

*Governing Board Meeting
Big Cypress Basin
July 6, 2012*

Big Cypress Basin Real Time Hydrologic Monitoring & Modeling System (BCBRTHMS)

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*Hydrologic & Environmental Systems Modeling
Water Resources Division*



Needs For BCBRTHMS

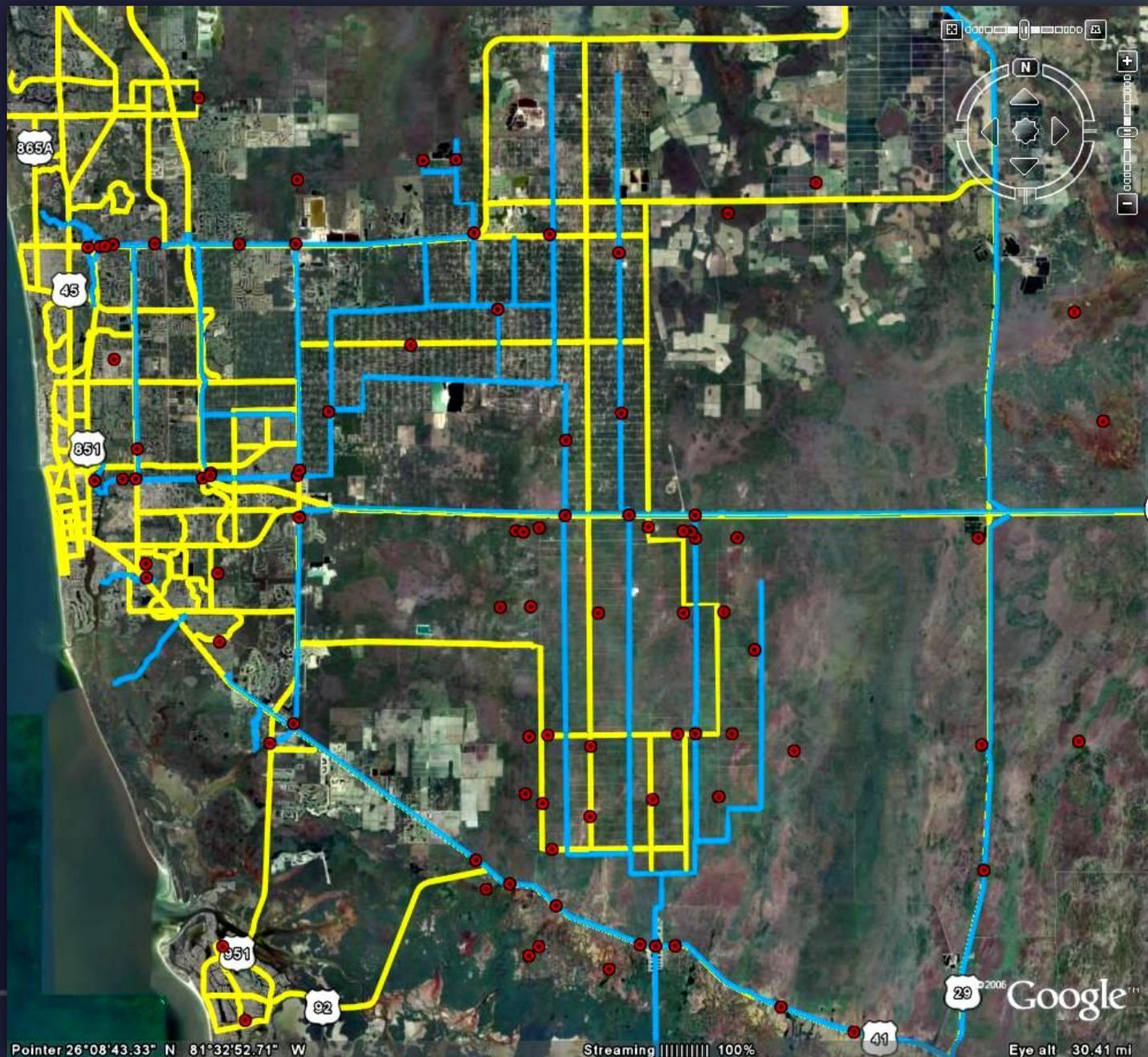
Unlike the C&SF system, BCB water control structures are not operated from the District Control Room

- A Real-time Hydrologic Monitoring & Modeling System is needed to:
 - ✓ provide decision making support to the BCB Field Station for operation of water control structures
 - ✓ provide public outreach platform on how the system is operated during the storms

