

Minimum Flow for Crystal River/Kings Bay

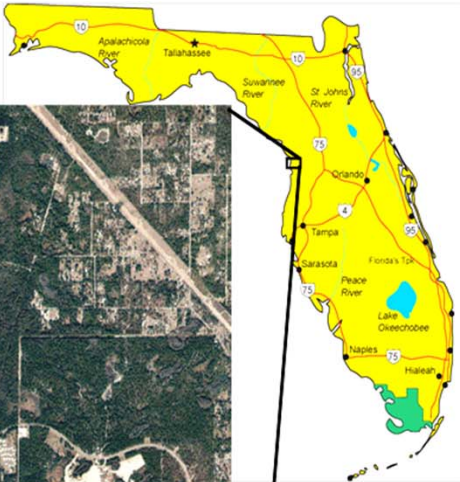
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Withlacoochee Regional Water Supply Authority Meeting
January 18, 2017



**WITHLACOOCHEE
REGIONAL
WATER
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AUTHORITY**



§ 373.042, Fla. Stat.

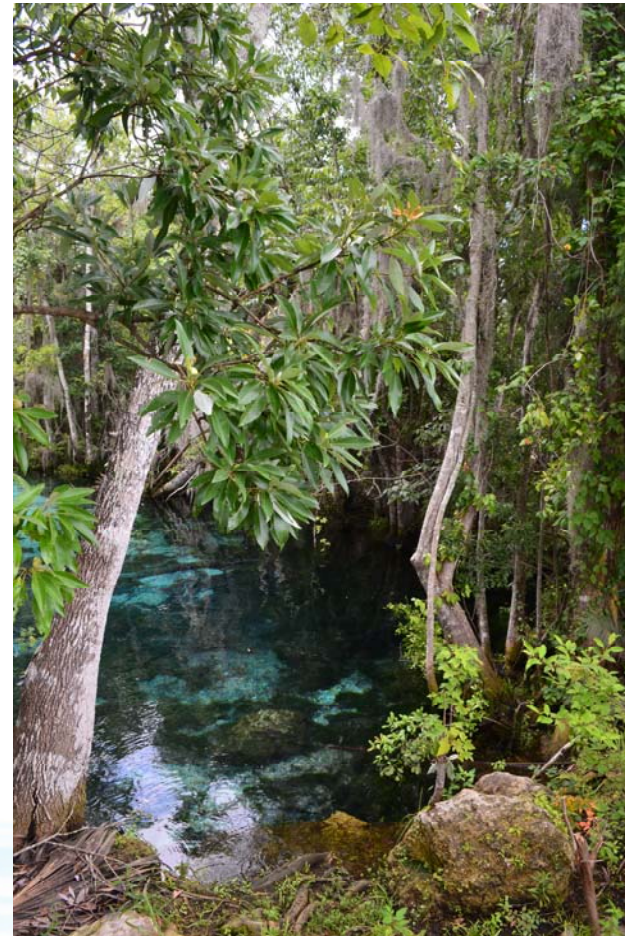
“The minimum flow for a given watercourse shall be the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area.”



