

Dynamic Position Analysis for December 1, 2019

SFWMM Model Simulation of 41 years (1965-2005)

Modeling Assumptions

Discussion of UPA Results

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 - [Dry Years](#)
 - [Wet Years](#)
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 - [Spaghetti Plot](#)
 - [All ENSO Years](#)
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 - [AMO / ENSO Sub-Sampling](#)
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 - [AMO / ENSO Sub-Sampling](#)
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December 1, 2019

Dynamic Position Analysis

Using Hybrid LOWSM

Modeling Assumptions

- December 1, 2019 DPA is based on regular Position Analysis applying V6.7.4 of the SFWMM, and assuming the current Lake Okeechobee Net Inflow Outlook (LONINO) for each year simulated. It is based on historical climatic conditions spanning the period 1965-2005
- The model is reinitialized November 1st of each year
- The Lake Okeechobee operations follow the Lake Okeechobee Regulation Schedule (LORS2008). Modeling assumptions consistent with modeling performed for LORS-2008 Supplemental, Environmental Impact Statement (SEIS).
- LOK Temporary Forward Pump operations will be in place, whenever necessary, to improve water supply deliveries from the Lake under low Lake stages.
- STAs reflect current operational conditions
- Lake Okeechobee Water Shortage Management (LOWSM) is included in the simulation which reflects the currently approved 40E-21 and 40E-22 water shortage rules.
- Water supply restrictions simulated for the urban areas reflect current District water shortage management policies.
- Wet and Dry years selected by examining all years and choosing the wettest or driest years in both near and far-term.

Lake Okeechobee Water Shortage Triggering Line										
01/01	03/31	04/30	05/30	05/31	09/30	10/01	10/31	11/30	12/31	
12.15	11.70	10.95	10.50	10.50	13.00	13.00	12.80	12.40	12.16	

- ENSO-neutral conditions are present. ENSO-neutral is favored during the winter 2019 (~70% chance), continuing through spring 2020 (60-65% chance).
- ENSO (El Niño Southern Oscillation) years (El Niño, La Niña and ENSO Neutral) are selected by locating the current month as it falls in the middle of the 3-month average in the official ONI table from NOAA/CPC:

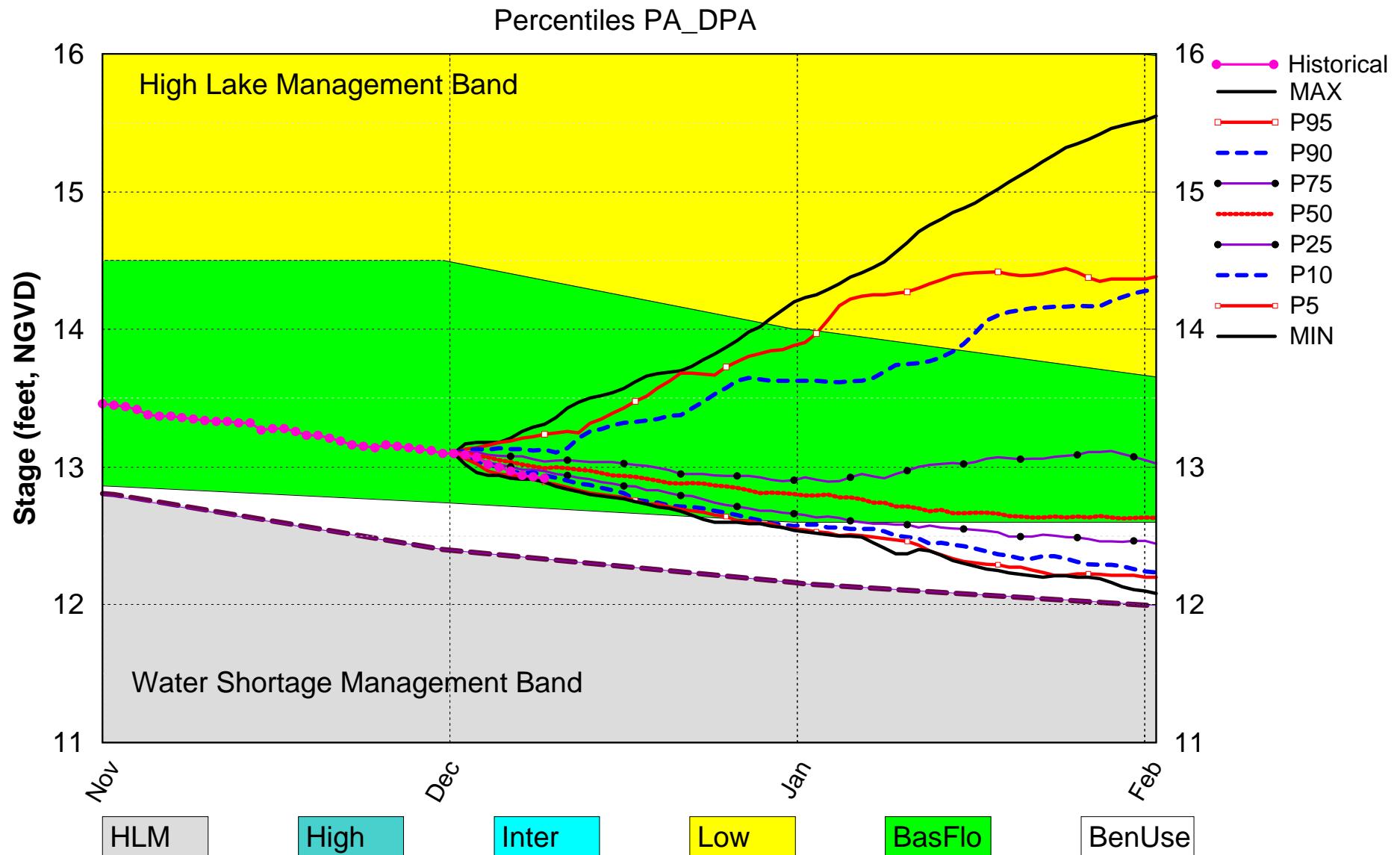
https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php

If the current month is within an official ENSO event (5 consecutive 3-month periods) then that year is considered an ENSO year for that month, these years are compiled ahead of the model simulations for all ENSO events within the period of record of the model simulation. Each month will have a different set of years. The strength of the ENSO event may vary among the selected years, and the DPA simulation of these years may show wide variability in modeled stages.

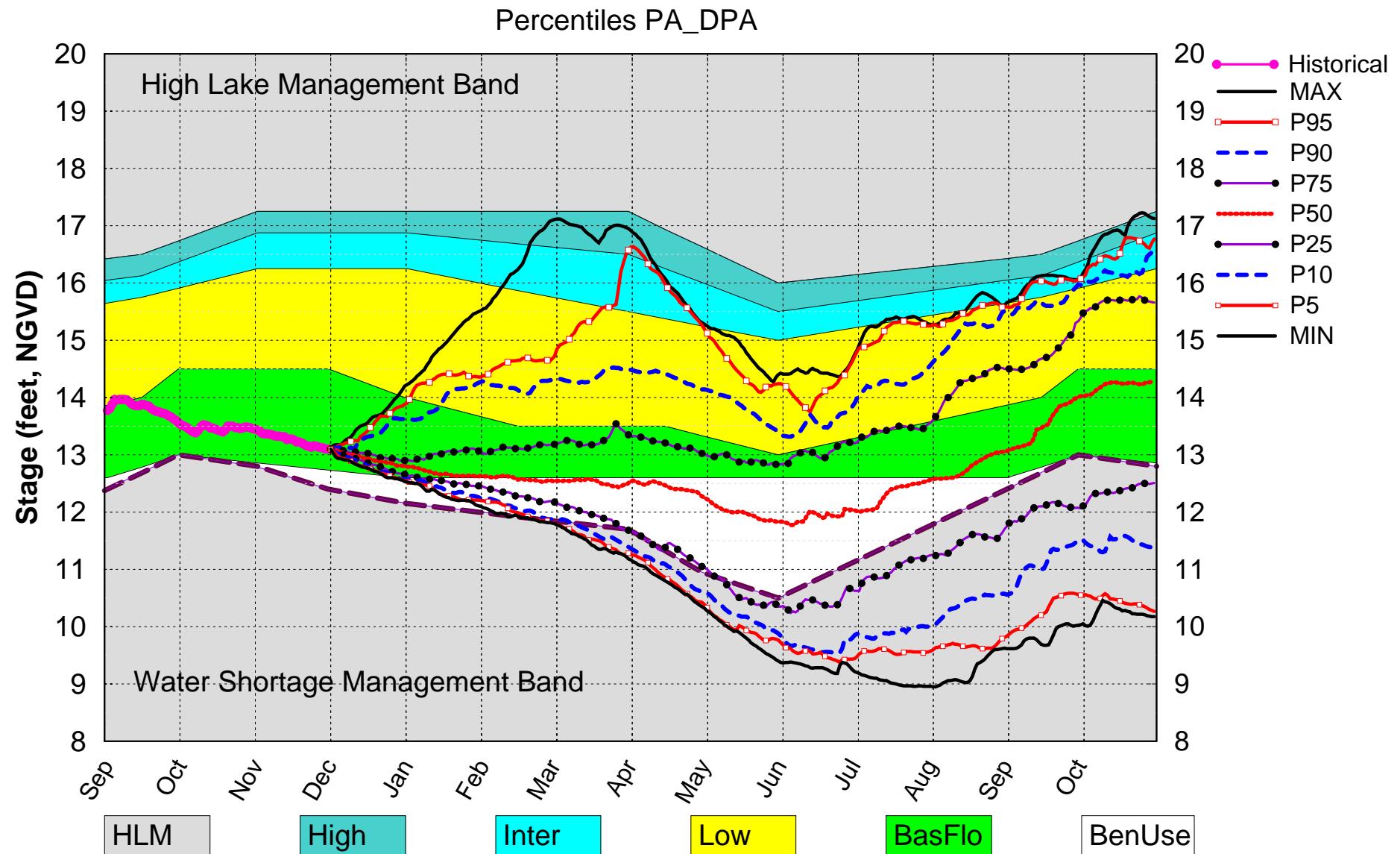
- S-65E inflows entering Lake Okeechobee in the SFWMM simulation were obtained by adding S-65 flows, obtained from the UK-OPS simulation in a PA mode, and local runoff contribution from the Lower Kissimmee, computed as the difference of S65E and S65 historical flows for the period 1965-2005. Runoff contribution on any given day of the current PA month is adjusted based on a correlation function of Palmer Drought Index, rainfall and historical flows.
- Back pumping of excess runoff from the EAA into Lake Okeechobee takes place only under flood control conditions (Interim Action Plan).
- Operations for structures in the SDCS are more consistent with Increment 1.1/1.2
- Temporary deviation of operations:
 1. L-29 Canal constraint of 8.5
 2. S-357 discharging to C-111SD Northern Detention Area
- Information for the initial conditions can be viewed [here](#). Initial stages for specified canals are shown [here](#) and gages are shown [here](#).
- Please view the [Documentation for the SFWMM](#).

[**Back to Operational Planning Main Page**](#)

Lake Okeechobee SFWMM Dec 2019 Position Analysis

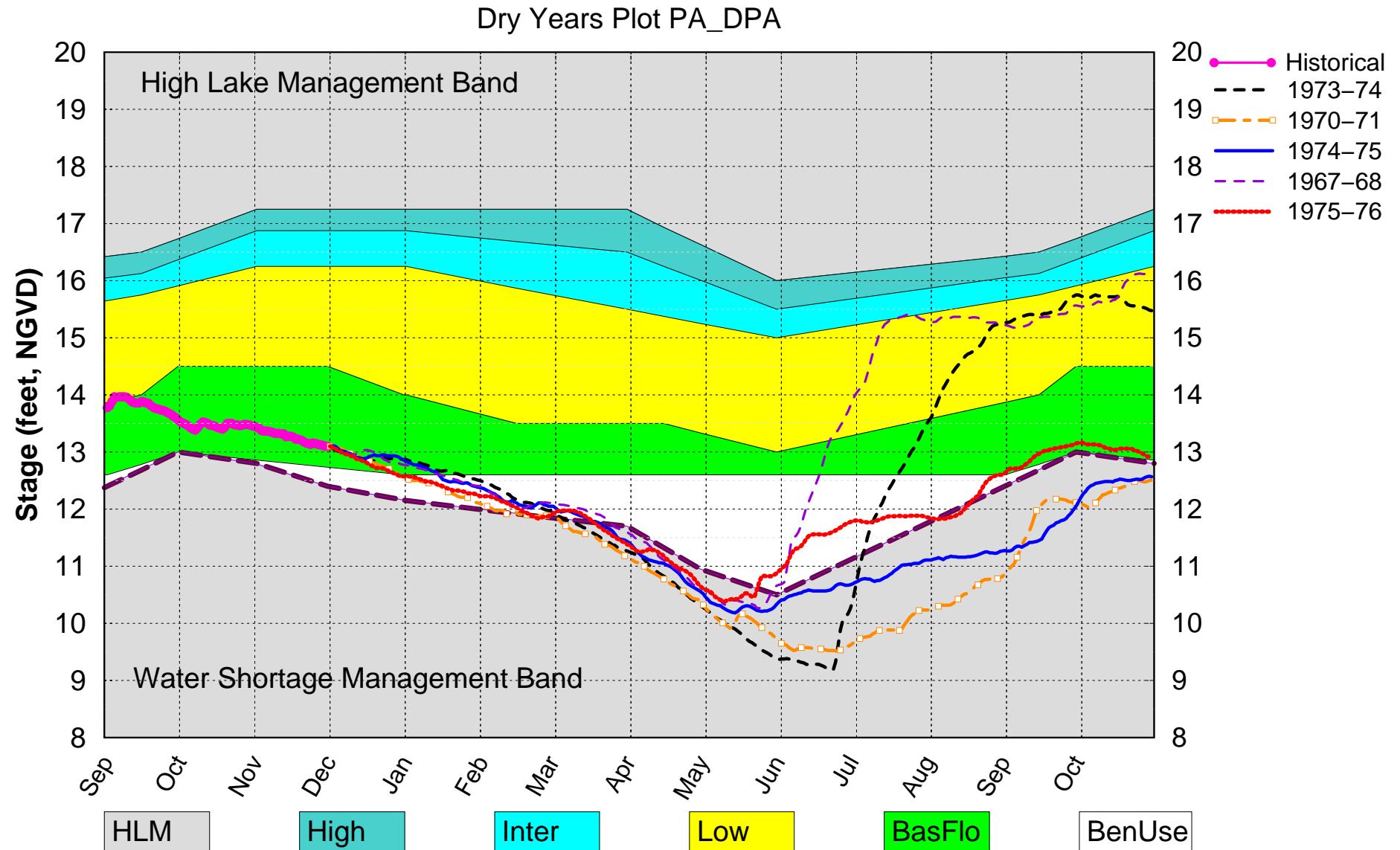


Lake Okeechobee SFWMM Dec 2019 Position Analysis



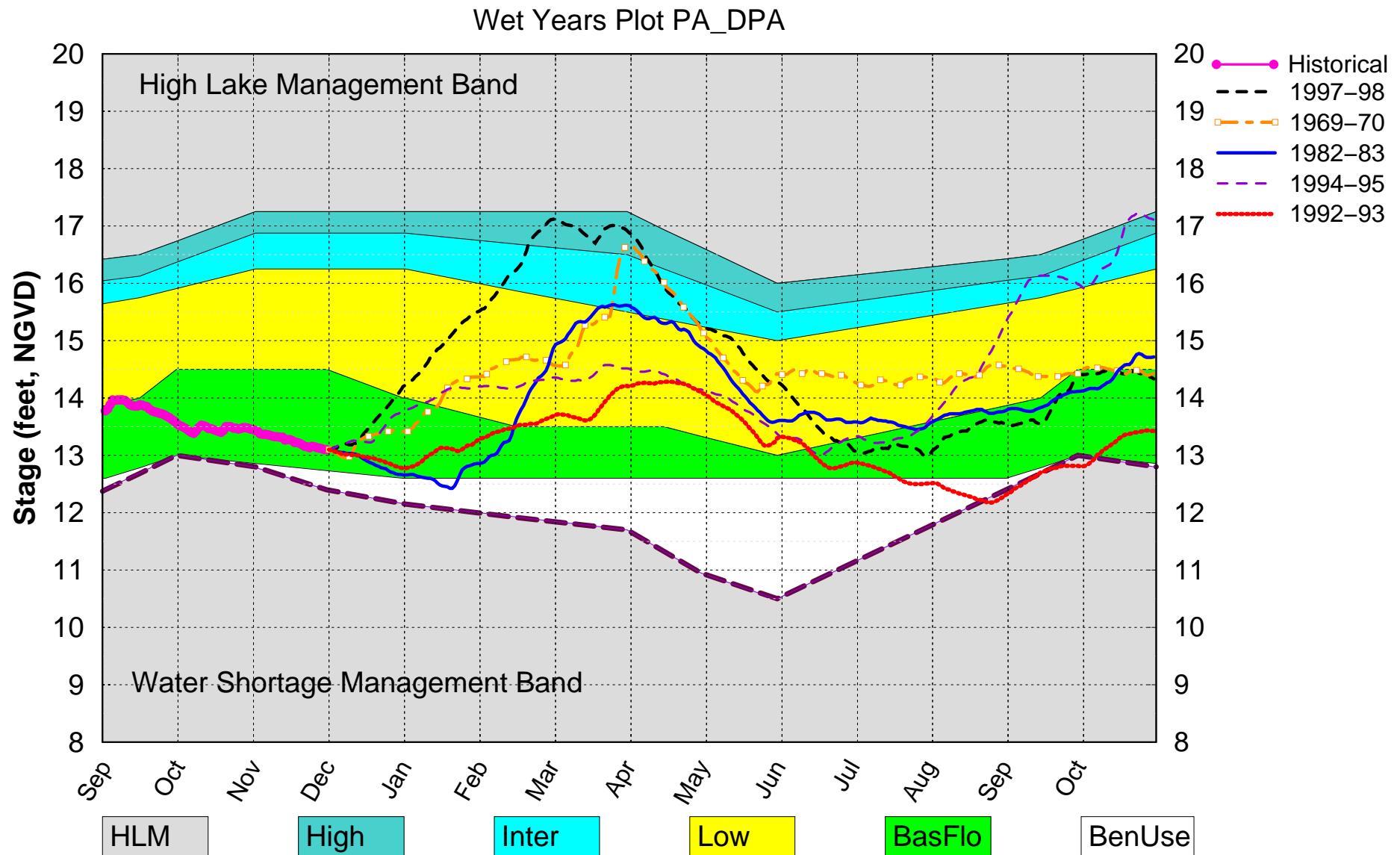
(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM Dec 2019 Position Analysis



