

FLORIDA KEYS NATIONAL MARINE SANCTUARY  
WATER QUALITY PROTECTION PROGRAM

STEERING COMMITTEE MEETING  
February 2, 2011

Florida Keys Mosquito Control District – Conference Room  
503 107th Street, Marathon, Florida

Minutes

Attendees

George Neugent—Monroe County Board of County Commissioners  
Charlie Causey—Florida Keys Environmental Fund  
Jim Reynolds—Executive Director, Florida Keys Aqueduct Authority  
Pete Worthington—Marathon City Council  
Susie Hammaker—Key Largo Wastewater Treatment District  
Charles Brooks—Key Largo Wastewater Treatment District  
Chris Bergh—Director of Coastal and Marine Resilience in Florida, The Nature Conservancy  
Richard Harvey—Director, EPA South Florida Office, representing the regional administrator  
Ron Sutton—Mayor of Key Colony Beach  
Jon Iglehart—Director, Florida Department of Environmental Protection South District  
Billy Causey—Southeast Regional Director, NOAA's Office of National Marine Sanctuaries  
Gil McRae—Director FWC Florida Wildlife Research Institute  
Ron Sutton—Mayor of Key Colony Beach  
Tracy Ziegler—National Park Service  
Anne Morkill—Refuge Manager for the Florida Keys National Wildlife Refuges  
Sandy Walters—Citizen Representative representing maritime interests in the Florida Keys  
Steven Blackburn—EPA, R4 Florida Keys Coordinator  
Tom Genovese—Florida Keys Service Center Director, South Florida Water Management District  
Gerald Briggs—Bureau of Onsite Sewage Programs Florida Department of Health

AGENDA

**I. Opening Remarks:**

Mr. Richard Harvey, Director, EPA South Florida Office  
Mr. Jon Iglehart - Director, South Florida District DEP

Mr. Harvey introduced himself. He reminded people that today's meeting is very important and could be a defining meeting of the steering committee, principally because of shrinking budgets. Typically, EPA comes to this meeting with a proposed budget, but they do not have one this year. He was asked by his boss to provide some recommendations on how he would recommend to proceed and upon which areas to focus. He complied with this request and will be discussing it with everyone at a later time today. At the end of the meeting, his boss basically responded by

saying that there is a high probability that funding this year will be reallocated. He pointed out that EPA's efforts in south Florida are part of the South Florida Geographic Initiative, which not only includes the Keys, but it includes the Southeast Florida Coral Reef Initiative (SFCRI). SFCRI is looking at corals and water quality issues in Dade, Broward and Palm Beach counties in a manner that is basically patterned after what is being done here in the Keys. They are about 10 years behind the Keys. In the last 6 years, EPA has given them \$600k. In the last six years, EPA has devoted \$8 million to the Keys. In addition to the Keys and the Southeast Florida Coral Reef Initiative, EPA has responsibilities in the Everglades. Over the last ten or so years, EPA has spent 2 or 3 million in the Everglades. All of that money comes out of the South Florida Geographic Initiative pot that EPA receives. Last year because of lawsuits, Jim Giattina, Division Director from Atlanta, needed about \$120K of our funds to deal with Everglades lawsuit issues. This year, as he mentioned, Mr. Giattina asked him for his recommendations on what/how much funding EPA should provide for the SFCRI. Mr. Harvey stated that he recommended \$400k to deal with ocean outfalls, to deal their monitoring program and deal with cause and effect relationships. When there is a fixed pot of money, the money has to come from somewhere short of having a huge bake sale, so he recommended that the money come out of the monitoring programs for the Keys next year. He knows a lot of you disagree with that decision. But at the end of the day, this committee will have the opportunity to provide your recommendations to Jim Giattina in addition to his recommendations. Mr. Harvey asked Mr. Iglehart if he had anything to say this time.

Mr. Iglehart explained that he would like to share with all that DEP has a new secretary, Herschel Vinyard, and give appreciation to Bill Kruczynski for setting up the field trip yesterday. He thought it was enlightening for all of the attendants and it came into play when we developed this schedule, which covers those issues in the morning session. This is a real working meeting this morning and in the afternoon, the committee can get back to the status of all the projects we have been working on thus far. As far as recommendations, DEP will be making a summary of this meeting, forwarding that summary to all committee members and then as a formal recommendation to Jim Giattina for the future of what this community thinks how the funds should be spent.

Mr. Harvey stated that there is a very aggressive busy agenda for the meeting today. He needs to add one agenda item. Mr. Iglehart would like add Jeanette Hobbs with the Keys Environmental Restoration Fun between the Little Venice seagrass study and the recap of the field trip. He would like her to be placed on the final agenda.

Mr. Billy Causey made an opening statement after being recognized by Mr. Harvey. He explained that he and Mr. Harvey disagree on how the funds are being spent. He has questioned the funds going to the Everglades or in setting up office there and saw that office as consistent with what is going on here in the Keys. However, SFCRI has had different pots of funding. The Florida Keys National Marine Sanctuary and Protection Act of 1990 authorized EPA in conjunction with state of Florida, working with state of Florida and NOAA, to develop a Water Quality Protection Program for the Florida Keys National Marine Sanctuary. That is what Congress authorized. The funds coming to that then have been appropriated to that, as far as he sees how funds move, these funds come over to fulfill the authorization under that act. How the money has been spent has been by the policy calls at the regional office. What he disagrees with

is what is authorized and what is appropriated and where it goes. This is a world class monitoring program that is just getting to the point, particularly with corals that have been spread out over 14 years of monitoring, where some predictions and future projections can be made. When the water starts changing on the mainland with the implementation of some of the projects in south Florida, this will start changing the way the water reaches the sanctuary, especially the quality, quantity, timing, and distribution. He feels that they will be talking about what came out of the Technical Advisory Committee (TAC) meeting. He is not saying that this cannot be done, but is just disagreeing with where the money is coming from and how it is being used. He wants to make it clear that we, the bigger NOAA, (not the sanctuaries section), but the Coral Reef Conservation Program has been putting close to a million dollars in science here in the Keys, even looking at corals and monitoring corals and taking a second look at their health. Mr. Harvey added that the bigger NOAA money was in addition to what EPA is funding down here.

Dr. Causey emphasized that every time he sees the EPA bosses, like at the Everglades coalition meeting, he gives EPA huge credit and he will do this at the Coral Reef Task Force meeting at the end of the month for what EPA has done down here. Don't mistake what he is saying, he respects and appreciates what EPA is doing and would continue to push for more. It's just that the sanctuary needs the funds to continue. So, without revealing his full recommendation at this point, he is just making this pitch so everyone else can hear it.

Mr. Harvey stated that he appreciated that and everyone needs to understand that he, Bill Kruczynski, and Steve Blackburn from EPA do not make that final budget calls. He was responding to his boss who asked him for his recommendations on what EPA needed to do for SFCRI and needed to do for the Keys and how it would be funded. He added that there is only one pot of money. If something is done for SFCRI or for everglades, it has to come from somewhere. Mr. Harvey is perfectly comfortable spending 100% of the money here in the Keys.

Mr. Harvey recognized that there has been good work done down here. He responded to his boss with his recommendations and they are only his recommendations. His boss responded saying that there will be a reallocation of funds and he would like to know what the steering committee recommends. This committee will have an opportunity to make your pitch to Mr. Giattina through Jon Iglehart, not through Mr. Harvey. He would strongly recommend that when this is done that the money and resources devoted to this effort above and beyond EPA be included. He added that money is tight and EPA has so many issues like mountain top mining and everglades issues. Jim Giattina has watershed offices that deal with watersheds around the region that are unfunded. At this point, a pitch can be made to Mr. Giattina and then let him make the call. With the amount of money that is left over for the Keys, then try to figure out the best way to spend that money to maximize environmental results. Mr. Harvey suggests emphasizing in the committee's recommendation the kinds of environmental results that will occur if he agrees to your recommendation. That is why this meeting is so important, to even listen to the presentation on the canals. Everyone needs to realize, too, that the offshore and nearshore waters are in compliance with water quality standards and the land use activities in the Keys have very little impact on that parameter. The same for the seagrasses—the seagrasses are in good shape. With a few little exceptions, land use activities in the Keys have very little impact. They are impacted by far-field sources. The corals are a challenge and are mostly influenced by far-field sources and local changes as opposed to land use activities in the Keys.

Mr. Harvey continued by stating that the waters in the state that are most significantly impacted by land use activities in the Keys are in the canals. He will explain later on when discussing the Reasonable Assurance Document that the canals will remain out of compliance with class 3 water quality criteria even after full implementation of the Monroe County Wastewater Master plan. If that is the case, EPA is obligated to develop TMDLs due to a law suit. He personally doesn't think a TMDL is appropriate, but thinks a demonstration project is needed to help determine how to bring the canals as close to compliance as possible, recognizing that the wastewater master plan needs to be fully implemented, along with the storm water master plan. Even after all is said and done, there will be crud in the bottom of canals and with the geometry, they will not be in compliance, so we are obligated by our lawsuit to do something about it.

Mr. Iglehart pointed out that there is a lot of food for thought and that this committee will have an opportunity to talk about that after the break. But, now, it is time to keep on track with the schedule.

### **Minutes**

Mr. Harvey stated that the first item for discussion is approval of the minutes and he will entertain a motion to approve those minutes.

Mr. Iglehart made the motion. Dr. Causey seconded the motion. Mr. Harvey asked for any discussion, recommendations, additions or deletions and there were none. Motion is approved.

Mr. Harvey introduced the next presentation from MacTec, a company that was contracted to study the canals by Monroe County in 2000.

## **II. MACTEC Keys Canal Study, Wendy Leonard, MACTEC Engineering and Consulting**

Ms. Leonard reminded everyone that the study was a team effort completed a while ago for Monroe County. There are approximately 480 canals in the Keys, totaling about 111 miles. Many canals are dredged 10 to 20 feet deep and many are dead-end systems. These physical constraints have caused impacts to water quality. This study compiled and evaluated the existing water quality information and developed a desktop GIS database of existing water quality conditions and canal physical attributes. From this information, the engineers created a canal classification system to capture the design characteristics of canals most likely to impact water quality. This classification system and existing water quality summaries were used to extrapolate water quality conditions for canals that had no water quality data available. This was done to get a cost-effective idea of water quality throughout the Keys. The report also outlined canal specific treatment technologies and provided a tool to allow prioritization, sorting and tracking of changes in the canals.

In the data collection step, the engineers created a bibliography and prepared electronic files with data that are linked to each canal through GIS. The product of this study is a tool that needs to be updated and could be very useful. Statistical analyses were done on existing data and box plots for seasonal and tidal variation for clusters of similar size canals were prepared to make

comparison to existing data feasible. They compared canal data to near shore water quality and determined a ranking for each canal (“Poor”, “Fair” or “Good”). They also evaluated the quality of the data itself using a variety of criteria.

Ms. Leonard turned the program over Mr. Stephen Hanks to summarize the GIS layer data. The study used FDOT Aerials (1998, 2 m resolution) for images of canals. For the Monroe County residential canal layer, they digitized water bodies from aerials. They created a point file of existing water quality monitoring stations (Baywatch, FKNMS, & Islamorada) and several base layers: stormwater basins, land use, hydrography, wetlands, aquifers, points of interest, surveying benchmarks, soils, elevation contours, geopolitical boundaries, and roadways. In the field, engineers then measured different attributes of the canals such as size, depth – not available for many canals, length, area/length ratio, canal construction method, number of mouths and orientation of mouths, canal outfall, wave and energy, convolutions and modifications since first dredged. Using this information, they classified the size and shape, shoreline energy, development and construction of each canal. There are only 10 jumbo canals in the Keys. Large canals tend to have the greatest water quality issues.

Ms. Leonard showed examples of the canal classification and pointed out that the information needs to be updated. Canals with similar classification were given the same water quality designation derived from canals with water quality data. An example of a canal with poor water quality is Port Largo, which is a very long dead-end canal with many convolutions, extensive development and commercial boating operations. An example at the other extreme is the canal system on Sugarloaf Key. The canals are short straight, have rapid flushing to a high energy outfall and no commercial usage. The study was begun in 2001 and completed in 2003. Today there are many more treatment plants in place and that is good to see. The study made several recommendations to improve canal water quality. Progress needs to be made with homeowners for best management practices. Bubble systems and weed gates can prevent seaweeds from entering canals. Pumps or other devices that increase flushing and the removal of impediments to flow are helpful. In some smaller canals, backfilling may be feasible. They may be able to use devices to increase circulation and apply nutrient strippers in some instances. The database can be used to query conditions and solutions in the various canals and allows for a customization of the approach for each canal depending upon its characteristics. Ms. Leonard presented cost estimations from 2003 for the various treatments (does not include permit costs). The report made recommendations to the county: develop a county-wide water quality sampling program to fill data gaps (e.g. small canals); add more canal-specific depth information; update and expand database of existing canal treatment technologies; add quantified pollutant loadings and a buffer analysis with the Keys Street map and develop a time table for periodic updates of database. The engineering firm does have a proposal for \$5,000 to update this database, which needs to be done. The study provides a basis and justification for selecting certain canals and canal treatment methods for remediation or for a demonstration project.

