

*City of Grand Rapids
Environmental Services*

Grand River Monitoring

by

Mike Lunn

Environmental Services Department Manager



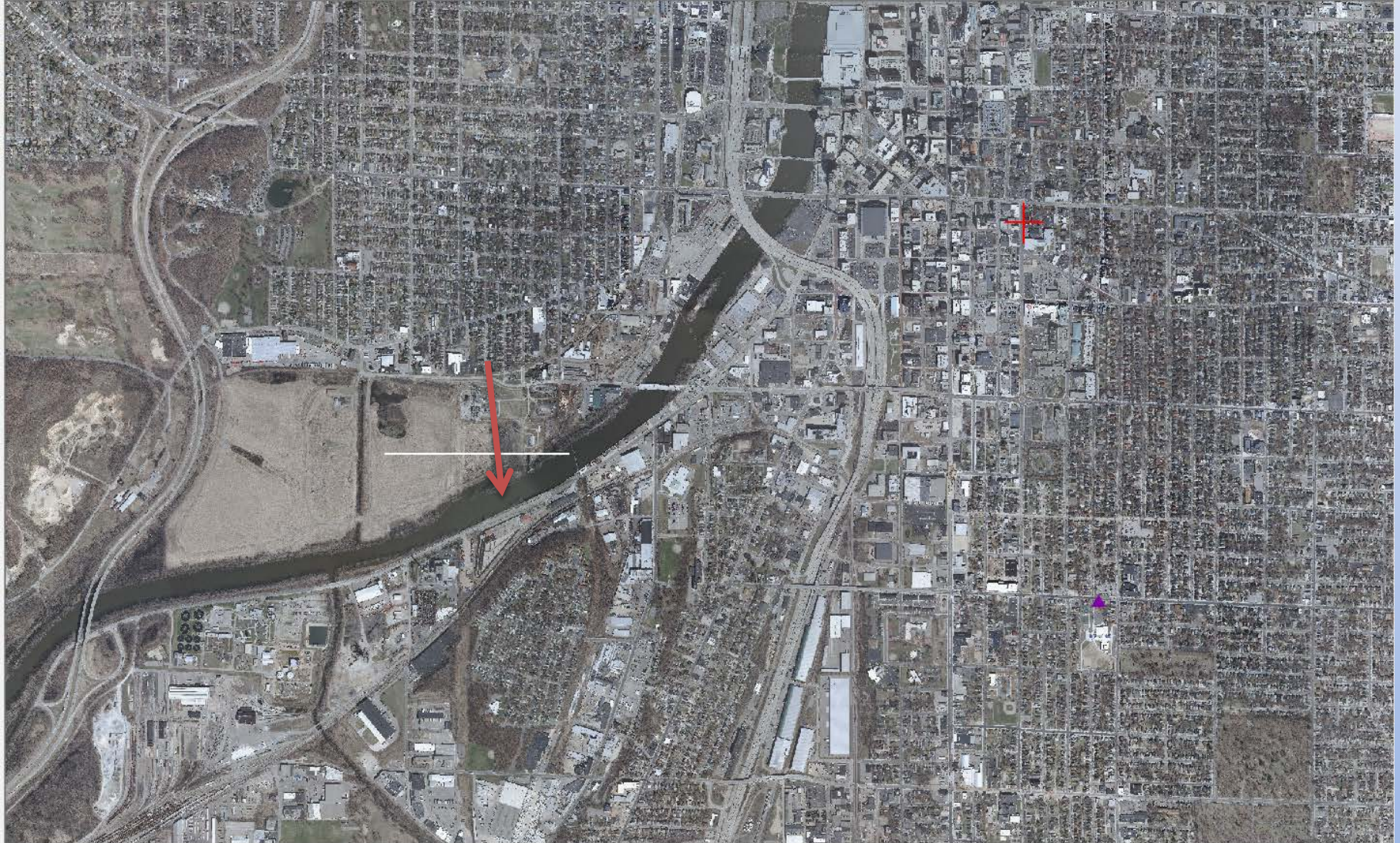
“A Glimpse into the Future: 2005 A.D. “Sewer Once a River”

New Year's Day prophecy of the Evening Press of January 1, 1905

“A Mr. Billjones makes one statement that, seeming almost unbelievable in many ways, is undoubtedly true. He says that the present trunk sewer which enters the city at Plainfield Station and empties into Lake Michigan at the suburb of Grand Haven was once called the Grand River and that the village secured its water supply there. The river, a century ago, was noted for its beauty. Billjones remembers well when in 1945 it was decided to build a cement covering over the river and use it for sewer. The exact line of the old river would be hard to find now, as great manufacturing and office buildings have been erected on it.

In the early days there were factories scattered along the river bank, and bridges connected with what were known then as the East and West side.”

1911



Excerpt from Report on Sewage Disposal made to the
City of Grand Rapids, Board of Public Works,
May, 1915

In 1909, the Township of Wyoming, the village of Grandvile and certain riparian owners upon Grand River in Wyoming Township brought an action in the Superior Court of Grand Rapids against the City of Grand Rapids and various of its officials to restrain the continuance of an alleged public nuisance resulting from the discharge of sewage and sewage materials into the Grand River. This was a proceeding in equity, filed in the name of the attorney-general of the state.

A decision was rendered in September, 1911, in favor of the defendant city. The case was appealed to the Supreme Court of the state, and was there argued by counsel in May, 1913. The outcome was that the decree of the lower court was reversed, and on December 20th, 1913, a decree was entered in the Supreme court directing the defendant city and its officials to “refrain and desist from continuing to discharge the sewage of the city of Grand Rapids, which is now discharged into the said Grand River, until the same shall have first been so **deodorized and purified** as not to contain the foul, offensive or noxious matter (which it now contains) capable of injuring complainants or their property, or causing a nuisance thereto.

The prophecy seemed somewhat ominous when on June 9, 1964, the Grand Rapids Press carried these words:

“An over-the-river ramp and an underground facility loomed Monday as alternate possibilities for solving the future Civic Auditorium parking needs. The Automobile Parking Authority called for a new look at an old proposal to build a ramp over the river between the interurban bridge and Pearl Street NW bridge.”

Grand River Monitoring History

1968 – Grand River Monitoring Network

Since 1988 -

- *Data in database*
- *Water Quality Index (WQI)*
- *Monthly Monitoring through August, 2005*
- *Quarterly Monitoring since August, 2005*
- *Currently 15 Monitoring Locations*

Michigan Grand River Watershed Council

- Authorized under Act 253 – Public Acts of 1964
- Grand River Council, formed in 1966 and second organized under this Act
- Council's purpose
 - Study
 - Plan
 - Be the coordinating agency



Initial River Monitoring

- Established a monitoring network in 1968, collecting monthly samples at 100 sampling locations
- Conclusions from a 2 year study
 - “DO was acceptable all along the river *except* below Lansing and Jackson (fish life cannot be sustained at times).”
 - “Chlorides (salt) – Acceptable all along river.”
 - “Total bacteria – Acceptable all along river”
 - “Fecal coliforms – Not acceptable all along river. (This matter under study.)”
 - “Metals Wastes – Acceptable – Under supervision of control agencies.”

sample of your site 1 data for July 22 1970

MICHIGAN GRAND RIVER WATERSHED MONITORING PROGRAM

STORED SYSTEM - WATER QUALITY DATA

LABORATORY BENCH DATA										COMPUTER CODED DATA									
STATION DESIGNATION					DATE OF SAMPLE					STATION CODE SERIAL					YR. MO. DAY				
252850					70 07 22					2 5 2 8 5 0					7 0 0 7 2 2				
HOUR & MINUTE OF SAMPLE										1-6									
1450										7-12									
ITEM Temperature UNIT °C										13-18									
245										PARAMETER CODE VALUE EXPONENT SIGNS									
00010										2450 1 2									
ITEM Dissolved Oxygen UNIT mg/l										19-25									
120										00300 1200 1 2									
ITEM ml UNIT Std.										26-32									
8.3										00400 8300 1 1									
ITEM Chlorides UNIT mg/l										33-39									
160										00900 1600 1 2									
ITEM Total Phosphate UNIT mg/l										40-46									
22										00650 2200 0 0									
ITEM Ammonia - NH ₃ as N UNIT mg/l										47-53									
52										00610 5200 0 0									
ITEM Nitrite - NO ₂ as N UNIT mg/l										54-60									
0045										00615 4500 0 2									
ITEM Nitrate - NO ₃ as N UNIT mg/l										61-67									
04										00620 4000 0 1									
ITEM Iron as Fe - Total UNIT µg/l										68-74									
00										01045 0000 0 0									
ITEM Manganese as Mn UNIT µg/l										75-81									
60										01040 6000 1 2									

9-667 (Formerly MIS-411-2)

