

**PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS**

AGENDA ITEM SUMMARY

Meeting Date:	May 19, 2009	(X) Consent	() Regular
		() Workshop	() Public Hearing
Department			
Submitted By:	<u>Environmental Resources Management</u>		
Submitted For:	<u>Environmental Resources Management</u>		

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to:

A) approve Contract with Florida Atlantic University (FAU) in the not-to-exceed amount of \$58,200 for digitizing and analyzing nearshore coastal aeriels county-wide in association with shoreline protection projects; and

B) authorize the County Administrator or his designee to sign all future time extensions, task assignments, certifications, and other forms associated with the Contract, and necessary minor amendments that do not change the scope of work or terms and conditions of the Contract.

Summary: This Contract will provide an automated means of digitizing aerial photographs for managing nearshore reef resources meeting permit and project design requirements. Staff and students from FAU will perform this effort. The Contract is funded from a combination of Tourist Development taxes, interest, and ad valorem funds. The Contract is effective upon execution by both parties and expires January 31, 2010. Countywide (SF)

Background and Justification: Environmental permits issued by the state and federal agencies for shoreline protection projects require mitigation for and monitoring of the nearshore reef resources, and this information is essential for project planning and design. Tracking nearshore resources has been done by completing aerial photographs with subsequent manual digitization of the resources. Florida Atlantic University (FAU), with their extensive Geographic Information System (GIS) expertise has developed an automated methodology that will significantly shorten the time to complete the digitization work and reduce the overall costs. Additionally, comparisons and trend analyses have not been performed due to the backlog of undigitized aeriels. This contract will complete the backlog, and with future aeriels and contracts, provide a significant savings over consultants. As permit-required monitoring, approximately 22% of the total contract cost will be eligible for cost sharing awaiting approval from the Florida Department of Environmental Protection.

Attachment:

1. Contract

Recommended by:


Department Director

4/28/09
Date

Approved by:


County Administrator

5/12/09
Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2009	2010	2011	2012	2013
Capital Expenditures	_____	_____	_____	_____	_____
Operating Costs	<u>58,200</u>	_____	_____	_____	_____
External Revenues	_____	_____	_____	_____	_____
Program Income (County)	_____	_____	_____	_____	_____
In-Kind Match (County)	_____	_____	_____	_____	_____
NET FISCAL IMPACT	<u>58,200</u>	_____	_____	_____	_____
# ADDITIONAL FTE POSITIONS (Cumulative)	_____	_____	_____	_____	_____

Is Item Included in Current Budget? Yes X No _____
 Budget Account No.: Fund _____ Department _____ Unit _____ Object _____
 Program _____

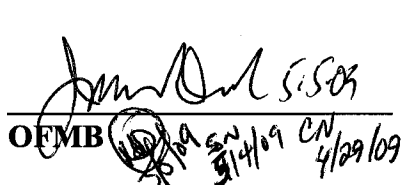
B. Recommended Sources of Funds/Summary of Fiscal Impact:

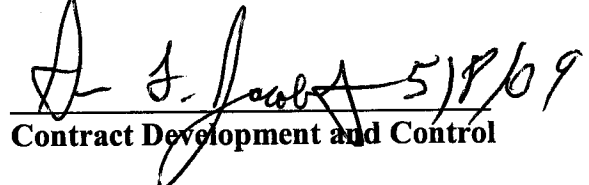
3652-381-M045-3120	Jupiter Carlin Shoreline Protection	\$1,786.84
3652-381-M028-3120	Juno Beach Shoreline Protection	\$3,318.42
3652-381-M037-3120	Singer Island Shoreline Protection	\$2,425.00
3652-381-M044-3120	S Palm Beach Shoreline Protection	\$2,042.11
3652-381-M015-3120	Ocean Ridge Shoreline Protection	\$3,318.42
3900-381-M700-3120	SLWI Management	\$3,446.05
3652-381-M041-3120	Delray Beach	\$3,956.59
3652-381-M039-3120	N Boca Raton	\$2,042.11
3652-381-M051-3120	C Boca Raton	\$1,786.84
3652-381-M016-3120	S Boca Raton	\$1,531.59
3652-381-M100-3120	Rest of County	\$32,546.03

C. Department Fiscal Review:

III. REVIEW COMMENTS

A. OFMB Fiscal and /or Contract Dev. and Control Comments:


 OFMB *5/14/09 CN 4/29/09*


 Contract Development and Control *5/19/09*

B. Legal Sufficiency:

This Contract complies with our contract review requirements.


 Assistant County Attorney

C. Other Department Review:

 Department Director

CONTRACT FOR CONSULTING/PROFESSIONAL SERVICES

This Contract is made as of the ____ day of _____, 2009, by and between Palm Beach County, a Political Subdivision of the State of Florida, by and through its Board of Commissioners, hereinafter referred to as the COUNTY, and Florida Atlantic University Board of Trustees, a state university authorized to do business in the State of Florida, hereinafter referred to as the CONSULTANT, whose Federal I.D. is 65-0385507.

In consideration of the mutual promises contained herein, the COUNTY and the CONSULTANT agree as follows:

ARTICLE 1 - SERVICES

The CONSULTANT'S responsibility under this Contract is to provide research and consultation services in the area of geographic information, as more specifically set forth in the Scope of Work detailed in Exhibit A.

The COUNTY'S representative/liaison during the performance of this Contract shall be Richard E. Walesky, telephone no. 561-233-2400.

The CONSULTANT'S representative/liaison during the performance of this Contract shall be as specified in Article 25.

