**FLORIDA KEYS NATIONAL MARINE SANCTUARY**
**WATER QUALITY PROTECTION PROGRAM**

**STEERING COMMITTEE MEETING**

**July 24, 2007**

**Key Colony Beach City Hall**
**600 West Ocean Drive, Key Colony Beach, Florida 33051**

Minutes

**I. Opening Remarks:** Mr. Jon Iglehart - Director, South Florida District, Florida Department of Environmental Protection and Mr. Jim Giattina - Director, Water Management Division, U.S. Environmental Protection Agency, Region 4

Meeting called to order sat 8:25 am by Jon Iglehart. He noted that a quorum had been reached with 15 members present.

Introductions: Mr. Iglehart introduced his co-chair, Richard Harvey from EPA, who attended in place of Jim Giattina. Two new WQPP Steering Committee members were introduced: Craig Diamond from DCA (Florida Department of Community Affairs) was unable to attend due to travel restrictions. Mr. Scott Zimmerman is a new member who represents the Florida Keys Commercial Fisherman's Association.

**Members present:**
Scott Zimmerman- Florida Keys Commercial Fisherman's Association
Ed Fussell - Director of Monroe County Mosquito Control District
Jim Reynolds - Executive Director, FKAA
Stu Appelbaum, US Army Corps of Engineers
Billy Causey - Southeast Regional Director of Office of National Marine Sanctuaries
Richard Harvey- U.S. EPA, Region IV
Jon Iglehart- Florida Department of Environmental Protection
Pete Worthington - Marathon City Council
Clyde Burnett - Mayor of Key Colony Beach
Gerald Briggs - Bureau Chief, Florida Department of Health
Anne Morkill - Manager of four National Wildlife Refuges in the Florida Keys
Sandy Walters - SWC, Inc.
Charlie Causey - Florida Keys Environmental Fund
Gary Bauman - Commissioner, Key Largo Wastewater Treatment District
Cecelia Weaver - FK Service Center Director, sitting in for Mike Collins, SFWMD
Bruce Popham- Chair of Sanctuary Advisory Council
Bob Doran- South Florida Task Force

Norman Edierson- City of Layton Mayor

Mr. Iglehart thanked Mayor Clyde Burnett, Key Colony Beach, for allowing us to use the meeting hall. He also extended thanks to Commander Dave Score, Superintendent of Florida Keys National Marine Sanctuary, for providing staff for meeting support and to Sanctuary Education Specialists Joy Tatgenhorst and Nancy Diersing for taking notes and setting up the snacks. He also acknowledged the Friends of the Sanctuary Foundation for providing the snacks and coffee for the meeting. Mr. Iglehart introduced Dr. Jeff Hughes, Director of the Finance Department, University of North Carolina, and thanked him for attending another WQPP Steering Committee meeting.

Mr. Iglehart announced that the speaker cards were available for public comment.

**A. Review Agenda:** Jon Iglehart

Agenda approved with no changes.

**B. Discussion and Approval of Minutes:** Jon Iglehart - Steering Committee Vote

Minutes were approved from the last meeting with no objections/comments.

**II. Review the FY 2008 Budget for the Water Quality Protection Program:**
Mr. Fred McManus - U.S. EPA, Region 4

FY08 budget

Mr. McManus gave a slide presentation about the budget, which was approved during the June conference call. He explained that last year's money was used to fund this year's project and the FY07 budget will be used for next years Water Quality Monitoring Program (WQPM). Mr. McManus reviewed the budget (shown below) and pointed out that it was important to get this approved during the June conference call so that other agencies can use this budget in their planning process.

EPA has been funding the WQMP at the $450k level for several years now. EPA has set aside $200k for the Coral Reef Monitoring Program and we are asking NOAA to find funds for this program, too. Seagrass Monitoring will receive $130k from EPA and money from NOAA/COP. Publication/Outreach will receive $20k; NOAA is also looking for money for this project. SeaKeys is a long-term project, with six stations throughout Florida Keys National Marine Sanctuary. It also receives money from NOAA. The EPA is very appreciative of the funding that the Little Venice Water Quality Monitoring received from the SFWMD. The evaluation of science program will include an objective evaluation of the sanctuary's science program, including the WQMP. EPA did set aside $125k for this comprehensive evaluation and $110k of that was used last year. A Request for Proposals (RFP) will be going out through Bill Kruczynski in January to announce the funding for the Special Studies/Demo Projects. Later in this

meeting, Jeff Hughes will discuss environmental outreach efforts and Dr. Kruczynski will discuss the State of Knowledge document.

The budget was summarized as follows:

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| • | Water Quality Monitoring | EPA | $450,000 |
| • | Coral Reef Monitoring | EPA | $200,000 |
| | | NOAA/CRCP | $180,000? |
| • | Seagrass Monitoring | EPA | $130,000 |
| | | NOAA/COP | $105,000? |
| • | Data Management | EPA | $ 60,000 |
| • | Florida Keys Office | EPA | $ 5,000 |
| • | Public Education/Outreach EPA | | $ 20,000 |
| | | NOAA | $ ? |
| • | SEAKEYS Project | EPA | $ 50,000 |
| | | NOAA | $150,000 |
| • | Little Venice WQM | FDEP | $100,000 |
| • | Evaluation of Science Program* | EPA | $ 15,000 |
| • | Special Studies/Demo Projects | EPA | $100,000 |
| • | Environmental Finance Outreach | EPA | $ 40,000 |
| • | State of Knowledge Document | EPA | $ 25,000 |
| | | Total - | $1,630,000? |

EPA total budget is 1.6 million dollars for next year for the WQPP. The following figures show a breakdown of funding toward the WQPP by agency.

- EPA Total $1,095,000 – 67.2% of total budget
- NOAA Total $ 435,000? – 26.7% of total budget
- SFWMD $ 0 – 0.0%
- FDEP $ 100,000 – 6.1% of total budget
- Monroe County $ 0 – 0.0%

EPA Headquarters gives Region IV South Florida office to for projects under the EPA South Florida Geographic Initiative. Of the FY 2007 Funds Available ($1,565,000), the WQPP receives 70.0% of them, so it is a priority for the EPA.

Dr. Bill Causey pointed out that the sanctuary budget is looking better than the past two years because of the House budget.

Mr. Charlie Causey asked if there a way to reopen Special Studies to projects that are worthy next year and possibly increase the funding, too. Mr. McManus pointed out that 2.3 million had been spent on Special Studies over life of project and that at some point managers should have enough information to take action. New projects may need to be identified in future and more can be spent, but the thinking is that what is needed has been done, although, other projects could also be considered, especially demonstration

projects. Mike Collins noted that we might need demonstration project with storm-water now.

