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WQSC Members Present

Billy Causey, Southeast Region of National Marine Sanctuaries
Charles Brooks—Key Largo Wastewater Treatment District
Gil McRae—Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute
Chris Bergh—The Nature Conservancy
Sandra Walters—SWC, Inc. citizen representative maritime interests of the Florida Keys
Ron Sutton— Key Colony Beach
Charles Briggs—Department of Health, Bureau of Water and Onsite Sewage
Susan Hammaker—Florida International University water quality outreach/education
Andrea Leal —Florida Keys Mosquito Control District
George Neugent— Monroe County Commissioner
Pete Worthington— City of Marathon
Charlie Causey— Florida Keys Environmental Fund
Judy Cheon— Florida Keys Aqueduct Authority
Bruce Popham, Sanctuary Advisory Council and a member of the business community
Carol Mitchell—Department of Interior, South Florida Natural Resources Center
John DeNeale—Key Colony Beach, canal subcommittee

I. Call Meeting to Order

Bill Cox, EPA, will now be co-chairing the meetings. He thanked everyone for coming and stated that it was his first meeting as co-chair with Jon Iglehart. EPA has been undergoing some changes in the region with realignment, retirements, etc. He is excited about being part of this process and has worked primarily in coastal and ocean programs, wetlands, watersheds, including the National Estuary Program. He noted that there has been quite a lot of work done in terms of wastewater and monitoring under this program since the 1990s. There are some successes that the committee needs to be congratulated for, but there are challenges ahead too in terms of water quality, canals, storm water. Resources are getting more difficult to obtain and more competitive. Having a story to articulate is very helpful in terms of securing funding. He thinks that this group is able to articulate the story. The EAP South Florida Initiative is still a priority with EPA at least through 2013. He thanked everyone for being here and recognized Jon Iglehart.

Jon Iglehart welcomed everyone, specifically Bill Cox. He is glad that Bill is filling this position. Bill came down for three days to learn about the Keys and is taking this role seriously. Jon wishes him the best of luck. Jon reviewed the minutes from five years ago recently and noted three areas of concern for the committee at that time. He explained that one area concerned wastewater for the entire Keys and progress has been made since then. While the wastewater job is not completely done, the Keys are close to finishing. Another concern involved the assessment of the biological monitoring programs. Several assessments have been done and some areas have been cut back, while still retaining a strong monitoring program. He also noted a third issue, which was that the committee made a determination to tackle storm water and canal issues and to take a thoughtful approach to outreach. Today, the committee will hear about canal issues and the successes that have been enjoyed in terms of outreach as well. At this five year mark, the committee has accomplished several milestones. At this meeting, time will be devoted to planning the future. He asked everyone to keep in mind enabling legislation, the reasonable assurance documents and the fact that some variables are outside of the committee's immediate control, both economic and environmental. He thanked everyone and looks forward to healthy discussions and encouraged all members to participate.

Bill Cox asked the steering committee members to introduce themselves. Billy Causey welcomed Bill Cox and added that his participation was very much appreciated. Members introduced themselves and welcomed Bill. Steve Blackburn announced that there would be a luncheon celebration of Bill Kruczynski's book arranged by George Neugent.

The audience briefly introduced themselves: Sean Morton, Bill Kruczynski, Jennifer Derby, Nancy Diersing, Daniel Kiermaier, Scott Donahue, Brian Barnes, Rich Pierce, Wendy Leonard, Stephen Hanks, Gus Rios, George Garrett, Debbie London, Bill Becker, Richard Jones, Greg Tindle, Kevin Wilson, Rhonda Haag,

Jon Iglehart proposed a change to the agenda—to switch the canal presentation with the wastewater presentation. This change was accepted.

Bill Cox asked if there was any discussion about the minutes. George Neugent made a motion to approve the minutes, which was seconded by Billy Causey. The minutes were approved by all.

Update from the canal restoration committee and discussion

Bill Cox introduced Wendy Leonard, thanked her for coming. Jon Iglehart explained that at the last steering committee meeting a subcommittee was formed to engage a contractor to evaluate canals and update a study conducted several years ago. It is not the responsibility of FDEP to bring recommendations, only to engage the contractor. The recommendations heard are those of the contractor.

Wendy explained that Monroe County in association with AMEC was awarded a grant from FDEP to complete a Phase 1 Canal Management Master Plan. The master plan is needed to develop a prioritization for canal restoration and develop feasible strategies to improve the water quality in the artificial canals. The scope of this project was to develop a basic conceptual framework for canal restoration and management including prioritization and development of feasible water quality improvement strategies. Phase I included only a subset of canals due to the 3 month schedule required to complete the project within the fiscal year funding cycle. Wendy presented their conceptual designs, cost estimates and recommendations developed for the top 3 priority canals. With Monroe County funding, AMEC updated the earlier GIS database of canals in Monroe County. She brought some CDs with the updated database for interested persons. This database is the current storage site for all related data. AMEC developed objectives for the master plan and a list of key management issues and goals. They received feedback from management plan on this list. She reviewed plans for the top three canals and cost uncertainties associated with sediment removal and disposal. AMEC presented a graph with funding sources and matches. Wendy noted that Section 319 and the RESTORE Act seemed to be the most likely candidates. AMEC recommends preparing a grant package to EPA that includes a technology evaluation to obtain design data, effectiveness and costs and other information that will be useful for the plan and the rest of the canals. The estimated cost for this project would be \$575,000 - \$1,579,000, depending upon whether or not backfilling was part of it. Backfilling may not be appropriate for all canals. Section 319 needs a 40% match and this is non-traditional project in that 319 usually addresses storm-water. However, she feels that the goals are aligned and it relates to overall water quality improvement. Wendy also mentioned other funding sources. She also advised that the canals in the Big Pine area were left out of the ranking at this time because they didn't have sewage treatment. They do have sulfur and weed wrack issues and weed gates could help a lot in certain canals. Bathymetry data is important for the master plan and she has a quote for 70k to profile all canals in the Keys. Monroe County has been awarded an EPA grant to complete the master plan for the Keys and they will be starting that project soon. She emphasized that it will be important to get residents tied into to make things work well and reaching out with a plan.

For more detail, see presentation attached at end of notes.

