


DRONES AND OUTFALL MONITORING

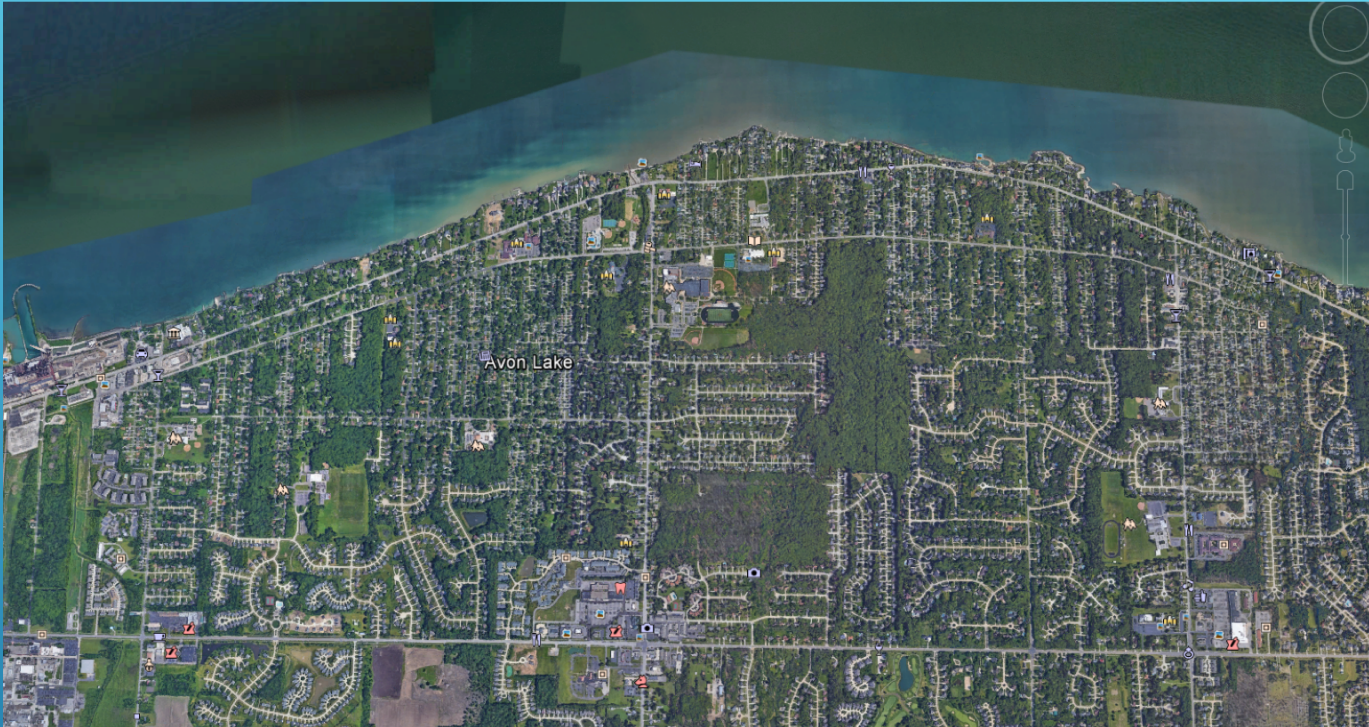
Joe Reitz

City of Avon Lake, Ohio




WHAT WAS THE PROBLEM?

- ▶ Avon Lake is a community of 22,000 people along the Lake Erie Shoreline.
 - ▶ 32 outfalls into Lake Erie, both public, public/private
 - ▶ Many do not have formal easements
 - ▶ Many are only accessible from the water
 - ▶ Sizes range from 6 inch to 108 inch diameter
 - ▶ The bluff is between 25 and 35 feet above the shoreline
 - ▶ 23 Watersheds directly to Lake Erie
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THE LOVELY CITY OF AVON LAKE

ONCE UPON A TIME...

- ▶ City had a situation where ODNR approached us about modifications to several City owned properties along Lake Erie;
 - ▶ The finished products did not match the permits;
 - ▶ Had to apply for after-the-fact permits for four properties owned by the City;
 - ▶ Final result is that the City had to do regular inspections of the outfalls after storm events.
 - ▶ HOW DO I DO THAT?
 - ▶ Can I figure a way to do outfall inspections too?
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WE ALL HAVE THE TYPICAL
OUTFALLS...