18 Peer Reviews of 15% Change

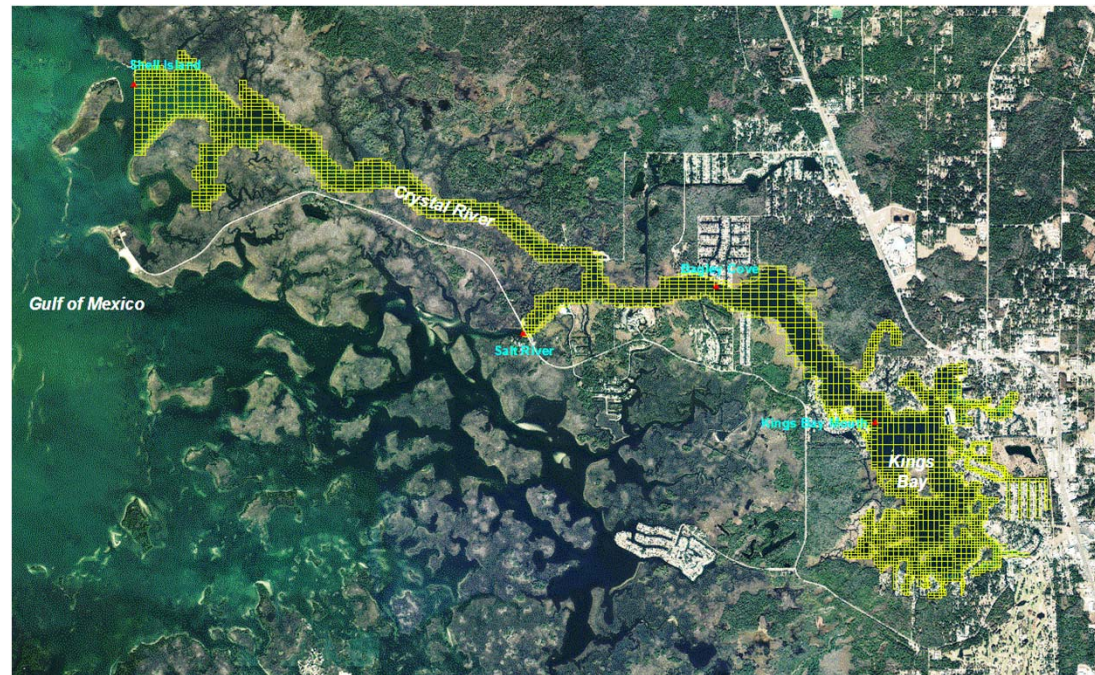
- “Reasonable”
- “Appropriate”
- “Innovative”
- “Rational and pragmatic”
- “Protective”
- “Prudent”

• ~~Perfect~~

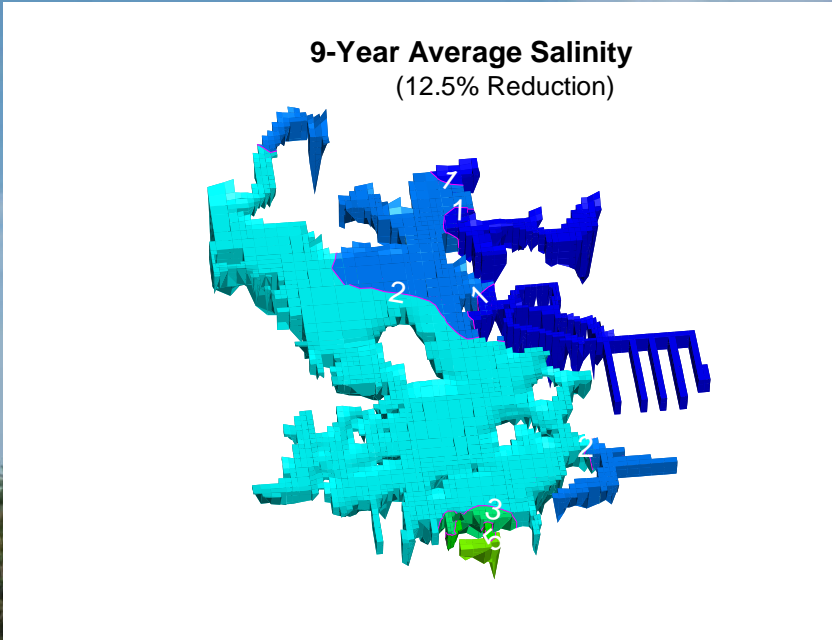
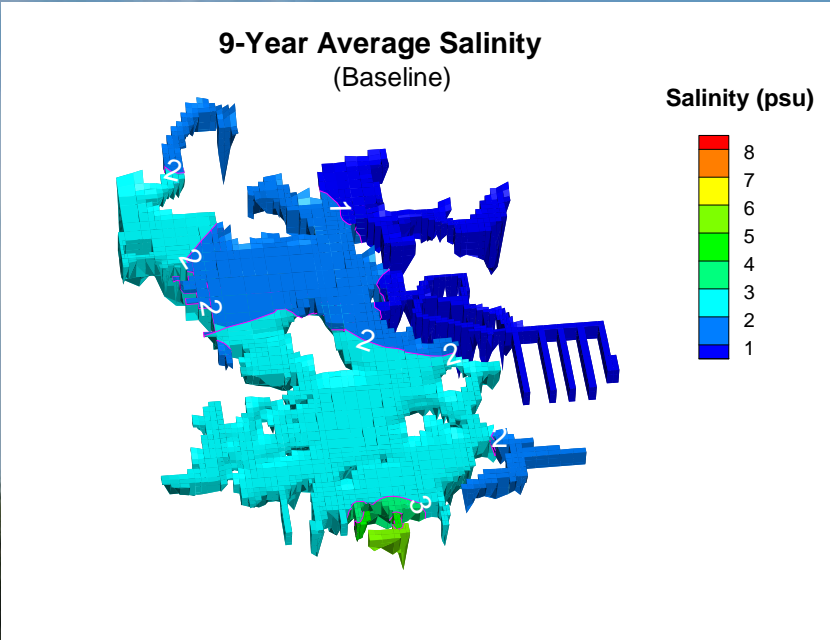


