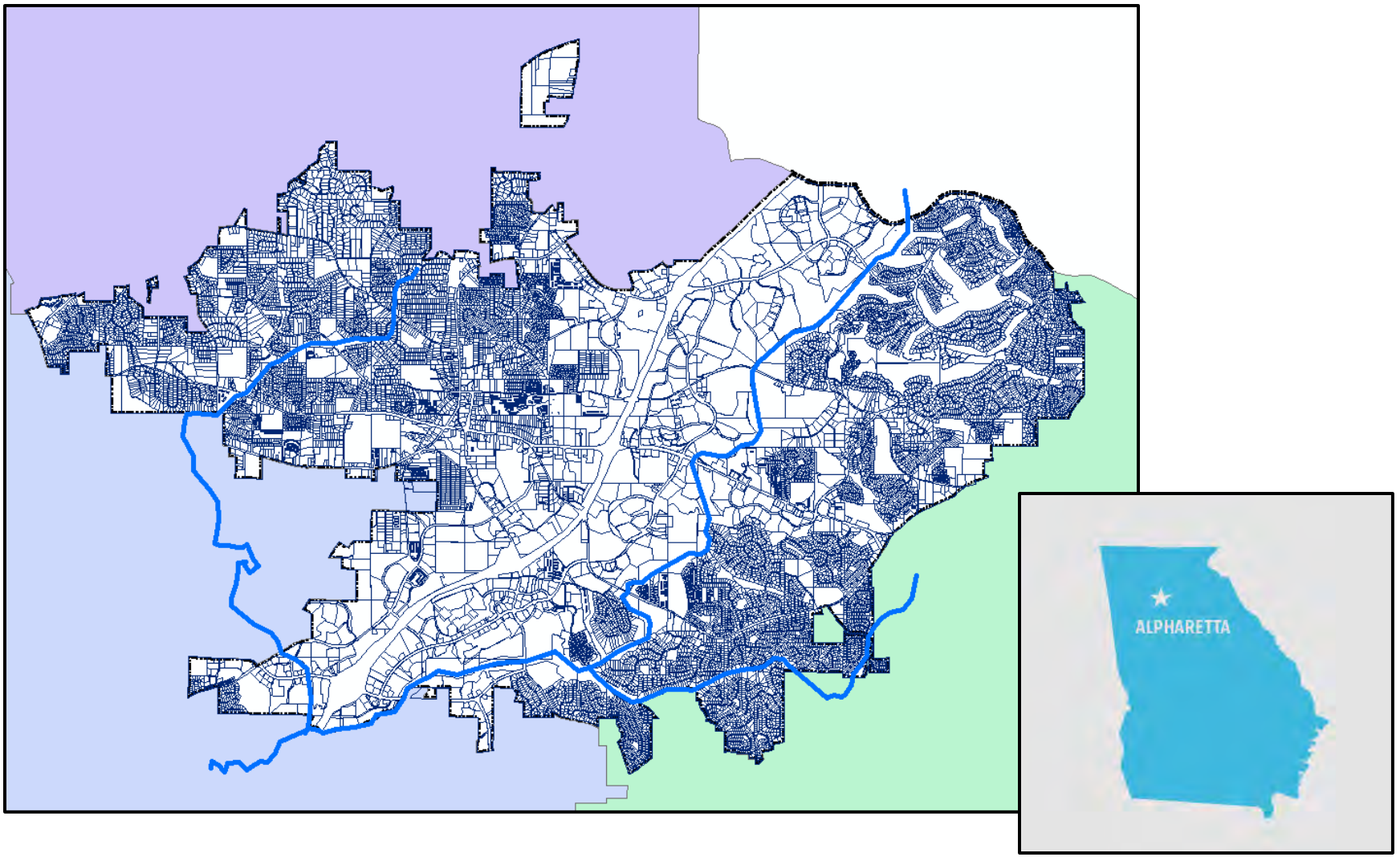
Long Indian Creek Watershed Improvement Plan

