

2022 UF WATER INSTITUTE SYMPOSIUM

SOUTH BROWARD DRAINAGE DISTRICT GREEN INFRASTRUCTURE PROJECTS & CLIMATE CHANGE IMPACTS

PRESENTED BY:

KEVIN M. HART, P.E., CFM
DISTRICT DIRECTOR
SOUTH BROWARD DRAINAGE DISTRICT

February 23, 2022



Outline

- History & Background of SBDD
- Effects of Climate Change & Sea Level Rise on SBDD's Operations
- Overview of SBDD Green Infrastructure Projects



SOUTH BROWARD DRAINAGE DISTRICT

- Created in 1927 by the Florida Legislature Out of Napoleon B. Broward Drainage District
- Originally Known as the Hollywood Reclamation District
- Original Purpose was to Reclaim Land for Agriculture



SOUTH BROWARD DRAINAGE DISTRICT

- 46,600 Acres (73 sq miles)
- 150 Linear Miles of Canals
- 7,500 Acres of Lakes
- 10 Stormwater Pump Stations - Automated



SOUTH BROWARD DRAINAGE DISTRICT

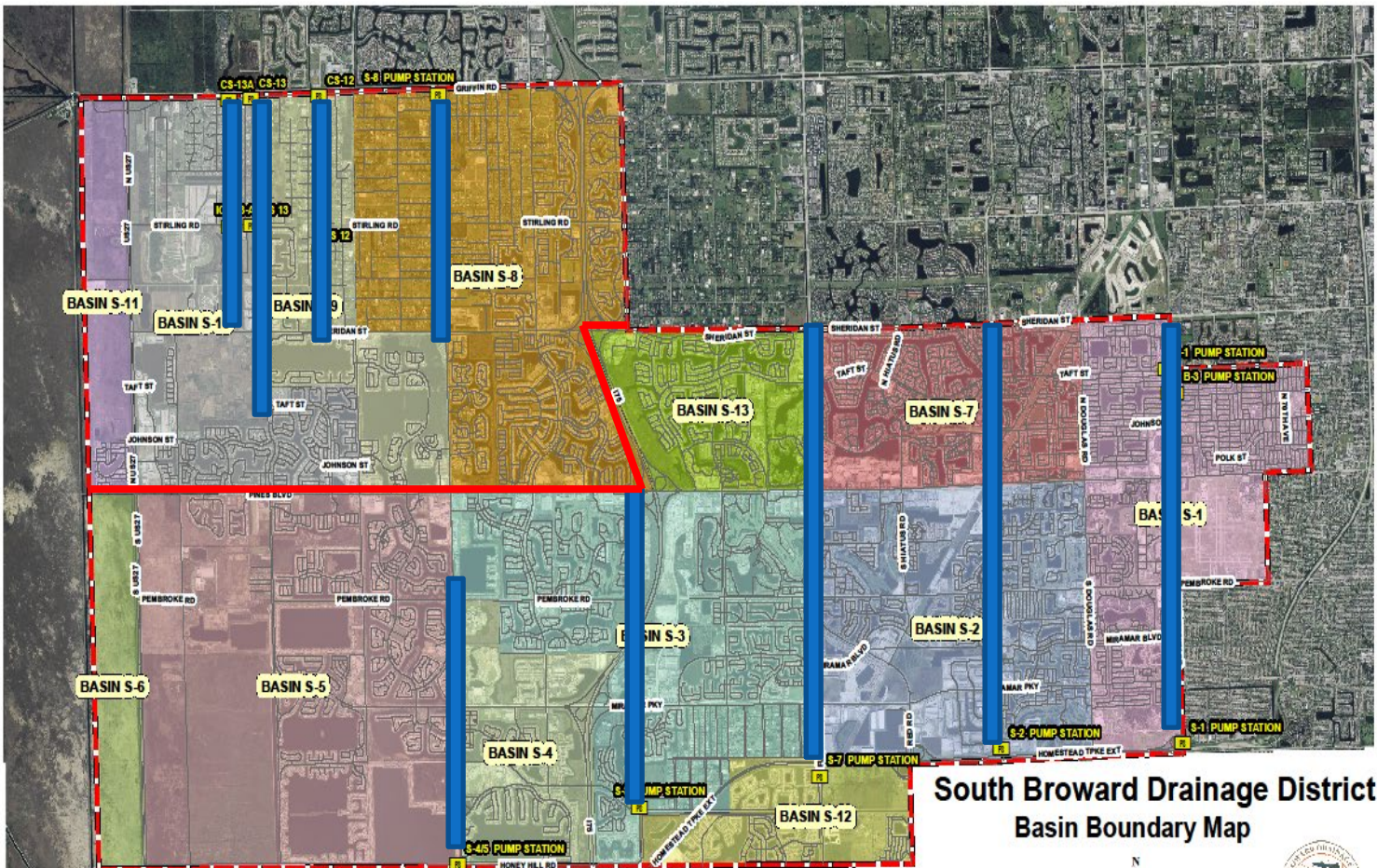
- 7 Person Elected Board of Commissioners
- Annual Operating Budget of \$3.9 Million +/-
- Annual Assessment Rates
 - = \$35/Residential Unit
 - = \$24.30/ Multi Family Unit
 - = \$72.30/ Commercial/Industrial Parcel