Accurate Prediction

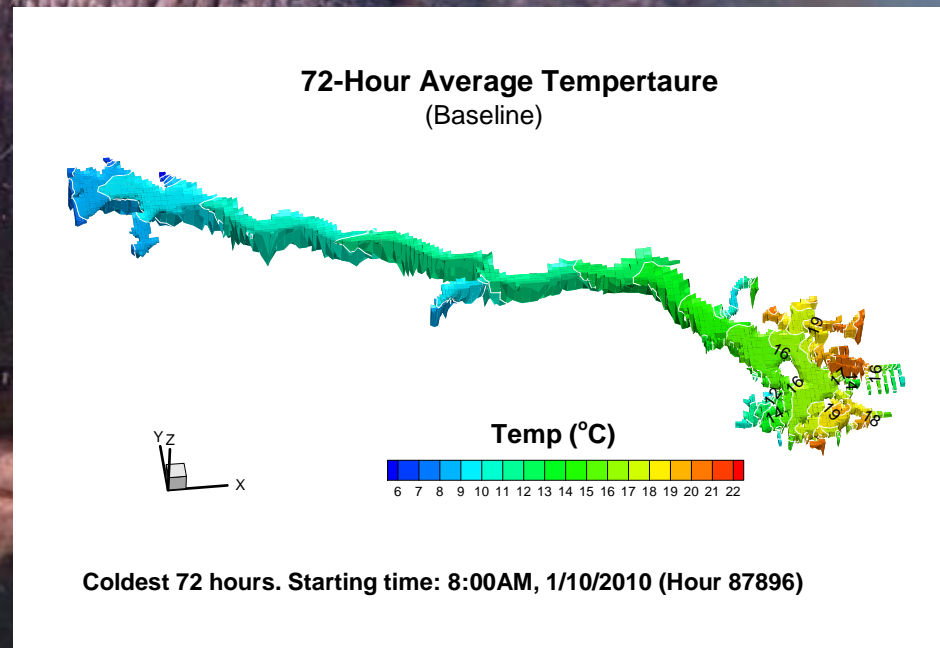
- Water Level:
98%
- Salinity:
75%
- Temperature:
90%



Chen, XinJian. 2012. Simulating hydrodynamics in a spring-fed estuary using a three-dimensional unstructured Cartesian grid model. *Estuarine, Coastal and Shelf Science* 115: 246–259.



- Two kinds of manatee stress: chronic and acute
- Enough warm water for several times current manatee use



Measuring Springflow is Challenging

- USGS Bagley Cove gage flow from 2002 through 2015 averages 447 cfs and is tidally-influenced
- Water budget: 20 in/yr of recharge in the springshed yields a springflow of 455 cfs
- 900+ cfs from the 1960-70s includes marine water and springwater; would require 40 in/yr of recharge in springshed (not realistic)
- Peer review panel believes spring flow varies between 300 and 450 cfs – and not much different in the 1960s based on little change in Floridan aquifer water levels over the last 50 years

NDM 5 - Withdrawal Impact

Year	Non-pumping flow (cfs)	Pumping Flow (cfs)	Impact(cfs)	Impact(%)
2010	449.0	442.1	6.9	-1.5
2014	449.0	443.8	5.2	-1.1
2035	449.0	438.1	10.8	-2.4
2035 w/ Conserv & Reuse	449.0	439.4	9.6	-2.1

