Southeast Florida Coral Reef Initiative (SEFCRI)
Land Based Sources of Pollution (LBSP)
Technical Advisory Committee (TAC)
Meeting #16
Report of Proceedings
May 31 - June 1, 2012

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

MEETING ATTENDANCE

LBSP TAC COMMITTEE

NAME	Affiliation	Day 1	Day 2
Joseph Boyer	Southeast Environmental Research Center – Florida International University (FIU)	X	X
Richard Dodge	Nova Southeastern University Oceanographic Center (NSUOC)	X	
Phillip Dustan	College of Charleston		
John Fauth	University of Central Florida (UCF)		
Dale Griffin	United States Geological Survey (USGS)		
Piero Gardinali	Florida International University (FIU)	X	
Vladimir Kosmynin	Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems (FDEP)	X	X
Judy Lang	Atlantic and Gulf Rapid Reef Assessment (AGRRA)	X	X
Brian Lapointe	Harbor Branch Oceanographic Institution at Florida Atlantic University (HBOI)		
Erin Lipp	University of Georgia		
Margaret Miller	National Oceanographic and Atmospheric Administration National Marine Fisheries Service (NOAA NMFS)	X	X
Valerie Paul	Smithsonian Marine Station at Fort Pierce	X	
Esther Peters	George Mason University	X	X
Gene Shinn	University of South Florida (USF)	X	X
Alexander Soloviev	NSUOC	X	
Michelle Wood	National Oceanographic and Atmospheric Administration Atlantic Oceanographic and Meteorological Laboratory (NOAA AOML)		

Peter Swart	University of Miami, Rosenstiel School of Marine and Atmospheric Science (UM RSMAS)	X	

LBSP TAC ORGANIZATIONAL COMMITTEE

Name	Affiliation	Day 1	Day 2
Ken Banks	Broward County Environmental Protection and Growth Management Department (EPGMD)		
Nancy Craig	Broward County EPGMD	X	X
James Byrne	The Nature Conservancy (TNC)	X	X
Cheryl Miller	Coastal-Eco Group	X	
Joanna Walczak	Florida Department of Environmental Protection Coral Reef Conservation Program (FDEP CRCP)	X	
Katharine Tzadik	FDEP CRCP	X	X
Julio Jimenez	FDEP CRCP	X	X
Wendy Wood	NSUOC	X	

ADDITIONAL PRESENTERS AND OBSERVERS

Name	Affiliation	Day 1	Day 2
Joshua Voss	HBOI at Florida Atlantic University	X	
Jeff Beal	Florida Fish and Wildlife Conservation Commission (FWC)		
Barret Barry	Martin County	X	
Joe Lopez	NSUOC	X	
Kurtis Gregg	NOAA NMFS	X	
Karen Bohnsack	FDEP CRCP	X	
Dan Clark	Cry of the Water	X	X
Stephanie Clark	Cry of the Water	X	X
Zachary Ostroff	NSUOC - meeting stenographer	X	X
Lauren Ordway	TNC	X	X
Paul Davis	Palm Beach County Environmental Resource Management	X	
Terry S.	Palm Beach County Reef Rescue	X	
Ed Tichenor	Palm Beach County Reef Rescue	X	
Doug Seba	Academy of Marine Sciences	X	
Katie Unz	FWC Fish and Wildlife Research Institute	X	
Jamie Monty	FDEP CRCP	X	X
David Gilliam	NSUOC		X

MEETING SUMMARY - DAY ONE: THURSDAY, MAY 31ST 2012 (MORNING)

Meeting Guidelines

Katharine Tzadik, environmental project coordinator for FDEP-CRCP, welcomed all in attendance to the 15th Land Based Sources of Pollution (LBSP) Technical Advisory Committee (TAC) meeting, reviewed meeting participation guidelines for TAC members and observers, which included the facilitator role, guidelines for discussion, consensus rules, comment card procedures, and the use of meeting evaluation forms. Katharine then reviewed the day's agenda.

Presentation: Past Project Update – LBSP Project 5: Conduct a biomarker study *– John Fauth, UCF*

Canceled; John Fauth in absentia.

Presentation: Update – LBSP Project 25: Establish a long-term regional water quality monitoring program *– Joseph Boyer, FIU*

- Objectives:
  - Initiate a long-term coral reef water quality monitoring program off the southeast Florida coast
  - Establish a baseline for a larger program which will assist in evaluating coral reef condition
  - Identify potential impacts on water quality from upstream water management activities
  - Provide water quality data for other programs operating in the SEFCRI region
- Design:
  - Built upon existing 17 SECREMP sites, added 5 more in 2011; spans 4 counties
  - Quarterly sampling to correspond with SECREMP
  - Coordinate with other research/monitoring activities in SEFCRI, such as FACE

- Work Plan:
    - Collect CTD casts at all sites to record vertical distribution of depth, temp, salinity, DO, and light (K_d)
    - Collect surface and bottom grab samples for NO_3^-, NO_2^-, NH_4^+, TP, SRP, TN, TON, DOC, pH, turbidity, and chlorophyll *a*
- Observed:
    - Mixed for different measured nutrients, whether surface or bottom waters have higher concentrations
    - Often bottom waters have lower total N, and generally less N overall as sites progress north
    - Phosphate levels generally lower near shore, at or under federally mandated concentration levels (10 ppb) for water entering Everglades
    - Comparing to EPA Water Quality targets from 1995-2005 baseline:
        - *Chlorophyll a* (surface and bottom waters) – percentage of 2010-2011 observations in which [chla] values were lower than '95-'05 baseline (≤0.35 mg l^{-1}) **did not meet** the percentage at which '95-'05 observations complied with target concentration.
        - K_d (water column) – percentage of 2010-2011 observations **exceeded** the percentage of '95'05 observations which complied with target concentration (≤0.20 m^{-1}).
        - *DIN* (surface and bottom waters, except bottom 2011) – percentage of 2010-2011 observations in which DIN values complied with target concentrations (≤0.75 μM) **met** percentages at which '95-'05 observations complied.
        - *TP* (surface and bottom waters) – percentage of 2010-2011 observations in which TP values complied with target concentrations (≤0.25 μM) **exceeded** the percentage of '95-'05 observations.
    - Interesting in that with the same [chla] as in Keys, get a higher standing stock of chlorophyll here.
    - Martin County TP values significantly higher than other regions, and slightly lower salinity.
        - Some Martin County sites may be influenced more by site location (proximity to inlets).
    - Water body stratification:

    - In general, surface waters had greater NO_x^-, chla, and temperature.
    - In general, bottom waters had greater TP, salinity, and dissolved oxygen.
    - Broward county sites showed the greatest surface-bottom stratification (by number of significant differences); Miami-Dade had the least.
- Future Plans:
    - Integration with other programs in area: Broward Monitoring & FACE
    - Proposal for continued funding by EPA for FY13 (4 events).

Questions and Comments (LBSP Project 25):

1. (Joe Boyer, noting uncertain funding futures) *Do we continue this monitoring, or should we think about doing something different? If we want to address inshore to offshore source effects, we might have to redesign the project…*

   -(Judy Lang) *How would you allocate similar funds differently?*

   - (Joe) *In terms of LBSP, may be better to concentrate on inlets and sources; we don't have a good idea of nutrient loading and range effects.*

   - (Valerie Paul) *How frequently are samples taken?*

   - (Joe) *Quarterly.*

2. (Peter Swart) *Concerning the higher abundances of chlorophyll with the same or less phosphorus than in the Keys, are there other nutrients we should measure? Iron?*

   - (Joe) *Iron we don't measure (differences extremely small), but would be good to include, silicate as well.*

   - (Peter) *Iron could be telling, as Fe is a limiting nutrient for many phytoplankton organisms.*

   - (Joe) *For iron and other nutrients, concentration values don't necessarily reflect input; biological activity in nearshore can quickly assimilate many nutrients.*

3. (Dan Clark) *When sampling, correlating with events such as port/inlet discharges, rain events, etc?*

- (Joe) *Quarterly sampling doesn't align with acute events. If measurements are taken soon after an event, an influence might be recorded. Issue is nutrient residence times, which are very short. Also, couldn't link water quality values to LBSP unless output water was traced.*

Presentation: Update – LBSP Project 29: Determine flux of pollutants exiting ocean inlets and net flux to reef communities *– Joseph Boyer, FIU*

