

# Starting Stage Duration and Empirical Frequency Curve

## DLS-114, Module 2.7



**U.S. ARMY**



**US Army Corps  
of Engineers®**

Dam and Levee  
Safety Programs

March 2026 / Version 1

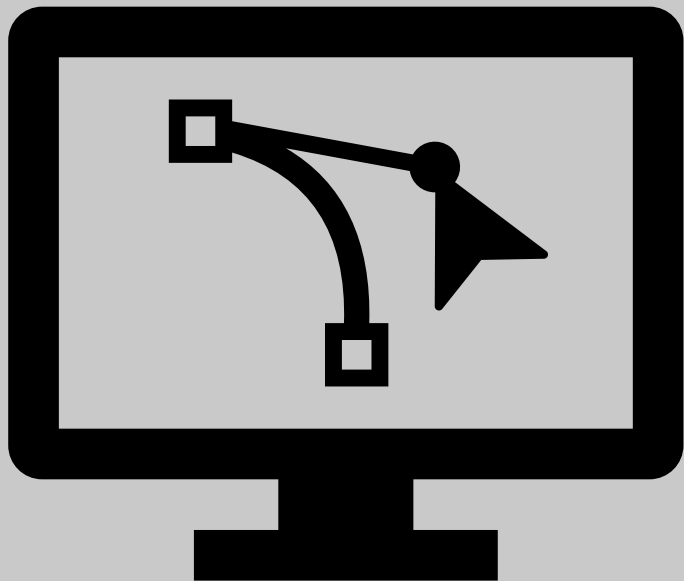
CARTERS DAM, GA (SOURCE: USACE)

# Learning Objectives

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- Perform a reservoir starting stage duration analysis in RMC-RFA
- Perform an empirical frequency curve analysis in RMC-RFA
- Discuss how they will be used to inform the loading curve

