Myakka River Management Coordinating Council
Lemon Bay Park
570 Bay Park Blvd.
Englewood, Florida 34223

January 22, 2010
9:00 A.M. – 1:45 P.M.

MEMBERS IN ATTENDANCE – acronym on website

Greg Blanchard-Manatee County
Jono Miller-Sierra Club
Tom Moralee-Venice Campground, Inc.
Dianne Davies- SWFWMD
Suzanne Cooper-TBRPC
Maran Hilgendorf – CHNEP
Peter Perez – City of Sarasota
Belinda Perry – Sarasota County
Kevin Kemp-FWC
Jim Beever-SWFRPC
Bill Byle – Charlotte County
Manon Lavoie – FDOT
Allain Hale – ECOSWF
Susan Hochuli - PRMRWSA
Tom Williams – FDOF
Mary Jelks – Friends of Myakka
John Dzuiba-Homeowner
Mike Chouinard – Homeowner
Lou Kovach-Homeowner
Jill Green-Dona and Roberts Bay
Marlene Guffey - Homeowner
Jerry Cattelane - Homeowner

INTERESTED PARTIES

Bernie Milosky-Charlotte Utilities
Kathy Meaux-Sarasota County
Jon Robinson-Myakka River SP
Hugh D. Dinkler-ESA
John Chassey-MR Ranger
Bruce Maloney-Sarasota Co.
Jack Merriam-Sarasota Co.
Judy Meents-FPS
John Ryan – Sarasota County
Michael & Betty Regan-fishermen
Jim & Sherry Diem
Dan Braswell
Terry Hingtgen-FPS
Laura Ammeson - Sarasota Co.
F.M. "Toby" Fogle-DEP/BPP
Shawn Liston-Cork Screw Swamp
Steve Suau – PWR

MINUTES

The meeting began at 9:00 A.M. with Belinda Perry beginning the proceedings. Maran Hilgendorf subsequently presided. Introductions were made. Peggy Morgan, DEP, was on the speaker phone. This meeting was advertised in the Sarasota Harold Tribune and the Florida Administrative Weekly on January 8, 2010.

There were no public comments.

Updates:

Charlotte County Update – Bill Byle
This is the first time that Charlotte County has had a Coastal Element in their Comprehensive Land Use Plan. He plans to create a stronger relationship between Charlotte County and the Myakka River.

The following points were added to the Coastal Element of the Comprehensive Plan: Charlotte County will continue to participate in the MRMCC, better collaboration between public and private sectors, future watershed studies, adding a surface water quality protection component in an attempt to create regional surface water quality protection overlay districts. Charlotte County has a Shell Creek water quality overlay protection district as an example. The County is also trying to establish a Charlotte Harbor Management Committee.

Charlotte County has updated the Comprehensive Land Use Plan; it is now in Tallahassee being reviewed by DCA. One can view the plan on the Charlotte County website

Charlotte Harbor National Estuary Program Update – Maran Hilgendorf
A list of concerns came from the reservoir workshop that was held 2009. Two concerns are being addressed this year, including clarifying the definition of reservoir and other related water storage practices, and completing an inventory of currently proposed reservoirs and related water storage facilities. More information can be found at the website: chnep.org.

In 2007 volunteers were asked to help map the shoreline of the estuaries in Charlotte Harbor. CHNEP is seeking more volunteers for the shoreline study. If there are any questions you can refer to a short article in their newsletter or talk with Maran.

Bureau of Park Police Update – Toby Fogle
Toby Fogle took over Tyson Mistead's position as the patrol officer for the river. *DEP is the phone number to reach him. The general telephone number to their Ft. Myers office is 239 332-6975 extension 235. He is notified on his cell phone when there is a message from the voicemail extension.

Sarasota County Environmentally Sensitive Lands Update – Belinda Perry
Sarasota County ESLP has been in negotiations to acquire Deer Prairie Creek & Eastern Ranchlands parcels. Negotiations are on hold for Warm Mineral Springs Resort parcel until the title defect is resolved.

The Land Management Plan for Carlton Reserve is under revision; the draft plan is available on the county website at http://www.scgov.net/NatualLands/CarltonReserve. They anticipate the Board of County Commissioners will review the plan in late March or early April.

