

# Lake Newport/Mill Creek Watershed Testing

November 23, 2015

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**Public Health**  
Prevent. Promote. Protect.

**Mahoning County District Board of Health**

# Timeline of Events

- June 29, 2015 - Fish kill reported in Lake Newport
  - Confirmed by ODNR
  - OEPA confirmed the kill was a result of low DO from CSOs discharges
- July 10, 2015 – Mill Creek Park closed 3 lakes due to initial high E. coli test performed by MCDBOH
  - Lake Newport, Lake Cohasset and Lake Glacier
- July 16, 2015 – Multi agency meeting with OEPA
  - Discussed Mill Creek Watershed Problems
  - Previous testing by OEPA and what can be done
- July 23, 2015 – Mill Creek Park & MCDBOH testing agreement
  - Test 3 predetermined locations on Lake Newport for 12 weeks including 24-48 hours after a significant rainfall event.
- Sept 11<sup>th</sup> 16<sup>th</sup> and 30<sup>th</sup> – Testing expanded to other locations
  - Locations selected within the watershed.



# OEPA/ Multi Agency Meeting – July 16, 2015

- Information provided by EPA.
  - CSOs are one contributing factor and should also be looking at a bigger picture - Watershed.
    - Septic Systems/AG Waste Management/AG Fertilizer/Wildlife
  - What is a Watershed:
    - Area of land that drains into a common water source such as a lake, river, or any point within a river system.
  - EPA
    - It's a small watershed and its up to us how we want to handle it.
  - EPA solutions:
    - Drain the lakes and return it to a stream
    - Dredge the lakes– would only be a temporary fix.
    - Continue with testing and establish a baseline
      - The more samples you can gather the more accurate the data.
    - Develop a Watershed Action Plan and community awareness



# Lake Newport Testing

- Agreement to test for 12 consecutive weeks at 3 predetermined locations. Sampled 24- 48 hours after rain events.
- Expanded to additional sites in the watershed – Total of 9 locations
- Considered a Class B Primary Contact Water – OAC 3745-1-07
  - Water that supports or potentially support, occasional primary contact recreational activities. All surface waters of the state are designated as Class B unless otherwise designated as bathing water.
- Tested for E. coli (cfu/ 100ml)
  - Single Sample Max 523
  - Seasonal Geometric Mean 161



3745-1-07

24

Table 7-13. Statewide numerical criteria for the protection of recreation uses. These criteria apply inside and outside the mixing zone at all times during the recreation season.

Recreation use	E. coli (colony counts per 100 ml)	
	Seasonal geometric mean	Single sample maximum <sup>1</sup>
Bathing water	126	235*
Class A primary contact recreation	126	298
Class B primary contact recreation	161	523
Class C primary contact recreation	206	940
Secondary contact recreation	1030	1030