IMPACTS OF CLIMATE CHANGE AND SEA LEVEL RISE ON SBDD'S OPERATIONS



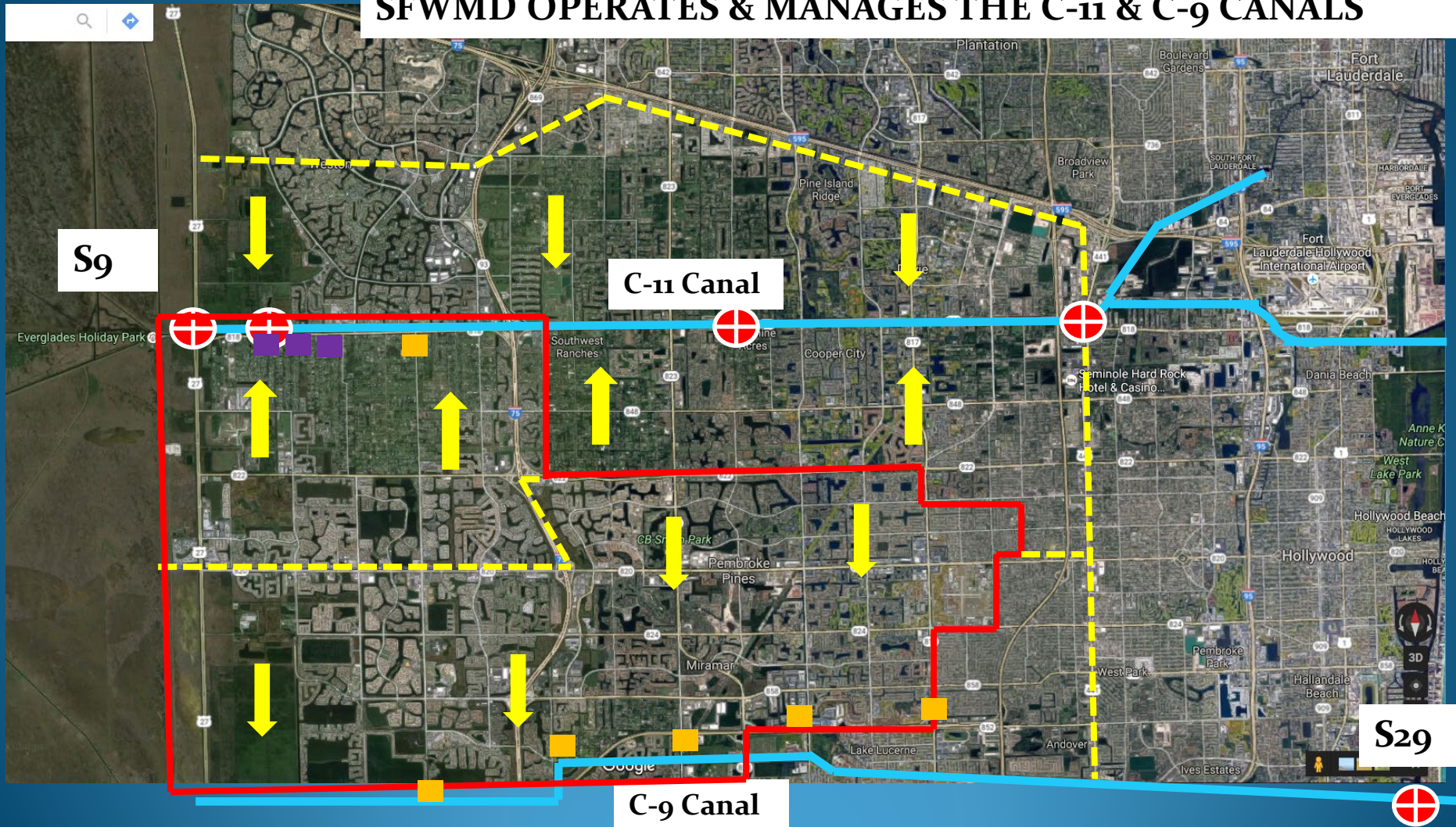


South Broward Drainage District
Basin Boundary Map

Interface Between Local and Regional Facilities

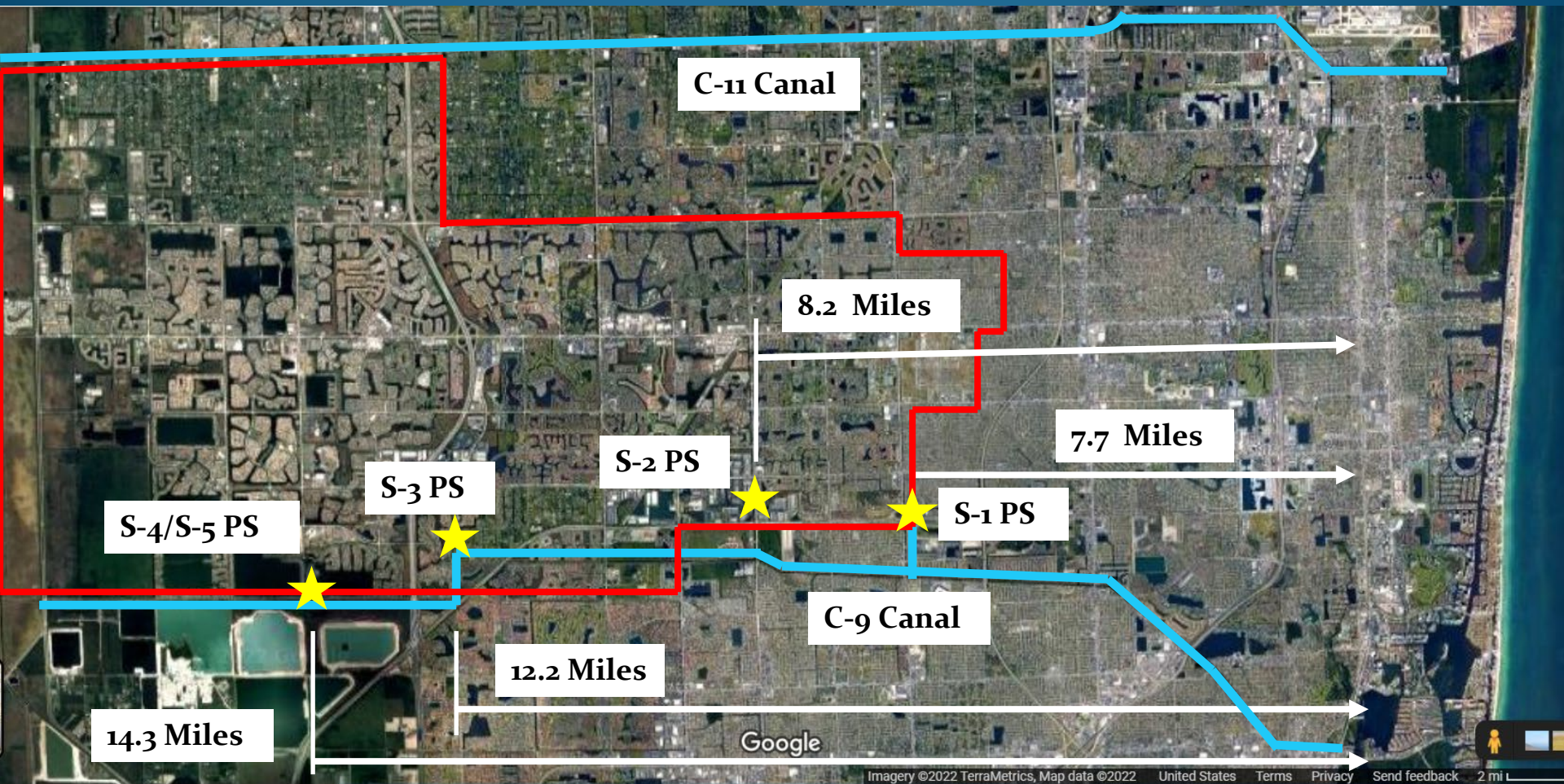
Allowable Discharge Rate = $\frac{3}{4}$ " Per Acre/Day

SFWMD OPERATES & MANAGES THE C-11 & C-9 CANALS





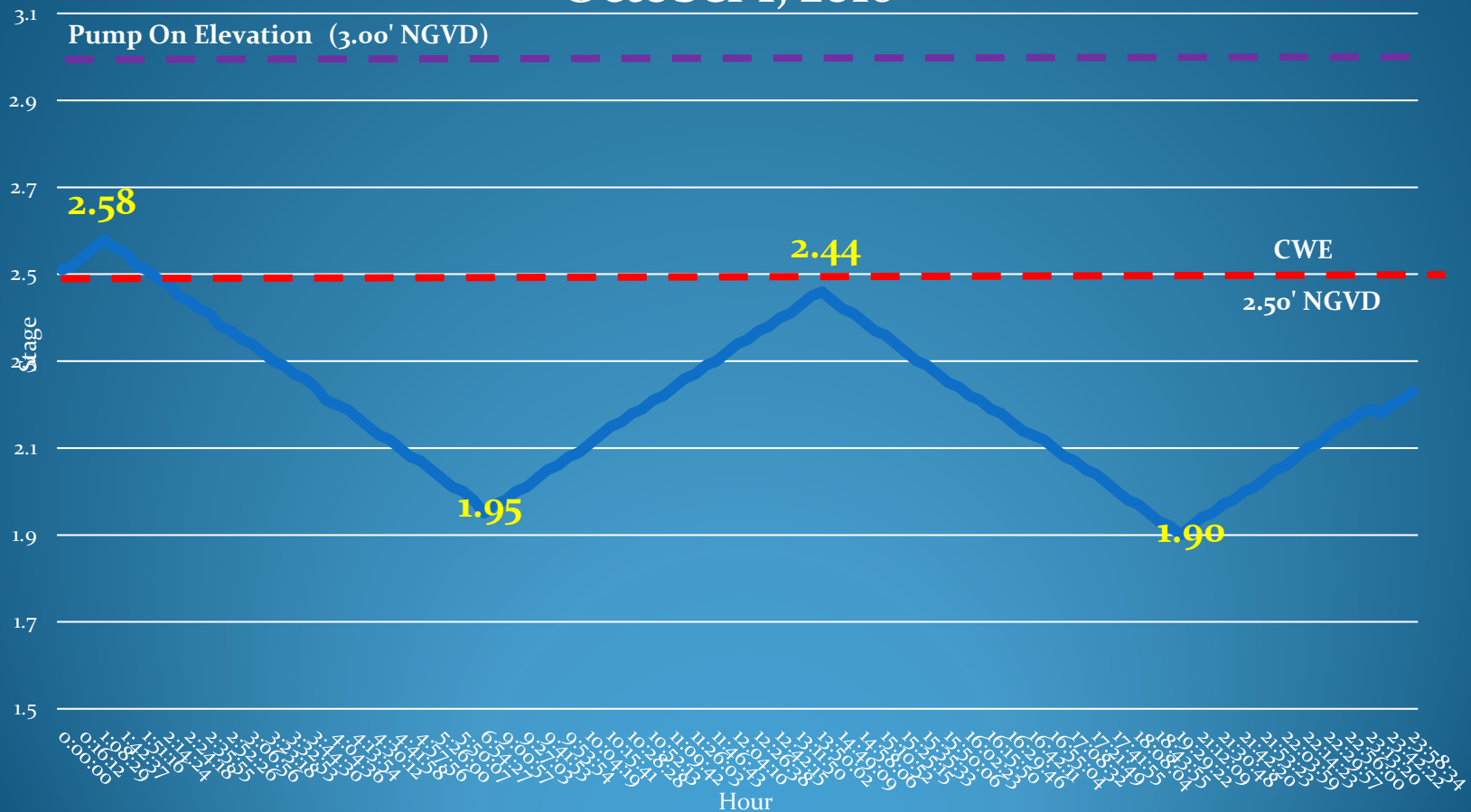
Effects of King Tides



No Pump Activity on 10/1/2016
2-Day Rainfall=0.63"

Effects of King Tides (S-1 PS)

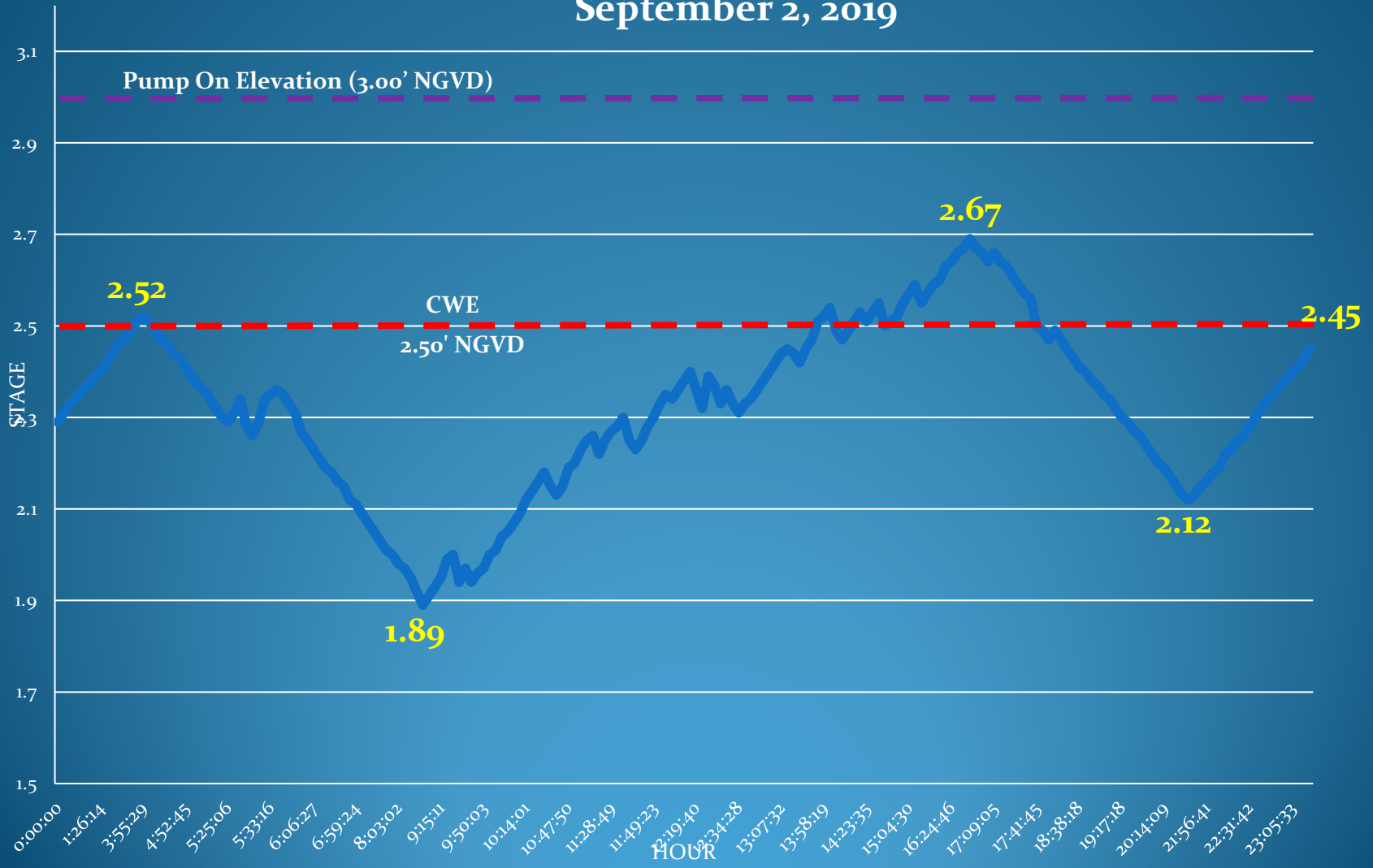
October 1, 2016



6 Hrs Pumping on 9/2/2019
2-Day Rainfall=0.94"

Effects of King Tides (S-1 PS)

