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Artificial Reef Evaluation Capabilities of Florida Counties

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FLORIDA SEA GRANT COLLEGE PROGRAM

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INTRODUCTION

Florida's coastal county artificial reef sampling and data management programs are surveyed in this report. The survey describes the county level capability for artificial reef documentation and performance assessment based on their needs, interests, organizational structure and "in-situ" data collection and data management techniques. The primary purpose of this study is to describe what staffing, training, techniques, organizational procedures and equipment are used by the coastal counties to establish local reef assessment projects, if they have such an effort. This information is necessary to help determine the feasibility of implementing standards of data quality assurance and control for a state reef database with information provided by local reef managers.

METHODS

This material represents new information obtained from mail surveys and personal contacts with Florida's 35 coastal counties (see Figure 1). Interviews by the senior author with 37 persons, associated with 21 county reef programs, were held between October 1991 and March 1992. Visits included a cross section of counties having different levels of reef development effort. The range included a county having a single "citizen volunteer" who administered all aspects of reef construction, fund raising, documentation and reporting, to Sea Grant Agents, and counties having full-time "reef coordinator(s)" working with their own equipment and staff. Some cities that were building reefs were not addressed except in the context of their county reef program. For example, the City of Fernandina Beach, administers the Nassau County reef program so it is described as a county program.

In October 1991 the survey (Appendix A) was mailed to all 30 of Florida's coastal counties (Figure 1) having reef coordinators or involved citizens. The contact list was provided in Florida Sea Grant's Pybas survey (1991), the Sea Grant Office at the University of Florida and by Florida Department of Natural Resources Artificial Reef Office. Follow-up phone calls or direct contact resulted in a 100% accounting for all 35 coastal counties (including the five which had no reef programs, See Figure 1). Between January and March 1992, the field visitations by J. Halusky, who interviewed reef managers, citizens or Sea Grant Agents in 21 counties verified the accuracy of most of the written surveys. Personal interviews were located in southwest Florida (Lee, Charlotte, Sarasota, Manatee, Hillsborough), south-east Florida (Dade, Broward, Palm Beach, Martin, St. Lucie), the panhandle counties (Escambia, Santa Rosa, Okaloosa,

Bay, Gulf, Franklin, Wakulla, Taylor), and the north-east Florida counties (Nassau, Duval, St. Johns). Interview results are summarized in the Appendices M and N. No attempt was made to interview all 30 county reef managers.

Descriptions of county reef monitoring and assessment capability are based on survey and interview responses about their ability to document the reef location and to field sample physical, chemical and biological parameters. It is also based on information collected, about their ability to implement techniques for data quality control, data management and storage and how they disseminated information to officials and the public. The organization and staffing of county reef programs was also investigated. Appendix B through N list the contact persons surveyed, and summarize their responses.

The seven page, 30 question survey document (Appendix A) contained 127 possible data parameters. Major pieces of information included: the key contact person(s), addresses, their agency or affiliation; whether or not they have a reef program and a public office; how do they actually collect data from their reefs; how do they locate them; what physical and biological data do they collect; how and where do they file reef information; how do they report it to officials and the public; do they use procedures for data quality assurance and control (a QA/QC program, See USEPA 1980 and USEPA 1988); do they use or have access to a GIS (Geographic Information System) and what are their priority concerns, expectations from the state agencies, and the academic institutions.

The original "raw data" are not included in this report. Data from the original surveys was coded on computer spreadsheets for summary and analysis. These are presented in Appendix B through M. Direct quotes and paraphrased statements from interviews by the senior author are included in Appendix N. These should provide the reader with insights about reef assessment and data management issues and concerns, which are not apparent from the tabulated survey data.

RESULTS

Presentation of findings in this section are divided into six categories.

1. General County Program Information

A Florida map showing the general locations of permitted reefs (See Pybas, 1991) might suggest that all but two counties (Flagler and Indian River) should have a reef construction program. However, only 30 of the 35 counties (See Figure 1) were found to actually have or have had, artificial reef construction activity. In some cases, such as in Walton and Dixie counties, they have reefs off their shores which have been built by

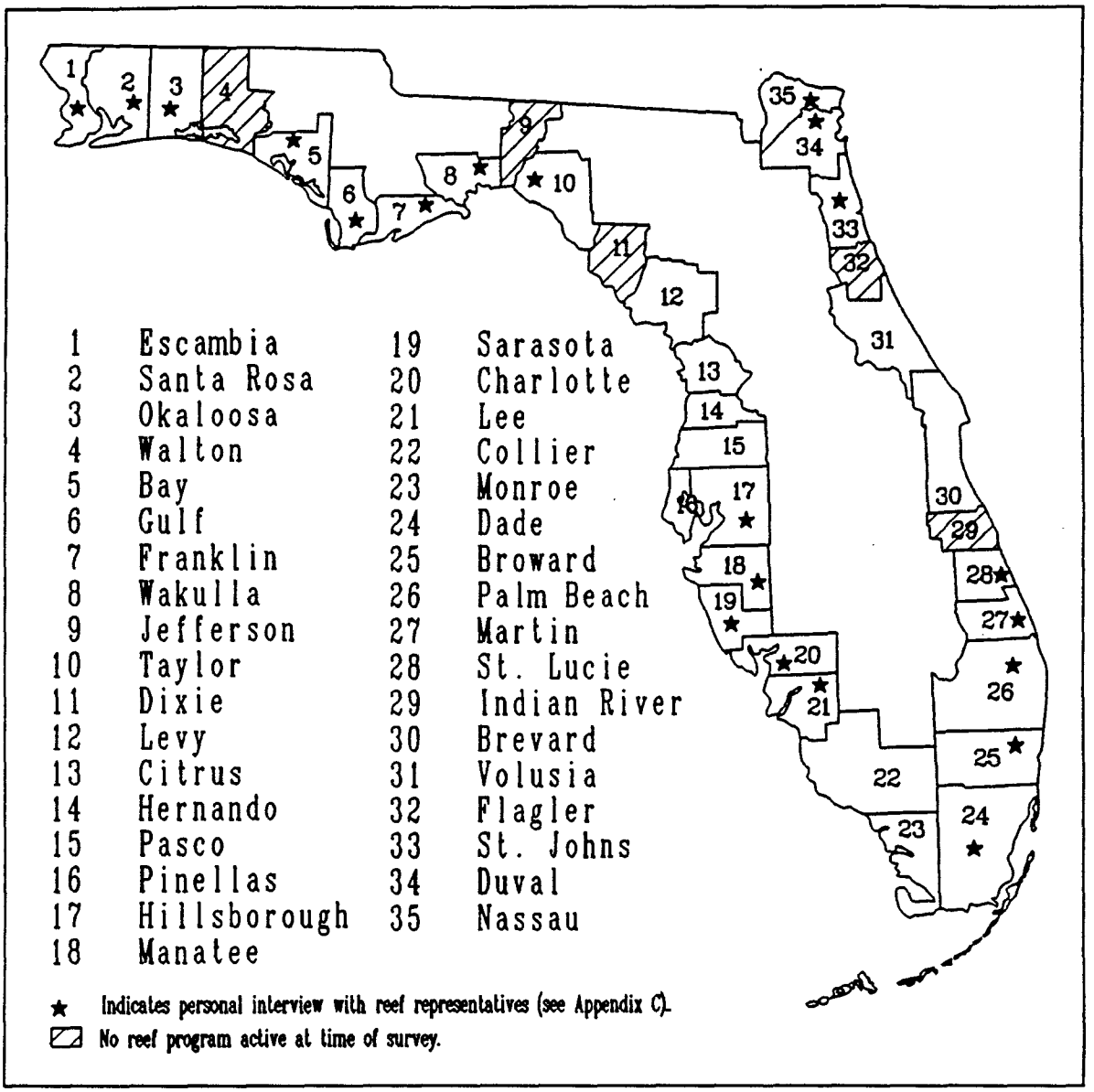

Figure 1. Florida Coastal Counties: Artificial Reef Assessment Capabilities Survey.

programs in adjacent counties. In the other three, Jefferson, Indian River and Flagler counties, there is no inlet providing access to the sea, thus no reef construction activity.

Lists of the 30 county offices and contacts having reef management programs are found in Appendix B and C. The list does not include all persons interviewed, but only the primary county reef representative. They were asked to estimate how long their reef program has been active, and comment on the amount or type of program involvement they have.

The amount of program involvement was defined by three categories, or combinations: "Special Office" - counties having a designated reef office, complete with salaried staff and space for files and office equipment; "Added Task" - indicating that no special office was designated for reef work, but that it was added as an additional duty for some salaried staff member(s); "Volunteers" - indicating that the county depended on volunteer(s) working either exclusively, or in cooperation with county staff. Appendix C lists the "Type of Program", "Contact Person and official name of the "Program Office" involved with reef activity.

It is significant that individuals representing three (Hillsborough, Levy & Pinellas) of the thirty counties **responded** that they have "Special Office's" designated for reef work. It should be noted that the Levy County reef office, is not located in the county, but is a special research project from the University of Florida, Department of Fisheries and Aquaculture, which is, in-effect, the established county reef program. Dade and Broward Counties responded that their "reef office" had other duties, even though the majority of their responsibilities were reef related. Broward's reef program, for example, was related to beach renourishment projects, turtle nesting, etc. , having multiple roles, and not "exclusive" to artificial reef activities. Most counties (22 of the 30, including Broward and Dade) have offices in which reef duties are an "Added Task" with volunteers (6) or without volunteers (16). Over three-fourths (23) of the 30 counties indicated they receive some data from volunteers in their programs (Table 2). Some county reef programs, (5 counties) are run solely by volunteers.

Years of operation.

Appendix C and Figure 2 summarize the length of time the counties have had a reef building program. Charlotte, Dade, Duval, Sarasota and Wakulla have had programs for over 20 years. Nineteen (63%) of the of the 30 counties have had programs for 10 or more years, the remaining 11, (37%) less than 10 years. Generally, Florida's county reef building efforts can be considered older programs. Of course, the number of years in operation does not necessarily reflect the size or complexity of their program, but is evidence for their ability to continue long-term construction efforts.

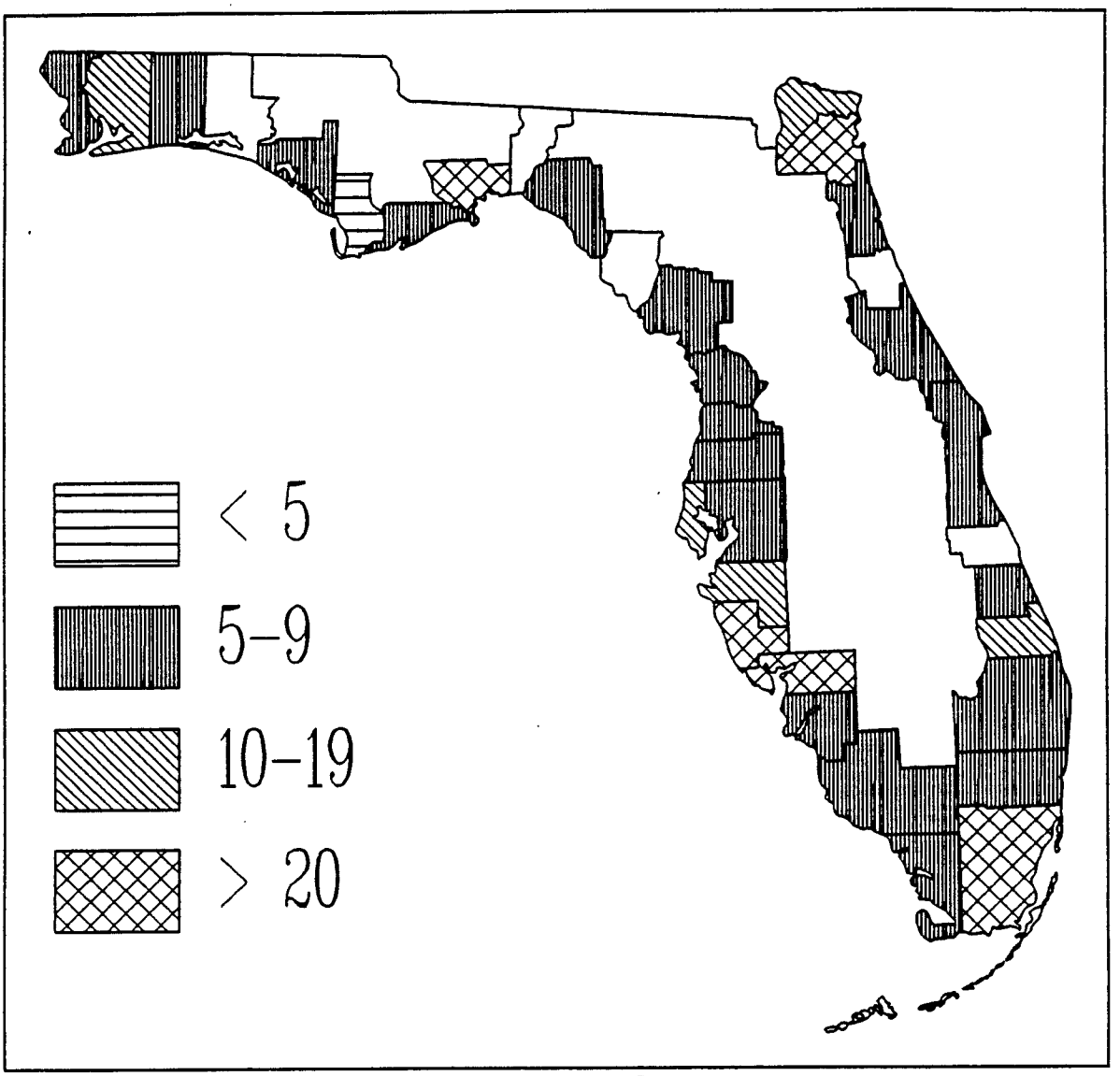

Figure 2. Years of Operation of County Reef Programs.

TABLE 1. REEF MONITORING AND ASSESSMENT

COUNTY	RANGE OF OPERATION						SCALE OF OPERATION	COLLECTION FREQUENCY	# OF PLACEMENTS MONITORED
	ONLY PERMIT REQUIRED (PR)	PR AND SOME ADDITIONAL	DETAILED SITE SELECTION	POST-DEPLOYMENT	EXTENSIVE POST-DEPLOYMENT	LONG-TERM MONITORING			
Bay		Y	Y	Y	Y		Simple	Sporadically	5
Brevard	Y						Simple		0
Broward		Y					Simple		7
Charlotte	Y						Simple	Sporadically	3
Citrus		Y		Y			Simple	Annually	1
Collier		Y					Simple	Semiannually	10
Dade		Y	Y	Y			Moderate	Monthly	5
Duval		Y	Y	Y	Y	Y	Moderate	Quarterly	4
Escambia		Y					Simple	Sporadically	0
Franklin		Y	Y	Y	Y		Moderate	Monthly	1
Gulf		Y	Y				Simple	Monthly	9
Hernando		Y	Y				Simple	Annually	2
Hillsborough		Y	Y	Y	Y	Y	Moderate	Quarterly	6
Lee			Y		Y		Moderate	Bimonthly	1
Levy			Y	Y	Y	Y	Moderate	Semiannually	48
Manatee		Y					Simple	Sporadically	5
Martin		Y	Y	Y	Y	Y	Moderate	Monthly	2
Monroe							Simple		0
Nassau		Y	Y	Y			Simple	Sporadically	5
Okaloosa							Simple		0
Palm Beach		Y	Y	Y	Y	Y	Moderate	Semiannually	2
Pasco		Y					Simple	Annually	2
Pinellas			Y	Y	Y	Y	Moderate	Monthly	12
Santa Rosa	Y						Simple	Sporadically	1
Sarasota		Y					Simple	Sporadically	37
St. Johns		Y	Y	Y	Y		Simple	Sporadically	3
St. Lucie		Y					Simple		0
Taylor		Y		Y			Simple	Sporadically	2
Volusia			Y	Y	Y		Moderate	Semiannually	8
Wakulla		Y	Y	Y	Y		Moderate	Sporadically	6

TABLE 2. REEF DATA SOURCES AND PERMITTED SITE LOCATING METHOD

	FIELD METHODS				OTHER SOURCES		INDIVIDUAL DOCUMENTING PLACEMENT			
COUNTY	SCUBA	SHIP	CENSUS	AERIAL	CONSULTANTS	VOLUNTEERS	GOV'T OFFICIAL	CAPTAIN	VOLUNTEER	OTHER
Bay	Y	Y				Y			Y	
Brevard	Y	Y			Y	Y	Y			
Broward	Y	Y			Y					
Charlotte	Y	Y		Y			Y			
Citrus	Y	Y								
Collier	Y	Y				Y				
Dade	Y	Y				Y	Y			
Duval	Y	Y	Y			Y	Y	Y	Y	
Escambia	Y	Y				Y			Y	
Franklin	Y	Y	Y			Y				
Gulf	Y	Y				Y		Y	Y	FMP, Cty. Reef Coordinator
Hernando	Y	Y		Y	Y	Y	Y	Y		
Hillsborough	Y	Y								
Lee	Y	Y				Y	Y	Y		
Levy	Y	Y								UF Researchers
Manatee	Y	Y			Y	Y	Y			Sea Grant Agent
Martin	Y	Y	Y			Y		Y	Y	
Monroe	Y	Y				Y				
Nassau	Y	Y				Y	Y		Y	
Okaloosa	Y	Y								
Palm Beach	Y	Y			Y	Y				
Pasco	Y	Y			Y	Y	Y			
Pinellas	Y	Y				Y	Y	Y		
Santa Rosa	Y	Y				Y	Y			
Sarasota	Y	Y			Y	Y	Y			
St. Johns	Y	Y				Y	Y	Y	Y	
St. Lucie	Y	Y		Y			Y		Y	
Taylor	Y					Y			Y	Sea Grant Agent
Volusia	Y	Y				Y				
Wakulla	Y	Y	Y		Y	Y			Y	

2. Data Collection, Monitoring & Laboratory Capability.

Level of Operation.

Survey respondents were asked to subjectively describe the level of sophistication of their county's assessment or monitoring program. Four responses were possible: simple program; moderate program; sophisticated program or no response which might indicate "no program" or an "I don't know." Table 1 "Scale of Operation" shows that 63% felt they had a "Simple" reef assessment and monitoring program, and 37% a "Moderate" program. Interestingly, none felt they had a "Sophisticated" program. All 30 did respond positively, implying they felt they had some reef assessment capability.

Observation Frequency.

How frequently reef data were gathered was determined by Question 4 (See Appendix A) asking if information was collected for:

> Detailed Site Selection -- site selection involving an actual visit to the bottom by divers and/or fathometer surveys by boat before deployment;
>
> Only Permit Required Data -- information required to fulfill the reef permit specifications;
>
> Permit Required and Some Additional Data -- minimum permit information required with some additional information from divers, fishermen, etc. at or shortly after time of deployment;
>
> Post-deployment Data -- any follow up data collected after the initial deployment documentation, such as fish surveys, reef scatter maps;
>
> Extensive Post Deployment Data and Long-term Post Deployment Data -- any regular mapping, physical and/or biological sampling of the reef (more than once) after deployment.

Table 1 summary of their responses under the heading "Range of Operations" clearly indicated that 83% (25 out of the 30) said they collected information beyond what was required by the permit. Forty percent (40%) indicated they had "Extensive Post Deployment" and 20% said they had "Long-term Monitoring" operations. These were counties who indicated they had either hired reef managers, well organized volunteers or an intensive research program such as Levy. Levy county, incidentally, monitors the largest number of reefs (48) of any county.

"Collection Frequency" (Table 1) reveals how often county reefs are reported to be monitored. The variety of answers, some numeric, some just a single word response,

(Appendix A, survey question No. 4h.) were coded into six possible classes; Sporadically, Annually, Semiannually, Quarterly, Monthly and Bimonthly. Ten (10) counties (30%) indicated they gathered data "Sporadically" and 8 (26.6%) said they gathered information monthly, bi-monthly or quarterly. Seven counties (23.3%) said they gathered data semi-annually or annually. Five had no response.

Number of Placements Monitored.

