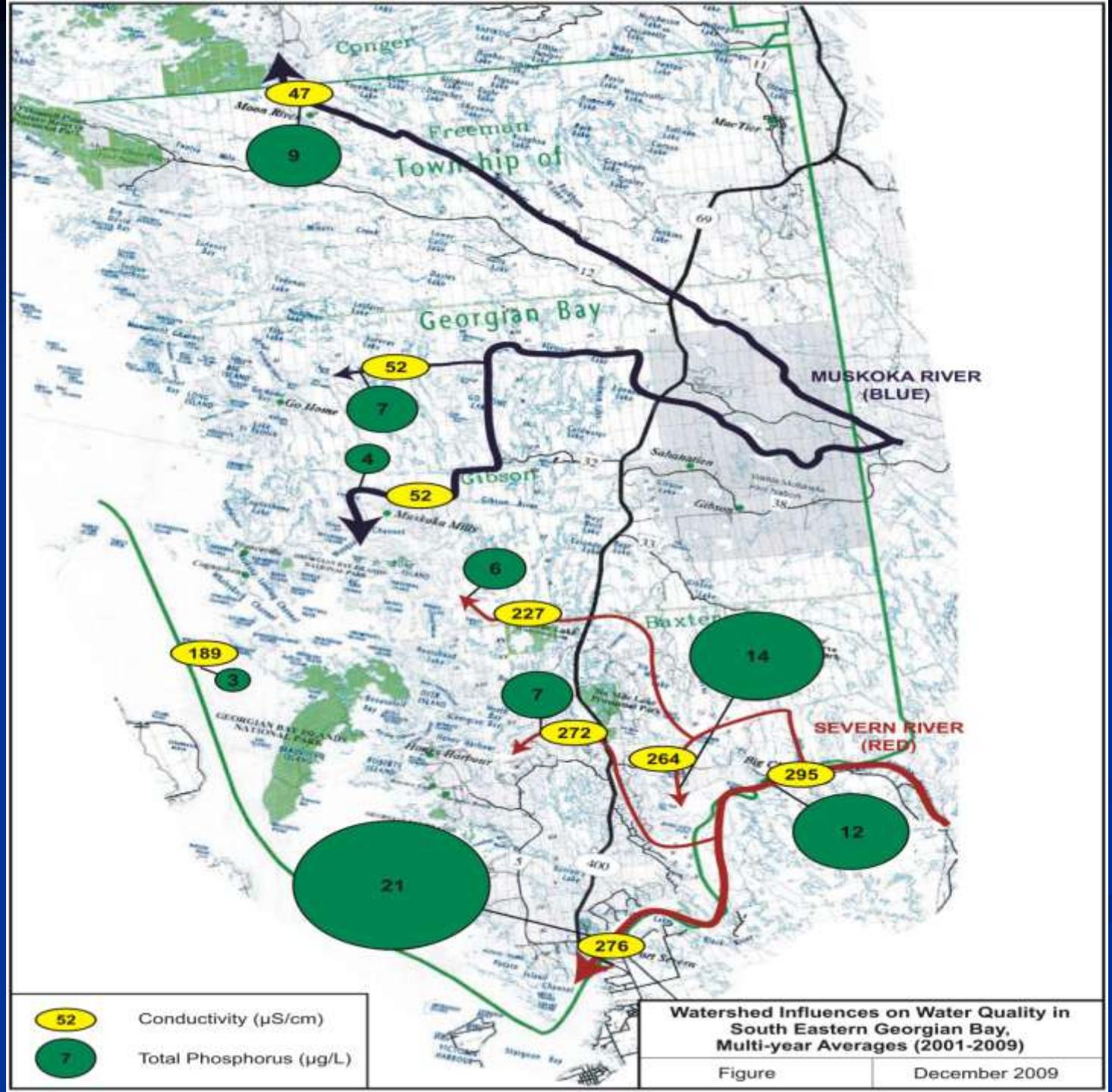
Inland Lake Water Quality

Data Summary

2005 - 2010


Conger
47
9
Freeman
Township of
Georgian Bay
52
7
4
52
Gibson
6
227
189
3
14
7
272
264
295
12
21
276
MUSKOKA RIVER
(BLUE)
SEVERN RIVER
(RED)
52
Conductivity (µS/cm)
7
Total Phosphorus (µg/L)
Watershed Influences on Water Quality in
South Eastern Georgian Bay,
Multi-year Averages (2001-2009)
Figure
December 2009