September 2, 2019

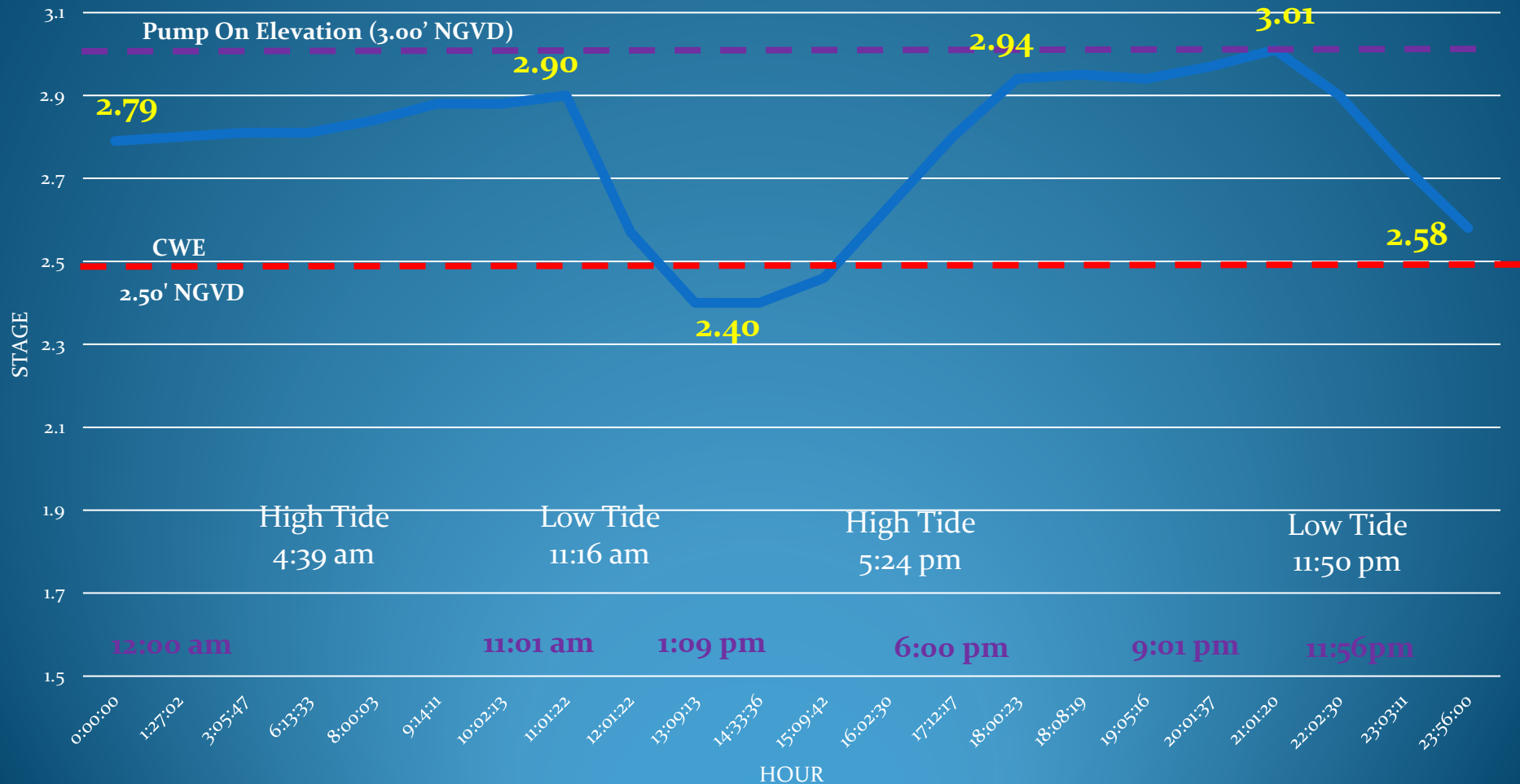


No Pump Activity on 10/7/2019

2-Day Rainfall=3.34"

Effects of King Tides (S-1 PS)

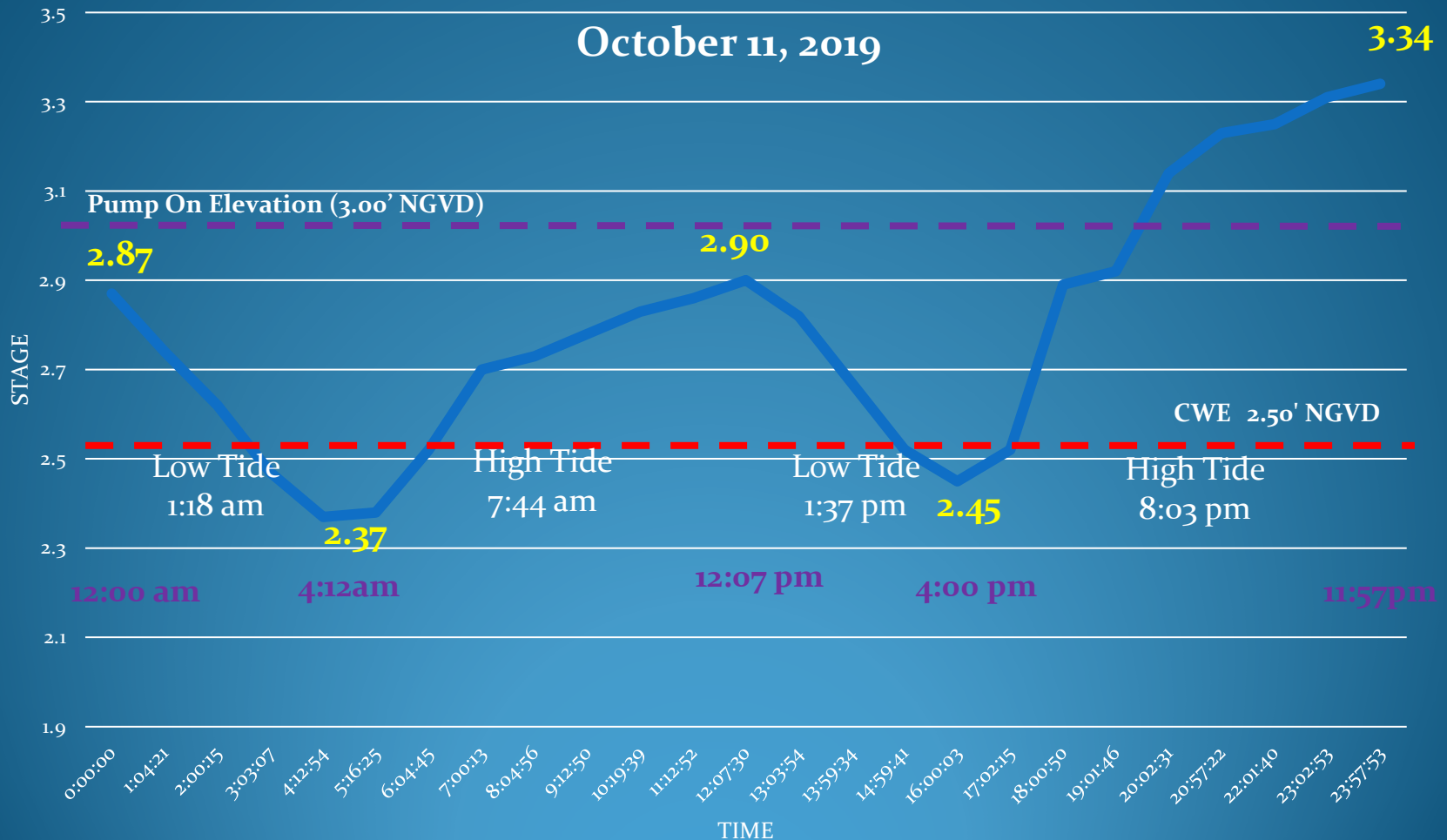
October 7, 2019



5 Hrs Pumping on 10/11/2019

2-Day Rainfall=2.19"

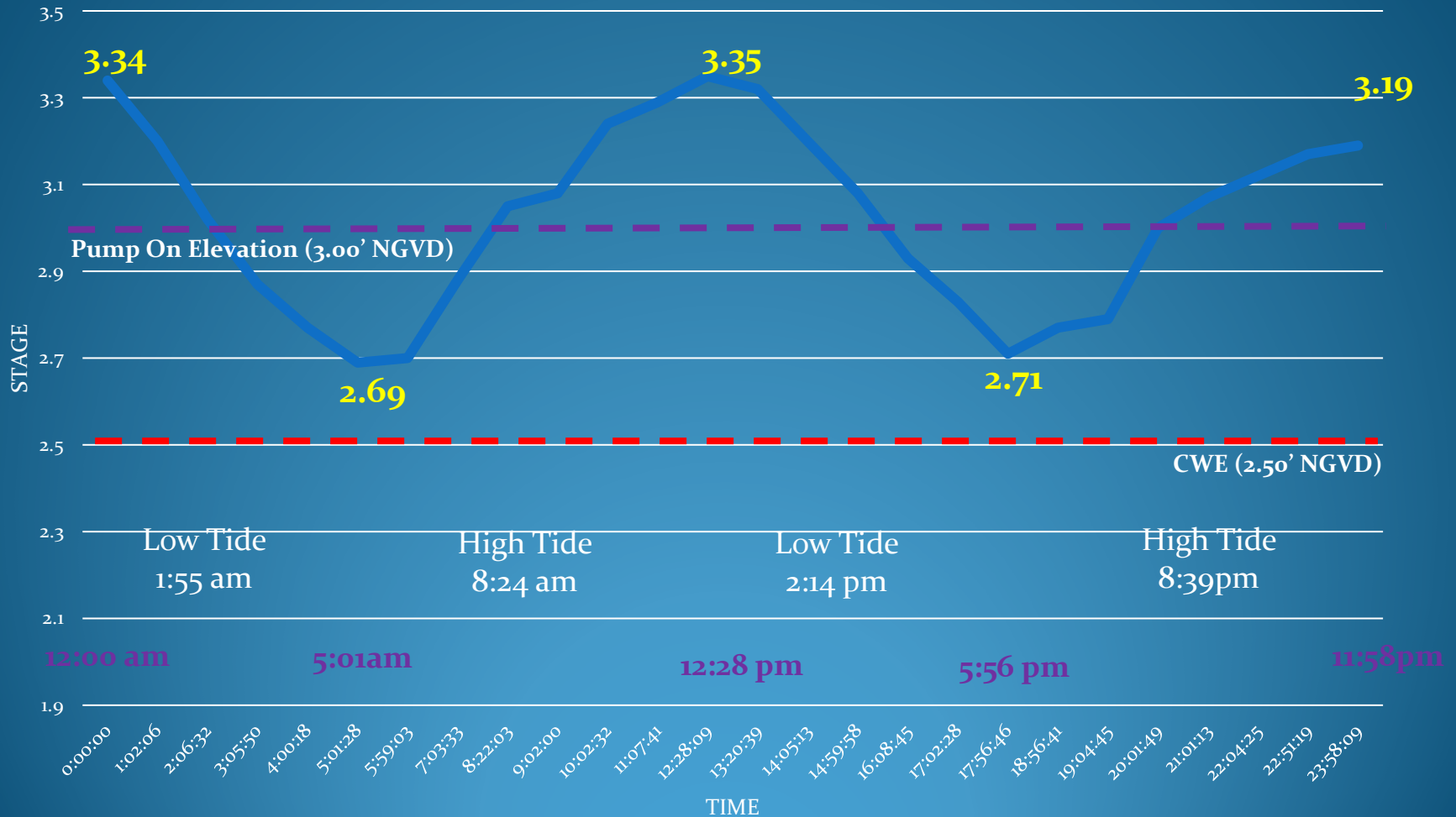
Effects of King Tides (S-1 PS)



