

SOLICITATION COVER SHEET

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT – REQUEST FOR PROPOSALS

SUBMIT PROPOSALS TO: PROCUREMENT OFFICE (MAIL CODE: BKV-4-PRO) SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT 2379 BROAD STREET - BUILDING #4 BROOKSVILLE, FLORIDA 34604-6899		
DIRECT INQUIRIES TO: RACHELLE JONES Phone: 352-796-7211, Ext. 4106; Fax: 352-754-3497; E-mail: Rachelle.jones@watermatters.org		
DATE POSTED: April 26, 2019	PROPOSALS WILL BE OPENED: June 11, 2019 at 2:30 PM Eastern Time	
PRE-PROPOSAL CONFERENCE: May 06, 2019 at 11:00 AM Southwest Florida Water Management District (Brooksville Headquarters) 2379 Broad Street – Building #4 (Governing Board Room) Brooksville, Florida 34604-6899		
ORAL PRESENTATIONS: June 27, 2019 (Tentative date, time(s) to be determined) (IF REQUESTED) Southwest Florida Water Management District (Brooksville Headquarters) 2379 Broad Street – Building #4 (Governing Board Room) Brooksville, Florida 34604-6899		
SOLICITATION TITLE: RFP 1908 DISTRICTWIDE SEAGRASS MAPPING PROJECT		
SPECIFICATIONS: The Southwest Florida Water Management District seeks proposals from licensed, qualified firms for acquiring digital orthophotos, photointerpretation of seagrass and other benthic habitats, and all necessary field work to produce seagrass maps of the Florida coast contained within the boundary of the Southwest Florida Water Management District (DISTRICT) roughly from Waccasassa Bay to Charlotte Harbor along the west-central and southwest Florida coast.		
Respondent Name:		Reason for No-Bid:
Mailing Address:		
City-State-Zip:		
Telephone Number: () -	FAX Number: () -	Toll-Free Number: () -
Email address for correspondence:		
Authorized Signature:		
Full Name (please print or type):		
Title (please print or type):		
I, the above signed, as Respondent, hereby declare that I have carefully read this solicitation and its provisions, terms, and conditions covering the equipment, materials, supplies or services as called for, and fully understand the requirements and conditions. I certify that this proposal is made without prior understanding, agreement, or connection with any corporation, firm, entity, or person submitting a proposal for the same goods/services (unless otherwise specifically noted) and is in all respects fair and without collusion or fraud. I agree to be bound by all of the terms and conditions of this solicitation and certify that I am authorized to sign this proposal for the Respondent. IT IS THE RESPONDENT'S RESPONSIBILITY TO ASSURE THAT HIS/HER SEALED PROPOSAL IS DELIVERED AT THE PROPER TIME TO THE SPECIFIED LOCATION. PROPOSALS RECEIVED AFTER THE DATE AND TIME SPECIFIED WILL NOT BE ACCEPTED.		

FORM 15.00 - 015 (05/07)

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
REQUEST FOR PROPOSALS (RFP) # 1908
DISTRICTWIDE SEAGRASS MAPPING PROJECT

TABLE OF CONTENTS

PART I - GENERAL CONDITIONS

- 1.1 Purpose
- 1.2 Definitions
- 1.3 Development Cost
- 1.4 Changes, Delays, and Addenda
- 1.5 Pre-Proposal Conference
- 1.6 Rules for Proposals
- 1.7 Contingency Fee
- 1.8 Proposal Format
- 1.9 Oral Presentations
- 1.10 Proposal Opening
- 1.11 Technical Questions
- 1.12 Conflict of Interest
- 1.13 Proposal Withdrawal
- 1.14 Public Availability of Records
- 1.15 Right to Accept or Reject Proposals
- 1.16 Notice of Intended Decision
- 1.17 Protests
- 1.18 Agreement Information
- 1.19 Truth in Negotiation
- 1.20 Indemnification
- 1.21 Withholding Payment
- 1.22 Termination without Cause
- 1.23 Law Compliance
- 1.24 Americans with Disabilities Act (ADA)
- 1.25 Public Entity Crimes
- 1.26 Employment Eligibility Verification
- 1.27 Correspondence
- 1.28 Background Checks
- 1.29 Purchases by Other Public Agencies

PART II - INTRODUCTION

- 2.1 General Information
- 2.2 Background Information
- 2.3 Term of Contract
- 2.4 Budget
- 2.5 Calendar

PART III – SCOPE OF WORK

- 3.1 Project Description/Work Objective
- 3.2 Professional Qualifications
- 3.3 Scope of Work/Deliverables

PART IV - INSURANCE REQUIREMENTS

- 4.1 Insurance Requirements

PART V - EVALUATION PROCEDURES

- 5.1 Evaluation and Final Selection
- 5.2 Evaluation Method and Criteria

ATTACHMENTS

- Attachment 1 Sample Agreement
- Attachment 2 Public Entities Crime Statement
- Attachment 3 Certification Regarding Drug-Free Workplace Requirements
- Figure 1 – Seagrass Mapping Areas of Interest
- Figure 2 – Estuaries of the Springs Coast and Suncoast
- Figure 3 – Passes/Areas of Special Concern

REFERENCE DOCUMENTS

- Suncoast and Springs Coast Tile Shape Files

PART I - GENERAL CONDITIONS

- 1.1 PURPOSE.** The purpose of this solicitation is to provide guidelines for submission of proposals to qualify for the nature of services described in Part III, hereinafter referred to as the "Project."
- 1.2 DEFINITIONS.** "Respondent" means any consultant, organization, firm, or other entity submitting a proposal to this solicitation. "Sub-Respondent" means any subconsultant providing services to the Respondent that is directly under contract with the Respondent. "District" means the Southwest Florida Water Management District, which is the issuing agency.
- 1.3 DEVELOPMENT COST.** Neither the District nor its representatives will be liable for any expenses incurred in connection with the preparation of a proposal for this solicitation. All proposals should be prepared simply and economically, providing a straightforward and concise description of the Respondent's ability to meet the requirements of the solicitation.
- 1.4 CHANGES, DELAYS, AND ADDENDA.** The District reserves the right to delay scheduled solicitation due dates if determined to be in the best interest of the District. All interpretations and supplemental instructions for this solicitation will be in the form of written Addenda to the solicitation documents. Respondents will acknowledge receipt of all such Addenda in their proposals.

