

Water Resources Analysis Coalition

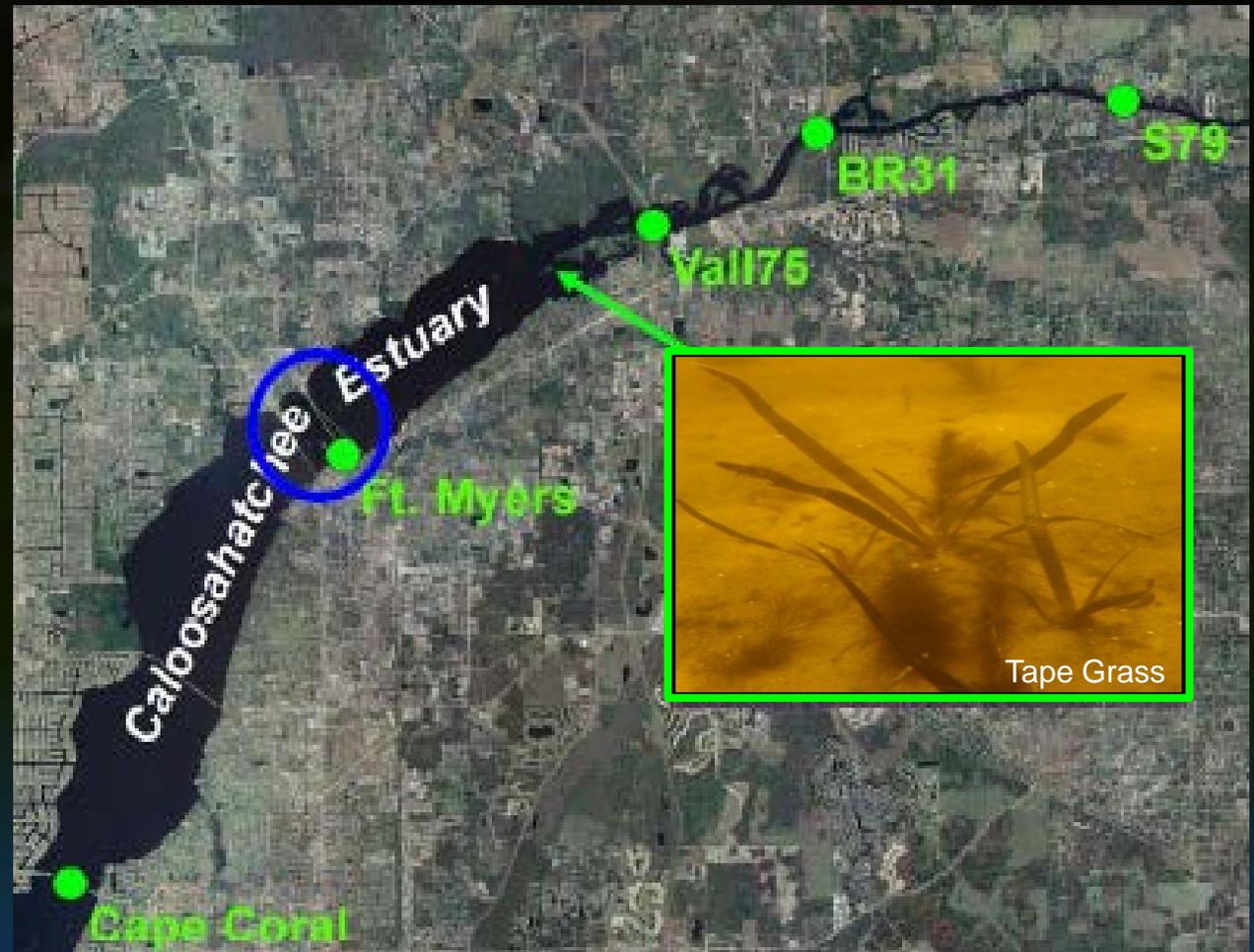
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Rule Development Update for Caloosahatchee River Minimum Flows and Levels

