High Discharge Events: Effects on St. Lucie Estuary and an Estuarine Predator

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Water Flow Alteration

HISTORIC FLOW

CURRENT FLOW

U.S. Army Corps of Engineers, Jacksonville District
High Discharge Events (2008-2014)
High Discharge Events (2008-2014)

Daily Avg Flow at S_80 (cfs)
High Discharge Events (2008-2014)
High Discharge Events (2008-2014)

The graph shows daily average flow at S_80 (cfs) with a high flow threshold indicated by a red line. The years 2008 to 2014 are labeled on the x-axis, and the flow is measured on the y-axis, ranging from 0 to 7000 cfs. Four high discharge events are highlighted:

1. 2008
2. 2010
3. 2013
4. 2014

These events exceed the high flow threshold indicated by the red line.
Effects on Abiota/Biota

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Common snook

- Euryhaline, tropical sportfish
- Protandric hermaphrodite
- Behavioral contingents

Adapted from Tampa Bay Soundings
Snook: Diane Peebles
Passive Acoustic Telemetry
Receivers in St. Lucie

Vemco

Sea-Bird Scientific

North Fork
Mid Estuary
Inlet
South Fork
Main Estuary
High Discharge Events (2008-2014)
2008 Snook Movement

- Inlet
- Main Estuary
- North Fork
- Mid Estuary
- South Fork

Daily Avg Flow (cfs)
2013 Snook Movement

- Inlet
- Main Estuary
- North Fork
- Mid Estuary
- South Fork

Daily Avg Flow (cfs)
Individual 9763 Movement

- Moving towards the inlet: Blue line
- Moving towards forks and tributaries: Green line

Distance From C-44 Canal

Flow (cfs)

Dates:
- 8/20
- 8/25
- 8/30
- 9/4
- 9/9
- 9/14
- 9/19
- 9/24
- 9/29
Individual 9764 Movement

Distance From C-44 Canal

Flow (cfs)


= moving towards the inlet

= moving towards forks and tributaries
Individual 9770 Movement

Flow (cfs)

Distance From C-44 Canal

- 0 = moving towards the inlet
- = moving towards forks and tributaries
Individual 9776 Movement

Distance From C-44 Canal

Flow (cfs)

- = moving towards the inlet
- = moving towards forks and tributaries
Individual Movement

Lots of Individual Variation!!

- Blue dots = moving towards the inlet
- Yellow dots = moving towards forks and tributaries
Summary

• Discharges greatly decrease salinity
  – No large change in temperature
• Population scale
  – Snook don’t have distinct movement patterns
• Individual scale
  – Some show movement coincident with discharges
  – So much variation
• Bet-hedging
• Population level resilience
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Questions?