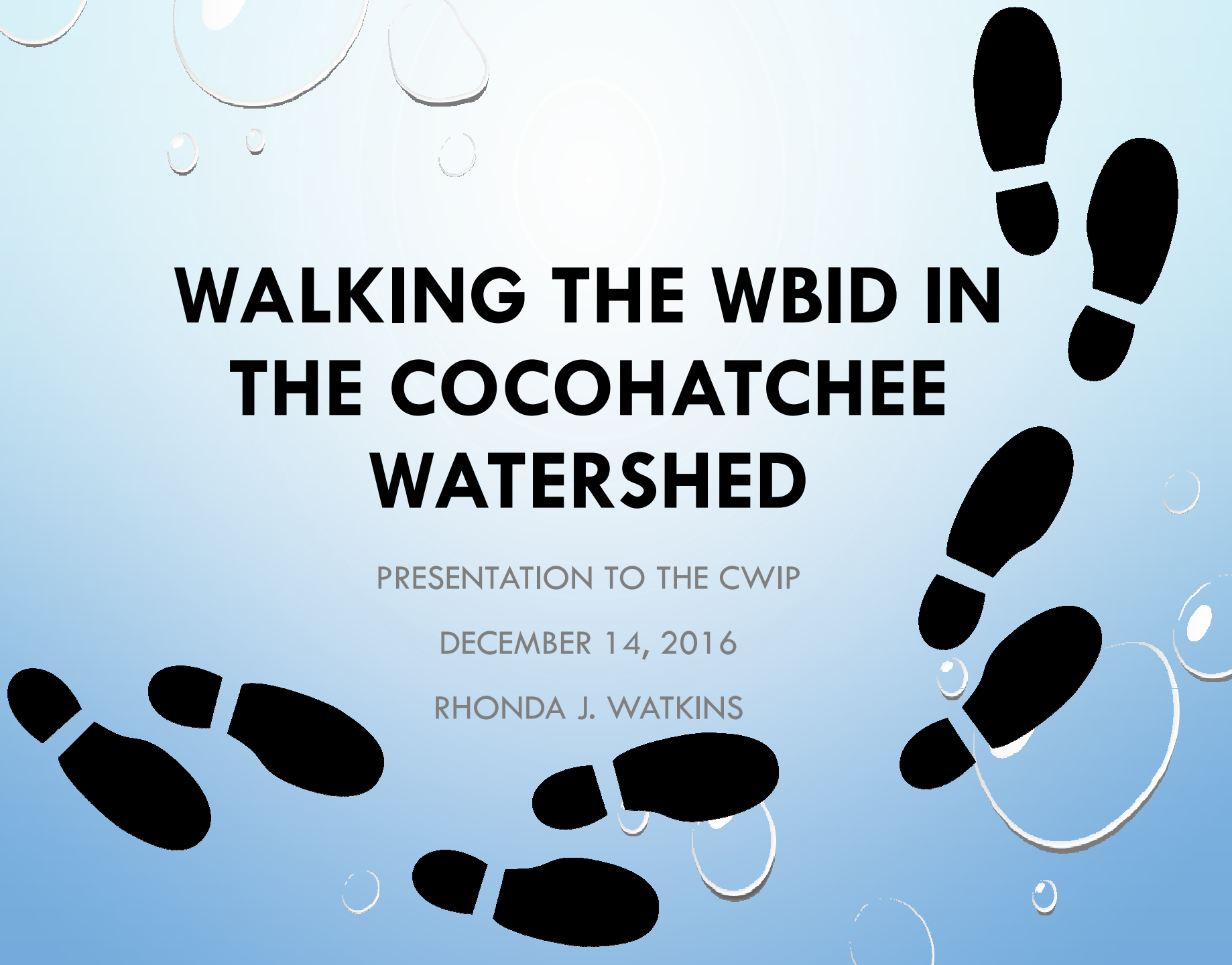
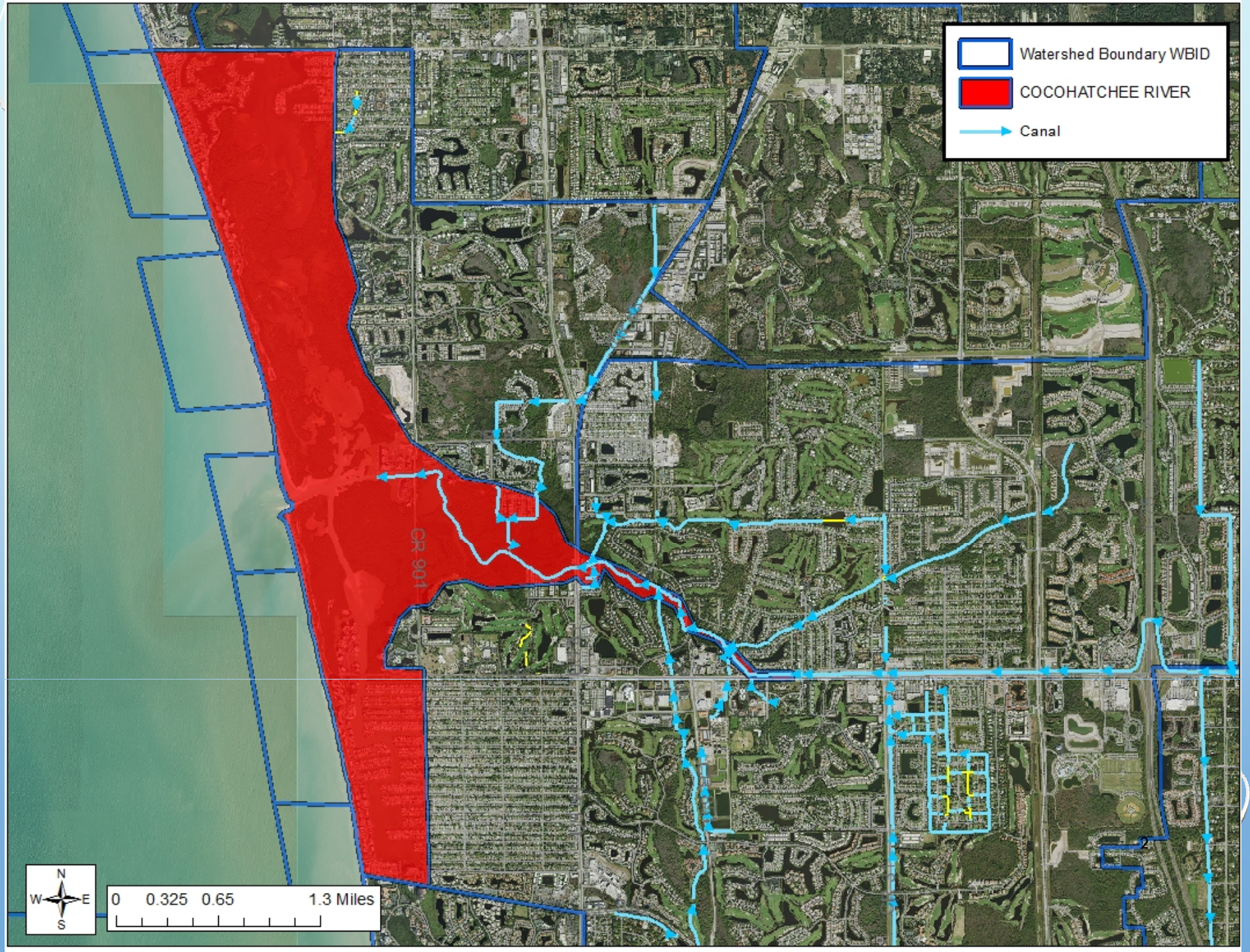
WALKING THE WBID IN THE COCOHATCHEE WATERSHED