### *Discussion after Canal Presentation*

Mr. Harvey asked Mr. Leonard about her feelings about canal water quality after wastewater upgrades are in place. Does she have any reason to believe that just implementing the wastewater plan will bring the canals up to full compliance with water quality standards? She answered by

stating that they conducted one study with post-monitoring on this in Sunset Acres, which has treatment and found that there were still degradation issues because of storm water runoff and residual organics in the bottom. There is no question that improving wastewater will reduce a lot of the problems, but some of the flushing issues will still be there. It would have to be a combination of methods to accomplish the goal.

Councilmember Worthington has been looking at lot of canals with a lot of different problems and feels he has a pretty good idea of what works and does not work. It seems like the shallower, more natural canals with mangrove shorelines have healthy fish stocks and bait. It seems like the culverts and natural circulation to take advantage of the tidal flow works best in the Keys. Duck Key has very healthy canals because of the tidal flow, even though they are 20 feet deep. A pilot project might be designed to take advantage of tidal flows from the Gulf to the ocean side. Maybe a culvert could be put in that allows flow to only go one direction, with a flapper valve. Fifteen years ago, they looked at opening up Boot Key Harbor, but EPA was not on board because of the harbor pollution, which has now been cleaned up. His observation is that is really helps to shallow up the canals to 6-7 feet and then get culverts and hydrology to move the water around. He asked if MacTec had done any studies on this kind of thing. MacTec has had some experience in this area.

Mr. Harvey asked Councilmember Worthington if they would be willing to participate in study and the answer was yes.

Mr. Reynolds pointed out that taking bad water and putting in good water can lead to regulatory issues. It's about the way that the regulations are written.

Mr. Iglehart explained that DEP takes into consideration any short term degradation that might occur and it becomes part of the analysis. The length of the degradation and what can be done to minimize the impacts to receiving waters are important factors to consider.

Mr. Harvey stated that although it has been a while since he read the OFW regulations, he recalls that if it is a direct discharge, the water quality of the receiving body cannot be changed measurably, but with an indirect discharge, the standard is that the water quality cannot be significantly changed. Even though the canals are in bad shape and there are slight changes in seagrasses, these do not represent an imbalance or a violation of water quality criteria.

Commissioner Neugent added that one of the biggest hindrances is money and the other is the state and agencies that have kept people from doing practical solutions like culverts that have worked throughout the Keys. Little Torch had a project and the county contributed expertise and it worked. One hindrance is the state and feds keeping the county/local entities from doing things, along with a lack of money. Certainly, there needs to be a combination of backfilling and hydrologic pumping. He has worked with Councilmember Worthington on projects over the years and there have already been demonstration projects done (Little Torch, Summerland, etc.). Key Colony Beach is a prime example of where culverts have cleared up the water in a very short time. This is complex situation that needs to be focused on, but it is not something that has not been recognized as a problem for many years.

Mr. Harvey stated that with the expertise in this room, everyone knows what needs to be done, but how to pay for it also has to be addressed.

Dr. Causey wanted to point out an example of success. There have been recent examples of when the water quality was degraded, but came back almost immediately. The removal of the Lake Surprise is one example. There had been several blooms in the area and there were concerns with the removal of the causeway, but now the water quality has stabilized. There were other examples on the field trip yesterday. They visited areas with culverts that were working with snapper and other fish. The big issue is what is happening in the canals. The grab samples had muck and smelled like hydrogen sulfide. He asked Wendy if they took into consideration the money it would take to remove the muck in their assessment. This is a step that will be needed in addition to the culverts. She answered that they looked at removal from seaweed end of things and added that another area that needs to be looked at is turbidity and new technologies, too. Dr. Causey wanted to make sure that the public officials at the meeting understood how much interest there is in this topic amongst residents. He explained that everywhere they went on the field trip, groups of public congregated around them. People see the need for this kind of thing. It's tough with costs, but this body can help get the momentum going in the right direction

Commissioner Neugent responded that money is needed and will be needed to resolve this issue, along with a joint effort and public relationship with people who live on the canals. These problems were created by construction industry, but they are gone now and they cannot be made responsible at this point.

Mr. Harvey wanted everyone to know that there is technology available to suck muck out of bottom and that technology can be examined.

Mr. Bergh pointed out that FDEP protective regulations are in place for reasons and there have been many examples of FDEP working with people to get things done. What this group can do, other than identifying the best technology for the situation, is to create demand on part of residents there who can see benefit to their property. If canal residents can contribute funding on their own (like they did on Little Torch Key special taxing district), then they could get clean swimmable water, instead of bad water. This committee should think ahead to quantify that for them, so that there is less reliance on state and federal funds.

Mr. Iglehart asked Wendy how long it would take to do the follow-up study and she answered about three weeks.

Mr. Iglehart made a motion that public comment be moved up to just before the break, so that people who are here do not have to wait until the end of the day to make comments. The motion was seconded and then approved unanimously.

Mr. Reynolds pointed out that removing the much was be very expensive and asked MacTec about the option of sequestering the canal muck with fill, instead of removing it. Ms. Leonard said that they talked a little about this idea yesterday. Things like how much muck, depth of canal, etc. would have to be considered, along with the turbidity associated with filling.

Mr. Causey noted that some canals have been filled, like Carysfort canal, and wondered if any data existed for these projects to give an idea of the impacts. Dr. Kruczynski answered that the canal was completely filled and is now dry land.

Ms. Walters has a list of six different things she wants to recommend to consider in looking at how to get the public involved with this process and working with regulatory agencies to remove permitting obstacles to make improvements. She thinks that adding to the monitoring effort with volunteers could be helpful. There are things that can be added to make projects more implementable and to help come to solutions. She will speak more about this at a later time.

### **III. Little Venice Seagrass Study and future seagrass studies,**

Dr. Darrell Herbert, FIU

Dr. Darrell Herbert showed an aerial photograph of the location of the 112<sup>th</sup> street canal where the Little Venice wastewater treatment plant, which became operational in 2004. FIU first started studying the seagrasses in the area in March 2006 to determine the effects of sewage treatment on nearshore benthic communities. Unfortunately, they missed two critical years and do not have a good quantification of the status of seagrass for that time period, except in terms of cover. Determining the effects of treatment on seagrass has meant defining the distribution of benthic communities in the area. They have been looking at nutrient concentrations and isotopic composition of nitrogen and carbon plant tissues, which provides high quality, quantitative data on the status of the seagrasses and helps detect trends in the distribution and status of the benthic communities. They have developed explicit models of behavior for the seagrass system that detect shifts in relative abundance of seagrass species toward more nutrient-loving species. He showed the succession of plant species that appear as the environment becomes more nutrient rich. If sewage treatment is working to reduce nutrients, then they might expect to see a trend toward plants that are favored under lower nutrient levels.

Dr. Herbert showed proof of concept for this model using what happened with bird stakes in Florida Bay installed in 1981. The birds sitting on the stakes provided excess nutrients and that caused an increase in *Thalassia* density first and then finally, *Thalassia* was replaced by *Halodule*. For this study, they sampled the seagrass along transects going out from the mouth of the canal up to 200 meters. The data shows change taking place, but trends are not evident. Dr. Herbert also discussed the second model of ecosystem behavior involving the Nitrogen to Phosphorus ratio, which shifts toward the Redfield Ratio of 30:1 with nutrient pollution. At the ratio of 30:1, *Thalassia* will be replaced by a more nutrient loving *Halodule*. A map of the Keys shows that different areas have different natural ratios of nitrogen to phosphate (N:P). The offshore waters are low in nutrients, while the nearshore and Florida Bay waters are rich in nitrogen, but low in phosphorus. Thus, there are different limiting nutrients in different areas. Scientists sampled seagrass at various distances from the mouth of four canals to determine if there were shifts toward the N:P ratio since the installation of the treatment plant. The nutrient ratios for *Halodule* were calculated through September 2010. At the beginning of the sampling, the canal mouths were replete with nutrients (very close to Redfield Ratio). They did see some small changes in the nutrient ratios for the first 18 months. After taking a break from 2007 until 2010, they returned and resampled the same sites. At that time, they detected a small increase in the N:P ratio, so that the area had become more limited by phosphorus. This trend is occurring at

the canal mouths and at 50, 100 and 200 meters offshore, so that the whole system is being affected. *Halodule* is the fastest growing species and is the one that replaces *Thalassia* under high nutrient conditions. It will be less competitive under lower nutrient conditions. Even offshore, there were still relatively high nitrogen levels, probably originating from deep in the canal sediments stirred up in wind events. They also determined the N:P ratios for slower growing *Thalassia* plants at the same stations, but the trends were not as clear. *Thalassia* is just starting to show an effect, but only slightly. Change is happening, though, and the system is cleaning up.

As a comparison, Dr. Herbert showed the N:P ratios for stations throughout the Keys derived from the overall seagrass monitoring project. Several offshore and nearshore sites have shifted toward the Redfield Ratio, which is an opposite trend from Little Venice. This shift in offshore sites may be due to terrestrial sources that are not easy to detect, but the trend toward lower nutrients nearshore is most likely the result of a management decision because it is not taking place elsewhere (offshore).

The study also examined heavier isotopes in the tissues of plants. The isotope ratio will become more negative with increasing <sup>13</sup>C nutrient pollution because under low light conditions, the plant will discriminate against  $\delta^{13}\text{C}$ . The signature on nitrogen is a little more difficult to interpret and varies depending upon the source. The results of the carbon analysis show that more heavy carbon is being absorbed at the canal mouths and that can be interpreted to mean one of two things (or both): the phytoplankton concentrations in the water column are reducing and the water column is becoming clearer and/or epiphyte loads are becoming reduced (with lower nutrients to support them). Either one of these will increase light availability and give this signal. This trend is not seen at the offshore sites.

In summary, rapid population increases adjacent to oligotrophic marine ecosystems in south Florida may have deleterious effects on those ecosystems. Changes are occurring in south Florida's offshore seagrass beds that are consistent with increased nutrient availability in the system – but few increases have been observed in the water column. Trends in seagrass nutrient content and isotopic signatures near-shore to Little Venice are in stark contrast to those measured offshore, indicating a shift away from its eutrophic nature. Dr. Herbert received a small grant to begin near-shore benthic monitoring off Key Largo in March 2011. He showed a slide with the sites that have been selected. These sites have baseline data from a study done in 1999 done by the Army Corps of Engineers. The monitoring will be the same as in Little Venice, but they will add two more indicators—sediment nutrient concentrations to detect long-term changes. The other indicator will be looking at rapid changes that might occur after the sewage treatment facilities come online in Key Largo. They also have baseline data for Key West, which improved treatment a while ago and could someday reexamine those sites as well.

#### *Discussion after Seagrass presentation*

Councilmember Worthington asked Dr. Herbert if he noticed any spikes in the data in 2006 after the hurricanes of 2005. The airport runway in Marathon had four feet of water and some people have seen sand coming up through the ground with the storm surge. Dr. Herbert was not here until June of 2006 and with his experience with hurricanes, he can believe almost anything.

Councilmember Worthington added that there is a groundwater surge in the porous rock and wondered if the nutrients in the Little Venice canals may have been pushed out at that time. Dr. Herbert stated they don't have that data as earlier they looked a plant cover and only have added nutrients in since 2006 because it is a sensitive indicator of change. He added that looking at the tissues will not necessarily show spikes as it is an integrator of what is taking place over time.

Councilmember Worthington asked about the offshore stations since things are improving in Little Venice. Dr. Herbert answered that he had been using the long-term sites. They are not in bad shape, but they are showing the opposite trend as what is taking place near shore, where seagrasses are improving. Councilmember Worthington stumbled onto one of the seagrass stations offshore. Because of the east-west movement of water in that area, he would not expect that station to receive much impact from the north/south canals of Little Venice. Dr. Herbert stated that the offshore sites are more of an indicator of what is going throughout the Keys, including what is being brought in from far away.

Mr. Iglehart asked Dr. Herbert for his opinion on what is minimally needed in the sampling regime to still show trends off of Little Venice. Dr. Herbert would like to get a full two years to capture the trends. He has been funded for 18 months and it would be nice to get another six months and then come back in a few years for more sampling. There are so many nutrients in the system that can still see results even after a break, especially since the baseline and trends are established. He needs six months more than he has now. Mr. Iglehart restated that to determine the trends he needs 2 full years and then can come back in another few years for two more years of sampling.

Mr. Harvey asked for any more questions and there were none. They will wait until later to have a public comment. Mr. Iglehart introduced Ms. Hobbs.

