Monitoring of the 2022 Rainy Season over Florida's Water Management Districts

Vasubandhu Misra & C. B. Jayasankar

Acknowledgements:
NASA Earth Science Division

The Dept. of Earth, Ocean and Atmospheric Science
Center for Ocean-Atmospheric Prediction Studies
Florida Climate Institute
@ The Florida State University

Florida Climate Institute
AT FLORIDA STATE UNIVERSITY

FLORIDA Water & Climate Alliance

FLORIDA STATE UNIVERSITY 1851

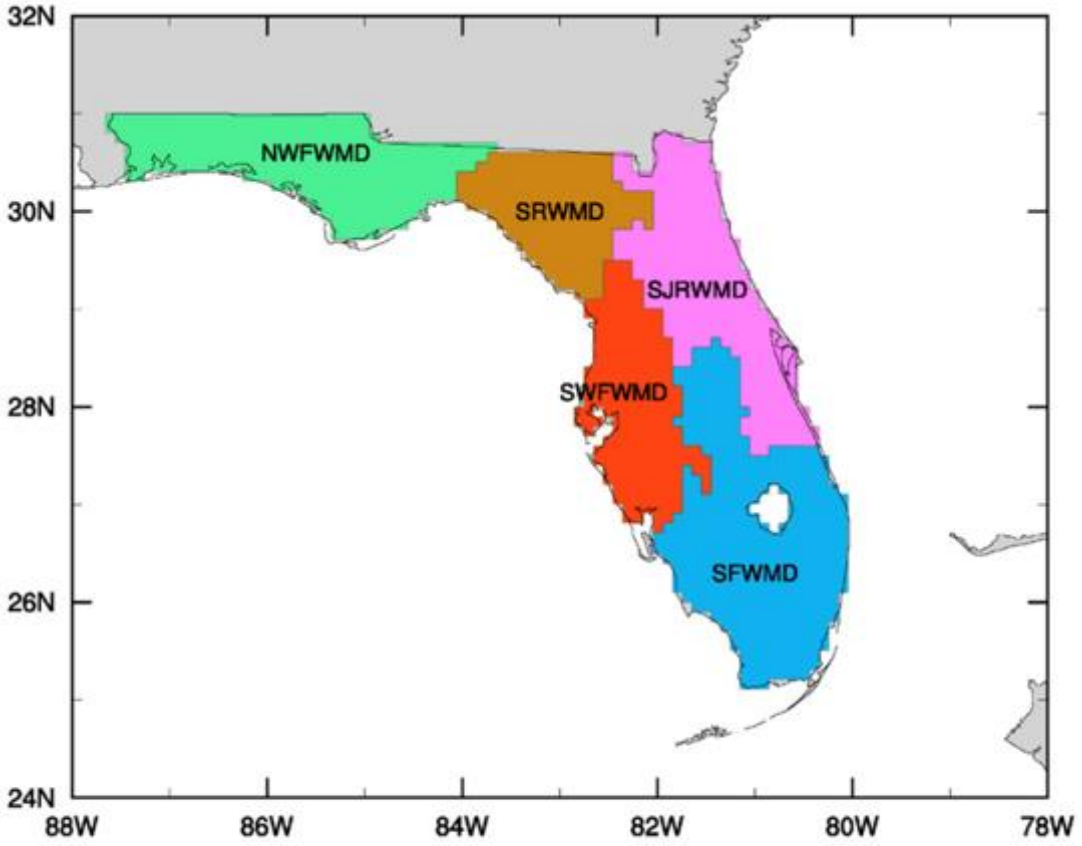
COAPS

Objectives of the NASA Project

Presented in Summer 2021, 2022

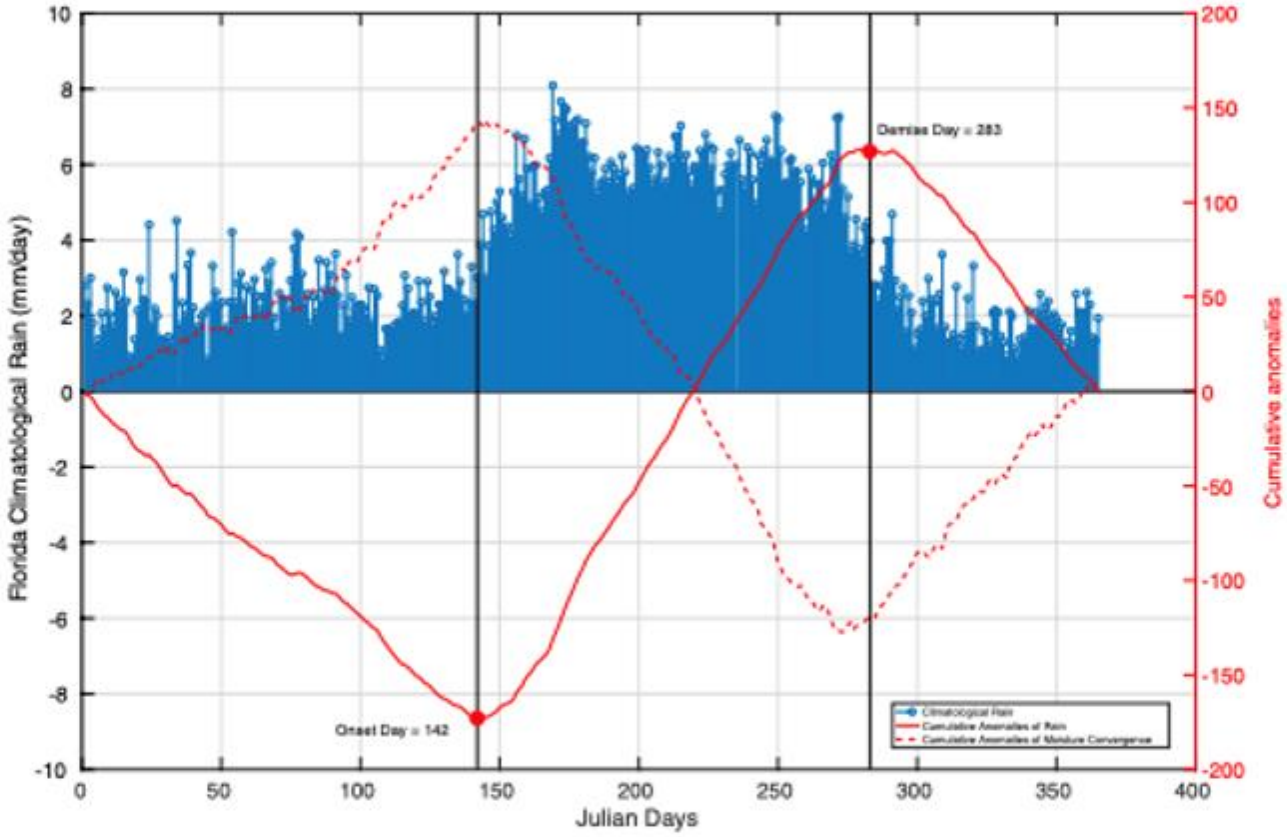
- Dynamical high-resolution model forecasts for the winter season
- Real time monitoring of the onset/demise of the wet season
- Transition of forecasts to operations in Tampa Bay Water and Peace River Manasota Regional Water Supply Authority—recently completed streamflow re-forecasts for the winter forecasts