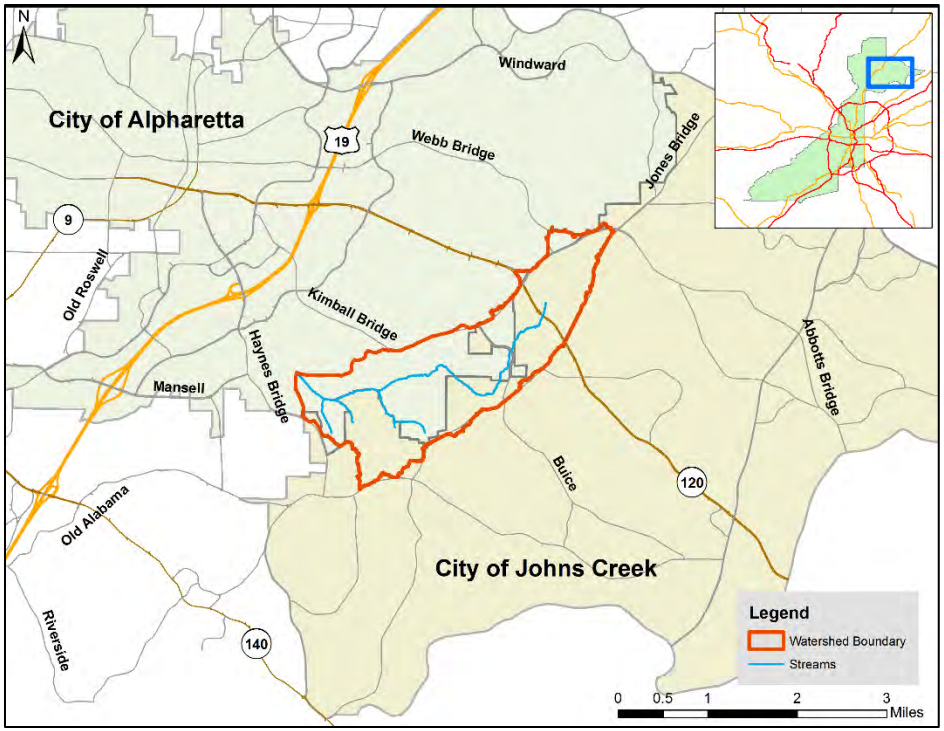
If a dog poops in the forest does it still contaminate your watershed?

Project Background



Watershed Background

- Long Indian Creek Watershed
  - Located in the City of Alpharetta and the City of Johns Creek
  - Landuse is primarily residential
- Long Indian Creek placed on 303(d) list for fecal coliform contamination
  - TMDL requires 95% reduction in fecal loads
- Potential fecal sources include:
  - Human: sanitary sewer leaks, SSOs, septic tanks
  - Animal: dogs, horses, cows
  - Wildlife: ruminant, waterfowl



Data Collection – Stream Walks

- Assess stream conditions
  - Habitat and Stability
  - Cross Section and Bank Height
  - Estimate Bankfull Width
  - Bank Erosion Hazard Index
  - Riparian Buffer Conditions

1538603
LONG INDIAN CREEK
SITE 1
LEFT BANK
3/14/2016

Worksheet 21. Summary of bank erosion hazard index (BEHI)