#### **IV. Keys Environmental Restoration Fund, Jeanette Hobbs**

Ms. Hobbs stated that she manages Audubon's Keys Environmental Restoration Fund. They have been doing restoration in the Keys for about 30 years now and that has given them the opportunity to participate in a number of projects with the members. Dr. Kruczynski asked her to come in today to discuss water quality opportunities. Most projects fall into two major types. One involves shallowing up the dozens of borrow pits in the Keys and the other involves shallowing up canals. The problems with these deep bodies of water are that they do collect organic debris and chemicals and nothing lives there. Canals vary in depth, but the borrow pits were dug from 22 feet to 35 feet deep. Most are 35 feet deep because the fill was needed for development. The other problem with borrow pits as opposed to canals is that if they are connected to open water with a deep canal, the flows are limited by the shallow nearshore bottom topography. When conditions are right, there can be a turnover of water and that can release the bottom sulfide rich water into nearshore communities. She showed the borrow pits at Bahia Honda State Park and noted that they will be restored and that borrow pits affected areas throughout the Keys. She also discussed the Carysfort canal restoration in Key Largo. The canal was 30-40 feet deep at one time. After plugging it, they began to scrape down the area and then use the material for filling the canal. They have recreated the surface contours to what they had once been. The process took place over several years and to date have restored almost 27 acres of

wetlands and submerged habitat. They can use clean concrete rubble and use on lower elevations and then top that with clean limestone fill. They work with the county to get clean fill material to the basin and that helps everyone. The total cost was about \$1.5 million and includes costs of in kind materials. The cost was reasonable, but the area is fairly large. The back basin at Carysfort has had some unexpected consequences like lowering the water table and making it hard for the hammock to come back naturally.

Ms. Hobbs pointed out that there are many borrow pits throughout the Keys that need to be filled/shallowed. The pit at Curry Hammock will be quite a challenge to fill. Another type of project involves impounded areas that were created when roads were built. These areas can become quite fresh during the rainy season, but when the dry season comes, the fresh water plants struggle. During hurricanes, salt water can fill the impounded area. When the area dries out again, the salt remains and creates a salt pan with 70 ppt. salinities. When this occurs over the freshwater lens on Big Pine, this can have an impact. As we address sea level rise, we should keep this in mind. Opening up areas can have a positive effect, but it can also make the fresh areas more susceptible to impacts from sea level rise.

#### *Discussion after Restoration Fund presentation*

Dr. Causey asked how funds were obtained for restoration projects and inquired about the process for selecting projects. Ms. Hobbs stated that funding is generally pieced together from what they can get. The Carysfort project used money from the Army Corp and FDEP. Mitigation funding can also contribute and needs to be applied to surface restoration and not used for fill. They have been fortunate to receive grant funding from US Fish and Wildlife Service coastal program. FDEP state park money has been used for improvements and they have received in-kind material from Crocodile Lake NWR. Dr. Causey asked about the Niles Channel mitigation money and whether or not it had been used in the past. She would have to look back to answer that, but the primary seed funding for the program came from a wetland case on Key Largo.

Ms. Hobbs explained that they do a competitive bid process for contractors for projects. Selecting the actual projects takes place at semi-annual meetings held by a working group. The working group has representatives from the parks, county, Fish and Wildlife, TNC, etc. At the meeting, they can propose projects and if it is going to be accepted for FDEP or Army Corps mitigation, then the staff from those agencies would have to approve. They mainly try to match up sources of funding with projects.

Dr. Hammaker asked about quality control regarding the fill. Ms. Hobbs explained that all contractors are licensed through the county and they can only accept clean materials as defined by FDEP. All inappropriate materials have to be sorted out. Park staff inspects fill going into state parks. If haulers violate the procedures, then they can and are banned from the program, after being warned once.

Mr. Iglehart congratulated Jeanette for putting together these kinds of projects. The cost of \$1.34 per square foot for these projects is about 30-40 % lower than comparable programs in the rest of the state and that has opened up the Keys for more good work.

## **V. Recap of Field trip, Steering Committee Member Observations**

Mr. Harvey noted that the committee needs to keep on schedule and asked if it was alright not to have a detailed summary of the field trip, especially since so many people participated in it. If someone needs a recap of the field, maybe that can be done at the break. Otherwise, they will move into the summary of the TAC and management committee (MC) meeting, which took place about a week ago. After Dr. Kruczynski's presentation, there will be a public comment period. There were no comments from committee members.

Dr. Kruczynski gave a short summary about yesterday's field trip, which helped showcase what this committee has done to improve wastewater treatment in the Keys. They looked the Little Venice treatment plant, which was an attempt to improve water quality in those canals. They also visited the brand new Marathon city treatment plant. Marathon should be really proud because this plant has reuse associated with it. Boot Key is where a nasty situation with live-aboard vessels has been dramatically improved because of sewage improvements. There are a host of canal problems. Some of the canal systems, including Little Venice, will have problems for a long time due to the depth and organic matter in the bottom. Indigo Reef is an example of where canals have been successfully restored by making them shallower, as little as 6 feet, so they are live to the bottom now.

## **VI. Summary of joint meeting of Management Committee and Technical Advisory Committee- Bill Kruczynski, Mr. Hunt, Gus Rios, George Garrett, Richard Harvey, Steve Blackburn, Billy Causey, Kent Edwards**

Dr. Kruczynski stated that a few years ago, the committee questioned as to whether the long-term monitoring money was being used effectively. They asked whether there might be duplicative programs, especially with corals, and wondered where money might be saved by eliminating or combining programs. So, finally, the MC and the TAC came together on January 19<sup>th</sup> to address this issue. The TAC members and their affiliations are: Jerry Ault – RSMAS, Doug Morrison – retired, Bill Perry – NPS, George Garrett – Marathon, Mr. Hunt – FWC, Dave Rudnick – SFWMD, Joe Boyer – FIU, Kim Ritchie – Mote, Mr. Hunt—FWC/FWRI; Ogden – USF, Gus Rios – FDEP, Alina Szmant – UNCW, Dave Makepeace –Coral Shores HS, Carrollyn Cox – Marathon HS, Martin Moe – Citizen, Mark Chiappone – MDCC, Rob Ruzicka – FWC, Joshua Voss – HBOI, Ilsa Kuffner – USGS, Jim Fourqurean – FIU.

Dr. Kruczynski noted that the TAC is not just for the WQPP, but to give sanctuary advice on all issues related to the sanctuary.

The MC members are: Sean Morton – FKNMS, Scott Donahue – FKNMS, Kent Edwards – FDEP, Gus Rios – FDEP, Tom Genovese – SFWMS, George Garrett – Marathon, Mr. Hunt – FWC, Roman Gastesi – Monroe County, Steve Blackburn – EPA, Richard Harvey – EPA, Bill Kruczynski – EPA.

Dr. Krucynski explained that by statute, these people have been asked to give advice on water quality issues and have been narrowly focused on water quality issues of significant importance--wastewater. At the last few meetings, some members of the committee have shown some angst about not addressing other issues. Bruce Popham, Chris Bergh and others have been the outspoken advocates of expanding the purview of committee to address other issues. Yesterday's field trip was an attempt to show that there are other water quality issues in the Keys that should be considered, including climate change, canal issues, habitat restoration, sea level rise, etc.

Dr. Krucynski reviewed some important dates to provide a history of the WQPP (given below).

1990—Florida Keys National Marine Sanctuary Act, Pub. L. No. 101-605

1996— Water Quality Protection Program Plan

1995-1996—Long-term monitoring initiated

1997— Florida Keys National Marine Sanctuary Management Plan

Incorporated WQPP Plan as Water Quality Action Items

Incorporated Research and Monitoring

2000— Science Review Panel – 1

2002— Comprehensive Science Plan

2007—Battelle Review

2007— Science Review Panel - 2

Dr. Kruczynski explained that in 2000, the sanctuary science program was reviewed by an independent panel that made recommendations. These recommendations led to the development of a science plan in 2002, which not only addresses water quality, but also includes queen conch, mangroves and seagrasses. It includes all things in the Keys that need science attention. The plan was written around management objectives—what the managers need to know. At that time, the TAC purview was expanded to address science that pertains to the entire sanctuary.

There is a disjunction between those committees and the focus of this body. In 2006, this committee asked the question whether the money was being spent effectively on long-term monitoring. About \$1.2 million dollars per year is spent on water quality, seagrass and coral reef monitoring. One of the members on the board asked whether that money would be better spent on shovel in the ground operations and they questioned whether money was being wasted on duplicative monitoring programs. That led to a second science review, paid for by EPA. Battelle was contracted to conduct this second review and was asked to convene a second independent panel of scientists from outside the area. So, every five years, a science review has been done. Mr. Hunt was the only person on the committee that was not from outside of the area and was there to provide local knowledge. Battelle provided a final report with recommendations.

Dr. Kruczynski showed a slide with the main 2007 recommendations from Battelle. He did not review each one individually, but did read the following recommendation, “Conduct rigorous statistical review of data sets to determine if and how monitoring can be streamlined spatially and temporally, followed by cost-benefit analysis.” He added, “Is the money being spent in a way that provides managers with what they need? “Can the programs be streamlined to spend less money on monitoring to use money in other areas?”

The Battelle report led to a science review panel. The members of the 2007 panel were Jane Caffrey, Mr. Hunt, Ronald Kneib, Marguerite Koch, Esther Peters and Rob van Woesik. They made both specific and general recommendations. The first general recommendation was that monitoring of water quality, seagrass, and corals/hardbottom should be continued to understand spatial and temporal changes. Monitoring keeps a pulse on the sanctuary and identifies where there could be issues and helped develop hypotheses used in the special studies. In addition, the special studies are important to understand key processes that drive changes and assist in interpretation of monitoring data.

Specifically, the panel recommended that they focus on integrating across monitoring programs. Dr. Kruczynski stated that this has been done to an extent with water quality and seagrass. If they know nature of the sediments and the water quality conditions, then scientists can predict what species of seagrass will grow there. This integration has not been done with corals and water quality and that is a hole in the program that needs to be addressed. A synthesis of this kind has been proposed as a post-doc project if they can find the funding. The water quality monitoring doesn't any event driven sampling right now, which was one recommendation of the panel. Sampling is quarterly and major events are missed, like the impacts of a hurricane, etc. The panel also suggested that monitoring be based on conceptual models that address how the system functions and that monitoring programs be revised around that concept. They recommended increasing the scope of the coral monitoring, which has been focused mostly on percent cover. Coral scientists should use the more than 10 years of data to develop hypotheses to further define mechanisms causing declines. There is no mangrove monitoring in the Keys right now and many mangroves have been lost due to construction, etc.

Dr. Kruzynski explained that about 32 special studies have been done in the Keys and they have been useful for getting at cause and effect. The panel recommended that future studies be process oriented and involve synthesis. The data have not been synthesized in any significant statistical way.

The key discussion points between the MC and TAC were reviewed by Dr. Kruczynski. He asked members to help explain if needed. The first point was that there has been an increased demand for EPA money spent in the Keys to go to other areas. There is a need for other agencies to "step up" to help with funding. There is also a need for a full time post-doc to integrate and "mine" existing monitoring data and from that hypotheses can be developed for testing. There might be clues about why some corals in Hawk Channel are doing better than those at the bank reefs. Seagrass will focus on detecting change at nearshore sites. They left the meeting with Jim Fourqurean getting some clear marching orders to look at reducing the frequency of sampling at his fixed 30 seagrass stations. Maybe these stations can be sampled less than annually.

Mr. Harvey commented on seagrass. He asked Dr. Fourqurean what basic information would be lost if they skipped a year of seagrass monitoring and he recalls that Jim said that they would not lose much, but he would probably have to lay off sampling crew since the university will not pick up those salaries. For water quality, Dr. Boyer was given some suggestions, including adding stations near shore on top of the seagrass stations that Dr. Herbert will be monitoring to detect changes in the seagrass community associated with sewage improvements. All of the offshore stations may not be needed, but reducing stations may not save much money since the

boat goes out to get the samples anyway and the boat time is expensive. The analyses costs would be saved.

Dr. Kruczynski then addressed the recommendations for the coral program. The coral monitoring, CREMP, quantifies changes in corals at fixed sites, but these data cannot be used to effectively project across the entire sanctuary because the sites are not randomly placed. Regardless of that fact, the coral scientists were asked to investigate reallocation of sites so that there are more representative of the coral cover in different coral community types in the sanctuary. There is a second coral program led by Steve Miller and Mark Chiappone based in Key Largo. This program, called Rapid Assessment Method, which uses a stratified random sampling approach that allows sanctuary-wide assessments that are not done annually. It allows for a sanctuary-wide estimate of the numbers of coral colonies. The panel also noted that the WQSC was narrowly focused on wastewater and added that they need to think in broader terms and should go through the science plan to better understand the ecosystem.

Ms. Morkill asked if the rapid assessment sampling was event driven. Dr. Kruczynski answered that it could be, but is it currently is not. Mr. Bergh added that using the same sampling approach that Miller and team, the TNC and its partners (sanctuary and others working on coral reefs in the Keys) are working together as part of the Florida Reef Resilience Program (FRRP). The FRRP is annually conducting disturbance response monitoring looking at stony corals and getting that probabilistic, fully randomized, robust information as to how corals are responding to disturbance like high water temperatures in the summer and cold water temperatures in the winter. Dr. Billy Causey asked if that sampling was disturbance driven. Mr. Bergh agreed that it was event driven.

Dr. Kruczynski continued with the discussion key points. Canals are Class III waters. The question is, "How can water quality in canals be restored?" This requires study and demonstration project. Other suggestions were to reevaluate Science Plan in light of what has been learned during the past 15 years and showcase the program to EPA Atlanta and headquarters. The program is world-class one that keeps the pulse on the sanctuary and needs to be continued. It should have permanent funding, without people trying to take money from it.

