

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

Day 1: Monday, January 23, 2017

Welcome, Introduction, Goals and Purpose of the Meeting

(Nick Aumen SCG Chair/ Susan Gray SCG Vice-Chair)

Nick explained the CM updates

Susan-discussed CISRERP report and explained that we have resources same-weve made a lot of progress, we have been documenting new science as we go and there is no need for this. This is a step for the process of CISRERP. Maybe we should have had a dialogue and can as the coming years.

Shannon Estenoz-on behalf of OERI, DOI we would like to welcome you. This is a meeting hosted by the SCG who is an advisory body to the TF. The responsibility of the TF is in law and one is to coordinate science. One of the things SCG has done is served as a convener.

That's what we are doing. There is public comment, the transmittal Recover, she explained the table set up and the.

Presentation: The Five Year Plan Overview (Patti Gorman)

Forward thinking to look at the next five years instead of the annual work plan only to get a longer perspective. Most monitoring has been going on 10 or more years. She explained te purpose of the 5-year plan and that it takes the IDS into consideration. She explained that focus on 1 task Science review and Integration but there are other components. She went over the components of the plan. She went over the major deliverables such as SSR.

Susan explained the broad participation and why SCG is holding this meeting.

Results from the Pre-meeting Questions (Nick Aumen)

Explained the Pre meeting questions went out to get input into the ecosystem vulnerability discussion. To he said it contained 6 questions and Jed Redwine will discuss what came out of it.

Jed Redwine explained that 1-3 subjects identified in each questions but some just had a singular issue throughout. Drivers and interactions of drivers were identified the most. 2/3 were unique. Only 4 topics coastal systems/seagrass any coastal, carbon soil and veg loss were, rare and endemic, foodweb and habitat mosaics. He went over some answers.

Presentation: Climate Change Scenarios for CERP Vulnerability Assessment (Sea Level Rise, Hydrologic Changes, and Extreme High/Low Temperatures) (Jayantha Obeysekera)

He explained that he used to do CERP modeling and now does Climate Change Scenarios. He went over the outline of the presentation. He will discuss climate change related to CEM's. He showed the 49 year period hydrologic model and explained that with weather change, climate change is fast becoming an important driver. He discussed the natural variability. He went over

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

the changes in the current speed and different prediction models. He ended with possible next steps.

Q:

Shifting seasonality and rainfall patterns effects? Obey went to the downscale data and said that it is increasing rainfall in the early part of dry season. Temperature definitely.

Connection AMO and longer term drivers of change? He explained he doesn't know how AMO will change yet.

How do you come to the 10% ? He went to magnitude and seasonality slide and said we look at both plus and minus side for models. He wasn't sure if 10% was too large but it allowed them to go to the edge. Nick said that PACE post doc USGS and her goal is to increase certainty of rainfall predictions forecast.

He is working on book "climate change of Florida" the slowdown of gulf stream some projections. The dynamic downscaling might be a better tool then this to take into account sea breeze. Nick said the post doc he hired is really looking at pixel downsizing.

This model is highly bias. Be careful to look at individual events.

Presentation: Invasive Exotic Species (Jon Lane, LeRoy Rodgers)

Jon Lane-explained that since the CEM's we have new invasions, some management, and some expansions, In general there are a lot of lifeforms that have come in. He showed slides of new species that came in since 2000.

Ecosystem level effects: nutrient regime melaleuca and etc. Also community population level decreased recruitment, stand structure allelopathy. Impacts of animals displacement of elimination of natives through competition predation grazing etc. He showed the species related to CERP performance Measures.

Jon pointed out that climate change uncertainty and uncertainty of IES are tied to make double up uncertainty.

LeRoy Rodgers went over the CEM's and noted the models that included IES. He went through some key ways to incorporated IES into the CEM including changes to soil compositions.

Q: What are the follow up for Melaleuca and Brazilian pepper what is or not effected, are there any success stories? Melaleuca yes management areas, OWCF fail. Tools are limited. Neighbor issues with invasive control.