- Objective: To quantify the exchange of water and nutrients through Port Everglades Ship Channel using an observational system approach.
- Instrumentation:
    - Side looking ADCP, binned on hourly basis
    - CTD casts across channel for Temp, Salinity, DO, Turbidity every hour over 36 hrs (during daylight)
    - Periodic grab samples, every hour over 36 hrs (during daylight)
    - NO_3^-, NO_2^-, NH_4^-, TN, SRP, TP, SiO_2, & TOC
- Unable to get full 24hr periods (unsafe night conditions in shipping channel), concentrated on capturing tidal cycles.
- Flux Model: original idea to create a 6 compartment 'box model' (3 upper and 3 lower boxes across the channel) - changed to 2 box model (upper and lower channel). Resolution of some flux data not adequate for 6-box model.
- Target Results:
    - Load estimates at scales of tidal, daily, and seasonal.
    - Try to tie flux to meteorological and hydrological drivers.
    - Will be compared with existing values from other rivers and passes in the region and used to begin estimating a LBSP nutrient budget.
- Observations:
    - Bottom flow more dynamic than surface
    - Nutrient flux from Port controlled by water flow; differences in concentrations overwhelmed by total volume of water moved
    - In an average tidal cycle, a net export of nutrients (on the order of 600 – 1000 kg of TN, 10 – 40 kg TP).
    - ~80% of nutrient load can be explained by net mass flux
    - Annual load can be estimated by abbreviated sample design

Questions and Comments (LBSP Project 29):

1. (Doug Seba) *How does the net flow volume relate to the total volume of the port?*

   -(Joe) *Don't know offhand, but a good question.*

   -(Jack Stamates) *When looking at these net numbers, remember they are taken over an experimental time period. If not framed perfectly on tidal cycle, can affect overall net flow numbers.*

2. (Joshua Voss) *When were these measurements taken in relation to spring/neap tides?*

   -(Joe) *We aimed for higher tides; measurement relation to spring/neap varied. Sometimes the wind field had a great affect on the tidal exchange (e.g. strong east winds hindering outgoing tides).*

Presentation: Update - MARINE AND ESTUARINE GOAL SETTING FOR SOUTH FLORIDA *– Joseph Boyer, FIU*

- www.sofla-mares.org
- Looking at ecosystem services, come up with an idea of how the natural, economic, and social systems interact in coastal south Florida to make better management decisions.
- SEFCRI a participant
- Objective - *"To reach a science-based consensus about the defining characteristics of a sustainable coastal marine ecosystem."*
- Strategy - build on an already established approach to Everglades restoration
- DPSER Model
  - **D**rivers – population, water management, agriculture, etc.
  - **P**ressures – LBSP, coastal construction, fishing & diving, etc.
  - **S**tate (of the environment)
  - **E**cosystem Services – aesthetics, beach activities, fishing, boating, etc.
  - **R**esponse – protected natural areas, fishing regulation, research and monitoring, etc.
- Difficulty in quantifying ecosystem services, as traditional methods produce only direct dollar values per habitat area, and don't include "non-use values" such as aesthetic values and the indirect uses and roles habitats play.

- Whether or not an accurate dollar value can be assigned, good to produce a list of values as material for politicians and the public to see (part of Response component).
- Geographic Scope: Southwest Shelf, FL Keys and Dry Tortugas, Southeast Coast
- MARES Report Card:
    - Produced every two years and delivered to DOI (for Everglades component), has traction; can be useful to SEFCRI
    - Combines data on indicators, and quantified goals for an ecosystem
    - Uses simple, "stoplight" format
        - Red – "substantial derivations from restoration targets"
        - Yellow – "current situation does not meet restoration targets"
        - Green – "Situation is good…"
    - Backed by scientific information – quantitative indicators and conceptual ecosystem models
- Progress and Challenges Ahead:
    - Coastal problems are known
    - Scientific information provides good base of understanding
    - Ultimate utility depends on flexibility/adaptability of existing programs for coastal management

<u>Questions and Comments (MARES)</u>:

1. (Gene Shinn, referring to the DPSER model) *This doesn't seem to have much substance; nothing tangible looks to be produced by this.*

   -(Joe) *In part, but this puts a helpful, conceptual framework from which management action can be guided. Sociology aspects can also provide valuable insight into public perception.*

2. (Doug Seba) *As a "conceptual framework" could this work both ways in telling management bodies what the value of say, a stretch of farmland is (considering it is a part-contributor to LBSP and TAC discussion)?*

   -(Joe) *It could work for any defined system. This started as an economic model; not strictly marine.*

3. (Peter Swart, concerning project 29) *Going to take data from snapshots, and try to provide a yearly estimate of nutrient export?*

   -(Joe) *Will be attempting, yes.*

   -(Peter) *A very useful estimate to compare with other output systems.*

Presentation: Update – LBSP Project 32: Using Cyanobacteria and Macroalgae Stable Isotopes as Anthropogenic Point and Non-point Source Nutrient Indicators – *Valerie Paul, Smithsonian Marine Field Station, Fort Pierce*

- **Goals:**
  - Establish indicator organisms for monitoring anthropogenic nutrients in wastewater
  - Isotopic approach (^{15}N and ^{13}C), field and lab based experiments with *Lyngbya* and *Dictyota*
  - Measure N-fixation (^{15}N approach)
- Most prominent *Lyngbya* spp. of Broward reefs: *L. polychroa* (red and brown varieties), *L. confervoides* (brown).
- **Project Activity to Date:**
  - Sampling completed (June and July, potential for more)
  - ^{15}N incubation of 2 *Lyngbya* sp, to assess N-fixation
  - Source water experiment complete
  - Over 111 individual samples of Cyanobacteria and Macroalgae
- Isotopic ratios, expected relationship: increase in nutrient enrichment (anthropogenic) - higher ratios of ^{13}C and ^{15}N in *Lyngbya, Dictyota*
- Overlapping isotopic ratios make differentiation between species that fix more or less atmospheric N difficult
- Growth rates of organisms also affect isotopic ratios (less uptake discrimination in fast-growing conditions). "Blooming" *Lyngbya* species exhibits more an assimilation signature of macroalgae.
- **Study sites:**
  - Seasonal surveys conducted at established monitoring sites
  - North and South of Hollywood sewage outfall (HWO2 & HWO3)
  - Port Everglades Inlet (PE2 and PE3)

- Control Sites: SEFCRI biomarker sites, C2 and FTL3

- **August 2010 sampling:**
  - *Dictyota sp.* - measured standard marine signature (+4‰ ∂^{15}N AIR)
  - Cyanobacteria varied by species
- **June 2011 sampling:**
  - Mat-forming black *Lyngbya* exhibited low δ^{15}N (more N-fixing)
  - Other species of *Lyngbya* with higher δ^{15}N may be fixing less than previously thought
  - Effects on δ^{15}N may be less a function of fixation, more of dissolved nutrient availability
  - Port Everglades sites had highest dissolved nitrogen concentrations
- **July 2011 sampling:**
  - Lots of variability, "classic enrichment signature" not observed
  - ^{15}N incubation (gas injection into chamber water) of *Lyngbya* sp. to verify expected fixation behavior/extent not fruitful – no statistically significant fixation measured. Both daytime and nighttime experiments run.
  - May need to reevaluate which *Lyngbya* spp. are being used if want to use as a signature for anthropogenic sources of N.
- **Growth experiments:**
  - Two cyanobacterial species (*L. polychroa, L. confervoides*) incubated for 6 days in water collected near a sewage outfall (HWO), within the Port Everglades inlet (PE Inlet), and offshore (control).
  - The species most responsive to dissolved nutrients (most potential "bloomer"): *L. confervoides.* Would expect *L. confervoides* to be most responsive to nutrient loading.
  - Growth did not correspond to nutrient availability; no significant difference from control.
  - Possible confounding factor: highest nutrient values present in control water.
- **Conclusions and next steps:**
  - Further data analysis
  - ^{15}N fixation was not significant between *L. confervoides* and *L. polychroa*

- N-fixation is occurring, but not always
- Isotopically enriched samples do not correlate with DIN (in the classic sense)
- More experiments for "bloomer" species.