District solicitations, addenda and questions and answers (Q&A) are available for review and may be downloaded from the District's website at: <http://www.watermatters.org/procurement> and at: www.demandstar.com. Persons receiving solicitations from these Internet websites are responsible to recheck the website for any addenda or Q&As.

No interpretation of the meaning of the specifications or other solicitation documents, or correction of any apparent ambiguity, inconsistency or error therein, will be made to any Respondent orally. Respondents are advised that no other sources are authorized to provide information concerning, explaining, or interpreting solicitation documents. Any information obtained from an officer, agent or employee of the District or any other person will not affect Respondent's risk or obligations or relieve it from fulfilling any and all conditions of this solicitation.

- 1.5 PRE-PROPOSAL CONFERENCE.** NON-MANDATORY: The District encourages attendance at the pre-proposal conference because it is beneficial to understanding proposal requirements and answering questions, although representation is not required at the conference in order to submit proposals.

Portions of the conference may be recorded however, minutes will not be produced.

- 1.6 RULES FOR PROPOSALS.** Two or more firms may combine for the purpose of responding to this solicitation provided that one (1) is designated as "Prime" Respondent. The other firms will be referred to as "Sub-Respondents." The signer of the proposal must declare that any person or entity with any interest in the proposal, as a principal, is identified therein; that the proposal is made without collusion; that the proposal is, in all respects, fair and in good faith; and that the signer of the proposal has full authority to negotiate for and bind the Respondent stated on the Solicitation Cover Sheet.
- 1.7 CONTINGENCY FEE.** The Respondent warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Respondent to solicit or secure this award 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 Respondent any fee, commission, percentage, gift, or other consideration contingent upon or resulting from the award. For breach or violation of this provision, the District will have the right to terminate this award without liability and, at its discretion, to deduct from the Agreement price, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration.

1.8 PROPOSAL FORMAT. In order to assist the District's review process, proposals should be prepared utilizing the following format. The original hardcopy proposal will be submitted in a three ring binder, on 8.5" x 11" paper printed on both sides, except for charts, graphs or tables, which may be on 11" x 17" paper printed on one side. All sections are to be tabbed and pages clearly numbered. Text will be single-spaced, 12-point font, except for headers, footers, charts, graphs or tables, which may be 10-point font. All information furnished must be legible. The required electronic copy must be an exact Adobe™ Portable Document Format File (.PDF) copy of the original. Discrepancies between the original and electronic PDF copy may result in rejection of the proposal in accordance with Paragraph 1.15, Right to Accept or Reject Proposals.

1.8.1 Solicitation Cover Sheet – Respondents must sign and return the Solicitation Cover Sheet with their proposals.

1.8.2 Letter of Transmittal – This letter should not exceed one (1) page and should briefly state the Respondent's understanding of the work to be done and make a positive commitment to perform the work in a timely fashion. It should also give the names of the individuals who will be authorized to make representations for the organization, and their titles, addresses and telephone numbers. This letter must be signed by an official authorized to negotiate for the Respondent.

1.8.3 Organizational Profile and Qualifications – This section of the proposal should provide a description of your organization, including location(s), size, range of activities, Project team organization chart, current and projected workloads and any other appropriate information to describe the organization. Emphasis should be given to the organization's experience with similar projects and expertise in the subject field.

1.8.4 Volume of Work – List the Prime Respondent and all Sub-Respondent names, including names of acquired or merged firms for the three (3) years prior to the posting of this solicitation. The District will calculate the volume of work it has awarded to the named firms over the three (3) year period.

1.8.5 Professional Qualifications – See Part III – Scope of Work, Paragraph 3.2 for details.

1.8.6 Scope of Work – See Part III – Scope of Work, Paragraph 3.3 for details.

1.8.7 Completion of all Proposal Documents. In addition to the proposal submission requirements listed in the Subparagraphs 1.8.1 through 1.8.6, all proposal documents and forms listed below must be completely and accurately filled out and submitted with the proposal. Failure to do so could result in rejection of the proposal as non-responsive.

- Addenda Acknowledgement: The Respondent must acknowledge receipt of all written Addenda issued for this solicitation on each Addendum Form issued with their proposal
- Attachment 2 – Public Entity Crime Statement
- Attachment 3 – Certification Regarding Drug-Free Workplace Requirements

1.8.8 Cost/Fees - Costs will not be submitted with your proposal. Fee Schedules will be negotiated with the most qualified firms as provided in Paragraph 5.1, Evaluation and Final Selection of this solicitation and Section 287.055, F.S.

1.9 ORAL PRESENTATIONS. The highest ranked Respondents will be required to participate in oral presentations with the Evaluation Committee. These presentations provide an opportunity for the Respondents to answer questions to clarify their proposals. Each presentation with questions and answers should last no more than thirty (30) minutes. The key team members as identified in the proposal must attend oral presentations.

Pursuant to Section 286.0113, F.S., the oral presentations are exempt from Section 286.011 and Section 24(b), Article I of the State Constitution. A complete recording shall be made of any portion of an exempt meeting. No portion of the exempt meeting may be held off the record.

Any Respondent deciding to appeal any decision made by the District with respect to any matter considered at such meeting, will need a record of the proceedings, and for such purpose, may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal may be based.

- 1.10 PROPOSAL OPENING.** The proposal opening will be public, on the date and at the time specified on the Solicitation Cover Sheet. It is the Respondent's responsibility to assure that its proposal is delivered at the proper time to the specified location. Proposals that for any reason are not so delivered will not be considered.

Proposals must be delivered by U.S. mail, postage paid, nationally recognized overnight courier, or personally. The District will not accept electronically transmitted proposals.