The TAC asked one other question, "Are we getting anything useful for \$60k per year to FWC for data management?" Mr. Chris Anderson is here today and can speak to that question.

Dr. Kruczynski described some suggestions for potential special studies. He presented a list to them as a representative of the MC. The list included: quantifying the impacts of mosquito control activities on non-target marine organisms in the sanctuary; measuring the potential loadings of nutrients and contaminants from storm water runoff from highways, bridges, and other impervious surfaces; testing methodologies to treat runoff before discharge into surface waters, and measuring impacts of weed wrack on water quality in residential canals and boat basins (don't know loading). They should also conduct a canal restoration demonstration project to improve circulation, tidal flushing, and water quality, assess sources of viral contamination of groundwater at bank reef and the potential impacts to background microbial communities of corals.

Based on all of this, the TAC says that these are some nice projects, but if money is limited, then they recommend conducting a synthesis study based on the data from all three projects for the past 15 years. The study should synthesize, identify cause and effect interactions, generate hypothesis and evaluate effectiveness of current sampling. Dr. Kruczynski asked the MC if he missed anything.

Dr. Billy Causey added Mr. Harvey is often asked how these monitoring data are being used and at the the last WQSC meeting, Rob Ruzicka presented coral study results. For the first time in years, a significant increase in coral cover was seen and this has been confirmed with more data. This is something to celebrate. Dr. Causey explained that he used to have questions about the value of the fixed sampling method, but after seeing Hal Wanless's sea level rise graphs and other data, he sees the value of fixed sites. The Miller study takes a more broad random approach to help overcome the deficiencies in the fixed station approach. Now, the trends are readily apparent with the fixed stations and those trends can be related to events like cold water, bleaching, etc. Managers can now look at both random and fixed sites and can say the CREMP sites are most visited sites. They can look at what is driving this change and decide about special studies. Can the program afford ignore looking at nutrients and the reef? Can the special studies address canals or disease and corals? They now have the information that shows if the canals are improved by reducing wastewater, that action alone will not save the reef. They first thought wastewater was one of the main driving factors, but now know that global climate change, pollution, overfishing and other factors are contributing to the declines in corals. At the local level, people can deal with impacts, but global phenomena are driving these changes. However, if the water is polluted, then there will never be recovery of these corals. He feels that so much has been learned through the long-term monitoring.

Mr. Harvey noted that the long-term monitoring program costs \$1.2 million per year. At the TAC MC meeting, Mr. Blackburn mentioned that he thinks they may get another \$1.2 million this coming year. Mr. Harvey emphasized that this not his or Steve's decision, but asked the committee to consider what happens if they only get \$1.2 million or not even that much. And, if all of the funding goes toward monitoring, then there will be no funds to do the synthesis study—a statistical analysis of the data. They would then have no money for canal studies or SFCRI or the Everglades. He is a big fan of what has been done, but he doesn't know if the monitoring program can be continued in the same way. As an EPA clean water guy, the water quality is in compliance with water quality standards. Everglades is not. That fact calls into question as to whether all stations need to be monitored quarterly and whether all stations need to be sampled. Mr. Harvey continued by stating that a statistical synthesis would tell us whether the effort can be reduced without losing information. The seagrass communities don't change that rapidly as he mentioned before and sampling could be reduced. The corals might be approached a little bit differently. He was asked by his boss specific questions about what studies need to be conducted to support our SFCRI program and where that money would come from. If there is a fixed pot of money, it needs to come from somewhere. He would love to have more money as in the past, but those days are gone. It is just his recommendation.

Mr. Iglehart explained that the expectation is that the subcommittee would come back with specific recommendations for the general steering committee as if these decisions have to be made by Jim Giattina, with a priority list of monitoring verses projects. He added that it is up to

this committee this morning to make that determination of that prioritization. They need to think about this for the next hour or so. They have a meeting schedule to maintain and want to allow time for public comment.

Mr. McRae questioned how Mr. Harvey could say that it is not his decision about the funding when he made the recommendations that he did. Mr. Harvey replied that it was his personal recommendations about SFCRI. In that last 6 years, we have funded 600k for SFCRI and much more for WQPP. He explained that the committee has the opportunity to make its own recommendations to Jim Giattina through Jon Iglehart, not him.

Mr. McRae inquired about the program that funds the work down here and noted that in comparison to other regional programs, this area gets much less. Mr. Harvey agreed. Mr. McRae thinks that this is one important issue of which the committee needs to be aware. Mr. Harvey added that most of those programs have multiple states and senators. The South Florida program deals with more than WQPP. They deal with TMDLS, SFCRI, water quality criteria performance measures that need to be reported on each year. Mr. Harvey was not here when this funding was first secured. The offshore waters here are in compliance, but the everglades waters are not. EPA spends more money on the Keys than the glades. The factors that affect the Everglades are locally controlled, not global issues. They are impacted by huge populations; they are underfunded and have secondary treated outfalls to the ocean. It is hard to balance everything. He would like to have more money.

Mr. McRae asked about the WQPP and the act that created it. Does WQPP state that there is a need to meet standards and then once that happens, a pull back is in order? Dr. Billy Causey answered that it was more general than that and the act seeks to restore and maintain and does not imply that there is reduction of focus or effort, if and when those goals are met.

Dr. Hammaker addressed the committee and invited Commissioner Brooks to comment on this, too. She and others have been involved in lobby efforts for the Water Quality Improvement Program and have been successful in their efforts. They whole heartedly agree with Mr. McRae's comments and support the argument that this area is equal to Chesapeake and other programs. Commissioner Brooks added that this is the time to ask for more money. Mr. Harvey confirmed that they could ask for more money and communicate with decision-makers, but government employees cannot lobby. Mr. Harvey reemphasized that the money is fixed and needs to be divided.

Dr. Billy Causey noted that they have had more money in the past, but budgets have been shrinking. The big change in funding came when EPA set up the south Florida offices and started looking at the south Florida ecosystem restoration efforts and that was consistent with water quality efforts in the Keys. What has continued to grow now is the SFCRI interest, which is new. Within NOAA, SFCRI and the sanctuary have to compete for funds and SFCRI doesn't have to match the funds in many cases. That is why he is concerned. Mr. Harvey reminded everyone that Washington takes money from the south Florida appropriation.

Mr. Iglehart reminded everyone that they needed to get to public comment and then take a break. But, the committee should assume from discussion that funding will be at the current level and in

that case, they need to prioritize monitoring versus shovel projects for the recommendations to Mr. Giattina. Mr. Harvey stated that the committee can ask for even more money and suggests documenting the environmental benefits and results.

#### Public Comment

Dr. Bill Kruczynski spoke on behalf of the people in avenues of Big Pine Key. They have tried for many years to address a very significant canal water quality problem that is also navigation concern and is a high quality priority issue. They need help from the government to solve this ongoing problem, which may be a public health issue as well.

Mr. Winston\* introduced himself from Cudjoe Key. His neighborhood has 10 closed in canals and a marina. They are looking to assess water quality in canals. He asked whether or not there were any resources or information that could help with this task and where could he go to find them. Mr. Harvey called on Ms. Walters to respond. Ms. Walters suggested that they get in touch with Sugarloaf Property Association. They have been coordinating with a program at University of Florida LakeWatch to conduct water quality sampling in Sugarloaf canals. At this time, the neighborhood has collected close to 10 years data in their canal system. The program is adapted to marine conditions and has been easy to do with volunteers. Councilmember Worthington stated that the City of Marathon conducts water quality sampling in the canals using a private contractor. He believes that they get reimbursed from Monroe County for the work that is done. He would be happy to share information on this topic with anyone who wants it.

*\*not sure if Winston is a last name or a first name*

Mr. Harvey asked if there were any other questions/comments and then announced a brief break to keep on schedule.

Break

#### **VII. Implementation Priorities / Canal Restoration, Richard Harvey, Bill Kruczynski, Gus Rios**

Mr. Jon Iglehart reconvened the meeting after the break. He announced that the next item on the agenda was the canal priorities topic. They have identified Bill Kruczynski, Richard Harvey and Gus Rios as speakers on this topic.

Mr. Harvey stated that he thought this discussion was a continuation of an earlier discussion. If there is a fixed pot of money, the question is how should the money be spent? He feels that there are canals water situation that needs to be dealt with sooner or later. The canals are designated class 3 waters and that means that they support healthy populations of fish, etc. He thinks right now they don't meet class 3 standards. Implementation of the wastewater master plan is a very positive thing, a step in the right direction, but it is not going to get the canals into full compliance. From an EPA standpoint, if they do not conclude that the canals meet class 3 criteria, then there will be actions due to lawsuits against EPA. EPA was sued to establish

TMDLs for water bodies that are out of compliance. Mr. Harvey explained that if Atlanta takes his recommendations, then the canals will be out of compliance and that triggers the next step of developing TMDLs (total mean daily loads). He personally thinks that would be waste of money and would rather use limited resources to determine how to bring canals back into compliance. He thinks they need a canal study/demonstration project where the master plan has already been implemented and that way the factors other than wastewater can be identified. This is one of the things the committee can consider when making recommendations to Atlanta with limited funds.

Mr. Iglehart asked for clarification on the connections between the proposed study and the wastewater master plan. Mr. Harvey explained that the study should be done where wastewater is not a factor any more, like Little Venice. This kind of study could help identify other factors that keep canals out of compliance, like physical conditions, circulation, etc. Mr. Iglehart restated the point as the prioritization of shovel works for areas already under sewer. Mr. Harvey agreed and added that collectively they know what needs to be done, but they need to know how to fund it.

Mr. Rios agreed with Mr. Harvey that a canal study should be a priority. Multiple factors contribute to poor canal water quality, including storm water and wastewater loading, geometry and poor flushing. He agrees that it would be good to eliminate the wastewater loading in the study to better identify how to improve the canal and learn how much improvement can be expected with the various remedies. A program to meet ATW is already in place. Once that is completed, then what else needs to be done can be determined.

Mr. Harvey commented that what he thinks the committee needs to decide when developing their recommendation is whether a canal project is one that should be funded. He pointed out that a research need in the sanctuary science plan is to improve water quality in canals, making this recommendation consistent with the science plan of the sanctuary.

Commissioner Brooks inquired about the canals that have been filled in at Indigo bay. Has the filling in of the canals improved conditions? Mr. Harvey added that the canals were in good shape now, but not before they were filled. Not all canals were filled, but many were brought up to 6 feet depth. They also have a levee system that keeps weed wrack out of canals. As a demonstration project, this appears to have worked as it flushes well and appears to be in good shape. Mr. Iglehart added that canals in the current shapes are oxygen limited. In a canal cut, oxygen won't get to bottom and will probably only go to 6 feet. Just by bringing the depth up, the canal oxygen can be improved and begin to support marine life. Councilmember Worthington added that shallow canals support plant life that produces oxygen. Mr. Harvey noted that waters in deep canals at the bottom spelled very badly, like hydrogen sulfide and some residents mentioned that they could smell the sulfide in their homes and it turned their silverware black. This could be a health issue. Mr. Charlie Causey stated that Mr. Harvey is suggesting if funding can be obtained from this program or somewhere, then a demonstration project or two is needed to learn more. They could study before and after to see whether this is a large part of water quality issue. Mr. Harvey added that people on canals have mentioned property values, too.

Mr. Iglehart suggested that they prioritize based on the MacTec study that showed the larger bang for the buck projects and the other interest is community involvement. If there is a community that wants to participate, then that should be a factor to consider.

Ms. Walters noted that one thing that came out at the trip was nutrient input from fertilizer use. Obviously, this is not an issue for pea rock lawns, but it is one for grass lawns near canals. The South Florida Regional Planning Council studied that issue and from that study has developed sample ordinance for regulating nutrient input from lawns. Since then, 26 local governments had adopted into this standard into the comprehensive plans, making real progress on reducing nonpoint pollution. This could be done here. Another thing that arose on field trip is that improvements are required on older homes only if the square footage of impervious surface is increased and that can be mitigated. She thinks incentive mechanisms could be developed to encourage the redesigning of landscape to reduce run-off.

Ms. Walters also explained that much better and ongoing education is needed to reach out to the public on simple messages to people. Right now, the messages are not getting out to people and to the tourists, who also need to be reached. Mr. Harvey pointed out the message about fish carcasses and water quality was conveyed to him at a local lodging place. Ms. Walters stated that publications should be reviewed by public before they are printed. News releases and meetings with homeowners associations should be done on a regular basis to accommodate for population changes. She thinks it would help to distribute more materials to marine and tourist businesses.

Ms. Walters also mentioned something that was brought up at an earlier meeting by Bruce Popham. He adds a voluntary fee to his bills to cover the costs for complying with environmental protection measures and has yet to have someone refuse to pay it. She wonders if there could be similar programs with local businesses to raise funds for improvement projects and hire professional staff to guide the program and train volunteers. She thinks a significant amount of money could be raised if done properly. Well-trained volunteers could be very helpful, especially for storm water issues. Some bacterial monitoring for very little money. Los Angeles has trained a large staff of volunteers who collect water quality data. The Keys has a hugely interested population and if efforts could be focused on productive positive things like this, it would be a win-win for everyone. A program could even include bacterial sampling for very little money.