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Background

- MFL Rule initially adopted in 2001
- Mean monthly flow of 300 cfs at S-79
- MFL exceedances are based on salinity criteria
- 2010 Governing Board approved implementation of MFL studies



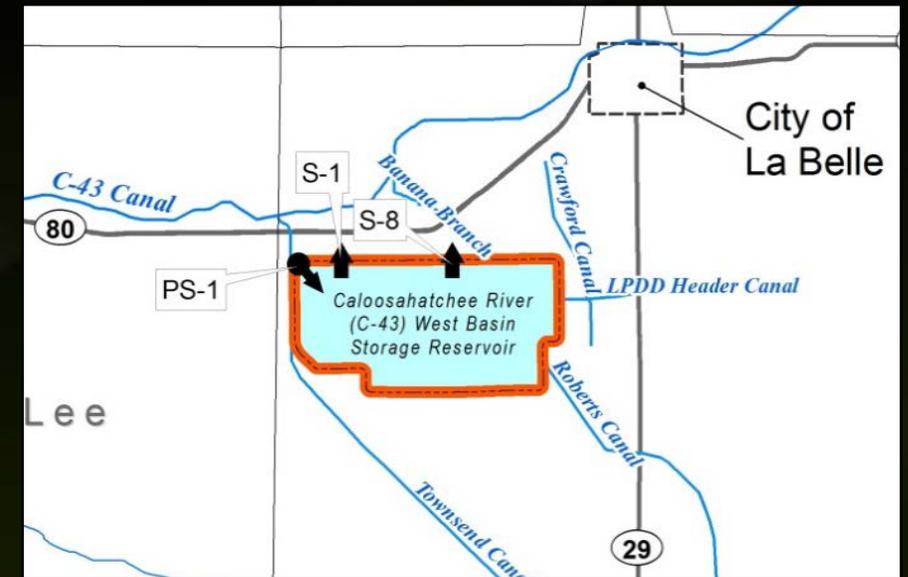
Caloosahatchee MFL Recovery Strategy

1. Caloosahatchee River (C-43) West Basin Storage Reservoir

- Construction started Nov. 2015
- Expected Completion 2022
- Costs ~ \$600 Million
- 170,000 Ac-Ft. storage
- New water solely for environmental purposes

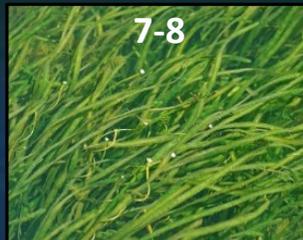
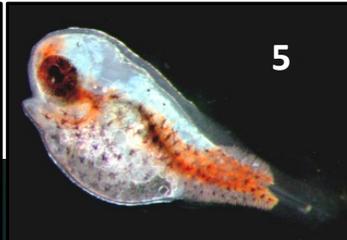
2. Water Reservation Rule

- Adopted in 2014
- Water protected for fish and wildlife



Science Overview

	Component	Method
1	Hydrodynamics	Influence of alterations on hydrodynamics
2	Inflow vs. Salinity	Monthly freshwater-salinity relationships
3	Water Quality	Relationships between inflow, salinity, and water quality
4	Zooplankton	Inflow, zooplankton and habitat compression
5	Ichthyoplankton	Relationships between ichthyoplankton and inflow
6	Benthic Fauna	Macrofauna-salinity patterns relative to inflow
7	<i>Vallisneria</i> data	Empirical relationships between tape grass, S, and inflow
8	<i>Vallisneria</i> model	Model exploration of tape grass, S, light, and inflow
9	Oyster Habitat	Salinity patterns for oyster habitat in lower CRE
10	Blue Crabs	Relationships between blue crab landings, rainfall, and inflow
11	Sawfish	Dry season inflow, hydrodynamics, and habitat extent



Science Overview

- 2016 - District scientists completed a comprehensive science assessment
- September 2016 - 2-Day Science Symposium
- March 2017 - Science Document finalized
- July 2017 - Draft MFL Technical document completed
- August 2017 - Public Peer Review Session