Michigan Grand River Watershed Monitoring Program
 Report for 7/22/1970



MICHIGAN GRAND RIVER WATERSHED MONITORING PROGRAM - SAMPLING RESULTS ON THE GRAND RIVER - DATE August 19, 1970

Station Code	Time	Temp. °F	D.O. mg/l	BOD mg/l	pH	Coliform		Total Ortho Chlor- ^{as}		NH ₃ N mg/l	NO ₃ N mg/l	SS mg/l	VSS mg/l	Fe mg/l	Cu mg/l	Cr mg/l	Zn mg/l	Ni mg/l		
						Total	Fecal	PO ₄ mg/l	PO ₄ mg/l											
250390	10:50	23 C	7.9	4.3	7.8			.10	-	8.5	.12	.17	8.4	-	.00	.00	-	-	-	
250378	11:15	24 C	6.0	2.8	7.9			.10	-	14.0	.34	.15	7.1	-	.00	.02	-	-	-	
250370	09:55	25 C	7.5	3.9	7.8			.14	-	20.5	.29	.09	6.6	-	.00	.02	-	-	-	
250360	08:26	67	5.4	5.8	8.6	4300	340	.30	-	21.0	.30	.60	-	-	-	-	-	-	-	
250350	08:35	68	5.2	2.0	8.4	2300	160	-	-	20.0	.50	-	-	-	-	-	-	-	-	
250340	08:46	67	5.6	3.6	8.4	140,000	3000	-	-	35.0	.60	-	-	-	-	-	-	-	-	
250330	08:55	67	5.0	2.2	8.3	140,000	20,000	-	-	36.0	.50	-	-	-	-	-	-	-	-	
250320	09:07	67	1.4	6.2	8.3	140,000	20,000	.9	-	52.0	1.7	.60	-	-	-	-	-	-	-	
250310	09:35	66	2.8	7.6	8.0	140,000	20,000	.9	-	80.0	1.6	.60	-	-	-	-	-	-	-	
250300	10:00	66	2.8	6.4	8.1	140,000	20,000	1.5	-	79.0	1.9	.80	-	-	-	-	-	-	-	
250290	10:17	66	4.0	3.2	8.1	4300	200	1.0	-	69.0	1.8	.60	-	-	-	-	-	-	-	
250280	10:37	65	6.0	3.4	8.1	730	160	1.0	-	48.0	0.4	.80	-	-	-	-	-	-	-	
250270																				
250260																				
250250																				
250240	09:45	77	9.4	2.2	8.5	46,000		9.5	.35											
250230	10:30	79	5.0	12.3	7.7	110,000		1.6	1.3											
250220	10:45	79	4.0	9.3	7.6	110,000		1.8	1.6											
250210	-	78	2.6	14.7	7.5	110,000		2.7	2.1											
250200	08:15	70	4.6	2.8	8.0	15,600		.54												
250190	09:00	71	5.8	2.0	8.0	13,500		.43												
250180																				
250170																				
250160																				
250150																				
250140																				
250130																				
250120	08:50	74	8.0	3.3	8.0	500	40	.23	.11	30.0	.32	.13	19	13	.08	0	0	.06	0	
250110	09:42	68	8.0	4.9	8.3	300	50	.23	.09	26.0	.12	.40	9	9	.06	0	0	.02	0	
250100	07:30	75	-	-	8.5	-	-	-	-	23.0	-	.49	-	-	.25	-	-	-	-	
250090	10:17	73	8.3	3.6	8.3	850	160	.10	.10	40.0	.37	.40	25	14	.03	0	0	.02	0	
250071	11:11	74	7.6	3.9	8.2	1400	200	.24	.17	56.0	1.2	.40	34	19	.07	0	0	.07	0	
250070	11:02	74	7.8	5.9	8.2	2200	220	.32	.20	56.0	.67	.13	26	7	.06	.01	.0	.02	0	
250061	11:36	74	7.6	5.5	8.2	2000	250	.28	.23	58.0	.57	.13	30	23	.04	0	0	.04	0	
250060	11:25	74	7.1	3.5	8.2	5800	520	.18	.17	58.0	.77	.40	27	16	.05	0	0	.03	0	
250050	9:00	75	4.6	4.4	8.1	60,000	-	.28	.27	54.0	1.1	.25	21	16	.05	0	0	.02	0	
250040																				
250030	10:20	69	6.5	2.7	8.1	2,200	-	1.7	1.2			27	12							
250020	09:50	68	5.9	4.8	8.0	1,750	-	1.5	1.1			21	12							
250010	09:20	68	4.5	1.0	8.0	1,800	-	.65	.24			19	10							

The Grand River Watershed Council - Special Report, November 1971-

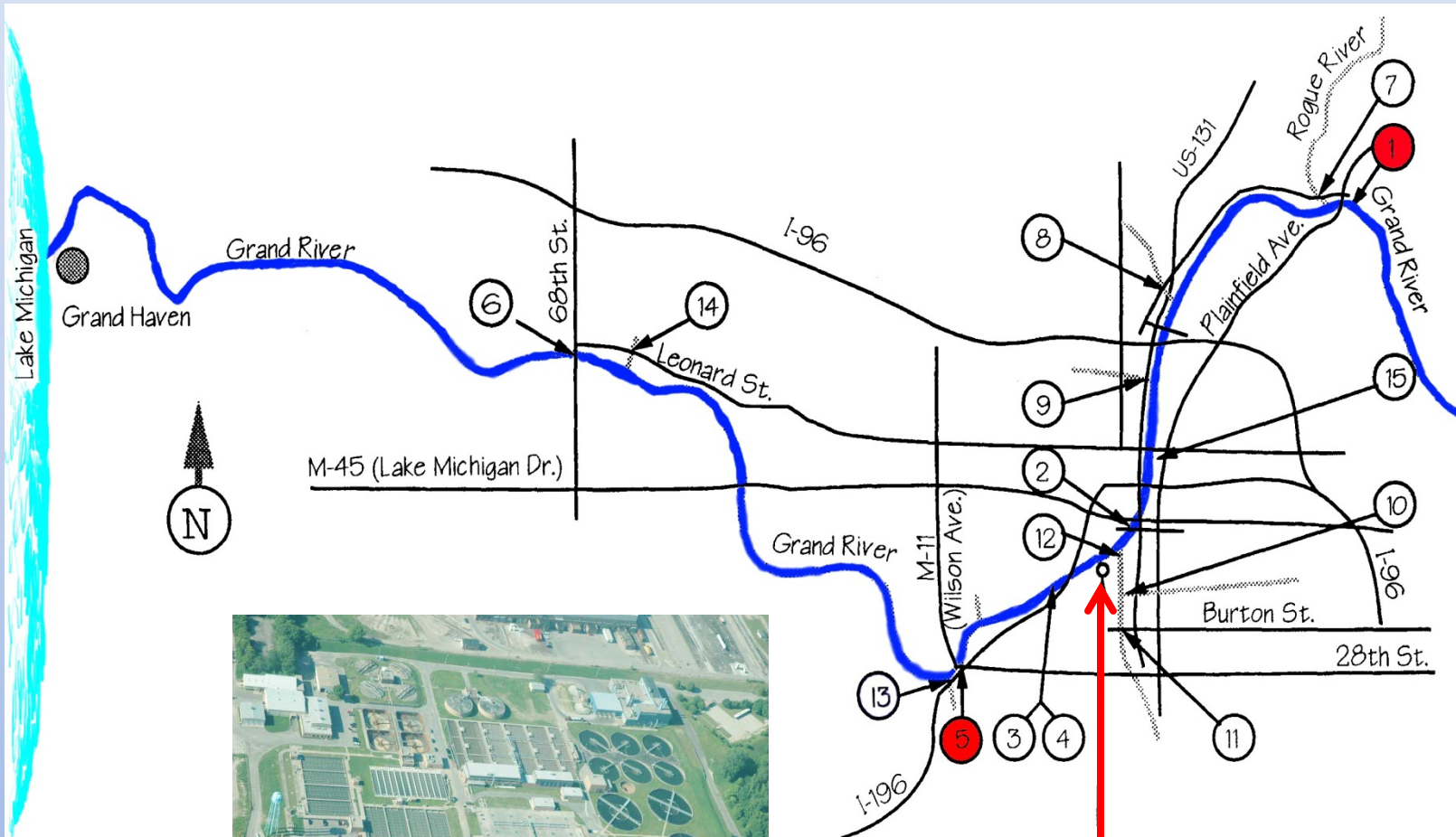
- “The Watershed Council considers **monthly sample data inadequate** for water quality management purposes. Therefore, it has developed plans, in cooperation with the Grand Rapids Center for Environmental Study, for a **network of continuous analyzers** connected to a computer in Grand Rapids for immediate data readout.”
- “In order that the people within the watershed can be kept better informed about water quality, the Watershed Council is participating in a study in cooperation with the National Sanitation Foundation in Ann Arbor to establish a **Water Quality Index.**”

The Water Quality Index (WQI)

- An informational tool
- Available via the media
- Common understanding
- Identify trends in a single body of water
- Compare different bodies of water
- Become a “daily household word”
- Yardstick for measuring water quality
- Uniform method for measuring water quality
- Surveyed 142 water quality experts to develop WQI



Monitoring Locations



Grand Rapids
WWTP

Grand River Locations

Northland Dr. Bridge



Wealthy St. Bridge



Railroad Bridge S.