A discussion took place with several questions being asked by committee members regarding costs of buying and transporting fill for canals and about requirements for obtaining federal and state permits needed for such projects. Permits will be required and it will be work best if the agencies cooperate and this committee can help in that area. FDEP issues water quality certification and doesn't usually have an issue if the overall water quality will be improved, but they do have to overcome any issues related to endangered and threatened species like the small tooth sawfish. Backfilling estimates will be a somewhat complicated issue with houses being in the way, but it can be done from a barge. Air pumps are being used in some places and run about \$200 a month in operating costs, mostly electricity. It was explained that the bubbling keeps the seagrass/weed out and it moves along the shore. In some neighborhoods, people volunteer money to keep the aerators operating. People living on canals might be able to help maintain the weed gates and other aerators. Sometimes they pump water in and that ends up pushing water out. Pumps do require electricity and will require that someone pays for it and in some cases, homeowners may have to provide the place and electricity. Maintenance will have to be done by someone for the long run. Charles Brooks explained that in Sexton Cove people let pumps be hooked up to their electricity and they were given credit. This has worked well. Several projects have been done in the lower Key on the property owner's dime because they wanted to clean up their canals. Other people who live on canals have already expressed a willingness to contribute to clean up of the canals. There will be expected volunteerism and a recognition of the responsibility of the property owners similar to responsibilities for wastewater. Cleaner canals will improve and affect the property values. The canal subcommittee has gotten a lot done during a short period of time and some of the credit goes to AMEC, FDEP and the committee members. George Neugent recognized the committee members who participated in the canal subcommittee. He noted how EPA how much can be accomplished when people (agencies and community leaders) work together. The Keys have been declared to have impaired waters and the county is required to take actions to correct that as noted in the Reasonable Assurance Document. He would like to see water quality issues be addressed proactively, which is always a better way than to have it mandated.

Charlie Causey pointed out how important it is to have the canal communities buy in to the process and thinks it would be good to have a percentage that the canal owners need to contribute. He feels there is a need to come up with something that is reasonable for canal owners. The idea of a special taxing district was discussed extensively. Property owners in that district (on that canal) would then contribute a certain amount toward the restoration costs.

Susan Hammaker noted that that the Army Corps asked the steering committee to develop a new authorization because the 800k will soon expire. This will take some organization and planning.

Jon Iglehart wanted some clarification regarding sediment analysis proposed by AMEC for 70k. Wendy explained that what was done in phase I with sediment samples is that they were taken and characterized, but no lab analysis was done. For 70k a benthic profile can be done and will show the hard bottom and the thickness of the organics. They will also do manual sampling and the time frame from developing a contract to finish construction is several months, without permitting. If the committee agreed on a project today, it could

probably be accomplished by July 1. If they were awarded the money in January, it could still be done by July 1. Permits will require sediment chemical analysis to determine disposal methods.

Sandra Walters has worked with several communities who wanted to improve canals and at times their success was uncertain. With this county-wide approach, things will be coordinated and that should make it more appealing to people. Gerald Briggs pointed out that the ongoing costs should be included and that this is a concern for residents for wastewater systems. Costs should be known up front and be part of the analysis. A question about tidal flows and making use of them was asked and the answer was that would not work in these canals, but could be done for other canals and should be considered. Pete Worthington has seen great improvements when tidal flows are restored.

Wendy Leonard would like to see a full characterization of sediments done for additional costs to the 70k sediment profile study. Chris Bergh had some comments about the opportunity for RESTORE funds. He would like to see the committee address this funding opportunity. He thinks it could be good for canals or other issues. George Neugent mentioned that the one penny sales tax is up for renewal and this tax provides money for water quality, too. He explained that Monroe County is participating in the Florida Association of Counties, which is involved in determining how the RESTORE act funds are delegated amongst 11 coastal counties that are not in the Panhandle. Field trips have been taken to look at different canals and some are in serious trouble and are health hazards. It is so important to work with the community as the neighborhoods know their own canals. Improvements will improve the quality of life as well as property values.

Jon Iglehart made a motion to continue the subcommittee as a working group for the next 6 months to assess whether the residents were willing to pay 30% of total costs. Motion was seconded by Pete Worthington. A discussion as to what a fair percentage would be took place. The motion was modified to assess what property owners were willing to pay instead of using the 30% mark. The discussion continued. Those neighborhoods willing to pay more might be elevated compared to those with no participation.

George Neugent pointed out that people who bought canal properties bought the problem and they have a responsibility to address these impaired waters. The contractor may be gone but the property owner bought that responsibility. Susan Hammaker offered FIU students to conduct outreach as needed. Pete Worthington pointed out that addressing a lot of canals and homeowners with a solution such as a weed gate could be received well by the owners because it will be doing so much for so many and in this case, 30% may not be too much of the total costs for people. This weed wrack kind of project could be very doable. May not be able to backfill, but could solve the weed wrack issue right away.

Charles Brooks pointed out that homeowners associations are in a small percentage of the neighborhoods in Key Largo and a municipal taxing unit may be needed. If about 50% of people who will be taxed vote for it, then everyone is taxed and this is the only way. People may not contribute if it is voluntary. An elected board has to say it is needed. George Neugent pointed out that it would still be best if there was voluntary participation and the community asked the commissioners to establish the taxing district. At least that is what has happened in the past.

Chris Bergh mentioned that now it appears that the community is moving from something that has been voluntary/ad hoc to more of a formalized plan and to that end will be testing different methodologies to see what works, etc. It would be helpful to know the amount/what percentage each community would be willing to put toward canal restoration when planning for the future and implementing programs. There were requests for a copy of the presentation.

The motion to continue the subcommittee called to vote by Bill Cox. It received unanimous support.

Jon Iglehart made a second motion to earmark, if available, 70k of special studies monies for the sediment profile analysis. This motion was seconded by Pete Worthington.

A brief discussion took place. It was confirmed that 70k would cover the entire Keys. Chris Bergh just wondered about what other special projects might be considered for this funding pot. Jon withdrew the motion with the agreement that special studies would be voted on toward the end of the meeting today. The withdrawal was seconded by Pete Worthington. Bill Cox thanked Wendy for the presentation.

Status of Implementation of Monroe County Wastewater

Liz Wood thanked everyone for the opportunity to present to the committee. She explained the state wastewater standard that the Keys community needs to reach. The FY2013 State Budget included \$50 m for Keys Wastewater projects. This is the first appropriation of the \$200 m grant authorized as a result of the Keys-wide collaborative effort to document status in 2007 (Keys Wastewater Plan). The appropriation requires contracts for construction by September 2012 and March 2013 for Islamorada and Cudjoe Regional, respectively.