Proposals MUST be identified with the solicitation title as identified on the Solicitation Cover Sheet and "Sealed Proposal - Do Not Open" marked on the sealed package. If proposals are sent via Express Mail, proposals MUST be placed in a sealed envelope properly identified within the Express Mail package. No responsibility will attach to the District or any official or employee thereof for the pre-opening of, post-opening of, or the failure to open a proposal not properly addressed and identified as required.

By submitting a proposal, Respondent agrees to all the terms and conditions of this solicitation and those included in the Sample Agreement attached hereto as Attachment 1. Any changes offered by a Respondent in a proposal will not be considered by the District. The submittal of a proposal will constitute the Respondent's acknowledgement of all terms and conditions of this solicitation and the District will construe the proposal as though no proposal changes were presented. If a Respondent desires to propose a change to a term or condition of this solicitation or Sample Agreement, Respondent must submit its request under the procedure set forth in Paragraph 1.11, Technical Questions.

- 1.11 TECHNICAL QUESTIONS.** All questions must be presented in writing to rachelle.jones@watermatters.org, the address as stated in Paragraph 1.27, titled "Correspondence," or faxed, followed by a written confirmation, to the Procurement fax number, 352-754-6884, for receipt no later than ten (10) calendar days prior to the proposal opening. Inquiries must reference the date of the proposal opening, and the solicitation title and number. Respondents are responsible to check the District's website as specified in Paragraph 1.4 of this solicitation, for the District's responses to the questions presented. The District will attempt to answer all submitted questions in a timely manner but accepts no responsibility for response delays.

- 1.12 CONFLICT OF INTEREST.** The award hereunder is subject to the provisions of Chapter 112, Part III, F.S., as amended, governing conflicts of interest. All Respondents must disclose with their proposal the name of any officer, director, or agent who is also a public employee. Further, all Respondents must disclose the name of any public employee who owns, directly or indirectly, an interest of five percent (5%) or more in the Respondent's firm or any of its branches.

- 1.13 PROPOSAL WITHDRAWAL.** Proposals may be withdrawn by written notice signed by the same person who signed the Solicitation Cover Sheet and received at any time prior to the opening. Proposals may be withdrawn in person by the Respondent or its authorized representative, provided the authorized representative's identity is made known and a signed receipt for the proposal is received.

- 1.14 PUBLIC AVAILABILITY OF RECORDS.** Once opened, all proposals will become the property of the District and, at the sole discretion of the District, may not be returned to Respondent. Any information, reports or other materials given to, prepared or submitted in response to this solicitation will be subject to

the provisions in Chapter 119, F.S., Florida Public Records Act. Any Respondent claiming that its proposal contains information that is exempt from the public records law must clearly segregate (separate binder and CD preferred) and mark that specific information and provide the specific statutory citation for such exemption (i.e., Section 815.04, F.S.).

The Florida Public Records Act, Section 119.071(1)(b), F.S., as amended, exempts sealed proposals from inspection, examination, and duplication until such time as the District issues a notice of intended decision pursuant to Section 120.57(3)(a), F.S., or within thirty (30) days after the proposal opening, whichever comes first. This exemption is not waived by the public opening of the proposals. See Attachment 1, Sample Agreement, Paragraph 7, Project Records and Documents, for additional details on the public record requirements.

- 1.15 RIGHT TO ACCEPT OR REJECT PROPOSALS.** Proposals which are incomplete, conditional, obscure, or contain additions not contemplated by the solicitation or irregularities of any kind, or do not comply in every respect with the solicitation may be rejected as nonresponsive at the option of the District. The District does not bind itself to accept the minimum specifications stated in this solicitation but reserves the right to accept any proposal which in the judgment of the District will best serve the needs and the interests of the District. The District reserves the right to reject all proposals and not grant any award resulting from the issuance of this solicitation. If awarded, no contract will be formed between the Respondent and the District until the contract is executed by both parties.
- 1.16 NOTICE OF INTENDED DECISION.** The notice of intended decision will be posted for review by interested parties on the District's website at: <http://www.watermatters.org/procurement>, at: www.demandstar.com, and at 2379 Broad Street, Building No. 4 Lobby, Brooksville, Florida 34604-6899.
- 1.17 PROTESTS.** Any Respondent who protests the specifications, or notice of intended decision, must file with the District a notice of protest and a formal protest in compliance with Chapter 28-110, F.A.C., and applicable provisions in Section 120.57, F.S. Failure to file a protest within the time prescribed in Section 120.57(3), F.S., will constitute a waiver of proceedings under Chapter 120, F.S.
- 1.18 AGREEMENT INFORMATION.** The contents of the proposal of a successful Respondent will be incorporated into a written Agreement in terms acceptable to the District at its absolute discretion. A Respondent's failure to accept this condition will result in the cancellation of any award. A Sample Agreement is attached as Attachment 1.
- 1.19 TRUTH IN NEGOTIATION.** Any agreement resulting from this solicitation will require the Respondent to execute a truth-in-negotiation certificate stating that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time for contracting. The Agreement will also contain a provision that the original Fee Schedule and any additions thereto will be adjusted to exclude any significant sums by which the District determines the Fee Schedule was increased due to inaccurate, incomplete, or noncurrent wage rates and other factual unit costs. Any such adjustments will be made within one (1) year following the end of the Agreement.
- 1.20 INDEMNIFICATION.** The Respondent agrees to indemnify and hold harmless the District and all District officers and employees, from liabilities, damages, losses, and costs, either at law or in equity, including but not limited to attorney fees and costs and attorney fees and costs on appeal, as a result of any negligent or reckless act or omission or any intentionally wrongful conduct of the Respondent and other persons employed or utilized by the Respondent in the performance under any Agreement resulting from this solicitation.
- 1.21 WITHHOLDING PAYMENT.** The District may, in addition to other remedies available at law or equity, retain such monies from amounts due the Respondent as may be necessary to satisfy any claim for damages, penalties, costs and the like asserted by or against the District. The District may set off any liability or other

obligation of the Respondent or its affiliates to the District against any payments due the Respondent under any Agreement with the District.