Bank Erosion Hazard Rating Guide

Stream LONG INDIAN CREEK Reach SITE 1 Date 3/14/2016 Crew CB

Bank Erosion Potential		Bank Height (ft): 6 / Bankfull Height (ft): 3.5	Bank Height/ Bankfull Ht	Root Depth/ Bank Height	Root Density %	Bank Angle (Degrees)	Surface Protection%
VERY LOW	Value		1.0-1.1	1.0-0.9	100-80	0-20	100-80
	Index		1.0-1.9	1.0-1.9	1.0-1.9	1.0-1.9	1.0-1.9
	Choice		V: I:	V: I:	V: I:	V: I:	V: I:
LOW	Value		1.11-1.19	0.89-0.5	79-55	21-60	79-55
	Index		2.0-3.9	2.0-3.9	2.0-3.9	2.0-3.9	2.0-3.9
	Choice		V: I:	V: I:	V: 60 I: 3.5	V: 45 I: 3.2	V: 70 I: 2.8
MODERATE	Value		1.2-1.5	0.49-0.3	54-30	61-80	54-30
	Index		4.0-5.9	4.0-5.9	4.0-5.9	4.0-5.9	4.0-5.9
	Choice		V: I:	V: 0.31 I: 5.9	V: I:	V: I:	V: I:
HIGH	Value		1.6-2.0	0.29-0.15	29-15	81-90	29-15
	Index		6.0-7.9	6.0-7.9	6.0-7.9	6.0-7.9	6.0-7.9
	Choice		V: 1.7 I: 6.5	V: I:	V: I:	V: I:	V: I:
VERY HIGH	Value		2.1-2.8	0.14-0.05	14-5.0	91-119	14-10
	Index		8.0-9.0	8.0-9.0	8.0-9.0	8.0-9.0	8.0-9.0
	Choice		V: I:	V: I:	V: I:	V: I:	V: I:

Data Collection: Stream Walks

- Identify Problem Areas/Opportunities
  - Potential Pollution Sources
    - SSOs, Illicit Discharges
    - Areas accessible to domestic animals
  - Debris Jams and compromised infrastructure
  - Outfalls causing significant erosion
  - Incision or Aggradation
- BMP, System Investigations
  - Size, Material, Shape, Condition, Invert
  - Maintenance Concerns and Potential for Retrofit

Data Collection: Fecal Monitoring

- Fecal Coliform Sampling
  - Sampling and Quality Assurance Plan (SQAP) with Alpharetta and Johns Creek
    - Collecting data since 2014
    - Sampled five (5) locations along Long Indian Creek
  - Fulton County
    - Sampled at one (1) location along Long Indian Creek
- Bacterial Source Tracking (BST)
  - Tested for: Human, Dog, Bird, Ruminant (3 locations), and Geese (2 locations)