# ANALYSES

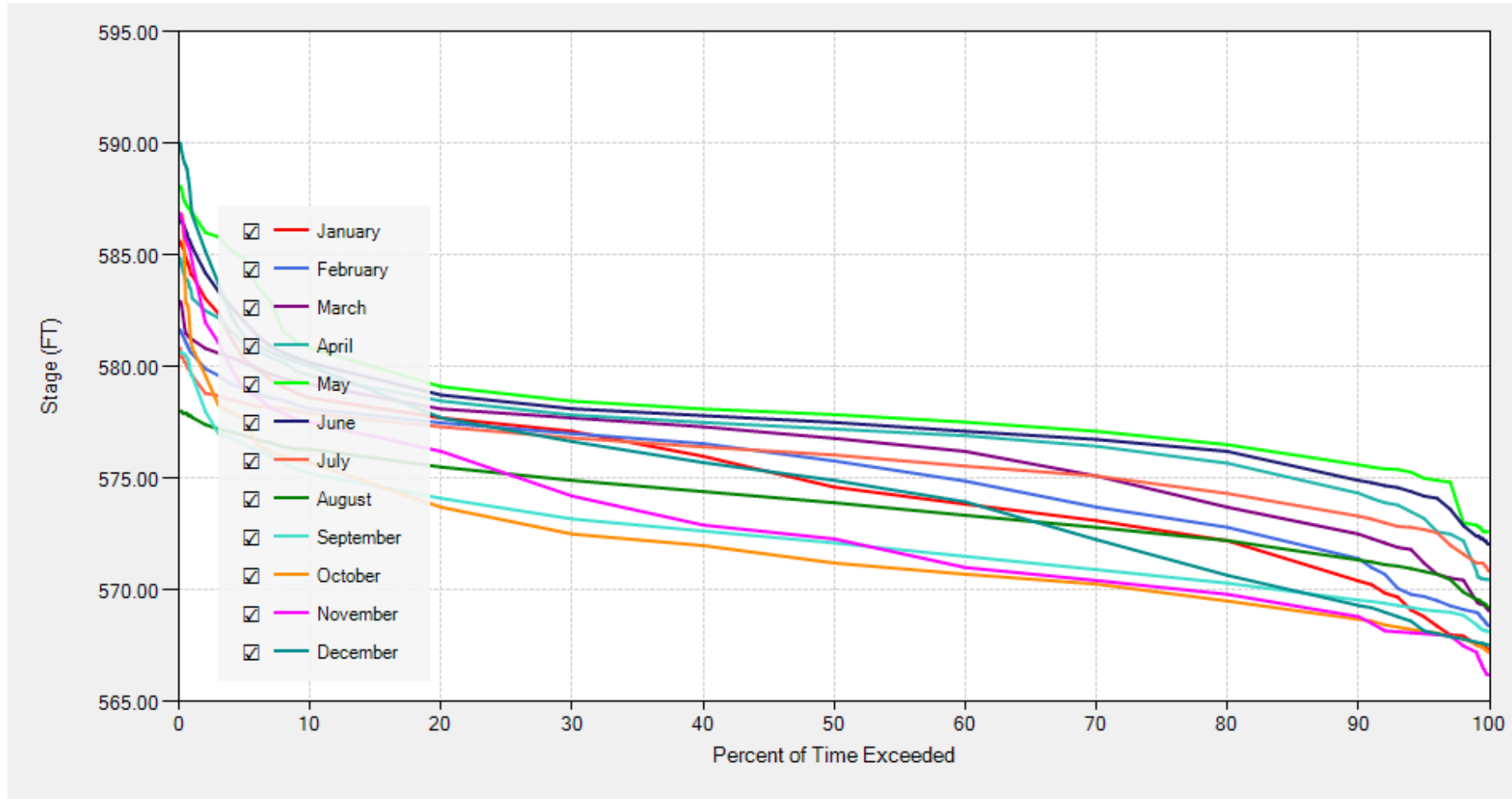


**Flood  
seasonality**

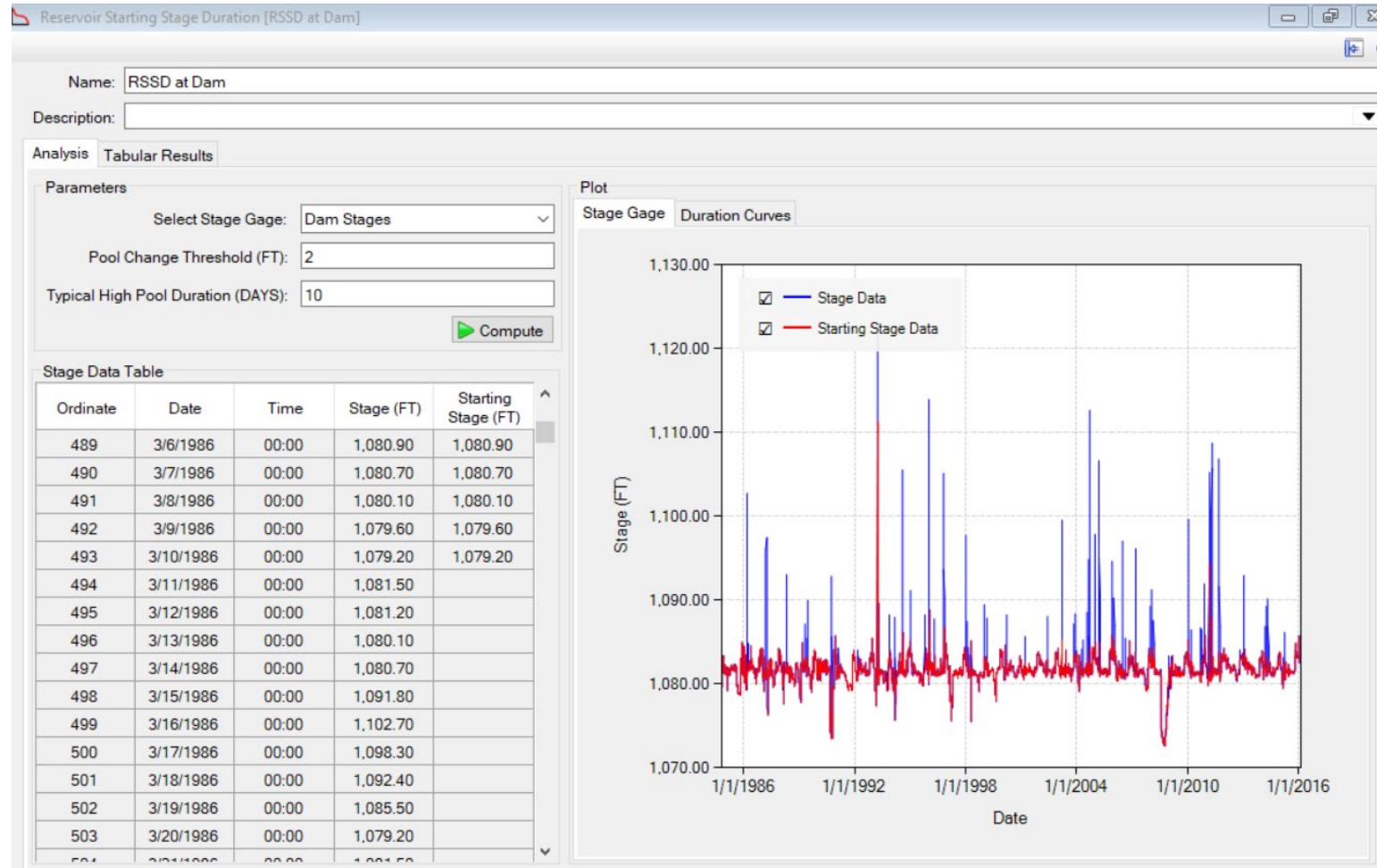
**Reservoir  
starting stage  
duration**

**Empirical  
frequency  
curve**

# Reservoir Starting Stage Duration: What is it? (1 of 2)

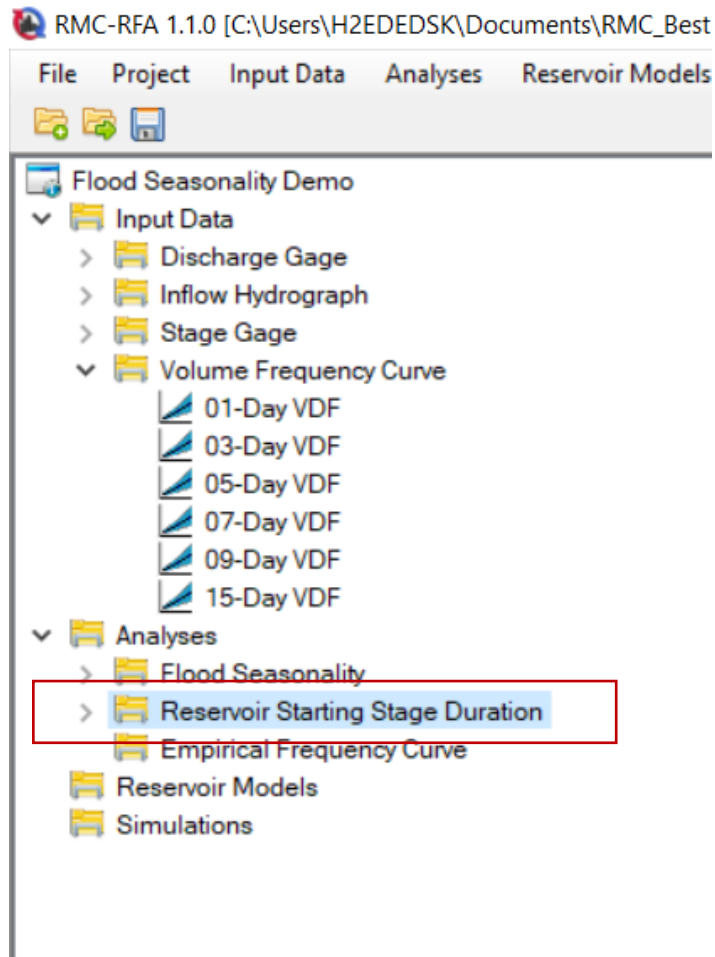


# Reservoir Starting Stage Duration: What is it? (2 of 2)





# Add a New Reservoir Starting Stage Duration Analysis



Reservoir Starting Stage Duration [1]

Name:

Description:

Analysis Tabular Results

Parameters

Select Stage Gage:

Pool Change Threshold (FT):

Typical High Pool Duration (DAYS):

Plot

Stage Gage Duration Curves

Stage Data Table

Ordinate	Date	Time	Stage (FT)	Starting Stage (FT)
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# Reservoir Starting Stage Duration: Parameters