ARTICLE 2 - SCHEDULE

The CONSULTANT shall commence services upon receipt of the COUNTY's written Notice to Proceed for each Task identified in Exhibit A and complete all services by January 31, 2010.

Reports and other items shall be delivered or completed in accordance with the detailed schedule set forth in Exhibit A.

ARTICLE 3 - PAYMENTS TO CONSULTANT

- A. The total amount to be paid by the COUNTY under this Contract for all services and materials shall be a total contract amount of fifty-eight thousand, two hundred Dollars (\$58,200). The CONSULTANT shall bill the COUNTY at the end of semesters: August 31, December 31 in accordance with the Scope of Work, Exhibit A.
- B. Invoices received from the CONSULTANT pursuant to this Contract will be reviewed and approved by the COUNTY's representative, to verify that services have been rendered in conformity with the Contract. Approved invoices will then be sent to the Finance Department for payment. Invoices will normally be paid within thirty (30) days following the COUNTY representative's approval.

- C. "Out-of-pocket" expenses including, but not limited to, mailing charges, copying fees, telephone charges and miscellaneous supplies will not be reimbursed under this Contract.
- D. Final Invoice: In order for both parties herein to close their books and records, the CONSULTANT will clearly state "final invoice" on the CONSULTANT'S final/last billing to the COUNTY. This shall constitute CONSULTANT'S certification that all services have been properly performed and all charges and costs have been invoiced to Palm Beach County. Any other charges not properly included on this final invoice are waived by the CONSULTANT.

ARTICLE 4 - TRUTH-IN-NEGOTIATION CERTIFICATE

Signature of this Contract by the CONSULTANT shall also act as the execution of a truth-in-negotiation certificate certifying that the wage rates, over-head charges, and other costs used to determine the compensation provided for in this Contract are accurate, complete and current as of the date of the Contract and no higher than those charged the CONSULTANT'S most favored customer for the same or substantially similar service.

The said rates and costs shall be adjusted to exclude any significant sums should the COUNTY determine that the rates and costs were increased due to inaccurate, incomplete or noncurrent wage rates or due to inaccurate representations of fees paid to outside consultants. The COUNTY shall exercise its rights under this Article 4 within three (3) years following final payment.

ARTICLE 5 - TERMINATION

This Contract may be terminated by the CONSULTANT upon sixty (60) days' prior written notice to the COUNTY's representative in the event of substantial failure by the COUNTY to perform in accordance with the terms of this Contract through no fault of the CONSULTANT. It may also be terminated, in whole or in part, by the COUNTY, with or without cause, immediately upon 30 days written notice to the CONSULTANT. Unless the CONSULTANT is in breach of this Contract, the CONSULTANT shall be paid for services rendered to the COUNTY'S satisfaction through the date of termination. After receipt of a Termination Notice and except as otherwise directed by the COUNTY the CONSULTANT shall:

- A. Stop work on the date and to the extent specified.
- B. Terminate and settle all orders and subcontracts relating to the performance of the terminated work.
- C. Transfer all work in process, completed work, and other materials related to the terminated work to the COUNTY.
- D. Continue and complete all parts of the work that have not been terminated.

ARTICLE 6 - PERSONNEL

The CONSULTANT represents that it has, or will secure at its own expense, all necessary personnel required to perform the services under this Contract. Such personnel shall not be employees of or have any contractual relationship with the COUNTY.

All of the services required herein shall be performed by the CONSULTANT or under its supervision, and all personnel engaged in performing the services shall be fully qualified and, if required, authorized or permitted under state and local law to perform such services.

Any changes or substitutions in the CONSULTANT'S key personnel, as may be listed in Exhibit A, must be made known to the COUNTY'S representative and written approval must be granted by the COUNTY's representative before said change or substitution can become effective.

The CONSULTANT warrants that all services shall be performed by skilled and competent personnel to the highest professional standards in the field.

All of the CONSULTANT'S personnel (and all Subcontractors) while on COUNTY premises will comply with all COUNTY requirements governing conduct, safety and security.

ARTICLE 7 - FEDERAL AND STATE TAX

The COUNTY is exempt from payment of Florida State Sales and Use Taxes. The COUNTY will sign an exemption certificate submitted by the CONSULTANT unless the CONSULTANT is itself exempt. The CONSULTANT shall not be exempted from paying sales tax to its suppliers for materials used to fulfill contractual obligations with the COUNTY unless CONSULTANT is itself an exempt entity, nor is the CONSULTANT authorized to use the COUNTY'S Tax Exemption Number in securing such materials.

The CONSULTANT shall be responsible for payment of its own and its share of its employees' payroll, payroll taxes, and benefits with respect to this contract.

ARTICLE 8 - AVAILABILITY OF FUNDS

The COUNTY'S performance and obligation to pay under this contract for subsequent fiscal years is contingent upon annual appropriations for its purpose by the Board of County Commissioners.

ARTICLE 9 - INSURANCE

- A. CONSULTANT shall, at its sole expense, agree to maintain in full force and effect at all times during the life of this Contract, insurance coverages and limits

(including endorsements), as described herein. CONSULTANT shall agree to provide the COUNTY with at least ten (10) day prior notice of any cancellation, non-renewal or material change to the insurance coverages. The requirements contained herein, as well as COUNTY's review or acceptance of insurance maintained by CONSULTANT are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by CONSULTANT under the contract.

