Synopsis of Caloosahatchee Science Workshop

November 19-20, 2013

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Workshop Objectives

- Summarize major environmental challenges facing the Caloosahatchee
- Discuss indicators for assessing environmental condition and tracking progress
- Identify gaps where more information would improve our ability to manage and restore the system

Workshop Structure

- Experts were invited to speak about ecosystem health
- Break-out sessions were convened
- The workshop closed with a final panel to synthesize findings

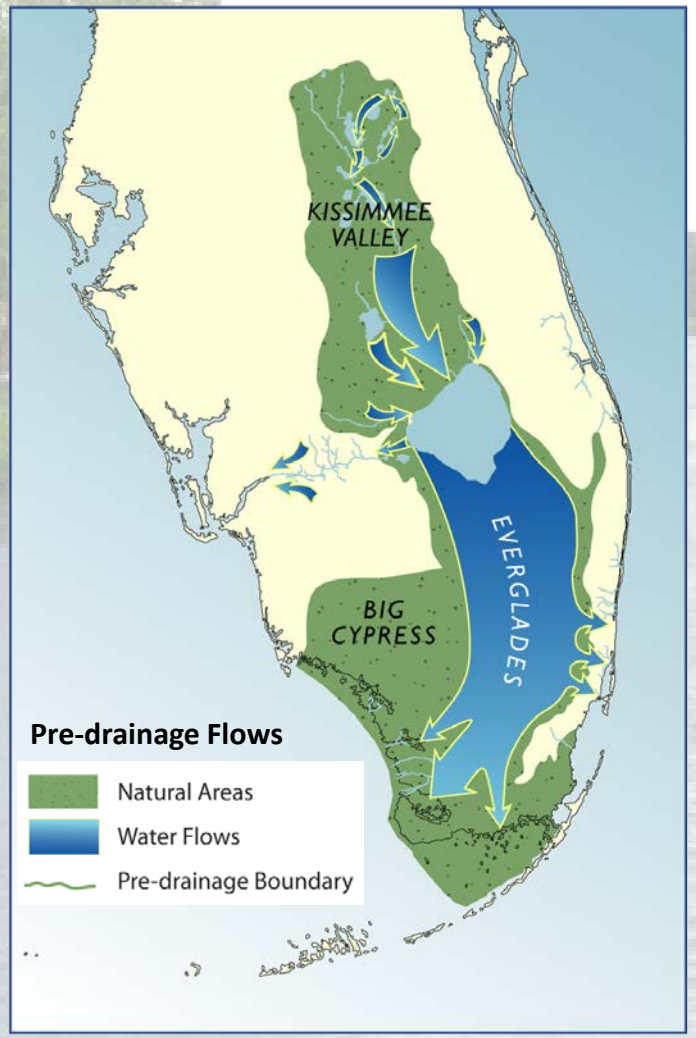
Workshop Attendance and Participation

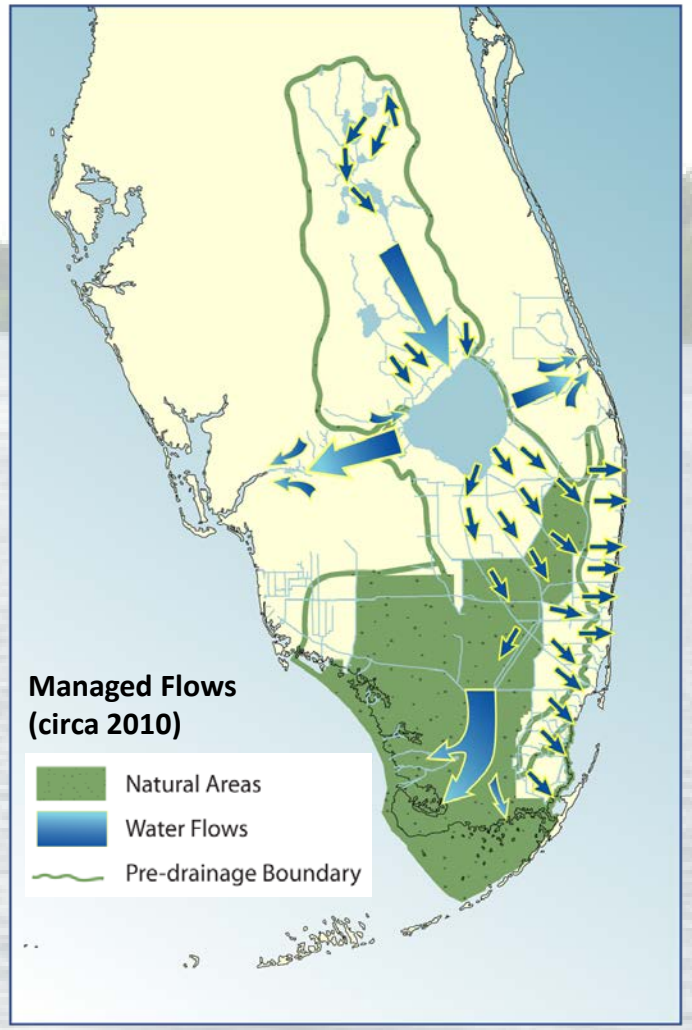
- Multiple governmental, non-governmental, and other interested stakeholders (75-150 people)
- Invited Speakers
  - FGCU (James Douglass, Leslie Haynes, Katie McFarland, Darren Rumbold, Greg Tolley); FWCC (Gregg Poulakis); Mote (Jim Culter); Johnson Engineering (Dave Ceilley); SCCF (Rick Bartleson & Eric Milbrandt); USF (Chloe Delhomme); FDEP (Melinda Brown)
- Final Panelists
  - James Evans (Sanibel); Judy Ott (CHNEP); Pete Quasius (Collier County Audubon Society); Jennifer Carpenter (FDEP)