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Parameters

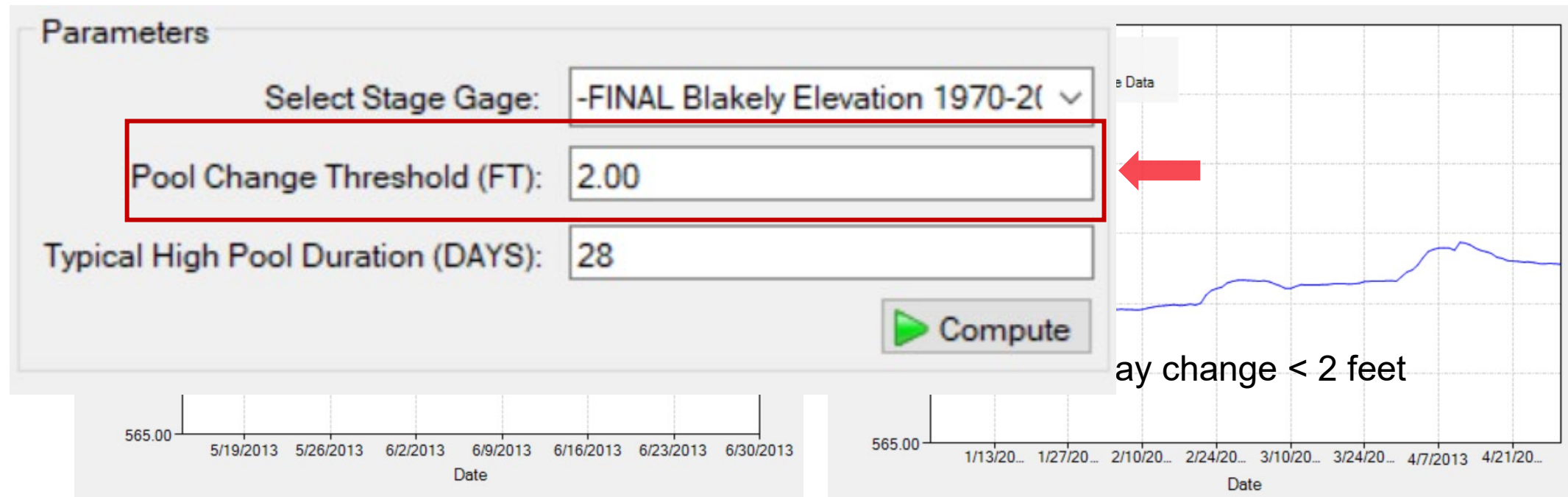
Select Stage Gage: -FINAL Blakely Elevation 1970-2010 ▾