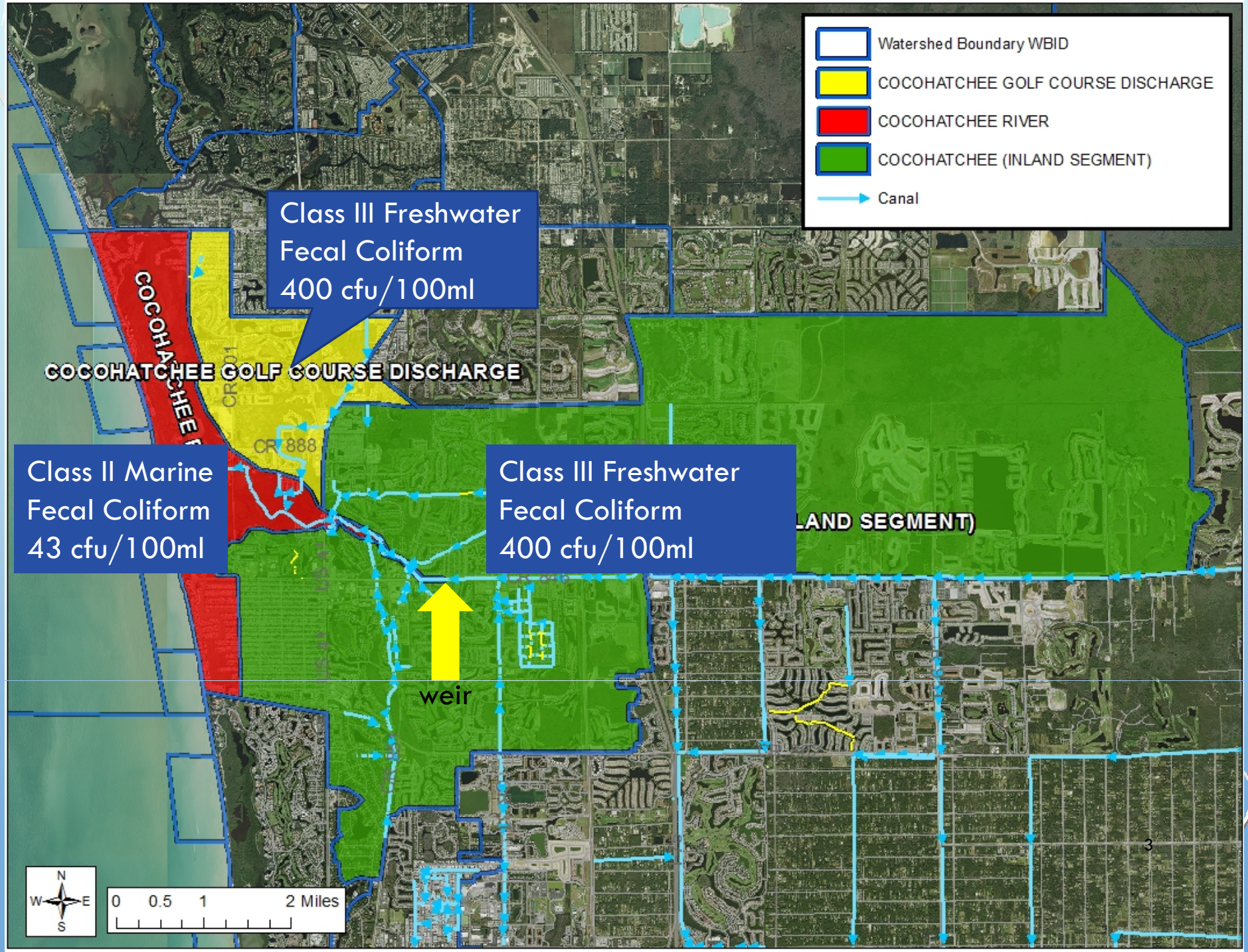
PRESENTATION TO THE CWIP

DECEMBER 14, 2016

RHONDA J. WATKINS




Watershed Boundary WBID
COCOHATCHEE RIVER
Canal
CR 901
N
W
E
S
0
0.325
0.65
1.3 Miles


Watershed Boundary WBID
COCOHATCHEE GOLF COURSE DISCHARGE
COCOHATCHEE RIVER
COCOHATCHEE (INLAND SEGMENT)
Canal
Class III Freshwater
Fecal Coliform
400 cfu/100ml
COCOHATCHEE GOLF COURSE DISCHARGE
CR 888
Class II Marine
Fecal Coliform
43 cfu/100ml
Class III Freshwater
Fecal Coliform
400 cfu/100ml
weir
N
W
E
S
0 0.5 1 2 Miles

BACKGROUND

- TMDL requires a 65 % load reduction of fecal coliform from non-point sources
- Where are theses non-point sources?
- VISA was implemented by Pollution Control in 2008
  - intensive sampling
  - on-the-ground site investigation
  - septic tanks surveys by Department of Health
  - integrity testing of the County's wastewater collections system
  - No sources were found
- FDEP did additional monthly water quali[illegible]g for one year.
- No sources were found