Ms. Walters added that this group needs to sit down with regulatory agencies and talk about removing permitting obstacles to create incentives. She works with obtaining permits and has encountered significant obstacles at the county and state level that exist because of lack of education between agencies and because there is a fear of causing more damage. She suggests bringing people together to look at what is proposed and change as needed. There could be more private money going into these options if the permits weren't so expensive. People hold back because after spending the money for the permit and study, they can be denied. She thinks more local contribution is needed so that matching money can come from the Keys. Perhaps volunteers could be a match or a voluntary environmental fee could be collected. A Keys contribution will play well when lobbying for funding and being able to quantify that contribution could be very important. She has this list written down and urges everyone to consider having more local funding.

Mr. Iglehart clarified about the permits for that last culvert project field inspection that was visited on the field trip. The only permit requirement was a newsletter of Best Management Practices for residents. Ms. Walters stated that was excellent. Mr. Rios pointed out that people could participate in the Clean Marina Program to improve environmental conditions through best management practices. There is also the Green Lodging program. Ms Walters added that it might be good to document the number of Clean Marinas in the Keys since there may be more here than elsewhere in the state and that shows a voluntary commitment to the environment. Mr. Rios pointed out that there is a website for Clean Marina that provides more information. It might be a good idea to have a dollar value for being a Clean Marina.

### **VIII. Funding Long-Term Monitoring and Special Studies, 2012 and beyond, Richard Harvey**

Mr. Harvey noted that there was one other thing that he would like the committee to consider before making the recommendations. It is the data evaluation and statistical analysis that was suggested in the Battelle report. Dr. Boyer has done some principal component analysis, which may allow for the reduction of sampling stations by identifying zones to represent certain areas. However, this would not save boat costs. If money is limited and a canal study is needed, monitoring might have to be cut, but they should try not to lose information. At one time, the idea of hiring a post-doc to do statistical analysis was discussed and he recalls that it might cost about \$100k, but he is not sure. A rough idea of costs for this project might be important information to know when making recommendations.

Mr. Iglehart brought the discussion back to the implementation priorities for canal restoration. He has from Ms. Walters that storm water already in place would be a prioritization for that. He also thought that any works need a historic monitoring station could be a priority to look at new trends. He asked the committee about the development potential for undeveloped lots. If the area is sewered and there is the potential for extensive development on the empty lots, should that be a factor to consider?

Commissioner Brooks pointed out that filling of canals is only one solution. In his neighborhood, they looked into it and it was about \$5k to fill in a canal lot. He is just thinking about having a promo going keys-wide to get a canal to set up a special taxing unit. It might help costs to have contractors in place to offer to the community. He is not sure who owns his canal—the army corps or the sanctuary. In the Sexton community, there are 220 people, with deep straight dead end canals. They can't really open up the other end of the canals, but could make improvements. It would mean having the community take steps to establish a district to collect money. They do not have a weed wrack problem.

Dr. Billy Causey wanted to state for the record that the sanctuary doesn't own the canals, but the state has jurisdiction over submerged lands and the state and sanctuary have joint permitting authority as to what will affect the seafloor. The sanctuary does have jurisdiction over water column.

Commissioner Brooks sought clarification that if everyone wanted to fill in the canals in his neighborhood, they would not have multiple jurisdiction permitting issues. Mr. Rios explained that normally the way that would work is that neighbors have to agree and submit one application. He noted that it seems like there is always one party that doesn't want the permit. A third party has right to petition, which delays the project. It is really important to have the communities on board, especially if they are going to participate in a demonstration study. The majority does not rule in this circumstance; it can be one person that holds up the project, but it still may go through in spite of petitions.

Mr. McRae stated that on the field trip they saw several places where removal of barriers would make big improvements and will increase flows. These could be easy improvements. He agrees that the permitting issue will need to be addressed no matter what project is done and agrees that there has to be a net gain provision that takes into consideration the eventual improvement. He also wondered whether the accumulated organic matter in the bottom of the canal could be capped before filling the canal, instead of removing the organic matter, which is costly. Mr. Charles Causey suggested doing a couple of easy canal culvert projects to get immediate results and then also conduct a fill demonstration project without removing muck and see benefits. If there is a finite amount of money, the easy projects need to be done first. The public and private sector need to be involved and the project needs to be done through this body.

Mr. Bergh added that this discussion is aimed at whittling down demonstration projects. He thinks that is fine, but the project should include a geographic distribution that represents the different kind of problems that exist. Making these projects available for the whole community is important for success and having a geographical representation is more important than even already having wastewater upgrades in place.

Dr. Kruczynski pointed out that they only saw a few canals yesterday, but the study done by Wendy and her crew included canals in the entire Keys. Their report should not get stuck on the shelf somewhere and is implemented because it is very useful.

Commissioner Neugent requested documentation on something before moving on to another subject. In conjunction with what Dr. Kruczynski and Mr. Bergh just said, wastewater is in design or completed almost everywhere in the Keys. The Cudjoe regional area is one that has not had wastewater upgrades. He suggested that maybe the areas that are not sewered should be part of the demonstration study. They have received a five year extension from the state on the statute. He wants to go on the record as stating that the focus of demonstration studies should be in the Cudjoe regional area.

Mr. Harvey stated that his sense from the steering committee is that they need to focus on canals and that the suggestion should be in the recommendation. The question that needs addressing is where that project falls out in the list of important projects (data synthesis, special studies, etc.) with a fixed amount of money. He thinks that a workshop could be convened at a later time to discuss the many options for cleaning canals, but for now, it could be described simply as a canal study.

Dr. Kruczynski wanted to reemphasize that they will not solve how to do it today, but could decide that it needs to be done. If an RFP is posted, then professionals can help with how it can be done to solve the problems.

Mr. Rios asked the group to consider what it wants to achieve with the end results. If they want to meet standards, then they would have to be careful on where the study is placed because storm water and wastewater will need to have been addressed. He thinks it is also useful to have comparisons. Today, he thinks the group needs to consider whether they want class 3 waters in the canals? Mr. Harvey pointed out that EPA's goal is water that is always fishable and swimmable and they have to deal with the lawsuit, too.

Dr. Billy Causey stated that there is a need to get the word out that this committee is paying attention to other issues and ask people in the Keys to contribute ideas for projects. Then, they could look at the canal assessment study to see what stands out when deciding the final priorities. He does agree that it could be geographically spread out.

Commissioner Neugent added one final thing that is an FYI for the committee. The FKAA is in communication on a project where the aqueduct may take over existing system on Venture Out. The infrastructure that would be put in place to bring in more homes in the proposed project area would generate a lot of fill could be used for backfilling. This needs to be on record that fill may be available for projects.

Councilmember Worthington mentioned that Marathon has been moving forward on storm water and wastewater at the same time. They have a project with the school board to fill a pit near high school, but the permit process has been held up for 1.5 years. If there is a way to help get this project along, then they could fill the pit with the fill that is right there. He added that utilizing the tides and hydrology of the area is the best way to go to keep costs down. Culverts are not always the high cost, but the studies can be very expensive and keep simple projects from going forward. On one culvert project a few years back, the cost of the study was \$150k before the permit was issued. This kind of thing puts a stop to such projects, even today. Marathon has weed wrack problems and an array of canal issues, but the cheapest biggest bang for the buck is using culverts and hydrology. He does agree that canal studies should be done in the Keys.

Ms. Morkill wanted everyone to take a minute to consider an evening workshop in July to involve the public. Interactive GIS could be available for people to use in providing feedback. This approach would require extra time from the committee, but it could also be an educational opportunity and a way to receive input from the community.

Mr. Iglehart has captured all of the prioritization items. He will send a survey to all members and people will have the opportunity to complete this survey.

Dr. Billy Causey added that the US Coral Reef Task Force (USCRTF) is meeting in Washington. EPA and state of Florida are on the task force. Department of Interior and NOAA co-chair task force. He would like the committee to consider a resolution to recognize EPA's leadership in carrying out authorization by Congress and recognize the contributions that EPA has made. He would seek a resolution from the committee for the task force for all entities represented. The

resolution would encourage EPA to continue these kinds of projects and to also extend this world class monitoring program to SFCRI area. He often tells EPA that they are doing a great job. This action will get this body recognized.

Mr. McRae added one point. Rather than introducing the SFCRI issue, simply point out that this is one reef tract and the proper approach is one that supports the entire reef tract. Given that caveat, I support Billy's idea for a resolution and make a motion. I hope that someone can draft it today so that we can see it this afternoon. Mr. Iglehart asked if Mr. McRae was making a motion as stated or making a motion to support drafting one for discussion as an agenda item this afternoon. Mr. McRae confirmed that it basically amounts to an agenda modification. Mr. Iglehart added to that motion that the item be dealt with early in the afternoon when a quorum is present. A second to the motion was made by Dr. Billy Causey, who will draft the motion during lunch. There were no objections. Motion passed.

Ms. Morkill inquired as to whether the handout on management actions provided to the committee will be part of the discussion for the funding or are there any actions that are needed based on this handout. Mr. Harvey remarked that it is part of Dr. Kruczynski's presentation, who explained that this handout represents an exercise to see what has been done on the WQPP action plan. The plan has 97 action items that could be considered when wastewater is well underway.

Mr. Bergh wanted to take a moment to remind everyone that the next meeting of the USCRTF will be here in south Florida in the fall of 2011. It is never too early for this group to gear up to have a presence there. The sanctuary and SFCRI will be involved, along with many others. It would be good to make sure that WQPP is highlighted in field trips, etc. Just prior to that meeting, the second reef resilience conference will be held. This will bring together the climate change work done in south Florida and the Keys over last five years to the task force audience. This is a big opportunity that people should not miss.

Ms. Morkill asked about the query and prioritization of the funding. Mr. Iglehart replied that he had thought about the query to help identify which of the shovel projects to fund and not as an answer to the monitoring vs. shovel projects question. He can do the same kind of query on all of the different kinds of monitoring and the third piece would be the monitoring vs. shovel projects question. Mr. Harvey didn't think there would be time for more discussion on this in the afternoon. Mr. McRae is feeling some angst on this issue, even though the timeline is tight. The TAC and MC provided specific guidelines that Dr. Kruczynski reviewed for the group today, but he doesn't think they have had time to fully consider these and to determine the priorities at different funding levels.

Mr. Harvey will keep RAD presentation short and then that will leave time for more discussion in the afternoon. He thinks he mentioned last time that he had been asked by Jim Giattina to review the RAD issues and provide input to him with respect to nearshore, offshore and canal waters. He already explained his opinion about the canals. Even after the wastewater system is in place, the canals will not be in compliance. Therefore, the RAD, is not giving reasonable assurance on that topic. Although they do see changes in seagrass at the mouths of canals, this does not represent an imbalance. For the nearshore and offshore waters, he has discussed this thoroughly with the scientists and other experts and these waters are in compliance in his

opinion. He conveyed this information to Atlanta. The final recommendation/decision from Atlanta has not been made yet.

Mr. Harvey further explained that if Atlanta goes along with his recommendation that the canals are not in compliance, this situation will trigger certain actions on the part of Atlanta to comply with a lawsuit filed against EPA by Earth Justice. A TMDL needs to be developed for each of the impaired water bodies. He is not entirely sure what a TMDL will entail, but if all of the point sources are dealt with, then it might be the stuff in the bottom of the canal.

Mr. Iglehart moved that Mr. Harvey's comments be accepted as the RAD comments and that after lunch they resume this discussion on monitoring and shovel projects, followed by a vote on Dr. Causey's motion.

Dr. Kruczynski asked if it would be possible to get the WQPP on USCRTF agenda to show what has been done in Keys. This would add to Dr. Causey's recommendation. The point could be made that the SFCRI and WQPP should not be competing with one another for funds. New funds have to be found to bring SFCRI up to the level of the Keys programs. Mr. Harvey thinks that he can work through the EPA task force representative and Dr. Causey can work through the NOAA representative to try to secure a place on the agenda. Dr. Causey agreed.

Mr. Harvey recognized public comment. A gentleman explained that there people here from Venture Out. He is here with others because they have been assigned a project to improve the water quality in their canals. They have ten canals that represent a little over a mile. He suggests that the WQSC look at their canal system for a possible pilot project. They have met current standards of wastewater and are very interested and would like to work with the committee on such a project.

Lunch

**IX. Keys Reasonable Assurance Document Update, Richard Harvey**  
(see summary of presentation above)

Mr. Iglehart will be gathering info and presenting the Ms. Morkill indicated that she needs clarification on what needs to be prioritizing. Ms. Walters thinks it relates to the list in the package.

Mr. Iglehart stated that they are trying to get consensus from the committee as to the prioritization of the monitoring projects and the second part is to address where shovel projects would come into prioritization with monitoring (seagrass, coral, water quality). He is referring to the types of projects with culverts, etc. Dr. Kruczynski's book that synthesizes the Keys, but there might be more needed. If they do need to hire post doc for statistical analysis, that might cost a lot. There may be a specific relationship between water quality and corals, but need to put that in the priority list. Dr. Kruczynski clarified that the book summarizes, but does not synthesize in any statistical way.

Ms. Morkill wondered if the task is as simple as prioritizing the monitoring program or is the synthesis needed to go forward with modified long term monitoring? Should we go forward with monitoring or do we need to add certain caveats?

