

Progress Toward Restoring the Everglades: The Ninth Biennial Review, 2022

Committee on Independent Scientific Review of
Everglades Restoration Progress (CISRERP)

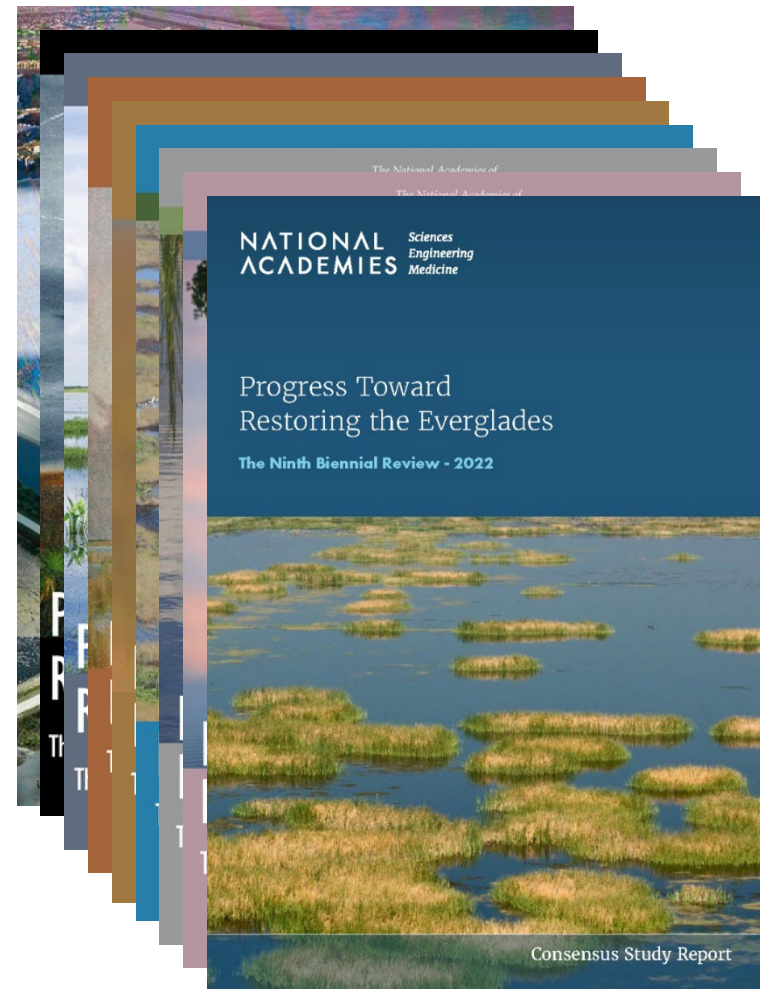
Denice Wardrop, Committee Chair

Stephanie Johnson, Study Director

Committee Charge

Produce reports every two years that:

1. Assess progress in restoring the natural system
2. Discuss significant accomplishments of the restoration
3. Discuss and evaluate scientific and engineering issues that may impact natural system restoration progress
4. Review monitoring and assessment protocols for evaluation of CERP progress