Recently the local Science and Environmental Council (SEC) received a grant from SWFWMD for education programs on the watershed. Ten SEC member organizations will take part in a 20 minute video production this spring that will be accessible at events, schools, libraries, and channel 19, with examples of what organizations are doing to preserve the watershed. Sarasota County's Carlton Reserve and Myakka River State Park are two organizations to be featured in the Myakka River watershed.

Sarasota County Water Resources Update – Kathy Meaux
The DEP released their draft Impaired Waters List last fall. TMDLs projected to be created in 2009 are from the 2008 verified list. The impairments without dates are new and included in the draft list. Some items were delisted and a TMDL will not be required. Many of the new WBIDs that have a high priority for TMDL development within the watershed are located within the main river channel from Clay Gulley to the estuary. These include WBIDs 1991A, B, C & D. The impairment within these WBIDs is for mercury in fish tissues. Sarasota County Water Resources hasn't received the official verified list.

Biologist's Report – Natalie Balcer
Since the last meeting in September there have been 3 new members appointed to the Council. Mike Chouinard is not a new member, but he will be taking over the primary membership for Marlene Guffey. He lives north of Snook Haven and will be representing that stretch of the river along with Lou Kovach who was appointed as a new member. The other two members are John Dzuiba and Jerry Cattelane who live south of US 41 on the east side of the river. These members were recommended by the Council to the Department during the April/September 2008 meetings.

The brochure is finished and copies were set out on the table.

Natalie has been working on the management plan and is almost finished editing what Chris Becker had written back in 2000. This draft has been subsequently worked on by prior biologists since Chris has left the position. She is also planning on adding a new restoration component, and mapping some nuisance/exotic areas along the river. The plan has not yet been reviewed by the district office. She hopes to move forward with the Office of Park Planning regarding the public meeting sometime this coming fall or early 2011. Once through internal review it will be posted on the website for Council comment and review prior to public meetings.

An overview on the Becker Property was given and maps were available. The property consists of two different parks: South Fork - in the Manatee River Watershed, and Wingate Creek – in the Myakka River Watershed. In order to obtain access one must call the park manager to get the code for the gate. The park was acquired in 1998 through mitigation process from Becker Phosphate Mine. Protecting the water quality and hydroperiod is one of the largest management objectives.

There has been some talk with DOT about going forward with replacing the SR 72 Bridge. It is her understanding that funding hasn't been acquired but they have sent a

preliminary drawing. DOT has been asked to give the Council a presentation in the future.

Myakka River Fish Kill – Mike Regan
Mike reported that he first spotted the fish kill on Tuesday, March 31, 2009. He contacted John Chassey who had also observed the dead fish. Mike spoke of a discharge site near Border Road on the old dolomite mine property. After the rain storm the water turned turbid and had a bad odor. Turtles and pigs were also reported dead.

During the Myakka River observations conducted on March 26th, 27th and 30th there were no observations of algae blooms reported, no water was flowing over Down's Dam. Turbid water was observed from the Border Rd. Bridge to I-75 Bridge. Water was discharging from the old dolomite mine and 26 dead fish were observed.

On April 6, 2009 Sarasota County's report stated the water was safe after they took water quality readings. Mike discussed stopping of the discharge. It is unknown what killed the wildlife.

On April 7, 2009 Mike read the article in the Herald Tribune by Kate Spinner which characterized the event as a natural occurring event caused by an algae bloom which created low oxygen levels.

On April 8, 2009 Mike received a call from Catalina Brown, Fish Kill Coordinator with Florida Fish & Wildlife Research Institute. She stated that the fish kill was not caused by a harmful algae bloom. On this day the water was starting to clear. However, the very next day the field of turbidity stretched approximately two miles south of Snook Haven.

It rained again on April 14th and another fish kill occurred. This time Ernie Estevez from Mote Marine met Mike on the river. Ernie theorized that the strong odor was caused by hydrogen sulfide, which is an eye, nose, and throat irritant, and can also cause headaches and dizziness.

The *Sarasota County Integrated Water Resource Management Inspection Report* stated that "there was no turbid or otherwise suspected elicit discharge from the ditch or other locations on the property observed during the inspection." Mike stated the report indicated there was little or no evidence observed to support assumptions that any runoff from the lake or ditch to the river was a direct cause of the fish kill. The report did not mention the dead animals or pH. Temperature at the discharge point was 4˚F cooler compared to the rest of the river, and Mike theorized that this was due to the high flows from the discharge point. Another explanation was tidal flow.

