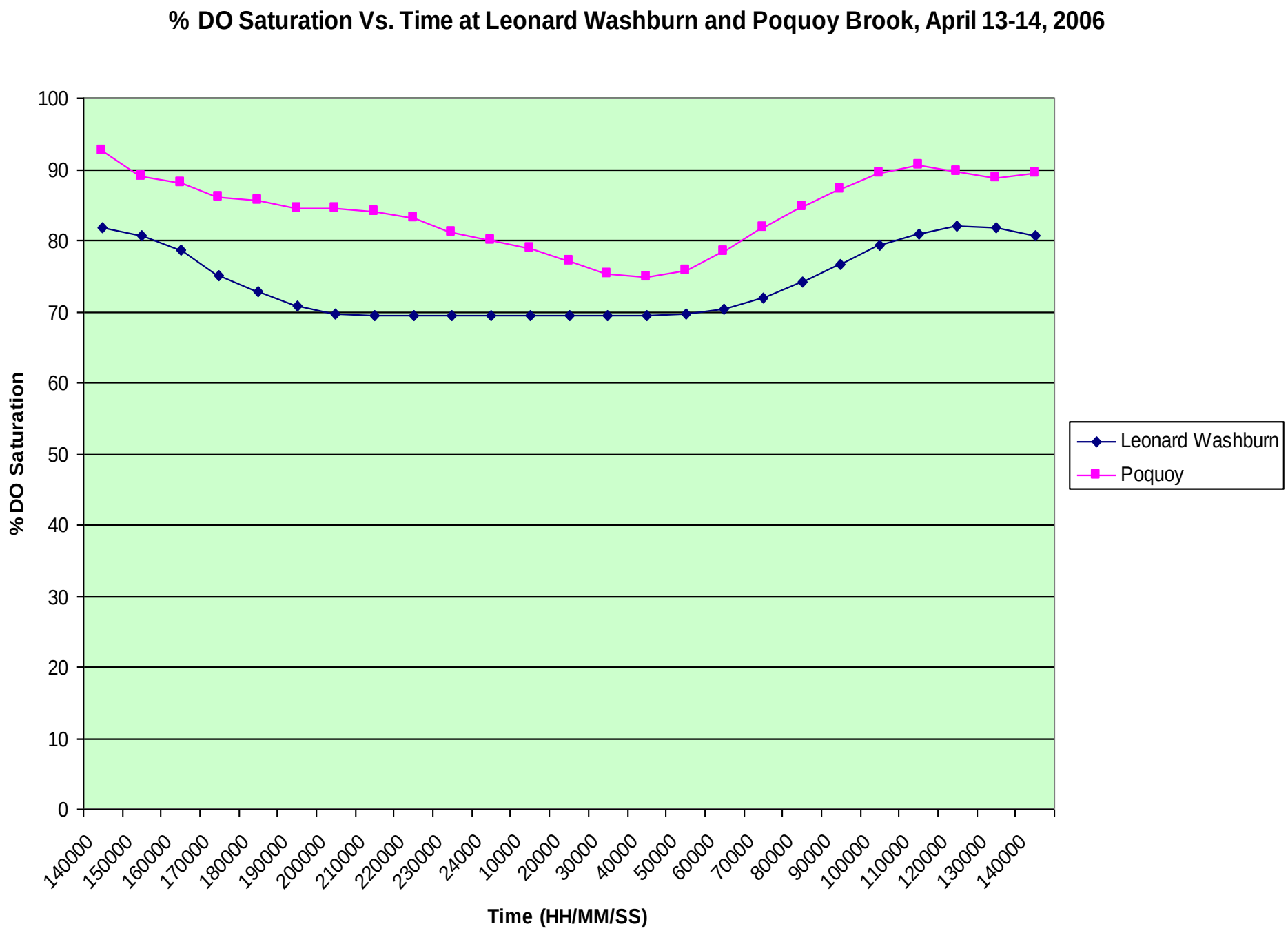

Temperature vs. Time, Leonard Wahburn and Poquoy Brook, 4/13/06 - 4/14/06
Temperature (degees Celcius)
18
16
14
12
10
8
6
4
2
0
140000
150000
160000
170000
180000
190000
200000
210000
220000
230000
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
120000
130000
140000
Time
Leonard Washburn
Poquoy Brook