Rule Development Public Process

- Nov. 2, 2017 – WRAC Updated
- Dec. 14, 2017 – Governing Board authorized Rule Development
- Feb. 15, 2018 – Public Workshop #1
- May 7, 2018 – West Coast Technical Meeting held
- June 1, 2018 – Public Workshop #2



Caloosahatchee MFL Draft Rule Criteria

- **Magnitude:** 30-day moving average flow of 400 cfs at S-79
- **Duration:** An MFL exceedance occurs during a 365-day period when the 30-day moving average flow at S-79 is below 400 cfs and the daily average salinity has exceeded 10 at the Ft. Myers salinity monitoring station for more than 55 consecutive days.
- **Return Frequency:** An MFL violation occurs when an exceedance occurs more than once in a five-year period

Note: MFL exceedances are expected until the recovery strategy is completed and operational

Technical Comments from 1st Workshop

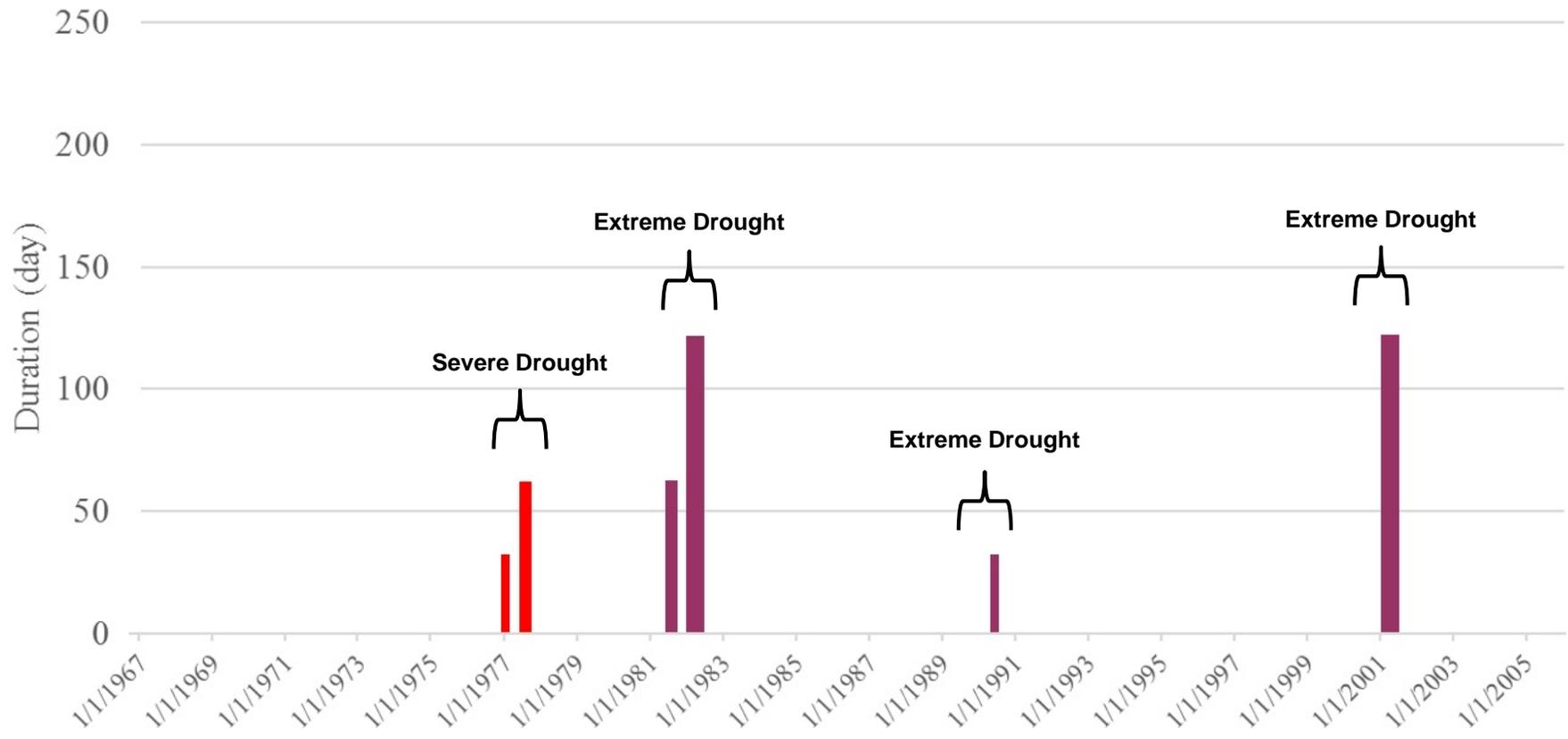
- Flow
 - Change in flow if May was included
 - Most sensitive species
- Duration
 - Consequences to Vallisneria
- Return Frequency
- Position of Low Salinity Zone
- High Salinity Events
 - Effects on other indicator species