Pool Change Threshold (FT): 2.00

Typical High Pool Duration (DAYS): 28

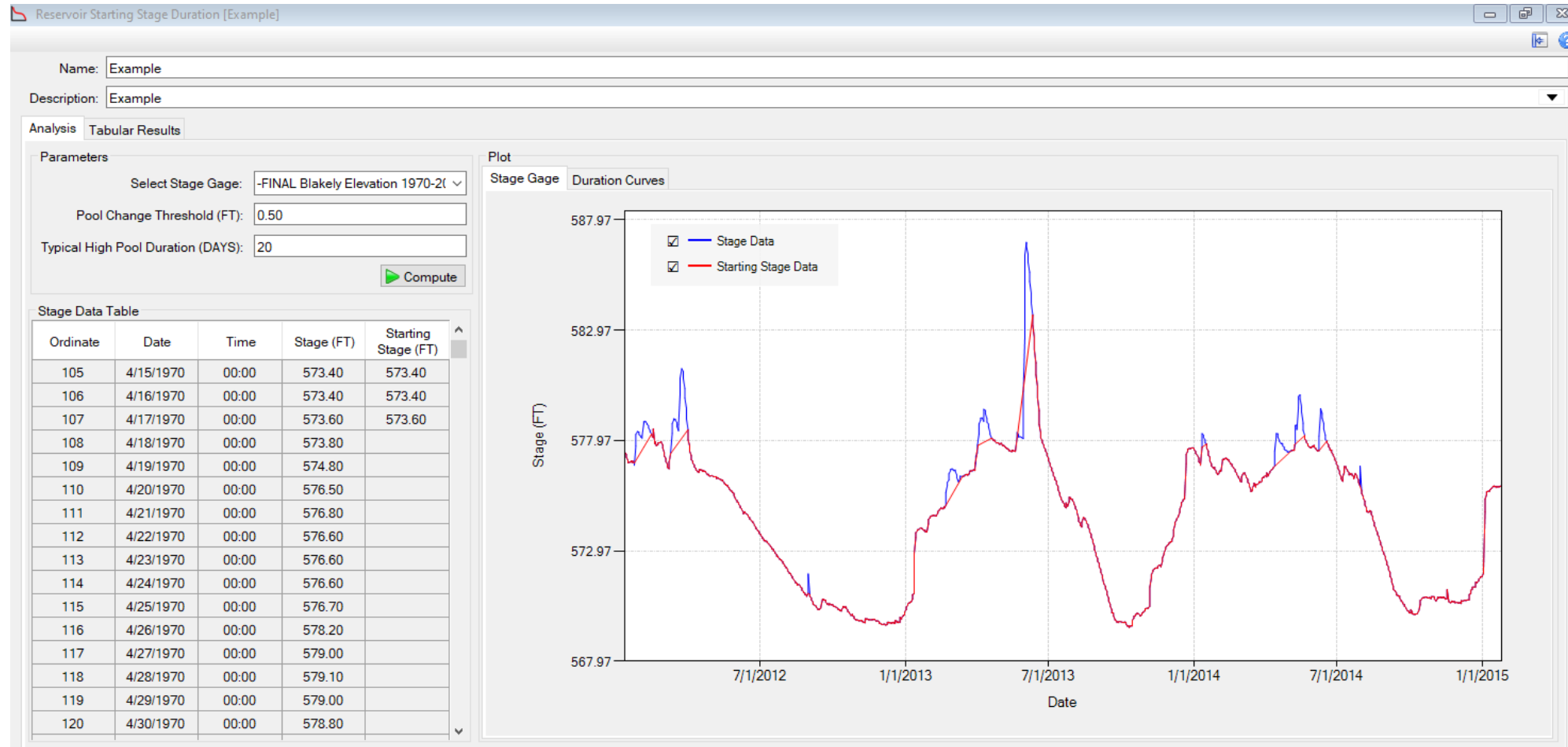
 Compute

# Reservoir Starting Stage Duration: Pool Change Threshold

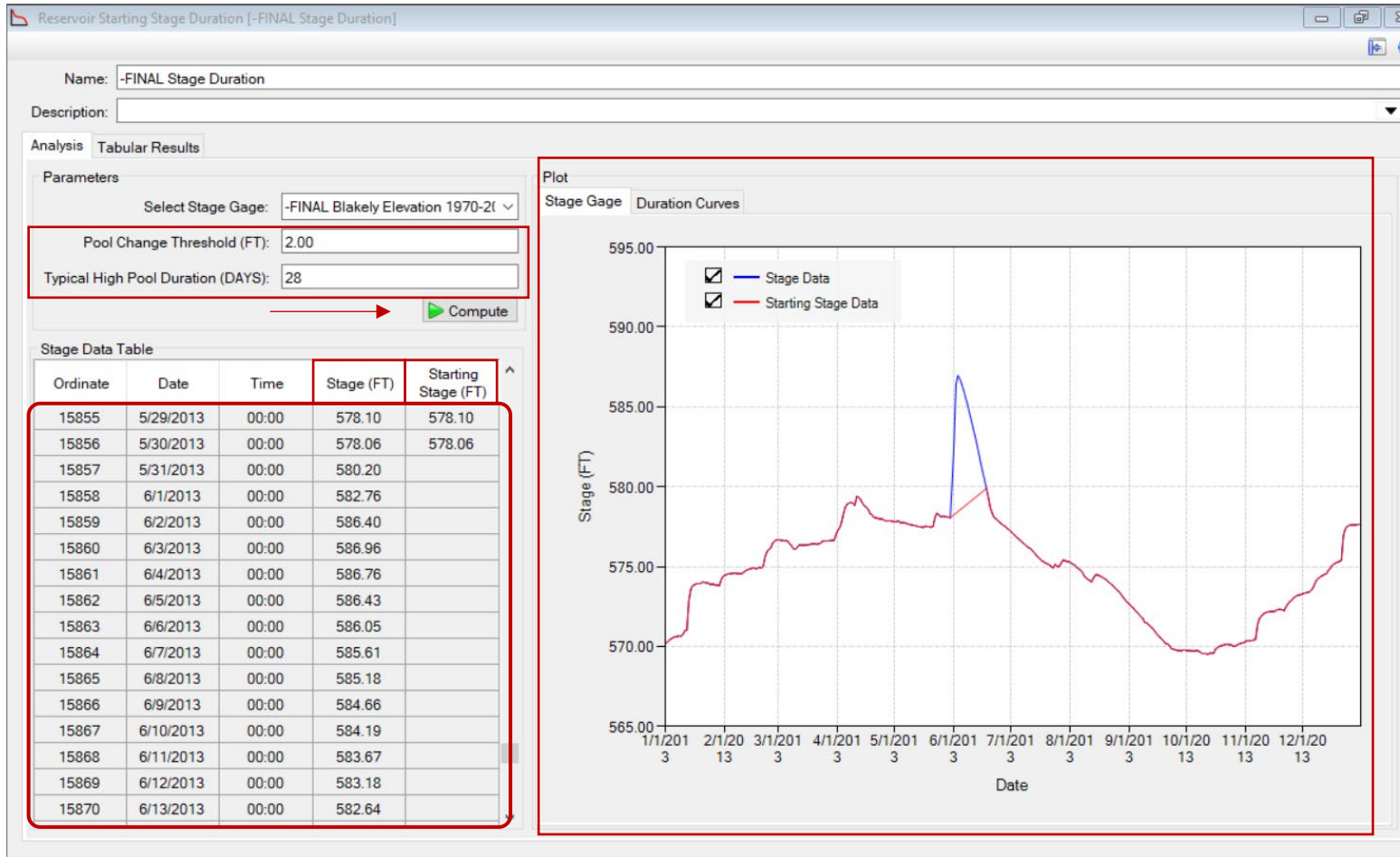




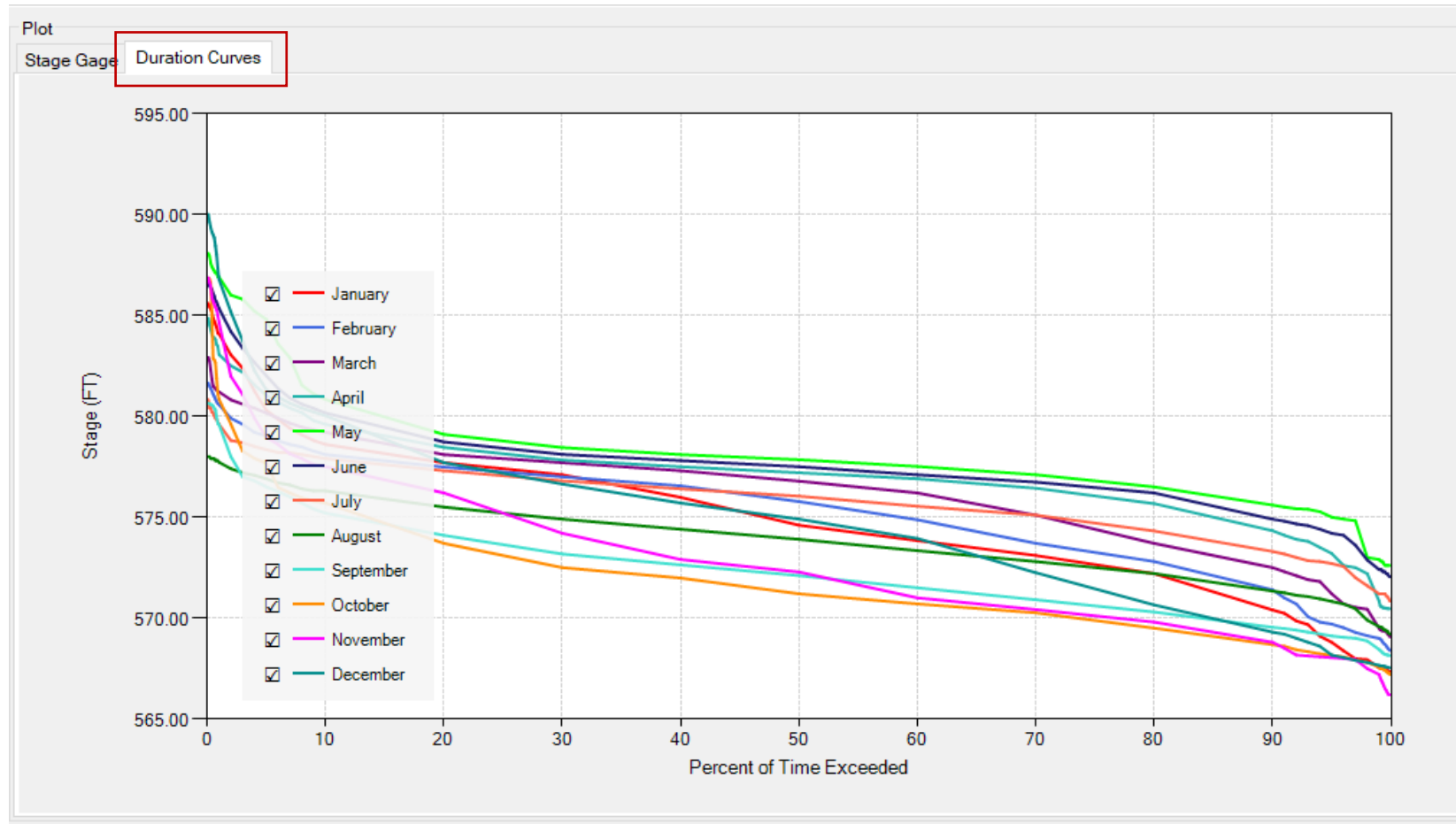
# Reservoir Starting Stage Duration: High Pool Duration