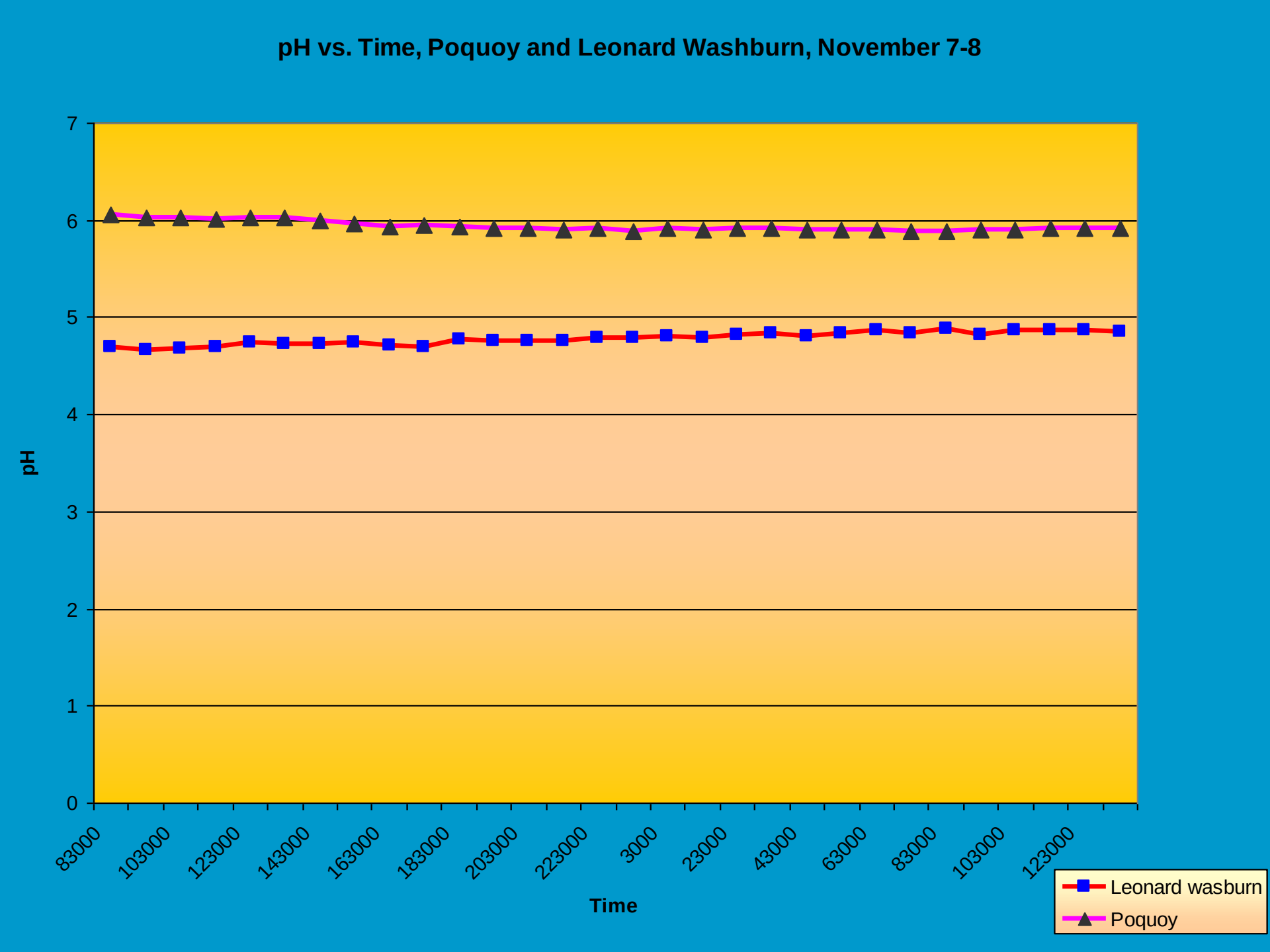
# Dissolved Oxygen Vs. Time, Leonard Washburn and Poquoy Brook, November 7-8, 2005