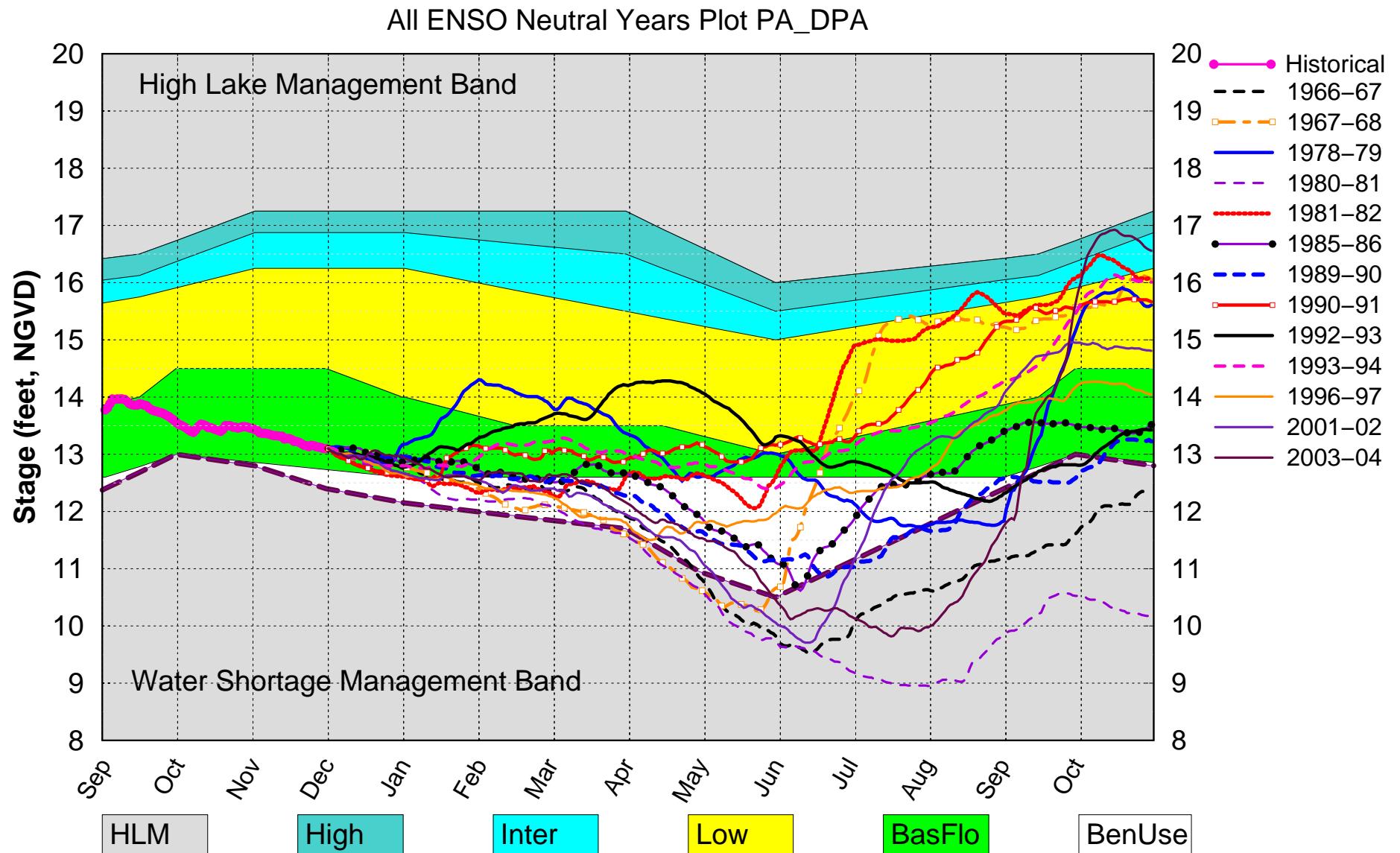
(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM Dec 2019 Position Analysis



(See assumptions on the Position Analysis Results website)

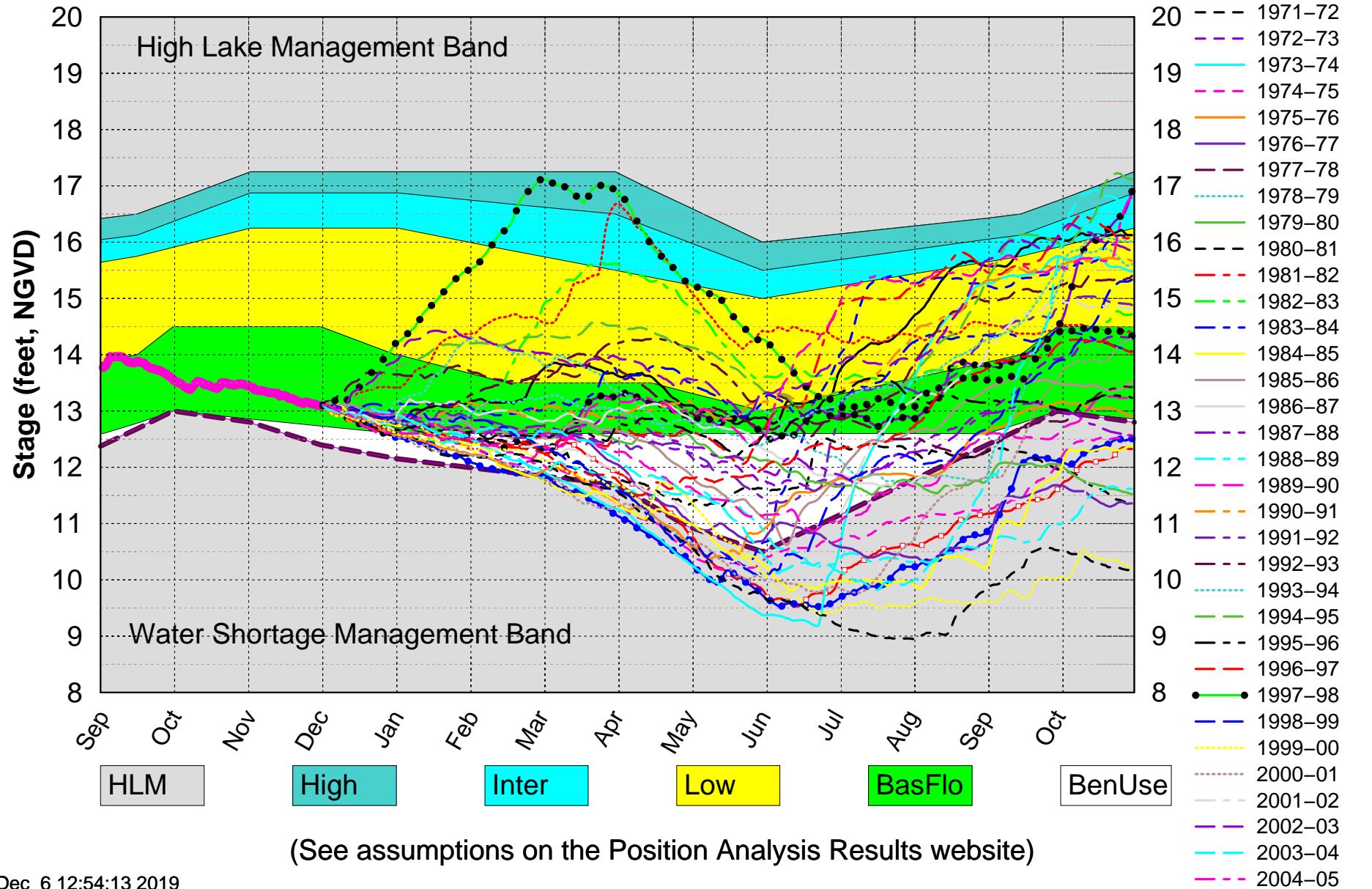
Lake Okeechobee SFWMM Dec 2019 Position Analysis



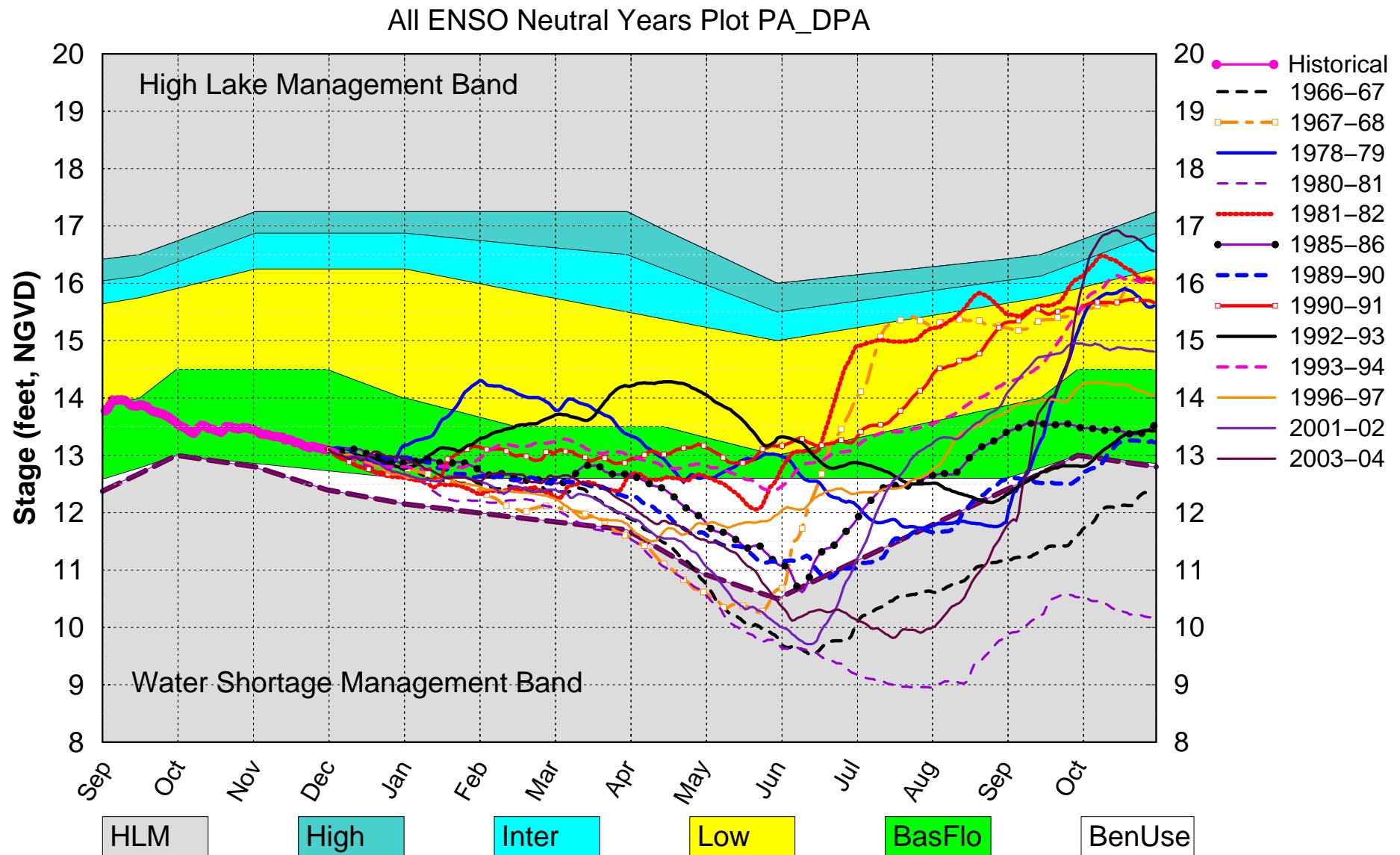
(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM Dec 2019 Position Analysis

All Simulated Years Plot PA_DPA



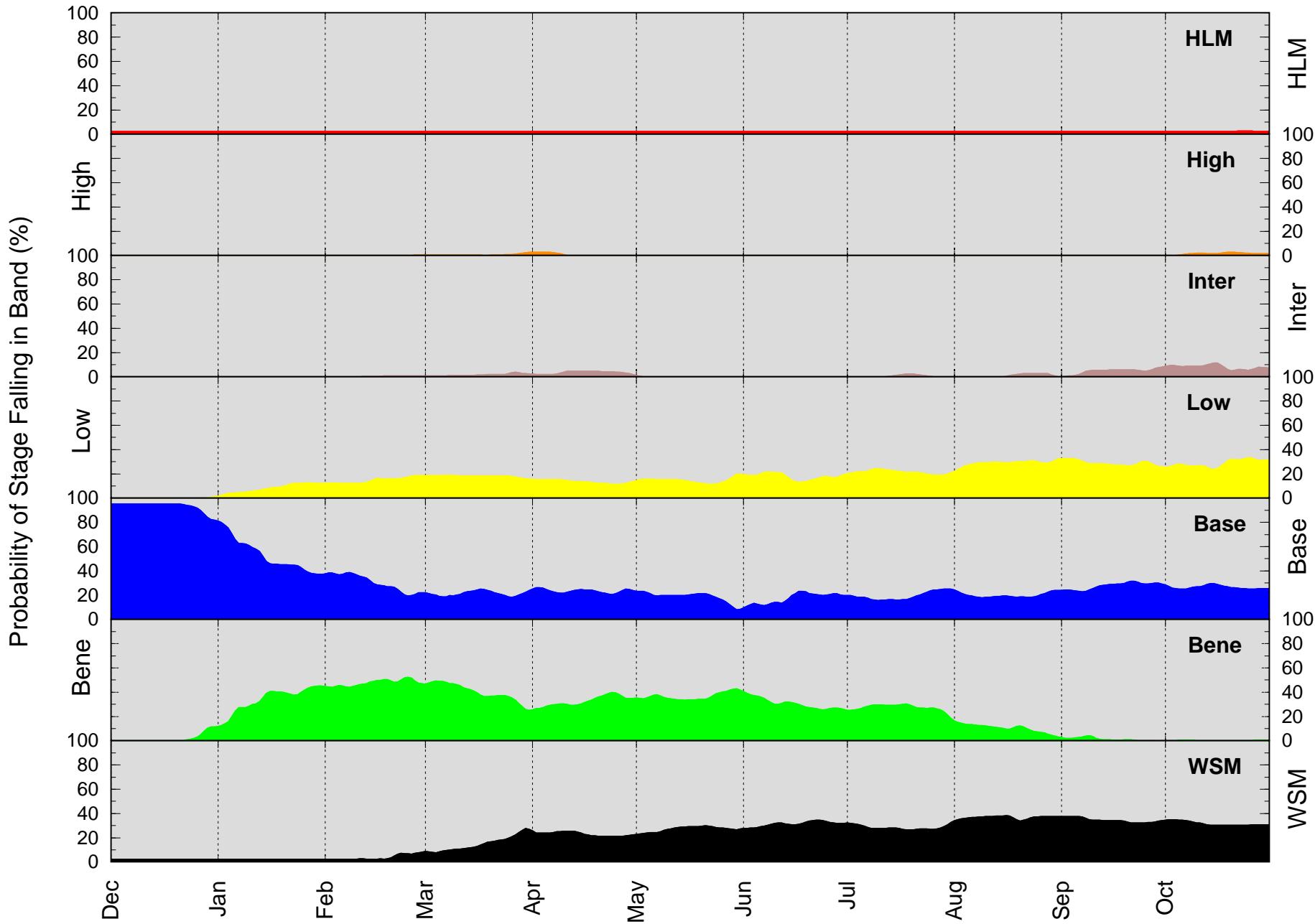
Lake Okeechobee SFWMM Dec 2019 Position Analysis



