Southeast Florida Coral Reef Initiative (SEFCRI)
Land Based Sources of Pollution (LBSP)
Technical Advisory Committee (TAC)
Meeting #15
Report of Proceedings
November 3 - 4, 2011

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 - FIU	X	X
Richard Dodge	NSU Oceanographic Center	X	
Phil Dustan	College of Charleston, South Carolina	X	X
John Fauth	University of Central Florida	X	
Piero Gardinali	Florida International University	X	X
Dale Griffin	United States Geological Survey		
Vladimir Kosmynin	Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems		
Judy Lang		X	X
Brian Lapointe	Harbor Branch Oceanographic Institution		
Erin Lipp	University of Georgia		
Margaret Miller	National Oceanic and Atmospheric Administration	X	X
Valerie Paul	Smithsonian Marine Station at Fort Pierce	X	X
Esther Peters	George Mason University	X	X
Gene Shinn	University of South Florida	X	X
Alexander Soloviev	NSU Oceanographic Center	X	
Peter Swart	University of Miami, Rosenstiel School of Marine and Atmospheric Science		

LBSP TAC ORGANIZATIONAL COMMITTEE

Name	Affiliation	Day 1	Day 2
Ken Banks	Broward County DPEP	X	X
Nancy Craig	Broward County EPD	X	X
Richard Harvey	Environmental Protection Agency		
Linda Brien	Florida Department of Environmental Protection	X	X
James Byrne	The Nature Conservancy	X	X
Cheryl Miller	Coastal-Eco Group		
Joanna Walczak	Florida Department of Environmental Protection - CRCP	X	X
Katharine Tzadik	Florida Department of Environmental Protection	X	X
Julio Jimenez	Florida Department of Environmental Protection	X	X

ADDITIONAL PRESENTERS AND OBSERVERS

Name	Affiliation	Day 1	Day 2
Bill Anderson	FIU	X	
Greg Foster	NSU	X	
Brian Walker	NSUOC – NCRI	X	
Kathryn Patterson Sutherland	Rollins College	X	
Kurtis Gregg	NOAA Fisheries	X	
Zach Ostroff	NSUOC – NCRI	X	X
Sara Thanner	Miami-Dade	X	
Janet Phipps	PBC	X	
Lou Fisher	BC – NRPMD	X	
Becky Mulheron	NSUOC	X	
Dan Clark	Cry of the Water	X	X
Stephanie Clark	Cry of the Water	X	X
Franziska Elner	NSUOC	X	
Jamie Monty	FDEP-CRCP	X	X
Douglas Seba	Academy of Marine Sciences	X	X
Bernhard Riegl	NSUOC	X	

Meeting Summary - Day One: Thursday, November 3rd 2011 (morning)

Meeting Guidelines

Katharine Tzadik, Environmental Project Coordinator for FDEP-CRCP, welcomed all in attendance to the 14th Land Based Sources of Pollution (LBSP) Technical Advisory Committee (TAC) meeting and introduced new FDEP-CRCP team member Julio Jimenez. She reviewed meeting participation guidelines, 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: Update – LBSP Project 8: Miami-Dade Acoustic Mapping – *Greg Foster – NSUOC-NCRI*

- Acoustic survey of Miami-Dade County to create "spatial benthic habitat maps" using dual-frequency (418kHz, 38kHz) single beam survey. Data paired with Brian Walker's habitat mapping project to add additional layers of information.
- Project components completed:
    - 75m E-W, and 150m N-S transects from 3m offshore to 40m depth profile; 6 miles S of Government Cut to N of Haulover. Survey pattern designed to ensure repeatability, higher resolution, and provide data overlap for validation.
    - All acoustic data processed; generated 600,000+ records. Each record equivalent to single point observation. Accuracy may not be equal to in situ measure, but method allows for rapid survey of vast areas.
    - All data depth-normalized; necessary with acoustic sampling vs. LIDAR.
    - All data passed through quality analysis filters (i.e. max depth span between acoustic pings to reduce inaccuracy due to boat rocking); especially important in reef ridge areas.
    - 444 GPS-stamped videos reviewed and classified (according to ~20 factors of substrate and epibiota); used for accuracy assessment, but also useful in providing a "snapshot" of nearshore and reef habitat condition.
- Post Processing (near completion):
    - "Sand" vs. "sand over hard bottom" – delineating deep sand vs. shallower, more ephemeral sand habitat.
    - Acoustic interpretation of LIDAR habitat sampling – combining data profiles with gorgonian habitat classes. Preliminary results show two basic gorgonian classes in Miami-Dade.
- Within habitat classifications (Brian Walker's project), acoustics will be able to provide a "breakdown" of what that habitat consists of. This will be in addition to

gorgonian classifications (based primarily on density and height). Many habitats are showing to be very homogeneous, such as the aggregated patch reef.

- Miami compared to Broward: gorgonian abundance markedly less in Miami; rare to see greater than 10 - 25% "planar cover," something common in Broward and West Palm Beach (WPB). Also, tall gorgonian species (>1m) virtually absent in Miami, but common in WPB (yet to be verified by ground-truthing).
- Final report forthcoming.

Questions and Comments (LBSP Project 8): n/a

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

- **Purpose:** Develop specific projects (engineering/management actions) for designated pollution hot spots, then implement priority engineering/management action.
- Project not yet started, though funding is written into current NOAA-CRCP 2yr grant. No project team has been assembled, no scope of work developed.
- **Proposed:** "Preparing for Watershed Scale Planning and Implementation for the Northern Extension of the Southeast Florida Reef Tract" – to delineate this region (Miami-Dade, Broward, WPB, Martin counties) of the FL reef tract and adjacent coastal lands into "sub-watershed units."
    - Watershed would be broke up via GIA data layers based on characteristics such as: slope, soil "erodibility factor," water quality, etc.
    - Useful to highlight the "hotspots" to concentrate efforts on.
- New team member (added capacity to FDEP CRCP): Kurtis Gregg – Florida Coral Reef Fishery Biologist (NOAA-Fisheries Service)
    - Three primary tasks:
        - Produce a technical document detailing effects of LBSP on estuarine and marine habitats, from which "useable" info material can be made (fact sheets, etc.)
        - SFWMD engagement
        - Project assistance with LBS Project 20/23
- (Kurtis Gregg): SFWMD working with Google Earth© to provide tool for anyone to access some of the district's data layers. Initial information is water use permits; more to be added in future. Planned availability is November, 2011.

Questions and Comments (LBSP Project 20/23):

1. (Phil Dustan) *Last meeting we talked about permitted outfall pipes (wastewater, industrial effluent, etc.) to target. Does that fit within the scope of this?*
    - (Katharine Tzadik) *One in a suite of possible ideas.*
    - (Joanna Walczak) *Looking for a project that directly reduces known impacts.*
    - (Linda Brien) *There are many condo cooling tower discharges, many derelict pipes no longer in use. Stormwater discharges the most numerous. Some but few industrial discharges, which are permitted and must adhere to water quality standards. Might be better to look for unpermitted outfalls that may not meet standards.*
2. (Margaret Miller) *Wasn't there already a watershed planning project conducted within CRCP?*
    - (Katharine Tzadik) *Yes, this is a follow-up. There were large research gaps, though products from previous projects will be incorporated. Goal of new project more than a report; a tool to focus efforts and attention.*
3. (Judy Lang) *In past have mentioned the multitude of nurseries in the region, and questioned what nutrient load they are contributing. This project may help highlight their contribution to watersheds.*
4. (Nancy Craig) *What about the designation process for WBIDs (Water Body Identification Numbers)?*
    - (Katharine Tzadik) *It will be of benefit to include these, especially how they're designated. Hoping to follow similar guidelines.*
5. (Judy Lang) *We'd suspect the Miami River to be one of the "hot spots" potentially identified by this project.*
    - (Joanna Walczak) *Purpose of this project would be to determine what feeds into the river, and from where.*
6. (John Fauth) *Doesn't the Water Management District have these data?*
    - (Katharine Tzadik) *Yes, but not to the extent that includes coral reefs (coverage, specificity). Excited for future relationships to share data and mutually enhance efforts.*
7. (Esther Peters) *Who / what organizational body will be implementing these management actions? How will we determine effectiveness? Monitor water quality?*
    - (Katharine Tzadik) *Determining management success will be included in project design, yes.*

Presentation: Update – LBSP Project 24: Educate and inform stakeholders about LBSP – *Katharine Tzadik – FDEP CRCP*

- **Purpose:** address lack of public awareness regarding land-based sources of pollution and its effect on coral reefs through the development of educational materials.

- **Brochure:** on fertilizer and pesticide use; completed. 20,000 printed, 10,000 distributed (including Spanish versions). Directed primarily at recreational gardeners.
    - http://www.dep.state.fl.us/coastal/programs/coral/reports/LBSP/LBSP_24_Fertilizer.pdf
    - Brochure will be used in GI-BMP (Green Industry Best Management Practices) training program – obligatory for all commercial landscapers Miami-Dade (by 2014).
- **Poster:** on SFL watershed; completed. Planning to design a "teaching pack" for FL teachers in which posters would be included.
    - http://www.dep.state.fl.us/coastal/programs/coral/reports/LBSP/LBSP_24_Watershed.pdf

Questions and Comments (LBSP Project 24):

1. (Phil Dustan) *We might consider putting these materials in airports (high traffic, high visibility). Could also put brochures in airplane seatbacks for FL flights (suggestion from Gene Shinn).*

2. (Judy Lang) *Could also give brochures to realtors to distribute to home buyers.*

Presentation: Update – LBSP Project 32: Using Cyanobacteria and Macroalgae Stable Isotopes as Anthropogenic Point and Non-point Source Nutrient Indicators *– William Anderson – FIU*

- **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.* (*Lyngbya*, though commonly N-fixer, not always).
    - 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.*
- **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.
- **June 2011 sampling:**
    - Mat-forming black *Lyngya* exhibited low $\delta^{15}N$ (more N-fixing).
    - Other species of *Lyngbya* with higher $\delta^{15}N$ may be fixing less than previously thought.
    - Effects on $\delta^{15}N$ 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.
- **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).
    - (Valerie Paul) The species most responsive to dissolved nutrients (most likely to bloom): *L. confervoides.* Would expect *L. confervoides* to be most responsive to nutrient loading.
    - (Valerie Paul) Most interesting: 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).
- One more sampling?

Questions and Comments (LBSP Project 32):

1. (Phil Dustan) *Considered sampling from similar latitude but different location (i.e. Bahamas, where we know LBSP influence is lower)?*
   - (William Anderson) *We have not considered adding that to the project protocol.*
   - (Valerie Paul) *Considering species distribution differences, not likely to see same species in Bahamas; at least in sufficient quantity.*
2. (Margaret Miller) *Where were the algae collected from?*
   - (Valerie Paul) *From the Port Everglades site.*
   - (Margaret Miller) *What might the determining factor(s) be if it isn't nutrients?*
   - (Valerie Paul) *Could be a major influence by trace nutrients (e.g. iron, molybdenum). Data suggests there's some other influence. Also looking at stable isotope data (already collected).*
3. (Phil Dustan) *Have you done in situ growth measurements?*
   - (Valerie Paul) *Have not, many associated difficulties. Would need to cage specimens to prevent herbivory, but then would be influencing environmental factors (light, water movement).*
4. (Dan Clark) *Where was the control water collected from if it was so high in nutrients?*
   - (Valerie Paul) *Traveled 2-3 miles offshore in order to escape anthropogenic influence, may have collected from a nutrient rich upwelling. Shows that the nutrient environment in our area is very complex.*
5. (Gene Shinn) *Has African dust been investigated as a nutrient source for these species?*
   - (Valerie Paul) *African dust nutrients likely assimilated immediately by water column organisms before it could reach benthic Lyngbya spp.*
   - (Margaret Miller) *Possible that a pulse could overwhelm that absorptive capacity.*

Presentation: Spatial analyses of benthic habitats to define coral reef ecosystem regions and potential biogeographic boundaries along a latitudinal gradient *– Brian Walker – NSUOC*

- **Purpose:** To look at habitat maps in a regional context to see if sub-regions could be defined by their morphologies. Current regional descriptors inadequate.
- County boundaries most widely used. However:
  - Not intended for habitat delineation.