- B. **General Liability** CONSULTANT shall maintain General Liability at a limit of liability not less than \$100,000/\$200,000.
- C. **Worker's Compensation Insurance & Employers Liability** CONSULTANT shall maintain Worker's Compensation & Employers Liability in accordance with Florida Statute Chapter 440.
- D. **Certificate(s) of Insurance** Prior to execution of this Contract, CONSULTANT shall deliver to the COUNTY's representative as identified in Article 31, a Certificate(s) of Insurance evidencing that all types and amounts of insurance coverages required by this Contract have been obtained and are in full force and effect. Such Certificate(s) of Insurance shall include a minimum ten (10) day endeavor to notify due to cancellation.
- E. **Right to Review** COUNTY, by and through its Risk Management Department, in cooperation with the contracting/monitoring department, reserves the right to review, modify, reject or accept any required policies of insurance, including limits, coverages, or endorsements, herein from time to time throughout the term of this Contract. COUNTY reserves the right, but not the obligation, to review and reject any insurer providing coverage because of its poor financial condition or failure to operate legally.

ARTICLE 10 - INDEMNIFICATION

Each Party shall be responsible for the acts or omissions of its officers, agents and employees, arising during and as a result of their performance of the terms of this Contract to the full extent required or permitted by applicable law. The COUNTY and CONSULTANT acknowledge the waiver of sovereign immunity for liability in tort contained in Florida Statute Section 768.28 and acknowledges that such statute permits actions at law against the COUNTY and CONSULTANT to recover damages in tort for money damages up to the amounts set forth in such statute for injury, loss of property, personal injury, or death caused by the negligence or wrongful act or omission of an employee of the COUNTY or CONSULTANT while acting in the scope of the employee's office or employment under circumstances in which the COUNTY or CONSULTANT, if a private person, would be liable under the general laws of this State.

ARTICLE 11 - SUCCESSORS AND ASSIGNS

The COUNTY and the CONSULTANT each binds itself and its partners, successors, executors, administrators and assigns to the other party and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract. Except as above, neither the COUNTY nor the CONSULTANT shall assign, sublet, convey or transfer its interest in this Contract without the prior written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of the COUNTY, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the COUNTY and the CONSULTANT.

ARTICLE 12 - REMEDIES

This Contract shall be governed by the laws of the State of Florida. Any legal action necessary to enforce the Contract will be held in Palm Beach County. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity, by statute or otherwise. No single or partial exercise by any party of any right, power, or remedy hereunder shall preclude any other or further exercise thereof.

ARTICLE 13 - CONFLICT OF INTEREST

The CONSULTANT represents that it presently has no interest and shall acquire no interest, either direct or indirect, which would conflict in any manner with the performance of services required hereunder, as provided for in Chapter 112, Part III, Florida Statutes. The CONSULTANT further represents that no person having any such conflict of interest shall be employed for said performance of services.

The CONSULTANT shall promptly notify the COUNTY's representative, in writing, by certified mail, of all potential conflicts of interest of any prospective business association, interest or other circumstance which may influence or appear to influence the CONSULTANT'S judgment or quality of services being provided hereunder. Such written notification shall identify the prospective business association, interest or circumstance, the nature of work that the CONSULTANT may undertake and request an opinion of the COUNTY as to whether the association, interest or circumstance would, in the opinion of the COUNTY, constitute a conflict of interest if entered into by the CONSULTANT. The COUNTY agrees to notify the CONSULTANT of its opinion by certified mail within thirty (30) days of receipt of notification by the CONSULTANT. If, in the opinion of the COUNTY, the prospective business association, interest or circumstance would not constitute a conflict of interest by the CONSULTANT, the COUNTY shall so state in the notification and the CONSULTANT shall, at its option, enter into said association, interest or circumstance and it shall be deemed not in conflict of interest with respect to services provided to the COUNTY by the CONSULTANT under the terms of this Contract.

ARTICLE 14 - EXCUSABLE DELAYS

The CONSULTANT shall not be considered in default by reason of any failure in performance if such failure arises out of causes reasonably beyond the control of the CONSULTANT or its subcontractors and without their fault or negligence. Such causes include, but are not limited to, acts of God, force majeure, natural or public health emergencies, labor disputes, freight embargoes, and abnormally severe and unusual weather conditions.

Upon the CONSULTANT'S request, the COUNTY shall consider the facts and extent of any failure to perform the work and, if the CONSULTANT'S failure to perform was without it or its subcontractors fault or negligence, the Contract Schedule and/or any other affected provision of this Contract shall be revised accordingly, subject to the COUNTY'S rights to change, terminate, or stop any or all of the work at any time.

ARTICLE 15 - ARREARS

The CONSULTANT shall not pledge the COUNTY'S credit or make it a guarantor of payment or surety for any contract, debt, obligation, judgment, lien, or any form of indebtedness. The CONSULTANT further warrants and represents that it has no obligation or indebtedness that would impair its ability to fulfill the terms of this Contract.

ARTICLE 16 - DISCLOSURE AND OWNERSHIP OF DOCUMENTS

The CONSULTANT shall deliver to the COUNTY's representative for approval and acceptance, and before being eligible for final payment of any amounts due, all deliverables prepared by and for the COUNTY under this Contract in accordance with Exhibit A.

To the extent allowed by Chapter 119, Florida Statutes, all written and oral information not in the public domain or not previously known, and all information and data obtained, developed, or supplied by the COUNTY or at its expense will be kept confidential by the CONSULTANT and will not be disclosed to any other party, directly or indirectly, without the COUNTY'S prior written consent unless required by a lawful court order. All drawings, maps, sketches, programs, data base, reports and other data developed, or purchased, under this Contract for or at the COUNTY'S expense shall be and remain the COUNTY'S property and may be reproduced and reused at the discretion of the COUNTY.

The parties agree that the CONSULTANT may use the data and analysis derived from this Agreement in any future publication, thesis, or dissertation provided that notice is given to the COUNTY and the COUNTY is recognized in the publication or document.