- 1.22 TERMINATION WITHOUT CAUSE.** The Agreement may be terminated by the District without cause upon written notice to Respondent. Termination will be effective on the date provided in the notice. In the event of termination under this Paragraph, Respondent shall be entitled to compensation for all services provided to the District up to the date of termination which are within the Scope of Work, documented in the Project Budget and are allowed under the Agreement. If the Agreement is so terminated, Respondent must promptly deliver to the District copies of all then completed deliverable items and all tracings, drawings, survey notes and other documents that directly support the deliverables prepared by Respondent.
- 1.23 LAW COMPLIANCE.** The Respondent will abide by and assist the District in satisfying all applicable federal, state and local laws, rules, regulations and guidelines (including but not limited to the Americans with Disabilities Act) relative to performance under this solicitation. The Respondent will not discriminate against any employee or applicant for employment because of race, color, religion, sex, handicap, disability, marital status or national origin. Respondent will obtain and maintain all permits and licenses necessary for its performance under this solicitation.
- 1.24 AMERICANS WITH DISABILITIES ACT (ADA).** The District does not discriminate on the basis of disability. This nondiscrimination policy involves every aspect of the District's functions, including access to and participation in the District's programs and activities. Anyone requiring reasonable accommodation as provided for in the Americans with Disabilities Act should contact the District's Human Resources Bureau Chief, 2379 Broad Street, Brooksville, Florida 34604-6899; telephone (352) 796-7211, or 1-800-423-1476 (FL only), ext. 4703; TDD (FL only) 1-800-231-6103; or email to ADACoordinator@WaterMatters.org.
- 1.25 PUBLIC ENTITY CRIMES.** Pursuant to Subsections 287.133(2) and (3), F.S., a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, F.S., for Category Two, for a period of 36 months following the date of being placed on the convicted vendor list. By submitting a proposal to this solicitation, the Respondent certifies that it is not on the convicted vendor list. Respondent further agrees to notify the District if placement on this list occurs.
- 1.26 EMPLOYMENT ELIGIBILITY VERIFICATION.** The successful Respondent must utilize the U.S. Department of Homeland Security's Employment Verification (E-Verify) Program to verify the employment eligibility of successful Respondent employees performing work directly associated with this Agreement in accordance with the terms and conditions applicable to the E-Verify Program. If the successful Respondent uses subcontractors to furnish services directly associated with this Agreement, performed in the United States, in an amount greater than \$3,000, the successful Respondent must include the requirements of this provision (appropriately modified for identification of the parties) in each subcontract. Information on registration for and use of the E-Verify Program can be obtained via the Internet at the Department of Homeland Security Web site: <http://www.dhs.gov/E-Verify>.
- 1.27 CORRESPONDENCE.** Unless otherwise notified in writing by the District, correspondence pursuant to this solicitation must be sent to the District at the following address:

**Procurement Office (BKV-4-PRO) Building 4
Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34604-6899
E-mail: Rachelle.Jones@watermatters.org**

Unless otherwise stated or notified in writing by the Respondent, correspondence pursuant to this solicitation will be sent to the Respondent at the address listed on the Solicitation Cover Sheet.

Proposed Respondents or persons acting on their behalf may not contact any employee or officer of the District concerning any aspect of this solicitation, except in writing to the Procurement Office as provided in this solicitation, until the Notice of Intended Decision is posted and becomes final. Violation of this provision may be grounds for rejecting a proposal.

- 1.28 BACKGROUND CHECKS.** The District will require the selected Respondents to perform a background check on all persons assigned to perform work for the District on behalf of Respondent. This will include, at a minimum, a check of each person's criminal history record with the Florida Department of Law Enforcement (FDLE), and such additional background checking as Respondent may deem appropriate.

Persons with certain types of criminal backgrounds may be automatically excluded from performing work for the District. Others may be excluded at the sole discretion of the District, based upon the results of the background check (see Section 373.6055 F.S. for further detail about statutory requirements).

- 1.29 PURCHASES BY OTHER PUBLIC AGENCIES.** With the consent and agreement of the successful Respondent(s), purchases may be made under this solicitation by other governmental agencies or political subdivisions within the State of Florida if otherwise authorized by law. Such purchases will be governed by the same terms and conditions stated herein. This solicitation and agreement in no way restricts or interferes with the right of any public entity to procure any or all these services independently.

PART II - INTRODUCTION

- 2.1 GENERAL INFORMATION.** The District hereby solicits proposals for the services of qualified respondent(s) for the following purpose:

Acquiring digital orthophotos, photointerpretation of seagrass and other benthic habitats, and all necessary field work to produce seagrass maps of the Florida coast contained within the boundary of the Southwest Florida Water Management District (DISTRICT) roughly from Waccasassa Bay to Charlotte Harbor along the west-central and southwest Florida coast. The professional services associated with image acquisition shall be performed in accordance with the following: all data shall be collected and processed under the supervision of a Florida licensed Professional Surveyor and Mapper (PSM) in accordance with Chapter 472 Florida Statutes and the Standards of Practice defined in Chapter 5J-17, Florida Administrative Code, and an American Society of Photogrammetry and Remote Sensing (ASPRS) Certified Photogrammetrist (CP). Photointerpretation of seagrass and other benthic habitats shall be performed by a team of photointerpreters (PI) with sufficient photointerpretation experience in mapping benthic marine habitats and under conditions similar to those found along the Florida Gulf Coast. See Part III – Scope of Work, Paragraph 3.2 of this solicitation for more details.

To be considered, **one (1) hardcopy original, one (1) copy and one (1) USB flash drive** containing an exact electronic Adobe™ Portable Document Format File (.PDF) of a proposal **must** be received by the District's Procurement Office (BKV-4-PRO), Building 4, at Southwest Florida Water Management District, 2379 Broad Street (U.S. Hwy. 41 South), Brooksville, Florida 34604-6899, by **June 11, 2019 at 2:30 PM**. All visitors must report to the lobby of Building 4 to sign in and be issued a visitor's badge.

During the evaluation process, the District reserves the right, where it may serve the District's interest, to request additional information from Respondents for clarification purposes.

The District reserves the right to retain all proposals submitted. Submission of a proposal indicates acceptance by the Respondent of the conditions contained in this Request for Proposals.