(See assumptions on the Position Analysis Results website)

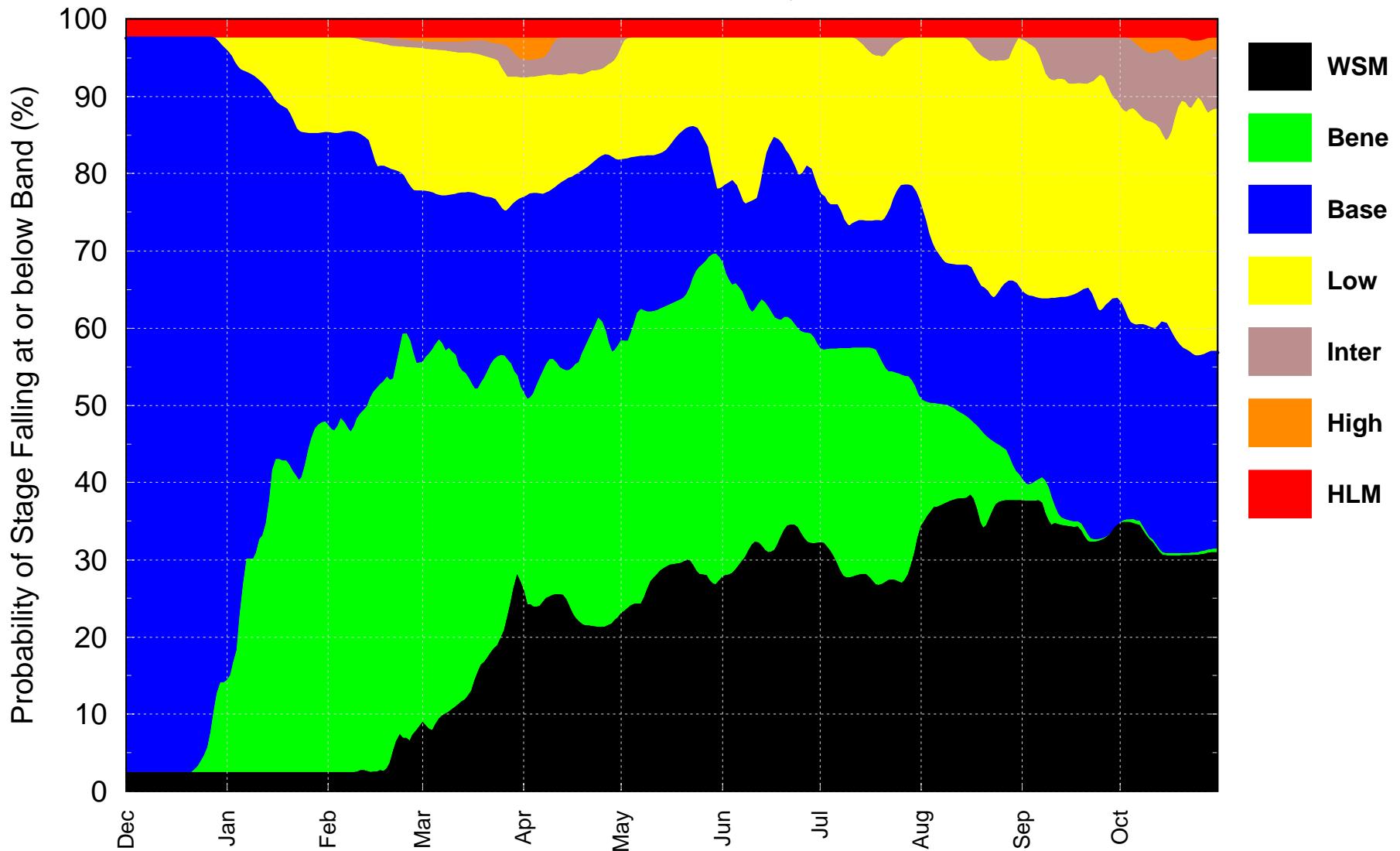
Lake Okeechobee – Band Probabilities

'(See assumptions on the Position Analysis Results website)'



Lake Okeechobee – Probabilities for Operational Bands

'(See assumptions on the Position Analysis Results website)'

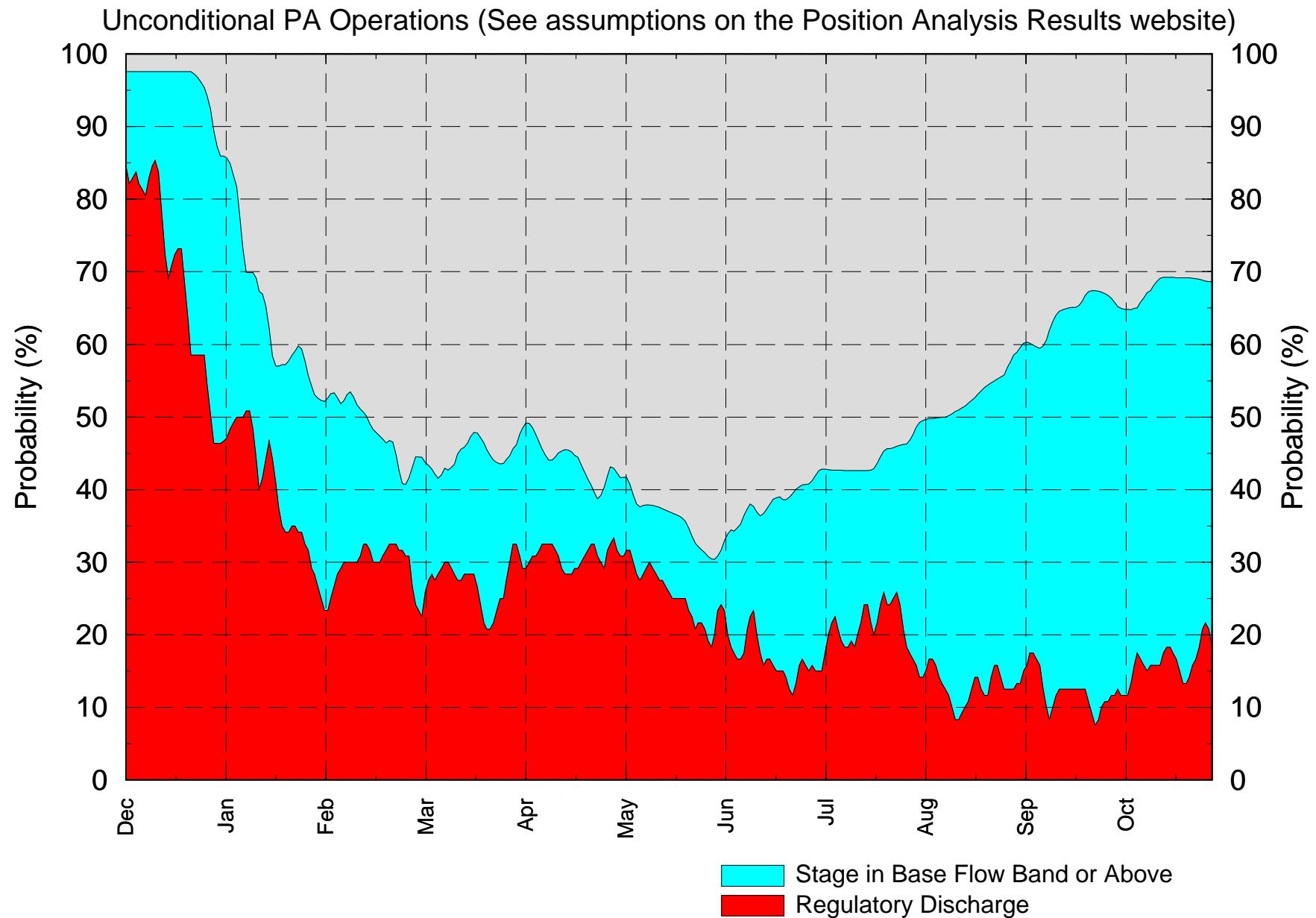


The width for each band gives the probability of stage falling in that band, as defined by the operational schedules.

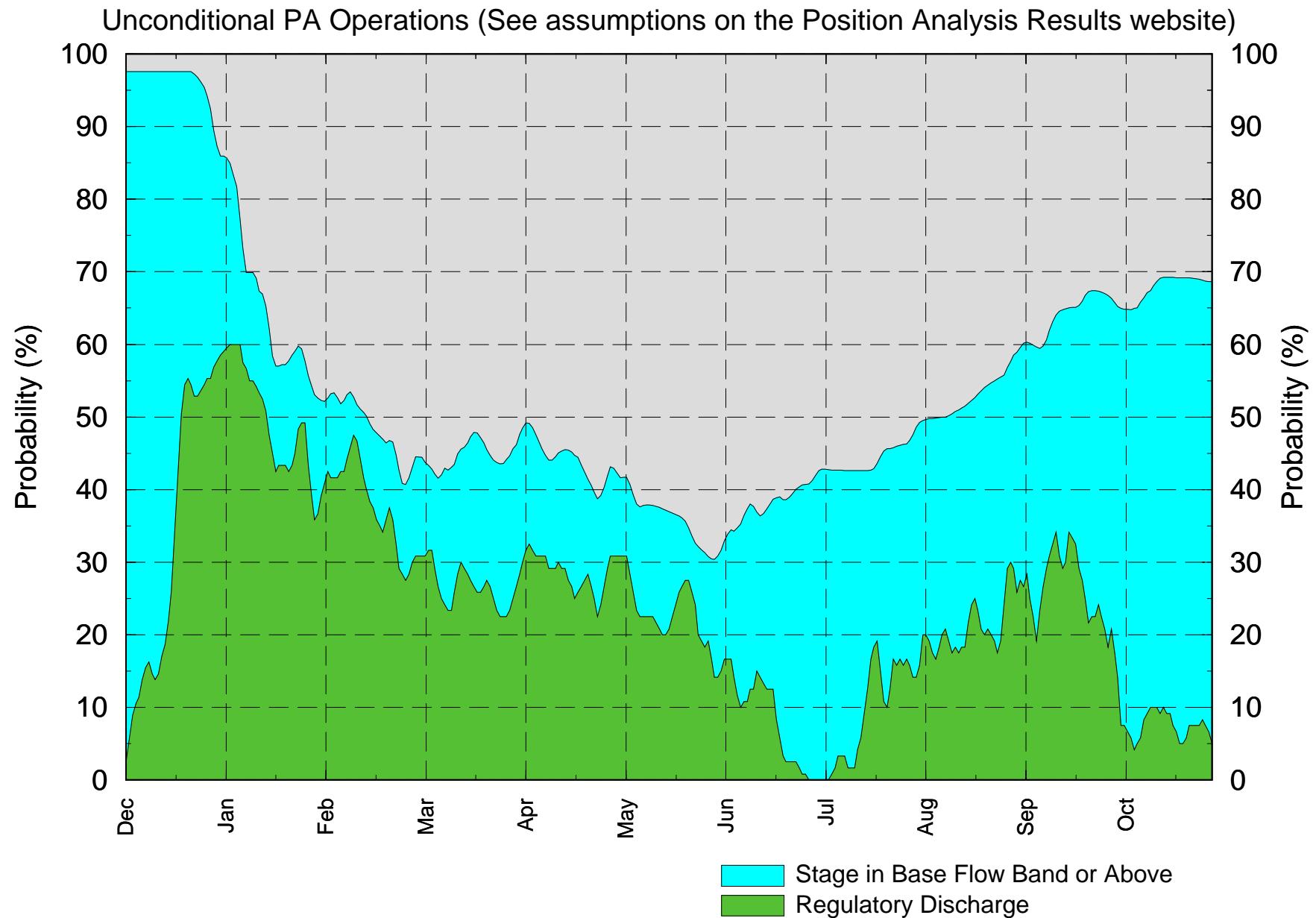
Lake Okeechobee Band Probabilities (%) at the Begining of Each Month
 '(See assumptions on the Position Analysis Results website)'
 Initial Stage 13.48 ft. for 11/01/2019

Date	HLM	High	Inter	Low	Base	Bene	WSM
2019 11 01	2.4	0.0	0.0	0.0	95.1	0.0	2.4
2019 12 01	2.4	0.0	0.0	0.0	95.1	0.0	2.4
2020 01 01	2.4	0.0	0.0	1.9	81.3	11.9	2.4
2020 02 01	2.4	0.0	0.0	12.4	37.7	45.0	2.4
2020 03 01	2.4	0.5	0.9	18.6	22.0	46.6	8.9
2020 04 01	2.4	2.9	2.3	15.7	25.2	25.5	26.0
2020 05 01	2.4	0.0	1.3	14.7	23.3	35.3	23.0
2020 06 01	2.4	0.0	-0.0	19.5	9.7	40.6	27.8
2020 07 01	2.4	0.0	-0.0	20.3	19.9	25.1	32.2
2020 08 01	2.4	0.0	-0.0	22.3	24.5	16.4	34.3
2020 09 01	2.4	0.0	0.3	32.8	24.1	2.8	37.6
2020 10 01	2.4	0.0	8.9	25.4	28.4	0.0	34.7

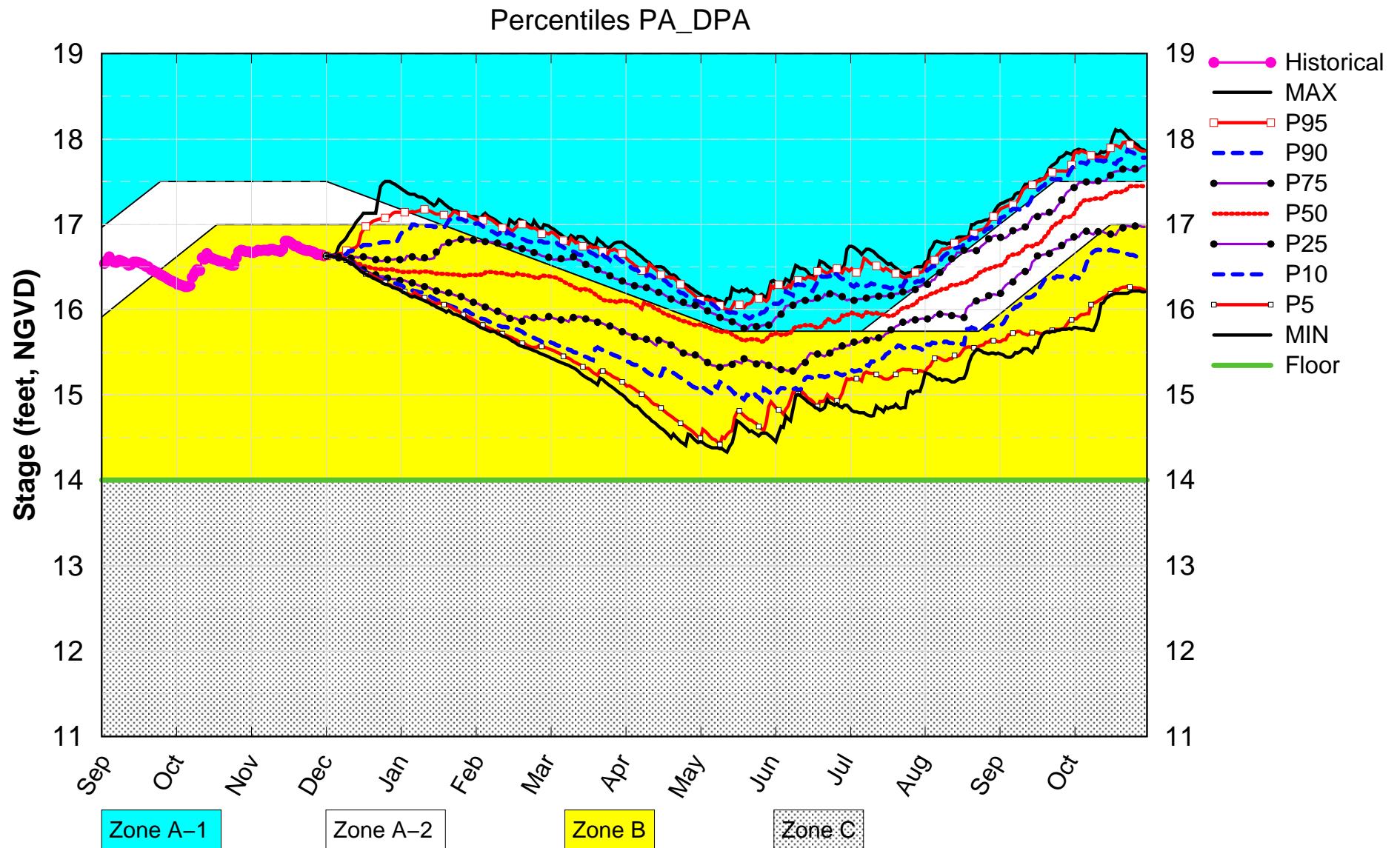
Lake Okeechobee – LORS2008 Releases to the Estuaries