8 Hrs Pumping on 10/11/2019
2-Day Rainfall=2.13"

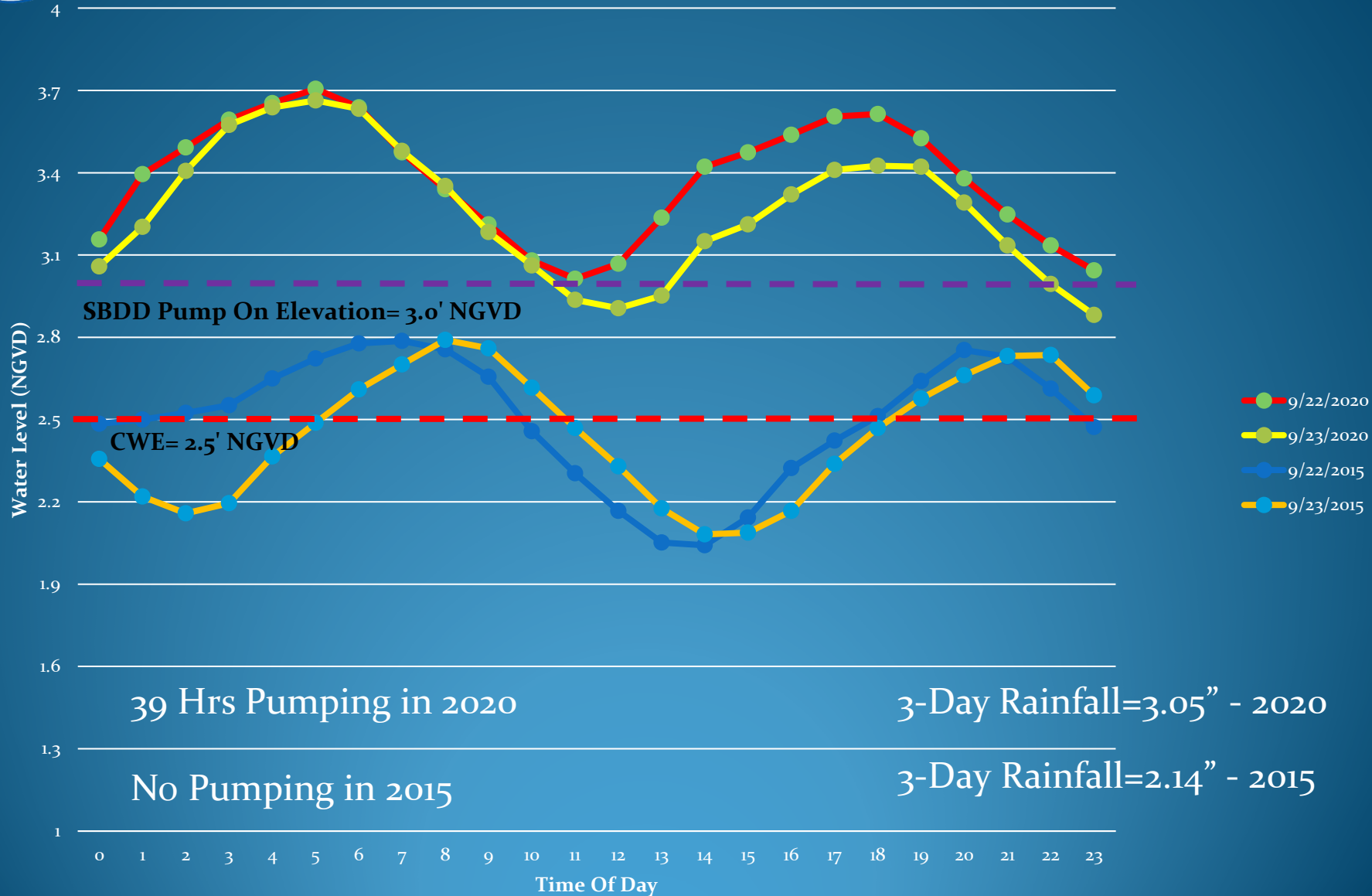
Effects of King Tides (S-1 PS)