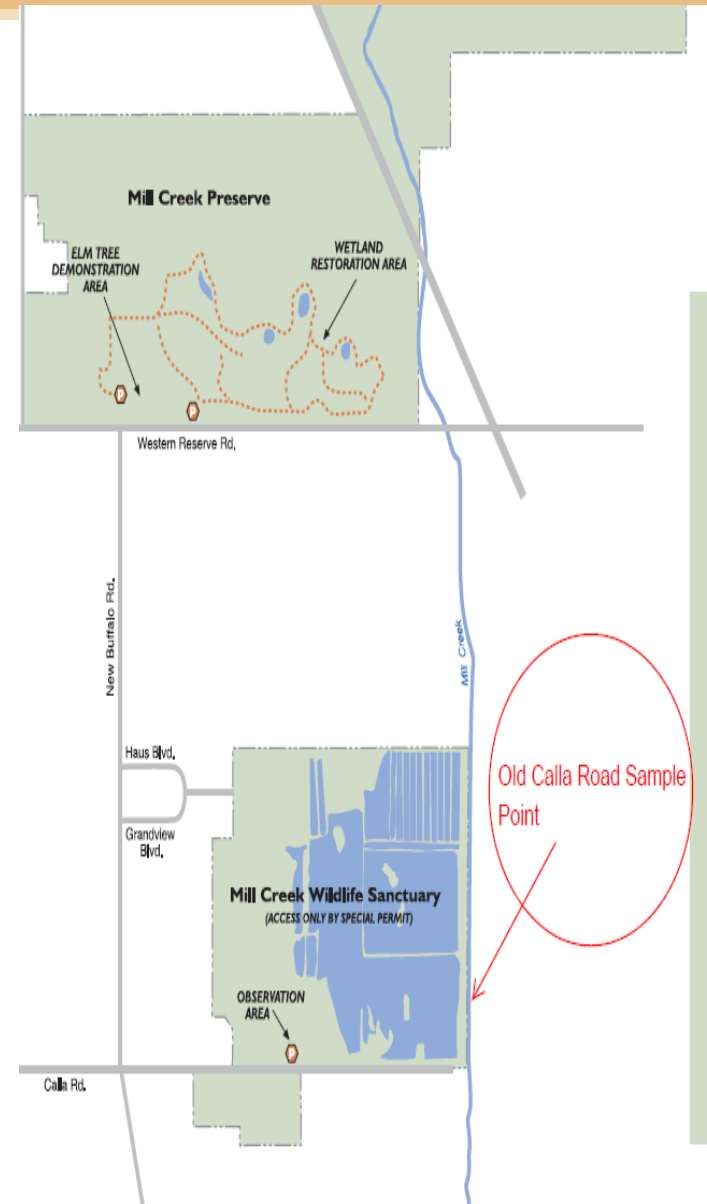
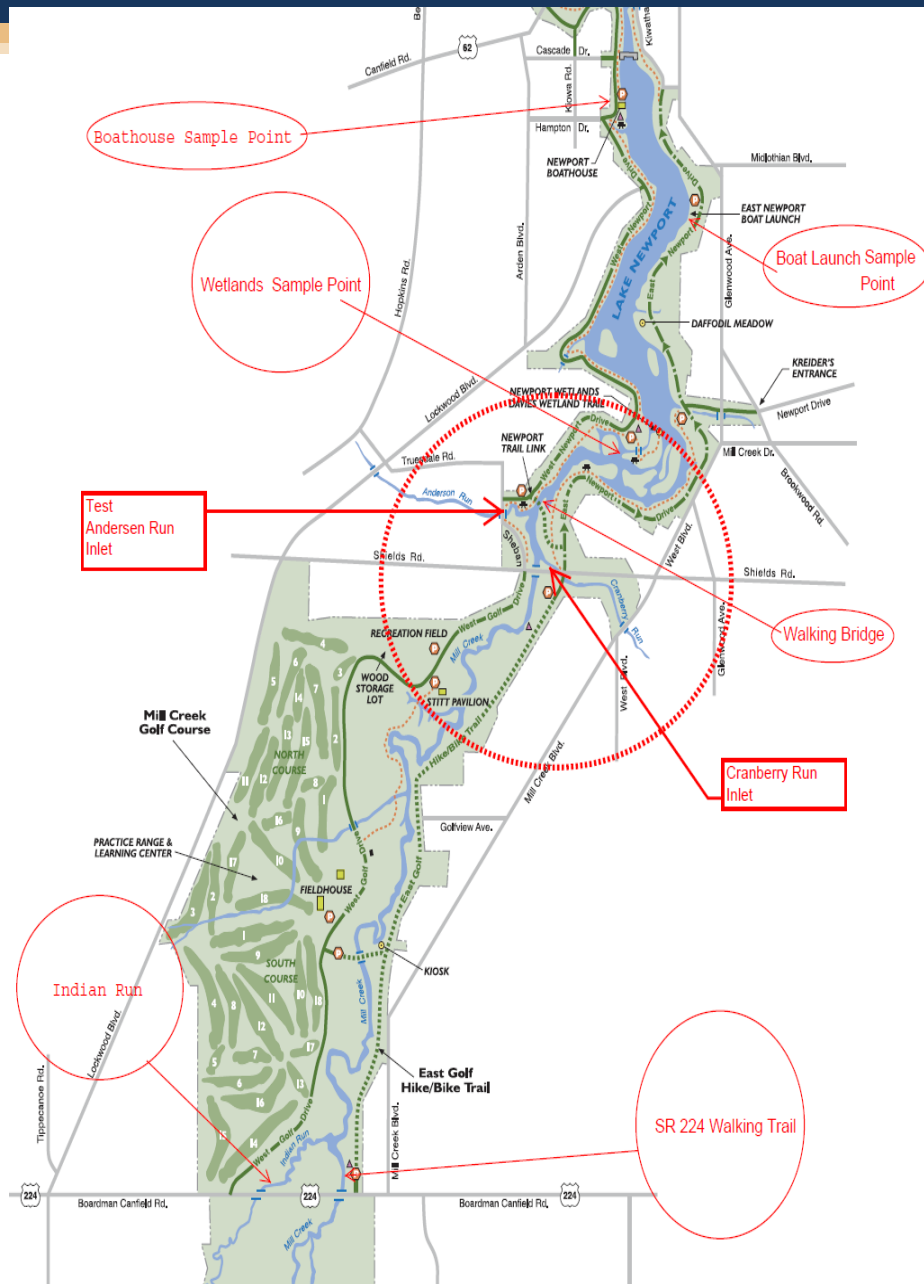
<sup>1</sup> Except as noted in footnote a, these criteria shall not be exceeded in more than ten per cent of the samples taken during any thirty-day period.