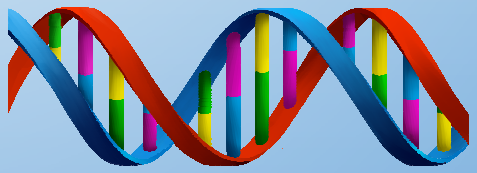
WALK THE WBID

- "Walk the WBID" is a bacteria source tracking investigation FDEP performs on fecal coliform impaired WBIDs.
- Brings in stakeholders and owners of potential large scale contributors (state, county, city, & citizens)
- Maps on the table to brainstorm potential sources
- Boots on the ground to look for obvious sources and monitoring locations
- "Snapshot" monitoring
  - Sample all major tributaries
  - Target potential sources
  - Wet vs. dry season
  - Tourist season- target higher usage (boating, swimming)
  - Uses biomarkers to distinguish sewage from other sources of bacteria

WALK THE WBID

BIOMARKERS

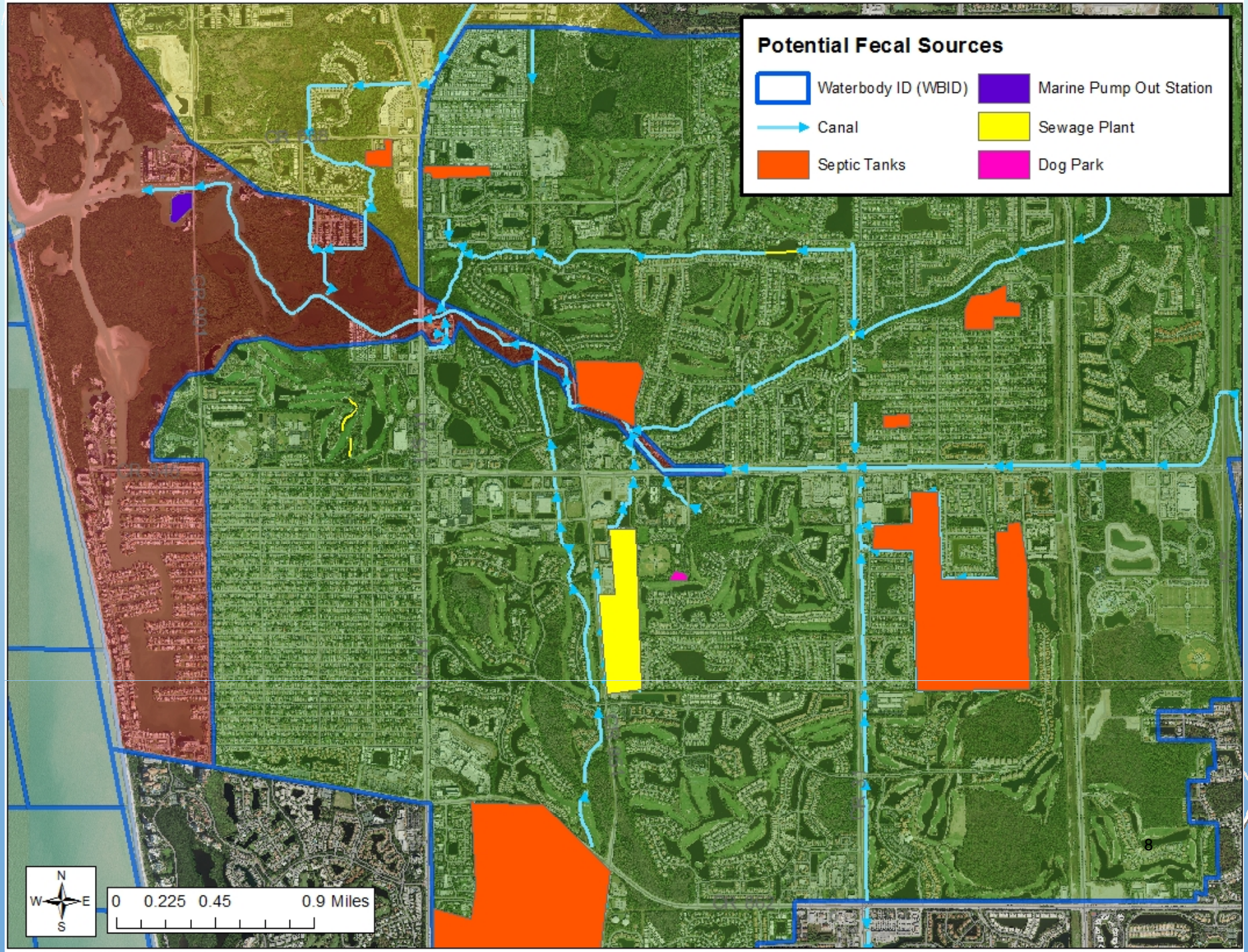
- Uses multiple markers to increase certainty
- Sucralose (Splenda®)
  - Not removed during the wastewater treatment process
  - Present in reuse irrigation water
- Acetaminophen (Tylenol®)
  - Removed during wastewater treatment process
  - Indicative of raw sewage source
  - Short-lived in the environment
- qPCR DNA
  - Specific to human DNA
  - No absolute guarantee that if not present, that no human sources are present



