Stormwater:

Importance of Preventative Maintenance

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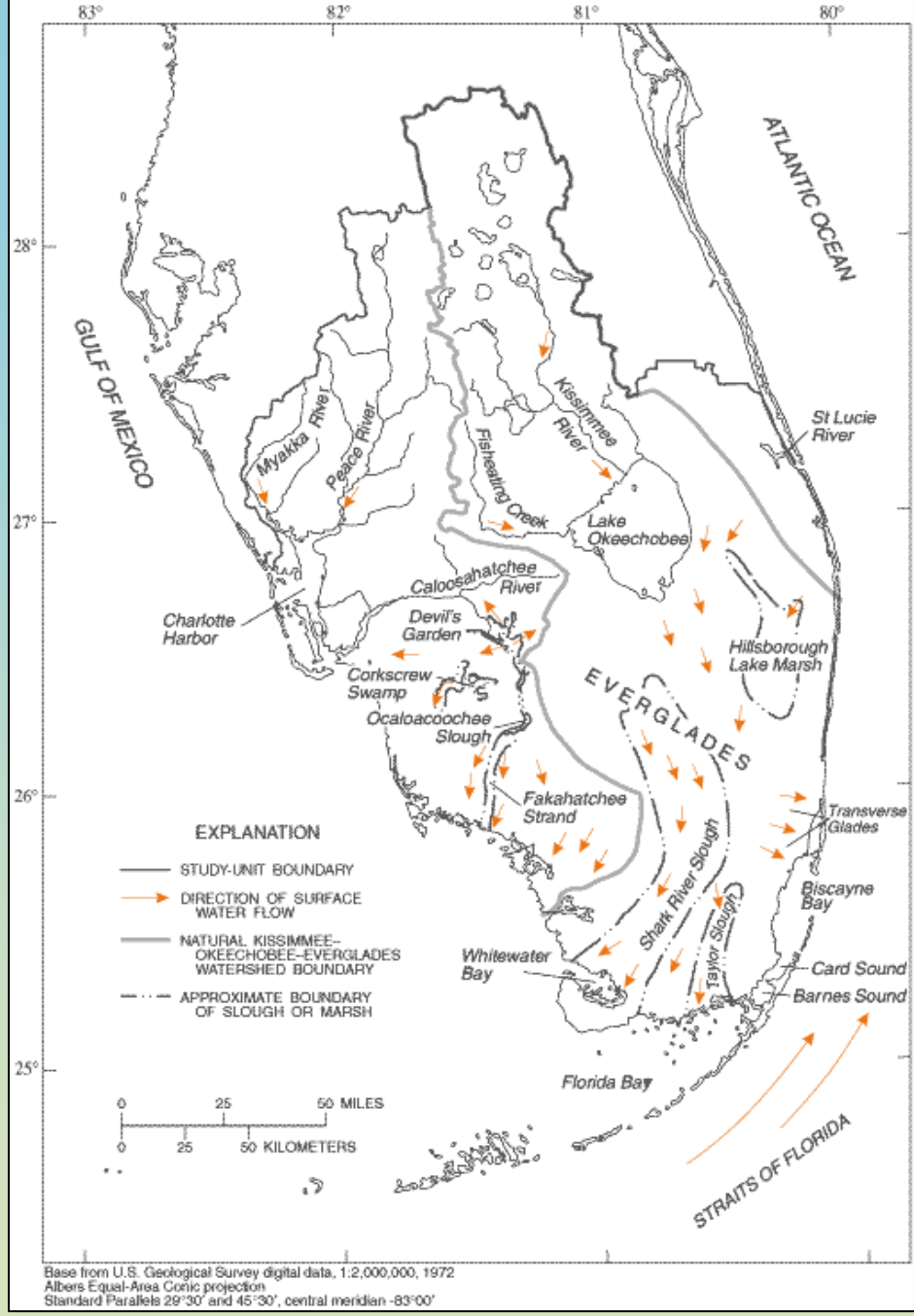
FLORIDA GULF COAST UNIVERSITY

Introduction

- Pollution in one area of the watershed impacts the entire region downstream because it is all interconnected.
- Human activities can change the critical functions of the watershed.

