Shark River Slough Compliance

Technical Oversight Committee meeting August 11, 2020 Donatto Surratt, PhD

Everglades National Park

Main operational findings

- WY2019 compliance for Shark River Slough
 - Water levels started the year lower than normal since WY2006
 - More than 50% of the annual flow occurred under 9.2 ft at S333 headwater
 - Water levels during the dry-wet season transition remained at or below 9.2 ft
 - Substantial water was delivered to NESRS during this transition period
 - Most past years a larger fraction of this water was routed to South Dade or not discharged
 - Much of this water was incorporated in compliance determination
 - TP concentration in these waters were higher than 10 ppb

Compliance for Shark River Slough under Appendix A



Frequency of exceedances since WY2007 = 25%

Compliance for Shark River Slough under Appendix A



TP when flowing

S333 tends to be the main source of flow to ENP during the dry-wet season transition



TP all conditions

S333 tends to have higher concentrations than the S12s and S356, especially during the Apr-Jul period





- No TP < 8
 <p>ppb when
 S333_H stage
 < 8.5 ft</p>
- Few TP < 8
 <p>ppb when
 S333_H stage
 < 9.2 ft</p>

S333 flow volume when stages are below 9.2 ft is generally less than 38% of annual flow; WY2019 was the exception at 54%

WYs when flows below 9.2 ft match or exceed flows above 9.2 ft had exceedances of the Long-Term Limit; WY2011, a severe drought year, was the exception



S333 load volume when stages are below 9.2 ft is generally less than 38% of annual load; WY2019 was the exception at 71%



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- WY2019 S333_H started the year lower than even the drought year WY2011
- Then during the normal dry-wet transition hovered around 9 ft, promoting higher concentration in delivered water **Exceedance** was not driven solely by the high Jun sampling event

Thin layer of sediment coating this irregular canal surface can easily be disturbed by turbulent flows



Once disturbed, these sediments can then be entrained into the flow and increase delivered TP concentrations Video courtesy of Jed Rewine, ENP

Turbulent flow is evident in general when structures are open

The turbulence is exaggerated where the structure is linked to a substantial bend in the source canal (Valentin and Martínez-Gomariz (2014))



S333N vs S333

- 2017, Henry Briceño of FIU sampled sediments, preliminary results suggest
 - L67A canal north of S333
 - very little stored sediments
 - L29 canal west of S333
 - high level of sediments at the canal bottom



Summary

- WY2019 compliance for Shark River Slough
 - Water levels started the year lower than normal since WY2006
 - WY2008 and WY2016 were the exception, but both years increased well above 10 ft during the year
 - WY2019 maximum S333 stage was 9.65 ft in Oct and remained below that for the remainder of the year
 - More than 50% of the annual flow occurred under 9.2 ft at S333 headwater
 - Water levels during the dry-wet season transition remained at or below 9.2 ft
 - Substantial water was delivered to NESRS during this transition period
 - Most past years a larger fraction of this water was routed to South Dade or not discharged
 - WY2019 much of this water was incorporated in compliance determination
 - TP concentration in these waters were higher than 10 ppb