Mr. Charlie Causey pointed out that we should review what we have done so far to see what still needs to be known. More in-depth scientific studies may be needed.

Mr. Harvey pointed out that EPA does review the budget every year and that there is some play in the budget. It new projects, etc, are identified, funds might be available.

Mr. McManus pointed out that they will be conducting the comprehensive evaluation and that should help identify what is known and not known.

Mr. Harvey announced that Jeff Hughes is here to meet with local government and has scheduled meetings with Pete Worthington, Chris Sante, Liz Wood and Key Largo, if people are available. This offer is good to any local municipality to help solve funding problems.

**III. Update on - 1) Development of the Comprehensive Report Summarizing the State of Knowledge on the Florida Keys Ecosystem,** Dr. Bill Kruczynski,U.S. EPA, Region 4

Dr. Kruczynski noted that years of monitoring have been completed and now it is time to let people know what has been learned. This knowledge will be summarized in a book that is being compiled through a series of workshops with experts on various subjects—water quality, seagrass, coral reef monitoring, etc. At each workshop, the experts develop pages that contain facts about that topic that are presented in a friendly and usable manner, including graphs and images and very little text. Dr. Kruczynski has workshops scheduled with the coral people tomorrow and will meet with mangrove and ocean experts later this summer. Some pages are now being generated and probably can provide them by next meeting. Creating these pages will need to be done to show to publishers. Various publishers have been contacted. The book may be independently published if the distribution problem can be solved. Sanctuary Friends will reap profits if the book ever turns a profit.

Sandy Waters inquired as to whether or not the book will include is being done or can be done do to address that problem. Dr. Kruczynski said that information will be included.

**2) Evaluation of the Long-Term Monitoring and Special Studies Programs of the Water Quality Protection Program and Florida Keys National Marine Sanctuary Science Program:** Fred McManus - U.S. EPA, Region 4

Mr. McManus discussed the ongoing evaluation of science program and monitoring projects had been taking place. The purpose of statement of work was “to perform an ‘objective’ review of the FKNMS Science Program, including the comprehensive long-term monitoring projects and special studies of the Water Quality Protection Program”

and "to determine whether the scientific information collected to date has been useful for the management of the FKNMS and local decision-makers."

The Statement of Work is as follows:

Specifications:
Task 1 – Work Plan Development
Task 2 – Compile, Review, and Summarize Annual/Final Reports
Task 3 – Review EPA 1999 White Paper – WQ Concerns
Task 4 – Review the Recommendations of the Year 2000
Science Advisory Panel and FKNMS Science Plan
Task 5 – Prepare Draft Report Summarizing the FKNMS Science
Program and Recommendations for Improvement
Task 6 – Conduct a Workshop
Task 7 – Prepare a Final Report

Task 2 involved producing a summary of all annual for monitoring and final reports for 28 special studies that have been done and the 1999 white paper, and the recommendations of Year 2000 Science Advisory Panel. The panel provided very good recommendations. The big task is Task 5 involves preparing a draft report summarizing and then providing recommendations and gaps. This comprehensive evaluation report will be provided by August 10 in draft form. It will be distributed to management committee and comments will be sent back to consultants and then to WQPP committee. A final workshop will be held and then a final report will be prepared from comments and the final workshop.

The evaluation will also look for duplication of efforts and ways to reduce costs, integration and correlation of data sets, practical special studies and may suggest demonstration projects for storm-water. The report will address methods to improve networking and stakeholders. The WQPP will be kept apprised of our progress on this endeavor. Please contact Fred McManus if you have any questions, comments.

**IV. Report on Water Quality Awareness Month:** Ms. Cheva Heck - Communications Manager, Florida Keys National Marine Sanctuary

Dr. Billy Causey gave the report on Water Quality Awareness Month for Ms. Cheva Heck and explained that Ms. Heck is leaving the sanctuary and moving to Lake Tahoe, California to work for the U.S. Forest Service. She has done phenomenal work for the sanctuary over the years and really helped to change the image of the sanctuary.

The WQPP steering committee recognized need to have communications plan to convey water quality issues. February 2007 was declared Water Quality Awareness Month (WQAM). Many municipalities stepped up to participate in this effort. Monroe County, cities of Layton, Key Colony Beach, Marathon, and Key West issued resolutions about WQAM. The FKAA and KLWT also recognized the importance of this month. Public

Service Announcements were written. Some water quality steering committee members also appeared on live radio shows. A special episode of the television program *Waterways* was produced. This first year seemed to be successful and may become an annual event if it goes the route of the Seagrass Awareness Month. Many agencies helped support this effort—National Park Service, EPA, Army Corps, SFWMD, DEP, FKAA and US Fish and Wildlife Service. A document called *Frequently Asked Questions about Water Quality* was also produced and distributed.

Ms. Sandra Waters mentioned that she participated in the WQAM and noted that we have an opportunity to coordinate the efforts with growth in green awareness. It is a natural connection to show people what can be done.

Dr. Causey noted that the sanctuary is planning to fill Cheva's position.

Mr. Harvey noted that EPA certainly appreciates her efforts.

Dr. Causey commented that recently there has been discussion about climate change. Even though climate change is important and affects coral reefs, it is also important to have the public understand that pollution, nutrient enrichment and other things are also affecting the reef and can be addressed. These issues are just as important as they were the day that Congress put the WQPP in place. Just because there are global changes, it doesn't mean that things can't be done at the local and regional levels, too.

**V. Status of Federal (Previously Appropriated and New) and State (FY 2007/2008) Funds to Support Wastewater and Storm Water Infrastructure Upgrades in the Florida Keys:** Ms. Cecelia Weaver - Florida Keys Regional Service Center, South Florida Water Management District and Jon Iglehart - Florida Department of Environmental Protection

Ms. Cecelia Weaver was introduced. She explained that she would be providing a brief update on behalf of Shelly Trulock, program manager for Florida Keys Water Quality Improvements program, USACOE. The Florida Keys Water Quality Improvements Act passed in 2001 allowing the Army Corp to provide up to 100 million dollars money for improving water quality in the sanctuary. As of July 20, three cooperative agreements have been submitted and sent to DC for signature. They total $3.18 million. The agreements call for $200k for Key Colony Beach; $500k for Key Largo Wastewater Treatment District (KLWTD) and 2.48 million to city of Key West. The Army Corp has a total of 5.5 million available, minus the 3.18 million that will be used on these three projects. These agreements should be reviewed by the end of the fiscal year in September.

Three additional project agreements being drafted as we speak: City of Marathon for 500k, Village of Islamorada for 500K and Layton for 800k. Money can not be given to Layton until the next passage of the Water Resources Development Act. Layton moved ahead with the improvements but, the previous act language stated that no construction could take place before cooperative agreements were in place. The City of Marathon

agreement was finished last week. A meeting will take place on Wednesday with Islamorada representatives. That leaves a remaining of $500k to be used for planning, design, etc. All of the NEPA documentation has been completed. The next opportunity for funding is the Water Resources Development Act.