Nearly two-thirds of the counties monitor less than five placements (Table 1). Only three counties monitor more than 10 (Levy, Pinellas and Sarasota). The respondents use of the term "monitoring" in this question should not imply their reefs were sampled more than once, or on a regular or systematic basis, as the word often implies. This was verified during interviews when it was discovered that "monitoring" frequently was defined as a single visitation to a site, sometime after initial placement, just to see if it was still there. Counties having hired reef coordinators and staff biologists or experienced volunteer reef research teams as Duval, St. Johns, Volusia and Wakulla indicated they "monitored" select reefs on a regular basis.

Personnel and Qualifications.

The number and qualifications of county personnel involved in reef assessment, even if as a part-time duty, provides a good indicator of a counties interest and capability for reef research. Figure 3 provides such a picture of Florida's local reef programs. Slightly over 40% had only one person, and 30% of the counties had more than one person (even if both are part time) involved. In fact, six had more than two persons, and three of these (Pinellas, Lee, Dade) had more than four persons involved in reef assessment. Six counties indicated they had no county staff people involved in reef programs, at all. Yet, one of these, Levy, has a very comprehensive monitoring effort as a result of a University of Florida research program. Appendix C and D is a table summary of each counties reef personnel, listing their level of education and Appendix E their job classification by title. Most are involved in county environmental offices as engineering, planning and zoning, ports authorities, safety and recreation departments. One senior official is the county administrator (Okaloosa) who has taken personal interest and responsibility for the reef program.

Data Sources, Methods and Ability to use Vessels.

The most valid assessment of a county's capability for reef documentation is by investigating their "Field Methods" and who performs them. "Field Methods" used in this survey is defined as those procedures used to document the reef site or placement at its geographic location. Such procedures as site selection and mapping, water sampling, sediment sampling, biological inventory, photography and remote sensing from vessel(s) and/or divers are included. Gathering field data from artificial reefs requires the ability to work at sea, perhaps underwater, or from aircraft. It is possible to document some

aspects of reef performance strictly from the land base, by inventorying reef materials, before transportation to the construction site, or from creel census of fish at the dock.

"Reef Data Sources" are summarized in Table 2. All counties indicated they use field methods, including SCUBA diving, to gather information about their reefs. Four counties (Duval, Franklin, Martin, Wakulla) indicated they have conducted creel census at the dock. Three counties (Broward, Hernando, St. Lucie) have used aerial data from reef sites. Eight counties indicated they have used consultants to study their reefs, but review of the survey data and the interview notes strongly suggests that consultant data are not the sole source of their reef database. Usually the consultants are used for special one-of-a-kind projects.

The survey (Table 2) indicated that volunteers in 23 of the 30 counties, were used to gather data. Only three (North East Florida, Organization of Artificial Reefs in Tallahassee, and Florida Oceanographic Society) "Reef Research Diver" training programs, modeled after the Sea Grant Extension Program, have been held in Florida. Most of the programs, who indicated they used volunteers, did not indicate their level of training and experience in underwater research methods.

Documentation of reef placement was verified by local government official(s) in 14 counties, by a vessel Captain in 7 counties and by volunteers in 10 counties. Ten counties did not indicate who verifies reef placement. One of these, Levy, has reef placement verified by the University of Florida research project investigators.

Another indicator of a county's ability to document field data is the use any "Standardized Field Data Forums". In Table 3 only ten (33%) counties indicated they used "Standard Field Data Forums" for reef data. When asked if they practiced any data quality control efforts, thirteen (43%) indicated they had some form of quality control program, nine (30%) recognized they had none, and eight (27%) had no answer. Follow up interviews revealed several interpretations of the meaning of "Data Quality Control" were made. Generally, "data quality control" was interpreted to mean "just looking over the data, and cleaning it up before filing it." This usually meant transcribing field notes onto a blank sheet of paper. Some counties actually summarized their data on computer spreadsheets, computer databases or word processors, using a simple form. For a few counties, quality control procedures consisted of review of the information for obvious errors, followed up by verification of questionable data with the person who gathered it.

Finally, the ability to get to the reef site at sea is perhaps the most significant factor limiting a reef assessment program. Ownership of a seaworthy vessel, assures the ability of frequent and timely sampling of reef sites. All but one (Taylor) have access to vessels which are either county or privately owned with time donated or chartered. Table 3 summarizes county and/or volunteer vessel access. Thirteen counties (43%) indicate they own vessels and can use them for reef assessment either full time or on a limited basis. Many were small vessels, operated by the law enforcement or rescue

Table 3.

Field Data Collection Formats, Quality Control, Vessels and Siting Markers

Siting Markers: C=Center; C & C = Center & Corners; CNS = Centerline & North & South; CO = Corners; E = Ends

County	Standard Format	Quality Control	Vessels County	Vessels Volunteer	Siting Markers
Bay	No	No	0	1	C
Brevard	No	---	1	0	C
Broward	No	Yes	1	0	C
Charlotte	No	No	1	0	C
Citrus	No	No	0	1	CO
Collier	No	No	1	0	CO
Dade	No	No	3	0	C & C
Duval	Yes	Yes	0	3	C
Escambia	No	Yes	0	1	C
Franklin	Yes	Yes	0	1	C & C
Gulf	No	---	0	1	C & C
Hernando	No	---	2	0	C
Hillsborough	Yes	No	1	0	C & C
Lee	Yes	Yes	1	0	C
Levy	Yes	Yes	0	2	C
Manatee	No	No	0	1	C
Martin	Yes	---	0	2	CO
Monroe	No	---	0	1	---
Nassau	Yes	Yes	0	1	C & C
Okaloosa	No	---	0	0	C
Palm Beach	Yes	Yes	1	0	CO
Pasco	No	---	1	0	E
Pinellas	Yes	Yes	2	0	CNS
Santa Rosa	No	---	1	0	C
Sarasota	No	Yes	1	0	C
St. Johns	No	Yes	0	1	C
St. Lucie	No	No	0	1	C & C
Taylor	No	No	0	0	C
Volusia	Yes	Yes	0	1	C
Wakulla	---	Yes	0	1	---

services in the county. These were not always available for a regular monitoring programs. In some counties, where privately owned vessels were used (50% of the counties), they were usually larger charter fishing or diving vessels, well maintained, equipped and authorized by U.S. Coast Guard to carry passengers, including divers.

Site Selection and Documentation Procedures.

The reef site or placement in the permitted area is usually geographically located by using Loran C (an electronic navigation system which computes radio signal time delays [TD's] then computes TD's to Latitude and Longitude. A more accurate GPS (Global Positioning System of satellites) that is becoming more available, was not widely used at the time of this survey.

Reef managers were asked if they located or marked their permitted sites by just the center location, the location of one end, location of the four corners or some combination. Table 3 lists by county the preferred method used. The majority (16 of 30) identified the site by marking the center of the reef. Second most used (6 of 30) was by location of reef centers and corners. Four indicated they used corners only. Only one used one end of the reef and one used a centerline from north to south to locate the reef.

Parameters Observed.

The survey asked for a listing of reef data parameters collected. These results are tabulated in Appendix F, G, and H. Generally, most indicated they collected water description data (Visibility, Sea State, Depth, Current, Temperature) which did not require much instrumentation, or lab analysis. Data requiring complicated field techniques, instrumentation or lab analysis, such as Sediment Depth, Coarseness, Reef Profile or Scatter, and Chemical Analysis, were taken by less than 10 counties.

Biological surveys (Appendix H) including Fish Counts, Visible Growth, and Benthic Organisms were reported taken by less than one-third of the counties. Half of the counties did report they had reef Fish Species Lists, but during interviews, most were found to be from informal fishing reports, with no verification of species identification and were not from actual systematic survey effort. Because so few programs use standardized data sheets and so few have received training to identify Florida's marine species, the reliability of this information is questionable.

Underwater photographic capability was assessed based on interview remarks. Generally, most counties who reported using volunteer or staff SCUBA Divers felt they had access to still camera underwater photography and a few even reported having access to video (Figure 4 and Appendix M). Most felt underwater photography was not a limiting factor on their ability to document reef structure.

Laboratory Facilities.

Access to local laboratories provides the ability to treat samples recovered from the reefs. This is necessary when certain data parameters cannot be analyzed at sea. Chemical analysis, specimen preparation, and map making require access to laboratory procedures. Appendix H indicates only one-third of the county staff indicate they have access to laboratories. In some counties, such as Duval and St. Johns where volunteers are sampling reefs, they are actually using private laboratories located on university campuses. Realistically, all 30 counties could use laboratories found within the high-school systems biology and chemistry classes, if the school system would agree work with such an effort.

3. Data Management, Archiving, GIS System, Quality Assurance (QA) & Quality Control (QC).

QA/QC Program and Standardized reporting forms.

Data Management and a QA/QC program begins in the field, at the initial point of data collection. It begins with a planned procedure and specific data parameters identified, usually on some standardized data sheet. Table 3 reveals that 10 counties have standardized data collection formats which serve to indicate if even the simplest QA/QC program exists. A complete QA/QC plan, according to the Environmental Protection Agency (USEPA, 1980 and USEPA, 1988), has 16 major elements in the written plan. These briefly include: 1. Title; 2. Contents; 3. Project Description; 4. Organization Chart; 5. QA Objectives; 6. Sampling Procedures; 7. Sample Custody; 8. Calibration Procedures; 9. Analytical Procedures; 10. Data Reduction; 11. Internal QC Checks; 12. Performance Audits; 13. Preventative Maintenance; 14. Routine Precision & Accuracy Checks; 15. Corrective Action and 16. QA reports.

Thirteen counties (See Table 3) indicated they had practiced Data Quality Control. No county was found to have
even a basic outline of a written QA/QC plan. Only two volunteer groups, Duval County and the OAR (Organization for Artificial Reefs) had written and some standardization of sampling procedures, forming the beginning of a QA/QC program. Based on interviews "Quality Control" was generally interpreted by those surveyed to mean that some knowledgeable individual would look over the field data to assure completeness and accuracy, before filing it. In very few cases, was their any notation that "calibrated" field instruments (thermometers, for example) were used or if data reduction and screening were practiced.

Archiving Methods & Software Used.

The second phase of data management is the method for storing and retrieving

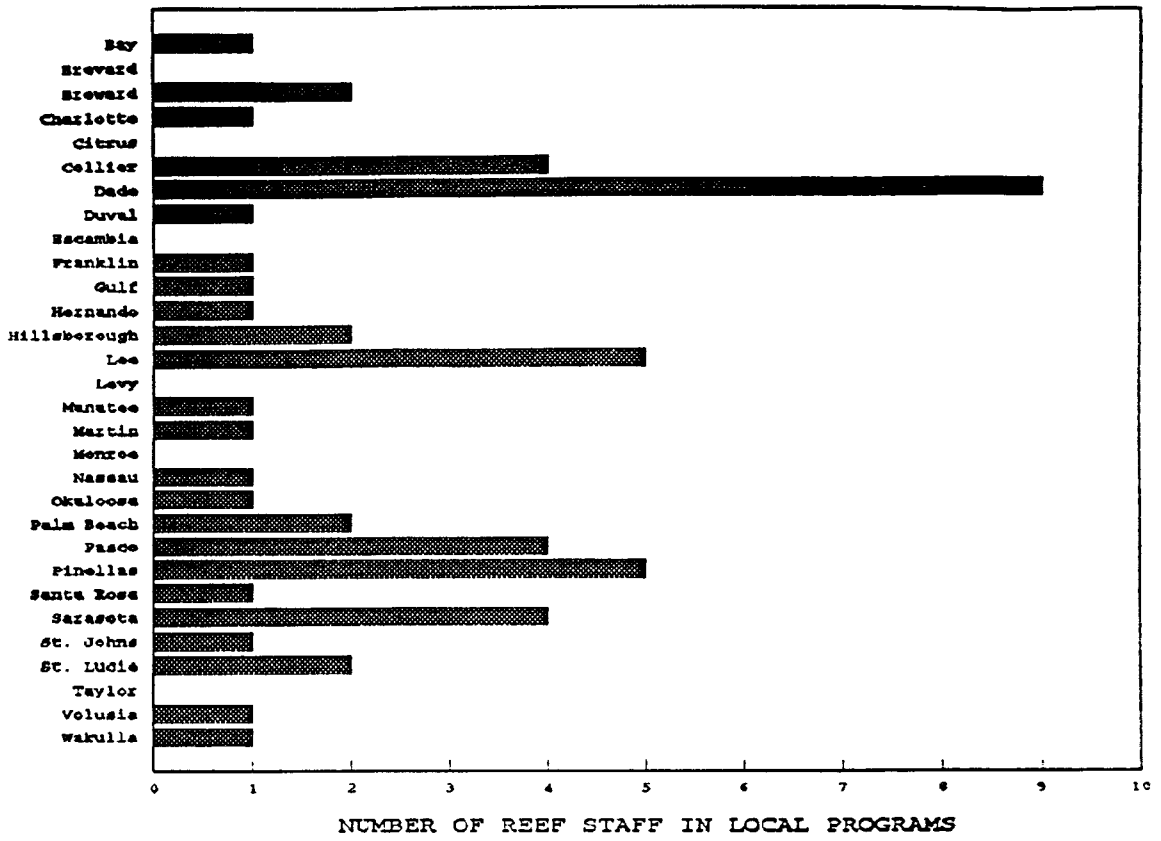

Figure 3. Number of Personnel

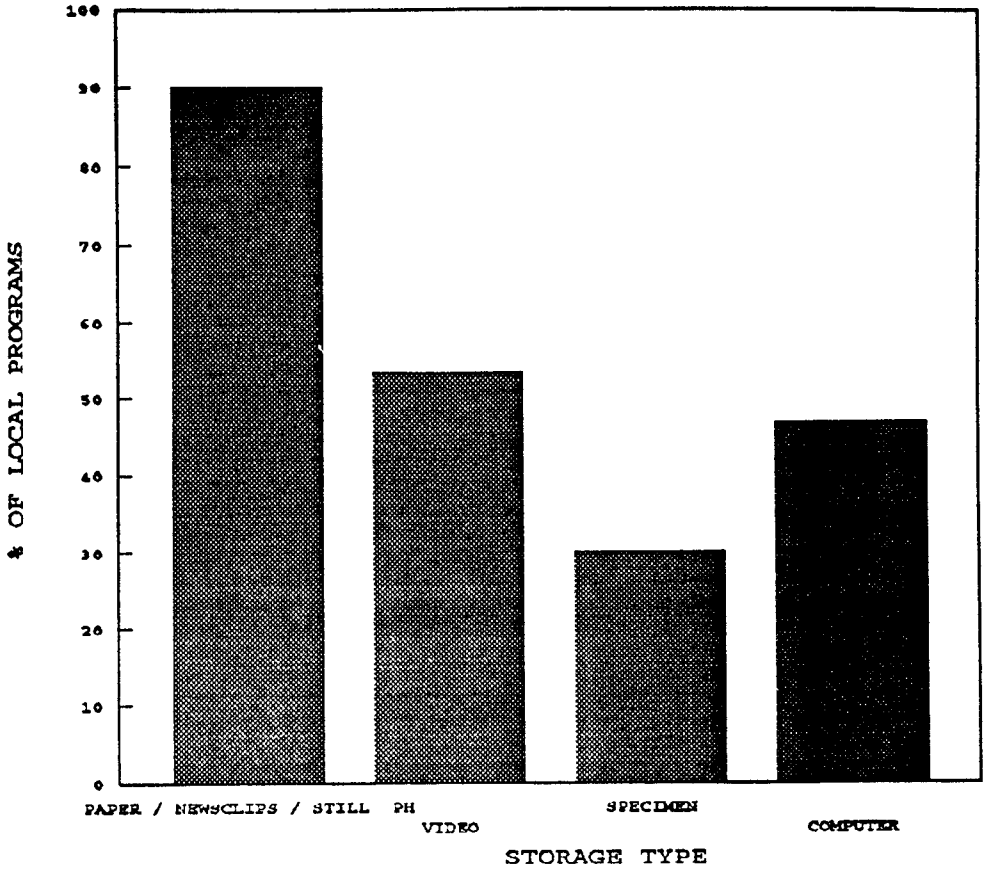

Figure 4. Data Storage Capabilities

the data from the data file or archives. While only one-third of the coastal counties indicated they use "Standardized Field Data Forms", 90% maintain some type of paper data storage file in the county (Fig. 4). These include written reports, contracts and grant applications & awards, maps, photographs taken on the surface or underwater and news clippings. Storage facilities usually consisted of file cabinets, or cardboard boxes of files. One county's complete reef data file was observed, during a personal interview, to be stored in four cardboard boxes in the place of business of a dedicated volunteer. No standardized data management systems were found or identified, with the exception of those counties having official reef offices, or formally trained reef research volunteer groups who established "Archives" in locations accessible to the public.

Surprisingly, 16 counties (Table 4) reported having video tapes of their reefs, in their files. Most were the result of special news features, made by local commercial TV Stations and some were made by local reef researchers. Nine (9) counties reported having "Specimens" of biological and physical samples from their reef. Fourteen counties reported having some reef data on computer (Table 4 and Figure 4). Figure 5 and Appendix I shows that the Computerized Data was stored either on "Wordprocessing" (14 counties) or "Spreadsheet" (12 counties) software programs. "Data-Based Management" software was used in Duval County. Approximately 40% indicated they were using "IBM Compatible" Programs, and the remaining 60% either did not respond, or did not know what computer systems were being used.
Geographic Information System Use.

Many county planning departments as well as resource management agencies are using computerized Geographic Information Systems (GIS) to portray their land use management data. This system keys all data to a geographic location by latitude and longitude number which significantly improves map-making ability. The survey requested information about county GIS capability, regardless if it was available for reef data. Figure 6 shows which counties currently use GIS for county planning, coastal information or reef data, and which are developing this capability. Four indicated they are currently using GIS for marine data, and 12 are developing this potential. Most reef managers, who were interviewed, expressed great interest in using GIS for its ability to draw accurate reef placement maps and to graphically portray complex data relationships.

4. Data Distribution & Reporting.

How a county reef program summarizes reef data, and reports it to local officials, state agencies and the public, gives some idea about their assessment capability. Public reports are brief descriptions of the reef, and/or "Assessments" of the reef performance, which are sometimes needed to account for spending public funds. Reef users benefit by receiving reef location and performance data from "credible" sources. Public relations programs based on quality data, help sell the program to the voters.

TABLE 4. REEF DATA ARCHIVING CAPABILITIES

COUNTY	PAPER / NEWSCLIPS / STILL PHOTOS	VIDEO	SPECIMEN	COMPUTER
Bay	Y	Y		Y
Brevard				
Broward	Y	Y		Y
Charlotte	Y			
Citrus	Y	Y		
Collier	Y			Y
Dade	Y	Y	Y	Y
Duval	Y	Y	Y	Y
Escambia	Y	Y	Y	Y
Franklin	Y	Y	Y	Y
Gulf	Y			
Hernando	Y			Y
Hillsborough	Y	Y	Y	
Lee	Y			Y
Levy	Y			Y
Manatee	Y			
Martin	Y	Y	Y	Y
Monroe				
Nassau	Y			Y
Okaloosa	Y			
Palm Beach	Y	Y	Y	Y
Pasco	Y	Y		
Pinellas	Y	Y	Y	
Santa Rosa	Y			
Sarasota	Y	Y		
St. Johns	Y	Y		
St. Lucie	Y	Y		
Taylor	Y			
Volusia	Y	Y	Y	Y
Wakulla				

Reporting frequency.

The frequency of reporting reef data to officials, was coded into five categories: by trip; sporadically; monthly; quarterly and annually. These are presented in Table 5. Most county managers (10) noted that their reports were either "Sporadically" or "Annually". Six (6) indicated they reported their data to some reef archives.

Audience.

Distribution of reef information is equally targeted to both "Officials" (Includes: State, County, City, Table 5) and to the "public." Less than half (13 of 30 counties) indicated they developed summary reports to local or state officials and 13 targeted the "Public" which includes volunteers, and the media.

Dissemination.