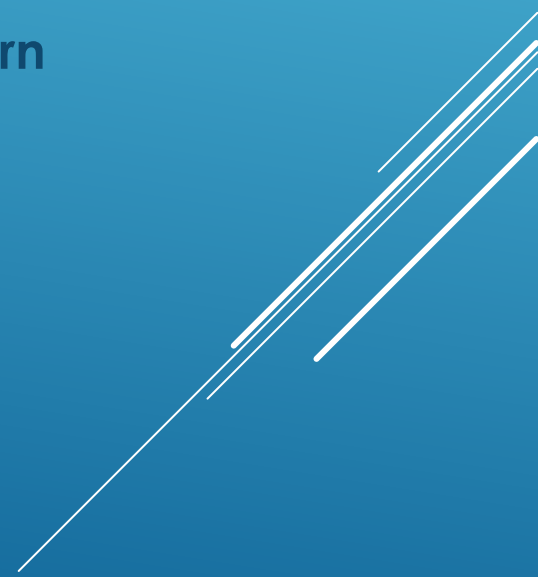


BUT WHAT HAPPENS WHEN YOU
HAVE A STEEP SHORELINE? THIS
ONE WAS AT A BEACH AREA




OR NO WAY TO SEE IT

WE HAD VARIOUS NEEDS TO WORK OUT.

- ▶ We need to do outfall inspections in Lake Erie
 - ▶ Budget would not allow me to buy the boat I needed to do my job
 - ▶ Fire Department would not let me use the jet ski for “work purposes”
 - ▶ We also needed to do regular inspections of three breakwalls to check for shifting of the fill
 - ▶ We had to think outside the box, but a young intern made a suggestion.
 - ▶ HOW ABOUT A DRONE.
 - ▶ THIS IS A HIGHLY TECHNICAL TOOL....not a toy
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JUSTIFICATION TO DO INSPECTIONS

- ▶ We all have to explain to the Mayor, Council and the PUBLIC why we do what we do
 - ▶ In the case of Avon Lake we have several situations for outfalls
 - ▶ Drainage areas for the outfalls into Lake Erie range in size from 5 acres to over 3000 acres not counting outside communities
 - ▶ Need to ensure the public that we are protecting the infrastructure
 - ▶ Did I mention NO EASEMENTS?
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LARGE PIPES ON BEACH ARE NO
PROBLEM



WHAT ABOUT A SUBMERGED
MANHOLE?

WE STILL HAD ISSUES WITH ODNR ABOUT THE SHORELINE ALONG CITY PROPERTY.

- ▶ **Miller Park has shoreline protection along a public beach**
 - ▶ **North Point Drive had shoreline protection along a public road**
 - ▶ **Veterans Park had several designs protecting a beach and park shoreline**
 - ▶ **Jaycox Road outfall is another story for a future presentation in 2018**
 - ▶ **STILL HAVE OUTFALL PIPES WITH UNKNOWN CONDITIONS**
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PEEK-A-BOO I SEE YOU



A DRONE CAN GO OUT IN THE
COLD OR WARM WEATHER



BURRIED CREEK ANYONE?

HO



LE BLUFF?





LE - 26 North Point Drive 10/20/17

FORMER COMBINED, NOW
STORM



NICE PIPES



WHERE DID THE PIPE GO?