Railroad Bridge N.

M-11, Wilson Ave. Bridge

Eastmanville,
68th Ave.
Bridge



Tributaries

Mill Creek

Indian Mill Creek

Coldbrook Storm Drain

Silver Creek

Buck Creek

Deer Creek



Rogue River



Plaster Creek, (2 sites)



Photos taken 4/16/2013

Water Quality Index

Parameter	Weight
Dissolved oxygen	0.17
Fecal coliform	0.16
pH	0.11
Biochemical oxygen demand	0.11
Temperature change	0.10
Total phosphate	0.10
Nitrates	0.10
Turbidity	0.10
Total solids	0.07

Water Quality Index
Legend

Range	Quality
90-100	Excellent
70-90	Good
50-70	Medium
25-50	Bad
0-25	Very bad

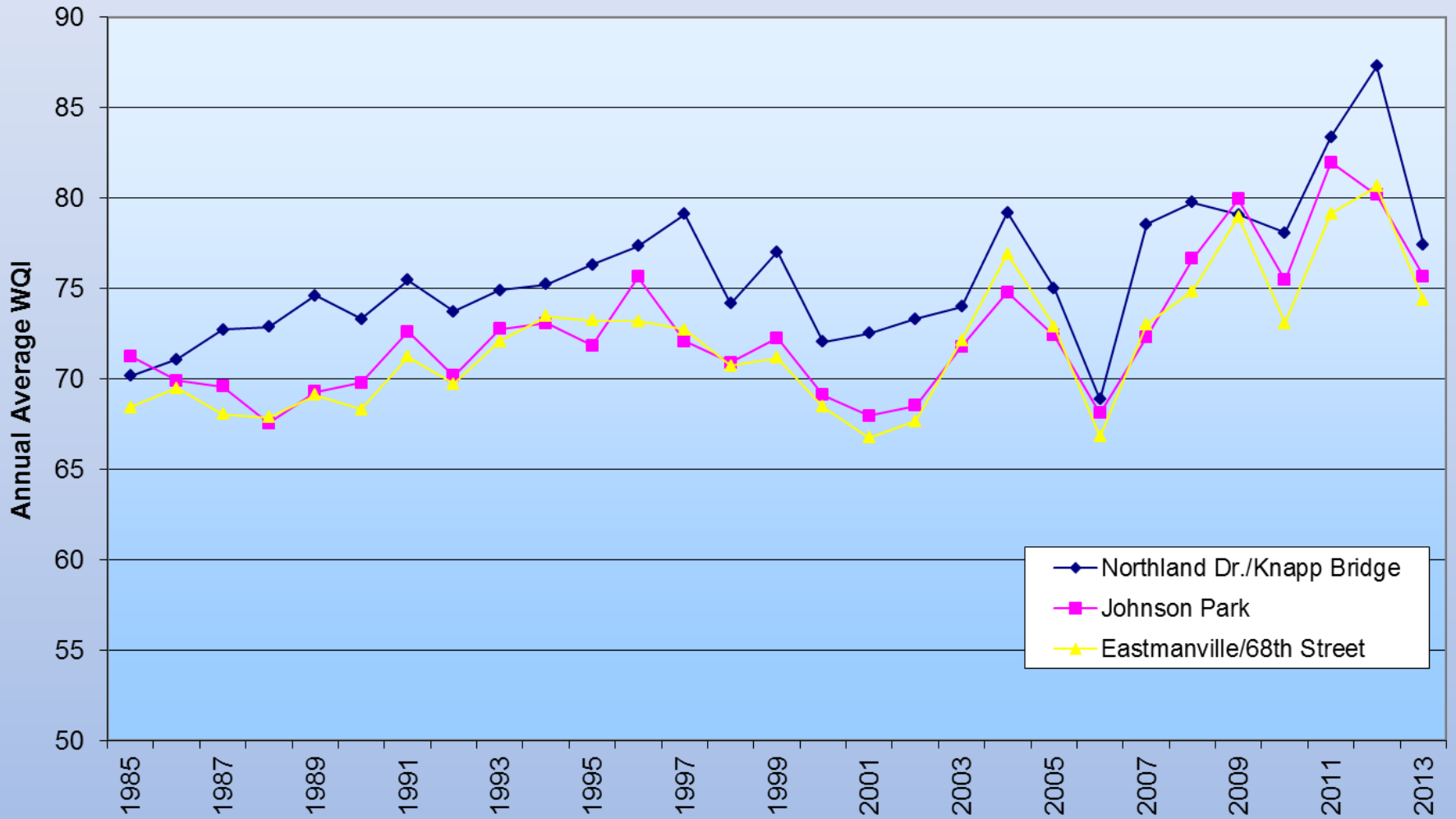
Grand Rapids Modified Water Quality Index

Parameter	Weight
Dissolved oxygen	0.18
Fecal coliform	0.17
pH	0.12
Biochemical oxygen demand	0.12
Temperature change	0.11
Total phosphate	0.11
Nitrates	0.11
Turbidity – Not Measured	-
Total Suspended Solids + Chlorides instead of Total solids	0.08