Table 5 summarizes what "Format" reef information is distributed to the public. The majority (23 of 30) of the counties provide public information through the mass media of Newspaper and Radio/Television". Public Meetings, Newsletters and Exhibits are also used to a lesser extant (15 of 30). Pamphlets were used in 16 of the 30 counties. These latter efforts require a more formal organizational structure, then the former where professional reporters develop the stories.

5. Reef Assessment Needs Priorities.

Reef coordinators were asked to identify and rank the three most important reef assessment priorities in their county program (Table 6). Responses were placed into the following priorities: funds, standards, training, data management and analysis, data acquisition, networking, no response.

Equally scaled, numeric, class intervals were set up for the three ranked priorities: 1 = 1.00; 2 = 0.66; 3 = 0.33. The count of each priority in each rank class was recorded. The sum of the number of counts times the rank value yielded a frequency-ranked value weighted score, which was used to scale the most important artificial reef program priorities.

Table 7 shows the rank of each of the top reef program priorities in the three-tiered rating system and its relative contribution to the final weighted total score. For example, "Funds" ranked first as the #1 Priority (33.33), second as the #2 Priority (13.20) and fourth as the #3 Priority (3.30); its unadjusted total was 49.83; its weighted total score was 24.92.

The weighted total column in Table 7 presents combined weighted scores as a percent index value. It shows that "Funds" ranks the most important priority (24.92 %),

TABLE 5. REPORTING AND DISSEMINATION OF REEF INFORMATION

		AUDIENCE			FORMAT					
COUNTY	REPORTING FREQUENCY	OFFICIALS	ARCHIVES	PUBLIC AND MEDIA	PAMPHLETS	NEWSLETTER	NEWSPAPER	RADIO/ TELEVISION	PUBLIC MEETING	EXHIBITS
Bay	sporadically	Y	Y		Y		Y	Y	Y	
Brevard					Y					
Broward	annually			Y	Y		Y	Y		
Charlotte						Y	Y	Y		
Citrus							Y	Y		
Collier	annually	Y			Y					
Dade	sporadically	Y		Y	Y	Y	Y	Y	Y	Y
Duval	by trip	Y	Y	Y	Y	Y	Y	Y	Y	Y
Escambia					Y		Y			
Franklin	monthly	Y		Y		Y	Y	Y	Y	
Gulf						Y	Y			
Hernando				Y	Y		Y	Y		
Hillsborough	quarterly	Y			Y		Y	Y	Y	
Lee	annually	Y		Y	Y	Y	Y	Y		
Levy	annually	Y					Y	Y	Y	
Manatee									Y	
Martin	monthly	Y	Y	Y	Y		Y	Y		
Monroe										
Nassau	sporadically	Y		Y						
Okaloosa										
Palm Beach	annually	Y			Y		Y	Y		Y
Pasco					Y					
Pinellas	by trip			Y	Y		Y	Y	Y	
Santa Rosa							Y			
Sarasota					Y		Y	Y		
St. Johns		Y	Y	Y	Y		Y		Y	
St. Lucie							Y			
Taylor	sporadically			Y			Y			
Volusia	sporadically		Y	Y		Y	Y		Y	
Wakulla	monthly	Y	Y	Y		Y	Y	Y		Y

TABLE 6. LISTING OF TOP THREE REEF PROGRAM PRIORITIES

COUNTY	PRIORITY 1	PRIORITY 2	PRIORITY 3
Bay	Data aquisition – field	Networking & info.	Training
Brevard	Funds	Training	Data management & analysis
Broward	Data acquisition – field	Data management & analysis	
Charlotte	Standards	Funds	Data aquisition – field
Citrus	Training	Funds	
Collier	Funds	Funds	Funds
Dade	Data aquisition – field	Data management & analysis	
Duval	Funds	Data management & analysis	Training
Escambia	Standards	Networking & info.	Training
Franklin	Training	Funds	Data management & analysis
Gulf	Funds	Standards	Networking & info.
Hernando	Data management & analysis	Standards	Networking & info.
Hillsborough	Standards	Training	Networking & info.
Lee	Data acquisition – field	Data management & analysis	Training
Levy			
Manatee	Data management & analysis	Training	Networking and info.
Martin	Funds	Training	Networking and info. exchange
Monroe			
Nassau	Funds	Funds	
Okaloosa	Funds	Data acquisition – field	
Palm Beach	Funds	Standards	Data management & analysis
Pasco	Data aquisition – field	Data management & analysis	Funds
Pinellas	Standards	Data management & analysis	Data management & analysis
Santa Rosa	Funds	Networking & info. exchange	Training
Sarasota	Standards	Networking & info.	Training
St. Johns	Funds	Data management & analysis	Networking & info.
St. Lucie	Standards	Data management & analysis	Funds
Taylor	Training	Standards	Data aquisition – field
Volusia	Standards	Data acquisition – field	Training
Wakulla	Training	Funds	Data management & analysis

TABLE 7. WEIGHTED RANKED SCORES (%) FOR RANKING COUNTIES' TOP ARTIFICIAL REEF PROGRAM PRIORITIES

PRIORITIES	#1 PRIORITY (WGT. = 1.00)	#2 PRIORITY (WGT. = 0.66)	#3 PRIORITY (WGT. = 0.33)	UNADJUSTED TOTAL	WEIGHTED TOTAL (WGT. = 0.50)
Funds	(1) 33.33	(2) 13.20	(4) 3.30	49.83	24.92
Standards	(2) 23.33	(3) 8.80*	0.00	32.13	16.07
Training	(4) 13.33	(3) 8.80*	(1) 7.70	29.83	14.92
Data Mgt. & Analysis	(5) 6.67	(1) 17.60	(3) 5.50	29.77	14.88
Data Acquisition	(3) 16.67	(4) 4.40	2.20	23.27	11.63
Networking	0.00	(3) 8.80*	(2) 6.60	15.40	7.70
No Response	6.67	4.40	7.70	18.77	9.38
Total	100.00	66.00	33.00	199.00	99.50

( ) Rank of Importance
* Tied

followed by "Standards" (16.07%); "Training" and "Data Management and Analysis" tie for third place (14.92% and 14.88%, respectively); "Data Acquisition" is fourth (11.63%), and "Networking" is fifth (7.70%). This is graphically shown in Figure 7.

Interview summaries - Needs Priorities.

Appendix N, pages 76 to 79, is a summary of written and oral statements taken from the surveys and interviews, in response to Question 27 (See Appendix A, page 6) asking for a list of the "Top three artificial reef data management and reef assessment needs." There are a total of 86 statements listed. They are included to provide the reader with an opportunity to gain an overview of ideas which are not revealed in the numerical analysis of needs discussed above.

It is clear the need for Funds and Standards for data sampling methods are clearly the highest priorities. The need for networking of state and county reef programs for information exchange was a lesser priority for the Weighted Ranked Scores but was still an important item in the interview data.

6. Expectations from State Agencies & Academic Institutions - Discussion.

State Agencies Expectations

Survey responses to Question 28 (Appendix A) are summarized in Table 8 and are found in Appendix N, pages 80 to 84. Written comments were coded into four classes: Funds - comments regarding state sources for support; Data Management Procedures - comments regarding the establishment of an archives at the local and state levels; Data Quality Assurance - comments regarding the need for standard sampling methods and screening of data to reduce errors and Information Sharing - comments about keeping informed about what and how other reef managers are functioning. The greatest expectation from state agencies was for Data Quality Assurance support (18 out of 30 counties). This would include developing standards and training for data gathering methods, and establishing the means for agency personnel to facilitate this. Funds (13 counties) and Data Management Procedures (14 counties) were the second most discussed items. Networking and information sharing received 10 responses.

More detailed and qualitative analysis of written and interview responses to Question 28, in Appendix A, provides some additional insight **what counties expect from the state agencies.** There were 104 statements recorded from the written surveys and the interviews. Within the 104 statements, roughly 107 different ideas are reduced into five major categories: (Note: The number at the end of each category is a count of the number of comments made.)

1. Feedback of information and findings and networking this information between

TABLE 8. COUNTY EXPECTATIONS FOR STATE ASSISTANCE

	FORMS OF ASSISTANCE			
COUNTY	FUNDS	DATA MANAGEMENT PROCEDURES	DATA QUALITY ASSURANCE	INFORMATION SHARING
Bay	Y	Y		
Brevard				
Broward	Y	Y	Y	
Charlotte		Y	Y	
Citrus				Y
Collier	Y		Y	
Dade	Y	Y	Y	Y
Duval	Y	Y	Y	Y
Escambia			Y	
Franklin	Y		Y	Y
Gulf			Y	
Hernando		Y		
Hillsborough		Y	Y	
Lee		Y	Y	
Levy				
Manatee		Y	Y	Y
Martin	Y	Y		Y
Monroe				
Nassau			Y	
Okaloosa				
Palm Beach	Y		Y	
Pasco	Y			Y
Pinellas		Y		
Santa Rosa	Y		Y	
Sarasota		Y	Y	
St. Johns	Y	Y	Y	Y
St. Lucie	Y	Y	Y	Y
Taylor	Y			
Volusia			Y	Y
Wakulla				

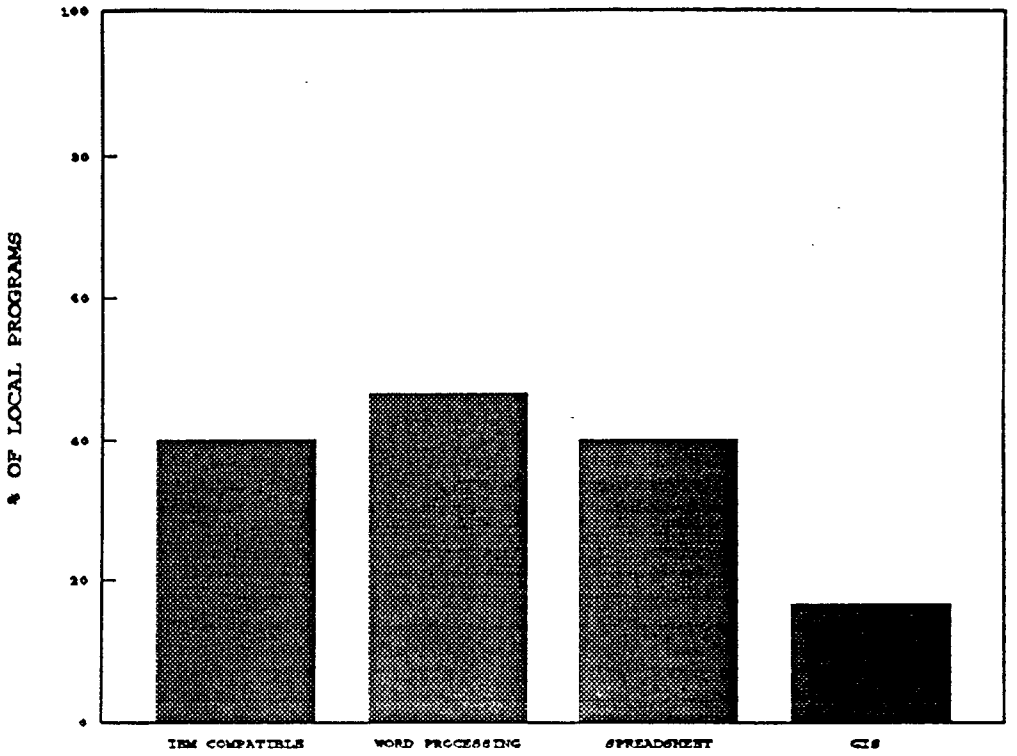

Figure 5. Computer Processing Capability

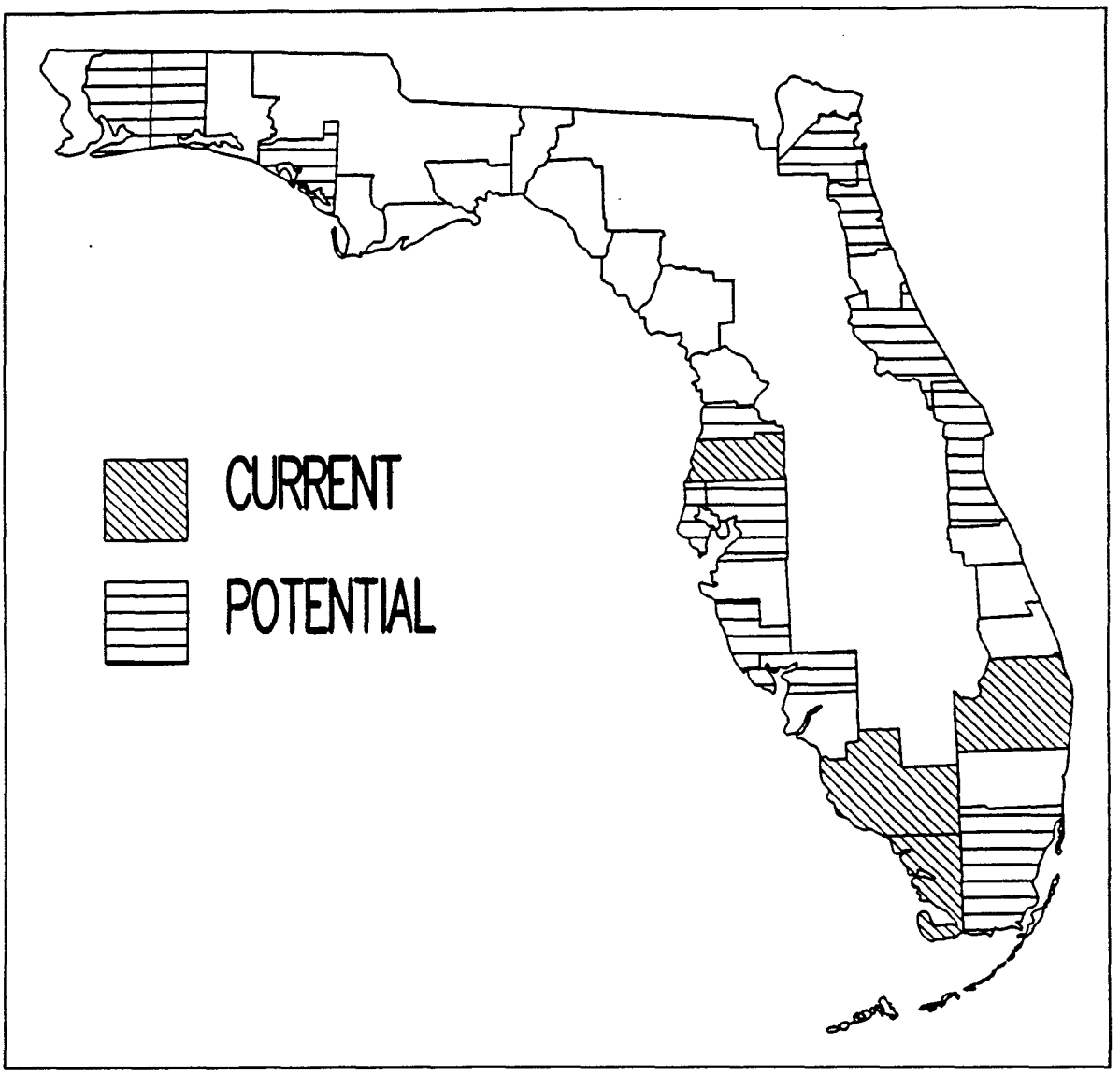

Figure 6. Current and Potential GIS Capability.

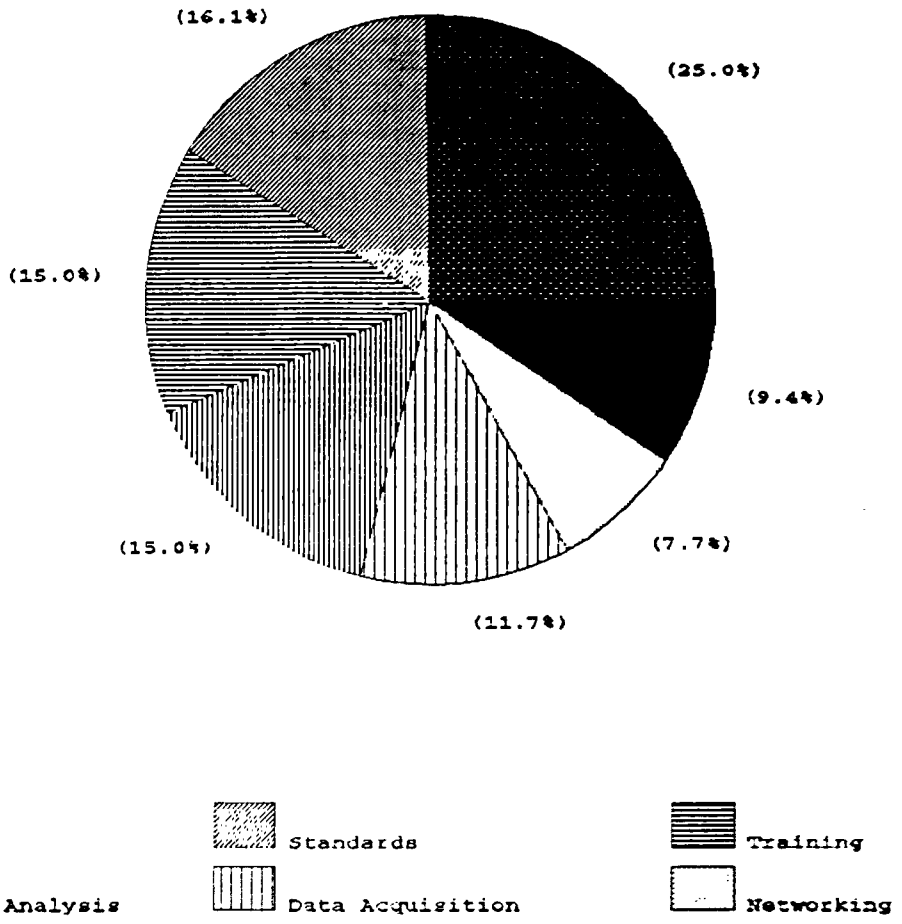

Figure 7. Weighted Ranked Scores (%) for Counties' Top Artificial Reef Program Priorities

state agencies, academic institutions and the local reef managers, volunteers and the public. This includes organizing regular (annual or bi-annual) statewide conferences & workshops, which move around the state regionally. Also, publishing and distributing newsletters, research summaries and published papers were suggested. ---> 37 comments.

2. Standards for data collection methods & management of this information, standard monitoring stations & training of county personnel & volunteers to these standards. ---> 34 comments.

3. Funding for start-up of monitoring programs to cover costs of appropriate equipment for data gathering, storage, reduction and reporting. Some funds for expenses for field work, as fuel costs, chartering, consultants or volunteer expenses and training. Many comments expressed an interest in allowing local reef managers more flexibility in how to spend these funds, and the need to fund for more long-term programs, not just year to year. ---> 20 comments.

4. Technical Reef Support Team from the Department of Natural Resources Reef Office, which could regularly visit each county reef program to answer questions, observe reef sites, review QA/QC procedures, assist with data management and GIS system, help interpret findings and give presentations to citizen supported activities. ---> 10 comments.

5. Guidelines for best construction practices, including materials selection, based on reef studies in situations similar to those experienced locally. ---> 6 comments.

A number of comments relate to special interests for research projects, such as the use of tires for reef material, oyster reefs and aquaculture projects included in artificial reef monitoring projects, water quality (pollution) studies which relate to reef success and placement criteria. There was concern for requiring monitoring methods which may not be appropriate for the particular region, thus the need for a "ground truthing" team to help resolve such problems.

Academic Institutions Expectations

Survey responses to Question 29, are summarized in Table 9 and Appendix N pages 85 to 88. Written comments were coded into three major categories & responses; Access to Academic Community (16 responses); Training and Conferences (9 responses) and Studies (15 responses). Clearly, at least half of the counties expected to have access to the academic community and that they should be engaged in basic or applied artificial reef research studies. One third felt the academic community should develop and participate in reef research methods training and reef conferences.

