

**Southeast Florida Coral Reef Initiative (SEFCRI)
 Land Based Sources of Pollution (LBSP)
 Technical Advisory Committee (TAC)
 Meeting #6
 Report of Proceedings
 May 24-25, 2007**

**National Coral Reef Institute
 Nova Southeastern University Oceanographic Center
 8000 North Ocean Drive
 Dania Beach, Florida**

TAC Members	May 24	May 25
Joseph Boyer, Florida International University (FIU) - Southeast Environmental Research Center	X	X
Richard Dodge, Nova Southeastern University (NSU)	X	X
Phil Dustan, College of Charleston, South Carolina	X	X
Dale Griffin, U.S. Geological Survey (USGS)	X	X
Vladmir Kosmynin, Florida Department of Environmental Protection (FDEP) – Bureau of Beaches and Coastal Systems		
Judy Lang, Independent Scientist	X	X
Brian Lapointe, Harbor Branch Oceanographic Institute (HBOI)	X	X
Erin Lipp, University of Georgia (UGA)		
Margaret Miller, National Oceanic & Atmospheric Association (NOAA) – Southeast Fisheries Science Center	X	X
Valerie Paul, Smithsonian Marine Station at Fort Pierce		
Esther Peters, Tetra Tech	X	X
Jim Porter, UGA		
John Proni, NOAA – Atlantic Oceanographic & Meteorological Laboratory	X	X
Gene Shinn, University of South Florida (USF)		
Alexander Soloviev, NSU	X	X
Peter Swart, University of Miami – Rosensteil School of Marine & Atmospheric Science (RSMAS)		
Organizational Committee Members	May 24	May 25
Ken Banks, Broward County Environmental Protection Department (EPD)	X	X
Linda Brien, FDEP – Southeast District		X
Chantal Collier, FDEP – Coral Reef Conservation Program (CRCP)	X	X
Nancy Craig, Broward County EPD	X	X
Nicholas Gadbois, FDEP - CRCP	X	X
Laura Geselbracht, The Nature Conservancy		
Richard Harvey, U.S. Environmental Protection Agency	X	X
Fred McManus, EPA	X	X
Wendy Wood, NSU	X	X

Presenters

Christopher Boykin, FDEP-CRCP

Steven Wolfe, FDEP

Kenneth Weaver, FDEP

Observers

Flavia Tonioli, University of Miami, RSMAS

Ed Tichenor, Palm Beach County Reef Rescue

John Fauth, University of Central Florida (UCF)

Stephanie Clark, Cry of the Water

Dan Clark, Cry of the Water

Tina Udouj, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife
Research Institute (FWC – FWRI)

Adrienne Carter, Coastal Planning and Engineering

Charles Messing, NSU

Joanna Walczak, FDEP-CRCP

Meredith Gibboney, FDEP-CRCP

Bernhard Riegl, NSU

Brian Walker, NSU

Kevin Kohler, NSU

Greg Jacoski, NSU

Dan Crean, South Florida Water Management District

Skylar Wilson, student

Kevin Carter, Broward County EPD

DAY ONE, Thursday, May 24, 2007

Chantal Collier from the Florida Department of Environmental Protection – Coral Reef Conservation Program (FDEP-CRCP) welcomed everybody to the meeting. The Technical Advisory Committee (TAC) members, Organizational Committee members, and observers introduced themselves. (See list of attendees above.)

Chantal Collier introduced Nick Gadbois (FDEP-CRCP) as the new Land-Based Sources of Pollution (LBSP) Project Coordinator, and facilitator for the TAC meeting. Nick Gadbois presented the meeting agenda, reviewed the facilitator roles, guidelines for discussion, guidelines for observers, the meeting evaluation form, and the procedures for submitting public comment. Nick Gadbois continued with the LBSP Project updates:

Year 1 Projects Recently Completed or Ongoing

LBSP Project 7 – The “Palm Beach County Benthic Habitat Mapping Project” has been completed as of March 2007. The final project report is on the FDEP CRCP website and CDs with the report GIS files have been submitted to FDEP-CRCP. A copy of the CD was presented to the TAC members for review and inclusion in their TAC project binders. This project was completed by the National Coral Reef Institute (NCRI) through FWRI, under contract to FDEP-CRCP.

LBSP Combined Project 3/19 – LBSP Project 3 “Identify Agencies and Activities addressing LBSP and Project 19, “Identify existing Best Management Practices addressing LBSP were combined to maximize staff capacity to carry out this work. Due to the low number of returns from original survey mailings, surveys have been re-sent to the same constituents as well as other agencies. However, this time in-person interviews will be conducted to ensure participation as well as completeness and verification of the information provided.

LBSP Project 12 – “SECREMP” – see Year 3 update below.

Year 2 Projects Recently Completed or Ongoing

LBSP Project 11 – This goal of this project is to “Develop an Integrated Data Management System” for geospatial and other data about LBSP and related Southeast Florida resource management information. The project will go live on the internet by June 30, 2007. Florida Fish and Wildlife Institute (FWRI) who has been leading development of the project for FDEP-CRCP will continue to maintain and update the site through December 2009. Tina Udouj of FWRI presented a brief project status update.

LBSP Project 14 _- “Land-Based Sources of Pollution Project Coordinator” – Nick Gadbois accepted the position in January 2007.

Year 3 Projects Recently Completed or Ongoing

LBSP Project 5 – “Southeast Florida Coral Biomarker Local Actions Study”- The pilot study was completed in January 2006. The contract for the larger study was executed March 2007 and will continue through the fall of 2008. John Fauth of the University of Central Florida is the lead Principal Investigator (PI), with partners from College of Charleston, NSU, Broward County EPD and Heareticus Laboratories participating as co-PI’s.

LBSP Project 12 – The Southeast Florida Coral Reef Evaluation and Monitoring Project (SECREMP) enters its fifth consecutive year. Sampling for the 2007 season will commence in the next week or two, weather permitting. Final SECREMP reports for 2003-2005 are available on the FDEP-CRCP website and the 2006 report should be available in July. David Gilliam (Nova Southeastern University), Jenny Wheaton (FWC-FWRI) and Chantal Collier (FDEP-CRCP) are the PI’s.

LBSP Project 17 – “Stakeholder Meetings for the four SEFCRI Focus Teams”- Two meetings were conducted on February 12 and 13, 2007. Feedback from meeting attendees was positive, but attendance from the public was poor. Considering the poor attendance and additional feedback from the LBSP Project 17 Team, FDEP-CRCP staff proposed that the funding for the next two years of this project be applied to another, unfunded LBSP project, especially since other SEFCRI public meetings would be conducted through the Fishing, Diving and Other Uses focus area. Chantal Collier suggested that the remaining funds for LBSP Project 17 (\$20,000/year,) could be reassigned to initiate

benthic habitat maps for Miami-Dade County (LBSP Project 8). A proposal has been submitted to NOAA for review, and feedback was requested from the TAC.

