

Use of Snook Thermal Refuge Criteria for Minimum Flows Development in Coastal Springs

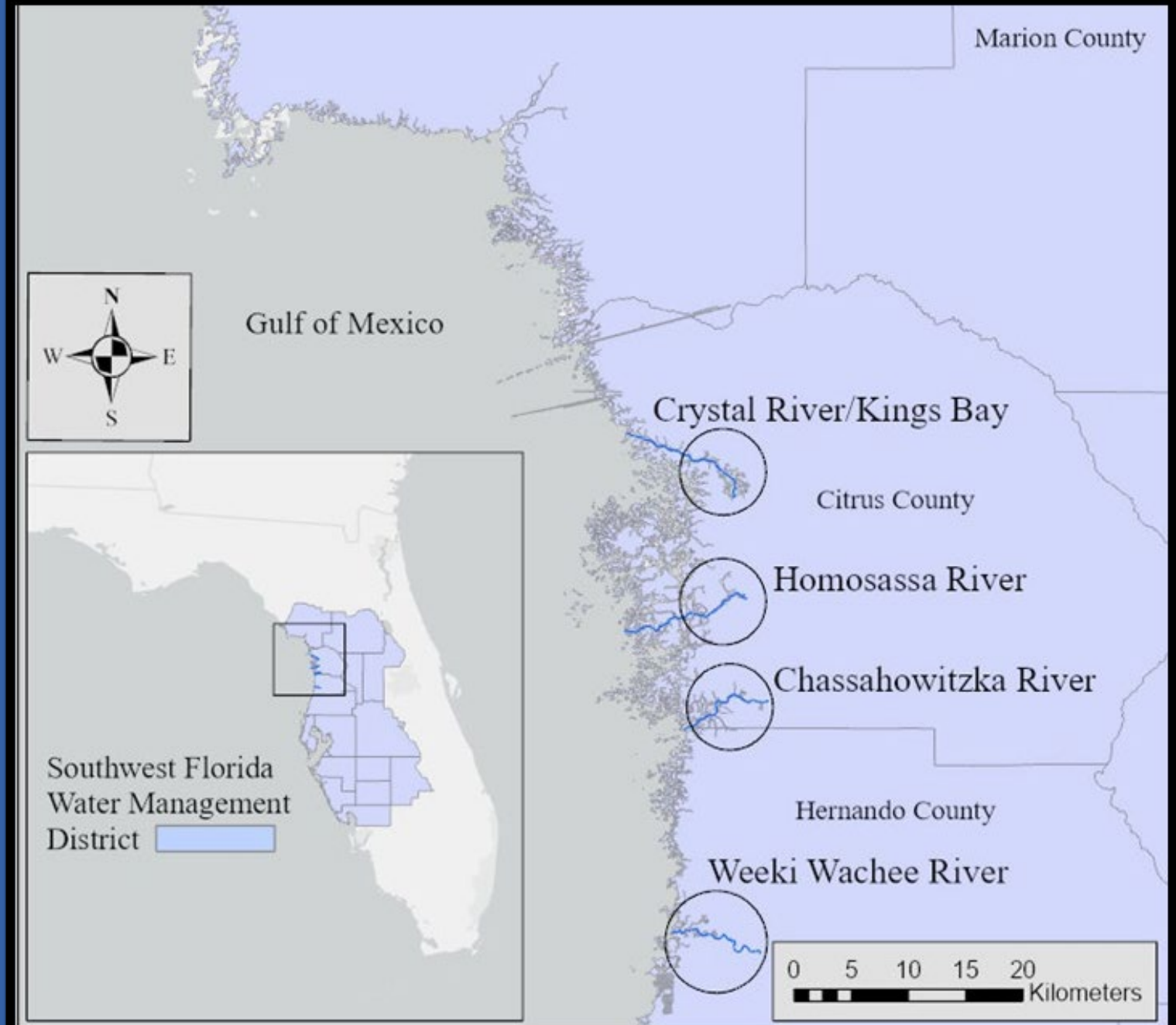
UF Water Institute Symposium
February 23, 2022

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Why Establish Minimum Flows?

- Required by state law for flowing waters (Section 373.042, F.S.)