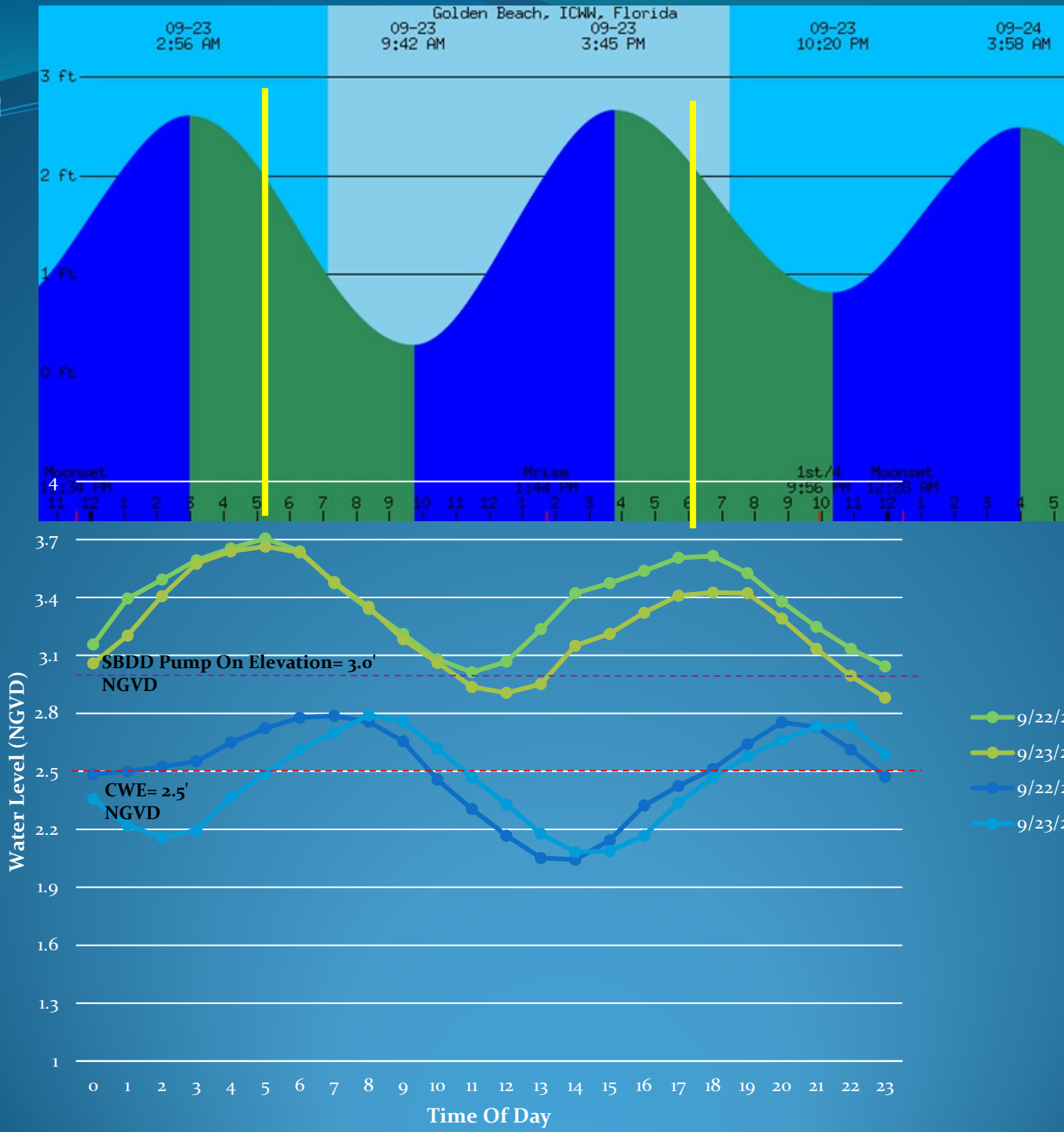
October 12, 2019





S1 Downstream 9/22/2020- 9/23/2020 vs. 9/22/2015-9/23/2015

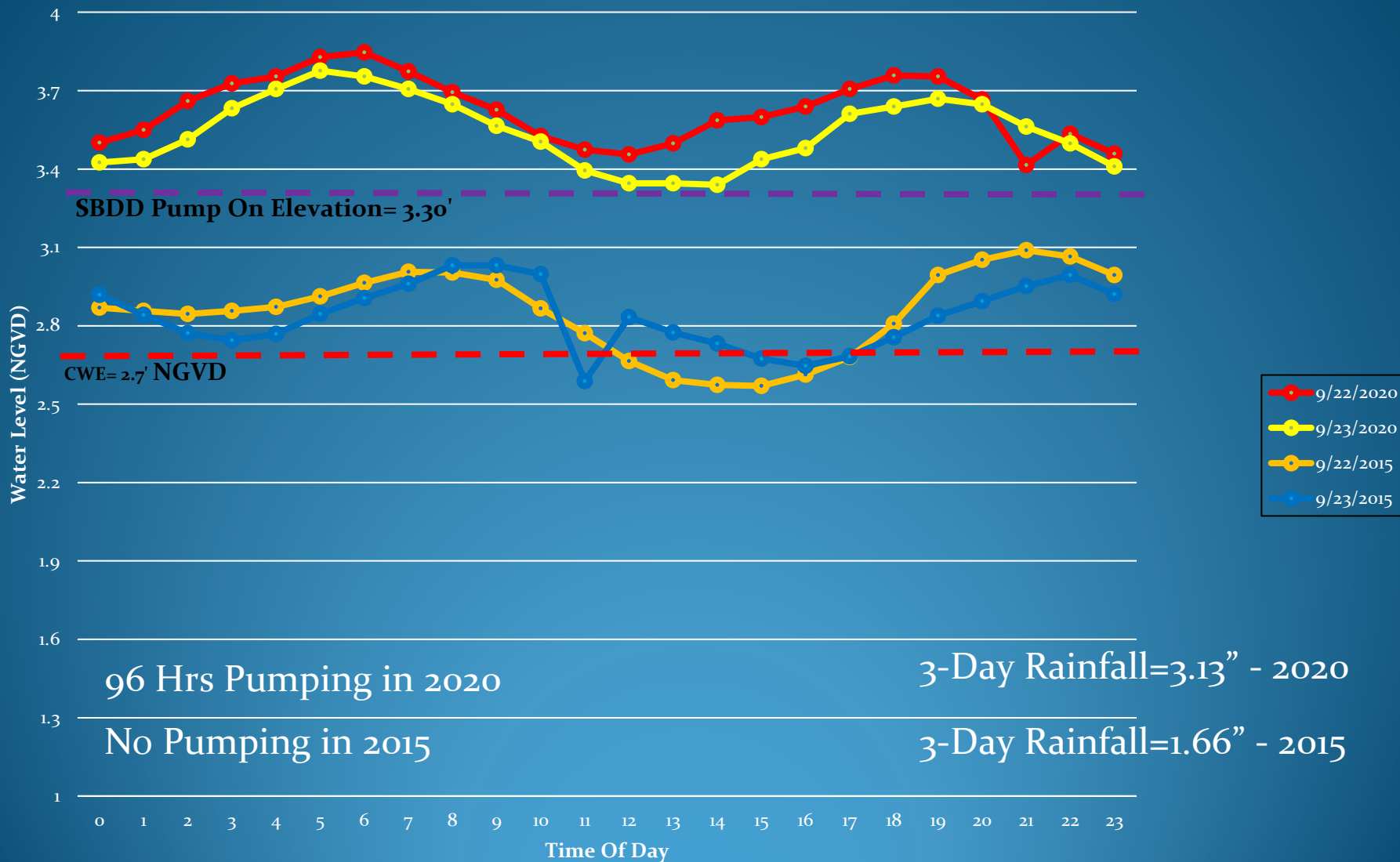


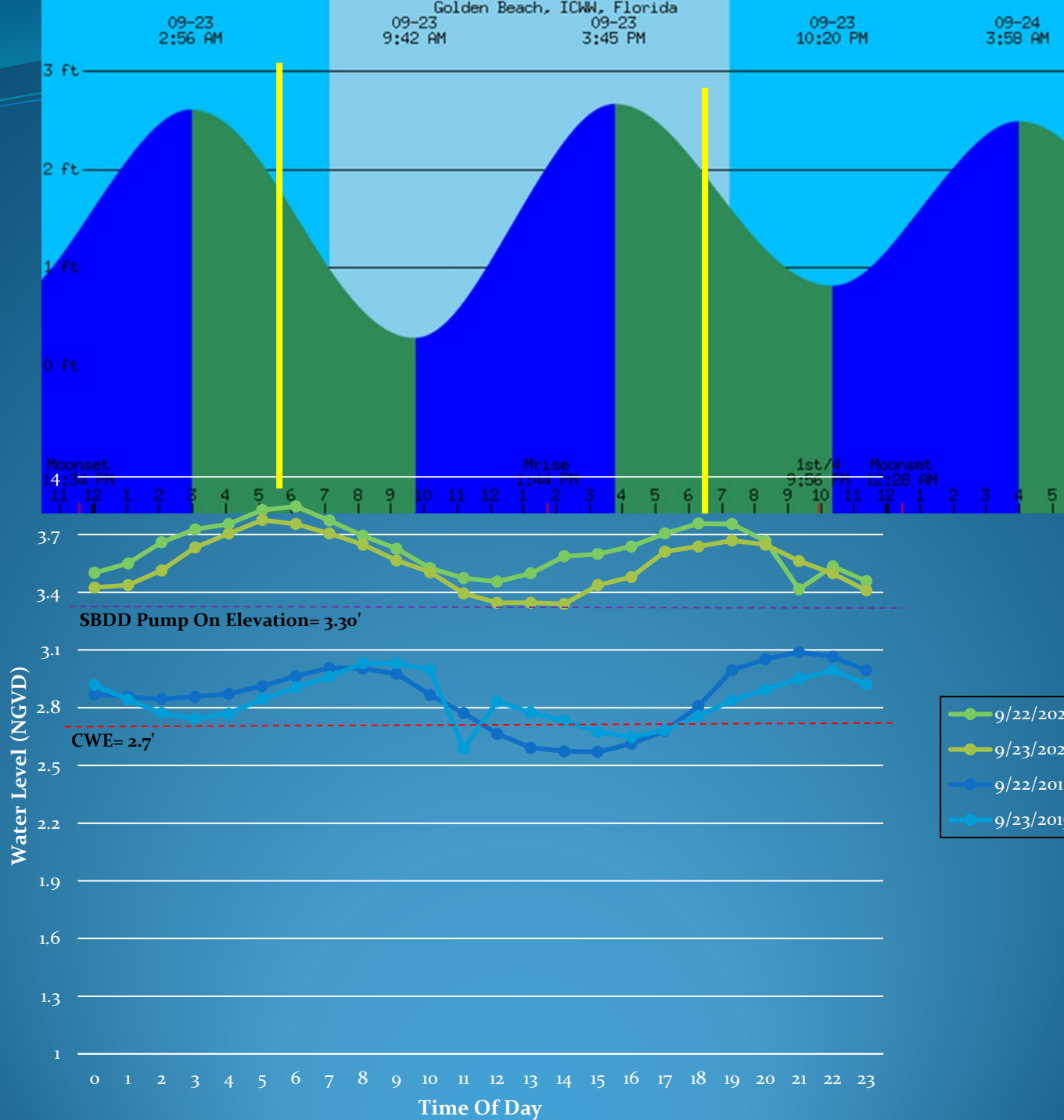




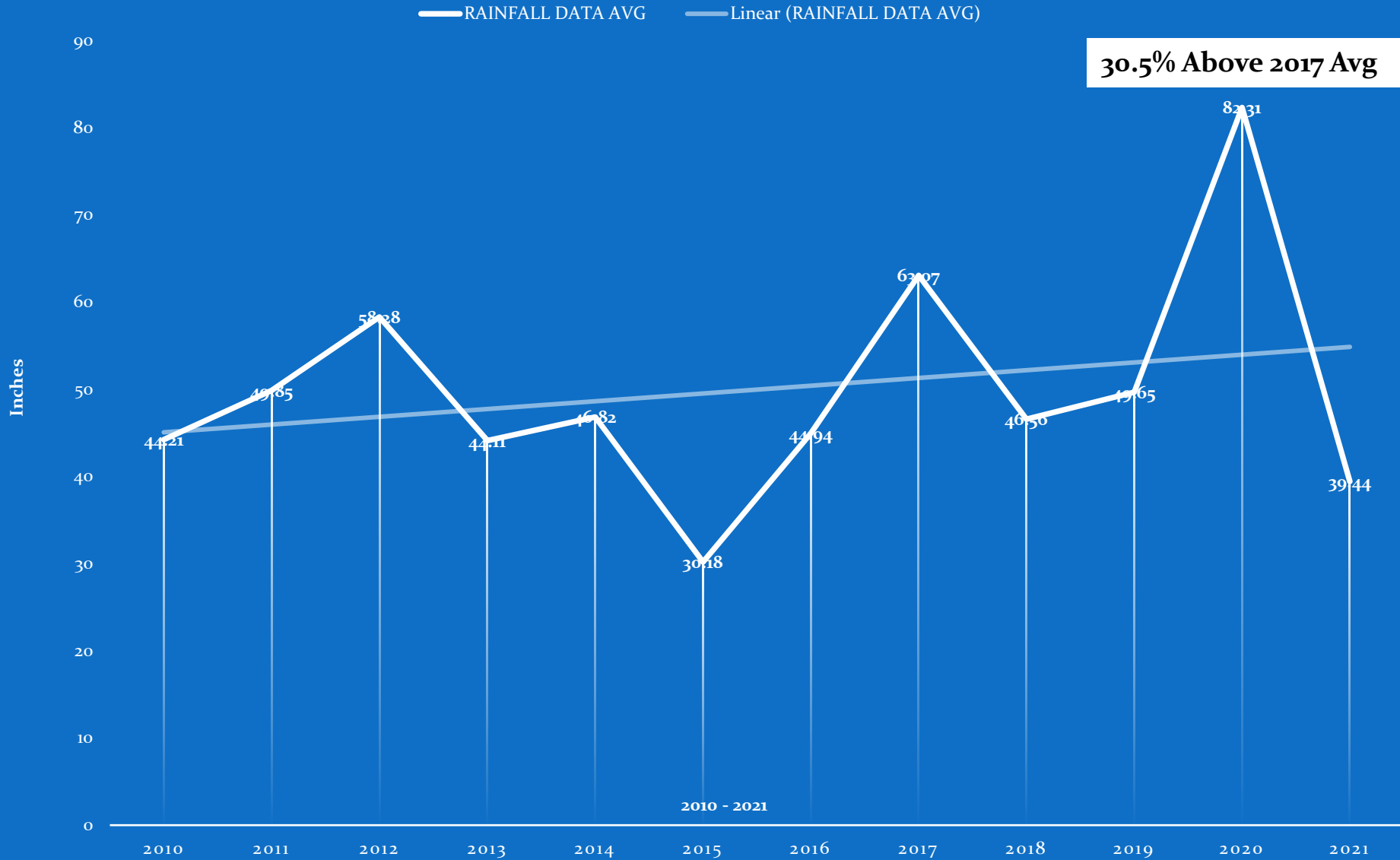
SOUTH BROWARD DRAINAGE DISTRICT

S2 Downstream 9/22/2020- 9/23/2020 vs. 9/22/2015-9/23/2015





RAINFALL ANNUAL AVERAGES





OVERVIEW OF SBDD GREEN INFRASTRUCTURE PROJECTS



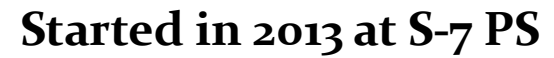
SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates



Goals

- **Reduce Dependency on Pumping & Usage of Diesel Engines**
- **Provide Emergency By-Pass at All Pump Stations**
- **Maintain Basin Water Levels at CWEs**
- **Reduce Maintenance & Operation Costs**
- **Lower Carbon Foot Print for PS Operations**