Committee Membership

DENICE WARDROP (Chair), Pennsylvania State University

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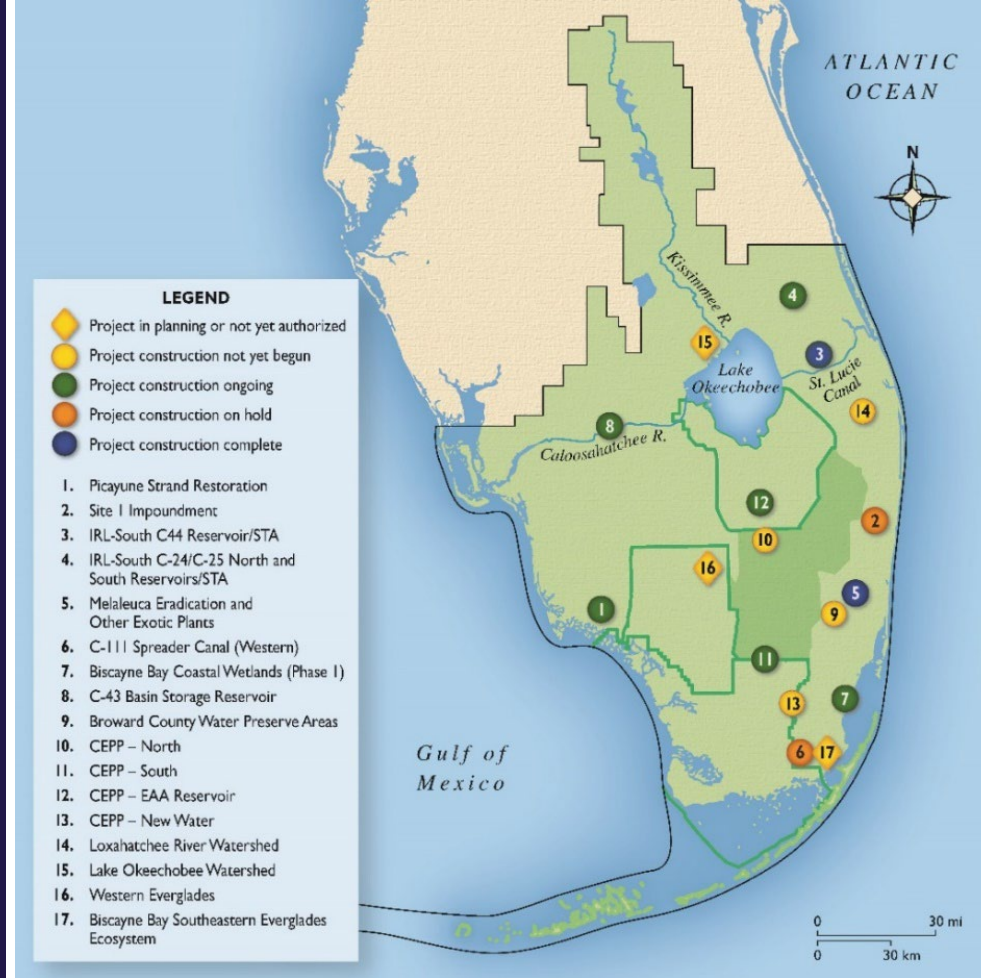


Restoration Progress



Restoration Progress

- Record funding levels are expediting restoration progress
- Hydrologic and vegetative response evident over large areas (COP, Picayune Strand)
- Rigorous approach to address uncertainties in ASR
- With record implementation, increased need for analyzing and synthesizing natural system response

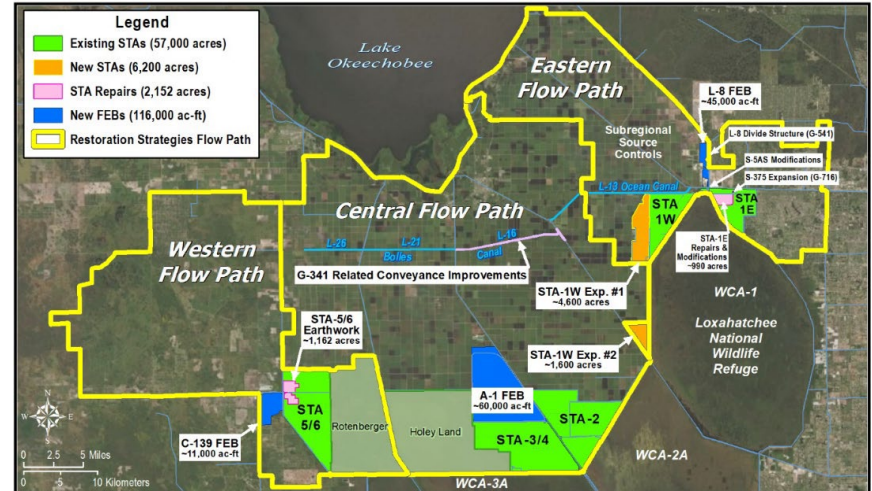
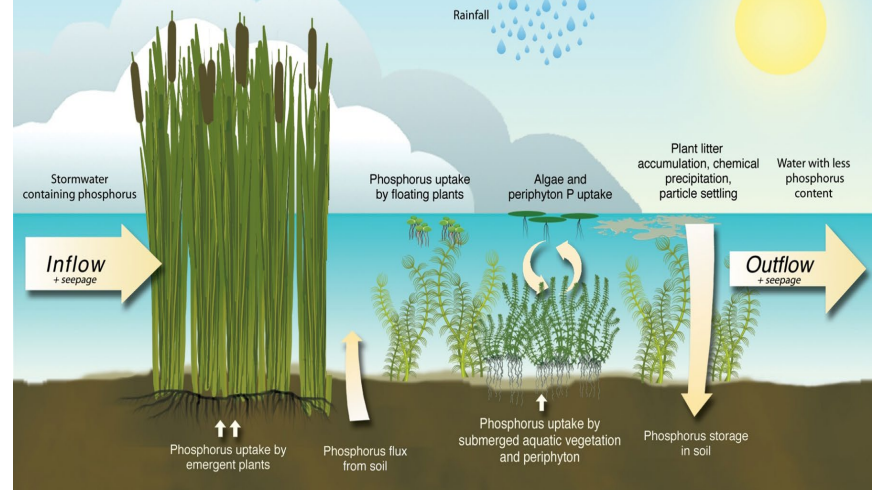