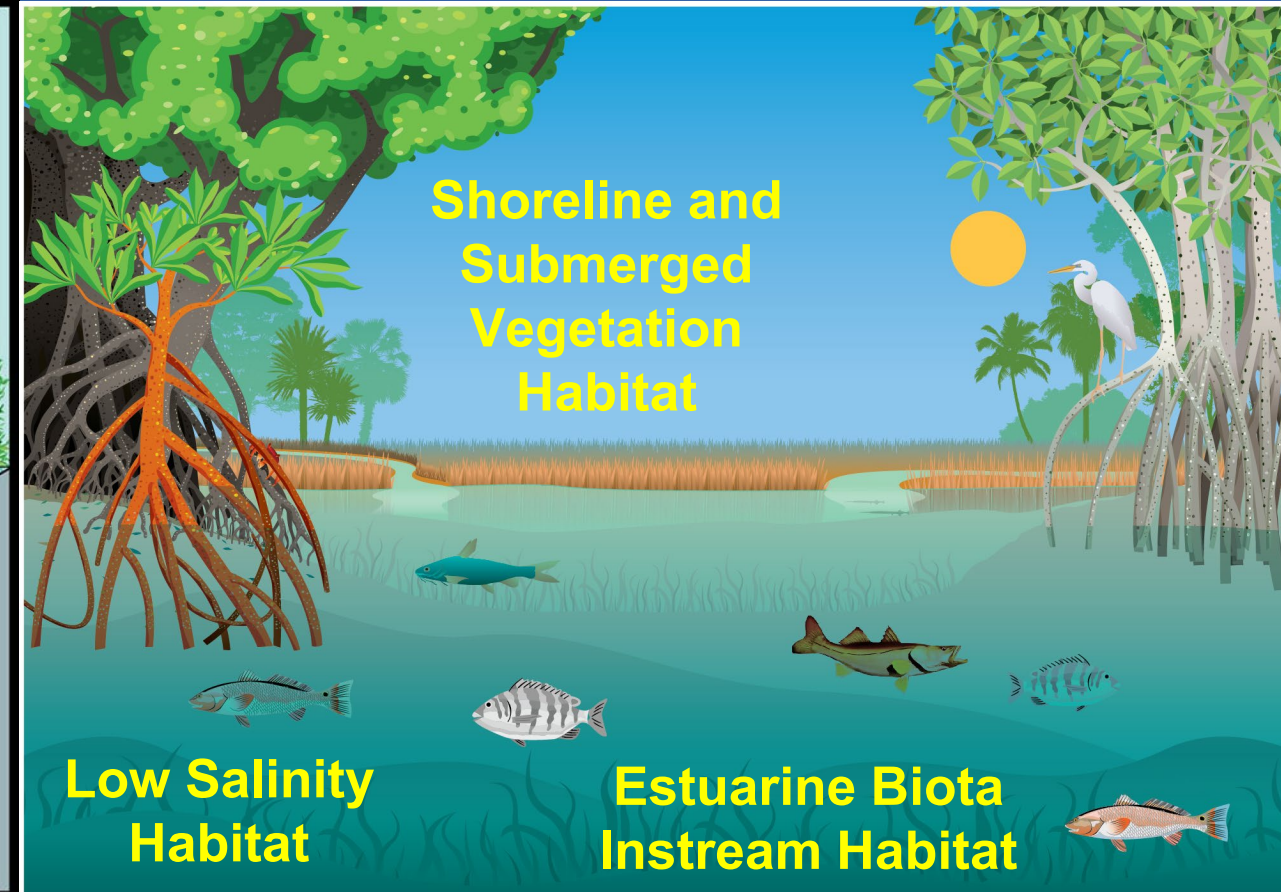
