New Daily Demand Patterns & the Financial Reality

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Casey Garland, PhD, PE and Nina Caraway, PE

Presenters

- Casey Garland, PhD, PE
  - WithersRavenel
  - Raleigh, North Carolina United States
- BS –Biological and Agricultural Eng.
  - North Carolina State University
- MS - Biological and Environmental Eng.
  - Cornell University
- PhD - Civil and Environmental Eng.
  - Cornell University

- Nina Caraway, PE
  - WithersRavenel
  - Cary, North Carolina United States
- BE – Civil Engineering
  - Vanderbilt University
- MS – Civil Engineering
  - University of Colorado at Boulder

PRESENTATION
TOPICS

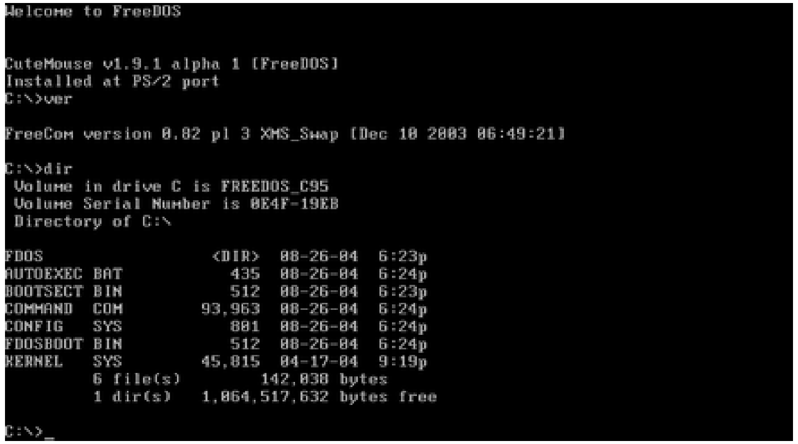
- Historical Data Collection (water)
- Historical Billing Practices
- New Data Collection
- New Billing Practices
- Historical vs. New Patterns
- Financial Impacts of New Patterns
- Future Applications

Historical Data Collection

- Manual reading of total usage that gives a single value for the period between readings
- Typically done in monthly intervals
- Involved the physical reading and writing down of values on “meter cards”

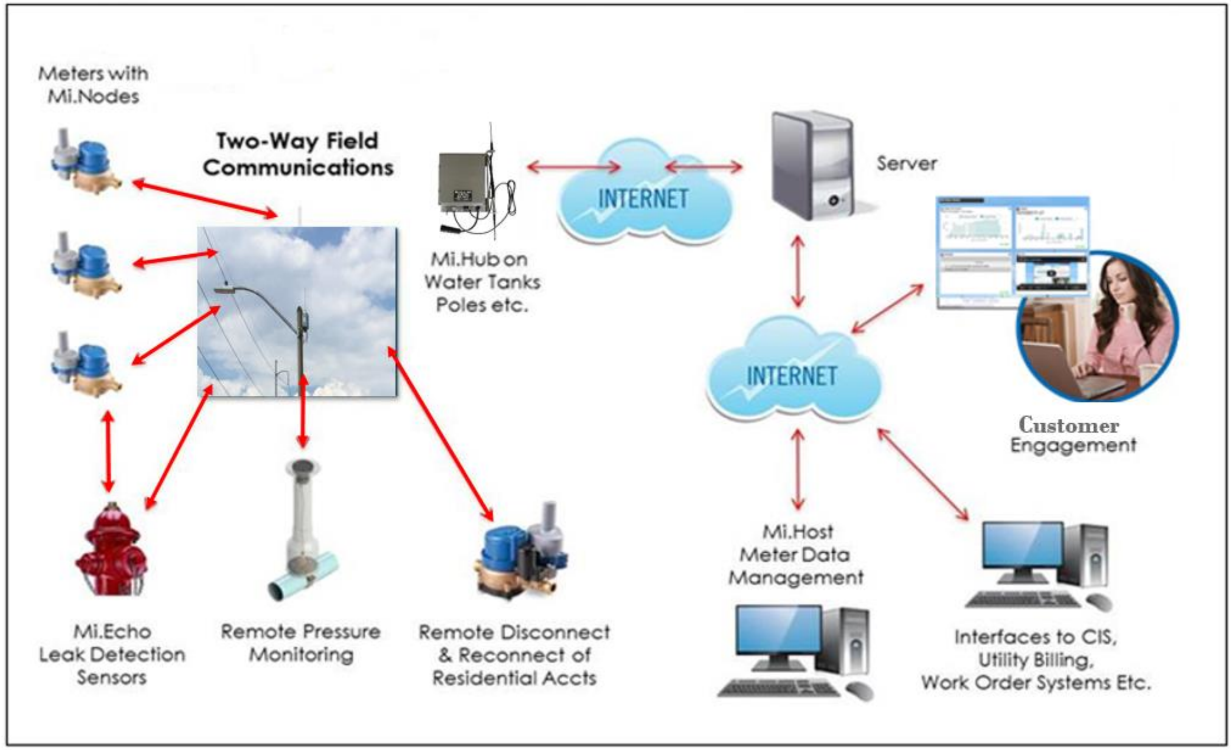
Historical Billing Practices

- Meter cards are manually entered into programs
- Errors are inherent as human factor cannot be avoided
- No way to search historical readings or evaluate leakage
- Intensive data analysis made reporting difficult



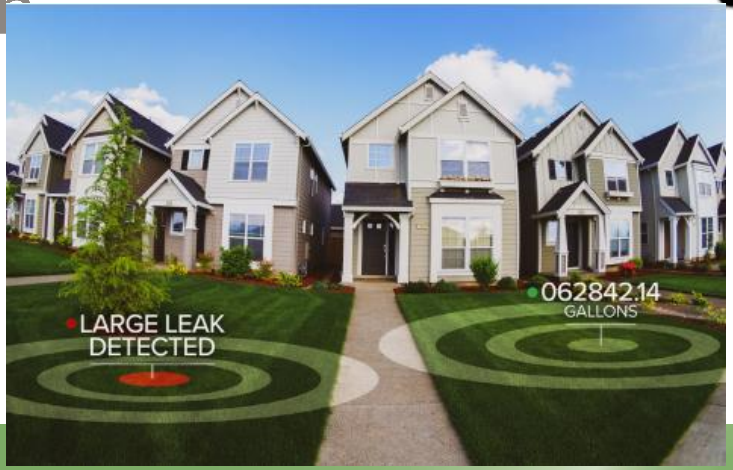
New Data Collection

- Remote reading on a schedule set by the owner with little to no staff interaction
- Allows for near real time leak detection
- Bases usage on actual use (no estimates)
- Allows for quick owner changes
- Logs usage in intervals
- Resolves billing conflicts efficiently



New Billing Practices

- AMI system readings brought directly into billing software
- Errors minimized by minimum human interaction
- Meter failure/damage noticed nearly immediately
- Hourly readings and logging capability allow for visual leakage documentation for customer presentation