Ken Banks said that he thought the mapping was coming from Steve Rohman of NOAA's Biogeography Team,. Chantal Collier said that that has been on the table as something that both Steve Rohman and Mark Monaco, who run the mapping program for NOAA, have set as a high priority; but to date, there has been no funding earmarked for our region at this time. Therefore, FDEP-CRCP is seeking ways to get the maps completed in other ways. Chantal Collier added that she has submitted a Legislative Bureau Request to the State for FY08-09 for \$100,000 to initiate Martin County mapping. In Miami-Dade County, the bathymetry has been done, but there is no habitat classification scheme overlaid on the bathymetry. Chantal has also explored possible funding through the Florida Wildlife Legacy Initiative for mapping Martin County because \$100,000 will not be enough to do the entire county. Both Broward and Palm Beach Counties came in with everything on the order of \$600,000 – \$700,000 per county for both the bathymetry and habitat classification work.

Chantal Collier spoke about the federal budget, saying that FDEP-CRCP was given an additional \$18,000 for SEFCRI projects. NOAA had asked what the priorities would be if additional funds are given. Chantal Collier suggested the mapping, adding that by combining the additional \$18,000 with the unspent funds from LBSP Project 17 there is enough to initiate the habitat classification work for the northern section of Miami-Dade. Ken Banks mentioned that he was going to reshoot Broward County LADS data and may be able to do Miami Dade at that time to save time and money

Stephanie Clark, Cry of the Water, asked why there was no notice given about the cancellation of the public meetings and Chantal Collier replied that nothing was cancelled yet; it was a suggestion by the CRCP staff based on Project 17 Team input, of which Stephanie Clark was a member, and that support from the TAC was being sought in order to make a decision.

Presentation by Dale Griffin: *Human Fecal Indicator Bacteria and Pathogenic Viruses in Offshore Reefs and Human Recreational Risk in Nearshore Waters of the Florida Keys*

Dale Griffin, United States Geological Survey, gave a presentation on LBSP Project 27 – “Florida Keys Transect Study”. He also gave updates of LBSP Project 33 – “Identify sources and signals of land-based pollutants in southeast Florida using human enteroviruses as an indicator of fecal contamination”, conducted by Erin Lipp and the presentation given at the previous TAC meeting (Fall 2006) by Peter Swarzenski regarding recessitivity. Dale is PI/Co-PI on these projects.

Dale Griffin gave an update on a Key Largo transect study that looked at long range transport of groundwater using coral mucus, water column, and groundwater samples. Brian Lapointe asked Dale Griffin to elaborate on the wells used to obtain the groundwater samples. Dale Griffin said they are made from ¾ inch PVC pipes, screened in, and are 30-50 feet deep. Some are set up where they have a shallow and a deep

setting, separated by cement. Dale Griffin continued, saying there were two samples taken at each site; one was a surface water sample 1 m above a coral head and the second was a groundwater sample collected by a pump on the boat. The organisms looked for are fecal coliforms, enterococci, adenoviruses, and the enteroviruses. Higher numbers of each of these bacteria and viruses were found in the near shore environments. The levels drop as you move off-shore. As far as the survival of bacterial indicators in the marine environment, the trend showed that in cooler water, the bacteria can survive longer. Results showed that in seawater the polio virus, one of the enteroviruses that were tested, can be detected for up to 33 days in the coral mucus. When temperatures are higher, the viruses cannot be detected after one day. The same trend is seen with adenoviruses.

Joe Boyer asked if the temperature of the groundwater changes much or if UV radiation affects it. Dale Griffin said it does not. Margaret Miller asked if mucus treatments were done on a coral. Dale Griffin responded that yes, mucus was removed from a coral and was done because there is a physical attachment between the viruses and the coral mucus; they are very charged. He added that any type of marine biofilm may also serve as a fly-paper like trap for use in looking for these types of sewage associated microorganisms.

Dale Griffin continued, saying, "For now we are going to map the plume coming from Port Everglades." He is going to look within the surface water and then map the plume to see what it looks like during slack tide and after an incoming tide and outgoing tide. Phil Dustan asked if these are just surface waters and what is down below? Dale Griffin responded that for the Port Everglades study they will map the plum using surface and bottom waters. In a plum study in the Florida Keys he looked at surface water only but divers have reported they could physically see a phased layer near the bottom of the canals. He added that when the incoming tide begins, the numbers are barely detectable in surface waters. However, when the tide went out, he saw the numbers of fecal organisms increase dramatically at the mouth of the Port Largo canal. Fred McManus asked who funded the Keys plum studies and Dale Griffin told him that the EPA did.

Next, Dale Griffin gave an update of LBSP Project 33 which is scheduled to commence before the rainy season. This project is being led by Erin Lipp, who is studying the prevalence of biomarkers and their relationship to inlets and the outfalls. Erin's project examines two sewage outfalls, two inlets, and has two control sites that are not affected by outfalls or inlets. Sampling should be done by the fall and the project is scheduled to finish by the end of the year.

Phil Dustin asked if these are standard primers that Dale is using and Dale Griffin said yes, the enterovirus primer set was created in 1989 by Rich DeLeon. DeLeon's is the most sensitive when compared to others. Phil Dustan then asked if they are they sold as a kit and Dale responded that no, what you have to do is buy a reverse transcriptase-polymerase chain reaction (RT-PCR) kit from Applied Biosystems and then buy the primers.

Dale Griffin next gave an update on Peter Swarzenski's study that focuses on determining Submarine Groundwater Discharge (SGD). Swarzenski presented the

recessitivity study at the previous TAC meeting. The second part of this study was delayed because Swarzenski had problems with the radon measurements so he will attempt to gather the radon data again in the summer. He will then compare the radon data with the recessitivity data to determine the SGD. Dale Griffin then said they would examine the levels of nitrogen, phosphorus, radon, and methane to establish a nutrient budget for SGDs. This study is currently ongoing. Dale Griffin finished, saying that in July or August he will do the first round of sampling for the new SGD project and should be done by the end of the year.

Joe Boyer said that there has been discussion about the problems with using radon and asked if Dale has any idea of using another method along with it, such as seepage meters. Dale Griffin said that he talked about this and it is controversial. They are doing a combined seepage meter study offshore of Tallahassee. Brian Lapointe added that seepage meters are controversial as well and added that clay pox has been noted to go up in the summer. Dale Griffin responded that some microbes are thermotolerant so they are more apt to survive in elevated temperatures. Margaret Miller said that it seems like there is something fundamentally different between hot and cold organisms. It suggests that these indicators are not showing us what is happening or the same pattern we would expect. Dale Griffin agreed, saying this shows a source, but it does not show pathways, which needs to be done. Joe Boyer then asked if everyone stopped all dumping in the Keys, would all viruses be gone? Dale Griffin responded that they would, but bacteria would remain. Viruses cannot grow in the environment, even in the coral mucus. Viruses have to infect human tissue to replicate. Viruses are only being used as a marker to see if human waste is reaching the coral areas.