This solicitation is in accordance with and pursuant to Section 287.055, F.S., "Consultants' Competitive Negotiation Act" (CCNA).

2.2 BACKGROUND INFORMATION. The District is one of five regional water management districts charged by Chapter 373 of the Florida Statutes to preserve and protect the resources for the people through water resource development, regulatory and other programs. Central to the mission is maintaining the balance between the water needs of current and future residents, while protecting and maintaining the natural systems which provide the District with its existing and future water supply. The District's services include, but are not limited to, flood control; regulatory programs such as surface water and water use permitting; natural systems management; preservation and restoration of threatened lakes, rivers, streams and estuaries; land management and acquisition; and public education awareness.

2.3 TERM OF CONTRACT. The expected term of the contract resulting from this solicitation will be from the date of execution through September 31, 2021.

2.4 BUDGET. The anticipated budget for Fiscal Year 2020 (FY20) is Eight Hundred Thousand Dollars (\$800,000) and is contingent upon approval by the District's Governing Board.

The District anticipates qualifying, negotiating and entering into a cost reimbursement Agreement with the highest ranked Respondent to accomplish the work detailed in this solicitation.

2.5 CALENDAR. The following is a list of key actions and dates:

ACTION	DATE	LOCAL TIME
REQUEST FOR PROPOSALS ISSUED	April 26, 2019	
PRE-PROPOSAL -CONFERENCE (Non-Mandatory) Southwest Florida Water Management District (Brooksville Headquarters) 2379 Broad Street – Building #4 (Governing Board Room) Brooksville, Florida 34604-6899	May 06, 2019	11:00 AM
DEADLINE FOR TECHNICAL QUESTIONS	10 calendar days prior to opening	
SUBMISSION DEADLINE	June 11, 2019	2:30 PM
EVALUATION COMMITTEE MEETING Southwest Florida Water Management District (Brooksville Headquarters) 2379 Broad Street – Building #4 (Governing Board Room) Brooksville, Florida 34604-6899	June 20, 2019	1:00 PM
ORAL PRESENTATIONS* (IF REQUESTED) Southwest Florida Water Management District (Brooksville Headquarters) 2379 Broad Street – Building #4 (Governing Board Room) Brooksville, Florida 34604-6899	June 27, 2019	2:00 PM
NOTICE OF INTENDED DECISION	July 05, 2019	TBD**
AGREEMENT EXECUTION	TBD**	TBD**

* Oral Presentations will only occur if the Evaluation Committee requests them during the Evaluation Committee Meeting.

**TBD – To be Determined

PART III – SCOPE OF WORK

- 3.1 PROJECT DESCRIPTION / WORK OBJECTIVE.** Since the early 1990's, the District has mapped seagrass every two years from Tampa Bay southward to Charlotte Harbor. For the purpose of this solicitation, this region will be referred to as the Suncoast Region. In 2007, the District began mapping seagrass habitat along the Springs Coast Region encompassing an area from Anclote Key northward to Waccasassa Bay on roughly a four-year cycle. This Project is a continuation of these previous mapping efforts to monitor the status and trends in seagrass and other benthic estuarine habitat contained within these waters. In 2004, the District switched from traditional film to digital photography for all its seagrass mapping projects. Today the District continues to use digital orthophotos, captured for the specific purpose of viewing benthic habitats through estuarine and nearshore coastal waters, to support geospatial mapping of seagrass and other benthic habitats along the west-central and southwest Florida coast. Previously, the District treated the Suncoast and Springs Coast regions as two separate projects. For this solicitation, the entirety of the District coast inclusive of the Suncoast and Springs Coast regions shall be mapped under a single agreement.
- 3.2 PROFESSIONAL QUALIFICATIONS.** Respondents must provide the following documentation to substantiate their qualifications to provide the services set forth in this solicitation.
- 3.2.1** This solicitation requires the services of a Professional Surveyor and Mapper and an American Society of Photogrammetry and Remote Sensing (ASPRS) Certified Photogrammetrist (CP). The following information is required to verify that the Respondent and all surveyors and mappers working on District projects are licensed to provide the professional services in the State of Florida, in accordance with Chapter 472, F.S., and Chapter 5J-17, F.A.C.:
- 3.2.1.1** Copy of Respondent's current Board of Professional Surveyors and Mappers "Certificate of Authorization"; and
 - 3.2.1.2** Names and Florida Professional Surveyor and Mapper (PSM) license numbers of all surveyor and mappers proposed for this solicitation, in accordance with Chapter 472, F.S.
 - 3.2.1.3** Copy of Respondent's current ASPRS Certification.
- 3.2.2** Respondents must have a Professional Surveyor and Mapper as the Project Manager for the Imagery Acquisition Section only. For the photointerpretation and field work sections, a Professional Surveyor and Mapper is not required.
- 3.2.3** Résumés of key team members detailing years of experience, years working with the Respondent or Sub-Respondent, relevant software or other proficiencies and significant accomplishments. The photointerpretation (PI) team and the field team are also considered key team members and the following information must be included:
- 3.2.4** Respondents must provide qualifications of the photointerpretation (PI) team to include but not limited to the following elements: (1) PI team must demonstrate experience mapping underwater habitats, to include seagrass, greater than 1,000 square miles in area, (2) PI team must demonstrate experience mapping complex benthic habitats similar to those found within the project area, and (3) PI team must demonstrate previous mapping experience in varying water clarity conditions and depths similar to those found within the Project area.
- 3.2.5** Respondents must provide qualifications of the field team detailing experience collecting, (1) field data for aerial image ground-truthing, and (2) benthic habitat mapping field verification and accuracy assessment. In addition, respondents must indicate how the field work was used to ground truth imagery and to verify map accuracy.

3.2.6 Respondents must provide a minimum of three references from organizations that they completed recent projects for within the last five (5) years, that are similar in scope and complexity to this Project, including all major aspects of the scope of work.

3.3 SCOPE OF WORK / DELIVERABLES. Respondents must clearly address their approach, time schedule, activities work products, and prior experience for each of the sections and tasks under each section detailed below. To facilitate the review process, all proposals must be formatted using the section and sub-section numbers and titles detailed below.