Mr. Harvey asked if there was a way to modify monitoring based statistical analysis to reduce sampling numbers. Dr. Boyer has done that to some extent with identification of the different bodies of water. Mr. Harvey asked if the program could be modified without losing info and noted that would have to be done systematically.

Dr. Kruczynski stated that at the TAC meeting they asked for recommendations/revised monitoring plans along those lines and they are waiting to hear back from investigators. This could save money. Mr. Harvey added that additional stations could be added at the mouths of canals, etc.

Mr. Iglehart noted that the report summary doesn't include the management recommendations, which also impact the monitoring recommendations. The monitoring should be the management objective. He thought the TAC would look at the management objectives like one that recommends elimination of redundancy in the coral program. This kind of thing is not captured in the monitoring recommendations, but it needs to be incorporated.

It was noted by Dr. Kruczynski that some of the key points from the TAC meeting are recommendations.

Mr. Harvey added that this committee is addressing one recommendation by the resolution to ask for more funding to the coral reef task force, but he has not seen the other recommendations addressed at this point. He mentioned the \$100k proposal to integrate coral random data with water quality data. Dr. Boyer pointed out that this approach would work best with the Miller coral data since it is distributed across the system. Mr. Harvey noted that Drs. Fourqurean and Boyer were looking at the programs to see about modifying the monitoring.

Dr. Boyer needs the management questions prioritized because he cannot answer them all with one program. He needs clarification on that point because there are so many questions.

Mr. McRae added that we are focusing this discussion on reef monitoring. The TAC and MC met together and gave direction to consider management needs. Was the Steven Miller project considered in this discussion? Dr. Kruczynski explained that Miller is funded from NOAA directly. CREMP and Miller's study are competing programs to some degree.

Mr. McRae explained that the needs are project specific. Dr. Boyer has identified his primary need is for someone to prioritize so that he can move forward. Dr. Fourqurean has done some analysis on his data and may be getting close to getting them very honed down.

Mr. McRae went on to explain that the coral problem is a little different. He agrees with what Dr. Causey said earlier. There are elements of the fixed station that are good to have—it integrates things over time. The Miller probabilistic design integrates over space and over a wide area. The probabilistic approach comes with a confidence interval that can be wide. CREMP may not need

the large number of stations as they have been doing, but some analysis needs to be done to determine which ones could be dropped. Dr. Causey agreed with Mr. McRae and added that the Miller program was more of a need for a second look over a large area. He pointed out that they have gotten so much more out of CREMP data analyses. Some general data comes out from the Miller program, but not much, not even graphs. They have been able to tell us there is more coral than we thought, but they can't tell us what is happening on any one reef over ten years. Those trends are invaluable now. Brian Keller used to work with the PIs to get those programs funded through NOAA/FKNMS through a MOA agreement. Miller doesn't think fixed stations are the way to go. Dr. Causey explained that he used to agree, but he does not any more.

Mr. Iglehart asked Dr. Causey if he wanted to maintain CREMP as it is or whether there a possibility of modifying the study. Dr. Causey stated that he tends to want to keep things the same, but now thinks that there is enough known to perhaps consider selecting certain stations to follow. Mr. Iglehart sought clarification and asked if it is necessary to have a data assessment to see if it is appropriate to cherry pick sites.

Mr. Bergh commented one of the valuable things about CREMP is that the program has long-term data. If certain sites are selected over others, it would be hard to make inferences about other sites and that approach would weaken the program. Instead, he suggests continue monitoring the fixed sites, but monitor fewer each year. Instead of sampling all of the sites each year, sample only a third of the sites each year. Then, they would still have data on all sites over time and thereby would continue the baseline. He suggested concentrating on how we can understand the system better. Maintain effort on the fixed sites to get historical baseline, plus look at a Miller approach to get information across the system and finally look at response sampling like FRRP. (He clarified that he was not asking for reef resilience funding.) Everyone should recognize that when the big events hit (cold snap, bleaching, etc.), that is the time when major ecological shifts take place. The goal should be to integrate all of these elements into a comprehensive coral reef monitoring approach. This would be done instead of favoring one approach over the other. The program could be adjusted to meet the funding level.

Ms. Morkill asked whether or not monitoring should continue as is or whether the money should be spent for integration of the program (as has been discussed and proposed previously). Councilmember Worthington commented that there might be better cost savings by cutting back on the frequency rather than cutting back on the number of sites. He suggested maintaining the baseline, but sampling less frequently. Dr. Causey said he is no longer in favor of cherry picking sites. Mr. McRae clarified that he was talking about the frequency of sampling, not the number of sites and added that the disturbances won't be picked up by the Miller approach, which is focused on abundance and distribution. At this point, he noted that the charge has been given to Rob Ruzicka to look at things differently and get back to the committee with something. The goal of tweaking the cycle so that not every fixed site is visited annually, but that is not enough. The committee should work to integrate these two programs—under some umbrella at the MOA level—bring the probability approach of Miller with the temporal inference capability of fixed site together. Mr. McRae is uneasy going outside and asking someone who is not familiar with the data to do the analysis. Maybe a certain level of synthesis needs to be tackled this year. The goal for CREMP should be to redesign the program to meet all needs. He does not envision

bringing someone in to look at coral and water quality data will be that productive because of data compatibility issues.

Mr. Bergh added that they looked at the disturbance data with Dr. Boyer's water quality data and there are things that can be said. The results were published the VanWoseik paper he brought last time. We might find something different when we look at CREMP data. Dr. Boyer said that they were discussing both approaches with water quality. He feels that the big program he has is that there were so many questions posed that needed answering. He then has to make the decision about which one to answer first and one of the big ones is inshore. Does answering that first mean that climate change, ocean acidification and human health are not addressed? He did not come away from the TAC meeting with consensus and now the ball is back in the committee's court. Mr. Harvey called for last comments on the subject. Ms. Morkill asked what would be best--a post doc synthesis or is it a workshop to sort things out with all three programs with people who know the data? Would the data synthesis be a special study? What needs to be done to synthesize and provide cost savings?

Mr. McRae noted that although the MC is charged the monitoring programs with coming up with recommendations, it is clear that Dr. Boyer needs additional guidance and prioritization from the MC. Is the committee able to provide that guidance? Mr. Hunt answered by stating that he and Dr. Kruczynski thought that they had provided the necessary guidance.

Dr. Boyer identified the items for re-task from the meeting that included looking at Port Largo canals, nearshore stations, increasing stations on the shelf and adding in SFCRI. Mr. Harvey thought it was to add in nearshore canal mouth sites. Mr. Hunt gave direction that task was a subset of everything else.

Mr. McRae proposed that they should bring the PIs back to the MC with feedback and then a decision can be made. Does the time window allow for that second meeting? Mr. Harvey clarified that the programs are funded through September. Dr. Boyer added that the program is funded by a two year grant, but the money is allotted each year. The original proposal exists, but the second year needs to be modified. He has to know what the funding level is to be able to determine what can be done and vice versa. It's like the chicken and the egg thing.

Mr. McRae added that there needs to be a mechanism to get feedback back from the PIs to the steering committee and it might not be able to wait until the summer meeting. He proposes in the form of a motion that the MC and the TAC ensure that their guidance to the PIs is well understood and clear as to how they should revisit their projects and there is an additional element that speaks to reduced funding levels. What would the step down approach be to scaling down the program in the coming year? Then, the steering committee would need to have a conference call or some venue in which to discuss the programs. Mr. Harvey asked for a date certain. Dr. Boyer mentioned that they didn't get anything specific back from the MC after the first meeting. Mr. McRae proposed April 1 to be the date that they would expect feedback from the projects. Dr. Boyer stated that if they receive something from the MC soon, then that date would work. The motion was seconded by Dr. Causey. Mr. Hunt expressed that they have heard from the TAC and had discussions and the MC needs to get together and take that information and put together a charge to the three monitoring programs and add to that the data management

group (that is a separate charge). Mr. McRae considers them under the monitoring program. He explained that his motion had the charge to revisit projects with best available science at current levels and then a step down version if funding was reduced.

Mr. Iglehart asked Mr. Blackburn when the other competitors for this money will be campaigning for these funds. Mr. Blackburn answered that the monitoring programs are funded for two years, so they will probably not go out with another RFP until the winter/spring of 2012. April seems to be enough time. Dr. Boyer clarified that April will be when he is expected to get back with the recommendations. Mr. Blackburn added that if they do not receive full funding, the programs will have to work with the funding they receive for that second year, but they are on a two-year grant.

Mr. Hunt asked on what day will the current monitoring program stop? Mr. Harvey answered that date is September 30th of this year. But, they do not have to go out with another RFP process because they were awarded two-year grants, but they were funded for one year. Mr. Harvey stated that if funding adjusts up or down, they can respond accordingly and they should know something by the next meeting. Mr. Hunt added that technically the programs go through September 30, 2012.

Mr. Iglehart asked Mr. McRae if the motion included not only looking at individual projects, but also identifying priorities outside of the monitoring for the program as a whole. Mr. McRae explained that the motion was meant to take in the full scope of the issues identified by the TAC and management. Mr. Iglehart wanted to know more about the step down version of reduced funding. There is a point in the funding scale where the project is no longer feasible. Will some projects be subjected to greater reductions than others? Mr. McRae answered that it was his intention in making the motion that the steering committee is supportive of elements of all three programs.

Councilmember Worthington wanted to know more about the source of the funding and how it would be divided. Mr. Harvey said that they would be deciding how to dedicate the money—monitoring, other programs and added that they think that they are now at \$1.2 million (full). If people want to only fund the monitoring programs only, that can be done, too. If all money goes toward monitoring, there will be no money for canal projects. The pot of money is the same for all. Councilmember Worthington mentioned that earlier they were discussing the potential of cutting back on monitoring money and putting that toward a canal project. Mr. Harvey stated that he has given his recommendation already to Jim Giattina who will be making the final decision. Mr. Harvey thinks a canal study is needed. The steering committee will be making their own recommendations for projects and components to Jim Giattina and provide the priorities. It may be that there is only enough money to fund the highest priority projects.

Ms. Morkill pointed out that the approach to programs adjusting to reduced funding is somewhat reactive. Maybe it would be best to have a more strategic approach. Maybe the question should be asked, “What should the integrated monitoring program look like?” This is different from asking what a reduced program would look like. She thought that the discussion was more about synthesis and integration, rather than dealing with reductions.

Mr. Charlie Causey asked about funding priorities and projects. Mr. Harvey said that typically they bring the budget to the steering committee for a vote. That did not happen last year. If EPA brings the budget, the steering committee can make the recommendations. Mr. Charlie Causey asked if they would be able to address this at the next meeting and the answer from Mr. Harvey was yes. If the steering committee decides that monitoring will remain unchanged and is the highest priority, it may be the only thing that is funded.

Mr. Charlie Causey also asked about the spending of the full allocation. Where does it go? Mr. Blackburn explained that it goes to the South Florida Geographic Initiative, the everglades and then \$1.2 million is left over for WQPP. To get more money, someone must lobby Washington to get more money. The money passes from Washington through Atlanta. Mr. Bergh asked for an accounting of the money along the way. He is not satisfied with supposition and wants to know because money is taken off the top. Mr. Blackburn should tell EPA that the steering committee wants to know where the money goes.

Before the question was called, Mr. McRae explained that he did not see his motion for the monitoring program as competing with the canal projects. He sees the canal work as a large separate issue. He did not see a positive vote for the monitoring as diminishing the canal work.

Mr. McRae restated the motion, which has already been seconded. The motion is: The MC and TAC should provide additional guidance if necessary to the four project PIs on revisions to their study plans based on input from TAC, management and other applicable groups. PIs should respond by April 1 and include a discussion of step down measures for each project in the event funding is reduced. Motion passed unanimously. Mr. Charlie Causey added that a program's money might need to be reallocated at a point when money is so low that it would not be effective anyway.

Mr. Bergh is concerned about what else the money is being used for in a general way. What is money in Washington and Atlanta being used for? Mr. Harvey said that last year they had a judgment against them and used \$120k of this money for the court judgment. They have also give SFCRI \$600k over the years and have given Athens money to conduct remap monitoring program in Everglades. In last 10 years, \$2 million has gone to everglades mapping. Mr. Bergh wants to see the real figures with projects in writing. This needs to be known if we are going to ask for money.

Mr. Iglehart suggested that they request that Mr. Blackburn put together a document on how the money is spent. Mr. Bergh added that it should include Atlanta and Washington level cuts as well. Dr. Causey wants to make sure Atlanta doesn't commit money until we have the answers. He is concerned that there have already been recommendations and decisions may have been made. Mr. Harvey does not have the sense that decisions have been made, but cuts may be happening at the Atlanta level. Mr. Blackburn will try to get the information. He has posed this question before. They only get \$1.2 million out of the \$2.1 million. Mr. Harvey stated that EPA will not wait until the next meeting to communicate the budget to you. They will send the budget via email and then we can have a conference call and if needed you can call another steering committee meeting before this summer.