Stormwater Treatment Area (STA) Water Quality and CERP Progress



Stormwater Treatment Areas: Objectives

- 10 ppb TP criterion established in Everglades Protection Area in 2003
- Establishment of WQBEL in 2012
- *Annual FWM STA discharge not to exceed 13 ppb in more than 3 out of 5 yrs and 19 ppb in any year*
- Restoration Strategies developed to meet these targets

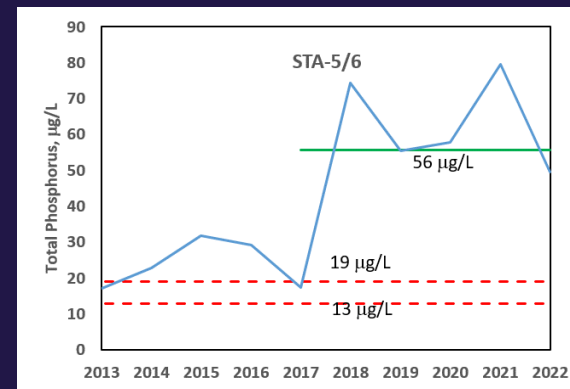
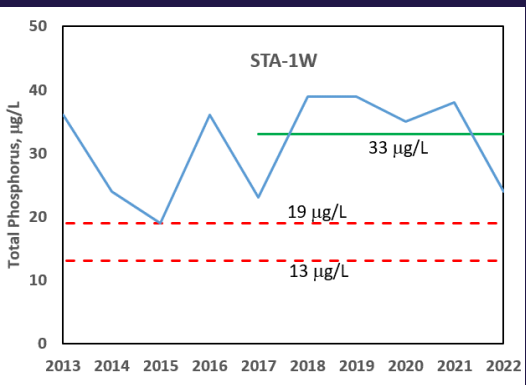
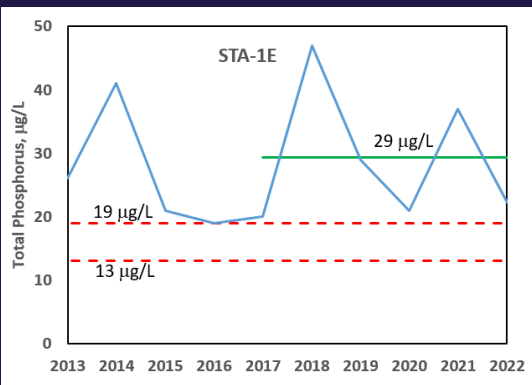
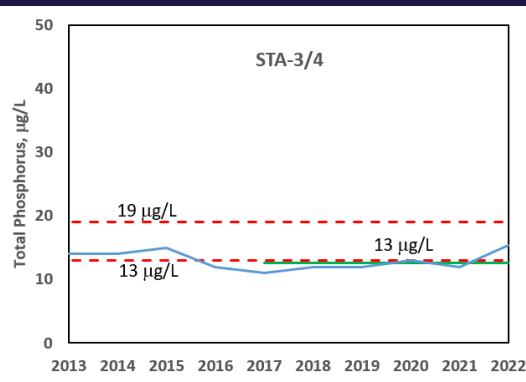
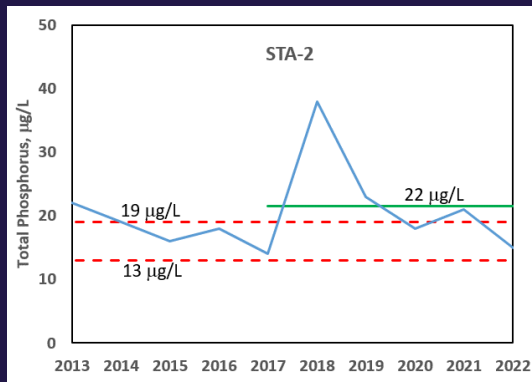


Stormwater Treatment Areas: Linkage to CERP

- Full benefits of CEPP N and CEPP EAA Reservoir dependent on WQBEL attainment. If WQBEL not met:
 - CEPP N canal filling could increase exceedances
 - EAA Reservoir flow benefits could be reduced to 44% of projected flows
 - STA sized based on use of STA 2 and 3/4



STAs: Current Status



***Substantial work ongoing in Restoration Strategies to meet WQBEL by 2027.

Flow-weighted annual mean TP concentrations shown. The solid green line indicates the average flow-weighted annual mean TP concentration during the most recent 6 years.