Questions and Comments (LBSP Project 32):

1. (Gene Shinn) *If only looking for anthropogenic effects, falsely ruling out other possible contributing factors?*

   -(Valerie) *Original goal was to see if these organisms were good indicators of LBSP.*

2. (Peter Swart) *According to graphs, it appears there's an inverse correlation where the isotopic ratio is getting higher in lower nutrient concentrations; this is in opposition to traditional models for point-source sewage discharge of heavy nitrogen isotopes. Data suggest the algae fractionate nitrogen isotopes during assimilation, removing the light nitrogen and enriching the residual nutrient pool with heavy nitrogen.*

   Due to the small value range (isotopic ratios), caution against inferring species differences because of the amount of value overlap and variability. You may see those ranges within same species just from local variability. As an example, Halimedia sp. growth bands can vary widely for one colony in their isotopic ratios just from environmental variability. Not sure that the data observed is enough to conclude species effects.

   -(Valerie) *For some species we may be able to make preliminary conclusions, such as the black-mat cyanobacteria which showed narrower ranges and a clear pattern.*

3. (Vladimir Kosmynin) *Is it only nitrogen that would cause a bloom in these species? What about phosphorus?*

   -(Valerie) *Phosphorus is important, iron too (nitrogenase), but neither can be fixed; only assimilated.*

4. (Gene Shinn) *Does the growth rate of Lyngbya affect its isotopic composition?*

   -(Valerie) *The rate of growth would appear to affect the fractionation of nitrogen assimilated.*

   -(Peter Swart) *How much the ratios change is affected by nutrient concentration?*

5. (Gene) *Was iron the best stimulator in growth experiments?*

   -(Valerie) *In fertilization experiments, only significant effects were observed under a combination treatment (N, P, and Fe).*

Presentation: Update – LBSP Project 20/23: Develop, Initiate and Implement Management Actions to Reduce Pollution from the Highest Priority Sources – *Katharine Tzadik, FDEP CRCP*

- Review – Original LAS Statement & Guidelines
  - Develop specific management action projects
  - Initiate the implementation of management actions to reduce pollution from the highest priority sources.
  - Implement priority engineering/management actions
- Done so far:
  - Solicited project ideas (received limited response)
  - Ideas ranged from restoration projects to end of pipe projects
  - Gained: multiple partnerships from which to possibly leverage future funds and/or agency cooperation (i.e. SFWMD).
- Next Steps:
  - Prioritize from the project list
  - Solicit project team from the SEFCRI Team
  - Development of full scope of work
  - Removal of NOAA CRCP SAC
  - End June 2014 completion deadline
- Project will be the first in post-SEFCRI restructuring, and serve as a test LAS in which SEFCRI team members from previously separate sections can work together.

Questions and Comments (LBSP Project 20/23):

1. (Joe Boyer) *Is this tied to TMDLs (Total Maximum Daily Loads)? Is there a nutrient TMDL for this region? Would be used to define the goal.*

   -(Katharine) *Yes, tied to TMDLs, but there's no nutrient TMDL for this region. Though the district is currently focused on pilot projects to reduce nitrogen and phosphorus.*

2. (Esther Peters) *How many organizations volunteered to collaborate on projects?*

   -(Katharine) *We have four projects; unfortunately had to turn down some because of project timeline constraints.*

3. (Valerie Paul) *When will the chosen project be implemented?*

   -(Katharine) *The next two years is the time range; hoping to choose a project with benefits beyond that time period.*

4. (Esther Peters) *So we are prioritizing the list of four proposals to one?*

   - (Katharine) *Yes, though can't discuss here due to conflicts of interest.*

5. (Stephanie Clark) *What will be the role of the SEFCRI project team?*

   - (Katharine) *Partly to choose the project, but more to develop the scope of work, timelines and deliverables once a project is chosen.*

(BREAK)

Presentation: SEAFAN – Southeast Florida Action Network *– Karen Bohnsack, FDEP CRCP*

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1. **SEAFAN:**

   - Plan to launch June, 2012
   - A reporting and response system designed to improve the management of southeast Florida's coral reefs.
   - Allows residents and visitors of southeast Florida to contribute to coral reef protection by becoming part of an observer network.
   - Enhances response coordination.

   o Coverage area: Miami-Dade to Martin County

   o Reporting method: phone (1-866-770-SEFL) and internet (seafan.net)

   o What will be reported:

   - Vessel groundings
   - Anchor damage
   - Fish kills and disease
   - Marine debris

        - Thermoclines
        - Coral disease and bleaching
        - Algae blooms
        - Discolored water
        - Invasive species
        - Other incidents
    - Beyond existing reporting networks: SEAFAN consolidates who to contact to report disturbances (instead of various agencies that may or may not have dedicated means of receiving public reports).
    - SEAFAN will also serve as an intermediate between the public and several agencies:
        - MDP – Marine Debris Reporting and Removal Program
            - Increase awareness about Marine Debris, its causes, and consequences.
            - Encourage local divers and dive shops to report marine debris they observe, remove small debris on a regular basis, participate in reef cleanup events.
        - RIPR – Reef Injury Prevention and Response Program
            - Minimize coral reef injuries from vessel impacts
            - Increase awareness to prevent coral reef injuries.
            - Implement appropriate restoration or mitigation activities when damages do occur.
        - SEMERP – Southeast Florida Marine Event Response Program
            - Extension of Mote Marine Lab's MEERA program in the Florida Keys
            - Provides early detection of potentially harmful biological disturbances off the coast of southeast Florida.
    - Reporting Follow-up – a focus on reporting actions taken back to initial public observers.

2. ***Xestospongia muta*** **disease event**

    - An example of a SEAFAN reportable subject

- SEAFAN reports would provide useful data such as disease extent and region progression
- Disease characterized by tissue discoloration, followed by tissue death and disintegration.
- A video compilation of *X. muta* disease progression was then shown.
- Karen then introduced Dr. Joe Lopez, who had done some preliminary work investigating the disease (below).

3. ***Xestospongia* disease investigation (Joe Lopez)**

- The disease causes the sponge tissue to become totally disaggregated; so soft that you can easily brush it away by hand.
- Disease sampling:
    - On May 11, sampled tissues from dying sponges
    - Tissues sampled included: dead tissue, apparently healthy tissue, and tissue at the interface of dead regions
    - Many sponges did not exhibit complete mortality (even after repeated observations); often basal tissue remained.
- Already known:
    - Disease has been described for a few decades
    - Disease outbreaks are cyclical, affecting 5 – 20% of *Xestospongia* individuals
    - Onset of disease was April, after strong rain events
    - Specific pathogen is unknown
- At May 29th Broward monitoring, no actively decaying *Xestospongia* observed (though past disease incidents present).
- Current plans:
    - Look at archival data of *Xestospongia* populations, and try to infer disease incidence rates
    - Apply for NSF rapid funding to perform meta-genomic analysis of sponge tissue samples
    - Analysis of sponge bacterial communities allow for the detection of distinct bacterial community composition between sponge species
    - A possible avenue of investigation: look for differences in bacterial assemblages between sponge tissue samples

Questions and Comments (SEAFAN):

1. (Vladimir Kosmynin) *We've observed a similar rapid wasting disease in Xestospongia before, back in the 1990's.*

   -(Esther Peters) *Though generally more scattered.*

2. (Valerie Paul) *What percent of Xestospongia are being affected?*

   -(Ed Tichenor) *Around 15% are affected.*

   -(Dan Clark) *It's never been as widespread before.*

3. (Gene Shinn) *Is [the disease] currently restricted to Xestospongia?*

   -(Joe Lopez) *Currently yes.*

   -(Joanna Walczak) *There have been some anecdotal reports of other sponge species being affected.*

   -(Joshua Voss) *Likely an influence of observer bias, divers notice Xestospongia and not less conspicuous species.*

4. (Valerie Paul) *Any unusual environmental events preceding this? In southern Belize last year, extensive sponge diseases (Xestospongia and others) followed a major planktonic algal bloom.*

   -(Judy Lang) *Was the Belize algal bloom linked to a particular event or condition?*

   -(Valerie) *The bloom followed strong rainfall causing runoff in Guatemala and Honduras.*

5. (Ed Tichenor) *Something unusual is that this disease is impacting the entire FL reef tract (since mid-April). Of note, the FL loop current connected in early April.*

   -(Joshua Voss) *Florida also has an early onset of the wet-season this year.*

6. (Vladimir Kosmynin) *Will you also process tissues from healthy sponges?*

   -(Joe) *Yes, and water and sediment samples.*

7. (Doug Seba) *On an earlier slide, tissue death appears to be concentrated on the outside of the barrel, while the inside of the barrel appears healthy.*

   -(Joe) *Yes, although the inner barrel tissue became quickly diseased and deteriorated.*

