

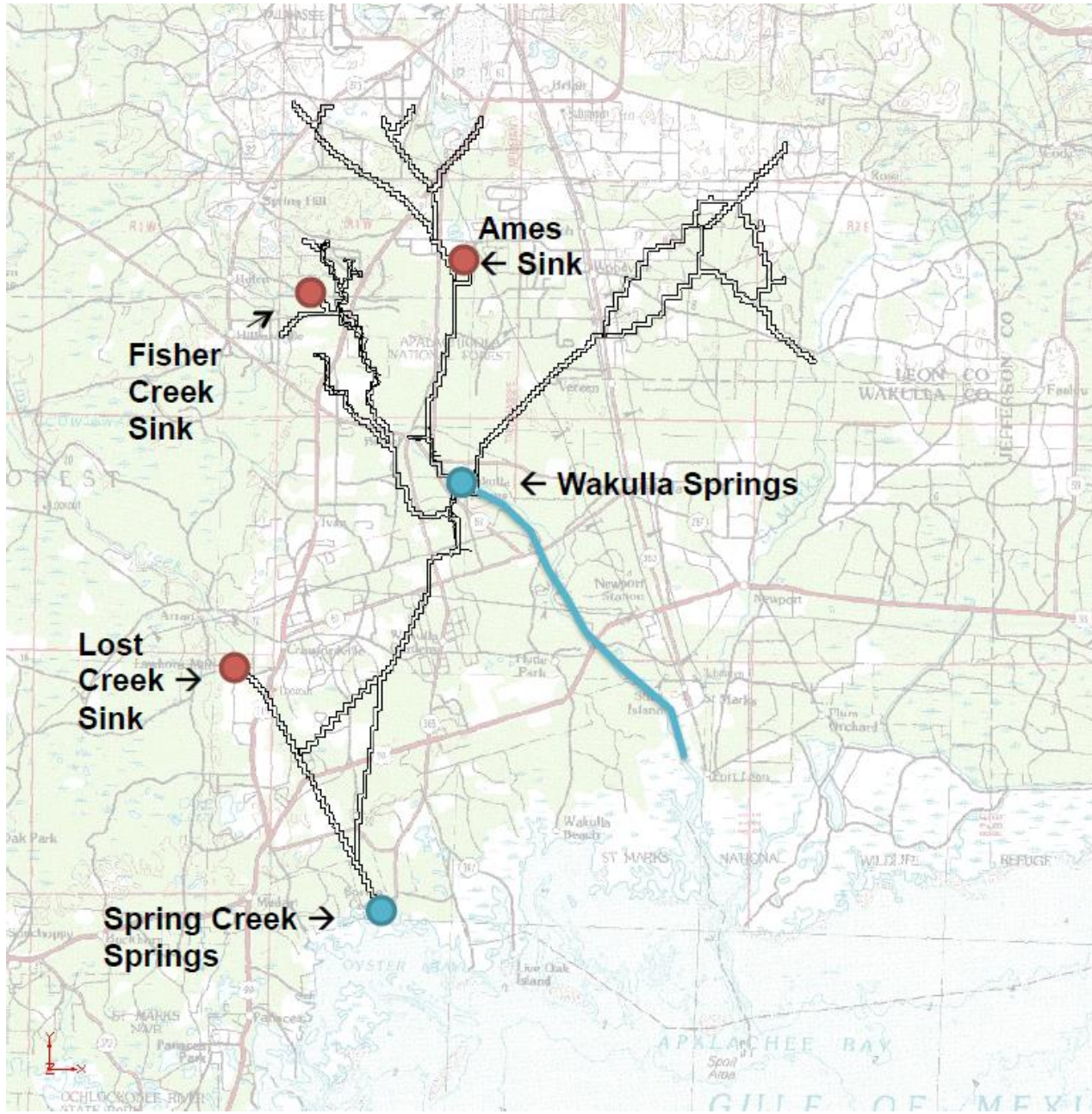


Wakulla Spring - Spring Creek Spring Group Analysis

*Interactions with Spring Creek and
long-term trends in discharge*

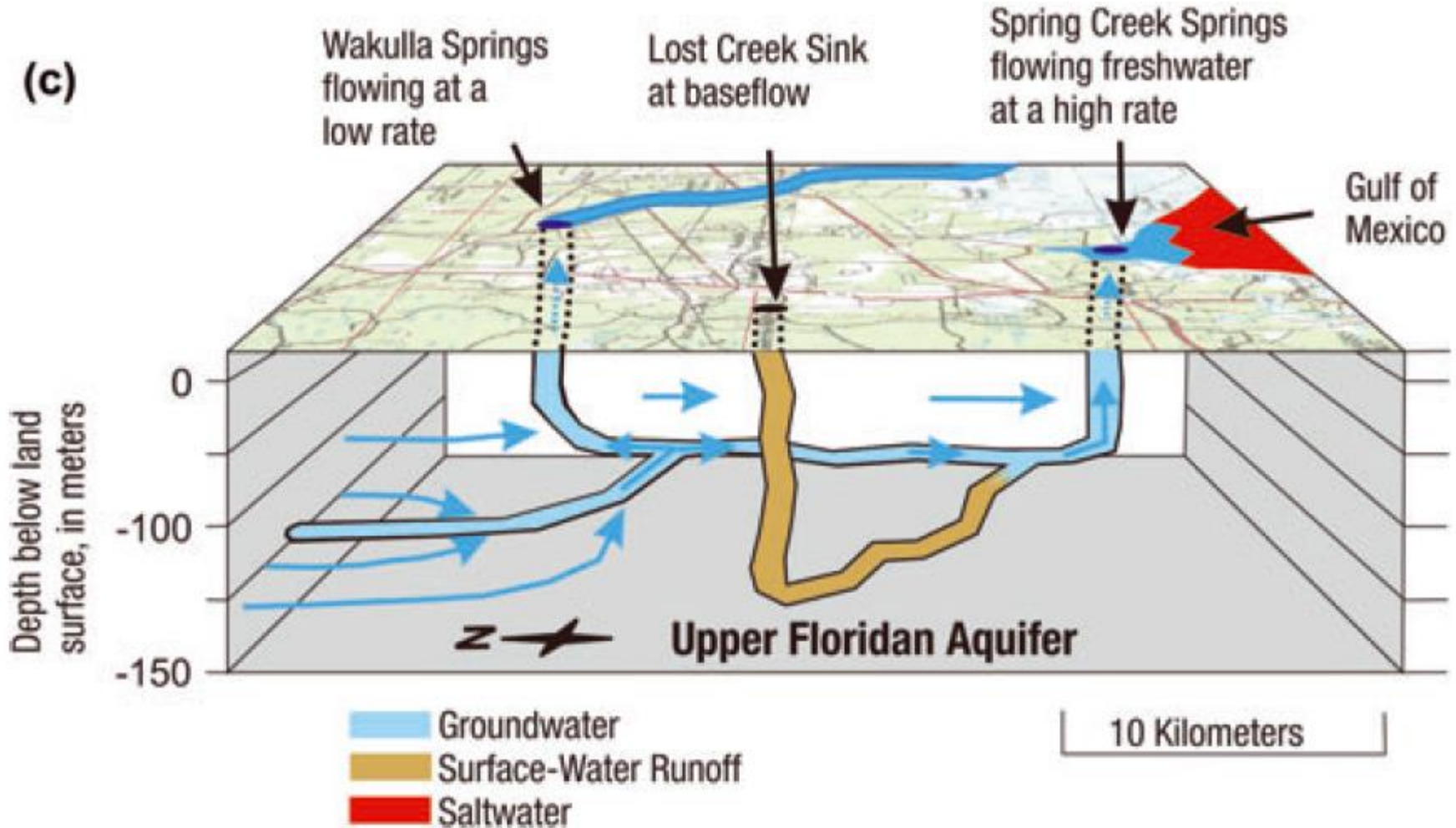
James Sutton

Hydrogeologist II