Lake Okeechobee – LORS2008 Releases to the WCA's

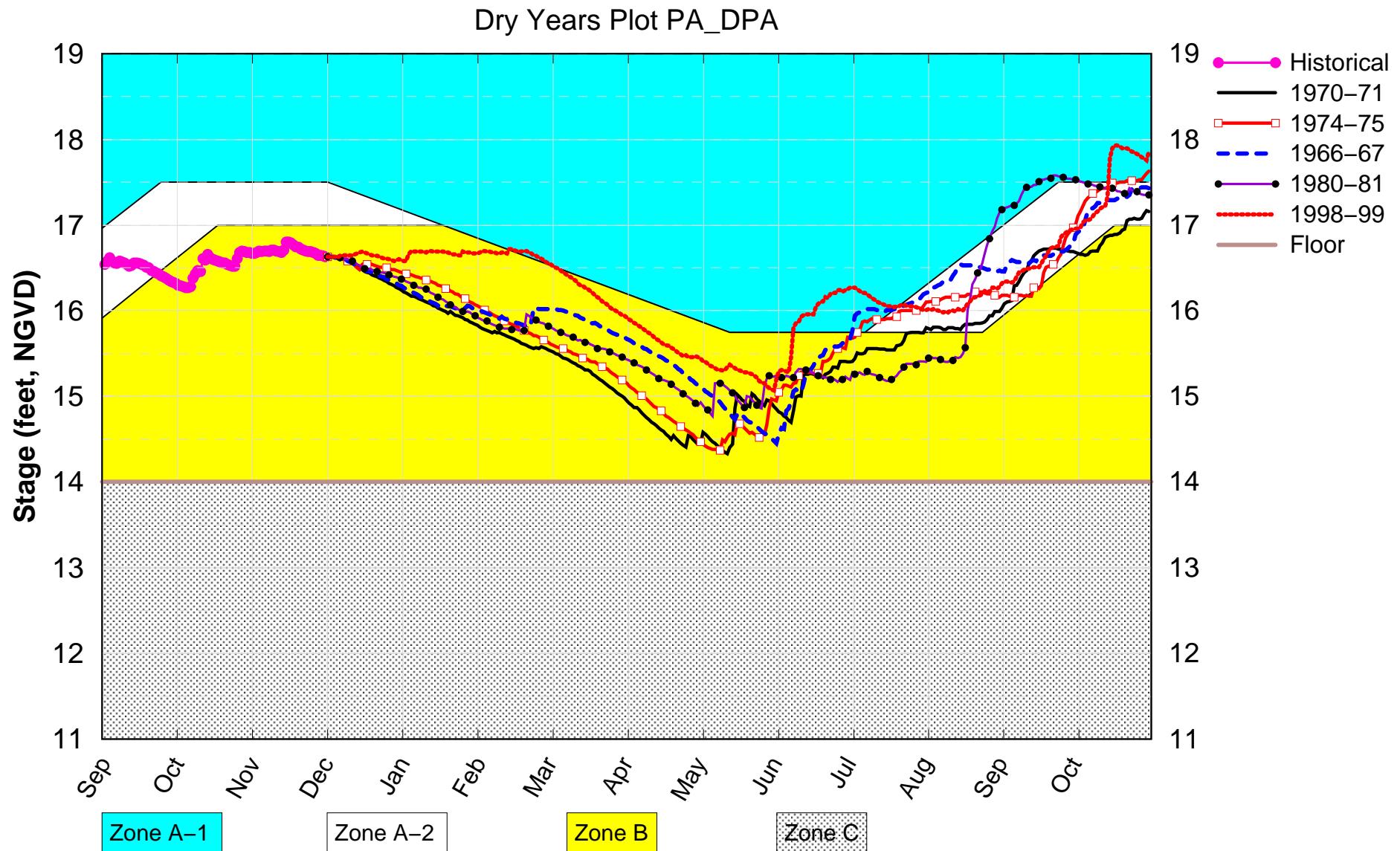


WCA1 SFWMM Dec 2019 Position Analysis

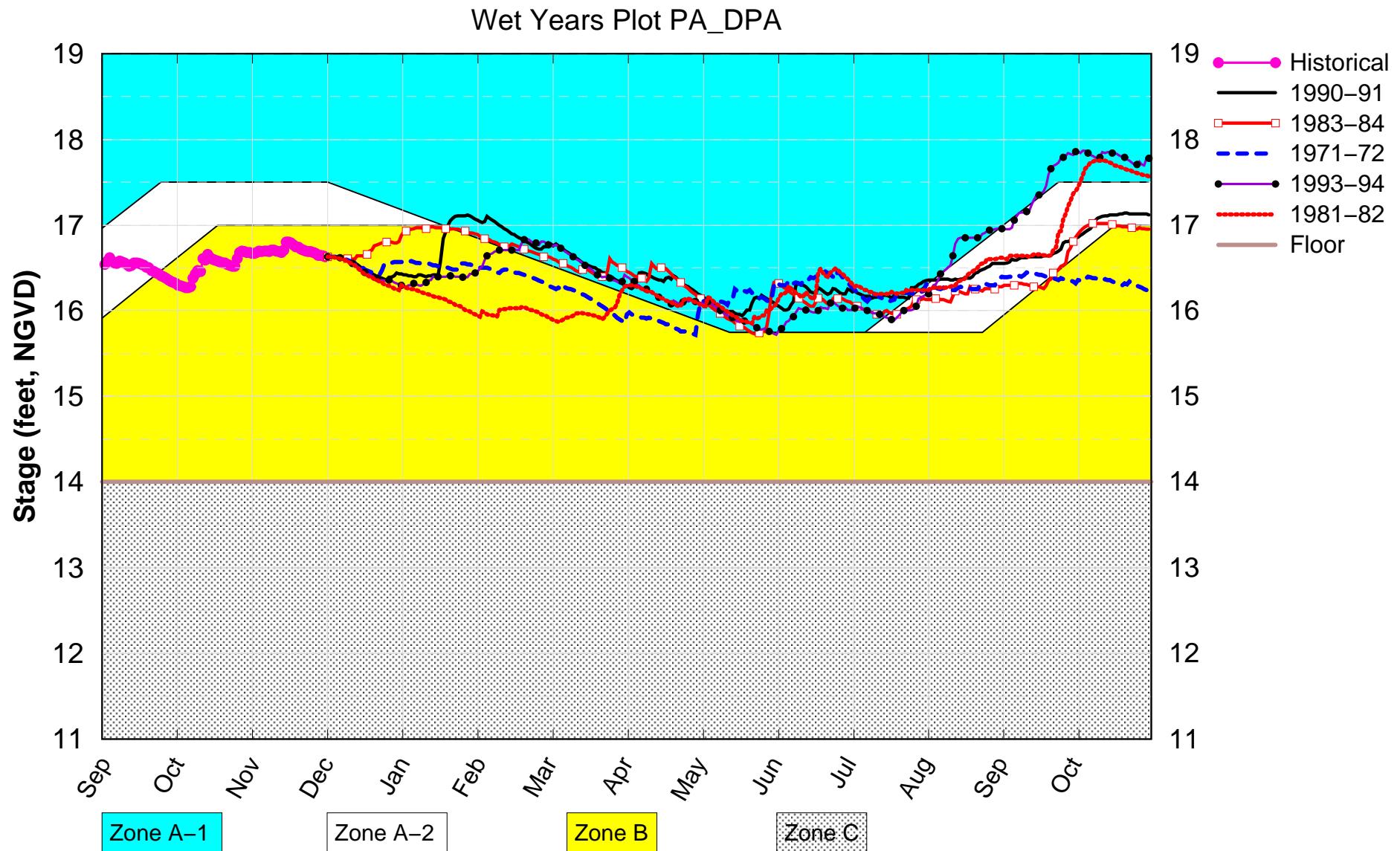


(See assumptions on the Position Analysis Results website)

WCA1 SFWMM Dec 2019 Position Analysis

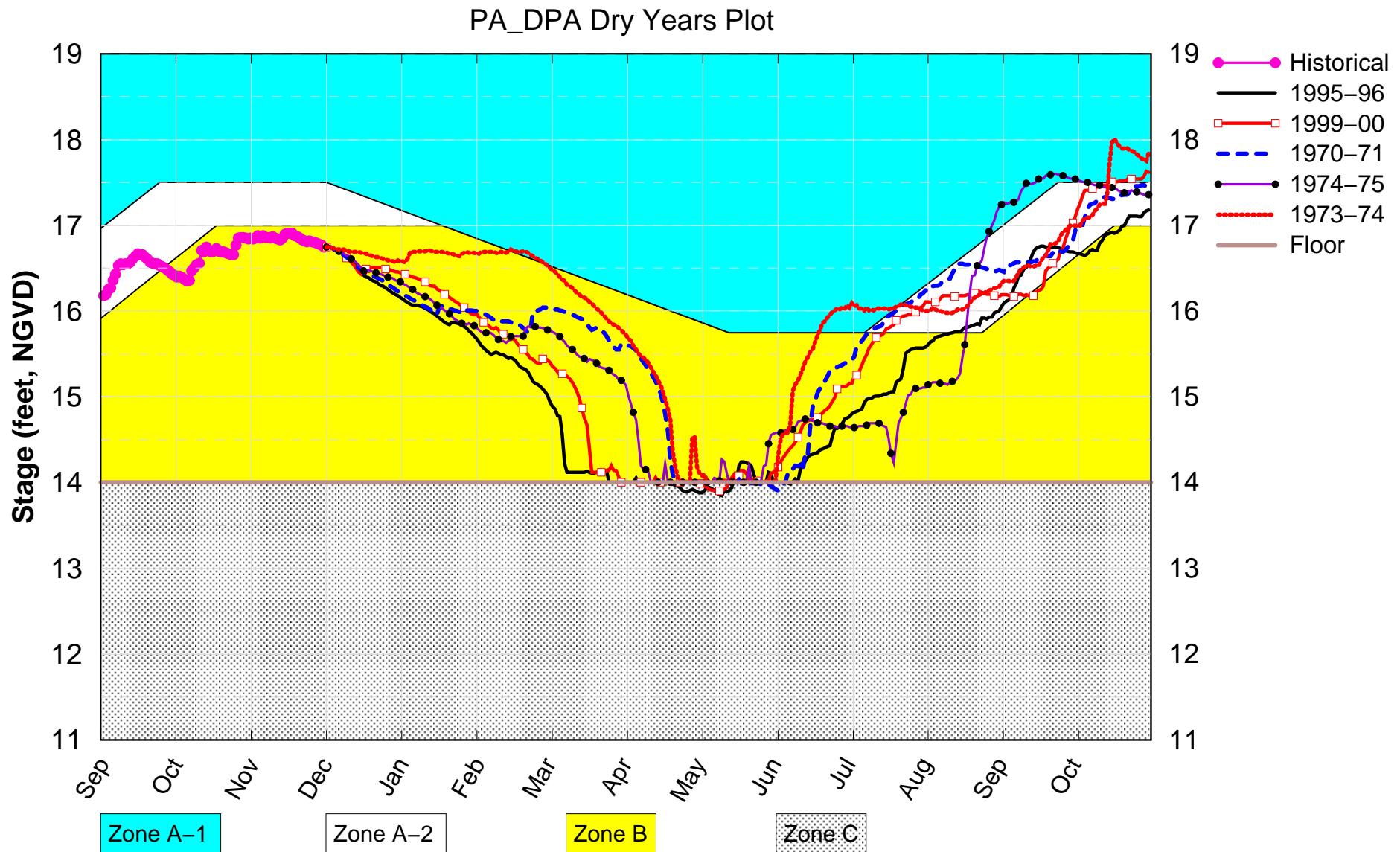


WCA1 SFWMM Dec 2019 Position Analysis



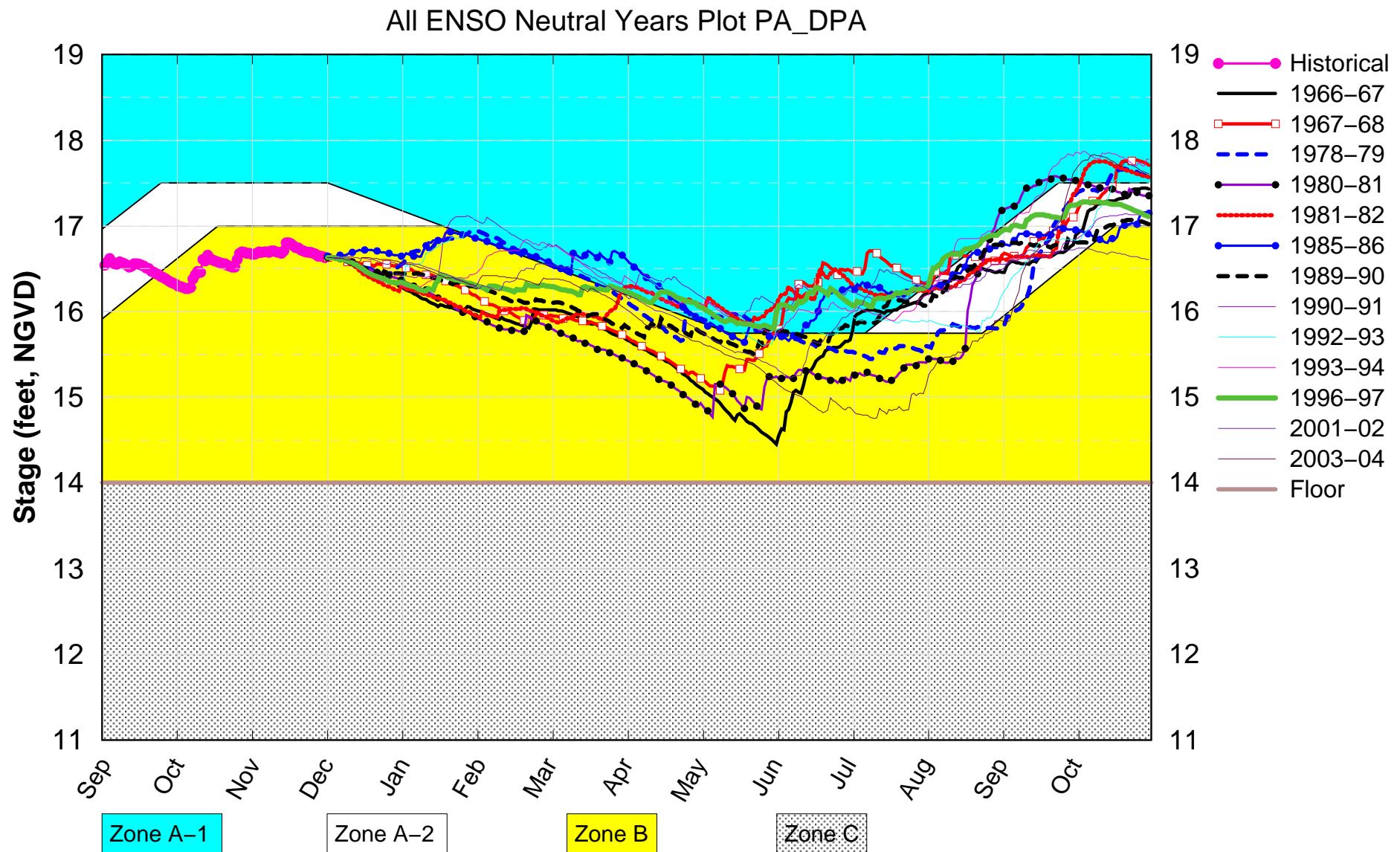
(See assumptions on the Position Analysis Results website)

