Top 10 CERP Science Needs and Gaps

Advancing Total Ecosystem Science for Success

GEER Progress from a Total Ecosystem view?

The Arthur R. Marshall Foundation

Science and Technology Team

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Why the question mark?

- GEER Presentation Title:

  Progress from a Total Ecosystem View?

  – The top level Science Needs and Gaps are virtually the same SNAGs we presented as a poster paper in GEER 2006;

  – Why are there still major SNAGs !?

    - For GE, *progress is our most important product!*

SNAG Number 10

- Wild Card: Suggestions appreciated.
- Comments should be traceable to Comprehensive Everglades Restoration Plan (CERP) goals and objectives.
  - More focus on total ecosystem view CERP Goals and objectives needed for science-based objective-oriented CERP implementation.

  Reference CERP Table 5-1, Yellow Book

CERP Goals and Objectives

Table 5-1 Yellow Book

Goal: Enhance Ecologic Values; Objectives:

- Increase the total spatial extent of natural areas
  - *Potential US Sugar land purchase is progress BIG-time!*
- Improve habitat and functional quality
- Improve native plant and animal species abundance and diversity
  - ***Kissimmee Restoration*** is major GEER progress, model to follow

Goal: Enhance Economic Values & Social Well-Being; Objectives:

- Increase availability of fresh water (ag, municipal, and industrial)
- Reduce flood damages (agricultural and urban)
- Provide recreational and navigational opportunities
- Protect cultural and archeological resources and values

SNAG Number 9

- Use cap-and-trade program to market CERP implementation as a carbon sink;
- Use carbon credits for funding CERP when the market becomes available.

References:

(1) Kyoto Protocol

(2) House Bill 7135 Section 65

SNAG Number 8

- Optimize CERP by considering the benefit of mitigating sea level rise through the buildup of peat and soil, per CERP 3 R's
  - What is optimization?
  - What are the CERP 3 R's?

Reference: Presentation by Hal Wanless, Geology Chair, UM, pushing the 3 R's of restoration to mitigate sea level rise.

Optimization Defined

- General: Maximizing performance while minimizing cost, long term.
  - Consider all benefits
- CERP: Maximize gravity-driven flow while minimizing pumping and infrastructure, long term
  - Total ecosystem performance per CERP Table 5-1
  - *Nature Optimizes!*
- Reference: Natural Capitalism
  - *Kissimmee restoration is the model to follow!*

CERP: 3 R's

- Restore Gravity-driven Flow
- Re-Vegetate
- Restore peat (re-peat)

Dr. Hal Wanless: *Action needed now to mitigate sea level rise!*

SNAG Number 7

- Consider socio-economic issues to minimize the economic impact of people and affected communities regarding state land acquisition
- Take actions in context of state tools:
  - Rural Economic Development Committee Initiative (REDI)
  - Development of Regional Impact (DRI)
  - Area of Critical State Concern (ACSC)

SNAG Number 6

- Study how water supply will be affected by the U.S. Sugar acquisition, to include a water budget.
- A viable water supply is essential to CERP as well as social well-being
- Specify Everglades ecosystem 80% share of 80/20 assurance concept

SNAG Number 5

- Calculate how current projects impact new acquisition and reformulated plan.
  - *Go with the optimal approach: Maximize gravity driven flow/minimize pumping and infrastructure (ASR's, mines, reservoirs)*
  - Often heard: *There is no silver bullet.* However this will save the taxpayers billions.

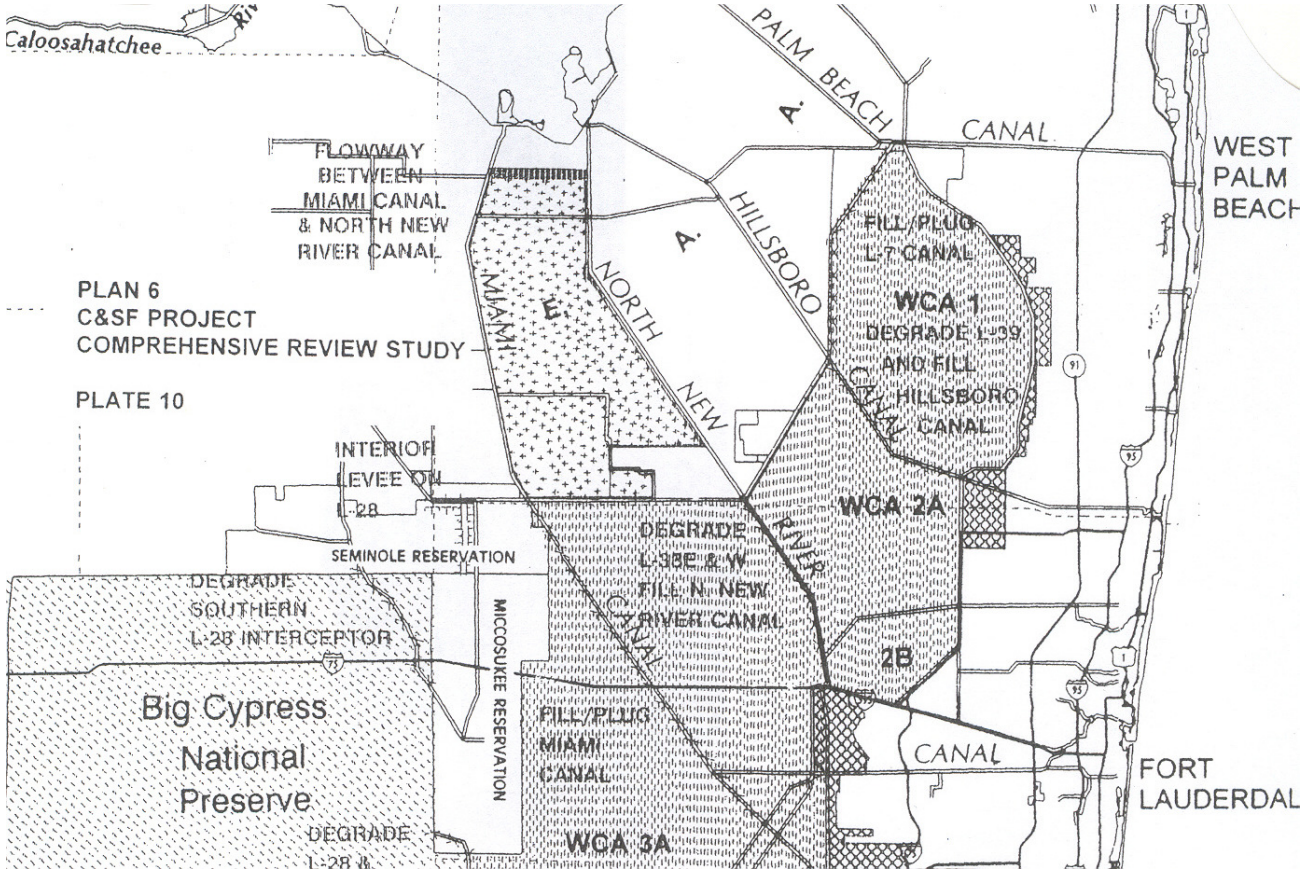
References: (1) Natural Capitalism; (2) ARMF S&T Presentation to SFWMD Gov Board 9/12/07