Mr. McRae asked Mr. Bergh about his request. He thinks the question is relative to the last appropriated funds. Since there is no budget now, the question then becomes, from this specific appropriation, where do the funds go rather than generally where do they go? Mr. Harvey would strongly recommend that the committee make the recommendations and desires as soon as possible so that Atlanta will have them before they make their decisions.

Mr. Rios pointed out that they don't know how much money they will be getting. It would be good to define the funding levels better. Mr. McRae suggested that they use a 50% reduction, but he personally would like to see the \$1.2 million there. Mr. Harvey stated that if they do receive the full amount, then they can decide how to spend them. Councilmember Worthington pointed out that some programs may not be able to operate on a 50% budget. Mr. Hunt suggested letting the MC figure out the tiers for funding and provide direction.

Dr. Hammaker pointed out that they like facts in Washington. The data synthesis provides facts. She empathizes with having to stop researching when there are more questions. Her plea is to somehow finish the study for now and then take that study to Washington and run with it.

Mr. Harvey mentioned that people are free to give recommendations individually to EPA. Steve Blackburn pointed out that it is not too early to think about priorities for 2012 because it will be here soon. There are funds for this year and they are already committed and then there are funds for 2012.

Dr. Causey read his draft of the resolution to be presented to the USCRTF. He received input from Gil McRae and Bill Kruczynski.

Dr. Causey read the following to the committee from the projected text:

RESOLUTION RECOGNIZING THE ROLE AND SUCCESS  
OF THE US ENVIRONMENTAL PROTECTION AGENCY IN THE  
WATER QUALITY PROTECTION PROGRAM FOR THE  
FLORIDA KEYS NATIONAL SANCTUARY PROGRAM

WHEREAS, the US Congress of the United States, in the Florida Keys National Marine Sanctuary and Protection Act of 1990, Authorized the US Environmental Protection Agency to develop a Water Quality Protection Program for the sanctuary in conjunction with the State of Florida and the National Oceanic and Atmospheric Administration;

WHEREAS, the Act called for EPA to establish a Water Quality Protection Program Steering Committee, comprised of local, state, federal agencies, as well as local stakeholders in the Florida Keys; and

WHEREAS, the EPA has established a Management Committee and a Technical Advisory Committee to support the Water Quality Protection Program, using the very best science and technical advice available to address water quality problems in the sanctuary; and

WHEREAS, consistent with the Act, the EPA and its partners established a world-class water quality, seagrass and coral monitoring program that began collecting data in 1995; and

WHEREAS, the EPA for the first 12 years supported a Special Studies Program to answer other scientific questions regarding water quality in the Florida Keys; and

WHEREAS, the EPA has funded over 18 million dollars supporting the FKNMS Water Quality Protection Program; and

WHEREAS, other agency partners in the WQPP have contributed substantial resources; and

WHEREAS, the EPA has accomplished an extraordinarily effective job of implementing the FKNMS Water Quality Protection Program; and

WHEREAS, the local, state and federal agencies have benefited enormously from the monitoring and special studies data for implementation of water quality improvement facilities; and

WHEREAS, the EPA and its state and local partners have implemented over 75% of the water quality strategies identified in the FKNMS management plan; and

WHEREAS, the geographical range of significant coral reef resources extends north of the Florida Keys, along the Southeast Coast of Florida to Fort Pierce; and

WHEREAS, the State of Florida has been managing these northern coral reef resources through the South Florida Coral Reef Initiative; and

WHEREAS, some of the funding for monitoring these corals reefs has been redirected from the FKNMS Water Quality Protection Program's ever-decreasing budget in the Florida Keys; and

WHEREAS, consistent with the principles of connectivity and ecosystem-based approaches to management, the EPA should be given additional funds to adequately include these coral reefs in the Water Quality Protection Program;

THEREFORE BE IT RESOLVED, that the members of the Water Quality Steering Committee commends the EPA for their long-term commitment and support of the world-class water quality, seagrass and coral monitoring program; and

BE IT FURTHER RESOLVED, that the WQPP Steering Committee members recognize the importance of the peer-reviewed Special Studies and their scientific merit in driving the decisions made by the Steering Committee, Management committee and the Technical Advisory Committee; and

BE IT FURTHER RESOLVED, that in comparison with the level of funding of the South Florida Ecosystem Restoration Program and the Comprehensive Everglades Restoration Plan; and

BE IT FURTHER RESOLVED, that the South Florida Geographic initiative, compared to other areas in the EPAs Large Aquatic Ecosystem Program has been significantly underfunded; and

BE IT FURTHER RESOLVED, that due to the fact that the coral reefs of South Florida and the Florida Keys are the most threatened coral reefs in the world; and

BE IT FURTHER RESOLVED, that due to the biological and ecological significance of Florida's coral reefs and their socio-economic importance to the State of Florida, the Nation and the World; and

BE IT FURTHER RESOLVED, that the FKNMS WQPP Steering Committee recommends the EPA provide additional funding to more adequately support the coral reefs of South Florida and the Florida Keys.

Mr. Harvey clarified that Dr. Causey's plans are to present this resolution to the US Coral Reef Task Force.

A question was asked as to whether this document was a lobbying document. Dr. Causey clarified that he can present this to the Coral Reef Task Force, which is made of state, territorial, federal jurisdictions. They may take the position to recommend that EPA take some action. This document can also be sent to the new EPA administrator. Mr. Charles Causey asked if people who are non-government can take this to other politicians and do something stronger than a resolution to the task force. Mr. Bergh answered that more can be done, but many people are not in a position to be part of the lobbying effort. He noted that he is not in a position to be a leader for the lobbying effort and inquired who was in such a position. Commissioner Neugent answered any entity like county, Key Largo Wastewater District. Mr. Bergh stated that someone should be there to coordinate the efforts, though. Mr. Iglehart pointed out that at the bottom of such as resolution, the two signatures of the co-chairs are usually placed—DEP and EPA. He recalled that they were not allowed to sign the document because DEP cannot legally lobby, so a resolution that asks for funding will not have a DEP signature. Mr. Bergh noted that this language becomes the framework for a separate lobbying effort. Commissioner Neugent asked whether or not this document can come from the WQSC without the signatures of those who are not allowed to sign. Dr. Causey agreed to present this to the task force. A question was asked as to whether the Sanctuary Advisory Council can present such a document. Other entities at different levels can present similar documents as needed (municipalities, Monroe County, etc.). Assuming this recommendation passes, then the next recommendation is for everyone to get approval from their respective boards. Mr. Harvey thinks those signatures would go a long way toward our goal.

Mr. Bergh noted that the paragraph at the top of the page was an incomplete thought and needed to be finished. Dr. Kruczynski thinks that the language needs to be word-smithed to say that all the funding started coming down here for this program and then the funding was diverted with the new southeast coral reef program became established. Mr. Harvey is not sure if he would say it exactly like that since the reef is continuous and it would be better to further recognize the importance of the southeast resources and secure further funding. Mr. McRae says it does need some further word-smithing, but is fairly comfortable with it. He is a registered lobbyist and can

work with anyone at the state level. Ms. Morkill pointed out that lately they have been taking the approach that it is one reef tract and not two separate reef systems and that newer approach should be considered in the language. Mr. Causey stated that it is well worded, but maybe it could be stronger. Secondly, it might be important to have someone from Monroe County to be with you to emphasize how much these funds are needed for a strong program. Dr. Causey agreed and states that he is okay with any word-smithing that is needed. A suggestion was made by Mr. Scott Donahue and Dr. Boyer to address the fact that a continuing presence of EPA is needed here, even when Dr. Kruczynski and eventually Mr. Harvey retire. Mr. Harvey asked Dr. Kruczynski if he could work on refining the document during the rest of the meeting. Mr. Iglehart suggested that they vote on the concept of a lobbying effort that meets essentially what is listed here and that allows for comments to go back and forth amongst members during the next few weeks. Mr. Harvey and Mr. Iglehart will refrain from any vote. Mr. McRae would prefer that the wording to be finished today and wants to leave here with something approved. Mr. McRae will work on the document too. Mr. Iglehart is concerned about time and the rest of the agenda. He thinks the committee should vote on this in principal with a word smithing effort and then a final draft out in two weeks. Mr. McRae would like to make a motion that the committee accepts the resolution in concept with the main points remaining intact and the wording to be polished and run by the committee for further comment, but the motion is an approval of the concepts as discussed. Councilmember Worthington seconded the motion. There was a call for discussion. Let the record show that DEP and EPA refrain. Mr. Harvey noted that the continued presence of EPA is called for in the Florida Keys NMS legislation. Motion passed with no oppositions.

**X. Climate Change Action Plan, Chris Bergh, TNC**

Mr. Bergh clarified that his presentation is about sea level rise, not the climate change action plan. This was the presentation he was slated to give at the last meeting, but time did not permit. He would be happy to give the climate change action plan talk at another time. He is the director of Coastal and Marine Resilience for The Nature Conservancy in the Florida Chapter, based in the Florida Keys. TNC has been working here for many years and has purchased lands that have become part of state parks, the national wildlife refuges. TNC also played a role in establishing the national marine sanctuary and have participated in the Sanctuary Advisory Council and WQPP.

The overriding factor that drives sea level rise is climate change and that is happening. He directed everyone to [climate.gov](http://climate.gov) to look at historic data. The trend of sea level rise is evident. This past year 2010 was one of the hottest years on record, along with 2005. Coral bleaching is one of the consequences of climate change that is familiar to people in the Keys. Unfortunately, ocean acidification is likely to become evident as well. TNC is working with the marine sanctuary and many other partners to identify areas that are resistant to bleaching. They are concerned about the impacts on natural resources as well as the impacts on people who depend upon these resources. He showed the tide gauge data at Key Largo harbor, which shows the acceleration of sea level rise in more recent years. At present, the rate is about 9 inches over 100 years. Natural areas, native species, coral reefs are at risk from this rise. The turbidity caused by sea level rise when more sediments are suspended in the water column and that could affect the

reef. The built environment and local culture are at risk over the long term. There is still time for people to act, though.

TNC released a study about a year ago that focused on Big Pine Key and then also addressed the rest of the Keys. The study addressed potential future shorelines, changes in terrestrial habitat distribution and property value loss estimates (in a rough way). Then, they posted some thoughts on how to adapt to these changes. The study used LIDAR data to get super detailed topographic data. They were interested in Big Pine because TNC has a nature preserve there and all of the rare species that are found in the area. In the study, they used information from a study by Ross, Obrien, Sternberg, "Sea Level Rise and the Reduction of Pine Forests in the FL Keys Ecological Applications 1994. The study classified the area into tidal, transitional and upland areas. Sea level predictions from the International Governmental Panel on Climate Change (IPCC) and other predictions were superimposed on the LIDAR maps showing the high and low elevation areas. The IPCC, a conservative body, released a report in 2007 that contained sea level rise prediction scenarios under different circumstances. These scenarios were superimposed on the LIDAR maps to show predictions for Big Pine Key under the different circumstances. Pie charts showing the percentage of land underwater were given. Because the IPCC is a summary of available literature and is conservative, they also used data from another approach. This approach used the empirical data and projected it forward (Rahmstorf scenarios) for 2100. Mr. Bergh's graphs showed some very serious impacts to Big Pine Key with this approach. He noted that there have been some other studies that have come out more recently that indicate a meter rise by 2100 is not out of the realm of possibility. He also showed property values on Big Pine Key 2008 tax rolls. At the worst scenario there would be about 6,000 acres lost, costing about 1.6 billion in property. This is just a rough estimate and not meant to account for every variable. Big Pine Key is about in the middle in terms of elevation for the Keys. Using this approach for all of the Keys, the total loss in property value is \$35.1 billion. There are properties on the tax rolls that are already currently under water, so it shows more acreage than there really is today.

Mr. Bergh suggests that the government take the next step in planning/mitigating for sea level rise. There is still time to plan and mitigate. The wastewater improvements are still likely to pay for themselves in improving environmental quality. To address these changes, there are two ways to go: mitigation and adaptation. Mitigation addresses the root causes (increased greenhouse gasses, deforestation). Adaptation takes sea level into account for all projects with canals, etc. It is important to enhance the resilience of the environment, natural and built. Buying high ground to protect rare species and replicating that habitat/species protection throughout the islands are both important strategies that can be used. Connectivity and effective management are also key to enhancing resilience to undesirable change. Many agencies and TNC have used these strategies (invasive control, wetlands restoration) for years because they are good management techniques, but now they have an added value in light of sea level rise. Key deer and other terrestrial organisms will have to be addressed. Captive breeding and seed banks are two "ex-situ" strategies that might be used. On the built environment side of things, storm proofing buildings and better storm water management are very important. Storm water is only going to become a bigger issue with sea level rise. People should manage for tomorrow's marine ecosystem. There are four landfills in the Keys that are potential sources of pollution (acid from batteries, nutrients, etc). Underground storage tanks could become a big deal if under water permanently. Artificial surfaces like asphalt should be scraped down so that they can be

colonized by marine life. There are several planning processes taking place right now involving many entities, including Fish and Wildlife Service, Monroe County, Key West and other agencies (DOI, Army Corps, SFWMD). Along with other south Florida counties, Monroe County is part of the Southeast Florida Regional Climate Change Compact. Everglades restoration is now seen as a way to mitigate for change. Restoring flows of freshwater into the Everglades ecosystem is going to counter salt water intrusion. EPA has a strategic plan to address climate change and has measures under development (reduce greenhouse gas emissions, integrate data into models, water quality). TNC continues to raise awareness about this situation and Mr. Bergh has been giving talks about this topic to various groups. TNC is also mapping freshwater lenses on Big Pine Key and examining ex-situ options for some species. TNC plans to also address things like pre-marine management strategies (what can be done with the dumps, etc.), modeling the future marine habitats and holding workshops. TNC and the Keys National Wildlife Refuges are holding a workshop for terrestrial species in the future. NOAA Coastal Services Center will be helping with that workshop to be held at Hawk's Cay on May 10, 2012. On the evening of the 11<sup>th</sup>, there will be a general presentation for the public to gather public input. Information about the TNC and other topics discussed can be obtained from FRRP.ORG.