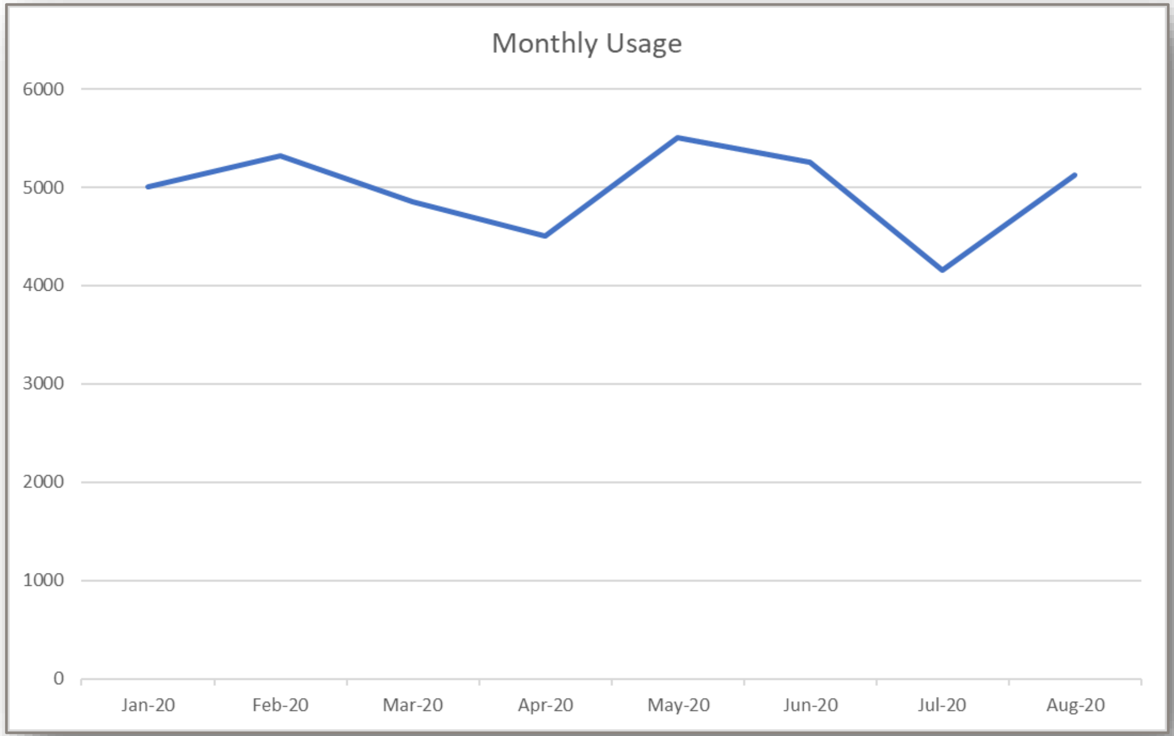


Historical Usage Patterns

- Simple monthly readings
  - Average Day?
  - Maximum Day?
  - Peak Hour?
- Not useful for operational insight

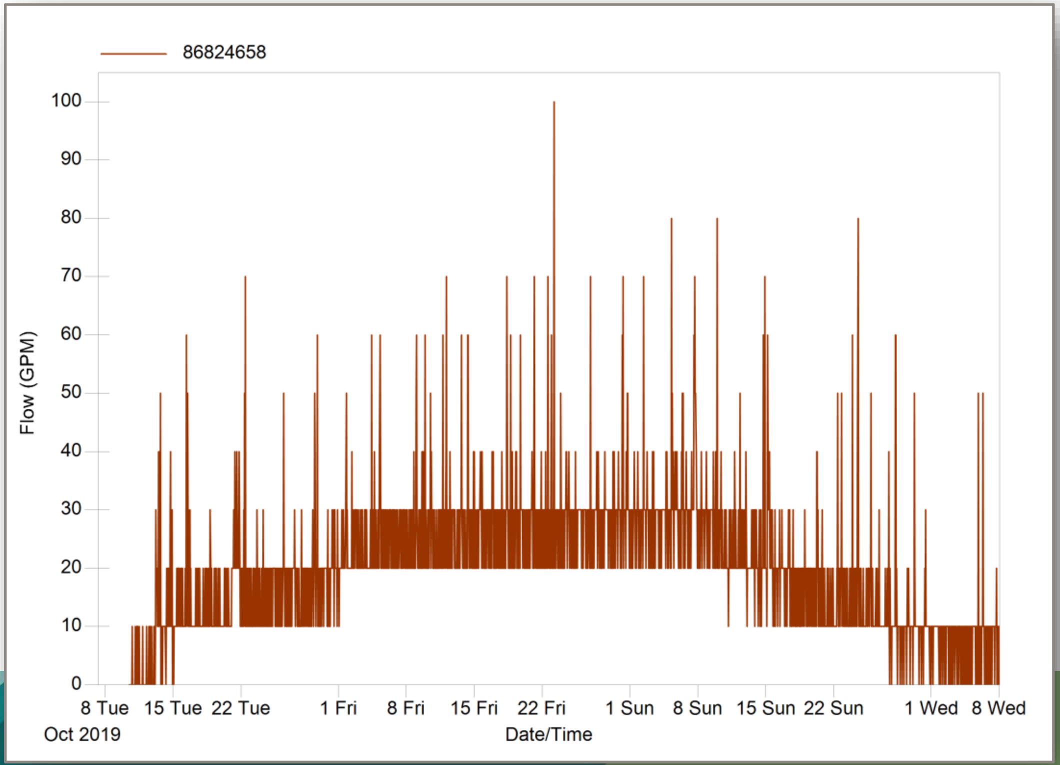
1 Gal = 3.8 Liters

Date	Total Usage (gal)
Jan-20	5000
Feb-20	5321
Mar-20	4852
Apr-20	4500
May-20	5500
Jun-20	5250
Jul-20	4152
Aug-20	5125