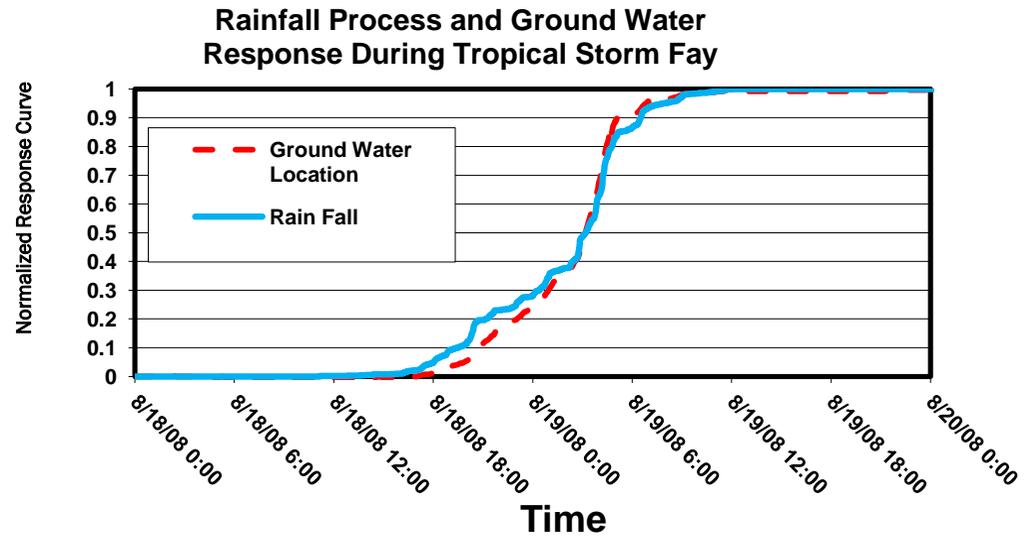
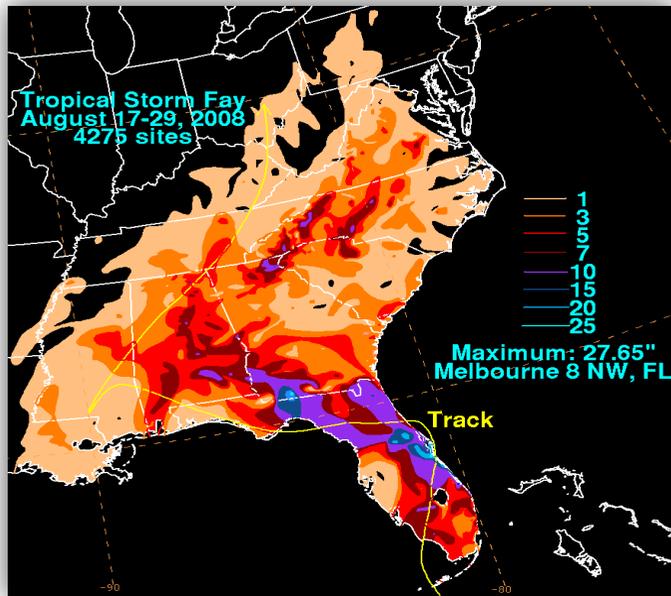
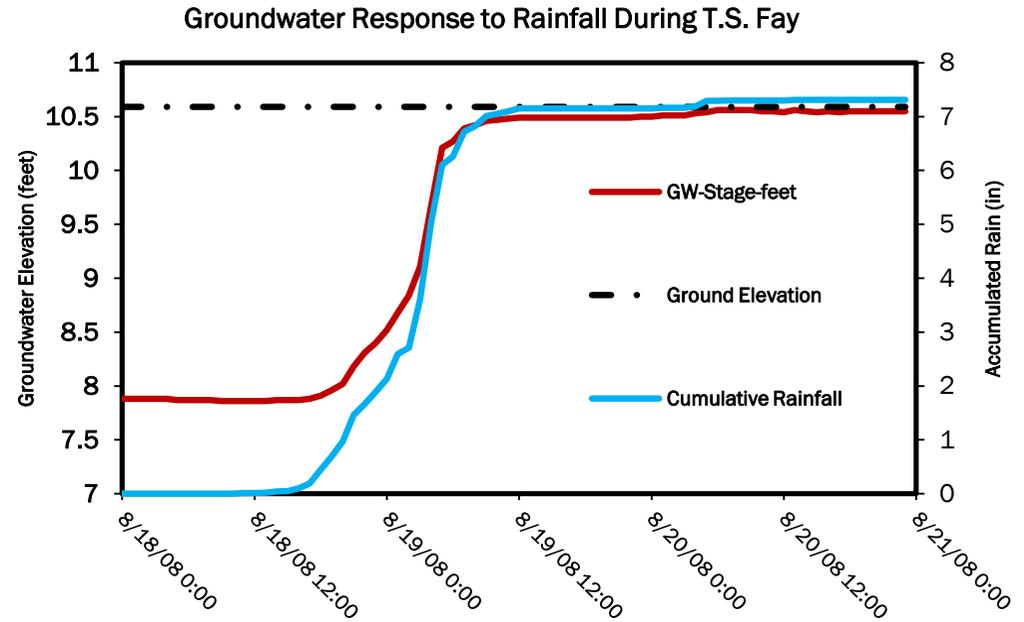


BCB Canal System & Telemetry Network

- Rainfall
- Structure operation
- Surface water stages
- Groundwater stages

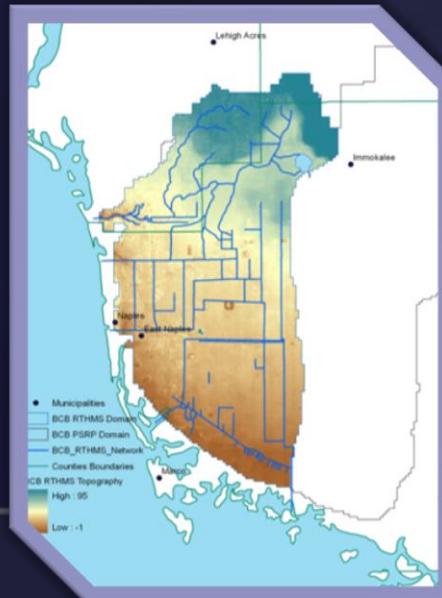
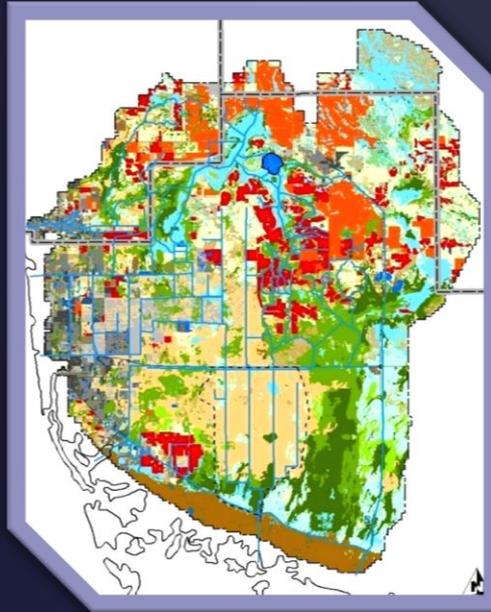


Interaction between surface water and groundwater - observed rainfall and groundwater table response during Tropical Storm Fay (August 18 - 21, 2008)