CA1 Canal SFWMM Dec 2019 Position Analysis



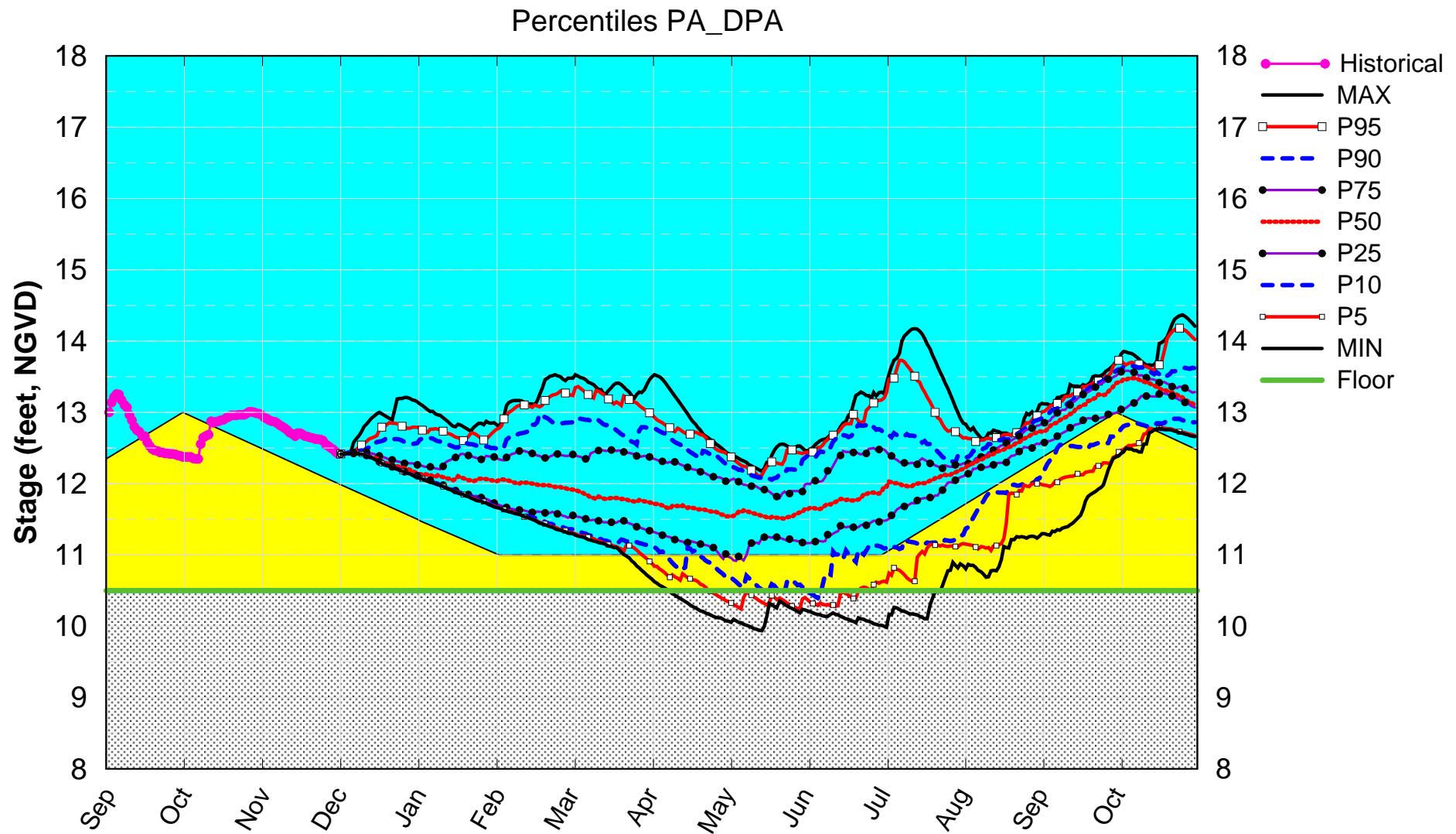
(See assumptions on the Position Analysis Results website)

WCA1 SFWMM Dec 2019 Position Analysis



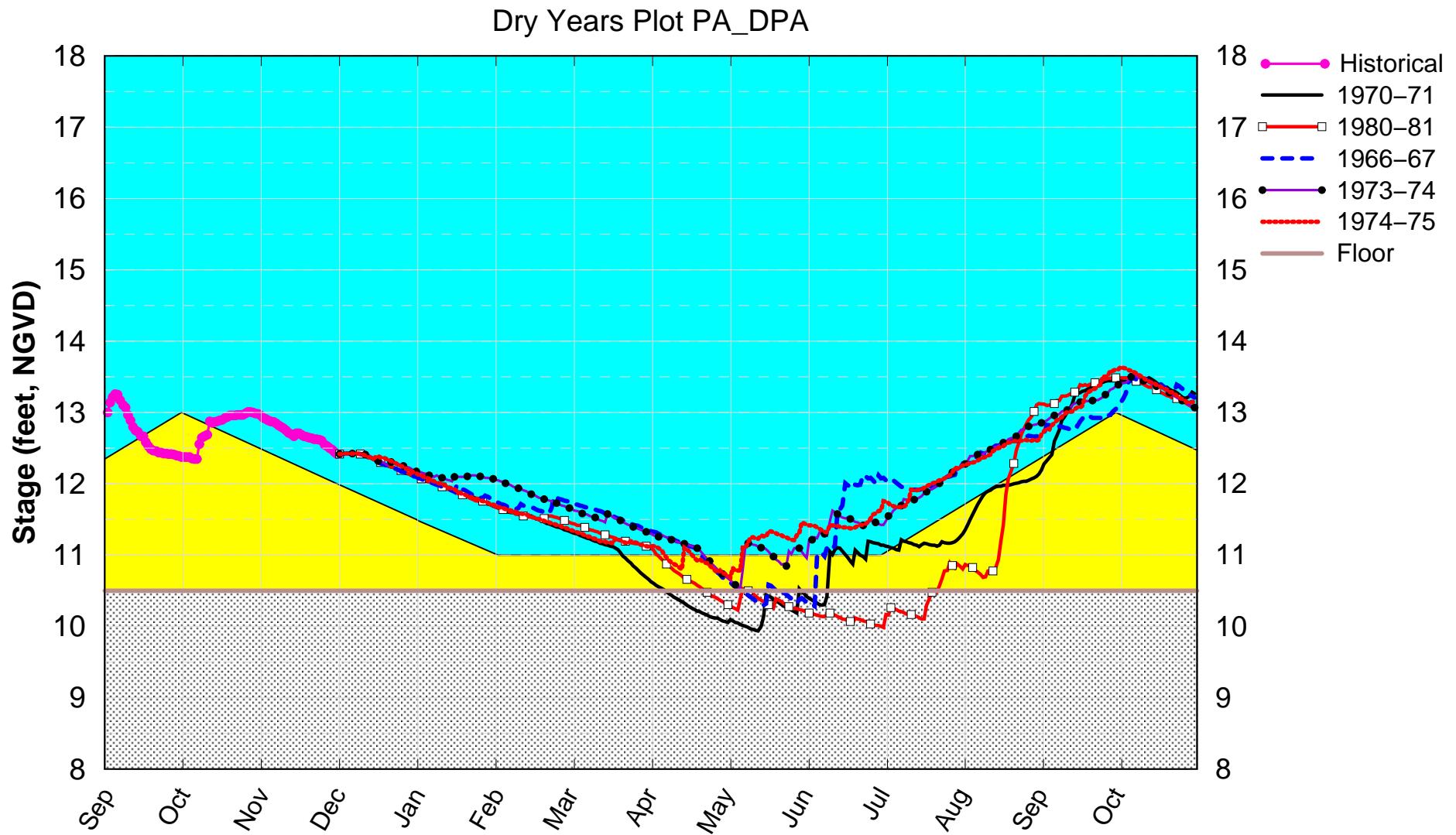
(See assumptions on the Position Analysis Results website)

WCA2A SFWMM Dec 2019 Position Analysis



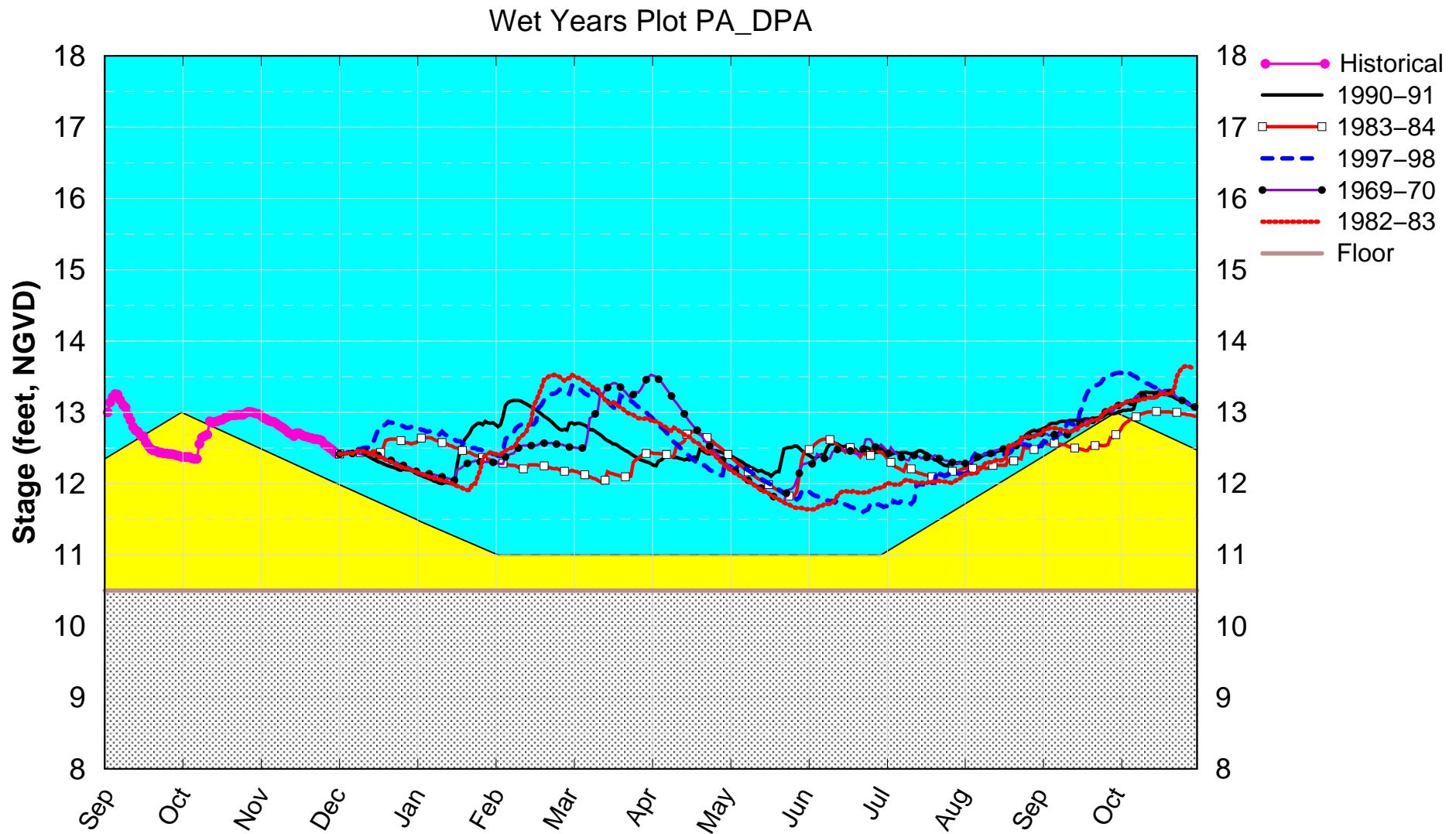
(See assumptions on the Position Analysis Results website)

WCA2A SFWMM Dec 2019 Position Analysis



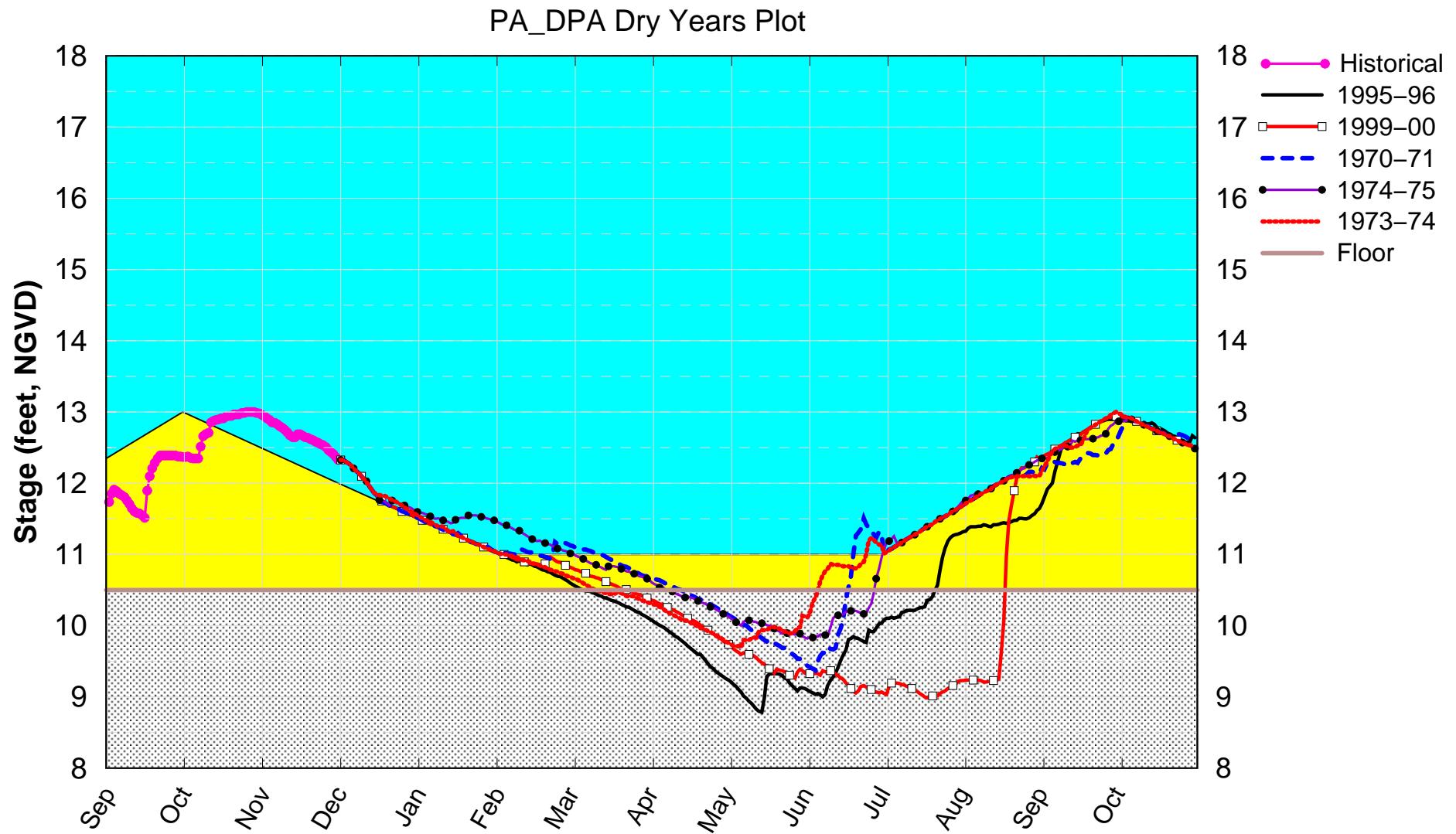
(See assumptions on the Position Analysis Results website)

WCA2A SFWMM Dec 2019 Position Analysis



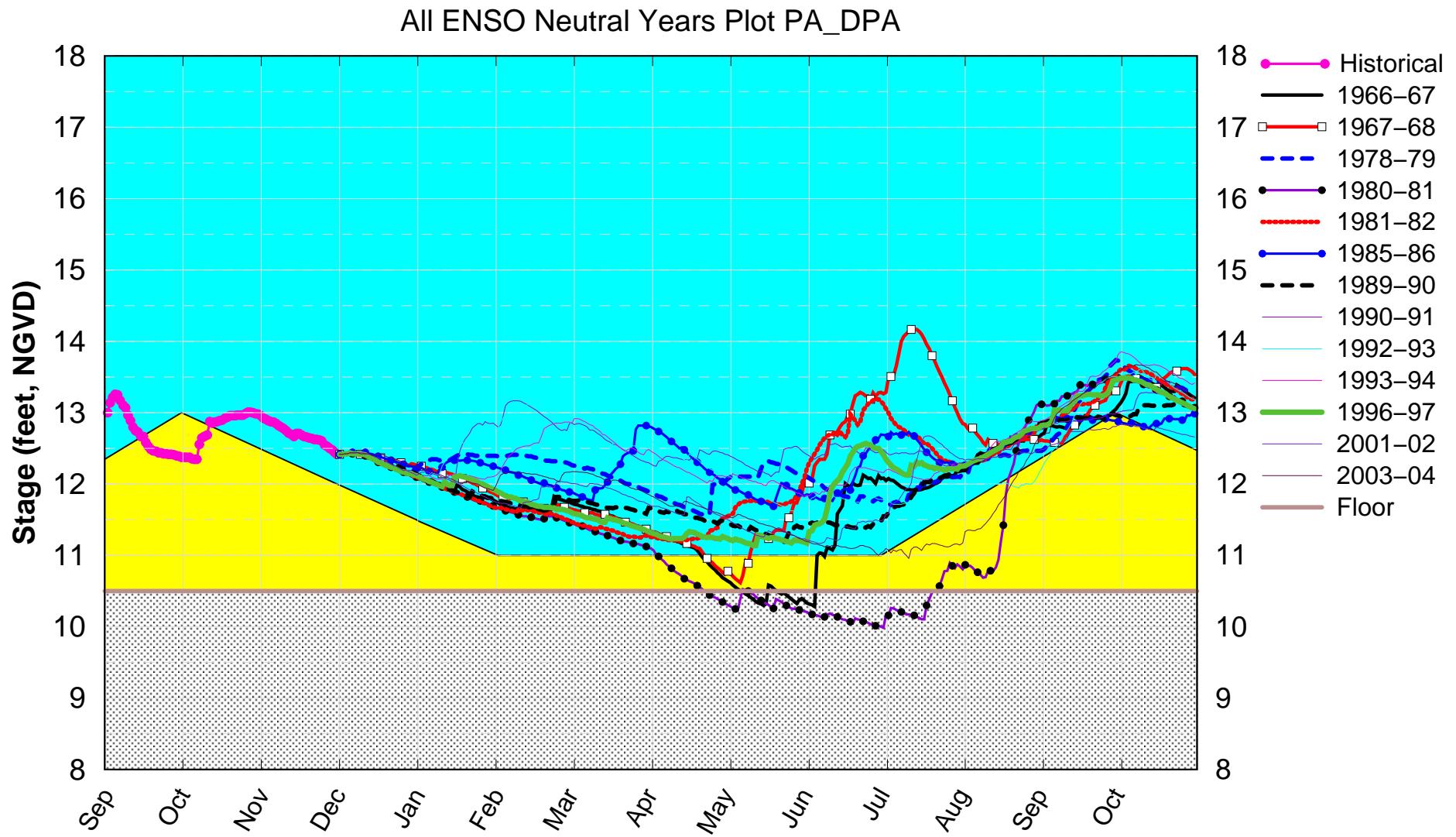
(See assumptions on the Position Analysis Results website)