TABLE 9. COUNTY EXPECTATIONS FOR ACADEMIC ASSISTANCE

	FORMS OF ASSISTANCE		
COUNTY	ACCESS TO ACADEMIC COMMUNITY	TRAINING AND CONFERENCES	STUDIES
Bay	Y		
Brevard			
Broward			Y
Charlotte		Y	Y
Citrus	Y		
Collier			
Dade	Y	Y	Y
Duval	Y	Y	Y
Escambia			Y
Franklin	Y	Y	
Gulf	Y		
Hernando		Y	
Hillsborough	Y		Y
Lee	Y		
Levy			
Manatee	Y	Y	Y
Martin	Y		Y
Monroe			
Nassau			
Okaloosa			
Palm Beach	Y	Y	Y
Pasco		Y	Y
Pinellas	Y		
Santa Rosa			Y
Sarasota	Y		Y
St. Johns			
St. Lucie	Y	Y	Y
Taylor	Y		Y
Volusia	Y		Y
Wakulla			

More detailed and qualitative analysis of written and interview responses to Question 29, in Appendix A, provides some additional insight what counties expect from the academic community. There were 98 statements recorded from the written surveys and the interviews. Within the 98 statements, roughly 111 different ideas were reduced into three major categories: (Note: The number at the end of each category is a count of the number of comments made.)

1. Conduct research in subject matter beyond what state agencies are able to do. ---> 61 comments. Some topic ideas include:

   Habitat research & Biological process (32 comments) Reef processes and life history interactions; Production vs attraction; Influence zones and "Halo effect" around reefs; Survival of juvenile fish; Trophic structures; Definition of a model "Standard Reef"; Comparisons of natural (nearby) reefs with artificial reefs; Optimum size for reef; Influence of inlets & bays on reefs; Water quality effects; Reefs as filters for toxins; Estuary reefs; Criteria for reef success; Comprehensive analysis of state reef monitoring data; Credibility of reef program.

   Reef management & construction (18 comments) Success criteria; best construction material, design and materials evaluation; Data management methods for management decision making.

   Reef research & monitoring methods (13 comments) Studies on the best, most effective data sampling methods used in reef research; improvement of methods; recommendations for standards acceptable to scientists.

   Economics (7 comments) Value of reefs to local and state economies; Multi-user reefs; Reef user needs; Cost effectiveness of various reef designs and monitoring methods; Reef value assessment methods.

2. Provide access to academic professionals, and facilities, at the local and state levels. ---> 34 comments.

   Generally, comments in this category refer to the desire for closer working relationships with faculty, and access to campus facilities. A frequently heard comment during the interviews was, "We (at the local level) would be happy to provide graduate students or faculty with a support base, and even some funds, from which to study our reefs." This category also includes: using faculty as technical consultants for QA/QC; organizing conferences and workshops; cooperating in seeking funds for projects; establishing a local reference library and participating in training programs.

3. Training and certifying local (regional) reef managers, consultants and volunteers in standard reef assessment methods. This includes research on the best (for the region) assessment methods. ---> 16 comments.

Additional Concerns

Responses to Question 30, in Appendix A, provides some insight what some additional concerns may be. Survey Analysis and Interview Summary in Appendix N pages 89 to 93. There were 98 statements recorded from the written surveys and the interviews. Within the 98 statements, roughly 71 different ideas were reduced into five major categories: (Note: The number at the end of each category is a count of the number of comments made.)

1. Research on: water quality, habitat; economics, reef users and multi-user reefs; protecting natural areas; life histories; establishing offshore "lab" of experimental reefs for management research; identification and mapping of bottoms NOT suitable for reef construction; live rock reefs; oyster reefs and investigation of various materials for reefs. ---> 23 comments.

2. Need for certification of reef research technicians, especially volunteers, to sample according to specific standard methods. State funds should support training, and provide "start-up" money to establish local reef monitoring. ---> 14 comments.

3. Statewide coordination of reef monitoring, to include establishing regional networks (perhaps through Regional Planning Councils) which could organize conferences and training workshops. More public relations is needed to promote reef programs, including the development of an awards program. When grants are awarded, more formal publicity should be given. ---> 14 comments.

4. Regional networks of reef managers, agencies, academics and citizens groups. These networks would organize workshops to share findings, ideas, methods and resources. Joint meetings would focus on sharing funds and efforts for cross county projects, which could not be achieved within the county. ---> 13 comments.

5. State reef resource team is needed to assist counties with implementing reef monitoring, data management and analysis. Some concern was expressed for law enforcement of SMZ's, and reef construction compliance, which could be coordinated by the resource team.

One final note of concern was that the state reef program should "encourage" sound reef building and monitoring methods, not "discourage" these activities by creating more paperwork, rules and regulations and bureaucracy. Counties wanted to know what they **should do** and not necessarily be told only what they **should not do** in a reef management and assessment plan.

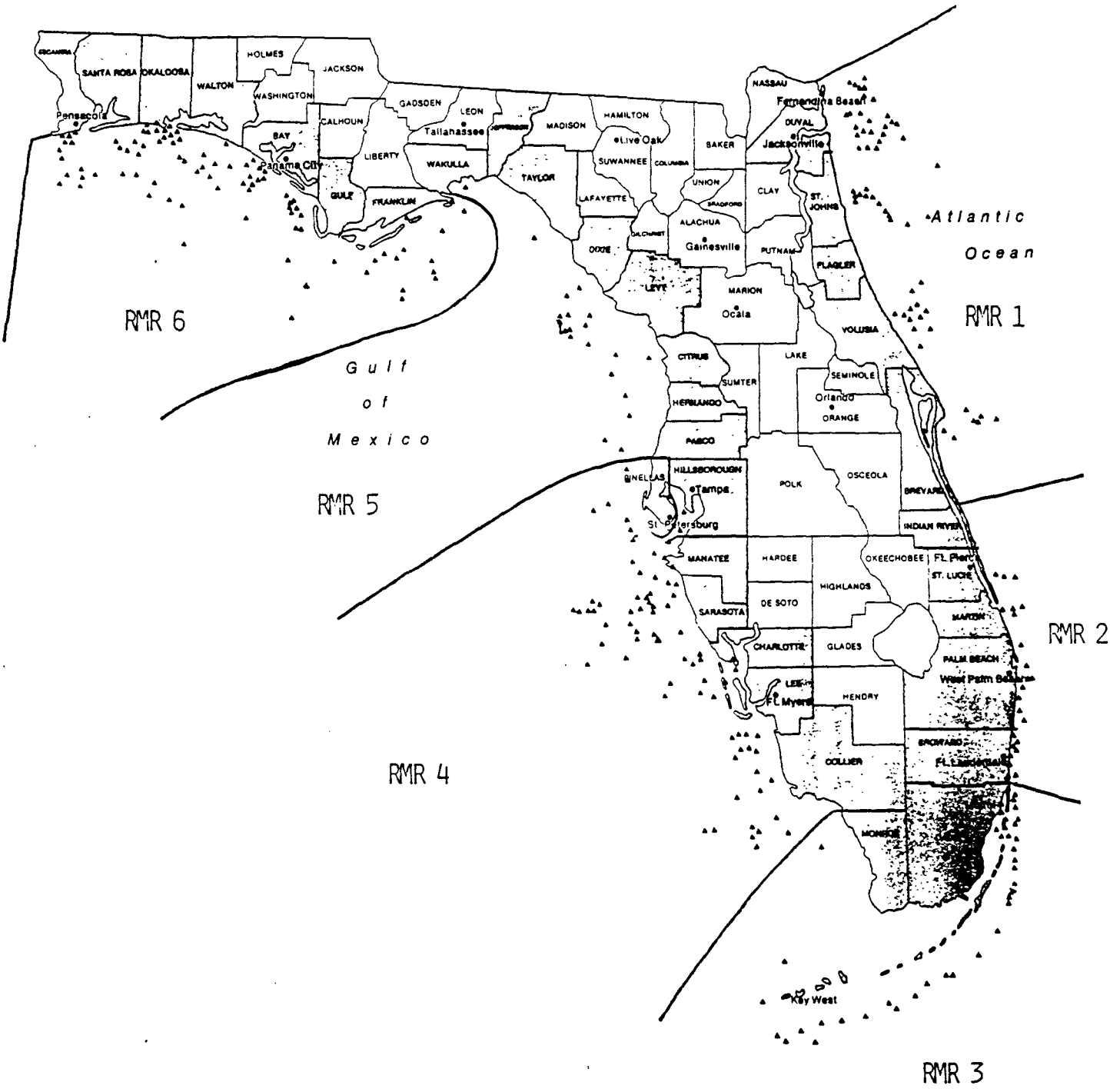

Figure 8. Reef Management Regions

Table 10.
Comparison fo Six Florida Geographic Regions
Based on Artificial Reef Depth and Distance Offshore

REGION	REEF DEPTH (Ft.)	DISTANCE OFFSHORE
1. North East	Deep (60 to 130). Rarely beyond 130.	5 to 50 miles, most 10 to 20 miles.
2. South East	Deep (60 to 130). Some beyond 130.	Nearshore to less than 5 miles.
3. South	Shallow (20 to 60). Deep (60 to 130). Deeper than 130.	Most 1 to 5 miles. Some bay reefs.
4. South West	Shallow (10 to 60).	5 to 40 miles, most more than 10 mi. Some bay reefs.
5. West	Shallow (10 to 60).	5 to 35 miles, most more than 10 mi.
6. Panhandle	Deep (60 to 130). Rarely more than 130.	2 to 25 miles, most beyond 7 miles.

COUNTY CAPABILITIES, SUMMARY AND CONCLUSIONS

County Reef Program Regions.

The need for dividing Florida into "Reef Management Regions" became apparent from review of survey data and interview comments with county reef managers, volunteers, fishermen, divers and local officials. In many cases, especially southwest, southeast, northeast and west Florida, regional networking between programs was already in evidence. Sea Grant Agents, volunteers, local managers and reef advisory committees were organizing regional reef conferences, coordinating construction activities, and exchanging ideas on a regular basis. Most reef managers were very aware what their neighbors were doing.

During the interview trips, a variety of persons were asked where they would place dividing lines, if the state were to be "regionalized" into Reef Management Regions. Figure 8 illustrates Florida divided into six Reef Management Regions, based on these remarks. These six areas already had the beginnings of regional coordination between reef managers.

There are some regional geographical similarities around Florida which provide further justification for regionalizing the reef program. Table 10 compares six regions with respect to reefs distance offshore and their depths. Reef depths are defined as "Shallow" (10 to 60 ft.), "Deep" (60 to 130 ft.) and "Deeper" (beyond 130 ft.) based on the safe limitations of depth on SCUBA divers breathing air, not mixed gas. "Shallow" diving allows more bottom time, "Deep" diving allows less bottom time and calls for more planning, and "Deeper" reefs may be beyond the limits of safe SCUBA diving on air, thus calling for more advanced methods such as mixed-gas diving, or remote sensing technologies.

The same can be said for distance of reef offshore. The greater the distance, the more planning and the larger a vessel would required. These considerations impose common limitations on reef monitoring projects within the same region. Regions having deeper reefs, and greater distances offshore may need more planning, special sampling techniques, possibly regional coordination of effort and increased funding to support reef assessment.

County Capability for Evaluating Artificial Reef Performance

A wide range of capability for reef performance assessment was found in the thirty counties who have active reef construction programs. Generally they ranged from a few counties which had full or part-time staff, with equipment, boats and special offices, to the majority, which had part-time reef coordinators who had little or no in-situ field data sampling capability and a "file box or cabinet" for the reef data. In a few

cases, some had only volunteers who did all the work, with a county official merely signing the paperwork. All who were surveyed and/or interviewed recognized the need for "monitoring their reefs, and typically welcomed the idea. They felt the information was essential for improving reef construction and increased effectiveness as fishing and tourism attractions. Most agreed that they had little or no idea how or what data (other than the most obvious such as reef location, materials description and date of reef "birth" and fish lists) was necessary for appropriate "monitoring" of reef performance. "Monitoring" as a concept was not well understood, drawing a variety of definitions.

Conclusions

1. Funding. Funds should be allocated to support reef monitoring at the local level. Initial "start-up" monies should be provided to equip, train and establish data collection methods and management capability at an accuracy and precision level acceptable to the state. Following "start-up" continuous funds at a lesser level should be provided to maintain program, continue training and implement new procedures, when needed. Local reef officials should be able to receive funding for long-term projects, and not just year-to-year proposals. This is especially necessary for monitoring activities.

2. Close working relationship should be established between local reef programs and the nearby academic institution faculty. Support for expenses of graduate programs, and cooperation on reef research projects between local and academics should be encouraged.

3. Standardized sampling methods, appropriate to the region, should be developed, and provided in a training program for local reef managers, and the leadership of supporting (volunteer) organizations.

4. Develop a simple, paper file model for a "Local" filing system, in a public office, to insure all information about the counties reefs are quickly assembled and preserved in an orderly fashion. Valuable historical data, which currently exists in unprotected files under the care of dedicated citizens, are in peril if that citizen becomes unavailable.

5. Inherent to the success of field studies of artificial reefs is the ability to work from a safe and adequate vessel. Ideally, this should be publicly owned, so that regular reef monitoring can be scheduled. If this is not feasible, or cost prohibitive for the county, then support should be provided for chartering privately owned U.S.Coast Guard Approved Vessels. If volunteers own their own vessels, some support should be provided to reimburse them for their expenses.

6. Training in Florida marine species identification and lab preservation and storage techniques should be provided, so that a local reference specimen collections can

be made available to state officials, academics, reef managers and new trainees.

7. A standardized computer field data format for minimal data parameters, and placement data summary templates (wordprocessing and spreadsheet software), compatible with Microsoft or IBM compatible computers should be designed for county reef managers. This will provide the first step towards a QA/QC program, insuring compatibility of data from across the state.

8. A team of state agency reef research professionals should be assigned to work with individual county programs, serving as trainer/advisors to assist with implementing a reef assessment program, and develop a QA/QC program for screening the data, before it is sent to the state reef database. Since it is more difficult to account for "bad" data which gets into the database, than to eliminate it in the first place screening should be accomplished at the local level.

9. Volunteer SCUBA divers have been used in all local Florida reef assessment activities. Most, however, have not had training in underwater research methods. The state agencies in cooperation with the academic institutions should fund underwater reef science technician training to certify leaders of local volunteer groups and county personnel who are responsible for reef research activities. This is necessary for statewide standards for reef data quality assurance (QA).

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APPENDICES

Appendix A

FLORIDA COUNTY ARTIFICIAL REEF ASSESSMENT CAPABILITIES SURVEY 1992 Ver. 10/21/91

The Florida Sea Grant College is assisting the Department of Natural Resources with developing methods for assessing artificial reefs and county reef monitoring for a statewide artificial reef database. The ultimate goal is to provide local and state reef managers with information and tools for making valid comparisons of reef performance to enhance your reef development efforts. Please take a few minutes (estimated 20 to 30 minutes) to give your **best estimate** of the county's artificial reef data acquisition, storage and management capabilities. This information will be used to develop recommendations for realistic local reef assessment practices. (Please clearly print your answers.)

*NOTE: This survey **is NOT** intended to gather information about your reefs; **it is** intended to describe how your county documents and perhaps monitors artificial reef performance.*

County: _____ Date:_____

Your Name:_____ Title: _____

Address: _____

City: _____, FL Zip: _____

Phone: ( )- _____ FAX No. _____

1. Does your county (or city) have an artificial reef building program?
   _____YES, _____NO.

   a. If YES, approximately how long has your county been involved with building reefs? _____.

   b. If NO, do you anticipate your public will want to develop one?
   _____YES, _____NO, _____DON'T KNOW, _____ WOULD LIKE MORE INFORMATION.

If your county has no reef construction program, you may stop here and return this survey in the return envelope to keep us from having to follow up with you further. If your county has a reef construction program, please continue answering the questions on page 2 through 7.

THANKS FOR YOUR TIME !!!

Select the most appropriate response(s)]

a. ____ a specialized reef office. (Give official name of office and contact person, address & phone).

b. ____ an office which handles reef information as an additional duty. (Give name, address and phone number of contact person).

c. ____ no office which handles reef information.

d. ____ a citizens group, club or not-for-profit organization which handles reef information. (Give name, address and phone number of contact person.)

3. I would say my county has a ____simple, ____moderate or ____sophisticated reef assessment or monitoring program.

4. My county artificial reef program gathers: (answer **all appropriate** responses)

a. ____ no data about offshore and near shore artificial reefs.
b. ____ only the information required by the permitting agencies.
c. ____ the required information plus a little additional information for local use and users.
d. ____ detailed site selection descriptive information.
e. ____ detailed post deployment information as placement scatter maps etc..
f. ____ extensive post deployment information as maps, physical data and biological assessments.
g. ____ regularly scheduled post deployment sampling program (Long term monitoring).
h. How frequently do you take data from reefs that you monitor? _____
i. How many placements do you usually monitor? _____

5. Are there county (or city) employees assigned to artificial reef construction and/or monitoring duties? ____YES ____NO. (Indicate how many) _____Full Time, _____Part Time, or _____None.

a. How many: _____Ph.D's; _____M.S.'s; _____B.S.'s; _____ A.A's; and _____ trained technician's.

b. Please briefly list them by reef related job title: (use other side of this sheet

if needed)

6. Do you use other reef data information sources? ____YES, ____NO. These include using _____hired consultants or _____ volunteers, _____others? (Please explain).

7. How is field data gathered? _____ SCUBA diving, _____from instruments on vessels, _____from fishing (creel) census? _____from airplane fly overs, _____other (please explain).

Please list the primary physical, chemical and biological data parameters your county usually gathers about its artificial reefs. (ie. Temperature, visibility, species lists, salinity, specimens etc.)

8. Does the reef program have: a. _____a reef laboratory, b. _____ access to some other county laboratory or c. _____ no access to lab facilities.

Briefly list the kind of scientific instruments the reef program has access to.

9. Do you develop summary reports of your reefs information? _____YES, _____NO.

a. How often?

b. Who gets copies of it?

10. Do you have specific artificial reef scientific research projects underway? ____YES, ____NO. a. Please list by title of project.

11. How is your artificial reef information shared with the public? (Regular newsletters, news articles ???)

The next section requests specific information about how you determine your reef's locations, how you manage reef data and if you use a Geographic Information System (GIS) in your reef management program.

REEF LOCATION DOCUMENTATION PROCEDURES

12. What equipment is used to document reef placement location?
    a. LORAN C _____ Make & Model _____
    b. GPS _____ Make & Model _____
    c. Dead Reckoning _____(speed, time distance, course est.)
    d. Triangulation on shore points.
    e. Other (Please explain).

13. How is the exact location of permitted reef identified?
    a. ____ Location of center of reef.
    b. ____ Corner(s) of reef boundaries (ie. four corners, other).

14. Who usually officially documents reef placement location?
    a. ____ Local government official.
    b. ____ Contracted barge Captain.
    c. ____ Volunteer
    d. ____ Other (Specify) _____

15. Does county (city) operate a vessel which can be used to document placement, monitor and assess reefs? ____yes, ____no.
    a. Name of Vessel & Port:_____
    _____
    b. Name of Captain: _____
    Address & Phone No. _____
    _____

16. List specific Hydrographic Chart Numbers used to Plot Reef Sites: [Chart, Scale and Date of Chart(s)].

17. Describe any problems you have experienced in finding or piloting to any specific reef locations (equipment inaccuracies, incomplete record keeping, experience &

training, etc.)

ARTIFICIAL REEF DATA MANAGEMENT & STORAGE

18. In WHAT FORUM are reef data stored or archived? (check all which apply) a. _____ paper files, b. ____ news clippings, c. _____computer data base, d. _____ photographs, e. ____ video tapes, f. ____ specimen collections, g. ____ other? (please explain)

19. Do you have standardized data gathering sheets used by the reef surveyors? ____yes, ____ no. (Would you please enclose sample copies of any with this survey.)

20. How is reef data managed and stored?

a. ____ Hand written reports and file cabinet.
b. ____ Machine-readable files (What software? _____
_____
c. ____ Micro-computer (IBM compatible? Apple?) _____
_____
d. ____ Mini Computer (Name) _____
_____
e. ____ Other devices, ____ Plotter, ____ digitizing board, ____ modem, ____ printer, ____ other _____.
f. ____ Linked to a statewide network. (Specify) _____
_____.
g. ____ Photographic and/or video archives.
h. ____ Specimen reference collection (___ fish, ___ invertebrates, ___ plants, ___ physical materials, ___ sediments, ___ water, ___ other
_____

21. How do you manage and monitor reef data quality assurance?

22. List computer software your office currently uses, which would be appropriate for reef management activities (data management, graphics, word processing etc.)