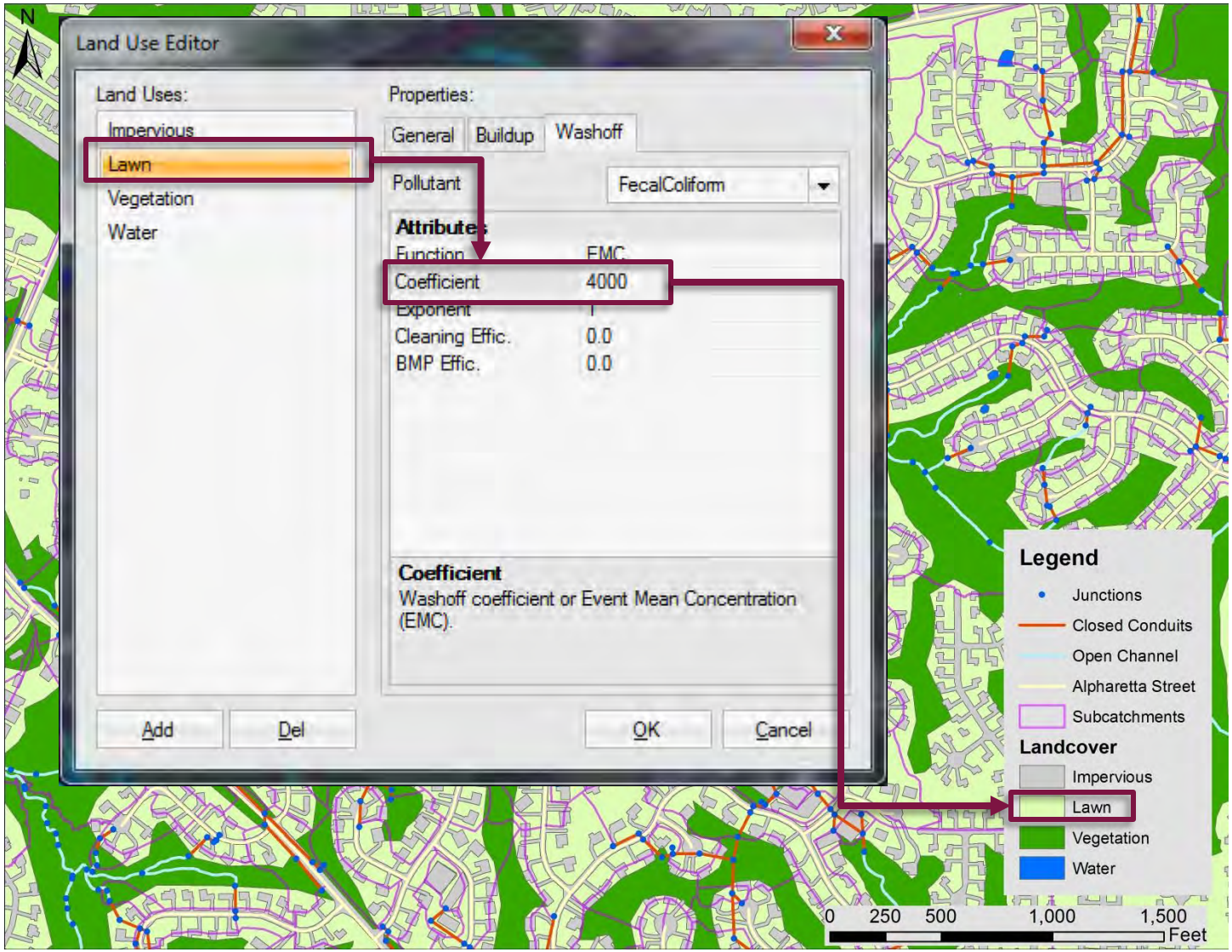
Data Development

- Intensive data development within ArcGIS
  - Areas of Concern (beaver dams, trash, debris jams)
  - Exposed Sanitary Sewer Pipes
  - Potential Septic Tank Locations
  - Drainage Complaints
  - Bank Erosion
  - Damaged BMPs
  - SSOs
  - Landcover