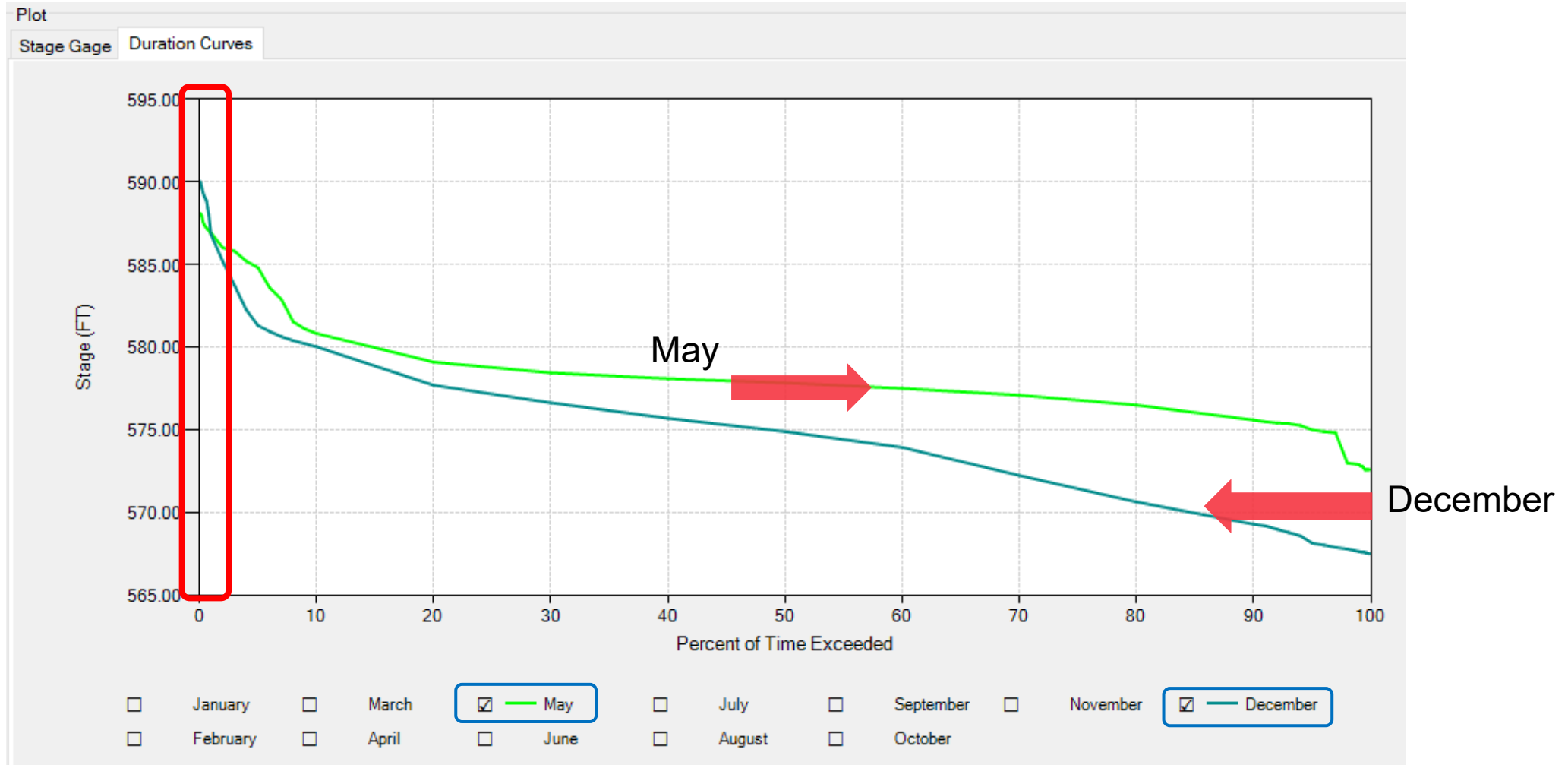
# Reservoir Starting Stage Duration: Compute



# Reservoir Starting Stage Duration: Plot (1 of 2)



# Reservoir Starting Stage Duration: Plot (2 of 2)



# Reservoir Starting Stage Duration: Tabular Results

Reservoir Starting Stage Duration [-FINAL Stage Duration]