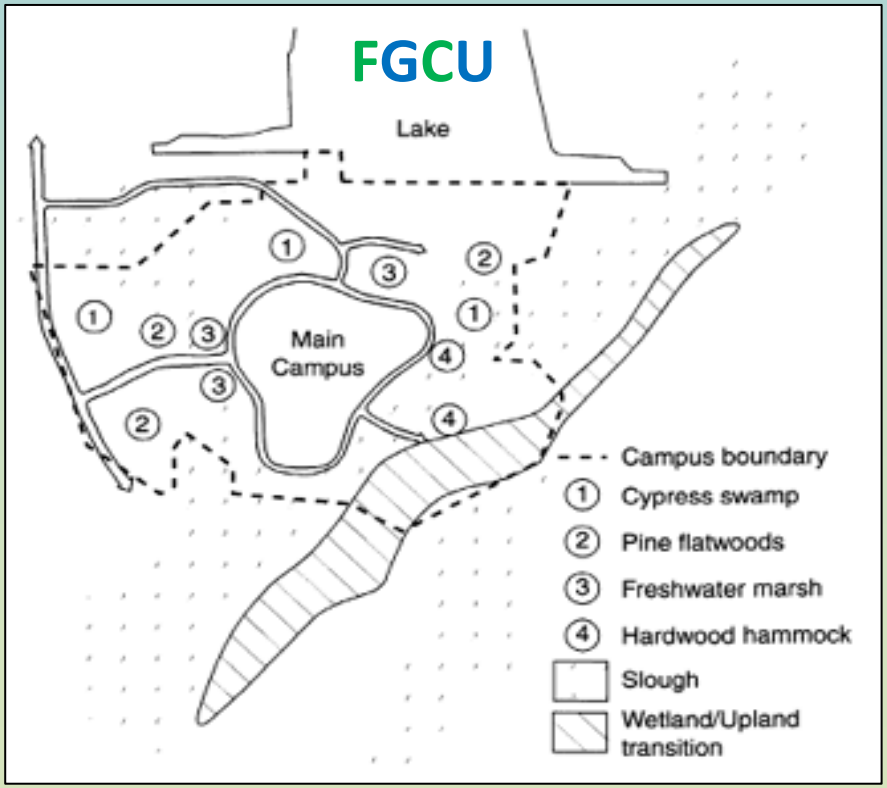


From: http://sofia.usgs.gov/publications/circular/1134/esns/koew.html

Introduction

- Florida Gulf Coast University is part of a regional watershed that eventually spills into the Estero Bay, and joins the Gulf of Mexico.

- This watershed helps maintain healthy estuaries and a healthy bay.



More information:
http://www.fgcu.edu/CAS/CEM/watershed.html

What is a Watershed?

- **A Watershed is:**
  - A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.
  - A watershed is a basin-like landform defined by highpoints and ridgelines that descend into lower elevations and valleys.
  - A watershed carries water "shed" from the land after rain falls and snow melts.
  - Every drop of water is channeled into soils, groundwater, creeks, and streams, making its way to larger rivers and eventually to our oceans.
  - https://www.youtube.com/watch?v=f63pwrMXkV4

Why is Stormwater Runoff a Problem?

- Stormwater can pick up pollutants that flow into our wetlands and groundwater, AND eventually into the oceans.

Hurricane Irma

Marco Island, 2017

Why is Stormwater Runoff a Problem?

- Storm drain maintenance is **KEY** to reducing flood risk potential!! (Cape Coral, Island Park, etc.)