Florida Gulf Coast University


Investigation of Environmental
Tolerances of the Invasive Green Mussel,

Water Flows: "too much during wet season" versus "too little during dry season"

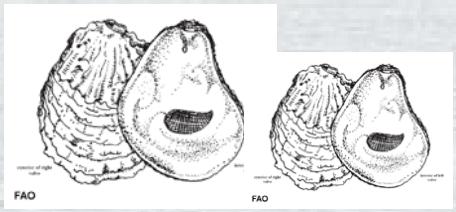


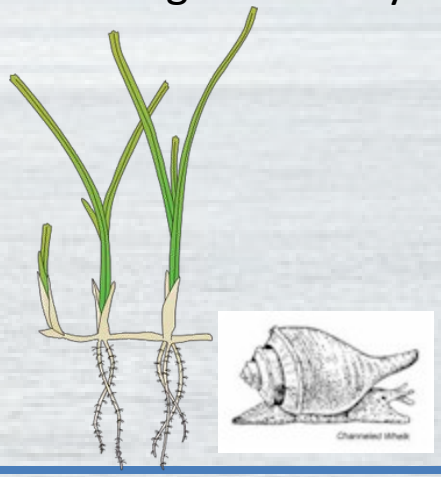


Indicators and Salinity

Prefer Low Salinity

Prefer Higher Salinity





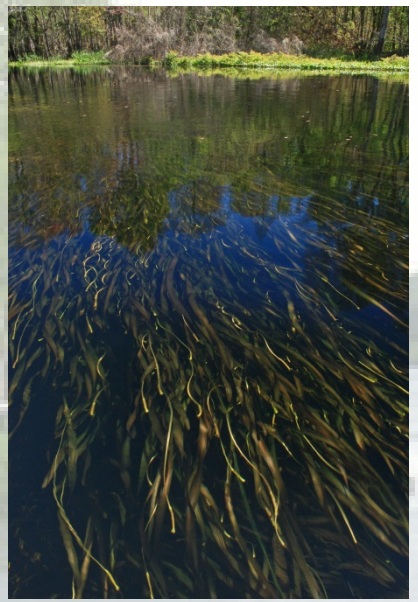
0 5 10 15 20 25 30

Salinity Gradient

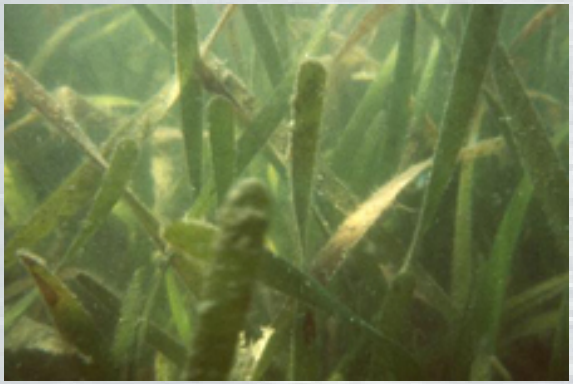
Ecological Indicators in the Caloosahatchee

- Monitoring some of these indicators for over a decade
  - Are they telling us what we need to know?
  - Are they still appropriate?
- Understanding of the Caloosahatchee has increased since the original ecological model
  - Are there other useful indicators we should be using?

What we learned: SAV and oysters



steady



What we learned: algal blooms

Stagnant waters (photo from 2008)

Result of high flows? (photo from 2003)