Presentation by Fred McManus: Review and Discuss Existing Special Studies Priority Topics Developed by the TAC and Determine if Appropriate for FY07 Request for Proposals; EPA FY07 Funds Available for Special Studies

Fred McManus, U.S. Environmental Protection Agency, said that last year the EPA put out a request for proposals in February '06 to fund special studies in the Keys and in the SEFCRI region. The topics included the identification of sources and signals of LBSP, and there are two special studies on that topic being conducted right now. The second one was linking ecological performance to pollutant exposure. Last year, EPA had \$100,000 for South Florida Geographic Initiative (SFGI) money that was available to fund those projects SEFCRI listed, which funded Project 33: Identify sources and signals of land-based sources of pollutants using human enteroviruses as an indicator of fecal coliformation by Erin Lipp and Project 32(A): Identify sources and signals of LBSP using stable isotopes as a sewage indicator signal in macroalgae by Peter Swart. The EPA provided \$50,000 and the USGS added \$30,000 for Project 27 - Task 1 and that was to determine submarine groundwater discharge and Project 27 - Task 2. For 2007, EPA has an additional \$200,000 to devote to special studies. For FY07, the question is how should the money be used? Are the existing topics still appropriate or should they be modified? Fred McManus wanted to make sure that the group is collecting the information that is going to help build the body of information that will allow the elected officials, the managers of the various agencies, and the public to say that they do have enough

scientific information now to make some of these tough decisions about decreasing the nutrient flow to near shore waters.

Chantal Collier added that the highest priority for funding should be focusing on research projects with unmet funding needs. There have been three ongoing priorities of LBSP that have not been met and those are the mapping, long term water quality monitoring, and other research projects that do not have funding. Chantal Collier said that the priorities of the State and the Ocean's Council include mapping and monitoring needs, so some of these projects may receive funding from the State. However, research projects are the most difficult to fund, therefore she suggested the EPA funds be used for ongoing or as yet unfunded, LBSP research projects. Fred McManus agreed, saying that if the group wants to continue with these ongoing projects as priority topics, Fred McManus thinks that is a good thing.

Fred then asked if anybody has tested the water for nutrients, pesticides, herbicides, other pollutants. Nancy Craig said that over the past year, Broward EPD has been looking at nutrients at Port Everglades. Richard Harvey then asked Nancy Craig what she needed to continue her study and she responded that she primarily needed resources. Richard Harvey added that the FDEP lab in Tallahassee has the technical capability the study needs.

Phil Dustan said that he started working on a biomarker idea which was to identify a pollutant and follow that upstream to identify the sources but got stuck working on sewage. He added that it is important to work the way into the watershed and figure out the sources. He said that he is not into the watershed yet but it is important to identify what are the sources for the inlets. Phil Dustan continued, stating that he could find a logical path inland from the coral reefs but the first step is to find the sources. Phil added that the summer before last, the hurricanes threw the study off track, but he has a rough idea of the surface area because of the GIS surveys. Richard Dodge said that it is a big bottleneck coming out of there and Phil Dustan has to know the current.

Joe Boyer suggested that they just need to take tidal samples and Nick Gadbois reminded him that was the objective of LBSP Project 29. Fred McManus asked if that was something USGS Water Resources Division could do; look at the depth of flow out of the inlets and then sample the water up into the watershed. Dale Griffin said that he could. Fred McManus added that a good way to do this is jointly between the EPA and USGS. Fred McManus said that he could amend the existing interagency agreement to increase the scope, and add more funding in if Dale Griffin were able to undertake this project. Dale said that it would not be hard but he needs a measurement; to find out how much is coming out of the canals. Task 2 of LBSP Project 32(A) will take place in the port, so Dale Griffin said that he will have some idea. If he gets the flow rate, then he will have sufficient data on nutrients and pollutants. Margaret Miller added that groundwater seepage is important too, and that is one component that you can get a measurement on straight off that helps with the partitioning issues between groundwater and run-off. Dale Griffin said that he can add an additional site in the water column, so he can differentiate groundwater input there and the canal inputs from north and south.

Alexander Soloviev reminded everyone that they still do not have the input from the channel. Nick Gadbois said that this can all be included under LBSP Project 29. Chantal Collier reminded the TAC that they had previously developed scopes of work for all the research LBSP research projects, and they are included in the TAC binders. She suggested the TAC revisit these to see if they are still adequate. There is a very rough budget and a brief description of what Project 29 should be in the old scope of work.

Phil Dustan said to Alexander Soloviev that he should be able to calculate the volume of water behind the beach, in channels. If he knows the acreage of the channels and the average depth, he should be able to get an idea of what the balance of water is. Ken Banks said that has been done already. Phil Dustan replied that if we know the volume and we know the tidal height, then we have a rough estimate to find how much water is moving through the tidal cycle. Brian Lapointe said that the Water Management District should be involved.

Chantal Collier summarized the discussion, saying that there are two items to revisit during the general discussion period. One is whether to use remaining funds from LBSP Project 17 for benthic mapping for Miami-Dade County. The second item is whether to revisit the scope of work for LBSP Project 29 and spend a little more time detailing this to see if the TAC wants to apply funds that might be available from the EPA to this project, or see if they want to go through the RFP process and allocate it out to a more general description of potential LBSP research projects to be determined by the proposals received.

Presentation by Christopher Boykin: *SEFCRI Appreciation and Awareness Update*

Christopher Boykin, FDEP-CRCP Awareness and Appreciation Coordinator, started with an overview of the Awareness and Appreciation (AA) Focus Area of SEFCRI, and then provided a status update on accomplishments and ongoing work. Projects presented included AA Project 1: Develop a logo and slogan. The SEFCRI slogan, “Acting Above to Protect What’s Below” was created along with the SEFCRI logo of a gorgonian coral. AA Project 2 was to develop and distribute media kits. AA Project 3 created informative tent cards which have been distributed to hotels in Broward and Martin Counties. This distribution will be an ongoing process. AA Project 4 was aimed at creating portable exhibits; there are currently three portable exhibits that are taken to events throughout the SEFCRI region. AA Project 5 was to design and post a website; www.southeastfloridareefs.net was created. AA Project 19 was to convert the old SEFAST brochures to SEFCRI brochures. With the exception of ongoing project 3, these have all been accomplished.