   -(Margaret Miller) *Is onset of disease at the barrel middle tissue consistent?*

   -(Joe) *Generally, yes.*

   -(group) *Many of the sponges with diseased barrels would have surviving bases.*

-(observer) *The pattern of infection (at outer barrel midsection, the site of greatest water intake) consistent with the possibility that the disease is prominently water-borne.*

8. (Dan Clark) *See lots of Xestospongia that look as if the top were sliced off, possibly a product of this disease killing off barrels of sponges.*

   -(Vladimir Kosmynin) *A student here at Nova has done a M.S. thesis on the reattachment of Xestospongia fragments. If secured adequately, they did regrow onto the substrate.*

9. (Ed Tichenor) *In transference trials, diseased sponge tissues did not seem to transfer ailment to healthy sponges.*

   -(Joe) *Yes, and from the imagery we can see many healthy sponges directly adjacent to diseased individuals.*

10. (Esther Peters) *It is possible that healthy-appearing sponges and tissues may still be affected.*

11. (Doug Seba) *Curious that the pattern of infection doesn't follow water channels, or create an expanding ring.*

    -(Valerie Paul) *In Belize, since outbreak was not species-specific, wondered if was simply a product of sponges trying to physically pump water carrying too much detritus; a mechanical process instead of pathogenic.*

12. (Dan Clark) *Have observed Spanish hogfish picking at Xestospongia, including diseased colonies, wondering if they could serve as a transmission agent.*

    -(Joe) *In transplantation experiments, physically securing infected tissue to a healthy sponge did not result in infection.*

13. (Joshua Voss) *In transference experiments, tried transplanting dead sponge or the dying tissue interface? Will you have access of samples from other locations? Is any fate-tracking of diseased Xestospongia being done?*

    -(Joe) *Some fate-tracking is being performed.*

    -(Ed Tichenor) *Many WPB sites have been videotaped for years, and can contribute to fate-tracking data. Thus far there have been no reports of disease north of the Palm Beach inlet.*

14. (Judy Lang) *For SEAFAN, should boaters self-report when they anchor on or run aground on reefs? What would be their motivation to do so?*

    -(Joanna Walczak) *Under Coral Reef Protection Act, boaters are obligated to self-report. As motivation, if they do self-report it is taken into consideration; for first instances recreational boaters are served only a warning.*

15. (Joshua Voss) *For SEAFAN feedback loops to public, a website and/or social media utilization could be efficient (vs. directly contacting original reporters).*

16. (Piero Gardinali) *For the "water discoloration" reports, what does that entail?*

    -(Karen) *Variable, could mean anything generally considered unusual about water condition. Reports will be gauged against reporter experience (e.g. a vacationer reporting brown Port water vs. a local reporting unusual conditions in a location they frequent).*

    -(Joshua Voss) *To shortcut less useful reports, could include information pertinent to each report type on the website, such as a Frequently Asked Question page.*

17. (Joshua Voss) *How in depth will reports be?*

    -(Karen) *An example report would include the location, what type of disturbance, when observed, site parameters (such as water depth, temperature, habitat), species affected (if applicable), and more.*

18. (Jack Stamates) *Will report data be assimilated for other organizations? Will there be a training component?*

    -(Karen) *We plan to maintain coordination and communication with associated organizations and observation networks. Training is a possibility we are considering for the future.*

19. (Margaret Miller) *A crucial differentiator, somewhere in the report process have a section that gathers information about the reporter to determine whether they are a visitor (and novice to the south Florida ecosystem), or someone with significant experience in the region.*

    -(Karen) *Yes, and something we do include in the reporting process to an extent.*

Presentation: NOAA NMFS Fisheries Liaison Update *– Kurtis Gregg, NOAA NMFS*

- In progress: a synthesis of effects of LBSP on fisheries habitats
    - Much research done on LBSP effects on reefs, but not fisheries habitat
    - Synthesis of worldwide research, will compare multiple regions including SEFCRI area
    - Working draft already produced, full draft to be ready by next TAC meeting
- Report focus on reefs and back reef systems (anything landward of reef crest)
    - For SEFL: marine and estuarine habitat landward of the outer (third) reef tract
    - Example topics of investigation: LBSP effects on each habitat region and interconnectivity between habitats

- Report built upon previous LBSP work done in south Florida (from TAC members, LAS projects, and other sources)
- Involvement with other LBSP projects, such as SFWMD and TMDL leadership
- Participation in Lake Worth Lagoon Initiative:
    - Broaden knowledge of how to address LBSP in watershed-scale planning
    - A good model for SEFCRI to utilize and/or participate in to inject reef conservation perspective
- South Florida Everglades Planning Project
    - An Army Corps project; synthesized NOAA (and various sub organizations) reviews which "have a voice" in the planning of the project.
- NOAA-CRCP internal funding; applying for funding of watershed-scale planning for LBSP reduction projects
    - "Inlet Perspective"
        - What are relative strengths of LBSP effects on marine habitat from each inlet in the region?
        - What are the contributing areas for each inlet?
        - What are priorities at each inlet that can produce measureable improvements
        - Will help narrow the scale of focus for LBSP reduction

<u>Questions and Comments (NOAA-NMFS)</u>:

1. (Dan Clark) *Glad to hear we are reaching out to Everglades operations, since our habitats are interconnected with theirs.*

   -(Kurtis) *Yes, will produce a good exchange of ideas and project development/focus.*

2. (Gene Shinn) *Does this region have aerial mosquito spraying as is done in the FL Keys? Might be a good source of LBSP to investigate.*

   -(Kurtis) *It is an LBSP pollutant category (as part of a "biocides group). SFWMD does have water quality monitoring for herbicides and pesticides, etc.*

3. (Dan Clark) *What about siltation and sedimentation from beach fill? Included as an LBSP category in report?*

   -(Kurtis) *Sedimentation is considered LBSP, but will not be included in review because it is a different focus (coastal construction).*

- (Katharine Tzadik) *In the future (after SEFCRI restructuring) those kinds of related issues will no longer be treated separately.*

Discussion: White Paper/Quick Guide for Policy Makers *– Katharine Tzadik, FDEP CRCP*

- "Quick Guide" completed (4 pages), layout to be sent for approval and review soon
- To complete "White Paper"
    - Suggested that the format would follow that same paper as the Quick Guide
    - Many figures, diagrams, fact-searching, etc. still needs to be done
    - Suggested that an intern be taken on to complete these tasks
- Need to determine:
    - Intended audience (same for Quick Guide and White Paper?)
    - Distribution plan (and timeframe)
- Important intern qualities/duties (as discussed by TAC members):
    - Adequate writing skills
    - Ability to get information from county/state employees who can be resistant to answering correspondence
    - Will need a semi-final draft (for TAC review) by November TAC meeting (ideally)

(LUNCH BREAK)

MEETING SUMMARY – DAY ONE: THURSDAY, MAY 31ST 2012 (AFTERNOON)

Presentation: The Nitrogen Isotopic Composition of Benthic Algae: An Update on the Mechanism and Meaning – *Peter Swart, University of Miami RSMAS*

- Nitrogen Isotopes:
  - "The DNA of sewage" – heavy, or more positive isotopic values of nitrogen allow for tracking of sewage-contributed nutrients
  - Isotopes give information on the nature of transformation processes
- **Summary**:
  - Fractionation of heavy isotopic nitrogen during assimilation is minimal at concentrations common to the marine environment.
  - Fractionation may even be reversed at low concentrations, which could lead to more negative values in algae at low [N], and enrichment of the residual nitrogen pool.
  - At higher DIN, significant fractionation occurs during assimilation, which also leads to enrichment of original DIN.
- Isotopic value ranges: interested in 0 to 10 parts-per-thousand for $\partial^{15}N$ (0 = atmospheric)
  - Different organisms of varying trophic levels possess signature combinations of $\partial^{15}N$ and $\partial^{13}C$. Essentially, higher $\partial^{15}N$ values indicate higher trophic levels.
  - An assemblage of organisms can be grouped via these signatures.
  - On a graph, thresholds for $\partial^{15}N$ and $\partial^{13}C$ can be used to help delineate the sources of nutrients for organisms with known isotopic signatures.
- Algal isotopic investigation:
  - Algae species have a signature range (from 0 to ~6 $\partial^{15}N$ per mille)
  - Study aim to see if useful information can be gleaned from algal isotopic signatures - to better explain what processes and factors influence algal $\partial^{15}N$
- **The Project**

- Examined the growth and behavior of $^{15}N/^{14}N$ in three species of macroalgae (*Gracillaria*, *Agardhiella*, and *Ulva*) under elevated DIN (2-500 µM)
- Two treatments: "free drift" and "constant"
- Measured $\partial^{15}N$ in algae and DIN of the water.