Objectives

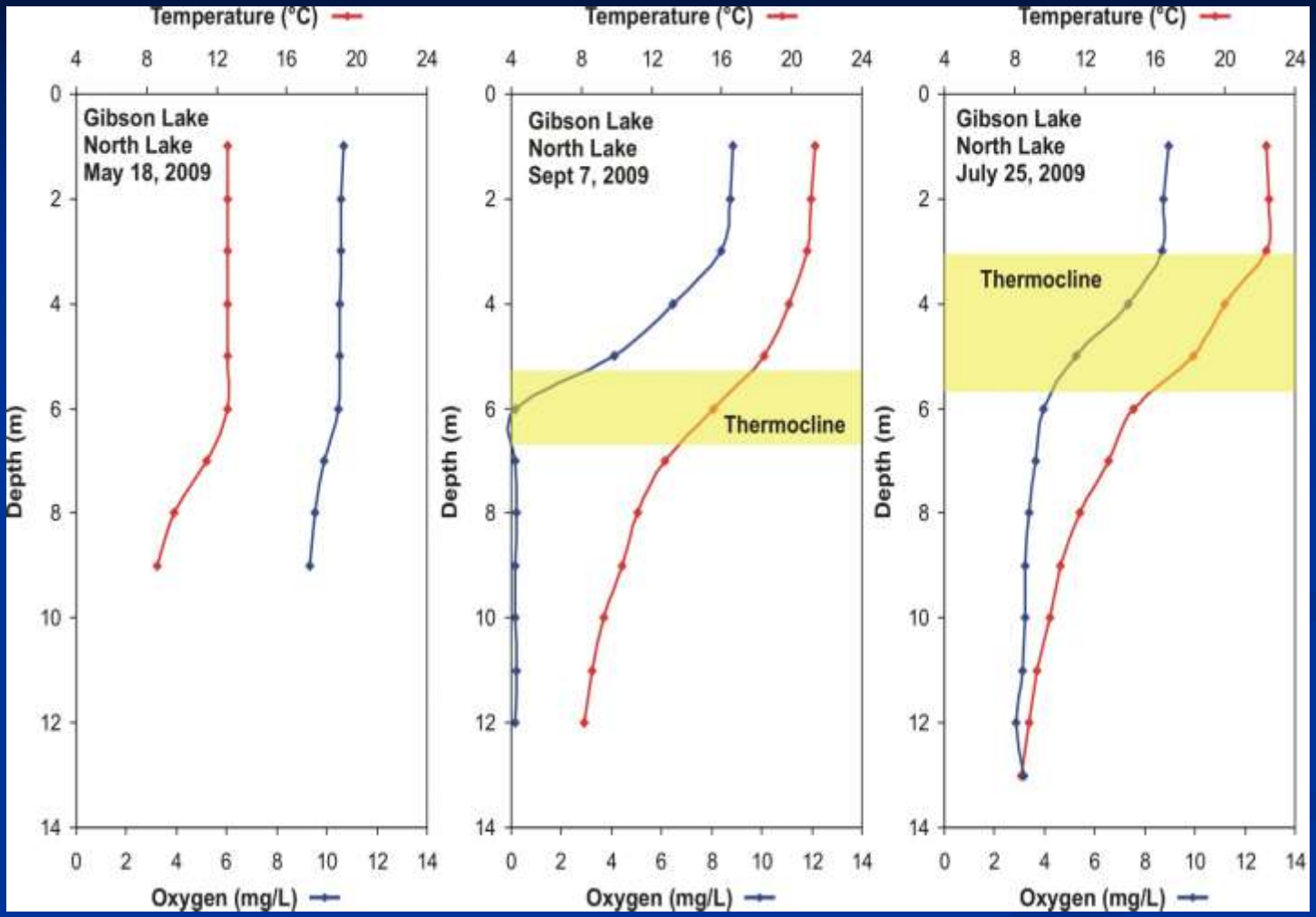
- Analyze data from 2005 – 2010
- Assess impact on each lake
- Identify any water quality concerns
- Establish a data base
- Recommend improvements