Mike filed a public records request from Mr. Miriam, Environmental Manager of Sarasota County, to answer his questions. Mike concluded stating thousands of gallons are discharged weekly from this site into the Myakka River, and the discharge does not appear to be significantly affected by rainfall conditions or tides. Mike would like to see the ditch dammed.

Discussion occurred.

Break at 10:15 A.M.

Resumed meeting at 10:25 A.M.

Updates Continued

Discussion continued regarding the discharge site from the old dolomite mine and possible solutions.

Jono Miller discussed getting notification and equipment to the right people in a timely manner and monitoring the weather and tides for similar conditions. Sarasota County agreed the suggestion was good.

Bill Byle spoke of thermal inversion as well as saline stratification.

PRMRWSA Water Conservation Summit Update – Susan Hochuli & Steve Suau
Last April there was a Water Conservation Policy Summit held. Representation included Sarasota, Charlotte, Manasota and Desoto Counties, SWFWMD, Englewood Water District, Lakewood Ranch Stewardship District, and the West Villages Improvement District. Presentations were given by University of Florida, and Conserve Florida.

The two priorities set by the Alliance members were (1) developing best management practices for water conservation and (2) quantifying the amount of water that can be saved through conservation efforts.

All Alliance members have been reducing per capita water use. That will probably continue due to procured rates. The focus of the Authority is to look at potable water supplies. The Alliance would like to see that the water conservation initiative is quantifiable; otherwise they can't gauge it against new water supply development.

The approach considers both the supply and demand side of water conservation BMPs. Supply side would be making sure that there is not much leakage, or losses from the utility system and reclaimed water source. Demand side would be primarily indoor water conservation measures for single family, multi- family and industrial, commercial and institutional uses. The general strategy is to increase indoor water-use efficiency and alleviate the use of potable water for outdoor irrigation.

The next steps will be collecting the data, and collaborating with SWFWMD on their efforts. Another Alliance Meeting is projected to occur in early summer/late spring to present the findings and discuss the implementation of new priorities.

Questions and answers followed.

Myakka River Watershed Management Initiative – Lisann Morris, Project Manager, Kent Boullico, St Hoffman Assoc. (Watershed Evaluation Phase) and John Loper, Interflow (Tatum Sawgrass Evaluation and Flatford Swamp Hydrological Restoration.)

Lisann Morris-Overview: Early 2007 the SWFWMD Board provided funding to move forward on the Myakka River Watershed Initiative which encompasses the Myakka Watershed, but they cannot study every portion in detail because of budgetary constraints. So far they have spent most of their time in the Upper Myakka Area, above SR 72.

The project objectives are numerous: (1) Evaluate and illustrate what land use changes and alterations have done within the watershed; (2) development of the Water Budget Model in the Upper Myakka; (3) the development of best management practices, either structural or nonstructural, that help achieve the District's goals of natural systems, water quality, water supply and flood protection; and (4) provide a framework for future FEMA flood insurance rate map development through hydrologic modeling.

Kent Boullico – One of the elements of the initiative involves the development of storm water lines. Their focus is along the main stem of the river and the Upper Myakka Region. There are 9 sub-basins that need new storm water models. There are three sub-basins that already have existing studies: Big Slough Watershed (AKA Myakkahatchee Creek) developed by the District and City of North Port, Howard Creek and the Lower Myakka River Model.

The objectives of the effort include developing a tool to evaluate alternatives, like if the flows to Blackburn Canal were modified, or the dikes in Tatum Sawgrass were breached. Another objective is to utilize the stormwater model to assist with the Flatford Restoration Design and Permitting. The stormwater models can also be used by the District and local stakeholders to update FEMA floodplain maps in the future and evaluate projects within the watershed.

Currently the project is in the watershed evaluation phase. This entails collection and review of available information, development of the model network, and delineation of the drainage sub-basins, field reconnaissance, and identification of survey needs. The team has been working to develop the model network to facilitate maintenance to the model in the future and to have the ability to use the data in the model in other platforms. They are about to begin the sub-basin delineation process. They are using ArcHydro, which utilizes topographic information to determine flow, in conjunction with terrain data.

Currently team members are conducting field reconnaissance and inspecting structures to verify the dimensions are consistent with construction plans. They have identified 600 initial locations for field reconnaissance within six of the sub-watersheds. During the reconnaissance they document conditions, maintenance concerns, take measurements,

take photos, etc. The watershed evaluations phase is scheduled to be completed between July 1, 2010 and September 1, 2010.