- Political, have no ecological basis.
- Habitats are not homogeneous throughout individual counties.

- "Biogeography" - The study of the distribution of species, genera, and ecosystems in space and through geological or evolutionary time.
- Latitudinal Gradients – recognized as an indicator for the distribution and diversity of marine organisms. Number of families, genera, and/or species generally decrease with increasing latitude.
    - Significant for reefs between Miami and Martin counties (compared to FL Keys which run predominantly E-W).
    - SEFL has a recognized terrestrial latitudinal gradient from tropical to warm-temperate (Holdridge Life Zones). Transition in estuarine fauna also observed.
- **SE FL reef biogeography patterns. With northward progression:**
    - Reduced community diversity.
    - Decrease in scleractinian diversity.
    - Reduced scleractinian growth rates.
    - Decreased macroalgal biomass.
    - Reduced fish species diversity.
- Since many marine species distributions are habitat specific, mapping habitats logical.
- **Objective:** Apply spatial analyses to statistically identify and quantify ecologically similar sub-regions in SE FL based on the present-day coral reef community and seagrass habitat morphologies that provides a scientific basis for local marine conservation spatial planning.
- **Mapping Approach:** combination of aerial photography and LIDAR bathymetry, acoustic mapping and ground-truthing to produce benthic habitat maps.
- Five primary habitat regions: colonized pavement shallow, ridge shallow, inner reef, middle reef, outer reef. First two categories combined for this project.
- **Methods:**
    - 209 parallel, cross-shelf vector-line transects spaced ~750m apart throughout the entire mapped region.
    - Intersect was performed between transects and benthic habitat polygons.
    - Length of each line segment was calculated to determine the linear cross-shelf distance of each habitat.
    -
- **Multivariate Analyses:**

- Cluster analysis using Bray-Curtis similarity indices (PRIMER v6) of the cross-shelf habitat width data to evaluate regions with distinct habitat composition.
- MDS plot was constructed to visualize clusters.
- Transects were then categorized in GIS by the clusters with 75% similarity and visually examined to evaluate the clusters for any spatial grouping consistency.
- Cluster analysis by transect: 9 MDS clusters at 75% similarity condense to 5 regions of distinct habitat number and amount.
- Weakest statistical difference between Deerfield and South PB (transitional).

- **ANOVA comparison results:**
  - 30 cross-shelf transects spread equally across full region.
  - Utilized feature width, feature distance from shore, distance from inner reef, depth analyses.
  - With northward progression:
    - Decrease in number of habitats with northward progression (from 9 to 4).
    - Decreased near shore ridge complex width.
    - Increased deep ridge width.
    - Increased inner and outer reef depths.
    - Decreased distance of entire habitat complex from shore.
    - Increased distance between inner and outer reefs.
- Biscayne Region (Government Cut transition):
  - N biogeographical limit of expansive seagrass meadows.
  - *Thalassia* and *Syringodium* exclusive to estuaries farther north.
  - Limited to shallow, protected, lower saline environments and likely have different associated communities.
- Broward Region (Hillsboro transition):
  - Northern limit of inner reef and extensive expanses of nearshore ridge complex (NRC).
  - NRC has statistically different benthic and fish populations than the middle and outer reefs.
  - Disproportionately high abundances juvenile fishes have been found on the NRC.

- Absence of this habitat in northern regions results in significant reductions in shallow water biomass, and likely changes the nearshore food web and linkages to deeper habitats.

- Boca Raton transition:
  - N limit of significant amounts (>1 acre) of NRC and middle reef.
  - N of this transition, 36km of coast without significant hardbottom habitat outside of the intertidal zone shallower than 15m.
  - Ecosystem functions associated with NRC that are presumably drastically reduced in the Deerfield region are absent in S PB, making Boca Raton a major biogeographic transition.
- BFZ (Bahamas Fault Zone) transition:
  - N terminus of historic outer reef morphology.
  - FL current extends farther from shore, coastal shelf widens.
  - Not an obvious spatial barrier, hardbottom habitat occurs in similar depths in both regions.
  - Coincides with differences in fish species richness between regions.
  - 2440 surveys showed that of 400 total species observed, 43 exclusive to NPB region, 56 exclusive to S region.
- **Summary**:
  - 5 regions have been statistically defined based on benthic habitat morphology.
  - Number of benthic habitats decreased with increasing latitude from 9 to 4 and many habitat metrics differed between regions.
  - Three biogeographic barriers (Boca, Hillsboro, and Biscayne) where specific shallow-water habitats and oceanic seagrass beds were absent further north.
  - These regions should be considered in future management decisions and marine conservation planning efforts; instead of county boundaries.
  - Regions still need to be ground-truthed.

<u>Questions and Comments (Benthic Habitat Spatial Analyses):</u>

1. (Dan Clark) *From what I've observed, there actually is fairly significant amount of shallow water habitat (<15ft) in Palm Beach area which has been buried by sand. Have you investigated what areas have been buried (on recent timescales) and what might be buried in such regions?*
   - (Brian Walker) *Current project does not have a 'next level' surveying effort. In certain areas a lot of nearshore habitat is indeed being buried. Significant differences in NRC fish assemblages likely due to barrier caused by higher*

frequency of upwelling and coldwater events in northern regions (due to geologic character and associated small scale (i.e. width) of NRC), rather than localized sand inundation of the NRC.

The NRC habitat farthest north appears to be a significantly different community than that which occurs farther south.

- (Dan Clark) *From the diversity and number of juvenile fishes in the shallow "worm rock" habitats up north, I suspect that those areas are serving a similar ecological function (nurseries) as the seagrass habitats of the south.*

2. (Gene Shinn) *What factors result in the abrupt cutoff of seagrass communities at Government Cut?*
    - (Brian Walker) *Possibly due to how the coastline is oriented. South of the area the ridge geology changes, becoming more bay-like. Likely other contributing physical aspects (i.e. watershed differences) as well. Some patches of T. testudinum and H. wrightii have been found in Broward, but very small (1-2m^2). Reefs are also shallower in southernmost region, and could be blocking more wave energy allowing for seagrass communities to develop and persist.*
3. (Phil Dustan) *Reef community classification based on Pleistocene or early Holocene? Looks like there's a large influence from geologic characteristics.*
    - (Brian Walker) *Not necessarily, based on habitat rather than geology. Growth is from Holocene, but it is very difficult to uncouple reef communities from their geology. In effect the geology provides habitat for reef organisms (on which these classifications are based) to inhabit.*
    - (Phil Dustan) *Seems like the next step would be to categorize the species assemblages and the geology independently, and see how well they align.*
    - (Brian Walker) *Yes, though it would be messier based on the fact that there would be multiple metrics of biota (scleractinians, gorgonians, fishes). You'll likely see separate zones and cutoffs for each. We may use Greg Foster's acoustic data for this, especially the gorgonian height index maps he's working on.*
    - (Bernhard Riegl) *Be cautious with using gorgonian species maps, we are still very close to the recent Lyngbya bloom (3 years) which killed a significant amount of large gorgonians in our area.*

(Break)

Presentation: Southward Flow Under the Florida Current and Coastal Countercurrent in the Straits of Florida *– Alex Soloviev – NSUOC.* In cooperation with *John Wood – Ocean Data Technologies, Inc.*

- Long-term observations in straits of FL:
  - NSUOC ocean observation system established 1999 (collaborative effort with USF) with funding support from private companies (i.e. Calypso) and federal grants. Have been consistently maintaining installations and adding new equipment.
  - Straits of FL region characterized by presence of Miami Terrace, where NSU maintains a deep-moored acoustic Doppler current profiler (ADCP) at 240m depth. Measurements are taken from 10m off the bottom (where mooring is situated) to the surface (nearly). Second ADCP at mooring points down, measuring current profile in bottom boundary layer.
  - Accompanying mooring at 11m depth has provided data for ~50 years.
  - Synthetic aperture radar (SAR) imaging satellites provide another measure of current structure in area (recent development with new satellites such as TerraSAR-X and Radar-Sat2).
- Calypso ADCP monitoring of Gulf Stream currents (Jan – June 2007 period) showed occasional southward flow at depth (usually below 150m, at approximately 0.5m s^{-1}).
- Five year average (by month) of coastal ADCP mooring (11m) showed seasonal pattern of northward coastal current in summer, southward in winter. Not very strong (<8cm s^{-1}), but interesting is its persistence.
- **Southward flow under the FL Current**:
  - 1971: First observation (580m depth) of "transient phenomena" of southward switch offshore Miami (observation location - http://g.co/maps/v4kfd).
  - Southward flow shown (via ADCP bottom-mounted to RV Walton Smith) as a "southward jet" attached to FL shelf.
  - Jet at ~100m depth, with currents of ~30cm s^{-1}.
  - Jet follows bottom contour closely; "attached" via Coriolis force directing Southward current to the West.
  - Jet is well-mixed (product of interaction with bottom and shear from Gulf Stream).
  - Semi-monthly monitoring revealed:
    - June – jet moved inshore.
    - September – migration back eastward.

        - November – significant weakening, jet pushed upwards towards surface. Possibly result of weakening water body stratification as summer ends.
    - Important to understand as a vector for pollution.
    - Strong Gulf Stream variability observed on week and month timescales. No significant pattern in mean transport seen. From 2007 – 2010, strongest mean transport – 2009, weakest – 2007.
    - **Conclusions**:
        - During summer months, a transient southward flow in the form of a jet attached to the Florida shelf is observed below the FL Current.
        - During winter months, the southward jet migrates to the surface, producing a coastal countercurrent.
        - Above can explain the seasonal pattern of the coastal circulation on the SE FL shelf (mean transport northwards in summer and mean transport southwards in winter).
        - Practical applications include: coastal pollution control, coral reef health, search and rescue operations, future development of ocean observing systems.

<u>Questions and Comments (Southward Flow Under the FL Current):</u>

1. (Phil Dustan) *Any shear-induced upwelling observed in those areas?*
    - (Alex Soloviev) *Not often. More so in West Palm Beach; not typical in this area.*
2. (Esther Peters) *Are there detectable temperature differences between the southward jet and the Gulf Stream?*
    - (Alex Soloviev) *Temperature differences are observed; the jet has a slightly lower temperature.*
3. (Joe Boyer) *Did you look at wind fields in relation to these data?*
    - (Alex Soloviev) *Typical seasonal patterns would likely not be the cause of the coastal countercurrent. The southward jet, at depth, wouldn't be influenced at all.*
4. (Phil Dustan) *How far south do you think the jet extends?*
    - (Alex Soloviev) *Presumably farther than Miami, the southernmost extent of ADCP observation on the RV Walton Smith.*
5. (Gene Shinn) *An important consideration for companies planning to install marine turbines in the Gulf Stream.*
6. (Brian Walker) *With average summer wind fields from southeast, and winter wind fields from northeast, it could be a strong influence.*

- (Alex Soloviev) *Maybe influential for coastal countercurrent, but likely not so for the southward jet.*
- (Brian Walker) *Offshore has a change in slope from 70-90m depth, and a deep ridge exists at ~90-100m depth. Something to consider when investigating dynamics of the jet.*

Presentation: Human pathogen shown to cause disease in the threatened Elkhorn coral Acropora palmata *– Kathryn Patterson Sutherland – Rollins College*

A. White pox disease:

- White pox disease exclusively affects Elkhorn coral (as far as we know); first described in 1996.
- Disease is characterized by irregular patches of tissue loss, which can spread and result in whole colony mortality.
- Significant decline in Elkhorn coral cover in FL Keys since 1996; largest drops between 1997 and 1999 (CREMP). Current *A. palmata* cover at CREMP monitored sites < 2%.
- 2006, *A. palmata* listed as ESA Threatened Species.