Number of Sample Sites by Responsibility/Season

Source	District	MOE	Inland Lake	Inland lake
Season Data Collected	**Water Quality** SPRING (May/June)		**Water Quality FALL (Sept.)**	**Bacteria (June – Sept.)**
Lake Sample Frequency	**Every 2 years (District Staff)**	**Annually (Volunteer)**	**Annually (Volunteer)**	**Annually (Volunteer)**
	Number of samples Sites			
Severn River	0	0	4	11
Gloucester Pool	1	0	8	11
Baxter Lake	1	0	1	0
Six Mile Lake	3	1	7	10
Gibson Lake	2	0	3	6
Go Home Lake	1	1	7	6
Galla Lake	1	1	3	4
Stewart Lake	1	1	4	6

Parameters

- Temperature/oxygen depth profiles to determine the thermocline
- Conductivity above and below the thermocline to asses flows and mixing patterns
- TP above and below the thermocline
- Surface water clarity

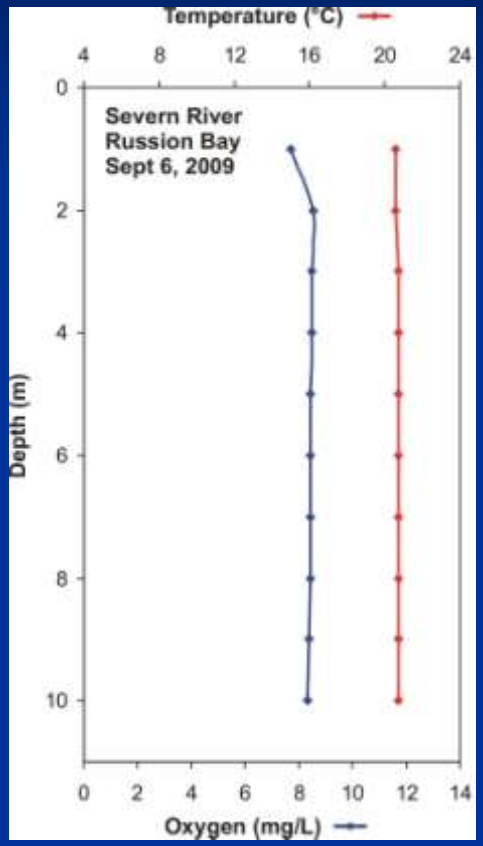

Temperature (°C)
Gibson Lake
North Lake
May 18, 2009
Depth (m)
Oxygen (mg/L)
Temperature (°C)
Gibson Lake
North Lake
Sept 7, 2009
Thermocline
Depth (m)
Oxygen (mg/L)
Temperature (°C)
Gibson Lake
North Lake
July 25, 2009
Thermocline
Depth (m)
Oxygen (mg/L)