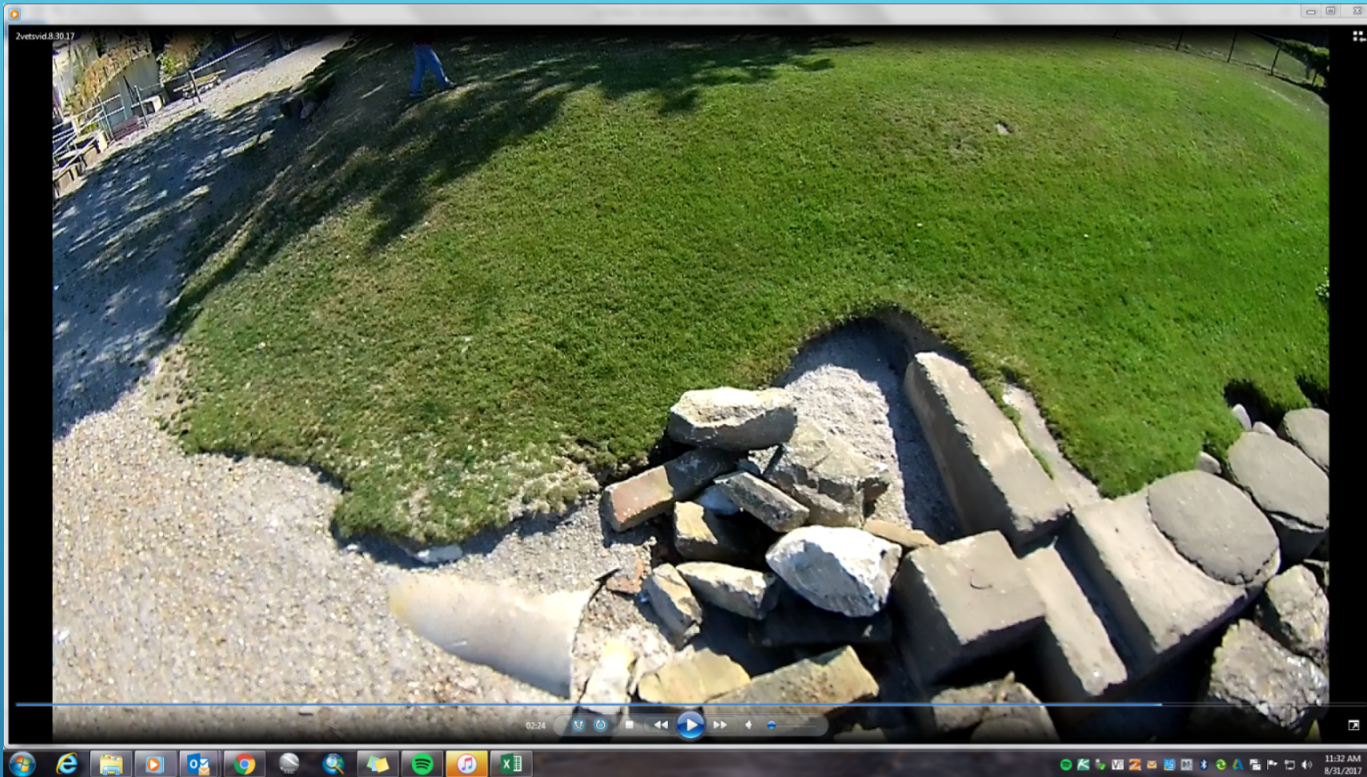
NORTH POINT BREAKWALL



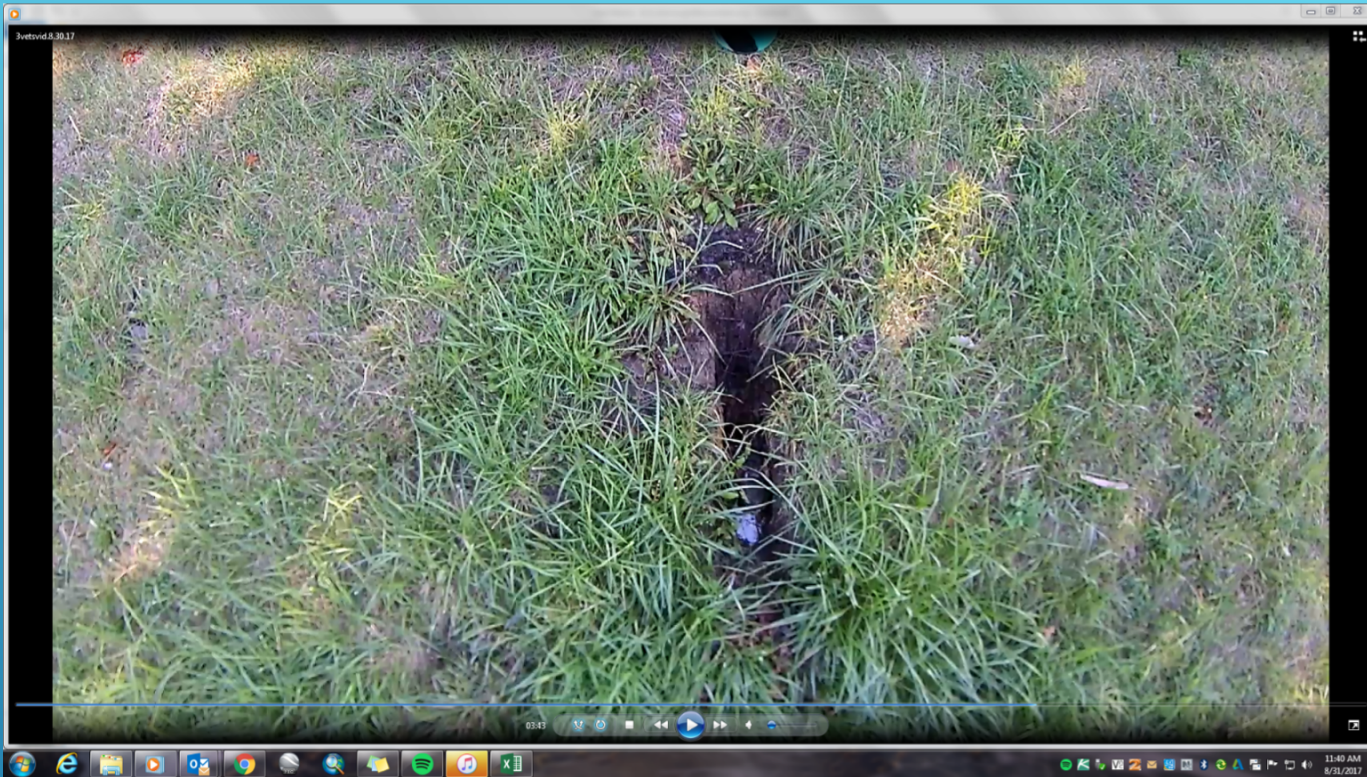
SETTLEMENT WE ARE WATCHING



EROSION ON PRIVATE PROPERTY
ADJACENT TO CITY PROPERTY
(WHO IS RESPONSIBLE HERE?)



DISCOVERED UNIQUE SHORELINE
PROTECTION (OLD PIPES AND
MANHOLES)



YES THERE IS A PIPE IN THERE
SOMEWHERE



MAKESHIFT SHORE STRUCTURES



EROSION ALONG A PARK
THIS GOT MUCH WORSE OVER APRIL
STORMS.




CAN GET UP CLOSE IF YOU
WANT TO

- ▶ Issues currently observed that will need investigation in 2018
- ▶ Lake levels are at a 20 year high level
- ▶ Access to beaches are more limited than in the past
- ▶ Storm have blown debris into outfall pipes and have potentially damaged the lakeward ends
- ▶ Old CMP Pipes do not hold up well with wave action
- ▶ Outfalls with SSO's need more monitoring
- ▶ As lakefront property values increase access is critical

2018 STORMS

PLUSES

- ▶ Gives us access to areas we could not see;
 - ▶ Gives us an opportunity to inspect winter or summer
 - ▶ Provides us the ability to monitor various sites in a single day with one person
 - ▶ It is pretty fun to explain to the elected officials why I had to buy this additional tool
 - ▶ The media loves a story about the government buying a drone
 - ▶ IT IS COOL!!!
- 
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MINUSES

- ▶ The media loves a story about the government buying a drone
- ▶ The residents love hearing that the community purchased a drone
- ▶ The FAA love it when the media announces that the community purchased a drone
- ▶ People call you to ask for you do take photo's of their homes, and
- ▶ People call you to make sure you are not going to take photo's of their homes.
- ▶ The drone is a delicate piece of equipment and WILL need to be repaired. Have someone on staff that is handy

- ▶ The local community events will want you there to take video of the parades
- ▶ Your stall will learn about wind gusts
- ▶ You will need an Amazon account to buy new parts like blades and camera mounts (see comment above)
- ▶ The investment is worth it with proper care and training.
- ▶ MAY BE ABLE TO USE OT FOR GEESE CONTROL

AND AS A BONUS

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I did not want to drone on for any longer because I am holding you from our afternoon break

Joseph Reitz, P.E., CPESC, CESSWI, CPSI

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THANK YOU

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