FGCU's Campus Water Flow

Introduction

- Because of the environmental sensitivity of our location, FGCU is required by federal and state regulations to complete a stormwater management plan (permit).
  - MS4 Generic Permit

Permitting Compliance

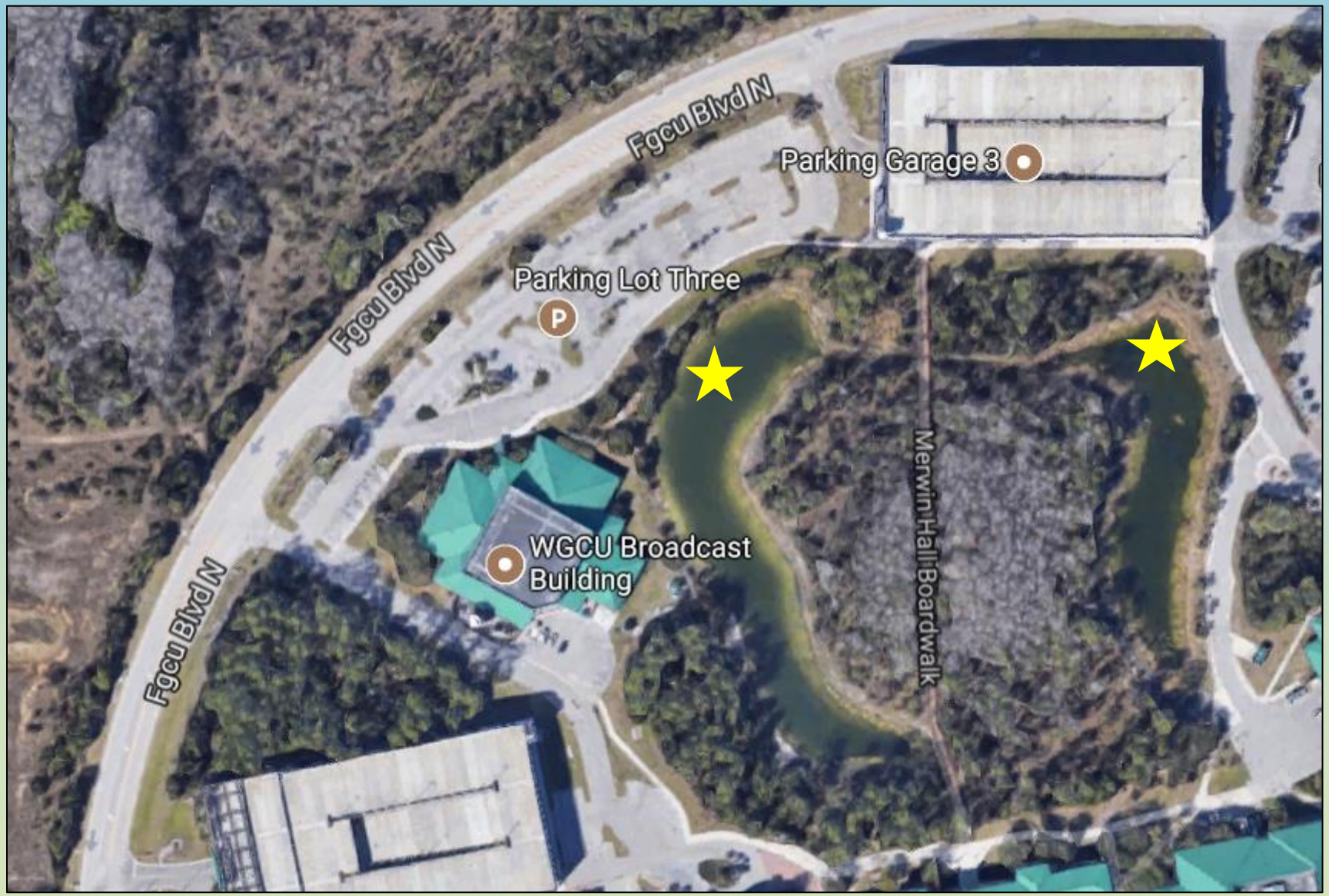
- Partnerships are essential for permitting compliance and overall community education.
  - Faculty/staff/students/contractors and anyone visiting our campus should have knowledge of the importance of the fragile ecosystem

Building Connections

- Connecting departments to achieve success
  - Storm and surface water monitoring with upper level undergraduate courses
    - Environmental Chemistry
    - Senior Research Projects
  - Grounds Department (Physical Plant)

Water Monitoring Sites

Water Monitoring Sites



New Proposed Sites – Spring 2018

Main Outfall

Secondary Outfall

Problematic Areas Discovered

Problematic Areas Discovered... AND Resolved!