Mr. Bergh addressed a question from the committee about whether or not the tides were expected to become more extreme as sea level rise proceeds. He has not heard that as a prediction at this time. Commissioner Neugent added that it might be good to use the most extreme condition for planning purposes. Mr. Iglehart pointed out that if an area is not tidal now, but become tidal, that means a lot more water movement at each tidal cycle and results in changes in the flows to and from that area. Mr. Bergh added that as sea level rise occurs, sediments will be resuspended, causing water quality issues.

Mr. Harvey thanked Ms. Nancy Diersing and Ms. Joy Tatgenhorst for their support of the meeting and thanked the Mosquito Control District for providing this most excellent facility. Ms. Diersing added that the Sanctuary Friends provided the coffee and snacks.

## **XI. Status of Wastewater Implementation, Liz Wood (lead)**

Ms. Wood noted that the first time she gave this talk was in 2006. There has been much progress since then. She presented a slide showing the projects that are finished, those that are currently under construction and those that are not done yet. Islamorada and Cudjoe are at the preliminary levels, so they will be focusing staff on getting those funded and underway. Almost 65% of the Florida Keys has been retrofitted with treatment facilities operating in compliance with Florida Statute 381.0065 (4) (l) and 403.086 (10) as amended by Chapter 2010-205 Laws of Florida. Twenty-one percent are still in design and 10% is still in the construction phase.

In the Key Largo Wastewater Treatment District, service is available to 8,711 of the 14,666 Equivalent Dwelling Units (EDUs). Of these 2,143 are connected to the facility. Key Largo District is 15% connected. Construction of Basins G, H, I, J, and K are anticipated to be complete by end of year.

Service is available to the Big Coppitt service area. 1,251 of the 1,713 EDUs are connected. Big Coppitt is 73% connected. Construction of the Duck Key WWTP upgrade and expansion to

serve Conch Key, Hawk's Cay and Duck Key is underway and anticipated to be complete next summer. Collection notices for Duck Key should start soon.

In Marathon service area, service is available to 4,268 of the 8,665 EDUs. Of these 1,309 are connected to the facility. Marathon is 15% connected. Construction of Service Area 1, 3, 5, and 7 are anticipated to be complete by end of year.

Construction of the Islamorada and Cudjoe Regional projects representing approximately 17,600 EDUs remain to be built.

Ms. Wood showed a slide with the status and costs throughout the Keys. A total of \$725 million has been or is expected to be spent on upgrading wastewater in the Keys. This figure does not include private ownership costs—the cost of the connection paid for by businesses and property owners. She showed committed funding for the project, which totals about \$480 million. Federal grants totaling \$43 million have funded 6% of project costs. Sixty five million remains under the WRDA authorization. State grants totaling \$51 million have funded 7% of project costs and \$200 million remains under Ch 2010-205. Local funds totaling \$380 million and includes sales tax revenue, capital development fees/assessments, ad valorem tax and rates. About \$240 million is still needed to finish the projects, which is less than it had previously been. The funding gap to complete wastewater treatment upgrades in the Florida Keys has been reduced from \$336 million in 2007 to \$250 million today. This reduction was achieved through the following: FY08 federal appropriation of \$24 million, an increase in capital system fees (started at \$2700, proposed increase to \$5,700) charged to property owners, reduced construction costs, and the alternatives analysis (onsite example) and the inclusion of capital costs in monthly rate. Ms. Wood noted that existing state and federal authorizations of \$200 million (Everglades Restoration Fund) and the remaining \$65 million (Water Resources Development Act) would fund remaining Islamorada and Cudjoe projects. These grants are not a sure thing and requirement for compliance is not dictated by availability of funds. Therefore, Monroe County and Islamorada are exploring all implementation options.

There have been other opportunities for funding. Monroe County, Marathon, and Islamorada jointly accessed Community Block Development Grant Disaster Recovery funds for connection assistance. The program currently has 250 income qualified applicants and additional outreach is necessary to ensure funds are used. They believe there will be additional funds remaining and that money can be used for onsite systems. The Cudjoe Regional project includes an onsite system installation and management program that FCAA is developing. The onsite program committed funds include an EPA demonstration grant, but the EPA funding is not sufficient to install all systems. The Monroe County Housing Authority has indicated that installation of onsite systems is an eligible cost. Assuming all goes well and our success streak continues, housing grants may be utilized to bridge the funding gap to complete the onsite installations.

There were no questions for Liz Wood.

## **XII. Key Largo AWT Regional Plant, Susan Hammaker**

KLWTD Commissioner Dr. Hammaker thanked everyone for letting KLWTD present at this meeting. She introduced KLWTD staff to the committee, including Mr. Brooks, a member of the WQSC. Mr. Fishburn, engineer, gave a brief presentation about the status of Key Largo. He provided a handout for the committee. Mr. Fishburn stated that this \$157 million dollar project is now coming in a \$140 million instead. Construction prices are down, assessments were increased, and they received more grant money than expected. More than half of the project was funded by residents of Key Largo. He thanked everyone who has helped them. FDEP in Ft. Myers never held them up on their tight schedule. KLWTD saved money because of improvements in engineering and by doing the projects in smaller phases. Construction costs have also dropped since they first began the project. They have received bridge loans and help from FKAA and he thanked them for the water main that helped save money. He thanked the Army Corps for the \$500,000 check for reimbursement. They hope stimulus will occur again (maybe under a different name). The main Key Largo regional plant went online August 25. It is the second largest plant in the Keys next to Key West. If Islamorada comes on board, this plant will be operating at a greater level (4 million gallon a day—total capacity is 10 million gallons per day). They met AWT at 200,000 gallons back in October. They are at 400,000 gallons right now and expect to be at a million by next September. They received a \$30 million bank loan from BB & T in March. They were moving too fast for State Revolving Loans to be obtained. They have received \$53 million in grant overall, with \$19 million of that from Army Corps. They received \$51 million in State Revolving Funds, which is federally funded. The north transmission line is active and they have 7,000 customers. By March 1st, another 3000 30-day notices will go out. Everything is engineered at this time and almost everything is under construction or done. They have kept management and construction costs low by having a staff of 32 employees who have done a great deal of work in house (only 12% of total costs of project). Their rates have remained the same as they were in 2005 and may even be reduced in the future as things get paid back.

Mr. Fishburn answered a question about base rates for Key Largo and explained that in the future, their goal is to reduce rates to the Key West level. He then showed a few photos of the new plant, which has one 3700 foot deepwell and a shallow water backup. Commissioner Neugent asked if it is still a possibility for Islamorada to hook up to their main treatment plant. Mr. Fishburn stated that this is one possibility, but the decision has not been made yet. The interlocal agreement between Key Largo and Islamorada is in progress right now. Dr. Causey commended everyone for the work they have been doing, especially Marathon. KLWTD has “token” reuse, but not systematic. Mr. Fishburn thinks the entire county should be proud and it was good that Islamorada wasn’t moving too fast because that would have driven prices up in this small county. Last year, Monroe did \$80 million dollars worth of business in this area. Commissioner Neugent stated that these facts need to be recognized. He noted that this was an unfunded mandate and in spite of the fact that the feds have not been the partners they promised, a tremendous amount of work has been done. Dr. Causey wanted to clarify about water quality and reefs. While sometimes he has stated that deterioration of the reefs is not primarily due to water quality, he wants it noted that polluted water makes coral reefs, which are already in jeopardy to climate change, more susceptible to climate change impacts. Water quality can affect the recovery, recruitment of corals in the face of future changes and what is being done is extremely important to the marine environment. Mr. Fishburn responded by stating that they have 200 houses left and they should be done in June. Many of the systems that were in place

prior to this new one were improperly connected or didn't even meet the most basic standards. Eventually, he wants to sell the reuse water back to FKAA for reverse osmosis. Councilmember Worthington noted that they have reuse built into their system and will be using it on golf courses, etc.

**XIII. Update on “Tropical Connections”, Bill Kruczynski**

Dr. Kruczynski circulated a draft copy for people to view. He hopes to conduct peer review soon and then get the book to the printer by May. All agencies that have contributed funding are on the first page. He showed a list of the 150 page authors who contributed to the book, which is dedicated to Brian Keller. There are 8 chapters and each starts with management priorities, research gaps, monitoring needs, etc. He wrote an introduction for each chapter footnoted with citations. Further reading suggestions are also provided. Dr. Kruczynski reviewed the cost break down for the book:

EPA	\$ 80,000	images
Sanctuary Friends	\$ 3,000	peer review honorarium
National Park Service	\$ 5,000	copy editor
Protect Our Reefs	\$ 80,000	Pamela 2 years of salary
EPA	\$ 23,533	printing
FAVOR	\$ 3,000	printing
FIU Foundation	\$ 1,500	printing
Sanctuary Friends	\$ 15,061	printing

The TAC and Program Management Committee and Florida Bay Science Oversight panel will also have a chance to peer review the book. Commissioner Neugent noted that Friends of the Sanctuary have been very supportive of sanctuary projects and scientific research projects. Over the last 10 years, they have funded a total of about \$600,000 projects. He would like everyone to consider becoming a member if they are not already. There are several membership levels and there is a national Friends organization for all sanctuaries.

They have funds available for printing 5,000 copies of the book, with 2500 copies being funded by EPA and the rest being funded by other entities as noted above. EPA will receive 2500 copies for free to give away to authors, schools, elected officials, etc. Each donator for printing will also get free books based on the amount they provided for printing. There will be about 2100 “buffer” books that will go to IAN press for sale at about \$20 per book. Profits will then go toward printing more books. Without the \$15,000 from Sanctuary Friends, there would only be 360 buffer books. The book will also be available online and can be purchased as a whole book or by chapters. Dr. Kruczynski provided these websites:

IAN Press web site:

<http://ian.umces.edu/press/books>

Draft chapters can be seen at:

[ftp://ftp.aoml.noaa.gov/pub/fletcher/Tropical Connections](ftp://ftp.aoml.noaa.gov/pub/fletcher/Tropical%20Connections)

**XIV. Steering Committee Discussion of Future Priorities / Task**

## **Assignments**

Mr. Harvey noted that this last item of discussing future priorities was done during the day. He thinks that the management committee has their charge from the steering committee. Jon Iglehart will work to pull together the recommendations from the steering committee to communicate to Atlanta about funding priorities. The resolution is a work in progress and will be distributed in a couple of weeks. Drs. Causey and Kruczynski are working on the resolution. If there is a need or desire to schedule a meeting before the July time frame, then that can be done. The sooner the recommendations are communicated to Atlanta, the better. Mr. Charles Causey asked if EPA could find the \$5,000 to fund the canal project. Mr. Harvey doesn't think this is too feasible at this time as it is hard to fund something for that small amount. Richard Jones, Monroe County, was asked about whether or not they could provide funds for this study. He stated that the county is best equipped to pay for it. He would like some input from the steering committee on the study and how it can be modified to meet the needs of the county better (if desired). While this expenditure would have to be approved by the Board of County Commissioners, Commissioner Neugent noted that it would help if they had the approval of the steering committee. Jon Iglehart noted that they will have a better understanding of the committee's priorities and he thinks it might be helpful to know those before funding this study further. Mr. Causey emphasized that this information is needed for making decisions about the canals and it might be helpful to get support for this projects from this committee. Mr. Harvey asked Wendy to explain what work would be done for the \$5,000. She stated that the update is prepared in writing. It would involve updating everything to be compatible with current GIS software, updated aerial photographs with higher resolution and identify the current treatment technologies available for the canals. Mr. Harvey thinks this is useful information even if they don't get to addressing the canals right away. There was a discussion about whether or not this would be sole sourcing since it was a continuation of earlier work. While the original contract is no longer in place, there would not be issues with giving this project to MacTec.

Councilmember Worthington made a motion to approve a letter ort to the count to support the request for money from the Boater Improvement Fund to upgrade the GIS for the canal study. The motion was seconded by Commissioner Hammaker and approved unanimously by the committee.

## **XV. Public Comments**

There were no public comments at this time.

## **XVI. Closing Remarks / Propose Date for Next Steering Committee Meeting, Steering Committee Co-Chairs and Others**

Mr. Blackburn suggested identifying dates for the next meeting in July. There was a motion for July 20. People noted that there is a county commission meeting on the 20<sup>th</sup>. July 19<sup>th</sup> was tentatively scheduled. Mr. Harvey thanked everyone for their participation and attendance.

Adjourn Meeting