Mr. Charlie Causey asked Ms. Weaver what the SFWMD is doing with regards to storm-water. Ms. Weaver stated that the district has contributed millions since she has been director and prior to that contributed as well. The district has also supported municipalities other than Monroe County, including the City of Marathon. In the past five years, Ms. Weaver noted that the district has contributed over $6 million for storm-water and water quality projects in the Keys. She explained that currently, the District is not contributing to WQPP for various reasons. Ms. Weaver pointed out that Mike Collins, whom she represents, strongly feels that the WQPP Steering Committee did not move forward fast enough with the evaluation. The District has funded little Venice, etc. The District also has a number of projects in place today. Mr. Collin's desires that the WQPP move forward with studies that identify how to fix the problem, not just study it.

There is a team called the Florida Keys Water Resource Initiative Team that consists of about 17 local and state entities. This team identifies the water resource projects that are submitted to district for funding. In 2007, out of the $4 million dollar budget, 3.5 million went to alternative water supply projects because they were ranked at the top of the list. Three million dollars went to FKAA and 500k to North Key Largo Utility Corporation. Every year, entities have opportunity to determine sit at the table and vote and to determine priorities. Usually, about $4 million is provided to the Florida Keys District office. There will be money, but with cutbacks. The amount that will be received next year is not known.

Mr. Jon Iglehart summarized the state funding for FY08, but did not restate everything that was discussed in the recent WQPP conference call. The highlights are that funding from the legislature was not obtained for specific projects in Keys. However, state revolving fund is doing very well as we are getting monies back from people we have loaned to over the years. The state may be able to provide interest rates for that money between 2 and 4 %. In the coming legislative session, looks like it will be a bleak year financially. The secretary and I have discussed obtaining other revenues for funding keys projects.

Ms. Sandy Waters inquired as to how the interest rate decision was made and Mr. Iglehart explained that it was an in-house administrative decision.

Commissioner Worthington asked it the federal government doesn't provide money for Monroe County, can the state offer a zero percent interest rate?

Mr. Harvey noted that EPA gives this money to state for a capitalization grant and once that money gets loaned out and comes back, the interest rate decision belongs to the state alone.

Mr. Iglehart mentioned that there is a tremendous amount of interest going on for this money. About 80 million is coming available along with what is coming back from loans from paybacks. No defaults, all money is coming back to the state.

A 5-minute break was taken by the attendees.

Chairperson Jon Iglehart introduced Representative Ron Sanderson who is working on central wastewater treatment for the Keys. Representative Sanderson thanked everyone for participating. He looks forward to hearing the reports.

**VI. Status of Implementation of Monroe County Wastewater Master Plan, Wastewater Upgrades by Municipalities and Key Largo Wastewater Treatment District, and Financing of Wastewater/Storm Water Infrastructure/UNC Environmental Finance Center (EFC) Assistance:**
Ms. Liz Wood - Monroe County, Representatives of Municipalities and Key Largo Wastewater Treatment District and Mr. Jeff Hughes - UNC EFC

VI—Ms. Liz Wood stated that she and the staff have been very busy these last six months getting work done in Big Coppitt and Duck key projects. A revenue source was needed for those projects. The Monroe County Board of County Commissioners (BOCC) adopted a $4500 fee for Big Coppitt and Duck Keys. Plumbers want about $2200 per house, plus other things. The total amount assessed to the resident is an estimated to be a little under $9k.

Ms. Waters mentioned saw a letter to the editor in a Marco Island paper that mentioned about the idea of keeping septic in place as a backup in case we have a power outage. After hurricanes, sometimes people have not been able to return to their communities because they don't have power and can't operate their wastewater systems. Ms. Wood knows of no plans to that effect.

Mr. Iglehart mentioned that the Energy Office is housed in DEP. One of DEP mandates is to ensure fuel supply after outages. They have a plan that targets where the fuel goes in an emergency. In emergency response situations, hospitals, wastewater, drinking water are important. When the storm is approaching, generators are moved to plants from one part of the state to the part that is needs them. This has been worked out and was presented to City Council of Marco Island a few months back.

Ms. Wood explained that DCA is working with Monroe County to develop GIS based map showing where treatment plants are located. She summarized the progress made on wastewater in the county. In Stock Island, 170 EDUs were connected in last 6 months, making 65% of the total number completed. The Naval Station has expressed interest in connecting, but that needs to be determined. The Bay Point system is functional and 99% connected. The best plan for Lower Sugarloaf will probably use force main that will allow them to reach 100,000 gallon per day mark. The Big Coppitt force main is 75% complete. Plant construction bids will open in August. Funding is in place from DEP,

county sales tax and assessments. In the Upper Sugarloaf and Cudjoe and Summerland areas, the county began design of plant. Big Pine will not have use of the county revenue for basis of design. A different approach will have to be used in this and other projects. The county may have to get loans from DEP. This will probably happen next year.

Planning, construction and design are all underway in Marathon. The Duck Key system is designed and available, but didn't get appropriations this year. Ms. Wood will work with Mr. McManus to provide numbers as to how many EDUs are connected each quarter. Monroe County is about 40% connected, including Key West. The Key Largo northern force main is complete and collection systems for basins A and D are underway. Chuck Fishburn provided some information about Key Largo to share. The north transmission main will provide 5000 EDUs and cover many hotspots. The contract was divided into two phases, saving 1 million dollars. Basin A will serve about 1600 EDUs and will cover the number 2 hotspot in Monroe County. Basin D2 will serve 1004 EDUs. Basin B design is 30% complete. The regional plant design is at 95% complete and is designed to serve 14000 EDUs in Key Largo area. Transmission main to go south is under design and moving forward. Up to 75 million has been borrowed through SRF and 25 million more is expected through grants. Money is needed for next year.

Mr. Harvey asked if Monroe County will have a tracking system that is accessible on the web. Ms. Wood explained that the implementation report is available on web and that in addition to managing and tracking, the county staff is also reviewing pay requests for getting revenue from sales tax, etc. and making sure the money goes from county coffers into project without delay. Ms. Wood stated that she would like to be able to provide information on the web and that may happen at a later time and Monroe County will need help setting that system up.

Charles Causey pointed out that it seems that we are asking too much of the citizens of Monroe County to fund the entire project. Ms. Wood replied that everyone needs to unite and seek money from the state.

Ms. Wood continued to summarize the progress made on various projects. On Big Coppitt the force-main is nearing completion and the collection system underway. On Duck Key the transmission and collection system design is complete and the wastewater treatment plant expansion and upgrade are under design.