Obstruction Found

Obstruction Resolved

Preventative Maintenance

- Students – SL Hours, Senior Research Projects, Course Requirements, etc.
- Physical Plant
  - (Grounds Department)

Preventative Maintenance

Priority Areas

- Above ground storage tanks
- Roadway/parking lots drains
- Storm sewer outfalls
- Vehicle/equipment/fertilizer storage areas
- New construction areas

Bioremediation

- Oil-Eating Bacteria Preliminary Experimentation - FGCU Parking Garage

Day 1 – Pre-Treatment

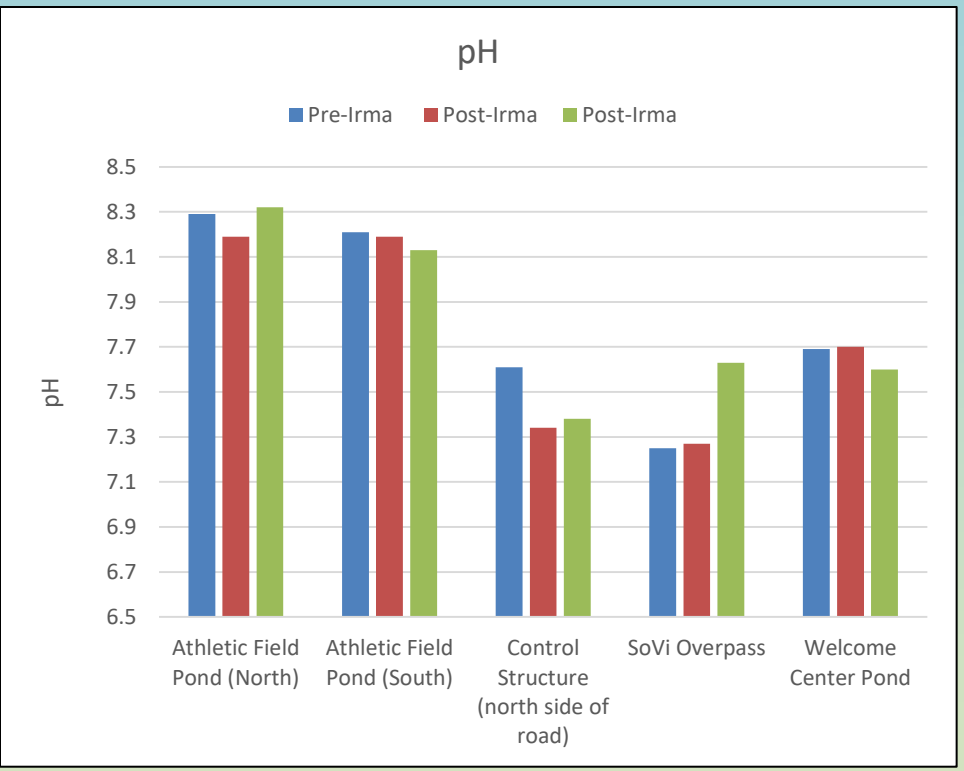
Day 5 – Post-Treatment

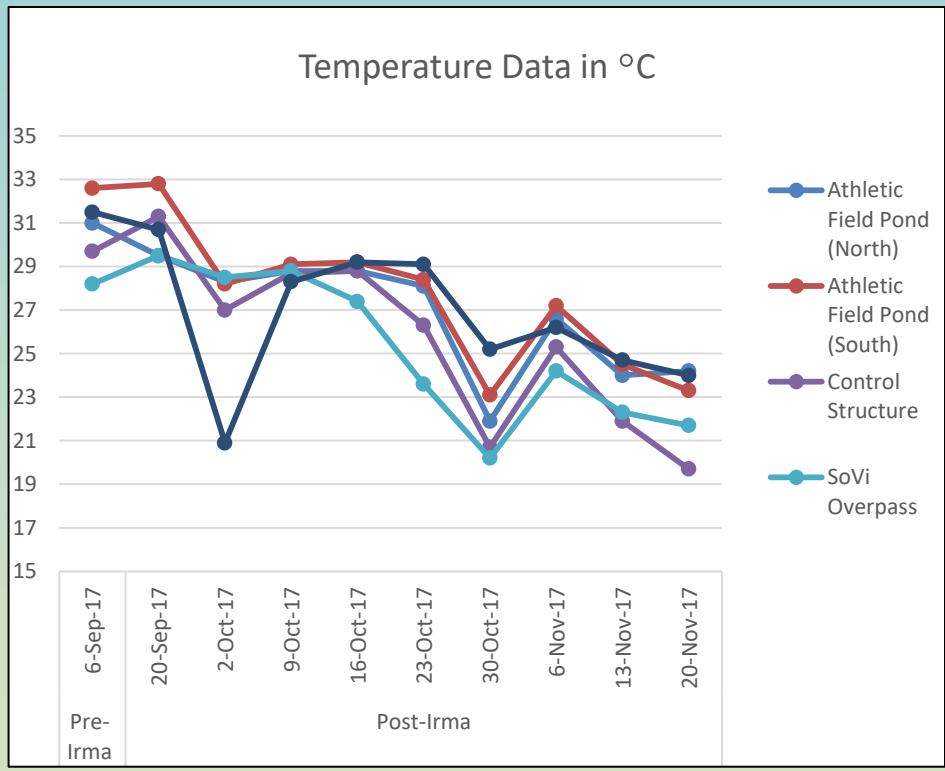
Day 20 – Post-Treatment

Bioremediation

- Oil-Eating Bacteria Experiment