Model Creation

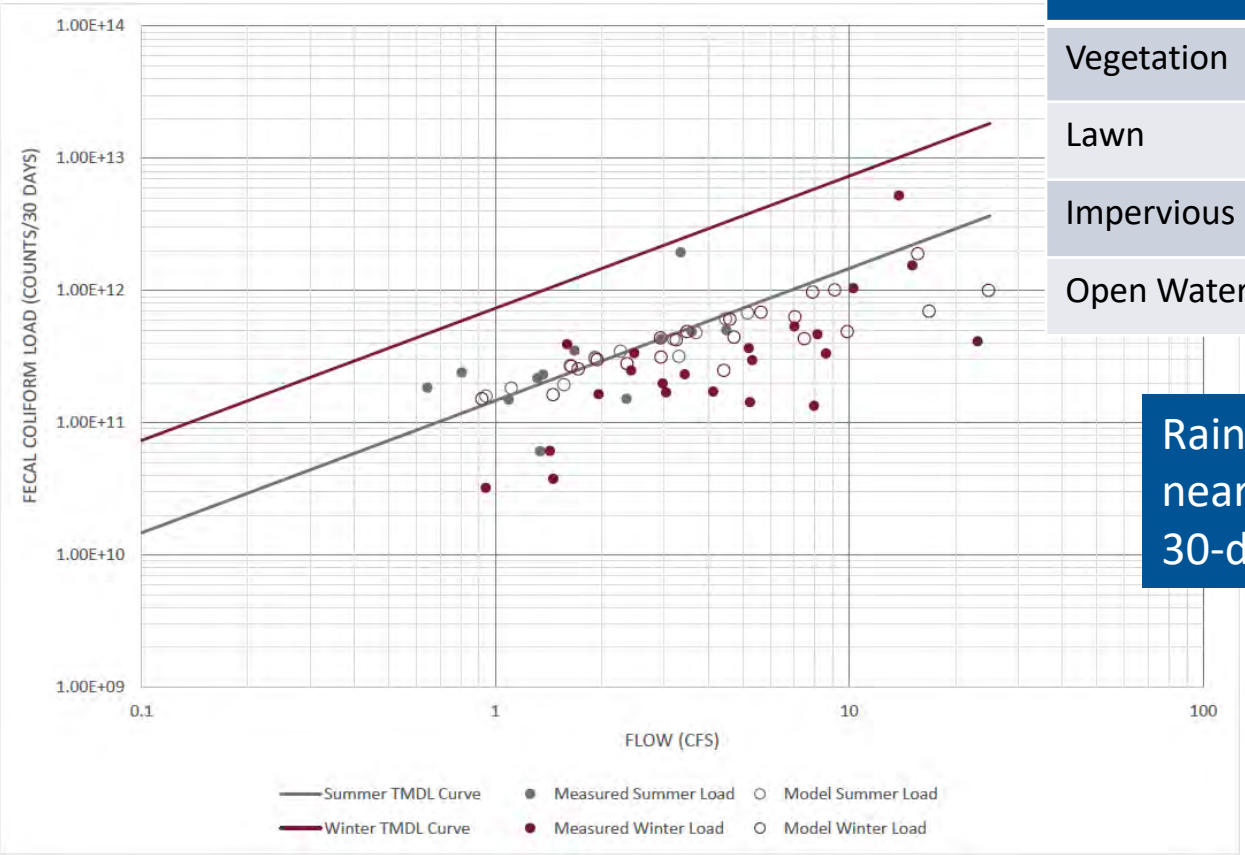
- Build single hydrodynamic watershed model
  - EPA's SWMM5 Engine (public domain) on a geospatial platform (PCSWMM)
  - Rainfall-Runoff Model
  - Most accurate representation of actual conditions
  - Accounts for timing of hydrograph as it routes through open and closed systems
- Simultaneously models water quantity and quality
  - Modeling of Stormwater System
    - Existing level of service
    - Upgrade scenarios
  - Water Quality Modeling
    - Wash-off load coefficient applied to different landcover types
    - 40% reduction of wash-off coefficient applied to areas with proposed dog waste stations
- Foundation for Identifying, Evaluating, and Selecting Proposed Improvements

Model Creation



Model Calibration

- Calibrated washoff coefficient to match sampled geometric means



Landcover Type	Washoff Coefficient
Vegetation	2000
Lawn	4000
Impervious	1000
Open Water	0

Rainfall totals from nearest gage utilized for 30-day model runs.

BST Results

- *If a dog poops in the forest does it still contaminate y[illegible]ershed?*

YES

DOG	Sample Date	Event	Site 1	Site 2	Site 3	Site 4	Site 5
	11/13/2015	Dry	Trace	Absent	Absent	356	Trace
	12/3/2015	Wet	14,300	16,600	8,560	12,300	19,300
	4/13/2016	Wet	2,600	29,600	12,200	17,200	24,900
	5/18/2016	Wet	4,610	5,030	7,680	7,690	15,300

HUMAN (Dorei)	Sample Date	Event	Site 1	Site 2	Site 3	Site 4	Site 5
	11/13/2015	Dry	Absent	Trace	Absent	Trace	Absent
	12/3/2015	Wet	387	377	251	294	330
	4/13/2016	Wet	Trace	Trace	294	Trace	Trace
	5/18/2016	Wet	599	758	739	693	1150