B. *Serratia marcescens*

- 2002 – reported as white pox cause.
- Pathogenic strain "PDL100" of *S. marcescens* isolated from 1999 disease outbreak at Looe Key.
- A fecal enteric bacterium, found in intestines of humans and other animals.
- Free-living in terrestrial environments (including freshwater).
- A human pathogen, particularly for infants and immunocompromised adults. Also a pathogen for some animals and plants.
- 2002 unknowns:
    - Prevalence in sewage.
    - Prevalence in the marine environment.
    - Source of white pox pathogen.

C. Source Tracking for *S. marcescens* (2002 – 2006 survey):

- Collected samples throughout FL Keys.
- Sampled:
    - Diseased *A. pamata* colonies.
    - *Coralliophila abbreviata* – coral predatory snail.

- Surface mucus of non-host corals.
- Nearshore water, including canals and beaches.
- Other animals (seabird guano).
- Key West sewage treatment center (raw sewage and treated effluent).

D. Identification of *S. marcescens* from samples:

1. Two-step culture method with *S. marcescens*-selective agar media.
    - MacConkey Sorbitol Agar (MCSA).
    - DNase Touidine Blue Agar (DTC).
2. Confirm identity as *S. marcescens.*
    - Serratia-specific PCR.
    - Sequencing.
3. Compare genetic fingerprints (against strains sampled from diseased corals) of confirmed *S. marcescens.*

- From 500+ samples, 413 isolates of *S. macescens:*
    - Human sewage 39.2%
    - Canal water 27.1%
    - Snails 13.8%
- 23 isolates of *S. marcescens* collected from white pox-affected *Acropora* (from upper and lower Keys, 2003):
    - All with same PFGE banding pattern (100% similarity).
    - All strain PDR60.
- 93 isolates of *S. marcescens* collected from reef environments (corals, snails, reef water) .
    - All strain PDR60.

E. *Serratia marcescens* strain PDR60

- Only strain found in both sewage and diseased coral samples.
- Distantly related to originally identified strain PDL100.
- PDR60 found in:
    - Diseased *A. palmata* (host).
    - Sewage (hypothesized source).
    - Corallivorous snail *C. abbreviata* (possible vector and reservoir).
    - Non-host corals: *Siderastrea siderea, Solenastra bournoni* (possible reservoirs).

- Reef water.

F. Challenge Experiments with strain PDR60

- To prove pathogenic effect of PDR60 on *A. palmata.*
- Setup and collection:
  - Mote Tropical Research Lab, Summerland Key.
  - Aquaria in open raceway with flow through 20 µm filtered seawater.
  - Closed system, aquaria filled with 10 µm filtered seawater.
  - Power supply in each aquarium to maintain water flow.
  - Raceway covered with shading tarp.
  - 24 hours acclimation before corals placed in the tanks.
  - Coral fragments (~25cm^2, n=36) and surface mucus layers (SML) collected at Western Sambo Reef, FL.
  - SML spread plated on *S. marcescens*-selective agar media.
  - Coral fragments distributed into aquaria within three hours of collection.
  - 48 hours acclimation prior to inoculation.
  - Daily partial water changes.
- Inoculation:
  - Tryptic soy broth and sterile sieved $CaCO_3$ sediment were combined and inoculated with a test isolate.
    - Incubated overnight at 25°C with horizontal shaking to adsorb pathogen.
    - Grown to 10^7 colony forming units/ml.
  - 0.85g of bacterial absorbed sediment was deposited onto each coral fragment.
  - PDR60 test inocula:
    - isolate 1, 2, 3 - white pox from diseased *A. palmata.*
    - isolate 4 - *S. siderea.*
    - isolate 5 - *C. abbreviata.*
    - isolate 6 - sewage.
  - Non-PDR60 test inocula:
    - isolate 7 - white pox PDL100.
    - isolate 8 - sewage.
    - *E. coli.*

- When white pox observed on specimen:
    - SML collected from margin of disease lesions.
    - Two-step culture method to identify presumptive *S. marcescens* utilizing same methods as initial surveys (MCSA, DTC).
    - *Serratia*-specific PCR to confirm identity as *S. marcescens.*
    - PCR-confirmed *S. marcescens* assayed with pulsed-field gel electrophoresis (PFGE).
    - PFGE patterns used to confirm that bacteria collected from lesions were the same strain inoculated in each challenge experiment.

G. Results of Inoculation Trials

- Tissue loss produced from diseased colony-sourced *Serratia* (isolates 1, 2), wastewater (isolates 6, 8), corallivorous snail *C. abbreviata* (isolate 5), vehicle control (sterile $CaCO_3$ sediment), PDL100 (original strain identified from Looe Key, isolate 7), and non-host coral *S. siderea* (isoalate 4).
- Disease produced most rapidly with strains sourced from wastewater and diseased *A. palmata.*
- 15 days until tissue loss observed from vehicle control - 14 day threshold chosen to prove pathogenesis.
- *E. coli*-plus vehicle, isolate 3-plus vehicle, and seawater alone treatments did not cause tissue loss for the duration of the experiments (26 days).
- Isolate 3 sourced from Grecian Rocks. Strain may not be pathogenic, or corals onto which it was inoculated were resistant.
- Fragments from some source colonies never showed signs of disease regardless of inocula, possibly result of resistance to existing *Serratia* strains.

H. Conclusions

- Human strain PDR60 is a coral pathogen.
- First example of a marine invertebrate "reverse zoonosis" (direct transmission from humans to organism).
- Human wastewater is a source of white pox.
- Snails & non-host corals may function as reservoirs or vectors of white pox.
- Expanding survey to investigate wider assortment of non-host "reservoir" corals and *C. abbreviata.*
- Promising: FL Keys sewage treatment upgrades remove *Serratia* from output.

<u>Questions and Comments (Human pathogen causing disease in elkhorn coral):</u>

1. (Margaret Miller) *Have you screened A. cervicornis diseases for these strains? Really should be investigated, most think the diseases are different but it's still unproven.*
    - (KathrynSutherland) *Not part of our expansion, but worth investigating.*
    - (Esther Peters) *Our lab is currently analyzing A. cervicornis disease samples collected this summer (for bacterial composition), should at least provide a strain for comparison.*
2. (Valerie Paul) *Is white pox known outside FL Keys?*
    - (Kathryn Sutherland) *It is Caribbean-wide.*
    - (Gene Shinn) *Even in areas not adjacent to human populations.*
3. (Gene Shinn) *How many strains of S. marcescens are there?*
    - (Kathryn Sutherland) *Hundreds, often the common red color but not always. As it is possibly pathogenic to humans, our strain isolation and determination methods came from hospitals (how they trace outbreaks).*
4. (Gene Shinn) *From visiting the coral nursery at the Coral Restoration Foundation, they don't seem to have disease issues. A. cervicornis grown via "clothesline" method grow twice as fast; separation from reef groundwater (shown to contain fecal coliforms) may be a factor.*
    - (Margaret Miller) *Outplanted populations have substantial disease issues; with much spatial variability.*
    - (Judy Lang) *Have heard that outplants fare better where there are populations of Diadema.*
    - (James Byrne) *One of the observed factors, but haven't done correlations yet; nor have Diadema densities been mapped and quantified. From observation, reefs with higher concentrations of Diadema tend to be better (or vice versa). In USVI, fireworms are a major issue – another possible vector to investigate.*
    - (Kathryn Sutherland) *Did search for fireworms initially, but did not find substantial populations as did with Corallophila.*
5. (Joe Boyer) *What about the effect of sedimentation in general as an important component to the initiation of disease/infection?*
    - (Kathryn Sutherland) *Both infection studies done with sediment vehicle, have not tried to inoculate the water. Suspected that dispersion of pathogen would result in false-negative. Overall the effect is non-conclusive, as some vehicles didn't result in any tissue death.*
6. (Dan Clark) *Damselfish as a transmission agent?*
    - (Kathryn Sutherland) *Not investigated as of yet.*
    - (Margaret Miller) *Damselfish behavior probably makes them less likely to act as a wide-ranging transporter; residents of a single elkhorn colony.*
    - (Esther Peters) *Possibly butterflyfish.*

7. (Phil Dustan) *In times past with immense Elkhorn coverage, would often find parrotfish fecal piles on colonies in calm water. Also observed that with disappearance of Diadema, excess microalgal growth around coral colony bases trapped sediment… could be contributing factors for spread of disease.*

   Seems as though decline of A. palmata populations in FL Keys came in waves of mortality (punctuated disease and bleaching events).

   - (Kathryn Sutherland) *Did survey parrotfish feces, no S. marcescens found.*
   - (Gene Shinn) *In the early 1980's, expansive, acute (within a few months) mortality of Acropora in San Salvadorian reefs.*

8. (Esther Peters) *Don't know what Serratia attacks/attaches to in human intestine. There are mucus-secreting cells which may create an analogous environment to coral mucus.*
9. (Phil Dustan) *At the start of CREMP, a huge disease event (40% decrease from 1996-2000). It coordinated with nutrient rich flush of water discharged from the Everglades. Wondering what else came with that water.*
10. (Doug Seba) *As a Key West resident paying thousands of dollars for sewage system upgrades, always wanted something conclusive to prove it was beneficial to the reefs. Curious: in the past there was no sewage treatment and many outhouses deposited straight into the ocean. With WWII and Vietnam, the number of soldiers stationed in Key West was immense; and all waste was discharged directly into nearshore waters. Yet corals were not affected (if at all) to the extent of today. Real question: what has changed in the corals to make them so much more susceptible?*

    - (Gene Shinn) *Have started spraying for mosquitoes since that period.*
    - (Phil Dustan) *In Discovery Bay, Jamaica used to pipe sewage directly offshore onto seemingly healthy reefs.*

      The population of the Keys has increased greatly. Now with multifactorial sources of LBSP in the Keys, removing one stressor could be the saving grace for this species ("last straw" scenario).
    - (Bernhard Riegl) *Could likewise ask what has changed in us? Our foods are loaded with antibiotics which presumably affect our intestinal bacteria. Our bacterial communities are likely much different than those of people decades ago. Do we have any knowledge as to how these bacteria change?*
    - (Kathryn Sutherland) *We know strains evolve rapidly.*
    - (Brian Walker) *Episodic mortality events from disease could be the evolution of new strains.*
    - (Esther Peters) *Looking at historical responses of corals. From A. palmata tissue sample (1976), noticeable changes have occurred.*

(Lunch Break)

Meeting Summary – Day One: Thursday, November 3rd 2011 (afternoon)

Presentation: Final Report – LBSP Project 5: Conduct a biomarker study *– John Fauth – UCF*

- **Goal:** Identify the chain of causality between land-based pollutants, responses of individual reef-building corals, and the condition of coral reef communities.
- Multiple-level coral condition assessment:
  - Cellular – contaminant analysis, cellular diagnostic.
  - Organismal – lesion regeneration, mortality, etc.
  - Coral Assemblage – species richness, evenness, percent cover, index of biotic integrity.
- **Results:**
  - Stations (of 8 total in 2 depth classes) near outfalls had greater percentage of bare substrate.
  - *Porites astreoides* (from regeneration experiment component) lesions regenerated slower at deep sites.
  - DNA AP sites (lesions in DNA, lacks either purine or pyrimidine base; natural occurrences and/or products of mutagens) – higher occurrences at survey sites near inlets.
  - Antioxidant enzymes (catalase and Cu/Zn SOD; beneficial, cancel out oxygen radicals) – consistently higher near Port Everglades (PE), and occasional spikes in other locations over time.
  - 3rd biomarker (ubiquitin) measured uniformly across all sites; shows antioxidant activity adequately capable of protecting cells from oxygen radical damage.
  - Sediment: Could not collect from sediment traps as frequently as required (resulted on trap colonization by fouling orgs). Rather, used as a measure of algal growth. Hollywood outfall (HWO) had significantly more algal growth.
  - Coral Larval Settlement – initial year thwarted by high sedimentation, 2nd year utilized "conditioning" of ceramic settlement plates in the field before use in lab-based settlement experiment.
  - Coral larval settlement significantly lower on plates conditioned at site PE3.