STAs: Challenges and Opportunities

	Inflow TP concentration µg/L	Outflow TP concentration µg/L	Treatment efficiency (%)
STA 1-E	157	29	81
STA-1W	194	33	83
STA-2	102	22	79
STA-3/4	84	13	85
STA-5/6	218	56	74



STAs: Challenges and Opportunities

	Inflow TP concentration $\mu\text{g/L}$	Outflow TP concentration $\mu\text{g/L}$	Treatment efficiency (%)	Future efficiency to meet 13 $\mu\text{g/L}$ TP	Future efficiency to meet 19 $\mu\text{g/L}$ TP
STA 1-E	157	29	81	92	88
STA-1W	194	33	83	93	90
STA-2	102	22	79	87	81
STA-3/4	84	13	85	85	77
STA-5/6	218	56	74	94	91

Strategies to meet the WQBEL:

1. Improve TP removal efficiency;
2. Increase the STA footprint;
3. Decrease TP loading



Recommendations

To support and sustain WQBEL attainment, the SFWMD should implement a rigorous adaptive management framework that includes:

- Establishment of near-term milestones for each flow-way;
- Establishment of an independent science advisory committee (like ASR);
- Consideration of phosphorus inflow concentrations and loading as key drivers affecting WQBEL attainment;
- Additional monitoring, research, analysis and modeling to help optimize and sustain STA performance.



Restoration in the Context of Climate Change

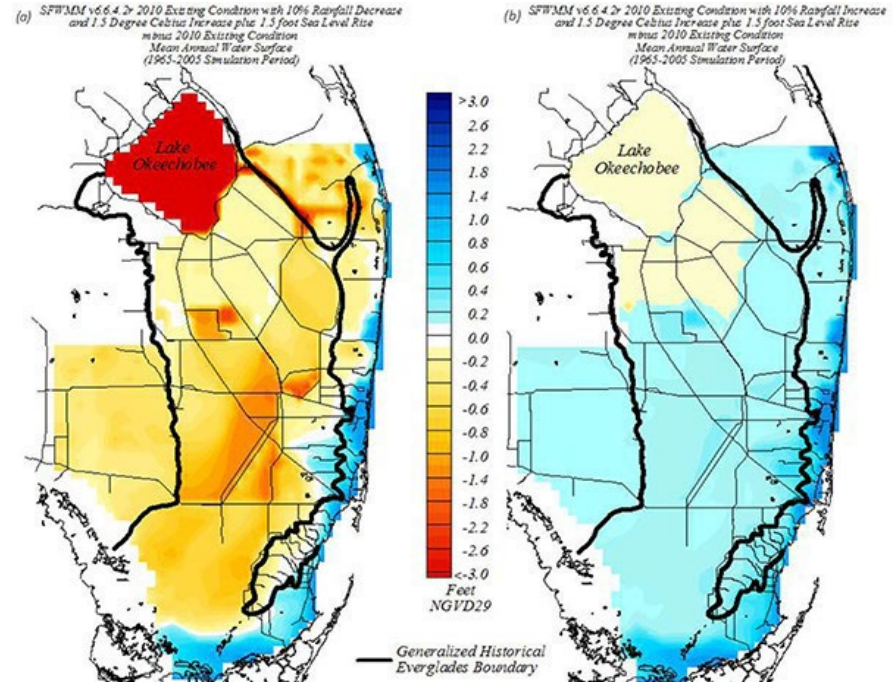


Climate Change in CERP Planning

- Progress in sea level rise consideration
- Lack of use of precipitation/temperature information in quantitative analysis
- Risk of advancing a project that is not viable under climate change

Recommendations:

- USACE develop guidance for quantitative analysis of inland flows
- USACE and SFWMD develop scenarios of future precipitation and temperature and a strategy to use them



CERP Climate Change: Additional Science Needs

- Existing modeling tools constrain CERP planning for SLR and climate change
 - Data/tools to assess progressive sea level change (vs. time slices)
 - Integration of various rates of SLR with hydrologic changes, as well as episodic events