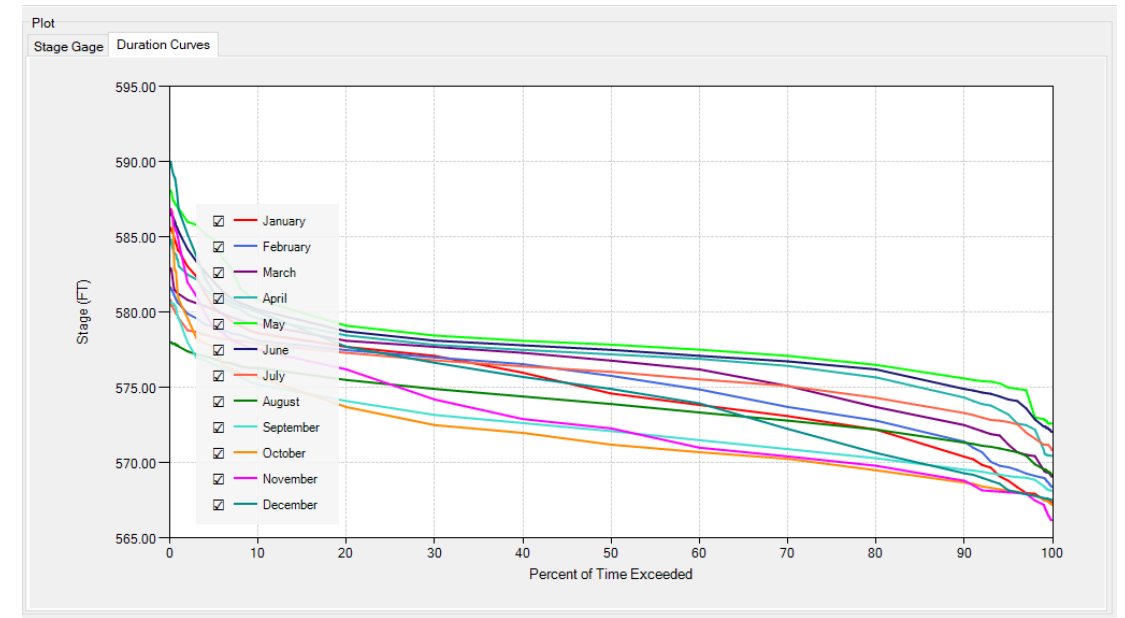
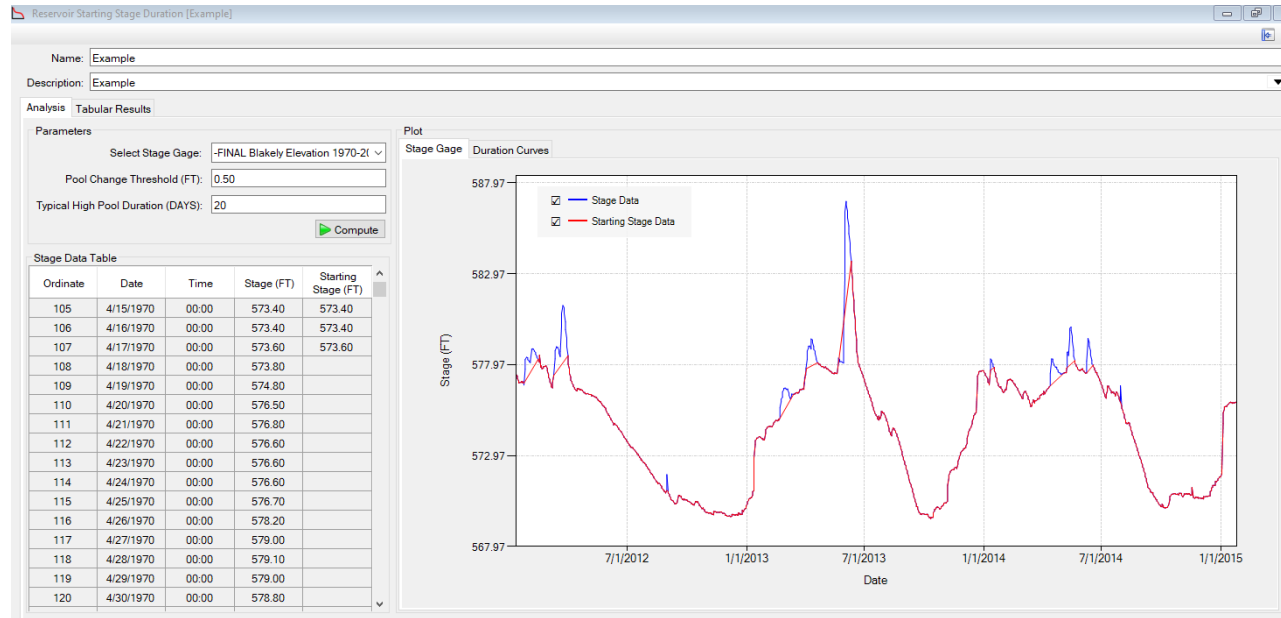
Name: -FINAL Stage Duration

Description:

Analysis: **Tabular Results**

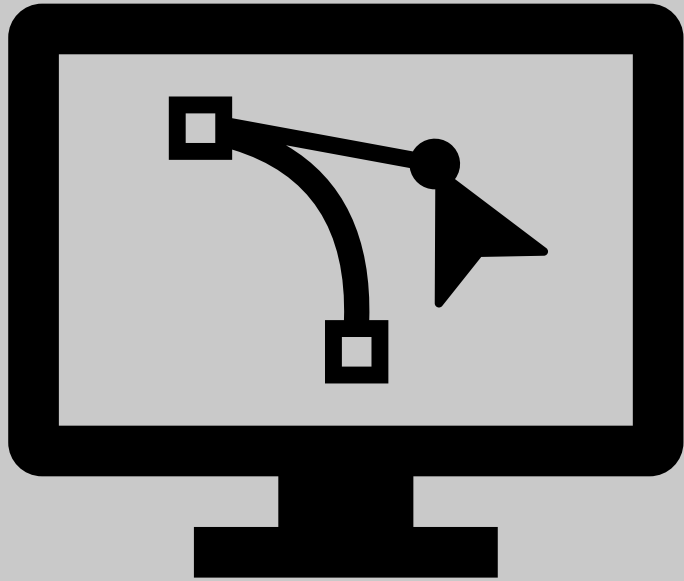
Probability	January	February	March	April	May	June	July	August	September	October	November	December
0.999	567.35	568.39	569.07	570.46	572.60	572.04	570.83	569.20	568.14	567.20	566.20	567.53
0.998	567.38	568.46	569.18	570.46	572.60	572.10	570.98	569.26	568.16	567.29	566.20	567.54
0.997	567.38	568.53	569.22	570.47	572.60	572.20	571.06	569.35	568.17	567.30	566.30	567.57
0.996	567.41	568.62	569.34	570.48	572.60	572.20	571.10	569.38	568.19	567.37	566.43	567.57
0.995	567.43	568.69	569.35	570.50	572.60	572.30	571.20	569.41	568.19	567.40	566.50	567.60
0.994	567.46	568.74	569.37	570.51	572.60		571.20	569.43	568.24	567.45	566.65	567.62
0.993	567.48	568.80	569.37	570.52			571.20	569.51	568.27	567.48	566.79	567.62
0.992	567.51	568.91	569.39	570.58			571.20	569.54	568.35	567.50	566.90	567.62
0.991	567.53	568.96	569.41	570.59			571.20	569.56	568.39	567.51	567.04	567.64
0.990	567.53	568.99	569.49	570.83			571.20	569.57	568.44	567.58	567.21	567.66
0.980	567.94	569.12	570.44	572.20	573.00	572.88	571.60	569.89	568.86	567.80	567.49	567.80
0.970	567.99	569.29	570.53	572.50	574.82	573.61	572.00	570.46	569.00	567.93	567.95	567.90
0.960	568.37	569.52	570.70	572.60	574.90	574.10	572.55	570.69	569.05	568.07	567.99	568.04
0.950	568.80	569.70	571.20	573.20	575.00	574.20	572.70	570.82	569.11	568.15	568.04	568.16
0.940	569.10	569.80	571.81	573.50	575.27	574.40	572.80	570.95	569.21	568.23	568.08	568.60
0.930	569.67	570.06	571.90	573.80	575.39	574.58	572.84	571.06	569.30	568.33	568.12	568.80
0.920	569.86	570.70	572.10	573.90	575.42	574.66	573.00	571.13	569.40	568.43	568.17	569.00
0.910	570.23	571.00	572.30	574.10	575.50	574.80	573.17	571.25	569.48	568.60	568.50	569.20
0.900	570.40	571.40	572.50	574.33	575.60	574.90	573.30	571.34	569.54	568.68	568.80	569.30
0.800	572.20	572.80	573.70	575.67	576.50	576.20	574.31	572.20	570.30	569.50	569.80	570.65
0.700	573.10	573.71	575.10	576.43	577.10	576.74	575.10	572.80	570.91	570.26	570.42	572.25
0.600	573.84	574.87	576.20	576.90	577.51	577.10	575.54	573.34	571.50	570.70	571.00	573.94
0.500	574.60	575.77	576.79	577.20	577.85	577.50	576.04	573.90	572.10	571.20	572.28	574.90
0.400	575.98	576.55	577.30	577.50	578.10	577.80	576.40	574.40	572.63	571.98	572.90	575.70
0.300	577.10	577.00	577.70	577.83	578.45	578.11	576.80	574.90	573.17	572.50	574.20	576.64