All covenants, agreements, representations and warranties made herein, or otherwise made in writing by any party pursuant hereto, including but not limited to any representations made herein relating to disclosure or ownership of documents, shall survive the execution and delivery of this Contract and the consummation of the transactions contemplated hereby.

ARTICLE 17 - INDEPENDENT CONTRACTOR RELATIONSHIP

The CONSULTANT is, and shall be, in the performance of all work services and activities under this Contract, an Independent Contractor, and not an employee, agent, or servant of the COUNTY. All persons engaged in any of the work or services performed pursuant to this Contract shall at all times, and in all places, be subject to the CONSULTANT'S sole direction, supervision, and control. The CONSULTANT shall exercise control over the means and manner in which it and its employees perform the work, and in all respects the CONSULTANT'S relationship and the relationship of its employees to the COUNTY shall be that of an Independent Contractor and not as employees or agents of the COUNTY.

The CONSULTANT does not have the power or authority to bind the COUNTY in any promise, agreement or representation.

ARTICLE 18 - CONTINGENT FEES

The CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT to solicit or secure this Contract and that it has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, gift, or any other consideration contingent upon or resulting from the award or making of this Contract.

ARTICLE 19 - ACCESS AND AUDITS

The CONSULTANT shall maintain adequate records to justify all charges, expenses, and costs incurred in estimating and performing the work for at least three (3) years after completion or termination of this Contract. The COUNTY shall have access to such books, records, and documents as required in this section for the purpose of inspection or audit during normal business hours, at the CONSULTANT'S place of business.

ARTICLE 20 - NONDISCRIMINATION

The CONSULTANT warrants and represents that all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or gender expression.

ARTICLE 21 - AUTHORITY TO PRACTICE

The CONSULTANT hereby represents and warrants that it has and will continue to maintain all licenses and approvals required conducting its business, and that it will at all times conduct its business activities in a reputable manner. Proof of such licenses and approvals shall be submitted to the COUNTY's representative upon request.

ARTICLE 22 - SEVERABILITY

If any term or provision of this Contract, or the application thereof to any person or circumstances shall, to any extent, be held invalid or unenforceable, the remainder of this Contract, or the application of such terms or provision, to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected, and every other term and provision of this Contract shall be deemed valid and enforceable to the extent permitted by law.

ARTICLE 23- PUBLIC ENTITY CRIMES

As provided in F.S. 287.132-133, by entering into this contract or performing any work in furtherance hereof, the CONSULTANT certifies that it, its affiliates, suppliers, subcontractors and consultants who will perform hereunder, have not been placed on the convicted vendor list maintained by the State of Florida Department of Management Services within the 36 months immediately preceding the date hereof. This notice is required by F.S. 287.133(3)(a).

ARTICLE 24 - MODIFICATIONS OF WORK

The COUNTY reserves the right to make changes in Scope of Work, including alterations, reductions therein or additions thereto. Upon receipt by the CONSULTANT of the COUNTY'S notification of a contemplated change, the CONSULTANT shall, in writing: (1) provide a detailed estimate for the increase or decrease in cost due to the contemplated change, (2) notify the COUNTY of any estimated change in the completion date, and (3) advise the COUNTY if the contemplated change shall affect the CONSULTANT'S ability to meet the completion dates or schedules of this Contract.

If the COUNTY so instructs in writing, the CONSULTANT shall suspend work on that portion of the Scope of Work affected by a contemplated change, pending the COUNTY'S decision to proceed with the change.

If the COUNTY elects to make the change, the COUNTY shall initiate a Contract Amendment and the CONSULTANT shall not commence work on any such change until such written amendment is approved and signed by the CONSULTANT and approved and executed on behalf of Palm Beach County.

ARTICLE 25 - NOTICE

All notices required in this Contract shall be sent by certified mail, return receipt requested, hand delivery or other delivery service requiring signed acceptance. If sent to the COUNTY, notices shall be addressed to:

Richard E. Walesky, Director
Department of Environmental Resources Management
2300 N Jog Road, 4th Floor
West Palm Beach, FL 33411

With copy to:

Palm Beach County
Attn: County Attorney for ERM
301 North Olive Avenue, Suite 601
West Palm Beach, FL 33401

If sent to the CONSULTANT, notices shall be addressed to:

Camille E. Coley, J.D.
Assistant V.P. for Research
Division of Research
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431

ARTICLE 26 - ENTIRETY OF CONTRACTUAL AGREEMENT

The COUNTY and the CONSULTANT agree that this Contract sets forth the entire agreement between the parties, and that there are no promises or understandings other than those stated herein. None of the provisions, terms and conditions contained in this Contract may be added to, modified, superseded or otherwise altered, except by written instrument executed by the parties hereto in accordance with Article 25- Modifications of Work.

ARTICLE 27 - CRIMINAL HISTORY RECORDS CHECK

The CONSULTANT shall comply with the provisions of Ordinance 2003-030, the Criminal History Records Check Ordinance ("Ordinance"), as amended from time to time, if CONSULTANT'S employees or subcontractors are required under this contract to enter a "critical facility" as identified in Resolution R-2003-1274. The CONSULTANT acknowledges and agrees that all employees and subcontractors who are to enter a "critical facility" will be subject to a fingerprint based criminal history records check. Although COUNTY agrees to pay for all applicable FDLE/FBI fees required for criminal history record checks, the CONSULTANT shall be solely responsible for the

financial, schedule, and staffing implications associated in complying with Ordinance 2003-030, as amended from time to time.