What we learned: fish

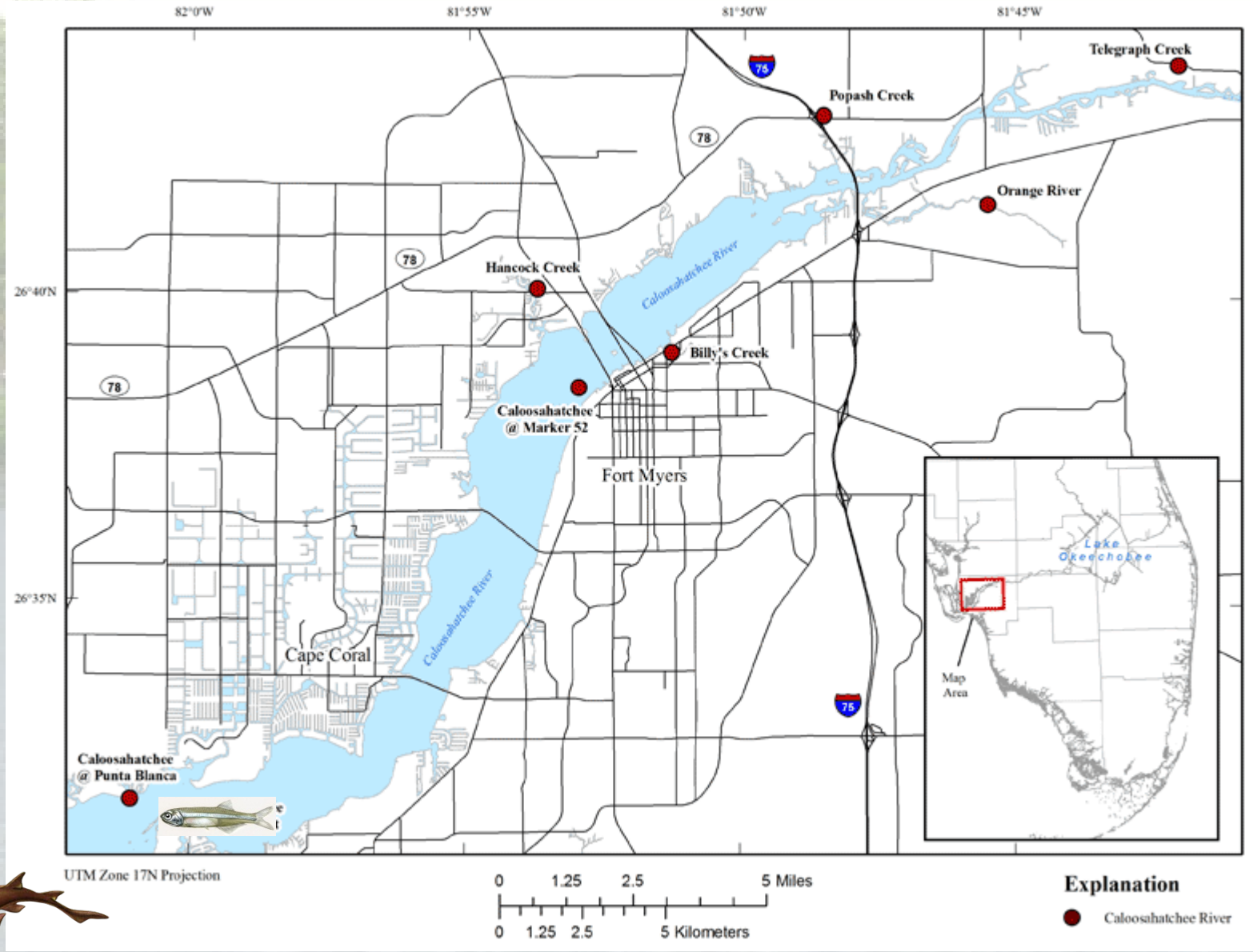


Table 3. Summary table of indicators providing salinity ranges, recommended flow regimes, temperature tolerances, other important stresors to consider, and proposed use to management.

Indicator	known salinity range?	recommended flow regime?	temperature?	Other important stressors?	Use to management?
Vallisneria	<10	>450 cfs		grazing; light	low salinity indicator; upper estuary
Halodule	20-30			light	moderate salinity indicator; mid- to lower estuary
Thalassia	>30	<2800 cfs		light	high salinity indicator; lower estuary and San Carlos Bay
oysters	15-30	1000-3000 cfs	<30		moderate salinity indicator; mid- to lower estuary
phytoplankton		1000-3000 cfs		high residence times	moderate flow indicator; establishment of productivity "sweet spot" in mid-estuary.
zooplankton		0 < x < 3000 cfs			moderate flow indicator; establishment of productivity "sweet spot" in mid-estuary.
cyanobacteria		>0 cfs	>25	high P	canary in the coal mine; stagnant waters
drift algae	>30		<25	grazing	canary in the coal mine; nutrient loading too high?
bony fishes					habitat fragmentation; zooplankton/food movements and location
sawfish	18-30		>30		food movements in river
oxbows					historical resource; use for backwater/protected water studies; nursery for *Vallisneria*
green mussels	>15		<30	desiccation; cold temperatures	SLR indicator; subtidal indicator

Summary of Findings

- Indicators are responding to river flow (and salinity)
- General agreement in optimal flow conditions
  - >450 cfs
  - <3000 cfs
- Can a “sweet spot” be created?
  - Optimize habitat spatially
  - Optimize productivity

Gaps

- Recovery periods?
  - *Vallisneria*
  - *Thalassia*
- Plankton and flow
- Need to collate and analyze available data
- Need for new spatial surveys and aerial maps

Panel summaries

- Need for a science working group
- Need to link various indicator responses
  - How are they responding similarly?
  - How are they responding differently?
- Need to study planktonic (water column) communities (phytoplankton and zooplankton)