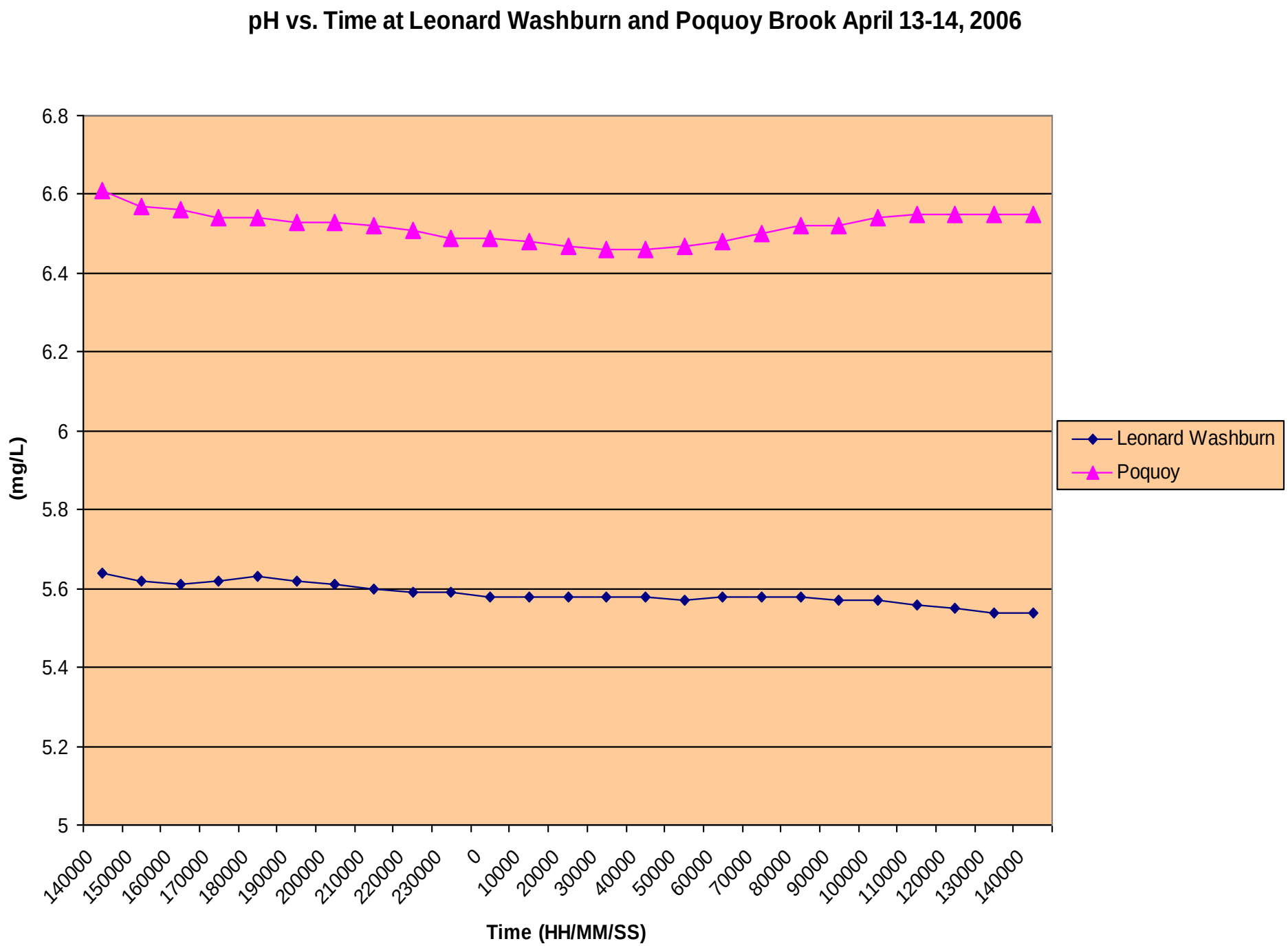


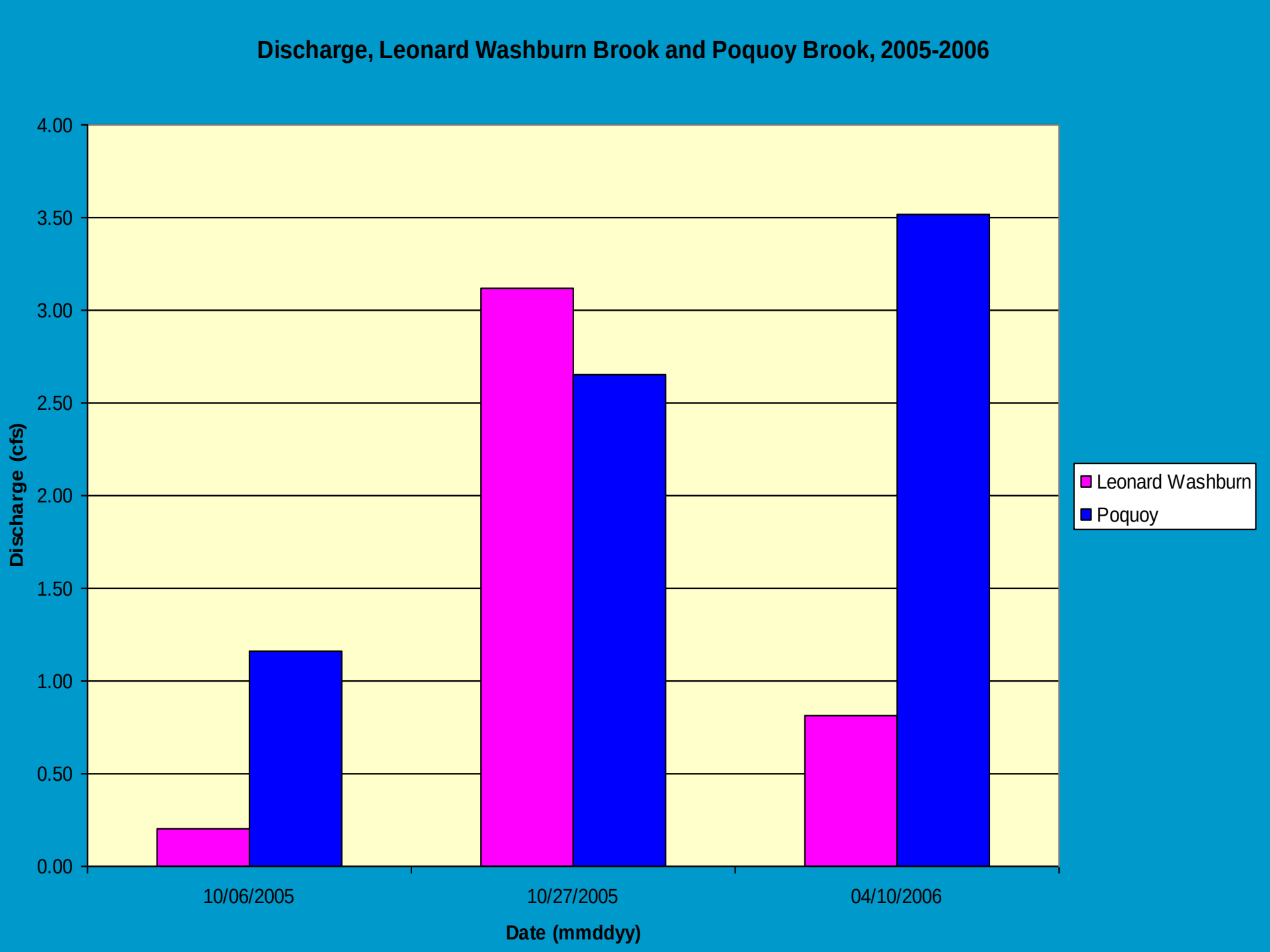

Dissolved Oxygen and Temperature vs. Time, Leonard Washburn Brook
November 7-8, 2005
DO (mg/L)
Temperature (Celcius)
Time (HHMMSS)
6.4
6.2
6
5.8
5.6
5.4
5.2
5
14
12
10
8
6
4
2
0
83000
103000
123000
143000
163000
183000
203000
223000
3000
23000
43000