COCOHATCHEE WTW

Get out the maps and look for sources

- Sewage Transmission Lines
- Lift Stations
- Septic Tanks
- Marine pump-out stations
  - Live aboard boats or boats with heads
- Dog parks or dog walks
- Farms
- Homeless camps
- Bird rookery


Potential Fecal Sources
Waterbody ID (WBID)
Canal
Septic Tanks
Marine Pump Out Station
Sewage Plant
Dog Park
N
W
E
S
0 0.225 0.45 0.9 Miles

COCOHATCHEE WTW

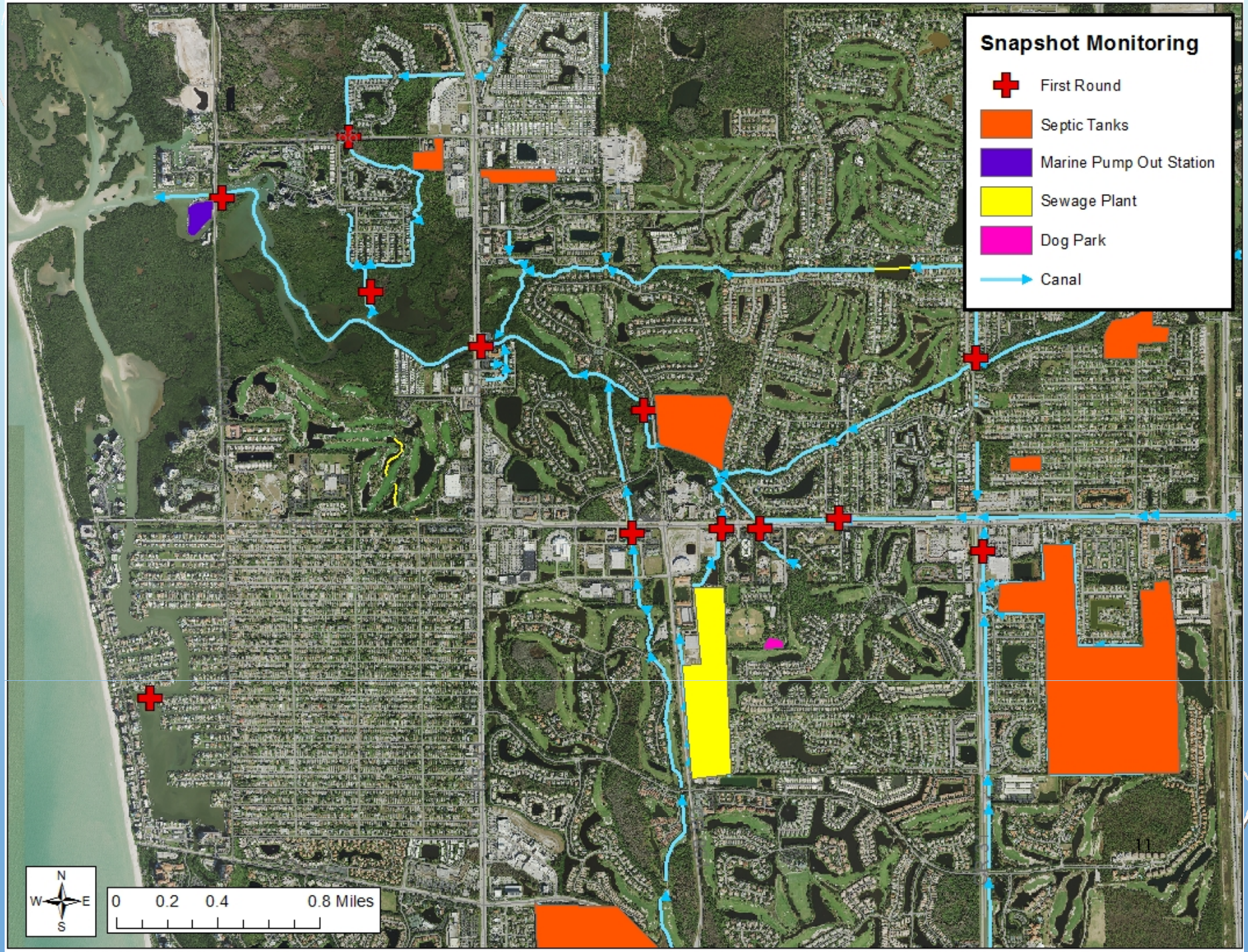
Boots on the ground

- Drive/walk the watershed to locate:
  - Tributaries and outfalls from potential source identified in map exercise
  - Locate water control structures and define drainage areas to be sampled
  - Look for obvious sources