Christopher Boykin said that through AA Project 8, *an Awareness and Appreciation Needs Assessment Study* was conducted to gather perceptions and existing knowledge of local coral reef resources in the four county SEFCRI region held by both residents and visitors to the region. The Study was conducted by Dr. Manor Shavian, University of Miami. This Study found that residents of southeast Florida were generally more aware of southeast Florida reefs than visitors. However, most respondents noted the Florida

Keys as the primary location of coral reefs while fewer identified the SEFCRI region as having coral reefs. Stakeholders generally agreed that the resource is in decline and/or poor condition. Stakeholders in different counties did not agree on a single cause for coral reef degradation. Almost $\frac{1}{4}$ of Marine Industry Association members did not consider their activities affected by, or affecting, coral reefs. Esther Peters asked for clarification that this meant $\frac{3}{4}$ of those surveyed did acknowledge their impact on reefs? Christopher Boykin responded that was correct. Christopher Boykin continued, saying in 2006 through AA project 23, FDEP-CRCP staff and volunteers spent 25 event days at boat shows, Ocean Day, and other community events around the region promoting awareness and appreciation of southeast Florida's reefs and SEFCRI. Over 1000 new stakeholders signed up to receive more SEFCRI information.

Christopher Boykin then presented some additional projects that the AA focus group had just started or hoped to start in the near future. AA Project 37 was started to conduct coral reef teacher training. SEFCRI had over 250 teachers contact them in response to the teacher training opportunity and there are about 120 on the waiting list for the next training workshop. The AA group is also working to create coral reef signage at boat ramps (AA Project 32). \$43,750 has been allocated for this project, which would only allow for three signs per county. AA Projects 10 and 17 were designed to develop PSAs for radio, television, and print, as well as a short educational video. The AA group has already generated four radio PSAs that ran for 30 seconds each, on six channels, for a period of two weeks. There are two - 30 second spots for television, which should be completed by early August. One part of Project 17 was the creation of an educational video that was generated for coastal hotels. This project should be completed in June. The year 3 continuation of Project 10, will focus more on printed materials, such as bus wraps and bus shelters. The AA group is has also considered designing a short trailer to be played in movie theaters. There is funding for Projects 10 and 17 for the next three years. AA Project 35 is focused on creating coral reef education kits that will consist of three products. Product 1 will be a resource binder to give to teachers; Product 2 will be 1,000 DVDs that will also be distributed to individual teachers; Product 3 will be traveling education trunks for use by entire school districts.

Esther Peters asked if it was possible to have marinas help pay for the boat ramp signs. Christopher Boykin said that the project was in the preliminary stage and they were looking at all different options. Margaret Miller asked if the group could accept donations from businesses and maybe include a logo. Chantal Collier responded that at this time SEFCRI does not have a process for accepting private donations. Esther Peters stressed that the key word is partnerships. Judy Lang asked what the take away message was from these materials. Christopher Boykin responded that they have different messages which focus on the socio-economic importance, coral fragility, and awareness that there are reefs in Martin, Broward, and Palm Beach and Miami-Dade Counties. Phil Dustan asked if the AA Team could come up with a mascot to engage the younger generation. Christopher Boykin suggested something like that of Officer Snook, who is the clean water representative. Phil Dustan then asked about sponsors for t-shirts. Chantal Collier responded that clothing and other "personal" items are a purchasing issue for the state. She added that FDEP-CRCP staff are going to places where people are already gathered

and targeting SEFCRI outreach efforts to them through established community events. This has proven to be a more effective outreach method than outreach through public meetings, where people have to come to us.

New Member Discussion

A spreadsheet was created that outlined the expertise of the TAC and identified the gaps. At the request of the TAC, the TAC Organizational Committee conducted a conference call to discuss the gaps and make recommendations as to how to fill the needed expertise. The TAC OC suggested that the TAC was light on chemistry and people with algal experience. Nicholas Gadbois asked that the group not discuss individuals proposed for possible addition to the TAC out of respect for the people who are in attendance today.

Phil Dustan suggested adding statistics and mathematical modeling expertise, but no managers or ecologists. Esther Peter responded that ecologists do other things, too. Judy Lang agreed with Phil Dustan that as studies get increasingly complicated they need to optimize their limited resources. Phil Dustan recommended John Fauth.

Margaret Miller agreed that someone with quantitative and chemistry/toxicology expertise would be beneficial. She also stated that chemistry/toxicology is a major void and is a crucial aspect. Esther Peters said that she felt her expertise is toxicology/microbiology and risk assessment. Phil Dustan asked if it was fair to make categories compiled like chemistry and toxicology. Margaret Miller suggested that the group start from the beginning

Phil Dustan asked if human health is something the TAC should include as a possible category for membership. Phil Dustan elaborated that there's a link between human health and water quality and it is a great way to build public awareness. Esther Peters asked if there were someone studying the impact of water quality on human health. Dale Griffin responded that Royts Immunology gave a talk about what little is known about water quality and human health. Judy Lang suggested the group get more specific about the link between the health of coral reefs, water quality and human health in the PSAs. Chantal Collier said that they didn't have the budget for adding new more material in the current PSA project but could possibly incorporate PSA's in the future.

Dale Griffin agreed with Phil Dustan, that the public becomes more concerned when they are threatened. The signage associated with the AA project should include verbage about water quality and the human influence on recreational water use.

Margaret Miller clarified the discussion by stating that they have identified three positions. Esther Peters said that Taylor Reynolds is working on coral diseases and human diseases. Nick Gadbois suggested they include this in Project 24: Educate and inform all stakeholders concerning the value and importance of the coral reef ecosystem of Southeast Florida, land-based sources of pollution, pollution impacts on the resource, and the strategies recommended to address the problems. Brian Lapointe added that they don't have the expertise for groundwater. Dale Griffin recommended a hydrological modeler, Hal Davis. Richard Dodge asked for confirmation about what the categories are.

Nick Gadbois said modeling statistics, chemistry/toxicology, ground water hydrology, and immunology and public health. Joe Boyer asked if the group should prioritize them? The question, how many TAC members can be on the board, was asked. Nick Gadbois replied as many as the TAC feels is adequate. Chantal Collier said that with Mike Risk resigning the TAC has currently has 16 members. If Jim Porter does not reaffirm his membership in the TAC, then the number would be 15 members. In the SEFCRI Team Charter, the recommended limit is 24 people on a focus team. Phil Dustan said that he thinks chemistry/toxicology and modeling statistics are important. Chantal Collier added that one of the good suggestions that came out of the public meetings was the idea of a knowledgeable concerned citizen added to the TAC. Richard Dodge disagreed, saying that this is a Technical Advisory Committee and there is enough input from citizens through all of the agencies. Joe Boyer suggested another aspect could be making sure we have all of the pertinent agencies represented. Chantal Collier added that Dan Crean, South Florida Water Management District, had joined as an observer for his first TAC meeting. Richard Dodge asked if Broward County should be included as a government agency. Chantal Collier said that would mean every county, the state agencies, and all of their divisions would have to be covered, too.