63000
83000
103000
123000
DO
Temp.

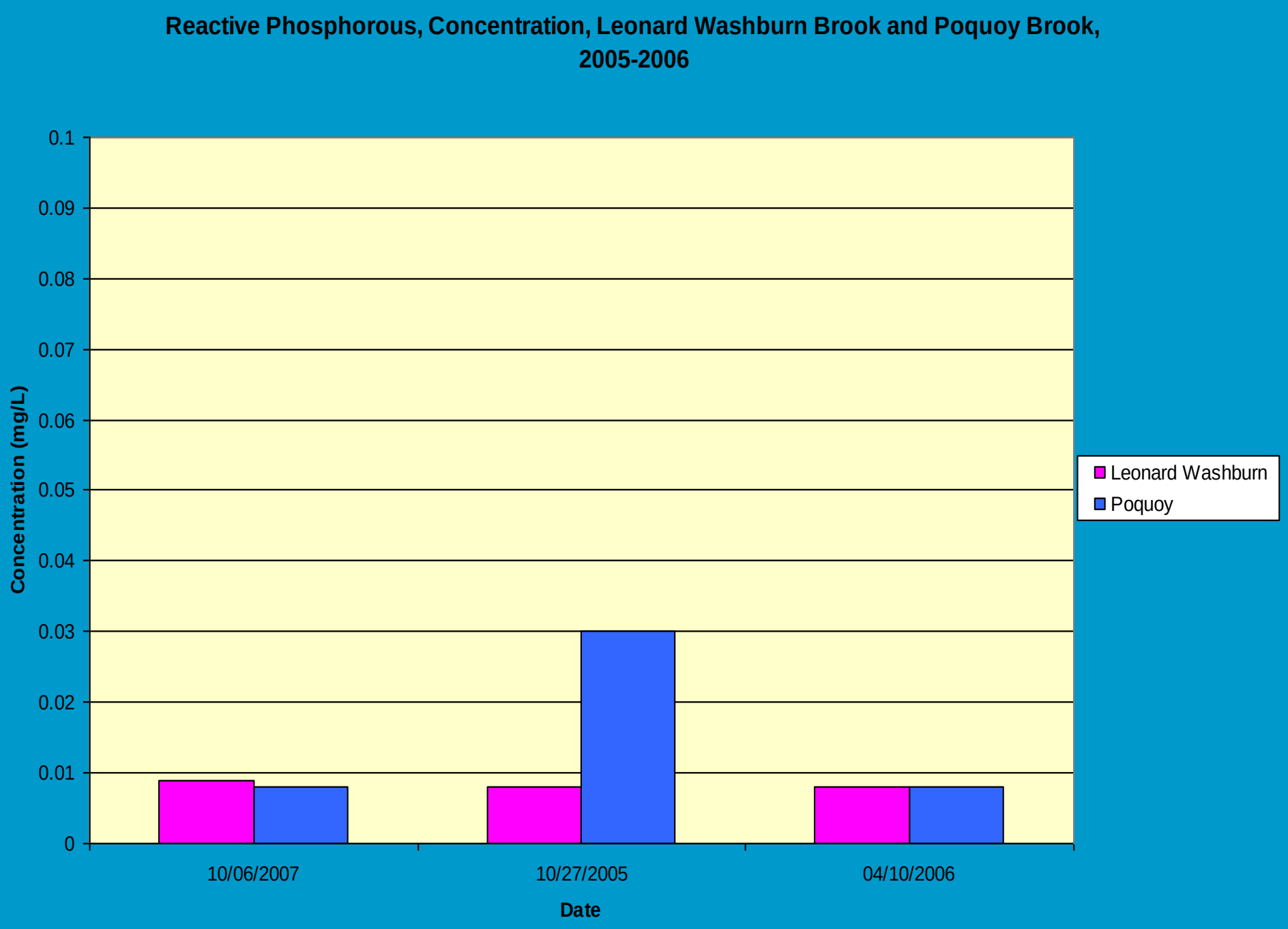

DO at Leonard Washburn and Poquoy Brook April 13-14 2006
DO
10
9
8
7
6
5
4
140000
150000
160000
170000
180000
190000
200000
210000
220000
230000
240000
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
120000
130000
140000
Time
Poquoy Brook
Leonard Washburn