Science Plan to Support Restoration



Science Support for Decision Making

CISRERP 2020 Biennial Report:

- Science even more important as CERP pivots from planning to operations/management
- Revised strategies for monitoring, modeling, and synthesis can strengthen the science support for future decisions

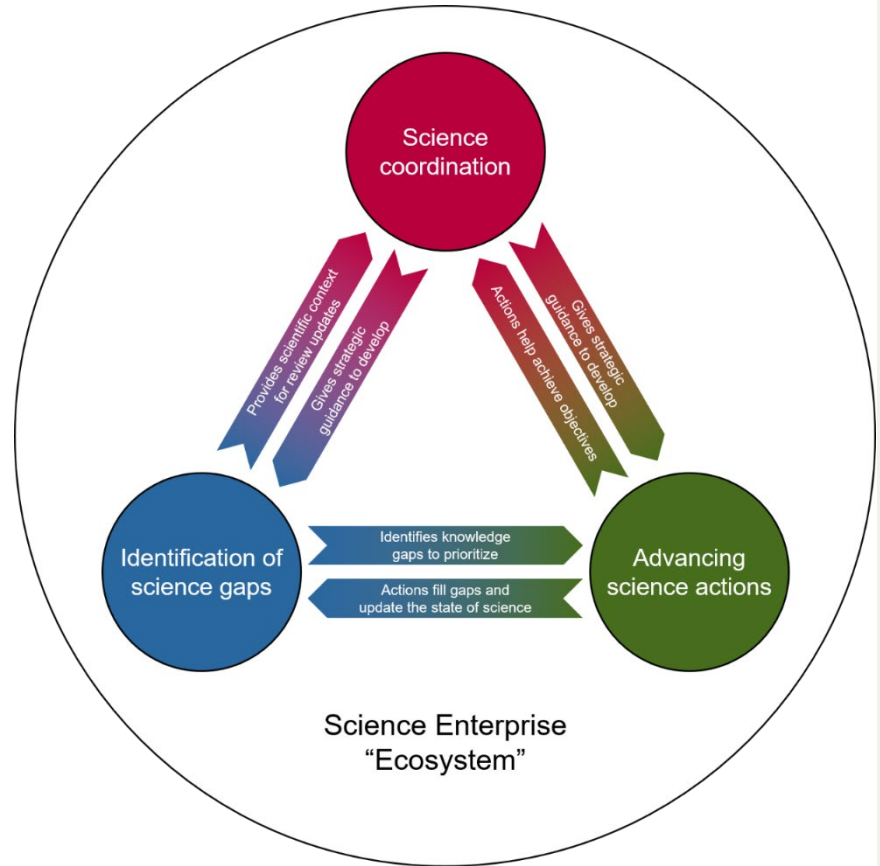


Operations/
management

Project planning

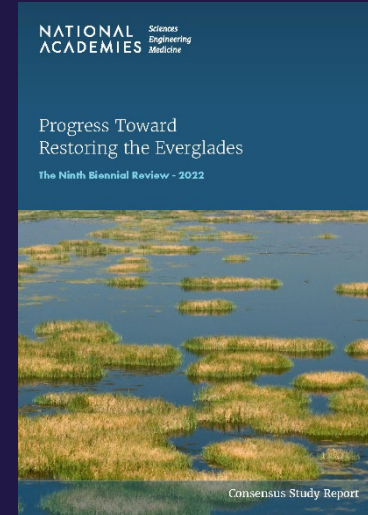
Developing/Implementing the Science Plan

- Restoration progress inhibited by lack of collectively identified science needs to support decisions
 - No recent centralized compilation of critical management questions or knowledge gaps
- Everglades science enterprise should develop a science plan to advance and implement essential science actions that support decision making
 - Requires multiagency and stakeholder coordination
 - Science Coordination Group best positioned to lead multi-agency effort



Summary

- CERP implementation proceeding at a remarkable pace, with record funding
- Large-scale restoration of the natural system now under way
- Two key areas deserve additional attention moving forward: water quality and climate change
- Many opportunities to leverage scientific expertise to address these challenges
- A renewed initiative to develop a multiagency Everglades Science Plan can ensure science support for these and other critical management decisions



2024 Biennial Review—CISRERP X

- 1st public meeting May 8
 - Heard from agencies and stakeholders about issues to consider in 2024 review
 - Common themes include climate change, tribal engagement/use of indigenous traditional ecological knowledge, and adaptive management
- Next meetings: Aug. 2-3 and Sept. 26-28 in South Florida
- Report due to sponsors in September 2024

