RECOVER SCIENCE MEETING Draft Meeting Notes

Wednesday March 2, 2016

Lake Okeechobee Session (1:00 – 4:00 PM)

1:00 – 1:05 – Introduction to Lake Okeechobee – Andy Rodusky (SFWMD)

Andy gave an overview of SAV, birds

3-5 years of baseline monitoring for the lake is not enough. Have hurricanes and stochastic events.

<u>New Lake Science</u>

Satellite Imagery for Algae Bloom Monitoring - Rich Botta

- HABs
- Lake O RECOVER PM
- Grab samples – labor and time intensive – does identify general trends and toxins in algal blooms
- Cyanobacterial index – use it to identify algal species from satellite images
- Limitations of detection – don't want false positives from emergent vegetation – masked out – clouds can mask out as well.
- Satellites can be a useful tool to detect HABs, real-time and free
- Potential use in LO and validation is ongoing

Wading Birds - Dale Gawlik (FAU)

- What do we do about the effects of stage on wading bird nesting at Lake Okeechobee?
- MAP data and historic data from 1957 – periodic surveys
- Lake O is the 2nd most important wading bird nesting area in south Florida (~20% of Everglades)
- Lake O stages and number of nests – nest numbers highest with water depth is moderate-high at the start of the dry season and prolonged recession, good dry season conditions preceded by 2 years of high water
- Want to have really dry periods with really wet periods
- Daily nest survival linked to recession rate and stage (preliminary)
- Wading bird productivity highest when high area of willow and high prey density
- Historic nest numbers highest with stage 12.8-14.4 ft
- Do they only nest in willow?
    - In the Everglades they nest in lots of vegetation, but nest more in willow

Wading Bird Foraging Prediction Model and Bolus Study - Mike Baranski

- Flights – provide quantitative assessment of wading bird foraging flocks throughout the dry season
    - 2010 bi-weekly flights December- June
    - Flight last week is the first time there were no flocks
    - Model habitat selection - great egret, snowy egret, white ibis
        - Hydrological variables – depth, day since drawdown, hydroperiod, recession rate
- Prey selection in wading birds – what are they selecting
    - Identify what they chose to feed their young
    - Snowy egrets – generalized diet of gambusia and killifish
    - Great egret – generalist on larger fish and individual specialization
    - White ibis – generalist – crayfish, generalist piscavores
    - First year of data – continue in year two

Marsh Bird Study - Mike Baranski (SFWMD)

- Secretive Marsh Bird Study – little information on population status
- Started in 2015 – playback call point count surveys
- Habitat characterization
- Common gallinule, purple gallinule, least bittern were most abundant – more than Everglades, but biased in Everglades
- Numbers similar to FWC study
- Lake O maybe an important breeding habitat for Purple Gallinule and Least Bittern
- Need for more data to improve detection rates
- Habitat management – consideration of a mosaic of sparse and dense emergent habitats – maximize the edge effect - need habitat for wading birds and marsh birds
- Are white herons considered marsh birds?
    - Really a wading bird, not secretive marsh bird
- What time of year do you survey?
    - March – May, but March may be early
    - In Everglades start in November and get a lot of secretive marsh birds
- Seasonal specialization – how do you account for that? How distinguish individual specialization is hard when you have one individual
    - The % frequency would show up if others were eating that as well.

Cattail Control in the Littoral Marsh - Chuck Hanlon (SFWMD)

- Vegetation monitoring and management – quantify the areal coverage and spatial distribution of the dominant emergent and submersed plan communities in Lake O
- Improve habitat for fish and wildlife
- Reduce exotic species
- Open marsh habitat in Lake O are productive – support forage and sport fish that serve as the link to wading birds
- Cattail provides poor or no foraging habitat for wading birds and snail kites and limited habitat for sport fish
- Create accurate maps of vegetation and habitat
    - Moonshine bay – 1973 dominated by spikerush
    - 1996 half of spikerush replaced by cattail and water lily
    - 2012 dense stands of cattail – elimination of the open spikerush community will have a negative impact on fish and wildlife
    - Map the dominant community within each grid and top species in each grid
    - Expensive and hard to do every year (4-5 years) – use sentinel sites every year
    - Sentinel sites allow to see vegetation issues and changes every year
    - How did you pick the sentinel sites
        - Picked based on places that cover a range of elevations
- Treatment of Cattail
    - Boundaries for treatment are created – treated and then have dead cattail, then burn to make sure they are not being used by nesting birds,
    - Burn out the dead cattail
- Treated torpedo grass – dense monotypoic stands – treat and burn
- What kept cattail from dominating historically?
    - 1990s – area of Moonshine Bay cattails along boat trails, found its way in to Lake O through boat trails

Marsh/Nearshore Vegetation Sites - use of Sonar for mapping - Chuck Hanlon

- Course scale of SAV mapping – track the big picture
- Use sonar to map SAV in Lake O – 1 km square area
- Gearing up and how to use at a larger scale
- Can you tell the difference between tape grass and Chara?
    - Not really – not able to groundtruth – not there yet
- Can you get canopy height?