\* This criterion shall be used for the issuance of beach and bathing water advisories.

# Geometric Mean?

- Definition: The **geometric mean** is a type of **mean** or **average**, which indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum).
- Geo. Mean provides a number that is more representative of the sample (or that number where half the samples are higher and half are lower)
- Helps reduce the effect of a few extreme values.
- Minimizes fluctuations in the levels of bacteria in water or one-time high counts.
- Example: Sample 1 (556)  
Sample 2 (350)  
Sample 3 (375)  
Geometric Mean = 417.88





# What does the Data Provide? 36/97 (37%)

Date	Boathouse	Bridge Sample	Boat Launch	Wetland Bridge	Wetland Shore	SR 224 Walking Path	Old Calla Road	Anderson Run	Shield Rd Bridge (Cranberry run)	Indian Run
7/29/2015	1	116	1.59							
8/4/2015	1	106	6							
8/12/2015	167	558	119							
8/19/2015	19	808	16							
8/26/2015	2	2420	16							
9/2/2015	5	2420	18							
9/9/2015	3	2420	13							
9/11/2015	3	349	5	2892	2274	145	356			
9/14/2015	753	630	687	852	1090	946	786			
9/16/2015	63	188	29	185	314	263	589	486	148	
9/21/2015	505	351	438	358	212	246	805	954	354	
9/23/2015	59	140	36	202	238	25	765	483	177	
9/30/2015	829	13411	894	8443		5486	3842	7837	5914	8645
10/5/2015	3363	990	2437	775		837	3533	949	1587	1396
10/7/2015	200	283	447	447		100	316	990	500	1673
10/14/2015	100	100	10	141		200	141	316	10	400

## Rain Events

9/12/15 – 1.5"

9/29/15 - .77"

10/3/15 - .73"