BCB MIKE SHE \ MIKE 11 Model

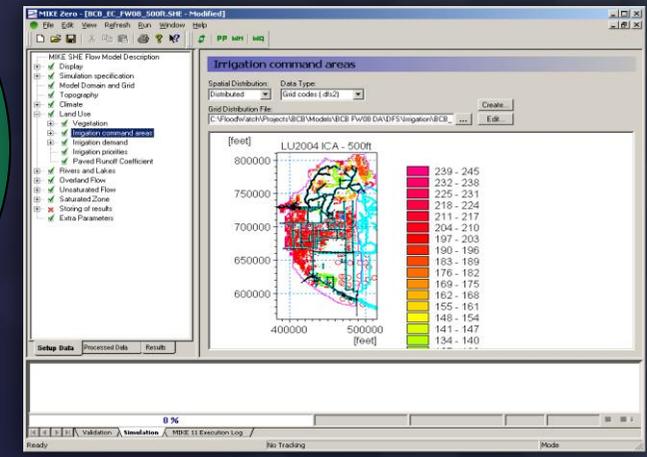
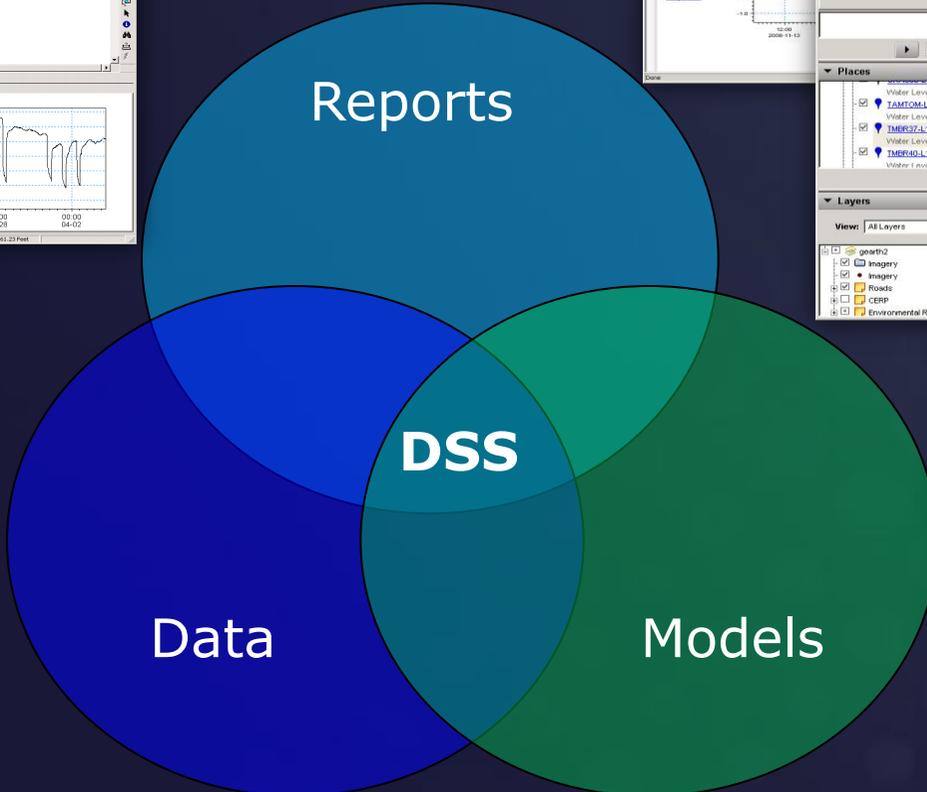
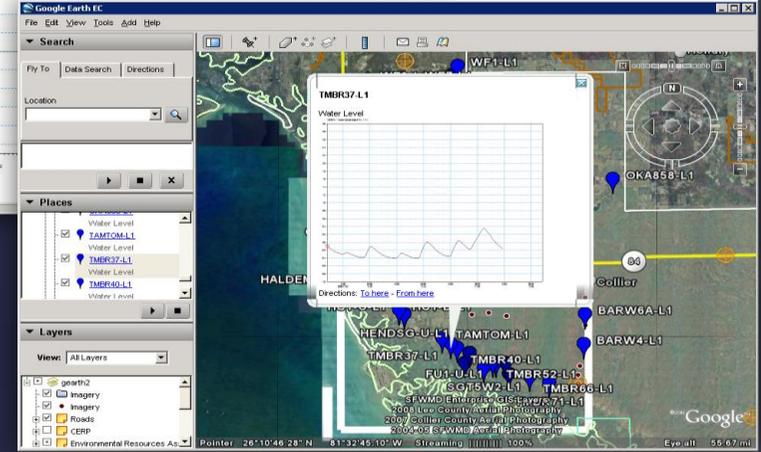
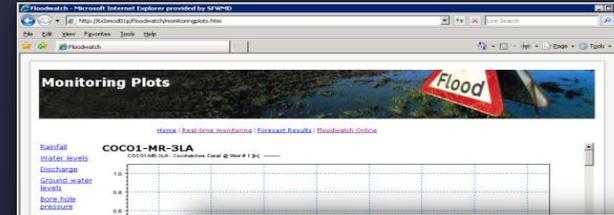
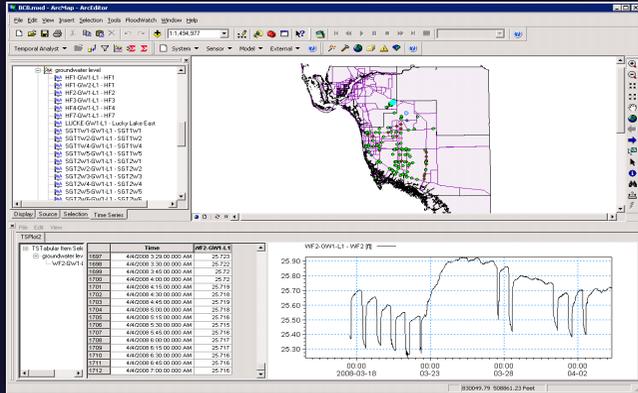
- Integrated Surface & Groundwater model
- Cover 1,200 sq. miles (1,500 ft grid)
- Main Components
 - Overland flow
 - ET (Evapotranspiration)
 - River and channel flow
 - Unsaturated groundwater flow
- Saturated groundwater flow (3 layers)



BCB Real-Time Model

- Updated structure geometry & Operations
- Use real-time rain gauge network
- Include real-time updating
- Reduced area, change grid to 500 ft