Margaret Miller agreed with Phil Dustan that chemistry/toxicology and modeling/stats are the biggest gaps, followed by groundwater and immunology. Dale Griffin said that if the group is really interested in modeling, he proposed to invite Hal Davis down, who's got groundwater projects from Tallahassee down the coast. Chantal Collier asked if everyone agreed that modeling is the most important. Richard Dodge disagreed, saying that the TAC has its own modeling but needs a statistician to help dissect information. Several people agree. Judy Lang asked if they need somebody to analyze the sampling strategy. Esther Peters added that it is key to know where hotspots are and where samples are coming from. Joe Boyer said that a statistician isn't needed for that. Nancy Craig said that the group talks to each other about what they're finding out and they don't need help with that.

Nick Gadbois asked if the group should prioritize the gaps. Brian Lapointe said that he thinks groundwater/hydrology is the most important topic. Dale Griffin said that he could invite Hal Davis down for the next meeting as he is also a hydrologist. Richard Harvey said that since the group has 15 people now, we can include a person from each category and still stay under 24 total. Chantal Collier said that is just the limit to keep the group functional. Margaret Miller suggested leaving everything on the table and finding nominees for the different areas. Chantal Collier reminded the TAC that there are nominees already put forward and to keep them in mind in addition to the new categories.

Joe Boyer thought everything had to be prioritized first. Margaret Miller agrees. Nick Gadbois said prioritization can be done through the nominations of each category. Dale Griffin said that an immunologist would not be a problem and there is a citizen on the list. Esther Peters reminded everyone to look for a toxicologist who knows the impact on coral tissues. Richard Dodge said that Nancy Craig is an agency representative and chemist.

Nick Gadbois then suggested breaking the meeting for lunch.

Lunch Break 12:05 – 12:45

White Paper Discussion

Esther Peters reminded everybody that at the last TAC meeting it was decided that the TAC should document the threats to the coral resources in southeast Florida and the recommendations to develop water quality criteria and coral reef biocriteria in a white paper. It was also decided that they would use the water quality white paper from the Florida Keys (by Bill Kruczynski) and Hawaiian nutrient criteria as the examples to follow for this paper. Esther Peters reviewed the outline for the white paper that was initiated following the last meeting.

Esther Peters began by explaining the TAC's concerns over hydrodynamics, threats from urban development, chemical contaminants, sedimentation and turbidity and resource utilization. The group should consider the economics of any recommendations so that resource managers can use them. She continued that there are a few issues to discuss because this could end up being a very long and involved paper and, depending on the audience, that might not be a good idea. She asked if the TAC wants to address all of the water criteria, just nutrients, or reef biocriteria. The first step should be to make sure that the outline covers everything. Richard Harvey does not think it is the time to make recommendations, saying the threats should be listed first, then talk about research and outcomes. Esther Peters said that is where the outline is now. Richard Harvey said that when Bill Kruczynski wrote his white paper, it was after all of the research has been done but Esther Peters said that they do not have all of the information. Margaret Miller said that there are two realms of recommendations which might be criteria vs. management. This may help organize our thinking.

Phil Dustan said that this is covered in a lot of other papers but the SEFCRI region has a lot of people here living near coral reef so they can narrow the focus to the urban environment. Phil is also concerned that they started talking about water quality criteria and it has ballooned into this list. Esther Peters asked if they need to wait until they've done all of the research. Judy Lang replied that no, the recommendations are going to establish what they need to do. Esther Peters asked Brian Lapointe if he would talk about the Hawaii situation. Brian Lapointe said that he was in Hawaii, got the DOH statutes, which were sent to the TAC. Richard Harvey said that he reviewed the Hawaii WQS and there's a lot of political science and since the group has not chronicled what is wrong with the resource, it is better to start by documenting what we know now and we can factor in what's going on in other places. Richard Harvey said that it needs to be chronicled in a paper that clearly says this resource is in trouble, where the trouble is coming from, what can be done and why we need to do it. Phil Dustan disagreed, saying that while they do that they lose 50 % of coral coverage. Richard Harvey again says that it needs to be documented. Richard Harvey demonstrated how the EPA uses their method in determining water quality in estuaries and lakes. They take data from reference site and establish a medium and 75th percentile from the data or they take data from an existing place and if it less than 25th percentile, then it is within the EPA's healthy range.

Richard Harvey stated that he is not arguing against the data, but the TAC needs to show that the resource is more important than the money being spent on it. He clarified that he was saying recommendations should be made after the white paper. Brian Lapointe asked what the white paper did for the Keys. Richard Harvey said that it tried to set water quality standards. Brian Lapointe said that part of the problem is that there is so much confusion about the nutrient problem. The permits for the outfalls lead many people to think outfalls operate with no impact. Richard Harvey said that the TAC should still do this, but if it is done now, it will not get very far. He also suggested the group gain the support of local officials.

Brian Lapointe said that just correcting the record of background nutrient information is a good start. Phil Dustan asked how far back in time should the report begin. Richard Harvey suggested whenever the reefs were unaffected. Phil Dustan asked if there was a decent historical photographic record that can be used for comparisons. Chantal Collier said that there are not a lot of before/after shots. Brian Lapointe mentioned that John Logan of the Palm Beach Post has some photos. Richard Dodge asked if the TAC can use the Keys experience. Richard Harvey stated the TAC should not ignore the Keys, but it is not the full picture.

Fred McManus suggested that the white paper should not include management options and this should be done separately. The TAC should document the resource, what is known and what is not known.

Esther Peters asked if the group should use Status of Reefs or Decline of Reefs as a title. Richard Dodge suggested using Threats to Reefs if the TAC does not want to establish criteria.

Richard Harvey said the main goal is to get the public's attention. Chantal Collier said that she is unsettled about not including recommendations because officials will want to know what to do. It would take too much time to wait until everything is known. Richard Harvey said that if everyone on the TAC feels recommendations for nutrient criteria should be included in the report then it should be included. The TAC does not have all of the answers yet but they will never have all the answers. Esther Peters said they should tie the chemistry to risk to organisms. That is where the problem is in developing criteria is that the south Florida region - we do not have that information. Joe Boyer said that Hawaii included this information in their Water Quality Standards, and we need to find out where they obtained their data. Brian Lapointe said that Ed Laws knows and he could ask him. Richard Harvey said that his recommendation is to pull this all together, then determine if there is a strong enough case to make a recommendation. Richard Harvey added that one part of the rule making process involves having an economist look at the economic impact, cost versus value. Margaret Miller said that is the risk assessment they were talking about. She worries about scaling an incremental increase in a certain water quality parameter against an incremental improvement in the resource and agrees that the TAC should compile what they have and then go from there.