Margaret Blank, Key Largo Wastewater Treatment District, passed out a handout showing the status of hookups in Key Largo. They have completed 15,000 EDUs and added 300 unique properties. At this time, they are at the 75% goal. Seventy nine percent of funding is local, coming from Monroe County and Key Largo. Liz added that Greg Tindle is here from Village of Islamorada and will provide an update. Greg Tindle explained that the Village has entered into a contract to design build and operate as system in Islamorada prior to the September 1st deadline. The plantation Key component has already been designed and construction should begin there by mid-October.

Liz Wood presented slides summarizing the progress that has been made by FCAA, which is responsible for projects in Big Coppitt, Duck, and Cudjoe Keys. In January 2012, 64% of the Keys were connected. By September 2012, it was 73%. Liz mentioned the referendum to extend discretionary sales tax which sunsets in 2018. This tax approach splits the cost between visitors and residents.

Continued keys-wide effort for future State and Federal appropriations is necessary to deliver projects with affordable rates. Kevin Wilson gave an update on several related topics. He mentioned that the 50 million dollar Mayfield grant money has already been delivered and bid upon. Islamorada contract has been delivered and expect a contract for Cudjoe by December. He is started working on the next 50 million dollar grant. The infrastructure sales tax is a critical part of funding. He wants everyone to know to look at the last page of the ballot to vote on the tax. George Neugent noted how important this sales tax for maintenance of infrastructure and for putting in new infrastructure for the future. Support for this tax will allow Monroe County to move forward with Cudjoe and Islamorada treatments. Kevin Wilson added that many projects throughout the Keys are funded by this tax and that at least 50% of the tax is paid by people who live outside of the county.

Liz thanked those communities who have moved forward for their leadership in making these projects. She introduced George Garrett, City of Marathon. He introduced Debbie London, who replaces Susie Thomas position in some part. George Garrett echoes what has already been said. The City is looking forward to a piece of the Mayfield grant. The City has five plants that are fully operational. Two service areas have been operating for two years and approach 100% connection. Overall, they are at 62% and notice to the Grassy Key residents have just been made and connections are starting there. Marathon also built a storm water system at the same time and put that in place when building the sewer system. The City won an award from FDEP for addressing storm water at the same time. It is hard to say exactly how much was saved by putting in storm water at the same time and storm water comprises about 1/3 of the total costs. Pete Worthington added that there were cost savings and benefits from doing both wastewater and storm water simultaneously.

Liz Wood added that she has had positive reinforcement by local fishermen and others for water quality improvements because people are seeing more fish and marine life in places where they have not been seen in years. (Presentation attached as a PDF at the end of the document.)

Bill Cox thanked Mayor Sutton for use of the room and mentioned that there are public comment forms for anyone who wants to make a comment at public comment time.

Assessing the Effects of Mosquito Control Pesticides on non-Targeted Organisms, Richard Pierce, Mote Marine Laboratory

Mote received special funding for this project from Region 4 EPA and Florida Keys Mosquito Control District. Region 4 money was not available for the second year as originally expected. However, the project has continued. He thanked Bill Kruczynski and Billy Causey for their encouragement and support. Dr. Pierce has two Co-PIs, Kim Ritchie and Tom Matthews. Dr. Ritchie will be looking at coral larvae toxicity and Tom Matthews will be looking at lobster larvae toxicity and doing field studies. The sanctuary staff will also be helping with field work.

One goal of the project is to determine if applications of mosquito control pesticides in the Florida Keys result in toxic effects to sanctuary organisms. If so, this team will work with stakeholders to assess the risk and develop appropriate response strategies. A slide showing the breakdown of funding support was presented (attached as a PDF) and the unique public-private partnership that involves shared funding and in-kind services from FWRI and NOAA FKNMS. Dr. Pierce welcomes advice from sanctuary stakeholders regarding his efforts to seek additional funds to expand the monitoring to include three pesticide applications instead of two. Once information is obtained from this study, they would like to examine synergistic effects of pesticides. He reviewed a previous EPA-mosquito control study in Key Largo conducted in 1998. They used a grid to capture the drifted pesticides (aerially applied by mosquito control) to see what moved into the surrounding areas from the canals in Key Largo. Permethrin drift with east wind collected at surface near shore. It was dispersed quickly. They did not find Naled drift into the bay, but four hours later on the leeward side, they found DDVP, a degradation product of Naled that drifted there. On the second application in September, they found surface permethrin in canal surface samples, but need to know if it gets into water column where it can affect organisms. They weren't able to complete the study because of Hurricane Georges.

The relative toxicity of these chemicals have been tested on certain organisms (*M. bahia* (mysid shrimp) and *P. duoarum* (pink shrimp) and the results were presented. Permethrin is quite toxic in general. It takes only a small amount to cause 50% mortality in shrimp test organisms. They used this toxicity information to design their more recent studies to answer a variety of questions. Do these pesticides degrade or remain in the sanctuary? Are they transported out to the sanctuary? If so, are they in significant concentrations to cause lethal or sublethal effects? Some Keys residents have mosquito net sprayers that dispense permethrin at any time and therefore pesticides can be present even when they are not applied by mosquito control. They want to obtain a better understanding of this practice. In this study, they will monitor ground and aerial applications of mosquito adulticides (naled, permethrin and malathion), to assess transport, distribution, concentration and persistence in the sanctuary; measure the toxic effects of environmental concentrations of the pesticides to early life stages of coral and spiny lobster through critical stages of metamorphosis that occur in near-shore waters; assess the contribution of residential pesticide applications to pesticide input to near-shore habitat and work with EPA, Florida Keys National Marine Sanctuary (FKNMS), Florida Wildlife Research Institute (FWR) and the mosquito control to evaluate potential impacts and develop appropriate response strategies as needed. They will be conducting the application tests in Venetian Shores on Plantation Key and on Key Largo. They recognized that it is really important to know the tidal cycles and flows for this study.

Coral larvae toxicity tests will be conducted at Mote Tropical Research Center on Summerland Key and will involve exposing larvae to relevant concentrations of the pesticides to determine acute and sublethal toxicity. Similar toxicity tests will be conducted by FWRI scientists on spiny lobster larvae. They will also monitor drift and runoff from pesticides misting systems and conduct a lawn maintenance study in the future. The common goal for all stakeholders is to preserve and enhance the living resources of sanctuary while maintaining adequate mosquito control to protect the public health and economic well being of the Keys.