Commissioner Worthington asked if Monroe County is addressing storm-water on Stock Island. Ms. Wood explained that storm-water project that she is working on is on Big Coppitt. A grant from the South Florida Water Management District will allow the outfall to be fixed.

Progress made in the City of Marathon was discussed. There are 2400 EDUs covered in one project area. At this time, the large users are being targeted and storm-water will also be addressed. Money is needed to fund projects. Marathon has demonstrated that progress is being made in this area, but assistance is needed from the federal government.

Commissioner Bauman added that in Key Largo 45 million is needed to finish and that means hotspots 2, 4, 7, 15, 19 and 29 will be done, the 2010 standards will be met and the project finished. The plant is at 2010 standards and everyone is welcome to visit it. The biggest problem is public doesn't understand what the repercussions could be if the standards are not met. It would be a good idea to send a press release about that to inform people.

Ms. Wood stated that it would be a good idea for DOH, DEP and Monroe County to come together to develop a plan.

Ms. Waters pointed out that the perception is that the Keys citizens are not doing their share. Communication is tough and this community is not the only one going through wastewater upgrades. Marco Island has a cost of close to $20K per EDU. If we can get this information out to people, they might understand that other people have similar situations.

Commissioner Worthington stated that the cost for EDU in Marathon is about $10k and inquired as to how it is possible for Key Largo to do it for $4500. Commissioner Bauman explained that expect that Key Largo citizens pay half and the rest comes from grant money. The project cost for the island is 100 million with 75 million from citizens—some paid through a monthly charge.

Charlie Causey stated that it seems to take about $20K per EDU on the average in most situations. Key Largo has lots of bidders and that helps keep the cost down.

Ms. Wood wrapped up the discussion pointing out that attention needs to be paid to the Key Largo southern force-main, Lower Sugarloaf, Big Pine and assistance provided to Islamorada and Marathon.

**Financing of Wastewater/Storm Water Infrastructure/UNC Environmental Finance Center (EFC) Assistance:** Mr. Jeff Hughes - UNC EFC

Mr. Jeff Hughes works in the field of finance and has had experience in local government utilities. Mr. Hughes is the director of one of nine environmental finance centers across the country. These centers concentrate on finding money to pay for upgrades that are funded by a combination of local communities, state and federal entities. EPA is the largest federal government providers of grant money for wastewater. This year, there was no money from EPA, although they may offer funds in the future. It has been somewhat productive on the state level. Monroe County has a relationship with the Army Corp of Engineers. Mr. Hughes offered to assist with figuring out the rules for federal earmarks. The paperwork is the same as it is for EPA. They require a pretty sizable match, but with the high assessments, Monroe County should be in good shape.

Mr. Hughes spends time is spent educating the public and looking at low income portions of communities. Although 20K per EDU is not out of line for the rest of the country, it is a large number and is worse if your home is not valued high. The finance center works

with communities to identify customer needs. In some cases, system development models have been developed to pay for things and these can be set up for a flat rate or other ways. Sometimes, zero percent loans have been secured. The EPA loan program to the states was slashed in for four years, but has gone back up this year. Florida saw their federal capitalization grant increase somewhat, but it is competitive to get these funds. This year money has been coming from private capital loans that have higher interest rates than the state. Mr. Hughes offered to work with the local Keys communities to find money and to plan for ways to obtain funds.

**VII. Update on the Total Maximum Daily Load (TMDL) Reasonable Assurance Process for the Florida Keys:** Mr. Pat Fricano - Environmental Consultant, Watershed Planning and Coordination, Florida Department of Environmental Protection and Mr. Steve Leinhart - URS Corporation

Mr. Fricano summarized the recent activities related to the TMDL process. Six technical working group meetings have taken place, one-on-one with all of the stakeholders. They have completed stakeholder write ups and a draft of stakeholder agreement has been distributed. There have also been one-on-one briefings with local elected officials and have taken EPA official Drew Bartlett on a field trip in the Keys.

Mr. Fricano explained that the Keys watershed is different from most. It has a small land mass and very large receiving water bodies with unfocused runoff and rapid dispersal of pollutants. The ambient water monitoring is too broad bush to document transient water conditions that are seen in the area. Local infiltration and percolation speeds nutrient releases. There are no soils to facilitate treatment and very limited land for Best Management Practices (BMPs) and there is extensive impact from far-field sources. The water quality monitoring data available to date is insufficient to demonstrate consistent water quality impairment in Keys. Basically, the impacts can't be seen, but everyone agrees that the Keys waters are impaired.

In this process we are concentrating on small areas around Keys, call these bubble WBIDs (water body ID units). There are both small and large WBIDs. Discharges from far-field sources are seen in the Keys, including impacts from the Peace River, C111 canal and Mississippi River. Since there is no ability in the Keys to control these far-field sources, the only thing to do is to control what is created on the islands themselves with regards to wastewater and storm-water discharges.

It is difficult to link what is generated in the Keys with what is seen out in the water. A Living Resource Assessment was conducted by Mr. Fricano. He found that there is limited data on fish and adequate data on algae and seagrasses, but a link between water quality and living resources could not be made. Since that link could not be made, the focus should be on infrastructure. It is understood that funding is an issue.

Mr. Leinhart presented information about the water quality baseline that was established in 1999 and current water quality conditions. By 2007 some keys communities have implemented solutions to loading of the nearshore water. By 2010.5 , anthropogenic

loading will be reduced further. Other communities have long term solutions in place. For example, Key West will have drainage taken care of in the future.

The WBIDs model provides estimates to look at relative impacts. There are 20 individual models across the Keys. They include out to1200 meters from beach shoreline and take into account the movement associated with tidal cycles. This is best available model to work with now. It will track the waters as they move offshore and through the canals. There were originally a set of 10 representative models developed under George Garrett's direction as part of the Florida Keys Carrying Capacity Study. This spreadsheet model and was calibrated with water quality data and gave a fairly accurate representation. Longer canals and branching canals require more complicated models. Twenty new models were created recently using the WBIDs and with stakeholder input. Using these models, the total nutrients in canals can be tracked as houses are put on system and the loads are reduced. The model will also help predict future conditions. Right now, the final inputs from the stakeholders are needed to finish the model. If the 2010 goal is achieved, the model predicts a great reduction in nitrogen entering canals and nearshore waters. To achieve zero loading, very expensive deep wells would have to be used or water would have to be pumped north to the mainland.