# Reservoir Starting Stage Duration: Questions?





# ANALYSES

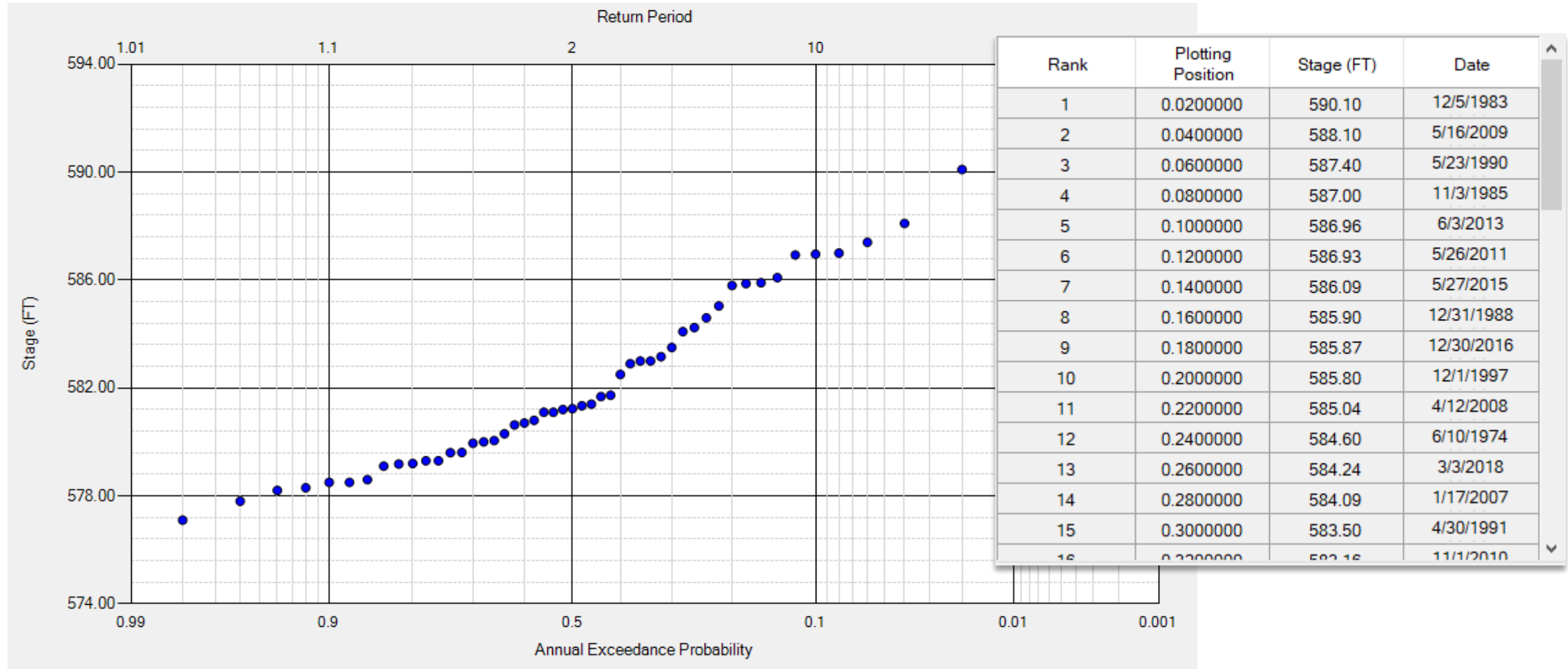


**Flood  
seasonality**

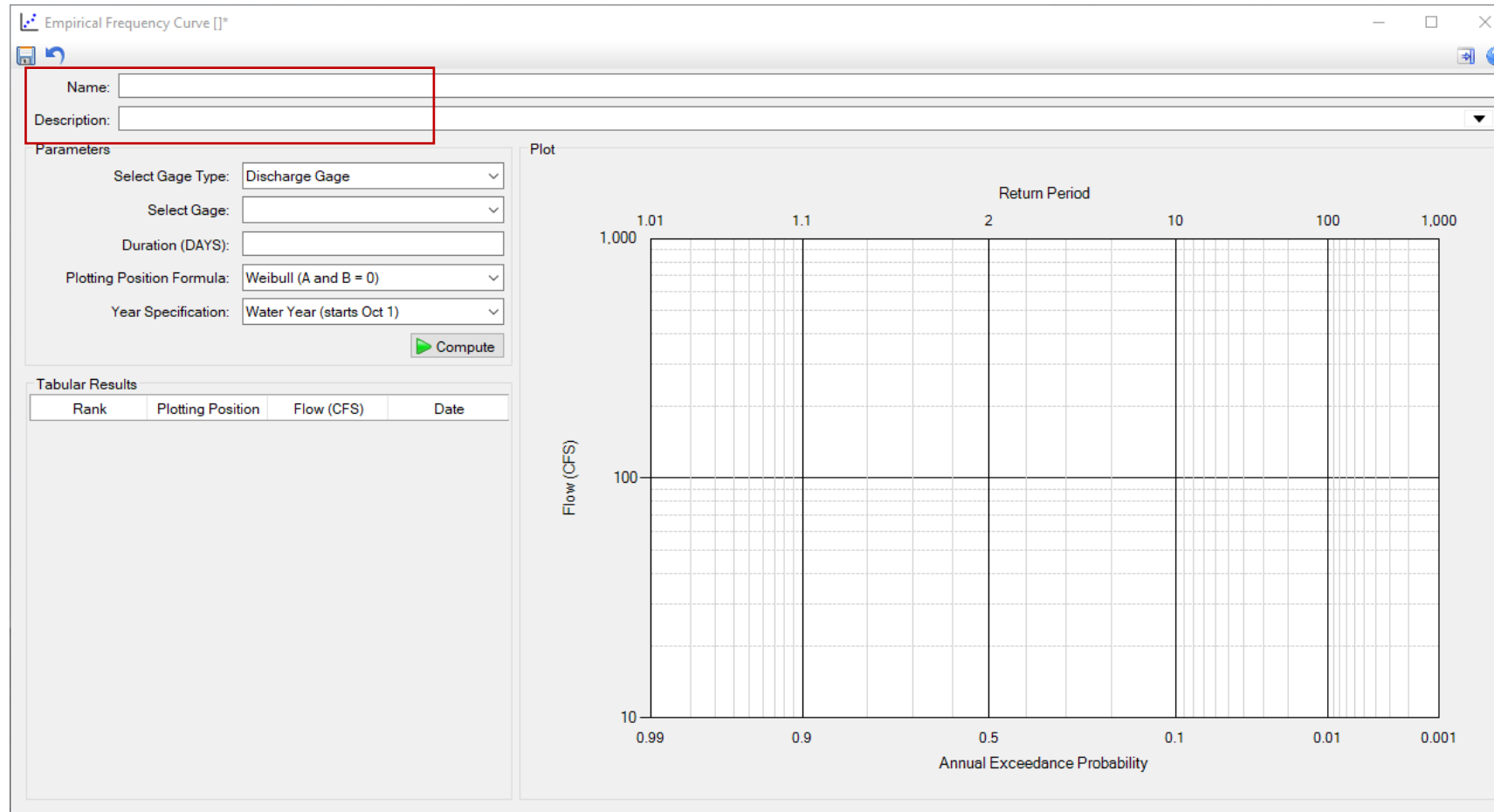
**Reservoir  
starting stage  
duration**