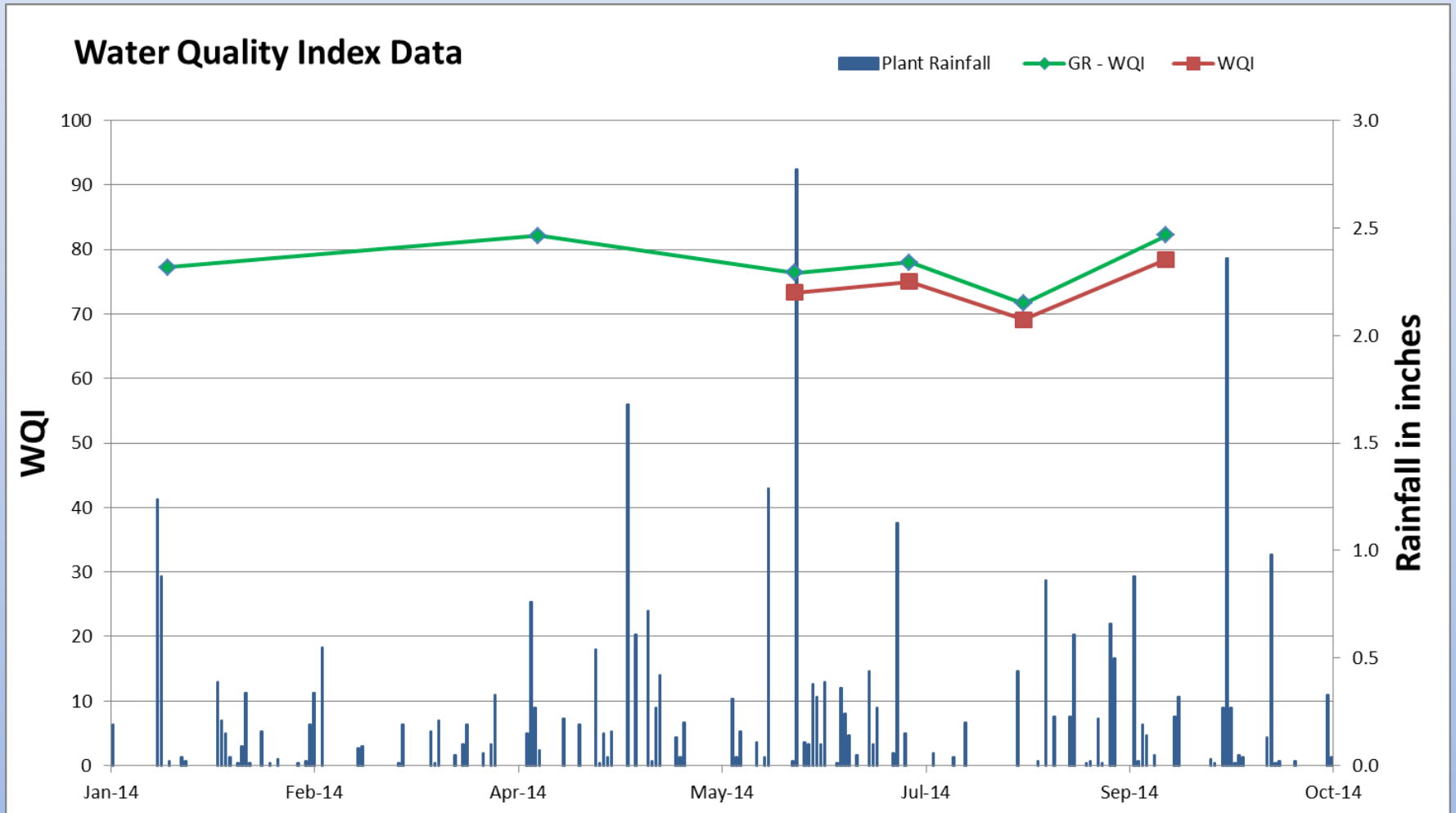
Water Quality Index
Legend

Range	Quality
90-100	Excellent
70-90	Good
50-70	Medium
25-50	Bad
0-25	Very bad

Water Quality Index



GR WQI vs Actual WQI



River Run without Any Rainfall in Previous 3 Days

RIVER SURVEY REPORT

DATE: 10/12/2011

CITY OF GRAND RAPIDS EPSD

LOCATIONS	TIME	TEMP	DO	pH	BOD	TSS	FC	EC	CHLORIDE	CON	TP	NH3-N	NO2-N	NO3-N
Grand River														
201103997 Northland Drive Bridge (250120)	8:48	14.8	9.5	7.86	<2.0	5.0	35	38	46	665	0.016	<0.20	0.001	0.5
201103998 Wealthy Street Bridge (250090)	9:42	16.1	9.2	7.96	<2.0	4.0	52	48	64	724	0.012	<0.20	0.003	0.5
201103999 Railroad Bridge South (250070)	13:10	18.6	8.8	7.62	<2.0	3.0	52		67	736	0.030	<0.20	0.006	0.5
201104000 Railroad Bridge North (250071)	13:10	18.2	9.3	7.68	<2.0	2.8	32	40	63	727	0.060	<0.20	0.010	0.6
201104001 M-11, Wilson Avenue (250062)	10:39	16.6	8.5	7.87	<2.0	3.4	40	24	61	741	0.034	<0.20	0.007	0.8
201104002 Eastmanville (250040)	12:04	18.0	9.2	7.74	<2.0	3.6	40	44	68	765	0.043	<0.20	0.011	1.0
Streams														
201104003 Rogue River at West River Drive	8:23	13.0	9.0	7.72	<2.0	4.4	73		40	635	0.013	<0.20	0.006	0.5
201104004 Mill Creek at West River Drive	8:06	12.4	9.7	7.73	<2.0	1.8	36		49	712	<0.009	<0.20	0.005	0.5
201104005 Indian Mill Creek at Turner Aven	7:53	12.6	9.3	7.54	<2.0	16.6	200		95	953	0.017	<0.20	0.005	0.9
201104006 Silver Creek at Croften/Roy	9:26	15.1	9.5	7.84	<2.0	0.8	530		187	1210	0.214	<0.20	0.006	1.1
201104007 Plaster 1 at Burton	9:16	14.3	7.2	7.59	<2.0	2.8	200		187	1260	0.023	0.23	0.036	0.4
201104008 Plaster 2 at Market	9:59	14.9	8.7	7.69	<2.0	1.4	173		199	1360	<0.009	<0.20	0.027	0.6
201104009 Buck Creek at Chicago Drive	20:52	14.7	8.8	7.77	<2.0	2.4	210		135	1140	0.009	<0.20	0.004	0.1
201104010 Deer Creek	12:15	15.7	4.2	7.43	<2.0	2.2	64		39	697	0.117	<0.20	0.004	<0.1
201104011 Coldbrook Storm Drain	7:36	14.5	9.9	7.68	<2.0	4.0	300		188	1260	0.026	<0.20	0.009	0.3

LOCATIONS	Cr	Cu	Fe	Hg	Ni	Ag	Zn	Hard	WQI	Miscellaneous Information and Test Descriptions:
Grand River										
201103997 Northland Drive Bridge (250120)	<2	2	120	<0.2	<1	<0.3	<5	307	85.1	Weather conditions: Sunny.
201103998 Wealthy Street Bridge (250090)	<2	2	80	<0.2	1	<0.3	<5	306	84.0	Air Temperature: 17°C
201103999 Railroad Bridge South (250070)	<2	1	80	<0.2	1	<0.3	<5	317	83.8	Comments:
201104000 Railroad Bridge North (250071)	<2	2	70	<0.2	2	<0.3	<5	324	85.2	River Flow: 1800 cfs
201104001 M-11, Wilson Avenue (250062)	<2	1	70	<0.2	1	<0.3	<5	317	83.4	Field Technicians: Kurt Anderson / Kathy Makarewicz (before 10:11AM)/Mike Bussey (after 10:11AM)
201104002 Eastmanville (250040)	<2	1	90	<0.2	1	<0.3	7	326	82.4	
Streams										
201104003 Rogue River at West River Drive	<2	2	150	<0.2	<1	<0.3	<5	311	82.3	Time samples (hh:mm) Nitrites as nitrogen (mg/L)
201104004 Mill Creek at West River Drive	<2	<1	90	<0.2	<1	<0.3	<5	341	84.9	Sample temperature (°C) Nitrates as nitrogen (mg/L)
201104005 Indian Mill Creek at Turner Aven	<2	2	510	<0.2	<1	<0.3	9	388	77.0	Dissolved oxygen (mg/L) Total chromium (µg/L)
201104006 Silver Creek at Croften/Roy	7	15	140	<0.2	8	<0.3	42	352	70.7	pH (pH units) Total Copper (µg/L)
201104007 Plaster 1 at Burton	<2	1	150	<0.2	<1	<0.3	9	381	73.7	BOD-5 (mg/L) Total iron (µg/L)
201104008 Plaster 2 at Market	<2	1	120	<0.2	1	<0.3	7	442	76.7	Total suspended solids (mg/L) Total mercury (µg/L)
201104009 Buck Creek at Chicago Drive	<2	1	200	<0.2	<1	<0.3	10	436	77.9	Fecal coliform (#FC/100mL) Total nickel (µg/L)
201104010 Deer Creek	<2	2	160	<0.2	<1	<0.3	<5	326	70.4	E. coli (#EC/100mL) Total silver (µg/L)
201104011 Coldbrook Storm Drain	<2	2	280	<0.2	1	<0.3	9	405	76.7	Chlorides (mg/L) Total zinc (µg/L)
										Conductivity (µS/cm) Hardness (mg/L CaCO3)
										Total phosphorus (mg/L) Water Quality Index (percent)
										Ammonia as nitrogen (mg/L)

River Run with Rainfall Exceeding 1"

QUARTERLY RIVER SURVEY REPORT

DATE: 06/16/2010

CITY OF GRAND RAPIDS EPSD

Grand River		Time	Temp	DO	pH	BOD	TSS	FC	EC	Chloride	Cond	TP	NH ₃ -N	NO ₂ -N	NO ₃ -N
201002385	Northland Drive Bridge (250120)	08:06	20.3	7.6	7.52	<2.0	47.6	>1500	>2420	23	466	0.184	0.07	0.015	0.9
201002386	Wealthy Street Bridge (250090)	08:46	21.2	7.6	7.65	<2.0	24.0	420	326	31	557	0.121	0.05	0.014	1.1
201002387	Railroad Bridge South (250070)	12:05	21.0	7.4	7.51	2.4	88.4	>1500		33	478	0.227	0.06	0.011	0.5
201002388	Railroad Bridge North (250071)	12:08	21.1	7.5	7.44	<2.0	27.2	>1500	2420	32	535	0.143	0.05	0.017	0.8
201002389	M-11, Wilson Avenue (250062)	09:48	21.1	7.4	7.22	<2.0	42.0	>1500	>2420	33	529	0.164	0.06	0.018	1.0
201002390	Eastmanville (250040)	11:13	21.6	7.0	7.17	<2.0	31.2	1390	1120	40	594	0.141	0.06	0.019	0.9