Substantial nutrient loading has taken place since baseline of 1800s. This explains why things are not the same as it used to be in the Keys. According to the model prediction, the nutrient loading from nitrogen is seen up to 2400 meters off the beach. Beyond that point, the difference is not noticeable and basically stays the same. Anthropogenic storm-water adds only a relatively small amount to the loading. There are similar trends for phosphorus. Models like this for boundary conditions and for different scenarios. Obviously, if reduce load, the numbers will come down, but not below the natural loading levels.

Mr. Leinhart pointed out that they have had input from stakeholders who tend to make the solutions work and come up with funding. There are many stakeholders: Monroe County, DOT, State Parks, U.S. Navy and Key Largo Wastewater Treatment District. The other players are regulatory agencies or other entities include: FKAA, FDEP, DCA, SFWMD, the Florida Legislature, US Army Corps of Engineers, Florida Keys National Marine Sanctuary, environmental organization, US EPA Region IV. Solutions are being sought as part of this process. There have been 6 one-day meetings and progress has been made. Mr. Leinhart showed a chart that summarized the progress made by each stakeholder toward the TMDL assurance document.

As communities come on board, more documentation to complete the chart will be obtained. Right now, Islamorada is still deciding how to proceed. The US Navy is also currently evaluating what to do with regards to an onsite system or connecting to the county.
A community is being asked to do several things to be included in the RA. They will have to agree to participate in the RA process and define which areas will be served. They will also have to outline specific management actions with regards to wastewater collection, treatment and disposal; storm-water treatment, and provide an annual report of

accomplishments. They will also have to describe what kinds of long-term investments they will make and commit to a schedule for completing construction of projects and an online operational date.

This will allow demonstrated reasonable assurance which really means a commitment from stakeholders, measurable pollutant load reductions, water quality benefits and enforcement of Chapter 99-385 by DEP. At this time, there will be an RA in Key West and in Key Largo district. Everyone else is included in the Florida Keys Information document. Key Colony Beach may not have to do anything more at this time until other communities have reached their level. Marathon and Key Colony Beach may be next to be included in RA. Another RA could be developed if Islamorada decides to participate. Several scenarios were presented with regards to the areas covered by RAs and the number of RAs covering the Keys.

Mr. Fricano stated that there are some decisions to be made. If a community commits to 2010, they must submit a summary and executed agreement. If a community does not commit, they will be included in Florida Keys Information Document. DEP needs to know by July 31 if a community is willing to commit to 2010. The DEP deadline is August 30. If the state approves, it will go to EPA for approval. If it does receive EPA approval, it will fall under the TMDL status. Mr. Fricano encourages Marathon and Islamorada to opt to participate. The final agreement will be executed in September.

Ms. Waters inquired as to why there was no natural wastewater in the plan. Mr. Leinhart explained that there are parts that we can not quantify such as the contribution from birds, etc. and other natural sources.

Mr. Reynolds inquired as whether or not the Florida Keys Reasonable Assurance Document (FKRAD) will be an enforcement tool. Mr. Leinhart explained that the RA and TMDL will both meet state goal, but under the RA plan, the community states what they will do and how it will be done. Under the TMDL program, a community may not have as much input and could be required to do even more. For example, all storm-water has to be treated from every outfall and may be required to clean up pollution that was not generated locally. If a community decides not to follow the RA, they will be subject to TMDLs.

Mr. Leinhart added that the deadline is not arbitrary. The document must be approved by DEP and then sent to EPA by their August deadline. The law will still be enforceable whether or not a community agrees to participate.

Mr. Charlie Causey pointed out that it is hard to quantify inputs. There are so many sources and influences from different entities like Florida's west coast. The algae blooms in Florida Bay are a problem. They started in 1987 and now this past spring, the bloom is very large. It would be very hard to quantify the nutrient inputs from the bloom and include this information in the RA. Mr. Causey pointed out that the algae blooms go through the bridges and surround the islands. The algae bloom may be the result of far-field sources.

Mr. Leinhart stated that the RA is specific only to the islands, not Florida Bay. Under TMDLs, a community may have to quantify far-field sources and that will be very expensive. The RA addresses only those impacts that come from the islands and therefore the islands can be eliminated as the source of a problem like the algae blooms.

Dr. Causey emphasized the importance of WQPP Monitoring Program under Dr. Boyer's leadership. This program regularly samples 300 stations in southwest Florida and the Florida Keys. Data are important to help distinguish local pollution inputs from far-field sources. Clearly, there is a halo near shore due to eutrophication, but there is also good baseline information as to what is upstream. The algae blooms are very serious and so are upstream sources, but can not ignore that pollution is coming from the Keys. The importance of science and monitoring and research can not be underestimated because the data help answer questions that arise, including helping to distinguish local inputs from far-field ones. Once the comprehensive everglades restoration plan is in place, there will be changes in the quantity, quality and timing of water upstream. The pieces of the big picture are falling together loosely. It is so exciting to see so much scientific work being done locally and at the state level.

Mr. Harvey added that he has had experience modeling background concentrations measured against discharges and it is not that simple. In fact, the AWT option was selected for everyone. The technology based approach was used because of the difficulty in quantifying the different contributions.

Mr. Leinhart noted that the data for the Florida Keys National Marine Sanctuary network and Florida Bay and from other areas. If these data were not available, it would be so much more difficult to assess the situation. Mr. Leinhart will be meeting with Islamorada and Marathon today and tomorrow and would be happy to answer any questions.

Dr. Causey recognized Glen Patton, Director of the Florida Keys Sanctuary Friends Foundation and thanked the Friends for providing the refreshments for the meeting.

**VIII. Report on Special Study Titled, "Human Fecal Indicator Bacteria and Pathogenic Viruses in Offshore Reefs and Human Recreational Risk in Nearshore Waters of the Florida Keys":** Bill Kruczynski - EPA, Region 4

Dr. Kruzcynski would like to acknowledge that the consultants selected to work on the RA documents could not have been more knowledgeable and experienced. He also noted that Monroe County Marine Resources Department should also be acknowledged for cleaning up Boot Harbor Key.

Dr. Kruzcynski presented results from a human fecal indicator study. The principal investigators for the study were Erin K. Lipp, Dale. W. Griffin, and Joan B. Rose. At the time the sanctuary was designated, water quality was assumed to be the cause of the reef's decline, but today other causes are known. Many different tracers have been used in the special studies projects, which should be continued because they identify the cause

and effects of things. Viruses and bacteria are good tracers because they occur in the intestines and they indicate the presence of nutrients and pathogens. A number of methods were used to trace water that was injected into deep injection wells, but it turns out that bacteria and viruses are better than other tracers. Viruses and bacteria also identify areas of human health concerns.