BCBRTHMS Concept



Major Functions

- Real-time BCB Condition Monitoring
- Real-time BCB Hydrologic Modeling

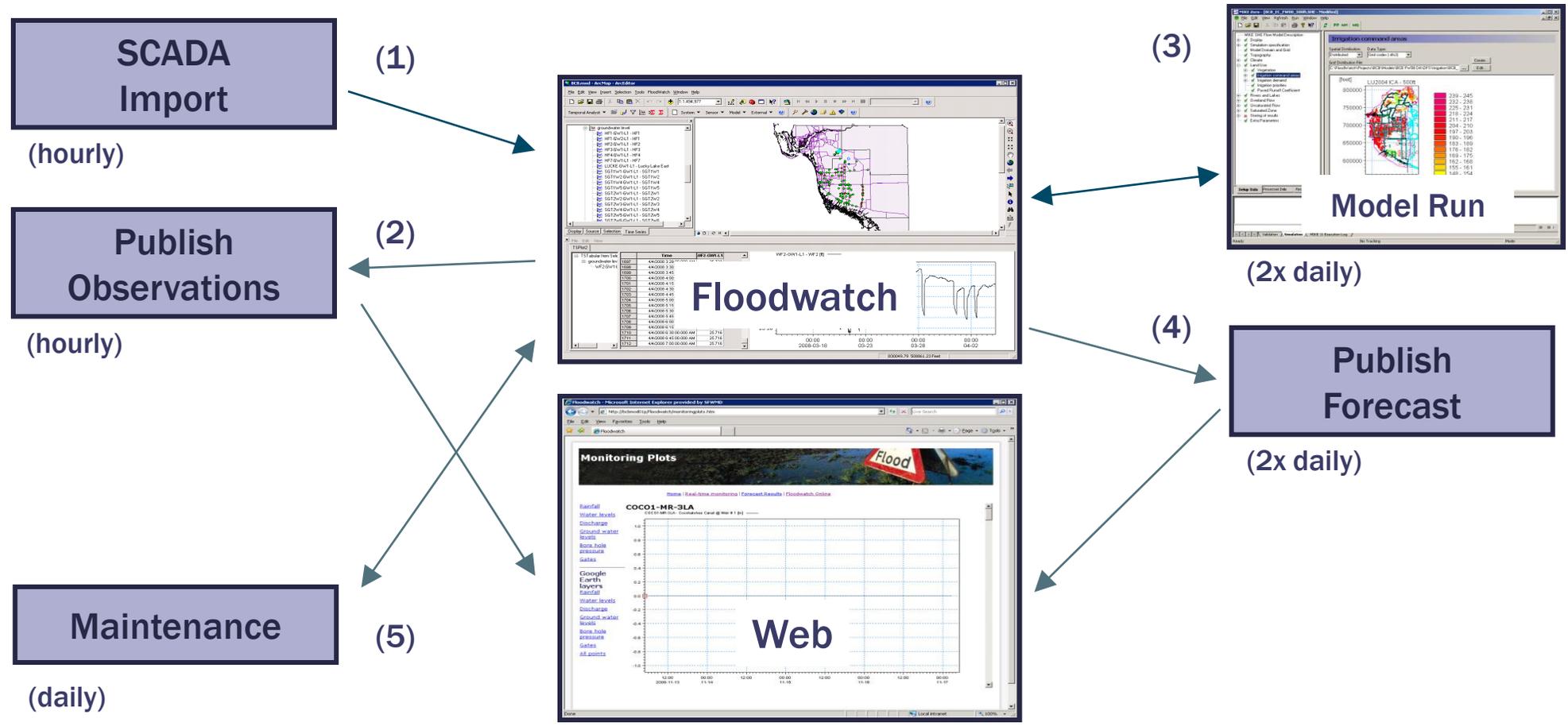
BCBRTHMS

is available on the SFWMD Website:

<http://my.sfwmd.gov/floodwatch/index.htm>



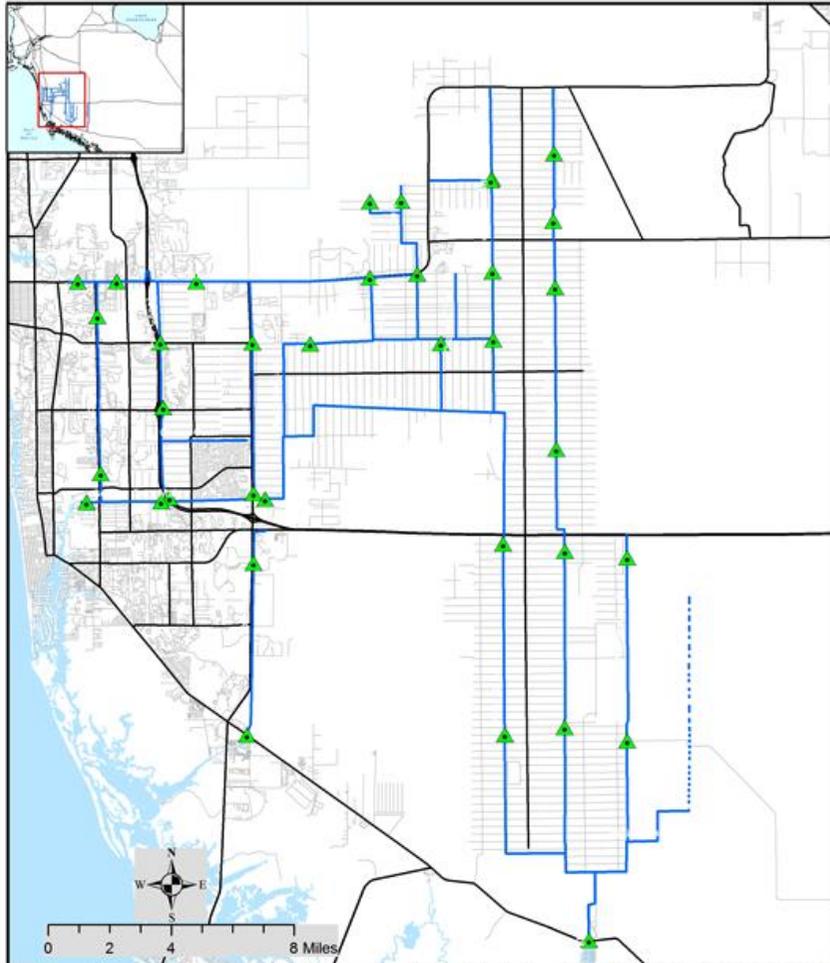
BCBRTHMS – Automatic Operation



Big Cypress Basin Real-time Hydrologic Monitoring & Modeling System



[Home](#) | [Real-time monitoring](#) | [Forecast Results](#) | [Gate Openings](#) | [Scada summary](#)



BCBRTHMS web

<http://my.sfwmd.gov/floodwatch/index.htm>

Big Cypress Basin, 2660 Horseshoe Drive N., Naples, FL 34104 Tel: 239-263-7615 kfeng@sfwmd.gov

[Rainfall](#)

[Surface Water \(in NAVD88\)](#)

[Ground water levels \(in NAVD88\)](#)

[Bore hole pressure](#)

[Gates \(in NAVD88\)](#)

Google Earth layers

[Rainfall](#)

[Water levels](#)

[Discharge](#)