23. List computer software by name and version, you would recommend be used for a statewide reef data management program.

24. Describe any problems you have encountered in storing and quality control of artificial reef data.
(Equipment, software, training, lack of standardization, funding, etc.)

GEOGRAPHIC INFORMATION SYSTEM

Geographic Information Systems (GIS) are becoming important tools for resource management at the county level. We wish to determine if it would be feasible, practical and useful for county and state reef managers to integrate their reef data into a GIS system.

25. Does the county (city) have GIS planning and coastal management capabilities?
____ YES, ____NO. Briefly describe please.

a. Is there an ongoing working relationship between your reef program and the GIS Unit? ____ YES, ____ NO.

b. Are you a current ARC-INFO user? ____YES, ____NO.

c. Do you use other GIS software? ____YES, ____NO. Please List:

26. Where is the GIS located?

Contact Person: _____
Address: _____
_____
Phone No. _____

What is it normally used for?

Would you be able to use it for artificial reef data? _____YES, _____NO.

27. List your top three artificial reef data management and reef assessment needs.

28. What reef assessment program assistance would you most expect to receive from the state reef management program?

29. What reef assessment program assistance would you most expect to receive from the academic community with respect to your reef management efforts?

30. Do you have any further recommendations or concluding remarks or suggestions?

APPENDIX B. GENERAL REEF PROGRAM INFORMATION

COUNTY	ADDRESS	CITY	ZIP	TELEPHONE
Bay	300 W. 7th Street	Panama City	32401	9047844025
Brevard	2725 St. Johns St.	Melbourne	32940	4076332016
Broward	6098 SW 1st Ave.	Ft. Landerdale	33301	3057654013
Charlotte	6900 Florida St.	Punta Gorda	33950	8136396255
Citrus	P.O. Box 440	Lecanto	32661	9047462694
Collier	3301 Tamiami Trail	Naples	33962	8137748454
Dade	111 NW 1st St, 1310	Miami	33128	3053753324
Duval	P.K. Box 43370	Jacksonville	32203	9042680414
Escambia	P.O. Box 1591	Pensacola	32597	9044365809
Franklin	P.O. Box 20054	Tallahassee	32316	9044883935
Gulf	P.O. Box 945	Port St. Joe	32456	9042296330
Hernando	6340 Shoal Line Blvd	Spring Hill	34607	9045961406
Hillsborough	1900 9th Ave.	Tampa	33605	8132727104
Lee	3410 Palm Beach Blvd	Ft. Myers	33916	8133383375
Levy	7922 NW 71 St.	Gainesville	32606	9043929617
Manatee	5502 33 Ave. Drive W	Bradenton	34209	8137497123
Martin	890 N.E. Ocean Blvd.	Stuart	34996	4072550505
Monroe	P.O. Box 917	Big Pine Key	33043	3057452719
Nassau	P.O. Box 668	Fernandina Bch.	32034	9042777320
Okaloosa	1250 N. Eglin Pkway	Salimar	32574	9046517105
Palm Beach	3111 Dixie Hwy. Ste. 146	W. Palm Beach	33405	4075541011
Pasco	6520 Ridge Road	Port Richey	34668	8138478156
Pinellas	2800 110th Ave. N.	St. Petersburg	33716	8138927720
Santa Rosa	1095 Old Bagdad Hwy.	Milton	32583	9046262149
Sarasota	P.O. Box 8	Sarasota	34230	8133786113
St. Johns	P.O. Drawer 349	St. Augustine	32084	9048232531
St. Lucie	2300 Virginia Ave.	Ft. Pierce	34982	4074681511
Taylor	P.O. Box 620	Perry	32347	9045846413
Volusia	440 S. Beach Street	Daytona Beach	32114	9042544637
Wakulla	P.K. Box 20054	Tallahassee	32316	9044883935

APPENDIX C. GENERAL REEF PROGRAM INFORMATION

COUNTY	REEF BUILDING PERIOD	TYPE OF PROGRAM	CONTACT PERSON	PROGRAM OFFICE
Bay	10	Added Task + Volunteers	Charles Gonzalez	Planning Department
Brevard	5	Added Task	Charles Turner	Office of Natural Res. Mgt.
Broward	10	Added Task	Kenneth Banks	Marine Resources/ONRP
Charlotte	22	Added Task	Will Sheftall	FL. Coop. Extension Services
Citrus	9	Added Task	Thomas H. Dick	Div. of Aquatics/Solid Waste
Collier	8	Added Task	Kevin H. Dugan	County Administration
Dade	40	Added Task	Benjamin J. Mostkoff	Dept. of Env. Resources Mgt.
Duval	30	Volunteers	Dennis Short	Jacksonville Scubanauts, Inc.
Escambia	8	Added Task	Cliff Breeland	Board of County Commissioners
Franklin	10	Volunteers	William Horn, OAR	Org. for Artificial Reefs
Gulf	4	Volunteers	Bill Koran	Friends of St. Joe Bay
Hernando	5	Added Task	Linda Buck	Port Authority
Hillsborough	5	Special Office	Tom Ash	Environmental Protection Comm.
Lee	5	Added Task	Stephen Boutelle	Marine Sciences Division
Levy	8	Special Office	Bill Lindberg	Univ. FL. Fisheries Dept.
Manatee	17	Added Task	Dan Ramsey	Parks and Recreation
Martin	20	Added Task + Volunteers	Mark Perry	Florida Oceanographic Society
Monroe	10	Volunteers	Curtis Kruer	FL.Keys Artificial Reef Assoc.
Nassau	19	Added Task + Volunteers	Ilona Preliou	Economic and Community Dev.
Okaloosa	10	Added Task	Ellen Holt	Board of County Commissioners
Palm Beach	7	Added Task	Carman Vare	Dept. Env. Res. Mgt.
Pasco	10	Added Task	Rodger Scofield	Parks and Recreation Dept.
Pinellas	17	Special Office	Bob Peacock	County Administration
Santa Rosa	13	Added Task	Devann Cook	County Safety Office
Sarasota	28	Added Task	Coastal Zone Div.	Natural Resources Department
St. Johns	7	Added Task + Volunteers	Gene Burns	Facilities Management
St. Lucie	10	Added Task	Brad Keen	Department of Leisure Services
Taylor	10	Added Task + Volunteers	Glen Porcian	Airport Auth./Mosquito Control
Volusia	10	Added Task + Volunteers	Dan O'Brien	Port Authority
Wakulla	28	Volunteers	William Horn	Org. for Artificial Reefs

APPENDIX D. NUMBER AND EDUCATION OF REEF PERSONNEL

	NUMBER			LEVEL OF EDUCATION		
COUNTY	TOTAL	FULL-TIME	PART-TIME	GRADUATE	UNDERGRADUATE	ASSOC./TECH.
Bay	1	0	1	1	0	0
Brevard	0	0	0	0	0	0
Broward	2	0	2	0	1	1
Charlotte	1	0	1	1	0	0
Citrus	0	0	0	0	0	0
Collier	4	0	4	3	1	0
Dade	9	0	9	2	7	0
Duval	1	0	1	1	0	0
Escambia	0	0	0	0	0	0
Franklin	1	0	1	0	0	1
Gulf	1	0	1	0	1	0
Hernando	1	0	1	0	1	0
Hillsborough	2	1	1	0	2	0
Lee	5	0	5	1	2	2
Levy	0	0	0	0	0	0
Manatee	1	0	1	0	0	1
Martin	1	0	1	–	–	–
Monroe	0	0	0	0	0	0
Nassau	1	0	1	0	1	0
Okaloosa	1	1	0	1	0	0
Palm Beach	2	1	1	0	2	0
Pasco	4	0	4	0	1	3
Pinellas	5	5	0	0	0	5
Santa Rosa	1	0	1	0	0	1
Sarasota	4	0	4	1	3	0
St. Johns	1	0	0	0	0	0
St. Lucie	2	0	2	1	1	0
Taylor	0	0	0	0	0	0
Volusia	1	0	1	0	1	0
Wakulla	1	0	1	0	0	1

APPENDIX E. JOB CLASSIFICATIONS OF REEF PERSONNEL

COUNTY	PERSON 1	PERSON 2	PERSON 3	PERSON 4	PERSON 5
Bay	County Planner				
Brevard					
Broward	Artificial Reef Coordinator	Natural Resources Specialist			
Charlotte	Sea Grant Extension Agent				
Citrus					
Collier	Sr. Environ. Spec.	Environ. Spec. II	Environ. Spec. II	Environ. Spec. II	
Dade	Reef Coordinator	Biologist	Biologist	Technician	
Duval	Recreation Planning & Grants				
Escambia					
Franklin	City Clerk				
Gulf	Reef Project Coordinator				
Hernando	Port Authority Liaison				
Hillsborough	Artificial Reef Coordinator	Assistant Reef Coord.(vacant)			
Lee	Biologist (Reef Coordinator)	Biologist (Monitoring)	Biologist (Monitoring)	Engr. Inspect I (Constr.Super)	Engr. Inspect I (Constr.Super)
Levy					
Manatee	Project Manager Parks				
Martin	Artificial Reef Coordinator				
Monroe					
Nassau	City Planner				
Okaloosa	County Administrator				
Palm Beach	Environmentalist	Environmentalist			
Pasco	Parks Construction Supervisor	Crewleader	Crew Member	Crew Member	
Pinellas	Program Supervisor	Ocean Operator	Reef Construction Specialist	Reef Construction Technician	Automatic Equipment Op. IV
Santa Rosa	County Safety Director				
Sarasota	Cty. Environ. Spec. III	Cty. Environ. Super	Cty. Coastal Zone Mgr.	City Genl. Ser. Reef Coord.	
St. Johns	County Engineer				
St. Lucie	Recreation Planner	Sea Grant Extension Agent			
Taylor					
Volusia	Port Authority Coordinator	Sea Grant Extension Agent			
Wakulla	Planning Director				

APPENDIX F. PHYSICAL CONDITIONS OBSERVED AT REEF

COUNTY	WEATHER	VISIBILITY	SEA STATE	DEPTH	CURRENT	TIDE	TEMPERATURE	STRATA
Bay		Y		Y			Y	
Brevard								
Broward								
Charlotte		Y						
Citrus								
Collier								
Dade				Y				Y
Duval	Y	Y	Y	Y	Y	Y	Y	Y
Escambia								
Franklin		Y					Y	
Gulf								
Hernando								
Hillsborough	Y					Y	Y	
Lee	Y	Y					Y	
Levy		Y					Y	Y
Manatee				Y				Y
Martin	Y	Y	Y	Y	Y		Y	Y
Monroe								
Nassau		Y					Y	
Okaloosa								
Palm Beach	Y		Y	Y			Y	
Pasco								
Pinellas	Y	Y	Y		Y		Y	Y
Santa Rosa								
Sarasota								
St. Johns				Y				Y
St. Lucie	Y	Y		Y			Y	
Taylor								
Volusia		Y			Y		Y	
Wakulla	Y	Y	Y	Y	Y	Y	Y	Y

APPENDIX G. PHYSICAL CONDITIONS OBSERVED AT REEF

COUNTY	DEPTH	COARSENESS	CONDITION	SCATTER
Bay			Y	
Brevard				
Broward				
Charlotte				
Citrus				
Collier				
Dade			Y	Y
Duval	Y	Y	Y	Y
Escambia				
Franklin	Y	Y		
Gulf				
Hernando				
Hillsborough				
Lee			Y	
Levy	Y			
Manatee			Y	Y
Martin	Y	Y	Y	Y
Monroe				
Nassau	Y			
Okaloosa				
Palm Beach				
Pasco				
Pinellas				
Santa Rosa			Y	
Sarasota				
St. Johns	Y	Y		Y
St. Lucie				
Taylor			Y	
Volusia				Y
Wakulla	Y	Y	Y	Y

APPENDIX H. CHEMICAL – BIOLOGICAL CONDITIONS OBSERVED AT REEF AND ACCESS TO LABORATORY

	CHEMICAL				BIOLOGICAL				
COUNTY	PH	CONDUCTIVITY	SALINITY	DISSOLVED OXYGEN	FISH COUNT	SPECIES	VISIBLE GROWTH	BENTHIC ORGANISMS	ACCESS TO LABORATORY
Bay						Y	Y	Y	Y
Brevard									
Broward									Y
Charlotte						Y			
Citrus									
Collier									
Dade							Y	Y	Y
Duval			Y		Y	Y	Y	Y	
Escambia									
Franklin						Y			Y
Gulf					Y	Y	Y		
Hernando									
Hillsborough	Y	Y		Y	Y	Y		Y	Y
Lee						Y			Y
Levy					Y	Y		Y	Y
Manatee							Y	Y	
Martin			Y		Y	Y	Y	Y	Y
Monroe									
Nassau			Y						
Okaloosa									
Palm Beach					Y	Y			Y
Pasco									
Pinellas						Y			
Santa Rosa									
Sarasota						Y			Y
St. Johns			Y				Y	Y	
St. Lucie						Y			
Taylor						Y			
Volusia					Y	Y	Y		
Wakulla	Y	Y	Y	Y	Y	Y	Y	Y	

APPENDIX I. COMPUTER PROCESSING CAPABILITIES

	CURRENTLY USED				POTENTIALLY AVAILABLE
COUNTY	IBM COMPATIBLE	WORD PROCESSING	SPREADSHEET	GIS	GIS
Bay	Y		Y		Y
Brevard		Y	Y		Y
Broward	Y	Y	Y		
Charlotte		Y			Y
Citrus					
Collier				Y	
Dade		Y	Y		Y
Duval	Y	Y	Y	Y	
Escambia					
Franklin	Y	Y	Y	Y	
Gulf					
Hernando	Y				
Hillsborough		Y	Y		Y
Lee					
Levy	Y				
Manatee	Y	Y			
Martin	Y	Y	Y		
Monroe				Y	
Nassau	Y	Y			
Okaloosa					Y
Palm Beach	Y	Y	Y	Y	
Pasco					
Pinellas	Y	Y	Y		Y
Santa Rosa					Y
Sarasota		Y	Y		Y
St. Johns					Y
St. Lucie					
Taylor		Y	Y		
Volusia	Y				Y
Wakulla					

LOCAL REEF MONITORING AND DATA MANAGEMENT CAPABILITY PARAMETERS

REGION/ COUNTY	REEF PROGRAM	PROGRAM OFFICE	REQUIRED INFO	REQUIRED W\ ADDITIONAL	DETAILED SITE INFO
REGION 1:					
NORTHEAST					
Nassau	Y		Y	Y	Y
Duval	Y			Y	Y
St. Johns	Y			Y	Y
Volusia	Y				Y
Brevard	Y		Y		
REGION 2:					
EAST CENTRAL					
Martin	Y		Y	Y	Y
St. Lucie	Y		Y	Y	
Palm Beach	Y		Y	Y	Y
Broward	Y			Y	
REGION 3:					
SOUTHEAST & FL. KEYS					
Dade	Y			Y	Y
Monroe	Y				
REGION 4:					
SOUTHWEST					
Pinellas	Y	Y			Y
Hillsborough	Y	Y		Y	Y
·natee	Y		Y	Y	
.asota	Y		Y	Y	
Charlotte	Y		Y		
Lee	Y				Y
Collier	Y			Y	
REGION 5:					
WEST CENTRAL					
Wakulla	Y			Y	Y
Taylor	Y			Y	
Levy	Y	Y			Y
Citrus	Y		Y	Y	
Hernando	Y			Y	Y
Pasco	Y			Y	
REGION 6:					
PANHANDLE					
Escambia	Y			Y	
Santa Rosa	Y		Y		
Okaloosa	Y				
Bay	Y		Y	Y	Y
Gulf	Y			Y	Y
Franklin	Y			Y	Y

LOCAL REEF MONITORING AND DATA MANAGEMENT CAPABILITY PARAMETERS

REGION/ COUNTY	POST DEPLOY INFO	EXTENSIVE POST DEPLOY	MONITORING INFO	REPORTING	PERSONNEL
REGION 1:					
NORTHEAST					
Nassau	Y			Y	Y
Duval	Y	Y	Y	Y	Y
St. Johns	Y	Y		Y	
Volusia	Y	Y		Y	Y
Brevard					
REGION 2:					
EAST CENTRAL					
Martin	Y	Y	Y		Y
St. Lucie					Y
Palm Beach	Y	Y	Y	Y	Y
Broward				Y	Y
REGION 3:					
SOUTHEAST & FL. KEYS					
Dade	Y			Y	Y
Monroe					
REGION 4:					
SOUTHWEST					
Pinellas	Y	Y	Y	Y	Y
Hillsborough	Y	Y	Y	Y	Y
[illegible]natee					Y
[illegible]rasota					Y
Charlotte					Y
Lee		Y		Y	Y
Collier				Y	Y
REGION 5:					
WEST CENTRAL					
Wakulla	Y	Y		Y	Y
Taylor	Y			Y	
Levy	Y	Y	Y	Y	
Citrus	Y				
Hernando				Y	
Pasco					Y
REGION 6:					
PANHANDLE					
Escambia					
Santa Rosa					Y
Okaloosa					Y
Bay	Y	Y		Y	Y
Gulf					Y
Franklin	Y	Y		Y	Y

LOCAL REEF MONITORING AND DATA MANAGEMENT CAPABILITY PARAMETERS

REGION/ COUNTY	LAB ACCESS	VESSEL	COMPUTER	FIELDSHEETS	GIS CAPABILITY
REGION 1:					
NORTHEAST					
Nassau			Y	Y	
Duval			Y	Y	Y
St. Johns					Y
Volusia			Y	Y	Y
Brevard		Y			Y
REGION 2:					
EAST CENTRAL					
Martin	Y		Y	Y	
St. Lucie					
Palm Beach	Y	Y	Y	Y	Y
Broward	Y	Y	Y		
REGION 3:					
SOUTHEAST & FL. KEYS					
Dade	Y	Y	Y		Y
Monroe					Y
REGION 4:					
SOUTHWEST					
Pinellas		Y		Y	Y
Hillsborough	Y	Y		Y	Y
Manatee					
Sarasota	Y	Y			Y
Charlotte		Y			Y
Lee	Y	Y	Y	Y	
Collier		Y	Y		Y
REGION 5:					
WEST CENTRAL					
Wakulla					
Taylor					
Levy	Y		Y	Y	
Citrus					
Hernando		Y	Y		
Pasco		Y			
REGION 6:					
PANHANDLE					
Escambia			Y		
Santa Rosa					Y
Okaloosa					Y
Bay	Y		Y		Y
Gulf					
Franklin	Y		Y	Y	

Appendix M

Summary of 35 Florida Coastal County

Artificial Reef Performance Assessment Capability

based on written survey and interview data

between October 1991 and March 1992.

BAY COUNTY Survey: 3/1 7/92 Interview: 3/17/92
Notes: Survey and Interview Dan Grizzard, Operations Director for Panama City Marine Institute (PCMI), Panama City, FL, and volunteer reef coordinator for county.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time county staff from planning Dept. handles contracts & grants only.	Paper files, and computer files. Mainly wordprocessing data (Wordstar v.6) Has DBase II, Supercalc	Site selections, post deployment mapping, and periodic monitoring with volunteers.	No county staff involved in field work. Must depend solely on volunteers, students and staff at PCMI.
Volunteer from PCMI coordinates reef construction, and documentation.	PCMI Director gives talks about reefs to public. Writes articles, takes public phone calls, media, & civic club slide shows.	Have their own vessels at PCMI, capable of basic oceanographic studies and diver support.	Not funded to do reef studies, but capable of providing a safe and consistent research platform.
Some volunteer assistance from local divers and PCMI students (untrained in science.	Photos and videos since 1986. Computer has modem capability.	Access to large labor force of youth and experienced marine teachers. (Technical and scientific)	
	Co has GIS system, not used for reef data, but does have potential with extra funds.	Access the NMFS Lab in Panama City. Works with many of their staff.	