Dr. Kruczynski reviewed some of the special studies involving tracers and human pathogens. An early study in 1997 studied human pathogens in canals in keys and showed that these pathogens are viable. A 2003 study asked the question how far off shore these canal pathogens can be found. A draft final report was provided to EPA in December 2006 and a brief presentation was made to the WQPP Steering Committee in January 2007. The report was then reviewed by Dr. Kruczynski and by Dr. Boyer. Comments were sent to the Principal Investigators, the final report was received in April 2007. Today, the results are being presented. There was no intention by EPA to delay the dissemination of the information in the report. There is a press release from EPA about this study on the back table for everyone to read.

EPA also funded 2006 study about human pathogens. This study will look at viruses that have not been examined yet, including the green pepper mosaic virus that goes through the human system. Please understand that no scientific study is perfect, including what is presented today. As with most studies, it is likely to generate new questions.

Dr. Kruczynski reviewed some of the common indicator bacteria. Coliform bacteria is found in the human gut and is commonly used to detect fecal contamination. There are two coliform tests done: total coliform and fecal coliform. Federal and state entities have adopted standards for total and fecal coliform levels because they indicate contamination. These bacteria themselves are not pathogenic, but indicate that pathogens from the human gut might be present.

One fecal coliform bacteria is Enterococci *Bacteria (E. coli),* which can cause very serious intestinal issues. The Enterococci bacteria are monitoring tools to determine the presence of pathogens in the water. There are other bacteria that are used, too, like *Clostridium perfringens* and *Serratia marcescens.* Total coliform bacteria are a collection of relatively harmless microorganisms that live in large numbers in the intestines of man and warm- and cold-blooded animals. They aid in the digestion of food. A specific subgroup of this collection is the fecal coliform bacteria, the most common member being *Escherichia coli*. These organisms may be separated from the total coliform group by their ability to grow at elevated temperatures and are associated only with the fecal material of warm-blooded animals.

Viruses have been added to this list of tracers because fecal coliform bacteria does not live long in saltwater. It may also live in muddy bottoms for a while. For these reasons, it may not be a useful indicator of recent fecal contamination. EPA maintains that enterococci are probably better than fecal coliform. Viruses are probably even better because a human pathogenic virus can only reproduce in a human cell and no where else, so their presence does indicate a relatively recent contamination from feces.

There is a long list of diseases caused by *E. coli*. The state of Florida has developed standards of what is safe for recreational use and above that level the water is not safe for swimming. The current level is 8000 colonies per 100 milliliters of water.

The EPA recommendation for enterococci, which are also part of the human intestine, is no more than 35 colonies per milliliter. These bacteria have developed resistance to antibiotics and become difficult to treat. The state of Florida has adopted this standard for enterococci for beaches. Recently, there has been some discussion now as to the legitimacy of the science that went into developing these standards and this issue is being reexamined.

Enteroviruses common in intestine and can cause polio, etc. Enteroviruses are second to common cold to making people sick. Everyone is at risk for enteroviruses, especially people with suppressed immune systems. The adenoviruses, another group of viruses that lives in the human intestine, have the ability to survive longer outside than other viruses. They can be transmitted between people easily.

In 1997, a special study was conducted by Joan Rose that examined whether or not human pathogenic viruses are found in the canals of the Florida Keys. The study sampled 19 sites in 17 canals and found the following results: 79% (15/19) of sites were positive for enteroviruses (polio, coxsackie A and B, and echoviruses); 63% (12/19) for positive for hepatitus A, 10% (2/19) for Norwalk virus; 95% (18/19) of sites positive for at lease 1 virus group (Sugarloaf site clean). Not one site had a single violation of coliform standard. Thus, if a sample was taken only for coliform, the canals would test safe. A later study showed that some of these bacteria are not dead and can pose a risk to people, especially those with compromised immune systems and demonstrated that the viruses are more likely to be viable in cooler temperatures.

The 2007 Lipp study assessed the extent of human sewage contamination on near shore to offshore transect using human enteric viruses as sewage markers. In the first part of the study, they sampled for fecal bacteria, enteroviruses, adenoviruses and *Clostridium perfringens* along a transect from Port Largo Canal to near Molasses Reef. They also took coral mucus from three corals at each station and sampled the groundwater from Shinn's wells that were dug in the 1980s. Corals act as flypaper and accumulate viruses in their mucosaccaride layer. Samples were also taken along a transect originating at Big Pine Key canal. The third part of the study involved sampling for viruses at two Keys beaches.

Dr. Kruczynski reviewed slides that showed the study results in the Port Largo and Big Pine Key canals. He then showed contour plots of the viruses found in the two canals during different tidal stages. These plots indicated movement of the coliform bacteria in and out of the canals with the exchange of tidal waters.

The third part of the study examined how safe is it to swim at Higgs and Bahia Honda Beaches. Two collections per season were taken at each beach. Only adenoviruses were

detected (those that last longer) at the beaches. Calculations indicated that 2.5 people out of 1000 are likely to get sick at Bahia Honda Beach and 7.9 people out of a 1000 at Higgs Beach. These standards are above the .1 per 1000 EPA standard, but that is for freshwater and probably should be using the saltwater standard of 19 out of 1000 as an acceptable standard.

The following study conclusions were reviewed. Human sewage has contaminated the groundwater underlying the Florida reef tract. The appearance of enteric viruses, or other sewage signals, at a distance removed from potential source is most likely explained by the heterogeneity of the limestone bedrock and numerous cracks and fissures in flow ways. Much of the study area has a layer of Holocene mud that acts as an effective confining layer against vertical migration and may tend to force groundwater to move laterally. The movement of groundwater is toward the bank reef because of hydraulic conductivity and tidal pumping (Keys Marine Lab study). This hydraulic gradient toward the reef has implications for corals.

The study also concluded that discharge is probable at reef due to increased porosity relative to muds and sediments and that submarine discharge of groundwater at the Florida Reef Tract may provide a mechanism to move sewage-derived constituents into the water column and reef environment.

Dr. Kruczynski can provide copies of this paper when it has been fully reviewed and he has received the peer review comments. He also has copies of other studies. Dr. Kruczynski added that sponges also concentrate these things and may be sampled, too.

Ms. Waters inquired as to whether or not the rates of movement through Miami oolite in the Lower Keys might be different from the movement through Key Largo limestone. Dr. Kruczynski replied that a study addressed this and found that water moved more slowly through oolite as compared with limestone.

Mr. Charlie Causey inquired as to why the standard for marine waters (19 out of 1000) was so high. Dr. Kruczynski stated that this figure takes into account that there are more infectious agents in the marine environment.

A break for lunch was taken until 1:30 pm.