L38 Canal SFWMM Dec 2019 Position Analysis



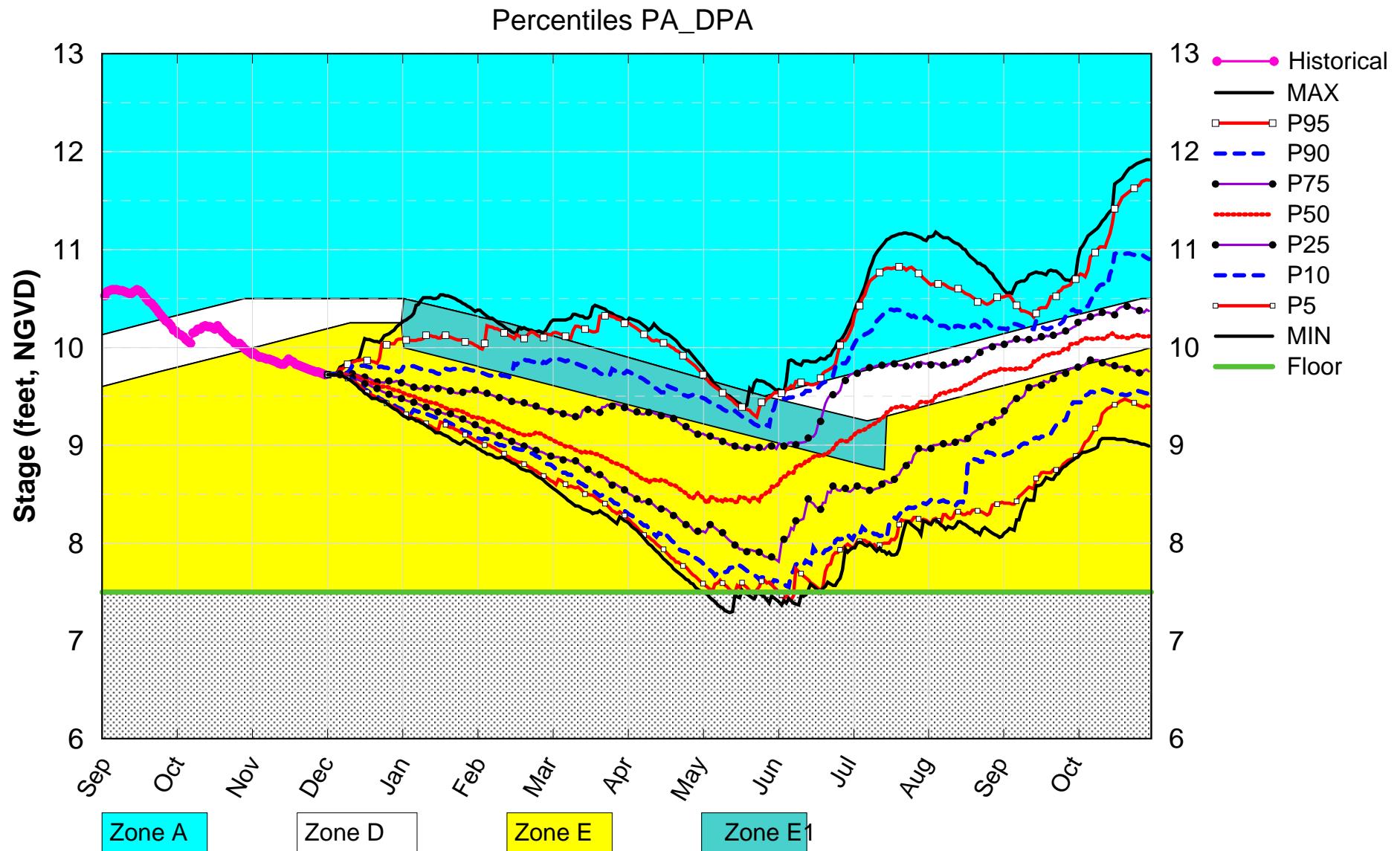
(See assumptions on the Position Analysis Results website)

WCA2A SFWMM Dec 2019 Position Analysis



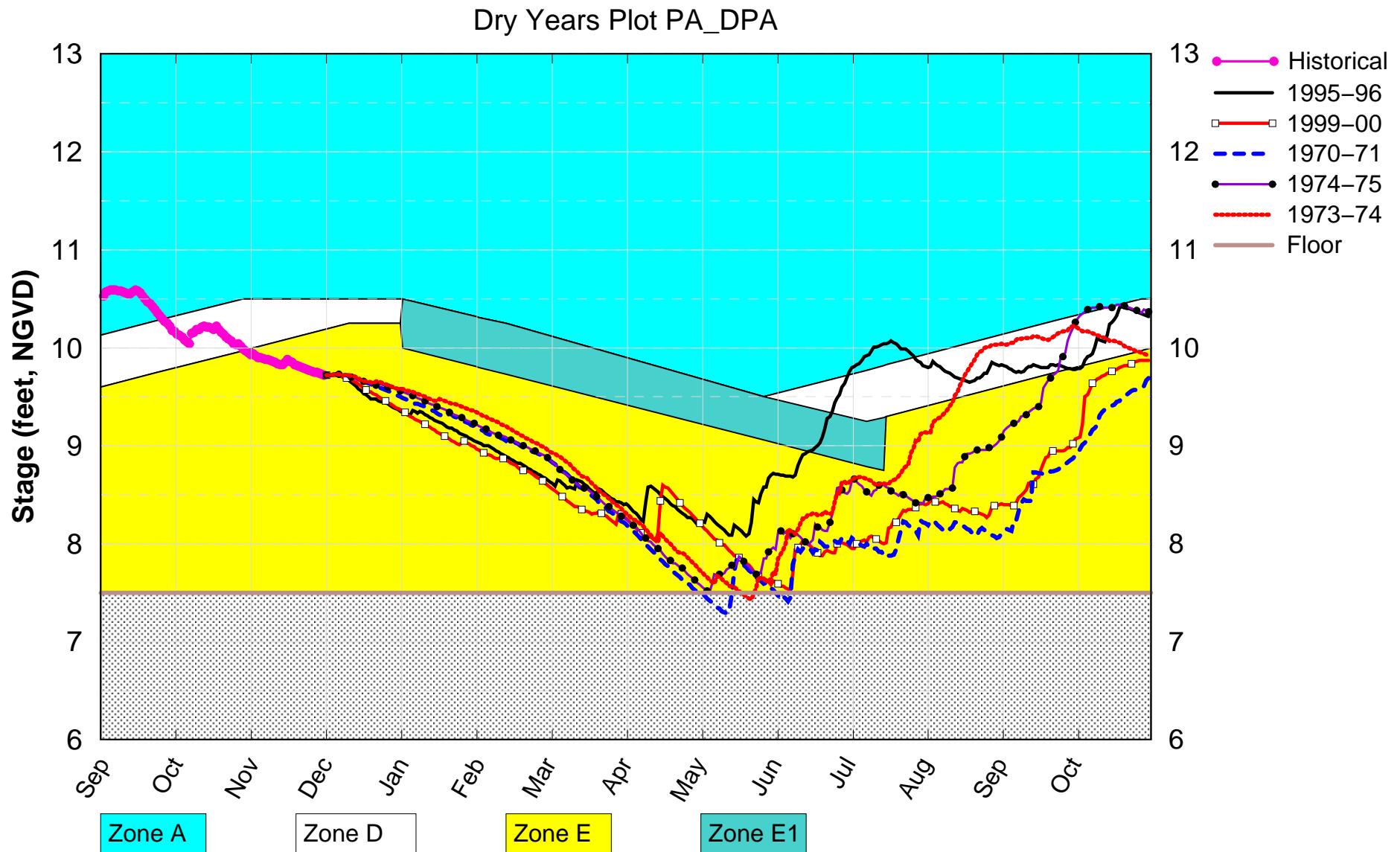
(See assumptions on the Position Analysis Results website)

WCA3A SFWMM Dec 2019 Position Analysis

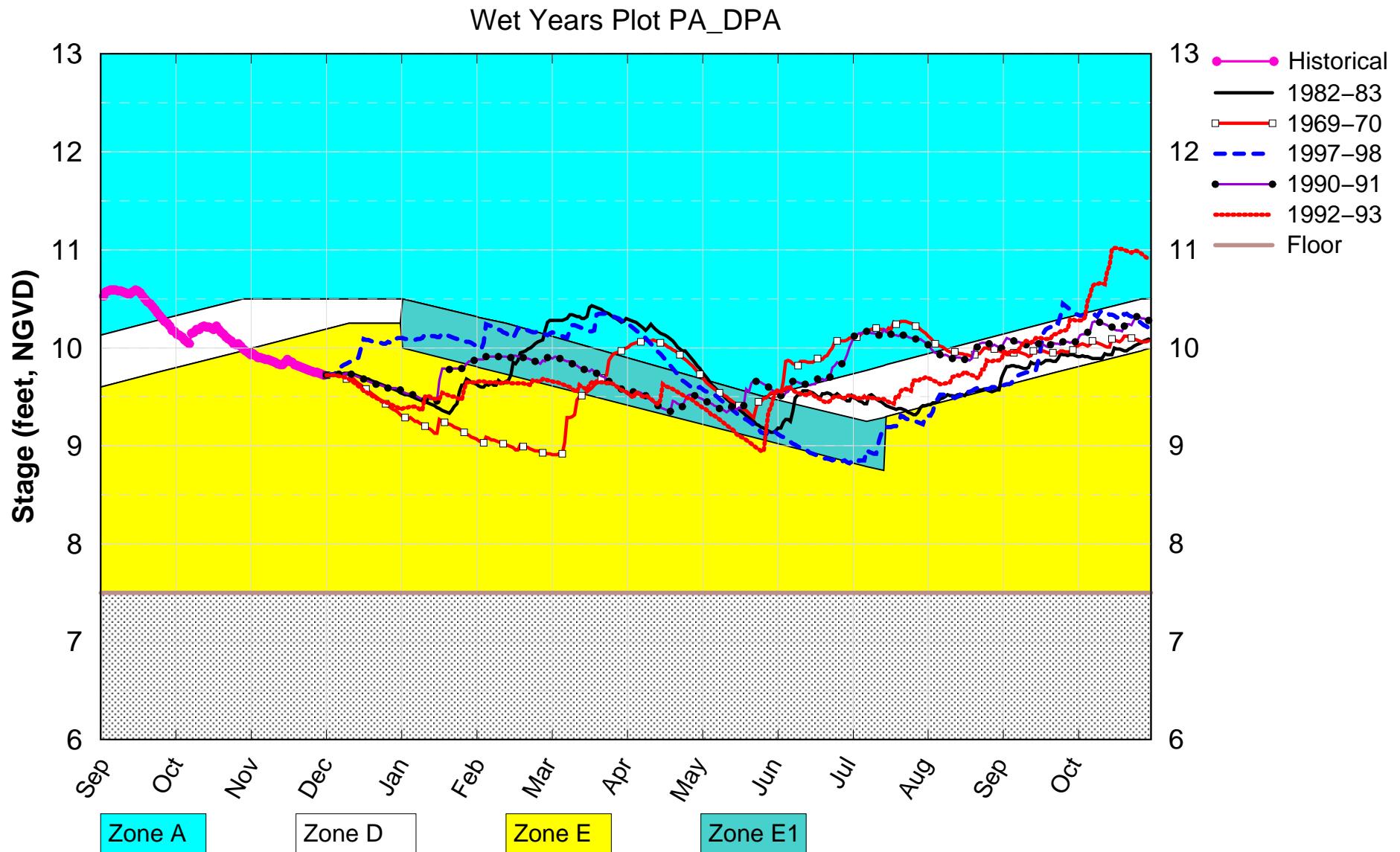


(See assumptions on the Position Analysis Results website)