Additional Technical Analyses

- Flow Component - Performed analysis with and without May
 - Result: Including May has minimal effect on flows at S-79
- Duration Component – Compared 30-day moving average to 55 or more consecutive days of salinity
 - Result: Comparison pending
- Return Frequency Component – Evaluated model outputs
 - Result: - Exceedances occur in either extreme or severe droughts
 - MFLs are not designed to drought proof natural systems

Regional Drought Conditions during Combined Exceedance Events in the CRE¹

Combined events for FCBW400, flow target 400 cfs



Palmer Drought Severity Index²

Extreme Drought	≤ -4.00
Severe Drought	-3.00 to -3.99
Moderate Drought	-2.00 to -2.99
Index Mid-range	-1.99 to +1.99
Moderately Moist	+2.00 to +2.99
Very Moist	+3.00 to +3.99
Extremely Moist	≥ +4.00

¹ From National Oceanic and Atmospheric Administration/National Centers for Environmental Information at <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/200201-200312>.

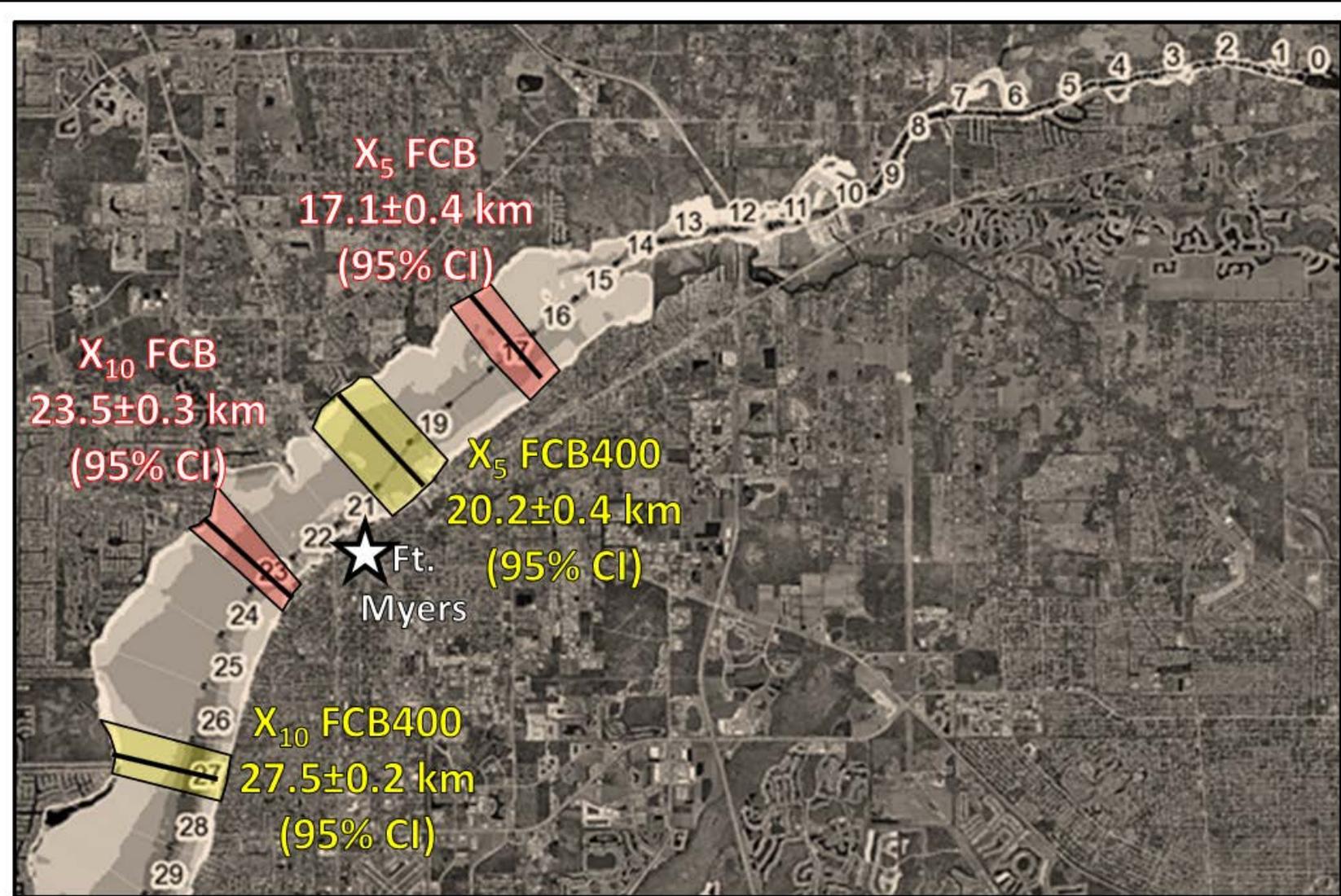
² Palmer, W.C. 1965. Meteorological Drought. *Research Paper No. 45*. U.S. Weather Bureau. National Oceanic and Atmospheric Administration Library and Information Services Division, Washington, D.C.