Streams		Time	Temp	DO	pH	BOD	TSS	FC	EC	Chloride	Cond	TP	NH ₃ -N	NO ₂ -N	NO ₃ -N
201002391	Rogue River at West River Drive	07:49	18.3	8.4	7.45	2.2	60.0	10100		27	457	0.151	0.06	0.009	0.4
201002392	Mill Creek at West River Drive	07:34	17.1	9.0	7.57	<2.0	21.6	2200		39	592	0.088	0.07	0.015	0.7
201002393	Indian Mill Creek at Turner Avenue	07:20	18.4	8.0	7.40	2.6	33.6	8600		49	459	0.147	0.08	0.015	0.3
201002394	Silver Creek at Croften/Roy	08:58	19.7	8.6	7.50	3.6	45.2	>15000		17	197	0.307	0.10	0.015	0.4
201002395	Plaster 1 at Burton	09:07	20.0	7.4	7.37	4.0	341	>15000		25	230	0.517	0.09	0.009	0.1
201002396	Plaster 2 at Market	09:19	20.3	7.5	7.12	4.6	296	>15000		36	288	0.472	0.09	0.015	0.3
201002397	Buck Creek at Chicago Drive	09:56	20.4	6.9	7.20	3.3	84.0	>15000		19	220	0.232	0.08	0.010	0.1
201002398	Deer Creek	11:23	19.8	5.8	7.25	<2.0	18.6	430		36	645	0.193	0.12	0.049	1.0
201002399	Coldbrook Storm Drain	07:10	20.4	8.5	7.61	3.8	38.8	>15000		72	464	0.189	0.08	0.001	<0.1

Grand River		Cr	Cu	Fe	Hg	Ni	Ag	Zn	Hard	WQI
201002385	Northland Drive Bridge (250120)	<2	3.0	2290	<0.2	1.8	<0.3	13	224	68.5
201002386	Wealthy Street Bridge (250090)	<2	3.0	1020	<0.2	1.3	<0.3	7	259	73.7
201002387	Railroad Bridge South (250070)	2	4.0	2920	<0.2	2.7	<0.3	21	223	67.2
201002388	Railroad Bridge North (250071)	3	3.0	1740	<0.2	1.7	<0.3	15	249	69.6
201002389	M-11, Wilson Avenue (250062)	<2	7.0	1610	<0.2	1.8	<0.3	15	234	68.0
201002390	Eastmanville (250040)	2	4.0	1330	<0.2	1.8	<0.3	13	259	68.2

Streams		Cr	Cu	Fe	Hg	Ni	Ag	Zn	Hard	WQI
201002391	Rogue River at West River Drive	4	2.0	1960	<0.2	1.1	<0.3	11	215	61.4
201002392	Mill Creek at West River Drive	<2	2.0	800	<0.2	<1.0	<0.3	7	268	68.7
201002393	Indian Mill Creek at Turner Avenue	<2	4.0	1600	<0.2	1.4	<0.3	22	163	60.7
201002394	Silver Creek at Croften/Roy	5	7.0	4070	<0.2	3.5	<0.3	27	79	57.8
201002395	Plaster 1 at Burton	17	13.0	11200	<0.2	8.1	<0.3	80	141	52.6
201002396	Plaster 2 at Market	13	11.0	9720	<0.2	6.8	<0.3	68	145	52.9
201002397	Buck Creek at Chicago Drive	3	5.0	3820	<0.2	2.1	<0.3	27	82	56.6
201002398	Deer Creek	<2	2.0	960	<0.2	1.1	<0.3	<5	300	69.3
201002399	Coldbrook Storm Drain	2	7.0	1630	<0.2	1.6	<0.3	21	126	58.2

Miscellaneous Information

Weather conditions: Overcast
 Air Temperature: 19°C.
 Comments:
 River Flow: 7460 cfs
 Field Technicians: Marc Barton / Sam
 VandenBerg

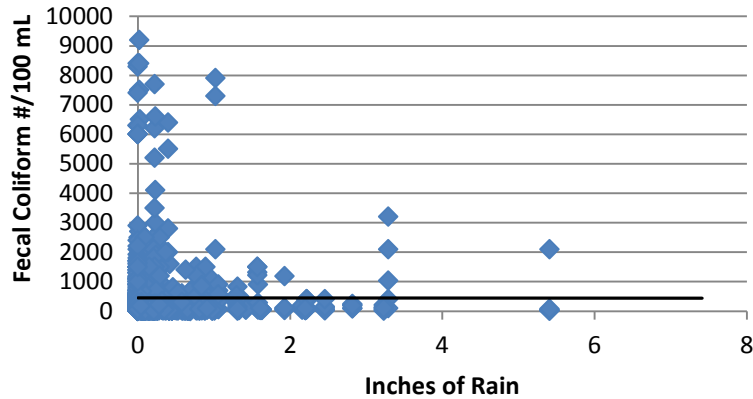
Test Descriptions

Time (h:mm)
 Temperature (°C)
 DO: Dissolved Oxygen (mg/L)
 pH (pH units)
 BOD: 5-day Biochemical Oxygen Demand (mg/L)
 TSS: Total Suspended Solids (mg/L)
 FC: Fecal Coliform (#FC/100ml)
 EC: E. coli (#EC/100ml)
 Chloride (mg/L)
 Conductivity (µS/cm)
 TP: Total Phosphorous (mg/L)
 NH₃-N: Ammonia as nitrogen (mg/L)
 NO₂-N: Nitrite as nitrogen (mg/L)
 NO₃-N: Nitrate as nitrogen (mg/L)
 Cr: Total Chromium (ug/L)
 Cu: Total Copper (ug/L)
 Fe: Total Iron (ug/L)
 Hg: Total Mercury (ug/L)
 Ni: Total Nickel (ug/L)
 Ag: Total Silver (ug/L)
 Zn: Total Zinc (ug/L)
 Hardness (mg/L as CaCO₃)
 WQI: Water Quality Index (percent)

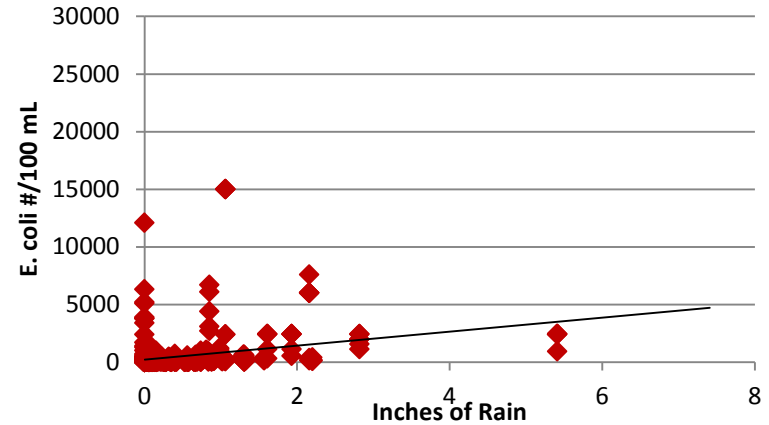
River Survey Report

Rain Events and Water Quality

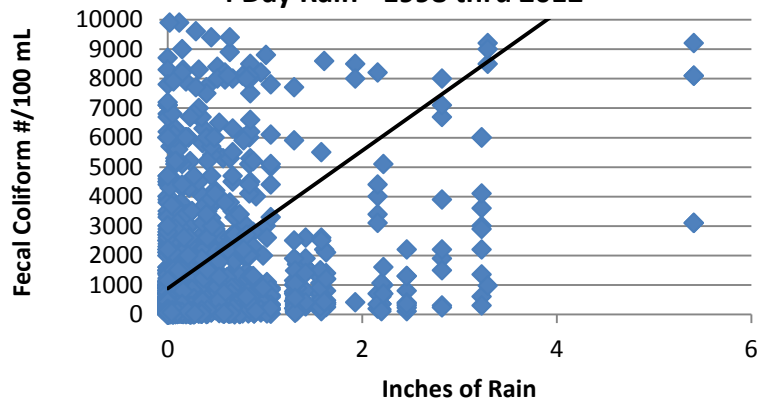
Grand River Locations - Fecal Coliform vs. 4 Day Rain - 1998 thru 2012



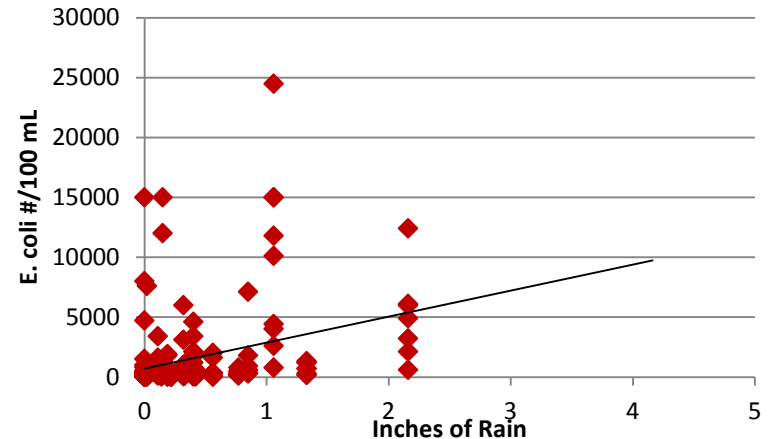
Grand River Locations - E. coli vs. 4 Day Rain - 1998 thru 2012