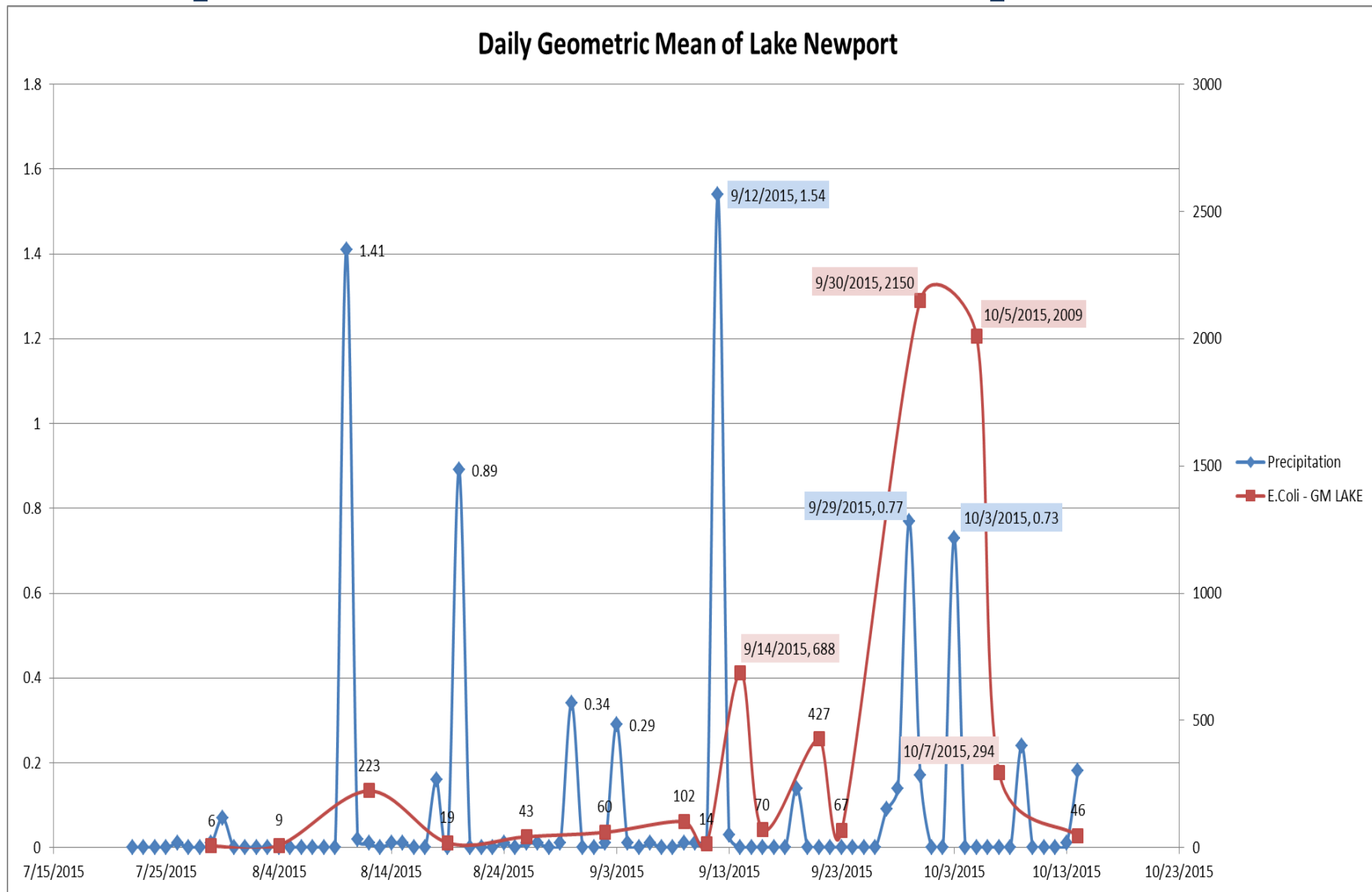
# Geometric Mean 3/16 (18%)

Date	GM Lake (Sample days)	GM over 12 weeks
7/29/2015	6	5.695942251
8/4/2015	9	6.959518156
8/12/2015	223	22.09684403
8/19/2015	19	28.70090717
8/26/2015	43	31.12521557
9/2/2015	60	34.69952721
9/9/2015	102	40.4779615
9/11/2015	14	35.37691882
9/14/2015	688	44.45046638
9/16/2015	70	45.93058722
9/21/2015	427	53.28902305
9/23/2015	67	54.05053795
9/30/2015	2150	67.12707751
10/5/2015	2009	81.07889483
10/7/2015	294	90.17978856
10/14/2015	46	84.08822878