- *P. astreoides* scarce at Second Reef sites – suggests they are not good locations for the coral to settle; a bad indication considering how "tough" *P. astreoides* is considered to be.
- Sea urchin fertilization assays – *Lytechinus* and *Arabacia* in reef water and pore water. Percentage of embryos that developed to pluteal stage significantly lower in reef water from HWO2 and pore water from HWO3 and control site 3.
- Salinity – August 2007, significantly lower in pore water (HWO2, HWO3, PE3). Salinity low enough to cause mortality in sea urchin embryos.
- All sites negatively affected in one or more ways; no true control sites.

o Other Studies – important patterns emerging:

- Biomarker stress responses higher here than in Bahamas.
- Biomarker stress responses lower here than off St. John, USVI – where catastrophic mortality occurred at some sites.
- Evidence of human fecal contamination at most sites.
- Gene expression arrays showed upregulation of stress genes near Miami-Dade outfalls, particularly after heavy rain.
- Limited genetic variability in *P. astreoides* compared to Bahamas.

o Next Steps:

- Reciprocal transplant experiment underway at HWO3, PE3 and C3.
- Still have coral tissues, sediments, and water archived for analysis.

<u>Questions and Comments (LBSP Project 5):</u>

1. (Margaret Miller) *Are you interpreting bare substrate as beneficial/detrimental?*
   - (John Fauth) *Detrimental; as there is less cover of live material.*
2. (Lou Fisher) *May be safe to say there's no local area that can be used as a control site.*
3. (Margaret Miller) *Are you measuring biomarkers for current reciprocal transplant experiment?*
   - (John Fauth) *We can, we have initial samples from parent colonies.*
4. (Judy Lang) *When were the reciprocal transplants started?*
   - (John Fauth) *April of this year; saw an initial 5% decline in average tissue cover.*
5. (Phil Dustan) *Often observe areas with just P. astreoides adults, or just recruits/juveniles. Also, have tissue samples from Bahamas that can be made available for biomarker measurements.*
6. (Doug Seba) *What amounts of coral tissue are being sampled for biomarker assays? With or without skeleton?*

- (John Fauth) *Most samples are just the tissue, around 4cm^2. Sediment samples are ~6oz. Water samples are 2L (bladders) and taken in triplicate.*

7. (Valerie Paul) *Do you think low growth and regeneration rates in deeper sites a product of lower light?*
   - (John Fauth) *Possible, although some colonies grew at the same rate as shallow-site counterparts. Pattern observed elsewhere (FL Keys).*
   - (Margaret Miller) *Increased growth rates in some deep-site colonies consistent with theory that outfalls may contribute heterotrophic nutrition to compensate for lower light levels.*
8. (Gene Shinn) *Could this study be repeated with Acropora? Its faster growth may net faster results than Porites.*
   - (John Fauth) *Possibly, but it's not present in the deeper sites. Porites a good indicator when given the required time. Especially telling will be assays done after this season; more local precipitation (presumably) carrying more pollutants out to the reefs.*
9. (Phil Dustan) *Also important is the information that P. astreoides genetic diversity is locally-depressed; an indication of the adaptive capacity of the local population.*

   What about the notion of deep reefs as genetic reservoirs for shallow reef populations?
   - (Margaret Miller) *Additional MSATs for P. astreoides being developed to address that question (genetic connectivity between deep and shallow reefs here and elsewhere).*
10. (John Fauth) *Of note, settlement of coral larvae (observed in experiments) highly variable with minute environmental changes. Small scale, prominent block effects observed. Large gradients in water composition didn't always result in settlement differences, yet minute changes in light regime (i.e. proximity to lab doors/windows) resulted in noticeable effects. Larvae are very sensitive, but selectivity is not well-understood.*
    - (Margaret Miller) *With larvae, getting a notion of delayed effects of stressors (post-settlement survivorship) an important factor to investigate (and incorporate to experimental designs).*
    - (John Fauth) *Promising new technique in development (abroad): ability to grow corals from tissue culture. Cloned corals will allow for more extensive experiments of this nature (including circumventing permitting issues).*

Presentation: Projects 27, 47, 48 - Recommendations to Improve Future Monitoring of Coastal Construction Projects in Southeast Florida *– Lauren Waters – FDEP CRCP*

- Introduction:
  - Project an evaluation of environmental monitoring of coastal construction projects (primarily within last 10 years in SEFCRI region).

- Recommendations (Allison Moulding – P.I.; and Cheryl Miller – Subcontractor, Coastal Eco Group, Inc.) developed for monitoring permitted coastal construction and mitigation, to improve ability to detect project-related impacts and determine mitigation effectiveness.
- To ensure that monitoring (at project level) is designed to be scientifically sound and relevant to resource management.
- Recommendations for standardization of monitoring protocols to improve ability to compare results among projects.

- Objective - develop guidelines to improve future monitoring of:
  - Permitted coastal construction projects.
  - Mitigation artificial reefs.
  - Non-mitigation artificial reefs.
- Methods:
  - Three Components:
    - Evaluation of past monitoring reports.
    - Interviews with agencies and consultants.
    - Literature review.
  - Monitoring reports evaluated on:
    - Experimental design (hypotheses, methods, frequency and duration of monitoring).
    - Statistical analyses (appropriateness, power).
    - Interpretation (correct interpretations, proper support of conclusions).
- Results
  - Report Review:
    - Experimental design most in need of improvement, followed by statistical analysis and interpretation.
    - Generally, non-mitigation artificial reef reports scored lowest (least criteria met), and mitigation artificial reef reports scored highest (most criteria met).
  - Interview:
    - Agency review of post-construction reports often lacking or restricted due to time, agency mandates, and staffing constraints.
    - Sampling design needs improvement; concern over limited budgets and lack of appropriate controls (e.g. hard to find shore areas not renourished at some point).

        - Need for alternate forms of hard bottom mitigation (other than limestone boulders).
        - Project size, impact scale, costs, and political pressure often define sample size.
        - Differences of opinion among agencies on the definition and purpose of monitoring (research vs. monitoring).
- Recommendations for Mitigation Artificial Reefs: Define minimum performance criteria to evaluate effectiveness.
- Recommendations for Nourishment/Dredging Projects:
    - Regional management approach.
        - GIS database.
        - Monitoring program not tied to a specific project.
    - More pre-construction surveys to better detect natural variation (seasonal, annual).
    - Better monitoring methods for tracking cross-shore sand movement.
    - Coupling physical and biological data.
- General Project Recommendations:
    - Defined hypotheses.
    - Use *in situ* data of percent cover, density, and size class for analysis of community structure.
    - Individual based measurements of biological condition.
    - *A priori* power analyses.
    - Equal numbers of reference and treatment sites.
    - Locate reference sites north and south of project.
    - Stratified random sampling and nesting.
    - Replicate samples of each variable (time, site, depth, distance from shore, etc.)
    - Non-metric multidimensional scaling (MDS).
    - Adequate power of performed parametric tests.
    - Alternative mitigation options for artificial reef deployment.
    - Formal training opportunities and refresher courses on experimental design and statistics for agency staff.
    - Avenue to share experiences, methodologies, knowledge, lessons learned, and recommendations.

- Separate companies perform project construction and monitoring (concerns over conflict of interest).
- Clearly define:
    - Define what qualifies as impact.
    - Level of acceptable change due to impact.
    - Acceptable probability of committing a Type I (rejecting a true null hypothesis) or Type II (accepting a false null hypothesis) error.

- Conclusions:
    - Inability to detect impact does not imply no impact.
    - Changes to experimental design are needed to better detect impacts.
    - Monitoring changes within individuals rather than populations will enable better determinations of impact.

Questions and Comments (Projects 27, 47, 48): n/a

Presentation: Projects 4, 21, 23, 24 - Policy Recommendations and Training to Improve Agency Permitting, Compliance and Enforcement for Coral Resource Conservation in Southeast Florida *– Lauren Waters – FDP CRCP*

A. MICCI Combined Projects 4, 21, 23, 24

- **Objectives**:
    - Identify issues, gaps, and overlaps that reduce compliance and enforcement efficiency.
    - Work with agencies to identify methods and processes to increase the effectiveness of regulatory oversight, monitoring, compliance and enforcement.
    - Build materials for Coral Resource Awareness Training.
- **Product Overviews**:
    1. Final Report Summarizing Findings:
        - Reviews: over a dozen interviews with senior staff and two workshops.
        - Reviews coral rules and policy background at all government scales.
        - Identifies select Best Permitting Practices (BPPs).
    2. Coral Awareness Training Program:
        - Unit 1: Coral Biology and Threats.

- Unit 2: Administrative Rules.
- Unit 3: Permitting and Field Best Practices.

3. Field Cards for Enforcement (waterproof, UV proof cards with reference material concerning rules and regulations, jurisdictions, etc.)
4. PDF Libraries (on CD):
    - Coral and Nearshore Hardbottom (NHB) Biology of SEFCRI Area.
    - Coral and NHB Administrative Rules and Policy.

- **Final Report Contents**:
    a. General Recommendations – 25.
    b. NMFS.
    c. USACE.
    d. FDEP.
    e. Special permit conditions: Created from templates under development by FDEP, USACE and NOAA's office for Puerto Rico and the Virgin Islands.
- **Recommendations:**
    - **Increased interagency interaction.** Example: FDEP and USACE concurred that both would benefit by establishing enhanced dialogue to improve interagency understanding and cooperation.
    - **Templates for special conditions.** Agencies now engaged in development of template special conditions to ensure that special conditions are clearly written, appropriately protective of resources, implementable and enforceable. **Coordination of templates among agencies would make permits more comprehensible and avoid conflicts between permits, leading to more compliance.**
    - **Best Management Practices.** Major industry and government systems pursue optimization using *best management practices* (BMPs) - and they use BMPs as performance measures. Given the political, spatial, and temporal complexity of multi-agency permitting endeavors, formal BMPs for permitting make sense. BMPs within administrative permitting can be captured by *best permitting practices* (BPPs).
- **Constraints**:
    - Limitations imposed by high workloads and limited financial resources at all agencies.
    - With more state and federal budget cuts pending, this reinforces the need to increase efficiency.
- **Conclusion**: Optimizing the front end of applicants' projects (the permitting process) using measurable BPPs should reduce the need for compliance and enforcement actions on the back end.