John Loper is working on a Continuous Simulation Model to run multiple years of data to estimate excess flows in Upper Myakka which caused the tree die off in Flatford Swamp, and develop linkages between land use practices and excess flows. He also uses the model for pollutant load modeling purposes and for simulating hydroperiods of Flatford Swamp under current, proposed (predicted out to 2050 using the Sarasota and Manatee County Comprehensive Plans) and historic (1950s) conditions. The model looked at what would happen if all the agriculture went away and all the development parts of the watershed were converted into low-density residential.

The average excess flow coming into Flatford Swamp is above and beyond historical conditions throughout the year. Their modeling analysis determined that over half of the excess flow was due to agricultural irrigation and related practices. The rest is due to urbanization and drainage improvements.

The team looked at the potential hydrologic restoration of a portion of Tatum Sawgrass. Once restoration was completed, the hydroperiods inside the diked areas would return to more historical conditions. The model also showed that excess flow downstream of Tatum Sawgrass would slightly improve post restoration. A significant improvement may result if a similar restoration scenario were applied to the rest of Tatum Sawgrass and other diked areas around the Myakka River.

FARMS projects, which implement surface water management systems and water reuse, have been shown as an effective method to divert water from Flatford Swamp, but will not be the solution to excess flows. Removal of sediment in strategic locations around the swamp will also be part of the solution. The team members are seeking some kind of structure that will allow them to remove excess flows or divert water before it gets to the swamp and put it somewhere else. The team came up with three options for removing excess flows from the swamp:

1. Divert water from the tributaries at strategic location before it gets into the swamp. Results from the model were shown to be effective.
2. Improve the conveyance through the swamp and divert the excess flow from a point downstream. The model determined this may be too effective in some areas and could potentially dry out the area.
3. Pump water directly from deep points within the swamp. The model determined this method is effective as long as too much water is not taken out.

The excess water could potentially be piped downstream of the Lake Manatee Dam. Another option is to put the excess water as a potable source to replace or offset water that's released over the dam in order to meet the minimum flow requirement. There is also the possibility of injecting the water in the Upper Floridan Aquifer to replenish aquifer levels in impacted areas. Finally, there have been discussions with mines to allow them to use the excess water to offset groundwater use.

Lisann stated that future tasks for the Myakka River Watershed Initiative in 2010 include finishing the watershed evaluation; completing the withdrawal scenarios; continue discussions with potential end users for the excess water and move on to preliminary design activities for those withdrawal scenarios. The team will start the watershed management plan aspect near the end of the year. Questions and discussions followed.

Myakka River Water Quality Sampling – Kathy Meaux

Kathy began with a brief history of the Monitoring Plan.

WBID 1981B was just delisted for iron and their data supports the delisting.
One parameter of concern for all sampling stations is fecal coliform. The DEP uses a value of 400 colonies/100 milliliter of sample to determine if a water body is impaired. Questions and answers occurred.

The DEP has established that 5 mg/l is the standard for dissolved oxygen. Kathy pointed out that 50% of the time the values were over 5mg/l for stations in the watershed. Clay Gulley seems to have a DO problem as well has Howard Creek. 56% of values were over 5mg/l at Border Road and 72% of the samples were above the minimum DO threshold at Big Slough.

Biochemical Oxygen Demand (BOD) is the oxygen demand that microorganisms put on systems as they decompose organic matter or pollutants. In most pristine rivers the BOD is generally under 1mg/l. In moderately polluted rivers the BOD is generally between 2 and 8mg/l. Their median values of samples from all stations were below moderately polluted levels.

In predominately freshwater systems, the value for accepted chlorophyll levels is 20µg/l. In saltwater systems, 11µg/l is the threshold. Most median values from all sampling stations were below the threshold for chlorophyll. Some extremes included 74.7µg/l in May 2008 for Big Slough and higher chlorophyll values during May 2009 are indicative of algae blooms.

There are no numerical water quality standards for nitrogen or phosphorus yet. The EPA just released a document and is planning to assign numeric values as thresholds for impairments. For total nitrogen (TN) the water resources group uses the 50th percentile for Florida's streams as a threshold value, which is 1.2µg/l. Most median values were below the 1.2 µg/l threshold except for MYA-F, CLG (Clay Gully - highest value), HWC (Howard Creek), and MYA-B (river inside the park).All stations had values both well below and up to 2 times the threshold value.