SNAG Number 4

- Revisit Plan 6 flow way to include a north-south transect down the flow path, and lifetime economic and energy costs tradeoffs.
- References: (1) Plan 6 - USACE Reconnaissance Study, 1994. (2) Marshall Plan, 1981 (3) CERP Section 7.5.3 Cost Analysis of Alternatives
- *Too few managers recognize value of the three R's of CERP in terms of solar-driven nutrient uptake, and energy savings; Nature optimizes!*

Plan 6 Geography

Ref: USACE 1994 Recon Study



SNAG Number 3

- Push for Kissimmee and Lake O nutrient control by considering the 3R's in the Kissimmee Basin;
- Provide cost share opportunities to vigorously pursue BMP's and energy production.
- Do in parallel with EAA re-formulation (SNAG 4)
  - Integrate the effort to optimize the total ecosystem.

Reference: (1) Northern Everglades [Ecosystem] Legislation (2) Natural Capitalism.

SNAG Number 2

- Publish the ***Landscape & Hydrology of the Pre-drainage Everglades*** ASAP!
  - (McVoy, Said, Obeysekera, Van Arman; et al; 2008?)
- This is the historic Everglades GEER baseline for CERP, some 11 years in the drafting.
- Reference: On July 10, 2008, SFWMD declared the draft *not ready for prime time!?*

SNAG Number 1

- Need for a regional conceptual ecological model (CEM) for the Northern Everglades Watershed (EAA region),
  - The biggest SNAG of all, AKA *the Governor's missing link*, now needed owing to the US Sugar land to be acquired, and the potential for restoration here!
  - Connect to CERP Goals & Objectives, and the McVoy report for a total ecosystem view integrated approach.

  Reference: CERP Monitoring & Assessment Plan
  - *CEM's exist for all other regions. Its time for this one!*

A Companion Top 10 list of federal policy needs was also developed by the S&T Team/Interns

1. Need for federal part of 50/50 share
2. Need for alternative energy v. off-shore drilling
3. Need for more science in decision-making
4. Need for total system view leadership
5. Need for Everglades to be redesignated an endangered ecosystem

A Companion Top 10 list of federal policy needs developed by the S&T Team/Interns, continued*

6. More priority on Senator Nelson's request for benefit:cost study of Plan 6 flow way
7. Need for more sustainability thinking.
8. Need to harmonize ESA & critical habitat designation with CERP implementation
9. Need to view CERP as carbon sink, and use cap-and trade to fund implementation.
10. Wild Card: Suggestions/Comments?

*For including science in policy per GEER conference theme

Purpose of Top 10 Everglades/environment federal policy needs and gaps (NAG)

- GEER: Balancing Policy with Science
- Science education for current political candidates and elected officials
  - Total system view policy for potential incorporation in presidential party platforms
- Homework assignment given to Everglades Coalition by Senator Bob Graham, Jan, 08

Total Ecosystem SNAGs Conclusions

- Optimize by giving the system back to nature to the maximum extent feasible, given cost and geologic constraints;
  - *NATURE OPTIMIZES!*
- Push CERP 3 R's to optimize: Save energy, sequester carbon, and mitigate sea level rise;
  - Exercise the *Precautionary Principle* now
- Restore gravity-driven flow – the primary characteristic of the Everglades ecosystem, and its historic *river of grass*!

Carbon Reduction Model

Reference: Governor 9 Executive Order

ASR wells, mines	Plan 6
Pumps, reservoirs	flow-way
CO_2 source →→→→→→→→	CO_2 sink
10 mil megawatts?	.200 mil megawatts?
Nil CO_2 sequestration	**CO_2 Sequestration! forested wetlands and river of grass marsh**

Arthur R. Marshall Summer Interns as prime time players!

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