This Scope of Work (SOW) is divided into three (3) sections. Section One, Imagery Acquisition, provides specific details regarding the collections, processing, and QA/QC of the digital orthophotography. Section Two, Photointerpretation, provides specific details regarding imagery QC, photointerpretation of benthic habitats, and GIS requirements. Finally, Section Three, Field Work, details specific field requirements related to both imagery acquisition and photointerpretation.

3.3.1 Section One - Imagery Acquisition

The Project tasks under this section will include the follow elements:

- Flight Planning and Coordination
- Digital Orthophotography – 4-band (RGBi)
- Project Management and quality assurance and control

3.3.1.1 The successful Respondent shall acquire new RGBi digital imagery at one-foot pixel resolution for the Project area of interest (AOI; Figure 1) covering a total area of approximately 3,813 square miles. The AOI contains the area known as the Springs Coast, comprising approximately 1,270 square miles of area off the coast of Pasco, Hernando, Citrus and Levy counties. The Springs Coast includes the estuaries of Waccasassa Bay, Withlacoochee River Mouth, Crystal Bay, Homosassa River Mouth, Chassahowitzka River Mouth, Weeki Wachee River Mouth, Pithlachascotee River Mouth, and Anclote River Mouth (northern portion of St. Joseph Sound/Clearwater Harbor) (Figure 2). The Suncoast region comprises approximately 2,543 square miles and includes the estuaries of Tampa Bay, St. Joseph Sound/Clearwater Harbor, Sarasota Bay, Lemon Bay and Charlotte Harbor, (Figure 2). The aerial imagery and ultimate creation of orthophotos shall be of high quality to facilitate the completion of a detailed benthic habitat thematic map (see Photointerpretation Key for a complete list of focal habitats).

3.3.1.2 The horizontal datum used for this Project shall be the North American Datum 1983-NAD83/2011, Florida State Plane, West Zone (0902), and expressed in US Survey Feet (ESPG 6443). The vertical datum used for this Project shall be the North American Vertical Datum 1988 (NAVD88), and expressed in US Survey Feet, using the most recent geoid model to compute orthometric heights based on GPS derived ellipsoid heights, which currently is Geoid12a.

3.3.1.3 The professional services shall be performed in accordance with the following: all data shall be collected and processed under the supervision of a Florida licensed Professional Surveyor and Mapper (PSM) in accordance with Chapter 472 Florida Statutes and the Standards of Practice defined in Chapter 5J-17, Florida Administrative Code, and an American Society of Photogrammetry and Remote Sensing (ASPRS) Certified Photogrammetrist (CP).

3.3.1.4 The District will collect thirty (30) new ground control PID's (Photo Identifiable points) along the coastline. The successful Respondent will utilize these new points plus any existing photo control captured after 2018 for accuracy assessment.

3.3.1.5 The professional services shall be performed in accordance with the following standards and guidance documents which are incorporated into and made a part of the subsequent agreement and SWFWMD Seagrass Specification 2.0, (Exhibit A, Scope of Work).

3.3.1.6 Section One, Task 1– Mobilization and Imagery Acquisition

The image acquisition flight window will be from November 1, 2019 to February 28, 2020. No more than a 5-7-day gap between mission sets is preferred.

- 3.3.1.6.1** The successful Respondent shall acquire new RGBi digital imagery at less than or equal to a one-foot ground sampling distance (GSD) from an approximate flying height not to exceed 9,500 feet above mean terrain covering the project area. For Airborne GPS (ABGPS), flight crews will set-up an ABGPS base station at the local airport from which they are based. The aerial imagery shall be acquired to completely cover 4,284 tiles of the Florida 2014 Statewide Grid 5,000' x 5,000' cells that serve as the District's tiling scheme (see Figure 1). The total Project area encompasses approximately 3,813 square miles.
- 3.3.1.6.2** Specific environmental condition criteria must be met to ensure successful imagery capture for visualization of benthic features. The successful Respondent is responsible for the initial flight mission planning, which shall include special consideration for target inlets and passes prone to high turbidity. The successful Respondent shall monitor, in close coordination with the District, optimal sun angle windows and tidal stage. In addition, the successful Respondent shall be responsible for monitoring daily atmospheric conditions to include wind, visibility, and cloud cover. The successful Respondent shall monitor wave height, water clarity, and preceding weather constraints.
- 3.3.1.6.3** To facilitate monitoring of water clarity, the successful Respondent will need to perform in-situ measurements prior to each data acquisition mission. During previous seagrass mapping projects, the District has provided the successful Respondent the names and contact information for volunteer persons distributed through the estuaries of interest. These volunteers have previously utilized Secchi disks and are skilled at evaluating water clarity in their respective estuaries. The successful Respondent will either provide staff or make every effort to coordinate with these volunteers, prior to authorizing each data acquisition mission. Because of the large offshore extent of the Springs Coast area, (up to 25 miles offshore), evaluating synoptic-scale water clarity presents a challenge. The successful Respondent needs to address in the proposal how they propose to evaluate water clarity.
- 3.3.1.6.4** The successful Respondent in coordination with the District shall evaluate the environmental conditions prior to each potential flight mission and come to a consensus whether to proceed given the follow parameters:
- Tidal Condition – tidal stage shall be within +/- two hours of low tide and no greater than mean tide level. Special consideration of outgoing and slack tides for specific inlets and passes shall be maintained.
 - Wave Height – optimum height less than two feet. General wave conditions monitored by the District via National Oceanic and Atmospheric Administration (NOAA) marine forecasts.
 - Wind Speed – optimum wind speed shall be less than 10 mph. General wind conditions monitored by the successful Respondent via NOAA marine forecasts and specific wind stations via National Buoy Center.
 - Water Clarity – For Suncoast: optimum Secchi disk readings of two meters or greater, monitored daily by successful Respondent staff or volunteers at 1-2 stations per estuarine waterbody, when available. For Springs Coast: use of District approved methods including remote sensing imagery or other means of measuring water clarity over large open-water areas shall be used to infer optimum Secchi disk readings of two meters or greater.