Severn River
Copp Bay
Lost Channel
Wood Bay
Russian Bay

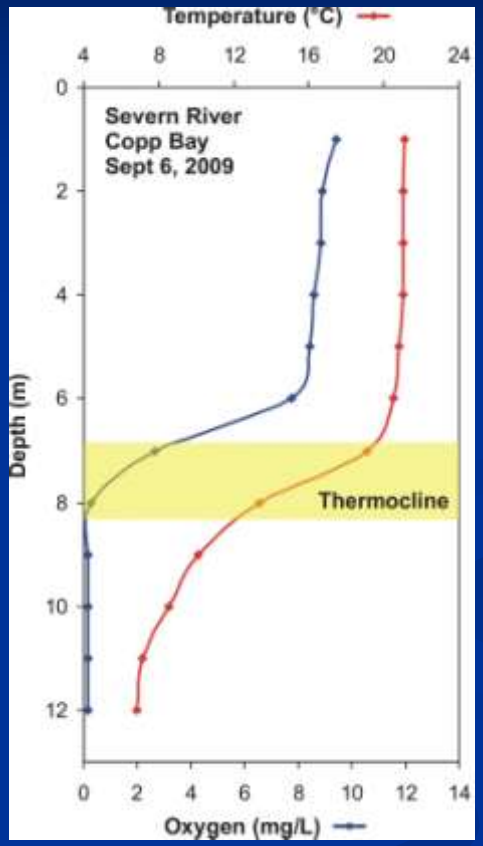
Severn River Multi-Seasonal Surface Averages Fall Data

Severn River Multi-Seasonal Surface Averages Fall Data			
	Conductivity	**Secchi**	**Total Phosphorous**
Russian Bay	313.5	5.4	10.4
Wood Bay	310.2	4.4	11.4
Lost Channel	282.2	5.2	9
Copp Bay	309.7	4	12.6
Average	**303.9**	**4.8**	**10.9**

Russion Bay



Copp Bay




Whites Falls Bay
Big Chute
Baxter Lake
Six Mile Channel
Little Go Home Bay
Main Pool
Upper Little Lake
Lower Little Lake
Black River Channel
Gloucester Pool

Water Quality
Gloucester Pool – Little Go Home Bay

Water Quality Indicator	Month	Top / Bottom	2005	2006	2007	2008	2009	2010	Multi-Seasonal Average	Multi-Year Average
Conductivity (µS/cm)	Spring	T		199.9	233.4				216.7	T 247.6 B 199.2
		B		189.8	292.0				211.6	
	Summer	T		265.0	245.5				255.3	
		B		184.0	126.1				155.1	
	Fall	T	211.1	280.6	260.2	283.2	305.6	285.1	271.0	
		B	208.2	279.5	221.8		229.9	215.6	231.0	
Secchi Disk (meters)	Spring	Depth From Surface			4.5				4.5	5.3
	Summer			5	6				5.5	
	Fall		7.7	7	5.5	6.5	5	4.1	6.0	
Total Phosphorous (µg/L)	Spring	T		5	5				5	T 9.4 B 11.2
		B		3	11				7	
	Summer	T		7	14				10.5	
		B		3	19				11	
	Fall	T	26	3	6	16	10	16	12.8	
		B	20		10	16	20	12	15.6	

Gloucester Pool Fall Seasonal and Annual Data

Gloucester Pool Fall Multi Seasonal and Annual Data						
	Conductivity		Secchi		Total Phosphorous	
	Fall	Annual	Fall	Annual	Fall	Multi-year
Big Chute	330.3		4.9		14	
Six Mile Channel	267.3		4.6		11.8	
White Falls Bay	245.2		4.8		8.8	
Main Pool	278.0	242.8	4.8	4.5	8.3	7.8
Little Go Home Bay	271.0	247.6	6	5.3	12.8	9.4
Black River Channel	236.6	227.0	Bottom	Bottom	11	10.3
Upper Little Lake	274.4	255.0	4.8	4.6	14	10.2
Lower Little Lake	281.3	253.9	Bottom	Bottom	9.8	9.9
AVERAGE	**273.0**	**245.3**	**4.9**	**4.8**	**11.7**	**9.5**

Total Phosphorous Data

Gloucester Pool

Total Phosphorous Data Comparison of District (1992-2007) and LGHB Data (2005-2010)						
Lake	**Location**	**District Spring Data**		**LGHB Data**		
		98-07	**00-09**	**Spring**	**Fall**	**Multi- Year**
Gloucester Pool	**Little Go Home Bay**	**8.6**	**9.7**	**5**	**12.8**	**9.4**