In the discussion that followed a question was posed as to how to distinguish the contribution by individual homeowners of pesticides applied through the misting systems from those applied by mosquito control. Dr. Pierce explained that this study wasn't designed to distinguish between the two, but that they will be monitoring some misting systems and the mosquito district has suggested that they can put a tracer in their pesticide to make their applications distinguishable from others. Andrea Leal added that they are researching tracers right now.

Billy Causey wanted to point out that the coral being used in the study, *Porites asteroides*, is one that is common in the nearshore environment and it spawns every month, unlike those at the reef. Bill Kruczynski reminded everyone that an earlier similar study was done on queen conch larvae and significant impacts were found from pesticides. Chris Bergh asked about restrictions on over the counter pesticides that people can buy. Andrea Leal explained that there are registered companies that can apply these pesticides and maintain the systems. She is not sure if there is really the manpower to regulate each homeowner, though, to make sure it is applied properly. This is growing practice in the upper Keys. Chris suggested that the steering committee become more aware of how restricted pesticides are being used. Andrea added that the US Fish and Wildlife Service is becoming more involved in this issue. She added that public use of these products is detrimental because it could lead to resistance to the pesticides, thereby limiting what can be used by the district. The mosquito control district is not in favor of people installing permethrin misting systems.

Water Clarity Assessment along the Florida Keys Reef Tract Using Ocean Color Satellite Data—potential use of this information in decision making activities such as rezoning, Brian Barnes, USF

Brian Barnes thanked everyone for their time. He explained that various agency partners are involved in this project, including NOAA, EPA, NASA, FWC, and University of South Florida (USF). The objective of this project is to describe new products developed to look at water clarity from satellite data and show potential applications of this product as it pertains to the rezoning effort of the marine sanctuary. He is particularly interested in strategies from the sanctuary's research and monitoring action plan: Ecological Research and Monitoring (W.33), Florida Bay influences (W.24), Researching Water Quality Issues (W.32). At the conclusion of the presentation, he would like to get feedback on this usefulness of the products in the rezoning effort.

Water clarity measurements were taken *in situ* in April 2011 and August 2012. Of the 26 stations collected, 10 stations were concurrent with the satellite as it passed over. Prior to this product, they didn't have a way to tell what the water clarity actually was. He showed the validation of the data with a correlation coefficient (R^2) of .91, which is great improvement of what was previously available and shows that the products work. This product is tied to the satellite, MODIS/Aqua, which passes over about once per day. This satellite dataset goes back to 2002, so he can apply this tool to previous satellite data to get an idea of water clarity over the years. He showed images that represented status and trends in water clarity over the 10 year period. There are times and locations when water quality is not as clear as others. Winter tends to be a little less clear with summer being the most clear. Waters of the lower Keys seem to be a little less clear than the upper Keys. This product does not work in water less than 10-15 feet deep, so it doesn't measure in shore, but is more of an offshore reef tract product. It is possible to look at which areas are more historically clear than others, from onshore to offshore and in different regions. This product shows that water gets clearer as move from shore to offshore. He included water quality data from Boyer, FIU and found similar trends. With this tool, conditions in specific places can be examined throughout the year along with episodic events like the one in 2003. He showed some maps of Florida Bay showing flows of unclear water flowing toward the reef tract and water masses can be tracked over time. He superimposed the Coral Reef Evaluation and Monitoring Program coral cover data on the water clarity values for the past 10 years. He did not make any inferences, but wanted to show that ecological monitoring data could be matched with satellite data to see if there may be a relationship. There are other remote sensing data sources available. Temperature can be determined from satellites that pass over several times daily (MODIS, AVHRR). The algorithms for chlorophyll, color dissolved organic (CDOM) matter concentrations are currently in the validation stage.

Blue green algae blooms can be picked up in the chlorophyll analysis. Will the Florida Bay blooms be visible? The answer is that it is commonly available for the bay and this allows the blooms moving from the bay to be visible. Covering the reef tract is what is new with this product. Data are available on the USF's Optical Oceanography Laboratory website. He would like any input on what data format would be most useful for managers.

In the discussion that followed the presentation, Billy Causey complimented USF on their work with satellite data. He would like to see someone examine the water quality parameters and then look at the satellite data to see if better predictions in terms of water quality can be made. He would like to see these data related to Coast Watch data, which picks up algae blooms. He feels that this tool might be helpful to island nations to track water quality in an economic way.

Charlie Causey pointed out that water quality and clarity is extremely important to the economy of South Florida and wondered how this tool could be used to make it better. He feels that everyone would agree water quality in this area has deteriorated over the years and this

tool allows tracking of the water so that something can be done before more deterioration takes place. Jon Iglehart stated that he did not see water clarity deterioration over time in the images shown and Brian Barnes agreed that this assumption has not been tested.

Billy Causey pointed out the application to the ecosystem restoration taking place on the mainland these data will be very useful when the water starts to flow from the mainland. He has a lot of faith in this project because the results correspond to what is known by people who work in the field. For example, the lower Keys receive the water from the Gulf/Bay side and that makes it a little less clear than in the upper Keys. Carol Mitchell asked if these data could be used with other satellites that were in place before 2002. To use other satellite data, a new algorithm would have to be developed for that satellite data. She also wanted to know whether other parameters, like CDOM, temperature and chlorophyll, could be tracked in shallower water. Brian explained that when the bottom is visible, it is not possible to get accurate information using this method. But, when the bottom can't be seen, it is possible and this is the case for Florida Bay for much of the year.

Bill Kruczynski suggested that the committee consider how these data could be used in the long term monitoring program. This question can't be answered today, but the review panel that evaluated the program suggested using satellite data. One review panels also mentioned episodic events and this method could be useful in learning more about episodic events, which are thought to drive the system in many ways.

Lauren Underwood, NASA, added that they would be very interested in providing the kinds of data products that are needed and in providing the data in a format that is useful to resource managers. She thanked the committee for supporting the research and welcomes feedback as to what is needed—maps, etc. over a certain time period. This presentation is just to show what can be done. They want to compliment what is already been done. Chris Bergh asked whether or not there would be confidence in these data if the water quality database did not exist. Brian Barnes answered that the dataset helps, but the correlation between *in situ* and satellite readings is very high and he has confidence in the method under these conditions. It might be possible to pick up turbidity from a large ship grounding, but clouds could get in the way. This method uses 250 meter pixels, so it would have to affect a large area. It was confirmed that this method will not be usable in less than 5 feet of water.