- Preceding Weather – following one inch or greater rainfall, ideally, no imagery acquisition shall occur within 72 hours of the rain event unless agreed to by the District. Both the District and successful Respondent shall monitor preceding weather conditions.
- Sun Angle – at the time of image acquisition the optimum sun angle shall be equal to or greater than 20 degrees. The successful Respondent shall be responsible for monitoring sun angle.
- Cloud Cover – 0 percent. General conditions shall be monitored by the successful Respondent.

3.3.1.6.5 Water clarity and sea state are the most important factors in obtaining the necessary image quality for evaluating benthic habitats. The successful Respondent shall compile a table representing optimal flight windows which meet the tidal stage and sun angle requirements for November 1, 2019 through February 28, 2020. The District and successful Respondent shall cross reference these potential flight windows each week with the daily environmental conditions to determine appropriate times for image collection.

3.3.1.6.6 The ortho-imagery shall be cloud-free, smoke-free, and fog-free. successful Respondent shall utilize the large format Leica ADS80 (or newer) digital aerial camera, which captures continuous image strips along the flight line, thus creating 100 percent endlap. All flight lines shall be flown with a minimum of 30 percent sidelap and shall adhere to all other inflight requirements. successful Respondent shall acquire all aerial imagery at a raw GSD of 0.98-foot (or less) with an output resolution of one-foot GSD. The imagery shall also be captured with a radiometric resolution of at least 12-bits/pixel for each band of imagery (NIR, red, green, and blue).

3.3.1.6.7 Previous experience indicates that there are 5 passes along the Suncoast region that present special challenges to the mapping effort (Figure 3). These passes are subject to extreme turbulence and lack of water clarity. For the Springs Coast, the entire Waccasassa Bay area (Figure 3) has proven challenging due to the relatively turbid waters and muddy bottom. Special attention will be paid to ascertain that the imagery is suitable for the mapping effort in these areas which may require multiple re-flights.

3.3.1.6.8 Within approximately 48 hours of each data acquisition mission, Level 02 geo-referenced Leica ADS80 image strips shall be made available for virtual online review to check data collection efforts for turbidity and water clarity issues by the successful Respondent and the District. A web-based client interface (WBCI), constructed by the successful Respondent, will be used to facilitate an efficient QA/QC review of both imagery and vector data. The successful Respondent shall provide a log-in to the District for reviewing the digital ortho-imagery. Once strips are approved, the successful Respondent shall commence with image processing.

3.3.1.7 Section One, Task 2 – Ortho-imagery Processing

3.3.1.7.1 The successful Respondent shall utilize District source data, such as existing Digital Elevation Models (DEM), breaklines or Lidar data available for the project area. The successful Respondent shall use a systematic approach to produce the digital ortho-imagery. This approach shall have QA/QC procedures integrated throughout the entire process. The methods used by successful Respondent for digital ortho-imagery processing takes place as follows:

3.3.1.7.2 The successful Respondent shall match the existing DEM data to a photo image to create a digital ortho-image. The relevant DEM data shall be merged with the orientation parameters and the new digital imagery. A complete differential rectification is carried out

with a set of algorithms that remove image displacement due to topographic relief and the tip and tilt of the aircraft at the moment of exposure.

3.3.1.7.3 Special consideration shall be made during the image post-processing to enhance the visibility of underwater features while still preserving the image fidelity of topographic features. Where applicable, two separate radiometric adjustment efforts shall be employed to emphasize visually seamless color balancing, tone, and contrast across both estuarine and topographic extents. Prior to finalizing the image post-processing, the successful Respondent shall submit samples to the District for approval from various areas within each individual waterbody.

3.3.1.7.4 The successful Respondent shall use software for color balancing, tone/contrast adjustments, and image mosaicking. There can be significant differences in water clarity and bottom reflectance both within and across the various Suncoast estuaries and along the entire Springs Coast. For example, variability in water clarity is driven largely by colored dissolved organic matter in the Charlotte Harbor estuary and off the Withlacoochee River mouth. Conversely, turbidity typically drives clarity in Waccasassa Bay in the Springs Coast and across several Suncoast passes. All images shall be merged to help eliminate mismatches between tiles in contrast and tonal quality. Tiles shall then be clipped from the mosaicked image. All adjacent tiles shall edge match with surrounding tiles. Tiles are then run through a visual QA/QC to ensure that no errors were introduced during previous steps.

3.3.1.8 Section One, Task 3 – QA/QC and Final Deliverables

3.3.1.8.1 The successful Respondent will be responsible for the QA/QC of the preliminary imagery and shall be accomplished using the WBCI redline tool. Any issues or errors within the data can be identified and logged into the redline tool. Once all edits are completed, reviewed and approved, final ortho-imagery shall be delivered in GeoTIFF format. The successful Respondent shall provide the District the following imagery deliverables as either preliminary or final data as specified:

- Project-wide preliminary georeferenced Level 02 imagery via the successful Respondent's WBCI image hosting service. Uploaded to the web service as acquired in the field, imagery shall be made available to the District for immediate review and acceptance of water clarity and image quality.
- Preliminary color balancing samples (Level 02) delivered by waterbody.
- Final 32-bit natural color (RGBi) 1-foot resolution ortho-imagery strips in GeoTIFF format.
- Final 32-bit natural color (RGBi) 1-foot resolution ortho-imagery tiled to Florida 2014 Statewide Grid in GeoTIFF format. The successful Respondent shall check the final imagery against existing control features to verify horizontal accuracy that meets or exceeds a horizontal accuracy of 3.46 feet at the 95 percent confidence interval (2.0 feet RMSE) as specified in the FGDC Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy.
- Image Cutline, Flight Line, and Image Strip Feature Classes
- FGDC-compliant Metadata
- Final report of survey that documents and certifies the procedures and imagery to the DISTRICT and is compliant with relevant Chapter 5J-17, Florida Administrative Code (F.A.C.) and Chapter 472, Florida Statutes (F.S.).