    - Yes can get canopy height and percent cover
- Is the sonar work better than what was used in Caloosahatchee?
    - Not sure what was done in Caloosahatchee, but this is working well
- Sidescan sonar?
    - No - looking directly down

Emergent Veg Decomposition and Nutrient Cycling Rates - Tom James (SFWMD)

- Lake O waters can rise quickly due to storm events and uproot aquatic vegetation and increased nutrient concentrations
- Litter bags in dry and wet areas – follow mineralization
- Initial decomposition – wet is faster than dry
- Initial rapid removal of P in wet
- After 14 days decomposition rates in dry and wet conditions very similar
- May get a flush of nutrients when water rises quickly
- Notice any grazers?
    - Mesh was so small, very few grazers – a worm or two

Marsh Throw Trapping in Three Habitats - Andy Rodusky (SFWMD)

- Food web structure in 3 marsh habitats with dominant vegetation
- Compare habitat prey suitability for wading bird foraging
- Sagitarius, lily and smart weed sites
- Mostly small fish, some grass shrimp and crawfish
- Smart weed had the highest abundance and density
- Going back to the same site? Same place?
    - Same site, but a different place at the site
- Community structure?
    - Haven't looked at it yet, but will

<u>Update on Projects in the Region</u>

Lake O Watershed Projects: Lakeside Ranch, Taylor Creek and Nubbin Slough STAs: update on their operation, water storage and nutrient removal - Odi Villapando (SFWMD)

- Northern Everglades STA
- TMC – temporary operations – 1 ft of water

Nutrient Load Trends: in the watershed - Joyce Zhang (SFWMD) and in Lake O - Tom James

- Decrease in monthly flow and P load in only 2 sub-watersheds were significant– Lake Istokopoga and Taylor Creek/Nubbin slough
- Lake O – TP concentrations influenced by sediment resuspension
- What do you attribute the decrease in TP loads in Nubbin/Slough?
    - Flows, not TMDLs
- Is all the P in water available to be taken up by phytoplankton?
    - A large portion of the material is absorbed to the particles, it goes up and down. Some is released
- Where is the legacy P? Any optimism?
    - When will the concentration be achieved, have to keep trying.

Wetland Reserve Projects: update on amount and function of wetland projects in the watershed - Steve Schubert (USFWS)

- WRE – a site must have 50% hydric soils
- Restore hydrology, wetlands, etc.
- Reduce water demand as well as store water
- 110,392 acres enrolled in this program
- Add all the conservation lands, lots of opportunities to store water
- Everglades Headwater Wildlife Refuge – conserve 100,000 acres of acquisition, 50,000 acres of easement
    - Acquired 4200 acres of easement
- Fisheating Creek National Wildlife Refuge – planning area to target easements and acquisition to connect habitat
- What is allowed under the ranching part? BMPs?
    - Allapatah is special – acquired in 2002 – some area was restored, NRCS wanted to keep cattle on site to control exotic plants – historically was wetlands and uplands and a ranch – Intent is on schedule to have construction done to put up perimeter berm on the southern end and then do more restoration, then work with NRCS to get the cattle offsite
- How does NRCS reach out to the landowners and what benefit to the landowners?
    - They put out a request to landowners
    - Benefit to landowners, they get a payment for the number of acres they are enrolling into the program – rancher can still operate the ranch
- Are cattle fed supplementally or just grazing?

    - The intent is the number of cattle is supported by what is available by grazing

Herbert Hoover Dike Repair Update - Ingrid Bon (USACOE)

- 143 miles of embankment around Lake O
- No overflow capability
- Problems – internal erosion, culvert structures, overwash/overtop
- Classified as a DSAC rating 1 – without intervention the dike will fail
- Reach 1 cutoff wall complete in 2016
- Culvert replacements by 2022
- Dam Safety Modification Study
    - What needs to be complete to reduce risk to surrounding communities
    - Look at the system, system-wide look
    - Final measures to complete the project are in the document
    - Start in 2019
    - TSP – shallow cutoff walls
- Lake O Regulation Schedule
    - Any updates will require an updated risk evaluation
    - Don't have a date when we will open LORS
    - Not before 2020

Panel Discussion - Reductions in watershed nutrient loads to the lake, Potential benefits and impacts from planned watershed storage projects, and discussion of lake stage on in-lake ecological performance measures.