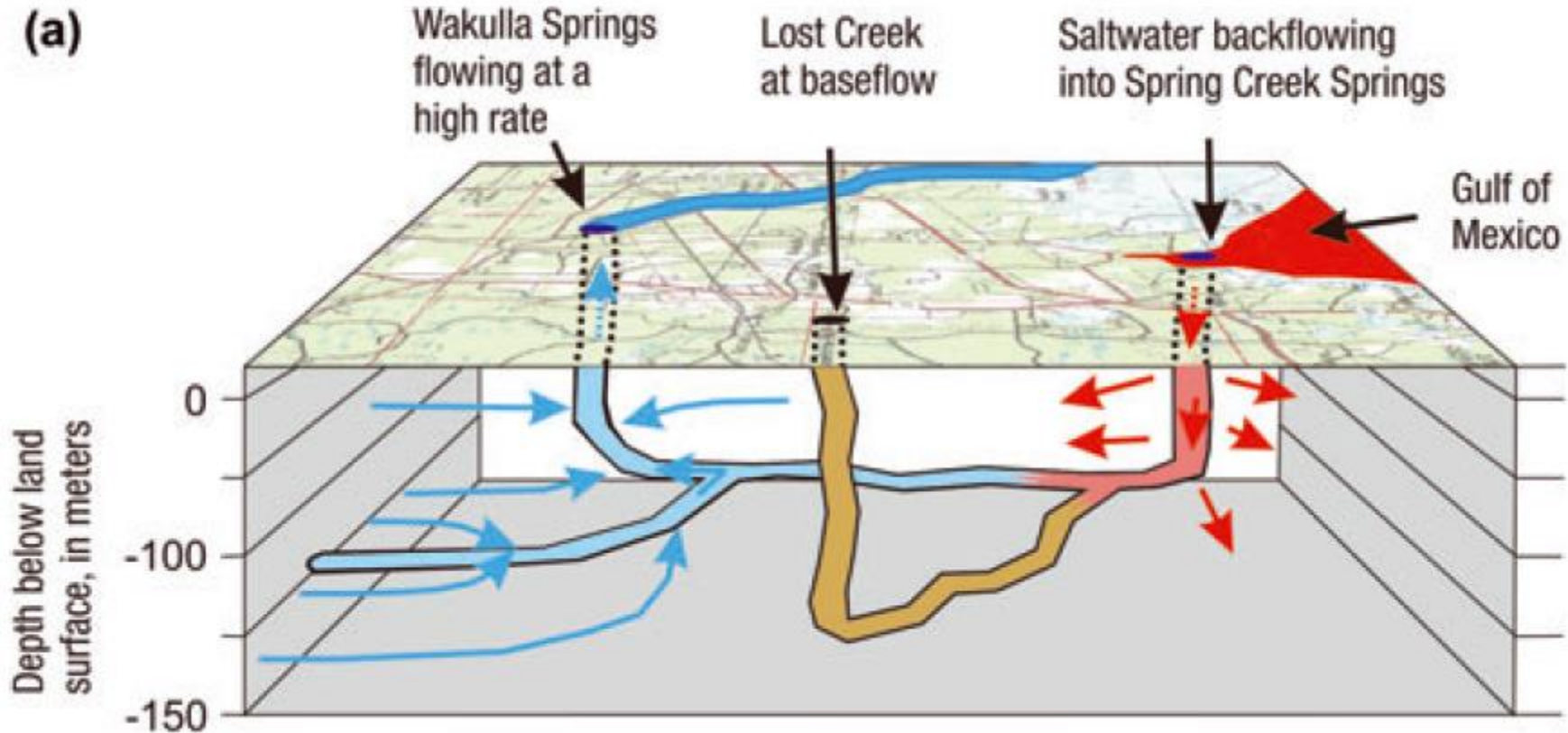




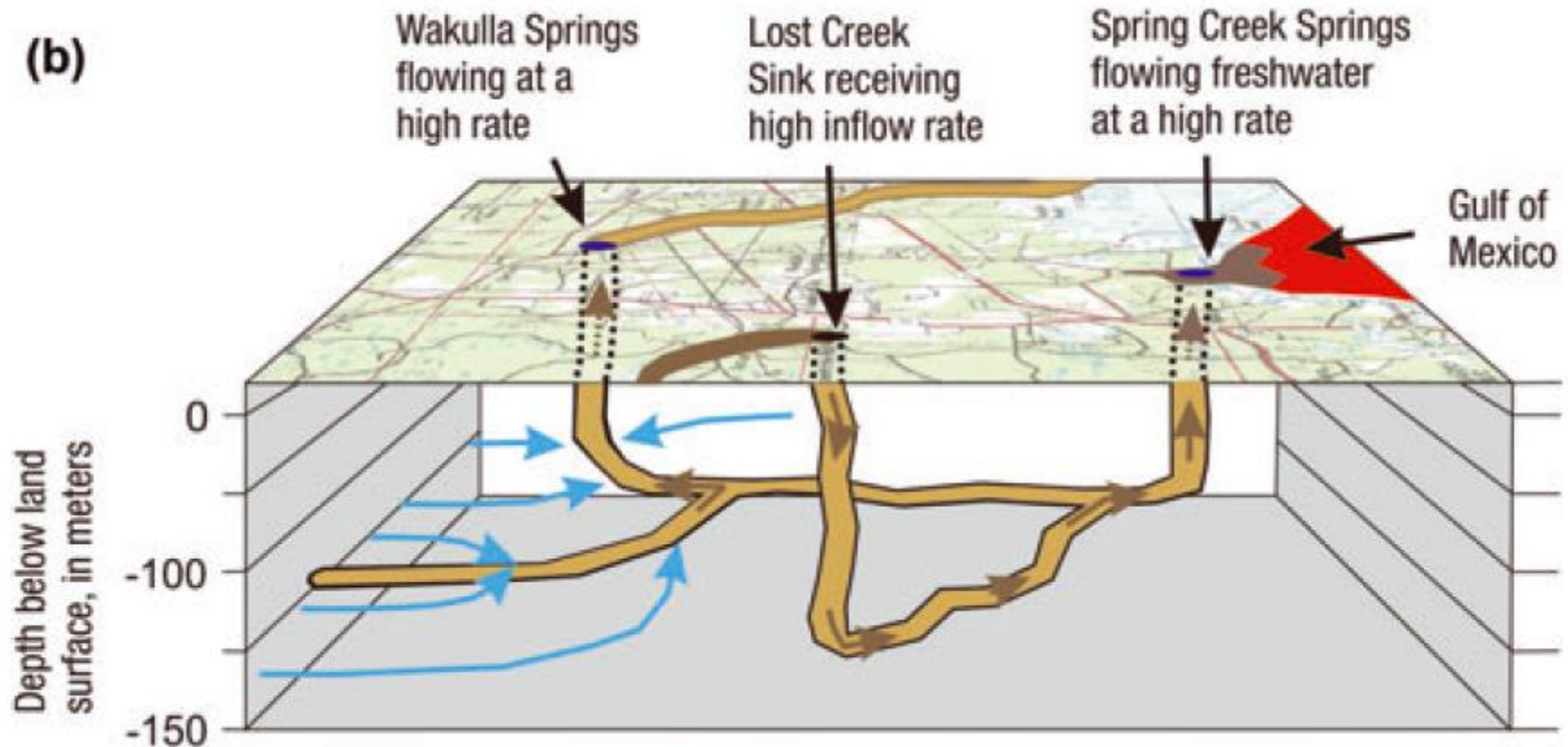
Conceptual Reversal



Conceptual Reversal

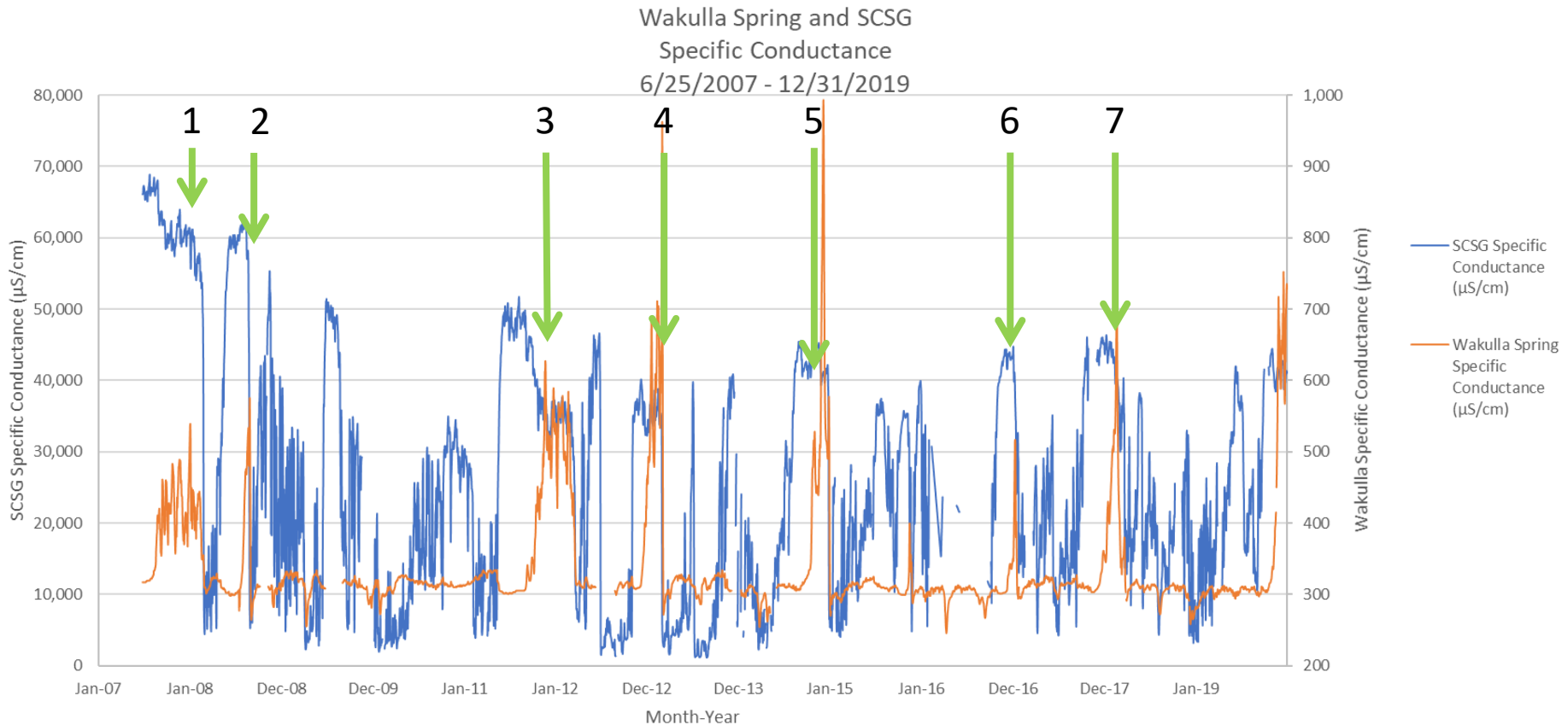


Conceptual Reversal





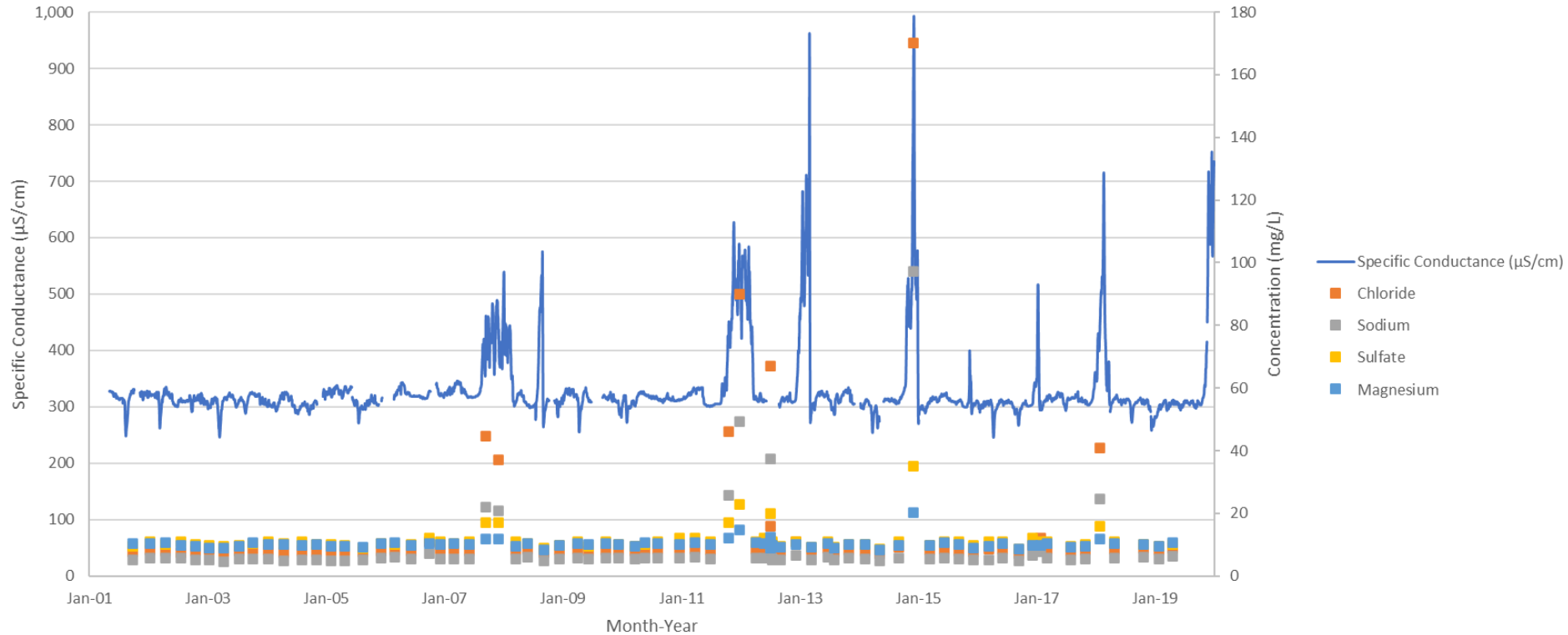