BREVARD COUNTY Survey: 5/22/92 Interview:
Notes: Bill Mahan, Sea Grant Extension Agent

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1 part time in Co. Dept. of Nat. Res Mgmt.	Contracts & grants, and handles paperwork required by FDNR	Limited site selection and reef verification by volunteer diver and contractors.	No trained employees or trained volunteers organized.
Sea Grant Agent works with volunteer divers, and sports fishing club.	Paper files, and hand written notes in Co DNRM office. County Reef location pamphlets.	Sea Grant agent and one trained volunteer capable of developing a volunteer training program.	No regular data collection is made. No formal data sheets used.
1 volunteer trained by Sea Grant in Jacksonville	GIS, ARC-INFO user, but not used for reef data.		

BROWARD COUNTY Survey: 11/15/91 Interview: 2/18/92
Notes: Interview with Ken Banks, P.E. Ocean Engineer, Erosion Prevention District, Office of Natural Protection, Ft. Lauderdale.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
2-Part time staff 1 BS, 1-tech. access to total of 5 staff, when needed.	Archives in Marine Resource Office, but limited to just the required by DNR, data. Annual reports.	Beach erosion and reefs, monitor natural reefs for damage from beach nourishment.	Do not have an art. reef monitoring program. No volunteer assistance.
Nova U. Stony coral growth rate study, 1987.	Dive log sheets, Loran maps and reef sites published, range maps. Aerial Photos of reefs, and has mapped all placements on Autocad.	Side scan sonar maps from consultant. Sediments, transect for fauna, water quality lab.	
	Press releases and good Chamber of Commerce connections, to promote tourism.	Has own county research vessel for 6 divers.	
	Presently just acquiring a GIS system. Will be dedicated to marine data use.	Location surveys with Differential GPS and range-range microwave station.	

CHARLOTTE COUNTY Survey: 12/31/91 Interview: 1/29/92
Notes: Interviewed Will Sheftall, Co Extension Director & Sea Grant Agent, Punta Gorda

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time staff, the Sea Grant Marine Agent. Some assistance from fire & rescue service	Archives in the Extension Office. Written placement reports. Photos of barge loads taken.	Grants and Contracts, and all coordination with reef builders.	One person operation.
Charlotte Co Dive club interested in assisting with reef program, but is untrained.	Paper and electronic files, wordprocessing, and photo files. News articles, and public speaking programs.	Limited site selection, and post reef placement agent dives, with assistance from fire and rescue service who provides boat.	
	No GIS system in county. Co soon to purchase in Engineering.	Water quality by DER in harbor, not offshore.	

Appendix M

CITRUS COUNTY Survey: 12/30/92 Interview: No
Notes: Thomas H. Dick, Director of Aquatics/Solid Waste Mgmt, Lecanto, FL

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time as additional duty.	Just site selection & post deployment information only. News clippings and permit files only.	Contracts & Grants, use sheriffs office divers to observe reefs.	No trained divers available. No vessels available. Must depend on sheriff Dept.
	No summary reports. No identified data parameters collected.		No standardized data forums
	Some news articles		
	,No GIS System, but Co. is interested.		

COLLIER COUNTY Survey: 11/12/91 Interview: No
Notes: Kevin Dugan, Environmental Specialist II, Naples, FL

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
4-part time, 3-MS, 1-BS Handles reef data as additional duty.	Paper and Computer files. Photos.	Limited diving. Has a county vessel available for reef monitoring.	No access to labs. No funds for reef assessment.
Use volunteers	Provides handouts to public.	Contracts & Grants, Site Selections and post deployment documentation by a county official.	No standardized data methods or log sheets.
	Uses GIS system to file reef data.		

DADE COUNTY Survey: 12/15/92 Interview: 2/19/92
Notes: Interview with Ben Mostkoff, Artificial Reef Program Coordinator, DERM, Division Miami, accompany him on trip to inshore reef in bay near Haulover Beach Park

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-Full time reef coordinator and 1 part time. Access to 1-PhD, 1-MS, 7-BS	Archives on paper and electronic. VAX system, Lotus spreadsheets, Photo archives, Wordprocessing & R-Base.	Monitor beach reefs quarterly, as required by renourishment program. Site selection, & post deployment usually done.	No regular long term monitoring of artificial reefs, but frequent visits to them are made.
No volunteers involved but are highly interested in Sea Grant Training Program to train volunteers to work with county DERM.	Summary reports to public, county and DNR. Commercial videos are available.	DERM lab can sample water quality but normally contracts this out.	Not funded to study artificial reefs, only the "beach reefs".
University of Miami Studies. Spawning on Art.Reefs, by Dr. McGowan	Univ of Miami Researchers. Many popular articles in dive magazines.	Three vessels available. All reefs within 4 miles of shore.	
	County has GIS but not used for reef data.		

DIXIE COUNTY Survey: 6/9/92 Interview: Scott Andre, 6/9/92 by phone.
Notes: Scott Andre, Sea Grant Extension Agent. Dixie Co. has no artificial reef program at this time. Any reef activity is through the Sea Grant Extension Program. Some reefs have recently been built off the coast by the Levy county efforts of a University of Florida Research Team. See Levy Co. data summary.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS

DUVAL COUNTY Survey: 12/3/91 Interview: 5/7/92
Notes: Phone Interview w/ Jack S. Ruppel, City of Jacksonville, Recreation Planning and Grants Coordinator.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
City Staff, Pt.time; formal reporting to the county through progress reports.	Paper Files, Reports from Volunteers, Word Processing,	Grants Management and Local Contracts for construction.	No field Capability in county by county staff.
Volunteer dive team, Jax Scubanauts RRT with 100 volunteers trained by Fl Sea Grant, since 1985. Team well organized, and has own training program.	Computer Archives at UNF- DBase III+, All dive logs, Specimen Collection at Jax. U.	Dive Team, Bio Lab at Jax U, Water Data, Mapping, Fish & inverts. Sediments sampled, sieved. Volunteers own vessel & use private vessels	Rely on volunteers to build reefs and assess reefs.
Team has published Standard Operating Procedures, U/W Methods Manual, 70% tested by Sea Grant SK Grant. Have own Dive Control Board.	New GIS, being installed as of 5/8/92, uncertain availability for reef use.	Site selections, pre and post deployment surveys and limited monitoring of fish and benthic communities. Photo & video. Some are Nitrox certified.	Limited bottom time due to depth of most reefs beyond 60'. Weather is a significant factor during the winter months.
Near meeting the AAUS standard for sci. divers.	Locations published in "Hotspots" book from Jax. RRT., "Reef Quarterly" newsletter.	Regular monitoring of three locations, began 1991.	

ESCAMBIA COUNTY Survey: 11/9/91 Beard & 12/2/91 Wood. Interview: 3/16/92
Notes: Interviewed Eilene Beard, Volunteer Chairperson, Gulf Activities for the Escambia county Marine Recreation Committee, Pensacola FL.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Volunteer handles all reef activity for the county. Uses county budget office to administer the funds.	Mostly paper files kept in four cardboard boxes at the SCUBA Shack Dive shop. Some photos. News clippings.	Site selections and post deployment surveys are done by volunteers. Have easy access to volunteer dive boats.	No oceanographic data taken. Has little or no capability for taking physical or biological data. Equipment & training limited.
Non-science trained divers on dive charter boats keep a mental record of changes they see.	Some computer files maintained by another volunteer using a database program. No formal dive log records kept.	Can do most photography, and some video. Uses a standard data sheet for site selections.	No systematic monitoring, just frequent dives to reefs with no documentation.
Marine recreation committee is appointed by Co. Commission	No GIS capability available.		

FLAGLER COUNTY Survey: 6/10/92 Interview:
Notes: Joe Halusky, N.E. Florida Sea Grant Extension Agent
County has no reef program, since it has no inlet access to the sea. There is interest in forming some reef activity from a dive club in the county.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS

FRANKLIN COUNTY Survey: 12/3/91 Interview: 3/20/92
Notes: Survey Charles Daniels, Carabelle City Clerk . Interview Bill Horn and John Brooks from OAR and Scott Andre, Sea Grant.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time city staff involved to handle funds and work w/ OAR. City of Carabelle builds own reefs, seperate from county reefs, w/help from OAR.	Archives managed by OAR, includes paper files, and computer data County files in Sea Grant office. City holds files for their own reefs.	Site selections, post deployment mapping, fish surveys,	Co. has no vessel. Volunteers provide vessel. Some use of FSU vessel.
Organization of Artificial Reefs (OAR) handles all aspects of reef construction and monitoring.	Wordperfect 5.1, Q&A Database, Maps on Harvard Graphics.	Access to FSU Marine Lab and campus faculty. Has a site permitted just for research purposes.	
Sea Grant Agent provides input from the county and serves as a liaison with OAR.	Quarterly Newsletter "Oarlines"	Access to FSU Academic Diving Program and Dive Locker Equipment.	
Appalachicola Nat. Estuary Program has some staff which can provide data.	No GIS in county. Possible access to one at FSU.	Nitrox capability, but none trained at this time.	

GULF COUNTY Survey: 11/9/91 Interview: 3/18/92
Notes: Survey & Interview Bill Koran, Volunteer Director of City of Port St. Joe Artificial Reef Project, Owner of Capt. Blacks Marine

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Co. has no staff involved with reef program. City Mgr. of Port St. Joe refers all reef business to volunteer reef program director.	Paper files and some wordprocessing. No photos. Permits & reports to DNR and Corps of Eng. only.	Limited diving capability, volunteer high school teacher, dive instructor. 4 to 8 people assist. Contracts & Grants handled through city manager.	No county vessel, must depend on volunteers. No dive logs are kept of observational dives. Estimates of visible growth & species made, but not documented.
Friends of St. Joe Bay volunteers contribute labor and some assistance	News articles and volunteer club correspondence. No GIS system.		

HERNANDO COUNTY Survey: 1/7/92 Interview: No
Notes: Linda Buck, Office Manager, Hernando CO Port Authority, Spring Hill

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
4-part time, assists construction contractor in reef construction.	Paper files, computer database, news clippings, photos	Contracts & Grants, site selections w/ divers, post deployment.	No access to lab, depends on incidental fishing reports for fish species list.
Hire consultants.	News articles and brochures	Has own vessel through Port Authority.	
	No GIS capability.		

HILLSBOROUGH COUNTY Survey: 11/12/92 Interview: 1/31/92
Notes: Interview w/ Tom Ash, Artificial Reef Coordinator, Tampa

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-Full Time, 1-Part time, both w/ BS. Funded by pollution recovery $, Envt'l Protection Commission.	Paper files, wordprocessing, lotus spreadsheet, news clippings, video & still photos, specimen collections	Contracts & Grants, Site selection, post Deployment, Monitoring of Bay Reefs, benthic grabs and water quality.	
	Indicates no formal means for handling data exists at this time. Does have standard data report form.	Citizen Input through CEAC (Cit. Envtl Awareness Committee. Do not provide data, just direction.	
	Est. cost of each sampling is $1100	Monitors six sites quarterly. Has 22' vessel.	
	GIS in Co. Engineers Office, high interest in using for reef data.	Access to Co. labs, and has some lab capability.	

JEFFERSON COUNTY Survey: 6/9/1992 Interview: 6/9/1992 phone.
Notes: Interviewed Scott Andre, Sea Grant Extension Agent. Jefferson Co. has never had an artificial reef program.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS

LEE COUNTY Survey: 11/13/91 Interview: 1/28/92
Notes: Interviewed Steve Boutelle, Biologist, Chris Koepfer, Biologist, & Chuck Listowski, Le Co. Marine Sciences Division, Fort Meyers.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
5-part time employees, 1-MS, 2-BS, 2-trained technicians. All can dive.	Paper and computer files., Lotus spreadsheet, and wordprocessing.	Contracts & Grants, Site Selections, and detailed post deployment, maps, physical descriptions	Not able to monitor fish on bay reefs due to poor visibility. No standard data log sheets.
Volunteers for Science Research (VSR) diving group of apx. 30 people.	Some summary reports, and maps and brochure for the public.	Can monitor monthly, but has no offical schedule at this time. Volunteers able to use photography and video.	Volunteers not trained, to design their own projects, must depend on input from county.
Lee County Fishing Reef Association, Inc.		Have new county vessel 25' can handle 6 divers.	Limited accuracy on Loran C, in some areas.
	No GIS available, but may be able to use Reg. Pl. council's. Hope to get one in future.		

LEVY COUNTY Survey: 5/28/92 Interview: No
Notes: Survey completed by Dr. William Lindberg, U.of Fl. Dept. of Fisheries. He is currently conducting research on reefs built by his project grant. Most reefs in Levy Co. are the result of this project.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Co. has no office which handles reef information. All reef data is handled by liason with U.of Fl. researchers.	U. of Fl. researchers files. Dept. of Fish. & Aquaculture. Computer data, IBM compatible spreadsheets. Still photos.	Full field data collection and access to University labs. Res. team has own vessel, dive locker and science equipment.	Co. DOES NOT have its own reef monitoring capability.
2 PHd.'s from U. of Fl. and graduate students.	Research team gives public talks on findings. Co handles permits through U. of Florida	Monitors 48 reef sites at least two times each year. Water Data, fish counts, photography, Temp.	
	Access to U.of Fl GIS. Co. does not have GIS available for reef data.		

MANATEE COUNTY Survey: 1/30/92 Interview: 1/30/92
Notes: Interview with John Stevely, Sea Grant Agent, and Dan Ramsey, Project Manager for Manatee Co. Parks & Recreation Department, Bradenton, FL.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time Co staff. Part of Recreation & Cultural Arts Dept.	Paper files, news clippings, photos, wordprocessing.	Contracts & Grants Site selections, and post deployment, obs. by Sea Grant agent.	No county staff dives, w/exception of Sea Grant Agent.
Sea Grant Agent		Site selections were done 10+ years ago.	No new sites permitted.
Environmental Action committee of volunteers sometimes assist with photos, but not normally involved.	Ch. of Commerce Envir. subcommittee, supports fishing reefs.	Some photo skills available from volunteers and Sea Grant.	Must depend on untrained volunteers and their vessels when available.
	No GIS capability		No vessel available.

MARTIN COUNTY Survey: 6/5/92 Interview: 6/5/92
Notes: Joe Halusky notes based on phone interview with Mark Perry, Florida Oceanographic Society, Ann Burford, Dept. of Environmental Services and discussions with Helen Harlson-Kite of the Florida Oceanographic Society (FOS), Stuart, FL.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
2 part time county staff, Mosquito Control and Co Envtl Services.	Permit files, contracts & grants,	Contracts & Grants, coordinates with volunteers from FOS.	No county staff dives on reef projects.
23 Volunteers from FOS & Stuart Dive Club have been trained.	Reef archives kept at the FOS Office. Volunteers trained by the FOS, using the Sea Grant and Jax. RRT's model. Standard data forms on computer.	Site selections, post deployment verification, mapping, still & video. Monitoring 2 sites each month for water, species, temp. salinity. Uses standard data forms.	Must depend on 23 available volunteers
	Uses DBase III, Microsoft Works	Access to a lab a t FOS and Fla. Atlantic Univ.	
	No GIS System available.	Capable of training own volunteers, has a training program underway in Palm Beach Co.	

MONROE COUNTY Survey: 12/6/91 Interview:
Notes: Curtis Kruer, Florida Keys Artificial Reef Association, Inc. PO Box 917, Big Pine Key, FL 33043 305-745-2719

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Volunteer reef building association.			
Pennecamp State Underwater Park Staff			
Looe Key National Marine Sanctuary Staff			

NASSAU COUNTY Survey: 4/15/92 Interview: 5/8/92
Notes: Phone Interview w/ Ilona Preliou, City of Fernandina Beach

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
City Staff, Pt.time; no formal reporting to the county.	Paper Files, Reports from Volunteers, Word Processing	Grants Management and Local Contracts for construction.	No field Capability in county.
Volunteer dive team, Jax RRT 80 volunteers	Computer Archives at UNF, Specimen Collection at JU	Dive Team, Bio Lab at Jax U, Water Data, Mapping, Fish & inverts. Volunteers own vessel & use private vessels	No local dive team in county, but are interested in getting training.
Local dive club "Six Flags Dive Club" interested in forming a team, or working with Jax. RRT.	GIS at Reg. Plan. Council, not available for reef use.	Site selections, pre and post deployment surveys.	
	Locations published in "Hotspots" book from Jax. RRT.	No regular monitoring.	

OKALOOSA COUNTY Survey: 11/13/91 Interview: 3/16/92
Notes: Survey and Interview Ellen Holt, Co. Administrator, along with Mike Mitchell, Co. Commissioner, Jack Spey, Volunteer Reef Coordinator and Bill Horn, DNR.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time County Administrator (Who received training from Fl. Sea Grant in 1989.	Paper files in co. office organized by reef number. Maintained by volunteer and Co. Admin.	Can get data from volunteer divers and fishermen. Site selection and post deployment is verified by volunteer and county employee.	No volunteers trained for underwater data taking.
Volunteer reef coordinator.	No published maps. Has news clippings, and some videos, taken within last 3 years.	Co. has no vessel, must depend on volunteers, and Charter Boat Association.	Charter fishermen don't take divers. There is a dive charter industry, who could help, if expenses were funded.
Volunteer from Destine Charter Boat Assoc.	Has GIS system, but no reef data in it. Is available for reef data.		

PALM BEACH COUNTY Survey: 11/21/91 Interview: 2/19/92
Notes: Interviewed Carman N. Vare-Vernachio, Senior Environmentla Analyst, DERM and James S. Vaughn, Co Environmentalist DERM (Dept. of Environmental Resources Management.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-full time (BS) & 1-part time county staff with DERM.	Extensive paper and electronic files. Charts and maps. Some special projects on Manatees & Estuaries. Access to 5 other Co. staff when needed.	Contracts, Grants, county funds for studies, and regular (monthly) monitoring of marine envt's. Has county boat, 26' for 6 divers. Good lab facilities for water studies.	Too few county staff, must eventually rely on volunteers if program is to expand. Not enough county divers. Range of vessel 45 miles
Now training volunteers through FL Ocn. Soc. to assist with field work	Publishes reef guides, and reports.	PEP Reef Study, Pre-fabricated Erosion Protection Device, nearshore.	
Univ. of Miami Fish Study of Pyramid Reefs.	Univ. of Miami Data	Monitoring two reefs for two years. Photo, Fish & Video.	
	GIS available in DERM and is used for reef data.		

PASCO COUNTY Survey: 11/14/91 Interview: No
Notes: Rodger Scofield, Parks Construction Supervisor, Port Richy

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
4-part time, (1-BS, 3-tech.)	Paper files, news clippings, no data sheets, videos	Contracts & Grants. Divers provide photos, and site selections. Post deployment surveys done.	No lab access. No funds for research or building a data base.
Volunteers are used to get field data. Some consultants in past were used.	Provides maps, histories to the public on request.	Has vessel which is used to assess reefs.	
	No summary reports.		
	No GIS in county.		

PINELLAS COUNTY Survey: 12/5/91 Interview: No
Notes: Survey completed by Bob Peacock, Reef Program Supervisor, St. Petersburg

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
5-full time employees, all technicians.	Paper files, news clippings, videos and specimens. Has standardized data sheets, uses word processing and lotus spreadsheet..	Contracts & Grants, site selections, post deployment, and monthly monitoring of all reef sites. Has landing craft vessel for reef construction.	
Some volunteer assistance.	Brochures and maps for the public.	Uses scuba diving and vessel instruments.	
Community College (H. Mathews)	News articles, radio & TV	Mapping of reef location	
	Co. has GIS but not used for reef data.		

SANTA ROSA COUNTY Survey: 6/5/1992 Interview: 6/5/1992 by phone
Notes: Interview by phone with Irene Kicker, County Finance Supervisor, Milton FL. She manages the reef grants program, and noted that the responsibility for the program has recently been passed to DeVann Cook, County Safety Director.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time as an additional duty.	Handles contracts and grants only.	Access to Civil Defense Vessel.	Divers not trained in underwater science, only search & rescue.
Some assistance from Civil Defense Divers and some volunteer divers and fishermen.	Maintains records required by the state DNR only.		
	Paper files and news clippings. No computer files.		
	Has GIS, used for land use planning in Co. Engineers office.		