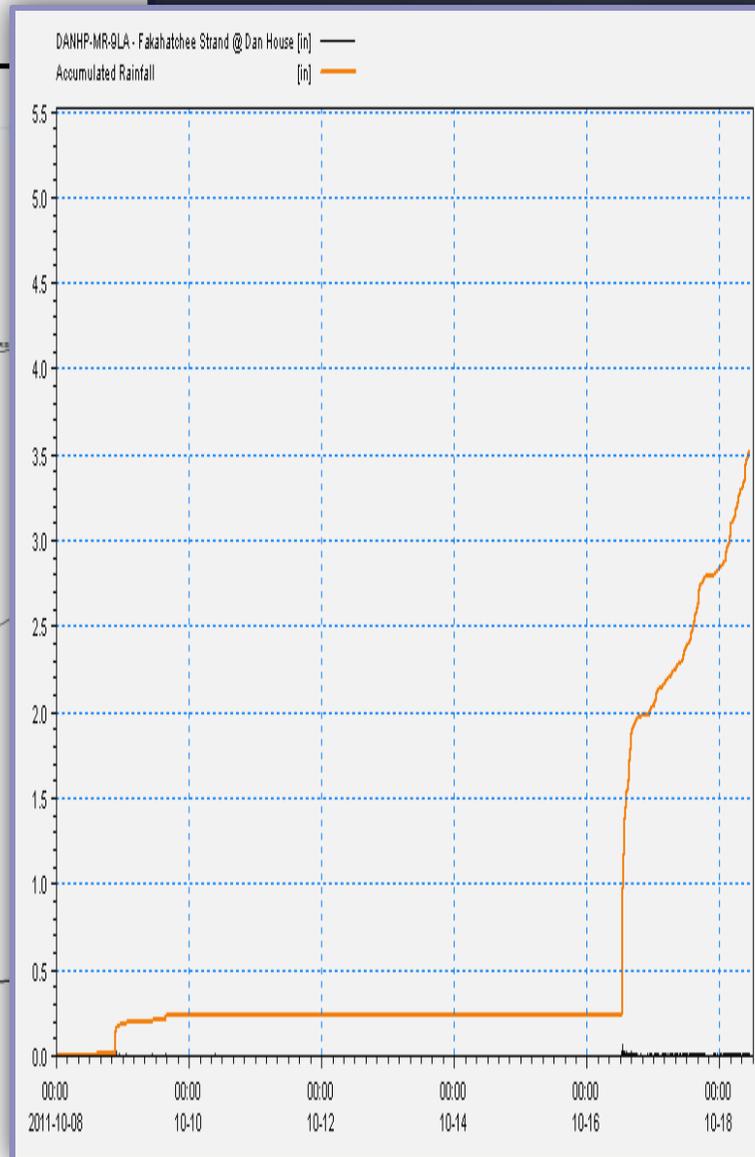
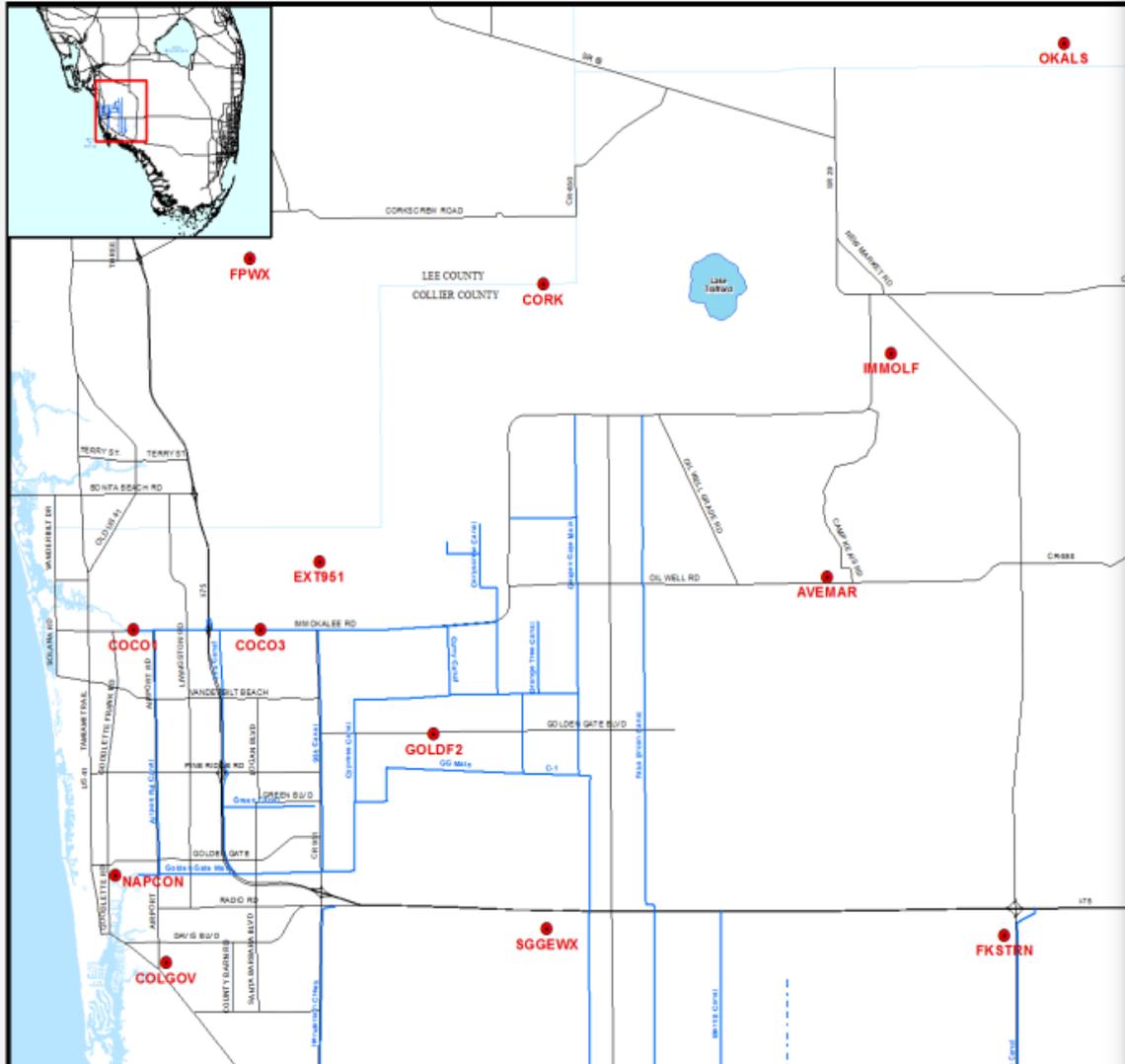
[Ground water levels](#)

[Bore hole pressure](#)

[Gates](#)

[All points](#)

Rainfall Stations



Floodwatch - Microsoft Internet Explorer provided by SFWMD

http://my.sfwmd.gov/floodwatch/GateOpenings.htm

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- [Coco 2](#)
- [Coco 3](#)
- [FU 4](#)
- [FU 5](#)
- [GG 1](#)
- [GG 2](#)
- [GG 3](#)
- [HC 1](#)

GG#1 Real Time Gate Position & Water Elevation - Overflow gate



10/31/2011 09:15

Upstream water elevation
= 3.6' ngvd

Downstream water elevation
= 1.2' ngvd

Gate opening

Gate 1 = 3.4 ft.
Gate 2 = 3.4 ft.
Gate 3 = 3.5 ft.