Panel Members: Dale Gawlik, Tom James, Bruce Sharfstein, Odi Villapando, Joyce Zhang, Steve Schubert and Andy Rodusky**.**

- What does a cutoff wall look like?
    - You cannot see it because it is built within the dike
- Wetland reserve program – evaluate project from a storage perspective?
    - Multi-agency team that ranks sites, storage calculations are made to set weir's so you don't get offsite flooding
    - Storage not identified as well as they would like. Have storage targets for CERP, hard to quantify the natural system storage
- How wide and deep are the cutoff walls?
    - 55 and 80 feet for cutoff wall 1
    - DSMS is shallower, 35-50 ft.

- When accounting for how much storage to build into the system, is there an estimate of how much storage we had when the system was pristine?
    - It was done for the Yellowbook
    - Looked at it during the Lake O watershed project
        - Lost 65% of the wetlands in the 3 counties surrounding Lake O
        - Looked at loss of wetland function as well
    - Use watershed assessment model to compare pre-drainage and existing system
    - Wetlands were all south and west of the lake – today the wetlands are within the dike
    - Amount of storage you need to regulate the lake is to protect the current wetlands
- Operation of regulation schedule and loss of floodplain from Kissimmee River would be a big volume of water you would have to deal with.
    - Study of different size reservoirs that would be needed.
    - Paper study looking at reservoir sizes, monthly time step screening model, no consideration to construction cost, land availability, impacts of construction
        - Have numbers, but need to be tempered to how they fit with reality of the world
- Just because it's a good year for wading birds in the everglades doesn't mean it will be a good year for wading birds in Lake O. Is that true?
    - Regional signal – reflected by rainfall
- Recession rate – if you look at that with wading birds. Does it have an effect?
    - Early work has shown it is important in the Lake, but recent work in the Lake calls it into question if it is. Saw birds nesting on rising water levels. Fish biomass is more in Lake O than the everglades. Recession is a mechanism to get high quality prey patches, there may be other mechanisms
- Willows important to wading birds, but went away, what happened?
    - Dying off after prolonged high water events and peat fires
- How do the Northern STAs differ from the Southern STAs?
    - Southern much bigger
    - Operational goals are different – southern to achieve a TP concentration, Northern to maximize?
    - Different soil properties
- Can you manage sediments in the lake to reduce P
    - Dredging – expensive and never get muck out of system
    - Chemical treatment – possibly, but unless you deal with upstream loading you will have the same problem again

    - Reaching TMDL – get the watershed loading down, then manage the sediments
- Reduction of nutrients or operations to fix the lake?
    - Regulation schedule more important in the short term – when lake stayed in 12.5-15 ft range over the last few years, lake ecology doing well, able to do well even with high nutrients
    - Vegetation management is needed to go along with the regulation schedule changes
    - Resolving TMDL may help, but not as critical
- Ongoing work – when will updated results be released?
    - Dataset from 2001-2009, extend period up to 2015 and report in the coming SFER in late summer

Session Wrap-up?

- Meeting designed at the regional level – different philosophy to present the information
- Trends Fred noticed
    - Day 1 – focused on problems, uncertainties, climate change, models may need to be updated with climate change, new NSRSM is now deeper, how does that change everything
    - Day 2 – construction – solutions to the problems and monitoring, been putting money into it more than in the southern part of the system
- Things in Florida Bay may get worse and this is real
- Kissimmee will not get worse
- Modeling the south Dade system and change operation schedule so water can move down Taylor Slough
- Mike Duever – you need to have an ecologist on site – echoed by Baharam – on the ground ecological oversight – flexibility
- Needs to be flexibility in the contract if there is uncertainty – critical in restoration
- DPM – more cutting edge science that has been done in the last 5 years – flow and ecology
- Satellite imagery, sonar – new science
- What was presented today – connecting water management, ecology, Melanie's talk – how the timing of flow could help the oysters survive to the next year – James Douglass - CEM – fostering stress models – how you do RECOVER monitoring, modeling and synthesis work all in one.
- Frank Marshall – need to mesh the PMs across the entire system – need SCS targets jive with GE targets

- Need to keep going on this pattern