Public Comment Period: Dr. Susan Hammaker represents a new foundation called Florida Wastewater Assistance Foundation, Inc. that is dedicated to finding environmental solutions through private and public sources. She is also on the KLWTD board. Dr. Hammaker and other people from the Keys met with key members from the Florida delegation and the Army Corps of Engineers this past July 19 and 20. The steering committee resolution and several other pieces of information were presented on this trip. After these meetings, it was clear that this steering committee has progressed more in the last 7 months than in the last 7 years. Dr. Hammaker emphasized that it is time to finalize the PCAs by Corp headquarters, preserve the higher level funding in the FY08 Energy and Water Appropriations bill and create a dialogue with the White House

Council on Environmental Quality. Dr. Hammaker named the many representatives that she met with regarding wastewater and water quality. There is strong support by Congresswoman Ros-Lehtinen and Senators Martinez and Nelson to hold the 3 million funding level in the Senate, as compared with the 1.5 million level approved by the House. This foundation seeks to work with stakeholders to find solutions to wastewater issues and advance the goals in a united fashion. One important goal is to encourage the Army Corp to sign the PCAs.

**X. Annual Reports on the Comprehensive Monitoring Projects for the Florida Keys National Marine Sanctuary:** Project Principal Investigators

**A. Seagrass:** Dr. Jim Fourqurean - Florida International University

Dr. Jim Fourqurean noted that seagrass is primary habitat in the Florida Keys (about 14,000 square kilometers of seagrass). Florida Bay also has large expanses of seagrass habitat. The project goal, which began in 1995, is to assess the long-term status and trend in seagrass and define how those trends were tied to water quality. Managers have to design monitoring programs, not scientists. A monitoring program needs to be constant input and refinement from managers and should be based on management oriented goals.

The water quality measurements must precise enough to detect changes and statistically robust. The goal is to provide information to managers before large-scale changes take place. Dr. Fourqurean explained that higher nutrient inputs shifts the balance to faster growing species, specifically from *Thalassia* (turtle grass) to faster-growing species. Any shift toward faster growing plants means that more nutrients in the environment are present than before.

Plants are sampling nutrients at all time. The nitrogen to phosphorus ratio is relatively constant for specific areas. If phosphorus (P) increases in the ratio, that means there is more P available, which can result in a shift in species.

The program has 30 permanent sites that are sampled every year to obtain temporal trends. A subset of seagrass monitoring sites are also sampled in Dr. Boyer's Water Quality Monitoring Program. In the northeast United States, an increase in nutrients means an increase in phytoplankton and that is not what is being observed. Instead, the result of increased nutrients is an increase in plant biomass, especially macroalgae. The data show that many stations are showing long-term increases in fast-growing species like macroalgae and the amount of algae is related to amount of nitrate in the water and the rate at which algae is increasing is related to the nitrate in the water column.

The N:P ratio of 30:1 shows a balance situation for seagrasses. In Florida Bay, seagrass is phosphorus-limited and out by the reef tract, seagrass is nitrogen-limited. Some of the sample sites have shown changes in these conditions, some areas are approaching light limitations. They are no longer limited by nutrients. There are broad areas that show

troubling signs that there are more nutrients than in many decades before. The full switch to algae has not taken place, yet.

The spatial sampling attempts to generate a map for each species. Each species has different water quality requirements and they segregate themselves out in space. Different distribution maps were shown for the different species: *Thalassia, Syringodium, Halophila.*

Dr. Fourqurean developed 2 values that summarize the trends in seagrass for the sanctuary. One value is the ratio of the abundance of the slowest growing plant to the total abundance of plants. A high value means the system is dominated by slow-growing things and vice versa. About 48% of the abundance of plants in the sanctuary is in the slowest growing plant, *Thalassia*. A decrease this number indicates a decrease in water quality.

The second value is the mean deviation of N:P ratio from number of 30:1. Right now, *Thalassia* averages 8.2 units away from 30. If that number gets less, then system is going to more eutrophic system. The question as to whether or not any changes are due to sewage inputs and Gulf of Mexico. However, if these trends turnaround by themselves in the next 10 years, it will be very surprising.

Dr. Fourqurean commented that submerged plants don't have a good way to move internal nutrients. If the current velocity across seagrass is increased, then plants get more nutrients. There is no way to tell if changes in seagrass species composition are due local or far-field sources.

Nutrient effects on broad-scale basis are being observed. These changes are relatively subtle changes, and haven't seen loss of seagrasses yet. There are multiple lines of evidence that support that point to changes taking place.

These data are made available to everyone as quickly as possible. Twenty-two scientific papers have been published and information has been provided to managers in a timely manner.

Benthic monitoring has been taking place for three years at Little Venice. A change toward more slow-growing *Thalassia* has not been observed even though there are no nutrients inputs from sewage. No changes in the N:P ratio have been observed either. This is not that surprising since seagrasses take time to respond to changes in nutrient conditions.

**B. Water Quality (Sanctuary/Little Venice):** Dr. Joe Boyer - Florida International University

Dr. Boyer gave a slide presentation about the 2006 data from the Water Quality Monitoring Program (WQMP). The WQPP was designed to detect temporal and spatial trends over the long-term. One-hundred fifty four sites are sampled on a quarterly basis.

Surface and bottom water samples are analyzed for nitrogen, phosphorus, silicon, chlorophyll, etc. The sampling regime does not pick up episodic events. The program also seeks to combine the FKNMS project with other projects to provide a more **r**egional integration of water quality and evaluate the relative effects of external influences on water quality.

The combined nitrate data were broken down by area: inshore, Hawk Channel, offshore reefs. An elevated level of Dissolved Inorganic Nitrogen (DIN) was detected in the inshore waters of the Keys. There was a slightly elevated DIN in Tortugas transect and no elevated total Phosphorus (TP) or Chorophyll-a CHLA in Keys or Tortugas transects. Elevated levels of Total Organic Carbon (TOC) and Total Organic Nitrogen (TON) were noted for the Keys, but not for the Tortugas transects.

The salinity trends for 2006 were presented. A significant amount of freshwater was observed going through Long Key to the Oceanside in January 2006. By April, the situation looked more normal.

The 2006 data for each parameter were compared with sanctuary data combined for all years. In 2006, the sanctuary experienced a very different water mass than in previous years. Levels of dissolved inorganic nitrogen were relatively high and there was a long term trend in decline of organic matter. The TP was elevated when compared to other years. Higher chlorophyll values were expected to accompany higher nitrogen, but instead, lower chlorophyll values were observed. Higher ammonia levels were noted offshore as compared with inshore. This is the opposite from what is expected if land is the source of the nitrogen. Upwelling in offshore areas may explain these elevated offshore ammonia levels. Usually, upwelling is associated with changes in temperature or stratified water, but this was not observed. Another possibility is that ammonia may have come from an offshore source and become entrained in Florida Current.

In 2006, regional circulation was strongly influenced by far-field external sources. It is very helpful to look at data outside of the Keys to see what is influencing Keys waters.