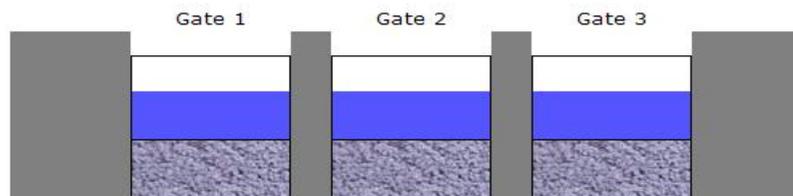
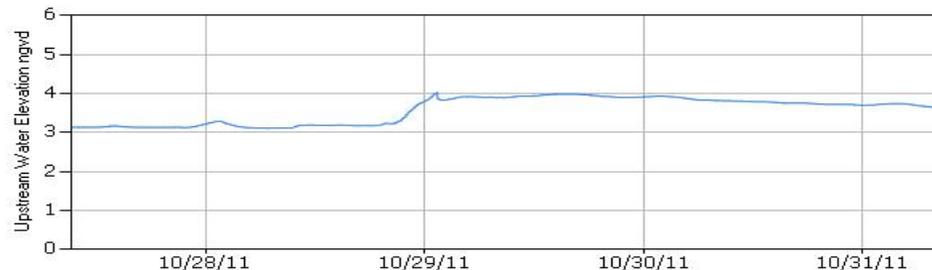
Gate discharge

Gate 1 = 261.2 cfs.
Gate 2 = 261.6 cfs.
Gate 3 = 266.7 cfs.

Gate range

Fully Closed = 0.0 ft
Fully Open = 6.0 ft
Gates open down

Golden Gate Weir #1. 4 Day Upstream Water Elevation History



Floodwatch - Microsoft Internet Explorer provided by SFWMD

http://my.sfwmd.gov/floodwatch/GateOpenings.htm

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- [GG 3](#)
- [HC 1](#)

GG#2 Real Time Gate Position & Water Elevation - Overflow gate



10/31/2011 09:15

Upstream water elevation
= 6.7' ngvd

Downstream water elevation
= 6.7' ngvd

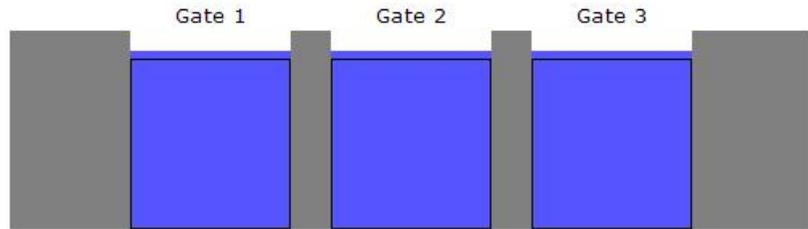
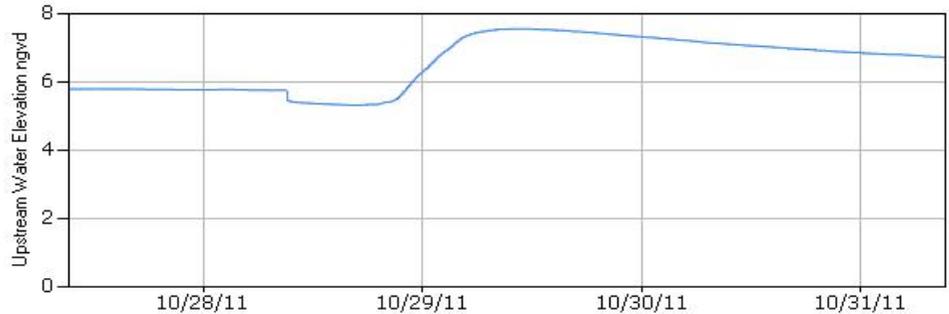
Gate opening

Gate 1 = 6.3 ft.
Gate 2 = 6.7 ft.
Gate 3 = 6.9 ft.

Gate range

Fully Closed = 0.0 ft
Fully Open = 6.3 ft
Gates open down

Golden Gate Weir #2. 4 Day Upstream Water Elevation History

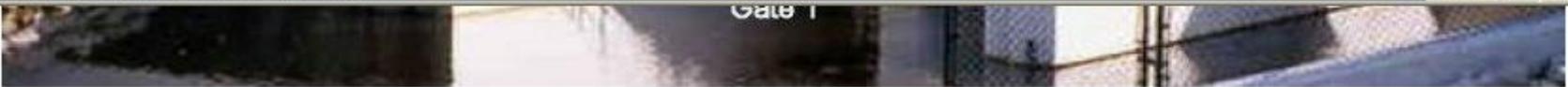


Floodwatch - Microsoft Internet Explorer provided by SFWMD

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Address <http://bcbmod01p/floodwatch/GateOpenings.htm> Go Favorites



9/28/2009 07:30

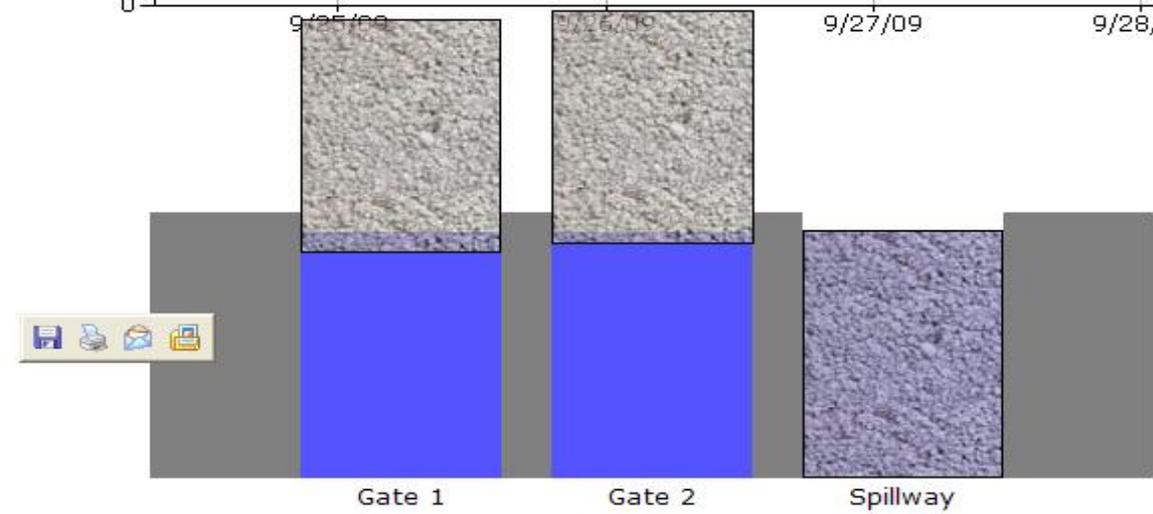
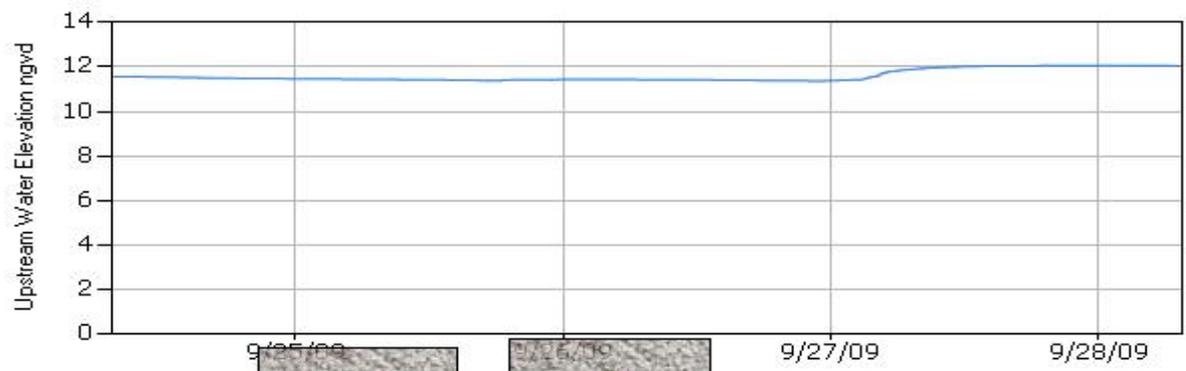
Upstream water elevation
= 12.1' ngvd