- **Protocol – Free Drift**
  - Take algae from large scale culture, grow in sterilized seawater for 2 weeks
  - Weigh initial amount of algae
  - Add seawater with appropriate concentration nutrients (DIN as NO_3^- or $NH_{3/4+}$), refresh solution every 24 hours
  - Measure concentrations in solution every 24 hours
  - At termination measure wet weight
  - Sample algae/DIN and analyze for stable N isotopes
  - Also let some experiments go for up to 48 hours sampling the DIN every 12 hours
- **Protocol – Syringe**
  - Take algae from large scale culture, grow algae in sterilized seawater for 2 weeks
  - Weigh initial amount of algae
  - Add seawater with appropriate concentration nutrients
  - Estimate addition rate (DIN as NO_3^- or $NH_{3/4+}$) using Free Drift
  - Measure concentrations in solutions every 24 hours
  - Adjust addition rate to stabilize concentrations around 2 µM
  - Measure $d^{15}N$ at end of experiment on algae
- **Nitrogen Cycling and $\partial^{15}N$ change**:
  - When N is processed between various states in the N-cycle (fixation, nitrification, denitrification, etc.), the isotopic ratio of $^{14}N/^{15}N$ changes.
  - Degree of isotopic change denoted by an alpha value - "α"
  - α-value represents the change (per mille) of N isotopic ratio for a process (i.e. for NH_4^+ - NO_2^-, α = 1.020, meaning that the process results in a change of -20‰)

- Manuscript to be submitted to *Geochimica Cosmochimica Acta*
- For algae grown, plotting equation (below) of changing isotopic composition over time can back-produce water DIN values, or can provide fractionation factor of algal N from growth

$$\partial t = \partial i - \varepsilon \ln\left(NO_3^- - (t) / NO_3^- - (i)\right)$$

^^^for above, epsilon = fractionation factor

- **Results**:
  - Ratio of algal assimilation of ∂^{15}N dependent upon DIN concentration
  - At high [DIN], diffusion into and out of the cell favors lighter isotopes; remaining DIN is enriched ($\alpha = 1.014$)
  - At low [DIN], active transport does not discriminate between types of N ($\alpha \approx 1$)
- **Implications:**
  - Fractionation of the heavy isotope of N during assimilation is minimal at concentrations typically encountered in the marine environment.
  - At concentrations in the marine environment (~ 1 µM) the ∂^{15}N of the DIN is the same as that in algae.
  - At higher DIN concentrations significant fractionation during assimilation takes place; leads to an enrichment in the DIN source regardless of the source of the original DIN.
- **Future Work:**
  - What is the fractionation at concentrations of less than 1 µM?
  - What is fractionation in axenic cultures of macroalgae? (without bacterial metabolic interaction)

<u>Questions and Comments (Isotopic Nitrogen Composition of Benthic Algae)</u>:

1. (Joe Boyer) *Ulva spp. algae grow worldwide, possible to analyze other works that report DIN and ∂^{15}N in Ulva and back-calculate fractionation values? Could be used to support/reject notion that positive ratios directly relate to sewage effluent.*

   -(Peter) *Unsure if that could be done, especially in light of varying measurement methods, experimental protocols, etc.*

   -(Vladimir Kosmynin) *Using Ulva would widen the geographic application.*

2. (Doug Seba, referring to topographical $\partial^{15}N$ chart) *Previous projects in Black Point (landfill) area showed a similar runoff dispersal pattern to the $\partial^{15}N$ distribution of your chart.*

   -(Joe Boyer) *Proximity of enriched DIN suggests that landfill runoff is the greater contributor of heavy nitrogen (compared to agriculture in the region).*

   -(Peter) *The flux of landfill LBSP would have to be investigated to calculate its contribution.*

   -(Joe) *Have groundwater samples been taken in that area?*

   -(Peter) *Have a well off Turkey Point (south of Black Point landfill), though it is used for unrelated survey efforts.*

   -(Gene Shinn) *Used to have a well by the south side of the landfill; it tested positive for a variety of pollutants from pesticides to plasticizers.*

3. (Piero Gardinali) *Can you isolate ammonia from sewage, and perform a growth study with those nutrients comparing to growth from fertilizer-sourced N?*

   -(Peter) *We used heavy N ammonia (+3 weight). Heavier (like that found in sewage) is available, but don't suspect that it would produce different results.*

Presentation: Broward County Monitoring Update *– Nancy Craig, Broward County EPD*

- Investigation (ongoing, began in 2006): "Are land-based pollutants being introduced into the near shore reef environment through the Port Everglades Inlet?
- Methods and Measurements:
  - Four stations sampled on a monthly basis. Samples are collected at the surface and ~1 m off the bottom on an outgoing tide.
  - Water column parameters: TN/TP, TDN/TDP, NOx, NO3, NO2, NH4, SRP, TOC, DOC, silica, chlorophyll-a, (as of 1/2009), turbidity and total iron (as of 9/2011).
  - YSI Parameters: temperature, depth, dissolved oxygen, specific conductivity, pH, chlorophyll-a and turbidity.
  - Secchi depth
- **Findings:**
  - Dissolved O_2 – no significant difference between bottom and surface waters

- TN – some variability but no clear, consistent trends between surface/bottom or between sites
- TP – 2006 spike observed, regularly higher at surface by Port
- DIN – Port much more variable than other sites
- Silica – significant effluent from Port; orders of magnitude higher than offshore; no temporal trend
- Chlorophyll-a – spike in Port-adjacent surface waters
- Total Fe – added Fall 2011, no clear trends yet determined

o **Summary:**

- Data suggest that water exiting through Port has elevated nutrient and [chl-a] concentrations compared to offshore. [Fe] variable.
- Stations (OS1 and OS2) bracketing the Port tended to have higher concentrations of certain nutrients compared to OS3. The station farthest north suggested potential for transport of less saline, higher nutrient surface water along the coast. Extent to which less saline, higher nutrient surface waters mix down to the reef community is unclear and appears to vary by nutrient.

Questions and Comments (Broward County Monitoring):

1. (Joe Boyer) *Silicate results interesting, indicative of Everglades periphyton From sawgrass communities, not an indicative of mangroves as sometimes thought; can almost be used as a freshwater tracer.*
2. (Jack Stamates) *When sampling Port Inlet, always at same tidal phase?*

   -(Nancy) *Sampled during middle four hours of an outgoing tide.*
3. (Observer 1) *Any correlations between nutrient variation and rainfall between seasons/years?*

   -(Nancy) *Parameter value changes sometimes coincide, but also influenced by the district controlling outflow. The direction of Port effluent (N or S) also contributes to measurement variability.*
4. (Doug Seba) *Keeping Fe variability in mind, you might try to match Fe increases with prior African dust events.*
5. (Observer 2) *Saw similar 2006 nutrient spikes in Lake Worth Lagoon, likely linked to drawing down Lake Okeechobee after strong hurricane season.*
6. (Joe Boyer) *Interesting that nutrient concentrations measured in inlets differ narrowly, while offshore variation is greater.*

Presentation: Update –Quantify the flux of pollutants exiting the Port Everglades, Hillsboro and Boca Inlets and entering the coastal waters *– Jack Stamates, NOAA AOML*

- In brief: it is known that anthropogenic materials are reaching the coastal ocean through inlets. This project aims to determine the fate of materials exiting the Port Everglades Inlet.
- Water samples from subset of FACE sites around Port Everglades.
- Goal to characterize inlet waters as they travel offshore and dilute.
- **Observations:**
    - For some monitoring periods, heightened nutrient values and low temperatures offshore suggest the influence of upwelling
    - N+N, P and Si appear to reside (and dilute) mainly in the surface layer.
    - The surface values seen at HW13 (3.17km from near-center of Port Everglades) are close to those seen offshore at HW9, implying that these nutrients have diluted to near background levels.
    - If the levels at HW13 and HW9 are indicative of background levels, levels at HW14 (near-center of Port) are typically five times higher than background.
- Current work:
    - Have begun performing same nutrient analyses for Hillsboro and Boca Inlets; will also be analyzing flows.
    - Currently identifying best application of ADCP at Hillsboro and Boca Inlets.
    - Sampling will also be performed more regularly than before to produce a higher resolution dataset of inlet nutrient levels over time.
    - Water flow sampling:
        - Data from Broward outfall-adjacent ADCP (deep), and an inshore ADCP show inshore currents often have a southern direction more often that offshore (at least 37% of the time for the period analyzed).
        - Above a product of Gulf Stream northward flow and inshore eddies
    - Water temperature:

- ADCP thermistors documented temperature drops in the offshore that may correspond to upwelling events.
- Water sampling during these events had increased nutrient concentrations as well, further supporting upwelling.