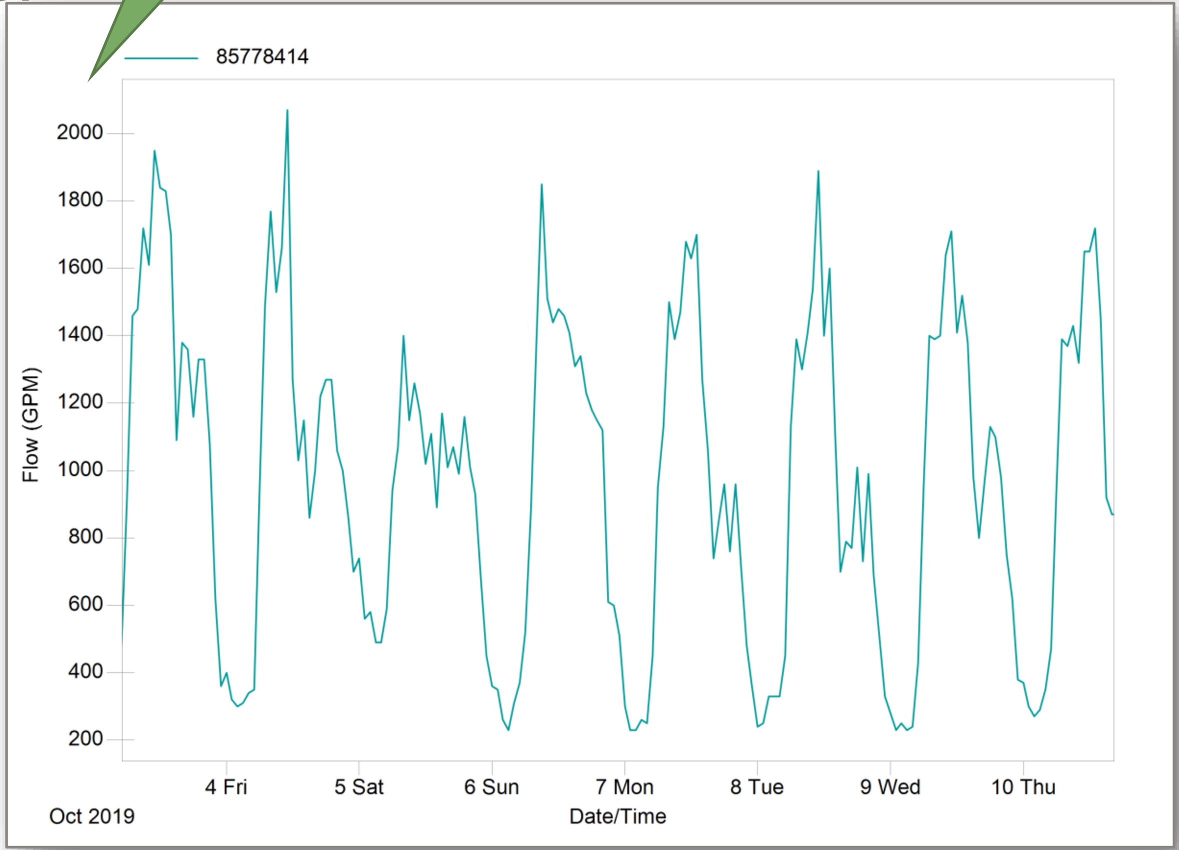


New Usage Patterns

- Readings done on hourly basis or other depending on user preference
- Generates actionable data