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

In reviewing the CEM's consideration for IES the effects are so species specific, but models are so general. Frank M has done some CEM for management and control. It may be too broad to get too specific. Frank-pathway models are needed to id pathway then pull it out.

Vulnerability Assessment Examples & Guidance (Sensitivities, Thresholds, and Tipping Points) (Dave Rudnick)

He noted that this is second task of the science integration section of the 5 year plan. He showed an illustration of resilience showing to types of ecosystems as curves and valleys. Explained deep valley is more resilient but the shallow valley takes less stress to push it over the tipping point.

He used the coastal areas as an example noting the coast has a high exposure to stress but is moderately resilient. The oligohaline freshwater ecotone marsh has moderate sensitivity and high exposure so resilience is low. He discussed Florida Bay die off events as evidence of Everglades ecosystem vulnerability. He pointed out that there is pattern of die off and algal bloom with the bloom following sooner each event. Exp: high sensitivity moderate => resilience moderate He listed some other examples of vulnerability in the ecosystem. He explained that the impacts are accelerating. He went over the challenges and opportunities for vulnerability analysis.

Presentation: Introduction to CEM Updates & Total System Model (Fred Sklar)

He showed a diagram with features from CEPP. He showed a comparison between CEPP and no CEPP for saltwater intrusion into the ecosystem and went over the definitions of drivers, Stressors and Ecological Effects and Attributes. He went to the handout and walked the participants through it.

Fred went over the Climate Change SL-Rise Driver.

Jack Meter commented that the Water Management Driver-is not a driver, actuallyt human dimension is the driver. Fred explained it was somewhere else but should put this in the notes section if it is not organized right.

Influences from changes in Agriculture? Dave explained that it would be zero on his CEM Bob-other CERP projects that are no longer on IDS? Pete fell apart 2047 unpredictable decision making. Len-need for management is going to increase exponentially. Tom D-have the influences of the drivers change. Invasive species is a continuous threat from the human dimension. Jerry said the EAA is a big concern –not a lot of agriculture just be Orlando south Intersection of climate change. Jay-tech-Development may be 0.

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

DCA –Jen population consumption patterns

Food supply agricultures

Energy demand

Hunting and fishing

Empowering behaviors-Restoration is a driver? Nick asked about natural disturbances
Tom Dreshal asked about nutrient management Human population. Evelyn-CO₂ effects on
organisms and availability of water

STRESSORS

Invasive exotics-Jeff Kline noted that we are approaching 50% increase in biodiversity aquatic
Nonnatives.

Len said that Everglades East expansion area is back into the protection. The STAs and FEB
back into the system that wasn't included 10 years ago.

Dave said that land use is not a stressor. Andy-competing for same spaces. Chris SL rise needs to
connect to this. Joel-expectation ENP remains but quality will be low.

GEOMORPHOLOGY

- Nick still filling in ridge and slough heterogeneity.
- Gretchen-2005 schedule for CERP loss of connectivity because of CERP not being implemented
- Altered firepatterns- Mike Simmons-lack of fire regimes and wildfires. Jed mentioned park fire program working well
- Jay- put 2 positives now-I have seen 2005- 2008 eastern park mustang area fire including a lot of peat loss, but also took care of many invasive plants.
- Homogeneity makes fire move fast and far-altered species composition
- Dave Ceily-improved prescribed fire done at wrong time of year- Picayune became a cabbage palm area. We do not get good burns that give deer forage.

ALTERED VOLUME

- Jed –better deliveries to ENP
- Gretchen-LORSS change volume
- Rebecca-better ways to move water to areas that need it
- Miles Myers-from 2005 to today-reservoirs have not come through
- Distribution
- Chris Kelbe Input of nutrients- effecting all the attributes of the system

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

- Sue-positive the phosphorous for internal is expanding.
- Sea level rise inundating septic and fertilizers
- Len -negative-- bmp reducing 2047 legacy phosphorous.