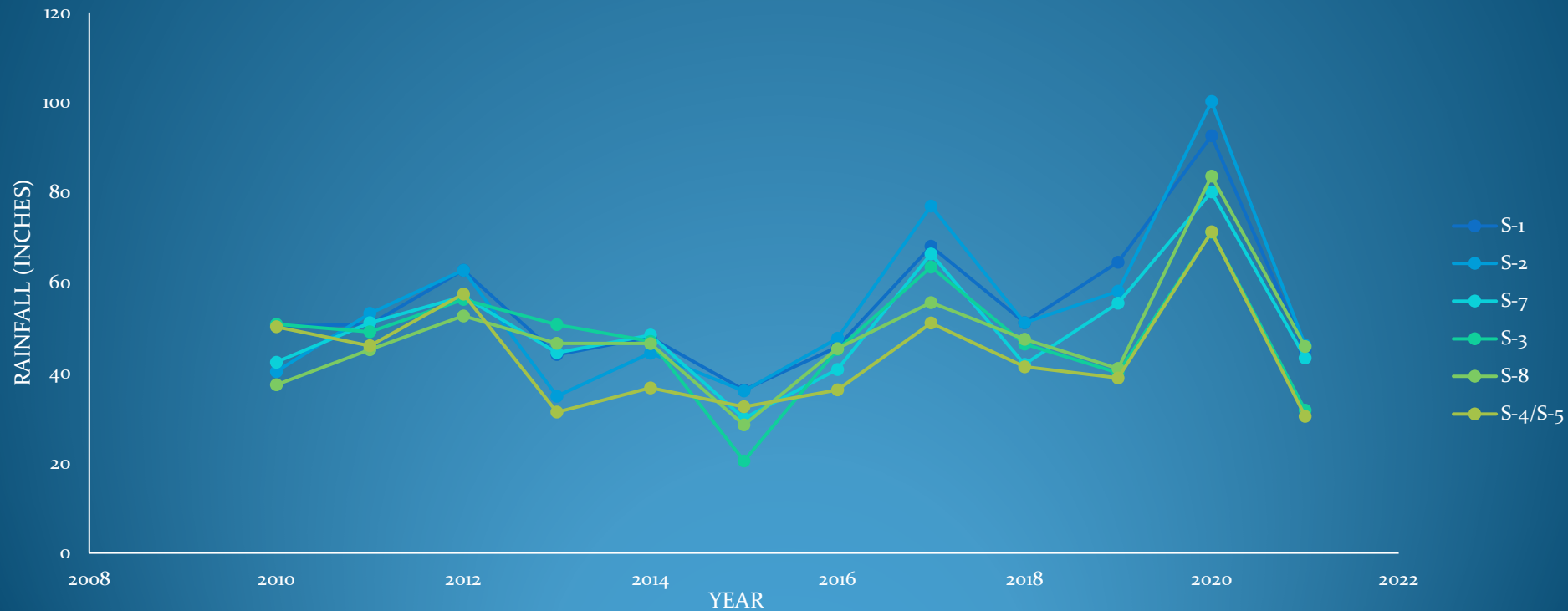




SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

RAINFALL DATA - ALL STATIONS

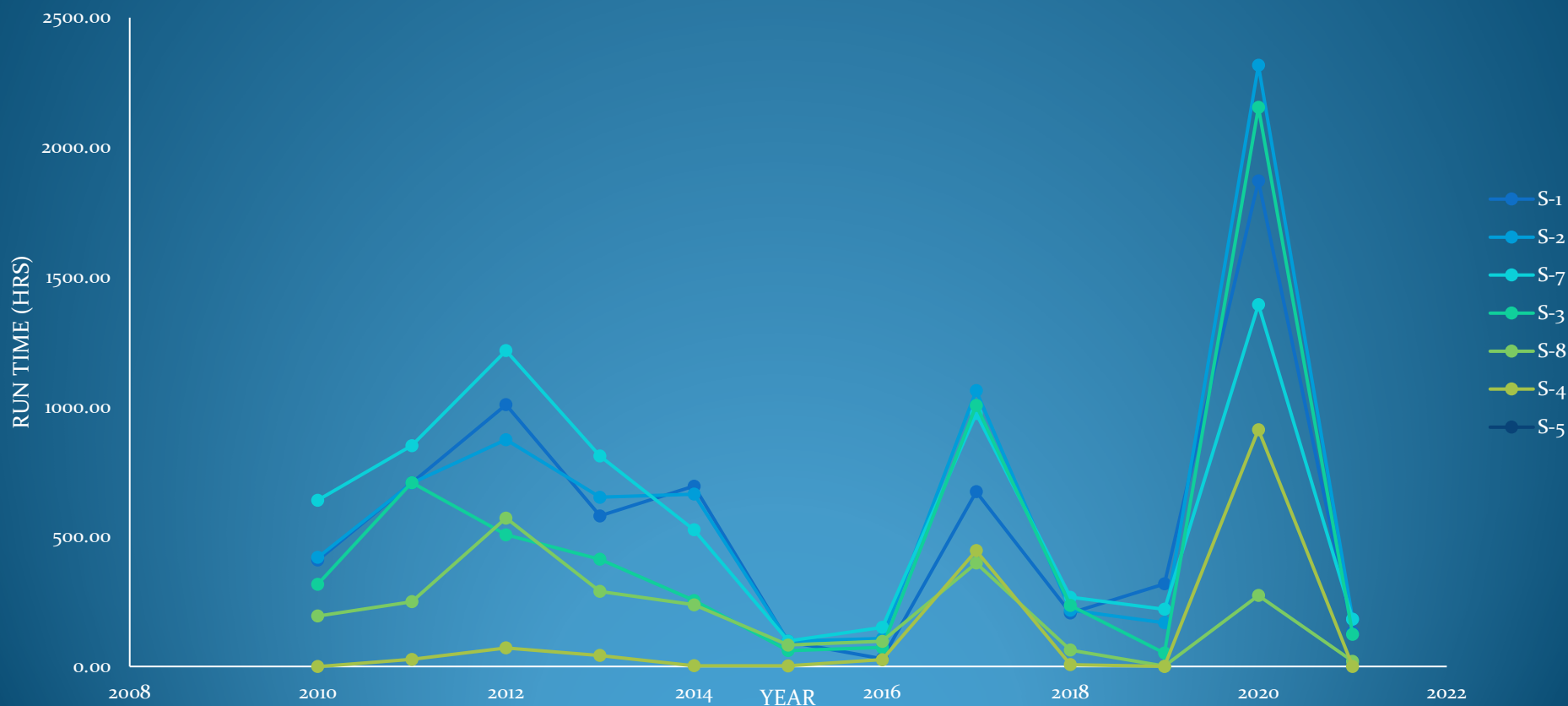




SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

PUMP RUN TIME DATA

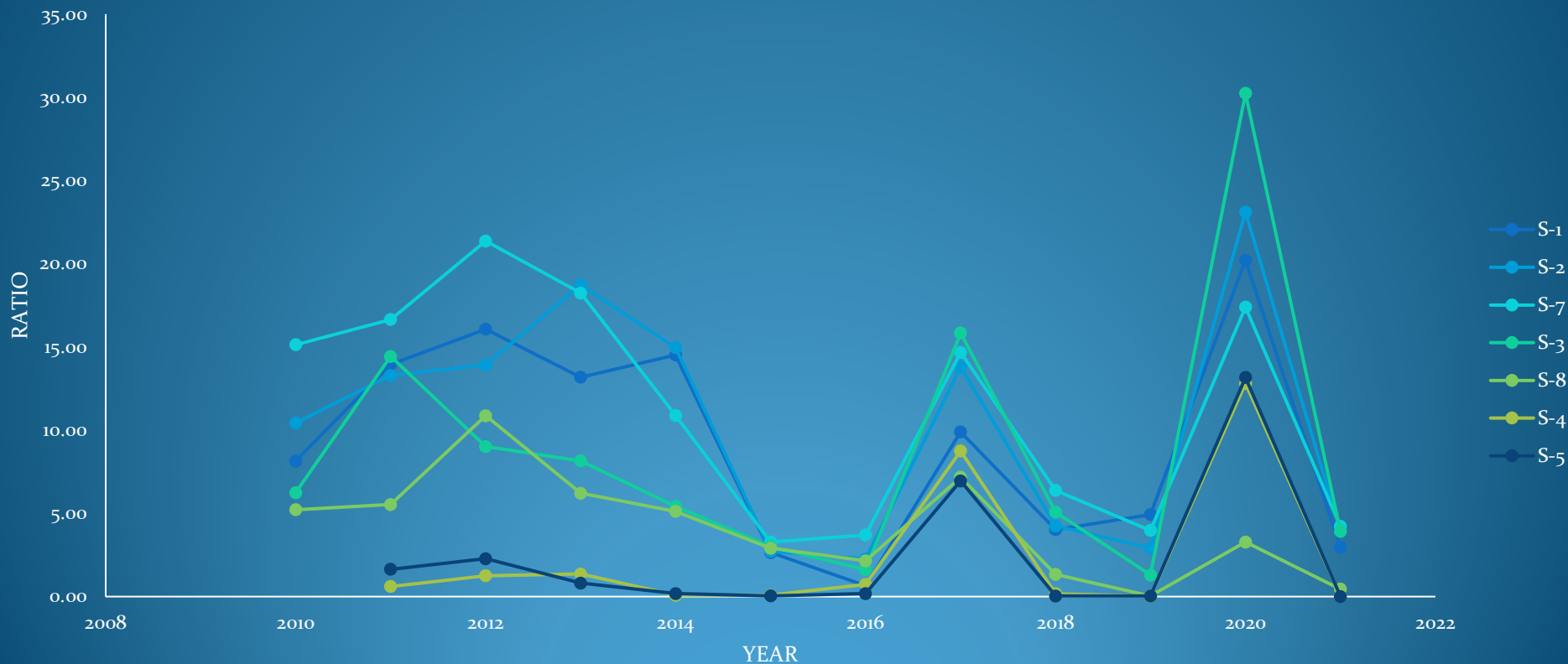




SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

RATIO OF PUMP TIME TO RAINFALL

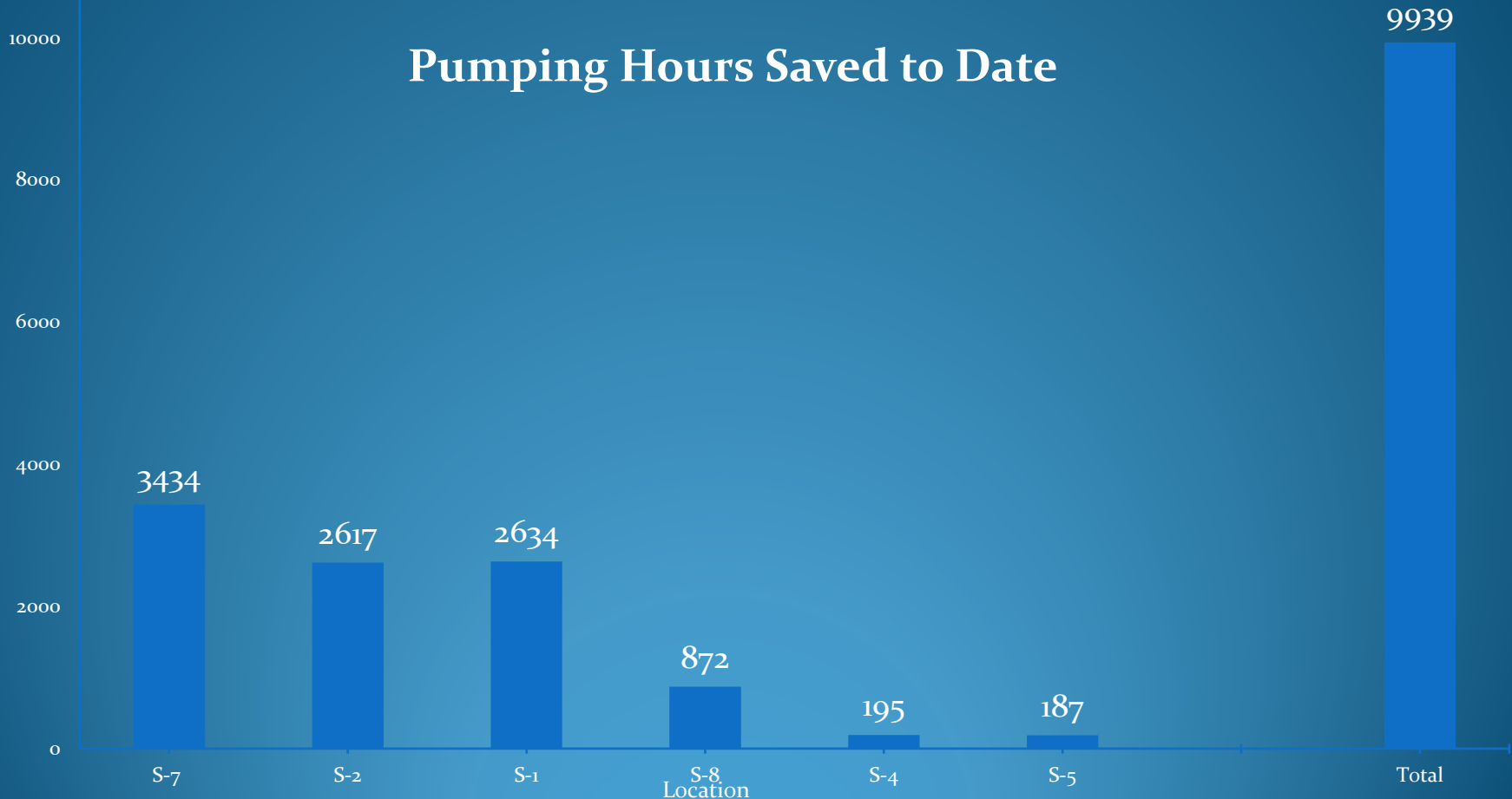




SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

Pumping Hours Saved to Date





SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

Ratio of Fuel Costs to Rainfall



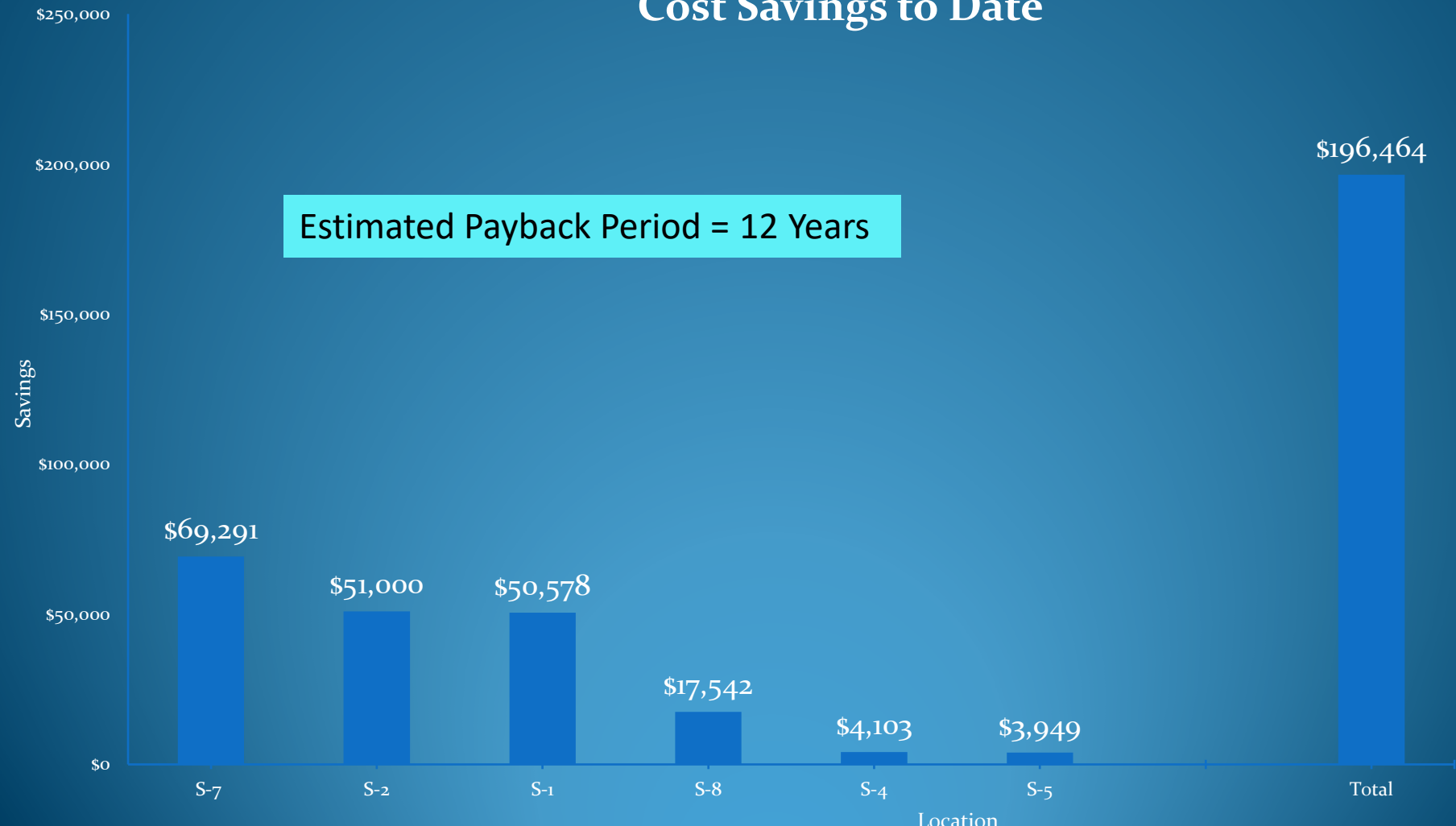


SOUTH BROWARD DRAINAGE DISTRICT

SBDD Sluice Gates

Cost Savings to Date