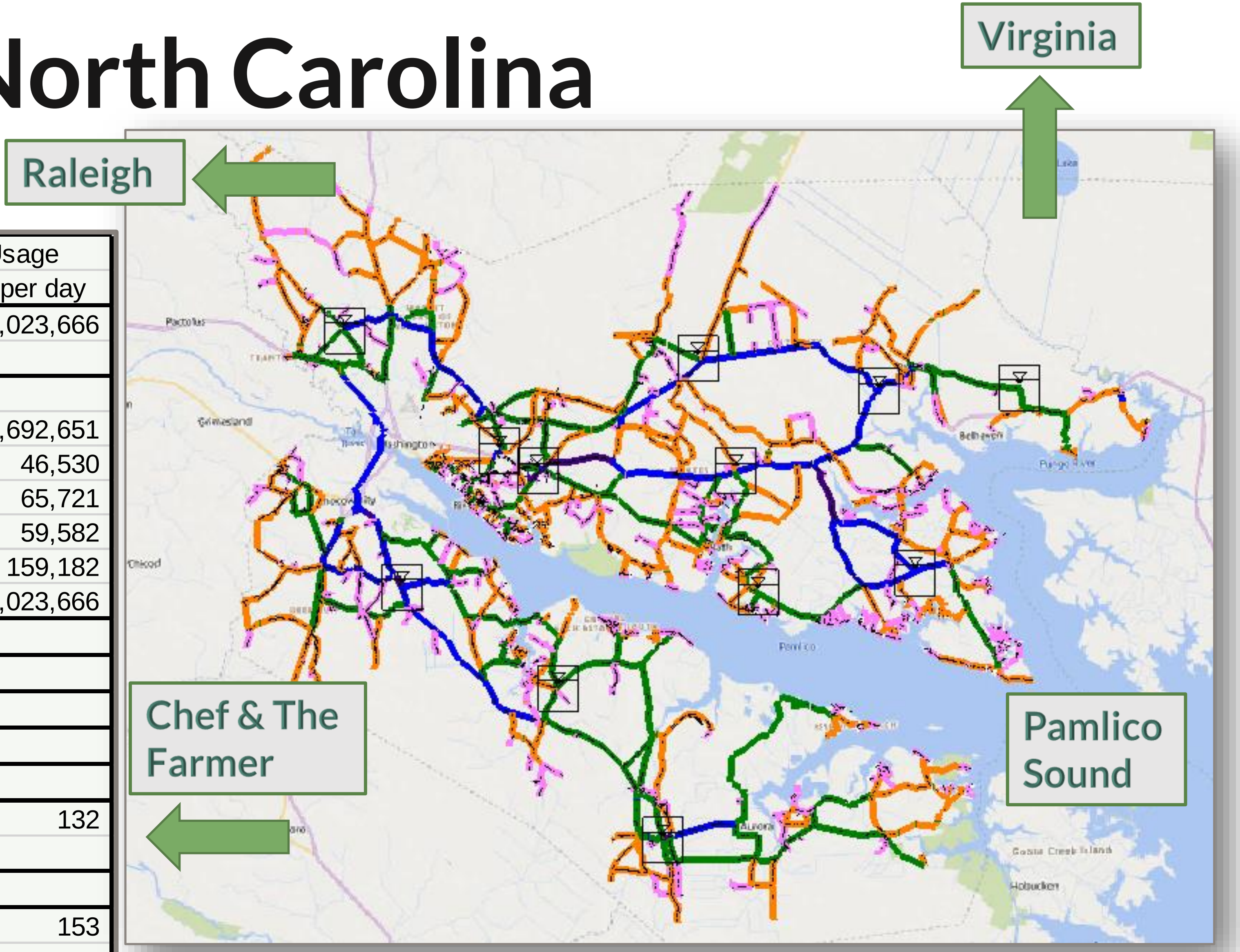


15.9 Gal/min
= 1 L/S



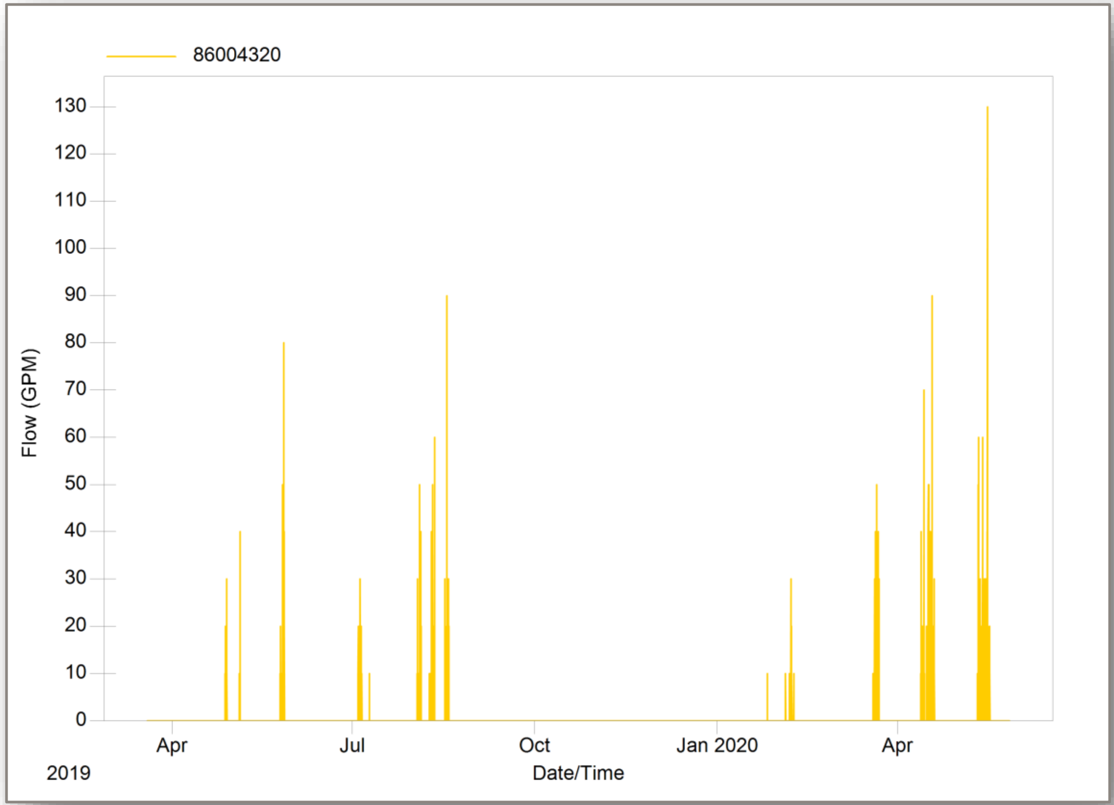
Beaufort County, North Carolina

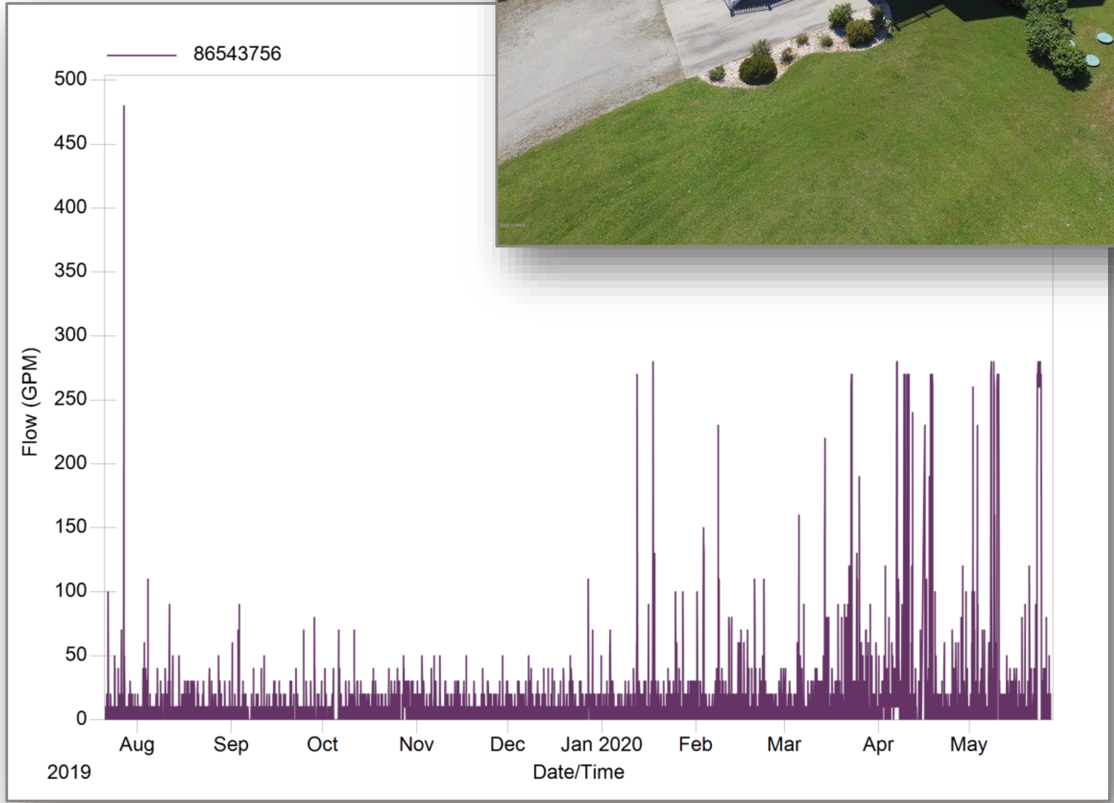
		Usage gal per month	Usage gal per day
Meters Total	13,476	24,621,275	2,023,666
Meters with size	12,607		
3/4" Meters	12,374	20,593,921	1,692,651
1" Meters	185	566,120	46,530
2" Meters	45	799,611	65,721
4" Meters	3	724,910	59,582
Meters no size	869	1,936,712	159,182
Subtotal		24,621,275	2,023,666
Meters with data	13,466		
Meters reading <250 gal per month	1,887		
Average 3/4" Monthly Usage including zeros		1,607	132
Average 3/4" Monthly Usage not including zero values		1,862	153