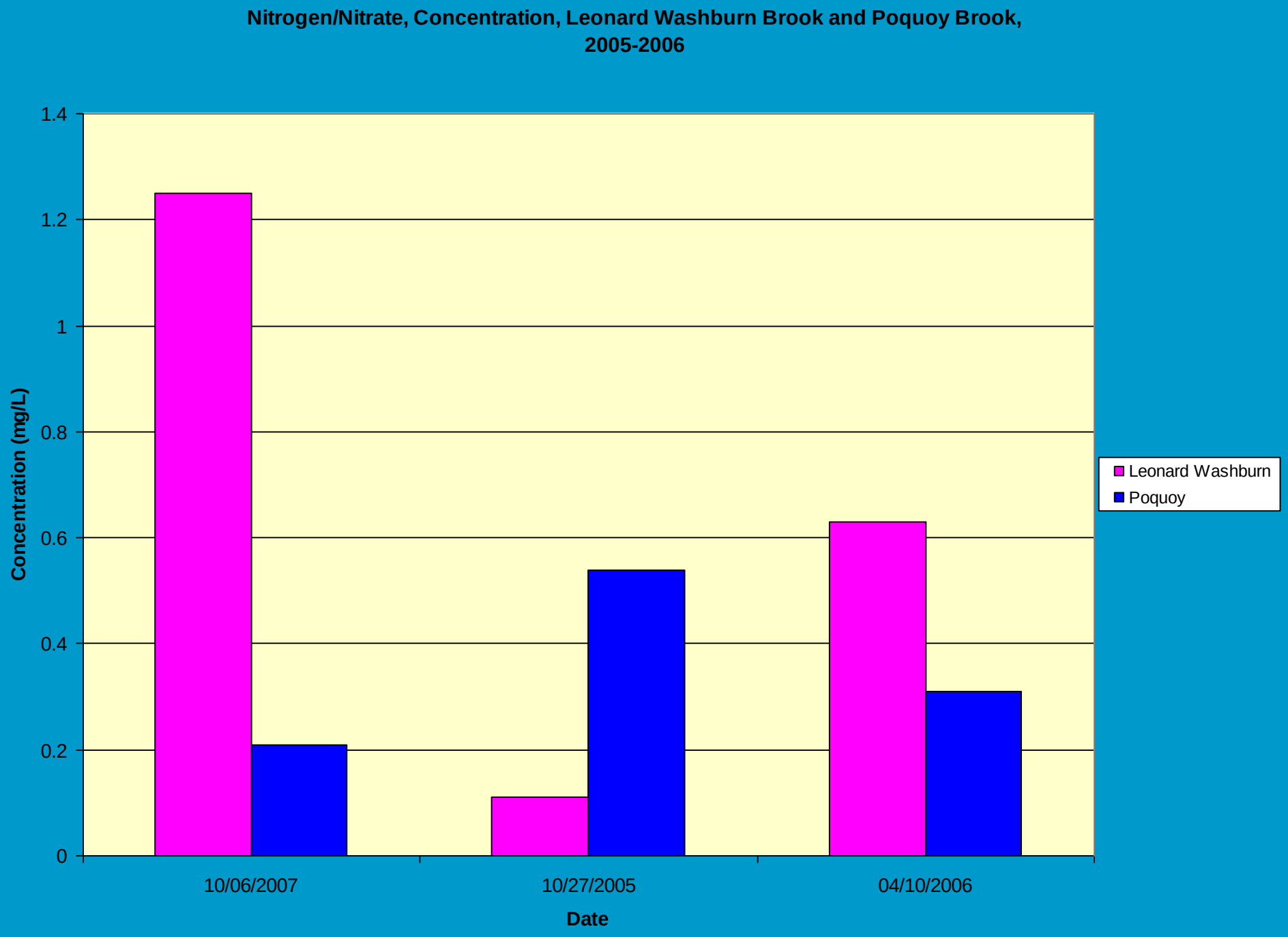

% DO Saturation Vs. Time at Leonard Washburn and Poquoy Brook, April 13-14, 2006
% DO Saturation
100
90
80
70
60
50
40
30
20
10
0
140000
150000
160000
170000
180000
190000
200000
210000
220000
230000
24000
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
120000
130000
140000
Time (HH/MM/SS)
Leonard Washburn
Poquoy