B. Awareness Training for Compliance and Enforcement of Coral and Hardbottom Resource Permitting - *Overview of Corals and Hardbottom Resources in Southeast Florida*

- Three units:
  a. Coral Biology and Nearshore Hardbottom Habitats.
  b. Regulations (State and Federal).
  c. Enforcement.
- DEP Enforcement Guidance - some primary resources:
  - DEP Submerged Lands and Environmental Resources Program (SLERP) Procedures Manual.
  - DEP Enforcement Manual of the Office of General Counsel (OGC). This is the definitive resource and is available online at: http://www.dep.state.fl.us/legal/Enforcement/enforcement.htm
- Field Cards (3) shown here, each covering one of the three training units.

Questions and Comments (Projects 4, 21, 23, 24):

1. (Joe Boyer): *Quite useful to implement in FL Keys, especially the reference cards with coordinates outlining jurisdictions and enforcement.*
2. (unknown): *Who are these cards distributed to?*
   - (Lauren Waters) *At first to MICCI team members, then at SEFCRI team meetings. Trying to ensure good distribution of material within funding limitations.*
3. (John Fauth): *Might be able to reduce sampling project costs across the board by having designated control and/or sampling sites (shared cost between projects). You'd also build up longer term datasets.*
   - (Lauren Waters) *That would help with the issue of gaps in baseline data for sites.*
4. (Ken Banks): *SEFCRI has a number of MICCI projects; don't know of any single project outcome that has been utilized for any purpose.*
   - (Joanna Walczak) *Much project data has been referenced; new goal is to use for management implementation plans.*
   - (Ken Banks) *Data should be taken to our state government, shown to the highest governing bodies.*
5. (Dan Clark) *Currently a movement to take funds from monitoring projects and use it to "just move sand." The importance of sound science disturbingly absent in high government.*
   - (Joe Boyer) *In recent talks to Gulf of Mexico Alliance… "inreach" (vs. outreach) a necessity to get information to the decision makers. Many believe we have adequate knowledge, and need to shift effort from monitoring to action.*

- (Margaret Miller) *The aforementioned a notion echoed by the CRCP currently.*

Presentation: Projects 7, 11 (MICCI) – *Lauren Waters – FDP CRCP*

- **Two Project Objectives:**
    1. Create an electronic database that will serve as a source of information on regulatory coordination, past and current resource impacts, impact assessment, examples of permit requirements and regulatory restrictions for permitted coastal construction activities in and around the southeast Florida region (Miami-Dade, Broward, Palm Beach, and Martin counties).
    2. Develop a resource reference document for planners, reviewers and permitters of large-scale coastal construction projects that contains important references, a history of past permitted projects, and a comprehensive view of major coastal construction permitted projects from 1995 onwards.
- **Data Mining for the Electronic Database:**
    - To address the project objectives and meet the project coverage, the following permit types were included in the mining, entry, and analysis:
        - Acquisition of DEP ERP (Environmental Resource Permits) and JCP (Joint Coastal Permits) databases (and SFWMD database) and the CCCL (Coastal Construction Control Line) database
            - JCP database = 180+ total permits (type example: beach renourishment, dredging)
            - ERP database = 19,000+ total permits (type example: marine pipelines, cables)
            - CCCL database = 2,000+ total permits (type example: building on barrier islands)
        - Refining of databases
            - Elimination of projects outside project purview
            - Limited to permits between 1995-2010
            - Limitation of permits to those initially available electronically
    - (Joanna Walczak) *Eventually would like to include historic permits, but currently infeasible.*
    - Web portal for database then demonstrated.

Demonstration: MapDirect *– Katharine Tzadik and Lauren Waters*

- Website: http://ca.dep.state.fl.us/mapdirect/gateway.jsp

- MapDirect – a web mapping tool housed by FDEP, which can take on all possible data layers desired
- Replacement for previous LAS project – Integrated Management System Web Mapping Tool. Criticized for not being user-friendly; investigation into better alternatives was desired.
- LBSP Project 11 will be terminated.
- Data will be housed under "Beaches and Ocean Systems" section.
- Centralized system housing broad array of layers from various databases (LBSP projects, permitting, enforcement jurisdictions, etc.) an extremely useful tool.

Questions and Comments (MapDirect):

1. (Joe Boyer) *What kinds of outputs can be had from this database?*
   - (Katharine Tzadik) *PDFs can be generated from any map view and layer combination.*
   - (Lauren Waters) *Generated reports can be exported to Excel as well.*
2. (Joe Boyer) *A good repository for project metadata (water parameters, biomarkers, etc).*
   - (Katharine Tzadik) *All data layers must have some degree of metadata, currently working to see what extent can be incorporated within reasonable effort. Data being moved from FWRI database (Project 11) includes accompanying metadata.*
   - (Brian Walker) *Metadata would be a critically valuable asset.*
3. (Stephanie Clark) *Will information layers from different organizations (i.e. SEFRCI and SFLWMD) be visible together?*
   - (Lauren Waters) *Layers can be viewed in any combination, so long as MapDirect has the data.*
   - (Katharine Tzadik) *A goal for the coming year is to incorporate all district layers.*
4. (Janet Phipps) *Who owns MapDirect? Is there a service fee or charge for access?*
   - (Katharine Tzadik) *The DEP operates MapDirect; there are no charges. What will be investigated shortly is what restrictions will be (e.g. storage space; MICCI data alone is 8GB).*
5. (Doug Seba) *Currently in the biomedical field, smart phone apps are seeing fast adoption and use in data collection. Within a few years, expect that there will be many applications/instruments used by individual citizens (e.g. dive computers) that will be collecting a variety of data (a kind of crowdsourcing). Would be advantageous to develop a platform to collect these data.*
   - (Joanna Walczak) *NOAA in the process of developing a "Coral App" which will gather observational reports from individuals (for things such as coral bleaching, marine debris, etc).*
6. (Sara Thanner) *Can the GIS shape files be downloaded for personal use?*

- (Lauren Waters) *Possibly since it is publically available data, though may have to request it.*
- (James Byrne) *May be able to directly link to the data through individual GIS clients.*
- (Lauren Waters) *Yes, but only if logged in via the DEP network.*

(Break)

Public Comment – Day 1

I. Recommendations for Conservation Strategies - Dan Clark – Cry of the Water

- **Things we know**:
  - Reef related expenditures in Southeast Florida contribute billions of dollars annually to the local economy.
  - Pumping partially treated sewage, industrial waste and leachate from landfills onto the reef is harmful to corals. **Senate Bill 720 set to roll back deadlines to stop outfalls.** *[Corrected, Bill 724: http://www.flsenate.gov/Session/Bill/2012/724]*
  - Coral reefs are one of the most nutrient sensitive habitats. **Detrimental *Lyngbya* blooms are being caused by a variety of nutrient influxes into our reef systems.**
- **Broward County Segment III Dredge and Fill Project Impacts:**
  - 60+ acres of reef burial; hundreds more impacted
  - 1.75 million y^3 of poor quality sand pumped on beaches in Segment III
  - Staghorn being buried
  - Millions of dollars of mitigation needed to off-set impacts to this Segment
  - Now 5 years post-construction and damage still has not been mitigated for.
  - Must look at the cumulative impact to reefs and essential fish habitats from dozens of these dredging projects in the SEFCRI area.
- **Coral farming** and transplantation may be futile if we don't address what is killing corals. Needs to be more funding to both study disease and monitor reefs during season of higher disease occurrence.
- **Port Everglades Channel Expansion:**
  - Would destroy Third Reef areas to deepen and widen channel

- 20+ acres of reef and tens of thousands of corals will be destroyed
- Project area borders the Segment III beach project that buried and smothered over 8 miles of reef
- Cumulative impact assessment must be conducted using all projects in the area

- **Recommendations by Priority:**

  1st. Water Quality

  2nd. An adaptive management plan in order to deal with outbreaks of disease and harmful algae blooms.

  3rd. Coral disease and health work to determine what is killing our reefs

  4th. Must address outdated sewer and storm water infrastructure (often witness sewer overflow into storm water drains during heavy rains).

  5th. Best Management Practices (BMP'S) for beach maintenance

  6th. Better enforcement of laws and rules such as The Clean Water Act, NPDES and MS4 and MS6 storm water permits

- **Coral Reef Conservation: Job Creator not Job Killer**
  - Enforcement of water quality regulations will create jobs building the needed infrastructure to comply with the Clean Water Act.
  - Would preserve jobs and revenue to the local economy that relies on the coral reef and fisheries.
  - When it comes to a management plan for the SE Florida reefs the state of Florida seems to want to "kick the can down the road" 5 more years, much like they are doing with Everglades Restoration and water quality regulations.
- **Discovery of WWII Ammunition**
  - Live, .50 caliber bullets (thousands of them; made of copper, including shell cases)
  - Curiously, where large densities of bullets begin, dense staghorn stands end.
  - How much Cu could be leaching? How much is required for detrimental effect?
  - Rounds protected under archeological laws.
  - Planning to map coverage.
  - Also, four concrete "dummy" bombs (used in past for target practice) with no fouling growth after six decades… contaminants?

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

1. (Lou Fisher, referencing "Port Expansion") *Fort Lauderdale would likely suffer economically if port isn't expanded as Miami's will be.*
    - (Dan Clark) *Unsure if the cost-benefit analysis supports two deepwater ports within 60 miles of each other.*
    - (Phil Dustan) *Years ago Charleston was going to build a "super port" with the capacity to accept Panamax ships. It would've completely destroyed the marine ecology of the area. Decided that there isn't appropriate shipping volume to justify.*
    - (Dan Clark) *Much of port money is in tourism, and the large cruise ships don't have the deep draft of the freighters.*
    - (Ken Banks) *Also, ecological cost (losses) not always factored in to cost-benefit analyses (or not factored well).*
2. (Phil Dustan, referencing "Sewer and Stormwater Infrastructure") *Before Clean Water Act, Charleston, SC houses were plumbed directly into stormwater drainage… wonder if that's a problem here in SFL, since much of the construction is dated.*
    - (Dan Clark) *Much leaking from sewage infrastructure (saltwater in at high tide, sewage out at low tide). So much leakage and saltwater intrusion that Hollywood unable to do reclamation. Fixing this infrastructure would generate many jobs.*
3. (John Fauth, referencing "WWII Ammunition") *Another issue with the rounds is the scouring effect they have in surge.*

II. Stephanie Clark – Cry of the Water

- Monitoring and mapping projects (such as Brian Walker's) don't measure the habitats nearest to the shore (at initial transition from beach sands).
- These habitats in the greatest danger from coastal activity (such as beach renourishment).
- Many regions currently mapped as sand over hardbottom may in fact have been important nearshore habitat in the past.
- Should make effort to better map these areas, lest coastal practices completely wipe them out because we have an incomplete understanding.

(Questions and Comments – Public Comment II): n/a

III. Doug Seba on Key West – Academy of Marine Sciences

- N Roosevelt Blvd to be widened in January. Planned: shipping sand and filling Cow Key Channel as "mangrove restoration" to mitigate for coming construction. This was good seagrass habitat, don't understand how it is considered mitigation.
- KW to explore widening the shipping channel as well.
- New oil well to be drilled between KW and Cuba. TAC needs to be represented to take the scientific issues to the decision-making discussions concerning that and what is likely going to follow.