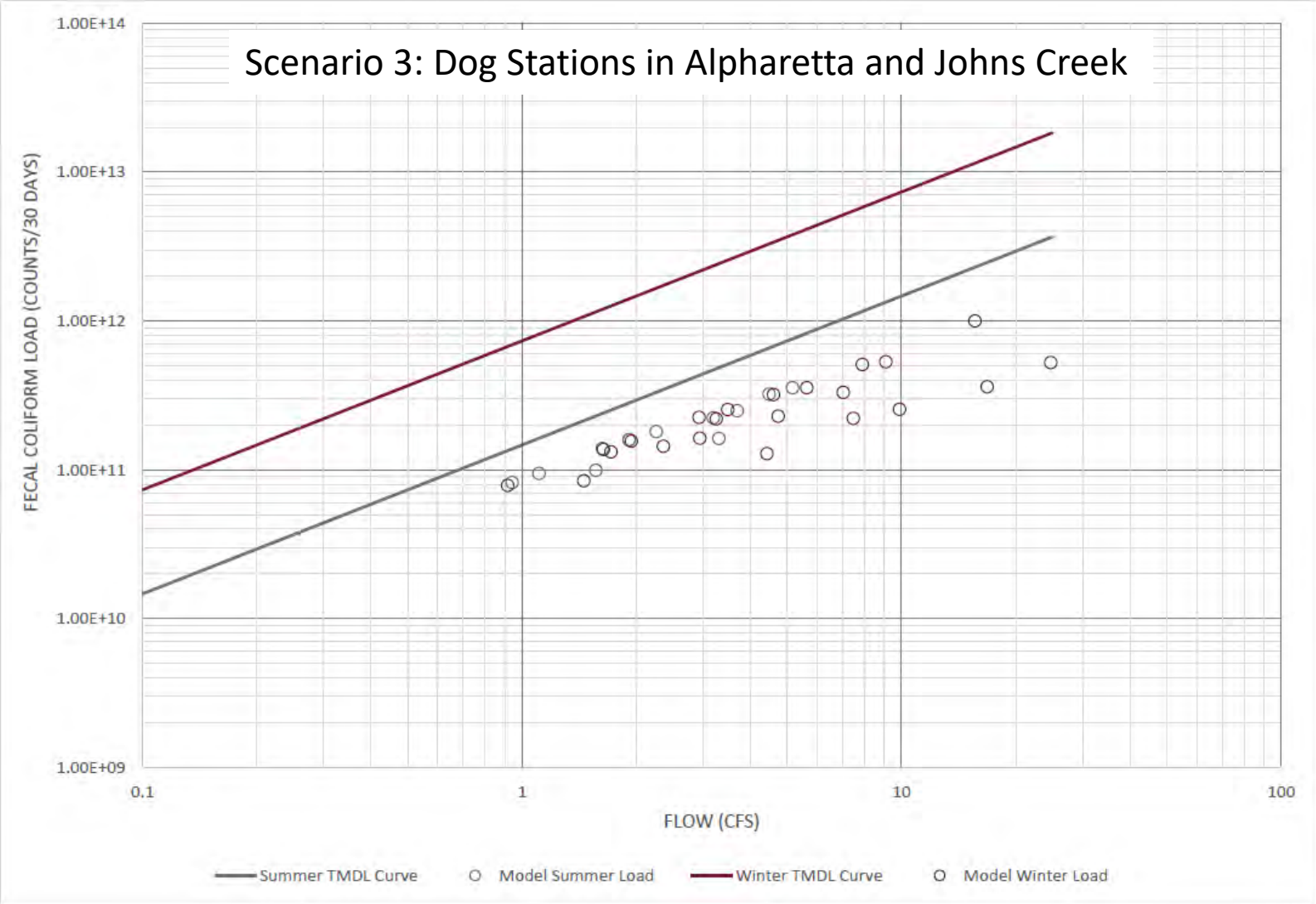
HUMAN (EPA)	Sample Date	Event	Site 1	Site 2	Site 3	Site 4	Site 5
	11/13/2015	Dry	Absent	Absent	Absent	Absent	Absent
	12/3/2015	Wet	Absent	Absent	Absent	Trace	Trace
	4/13/2016	Wet	Absent	Absent	Absent	Absent	Absent
	5/18/2016	Wet	Trace	Trace	Trace	320	371