Esther Peters said that based on the discussions, she proposes not to worry at this time about developing water quality standards. For the purposes of this document, Esther she proposed the TAC throws out sections 5, 6, and 8 (from the draft outline) to the end, addressing them later. She also proposed starting with the issue up front of water quality and the decline of the reefs, looking at the southeast Florida reef issues over the last 30 years. Richard Dodge said that would be difficult because they have only been studied for 15 years. Richard Harvey said the group needs to clearly define the resource, specifically near shore coastal waters of Dade, Martin, Palm Beach, Broward County and the hard bottom reefs.

Phil Dustan said that on the SEFCRI website there is a LBSP Local Strategy Project 1 and 2 which details water quality. That is the white paper with a state of a reef report. He added they might need to be condensed a little. Fred McManus said that this was the reason Bill Kruczynski wrote his white paper. The problem was that the information was scattered all over, so Bill compiled existing data into a succinct document and did not include any recommendations. Judy Lang asked if there are reports for this area but Fred McManus said that after the Keys paper officials said they have enough info. Richard Harvey said that the TAC needs to repackage what they've already got with the literature references and what Hawaii and the Keys did.

Esther Peters asked if the outline should be revised and how does the group want to move forward. Nick Gadbois asked if the group wants to rework the document now since all afternoon is allocated for this. Dale Griffin asked why the group would rewrite what is already been written. Can the TAC not just cut down the original document, bullet hot topics for each section, and add recommendations? Phil Dustan suggested starting the paper with Dr. Ray McAllister, who documented southeast Florida reefs. There could be a half page about the change and oral history from credible people. Preface that by saying that there are no quantitative line-transect measurements. Judy Lang said that the Ocean Conservancy's "State of the Coral Reefs of the U.S. Virgin Islands" paper had profiles of local users which humanized the whole document.

Chantal Collier said that she likes the idea of using different folks to frame the information for the audience, but one thing the group needs to do is establish a target audience. Judy Lang asked if the paper is looking to change policy via policy makers or via the public. Richard Harvey said it is nice if it is the public that is demanding change and they get the attention of the policy makers. Brian Lapoint said that the time is now, as Representative Richard Maycheck is very concerned about wastewater treatment laws. Ken Banks said that he and Chantal want to meet with policy makers and can take this white paper to the elected officials. Chantal Collier said part of the SEFCRI AA focus area is to inform elected officials about southeast Florida reefs and the threats to their health, however, laws prohibit allocating any funding to engage officials in on-the-water experiences. Therefore, we must bring the experience to them. One way to do this is to show them the PSA that is being developed. There also needs to be a succinct document to highlight all of the issues with TAC recommendations. As a State and County representatives, they cannot lobby elected officials, but can bring information to them.

Chantal Collier reminded everyone that the TAC is an independent group of scientific advisors, so it can recommend anything it wants.

Nick Gadbois turned the meeting over to Brian Lapointe to give a brief presentation about the report he wrote for Tobago's Buccoo Reef and water quality monitoring. Brian Lapointe said Buccoo Reef Trust, is a local non-profit that invited him down to set-up a water quality monitoring program. The reef has been impacted by sewage. As the watershed drains into the back of the reef, it is very susceptible to nutrient buildup. Brian wrote a brief document in which the results of the study are shown as bullets. The same numbers as the Hawaiian standards were used and document was very effective. Phil Dustan asked what an appropriate length is and Brian Lapointe said that his was 20 pages with lots of photos. Esther Peters asked if the group could get to something like Brian just presented but for southeast Florida. Brian Lapointe said that he thinks there is enough information. Nick Gadbois said he will e-mail the Buccoo Reef paper and post it on web.

Esther Peters asked if there was any funding to print the document. Chantal Collier said that there was no funding for this project because it was decided on at the last meeting by the TAC, and not part of a specific LAS project. She added that it can be kept as an electronic document for now and copies can be printed in the FDEP-CRCP office as they are needed. Chantal Collier suggested breaking up the paper into sections and putting a reasonable timetable on it. Nick Gadbois said that the current outline is based on the Hawaii Water Quality Standards document and needs to be reformatted to smaller document.

Chantal Collier said that in order for this document to be completely independent of SEFCRI, it needs to be authorized and written by members of the TAC. Individuals, who are not directly on the TAC, can provide support by gathering documents and finding information, but the TAC needs to develop this document on their own. Chantal Collier also said that this shouldn't be funded through SEFCRI or any agency. Esther Peters volunteered to make sure everyone does what they are supposed to do.

Chantal Collier said that some of the resource status information is in the draft 2008 State of the Reef Report which is a NOAA technical document. This is a good starting point with all of the references attached and she will forward the draft document to the TAC.

Richard Harvey asked John Proni if he has pictures of plumes that show the movement of outfall. John Proni said he does. Chantal Collier then asked if there should be a list of what graphics are included and who is supplying them. Esther Peters said that she agrees with Margaret Miller and Phil Dustan's idea of including examining the global impact, then focusing locally. Phil Dustan volunteers to work on this section. Dale Griffin said he would write a section on the number of septic systems and population growth and projected growth.

John Proni said he has some information about upwelling but he has to go through a NOAA clearance process before he can give it out. Esther Peters said John Proni can

write the upwelling section and asks about marinas and ship traffic. Chantal Collier said there is information on ports and ship traffic in the State of the Reefs Report.

Phil Dustan asked if anybody has the overall data about how much water is pumped through the outfall on a daily basis. Esther Peters said that South Florida Water Management has the flow rates. John Proni asked if stream and canal water includes inlets. Dale Griffin said it includes everything up to the mouth of the inlet.

Dale Griffin volunteers to write that section about storm water discharge. Esther Peters volunteers to write the section on diseases.

John Proni said that there are three areas the TAC should be looking at - identifying the sources, the amount of exposure, and the impact. Esther Peters added that for any of the contaminants, the allocated data should be listed. Esther Peters said the disease, habitat, and human health sections should be eliminated. Dale Griffin volunteers Erin Lipp to write the loss of habitat section. Chantal Collier said that the economic information is in the Hazen and Sawyer study and covers all four counties. Richard Dodge volunteers to pull the economic summary from the abstract.

Richard Harvey asked John Proni if anything from the outline is conflicting with his work with ocean outfalls. John Proni responded that he needs to know the conclusions before he can answer. Richard Harvey said that is really important. If this TAC concludes that nutrients from the outfalls have impacted the reefs in a negative way, it is a big deal if John Proni's conclusion differs from ours. John Proni agreed that the conclusions must match.