**Empirical  
frequency  
curve**

# Empirical Frequency Curve (1 of 2)



# Empirical Frequency Curve (2 of 2)




# Empirical Frequency Curve: Parameters

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Parameters

Select Gage Type:	Stage Gage	▼
Select Gage:	Dam Stages	▼
Duration (DAYS):	1	
Plotting Position Formula:	Weibull (A and B = 0)	▼
Year Specification:	Water Year (starts Oct 1)	▼


 Compute

# Empirical Frequency Curve: Parameters

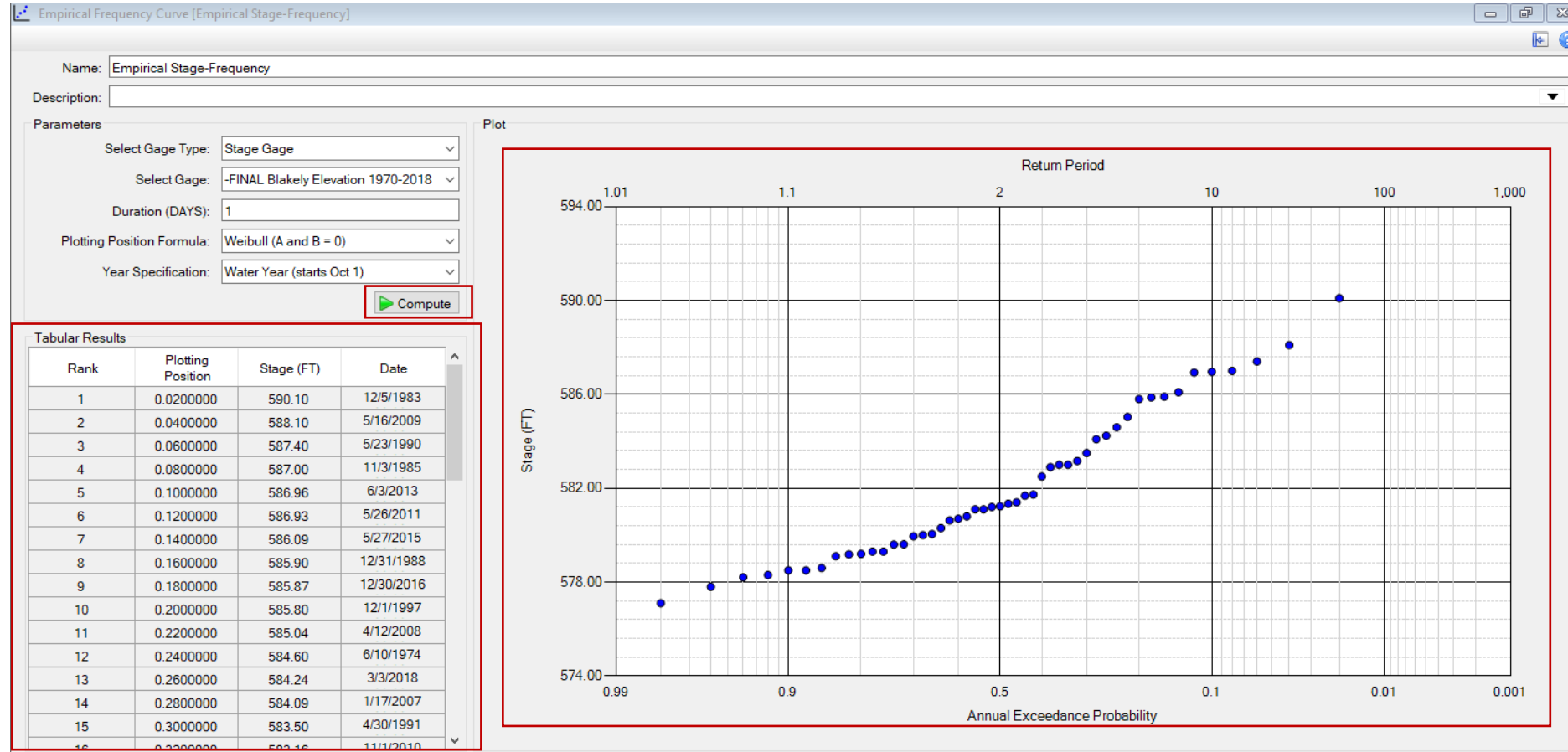
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Parameters

Select Gage Type:	Stage Gage	▼
Select Gage:	Dam Stages	▼
Duration (DAYS):	1	
Plotting Position Formula:	Weibull (A and B = 0)	▼
Year Specification:	Water Year (starts Oct 1)	▼

 Compute

# Empirical Frequency Curve





# Empirical Frequency Curve: Limitations

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- Data must be a continuous record
- Stage- or flow-frequency curves need to be manually created outside of RMC-RFA

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# Questions