Questions and Comments (LBSP Project 29):

1. (Jack Stamates, asking TAC) *Do we know the net direction of flow within the intracoastal waterway is?*

   -(Valerie Paul) *It's north for the Indian River Lagoon.*

2. (Alexander Soloviev, concerning inshore flow) *Averaging over monthly and seasonal cycles, inshore flow direction is often northward in summer and southward in winter.*

   -(Valerie Paul) *How much of that is wind-driven?*

   -(Alex) *Much; also there's a sea level difference between Miami and northern regions (maybe wind-driven too) producing hydrostatic differences.*

3. (Piero Gardinali) *With the fixed ADCP, possible to use average duration of upwelling cycles, and then sample water during an upwelling event?*

   -(Jack) *ADCP data aren't live, are retrieved from the device at intervals. Having advanced warning would allow for sampling during upwelling events.*

   -(Katharine Tzadik) *SEAFAN "thermocline" reports from divers could possibly aide in this.*

Presentation: Living on the Ledge: Assessment of Coral Stressors on St. Lucie Reef *– Jeff Beal, FWC and Joshua Voss, HBOI-FAU*

A. **St. Lucie Reef: characterization, terrestrial influence, and summary of coral stresses** (Jeff Beal)
   - St. Lucie Reef (SLR) – corals living at edge of habitat range face many stressors; considered northern-most reef in Florida
   - Useful for investigations of stress in corals
   - SLR inhabitants:
     - >250 species of fishes
     - 21 species of sponges
     - 24 species of hard corals including 2 fire corals
     - 13 species of soft corals

        - 17 species of crustaceans
        - 45 other inverts, large population of *Diadema*
        - 23 species of algae
    - St. Lucie Estuary linked to the Everglades, watershed composed of many Everglades canal systems in addition to Okeechobee
    - Agriculture (runoff from northern regions brought in by St. Lucie River) a big LBSP component for St. Lucie Estuary
    - Sustained Lake Okeechobee discharges following 2004 and 2005 hurricanes resulted in SLR coral bleaching event
        - First documented bleaching event at SLR
        - In February – likely note temperature-related)
        - All hard coral species affected, *Montastrea cavernosa* impacted most
        - Majority of individuals recovered
    - Part of SECREMP
        - Less, but comparable percent coral cover
        - Similar number of hard coral species
        - Half of monitored colonies decreasing in size from 2006 – 2011
    - Salinity fluctuations also a major stressor – during wet season, SL inlet can be as low as 1psu (as low as 8psu during dry season)
    - Turbidity another stressor – secchi depth can be as low as 0.75m
    - Three monitored SLR sites, *Diploria clivosa* at all 3, *Montastrea cavernosa* at southern and central sites
    - Summary of effects of blackwater events on SLR corals:
        - Reduction of light (PAR; color; turbidity; POM; DOM)
        - Osmotic shock (salinity; minerals)
        - Excess nutrients (N; P; DOC; DO)
        - Pollutants (microbes; metals; hydrocarbons; pesticides; herbicides)
    - Light attenuation at SLR - winter blackwater events can restrict light strength reaching the reef by as much as ~75%.

B. **Coral Molecular Health Diagnostics and Reproduction Assessment** (Joshua Voss)
    - Subjects investigated:

- Coral/zooxanthellae gene expression (*M. cavernosa*)
- Coral mucus bacterial LH-PCR profiling (*M. cavernosa, D. clivosa*)
- Coral reproductive condition (*M. cavernosa, D. clivosa*)
- Samplings August 13 and October 12, 2010

- **Mucus Bacterial Composition**
  - Significant differences in mucus bacterial communities between sampling events
  - Time much more influential than site; was expecting gradient along sites with distance from inlet
  - Lack of (inferred) stress gradient indicative of either inlet effluent affecting all sites equally or not at all
  - Time-based bacterial shifts on SLR corals greater than distance-based differences between corals of Florida and Curacao
  - SLR *D. clivosa* bacteria communities completely distinct from anywhere else in Caribbean
  - SLR considered marginal habitat for persistence of hard coral species, may also be marginal habitat for their associated bacterial communities
- **Gene Expression in *M. cavernosa***
  - In August – a very significant difference between central and south sites
  - Strong differences in genes related to metabolic function and stress-related genes
  - At central site, many normal metabolic functions are depressed
  - Central site exhibited more temporal difference than south site
  - 29 of 150 investigated genes showed significant differences
  - Site differences > time differences (contrast to bacterial differences seen in *D. clivosa*)
  - South site in August: elevated levels of cell metabolism, tissue repair, stress-related genes (cf. central)
  - Central site in October showed elevated levels of cell metabolism, stress-related genes (cf. August)
  - Elevated levels of xenobiotic-related genes observed

- **Reproductive Condition**
    - Only found one colony with gametes (of 20)
    - No spawning has been observed at SLR
    - 2009 – three *S. siderea* were found to contain developed gametes
    - SLR likely a sink population for coral larvae
    - Central site showed significantly low levels of vitellogenin (reproductive gene, stress indicator)
- **Conclusions**:
    - Estuarine discharge events from SLR/Lake Okeechobee reduce light levels dramatically during high flow periods
    - Tidal stage influences available light
    - Bacterial communities on *Diploria clivosa* differ over time, but not site
    - *Montastraea cavernosa* bacterial DNA was degraded…is there more nuclease activity at SLR?
    - *M. cavernosa* gene expression at SLR is similar to corals exposed to sewage outfalls in south FL
    - SLR corals might be highly adapted to a stressful environment containing xenobiotics
    - New toxicant microarray developed
    - Expanding the project to include reef salinity and nutrient effects on benthic community ecology
    - Assessing optical water quality and photophysiology
    - Continued assessment of wound recovery

Questions and Comments (Coral Stressors on St. Lucie Reef):

1. (Joe Boyer) *Does the magnitude of coral-associated bacteria shifts decrease with latitude? Less dramatic seasonal changes may lessen the extent of bacterial shift.*

   -(Joshua) *Spatial differences usually drive assemblage differences rather than temporal, SLR the only location where temporal differences were more influential than spatial.*

2. (Margaret Miller) *If light limitation is so strong, coral colony energy budget may be an influencing factor.*

   -(Joshua) *Zooxanthellae (including clade determination) and chlorophyll abundance to be investigated this summer.*

-(Margaret) *Could also try feeding corals to supplement their energy budgets, then perform same gene expression analyses to see if anything changes.*

-(Joshua) *Would expect M. cavernosa to feed better because of its physiology.*

-(Judy Lang) *If M. cavernosa is better at heterotrophic feeding, interesting that D. clivosa is growing better on SLR.*

-(Joshua) *Constant sediment inundation likely a feeding inhibitor.*

3. (Joe Boyer) *Performed toxicant arrays?*

   -(Joshua) *Doing dose responses of oil and dispersants, temperature stress, and pH stress. Selected specific genes (function already known) to track distinct metabolic pathways.*

4. (Joe Lopez) *Concerning issues with DNA degradation, any issues with DNA sampled from water, sediment, etc?*

   -(Joshua) *All other DNA samplings were ok; didn't take samples from water (planned for future*).