WCA3A SFWMM Dec 2019 Position Analysis

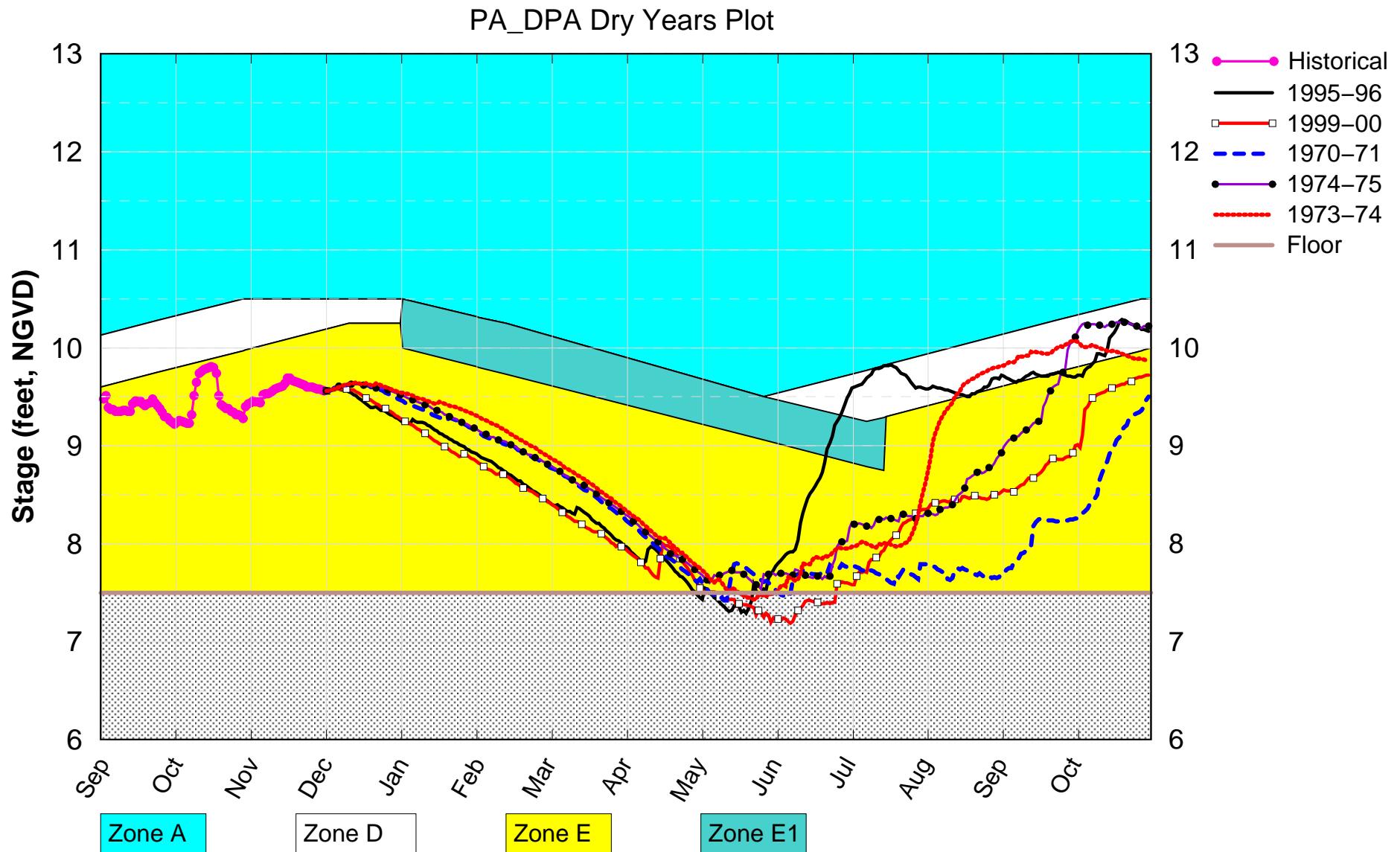


WCA3A SFWMM Dec 2019 Position Analysis



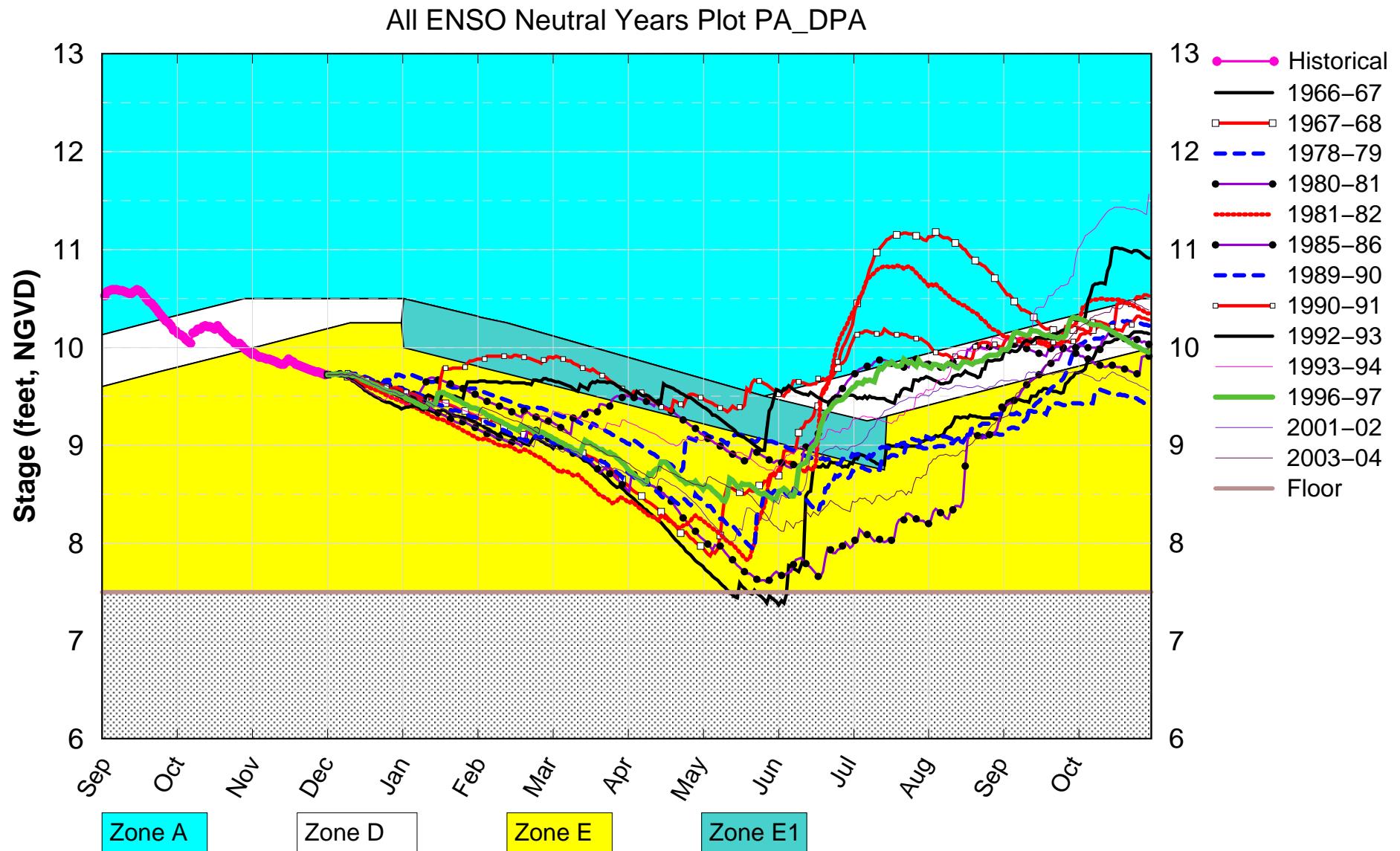
(See assumptions on the Position Analysis Results website)

CA3 Canal SFWMM Dec 2019 Position Analysis



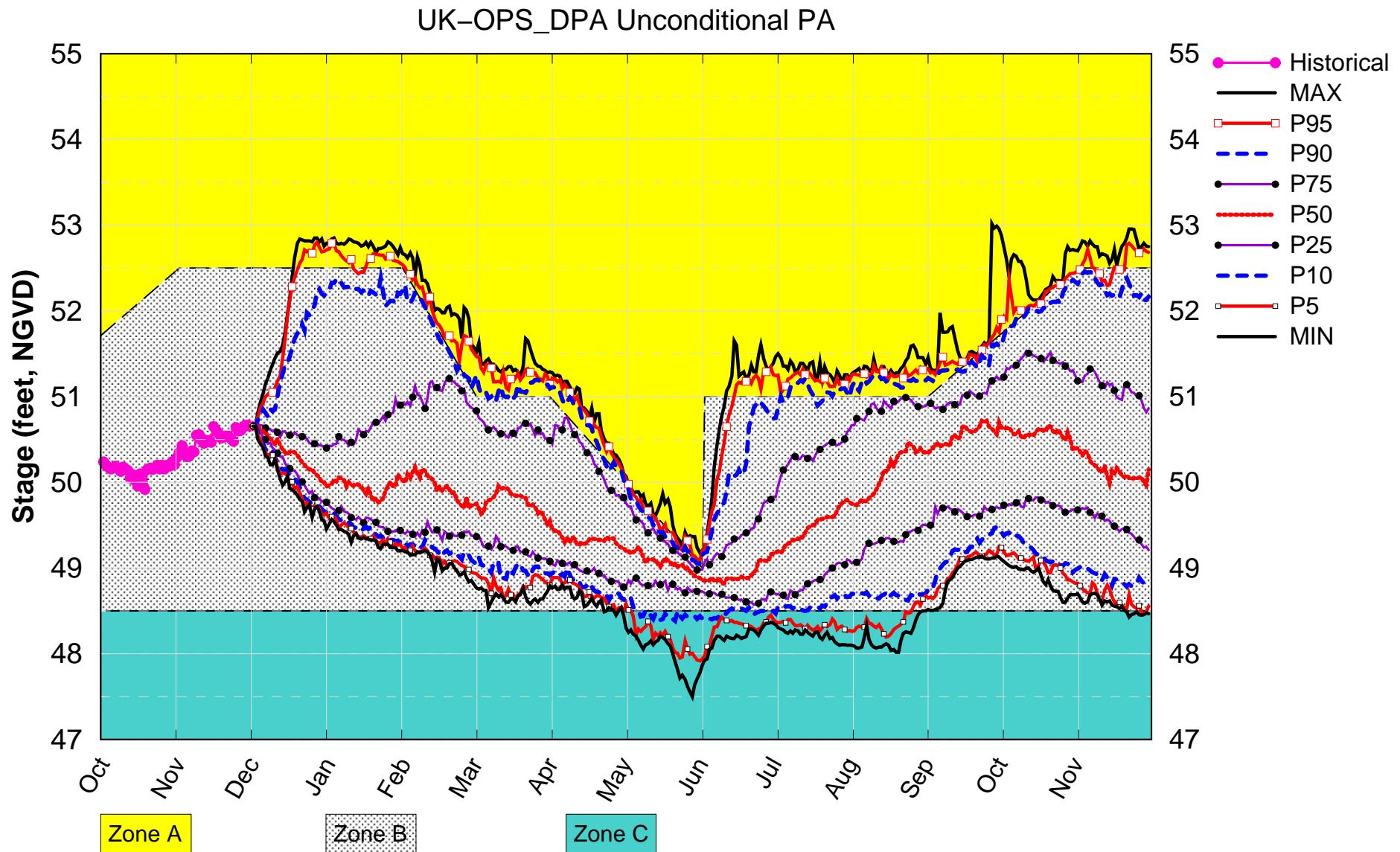
(See assumptions on the Position Analysis Results website)

WCA3A SFWMM Dec 2019 Position Analysis



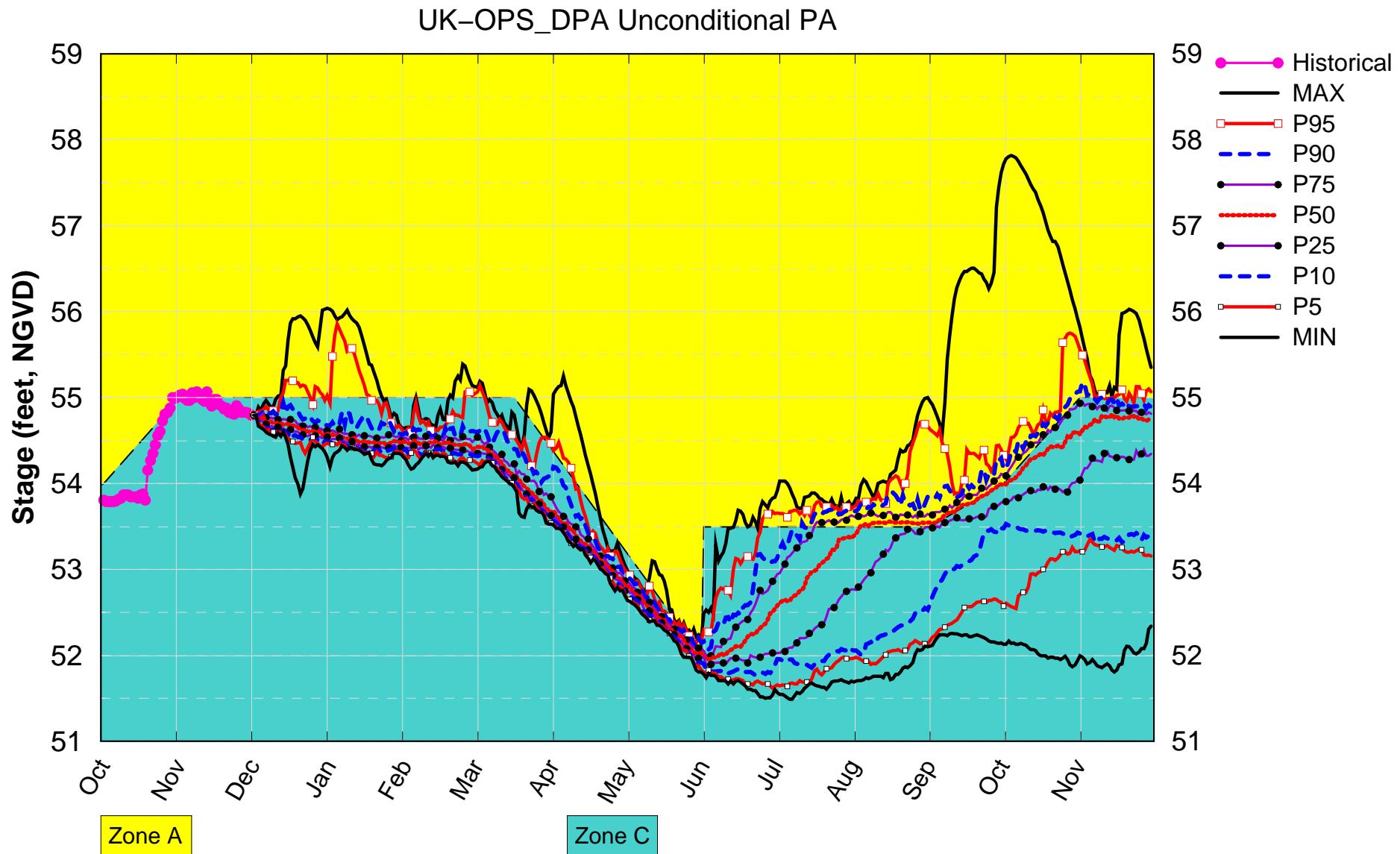
(See assumptions on the Position Analysis Results website)

S65 UK-OPS Dec 1 2019 Position Analysis



(See assumptions on the Position Analysis Results website)

S61 UK-OPS Dec 1 2019 Position Analysis



(See assumptions on the Position Analysis Results website)

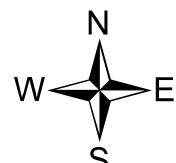
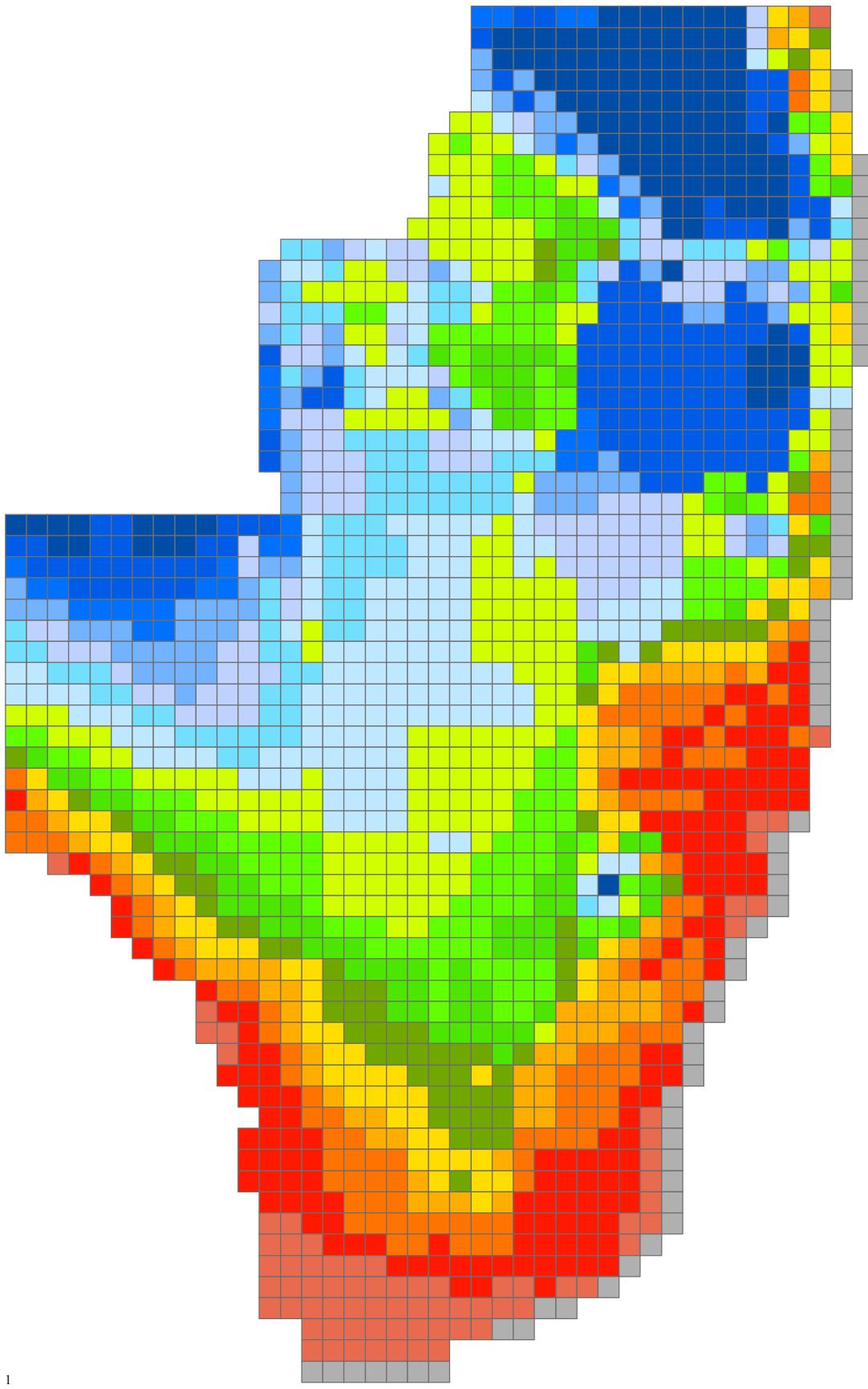
For the Dynamic Position Analysis the Upper Kissimmee Operations Screening (UK-OPS) Model is used to simulate water levels and releases from Lakes Kissimmee-Cypress-Hatchineha, Tohopekaliga, and East Lake Tohopekaliga. The UK-OPS Model is used to obtain a representation of the Lake Kissimmee operations per the 2015 Wet Season Kissimmee Basin Interagency Planning Meeting. While SFWMD staff efforts continue toward improving the modeling tools for the Kissimmee basins, an intermediate solution is to use the UK-OPS Model.