Tributary Locations - Fecal Coliform vs. 4 Day Rain - 1998 thru 2012

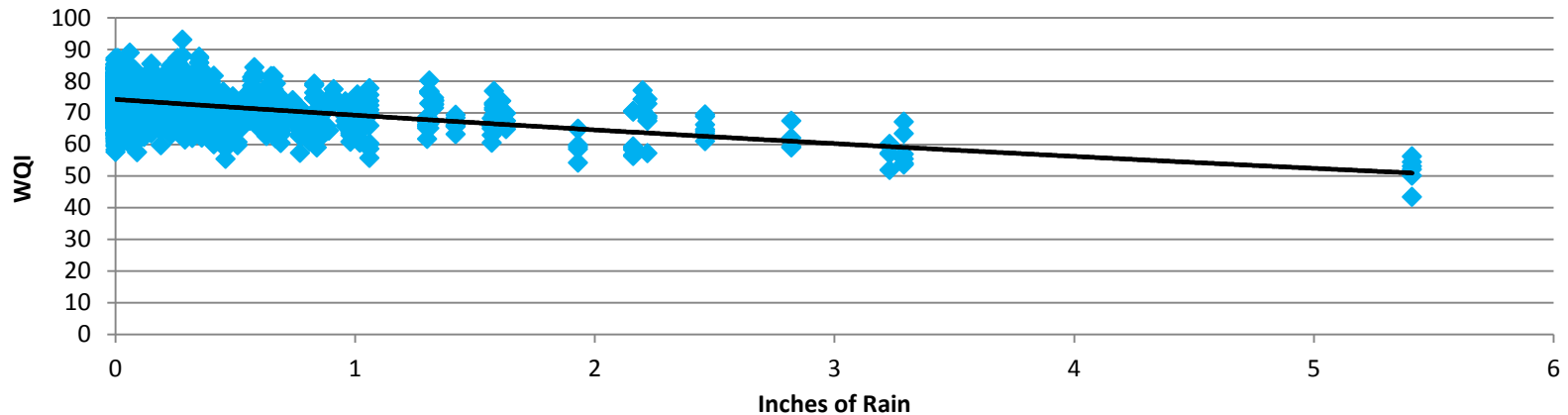


Tributary Locations - E. coli vs. 4 Day Rain - 1998 thru 2012

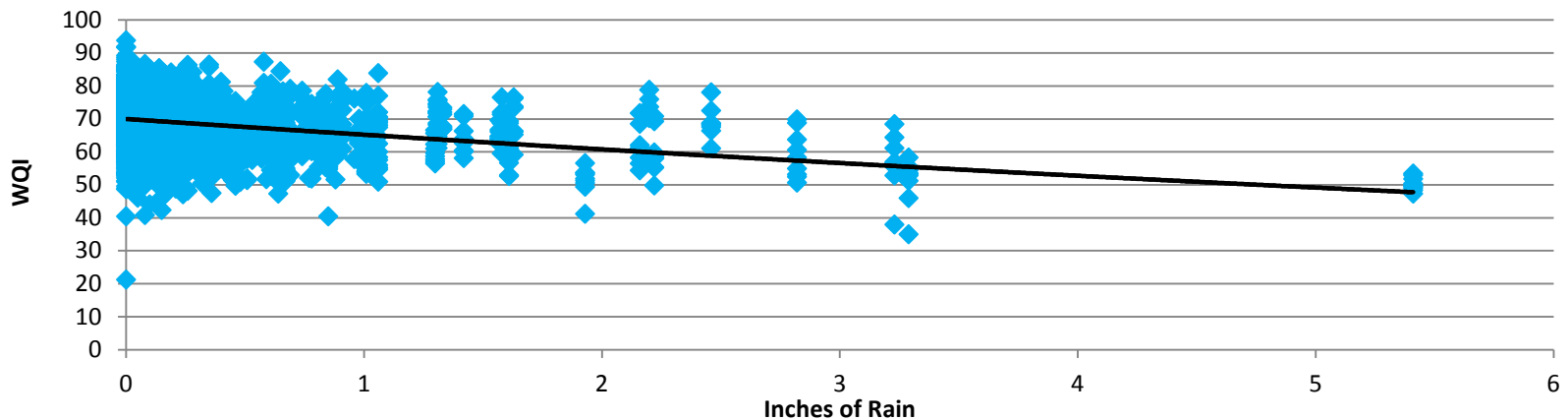


Rain Events and Water Quality Index

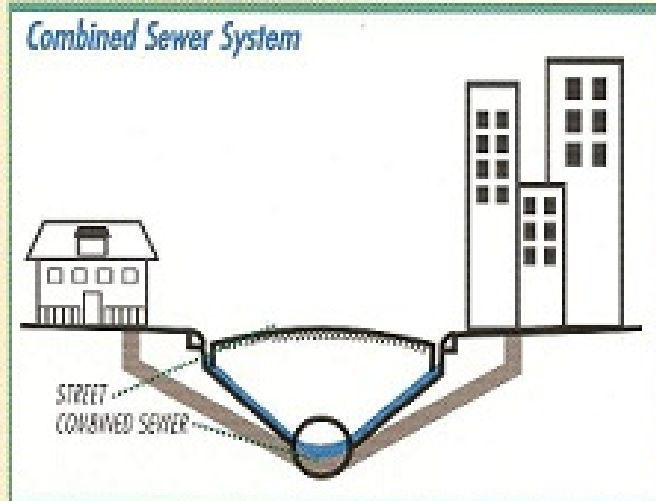
Grand River Locations - WQI vs 4 Day Rain - 1998 thru 2012



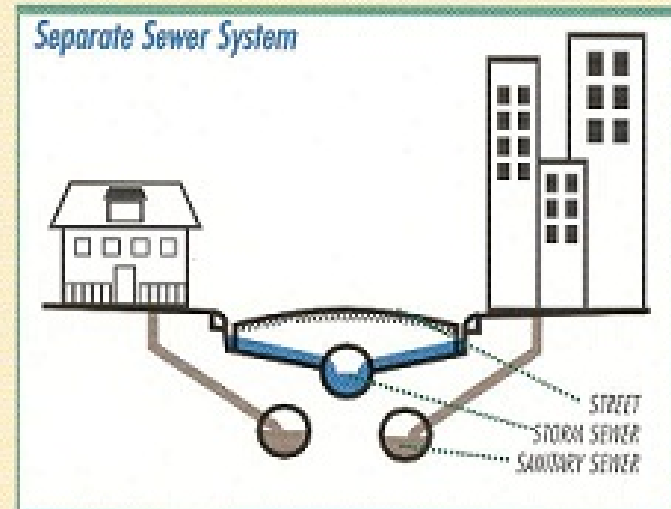
Tributary Locations - WQI vs. 4 Day Rain - 1998 thru 2012