Downstream water elevation
= 12.1' ngvd

Gate opening
Gate 1 = 3.8 ft.
Gate 2 = 4.5 ft.

Gate range
Fully Closed = 0.0 ft
Fully Open = 4.0 ft
Gates open up

Cocohatchee Weir #3, 4 Day Upstream Water Elevation History



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- [GG 3](#)
- [HC 1](#)



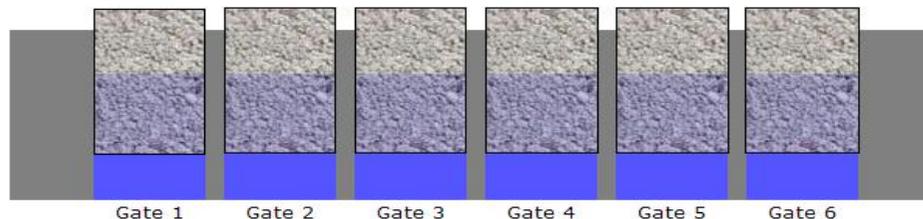
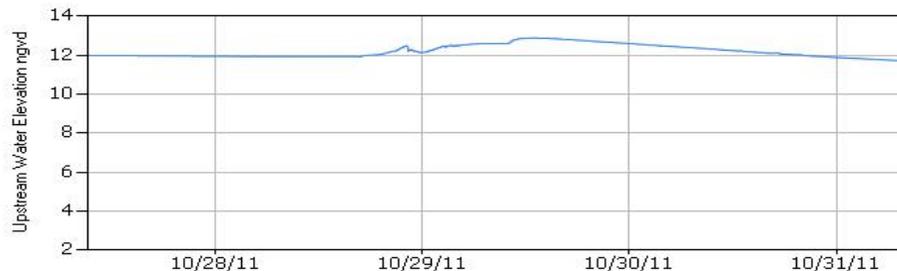
10/31/2011 09:15

Upstream water elevation
= 11.7' ngvd
Downstream water elevation
= 11.7' ngvd

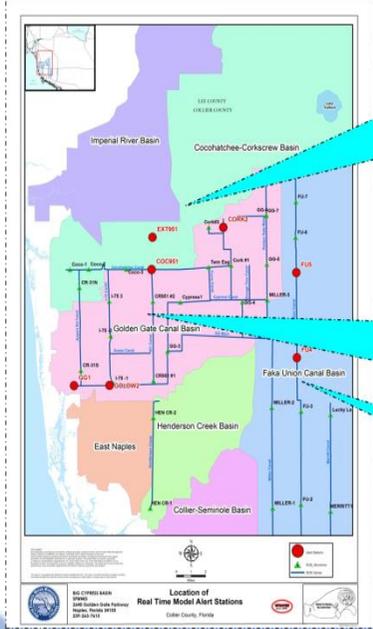
Gate opening
 Gate 1 = 3.1 ft.
 Gate 2 = 3.2 ft.
 Gate 3 = 3.2 ft.
 Gate 4 = 3.2 ft.
 Gate 5 = 3.1 ft.
 Gate 6 = 3.2 ft.

Gate range
 Fully Closed = 0.0 ft
 Fully Open = 8.0 ft
 Gates open up

Faka Union #4. 4 Day Upstream Water Elevation History



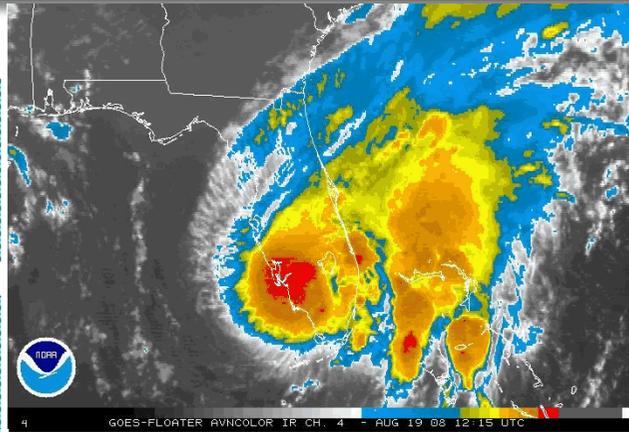
Alert System



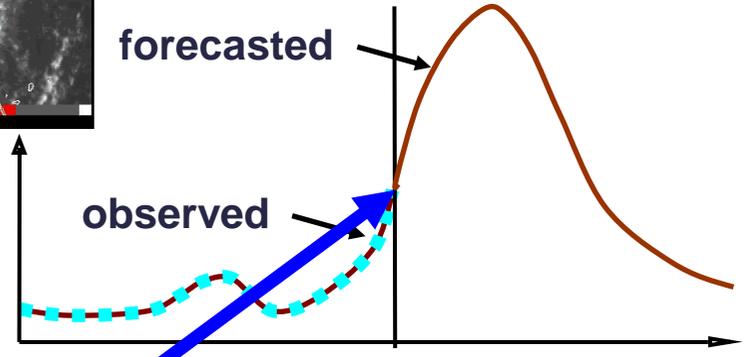
If EX7951-L1 >= 14.5 ft >= 2hrs AND
COC951-L1 >= 12.25 > 2hrs AND
CORK2-L1 >= 14.0 ft for more than 2 hrs
THEN SEND EMAIL to the defined group
The water level in the Cocohatchee Canal is
extremely high, please check operational
condition of gates COCO#1, COCO#2 & COCO#3

If GG2-U-L1 >= 6.5 ft >= 2hrs
AND
GG1-U-L1 >= 5.2 MORE THAN 2hrs
THEN SEND EMAIL:
The water level in the Golden Gate Canal is
extremely high, please check operational
condition of gates GG#1, GG#2