The Five Water Management Districts of Florida



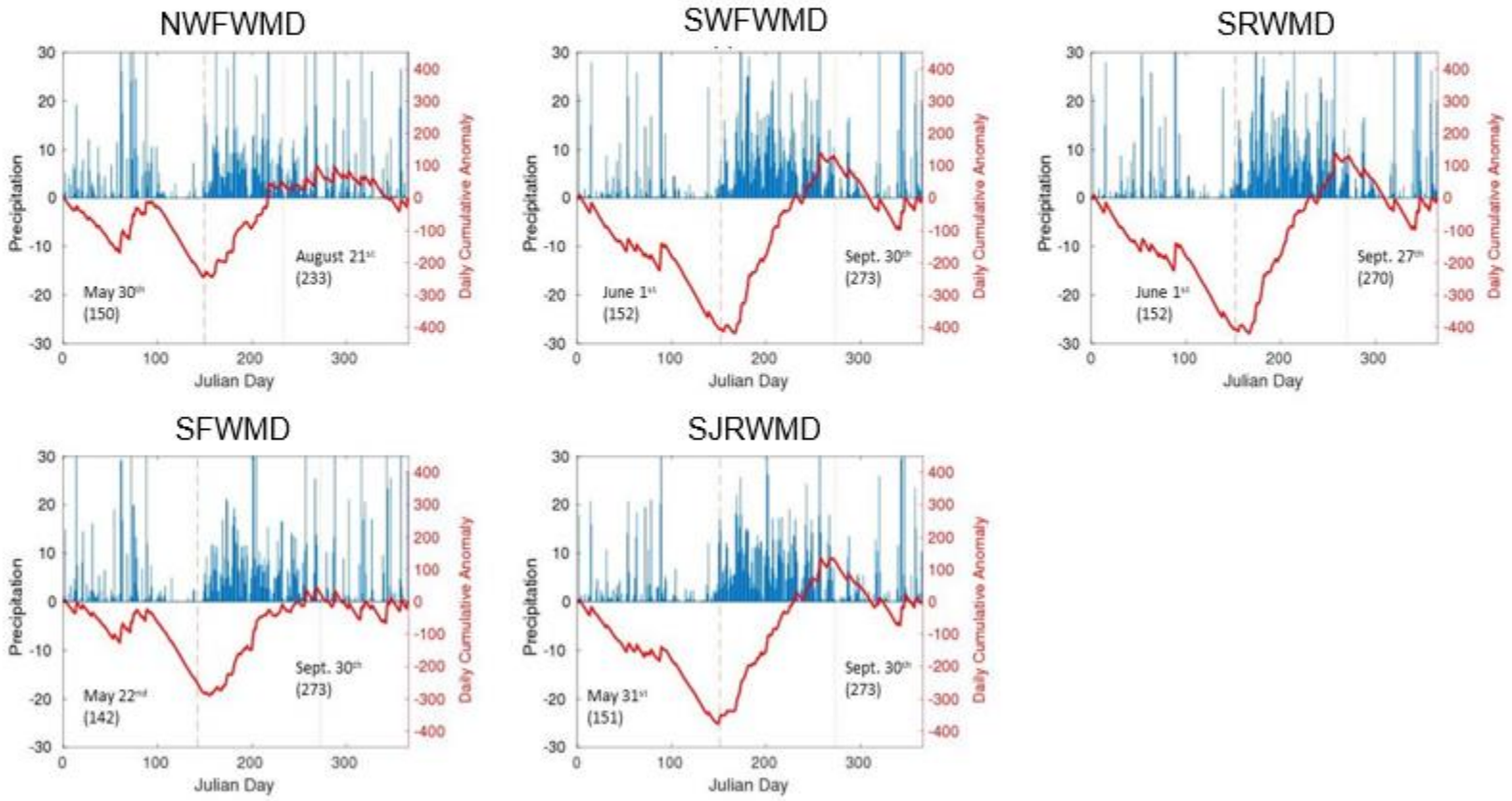
The domains of the five Water Management Districts (WMDs) of Florida: 1) South Florida (SFWMD), (2) Southwest Florida (SWFWMD), (3) St. Johns River (SJRWMD), (4) Suwannee River (SRWMD), (5) Northwest Florida (NWFWMD).

The Seasonal Cycle of Rainfall over Peninsular Florida



The time series of daily climatology of rainfall (mm/day) averaged over Peninsular Florida

Seasonal cycle of rainfall over the WMDs



The time series of daily climatology of rainfall (mm/day) over the WMDs.

Benefit of monitoring onset/demise of rainy season

Region		Demise	Seasonal Length	Seasonal Rainfall
SFWMD	Onset	0.17	**-0.46**	**-0.41**
	Demise	1	**0.80**	**0.53**
SWFWMD	Onset	**-0.39**	**-0.79**	**-0.57**
	Demise	1	**0.87**	**0.64**
SJRWMD	Onset	0.11	**-0.45**	**-0.40**
	Demise	1	**0.84**	**0.47**
SRWMD	Onset	0.11	**-0.48**	-0.24
	Demise	1	**0.82**	**0.66**
NWFWMD	Onset	0.38	**-0.40**	**-0.50**
	Demise	1	**-0.69**	0.34

The correlations of onset and demise dates of the rainy season with the seasonal length and seasonal rainfall anomalies over the five WMDs of Florida. Bold values are significant at 10% significance level according to t-test.