Sean Morton said that there are uses for this methodology as it relates to water quality and zoning, but it might be used for specific activities as well. He noted that diving was on the list shown and recommends that fishing be added. The Navy's proposed widening of the channel into Key West is a topic of concern for many locals, including fishermen who say that the cruise ships cause turbidity that has effects beyond the immediate area. Since a dataset exists back to 2002 and the Navy dredged the channel in 2004, he suggested looking before and after dredging to get an idea of the turbidity that might be created from this type of activity. Chris Bergh encouraged the team to get together with members of the Sanctuary Advisory Council to find out how they could become more engaged. Lauren Underwood added that they have already initiated a conversation. Bill Cox thanked Brian and added that the presentation was very informative.

Update on the Marine Zoning and Regulatory Review Process—WQPP's role in this process, Sean Morton, Sanctuary Superintendent

This marine zoning and regulatory review is being undertaken by the Sanctuary Advisory Council (SAC), which has done a fantastic job moving forward through the process in this past year since 2011 when the council began to undertake the review. A public workshop on marine zoning in 2008, but significant progress wasn't made until more recently. Scoping was wrapped up last June and the public comment received will set the direction for things moving forward. Sean explained that the goal of this presentation is to provide an update and a timeline and to discuss the interaction with the steering committee and comments from the public scoping process. He handed out a document with the scoping comments from the public. It is available online as well on the sanctuary's website (floridakeys.noaa.gov). Water quality was a hot topic in the list from the public. Sean noted that it does make one think that more outreach and education needs to be done in this area as things move along. In 2011, the SAC adopted goals and objectives, articulated in the document provided. Some goals came out of the condition report, published in 2011. In terms of the condition of sanctuary resources, there have been improvements, but there is also room for improvement. A timeline for the review has been adopted. Scoping was completed in June. During the next year, the SAC will be drafting recommendations to be considered. Working groups will be formed and workshops will take place, followed by another public process that involves the release of an Environmental Impact Statement and a socioeconomic statement. Beginning in spring 2014, coordination between state and federal agencies and with fishery management will take place. The sanctuary and SAC hope to have the final regulations, a final EIS and Record of Decision made by spring 2015. Sean pointed out that this time line is ambitious for all the work that has to be done.

The SAC and sanctuary launched the entire process with scoping meetings—one held in each of the five areas: Marathon, Key Largo, Miami, Ft. Myers and Key West. Nearly 500 people showed up to give their opinions. There was a coordinated outreach effort to get this input. Over 200 comments were also submitted online. Comments fell into several categories: administration, artificial habitat, boundaries, coastal development, coral and reef restoration, fishery issues, invasive/non-native species, nursery and spawning aggregations, new or modified sanctuary preservation areas and ecological reserves, seagrass protection, submerged cultural resources, user conflicts, water quality and wildlife protection. Many different topics were mentioned and some suggestions conflicted with one another. For example, some people wanted to see more regulations and others wanted fewer regulations and so on. There is a range of opinions and that is captured in the document. This process is focused on the zoning plan and managing public uses with the goal of resource protection.

The SAC knows they will be looking at the current zoning schemes in light of the science findings associated with black grouper and mutton snapper in ecological reserves and the success of the Tortugas Ecological Reserve in protecting spawning aggregations. The economics of the zones have worked out as well. Economic studies show that the charter recreational and commercial fishermen did not suffer economic losses due to the establishment of ecological reserves.

Water quality related issues include: temperature, clarity, canals, more pump-out stations, and other related issues that this committee has also been interested in over the years. Many of these issues are being addressed and there is room for more education and outreach on the progress that has happened and on the plans that are in place. It is a challenge to have the resources to implement the plan. He found it most interesting how much is being, has been or is planning to be addressed by the steering committee and maybe this information will help inform the committee in terms of the future. The SAC and is currently reviewing the scoping comments and will be prioritizing the items to be addressed in the near future. They will then put together a work plan with those top issues and a schedule. This discussion will start in October at the next SAC meeting, October 16, in Key Largo. For more information on what has been done to date and for contact information for SAC members, consult the sanctuary's website. Water quality will be discussed and some issues may come back to the steering committee.

George Neugent mentioned that derelict vessels cost the taxpayers 250k per year that money could be spent in better ways. By having managed mooring/anchorage fields, the county will reduce the number of derelict vessels and illegal pump-outs and for that reason they are very important. He doesn't want to take anything away from the live-aboard or transient boaters, but this money could be spent on more law enforcement. This committee needs to take this issue seriously and managed fields may help with that goal. He asked that the state help support the community in this effort and save boater improvement funds. The county has only a few fields and yet they have been dealing with this for many years. Boot Key has been a great success. The county and state have a responsibility to the boating public to provide upland amenities so that they can do the right thing like using a pump-out. Sean Morton also agrees and adds to the county's numbers because the sanctuary spends money (100 to 200k) on derelict vessels. Sanctuary enforcement (100k) money also goes to derelict vessels. George explained that the associated costs really add up fast. He thinks this is a classic issue that involves zoning, discharge regulations, etc. explained that the SAC supports managed moorings. Some people think that this substitutes as affordable housing when it is not responsible boating and should not be endorsed. Protecting resources should be the focus of the discussion and leaders in the community need to be educated on this topic.

George Garrett added that he has been in Keys for 30 years and sees this as interplay between the regulatory and management communities. Regulators do not always think that managed moorings are a good idea and the rights to navigate also muddy the situation for some. Charlie Causey noted that good points have been made, but the key point is resource protection and things that will improve the water and sanctuary are most important. In Everglades National Park's new management plan, they want to reduce prop scarring, so they will be requiring people to take the Eco-mariner's online boating course. He sees this as a wonderful thing to do to protect Florida Bay. He has made a presentation about this to the SAC and the idea of having a boater's education course in the sanctuary was mentioned. It would be voluntary at first, but eventually would be mandatory. That is the direction that the park is going in with its new management plan. This can be done with the sanctuary, too. He would like to see this on the sanctuary's agenda as part of the marine zoning and regulatory review process. This will protect seagrass beds, which are so important. Superintendent Dan Kimball said he would be happy to talk about it with the SAC.