All stations were above the 50th percentile for total phosphorus (TP) so Kathy compared the stations to the phosphorus values in 70% of Florida streams, which are below 0.25 µg/l. Howard Creek stands out with high TP levels. Howard Creek could have naturally high P levels in the soils that could contribute to the P levels in the water. Sarasota County Water Resources proceeded by sampling soil in the region for P content. They

got various concentrations of P along Howard Creek and the sediment study warranted further investigations.

The pH range in the freshwater portion of the river should be between 6 to 8.5. The pH range in saltwater systems should be between 6.5 to 8.5. All median pH values were within the desired range. A couple individual samples fell outside of the range.

In summary the data supports the delisting of WBID 1981B for iron. The fecal coliform median values are typically below the threshold of 400 milliliter threshold except during high runoff events. The DO values in the river vary widely throughout the year. The DO dropped below 5.0mg/l in WBID 1981 and throughout the watershed. Historical data indicate that the background DO concentrations generally fall below 5.0mg/l due to geomorphology, hydrology and processes that are probably not related to any human activities. BOD values are consistently below 2.0mg/l. Chlorophyll values in the river channel are consistently above water quality standards. TN values are consistent with 50% of Florida streams and the TP value is consistent with 70% of Florida streams. Some high TP values could be related to natural soil phosphate content. The pH is consistently within acceptable ranges. Questions and answers followed.

MRMCC BUSINESS

It was decided to conduct business next since a few voting members would need to leave soon.

Public Comments: There were no comments.

Call to Order and Roll Call:
Peggy Morgan, Manon Lavoie, Kevin Kemp, Tom Williams, Dianne Davies, Jim Beaver, Greg Blanchard, Belinda Perry, Bill Byle, Peter Perez, Susan Hochuli, Maran Hilgendorf, Jill Green, Allain Hale, Mary Jelks, Jono Miller, Suzanne Cooper, Mike Chouinard, Tom Moralee, John Dzuiba, Marlene Guffey and Lou Kovach were present. It was determined that there was a quorum.

Other Agenda Items: A new business surprise, Myakka River Management Plan, and Nominating Committee was suggested to be added by Maran. Sarasota County Water Quality Monitoring near Border Road was added by Jono.

Elections of the Chair and Vice-Chair:
Jono Miller nominated the current Chair and Vice-Chair. Manon Lavoie seconded the nomination. There was no discussion. Manon made a motion to close the nomination. Mary Jelks seconded the motion. All were in favor.

Maran talked about creating a Nominating Committee who would talk to others to serve on the Council. The Nominating Committee would have a slate of officers by the fall meeting with the election occurring in the first meeting of the calendar year. Dianne Davies, Susan Hochuli and Greg Blanchard volunteered to be on the Nominating

Committee. Some Council members who are part of an agency are not allowed to serve as Chair or Vice-Chair.

Minutes: There were no changes to the September 18, 2009 Minutes. **Susan Hochuli moved to accept the Minutes. Dianne Davies seconded. All were in favor of approving.** Maran suggested that the affiliations be listed starting with these Minutes next to the members in the "Members in Attendance" section.

New Member Introductions took place.

Old Business: Recognize Marlene Guffey for her long service on the Council

New Business:
There was a discussion of how the MRMCC plan will be updated: Maran stated DEP would like to work in-house for about a year and then present the plan and some Council members would prefer to be involved prior to it being presented. Suzanne Cooper suggested creating a subcommittee to work on reviewing the plan. Maran suggested that the Council draft a letter to DEP requesting that the Council participate in the revisions by creating a subcommittee and partner in the revision and update of the plan. **Dianne Davies made the Motion and Susan Hochuli made the second.**

Belinda Perry recommended that the Council include the members for the subcommittee in the letter in the interest of expediting matters. Suzanne Cooper reminded the Council that it is part of the legislature that the Council assists with the development of the plan. Jono Miller, Jim Beever, Marlene Guffey, Allain Hale and Belinda Perry volunteered to serve on the subcommittee.

Jono Miller made a motion that the Council encourage Sarasota County to adjust or improve water quality sampling to better document the causes and nature of fish kills in the Myakka River. Allain Hale seconded the Motion. All were in favor.

Future Agenda Items: North Port US 41 Corridor Master Utilities Study, Sunshine Laws, Our Lady of Perpetual Help Special Exception, Farms Presentation, report from the Nominating Committee, Subcommittee Status Report on management plan, Council brainstorm ideas for the Plan (1 hour).