  - FGCU Parking Garage #2

Environmental Chemistry





Senior Research

- New innovative and ongoing projects are underway!
  - Multiple departments are involved and new discoveries are in the process... TBD!

Introduction: Illicit Discharging

- How does illicit discharge occur?
  - Intentional pouring of **liquids or solids** into drains
  - Runoff from construction/agriculture activities
  - Pollutants entering the drains

Nine Major Sources of Pollutants

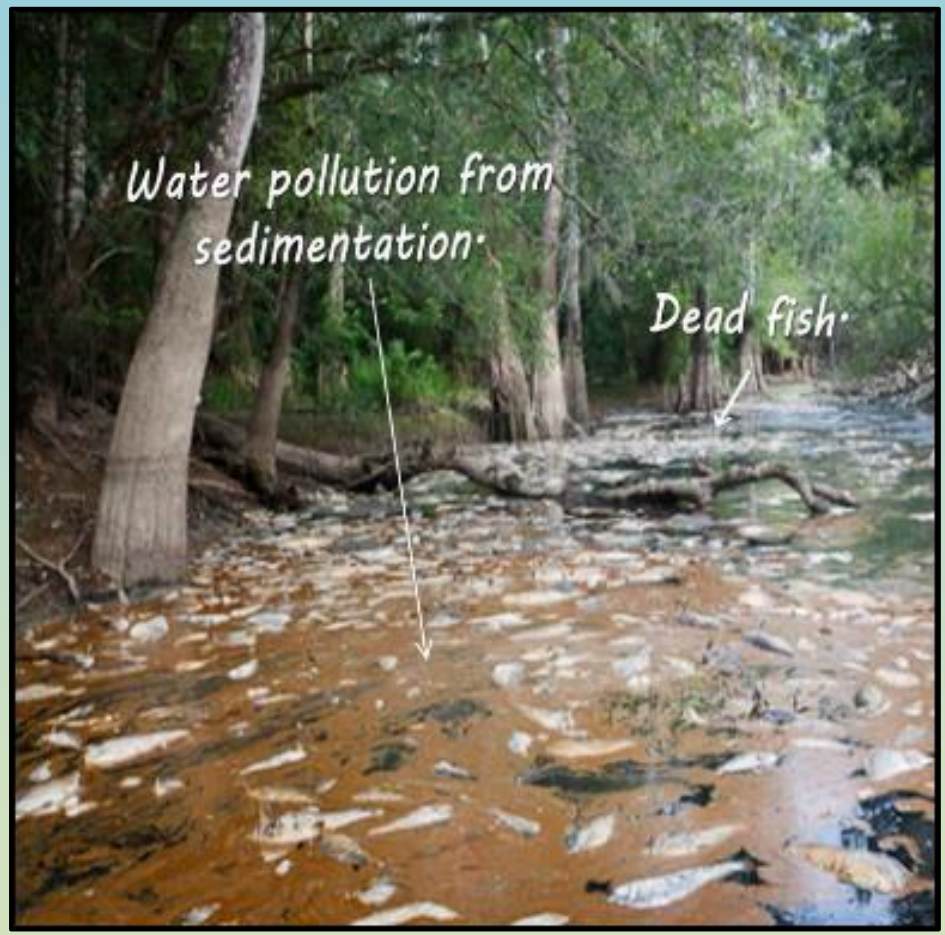
1. Street pavement
2. Motor vehicles
3. Atmospheric deposition
4. Vegetation
5. Erosion
6. Litter
7. Chemicals
8. Construction/agricultural activities
9. Wastewater