Questions and Comments (Public Comment III):

1. (Katharine Tzadik, referencing "new oil well") *Quite timely that this is brought up; Dr. Dodge presented during Coral Reef Task Force public comment period specifically concerning that.*
    - (Joanna Walczak) *The vessel planned to install the oil rig will pass through US waters, and therefore will be subject to Coast Guard inspection and US safety standards. A positive thing to come from the Deepwater Horizon spill… planned course of action with regards to FL coral reefs created and in place.*
    - (Margaret Miller) *Would machinery for oil spill containment and cleanup even be deployed if the rig site isn't in US waters? A fundamental issue concerning the response process.*

(Break)

Following afternoon break, the TAC reconvened to work on the ***"Southeast Florida Coral Reefs: Impacts of Land-Based Pollution Document"***

Day One – adjourn

Meeting Summary – Day Two: Friday, November 4th 2011

Meeting Guidelines

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

Presentation: SEFCRI Team Meeting Summary – *Katharine Tzadik – FDEP*

- Completed CRCP 5 year plan (2011 – 2016)
- Started composing new SEFCRI charter
- **Overview**:
    - Time and location: 9/21-22/11; Long Key Natural Area, Davie FL
    - Attendance: SEFCRI team members, speakers, and observers (Day 1: 60, Day 2: 46)
- **Topics:**
    - Focus teams – project overviews
    - Management alternatives
    - National and Coral Reef Conservation Plans
    - The Future of SEFCRI:
        - Review of pre-meeting discussions held by team navigators
        - DEP CRCP staff perspectives on SEFCRI
        - Discussions on SEFCRI charter proposal and LAS development process
- Prior to meeting, survey sent out through SEFCRI "navigators" to different team members inquiring about knowledge of project process (knowledge of other focus areas and their activities, existence and purpose of the TAC, etc) for feedback useful to drafting new charter.
- **Outcomes:**
    - Reiteration of support for SEFCRI and continued participation
    - Emphasis on importance of timing (concerning implementing goals and objectives)
    - Need for *implementation* of SEFCRI's goals & objectives
    - A call for annual SEFCRI team meetings
    - Disparity between break-out groups: LAS development and SEFCRI charter development

Questions and Comments (SEFCRI Team Meeting Summary):

1. (Gene Shinn) *Is there another SEFCRI group dealing with maritime construction?*
    - (Joanna Walczak) *There are four focus areas of the SEFCRI team, we focus on LBSP, others cover their respective category.*
2. (Valerie Paul) *Seeing that there is a call for annual meetings, how often are they held currently?*
    - (Katharine Tzadik) *Individual focus areas have met semi-regularly over time, but SEFCRI as a whole has not met until this meeting.*
    - (Valerie Paul) *Another good reason to have "full" meetings is because there is some overlap between focus groups. More coordination could increase efficiency.*
    - (Joanna Walczak) *Also, bringing focus groups together offers the sharing of expertise between groups.*
3. (Joe Boyer) *Would encourage SEFCRI and FKNMS to look at each others' programs and pull strengths from both sides.*
    - (Joanna Walczak) *Have used elements of FKNMS charter in past SEFCRI charter updates; definitely a benefit.*
    - (Joe Boyer) *Is anyone from FKNMS a member of this TAC?*
    - (Joanna Walczak) *Continually trying to encourage cross-participation.*
    - (Joe Boyer) *Timely, as FKNMS is being redefined (special use areas, etc).*
    - (Ken Banks) *Has been suggested that we merge (SEFCRI and FKNMS TACs).*
    - (Margaret Miller) *Makes sense considering perspective of CRCP objectives.*
4. (Phil Dustan) *Current status of FL state waters? There used to be no travel, no use areas (without exception).*
    - (Gene Shinn) *Master plan was for Largo reefs to be part of Everglades NP, but much resistance from area homeowners.*
    - (Joe Boyer) *Some areas were annexed.*
5. (Judy Lang) *What representatives are on the various SEFCRI teams?*
    - (Joanna Walczak) *We recruit from a broad range of industries and organizations, though can only encourage participation. Examples include: tourism, diving, universities, stakeholders, government, recreational fisheries…*
6. (Phil Dustan) *How has science (results from projects) guided NOAA management decision in FKNMS program?*
    - (Joe Boyer) *Should be influencing the coming round of sanctuary policy revision and management direction.*

Presentation: Management Alternatives Update – *Jamie Monty – FDEP CRCP*

I. SEFRCI Management Alternatives Identification Process:

A. Introduction

- Different or new management actions that can be applied to reduce threats to SE FL coral reefs.
- A stakeholder-driven process to determine what management alternatives should be used, and where to apply them.
- SEFCRI Mission Statement: *"To develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties."*
- Achieving the SEFCRI Mission via SEFCRI LAS projects: A combination of stakeholder and science (biophysical and social) projects, which will contribute essential information to stakeholder working groups (to provide a prioritized list of management alternatives to reduce threats to FL reefs), and eventually to public meetings.

B. Proposed Steps:

- SEFCRI (& Other) Projects - Information from Biophysical Science, Social Science, and Partner Projects
- Stakeholder Working Group(s) - Will use project results to develop management alternatives
- Public Meeting(s) - Will be held to get feedback on Working Group(s) recommendations
- FDEP CRCP - Take public-approved recommendations to the appropriate management agency

C. Proposed Timeline:

2004 - 2011: SEFCRI LAS Projects

2011 - 2013: Management Alternatives Identification Planning

2013 - 2015: Working Groups

2015 - 2016: Public Meetings

D. End Results:

- Outcomes from projects will form the basis for the management options for the SE FL region, to be recommended to the appropriate governing authority, beginning in FY 2016.

- Once these management options are approved, FDEP CRCP will draft a management plan to guide implementation.
- CRCP limited in authoritative abilities; will have to take recommendations to respective management authorities.

II. Management Alternatives Break Out Session - Input from SEFCRI Team Members

A. Desired outcomes of stakeholder working groups:

- Must get stakeholders to buy-in
- Need working group goals and objectives
- Identification of areas of agreement vs. disagreement of resources that need protection
- Prioritize these resources
- Need to make sure all stakeholders stay involved and are represented

B. Information that should be provided to stakeholder working groups:

- Detailed info in acceptable and generally understandable language
- Info on data itself (spatial and temporal differences, "hard" and "soft" data, exceptions and limitations in the data).
- Work and information from other agencies, including regulations
- Data from previous projects (CRCP and others), to provide working groups with the information they need when working with management alternatives.

C. Priority information gaps:

- Socioeconomic data for specific areas; out-of-date for others.
- Fisheries data: spawning information, aggregations, etc.
- Nearshore data; edge of existing reef tract transects
- Tourism groups
- Boating industry
- Water quality
- Dominant environmental ethics of stakeholders

D. Approach and steps to develop management alternatives:

- Educate - provide necessary education to stakeholders on subjects to be discussed in focus groups.
- Formation of groups
    - Integrated ecosystem management approach - expand connectivity both inland and along coasts

- Multi-county approach
- Break up groups by use, not by county
- Mixed groups, with different user group stakeholders
- Two group setup: "Technical experts in mapping & management" and "Stakeholders and planners"

- Have focus group first meet on per issue basis to formulate goals, compile goals to highlight overlap and then bring the groups together in a plenary to start talking about goals and objectives of management.
- Demonstrate what works using local examples (some also wanted to see worldwide case studies to see what worked).
- ASK stakeholders what they think is most important.
- Get the word out on these meetings; media campaign?

E. **Possible additional tools:**

- Identifying linkages in areas
- Biogeographic assessments (i.e. NOAA assessment of entire FL reef tract, producing "threat layers," etc).
- Literature set up for needs of focus groups (setup by region, topic, etc.)
- Maps and visuals with appropriate data layers - possibly through Google Earth because it's more accessible to all stakeholders.

F. **General Comment – Timeline too slow:**

- We have enough data to start now
- Resources won't be alive to save
- Will lose stakeholder/public attention

G. **Next Steps:**

- Fill data gaps
- Plan the process
- "Other" projects finish
- Prep education/outreach talking points
- Form project team
- Possible TAC expertise expansion

<u>Questions and Comments (Management Alternatives Update):</u>

1. (Joe Boyer) *What exactly are stakeholder working groups? Is their composition currently defined? How are members determined?*

- (Jamie Monty) *They are currently not defined; methodology of working group selection to be determined. Composition will likely be similar to that of existing SEFCRI team (not necessarily same individuals); will have county representatives, diving, fishing, and tourism reps, etc. Still deliberating whether to divide by county or issue, or maintain one large working group.*
- (Joe Boyer) *How big do you estimate these groups will be (to be effective)?*
- (Jamie Monty) *Twelve people or less.*
- (Joe Boyer) *FKNMS Science Advisory Council (SAC) breaks things up by issue, then a subset breaks off to cover it. Following this they advertise in newspapers and media outlets asking for volunteer reps from pertinent organizations, industry, regular citizens, etc. They also employ alternates.*
- (John Fauth) *The idea of alternates is good, in the past people have dropped out after early meetings (following unresolved points of contention or loss of interest).*
- (Ken Banks) *SEFCRI has difficulty getting representatives from some groups, especially those groups which aren't very organized themselves (e.g. fishing, diving).*
- (Jamie Monty) *Scheduling conflicts are another difficulty – hard to find time of the week where all parties can attend.*
- (John Fauth) *Another option is to bring the meetings to reps/industries that are difficult to get participation.*
- (Joanna Walczak) *New goal is to target individual groups that are underrepresented and inform why participation is to their benefit.*
- (Joe Boyer) *Most of these organizations hopefully have ad-hoc organization already, such as dive industry and charter fisherman in Broward. Terms such as "marine zoning" usually catch people's interest…*
- (Jamie Monty) *Terminology choice is very important; we don't want to inadvertently drive people away or prematurely engender opposition.*

2. (Phil Dustan) *The "Working Groups" attendance is where/who the "White Paper" should be targeted towards (and written for in terms of diction, style).*
3. (Ken Banks) *Considering the path of approval final recommendations would need to take (through bureaucracy), could take exceptionally long periods of time for real action.*
4. (Phil Dustan) *Timeline diagram makes it appear we've learned all we need to know from our environment…*
    - (Jamie Monty) *Not intended to represent an end to research and sampling efforts, though priority now shifting to management/alternatives phase.*
5. (Joe Boyer) *Will the working group meetings be public? Would be important to advertize that if so.*
    - (Jamie Monty) *Yes, but will be run similar to TAC meetings (where public participates in designated period).*

6. (Judy Lang) *Might also look at how Flower Garden Banks NMS made this transition.*
7. (Phil Dustan) *Have a press secretary? Will probably need to run regular ads to "gear up" public for working group participation.*
    - (Jamie Monty) *A recognized necessity, need to develop our capability and expertise in this area.*
    - (Katharine Tzadik) *A big comment in the last SEFCRI team meeting.*
8. (Gene Shinn) *At recent SEFCRI meeting, any stakeholder participation?*
    - (Jamie Monty) *Yes, basically anyone who has interest in the fate of SFL reefs is deemed a stakeholder (even if they already are members of SEFCRI, DEP, the TAC, etc).*
9. (John Fauth, referring to comment on recent $USD 33.57 billion appraisal of Hawaiian reefs by US populace) *The Keys have even higher visibility; results from such a survey might be quite promising.*
    - (Ken Banks) *Important to note, even if the appraised value of our reefs drops, the percent contribution to US GDP may increase given the current economy.*
    - (Phil Dustan) *The entire country of Australia has the mindset of the Great Barrier Reef being a national treasure deserving the utmost effort to preserve it. That is not so here, although perspectives are changing.*
    - (Doug Seba) *On flights into Key West, seeing the excitement of people looking out over the reef… your comments about the positive perspective of mainland America on the FL Keys is correct. We could really leverage this public opinion. Too bad the seatback pamphlets are all for diving the Bahamas, Caymans, etc; could generate even more positive public opinion with FL reef promotional material in airline seatbacks.*
    - (Joanna Walczak) *We have looked at targeting airlines for information distribution, but would have to cover entire airline fleets (rather than just FL legs). Smaller airlines a possibility.*
10. (Joe Boyer) *In the timeline, would almost suggest a public meeting be held before the working groups… from which you could get working group participants.*
    - (John Fauth) *For this, local media coverage of a SEFCRI meeting would fuel interest in the public.*
    - (Phil Dustan) *Hear much on the connection between ocean health and human health (beach closures from sewage, etc); would make great TV spots.*
    - (Judy Lang) *May be hard to get editors to agree to such interviews; may have to start with a press release. Professional environmental television journalists aren't common in local media.*
    - (Dan Clark) *An example from local media: while conversing with reporters covering beach projects… none knew of SEFCRI. More exposure is necessary.*