Schedule Meeting Dates: April 23, 2010 first choice, April 30th is alternate. September 17, 2010 first choice; September 24th is alternate. Meetings for the 2011 Calendar year will be scheduled at the September 2010 meeting.

Break 12:40 to 12:50

Presentations Resumed:

Climate Ready Estuaries Vulnerability Report – Jim Beever

This study encompasses the Myakka River Basin and other locations. The Climate Ready Estuaries Program is funded by EPA for the CHNEP, who works with the SWFRPC. CHNEP has had climate ready estuary projects in place for a year. CHNEP is one of the few national estuary programs and has been funded for the second year.

The CHNEP and SWFRPC have worked with the City of Punta Gorda who has completed and adopted a Climate Change Adaptation plan for their city, the first one according to EPA for small coastal cities. Punta Gorda now has a better city post Hurricane Charley compared to what was there before. Jim has also been working towards a transfer of development rights program to let people move out of coastal areas. The Council is also working on Climate Change Prosperity and identifying opportunities to become prosperous as climate changes.

SWFRPC had completed much of the work before a climate ready estuaries program existed. They have already developed hurricane preparedness planning, a GIS library, and regional wildlife habitat planning for more than 20 years. Additionally the NEP has addressed climate change in its Comprehensive Conservation Management Plan. The Council has been planning major land acquisitions which will allow habitats to move as sea level rise occurs. Two identified restoration projects are the Yucca Pan Flatwoods in Lee County and the Fakahatchee Strand area.

Currently, the NEP is working on environmental indicators for climate change. Example ordinances could be shared through local governments which utilize native plants and use less water. A team is working on a salt marsh assessment for the whole NEP region to determine the vulnerabilities of salt marshes and adaptations they can undertake to continue to survive as climate changes in the future.

The vulnerability assessment for SW Florida had 84 potential effects of climate change. They looked at five different futures from a best case scenario future to a worst case scenario. All effects were entered into a database and grouped into 12 categories: drivers, responses, effects, effects upon humans etc. As sea level rises, habitats will have to shift. Changes in pH will occur as more carbon dioxide accumulates in the air and water. Oceans and estuaries will become more acidic and more hypoxic with thermal stratification. As they become more acidic the organisms which depend upon calcium to build their shells will be affected negatively. At the same time that we're having the climate change some periods will have wetter wets and dryer dries creating more severe fires. All these things interlink with each other and are described in the report.

Data collected for SW Florida shows there is a trend that we are getting warmer, with elevated carbon dioxide and increased rate of smog formation is expected. The warmer air will affect the hydrology, and ground level ozone will increase. The worst case scenario shows the average temperature increasing 2 degrees F to lead to these pronounced effects. It doesn't take much shift to have some extreme effects by 2050, and it appears that urbanization is having an increased impact on higher temperatures. The rate of change is not constant.

Graphics show varying degrees of sea level rise for the five different scenarios during 2050, 2100 and 2200. In the least case scenario the rise would be about 5 inches, moderate about 9 inches and the worst case 16 inches by 2050. The sea level rise was projected to be up to 3 feet by 2100 in the worst case scenario. By 2200, sea level rise was estimated at 21 inches for the best case scenario and 110 inches for the worst case. Finger canal systems are an invitation for sea level rise to move much further inland than they would have under the original landscape.

Models for habitats within specific areas were preformed and the adaptability of habitats was estimated. The study looked at projections if different scenarios occurred such as stabilization of greenhouse gases. Ultimately sea level will rise even when you stabilize greenhouse gases; however it will take longer giving you more time to adapt

The study looked at what amount of inundation would occur for salt marshes, mangroves, beaches, coastal strands, freshwater wetlands, and uplands under different hurricane scenarios around Sarasota, and which areas would be subject to peak sea level rise and altered hydrology. It is predicted that the Myakka River will decrease in stream flow; however there will be some pronounced high flow events.

Any planning done for the Myakka River water supply that's dependent upon a static climate is obsolete. Open reservoirs are also in trouble in terms of climate change in Florida with pronounced dry seasons. Their performance will be very different in the future where there are longer dryer periods.

Geomorphic changes are expected such as the movement of mangroves to the new sea level. Where there is no shoreline armoring, there will be accretion of beaches. Habitats in trouble include coastal strand and tropical hardwood hammocks since they will have very little place to go. Mangrove acreage can be expected to increase where there are no seawalls behind it. Some expansion of sea grasses may occur as the areas which are now mangroves become the sea grass beds.