Period of Record Evaluated



1,000 $\mu\text{S}/\text{cm}$ \approx 0.5 PPT salinity

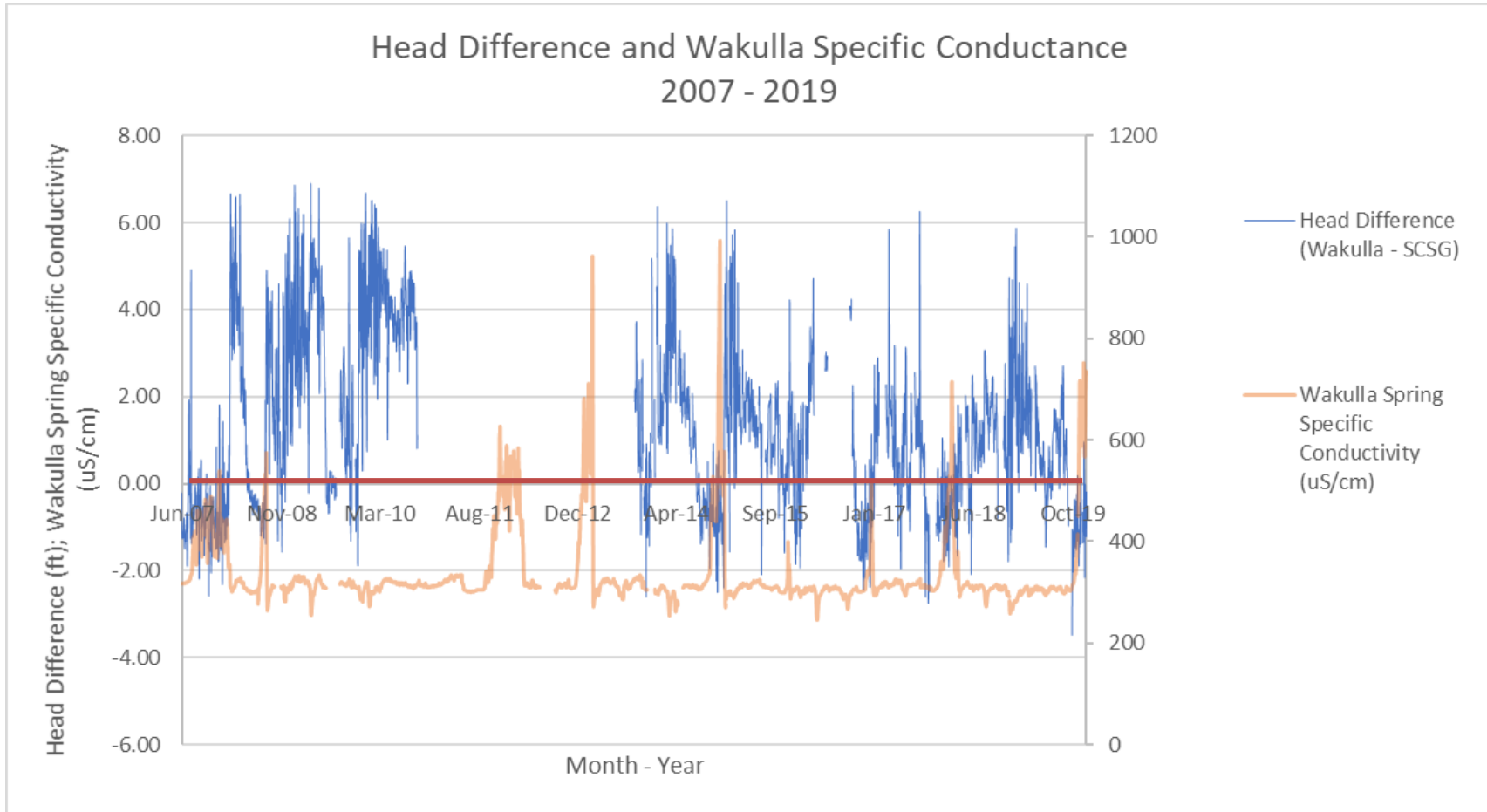


Wakulla Spring Water Quality
5/4/2001 - 12/31/2019



Average Wakulla Spring Conductivity= 330 $\mu\text{S}/\text{cm}$

Reversals and Head Gradients



- Water from SCSG flows north towards Wakulla Spring because the “normal” head gradient between the two have reversed
- This is the physical process that determines flow direction and magnitude
- Followed methods from Davis and Verdi, 2014



SCSG Reversal Events

Event	Date of beginning of reversal event at SCSG	Date of end of reversal at Wakulla Spring	SCSG under reversal conditions (Approximate # of Days)	Wakulla Spring with elevated specific conductance (Approximate # of Days)
1	5/7/2007	2/27/2008	296	203
2	4/15/2008	8/31/2008	138	42
3	5/4/2011	3/27/2012	328	207
4	10/27/2012	3/3/2013	127	87
5	4/22/2014	12/30/2014	252	116
6	9/25/2016	1/17/2017	114	42
7	9/10/2017	3/26/2018	197	105