Estimated Payback Period = 12 Years

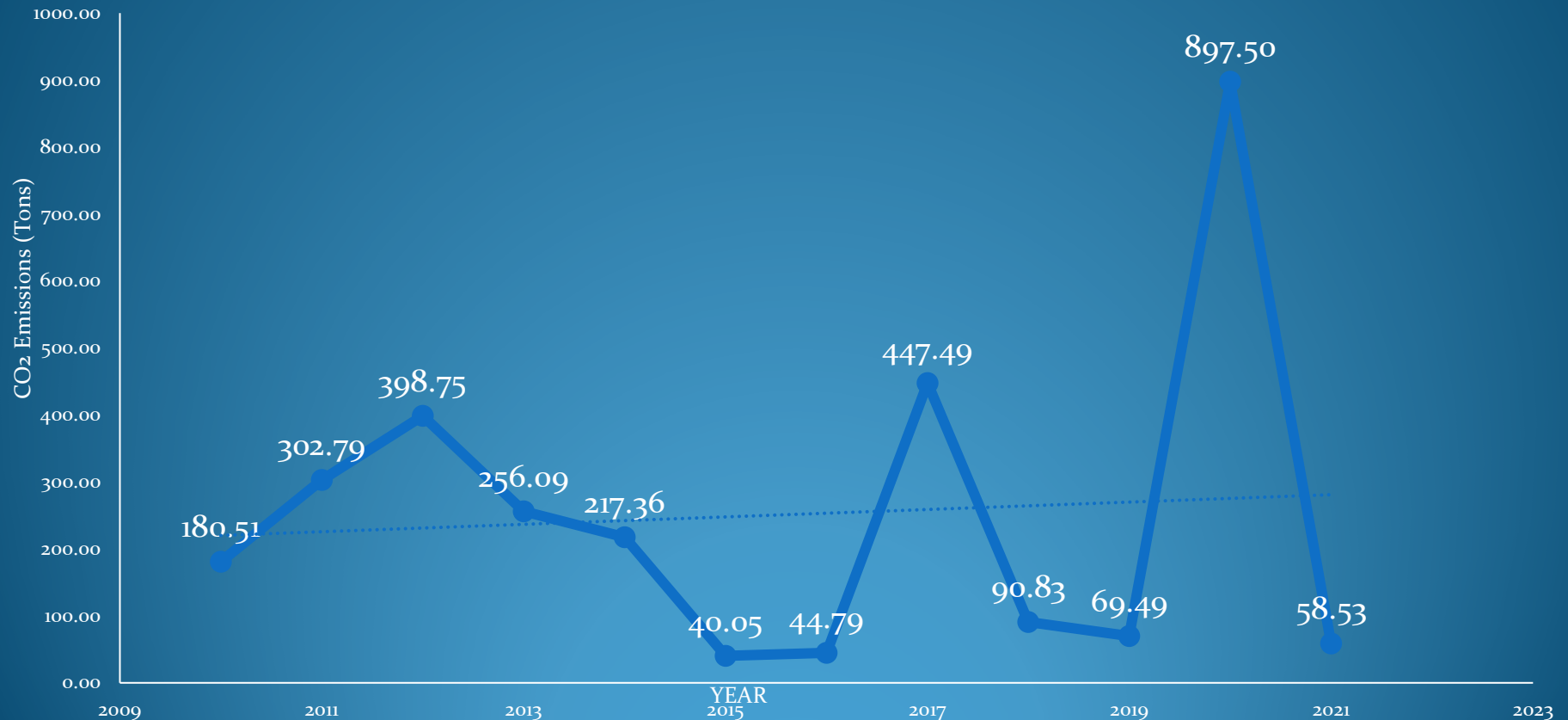




SOUTH BROWARD DRAINAGE DISTRICT

CO₂ Reductions

CO₂ Emissions (Tons)





SOUTH BROWARD DRAINAGE DISTRICT

CO₂ Reductions

- Each Gallon of Diesel Fuel Produces, on Average, 22.2 Lbs Carbon (CO₂)
- Total Fuel Savings = (9,939 Hrs x 8.2 Gals/Hr = 81,497 Gals)
- Total CO₂ Reduction = 81,497 Gal x 22.2 Lbs/Gal = 1,809,227 Lbs = 905 Tons

Source: ehow.com





SOUTH BROWARD DRAINAGE DISTRICT

S-3 PS Sluice Gates





SOUTH BROWARD DRAINAGE DISTRICT

SW 205th Avenue Rear Yard Drainage



Goals

- **Replace Existing Shallow Ditch with Grass Swale and Piping**
- **Maintain or Improve Current LOS**
- **Improve Water Quality**
- **Reduce Maintenance & Operation Costs**