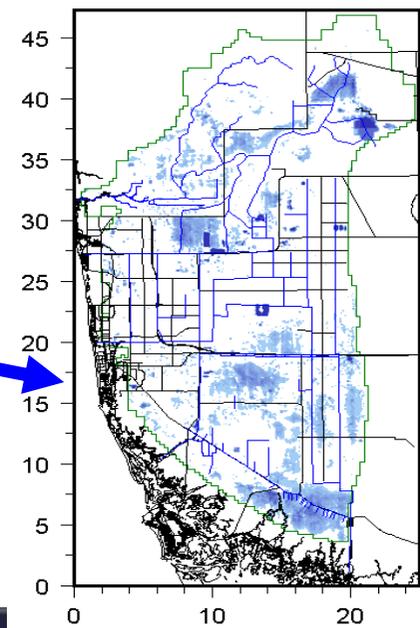
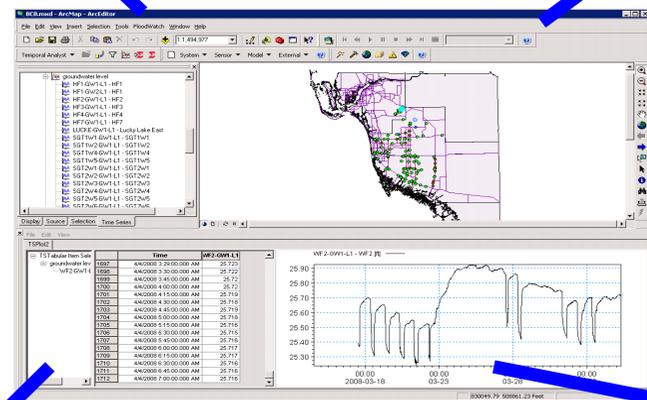
If FU5-U-L1 >= 13.7 ft AND
FU4s_U_L2 >= 12.5 ft more than 2 hrs
THEN SEND EMAIL:
The water level in the Faka Union canal is
extremely high, please check operational
condition of gates FU#4 & FU#5



Forecasts



Time of forecast



Flood Maps

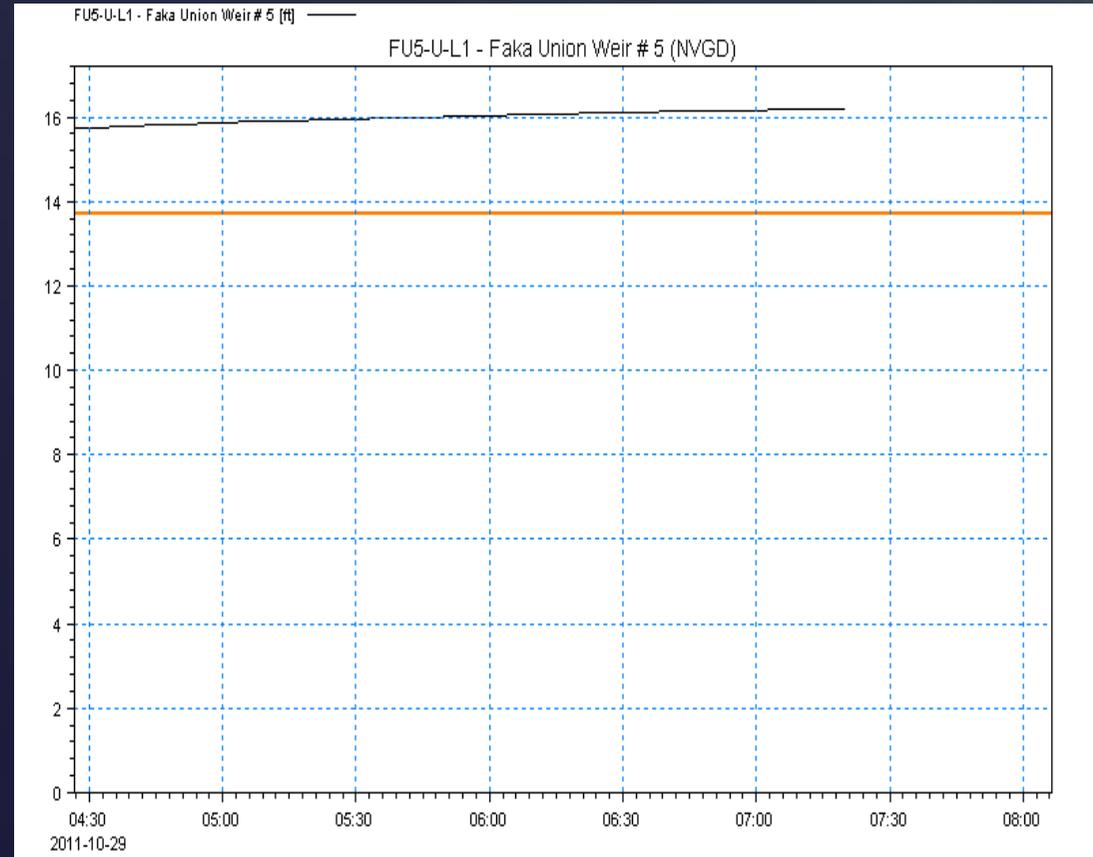


Gate Operation Status

Alert Email: (Oct 29, 2011)

From: Floodwatch
[mailto:mbutts@sfwmd.com]
Sent: Saturday, October 29, 2011 9:07 AM
To: Feng, Ke; Nath, Ananta; Potts, Andrew
Max, Guerra; Patino Eduardo; Tears,
Clarence
Subject: Floodwatch Threshold Alarm
Scenario 1

The water level in the Faka Union Canal is extremely high, please check operational condition of the gates FU#5 and FU#4.



System Forecasting Capabilities

- **Automatic forecast twice a day**
- **Input forecast rainfall**
(Needs better data – biggest challenge at this time)
 - Take National Weather Forecast as default (6hrs interval)
✓ *presently no NWS rainfall forecast station between Tampa and Miami*
 - District Weather Forecast Rainfall (daily data)
 - BCB generated rainfall based on local weather forecast (when needed)
 - Scenarios as needed
 - 3-day, 10-year, 25-year, 100-year

Key Capabilities

- Tool for O&M: Provide an efficient overview of what is happening within the watershed
- Real-time modeling – how the water levels in the channels and groundwater will change
- Publish monitoring online in a way that is easy to understand
- Flood maps



Budget

The FY13 \$25,000 budget will be used for the following purpose:

- Reoccurring system operation & maintenance
- System expansion to include operating data support for PSRP Merritt pump station
- System update to reflect the hard-coded real-time monitoring stations reduction in the real-time model

QUESTIONS?

**Big Cypress Basin Real Time
Hydrologic Monitoring & Modeling System
(BCBRTHMS)**

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