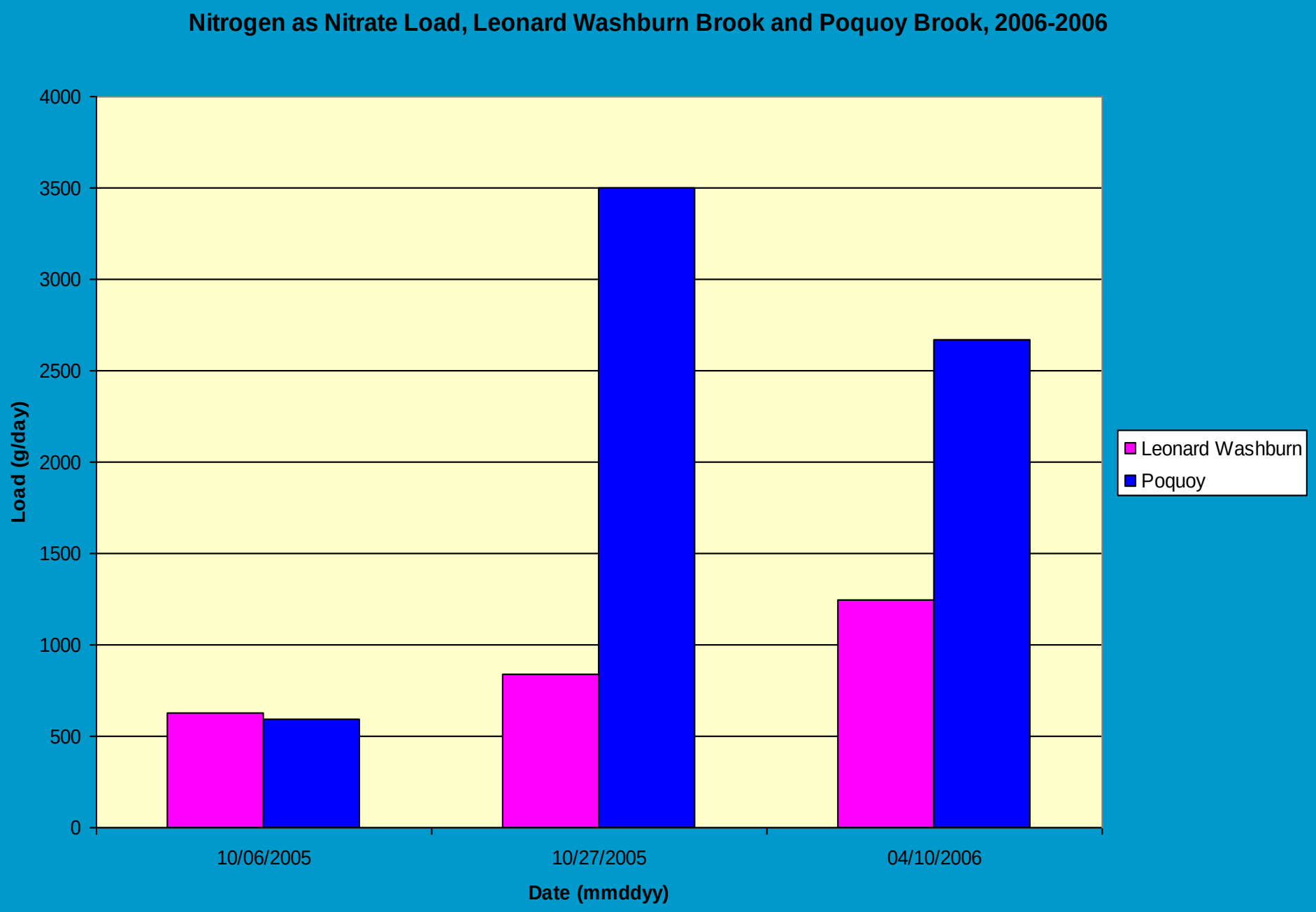

pH vs. Time, Poquoy and Leonard Washburn, November 7-8
pH
7
6
5
4
3
2
1
0
83000
103000
123000
143000
163000
183000
203000
223000
3000
23000
43000
63000
83000
103000
123000
Time
Leonard wasburn
Poquoy