Six Mile Lake
East Crooked Bay
Hungry River
West Crooked Bay
Main Lake
Lost Channel
Long Lake
Trans Canada Bay

Six Mile Lake Multi Seasonal (Fall) and Annual Data

Six Mile Lake Multi-Seasonal (Fall) and Annual Data						
	Conductivity		**Secchi**		**Total Phosphorous**	
	Fall	**Annual**	**Fall**	**Annual**	**Fall**	**Multi-year**
Lost Channel	230.6	228.2	5	4.8	11	8.7
Main Lake	239.2	226.1	6.5	5.3	7.8	8.4
TransCanada Bay	218.8	212.9	5	4.8	8.3	9.5
Hungry River	202.7	206.2	Bottom	Bottom	12.2	10.8
Long Lake	148.9	138.6	4.7	4.2	5.6	6.1
East Crooked Bay	204.2	184.7	5.6	4.3	7.3	7.6
West Crooked Bay	175.3	184.6	6.5	5.1	8.3	7.4
AVERAGE	**202.8**	**197.3**	**5.5**	**4.8**	**8.6**	**8.4**

Total Phosphorous Data – Six Mile Lake

Total Phosphorous Data Comparison of District (1992-2007) and SML Data (2005-2010)						
Lake	**Location**	**District Spring Data**		**SML Data**		
		92-01	**98-07**	**Spring**	**Fall**	**Multi Year**
Six Mile Lake	**TransCanada Bay**	**8.7**	**8.7**	**14.3**	**8.3**	**9.5**
	Main Lake	**8.9**	**11.1**	**10.2**	**7.8**	**8.4**
	Lost Chanel	**8.5**	**10.2**	**8.1**	**11**	**8.7**