Dr. Boyer gave a slide presentation about the Little Venice project. Phase 1 (5/01-12/03) was conducted for about 2.5 years prior to the initiation of operation of the central sewage treatment system to establish existing conditions in the canals within the service area. Phase 2 (6/05-present) is being conducted for minimum of 2 years after remediation to document changes in water quality of the canals. Funds for monitoring are available until Feb 2008 (FDEP). This project was set up as a before and after control impact design with three comparisons: reference canal, remediated canal, and offshore waters.

The variables measured were: fecal coliform, enterococci, TN, TP, chlorophyll, temperature, salinity, etc. The bacteriological results show that there is no difference in fecal coliforms between phase I and II at reference canal. The remediated canal showed a significant decline. For enterococci, an increase was observed in the reference canal, but no change in the remediated canal. Dr. Boyer also looked at the head of the canal vs.

the mouth of the canal. In the remediated canal, there was a significant decline in head of canal in fecal coliform. The big change was inside canal, numbers are going down in remediated canals and they drop more in head than at mouth of the canal.
One interesting observation was that there was a large difference in Phase I temperatures than temperatures after remediation. They were about 2 degrees higher. Salinities were also higher after. The system has changed before and after for reasons other than the treatment, which makes things complicated. The dynamic external environment obscures internal canal changes and observed improvements in water quality may not be exclusively related to remedial actions. The bacteriological data is the strongest since it is not influenced by external sources as much as other factors. In the future, Dr. Boyer will be collaborating with NOAA AOML cruise that does microbial source tracking.

Dr. Boyer also made some comments on the cyanobacteria blooms. In March 2007, the phosphorus and chlorophyll numbers started to come back down from high levels observed in June. There have been multiple meetings with other agencies and have come to the conclusion that the bloom resulted from a combination of factors: outputs from canals associated with hurricanes and highway construction. Chlorophyll concentrations have dropped and are almost back to normal these past few months. This was an unprecedented blue-green bacteria bloom in this eastern part of the bay.

C. **Coral Reef:** Dr. Jim Porter - University of Georgia

Dr. Jim Porter, University of Georgia, gave a slide presentation about the Coral Reef Evaluation and Monitoring Program, which began in 1996. CREMP methods have used by other agencies in South Florida, including the National Park Service. There are 170 stations in the Florida Keys.

Coral loss is a continuing problem. About 50 %of all living coral cover has been lost in the last decade. Most of the loss at the end of the 1990s is due to coral diseases, some identified and some not. Some losses were due to bleaching. *Acropora palmata* and *Montastrea annularis* together account for almost a third of all losses noted. Disease may be related to a common intestinal bacterial

Dr. Causey added that in 1997-1998, corals bleached throughout the world and the disease came after the globally observed bleaching in corals. Temperature was also important, not just disease.

Dr. Porter showed before and after data for the same coral colony affected by Hurricane Dennis in 2005. This loss shows up as coral mortality, but was really due to mechanical damage from storms. The living corals found on reefs after hurricanes were not always the same ones as before the storm, but were from pieces that broke off and formed new colonies. If examine the 15 new colonies in 2006, found that100% of attached pieces survived from 2006 to this year. All unattached pieces had died. For 2006 all new colonies were attached broken pieces, but in 2007, the new colonies are not from fragments, half from sexual recruits and half from fission products. Shallow water zones were abiotically controlled in 2006 shifted to biotically-controlled in 2007.

One goal is to examine water quality status and trends related to coral cover over time. In most areas of the Caribbean, as turbidity increases, percent coral cover goes down, but in the Keys, the downward trend is weak. The contrary data originates with the mid-channel patch reefs in Hawk Channel, where higher turbidity is correlated with higher coral cover. This Hawk Channel area could be very important and new sites might be added from these areas, increasing the total number of sampling sites.

Dr. Porter stated that his team may be seeing a new species of coral in the Keys. This coral is green with white stripes. At present, there are three species within the genus *Agaricia*. This apparent new species is found only in cryptic environments under ledges, etc. It may not have been described when most corals were described back in the 1700 and 1800s and may even be newest species in 150 years. Two taxonomic characteristic are used in distinguishing corals: number of polyps per valley and the depth of ridges and valleys. This new coral is different physically, but coral genetics are also being conducted to see if it is a new species. If this is a new coral, it may be named *floridensis* to indicate that it is found in Florida.

Dr. Causey pointed out that 50% loss may not be accurate because you have not been measuring corals in Hawk Channel, where losses may not be that great. CREMP is biased toward sampling the shallow-water corals. It is important to emphasize that 1997-98 declines were unprecedented events that were not confined to the Keys. It is good to know that the CREMP may be examining new sites.

Each of the hurricanes in the 2005 season lowered sea surface temperatures and that might have prevented bleaching that took place in other parts of the Caribbean that year.

**XI. Presentation on Boot Key Harbor Monitoring Project:**
Mr. Brannon Riggs - Monroe Analytical

Mr. Brannon presented results for monitoring of Boot Key Harbor. Tests were run on samples from 8 sites and manmade canal. Measured parameters were DO, pH, salinity, etc. Since testing has been done, all parameters that have Florida requirements associated with them, met those standards. Fecal coliform has not failed the standards. In 1989-90, this body of water exceeded the standards regularly. This change is attributed to pump-outs, wind driven currents and tidal flushing. The study will end in January 2008.

**XII. Review the Data Management Program for the Water Quality Protection Program/Florida Keys National Marine Sanctuary and Integrated Data Management Program for South Florida:** Mr. Chris Anderson - Florida Fish and Wildlife Research Institute

This goal is to make the long-term information available to scientists. The storet is the EPA database for physical, biological, etc. For the WQMP surveys 1-45 are available

and almost of the seagrass data is available through Storet, too. This system can be difficult to use. The website: http://ocean.floridamarine.org/fknms_wqpp contains raw data metadata reports, movies and links to the monitoring programs web sites. This user friendly site contains links to scientists and to GIS files that are being updated. Annual reports are posted on this site, too. This website is contained on a CD.

The data are backed up in a different location to prevent loss in the event of a storm or fire.

These data are useful in creating Digital Area Contingency Plans, plans for oil spills, etc. for US Coast Guard. These tools that help responders develop tidal inlet protection strategies and take other actions that protect natural resources in the event of disasters like oil spills, etc.

Mr. Iglehart noted that the Ocean Council stated that the number one thing that can be done is to get the water quality data combined.

Public Comment Period: No public comment.

Closing Remarks: Mr. Iglehart announced that the next meetings will be a teleconference, followed by face to face meeting in January. Fred McManus will contact people to determine the best date for a conference call.

The meeting was adjourned at 3:55PM.