Common Pollutants

- Sediments (largest source)
- Nutrients
- Heavy metals
- Petroleum hydrocarbons
- Pathogens
- Toxic materials
- Changes in water temperature
- Oxygen demanding substances

Effects of Pollution

- **Sediments** cloud the water affecting aquatic plants and entire aquatic habitats
- **Excess nutrients** can cause harmful algal blooms, killing fish and other organisms



Effects of Pollution

- **Debris** (plastic bags and cigarette butts) can choke, suffocate, or disable aquatic life such as birds and fish.

- **Polluted stormwater** often affects drinking water sources.

Problems

- **Any** type of liquid or solid waste that could make it into stormwater drains
  - Chemical, oil, gas
  - Trash, debris, soil, fertilizers
- **Suspicious flows** during dry weather
  - Water in normally dry ponds
  - Discharges from outflows to ponds or wetland areas

Not at FGCU

When a Problem is Found

- **Trash, debris, etc.**
  - Clean-up and dispose of in regular trash
- **Soils, fertilizers, other solids**
  - Notify EH&S
- **Chemicals, gas, antifreeze, etc.**
  - Notify EH&S immediately
- **Suspicious flows**
  - Notify EH&S immediately

Construction Areas

The “Good”, the “Bad”, and the “Ugly”

What NOT To Do

- Motor vehicles, golf carts, tractors, & boats **CANNOT** be washed on campus property.
  - Take to an off-campus washing station
- Activities such as oil changes and other fluid changes are **not allowed.**

Not at FGCU

Outreach Opportunities

- Would you like to help with storm drain outreach?
- Opportunities:
  - Stormwater systems GPS mapping and routine drain inspections
  - Stormwater outreach – tabling, projects, etc.
  - Data entry for both historical and ongoing water quality and other data for FGCU campus
  - Data analysis (precipitation vs. water quality comparisons)
  - Updating website information (Campus Ecosystem Model & EH&S websites)

Please contact EH&S for more information.

Trash That Lasts!