11. (Joe Boyer) *Are there official SEFCRI boundaries? Are they on any navigational maps? Every SFL boater knows of the FKNMS since its boundaries are prominently mapped.*
    - (Jamie Monty) *There are boundaries; unmapped.*
    - (Joanna Walczak) *Can't be mapped until we have a management plan.*
    - (Jamie Monty) *Recent idea is to have benthic habitat layers (i.e. "reef zones") on maps to assist with keeping anchoring off reefs.*
    - (Margaret Miller) *The lack of jurisdictional authority in this area (don't have a FKNMS-like entity) is the reason for SEFCRI stakeholder-driven process of management (how we'll generate jurisdictional authority).*
    - (Joanna Walczak) *Exactly why we're focused on getting this process right.*
12. (Dan Clark) *Public meetings should be prioritized (chronologically). If you don't involve the public from the start, you won't get the support in the end. Must not make the mistake of inadvertently excluding public from the start, or risk losing the support of influential individuals.*
    - (Stephanie Clark) *(Above) somewhat like the public meetings that became the precursor to SEFCRI.*
    - (Joe Boyer) *If you can identify the individuals that are most opposed, and get their participation early on… of huge benefit to the process (and contributor to project success).*
    - (Joanna Walczak) *Incorporating an additional, earlier public meeting a definite possibility.*
13. (Phil Dustan) *Our poster child is the reef, but a bit too big to conceptualize. We could use something like the Miami River as a LBSP source to put into people's minds; could start there and clean upstream. Something like "Clean up the Miami River" is easy for people to wrap their heads around, and could again use the human health angle.*
    - (Judy Lang) *Could start on subsets to make it even more personal/local.*
    - (Piero Gardinali) *Could find another location similar to the Miami River in which pollution sources have been well-mapped… would assist our efforts to target LBSP sources in Miami River.*
14. (Dan Clark) *Getting community involvement in this regard could be a double-edged sword. Utility companies are trying to roll back outfall legislation, and could use our focus on Miami River as a reason that outfalls aren't detrimental and don't need to be fixed/removed.*

(Break)

Presentation: The Future of SEFRCI: Updated Charter Proposal *– Joanna Walczak FDEP CRCP*

I. Step 1 - Solicit Team Input on Current SEFCRI Operations

A. Things to keep:

- The SEFCRI team itself
- Communication tools (email, Southeast FL Reef Newsletter, SEFCRI websites)
- SEFCRI Meetings - meetings provide an opportunity for reef managers and stakeholders to regularly engage on issues of mutual interest.

B. Things to Change – SEFCRI Structure:

- Reduce information disconnect between focus areas
- Whole SEFCRI Team should meet at least every 12 - 18 months (possibly combine Focus Areas)
- Considering the differing levels of support from individuals and organizations, clearly re-define the roles and responsibilities of Team members & FDEP CRCP staff
- Require periodic re-application or recommitment by Team members.
- Navigator positions - redefine as advisory roles or eliminate
- More frequently review priorities, threats, and emerging issues (e.g., lionfish, disease, climate change, etc.)

C. Things to Change – SEFCRI Team Function:

- Smaller, more engaged teams = more efficient
- Expand role of the Technical Advisory Committee (TAC) beyond just LBSP (potentially use 'support' or 'sub' teams with specific expertise)
- Improve teleconference capabilities to reduce the need for travel.

D. Things to Change – LAS Development:

- Develop goals and performance measures for the Team, and success criteria for the SEFCRI LAS process and LAS projects.
- **Focus new projects on directly supporting the management alternatives identification process – fewer but more focused projects.**
- Obtain project team members, assign project leads, and develop a scope of work (including a realistic budget and timeline) before a project is funded.
- Be more realistic when estimating project costs and project scope.
- Develop implementation plans for completed SEFCRI products (especially regulatory or policy focused projects).

II. Step 2 – Review Old SEFCRI Charter

- Adopted February 2005
- SEFCRI MISSON: *The mission of the SEFCRI and its Focus Teams is to develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties.*
- Provided basic guidelines regarding Administration, Powers, Duties, Membership, and Interaction with TACs
- Lacked clear definitions of roles and responsibilities

III. Step 3 - Step 3: Update SEFCRI Charter Based on Existing Charter Models

A. Florida Keys National Marine Sanctuary (FKNMS)
   - Sanctuary Advisory Council
   - Comprised of similar agency and stakeholder group representatives
   - Has clear definitions of roles and responsibilities – including FKNMS Staff, Chair & Co-Chair, and members
   - Sets protocol for determining appointments and timeframes for service

B. FDEP Office of Coastal and Aquatic Managed Areas (CAMA) - 2010 Stakeholder Plan
   - SEFCRI Team = standing long-term stakeholder group = can provide recommendations to FDEP CRCP Manager regarding the development and implementation of the SEFCRI LAS program.

IV. Step 4 - Incorporate SEFCRI Team Feedback into Draft Updated Charter

A. AUTHORIZATION – Expand to include SEFAST history

B. SEFCRI VISION STATEMENT – minor editing

C. OBJECTIVES AND ROLES
   - Objectives of the SEFRCI Team
     - Clarify role of Team as defined by CAMA Stakeholder plan
     - Establish a consensus process for recommending and developing new LAS projects
   - Members, Alternates, and Officers
     - Clarify roles for Team Members
     - Eliminate Navigator positions
     - Establish Officers positions
     - Member/Officer appointments & terms

- Clarify FDEP CRCP staff roles

D. PROJECT TEAMS AND ADVISORY GROUPS
    - Define duties and roles of Project Team and Advisory Group members and officers
    - Project Teams composed solely of members of the SEFCRI Team, or their alternate.
    - Advisory Groups (e.g. TAC) composed of members of the SEFCRI Team and persons outside the SEFCRI Team

E. OPERATIONS
    - General Meeting Protocols (public comment periods, meeting frequency (every 12 -18 months, etc.)
    - Procedures for providing recommendations to Team/ FDEP CRCP Manager
    - Requires establishment of Goals and Performance Measures
    - Conduct of Individual Members & the SEFCRI Team as a Body

F. OTHER – Charter effective for five years from approval.

V. Step 5 – SEFCRI Team Review of Draft Updated Charter – Preliminary Feedback

A. General agreement to combine focus teams and meet annually (1-2 days)
    - Still want to keep focus area topics elevated
    - Combining allows cross-pollination of expertise for future LAS projects
    - Individual project teams will continue to meet as needed – report out at annual meeting

B. No re-application for current team members – only formal recommitment.
    - Develop tiered participation levels
    - Actively try to fill missing stakeholder representation seats through application process

C. Officer Positions
    - FDEP CRCP Manager = Chair
    - 5 Navigators (Local, State, Federal, NGO, University) = Vice-Chairs

D. New LAS Project Development
    - Focus on finishing up original LAS
    - Implement products and recommendations produced from the original LAS projects.
    - Concurrently – identify new ideas/projects

E. Preliminary Feedback on LBSP TAC

- General agreement that TAC should be expanded to represent all SEFCRI issues/topics. (May need to be broken into subgroups if we expand their expertise).
- Need to more clearly define roles, goals, purpose
  - TAC function is to support and provide service to project teams
  - TAC role could be expanded to include budget and schedule development - project team needs their service/support from those knowledgeable
- Perceived problems with TAC:
  - Due to institutional associations, TAC feel they cannot provide recommendations and/or resolutions.
  - Should just become advisory in nature?

VI. Steps 6, 7, 8 – Gather and Integrate TAC Feedback into Charter, SEFCRI Team Member Recommitment, Adopt Updated SEFCRI Charter (once finalized)

- Gather input from today and continue update of charter.
- Ask for formal recommitment from SEFCRI Team & TAC members
- Finish charter revisions & adopt new charter
- Timeline:
  - Need to identify new projects for funding by July/August…
  - New charter should be in place no later than June 30, 2012
  - Consensus on the need for expediency

<u>Questions and Comments (Future of SEFCRI):</u>

1. (Margaret Miller) *The reason the TAC focused on LBSP was because scientific knowledge gaps concerning LBSP were identified as a major point of concern; not because other topics were ignored.*
2. (Joe Boyer) *Should reconsider reapplication vs. recommitment. Need to ensure that you can bring in new people. Foresee a definite problem whereby some individuals recommit (thus preventing a new replacement) without intention of serving adequately. Unsure if "recommitment" method manageable in the long-run.*
   - (Joanna Walczak) *Contemplated assigning a set number of participants in each working group… overwhelming response was negative from breakout sessions. Particular concern over losing expertise.*
3. (Piero Gardinali) *What are the criteria to apply? Recommitment seems much easier than (re)application… what would the process be to remove a member?*
   - (Joanna Walczak) *Currently trying to devise such mechanisms.*

- (Katharine Tzadik) *Could use participation amount (i.e. percent of meetings attended per year) as a guideline for removal/replacement.*
- (John Fauth) *Participate in a Restoration Advisory Board where participants are dismissed for missing enough meetings (below a threshold); usually relinquish seats when approached, allowing for new recruitment.*
- (Joanna Walczak) *Have tried a recommitment by email (if after several emails the individual does not respond, they are assumed inactive and removed), which allows for an easy first step identification and creation of available positions.*
- (Dan Clark) *When this was addressed in the September meeting, something brought up was the number of NGOs to be created. Original thinking was one to two, which met much resistance; didn't want topics to get personal/confrontational between people with the same goals in mind.*
- (Joanna Walczak) *Early feedback is one reason such numbers haven't been set yet. If that process is more transparent, would people be more open to choosing such numbers?*
- (Stephanie Clark) *Possible imbalance when considering participant numbers and variance of groups involved.*
- (Joe Boyer) *In FKNMS Advisory Committee (SAC), agency representatives (NOAA, FWC, etc) are non-voting members. SAC makes recommendations to agencies.*
- (John Fauth) *Likewise for Restoration Advisory Council; government representatives non-voting (state, city, Army Corps).*
- (Joanna Walczak) *Currently, only non-voting agency in SEFCRI is CRCP.*