Model Results

- City of Alpharetta wanted to meet the TMDL requirement while minimizing project costs
  - Limit investments in structural solutions due to cost and land availability concerns
- Explore feasibility of dog waste stations to meet TMDL goals
  - Modeled pollutant loading for three (3) scenarios:
    - Scenario 1: Existing Conditions
    - Scenario 2: Dog Waste Stations Installed only in the City of Alpharetta
    - Scenario 3: Dog Waste Stations Installed in the City of Alpharetta and the City of Johns Creek
  - Estimated a 60% reduction in fecal loads where dog waste stations are installed

Landcover Type	Washoff Coefficient
Lawn with Dog Stations	1600
Impervious with Dog Stations	400

Model Results



Project Option Selection

- Ranking Matrix
  - Each category given a score of 0, 1, or 2
  - Favors non-structural solutions
  - Green Infrastructure (GI) Solutions highly ranked

Project Ranking Equation:

Points Total = (FC + C + S + E + FL + I + A + SC) X L

Where: L = Public Land Availability Score
FC = Fecal Coliform Reduction Score
C = Capital Cost Score
S = Sediment Reduction Score
E = Constructability Score
FL = Flood Risk Mitigation Score
I = Community Involvement Score
A = Aesthetics Score
SC = Shared Cost Score

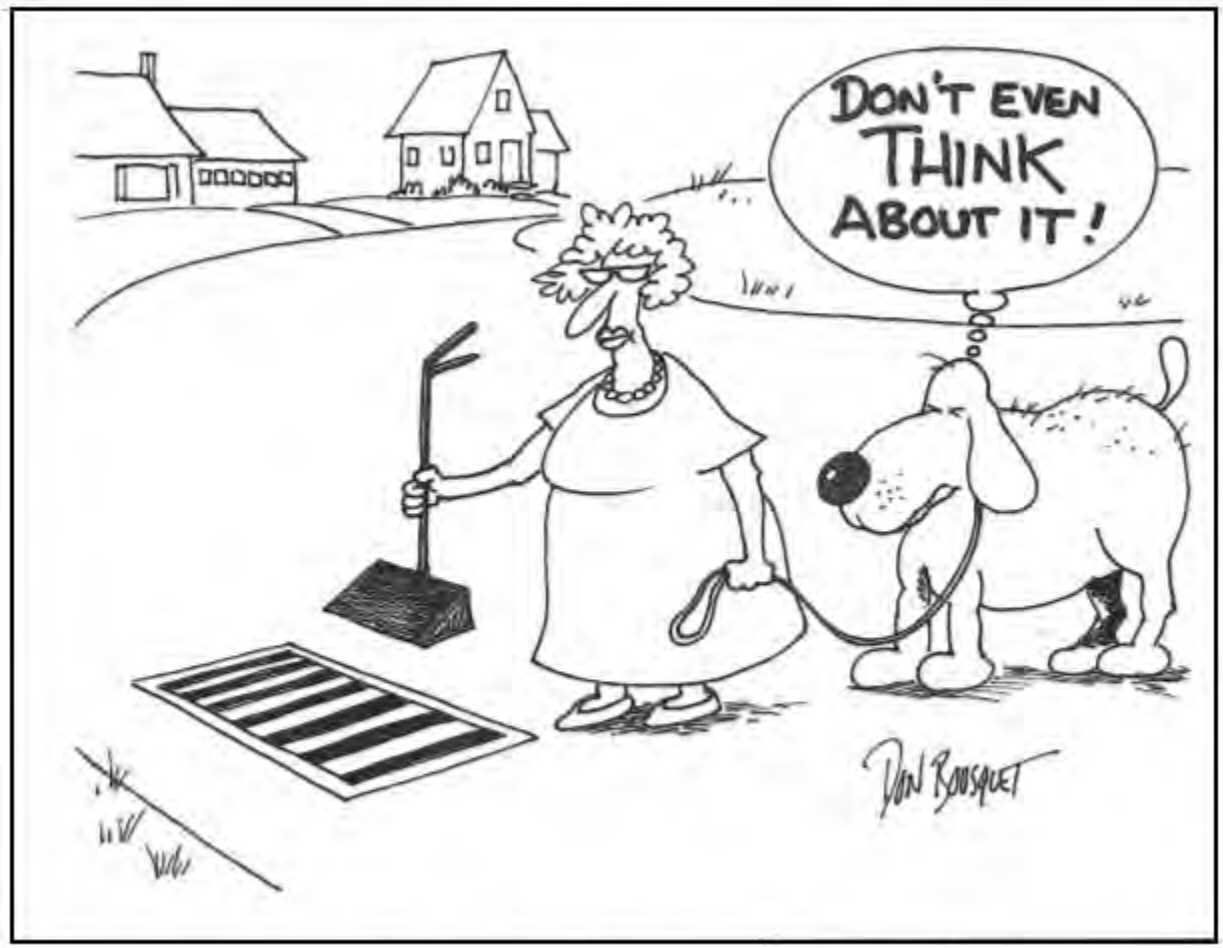
Ranking	Dog Waste Station & Public Education
1	Dog Waste Stations & Public Education
2	Waters Road Enhanced Dry Swales Project (South)
3	Waters Road Enhanced Dry Swales Project (North)
4	Bacterial Source Tracking (BST)
5	Stream Restoration & Sewer Protection Project 1
6	Stream Restoration & Sewer Protection Project 2
7	Stream Restoration & Sewer Protection Project 3
8	Stream Restoration & Sewer Protection Project 4
9	Stream Restoration & Sewer Protection Project 5
10	Birch Rill Drive CIP Project
11	Pinehollow Court Neighborhood Flooding
12	Tuxford Neighborhood Flooding