Isohaline Position Analysis (Low Salinity Zones) in Dry Season

Legend

- FCB Without C-43 Reservoir
- FCB400 With C-43 Reservoir

FCB = Future Condition Base model run



Additional Technical Analyses - Zooplankton

<u>Total # of Compression Events</u>	<u>No Res.</u>	<u>With Res.</u>	<u>%Change</u>
Lironeca spp. (isopod)	29	4	-86.2
Edotia tribola (isopod)	29	5	-82.8
Americamysis almyra (mysid)	50	31	-38.0
Clytia spp. (jellyfish)	28	4	-85.7
Bowmaniella brasiliensis (mysid)	26	4	-84.6
Gobiidae preflexion (Goby larvae)	24	2	-91.7
Anchoa mitchili (Common Anchovy)	54	7	-87.0
Mnemiopsis leidyi (comb jelly)	54	7	-87.0

Groups Present at Workshop #2

- Lee County
- City of Sanibel Island
- Florida Fish and Wildlife Conservation Commission
- Department of Interior
- Sanibel-Captiva Conservation Foundation
- Conservancy of Southwest Florida
- Charlotte Harbor National Estuary Program
- Responsible Growth Management Coalition
- Florida Gulf Coast University
- Environmental / Engineering Consulting Firms
- Law Firm

Comments Received from 2nd Workshop

- Main concern is about the duration component of the proposed rule triggering an exceedance
- Lack of recovery/regrowth of tape grass when the flows have been greater than 400 cfs
- Questioned the purpose of the MFL re-evaluation effort before the C-43 Reservoir is completed
- Differences between recovery and restoration
- Data differences and how indicators responses will be monitored consistently

Rule Development Schedule

Caloosahatchee MFL Rule Development Activity	Expected Date
Request Review by Office of Fiscal Accountability and Regulatory Reform – Governing Board Action Required	July 2018
Publish Proposed Rule in Florida Administrative Register – Governing Board Action Required	July 2018
Public Comment Period	July/August 2018
Rule Adoption/ Public Hearing - Governing Board Action Required	September 2018
Rule becomes effective 20 days after filing with Dept. of State	November 2018



Discussion