The study looked at many listed species to see how they would respond to climate change. The beach-nesting species will have much trouble with climate change, not just from the sea level rise but also from the precipitation change. Strong precipitation events with heavy wave action are the major cause for colonial bird nesting failure. For the shore nesting birds and reptiles expect problems from increased sea level, storm frequency, higher high tides and erosion. These problems will be exacerbated as people start armoring against sea level rise. All wading birds will have trouble particularly as the mangrove islands get inundated. Moving inland into xeric habitat will eliminate areas for other listed species and large ranging mammals.

The frequency of tropical diseases is increasing and expected that by 2100 the climate for Fort Myers will be equivalent to today's climate in Bangkok. The disease profile will probably be very similar.

The study looked at what happens with inundation to infrastructure and storm surge shifts associated with sea level rise. Most of the housing is in at least one hurricane storm surge zone, and major infrastructure investments are located in the coastal high-hazard areas. In Sarasota there are 92 critical facilities located in high hazard zones for storm surge and hurricanes and with sea level rise more landward facilities will be included.

They looked at which of these effects are the most pronounced and ranked these for the prioritization of interest for the NEP. Jim is happy to answer questions by email.

Wood Stork Ecology – Shawn Liston, Audubon of Florida, Corkscrew Swamp
Adult Wood Storks have a darker head and beak; the young will have more yellowed beaks. In older literature Wood Storks are known as Wood Ibis. They are the only stork species currently breeding in the US. The largest breeding colony in the northern hemisphere is in Naples at Corkscrew Swamp Sanctuary. Their weight ranges from about 4 ½ to almost 6 pounds as adults.

They are very large birds and use very little energy because they take advantage of atmospheric thermals. They can reach heights over 1,000 meters and travel over 40 kilometers from a nesting site to a feeding site in one day. Other birds like ibis may only go 10 kilometers. When the thermal updrafts are very strong the Wood Stork can glide 10 to 15 miles with their wings motionless.

They are present in peninsular Florida year round. They summer near the northern end of the Gulf up to South Carolina. They are most common in South and Central America. They seem to tend to go back to the same areas year after year. Satellite tagged data can be accessed through a partnership that they have with seaturtle.org.

The storks are captured using a rocket net. Once captured, biological information is taken: size, general health, etc. A dozen birds have been tagged and fitted with radio transmitters.

Colony sites tend to be freshwater and marine, estuarine and forested wetlands where the trees are inundated. This allows the nest to be isolated from mammalian predators. Many times they will nest in freshwater wetlands which have alligators to guard the nest. The mating pairs are monogamous for the season.

There is no apparent site fidelity from year to year, although they do tend to go to the same region. The male establishes the nest site and courts the female. Courtship lasts anywhere from a few hours to a few days. They most often nest in mixed colonies, with Anhinga, Great Egrets and Great Blue Heron. Their clutch size is between 2 to 5 eggs and both male and female tend the nest equally. The nest is lost if one adult abandons the nest. The egg incubation lasts 27 to 32 days and the nests are attended by at least one parent full time until the chicks are about 20 days old. When they are 50 to 60 days old they begin to leave the nest. The fledge rate varies averaging about 1 to 3 chicks.

Wood Storks grow quickly requiring a lot of food. They like the water depth to be between 10 and 30 cm. They are tactile feeders and don't depend on sight. They often use foot-stirring and/or wing-flicking to disturb sediment on the bottom. They require about 16 ½ kilograms of food to go from a hatchling to a fledgling. Each adult requires about half a kilogram of food per day, for courtship, nest building, incubation, caring for chicks. They are very efficient at depleting the larger size fish within a matter of a couple days. From October to December most of the biomass in terms of aquatic animals is crayfish.

Wood Storks nesting at Corkscrew have decreased dramatically correlating with the increase in development in the area. Development has caused the Wood Storks to nest later in the year giving them a much shorter window of time to produce chicks before the end of the dry season when all the fish are gone. Historically they would nest early in the year beginning Nov/Dec, now they don't begin nesting until Jan/Feb.

If wetlands could be preserved, allowing the Wood Storks to nest earlier, it is predicted a 28% increase in the population over the next 30 years would occur. If they continue the trend they are currently in, a 38% decrease over the next 30 years is predicted.

The meeting adjourned at 1:45 PM.