SARASOTA COUNTY Survey: 12/2/91 Interview: 1/27/92
Notes: Interview with Belinda Perry, Environmental Supervisor, Sarasota Co. Natural Resources Depart., Sarasota (New reef coordinator Mike Solum, who works for Belinda.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
4-part time, 1-MS, 3-BS (3 are divers.). City has a reef coordinator, part time. City & Co. work together on bay reefs.	Paper files and word processing Wordperfect 5.1. Has DBaseIII+, SAS, News Clippings, Photo Archives	Contracts & Grants, Use volunteer divers and fishermen for data input. Water Quality lab, still & video	Not budgeted for routine reef work. No complete species list or specimens, and depend on untrained citizens to ID.
Artificial Reef Committee, Volunteer	Annual reef brochure w/boater registrations.	Site selections and post deployment. Inventories materials before placement. Some spot checked after placed.	Does not do a scatter map of a placement.
Mote Marine Lab contract	Epifaunal seasonality study, 1986-87.	Has 20' vessel for 4 divers.	
	Co. has GIS in planning Dept. but is not used for reef data. Would need own computer.		

ST. JOHNS COUNTY Survey: 2/1/92 Interview: 5/7/92
Notes: Phone interview with Gene Burns, Director of Facilities Management, County Reef Grants Coordinator, in the County Engineers Office.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Part time county employee.	Paper file reports from volunteer dive team. Publish locations on free map, and in Jax.RRT's "Hotspots"	Contracts and Grants, Word processing and some electronic data storage.	No field capability in county, must depend on Sheriff's Patrol boat and volunteers to view reef placement.
St. Johns Reef Research Team, with 8 volunteers, trained by Fl Sea Grant in 1983.	Data archives at the Whitney Marine Res. Lab, Marineland.	Underwater observation, mapping, water data, sediments, fish and benthic communities.	Small number of volunteers. Limited availability of boats.
Sea Grant Agent able to dive and train volunteers.	Still photo and video files at Whitney Lab. Site selection & post deployment verification.	Offshore beyond 5 miles, and in depth range from 60 to 130 feet.	Most reefs deeper than 60 feet, and beyond 5 miles offshore. Limited bottom times.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
	GIS system in county planning, may be available for reef data, if funded.	Still Photo & Video	

ST. LUCIE COUNTY Survey: 11/26/91 Interview: 2/20/92
Notes: Interview Robert Cutcher, Sea Grant Agent; Brad Keen, Recreation Planner, Div. of Leisure Services, & reef grants coordinator; & J.S. "Stan" Blum, Fort Pierce Sport Fishing Club.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Part time county staff with Sea Grant Agent.	Permit files, reef locations, in county office.	Grants & Contracts, Site selection, by volunteer fishermen and some divers.	No post deployment assessment, other than from vessel. Diving limited to Agent and untrained volunteer.
Sea Grant Agent working with volunteers in fishing club.	Maintains some reef data information in Sea Grant office.	Site selection and limited mapping.	No systematic monitoring plan. No funds from county for assessment. Only DNR $.
Ft. Pierce Sport Fishing Club	Files on reef locations. Anecdotal Information.	Club handles private donations.	
	Co. has GIS but not used for reef data.		

TAYLOR COUNTY Survey: 3/20/92 Interview: 3/20/92
Notes: Scott Andre, Sea Grant Extension Agent

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time Co. staff, handles paperwork only.	Paper files, news clippings, photos, and reports from OAR, and Sea Grant Agent.	OAR volunteers able to develop species list, site selection surveys and deployment maps	No in-county persons involved with diving.
Sea Grant Agent assists with site selection and deployment documentation.	No computer files in county. Reports from OAR are on computer. Wordperfect, DBase III+, Lotus	OAR uses standard dive logs. But files are in Tallahassee.	No in-county vessels. Must depend on volunteers.
OAR volunteers assist.			
	No GIS capability in county.		

VOLUSIA COUNTY Survey: 12/5/91 Interview: No
Notes: Dan O'Brien, Port Authority Coordinator, Daytona Beach

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
Part time reef coordinator. Some Co. employees help during placement.	Paper and electronic archives on Port office. File cabinet and word processing.	Contracts & Grants management, Co & State provides funds for reef construction.	No county staff in field capability for assessment.
Volunteer reef research team of 10, trained by Fl Sea Grant in 1980.	Files maintained by staff and volunteers. Using Loran Software for reef map locations.	Site selections, mapping, sediments, fish & benthics.	No. of volunteers is limited. Availability of boats dependent on volunteers.
Halifax Sport Fishing Club & Halifax Reef Inc. provides reef construction assistance.	Film and Video files. Publish a map through Halifax Fishing Club.	Construction by volunteer and county cooperation. Some funds available from county to support volunteers expenses.	
Sea Grant Agent can provide diver training, and does work with Port.	GIS used by county for planning, but no connection to reef data.		

WAKULLA COUNTY Survey: 12/26/92 Interview: 3/20/92
Notes: Survey Ed Mills, Co. Planning Director. Interview Bill Horn and John Brooks from OAR and Scott Andre, Sea Grant.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS
1-part time county staff involved to handle funds and work w/ OAR.	Archives managed by OAR, includes paper files, and computer data	Site selections, post deployment mapping, fish surveys,	Co. has no vessel. Volunteers provide vessel. Some use of FSU vessel.
Organization of Artificial Reefs (OAR) handles all aspects of reef construction and monitoring.	Wordperfect 5.1, Q&A Database, Maps on Harvard Graphics.	Access to FSU Marine Lab and campus faculty. Has a site permitted just for research purposes.	
Sea Grant Agent provides some training and liaison with FSU.	Quarterly Newsletter "Oarlines"	Access to FSU Academic Diving Program and Dive Locker Equipment.	
Mola Marine Consultants, Paul Johnson	No GIS in county. Possible access to one at FSU.	Nitrox capability, but none trained at this time.	

WALTON COUNTY Survey: 6/9/1992 Interview: 6/9/1992 by phone.
Notes: Scott Andre, Sea Grant Extension Agent. County has no inlet and no reef program at this time.

PERSONNEL	DATA MGMT	CAPABILITIES	LIMITATIONS

Appendix N

Summary of Statements by County

Based on Written Survey & Interviews

Top Assessment Needs
Expectations from the State
Expectations from the Academics
Additional Concerns

TOP ASSESSMENT NEEDS:

Bay
1. Standard forms and data gathering methods needed. Should establish data management through the use of IBM compatible "menu driven" programs.
2. Access to reef data from other programs.
3. Assistance with training volunteers and leaders of volunteer groups.

Brevard
1. Funds.
2. Staff.
3. Long range management plan.

Broward
1. We need a reef monitoring program, first priority need.
2. Various scientific studies needed. Need to study deep and shallow reefs, and the connection to the inshore habitats. Most studies dependent on divers, not remote sensing.

Charlotte
1. Need standardized methods which "fit" the local environment.
2. Funds and full time county biologist needed to document reefs.
3. Need assistance to validate "other reef sites".

Citrus
1. Just some guidance or a model program for a county of our size.
2. Funds.

Collier
1. Funds, funds, funds.

Dade
1. Documentation of function of artificial reefs, with emphasis on production/productivity vs aggregation argument. Then get on with management strategies.
2. Documentation of effectiveness/longevity/stability of various artificial reef materials.
3. Basic data collection on sequential events of epibenthic fouling and fish/crustacean utilization & settlement at reef site.
4. Document "Habitat Resource" and Manage Fishing pressure. Reef should enhance fishery "resource" not just the "fish".

Duval
1. Funds to support staff and for equipment to maintain data. Feels that county could come up with a 50% match to state funds.
2. Hardware and software.
3. Software Training.

Escambia
1. Simply establish a program with a dedicated county employee or Sea Grant employee that works on nothing but reefs. (Note: does not understand Sea Grants actual role here! comment by Joe Halusky)
2. Standardize procedure for data collection.

3. Establish a statewide network to share what other counties are doing.

Franklin
1. Additional volunteers and reliable vessels.
2. Permanent location for archives and laboratory.
3. Additional equipment (ie. U/W sleds, scooters, video, cameras, GPS units, vessels).
4. Guidelines for ways to determine how productive reefs are.
5. Wants state to make monitoring methods more effective by determining the "proper" monitoring methods.
6. State should provide tech. assistance by translating "academic" research information into easy to understand form. Interpretation of technical language for implementation and application.

Gulf
1. List of approved materials that are ranked by environmental productivity(ie. marine growth, fish holding ability, ageing and deterioration-- not politically motivated.
2. Funds. Reef builders need a steady budget ($10,000 to $20,000/year) to get consistency in reef building and monitoring. SHOULD NOT HAVE TO NEGOTIATE EACH YEAR! We cannot survive with annual bidding, especially when contract $ are made available for a limited time and during the worst time of the year for the weather, especially in the northern gulf.
3. A Monitoring program needs special equipment, standardized formats, access to a large dependable group of divers such as OAR, and someone salaried (part time) at the local level to handle the paperwork.

Hernando
1. State wide reef management data exchange and standardized reef assessment information.
2. Would like to see newsletter statewide with information exchange.

Hillsborough
1. Standardization of methods, sampling and data management.
2. Manpower.
3. Scientifically valid methodology.
4. Better communication with other programs.
5. Get the academic and regulatory agencies together to sort out what needs to be done.

Lee
1. Global Positioning System.
2. Computer mapping capabilities.
3. Increased trained manpower, from volunteers.

Manatee
1. Need data management guidelines.
2. Need to organize and train volunteers.
3. Need to network with others involved in reef work, locally.

Martin
1. Funds to assist with staffing, training volunteers and for data collection expenses. Need county support in matching funds. Funds to support building a data collection and management system.
2. Continued training of volunteer divers to gather data in the field.
3. Liaison with the scientific and academic community.

Nassau

1. Funds to support volunteers expenses, and volunteer training.
2. Funds for part time person on staff funded to coordinate grants, and handle data.

Okaloosa
1. Funds for seed money to support getting county started. Should include funds for training volunteers, equipment and expenses for sustaining their involvement. $20,000 for the first year, and some reduced amount each year after to continue the program, and motivate volunteers to keep going.
2. Develop methods for gathering data and networking it with other counties.

Palm Beach
1. Need additional funding to get full capability up and running. Then less funds once full capabilities are realized. Need to maintain funds for "Long term" studies, not year to year projects.
2. Need standard assessment criteria.
3. Need standard data management program that is networked across the state.

Pasco
1. Data collection (Personnel, procedures, equipment).
2. Data storage (computer programs).
3. Funding.

Pinellas
1. Assessing reef effectiveness.
2. Evaluating our vast data bank of survey data.
3. Cooperative analysis.

Sarasota
1. Criteria on what, how and why we should be monitoring reefs. These need to be practical and should be accomplished on the local level with minimal funding and equipment.
2. Standardize data collection in a form which can be exchanged with other reef programs or scientific institutions.
3. Workshops on utilizing/training volunteer divers to monitor reef sites.

St. Johns
1. Full time program vs and annually funded project approach. Feels counties need to be able to plan long term monitoring of reefs, over many years, and not be confined to an annual project proposal process.
2. Reef monitoring using local resources (volunteers, staff or consultants) for data collection, with evaluation by professionals in the marine environment (state agencies and academic institutions).
3. Public awareness of programs.

St. Lucie
1. Come up with a reef assessment plan or policy, guidelines, standards and methods.
2. Need to define the "MINIMUM" data required for assessment.
3. Funds ($25k to $50K) for hardware, software for a data archives for "physical" data. This should include funds for field sampling: water samplers, still and video photography, boat and diving expenses, as well as office equipment etc.
4. More Ships and other reef materials.

Santa Rosa
1. Funds for equipment and staffing.

2. Information on standards and methods.
3. Training of staff and volunteers.

Taylor
1. People (Volunteers to run a program.
2. Standard methods/technology to conduct management/assessment.
3. Boats and facility on coast to serve this function.

Volusia
1. Profile, growth, species from coordinator's view.
2. Boat, Lab, add staff from volunteer's view.

Wakulla
1. Additional volunteers and reliable vessels.
2. Permanent location for archives and laboratory.
3. Additional equipment (ie. U/W sleds, scooters, video, cameras, GPS units, vessels).
4. Guidelines for ways to determine how productive reefs are.
5. Wants state to make monitoring methods more effective by determining the "proper" monitoring methods.
6. State should provide tech. assistance by translating "academic" research information into easy to understand form. Interpretation of technical language for implementation and application.

EXPECTATIONS FROM STATE:

Bay
1. Funding -- for GPS system, and microcomputer dedicated to reef data processing. Also need specialized data gathering equipment which is calibrated and standardized. Need fuel and expense money to support volunteers. They shouldn't have to pay for everything.
2. Consistency of treatment between communities, fair treatment with respect to who gets funded. Get politics out of the process.
3. Information sharing -- keeping people informed.
4. State agencies should help to "market" the reef program through positive actions and pro-active publicity. They should do press releases across the whole state to show how the tax money, and license money is benefitting the people.
5. Send $$$ to the local reef programs, then don't meddle with how locals need to spend it. Keep paperwork down. Give locals some credit for their professionalism for making the best decisions which fir their local situation. Don't support those who don't know what they are doing.

Brevard
1. Funds to produce detailed maps.

Broward
1. Management and assessment guidelines and a data network.
2. Funding for something other than just "sinking ships".
3. Computer bulletin board updated regularly, and electronic mail messages, studies, grants and opportunities to exchange information with others.
4. Ability to share data, especially with adjacent counties.
5. State should take a regional approach for establishing monitoring programs, to account for wide differences in Florida marine environments.

Charlotte
1. Guidelines and standard reporting procedures.
2. DNR Lab studies on fish habitats to assess fishery needs, and stock assessment.

Citrus
1. Training for the type of assessment needed.

Collier
1. Standardized procedures and the funding to carry them out.

Dade
1. "Tell us what to do, and we'll find the means to do it." If state demands we need to do something, we can get the local government to find the funds to do it.
2. Top priority of the reef management program should be to address the issue of production vs aggregation question, and at the same time to develop a state management plan for the fishery resources of all existing state artificial reefs. There needs to be a plan, which would be authored by the Marine Fisheries Commission, to establish SMZ status for all artificial reefs in state waters.
3. Would not want to be required to do anything "esoteric" just limit parameters to the minimum needed by to make management decisions.
4. Name of program should be "DNR Aquatic Habitat Enhancement Program" not Artificial FISHING Reef Program. Reefs are being built to enhance productivity of all marine species, and not JUST those which

have "Fishery" value.
5. Monitoring goal should focus on reef productivity, i.e. spawning and to enhance habitat.
6. Should be considered as a form of mitigation (Ref. CA Study at the 5th Intl Conference.)

Duval
1. GIS Mapping assistance, funds (seed money to get things started) & software to support.
2. Standardization of the data required and report formats, and some assistance with interpreting with data from other areas of the state.
3. Allow reef construction grants to use a portion of the funds to help fund establishing a monitoring program, and purchase a computer for desktop GIS capability, in the reef coordinators office.

Escambia
1. Make permits easy and to be CONSISTENT between counties.
2. Assistance in establishing a reef program parallel to the Alabama program. "NOAA-Panama City Lab statistics shows it is working!"
3. Encourage the citizen to do it right, and don't be discouraging. With to many rules and discouragements put in the way, the citizens will continue to build reefs anyway, even if it is wrong.
4. Permit a large permitted area where small boaters are allowed to place "approved reef materials."
5. Training for volunteers.
6. Access to statewide findings.
7. A standard computerized data handling network.

Franklin
1. Standardized methods.
2. Funds for training, monitoring activities, and support team expenses as transportation, materials, instruments.
3. Continuing education through meetings, seminars, etc.
4. Statewide newsletters and publications.
5. Coordinate between volunteers and the research efforts in the state.
6. Need to assess "Oyster" reefs with the building of fishing reefs.
7. Need a list of experienced reef building contractors.
8. Provide a "model" specification for monitoring bid contracts.

Gulf
1. Funds for equipment, consultants, manpower, expenses.
2. Technical data on proper materials.
3. Feedback from other reef programs, to tell me what to look for, and what works.
4. Put information on a computer network which I at the local level can access.

Hernando
1. Standardized reef assessment information and guidelines for data collection.
2. Exchange of information regarding placement, monitoring and problems.

Hillsborough
1. Standardization and methodology for management and assessment of reefs.
2. Would like to see feedback form state agencies in the monitoring effort. These should include personal visits from DNR biologists.
3. Would like "overview summaries" of reef programs from other parts of the state.
4. Design a data template, compatible with computer systems and GIS.

Lee
1. Recommendations for standard (primary and alternate) methods and techniques for reef data acquisition, processing and networking.
2. Revision of the rules regarding "kinds of materials" allowed.
3. Allow reef funds to be used to but instrumentation such as cameras, data storage equipment. If state requires data, then they should help to finance acquiring and storing it.
4. The data precision required vs the counties willingness to buy, should be considered by the state. don't require the counties to gather data that would be more costly, than needed for its intended use.
5. the state should regionalize the reef assessment methods. The effects of depth, distance offshore, visibility and consistence of the weather should be factored in to the methods recommended.
6. Reef design recommendations which are based on design parameters which results in reefs which mimic the areas natural reef communities.
7. Design for a "standard" reef monitoring station to be able to compare reefs with those in other parts of the state.

Manatee
1. Determine appropriate assessment methods, standardize to lowest common denominator, but keep them "open ended" i.e. don't "lock-in" on just one method, and thus avoid the ability to adjust to local conditions. Need to regionalize assessment strategies.
2. Training in data collection and management methods. Need to conduct a seminar on the data that needs to be collected.
3. Not all data parameters may be needed. State need to determine under what circumstances certain data needs to be taken. Example: Dissolved oxygen may not need to be taken in open ocean conditions, but in a bay situation, it may be extremely important.

Martin
1. State agencies should bring the county, state and academic reef people together more often on a regional and statewide basis. We need feedback information from others building reefs in similar environments, and a regular reef conference each year or two, to share reef building and monitoring techniques, and scientific findings.
2. Provide information on the types of reef material which is best. What habitat designs work best in the different regions of the state??
3. More coordination of reef programs on a regional basis. Regions defined by the type of reef habitats found there.

Nassau
1. Standardization of data needed.
2. Network with others.
3. Construction guidelines.

Okaloosa
1. Guidelines about what data to collect.
2. Training of the data gatherers.
3. Funding of the data management activities, at least on a cost sharing basis.
4. Feedback form the state, in the form of "Executive Summaries", suggestions but not mandates. DNR should let the locals make some decisions based on their experience and data they collect. There's no point in collecting data just for the state. We should have the authority to be able to use the data to make decisions, without interference from the state. The state is too diverse for a broad brush plan. This is especially true of the materials selection question. What may work in some parts of the state, may not work

in some others. Let the locals use their data to decide some things.
5. Guidelines for testing new reef material.

Palm Beach
1. Funding and data management assistance. Start-up funds for reef data dedicated equipment..
2. Network computer with electronic mail accessible to county managers for data sharing.
3. Quarterly newsletter to keep managers and volunteers up to data on what works and doesn't work. Get counties to write stories for it.
4. Need a state level person to design a data template and software for uniformity of input. "We're project driver, not "data" driven.
5. Add incentives for "Constructed" reefs.
6. Allow counties to have more flexibility for using funds for monitoring/assessment activities. Have two categories of grants, one for construction, the other for assessment. Use for purchase of assessment equipment, cameras, computers, GPS system, and some staff support.
7. Need to pull all studies (including gray literature) together from all the counties.
8. Need a reef data electronic data and mail bulletin board. Facilitate on-line discussions etc.

Pasco
1. Either funding or providing the personnel to perform regular reef studies and assessments.

Pinellas
1. Developing reef usefulness data. That is, developing criteria for assessing cost effectiveness of artificial reefs.

St. Johns
1. Guidelines to assessment and monitoring.
2. Funding (for monitoring, training, equipment, and data management).
3. Annual Reef Seminars.