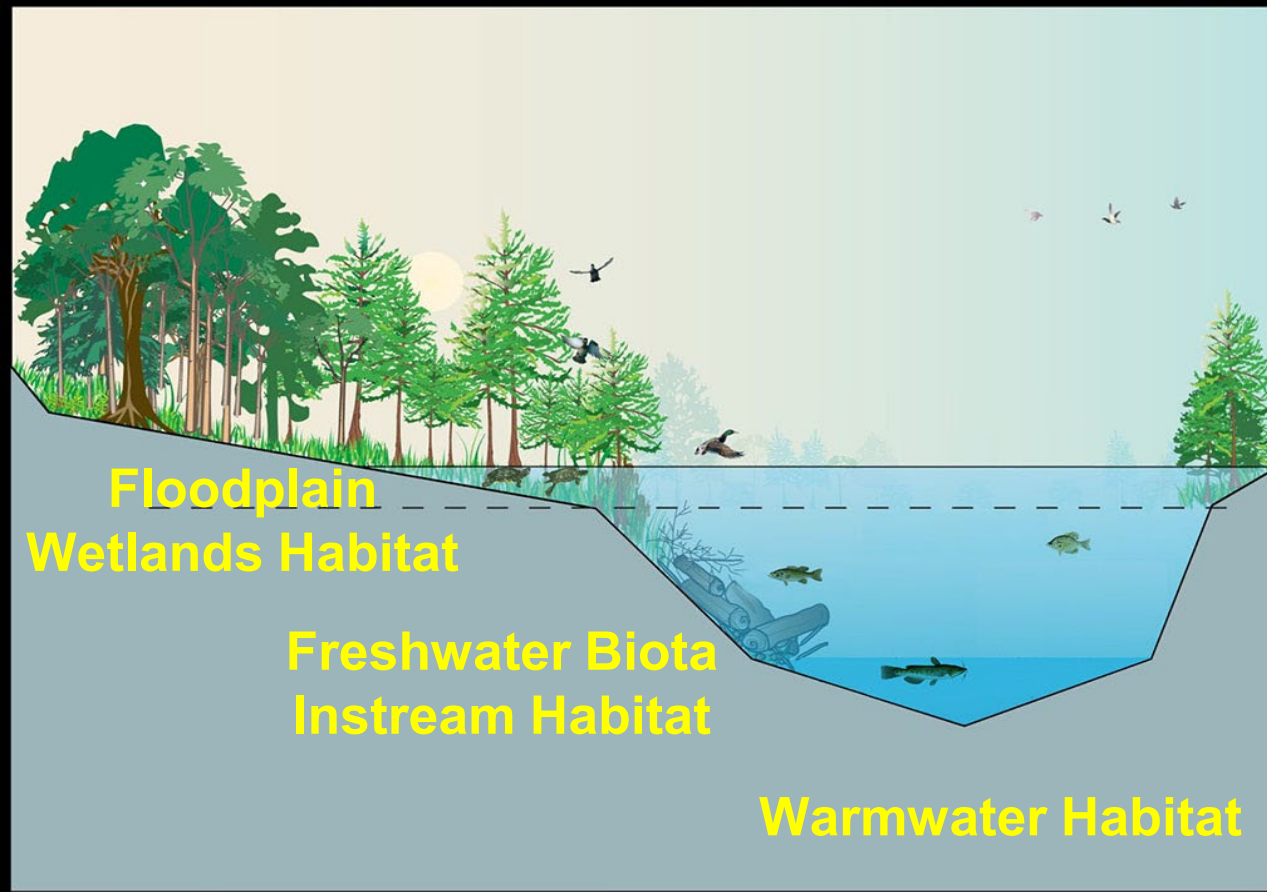