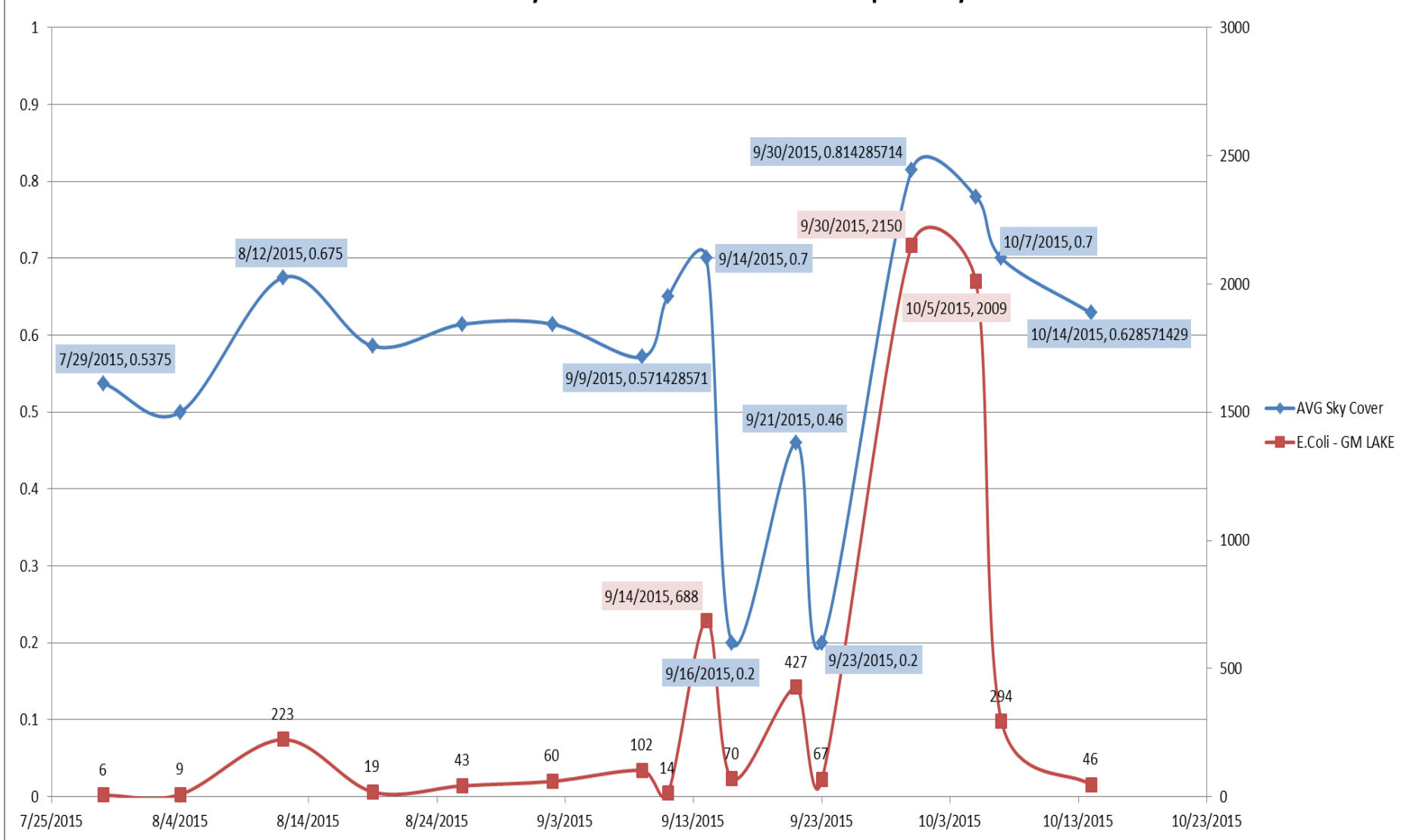


# Precipitation and GM of Lake Newport



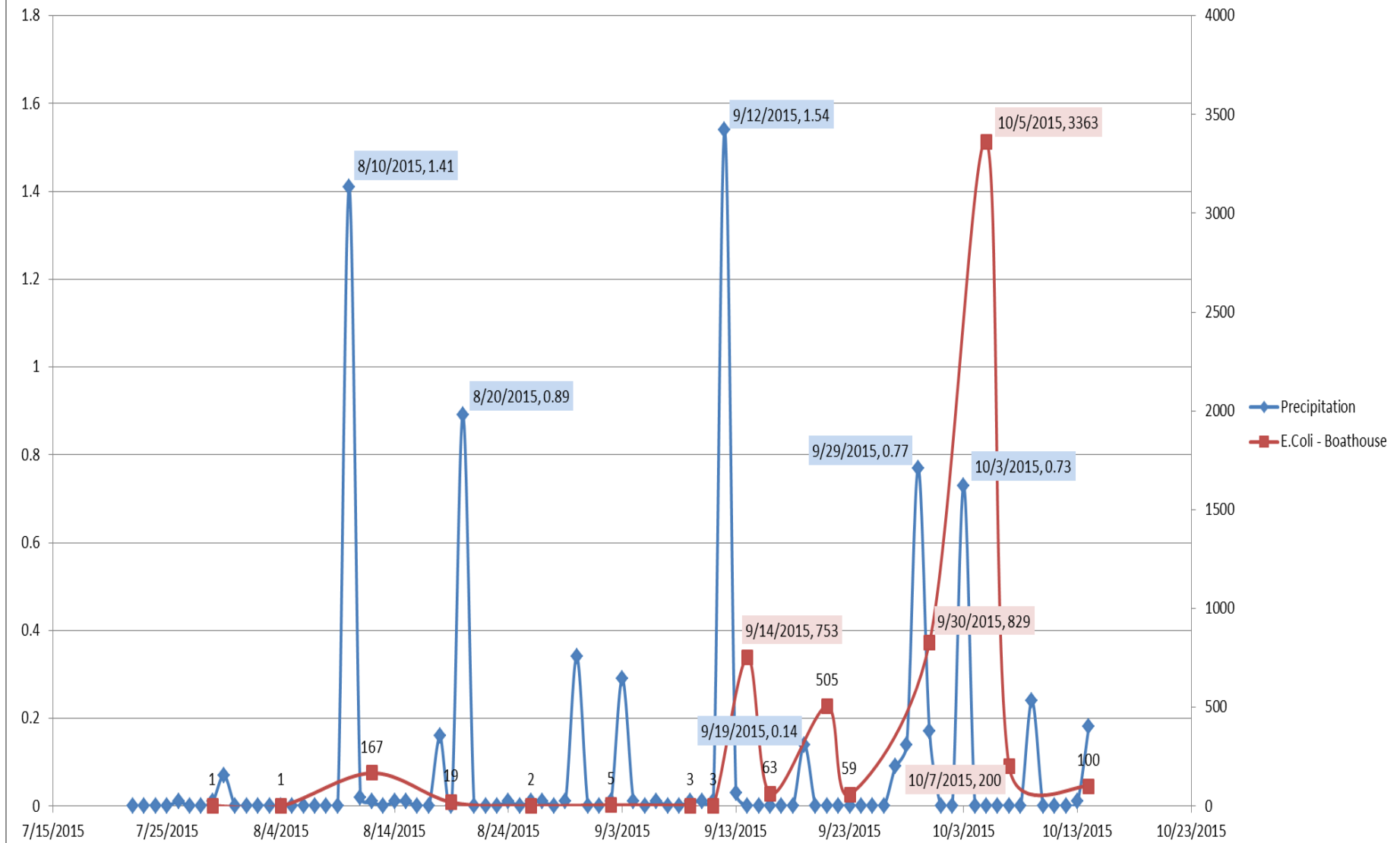
# Sky Cover and GM of Lake Newport

Daily Geometric Mean of Lake Newport- Sky Cover



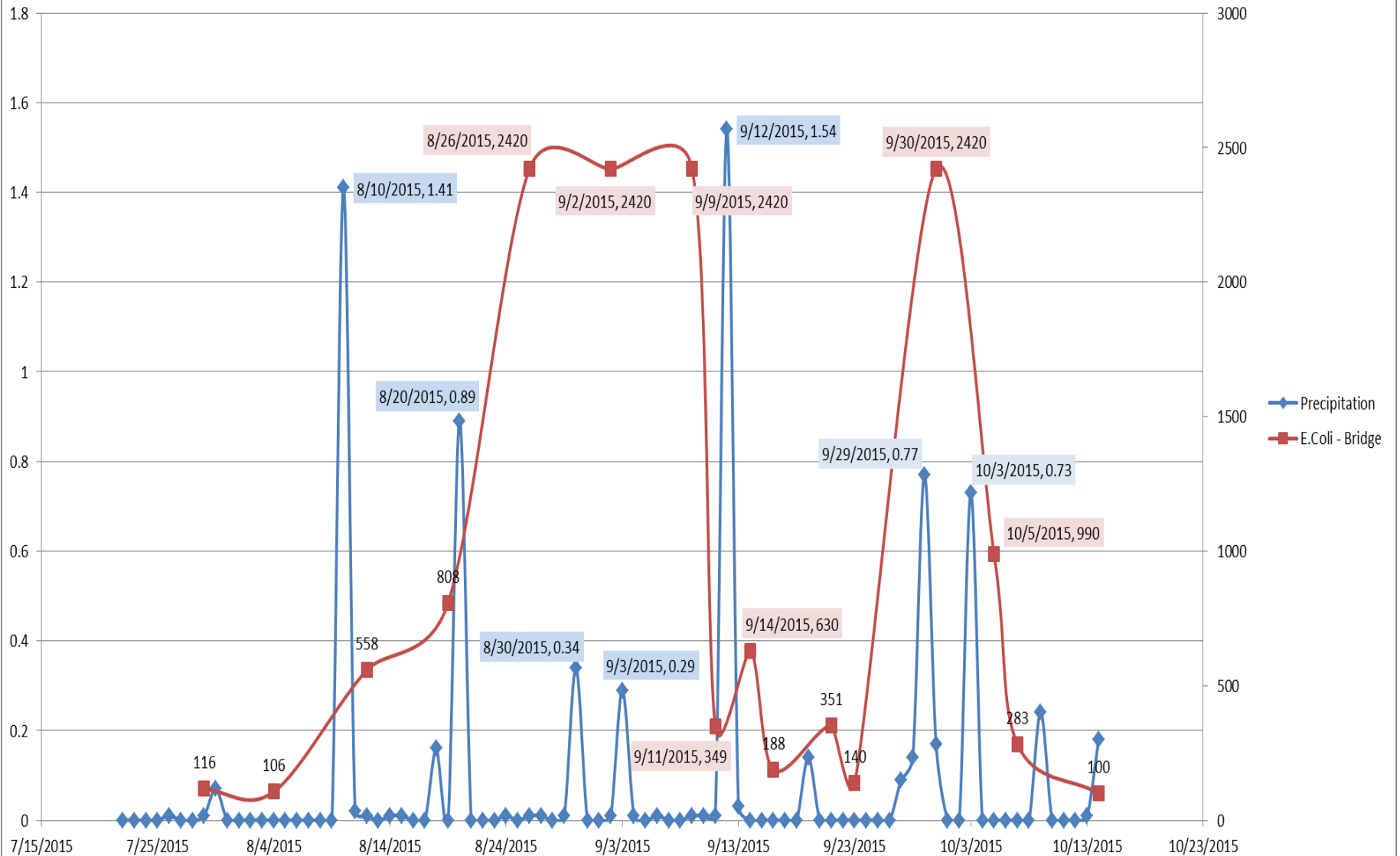
# BOATHOUSE

## Boathouse



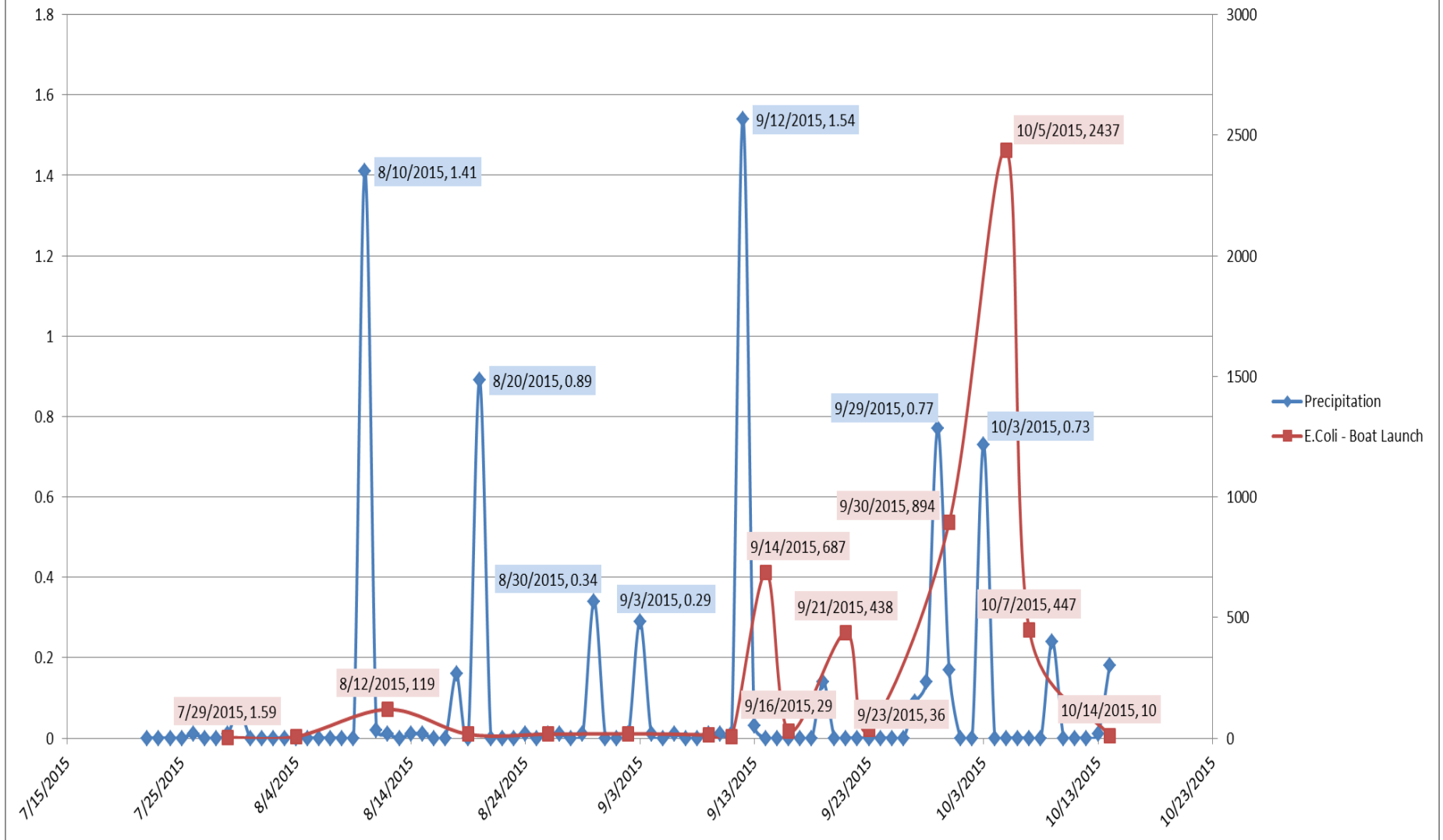
# BRIDGE

## Bridge Sample



# BOAT LAUNCH

Boat Launch



# Conclusion

- Week 1 - 12 Geometric Mean of Lake 84.08822878
- Week 1 - 12 Geometric Mean w/ Watershed 205.6738494
  
- The rainfall trends indicate a baseline for Lake Newport:
  - Levels will elevate 24-48 hours after a rainfall event and will decrease 72-96 hours.
  