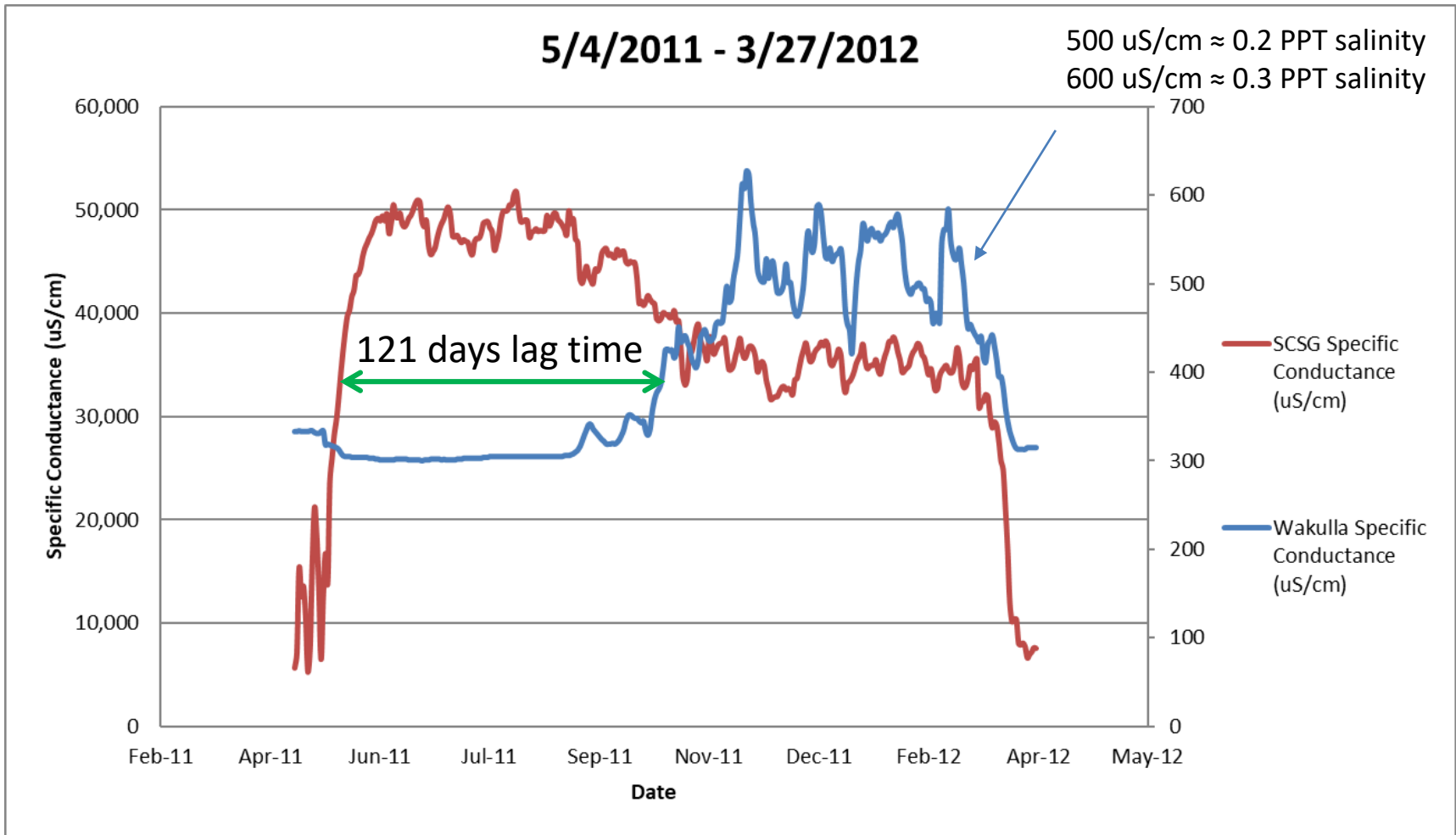
Average

207 days

115 days



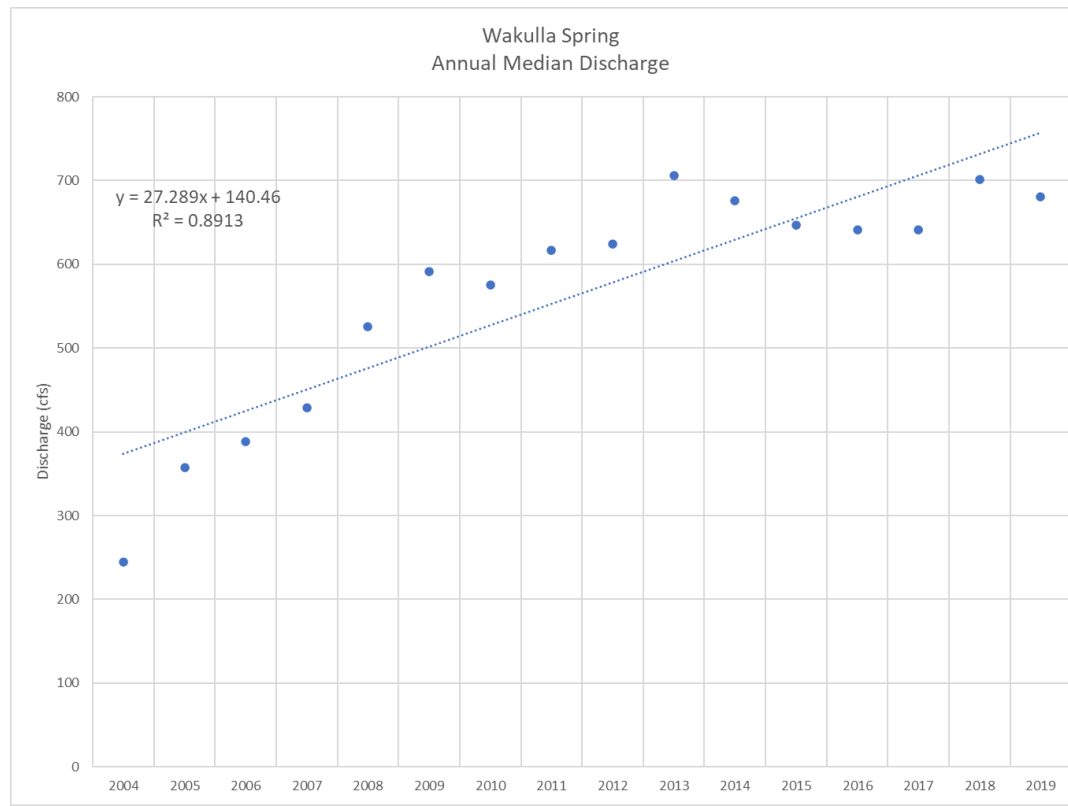
Event #3



35 PPT salinity \approx 53,000 uS/cm

Trends in Wakulla Spring Discharge

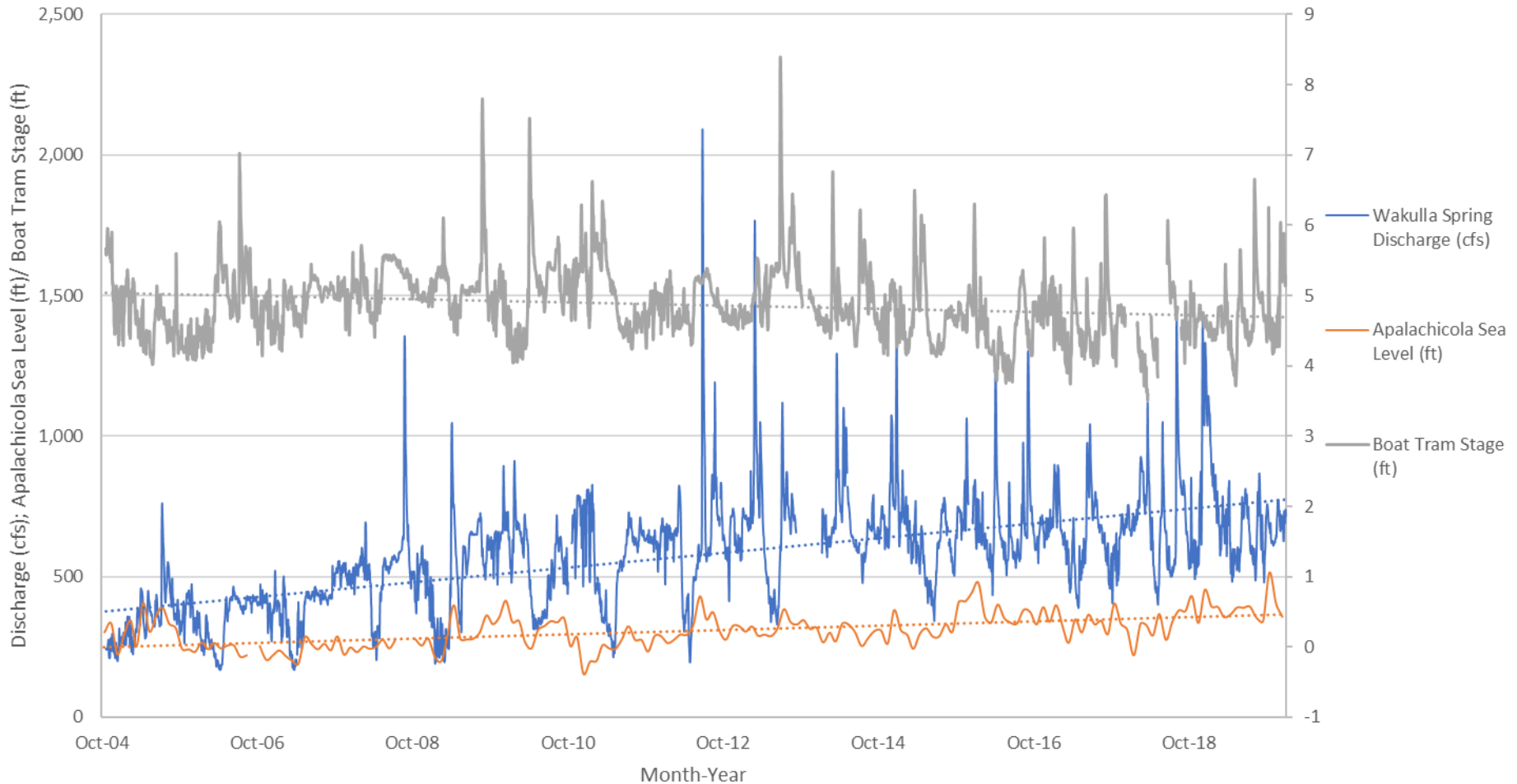
- Annual average discharge at Wakulla Spring has increased approximately 176% from 2004 – 2019
 - Annual median discharge has increased ~178%
 - Annual minimum discharge has increased ~140%





Sea Level Trends

Wakulla Spring and Apalachicola Sea Level
2004 - 2019





Summary

- There are multiple factors that influence discharge at Wakulla Spring
- The relationship between short-term Spring Creek Springs Group reversal events and long-term sea level changes appear to have an effect on changes in discharge at Wakulla Spring
- Further investigations into these processes and other factors may provide more insight into additional drivers of Wakulla Spring discharge



Questions?