Combined Sewers

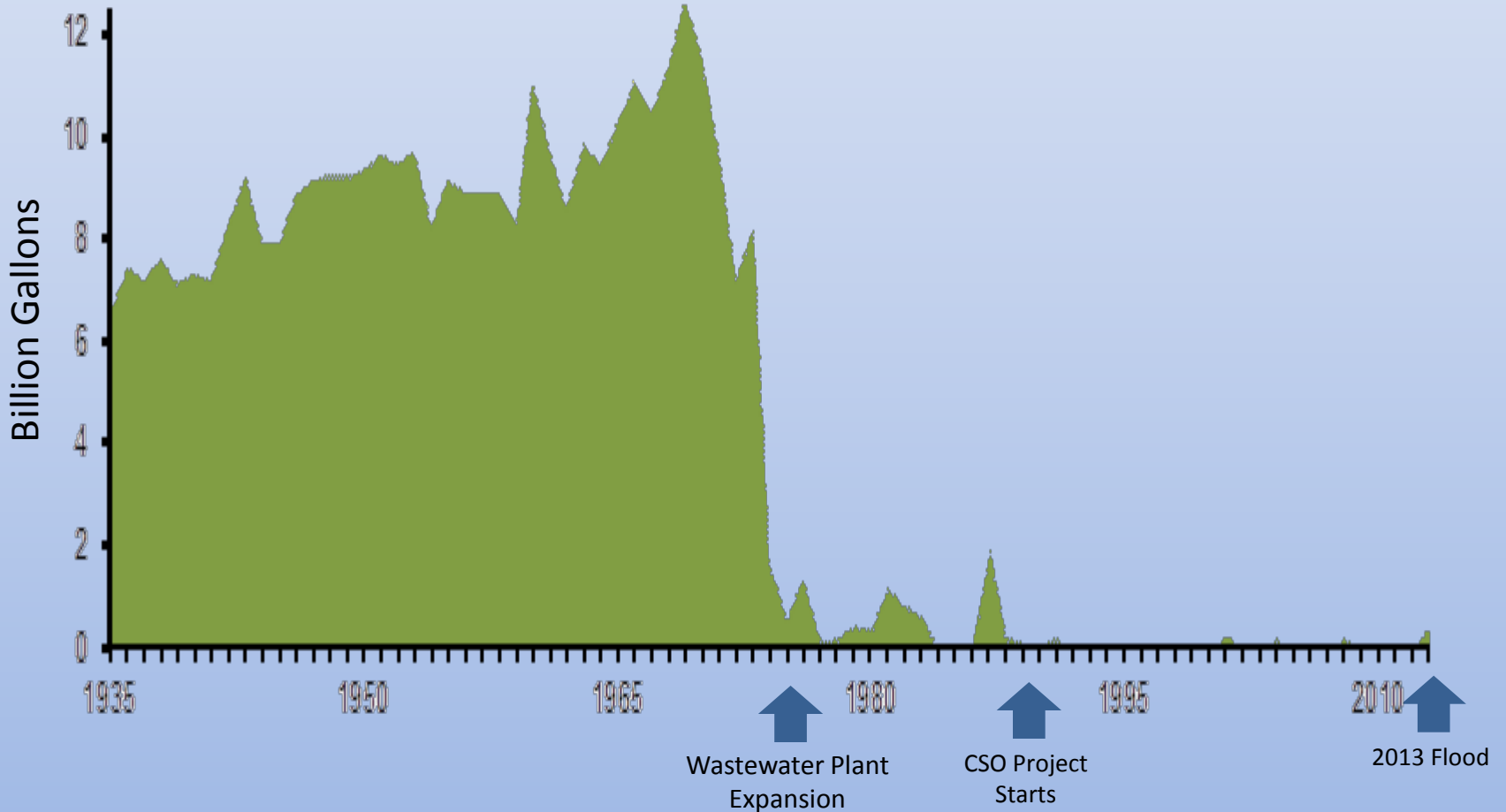


Combined sewer overflow (CSO) occurs when a single collection pipe is used to convey both storm runoff and sanitary wastes. During heavy rains or snow melts, the overflow, which includes sewage, is discharged into a nearby river or lake.

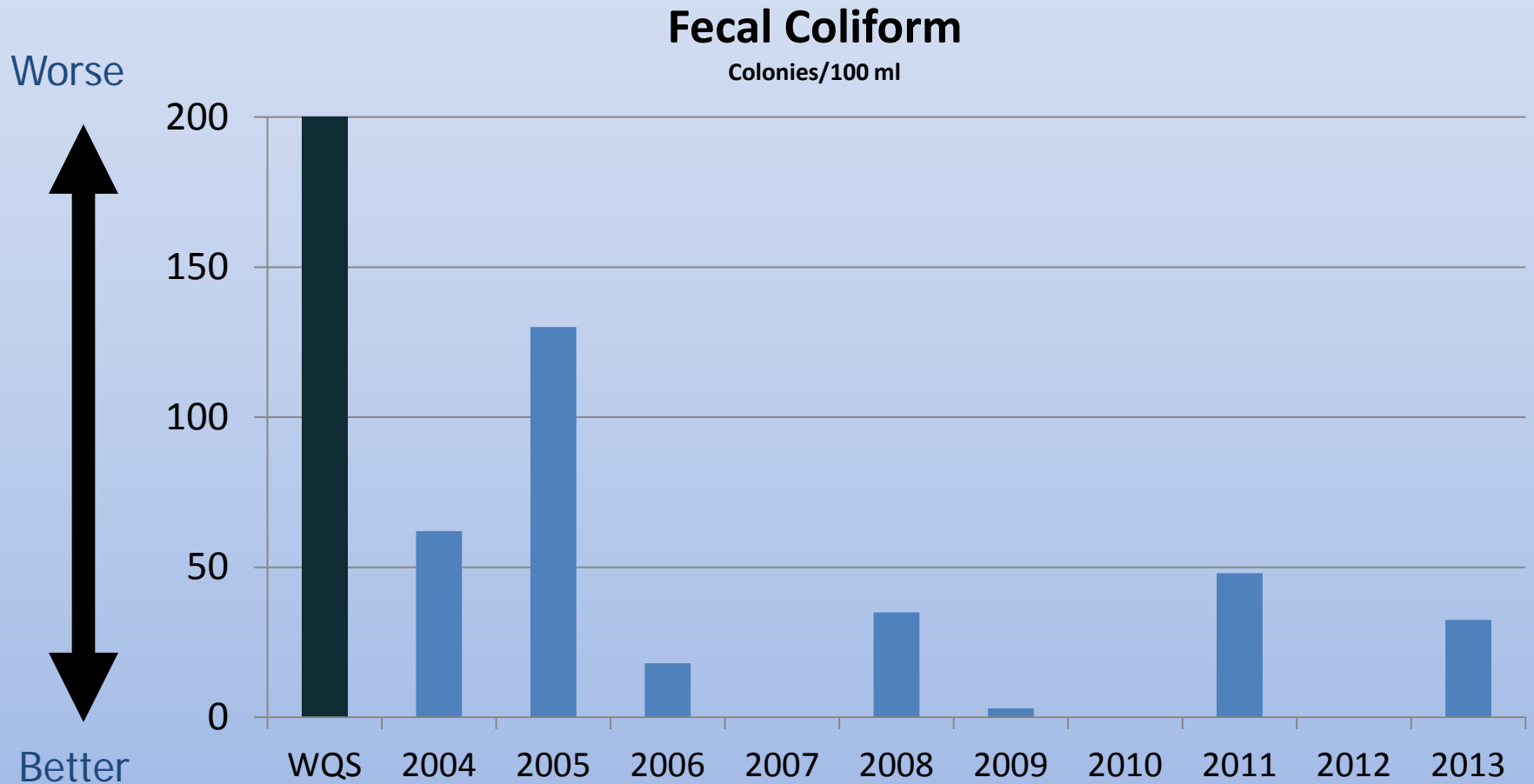


Recognizing that combined sewer overflows are sources of pollution, state and federal legislation and guidelines have been adopted to reduce or eliminate them by various means, including separation of combined sewers.

Grand Rapids Combined Sewer Overflow History (Billion Gallons)



Market Avenue Retention Basin (MARB) Effluent Quality 2004 – 2013



Water Quality Standard – 7-Day 400 colonies per 100/mL, 30-Day 200 colonies per 100/mL

Wastewater Treatment Plant



A Watershed approach must be taken to improve water quality. By implementing the following programs we are making better water quality an integral part of our future:

- Lower Grand Watershed Organization
- Green Grand Rapids Master Plan Update
- Sustainability Plan
- Renewable Energy
- Green Infrastructure Portfolio Standards
- Energy Efficiency Projects
- Stormwater Master Plan
- Soil Erosion and Sedimentation Control
- Grand River Water Quality Monitoring

LOWER GRAND RIVER ORGANIZATION *of* WATERSHEDS



Grand River Watershed



Mission of LGROW:

Discover and restore all water resources and celebrate our shared water legacy throughout our entire Grand River Watershed community.

Our Vision for the Watershed:

Swimming, drinking, fishing, and enjoying our Grand River Watershed: Connecting water with life.

Core Values of the LGROW:

- Watershed activities are diverse, inclusive, and collaborative
- Watershed efforts are sustainable and of high quality
- Watershed images and messages create a widely shared sense of legacy and heritage
- Watershed methods and products are holistic and employ a systems approach
- Watershed organization and program evaluate progress and reward success

Board of Directors



Subcommittees

- PAM/PEP
- SW Ordinance
- DIP

Data Information and Procedures Committee



"To pool data about the Watershed and be a clearinghouse for information...create a framework for coordination to provide a credible and usable source of information in a data repository..."

2010-2013 Focus:
Assist in IDEP
Volunteer Monitoring Assistance
Data Repository

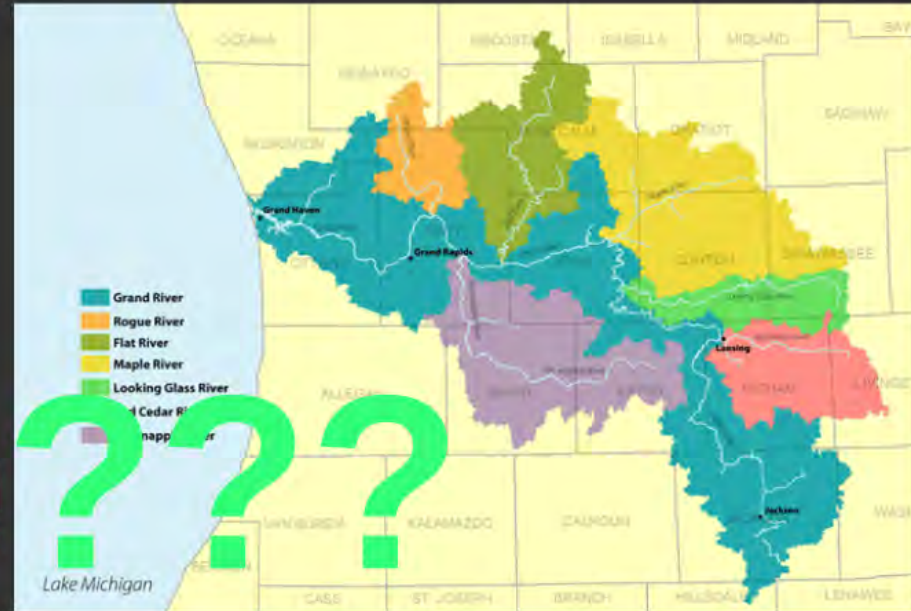
2014-15/16 Focus: Watershed Monitoring



WHY???