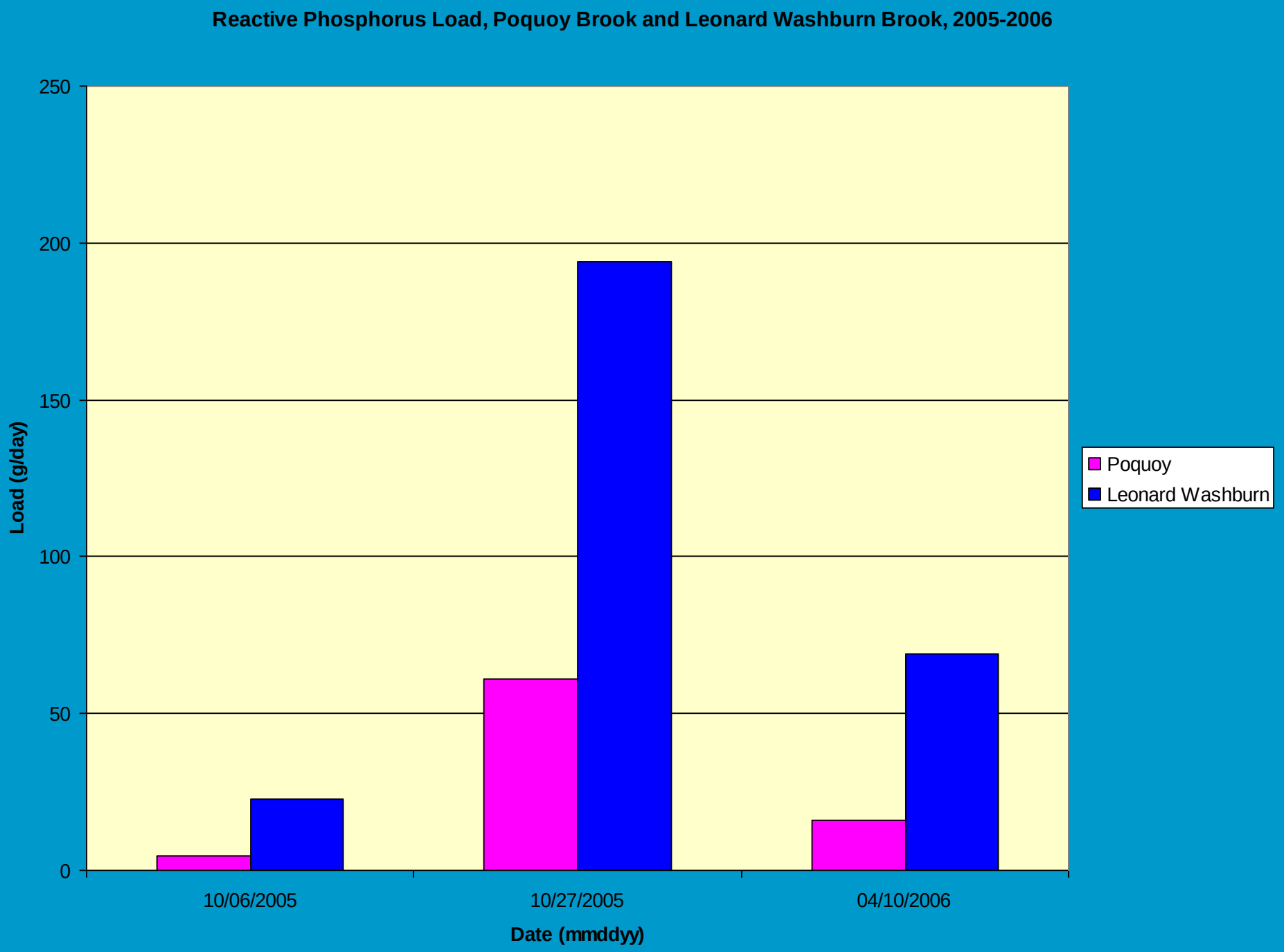

pH vs. Time at Leonard Washburn and Poquoy Brook April 13-14, 2006
6.8
6.6
6.4
6.2
6
5.8
5.6
5.4
5.2
5
(mg/L)
140000
150000
160000
170000
180000
190000
200000
210000
220000
230000
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
120000
130000
140000
Time (HH/MM/SS)
Leonard Washburn
Poquoy


Discharge, Leonard Washburn Brook and Poquoy Brook, 2005-2006
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Discharge (cfs)
10/06/2005
10/27/2005
04/10/2006
Date (mmddyy)
Leonard Washburn
Poquoy


Reactive Phosphorous, Concentration, Leonard Washburn Brook and Poquoy Brook, 2005-2006
Concentration (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
10/06/2007
10/27/2005
04/10/2006
Date
Leonard Washburn
Poquoy


Nitrogen/Nitrate, Concentration, Leonard Washburn Brook and Poquoy Brook, 2005-2006
Concentration (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
10/06/2007
10/27/2005
04/10/2006
Date
Leonard Washburn
Poquoy


Nitrogen as Nitrate Load, Leonard Washburn Brook and Poquoy Brook, 2006-2006
Load (g/day)
4000
3500
3000
2500
2000
1500
1000
500
0
10/06/2005
10/27/2005
04/10/2006
Date (mmddyy)
Leonard Washburn
Poquoy


Reactive Phosphorus Load, Poquoy Brook and Leonard Washburn Brook, 2005-2006
250
200
150
100
50
0
Load (g/day)
10/06/2005
10/27/2005
04/10/2006
Date (mmddyy)
Poquoy
Leonard Washburn