AREA stage(ft)	:Canal Name	:SFWMM Name	:Location	:SFWMD sensor
WPB	:C-18	:C18	:G92-H	: 13.78
WPB	:C-17	:C17	:S44-H	: 7.11
WPB	:C-51W	:C51W	:S5AE-T	: 11.81
WPB	:C-51	:C51	:S155-H	: 8.32
WCA	:WCA-1 L-40	:CA1	:1-8C	: 16.75
FTLD	:Hillsboro Canal	:HLSB	:G56-H	: 8.57
WCA	:WCA-2A L-38	:L38	:S11B-H	: 12.33
WCA	:WCA-2A L-39	:CA2A	:S10A-T	: 12.63
FTLD	:C-14	:C14	:S37B-H	: 7.35
FTLD	:C-14E	:C14E	:S37A-H	: 4.18
FTLD	:Pompano	:POMP	:G57-H	: 4.71
FTLD	:C-12	:C12	:S33-H	: 3.68
FTLD	:C-13	:C13	:S36-H	: 5.32
FTLD	:North New River Canal	:NNRC	:G54-H	: 4.42
MIAMI	:L-33	:L33	:S30-H	: 5.91
MIAMI	:C-304	:C304	:S31-H	: 7.72
MIAMI	:C-9	:C9	:S29-H	: 2.52
MIAMI	:C-9 DEN	:C9DEN	:S29-H	: 2.52
MIAMI	:C-8	:C8	:S28-H	: 2.00
MIAMI	:C-7	:C7	:S27-H	: 1.84
MIAMI	:C-6	:C6	:S26-H	: 2.82
MIAMI	:C-2/C-4	:C4	:S25B-H	: 2.90
MIAMI	:L-30	:L30	:S335-H	: 6.75
WCA	:WCA-3A L-29	:CA3	:S333-H	: 9.56
WCA	:S-12A	:S12AD	:S12A-T	: 8.47
WCA	:S-12B	:S12BD	:S12B-T	: 8.15
WCA	:S-12C	:S12CD	:S12C-T	: 8.16
WCA	:S-12D	:S12DD	:S12D-T	: 7.74
MIAMI	:L-29	:L29	:S334-H	: 7.33
MIAMI	:C-100C	:C100C	:S119-H	: 2.66
MIAMI	:C-100	:C100	:S118-H	: 2.92
MIAMI	:C-100A	:C100A	:S123-H	: 2.40
HMST	:C-1/S-148	:S148U	:S148-H	: 3.81
HMST	:L-31N	:L31N	:S331-H	: 5.37
HMST	:C-1N	:C1N	:S149-H	: 2.73
MIAMI	:S-21	:S21	:S21-H	: 2.27
HMST	:L-31S	:L31S	:S176-H	: 4.35
MIAMI	:C-102N	:C102N	:S21A-H	: 1.38
HMST	:C-102	:C102	:S165-H	: 3.46
MIAMI	:C-103S	:C103S	:S167-H	: 3.00
HMST	:C-103N	:C103N	:S166-H	: 2.60
HMST	:C-103	:S179	:S179-H	: 2.23
HMST	:L-31W	:L31W	:S332-H	: 4.32
HMST	:C-111	:C111	:S177-H	: 3.12
HMST	:CNO	:CNO	:S179-H	: 2.23
HMST	:C-111E	:C111E	:S18C-H	: 2.34
HMST	:S-197	:S197	:S197-H	: 2.22
EAA	:L-23E	:L23E	:S8-T	: 10.63
EAA	:C-60	:C60	:S140-T	: 10.29

SFWMM	Name	col	row	STAGE	Source	Data	match	domain	match	areas
1-7		31	48	16.63	USACE		PA	CA1		
1-8T		34	47	16.61	USACE		PA	CA1		
1-9		33	46	16.65	USACE		PA	CA1		
2-17		29	40	12.42	USACE		PA	CA2		
2-159		28	43	13.22	SFWMD-ARDAMS		PA	CA2		
3-99		30	35	10.86	USACE			CA2		
3A-2		18	36	10.57	USACE		PA	CA3		
3A-3		25	37	9.76	USACE		PA	CA3		
3A-28		19	24	9.52	USACE		PA	CA3		
3A-4		21	29	9.88	USACE		PA	CA3		
3A-NW		18	40	10.81	SFWMD-ARDAMS			CA3		
3A-NE		23	40	9.97	SFWMD-ARDAMS			CA3		
3A-SW		16	30	9.81	SFWMD-ARDAMS			CA3		
3A-S		20	33	10.03	SFWMD-ARDAMS			CA3		
3-76		27	30	7.81	USACE					
3-71		24	26	8.05	USACE					
SHARK		24	23	7.88	USACE			CA3		
3BS1W		26	23	7.44	SFWMD-ARDAMS					
HOLY1		19	45	11.55	SFWMD-ARDAMS			WMA		
HOLY2		21	42	11.55	SFWMD-ARDAMS			WMA		
ROTTN		15	46	12.94	SFWMD-OPERATIONS			WMA		
ROTTS		16	43	12.75	SFWMD-OPERATIONS			WMA		
NP205		15	20	5.49	USACE			ENP		
NP201		19	21	7.26	USACE			ENP		
NP36		17	14	4.57	USACE			ENP		
NP38		16	9	2.11	USACE			ENP		
NP46		17	7	1.91	USACE			ENP		
NP67		22	7	2.49	USACE					
NP33		20	17	6.51	USACE			ENP		
NP34		13	17	2.69	USACE			ENP		
NP44		19	11	3.65	USACE			ENP		
NP206		21	15	6.28	USACE			ENP		
NESR2		25	21	7.23	USACE			ENP		
THSO		23	9	3.99	USACE					
RG2		23	15	5.93	USACE			ENP		
G3273		24	17	6.89	USACE		PA	ENP		
ANGEL		25	17	6.18	USACE		PA			
ANGEL		26	17	6.18	USACE		PA			
EVER4		25	8	2.32	USACE		PA	SA3		
E112		23	10	4.83	USACE			ENP		
G620		18	19	6.54	USACE			ENP		

SFWMM DYNAMIC POSITION ANALYSIS RUN
INITIAL STAGE VALUES DEC 1, 2019

77
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0 5 10 20
Miles

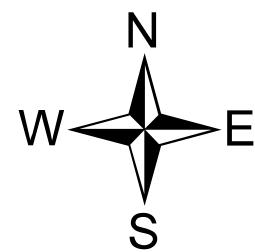
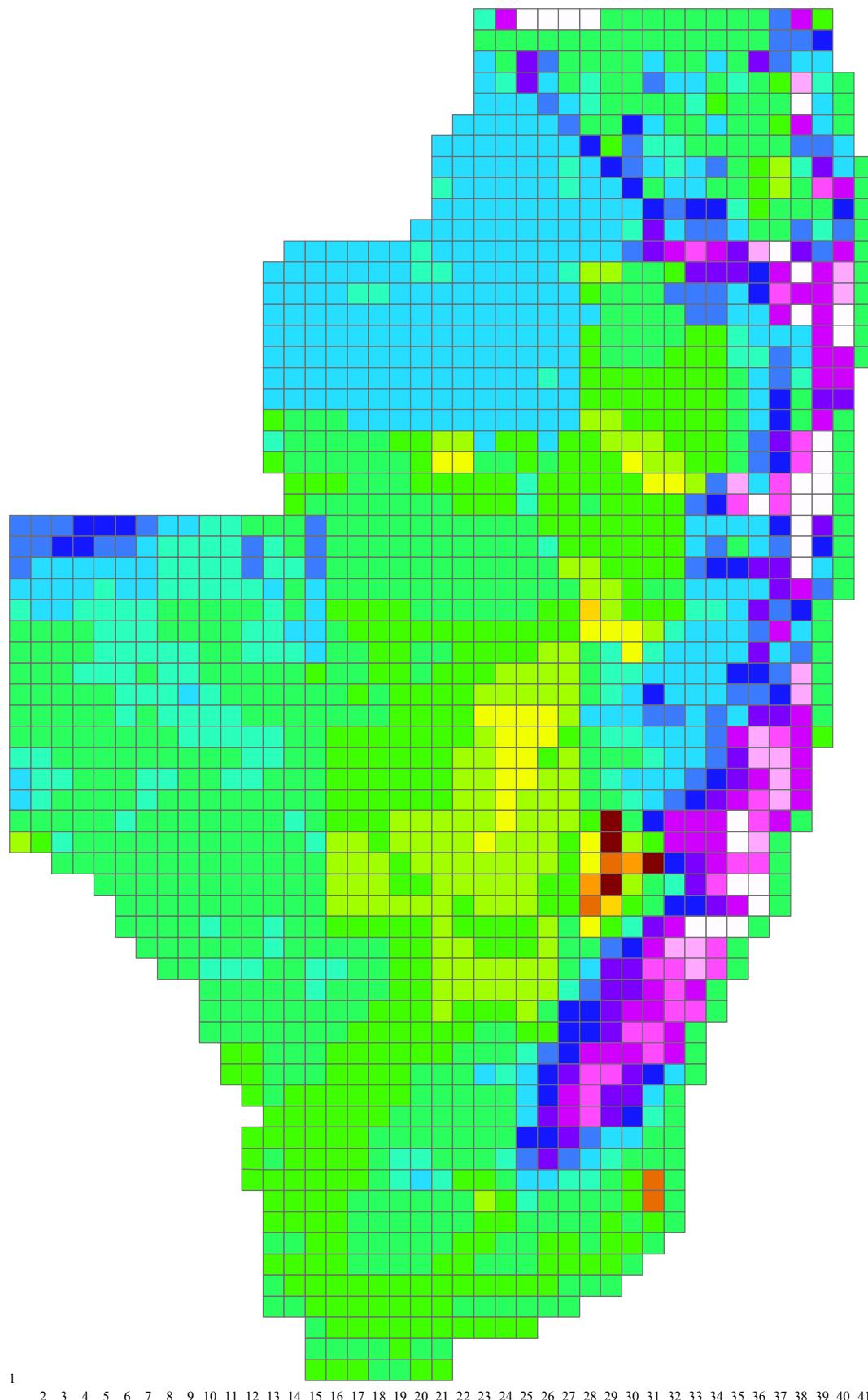
**Stage Class
(feet NGVD)**

SFWMM Grid

<=1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
12.01 - 13.00
13.01 - 14.00
14.01 - 15.00
15.01 - 16.00
16.01 - 17.00
< 17.00

SFWMM DYNAMIC POSITION ANALYSIS RUN
PONDING DEPTH VALUES DEC 01, 2019

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74
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2



0 5 10 20
Miles

**Ponding Depth
(Feet)**

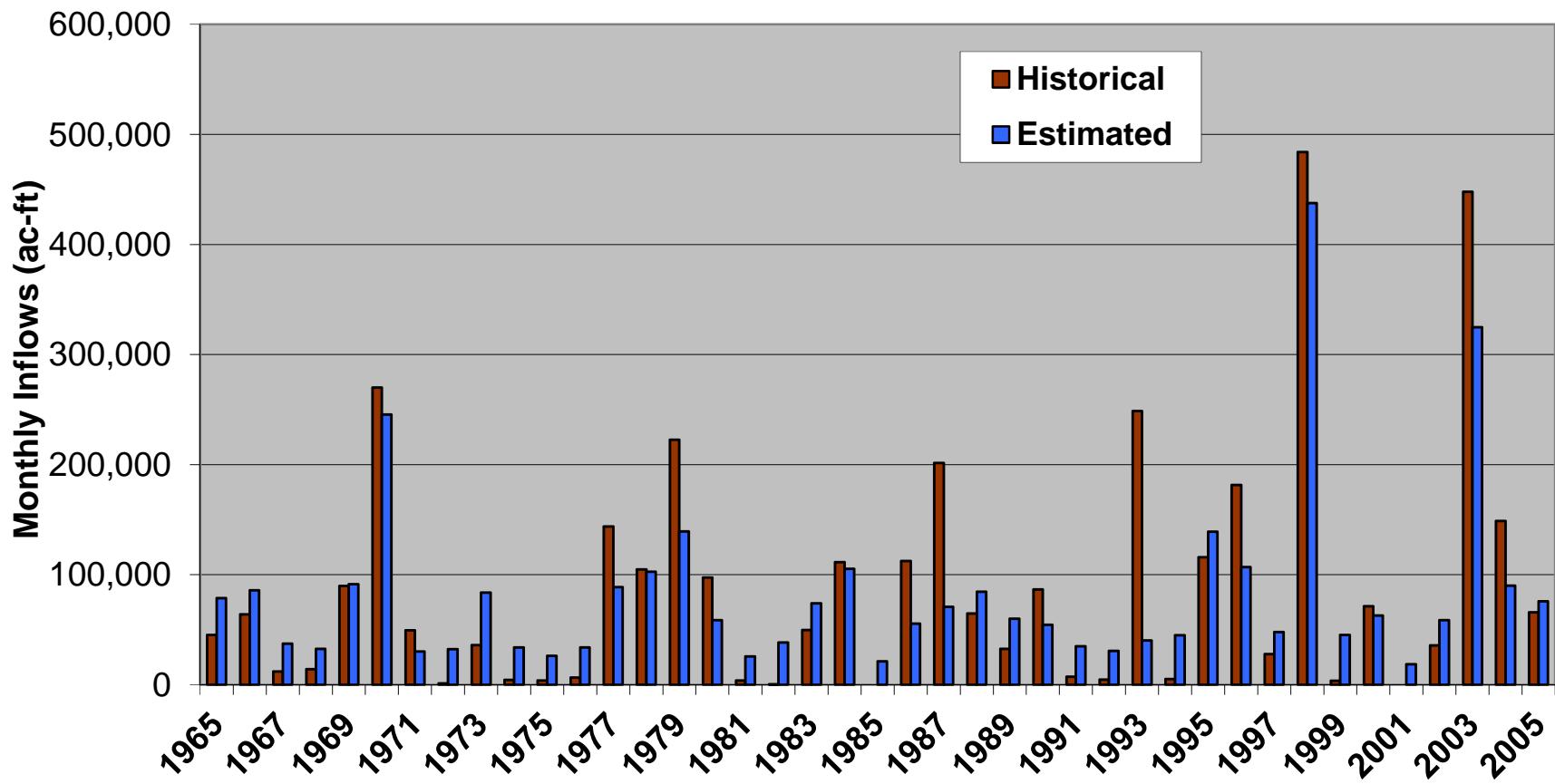
<= -8.0
-7.9 - -7
-6.9 - -6
-5.9 - -5
-4.9 - -4
-3.9 - -3
-2.9 - -2
-1.9 - -1
-0.9 - 0.0
0.01 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1 - 6.0
6.1 - 7.0
7.1 - 8.0
> 8.0

Lake Okeechobee Band Probabilities (%) at the Begining of Each Month
 '(See assumptions on the Position Analysis Results website)'
 Initial Stage 13.48 ft. for 11/01/2019

Date	HLM	High	Inter	Low	Base	Bene	WSM
2019 11 01	2.4	0.0	0.0	0.0	95.1	0.0	2.4
2019 12 01	2.4	0.0	0.0	0.0	95.1	0.0	2.4
2020 01 01	2.4	0.0	0.0	1.9	81.3	11.9	2.4
2020 02 01	2.4	0.0	0.0	12.4	37.7	45.0	2.4
2020 03 01	2.4	0.5	0.9	18.6	22.0	46.6	8.9
2020 04 01	2.4	2.9	2.3	15.7	25.2	25.5	26.0
2020 05 01	2.4	0.0	1.3	14.7	23.3	35.3	23.0
2020 06 01	2.4	0.0	-0.0	19.5	9.7	40.6	27.8
2020 07 01	2.4	0.0	-0.0	20.3	19.9	25.1	32.2
2020 08 01	2.4	0.0	-0.0	22.3	24.5	16.4	34.3
2020 09 01	2.4	0.0	0.3	32.8	24.1	2.8	37.6
2020 10 01	2.4	0.0	8.9	25.4	28.4	0.0	34.7

Year	Mon	SSM			Convey.			% Total		
		# Days SSM	# Days SSMwC.B.	Supplem. Volume	Cutback Volume	% SSM Cutback	Convey. Volume	Cutback Convey.	Total Cutback	% Total Cutback
2004	10	0	0	8.44	0.00	0.00	0.00	0.00	0.00	
2004	11	0	0	31.74	0.00	0.00	0.00	0.00	0.00	
2004	12	0	0	57.46	0.00	0.00	0.00	0.00	0.00	
2005	1	0	0	44.54	0.00	0.00	0.12	0.26	0.12	
2005	2	0	0	78.27	0.00	0.00	0.06	0.07	0.06	
2005	3	0	0	0.54	0.00	0.00	0.00	0.00	0.00	
2005	4	0	0	59.75	0.00	0.00	0.00	0.00	0.00	
2005	5	0	0	66.84	0.00	0.00	0.09	0.13	0.09	
2005	6	0	0	4.19	0.00	0.00	0.00	0.00	0.00	
2005	7	0	0	19.75	0.00	0.00	0.00	0.00	0.00	
2005	8	0	0	6.01	0.00	0.00	0.00	0.00	0.00	
2005	9	0	0	12.75	0.00	0.00	0.00	0.00	0.00	

December 2019 Dynamic Position Analysis
Historical and Estimated S-65E Monthly Flow
for December from 1965 - 2005



December 2019 Dynamic Position Analysis
Historical and Estimated S-65E Monthly Flow
for January from 1965 - 2005