"Early onset of the rainy season leads to wetter and longer rainy season"

Rainy season outlook(Issued June 20, 2022)

Given that we are monitoring the rainy season and not forecasting we cannot provide the exact date of onset until after it occurs (usually a week after).

The onset in SFWMD clearly occurred on 02 June, which is 9 days after climatological onset and falls after May 27th (upper tercile threshold). **Therefore, we anticipate drier than normal and shorter than normal wet season for SFWMD.**

The onset in SWFWMD clearly occurred on 07 June, which is 8 days after climatological onset and falls after June 3rd (upper tercile threshold). **Therefore, we anticipate drier than normal and shorter than normal wet season for SWFWMD.**

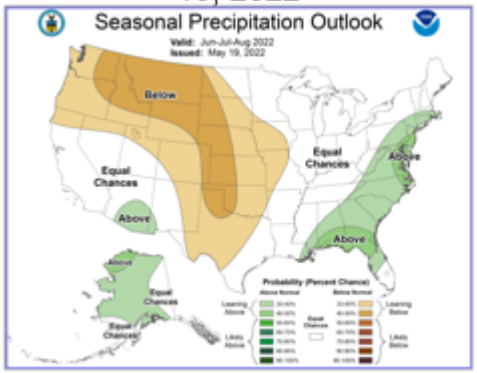
The onset in SJRWMD clearly occurred on 05 June, which is 7 days after climatological onset and falls after June 1st (upper tercile threshold). **Therefore, we anticipate drier than normal and shorter than normal wet season for SJRWMD.**

The onset in SRWMD clearly occurred on 08 June, which is 9 days after climatological onset and falls after June 5th (upper tercile threshold). (It should be noted that the historical data for this WMD reveal that onset date of the rainy season is not a good predictor of the wet season).

The onset in NWFWMD clearly occurred on 08 June, which is 2 days after climatological onset and falls within June 12th (upper tercile threshold). **Therefore, we anticipate normal wet season for NWFWMD.**

Region	Onset date climatology	Lower tercile threshold	Upper tercile threshold	Onset date for 2022 season
SFWMD	23 May	May 16	May 27	Jun 02
SWFWMD	30 May	May 24	Jun 03	Jun 07
SJRWMD	29 May	May 21	Jun 01	Jun 05
SRWMD	30 May	May 25	Jun 05	Jun 08
NWFWMD	06 Jun	May 25	Jun 12	Jun 08

NOAA outlook issued on May 19, 2022



Rainy season of 2022 with respect to the climatology

Onset Date

Region	Onset date climatology	Onset date for 2022 season	Departure
SFWMD	May 23	Jun 02	10
SWFWMD	May 30	Jun 07	8
SJRWMD	May 29	Jun 05	7
SRWMD	May 30	Jun 08	9
NWFWMD	Jun 06	Jun 08	2