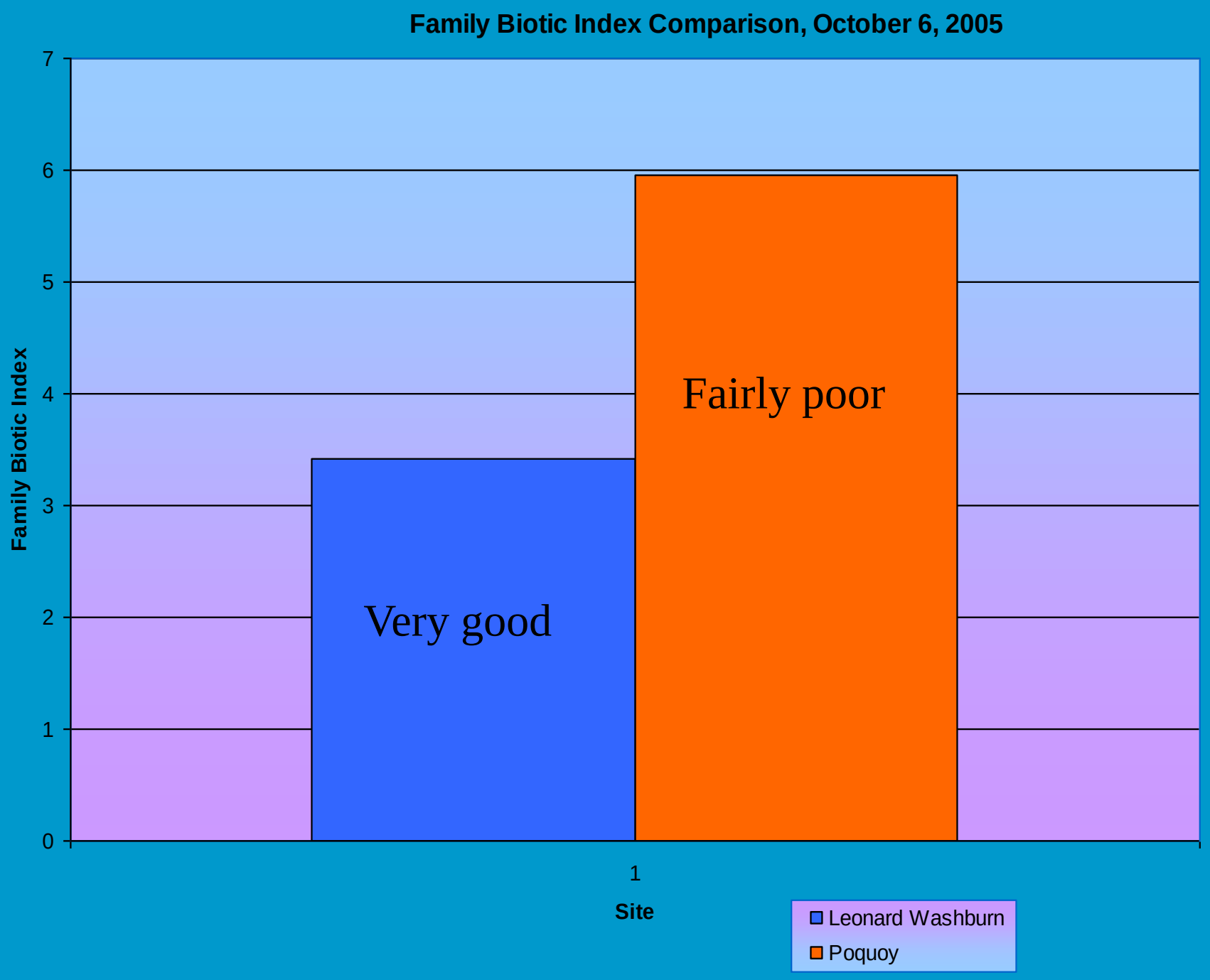
# Family/Group Biotic Index Data Sheet

## Leonard Washburn Brook

| Major Group/Family | Count Replicate 1 | Group or Family % |
|---|---|---|
| Ephemeroptera Leptophlebiid | 1 | 2 |
| Plecoptera Capniidae | 1 | 2 |
| Plecoptera Taeniopterydidae | 1 | 2 |
| Plecoptera Perlidae | 2 | 4 |
| Trichoptera Hydropsychidae | 21 | 40 |
| Trichoptera Philopotamidae | 3 | 6 |
| Trichoptera Polycentropodida | 1 | 2 |
| Diptera Tipulidae | 1 | 2 |
| Odonata Cordulegastridae | 5 | 10 |
| Megaloptera Corydalidae | 5 | 10 |
| Coleoptera Elmidae | 3 | 6 |
| Amphipoda | 8 | 15 |
| Total | 52 | |
| | | |
| Percent Intolerant | 78 | |
| Percent Tolerant | 15 | |
| | | |
| FBI | **3.92 - Very Good** | |

# Family/Group Biotic Index Data Sheet
## Poquoy Brook

| Major Group/Family | Count Replicate 1 | Group or Family % |
|---|---|---|
| Plecoptera Perlodidae | 1 | 4 |
| Diptera Simuliidae | 2 | 7 |
| Odonata Lestidae | 1 | 4 |
| Trichoptera Hydropsychidae | 3 | 11 |
| Odonata Libellulidae | 1 | 4 |
| Isopoda Asellidae | 4 | 16 |
| Pelecypoda | 4 | 16 |
| Coleoptera Elmidae | 3 | 11 |
| Amphipoda | 7 | 27 |
| Total | 22 | |
| | | |
| Percent Intolerant | 15 | |
| Percent tolerant | 59 | |
| | | |
| FBI | **5.96** | **- Fairly poor** |


Family Biotic Index Comparison, October 6, 2005
Family Biotic Index
7
6
5
4
3
2
1
0
Very good
Fairly poor
1
Site
Leonard Washburn
Poquoy

# CONCLUSION

- *What we learned?*

  **Land use does effect water quality. Determine by calculating the FBI. Poquoy resulted as fairly poor, while Leonard Washburn resulted as very good.**

  **The nutrient load at Poquoy Brook is higher than Leonard Washburn**