Impacts from COVID19

Residential - Vacation

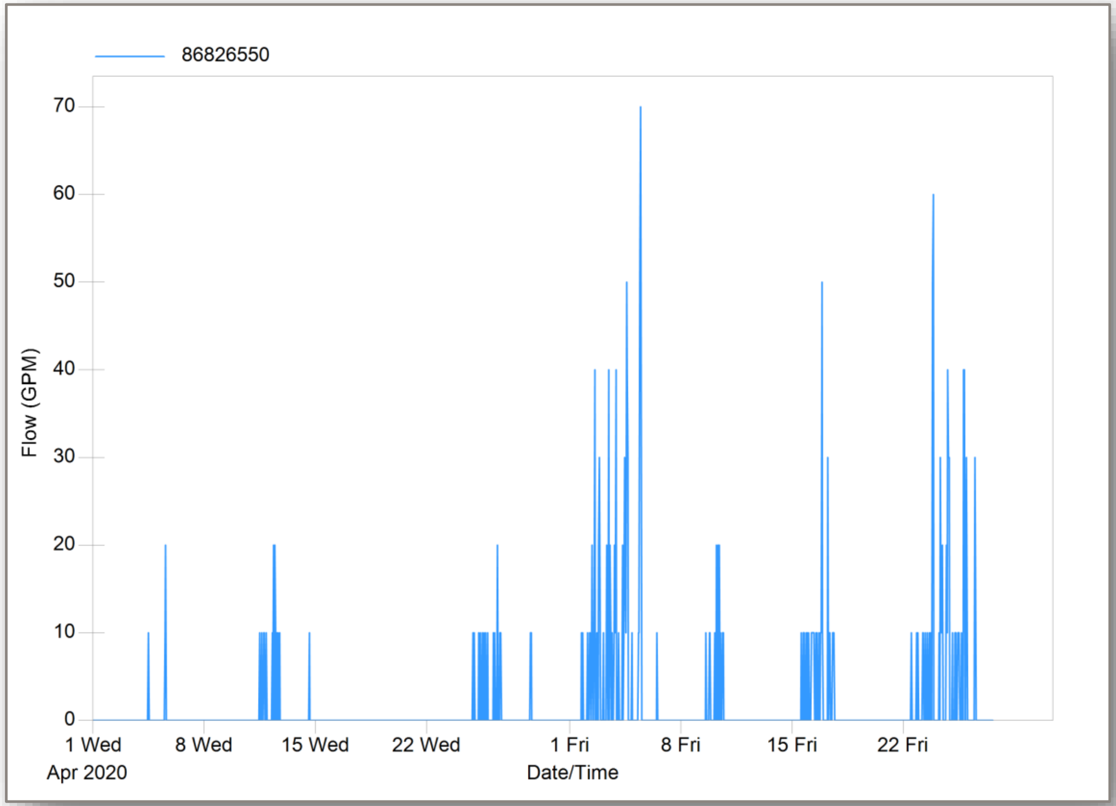




Impacts from COVID19 - Residential

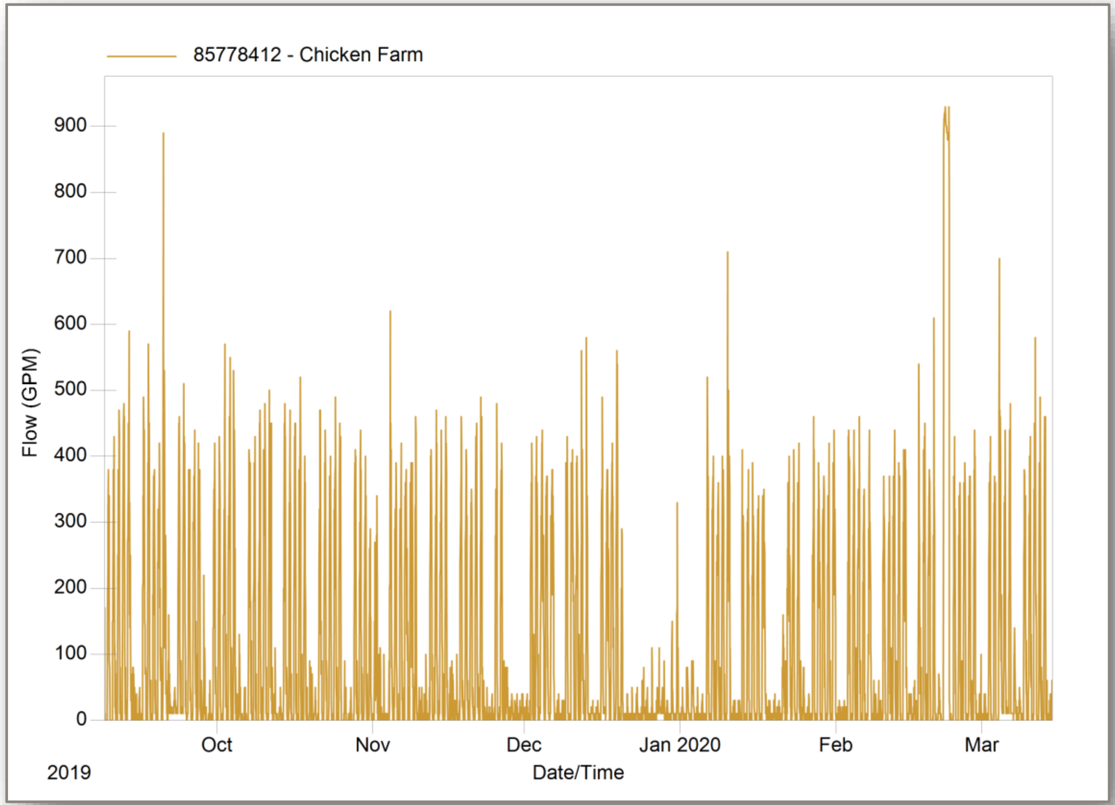
Residential Usage

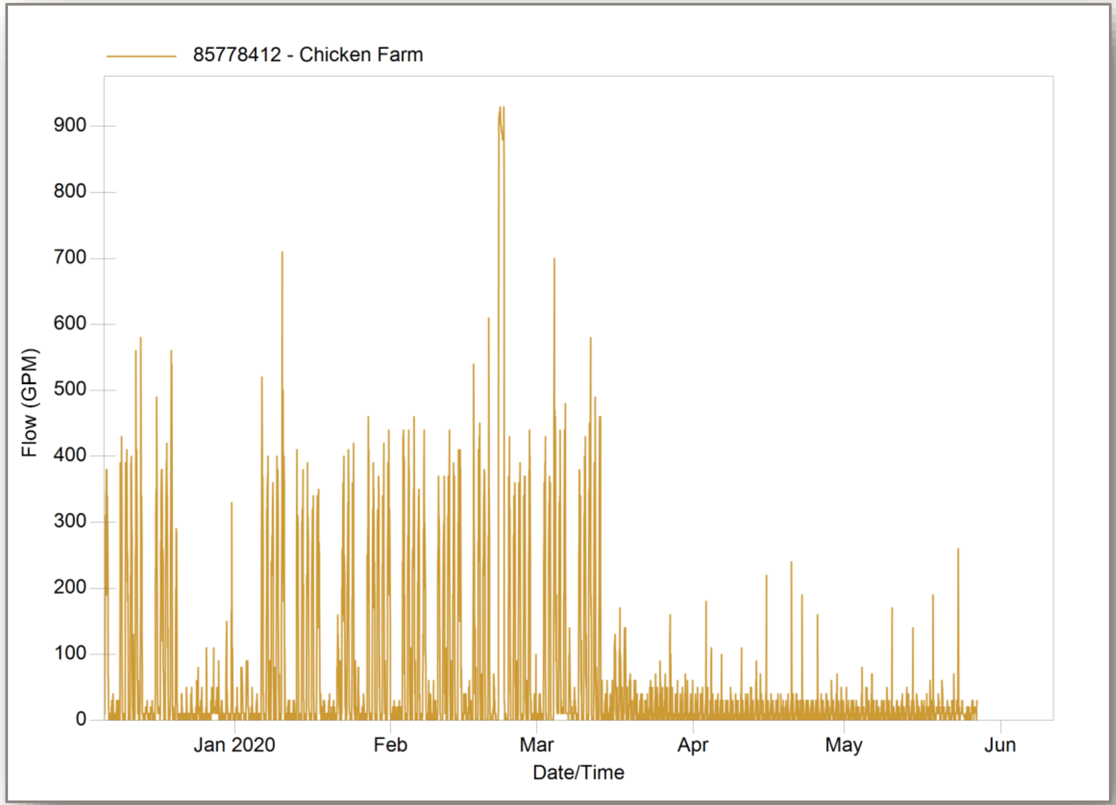
- Weekend use increased monthly demand by 2,500 gallons a month
- Equated to $17 in revenue gain on account from previous year