5. (Vladimir Kosmynin) *D. clivosa has a tendency to shrink and regrow, as it naturally inhabits shallow areas with lots of sedimentation. This characteristic a contributor to why it inhabits SLR better than other coral species. What is the distance between sites?*

   -(Joshua) *All the D. clivosa colonies are thin, plating colonies; most have receded at the edges. The distance between the northern and southern-most sites is ~2.4 miles. We will be adding an additional north site, increasing this range to 3 miles.*

   -(Vladimir) *Found correlation between your results and proximity to the inlet and/or water depth?*

   -(Joshua) *Hoping to expand to incorporate a way to track effluent. The installed salinity meters may be the easiest way to do this (decreased salinity correlating to effluent).*

6. (Gene Shinn) *These corals which are very thin (and not reef-building)… how old are they?*

   -(Jeff) *One of the larger Diploria was dated to 1894.*

   -(Joshua) *The core was approximately 0.5m in depth.*

7. (Esther Peters) *How did you sample the coral bacterial communities?*

   -(Joshua) *By syringe.*

8. (Vladimir Kosmynin) *Reproduction may vary annually with how good a year's weather is.*

   -(Joshua) *For how often this reef is visited by divers, the lack of spawning reports suggests that spawning is nonexistent or nearly so.*

(BREAK)

Public Comment – Day 1

I. Dan Clark – Cry of the Water

A. Outfall legislation

- Bills governing outfalls still may be rolled back; the notion didn't pass this year, but expect it to return
- DEMA in support of rolling back outfall legislation… DEMA support possibly an exchange for paid convention space at Broward Convention Center

B. Lauderdale Beach Re-nourishment (Segment 2)

- Not dredged, current plan for 2 years of truck-hauled sand
- Want an EIS for this project
- New bill passed – "Beach Bill" changes rules for how these projects are challenged and reviewed; in effect 7/1/12; expecting truck haul application to be submitted soon after new bill goes into effect

C. TAC White Paper – could really use that type a product for support at legislative sessions

D. Iron – a beach project observation… a lot of fine black sediments settle out from sands. With all the talk about the effects of iron in coastal waters, what does the TAC think about this?

<u>Questions and Comments (Public Comment Day I):</u>

1. (Joseph Boyer, in response to black sediments in beach sands) *The black sediment is likely iron sulfide, not very soluble. If it's being created at the site, that means there's soluble iron there.*

   -(Dan Clark) *The source sands for these projects do have the black fines in them.*

   -(Vladimir Kosmynin) *Could also be accessory heavy minerals, which are less likely to be iron.*

-(Dan) *A positive note, have heard that re-nourishment source sands will be washed more thoroughly. As SEFCRI is restructured, could possibly approach these types of projects as MICCI on grounds that they cause losses in the nearshore habitat.*

-(Gene Shinn) *Bahamian oolite sands may be a preferred (cleaner) source for these projects.*

-(Dan) *Early opposition to sand importing from the dredging lobby; now that it will be truck haul, importing may be more attractive. Also could seek public support from condo owners in the region, who likely don't want to see/hear two years of heavy trucking.*

2. (Gene Shinn) *What's the latest on the Port Everglades channel dredging? How Miami settled with environmental regulators/lobbyists may help us in pushing for mitigation for PE dredging.*

   -(Joanna Walczak) *Believe that the PE dredging project is awaiting the final draft of the EIS from the Army Corps of Engineers.*

3. (Stephanie Clark, referring to LBSP Project 29 presentation) *Are the temperature logger data used to monitor water temps accessible?*

   -(Katharine Tzadik) *Digital open access on collected temperature logger data from the FL reef tract is in the works.*

DAY ONE – ADJOURN

MEETING SUMMARY – DAY TWO: FRIDAY, JUNE 1ST 2012

Meeting Guidelines

Katharine Tzadik reviewed meeting agenda and participation guidelines, and what topics would be focused upon for day two.

Presentation: TAC Role within SEFCRI – *Katharine Tzadik – FDEP*

- Recap – SEFCRI Team Meeting on Structure and Function:
  - Combine 4 Focus Area Teams (member expertise no longer confined to individual areas)
  - Information disconnect between focus areas
  - Clearly define roles and responsibilities of Members & FDEP CRCP Staff
  - Expand role of the Technical Advisory Committee (TAC) beyond just LBSP SEFCRI Charter
  - Reviewed in SEFCRI Team Survey: roles and responsibilities, term limits, SEFCRI structure, TAC structure
  - 53 current SEFCRI team members; term limits approved (with option to reapply)
  - Still to decide: how to allocate seats, representation by vice chairs (possibly multiple vice chairs)
- Applications to TAC (changes in structure and function)
  - Established minimum participation requirements for TAC members
    - Attend (in person or teleconference) a majority of team meetings
    - Respond to a majority of correspondences
    - Be a resource for identifying funding mechanisms for LAS implementation
  - TAC will oversee 4 SEFCRI focus areas
  - New members can be solicited when new LAS projects are developed
  - Should there be a TAC Organizational Committee?
- TAC Goals and Objectives: *"To collect, review and assess data, and identify data gaps, conduct technical workshops, and advise SEFCRI Team. Assess existing data*

and make recommendations as to what additional information is necessary/required and prioritize data gaps."

- Future Tasks for the TAC – Bio-geographical assessment for the Management Option Identification Process.
- Future Expectations:
  - New Revised SEFCRI Charter
  - Combine fall meeting with the SEFCRI Team Meeting (September)
  - Development of new LAS projects
  - Management Option Identification Process

Questions and Comments (TAC Role):

1. (Joe Boyer, concerning SEFCRI size) *Could help limit SEFCRI team member count by having role-specific seats (i.e. fishing, diving, etc.).*

   -(Katharine) *That would also help maintain balance between industry representatives.*

2. (Joe Boyer) *Is there now a new SEFCRI charter?*

   -(Katharine) *Not yet, SEFCRI survey addressed key items that will be included in new charter.*

   -(Joe) *Are there bylaws?*

   -(Jamie Monty) *In past, charter has served as the bylaws, updated charter still dependent on some outstanding questions (such as balancing team representatives).*

   -(Judy Lang) *When is the new charter due?*

   -(Katharine) *In time for the September meeting.*

   -(Richard Dodge) *How will the new charter be approved?*

   -(Jamie) *Stipulated by existing charter, SEFCRI Team must vote on changes.*

   -(Katharine) *TAC will not vote on charter, but section pertaining to "advisory bodies" affects the TAC.*

3. (Judy Lang) *SEFCRI voted to have vice chairs?*

   -(Katharine) *Yes. A suggestion was to have six members (local, state, federal, NGO, academic, other).*

   -(Margaret Miller) *An analogue to old 'navigator' positions and roles.*

   -(Jamie Monty) *Vice chairs would assist SEFCRI project teams (helping manage SEFCRI and plan meetings vs. planning scopes of work for LAS projects, etc.) – both sets serving different functions.*

-(Katharine) *Things should become easier to manage now that LAS project direction is being focused.*

4. (Joe Boyer) *How often does the SEFCRI meet?*

   -(Katharine) *Aim is to make team meetings annual.*

5. (Dan Clark) *Still working towards management plans? If so, important to return to having more meetings concentrating on this, including public involvement (need buy-in from stakeholders).*

   -(Katharine) *Agreed.*

6. (Katharine, concerning TAC expansion to cover all 4 SEFCRI areas) *Already a group of 24, don't want to quadruple in size. Will get a sense of existing TAC member expertise to identify knowledge gaps. Currently hard to do assess before new LAS are developed; will wait to solicit new members for now.*

   -(Joe Boyer) *Might as well come up with a categorical list of existing and lacking expertise now (i.e. fisheries) to identify what we may need later.*

   -(Margaret Miller) *Engineering also a TAC knowledge gap.*

   -(Vladimir Kosmynin) *A reminder, when TAC was created it was determined that we would focus on what local reefs are getting from LBSP. We should refocus on synthesizing our project products before moving on.*

   → (Katharine) *Can be an element of what TAC will do; specific products will help when lobbying to keep a TAC. Changing the meeting structure of TAC (e.g. limiting amount of time spent of project updates) could make it more efficient and productive.*

   → (Judy Lang) *Maybe TAC could assist LAS projects perform better; currently only hear the end product.*

   -(Vladimir) *The TAC could provide new information/knowledge developments to running LAS projects.*

7. (Katharine, concerning TAC Organizational Committee) *Is the role of TAC O.C. still required?*

   -(Vladimir Kosmynin) *The TAC O.C. was organized after the creation of the TAC; partly to gather individuals of the same expertise but with differing opinions of select topics.*

   -(Margaret Miller) *TAC O.C. members also on SEFCRI Team, and served as a bridge between broader SEFCRI and TAC.*

   -(Gene Shinn) *We don't have the same resources we had then, though.*

   -(Katharine) *Agreed, can we merit a distinction between a TAC and a TAC O.C.?*

-(Margaret) *With the impending SEFCRI integration, separate TAC O.C. seems unmerited.*

8. (Margaret Miller) *An important distinction to still consider… whether TAC members can serve as a subject expert because of job description limitations.*

   -(Katharine) *Something we could write into the new charter – whether an individual chooses to represent themselves or their agency.*