Gibson Lake
North Lake
Middle Lake
South Lake

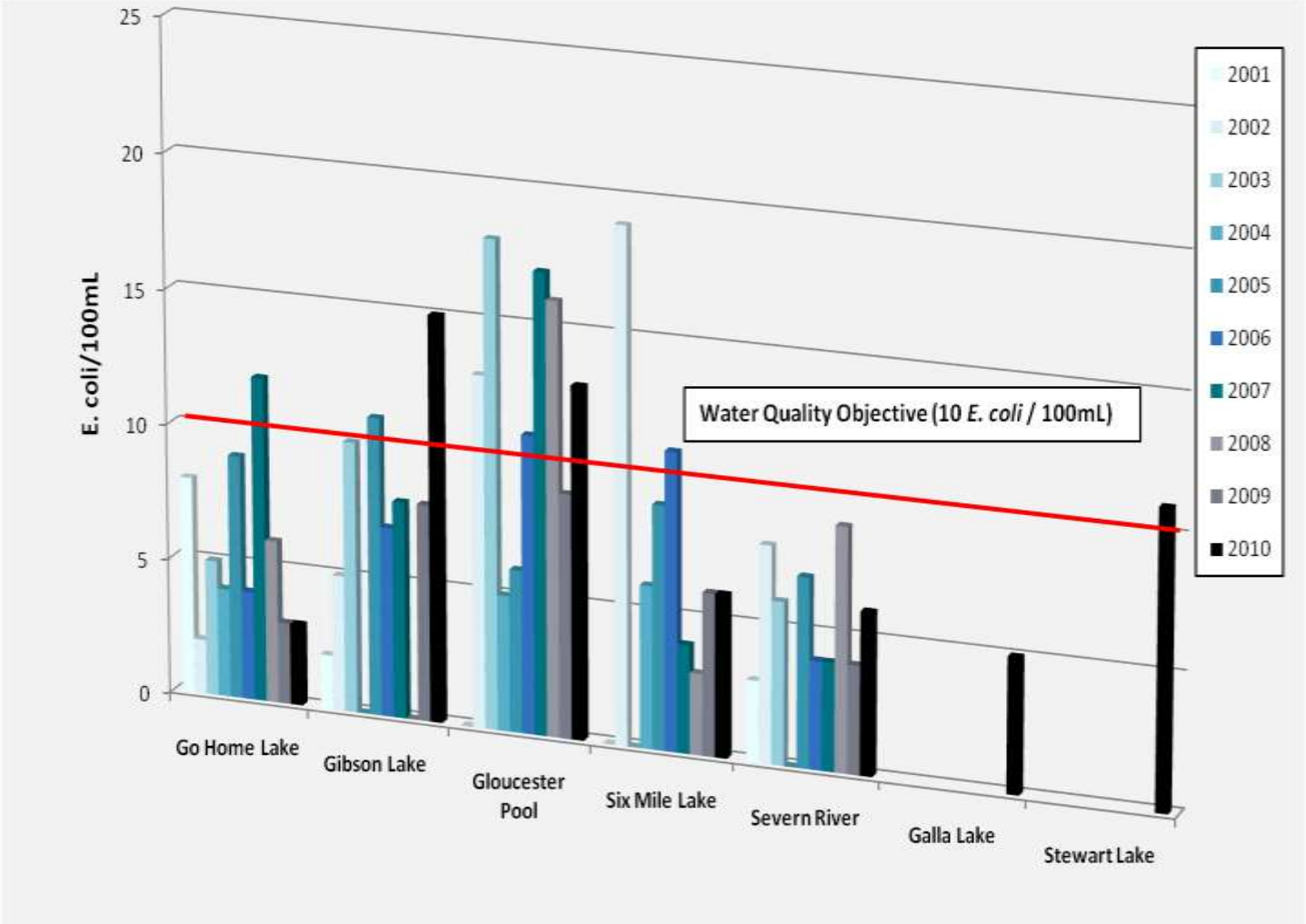
Gibson Lake Surface Multi Seasonal (Fall) and Annual Data						
	Conductivity		**Secchi**		**Total Phosphorous**	
	Fall	**Annual**	**Fall**	**Annual**	**Fall**	**Multi-year**
South Lake	36.0	35.3	2.9	2.5	12	12.8
Middle Lake	36.6	36.6	3	2.6	12	11.7
North Lake	45.1	48.3	2.9	2.6	11.2	8.6
AVERAGE	**39.2**	**40.1**	**2.9**	**2.6**	**11.7**	**11.0**

Total Phosphorous Data Comparison of District and Gibson Lake Data (2006-2010)						
Lake	Location	District Spring Data		Gibson Lake Data		
		1981-2003 2000-2009	1992-2003 2000-2009	Spring	Fall	Multi-Year
Gibson Lake	South Lake		14.4 13.5	16	12	12.8
	North Lake	12.3 10.8		10.5	11.2	8.6


Manning Bay
Swallow Bay
Crystal Bay
Bay of Many Winds
Four Seasons Bay
Blue Lagoon
Control Dam
Go Home Lake

Go Home Lake Multi Seasonal (Fall) Data						
	Conductivity		Secchi		Total Phosphorous	
	Fall	Annual	Fall	Annual	Fall	Multi-year
Swallow Bay	55.2		5		8.1	
Manning Bay	45.9		4.2		5.5	
Crystal Bay	55.4		4.4		8.5	
Bay of Many Winds	55.2		4.5		6.8	
Four Seasons Bay	54.7		5.5		7	
Blue Lagoon	55.1		4.8		11	
Control Dam	55.6		4.5		11.3	
AVERAGE	**53.9**		**4.7**		**8.3**	

Average E. coli Levels Throughout Inland Lakes within Township of Georgian Bay 2001-2010



Recommendations

- Program should continue for another 5 years
- Fall sampling only
- Protocols to match District and other Townships
- Goals and objectives need to be reviewed
- Some site consolidation and some additions
- Presentations to Associations
- Implement shoreline photo program
- Bacteria program to continue