ARTICLE 28 – REGULATIONS: LICENSING REQUIREMENTS:

The CONSULTANT shall comply with all laws, ordinances and regulations applicable to the services contemplated herein, to include those applicable to conflict of interest and collusion. The CONSULTANT is presumed to be familiar with all federal, state and local laws, ordinances, codes and regulations that may in any way affect the services offered.

Remainder of page intentionally left blank.

IN WITNESS WHEREOF, the Board of County Commissioners of Palm Beach County, Florida has made and executed this Contract on behalf of the COUNTY and CONSULTANT has hereunto set its hand the day and year above written.

ATTEST:
Sharon R. Bock, Clerk & Comptroller

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS:

By: _____
Deputy Clerk

By: _____
John F. Koons, Chairman

WITNESS:

CONSULTANT:

C. Elisa Gaucher
Signature

C. ELISA GAUCHER
Name (type or print)

Florida Atlantic University

Michael Moriarty
Signature

Nancy Thoman
Signature

Nancy Thoman
Name (type or print)

Michael Moriarty, Ph.D.
Typed Name

Interim VP for Research
Title

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

By Mark [Signature]
County Attorney

(corp. seal)

APPROVED AS TO
TERMS AND CONDITIONS

By Richard E. Walesky
Richard E. Walesky, Director
Department of Environmental Resources Management

APPROVED AS TO FORM
AND LEGALITY
General Counsel 5/8/09
Florida Atlantic University

EXHIBIT A SCOPE OF WORK (SOW)

NEARSHORE REEF ANALYSES AND QUANTIFICATION PALM BEACH COUNTY

1.0 BACKGROUND

The nearshore reefs adjacent to the Palm Beach County beaches are a unique marine habitat composed of coquina rock that is repeatedly exposed and recovered by shifting sands. This process is naturally affected by daily and seasonal changes in wave and wind regimes. Historically, the creation of the inlets has affected the degree of exposure of the nearshore reefs, and now this natural process is also periodically affected by beach nourishment projects, as well as inlet and Intracoastal Waterway dredging and spoil disposal.

The ecological value of the nearshore reefs is recognized; however, this importance may vary seasonally with fluctuations in the quantity and diversity of biota accessing or growing on the reefs, the areal extent of hardbottom exposure, the duration of exposure, the degree of relief and rugosity, and proximity to an inlet. The reefs also have a physical importance because they form a semi-permanent bar offshore which acts (in conjunction with shifting sand bars) to retard the rate of beach erosion and reduce the intensity of wave action on the beaches. Monitoring the extent of nearshore reef hardbottom exposure is one measure of the value of this system to Palm Beach County. This measure also helps guide management decisions affecting nearshore reefs and designs of future beach projects.

2.0 OBJECTIVES

In order to fulfill the objectives required by this SOW, the CONSULTANT, Dr. Charles Roberts, shall conduct research to:

- a) Develop a standardized automated or partially automated method with satisfactory Quality Assurance/Quality Control (QA/QC) procedures for digitizing nearshore resources and document methodologies;
- b) Compare results of automated method with hand-digitized reef maps showing an accuracy of 90% or greater;
- c) Digitize backlogged countywide aerials and summarize by resource types; and
- d) Summarize and compare trends in reef resources among the years of aerial data.

3.0 POINT OF CONTACT

All communication from the CONSULTANT to the COUNTY associated with this SOW shall be through Palm Beach County Environmental Resources Management Department (ERM) Project Manager, Dr. Janet Phipps telephone: (561) 233-2513, Email:

iphipps@pbcgov.org . In the event Dr. Phipps is unavailable, Carman Vare (561-233-2444) will act as an alternate contact.

All communication between the COUNTY and the CONSULTANT shall be done through the Project Manager unless directed otherwise by the Project Manager or in the Contract for Consulting/Professional Services. The role of the project manager is to ensure that communication between COUNTY and the CONSULTANT is frequent, consistent, and documented. This includes gathering and disseminating documentation and deliverables, schedule review, and invoice review and approval.

The COUNTY reserves the right to authorize or decline to authorize each Task in this SOW. This decision will be at the sole discretion of the COUNTY and will be communicated in writing to the CONSULTANT. CONSULTANT shall not be paid for completion of any Task unless authorized by the COUNTY and shall not be paid for Tasks undertaken but not completed or not properly completed.

4.0 SCOPE OF WORK

This SOW is for conducting research to develop faster, cost-effective, and accurate, method for digitizing nearshore aerials; for the digitization of nearshore and beach resources from the existing and future annual countywide coastal aerials; and for the analysis, quantification, and comparisons of the resultant data. Coastal aerial data to be digitized include years 2005 through 2008 and 2009 when it becomes available. Data analyses shall include the above-mentioned years plus years 1993, 2000, 2001, 2003, and 2004; these years are digitized, and the data will be provided by the COUNTY. All tasks associated with this SOW shall be conducted by the CONSULTANT in accordance with established techniques outlined within this SOW. Work will be authorized by Task and will depend on satisfactory results from each previous Task.

5.0 WORK BREAKDOWN STRUCTURE

TASK 1. Develop an automated (or partially automated) method to more cost effectively digitize areal extents of reef and beach resources.

The intent in developing this automated method is to generate maps in a more cost effective method than hand digitizing, but also to expedite mapping to enable groundtruthing future year’s aerials. Resources will be mapped by category type as shown in Table 1.

Table 1. Reef and Beach Category Types.