Impacts from COVID19 - Industrial

Chicken Processing Facility

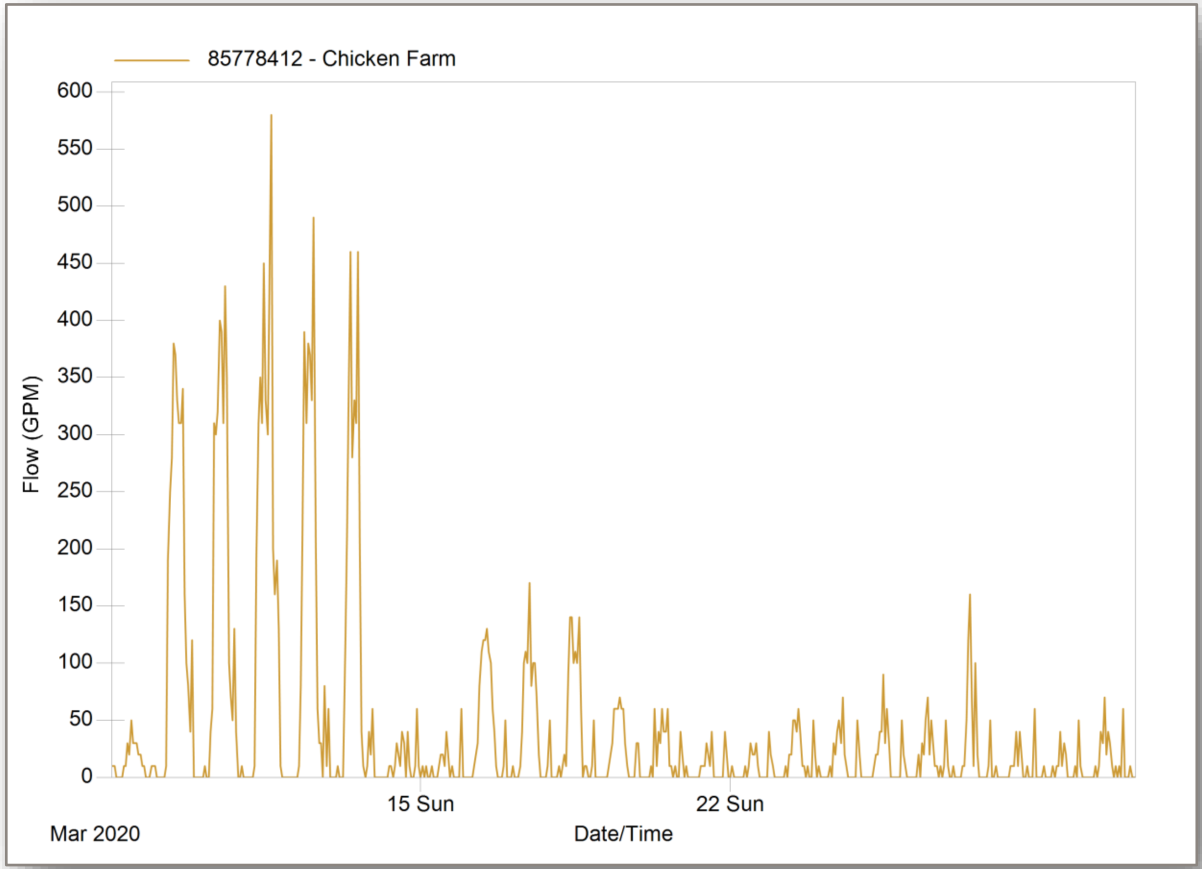




Impacts from COVID19 - Industrial

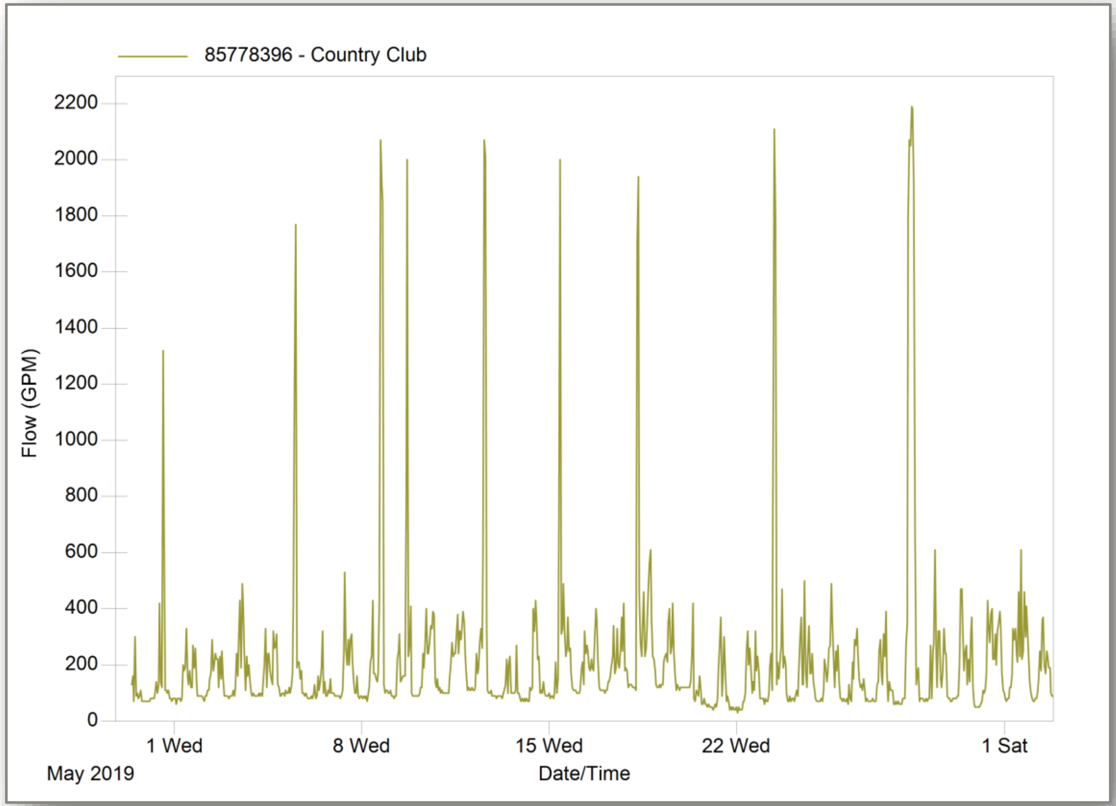
Chicken Processing Facility

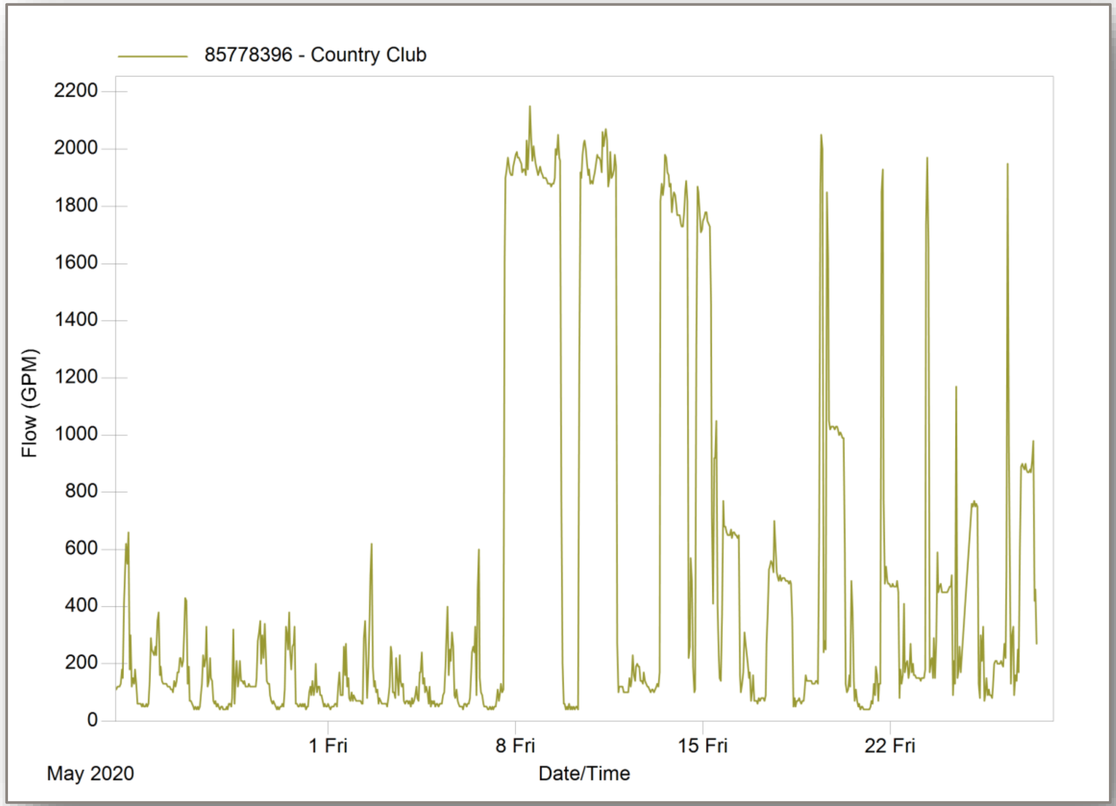
- Weekly usage dropped by average of 10,000 gallons
- Equated to $65 a week in revenue loss on account



Impacts from COVID19 – Recreational

Country Club