Project Deliverables

- Project Sheets for Proposed Projects
- SSAP Database and Cost Tool
- Monitoring Criteria
- Cost and Funding Options for Proposed Projects
- Data-Informed Implementation Schedule
  - Allows for schedule flexibility based on continued monitoring results

Next Steps

Next Steps



Source: RIStormwaterSolutions.org

Next Steps

Inspection | **Details**

Type: Catch Basin Inspection

Submit To: ROLAND, DENNIS R — Date: 10/17/2016 9:43 AM

Priority: Emergency

Initiated By: , Stormwaterinsp — Initiated Date: 10/17/2016 9:42 AM

Projected Start: 10/17/2016 9:42 AM — Projected Finish:

Actual Finish: 10/17/2016 9:44 AM

Closed By: — Date Closed:

Cancel Insp? — Cancel Date:

Cancel WO?

Cancel Reason:

Cancelled By:

Location

Update Map:

Map Layer Fields

Reset

Entity

Highlight | Get from Map | History | Remove | Asset Costs

Update Inspection XY when adding/removing asset? ☑

Editable Fields: ◉ All Fields: ○

UTILITIES_STORMWATERSTRUCTURES

Structure Type	Catch Basin
Structure Shape	Double Wing Catch Basin
City Responsibility	Yes
Condition	Good
Inspection Date	4/30/2017
Inspector	DRoland
Maintenance Needs	None
Collection Status	Inlet
Regulatory Outfall	No
Depth to Invert Out	8.6
Structure Material	Pre-Cast Concrete
Structure Damage	None
Sediment in Structure	None
Debris	Moderate
Water Presence	None
Scour	None
Notes	Brick invert. Dog waste bags.

Dewberry

Thank You

Are there any questions?

THE CITY OF ALPHARETTA

Dewberry