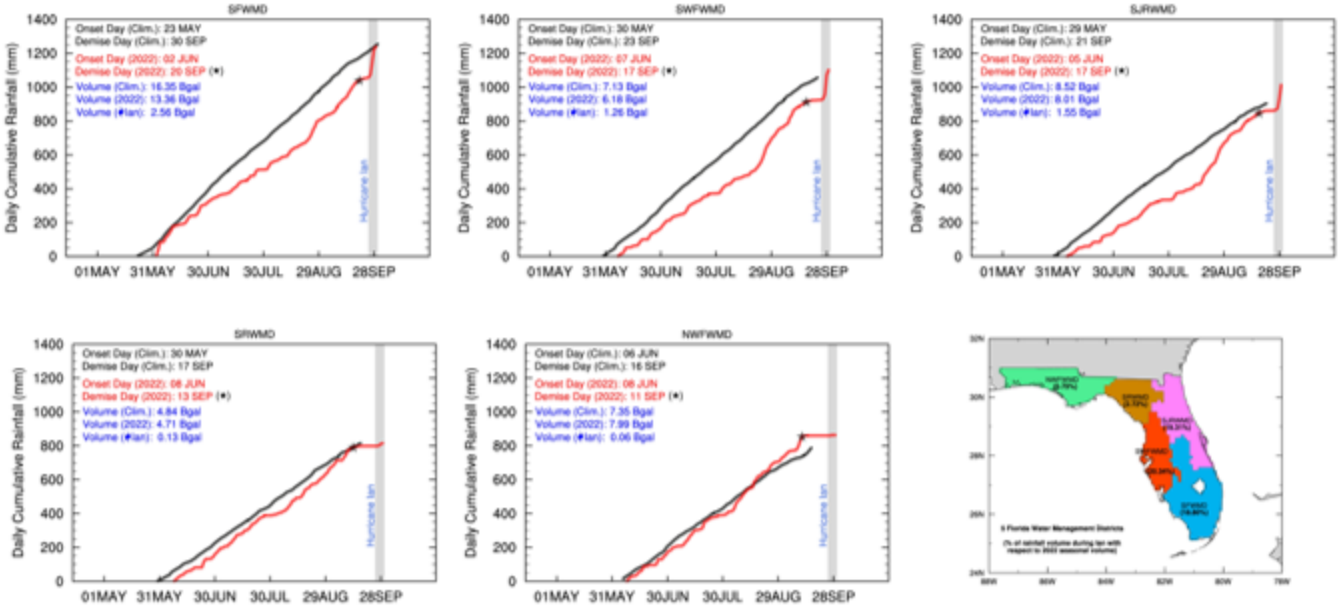
Demise Date

Region	Demise date climatology	Demise date for 2022 season	Departure
SFWMD	Sep 30	Sep 20	10
SWFWMD	Sep 23	Sep 17	6
SJRWMD	Sep 21	Sep 17	4
SRWMD	Sep 17	Sep 13	4
NWFWMD	Sep 16	Sep 11	5

Seasonal Length

Region	Season's length climatology	Season's length for 2022 season	Departure
SFWMD	131	111	20
SWFWMD	117	103	14
SJRWMD	116	105	11
SRWMD	111	98	13
NWFWMD	103	96	7

Verification…



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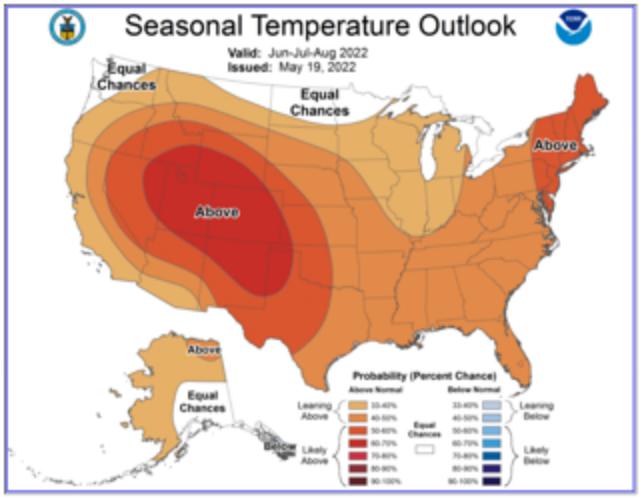

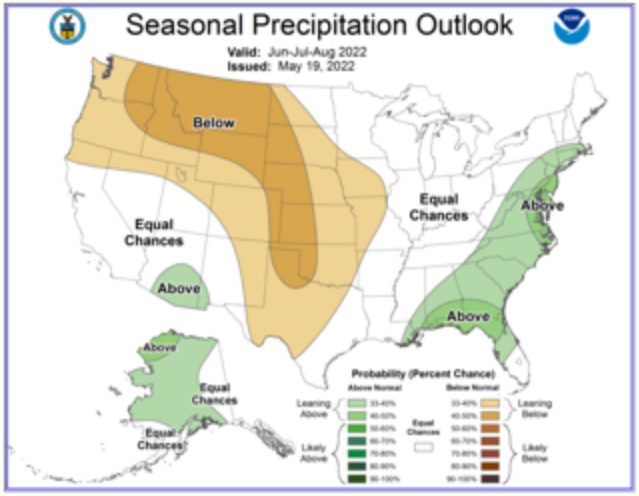

- SFWMD, SWFWMD, SJRWMD ended the 2022 wet season with a water deficit of ~ 3, 1, and 0.5 Bgal, respectively.
- But Hurricane Ian dumped sufficient water to wipe this deficit a week after the season ended.
- This has happened only once in the past 22 years when Dorian (2019) drenched east coast of Florida after a relatively dry summer season.