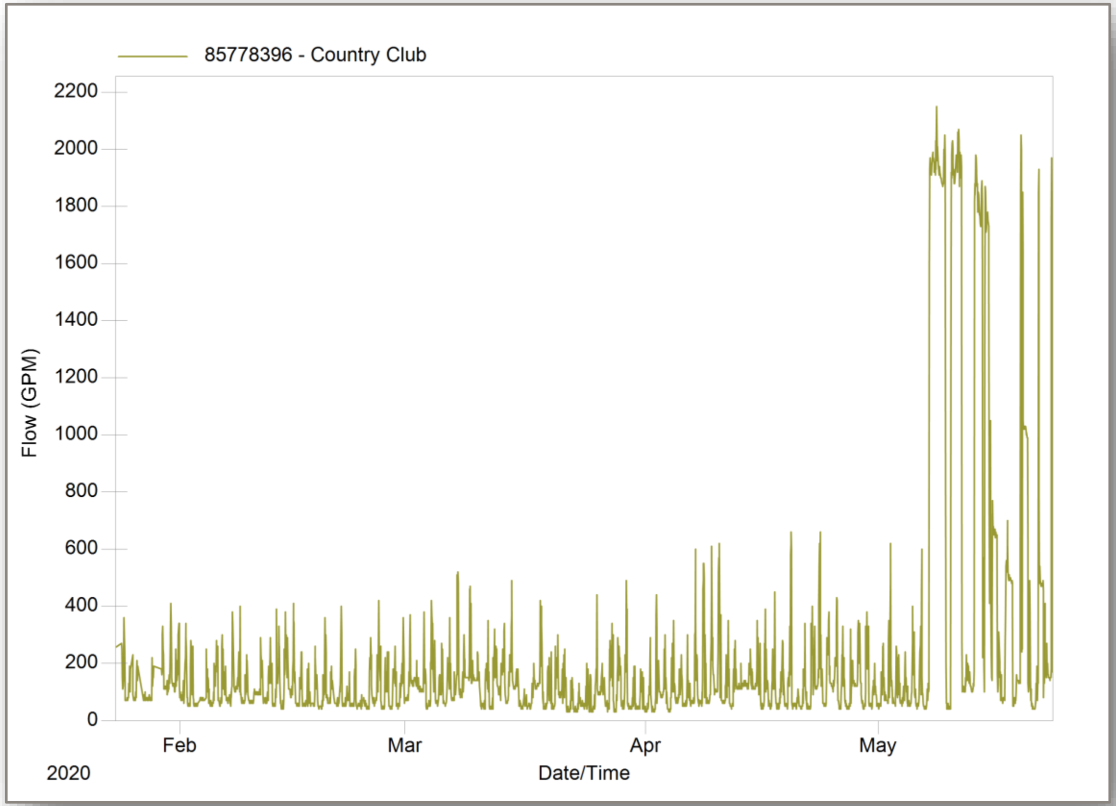




Impacts from COVID19 - Recreational

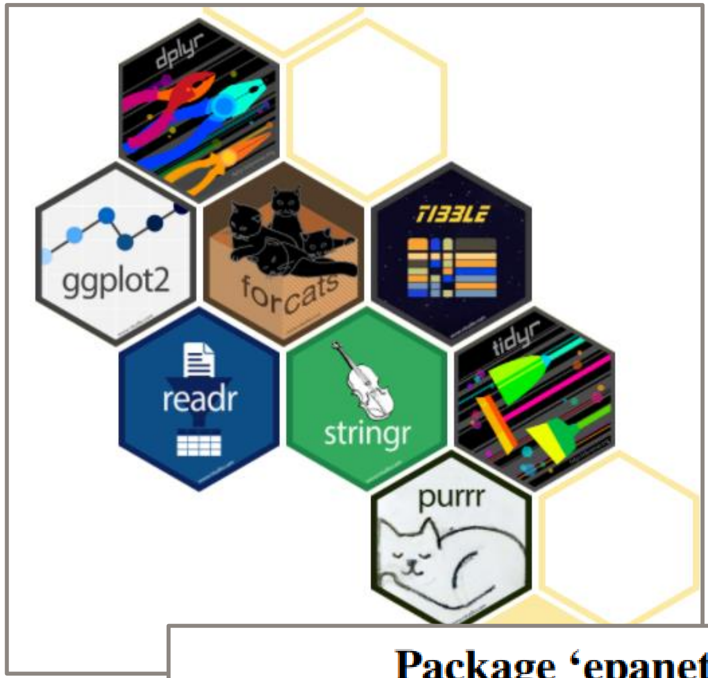
Country Club

- Monthly usage increased by average of 23,500 gallons during reopening for COVID19
- Equated to $155 in revenue gain on account from previous year



Modeling in a Changing World

- Calibration (prescriptive) vs Predictive
  - What are the representative demand conditions?