Chris Bergh added that this is one example that could be addressed by a separate working group that would make recommendations after a year. There are so many topics and the SAC is focusing on marine zoning at this time. Water quality will not be the focus of the review because so much has been done as is evident in the WQPP biennial report to Congress. He suggests that the WQSC tackle the water quality issues on behalf of the SAC because they are the experts on water quality. Bill Causey added that this has essentially been done already by the creation the WQPP in 1990 as codified into law in the act that created the sanctuary. The planning and engineering infrastructure comes out of the WQSC/PP and much of this is directed by federal mandates like the Clean Water Act, etc. Both people and marine critters require good water quality.

Sean Morton added that many issues that were raised have already been addressed in some way. Education needs to be done to let people know this and what is planned. He thanked everyone.

Future direction of WQPP (priorities, management plans, FDEP/EPA funding, biennial report, continuing integration, other-open discussion) Steering committee co-chairs and others

Bill Cox introduced the discussion about future priorities. He mentioned the report to Congress and noted that comments can be made, although it is nearly complete. People have two weeks, until mid-October, to make comments. Steve Blackburn then has to send it to the EPA lawyers and it should be done by the end of this year. He has already asked for and received comments that have been incorporated into this draft. There will be another one within two years. He wants everyone to make sure that they have the right logos and agency heads/contact information. He will send an electronic version and a reminder to check agency information, etc. Chris Bergh commended him for getting this far and the next version can build upon this one. Sandra Walters said that she did a quick leaf through and really liked the summaries and format. She thought it was a comprehensive approach and thanked Steve. Steve noted that other people also worked on this and it was a group effort. Sandra likes the photos, diagrams, sound bites, etc. Steve wanted it to be an attractive readable document. It has an executive summary and at the end contains fact sheets similar to those done by NOAA. He will send an email with the document attached.

Bill Kruczynski mentioned that his name was on the vision for the future section and this should be changed to be from the committee because it is the committee's vision of the future and they should make sure they agree with what is written.

Chris Bergh brought up the RESTORE act and available funds. The next steps identified in this document could be good candidates for recommending how restore money is spent. Many categories fit all or one of the priorities of the restore act. Steve Blackburn noted that the future priorities section of the biennial report can still be amended especially if things are added that are good candidates for funding. The appendix has priorities developed about a year ago by the management committee. People should make sure they are in agreement with those priorities. Steve will send any radical changes to the group for comments to get consensus through email. Chris Bergh wanted to make sure that appendix with the ratings is the same as what appears in the sanctuary's condition report. He is asking that these two documents correspond so that there are no conflicts in information, but not that they physically look alike. Steve said he would take a look at both documents to make sure they correspond.

Bill Cox commented about the sources of funding coming from the pollution act and natural resource management assessment act. Each of the five states, NOAA, DOI and EPA are trustees and the discussions involving these funds have been underway for a while. Mimi Drew is the contact for the State in the Governor's office. If there are good ideas, make sure they are heard at that level because that is where the conversation is taking place. The RESTORE act is another source of potential funding. There is a formula for how funds will be spent from that pot. One of the best things is to let key people know what the Keys are interested in doing should the money become available. The trial is set for January and there may be a settlement before that point. Projects in the list should be prioritized in advance so that the top one or two projects are identified.

Billy Causey added more information about the RESTORE act. A council is being put together and Mimi Drew will be the state representative for Florida, along with a co-chair from Department of Commerce. This position may be delegated to NOAA. A NOAA research team led by National Ocean Services, NOAA fisheries and the Office of Atmospheric Research has been formed and is actively developing a research plan due in January. Other line offices are also participating including Billy himself. 2.5 % of the restore funds will be obligated to research conducted by this NOAA team. He has been on a lot of calls related to this funding lately and the State of Florida has been commended for having their project plans ready before other states. He congratulated the State.

Jon Iglehart announced the legislature appropriated 100k through FDEP. As mentioned this morning, he would like the committee to decide in January how that money would be spent on projects that could be completed before the end of the state fiscal year on July 1. FDEP did not take this request out of next year's budget, so the funding may be available again next year.

Charles Causey asked about the 70k for the canal study. Jon asked Wendy Leonard to estimate the cost for characterizing the sediments in the canals in addition to the 70k. Her feeling is that 10k would go a long way to characterizing most, maybe not all, of the canals. It would certainly provide a representation and give an idea of what needs to be known for disposal—texture, moisture content and toxicity. With this information, they could better evaluate whether disposal is needed, etc. This information is important for the master plan, which will contain baseline data, because they won't have as many uncertainties and their cost estimates in the plan will be more accurate.

Sandra Walters asked about the goal of the sampling. If this sampling is needed for the permit process, then the 10k estimate might be low. But, if this is being done to get an idea of whether the materials need residential or industrial cleanup standards, then that amount might cover it. She would double that amount if it were her decision because that would allow for tests needed to meet the permit requirements. Several samples might be needed from each canal and each lab analysis can be 2-3k.

Charles Causey stated that if there is a finite amount of money from the various sources, these data will be valuable because it will help guide decisions about which projects can be funded.

Pat Bradley mentioned that someone might want to contact the NOAA Coast Program, which is involved in Status and Trends monitoring. They are already conducting sediment sampling and may be able to do that in Keys canals as well.

Sediment samples would have to be analyzed for moisture content, sediment size, heavy metals because all of these factors play into the removal costs. Wendy Leonard explained that 10k may not be enough for permitting requirements, but will give important background information. She was talking about a representative set of canals getting this full profile, maybe a total of 10 canals.

Jon Iglehart explained that when FDEP issues permits to dredge canals or similar activities, they look at reasonable assurance for containing pollution. The ultimate way that the sediments have to be disposed of determines the level of sampling required. If it is presumed they are contaminated and they are already being disposed of with the greatest protections, then additional sampling is not required. If the fill is going to be put in a residential area, then different criteria apply and more sampling is needed.

George Neugent asked about the remaining portion of sediments after dewatering takes place. If this remaining portion was contaminated, could it be incinerated? Jon Iglehart said that it could be treated as contaminated soil and it could be treated that way. Wendy already considered worst case cost scenario for disposal in her project estimates given in her earlier presentation.