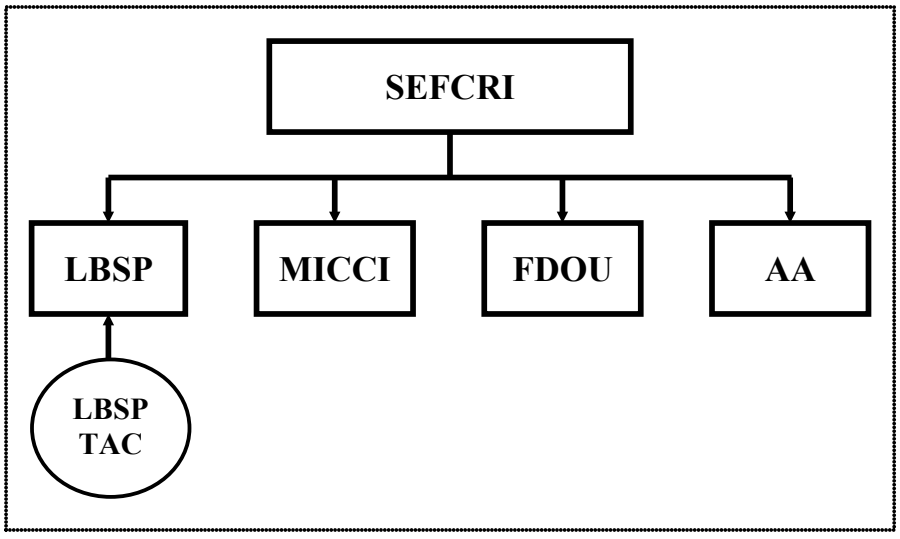
4. (Margaret Miller, referencing TAC feedback) *Need to better define what limitations are, and what can be done by the TAC.*
    - (Katharine Tzadik) *Properly delineating/outlining what can and can't be contributed by TAC will lead to clearer definition of role.*
    - (Esther Peters) *When developing Quick Guide, had difficulties with some members being associated with certain recommendations. An interim solution, put forth recommendations as from the TAC as a whole, without any names associated.*
    - (Margaret Miller) *Limitations on what can/can't be recommended seem counterintuitive to what the TAC was designed to do. Individuals on TAC for their expertise; should be a degree of division from one's institution.*
5. (Phil Dustan) *When creating CRTF, academia ("problem-driven" people vs. "mission-driven people") didn't sit at the table, TAC is very unlike CRTF in that way. Should strive to maintain TAC as the vital resource that it is (idea production, issue discussion, etc).*
    - (Joanna Walczak) *Unfortunately, one thing we struggle with is showing what the TAC does and what it produces (questions posed from funders and others).*
    - (Margaret Miller) *Hard to quantify TAC input to various projects.*

- (Joanna Walczak) *Meeting resistance from those suggesting to breakup TAC and rely on members as unpaid, outside expertise (i.e. SEFCRI technical advisors).*
- (Judy Lang) *Suggest that we go release present state of both the Quick Guide and White Paper as Spring 2012 versions; can serve as 'real products' to present at next CRTF meeting.*
- (Piero Gardinali) *Confused, we are a Technical Advisory Committee, but we need to become more 'advisory' in our role?*
- (Joanna Walczak) *In essence, need more exposure to help promote our purpose.*

Discussion – TAC Structure – *Katharine Tzadik – FDEP*

- Will contribute to new SEFCRI charter
- Define TAC structure, function, expertise it encompasses, roles and responsibilities
- TAC must illustrate role(s) beyond "advising" (beneficial when applying for CRCP funding)

1. (Joe Boyer) *Is there an organizational structure for SEFCRI? An illustration that can be shown, and show how you plan to modify it with the new charter?*
   - (Joanna Walczak) *Not formally outlined, but there is an organizational structure. New structure open for discussion, considerations such as: smaller groups per subject, group combinations, etc.*
   - Current SEFCRI structure (Katharine Tzadik):



2. (Joe Boyer) *How many people from TAC are on the LBSP group?*
   - (Katharine Tzadik) *Four. There is representation in the SEFCRI Team from the TAC. Some individuals also serve on multiple teams.*

- (Joanna Walczak) *Cross participation a product of filling needs for technical expertise in various topics (at the time).*

3. (Valerie Paul) *Support broadening the TAC's advisory role to all the SEFCRI groups.*
    - (Phil Dustan) *Would help the TAC guide research if we also participate in the other three groups.*
    - (Margaret Miller) *Makes sense; time already spent at every TAC meeting presenting updates from other groups.*
    - (Joe Boyer) *Are there individuals in the other groups that we want added to an expanded TAC?*
    - (Joanna Walczak) *Something to identify.*
4. (Katharine Tzadik) *Expanding TAC expertise, bringing in more people beneficial, but might bring logistical difficulties (meeting scheduling, focus within broader topic ranges, etc).*
    - (Valerie Paul) *Not necessarily a 4x increase in group size; already have broader expertise than just LBSP. Would likely need to concentrate on a few prominent knowledge gaps such as engineering (for MICCI).*
    - (Katharine Tzadik) *Also: socioeconomics, politics.*
    - (Judy Lang) *Advertising.*
5. (Margaret Miller) *As the management alternative development working groups proceed, an advisory role may emerge concerning their structure and information handling. Depending on what structure the working groups take, role of the TAC could be redefined based upon needs of working groups. Example: filtering working group interaction with the four SEFCRI Teams.*
    - (Joanna Walczak) *Would directly address question of "what does the TAC do for alternative management direction?"*
6. (Katharine Tzadik) *If we adopt more frequent SEFCRI meetings, combining when SEFCRI meets and when the TAC meets, could allow for direct interaction and eliminate much of the review that occurs at both meetings.*
    - (Valerie Paul) *(Above) could be accomplished in less than a day.*
    - (Katharine Tzadik) *If combined with SEFCRI, would look favorable and highlight role of the TAC.*
7. (Joe Boyer) *Should we have a way to recruit/solicit to as well as remove people from an expanded TAC?*
    - (Margaret Miller) *An ad hoc process.*
    - (Piero Gardinali) *May want to reconsider alternate members. Are there written requirements for identifying alternates?*
    - (Joanna Walczak) *For SEFCRI Team members, nothing written but could formerly identify an alternate.*

- (Margaret Miller) *TAC is fundamentally different than SEFCRI Teams, members do not represent agencies.*
- (unknown) *Should also include a way to get temporary expertise depending on what topics are being addressed.*
- (unknown) *At one point, idea brought up of including politicians in a broadened TAC… should not include politicians to keep TAC purely scientific and prevent conflicts of interest.*
- (Phil Dustan) *Would like to have a lobbyist we could refer to for political views on topics.*
- (Margaret Miller) *At most an ad hoc advisor.*

8. (Phil Dustan) *Would like there to be provisions for TAC members to attend SEFCRI Team meetings.*
    - (unknown) *A reason to expand teleconferencing capability.*
9. (Katharine Tzadik) *Reiterating discussion, what is being recommended is to preserve the core TAC, with charter addendum to bring in additional expertise when needed (without letting it expand too greatly in size).*
    - (Joe Boyer) *It would be good to have profiles on SEFCRI Team members to know where we might solicit outside expertise.*
10. (Katharine Tzadik, asking TAC members) *What do you see as the major definable contributions of the TAC to SEFCRI (its role and responsibilities)? What limitations might you be encumbered by as individuals?*
    - (Margaret Miller) *Early on, much contribution to project development, prioritization, etc.*
    - (Valerie Paul) *[We are] limited in our inability to take recommendations directly to politicians.*
    - (Margaret Miller) *In TAC meetings, we make recommendations based upon our expertise, not on behalf of our organizations (i.e. NOAA); nor can we take TAC recommendations back to our organizations. Should continue to reinforce that our recommendations are irrespective of our agencies.*
    - (Ken Banks) *A difficult conflict, as many of us are instructed that what we say on and off duty is representative of our organizations.*
    - (Joe Boyer) *May need to deal with conflicts of interest in future project development and management direction. Individuals may need to recuse themselves from discussion/decisions that may affect them monetarily.*
    - (Ken Banks) *Early perception was that TAC members were responsible for pursuing funding to conduct projects.*
    - (Joanna Walczak) *Original intent of SEFCRI process was for team members to pursue funding for projects. DEP not intended to be main source of funding.*

11. (Katharine Tzadik) *Do we want to still keep TAC organizing committee?*

    (Group) *Important to have TAC organizational committee to relay recommendations to recipient groups, as many TAC members are contractually prohibited from doing so. Could possibly utilize "agency representatives" or "liaisons" for this purpose.*

12. (Piero Gardinali) *If we review projects once completed (yes)… another addition to TAC roles.*

    - (Ken Banks) *Also, show the many projects created as a result of this group (e.g. biomarkers, groundwater, water quality monitoring).*
    - (Phil Dustan) *TAC an "idea incubator" group. If we had one representative from each of the SEFCRI Teams on the TAC, they could act as liaisons between TAC meetings and Team meetings to identify what expertise is needed at TAC meetings for coming discussion topics.*

13. (Katharine Tzadik) *Another possible change: changing meeting structure/agenda based on questions to address; a pointed discussion.*

    - (Joe Boyer) *Some such questions will come from other group meetings, which could be relayed to TAC.*
    - (Katharine Tzadik) *New structure could affect better output from TAC meetings.*

Public Comment – Day 2

I. Dan Clark – Cry of the Water

- Senate Bill 716 would roll back turbidity and sedimentation standards, making permit applications for maritime construction easier. Very disturbing language concerning "self-permitting." http://www.flsenate.gov/Session/Bill/2012/716
- Article in Sun Sentinel: "Broward contract blocking clean sewage plan" http://articles.sun-sentinel.com/2011-08-28/news/fl-sewage-pollution-20110827_1_sewage-outfall-discharges
    - Proposal to Broward county concerning development of 2,000 acres of annexed land (from PBC to BC).
    - Land developer proposal: build own sewage reuse and treatment facility.
    - Would assist Broward County in meeting goal of increased sewage reuse percentage and aquifer recharge
    - Existing contract for the area locks the district (North Springs) into discharging water via existing treatment plant and ocean outfall
    - (Dan) *disheartening that this proposal, which would reduce LBSP and "do it right finally" is being fought by the county.*
- **Recommendations**:

- For these bills (SB724, SB716) understand that TAC can't lobby, but Cry of the Water can. Want recommendations from TAC, something in writing that can be brought as supporting material.
- Could use a commercial fisherman to participate in TAC. Generally the biggest opponent in marine management.

Questions and Comments (Public Comment I):

1. (Joe Boyer) *Concerning first recommendation, the way it works in FKNMS, the TAC makes recs to SAC, which in turn makes resolutions (the equivalent to what you're looking for). This TAC doesn't have that mechanism. Agreed that there needs to be power within SEFCRI to make such resolutions that you can use.*
   - (Dan Clark) *We all know what can be detrimental to our reefs (i.e. sedimentation, LBSP), and know that politics can be a major controlling factor for these things.*
   - (Esther Peters) *Isn't there a FL Oceans Council?*
   - (Group) *Lost funding; gone.*
2. (Ken Banks) *Concerning the Sun Sentinel article, the people making the regulations generally only concerned with votes and budgets; and may not even care what our advisory committee recommends. Best place to take up concern is with the county commission.*
3. (Group) *Concerning second recommendation, commercial fishermen to be included in FDOU working group.*
   - (Esther Peters) *If possible, finding someone with both scientific and commercial fishing background/association would be of choice to serve on TAC (and/or in working group).*
   - (Dan Clark) *May yet want to shy away from anyone with a scientific background; fishermen don't trust scientists (in general).*
   - (Esther Peters) *[Commercial] fishermen are organized in the Keys and participate in SAC; but don't seem to be organized here.*
   - (Jamie Monty) *A member of PB Fishing Club on FDOU Team, but participation is poor.*
   - (Dan Clark) *Another individual we'd benefit from including is Colonel Hamilton – background in agriculture, instrumental in starting ecosystems task force, runs water and soil board in Broward County, involved with beach dune management/preservation (a topic which the TAC should expand to include).*

II. Stephanie Clark – Cry of the Water

- With TAC/SEFCRI restructuring, don't think we should lose non-voting members of the TAC – bring much appreciated expertise and discussion.
- Was hoping to see 'White Paper' in time for most recent CRTF meeting. Completion would provide needed lobbying material for our cause.

- Would also like to see TAC be able to make recommendations.

Questions and Comments (Public Comments II): n/a

TAC November 2011 – Meeting Conclusion

Katharine thanked the TAC for its attendance and contributions. Dates for the next TAC meeting were not finalized.

Day Two – adjourn