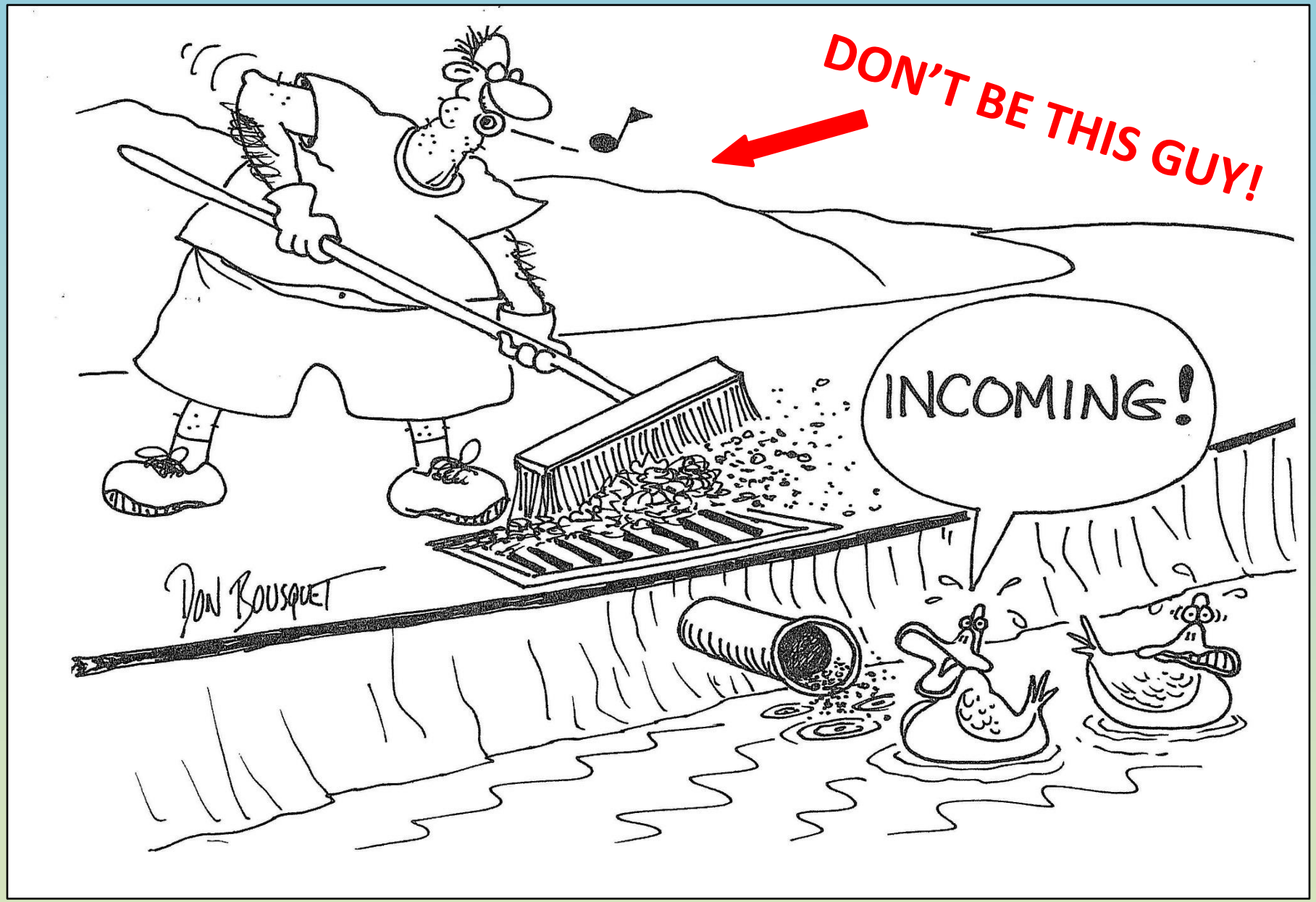
Question: How long do you think a plastic bottle takes to decompose in the environment??

~450+ YEARS!

Take Home Message: Illicit Discharge Prevention

What is illicit discharging?

– Defined as <u>any</u> discharge that enters the storm drains that <u>is not</u> entirely composed of stormwater


DON'T BE THIS GUY!
INCOMING!
DON BOUSQUET

Keep on the Look-out!

- While out and about, please keep an eye out for construction sites and other areas near storm drain systems:
  - BMP's
  - Illicit discharging
  - Pollutants or other unnatural conditions

We Need Your Help

- Report any problems to the FGCU's EH&S Department
- Help spread the word!

Remember…
Storm Drains are REAL!!

Conclusions

- Please report any illicit (or potential) discharging activities to EH&S immediately.
- This is just an introduction to the importance of stormwater management!
- Contact EH&S with any questions or concerns

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