1. Determine WQS and TMDL Compliance
2. Establish baseline/standard for determining future watershed quality indicator
3. Evaluate effectiveness of municipal stormwater BMPs
4. Evaluate effectiveness of non-point source pollution BMPs
5. Establish quality monitoring program subwatersheds can adopt.

Where???



Lower Grand River (main focus)
secondary/tertiary streams (secondary focus)

WHO???



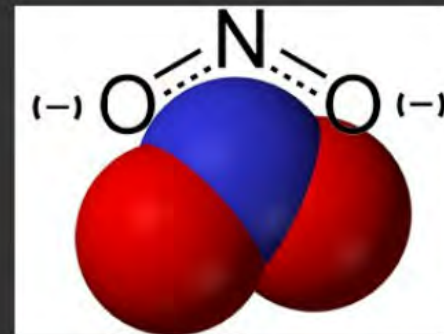
HOW???



Prezi



- Assemble/review existing data



- Review other programs

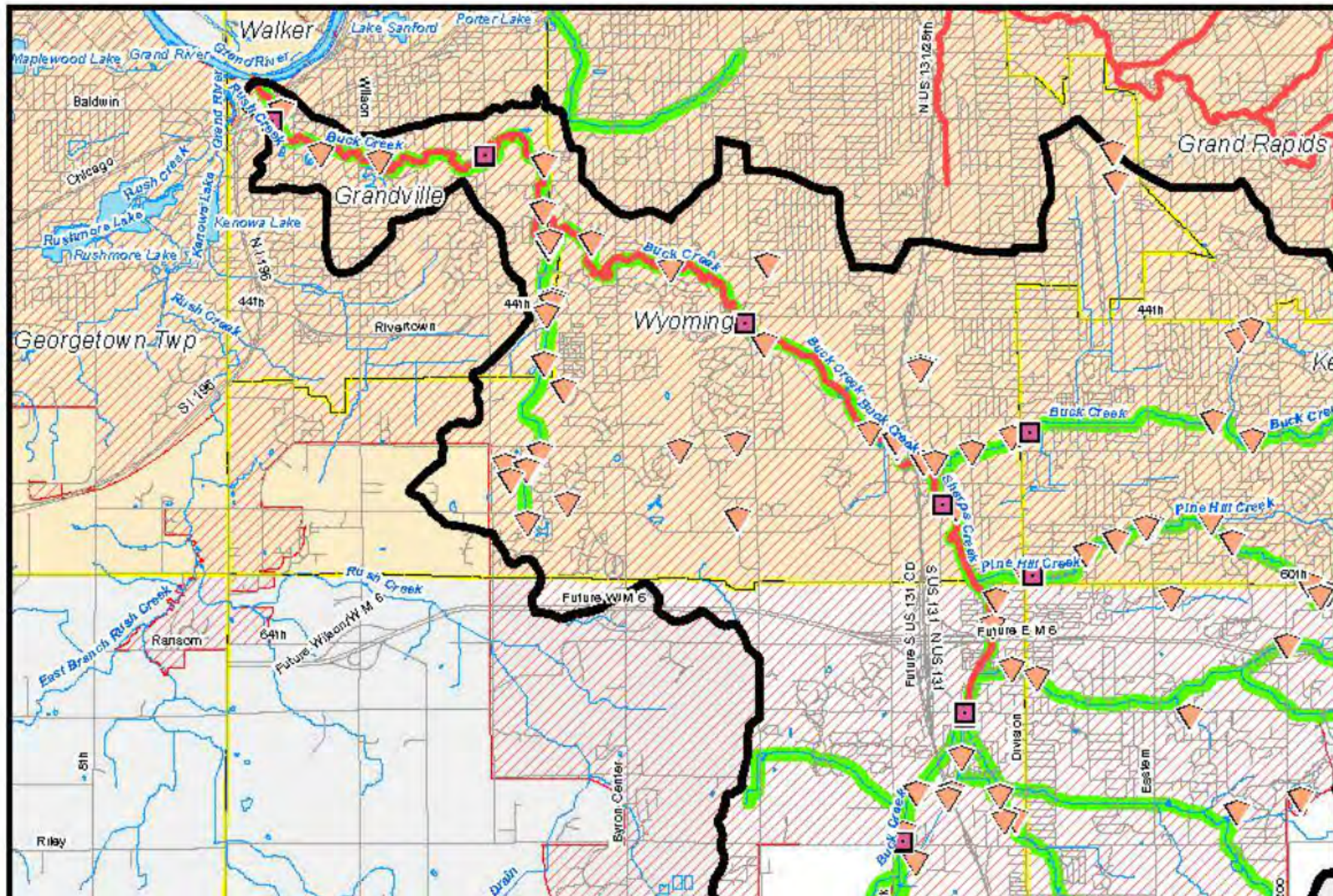


- Data screening

- Identify gaps



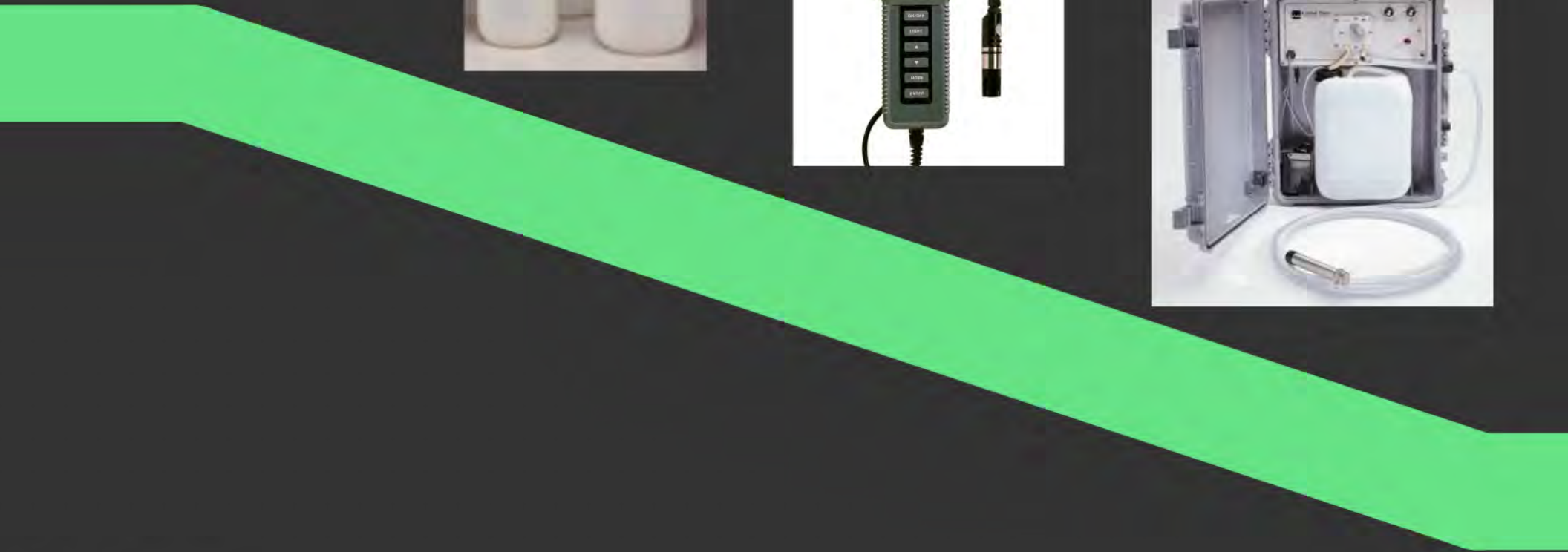
Site Selection



Sampling Protocol



Secure Resources and Equipment



Data Repository



Key Outputs:

Quality
Data

Watershed
Monitoring
Manual

Water Quality Index
(based on NSF and Grand Rapids)





Thank You!