Jon Iglehart explained that one of the benefits of doing the sediments analysis is that the sediments may not have to be removed at all if they are of a certain consistency. Instead, something may be able to be put on top of it to shallow up the canal instead of removing the sediment.

Chris Bergh inquired about EPA has for funding next year. Steve Blackburn reported that fiscal year 2011 took a 35% cut (to 1.653million) and cut the monitoring accordingly. In 2012, funding was restored to 2.058 million and that enabled EPA to fund the MOTE and Monroe County studies. In 2013, the funding will be 1.7million (17 % reduction). He doesn't anticipate going out for a call for proposals. The everglades remap has to be done and will be funded out of this amount. The monitoring programs can stay at baseline for now. He doesn't know what will happen with fiscal year 2013. These are just projected numbers. About 1 million of the 1.7 would be available for the remap and monitoring and the rest would go to the office in South Florida, which is being reorganized.

Chris Bergh mentioned that he understands that Bill Kruczynski's position will not be replaced when he retires. He recalls that the act that established the program requires that someone from EPA reside in Florida and he wonders who that might be. Bill Cox explained due to budgetary constraints EPA may not have someone in Florida. Pat Bradley is here from ORD and is able to represent EPA on technical issues. There may be bigger issues. He would like to get Steve Blackburn down here as much as possible. While the program may be losing presence, they may gain a more direct connection to the regional office. EPA's discretionary pots are drying up and that is making it more difficult. There is uncertainty about budget at this point because of decisions yet to be made at the congressional level. While Bill Kruczynski will never be replaced, there are experts within EPA that can be consulted and put their resources to work.

Jon Iglehart inquired about 2013 funds. Steve responded that 2013 does look pretty definitive at this point and 1.7 million is probably the worst case scenario. Steve confirmed that the current monitoring should be set to continue at the lower funding levels.

Bill Cox explained that they have been conducting the REMAP sampling about every five years and there are other partners contributing funds. EPA put in the minimum to get a minimum water quality picture and then brought in partners to add on to the sampling regime. This discussion about how to spend resources is taking place now. EPA will spend 200k on REMAP in 2013 and already spent 300k in 2012, so REMAP is getting 500k total for two years. Out of the 1.7 million, some amount will go toward monitoring, but how will the remaining 500k or so be spent? It has been going for staff positions, etc. at the south Florida office. EPA doesn't know yet what will be happening with those positions yet.

Jon Iglehart wondered if would be appropriate to earmark any extra funds that may become available. Steve Blackburn thinks that can wait until January and the decisions can be made then, although EPA may not even know 2013 funding by January.

Pat Bradley suggested another source of funding associated with the sustainable healthy communities research initiatives. The 2013 projects have been funded already, but proposals are taken in March, so a proposal could be worked up to apply for those funds. Pat will send Steve an email with more information. This money is applied through the regional offices. She has worked with region 2 on this funding before. The region asks for it and ORD and the region work together on it.

Jon Iglehart asked if the steering committee could ask EPA region for sediment analysis money (to complete the analyses). Jon made a motion that the steering committee would like to see the canal study sediment analysis for all the canals for depth width, etc., and a representative sample of type of sediments for those canal systems for the amount of 80k (70k plus 10k). Billy Causey seconded the motion. A vote was taken and the motion passed unanimously.

Wendy Leonard mentioned that if there are contaminants found, then toxicity tests would be needed unless it is being disposed of as contaminated.

Chris Bergh wondered what would happen to the FDEP money if the EPA money comes through. Steve explained that this past year, EPA received its funds in May, which is relatively late. They had to get the funds out by July. It was really quick turnaround to get projects into the queue to be funded.

Jon Iglehart explained that if the 100k FDEP money is spent on weed wracks, etc. in three canals, that will improve those canals and then if the EPA money comes through, things can go forward with that and provide information on which communities are willing to participate in projects.

George Neugent added that there a tremendous amount of the responsibility is with local government. With the passage of the sales tax infrastructure, this is part of the water quality responsibility. If the tax passes, he feels that the county will help fund projects. Rhonda Haag has been very helpful in getting the sales tax info in front of the commission. This will be the third extension of the sales tax.

Chris Bergh thinks that the county attorneys should be brought into the process because having pumps on private properties requires easements and agreements. They should also consider design and where to place pumps (public/private properties).

Chris Bergh made a motion that priority corrective actions identified by the WQPP and its associated monitoring and special studies program be identified as priorities for RESTORE act funding. The un-prioritized list can be prioritized and then given to the trustees for allocating the money.

George Neugent thinks the request should be more specific. Monroe County has attended two of the meetings with the Florida county association on spending this money in a responsible manner. There are four pots of money that may receive BP money and the exact amount depends upon the settlement. One pot will be guaranteed to the counties and the 8 counties in the Panhandle will receive 75% of that pot. The other 15 counties will get 25% of the money. There is a competitive pot (called the federal pot) and proposals can be made. He has met with people to discuss getting these proposals ready to go because timing could be very important. RESTORE stands for Resources Ecosystem Sustainability Tourist Opportunities and Revised Economy. This is a huge umbrella and many things can fit under it. They have been asked to put together a committee in the county to decide how this money is spent. He thinks this could go more smoothly if things were specified earlier rather than later. He thinks canal restoration needs to be on the list and the sooner the proposals can be developed in an articulated way, then they can be submitted to the consortium group that will be deciding which projects get funded. He would also like to identify overlap in objectives from the different counties in order to better align themselves with other counties. All of the in-county municipalities have canals, so this is a good candidate for the county. Shovel-ready is very important and things have to be publically vetted in advance as well. Regional projects like Everglades restoration may also rank high.

A question was raised about priorities for the council making the decision on other pots of BP money. The priorities of the Gulf of Mexico Task Force that was established prior to the council were focused on restoring wetlands along the gulf, especially the Mississippi delta. Will this be the focus of the council? Bill Cox explained that the task force published its strategies. They had four areas of emphasis: habitat, water quality, community resilience and fisheries. The council will be focused on implementation of shovel ready projects that fit these strategies. Billy Causey added that the federal agencies involved on the council, along with the states, are: NOAA, DOI, DOT and EPA. This makes up a broader council. The National Resource Damage Assessment (NRDA) process is separate from the council one and projects are being developed that may affect the Keys. The RESTORE act funds will be based on penalties from the Clean Water Act and will be dispensed more quickly than those for NRDA. Within NRDA there are restoration and compensatory funding pots.