St. Lucie
1. Guidelines, technical support such as satellite imagery for inshore and nearshore reef areas.
2. Professional visitations from DNR biologists.
3. Workshops to convey State wants and needs... regular annual workshops, to help train new people and share between local reef managers.
4. Concern for when funds are available from the state. Construction contracts are time constrained.. forces people to build reefs when weather is least suitable! Need to cut the red tape.. for handling contracts and grants.. need to be able to rollover funds, without penalty, to allow for good weather or making long term arrangement with vendor's.

Santa Rosa
1. Funds for equipment, data gathering expenses.
2. Guidelines and standards for data sampling.

Sarasota
1. State approved assessment program which the local program could adopt and incorporate into its own plan.
2. Funding, training and staff inspectors (for quality control).
3. Annual reef conference (workshop) to exchange information.
4. Need to determine local variations between placements, on a regional basis to build reef construction

guidelines.

Taylor
1. Funds.

Volusia
1. Standard Forms & Software
2. Training Manual

Wakulla
1. Standardized methods.
2. Funds for training, monitoring activities, and support team expenses as transportation, materials, instruments.
3. Continuing education through meetings, seminars, etc.
4. Statewide newsletters and publications.
5. Coordinate between volunteers and the research efforts in the state.
6. Need to assess "Oyster" reefs with the building of fishing reefs.
7. Need a list of experienced reef building contractors.
8. Provide a "model" specification for monitoring bid contracts.

EXPECTATIONS FROM ACADEMICS:

Bay
1. Get involved with the local reef monitoring programs.
2. We can properly gather (with training) the reef data, but we need the scientific community to analyze it and give it scientific credibility.
3. Give us feedback so we know we aren't wasting our time collecting useless data.
4. Academics should provide feedback on reef data quality assurance.
5. Academics should look to the locals for assistance with their projects. We can provide the platform from which to work.
6. Would like to see more professors and graduate students funded to do habitat studies, as we have with S. Bartone at UWF.

Brevard
1. Committee support and technical expertise.

Broward
1. Reef research projects that are funded outside of county government. County can provide boat and a research platform, some diver time, and limited data analysis. Can deploy study reefs. Would like to see more graduate students involved.
2. Research projects we would like to see: (A.) Benthic infauna "influence zones" correlated with fish community; (B.) Baseline fish population on natural reefs for comparison with natural reefs; (C.) Trophic structures on reef fish, and seasonality; (D.) seeding reefs with hatchling juveniles (headstart program and fish tagging study.
3. Aggressively seek funds for reef research.
4. Build a "model" standard reef as a basis for comparison with other areas.

Charlotte
1. Basic research studies on reef process.
2. Training volunteers in acceptable underwater methods.

Citrus
1. Interpretation of the assessment data.
2. Recommendations for improvement.

Dade
1. Unbiased studies designed to determine the function of artificial reefs, i.e. the productivity/aggregation issue. This would support our efforts to manage our reef sites.
2. We will provide a platform for basic research, but we will not do it!

Duval
1. Economic and reef user data analysis, to be used to gain support from local and state officials.
2. Training of volunteers by Sea Grant Extension.

Escambia
1. Studies of the life cycles and how they are expressed in local environments.
2. Need more studies in the estuaries, and the effects of pollution on fish populations on the reefs. Feel this is our No.1 problems facing the reefs.

3. Study habitats which attract specific marine life. What kind of reef attracts what kid of fish. Should target some reefs for Snapper, Grouper, Amberjacks, Triggerfish and Black Sea Bass.
4. Study the economic benefits of a reef program on the charter industry.
5. Recommendations on the best data collection methods.
6. More involvement with the academic researchers in local reef studies, like S. Bortones work.

Franklin
1. Access to university faculty and facilities, as dive lockers, classrooms etc.
2. More involvement by university faculty in training. Funds should be made available for this.
3. Recommend standardized methods for assessment of reefs.
4. Input and guidance on individual monitoring projects.
5. Updates on current research projects.
6. Annual or regularly scheduled summit for reef research.
7. Should plan research on new reefs.
8. Need ideas for "Reef Design" for building reefs from materials of opportunity. Need to develop design concepts, based on field research on fish community structure and behavior.
9. Need to develop reef placement criteria for various desired effects, and materials.

Gulf
1. Basic research on material types, and benefits for developing reef habitat.
2. More scientific data on reef community development, succession, effects of water quality changes on ALL reef life and not JUST the fish. All reef research should focus on HABITAT, and BIOMASS. The

Hernando
1. Standardized reef assessment information and guidelines for data collection.

Hillsborough
1. Some "presence" in the field.. fresh ideas.. more interpretation of the monitoring information, and more interaction with the scientists.
2. Research on reef success and values both biologically and economically.
3. Science is more "credible" from the universities, we need more basic experimental design and hypothesis testing.
4. Scientists need to be more involved with the local reef programs, wishing to gather more data on artificial reefs.
5. Need regular regional meetings with scientists.

Lee
1. Recommendations on design, construction, placement and management specifics to increase the value of reefs as productive habitat.
2. Oceanic factors which effect reef communities.
3. Growth rates of the reef habitat. Natural vs the artificial habitats - how quickly can you exact certain designs to mimic natural communities.
4. Need to study the "Halo" effect around the reefs.
5. What is the optimal sized placement within a reef site?
6. High priority-- Need to determine the relationship between the inshore habitats, and water quality and the offshore reef community.
7. Use of inshore reefs to remove toxins before water gets offshore.
8. Life history connections between inshore and offshore recruitment. Politicians need to understand the connection between inshore and offshore habitats.

9. Studying artificial reefs built in estuarine systems.

Manatee
1. Interpretation of the data, above and beyond that done by the state DNR.
2. Develop guidelines for reef construction, based on research findings from monitoring.
3. Determine what kind of data should be taken and when it should be gathered.
4. Research community represents "unlimited" resources and knowledge, counties would like to have more access to this, perhaps through conferences, local seminars and workshops.
5. Sea Grant Extension should provide the training for local reef assessment programs.

Martin
1. Liaison with university staff, students and projects. We need more integration with the academic community and private labs, working on local projects.
2. Local academics should get support (grants from the state) to help analyze data for the local reefs. More state and local funds should be available to support graduate student reef projects.
3. Increase communication with the academics. More access to seminars, workshops.
4. Training volunteers or volunteer trainers.

Nassau
1. Training programs in methods.
2. Research studies.
3. Training Certification.

Okaloosa
1. Make sure academic researchers work in cooperation with the county reef programs. Keep an open communication, beyond just publishing in technical journals. More extension involvement bringing the researchers to the community.
2. Do research on: 1) Comparison of types of structures as fish habitats; 2) Determine cost-effectiveness of various reef materials; 3) Documentation of what economic impact reefs have for the communities that build them.

Palm Beach
1. Specimen identification, Assessment suggestions, and monitoring assistance.
2. Conduct basic "scientific" experiments and studies to build knowledge about reef processes.
3. Provide graduate students to do specific projects. County could help fund student thesis and dissertation projects. Can also provide limited support for "in-kind" services for field studies.
4. Need to determine if artificial reefs "work" ie. the "Production vs Attraction" argument. Need a major tagging study. Should aim all monitoring toward resolving this question.

Pasco
1. Data collections to include personnel, procedures etc.

Pinellas
1. Comments and assessments on construction parameters and effectiveness of artificial; reefs in Florida.

St. Johns
1. Academic community provides significant insight to the pro and con of reef success.

St. Lucie

1. Professional help to build and guide program, refine methods.
2. Library of data, maps charts, and reef information.
3. Reef studies, fish tagging, and studies to establish the value of reefs.
4. Need access to Fl. Institute of Technology, Harbor Branch Foundation, Community Colleges, for assistance in monitoring.
5. Study FAD's on shipwrecks.

Santa Rosa
1. Research on reefs, data analysis and new construction ideas.

Sarasota
1. Valid scientific data which could be incorporated into a local monitoring program.
2. Recommend reef management techniques based on up-to-date scientific research.
3. Make recommendations for management techniques on frequency of monitoring, identification of "criteria for success" and indicator species (best flora & fauna that reefs should have) for study.
4. Help determine "What are the questions?" Prioritized the research program in the state.
5. Some questions are: Attraction vs production? How does biomass change on a reef? Are the fishes and marine life attracted to the reefs what the divers and fishermen want? How can we make "multi-user reefs? How can we provide the best access to the reefs? Do different reefs have different biological functions? Can we manage for this? Are we altering existing fish stocks by building a reef? What are the "users" needs?
6. Need to determine impacts of inlets and bays on nearshore bottoms and reefs, to give us some idea how far out to place them for the most desirable effect.
7. Need to define "habitat" that we are trying to construct. i.e. what are the characteristics that we should build into a reef for the most "success".

Taylor
1. Assistance: technical information, support for permits/grants.

Volusia
1. State of the art reef construction methods.
2. Identification and analysis of growth of species.

Wakulla
1. Access to university faculty and facilities, as dive lockers, classrooms etc.
2. More involvement by university faculty in training. Funds should be made available for this.
3. Recommend standardized methods for assessment of reefs.
4. Input and guidance on individual monitoring projects.
5. Updates on current research projects.
6. Annual or regularly scheduled summit for reef research.
7. Should plan research on new reefs.
8. Need ideas for "Reef Design" for building reefs from materials of opportunity. Need to develop design concepts, based on field research on fish community structure and behavior.
9. Need to develop reef placement criteria for various desired effects, and materials.

ADDITIONAL CONCERNS:

Bay
1. Suggest improved public relations at the DNR reef office. We need a reef newsletter, with examples of others who are doing it right. Encourage us, don't regulate us.
2. Should have an awards program at the local level when a grant is given to the community. This can be as simple as a press release from Tallahassee to the local newspaper, when a reef grant is given. Help us make people like us for what we are doing.
3. Concerned that data quality is too dependent on the individual who is collecting it. We need some kind of "certification" program, to help screen the data at the source, to begin with.

Broward
1. We are very much interested in developing a volunteer reef monitoring program.
2.We also hope to develop an offshore reef "laboratory" with an academic group, such as NOVA Oceanographic Institute, and the University System. The "lab" would be a permitted site dedicated to a variety of reef research studies.
3. Has noticed that artificial reefs have taken diver pressure off natural reefs. S.E. Florida has many natural reefs, near shore (within 3 miles) that need studies. Research should study if artificial reefs are able to take the "pressure" from divers, fishermen and boat mooring, off the natural reefs. Should also investigate shallow water nearshore "snorkeling" reef sites as a tourism tool.
4. Many reefs are built to support diver tourism, fisheries enhancement is NOT the primary motive for building many of their reefs.

Citrus
1. Any assistance you could give in terms of monitoring would be gladly appreciated.
2. Citrus county has made annual drops at our reef for the past seven years, but have little/no data on whether we are doing our placements properly, and actually getting the maximum benefits from our money spent.
3. We would welcome any input on the start-up of a basic reef information gathering program.

Dade
1. We look forward to working with the state reef management program to the common goal of consistent management of the fishery resources represented by artificial reefs.
2. To this end, the active participation by Sea Grant in establishing a volunteer data collection of basic artificial reef function and or productivity would be of great benefit to the Dade County program.
3. Monitoring, historically, has never been looked at as necessary, but just as a frill. We need a consistent monitoring program.
4. Working with MAST Academy and Dade Marine Institute to obtain assistance to monitor inshore reefs.
5. Building Inshore (Bay) reefs for snorkeling tourists (Oleta River State Recreation Area).
6. Sunny Isles Community wants to market reefs strictly for diving tourism. Attracts many foreign visitors.
7. Dade County DERM focus is "Enhance resources (habitat) for ALL users (divers, fishermen, & tourists), and all MARINE ORGANISMS.

Duval
1. Need for regionalizing Florida's reef management plans and the methods for monitoring the reefs.

Escambia
1. Our No. 1 problem is pollution of estuaries and subsequent open water. "I've approached DNR several times for their involvement, but its hands off. SOMEONE has got to take the problem in hand." Diseased

fish are showing up in Escambia Bay.
2. We need to devise a program to enable the "little man" to get a permit to build his own reefs on permitted sites. People are afraid of the state because it is too strict, thus many are forced to do it illegally. State needs to grease the path.
3. The primary reason for building reefs should be to increase the "Ecological System" that supports all marine life, and not just the fishes. Thus criteria for success should be based on a simple increase of biomass, in areas where it did not exist before. A reef is working when it simply supports new life.
4. Reefs are just the right thing to do to give back life, especially when we have done so much harm to the environment already with other things. Building reefs makes us feel we are doing something right for a change.
5. We must regionalize our reef efforts, since Florida's marine environments are so drastically different around the state.
6. We have done some fish tagging of snappers. Fish Trackers Inc. from Texas has been keeping some data on this.

Franklin
1. There should be some way of communicating reef building activities back to the academic community to encourage them to develop more basic research projects.
2. Should provide better rapport with the FL Marine Patrol for more effective reef regulations enforcement.
3. Concern for "Oyster Reefs and "live rock" reefs as a commercial enterprize. Some planning should include these commercial operations as part of an artificial reef management plan, even though they come under the Florida "Aquaculture Lease" program. There need to be coordination between the oyster reef "cultching" program and the reef construction activities.
4. The OAR/RDT is pleased to contribute to this survey, and look forward to seeing the results. We would also like to thank Sea Grant for its leadership in artificial reef programs.

Gulf
1. Make assessment of bottom types suitable for reefs, statewide, and create a map of where reef construction would be most suitable. Identify areas where reef construction would not be suitable due to conflicts with the commercial trawlers, improper sediments, pollution ect.
2. Tires make excellent material in the right places, and are easy to get. More research is needed. We have observed large colonies of sea anenomes on some of our old (since 1968) tire reefs. Tire reefs appear to have lots of small holes which protect smaller fish from predation.
3. 90% of the live bottom has already been damaged or destroyed by the shrimpers and scallop trawls. Why don't they have to get a permit to "damage live bottom?" Yet when I want to build a reef, I'm not allowed to put it anywhere near where there is "live bottom." Pulling trawls in "live bottom" areas should be regulated. To do so, the state would need to map all the existing live bottom, as suggested in 1. above.
4. There is a demand for bottom fishing sites. Most fishermen perceive that reefs improve fishing. So long as their is a demand, people will continue to build reefs, even if they are illegal. So why not encourage people to do it right to start with, rather than make criminals out of basically honest people, by passing more regulations. We should have a reef program plan which encourages, not discourages by regulation. Some feel the "Alabama" reef program "encourages."

Hernando
1. Thank you for conducting this survey and good luck to you.

Hillsborough
1. To implement GIS feels he would need to set up system in-house, and would not require new staff. Would like data formats to be provided, to ease set up process.

2. Regional meetings organized by Sea Grant Extension Agent have been good.. helpful to share ideas with others in a common region. Meetings need to facilitate dialogue and exchange of ideas and comradery between participants, and not be just a series of lectures. They should have a theme each time.
3. I would like to do it right the first time, and not waste a lot of time making changes. Need assistance with the scientific method. County can support research effort.

Lee
1. What kind if data would you refuse to collect? Ans. Depends on the cost in $ and on staff time.
2. Should reef data be networked through the Regional Planning Councils, -- link their work with eliminating some materials from the landfills, such as concrete, and other suitable reef materials.
3. Need for regionalization for training, methods, analysis conferencing and networking.
4. Would like to see an regular statewide reef conference planned, perhaps rotated around the state through a six bioregion area.

Manatee
1. Need to provide a grant program to fund monitoring start-up activities for locals. Start up grant could be in the $15 to $20K range, for the first year or two, followed by smaller grants of $5K to $10K to assist with continuing the effort.
2. Would not like to see this become a paperwork mill. Keep data handling to a minimum computer system that is compatible with a GIS capability. Suggest using Lotus or a menu driven data based program, compatible with MS-DOS.
3. MAKE ASSESSMENT METHODS SIMPLE AND EASY!

Martin
1. Martin Co. does not have a staff to handle reef data, so they must depend on volunteers trained by FOS, using Sea Grants model. FOS is in good position to help with the training, with cooperation from the state and county governments.

Nassau
1. How to prevent improperly trained or experienced divers from "bidding" on monitoring projects, and producing inferior reports.

Okaloosa
1. Any materials should be allowed for reef construction so long as it is ecologically sound, affordable, economically available and lasts a reasonable amount of time. We must have the freedom to "examine" new materials, before passing final judgement on them, in the various Florida environments.
2. Need more construction funds.
3. With no reef program in this county, we will loose $$$ to the Alabama reef program. A reef program attracts tourists, fishermen, divers. We don't want them to all go to Alabama. We need help on marketing our reefs, just the same way DNR helps market Florida's Commercial Seafood.
4. Destin Charterboat fleet is worth $44 million each year (1987 study), not including the dive charters and personal fishing boaters. We don't want to loose this.
5. We need documented "success" and "failure" stories to guide us in how to build our reefs properly.

Palm Beach
1. Idea --- Develop a "state reef team" which is regionalized, ie. they do a regular visit to each "reef region" to work with the local reef assessors. Assures quality control, and exchange of information across the whole state, over time.
2. Recognizes the need for regionalizing reef assessment methods. Area north of county is more temperate,

area south is more tropical. Suggest Jupiter Inlet (N. border of Palm Beach Co.) be the dividing line between the north bioregion and south region, because faunal changes north of the Jupiter Inlet.
3. Need to tie management of the reef grants through designated "SMZ's" or special "protected zones in state waters, and designate "harvest areas" and "tourist areas". These could perhaps be moved around. Should require some "no-kill zones".
4. Fishery "Habitat Enhancement" work should be to emphasize building more and better habitat.
5. County would like to do its own economic studies, but to date has not done so. It is also interested in doing its own self-imposed reef monitoring. It welcomes the state desire for imposing a monitoring requirement, so long as some support comes with it.

Pinellas
1. We have a very active program with an intensive data base. Due to the nature of academic evaluations of reef effectiveness, it would be difficult to fairly and accurately compare data. We are addressing in Pinellas County, reef shape, size, and spacing in determining effectiveness. I feel with budget problems progressing the way they are, a concerted effort needs to be made to address the economic benefits of artificial reefs.

St. Johns
1. Not all county's have equal resources and an effort directed towards helping the small group (small county's) obtain equal results in monitoring, construction, assessment and funding is a great start.
2. Would like to see a program enabling local government utilizing volunteers formulate reef monitoring and assessment that is realistic and beneficial.

St. Lucie
1. Better federal policing of our two reef sites - from the "SMZ" (Special Management Zone" point of view. It took us 4 years to get "SMZ" , hardly a day goes by when some "SMZ" regulation is broken. There is no federal enforcement (the reefs are in federal waters).
2. Need data on water quality in estuaries and effects on offshore reefs.

Sarasota
1. We've developed a draft artificial reef management plan for Sarasota Co. and are eagerly awaiting a state wide plan prior to finalizing the local one.
2. Requirements developed, need to be practical, both in costs and time; and generate statistically valid data that can be used over the long-term.
3. County is not likely to be able to hire additional county employees to do reef work, unless mandated by the state, and some additional funds are made available from the state.
4. We need to balance the "users needs" against the "marine species" needs, --most grants have focused on the users, and not the species. We need to know the long-term ramifications of what we are doing.

Santa Rosa
1. We are really interested in building reefs, but the county has no funds available to build them.
2. The reef permitting process is too complicated, ... it should be greatly simplified.
3. We would like to know how the reefs are doing, and what the best ways are for building them.

Volusia
1. MOST IMPORTANT - We need training and information to allow our volunteers to continue. If it becomes so scientific and rigid with rules and regulations that volunteers would have to be replaced by hired professionals or divers, then our reef assessment program and archives would cease to exist.

Wakulla

1. There should be some way of communicating reef building activities back to the academic community to encourage them to develop more basic research projects.
2. Should provide better rapport with the FL Marine Patrol for more effective reef regulations enforcement.
3. Concern for "Oyster Reefs and "live rock" reefs as a commercial enterprize. Some planning should include these commercial operations as part of an artificial reef management plan, even though they come under the Florida "Aquaculture Lease" program. There need to be coordination between the oyster reef "cultching" program and the reef construction activities.
4. The OAR/RDT is pleased to contribute to this survey, and look forward to seeing the results. We would also like to thank Sea Grant for its leadership in artificial reef programs.