   -(Jamie Monty) *SEFCRI is meant for people to represent agencies/groups while TAC is meant for members to serve only as individuals of expertise.*

   -(Katharine) *An important distinction to make clear in the restructuring.*

   -(Vladimir Kosmynin) *The above a good means to dissolve the TAC O.C., put them in SEFCRI if they're to represent an organization, or into the TAC if they're to represent themselves. Can limit membership based upon geographic limits, as well as offer the chance for people to leave to simplify the participants.*

9. (David Gilliam) *To clarify: (1) the process for selecting new TAC members is not finished, (2) the continuation of a TAC O.C. is undetermined, so (3) why worry now about who will be on the new TAC?*

   -(Katharine) *On SEFCRI survey, mixed responses on whether to keep current TAC or restart anew (current members would still be allowed to apply).*

   -(James Byrne) *The SEFCRI Team needs to decide what its topic priorities are, and organize the TAC around that. Depending on the new focus of SEFCRI, TAC composition could change markedly.*

   -(David) *Right, can't maintain the same TAC if it is to oversee all four SEFCRI areas.*

10. (Dan Clark) *Past notion of including beaches, dunes, and related BMPs… don't think we have the capability with current TAC. Early LAS priorities were to identify LBSP, still haven't adequately done that (i.e. landfill leachate).*

    -(Joe Boyer) *TAC only serves to recommend what projects should be done, not conduct the research.*

    -(Dan) *We still haven't done the first step we wanted, caution against broadening scope.*

    -(Judy Lang) *Simplifying SEFCRI and LAS will help to bring back focus, possibly including a return to the basics.*

    -(Vladimir Kosmynin) *Early on these were many LAS projects and lots of products, maybe need to hire a group to synthesize what we have thus far.*

    -(Jamie Monty) *Still value in TAC to discuss 'mass pollution budget' to steer DEP in what it may do with funds.*

    -(Katharine Tzadik) *'Mass pollution budget' discussion – an example priority topic/future meeting objective in a restructured SEFCRI.*

11. (Jamie Monty, concerning Dan Clark's caution on broadening TAC scope) *Though SEFCRI still wants TAC to cover all four areas, doesn't mean we'll be eliminating TAC LBSP expertise. Will apply and combine expertise in all four areas.*

    -(Dan Clark) *What about multiple TACs to maintain focus in each SEFCRI area?*

    -(Stephanie Clark) *In answering SEFCRI survey, envisioned still having LBSP TAC, but bringing other projects to them.*

12. (James Byrne) *The obvious role for a TAC: to move SEFCRI forward on whatever direction is chosen; could be LBSP, could be other topics.*

    -(Vladimir Kosmynin) *TAC also supposed to be a jury on a topic such as a proposed new outfall; TAC would discuss and provide recommendations / expert opinion. We currently do discuss these things, but do nothing more.*

    -(Joe Boyer) *SEFCRI group could use an organizing vision, such as the MARES central model presented yesterday.*

    -(Esther Peters) *If trying to provide risk assessment, need stress models, etc. such as those in MARES. Could use LAS products to specify what exactly contributes to different stressors, and then convey this information to risk managers.*

    -(Vladimir) *Relating to MARES, support for the expansion of Port Everglades includes socioeconomic benefits. Examples include how much cheaper 'product X' will be (i.e. cement), which results in decreased expenses for 'industry Y' (i.e. construction) which correlates to 'benefit Z' (more development and job creation). A bit beyond our scope, but affects our area nonetheless. It is very clear that we are in a time of business-oriented direction.*

13. (James Byrne) *It is difficult to move away from established patterns; for TAC, this has been developing LAS projects. We are at the junction of whether or not we have enough information to continue on and away from research to implementation (which would be the most useful).*

    -(Vladimir Kosmynin) *Ideally our products would influence governance.*

    -(Margaret Miller) *In a transition from science to policy, most of TAC not capable.*

    -(Joe Boyer) *Can SEFCRI make resolutions? FL Keys SAC (Sanctuary Advisory Council) operates around this by making agency representatives non-voting members on specific issues.*

    -(James) *A process that works well in SAC-TAC: take issues and make recommendations on what SAC should do. A good role for a body of people (future TAC) with knowledge of a wide range of subjects, that can offer their independent views on topics, and make recommendations to acting bodies (SEFCRI).*

    -(Joe) *Difficulty with adopting this for SEFCRI in that there is agency representation.*

    -(James) *Ideally the management alternatives process will fix this.*

14. (Margaret Miller, in relation to 'TAC Goals and Objectives') *The cyclical involvement is confusing, and muddles roles and objectives. For TAC to advise SEFCRI, they need to specifically ask for advice.*

15. (Piero Gardinali) *So Project 19 (identify research priorities) and 21 (conduct technical workshops, etc. based upon 19) are done, and from that project 20 is implemented (conduct new projects based upon priorities topics produced by 19 and 21)… we could continue to do this indefinitely with no outcome. At some point, need SEFCRI to question the TAC on how to move forward on issues.*

16. (Katharine Tzadik) *To help with future funding, currently a project in the works (a bio-geographical assessment) to synthesize all the data layers we have for our area, and illustrate the status of reef regions with relation to prominent threats. Action to tackle priority threats something that could focus and involve TAC (recommend course of action, etc.).*

17. (Dan Clark) *Why not routinely hold SEFCRI meetings shortly before TAC meetings? Could then forward SEFCRI questions to TAC.*

    -(Stephanie Clark) *At SEFCRI meetings, never hear "what should be brought to the TAC?" Directly asking this at meetings would promote the process we're after.*

(BREAK)

TAC Administrative Business

Katharine Tzadik, leading TAC discussion, announced upcoming events, meetings, reports, public sessions, etc. which involved TAC members or would benefit from TAC participation. Examples include:

- Florida Keys National Marine Sanctuary public scoping - a survey of the public on aspects of the FKNMS which may lead to changes in sanctuary regulation (boundaries, zoning, etc.)
- Public ESA workshop at NSU Oceanographic covering the proposed listing of 82 coral species
- SEFCRI Management Options – embark on a new endeavor to identify management options of SEFL coastal resources

- Since last TAC: have set up the process planning team to figure out logistics of implementing SEFCRI public meetings / stakeholder working groups
- Taking TAC recommendation to hold public meetings first, and disseminate LAS products (status and risks of reef regions, etc.)

o Outfall legislation – high public interest and visibility… leading to public comment day 2.

Public Comment – Day 2

I. Dan Clark – Cry of the Water

A. Outfall Legislation - need supporting material to lobby against rollbacks – could be an official TAC recommendation, the White Paper…

B. Illegal Beach Discharges and Spillways

- Numerous illegal discharges in beach-adjacent developments, parking lots, etc.
- So many resources are going to be spent on beach re-nourishment, why not invest to protect them from being washed away by rainfall?
- Why not make recommendations to reduce the need for re-nourishment, something we know is detrimental to nearshore habitat?
- Have had many LAS projects and meetings; don't necessarily need to finish a comprehensive, polished document. Simple recommendations on a per-issue basis would be just as helpful.
- In winter in stormy periods, there are no tourists on the beaches, yet beach-rakers operate every morning. Leaving the weed line might also help protect against erosion. An example of something we can do to lessen the need for re-nourishment projects.

C. Beach Management

- A new movement to establish "beach management areas"
- Concept to remove beach management by individual municipalities, make cells between inlets to manage things
- Unfortunately, set up to streamline permits
- Would make things too easy to get permitting for coastal projects (without environmental oversight)
- Overall a good idea, but being done for the wrong reasons

D. Pipe Systems

- Old infrastructure not supporting new construction
- Met with much resistance because of the cost to replace
- Systems so bad, that city of Hollywood can't pursue reuse because so much saltwater enters the system at high tide. And at low tide, sewage is likely seeping out into coastal lands (and then into the nearshore).

II. Stephanie Clark – Cry of the Water

- LBSP 21 – Looking at watershed BMPs, storm water permits, etc.
- Thought that sharing concerns at permitting meetings would work, but lobbyists end up getting development permits out without regard to BMPs
- At a (personally monitored) construction project: debris, pollution, and silt was washed directly into adjacent canal system
- Only after calling DEP were BMPs initiated (turbidity barriers, barricades, etc.). Compliance after two months of calls.
- Mandated BMPs for construction projects are not being followed. Word from the county is that they don't enforce BMPs.

DAY TWO – ADJOURN