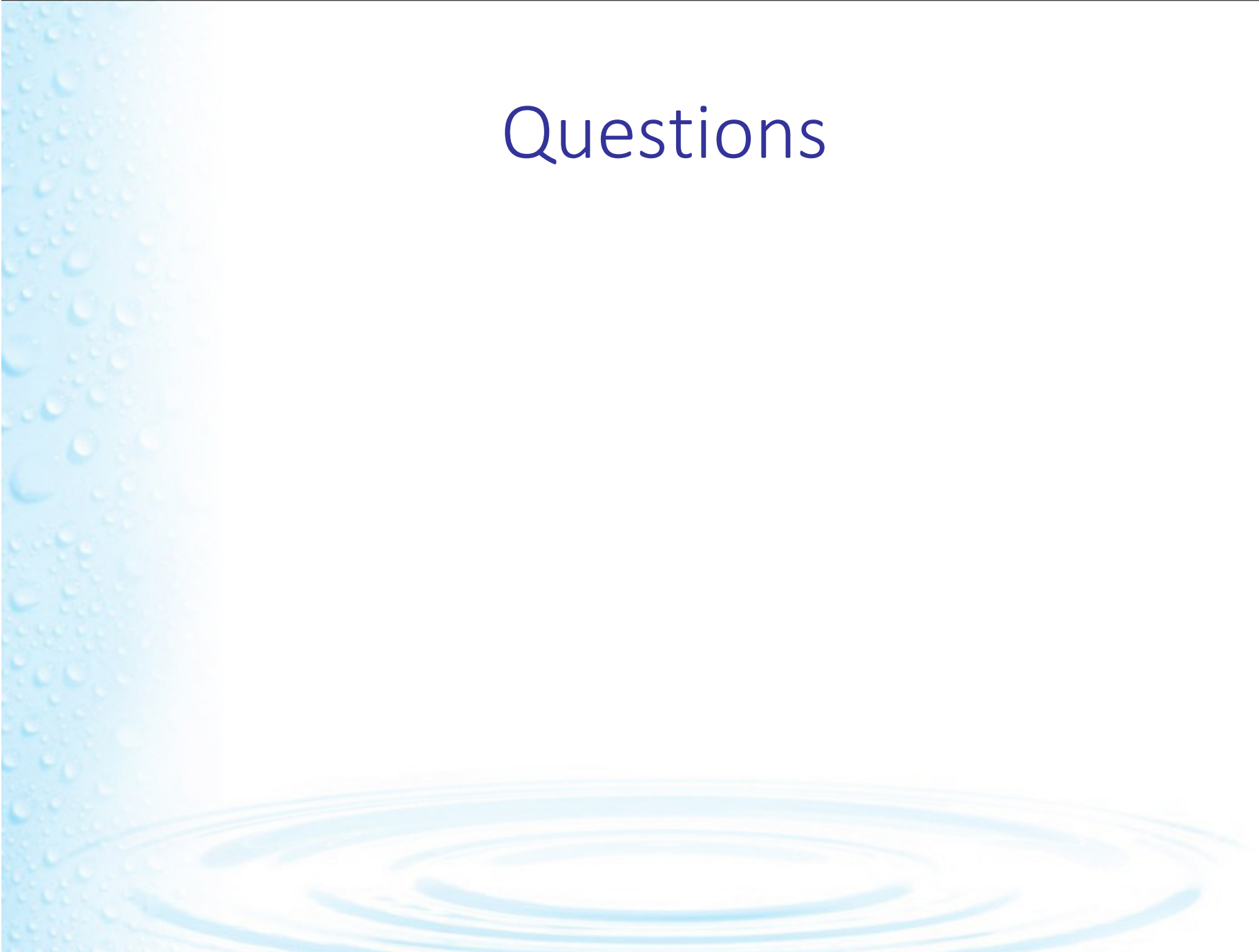
Minimum flow recommendation

- 12 percent-of-flow
- Based on low-salinity (2 ppt) habitat
- No recovery or prevention needed
BECAUSE
 - 1.5% current impacts
 - 2.5% anticipated 2035



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Questions



Southwest Florida *Water Management District*