CATEGORY TYPE	DESCRIPTION OF CATEGORY
BASIC:	
ARTIFICIAL REEF	Manmade structures placed in the water as “reefs”
NEARSHORE REEF	Exposed hardbottom (reef) in waters less than 18 ft. depth
OFFSHORE REEF	Exposed hardbottom (reef) in waters greater than 18 ft.
NS REEF ROCK	Recently Exposed hardbottom (reef) minimal to no growth

NS REEF ALGAE	Exposed hardbottom (reef) with benthic growth evident
EMERGENT ROCK	Exposed hardbottom above the wrack line
BOULDER REVETMENT	Shore protection structure made up of limerock bounders
RUBBLE	Scattered rock in a specific area
BORROW AREA	Depressional areas where sand has been removed by dredging
OPTIONAL:	
<i>DUNE VEGETATION</i>	<i>Vegetation within the dune system</i>
<i>SEAWALL</i>	<i>Vertical wall fronting a building or road</i>
<i>WRACK LINE</i>	<i>Debris (seaweeds, etc.) deposited above the water line</i>
<i>GROIN</i>	<i>Rock structure oriented shore perpendicular</i>
<i>PIER</i>	<i>Linear structure extending out over the water</i>
<i>PIPE/CABLE</i>	<i>Submerged pipe extending into nearshore waters</i>
UNKNOWN	Significant underwater shading not identified by above are and not fish or alga

The Optional Category Types *in italics* are addressed in Task 5.

The procedures for researching and developing and testing the automated methodology shall be as follows:

1. Classification: Computer classification shall consist of subsetting the mosaiced coastal imagery and applying an unsupervised classification using either Leica Erdas Imagine or Erdas Image Analyst in Arc-Info. The resulting classification will be density sliced to identify classes. The classified image will be imported into Adobe Photoshop where remaining reef structure not picked up in the unsupervised classification, such as rock, will be added to the reef categories using the magic wand tool.
2. QA/QC of Classified Image: A quality control procedure may be applied here to insure that 90% to 95% of the features or better are appropriately classified. This will consist of a full accuracy assessment as described in Task 2 to a simple overlaying of the polygons on the imagery and on the 2003-2004 reefs to look for any discrepancies that need correction.
3. Recoding to Table 1 classes: Once the many classes are identified as belonging to the category types defined above, a recoding will be undertaken to place all classes that represent similar category types in the same category.
4. Raster to Vector Conversion: A raster to vector conversion will be undertaken. The classes that are not being utilized in this study will then be removed (e.g., sandy bottom).
5. QA/QC of final coverage: A QC procedure will be applied to the vector coverages of the polygons, emphasizing labeling errors by the CONSULTANT P.I. The goal will be to identify any mistakes introduced in the stages after the

initial classification. The method will be to convert the polygon coverage back to a raster coverage and then subtract one image from another. Since each raster consists of a class number, the resulting file should be composed entirely of zeros. (Any non-zeros will represent a change from the original classification, i.e., a mistake in editing classes, and this represents a 100% sampling of the vector coverage.) All mistakes shall be identified and corrected.

6. Merging of Subsetted Vector coverages: The initial classification involves subsetting pieces of the mosaiced aerial photograph shapefile. After the classification and raster to vector conversion and the QA/QC of the final vector coverage, the individual layers will be merged into a single file. QA/QC will be performed along the boundary of the merged subset vector layer; every polygon will be checked for shape and classification accuracy.
7. Documentation of Task 1 procedures:
 - a. A training manual will be developed showing step by step procedures for training in this methodology. Since the same company that produces Leica Erdas Imagine also produces Image Analyst, a plug in for ESRI products, the training manual will be designed for the Image Analyst software.
 - b. Work flow sheets that show basic information on every step of the project will be compiled.

TASK 2. Compare results of the automated method with previously hand-digitized method.

Imagery and geodatabases from the hand-digitized years 2003 and 2004 for 3 shoreline project locations (Juno, Singer Island, and South Palm Beach) will be provided by the COUNTY for CONSULTANT to conduct research to compare with the automated results to ensure an accuracy of 90% to 95% or greater. If accuracy falls below 95%, CONSULTANT will notify the COUNTY, and a determination will be made if additional tasks need to be added.

The following research comparison analysis will be conducted to validate the automated method:

- A. Conduct accuracy assessments on the results of the automated reef mapping by comparisons of 204 stratified random sample points taken from the new machine-classified geodatabase and compare to (1) the original photograph from which the reef geodatabase was mapped, and (2) to the hand-digitized geodatabase previously created by the COUNTY. Perform an analysis of the structure of the errors including errors of omission and commission, producers and users accuracy for both the hand-digitized geodatabase and the machine-classified geodatabase. Each error will be analyzed to determine the cause of the error. This will be done twice, once for 2003 imagery and reef geodatabase and once for 2004 imagery and reef geodatabase.

- B. Using the machine classified geodatabase and the hand-digitized geodatabase, perform an analysis of differences between the two databases, with a report that examines the area and percent area difference in machine-classification versus hand-digitizing for 2003 and 2004 for each category of information and produce a map that shows where areas are the same or where they are different between the two classification methods for both the 2003 and 2004 geodatabases.

Documentation of Task 2 procedures: A research comparison report shall be developed that contains the steps, flow sheets, maps, and results of the comparisons and accuracy assessments completed in Task 2. It shall also contain the structure of errors and explanations on how errors were corrected for future mapping. **Approval of this comparison report by the COUNTY shall occur prior to commencing Task 3.**

TASK 3. Digitize countywide aerials and prepare areal summaries (square feet and/or acreages) for each basic reef resource category type.

Digitizing the years 2005, 2006, 2007, and 2008 will focus on the basic (non-*italicized*) Category Types in Table 1. The priority order for the years will be to start with the most recent year and work through to the oldest. The aerials for 2009 shall also be digitized when they become available. All data shall be maintained in a geodatabase and be segmented by R monument intervals for each year. The COUNTY will provide the CONSULTANT with an electronic file of the R monument intervals.