COCOHATCHEE WTW

Snapshot Monitoring

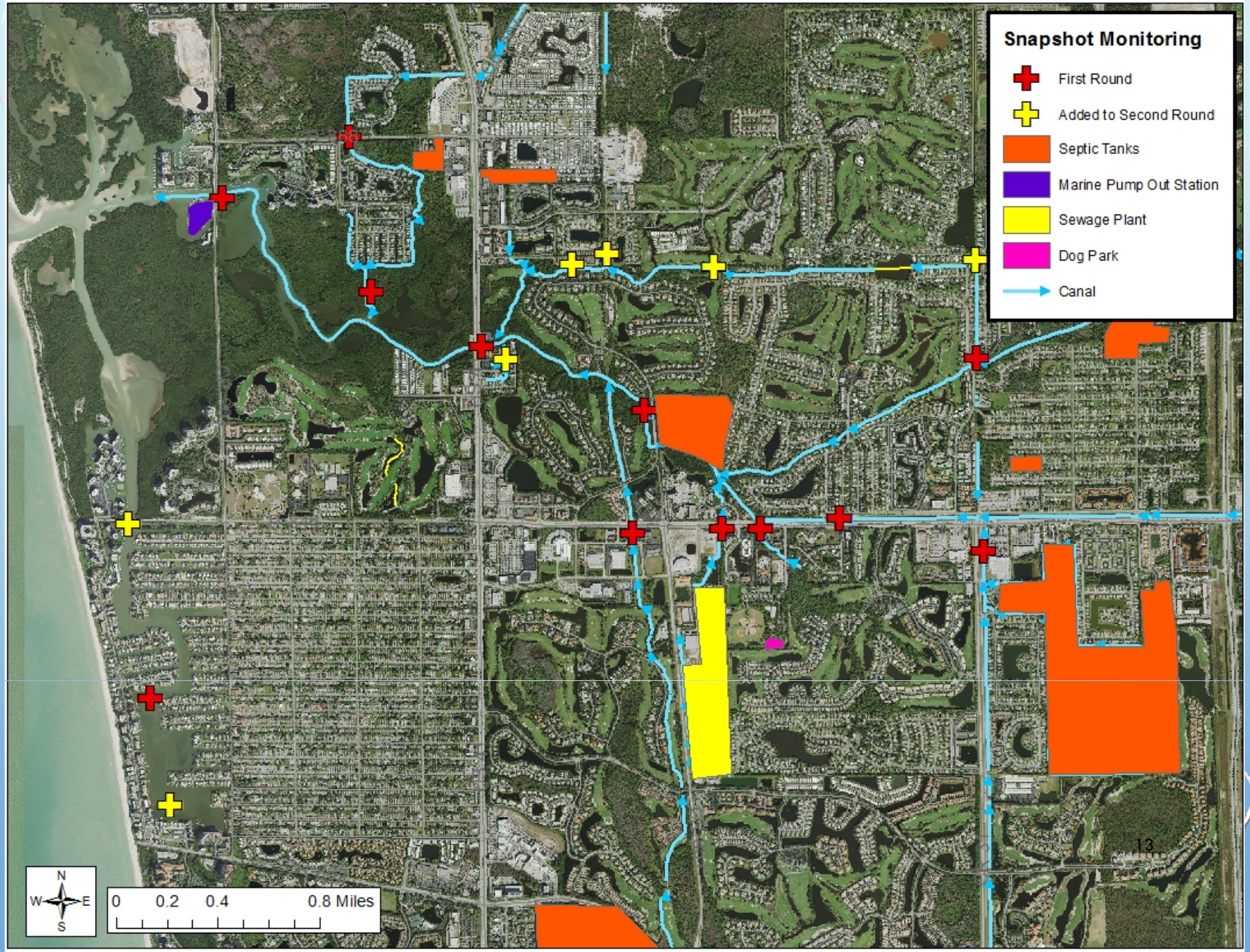
- Sites selected by Collier County and FDEP
- First round sampled 12 sites—number defined by FDEP
- Sampled all major tributaries
- Sampled on out-going tide
- First round done October 2014—end of wet season
  - Fecal coliform (marine and freshwater)
  - Enterococci (marine)
  - E. Coli (freshwater)
  - Sucralose
  - Acetaminophen
  - PCR-HF183