Package 'epanetReader'

June 26, 2018

Type Package

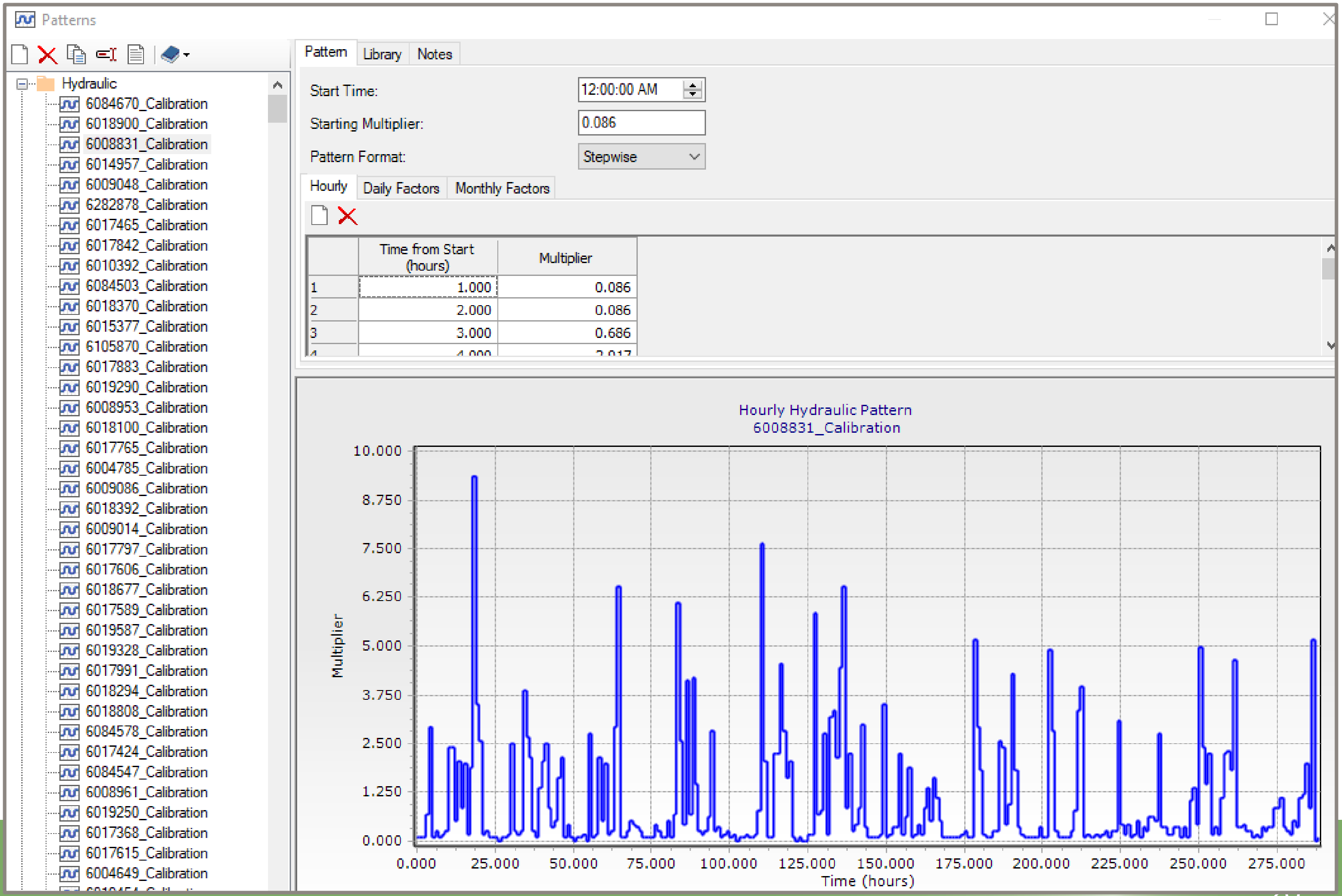
Title Read Epanet Files into R

Version 0.7.3

Date 2018-06-27

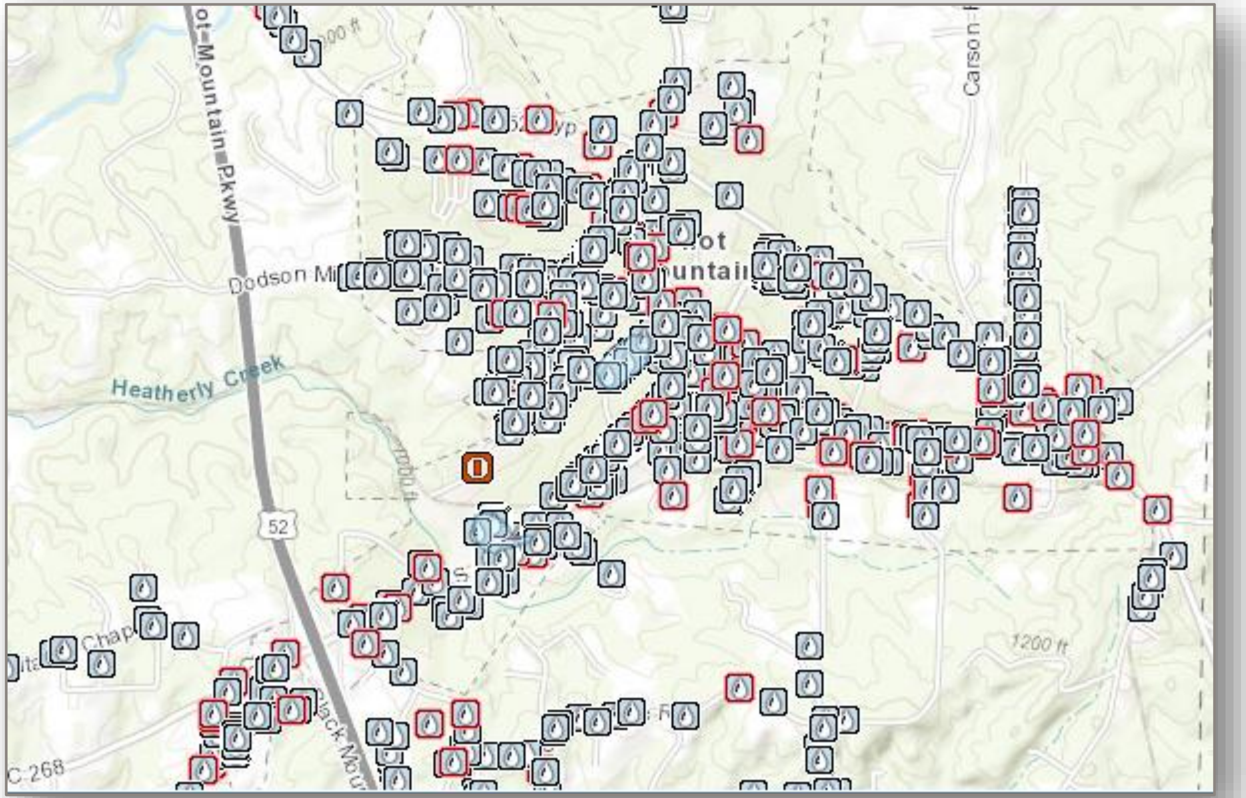
Author Bradley J. Eck

Maintainer Bradley Eck <brad@bradeck.net>



Future Applications

- Near real time revenue projections
- Notification of
  - Potential leaks
  - Pressure drops
- Peak demand operation data
- Improved water age approximation
- Better chemical feed approximation



For information on resources to learn more, contact:

Nina Caraway, PE

ncaraway@withersravenel.com

Casey Garland, PE

cgarland@withersravenel.com

ANY QUESTIONS?

THANK YOU.