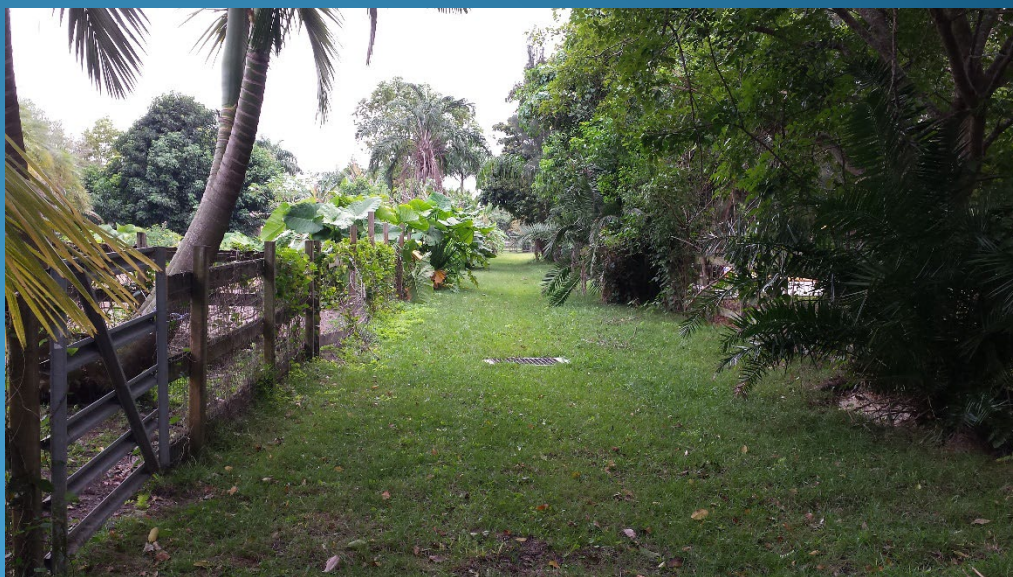


SOUTH BROWARD DRAINAGE DISTRICT

SW 205th Avenue Rear Yard Drainage



Before



After



SOUTH BROWARD DRAINAGE DISTRICT

SW 205th Avenue Rear Yard Drainage



Before



After



SOUTH BROWARD DRAINAGE DISTRICT

SW 205 Ave Rear Yard Drainage



Before



After



SOUTH BROWARD DRAINAGE DISTRICT

SW 205 Ave Swale & Outfall Connection

Goals

- **Construct Roadside Swale & Provide Positive Drainage Outfall for Roadway & Adjacent Properties**
- **Improve Current LOS, Especially for Adjacent Properties**
- **Provide Water Quality**



SOUTH BROWARD DRAINAGE DISTRICT

SW 205 Ave Swale & Outfall Connection



Before



After

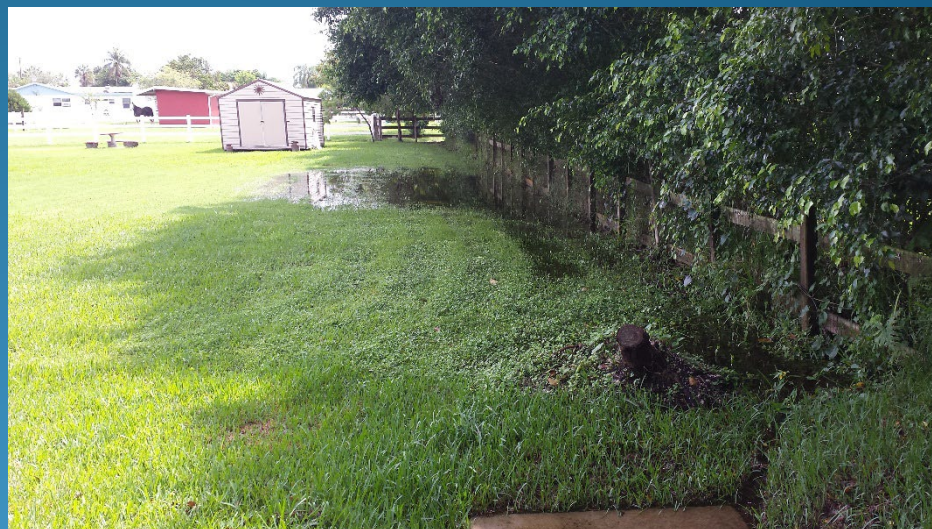


SOUTH BROWARD DRAINAGE DISTRICT

SW 205 Ave Swale



5" – 6" Rainfall



**Rear Yard Substantially
Drained within 24 Hours**



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale

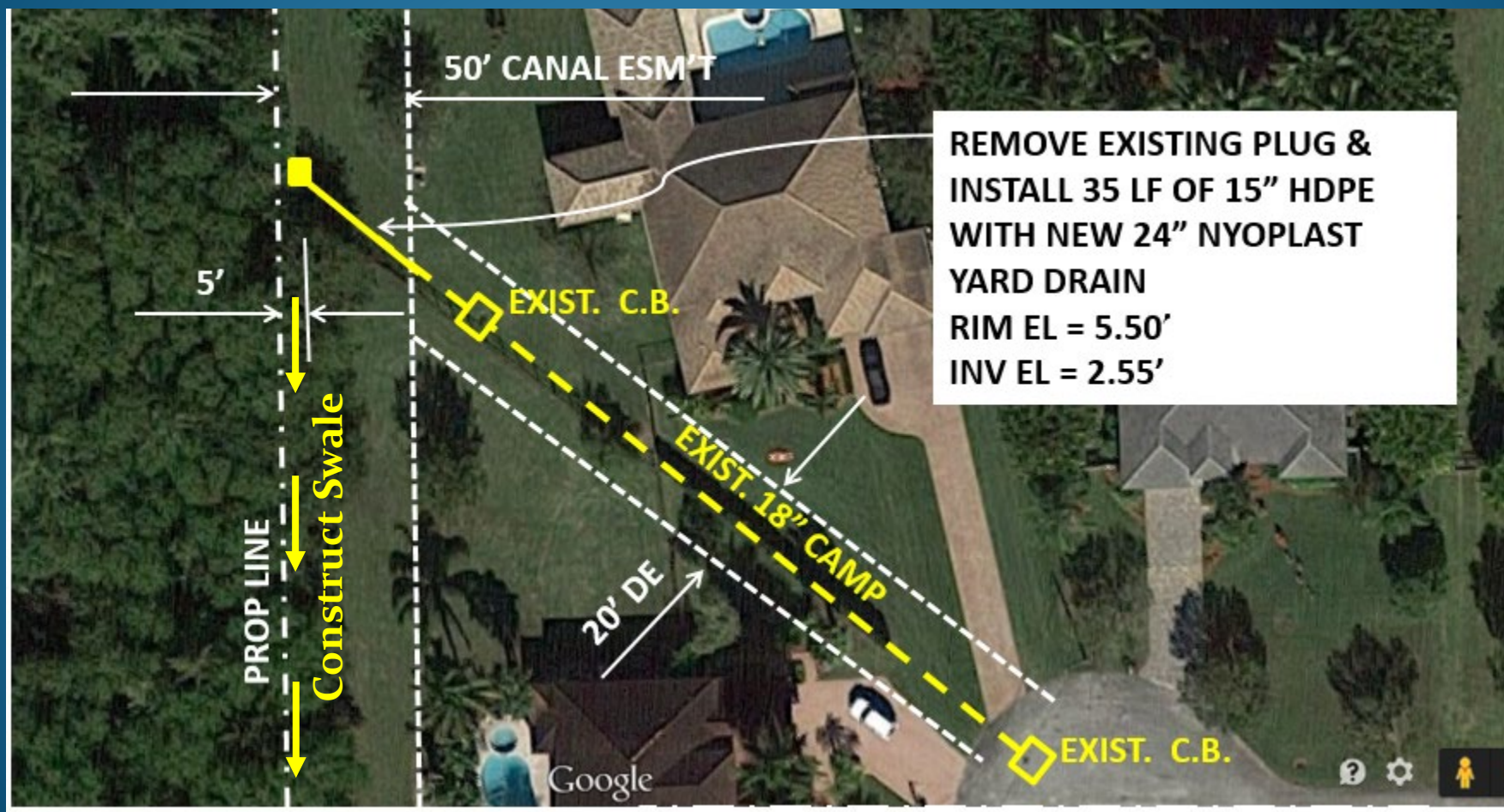
Goals

- **Construct Swale & Provide Positive Drainage Outfall for Roadway & Adjacent Properties**
- **Improve Current LOS, Especially for Adjacent Properties**
- **Provide Water Quality Prior to Discharge**



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale





SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale





SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



Before



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



During



During



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



During



During



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



During



During



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



Before



After



SOUTH BROWARD DRAINAGE DISTRICT

Landmark Ranch Estates Swale



Before



After



SOUTH BROWARD DRAINAGE DISTRICT

Rolling Oaks Lateral 6 West



Goals

- **Replace Existing Shallow Ditch with Grass Swale**
- **Maintain or Improve Current LOS**
- **Improve Water Quality**
- **Reduce Maintenance & Operation Costs**



SOUTH BROWARD DRAINAGE DISTRICT

Rolling Oaks Lateral 6 West





SOUTH BROWARD DRAINAGE DISTRICT

Rolling Oaks Lateral 6 West





SOUTH BROWARD DRAINAGE DISTRICT

Griffin 345 Swale Inter-Connect



Goals

- **Install Cross- Drains for Existing Swales**
- **Improve Current LOS**



SOUTH BROWARD DRAINAGE DISTRICT

Cemetary Canal Mitigation Area





SOUTH BROWARD DRAINAGE DISTRICT

Solar Panels and LED Lighting





SOUTH BROWARD DRAINAGE DISTRICT

Green Retaining Wall





SOUTH BROWARD DRAINAGE DISTRICT

Green Retaining Wall





SOUTH BROWARD DRAINAGE DISTRICT

WATER QUALITY INITIATIVES



The Town of Southwest Ranches

In partnership with the

South Florida Water Management District (SFWMD)

South Broward Drainage District (SBDD)

Florida Department of Agriculture and Consumer Services

Presents:

Nursery Owners

Best Management Practices (BMPs) Workshop

Wednesday, February 23, 2011

Topics:

- Effective Maintenance of Stormwater Management Systems
- Nursery BMPs
- Pollution Prevention
- Water Conservation Practices

This informative workshop is directed to Southwest Ranches Nursery Owners. Your business is located in the C-11 West Basin adjacent to the Everglades. The Town is partnering with SFWMD, SBDD and FDACS to implement a nursery BMP program to promote phosphorus source controls which will result in water quality improvement. This workshop will provide insight into fertilizer application techniques and water conservation.

Your agribusiness will be recognized by the Town for attendance at this workshop!

Date: February 23, 2011

Time: 8:30 AM

Place: 5840 SW 148 Ave. (Volunteer Rd.)
Southwest Ranches, FL 33331

RSVP: Lee Rickles, (954) 343-7441 or

Email: lrickles@swranches.org

REFRESHMENTS

WILL BE SERVED



COMMUNITY WORKSHOPS AND NURSERY BMPs



SOUTH BROWARD DRAINAGE DISTRICT

QUESTIONS?