Snapshot Monitoring
First Round
Septic Tanks
Marine Pump Out Station
Sewage Plant
Dog Park
Canal
N
W
E
S
0
0.2
0.4
0.8 Miles

COCOHATCHEE WTW

First Round Results

- DNA—none found
  - only 4 freshwater sites were analyzed (NNAPLES, WCOCORIV, WIGGINSBY, COCO@IBIS)
- Acetaminophen—one hit in Vanderbilt Lagoon-VBILT
- Sucralose
  - Found at every site except COC@IBIS and BC14
  - Highest at WCOCORIV
- NNAPLES had highest E. Coli and fecal coliform, but no DNA hit
- COCAT41 had higher sucralose than nearest upstream site suggesting there was another input (Horse Creek?)


Snapshot Monitoring
First Round
Added to Second Round
Septic Tanks
Marine Pump Out Station
Sewage Plant
Dog Park
Canal
N
W
E
S
0
0.2
0.4
0.8 Miles

COCOHATCHEE WTW

Second Round March 2015 Dry Season

- Added 7 more sites, total of 19
  - 2 more sites in Vanderbilt Lagoon to target boats and boating season
  - 4 sites in Horse Creek
- Same parameters
- DNA added to 7 more sites (dropped WIGGINSBY, added COCAT41, HORSECRK, ECOCORIV, 28030009, IMPFPL, PLMRVESW, VBILT)
- No DNA hits—HORSECRK "hit" below detection limit
- No acetaminophen hits
- WCOCORIV still had highest sucralose
- HORSECRK—highest enterococcus
- WIGGINSBY—highest fecal and E. Coli

COCOHATCHEE WTW

Third Round June 2015 First Flush

- Repeat of sites in second round
- Same parameters
- No human DNA found—HORSECRK "hit" below detection limit again
- WCOCORIV had the highest E. Coli, fecal and sucralose
- Acetaminophen found at IMPFPL, COCAT41, BERMUDA, VBILT, WIGGINSBY, 28030009 and HORSECRK
  - IMPFPL and COCAT41 had highest levels—suggests inputs from Horse Creek.

COCOHATCHEE WTW

Overall Results

- October had highest bacteria counts
- NNAPLES had highest E. Coli and fecal coliforms, but no DNA
- COCOST has highest Enterococcus average for a saltwater site
- HORSECRK had the only human DNA "hits" on both samples collected; however, both were inconclusive because results were below the laboratory method detection limit.
- Acetaminophen—raw sewage source
  - VBILT had hits 2/3 times
  - IMPFPL (highest hit) and COCAT41 (second highest hit)

COCOHATCHEE WTW

Overall Results-cont'd

- Sucralose—treated and untreated sewage source
  - WCOCORIV had highest sucralose average, NNAPLES had the second highest. No acetaminophen.
    - WCOCORIV site does not collect large amount of reclaimed water irrigation runoff, but is near reclaimed water transmission lines.
    - NNAPLES collects all of Pelican Marsh reclaimed water runoff.
  - PLMRVESW and COC@IBIS were the only two sites with no sucralose hits. No reuse irrigation in their drainage areas.
- **No smoking gun**

COCOHATCHEE WTW

Next steps

- FDEP will do write-up that includes next steps (when?)
- In the mean time….
  - Check to see if reclaimed water transmission lines in drainage area for WCOCORIV are leaking
  - FPL easement with high acetaminophen hits
    - Sample upstream/downstream of septic area for biomarkers (can't do this without FDEP)
    - Look for aging pipes in this drainage area
    - Integrity test of County wastewater collections system

COCOHATCHEE WTW

Next steps

- Check for
  - Lagoon
- Checked
- Check out
- Clear hom
- Get Clear
- Education
  - Target
    - BMPs
    - Identif
      - and e
- Reclassify

nd Vanderbilt

aboards

ridge

water for boater

eas with signage

Class III Marine?[19]

QUESTIONS?