Nick are we still increasing legacy phosphorous? Jay put it in the neg and positive column, in the eastern boundary of park, plus without restoration sea level rise shark valley salt water will have phosphorous.

Day 2: Tuesday, January 24, 2017

**Welcome and Recap From Day 1 and Instructions for Day 2 (Nick Aumen SCG Chair/
Susan Gray SCG Vice-Chair)**

Break Out Session Report Out

Northern Estuaries

Focus on drivers-work our ways to stressors and effects. Lot of discussion is how to lump or split. As we went through the 3 areas they are the same. So we combined the 3 to 1 northern estuary. He showed the slide with climate change sl rise.

Q in lite of sl rise should we have land use adaptation-yes.

SCS

He noted some of the added folks was helpful –he discussed issues with the structures being outdated. He went over the drivers and stressors and effects

He included invasive exotics. The effects became the big difference. Referred back to MARES. Produced publications ecosystem services included and human dimension. They can review and try translating it into this CEM.

Laura B: simple is good. What is purpose of these models changes to model structure and that will happen depends on what RECOVER wants to use it for...recover needs to figure that out

Greater Everglades

Went through the ranking process and presented a spread sheet. He noted that there were a lot of divergence on the scoring in some areas dealing with, while other areas had convergence

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

C: Jed note on voting was the interpretation considering if the driver would be more influential as time went on. Direct vs indirect effects. Sort through those and look for consensus perspective.

The add driver of climate change-didn't add to this but did agree that it would have to be. change to two ecological models and redefine fire in marl prairies and changed name. They noted water quality was more than phosphorous –sulfur, ionic content, subsidence, oxidation. All that is going to increase quality concerns.

Frank- If the EAA is developed it will increase quality concerns.

Jed noted the separate phosphorous stressor and thought it might be a little confusing.

Fred-the nomenclature has changed and stressors are different and need to think of interactive – capture feedback /biomagnification .

Dave-big cypress-mangrove only to Lawsons river, Picayune doesn't include coastal or go offshore-big cypress just south of Naples by nothing to Marco, there is a big section deficiency.

We also discussed feedback in NE stick true to definitions –to parse it out.

Lake Okeechobee

Our CEM is just for lake not watershed-had 4 HCs. We started out with 3 drivers –we added climate. (we understood it). Didn't want to predict magnitude of climate change. Has a lot of subsets like temp that will have effects in Lake o. Add 1 stressor for rising rate-lake level outside the envelope then extremes –stressor for that level NO.

How the drivers changed over time-we saw the IES change the most over the recent history. Water level and climate have greatest effect now but IES and landuse change could be the big ones in the future. In general without restoration-things will get worse.

He wanted to add some visual cues to help with order of magnitudes

Q: climate what you do should be same across board-don't use uncertainty as a reason to not address them. This is only 1 page don't overthink keep as possible.

Q: You may be looking at bookends

Q J: unity as a data user and manager-unify the drivers and 1 to another region would be helpful.

5 Year Plan Next Steps - (April Patterson/Patti Gorman)

Thanks for sponsoring the event. April Patterson works for Corps of engineers. How this work will transition into the SSR. She explained the workplan science integration tasks

Meeting Summary
South Florida Ecosystem Restoration Science Coordination Group Science Meeting
RECOVER Five Year Plan
Conceptual Ecological Model Updates
South Florida Water Management District, Bld. B-1 Auditorium
3301 Gun Club Road, West Palm Beach, FL 33406

Monday, January 23, 2017, 9:30 – 5:00

Tuesday, January 24, 2017, 8:30 – 3:30

She noted that the SSR will be similar to the 09-14 report.

Will create a new ecosystem health report card. –U of Maryland will help this and to improve synthesis across the system. The report card process have a 5 step process. Conceptual framework-defining goals –how the monitoring –communicating the results.

Mississippi river report card example

Q: L- integration and SSR and TF's indicator report. Susan noted no path forward yet but would be good to work through a combined structure and agree on different issues.

Q Jed informed the group that NPS has a natural conditional assessment report available.