- The deeper and more sunlit lake areas have lower E. coli levels.
  - Bacteria do not prefer UV conditions
  
- The Wetland area is providing some form of bacterial cleanup.
  - Studies have been done that prove wetlands have a pollution uptake in the plants.
  - Retention time on consecutive rain events decrease
  
- There is not just one contributing factor causing the problem.
  - CSOs/Wildlife/AG manure management/ AG fertilizer application/failing septic systems/ Domestic animal management.
  - Non-point source pollution is very difficult to locate and control.



# What's Next?

- Agency's have to continue with their programs.
  - **Mahoning County Board of Health Household Sewage Program**
    - Real Estate Transfers
    - Onsite Programs
      - New construction
      - Additions
      - Re-plats
      - Structure Replacements
    - Complaints
    - Operation and Maintenance Program
      - The Ohio Administrative Code 3701-29 – requires all LHDs to have an O&M program in place or working towards one that will include all septic systems.
      - MCDBOH adopted an O&M program in June of 1997
        - All aeration systems installed, altered or repaired after the adoption date shall enter into the program
        - Currently developing a full O&M program to include all STS in the program



# Other Agency Participation

- Youngstown City Sanitary - Monitor the CSOs and provide the information to the Mill Creek Metro Parks
- Mill Creek MetroParks to evaluate their Privies(outhouse) for water tightness.
- Mill Creek MetroParks to monitor Wildlife activities
- Soil and Water to provide education and support for the Agricultural Industry
- Mahoning County Sanitary to continue with monitoring discharges.
- **PUBLIC PARTICIPATION IS KEY FOR WATERSHED AWARENESS**





# QUESTIONS



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