Esther Peters said the group has an outline modeled on Brian Lapointe's Buccoo Reef Trust paper, but involved with water quality, nutrient and chemical contaminants, and sedimentation around south Florida reefs. Judy Lang said that the TAC should continue to go though with this. Phil Dustan seconds to proceed. Esther Peters asked if anybody opposes. Nobody does.

Dale Griffin asks about a timeline. Brian Lapointe said they should have a working copy before the next TAC meeting. Esther Peters volunteers to piece the sections together.

Richard Harvey asked John Proni if NOAA is involved in any studies that might refute this paper. John Proni said there are some that are ongoing and none directly refute this but it should be discussed at a later time. He said we would present what he could at the next meeting. Dale Griffin said that John Proni needs to examine the drafts as they become available to see if conflicts arise.

The TAC discussed having the next TAC meeting either November 28 - 29, 2007 or November 29 - 30, 2007.

Public Comment Period

Public comment was offered by the following individuals, however, no written comments were provided for inclusion in the meeting summary.

Stephanie Clark, Cry of the Water
Dan Clark, Cry of the Water

General Discussion Period

Nick Gadbois asked if Project 17 should be reallocated to Project 8 – Miami-Dade County Benthic Habitat Mapping. Chantal Collier said that the public will have other opportunities to learn about the outcomes of SEFCRI projects at different public meetings to be held as part of the Fish Diving and Other Uses projects. She added that there was \$20,000 allocated for the 2007 meetings, but only half was needed. Esther Peters then asked if there should be another meeting before FDOU. Chantal Collier said no because there will not be many new projects completed to present. She added that through the Awareness and Appreciation projects, they are bringing the information to much larger groups of people instead of asking the public to come to them in small numbers. Nick Gadbois asked if everybody agrees that this is the best method of public outreach. Judy Lang said she does as long as the AA project means can continue unabated. The TAC agreed that reallocating the funds from Project 17 to Project 8 would be the best use of the money.

Nick Gadbois asked if they should revisit the scope of work for LBSP - Project 29. Margaret Miller said that it sounds like similar projects are being conducted with USGS and NOAA. Dale Griffin asked John Proni if NOAA has any future plans to study the inlets. John Proni said they would like to cover all of the inlets through the FACE project. He supports Project 29 but thinks the group needs to find more funding. NOAA wants to install 35 new stations to provide data in real time. Fred McManus said that there has been a sense of urgency to initiate this research ever since SEFCRI was formed. The EPA took heat in the Keys for taking so long to compile the information that allowed them to upgrade the wastewater and storm water discharge. Fred McManus suggested meeting the next morning at 8:00 am with John Proni, Dale Griffin, Richard Dodge, Joe Boyer, and others to establish a rough budget and develop a scope of work to undertake Project 29: Determine the flux of pollutants exiting the inlets and net flux to the coral community.

Nick Gadbois then adjourned the meeting for the day.

Meeting Adjourned

DAY TWO, Friday, May 25, 2007

Nick Gadbois began the meeting by reviewing meeting rules and gave an overview of the day's schedule. TAC members, Organizational Committee members, and observers introduced themselves around the room. (See list of attendees above.)

Presentation by Steven Wolfe: *Ocean and Coastal Resources Council Update*

Steve Wolfe, FDEP, began by saying the Governor put in a recommendation that the Oceans Council get \$8.4 million in funding for this coming year. The legislature came through with \$3.2 million and the Governor has supported this as of 5/24/07. The Oceans Council was charged with recommending research priorities. After the Legislature put forth a budget of \$3.2 million, the Oceans Council redistributed the potential funds. There is \$150,000 designated to resource review and assessment on the web. The Oceans Council put together a demo of a program similar to *Google Earth* from which data from many sources which will be continually updated. For the integrated data management initiative, the Council asked for and received \$600,000 to get started on the first year's scope of work. The four focus areas are operating costs, integrated data management, integrated COOS, and the funding of research priorities. The \$600,000 will be used to establish metadata standards and designing the network and wait until year 2 to implement the second 2 priorities. In addition to integrated data management component, the Oceans Council also recommended \$1.5 million in funds for coastal ocean observing of near shore Florida waters. Request for proposals (RFPs) will be announced next week. With the left over \$150,000 - \$1.65 million, the priority research is water quality control in ocean and coastal ecosystems.

John Proni said that NOAA is going through a difficult process of trying to focus their three programs to look to the future of everything from Key West to Martin County. There is an opportunity to coordinate in an interested area. There might be ways to look at how much money is available to create synergy with universities. Steve Wolfe that fits perfectly with what FDEP is trying to do. One of the important factors of the ocean observing system is looking at partnerships and collaborations. Linda Brien asked who the chair of the Oceans Council is. Steve Wolfe responded that the legislatively appointed chairs are the FDEP Secretary and the FWC Executive Director. FDEP Secretary Sole was the co-chair for the March meeting and appointed Deputy Secretary Bob Ballard.

Presentation by Ken Weaver: *Nutrient Standards TAC Update*

Ken Weaver, FDEP, said FDEP cannot deal with all of the waters at once, so lakes, streams, and canals are the first priority, then estuaries and coastal systems followed by wetlands. The State's Nutrient Standards TAC was established in 2001. In 2002, TAC members were selected and in 2003, the first TAC meeting was held. One issue that FDEP and the Nutrient Standards TAC realized is that they do not have enough research to develop criteria, especially for freshwater. The TAC initiated a large focus study on nutrients and dissolved oxygen that finished in the last year. Within the next year they hope to conclude the process and have recommendations for nutrient criteria for lakes, rivers, streams, and canals. Stream bioregions include panhandle, northeast, peninsula, and the South Florida/Everglades. EPA has two recommended approaches determine the health of a waterbody; use reference sites characteristics of the region with healthy well-balanced populations of flora and fauna using upper percentile EPA recommends 75th – 90th; take all the data for the region and use a lower percentile. Ken Weaver said they initially selected a break point of a Landuse Development Intensity Index (LDI) of two. That would be associated with mature silvicultures, a minimal amount of disturbances in the landscape. An LDI of less than two represents a benign level of land use. This is a

biologically significant break point. Their goal is balancing the natural population of flora and fauna. The last step involves establishing a TMDL but they have not figured out a way to exclude the phosphate region. When they excluded the statistical outliers it seemed to work. Right now the total phosphorus criteria for the peninsula region is 113 ug/l, and for total nitrogen it's 1.7 mg/l.