Chris Bergh can withdraw the motion or make it more specific. Jon explained that if there is a motion from this body that just affects Monroe County, it might cause the counties to not cooperate as much with one another as they would otherwise. He would not be voting on this motion anyway, but that is a concern.

Charles Causey noted that George Neugent spoke about canal restoration and he doesn't know if this will be a priority for the county. He doesn't see the total amount of money needed becoming available for full canal restoration. It would take millions. If the county wants to get meaningful canal restoration, it will take a large amount of money, millions. George Neugent agreed that it will be a lot of money. The Florida Association of Counties suggested that if you have large ticket items, the entity should put a proposal for the federal pot, too, and try to get as much from the federal pot first.

The Mayfield grant is available now for wastewater, but this legislation could be tweaked to address storm water, too. This could make more money available. In terms of shovel ready projects, this county is ahead of the game because the issues have been publically vetted. He would like to see a proposal put together earlier rather than later. The next meeting is January-February. George Neugent would like to see a proposal before the committee before the next meeting. The money become may even available before the end of next year for approved projects. The county will establish a committee by November and that committee will take public input and proposals. January will probably be soon enough for the steering committee to weigh in.

Jon Iglehart proposed the idea that the committee endorse the list of projects proposed this morning and provide that to the county. George Neugent thinks that this committee adds a lot of weight to a proposal. An endorsement puts one ahead of the game. Specific examples of what kind of projects might be recommended could be included in the proposal. The WQPP steering committee recommends that the WQPP priority actions be considered in RESTORE act funding decisions. This includes in particular, canal water, storm water quality improvements and monitoring and special studies.

Bill Cox added that if the proposal Wendy on canals were cut down into two pages or so, that approach would work well to cover canals. But, more specifics, including funding needs, would probably be needed for other areas and increase chances for funding. He does think that the county is the right vehicle to send that information to. George Neugent noted that the municipalities could offer their endorsements too for canal projects and that would add more weight. He thinks canals could be prioritized within each city/community and each city could bring forward their proposals for canal projects to build support.

Bill Cox wondered whether there was value to adding storm water and monitoring to this proposal. Chris Bergh withdraws his motion because he feels that it may not be specific enough in the monitoring and storm water aspects. George Neugent noted that Wendy's proposal was pretty specific. The money that is received could be used for those of the highest priority or for what can be done.

Susan Hammaker suggested using the process that was used to endorse the Reasonable Assurance Document (RAD). At first, there was a general resolution of support for the RAD and then the entities picked it up. George agrees that this could work. He added that he does not know whether match money plays a role in receiving funds, but if so, Monroe and the municipalities might want to put in match money to increase the chance of funding Monroe projects. Charles Causey would like to suggest that a large part of the January meeting be devoted to this issue and hearing presentations from the county and other projects. It is important to have a good strong session.

Jon Iglehart agrees but in the mean time, they might be able to help out the counties. Carol Mitchell had a question as to whether the endorsement is needed before the January time frame. She knows that a number of projects have been developed, presented and are being considered. She put another motion on the floor for this committee to endorse the AMEC report on the canal project for Monroe County to use as they see fit in securing and using RESTORE act funds.

George Neugent seconded the motion and the motion passed unanimously.

Steve Blackburn pointed out that the RAD also addressed wastewater and storm water and might have the information needed. George Neugent agreed and noted that everything is linked together and timing is of the essence. Susan Hammaker wants to know who would present that proposal to the various entities similar to what was done with the RAD. George will be gathering ideas, including those from the municipalities. He hopes that the committee that will be formed can take proposals after November. Bill Cox said asked George to let Jon or himself know if the county needs anything else before the January meeting.

Chris Bergh noted that the proposal didn't include Cudjoe and Islamorada because they didn't have wastewater. George said that in the steering committee canal committee, they agreed that these areas could also be addressed in parallel to making progress toward wastewater treatment. It would be better not to wait since things take so much time.

Sandra Walters noted that as part of the wastewater projects a lot of spoil material will be generated and that might be suitable for use in filling canals and save money. She supports the idea of addressing these projects together for this and other reasons. It's unfortunate that this coordination opportunity was not available with other projects.

Tropical Connections CD distribution, Bill Kruczynski, EPA

Bill Kruczynski offered copies of the presentations that were given today. He announced that this is his last meeting. It has been an honor to work with everyone all these years and this committee should be proud of what has been accomplished. He leaves everyone with four words, "Science drives the boat." He cautions that people not lose track of that fact.

He asked for help in distributing the book, *Tropical Connections*. The CD containing a copy of the book is compliments of Charles Causey and the Florida Keys Environmental Foundation.

He thanked everyone for their patience as the scope of the project expanded from two to five years. He really enjoyed working with his co-editor, Pamela Fletcher. Books are stored at University of Florida campus in Davie. Many entities contributed to funding and printing costs (see presentation at end of minutes). Each book cost \$9.70 to print 6,000 books. These 6,000 copies are being given away free to libraries, schools, politicians, etc. He wants to see them distributing to the Coral Reef Task Force, etc. Billy will cover the task force. George Neugent will be doing that the next time he is in front of the Governor and Cabinet. Sandra Walters will take one to the regional planning council on Monday. Bill can make them available upon request.

Tropical Connections can be purchased at IAN press, University of Maryland. They are selling the books at cost (\$25). A PDF copy is \$12.50 with each chapter costing \$2.50. IAN press is working with Amazon to have it sold through them. Bill named some other book stores including the Eco-Discovery Center. He wondered if it could be available at the Everglades National Park's book store. It is also being distributed to Monroe County schools, Sea Grant and Marine Lab. Sea Grant is in the process of distributing books for schools in Miami-Dade County. He has heard that the book is being used as textbooks in colleges and universities.

Closing Remarks

Bill is glad that he is leaving everyone with this book that contains so much knowledge. He added that it has been a pleasure working with everyone. A plaque from the WQPP steering committee was presented to Bill at lunch in recognition of his contributions to the program and to recognize publishing the book. Bill Cox concluded the meeting by thanking everyone and Friends of the Sanctuary for lunch. Gus Rios presented a cake that was decorated to look like the book's cover.

A brief discussion about the next meeting date took place and it may be late January, February.

Adjourn Meeting

Meeting was adjourned.