What are Minimum Flows?

- Limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area
- Established to protect flowing systems from impacts due to ground and surface water withdrawals
- Used by the District to:
 - Protect water resources
 - Supports water use permitting
 - Supports water supply planning



Coastal Springs Systems Minimum Flows Development: A Habitat-Based Approach



How Do Changes in Flow From Withdrawals Affect Habitat?

Common Snook Use of Coastal Springs Systems as Winter Thermal Refuge

- Common Snook:
 - High profile, ecologically and economically important recreational fish
 - Northward range expansion in recent years
- Fish surveys conducted from 2013-2019 demonstrated use as winter thermal refuge
- Recent study detailed use of Homosassa as winter thermal refuge



Recent Re-Evaluations of Minimum Flows for Chassahowitzka and Homosassa River Systems

- Protection of warmwater habitat for Common Snook winter thermal refuge identified as one criteria to examine when minimum flows were recently re-evaluated
- First time this criterion was used for minimum flows development/re-evaluation

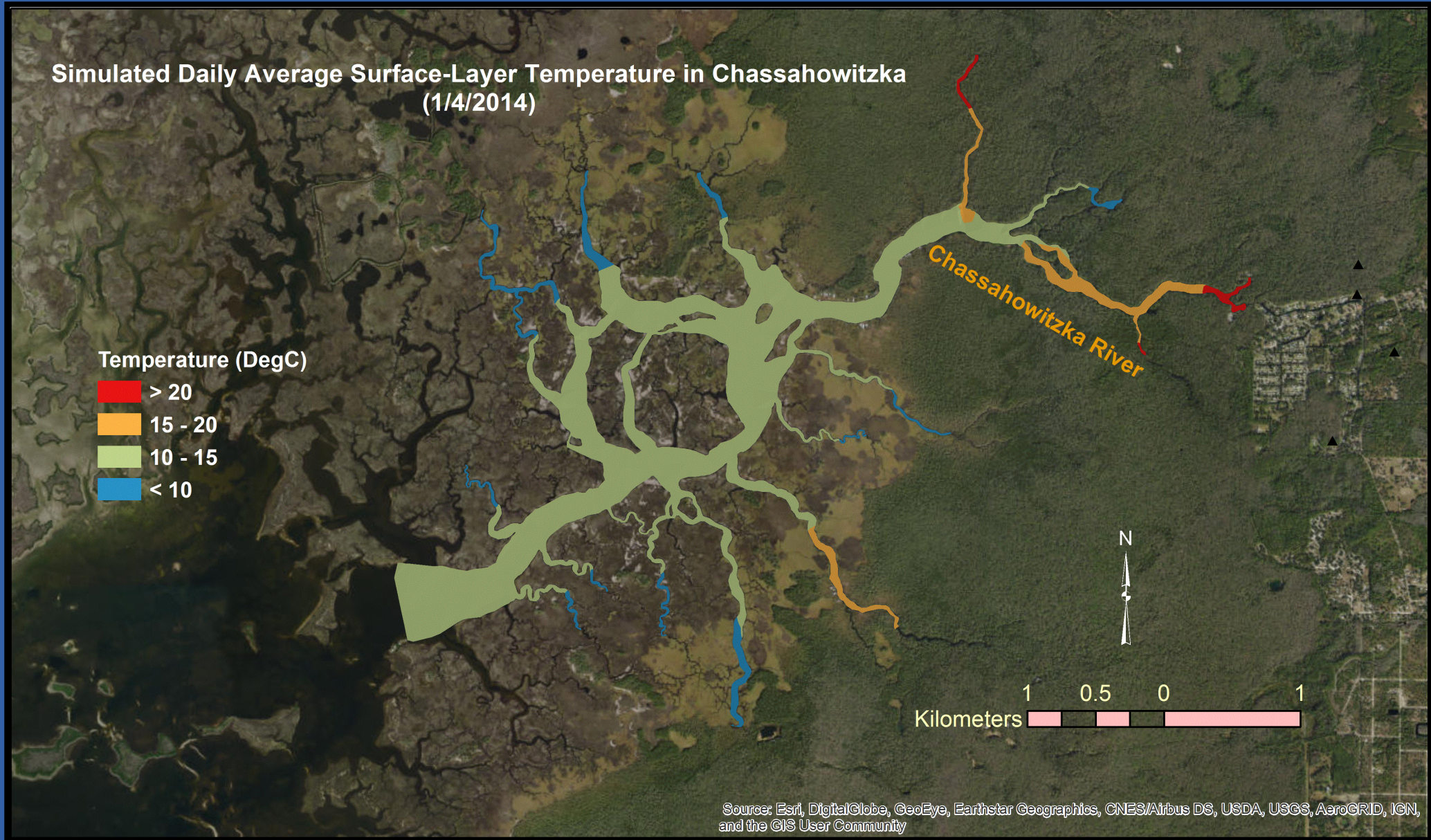


Definition of Common Snook Thermal Refuge Habitat

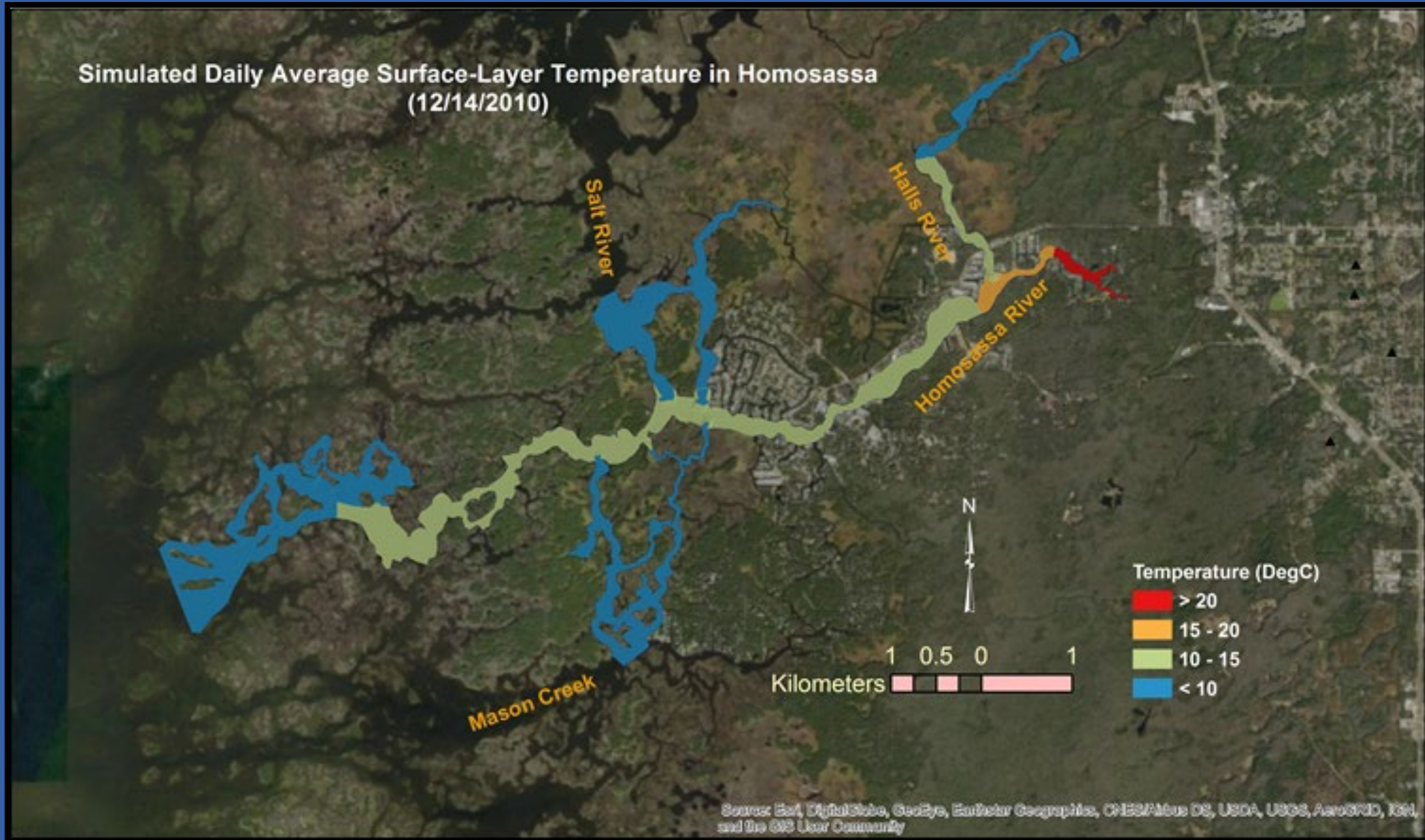
- Stress to Common Snook identified as when temperatures drop below 15° C for ≥ 24 hours
 - Stop feeding at 14.2° C
 - Lose equilibrium at 12.7° C
 - Die at 12.5° C
- Hydrodynamic model identifies warmwater habitat and predicts impacts of reduced flows
- Compare flow scenarios
- Evaluate available habitat area and volume



Common Snook Habitat Modeled as Area and Volume $>15^{\circ}\text{C}$



Common Snook Habitat Modeled as Area and Volume $>15^{\circ}\text{C}$

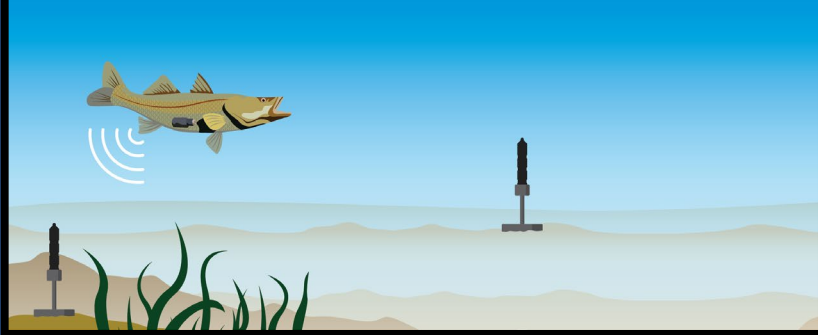


Common Snook Thermal Refuge Habitat Impacts (Exposed to $<15^{\circ}\text{C}$ During Most Sensitive 24-Hour Period)

	Chassahowitza River System Snook Habitat Change (%)	Homosassa River System Snook Habitat Change (%)
Volume	8%	6%
Area	11%	5%

Flow Reductions Corresponding to 15% Decrease in Available Habitat

Refining Definition of Common Snook Thermal Refuge Habitat for Upcoming Re-Evaluation of Kings Bay/Crystal River Minimum Flows



Questions?

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