Joe Boyer suggested that the levels of organic vs. inorganic nitrogen and oxygen should be measured in saturation, not an actual number. Ken Weaver said their oxygen measurement is saturation based and there is discussion in their TAC about the organic vs. inorganic debate. Brian Lapointe said the criteria of 1.7 mg/l for nitrogen and 113 ug/l for phosphorus was a little high for what they call a pristine wetland. Ken Weaver said those were based on their reference sites from across the state. Richard Harvey asked if Ken Weaver would provide advice to this TAC to establish criteria for southeast Florida and then have the Oceans Council review a document the SEFCRI LBSP TAC develops. Ken agreed this would be beneficial to both TACs and that the Nutrient TAC is having problems determining the downstream effects. An overall look at the entire system will help develop better recommendations for nutrient criteria.

Public Comment

Public comment was offered by the following individuals, however, not written comments were provided for inclusion in the meeting summary.

Dan Clark, Cry of the Water
Stephanie Clark, Cry of the Water

Linda Brien said that in the early 1990's EPA tried to issue a renewed permit; however, Miami-Dade filed a lawsuit, which was never resolved. FDEP took over the delegation in 1994 from EPA. The FDEP issued a draft permit last year without public protest. The outfall discharges approximately 90 million gallons per day. Phil Dustan then asked if there has been a protest to make the water cooling pipes that Dan Clark discussed into a closed loop systems. Linda Brien said that right now there is not and that handling all of the condo buildings is a district wide problem.

Final White Paper Discussion

Nick Gadbois moved the meeting on to a recap of the white paper from yesterday. Esther Peters said they planned a first draft of this white paper that is formatted similar to Brian Lapointe's document on Bucco reef. The sections were then allocated to individual to prepare. Margaret Miller said the information for the introduction is in the State of the Reefs Report and she will write that section. Judy Lang volunteers to help. Esther Peters said that Section 3 will be done by Phil Dustan, Margaret Miller, and Valerie Paul. The visible signs of stress section will be compiled by Brian Lapointe, Esther Peters, and Erin Lipp. Section 5 will be written by Richard Dodge. A complete draft will be finalized by the November 2007 meeting.

Richard Harvey reminded the group that everything must match what the FDEP Nutrient TAC is developing. Esther Peters said she will provide Ken Weaver further documentation and a summary document. Dale Griffin asked if anybody in the water quality program for the SEFCRI region is looking at current concentrations. Nancy Craig said they were just getting started but is limited to nutrients and not all pollutants. Joe Boyer said if they want to set standards, they need background data. Esther Peters asked if there are plans to do that kind of monitoring. Joe Boyer said that some has been done in Biscayne Bay and that Ed Long from NOAA has the data.

Esther Peters said a rough draft should be written by August 1st. A reminder will be sent in one month and Brian Lapointe's document will be sent to the group by Nick Gadbois. Esther Peters again asked if funding was available to distribute the document. Chantal Collier responded that there is no specific funding, but that her office could handle the electronic distribution. Richard Harvey said that the EPA might be able to handle the hard copy distribution.

General Discussion

Nick Gadbois turned the meeting over to Fred McManus. Fred summarized the morning meeting between him and John Proni regarding using the \$200,000 to fund Project 29. Fred reiterated the EPA has \$200,000 that can be used for a SEFCRI special study. John Proni has done a study of Boynton Inlet. In this morning's meeting, they decided to bring a recommendation to the TAC that the EPA will provide \$100,000 to NOAA. John Proni will place monitors at one inlet, either Port Everglades or Hillsboro, whichever the TAC decides is more important. NOAA will match at least \$100,000 and prepare a detailed scope of work including net flow, amount of toxins, and the effect on the reef system. John Proni will provide a detailed schedule and budget to Fred McManus in about two weeks. Fred McManus continued, saying that Port Everglades would be better, but ship traffic will provide interference. As far as the remaining \$100,000, Fred McManus said he can issue a request for proposals (RFP) for two additional projects. Ken Banks brought up that we might want to piggyback on the work John Proni will be doing at Port Everglades. Ken Banks said that this is a unique opportunity to see where the plume affects reefs around the inlet.

John Proni said that NOAA will explore this at sites where they have a ship doing plume mapping. That can be done with FACE resources. Dale Griffin said they showed short range plumes by Erin Lipp and will do some in the channels. They will be able to determine which way it flows but not how far it travels. John Proni asked if the notion of injecting dye a worth while activity and Linda Brien said she thinks so. Fred McManus asked Ken Banks to prepare a fourth topic for special studies so Fred can go after an RFP and add them to the three special topics.

Phil Dustan said that he and Dale Griffin talked about looking at microbial communities. Richard Harvey asked how much it would cost to do that. Dale Griffin said that depends on the number of PCR runs but it is not expensive. Phil Dustan estimated \$15,000 for the collaboration and we will be able to determine the effects on the microbial communities.

Dale Griffin added that the first responders are the microorganisms. Richard Dodge added that they do not want to get into a situation where these results are used but without reintegrating the recommendations of the TAC. Phil Dustan said that what John Proni and he want to do is map that on top. This is the opportunity to take one aspect and move it into something the TAC wants to accomplish. Steve Wolfe said that the impact and correlations would still be unknown. Phil Dustan said that they are going to the first principles of organism health. Margaret Miller said that is a performance that they need to link. Given our other studies, we should emphasis our second priority. That's where the white paper is weakest. Linkage doesn't mean correlation. The \$100,000 should be focused on causation.

Fred McManus asked if the wording for priority two should be changed to include mapping the plume. Margaret Miller did not think it should be changed. Richard Dodge asked how a sampling scheme could be set-up at a reef site spatially and its influence on the reef studied if they haven't studied the plume yet. Phil Dustan agreed that determining the plume is the first step. Nancy Craig suggested studying surface vs. bottom water. Ken Banks said that when they study the plume movement they'll know what water hits the reef. Fred McManus said that he wants an RFP focusing on John Proni's idea.

Chantal Collier said that everybody who is providing resources should do so as soon as possible. Nick Gadbois thanked everyone for coming and adjourned the meeting.

MEETING ADJOURNED

Action Items

No.	Action Item	Responsible Party	Due Date
1	The TAC needs to determine areas of expertise needed for potential TAC members.	All TAC and Organizing Committee Members	Before the next TAC meeting
2	TAC members need to write rough drafts for their assigned sections of the white paper and send them to Esther Peters.	All TAC Members	August 1
3	Send to each TAC member the Tobago's Buccoo Reef Trust document that Brian Lapointe wrote.	Nick Gadbois	Once document is released by Tobago's Buccoo Reef Trust
4	John Proni to send budget and schedule for Inlet study to Fred McManus	John Proni	June 8

5	Send the NOAA State of Reef report to the TAC members	Chantal Collier/Nick Gadbois	Completed
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