QA/QC procedures will be instituted by and overseen by the CONSULTANT P.I. This will consist of random quality checks of the work of each student at each step of the operation during the initial training period, which will end when the student has successfully mapped two photos and merged the polygons together accurately. Digital Work Flow Forms will be filled out as each step is completed so that the work flow is documented, and problem areas can easily be identified. Each graduate student will produce a product and a complete accuracy assessment will be made of that product. When the students achieve an accuracy level of 90% or better, they will then work independently with random quality checks of each step of each completed product, with emphasis on the finished, classified raster maps and the final polygon coverages.

TASK 4. Research to summarize and compare trends in the reef Category Types over time.

The purpose of this Task is to look at changes in the resource types by time and by location, as well as at specific locations along the coast under differing influences. Hence, comparisons of changes by inlet interval and by project are important, especially when compared to the 1993 data. The first set of comparisons to be completed will be for the priority interval that is the Jupiter Inlet to Lake Worth Inlet interval that also contains the Jupiter/Carlin, Juno, and Singer Island beach nourishment project intervals. This set of comparisons will establish the methodology for the rest of the comparisons.

The reef category types to be compared are the nearshore and offshore reefs. The units for comparison will be countywide; by inlet intervals; and by beach nourishment project intervals; all compared among the years of data.

For the purposes of comparisons, the inlet intervals are defined as: County line to Jupiter Inlet, Jupiter Inlet to Lake Worth Inlet (priority), Lake Worth Inlet to South Lake Worth Inlet, South Lake Worth Inlet to Boca Raton Inlet, and Boca Raton Inlet to south county line. Beach nourishment project intervals are defined as the areas within the following DEP R-Monument numbers: Jupiter/Carlin: R-12½-19; Juno: R-26-38; Singer Island: R-60-70; South Palm Beach: R-135-142; South Lake Worth Inlet Management: R-143-152; and Ocean Ridge: R-153-164.

The geodatabases for the years 1993, 2000, 2001, 2003, 2004, that were previously hand-digitized will be provided by the COUNTY. The CONSULTANT will subdivide each of these older geodatabases into 5 inlet intervals, and 6 beach nourishment intervals as approved by the COUNTY.

A post-classification change detection analysis will be performed on each time pair, i.e. 1993-2000, 2000-2001, etc. for the priority interval/projects to the final hand-digitized maps of 2004. Then a second series of analyses, including the machine-classified year pairs will occur. Lastly, a comparison of the hand-digitized 2004 will be compared to the machine-classified 2005 will be made. This analysis will include a geodatabase of changes between the time periods, and a report that will summarize the type of change and area of change between each pair of categories. (reef to sand, sand to reef, etc.). In addition a new category will be created: persistent reef, which will be defined as reef present at all times.

The rest of the comparisons of specific date-pairs for specific location intervals will be completed according to the following table:

Years/ Intervals**	1993- 2000	2000- 2001	2001- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	2008- 2009	1993- 2004	1993- 2009	2004- 2006	2004- 2009
Co – Jup	X				X	X				X	X	X	X
Jup – LWI	X	X	X	X	X	X	X	X	X	X	X	X	X
LWI – SLWI	X		X		X	X				X	X	X	X
SLWI-Boca	X		X	X	X	X		X		X	X	X	X
Boca – Co	X		X		X	X				X	X	X	X
J/C	X	X	X	X	X	X	X	X	X				
Juno	X	X	X	X	X	X	X	X	X				
SI	X	X	X	X	X	X	X	X	X				
SPB	X												
SLWIM	X					X	X	X	X				
OR	X					X	X	X	X				
TOTAL:	11	4	7	5	8	10	6	7	6	5	5	5	5

A total of 84 date comparisons.

****Co-Jup = County Line to Jupiter Inlet; Jup – LWI = Jupiter Inlet to Lake Worth Inlet; LWI – SLWI = Lake Worth Inlet to South Lake Worth Inlet; SLWI – Boca = South Lake Worth Inlet to Boca Raton Inlet; Boca – Co = Boca Raton Inlet to south County Line; Beach Projects: J/C = Jupiter/Carlin; Juno = Juno; SI = Singer Island; SPB = South Palm Beach; SLWIM = South Lake Worth Inlet Management; and OR = Ocean Ridge.**

TASK 5. This research will digitize countywide aeriels and prepare areal summaries (linear distance, square feet and/or acreages) for the Optional reef resource category types.

Digitizing the years 2005, 2006, 2007, and 2008 will focus on the *italicized* Category Types in Table 1 (DUNE_VEGETATION, SEAWALL, WRACK_LINE, GROIN, PIER, PIPE/CABLE). The priority order for the years will be to start with the most recent year and work through to the oldest. The aeriels for 2009 shall also be digitized when they become available. All data shall be maintained in the geodatabases for each year.

QA/QC procedures will be undertaken by the CONSULTANT P.I. This will consist of random quality checks of the work of each student at each step of the operation during the initial training period. Digital Work Flow Forms will be filled out as each step is completed so that the work flow is documented, and problem areas can easily be identified. Each feature digitized by these students will be checked by the CONSULTANT P.I. or by the senior graduate student. The procedure will represent a 100% sampling of digitized features.

The trend analyses described in Task 4 will not be performed for the Optional Category Types digitized in this Task.

6.0 DELIVERABLES

TASK 1: An electronic copy of the draft training manual shall be submitted to the COUNTY for review and comments upon completion of Task 1 or no later than three (3) weeks after issuance of the Notice to Proceed (NP). This training manual shall outline and explain the developed methods and include QA/QC procedures. In addition, a work flow sheet showing basic information on every step of the project shall be included. The COUNTY shall provide comments to CONSULTANT, and the Final training manual shall continue to be expanded upon during completion of the subsequent tasks. One hard copy and one electronic copy of the final training manual shall be submitted with the Task 4 (and 5) Final Report.

TASK 2: The comparison report shall be submitted to the COUNTY for review in hard and electronic formats as soon as possible but no later than three (3) weeks after issuance of the Notice to Proceed (NP). The report shall include a map that shows where areas are the same or where they are different between the two classification methods for both the 2003 and 2004 geodatabases and an analyses of the differences (the structure of

errors) including errors of omission and commission, producers and users accuracy for both the hand-digitized geodatabase and the machine-classified geodatabase.

TASK 3: Initially, the data and maps for all years for the priority intervals (Jupiter Inlet to Lake Worth Inlet with Jupiter/Carlin, Juno, and Singer Island beach projects), shall be retained in a single geodatabase and submitted to the COUNTY in electronic format for review no later than seven (7) weeks after issuance of the Notice to Proceed (NP). The COUNTY will make every effort to expeditiously review this submittal and provide comments to the CONSULTANT. Satisfactorily addressing the COUNTY's review comments must occur before commencing Task 4.

The completed data and maps for all years for Tasks 3 shall be submitted to the COUNTY in electronic format for review fourteen (14) weeks after issuance of the Notice to Proceed (NP). The coordinate system for the geodatabase shall be State Plane NAD 1983, Harn, Florida East Coast, FIPs 0901 measured in feet. The summary tables of areal extents for each category type shall be broken down by Category Type and year and by R monument interval. Upon receipt of the COUNTY's approval, CONSULTANT shall proceed with development and submittal of the final geodatabases and tables eighteen (18) weeks after issuance of the Notice to Proceed (NP). A metadata worksheet in the form provided by the COUNTY shall be provided with each geodatabase. Evidence of quality control performed and level of accuracy shall be provided.

TASKS 4: A draft of the Final Report including maps, graphs, and tables to show comparisons and evaluations of changes and trends over time and beach intervals shall be submitted to the COUNTY for review and comment twenty-eight (28) weeks after issuance of the Notice to Proceed (NP), and the COUNTY shall provide comments to CONSULTANT. The CONSULTANT shall have thirty (30) days to incorporate the comments and submit two (2) hard copies and one (1) electronic copy of the Final Report. In addition, the final training manual with work flow sheets, including all updates from the various accuracy assessments and analyses of the structure of errors, shall also be submitted. The geodatabase shall be provided in electronic format subdivided by R Monuments as well as not subdivided.

TASK 5: The completed data and maps for all years for Task 5 shall be included with the Task 3 submittals. The coordinate system for the geodatabase shall be State Plane NAD 1983, Harn, Florida East Coast, FIPs 0901 measured in feet. The summary tables of linear/areal extents for each category type shall be broken down by Category Type and year and by R monument interval. Upon receipt of the COUNTY's approval, CONSULTANT shall proceed with development and submittal of the final

geodatabases and tables twenty-eight (28) weeks after issuance of the Notice to Proceed (NP). A metadata worksheet in the form provided by the COUNTY shall be provided with each geodatabase.

7.0 REPORTING

All data shall be maintained in a single geodatabase and reports shall be submitted in Microsoft Word. The CONSULTANT shall submit monthly reports by the 5th day of each month to provide a summary of work performed the previous month.

8.0 SUMMARY OF DELIVERABLE AND PAYMENT SCHEDULES

TASK DELIVERABLE	COST	DUE (WKS AFTER NP)
Task 1 and 2	\$1,200	3 weeks
Task 3	\$25,000	18 weeks
Task 4	\$24,000	28 weeks
Task 5	\$8,000	28 weeks

9.0 PAYMENT

Invoices may be submitted for each Task when completed and approved. The total amount for which the CONSULTANT shall be compensated shall not exceed a total contract amount of fifty-eight thousand two dollars (\$58,200).



CHIEF FINANCIAL OFFICER
STATE OF FLORIDA

ALEX SINK
STATE RISK MANAGEMENT TRUST FUND

CERTIFICATE OF COVERAGE

Policy Number: GL-08-0201 GENERAL LIABILITY

Name Insured: FLORIDA ATLANTIC UNIVERSITY

General Liability Coverage provided pursuant to Chapter 284, Part II, Section 768.28, Florida Statutes, and any rules promulgated thereunder.

Coverage Limits:

General Liability: \$100,000.00 each person
\$200,000.00 each occurrence

Inception Date: 7/1/08

Expiration Date: 7/1/09

Alex Sink

Chief Financial Officer

DI4-863
(REV. 3/01)



CHIEF FINANCIAL OFFICER
STATE OF FLORIDA

ALEX SINK
STATE RISK MANAGEMENT TRUST FUND

CERTIFICATE OF COVERAGE

Policy Number: WC-08-0201 STATE EMPLOYEE WORKERS'
COMPENSATION and EMPLOYER'S
LIABILITY

Name Insured: FLORIDA ATLANTIC UNIVERSITY

Coverage Limits:

Coverage A - Compensation coverage is provided to comply with the applicable State Workers' Compensation, Occupational Disease Laws and any rule promulgated thereunder.

Coverage B \$100,000.00 each person
 \$200,000.00 each occurrence

Inception Date: 7/1/08

Expiration Date: 7/1/09

Alex Sink

Chief Financial Officer

DI4-867
(REV. 3/01)