3.3.1.8.2 The successful Respondent shall provide Monthly Progress Reports that shall contain, at a minimum, the following information:

- An assessment of the Project's actual progress as compared to the Performance Schedule (details must include any deficiencies and the recovery actions completed and planned).
- An updated Gantt chart showing task percent complete, current date, and estimated schedule to completion by task.
- Labor resource planned and actual (show - prior months, past month, current month, months to completion).
- Anticipated date of next pre-submittal meeting or deliverable.

3.3.1.8.3 The successful Respondent shall schedule a pre-submittal meeting with the District's Project Manager prior to transmitting to the District any deliverable identified in this section. Upon written approval by the District's Project Manager, the successful Respondent shall submit the deliverable to the District for review. The District will either accept the deliverable or provide written comments to the successful Respondent within 30 days business days from date of receipt of the deliverable. If the District's Project Manager provides comments, the successful Respondent shall provide a response within 30 days business days from receipt of the comments, unless another timeframe is communicated in writing by the District's Project Manager. This process shall continue until the District accepts the deliverable.

3.3.1.8.4 Deliverables

1. Monthly Progress/Status Reports
2. Daily Progress Reports during data acquisition
3. Preliminary Level 02 image strips via WBCI
4. Preliminary color balancing samples via WBCI
5. Final 32-bit RGBi image strips in GeoTIFF format
6. Final 32-bit RGBi tiled ortho-imagery in GeoTIFF format
7. Final compressed mosaics in MrSID format
8. Image Cutlines, Flightlines, and Strip Feature Classes
9. FGDC Metadata for Image Cutlines, Flightlines, and Strip Feature Classes as well as Final ortho-imagery
10. Final Report of Survey, with PSM certification per Chapter 472, F.S.; Chapter 5J-17, F.A.C.

3.3.2 Section Two - Photointerpretation

The successful Respondent will complete photointerpretation of seagrass and other benthic habitat types using digital orthophotos collected under 3.3.1, Section One - Imagery Acquisition. All line work will be completed to the satisfaction of the District and in accordance with the Performance Schedule and Performance Budget set forth in the subsequent agreement with the selected firm.

3.3.2.1 Section Two, Task 1 - Quality Control of Imagery

The successful Respondent will review all the imagery and will provide feedback to the District on any issues found and any challenges anticipated for the interpretation. This feedback will be provided within the web mapping system and approval of the imagery will be provided directly to the District. Quality control shall include manual verification of positional accuracy and attribution of photointerpreted data. A second party photointerpreter qualified in seagrass mapping who did not participate in the photointerpretation shall conduct the quality control review. In addition, automatic verification shall be conducted of missing polygon label points, invalid attribution codes, and adjacent polygons with the same attributes.

3.3.2.2 Section Two, Task 2 - Photointerpretation and GIS-Based Mapping

The Project area is contained within an approximately 3,813 sq. mile area (Figure 1), with the area to be mapped consisting of two large regions, (1) Suncoast Estuaries and (2) Springs Coast. Within the Suncoast region there are 5 estuarine segments (Figure 2) including: (1) Tampa Bay, (2) Sarasota Bay, (3) Lemon Bay, (4) Charlotte Harbor, and (5) St. Joseph Sound / Clearwater Harbor. The Springs Coast is a large open water area, with several spring-fed rivers flowing into this region. Though the entire Springs Coast area is to be mapped, within the larger mapped area are seven estuarine segments including: (1) Waccasassa Bay, (2) Withlacoochee River, (3) Crystal Bay, (4) Homosassa River, (5) Chassahowitzka River, (6) Weeki Wachee River, and (7) Pithlachascotee River. In addition, the northern portion of the St. Joseph Sound / Clearwater Harbor estuarine segment falls within the Springs Coast area of interest (Figure 2).

3.3.2.2.1 Photointerpretation Kickoff Meeting – The successful Respondent, including all staff completing photointerpretation for the Project, shall attend a photointerpretation kick-off meeting. During the meeting the Project team shall review ancillary data available for use during the Project, discuss areas in question from previous maps, review imagery, and begin coordinating a field work schedule.

3.3.2.2.2 Photointerpretation – The successful Respondent shall interpret photographic signatures of various benthic habitat types from imagery acquired between November 1, 2019 through February 28, 2020, under this solicitation using a modified Florida Land Use Land Cover Classification System (FLUCCS). A GIS workstation will be utilized with ESRI ArcGIS software tools to visualize imagery and delineate polygons using the modified FLUCCS classification scheme provide by the District. Each FLUCCS Level III category will be identified within the minimum mapping unit (MMU) of 0.25 acres. The existing 2016 Springs Coast and 2018 Suncoast seagrass vector data will be superimposed on current digital imagery to serve as the baseline dataset during the photointerpretation process. For signature identification purposes, information sources beyond the 2016 Springs Coast and 2018 Suncoast imagery that can be utilized by the PI team include previous District seagrass maps, independent imagery, bathymetry data, other ground truth data points, oyster bar maps, and hard bottom maps. All ancillary data used for this Project must be approved by the District.

3.3.2.2.3 Mapping – On screen, head's up digitizing techniques shall be used to produce an ESRI file-based geodatabase (.GDB) containing feature classes for the 2020 Seagrass Map, plus 2016 to 2020 Springs Coast Change Analyses vector datasets and 2018 to 2020 Suncoast Change Analyses vector datasets. The geodatabase and subsequent feature classes will have the following minimum characteristics:

- Each FLUCCS Level III category will be identified within the MMU of 0.25 acres.
- Polygon topology with no overlap/underlap
- Each polygon will have only one label within its boundaries
- Florida State Plane Feet West NAD 83/2011

The feature attribute table will contain the following fields:

- FLUCCS_Code – Four (4) digit numeric Florida Land Use and Cover Classification System
- FLUCCS_Descrip – Florida Land Use and Cover Classification System text description
- DATESTAMP – Represents the date of final processing coverage
- GIS_ACRES – Each polygon's defined acreage

3.3.2.3 Section Two, Task 3 – Project Management and Final Deliverables

- 3.3.2.3.1** The successful Respondent will provide management and oversight of subcontractors, project administration, contract management, billing, and project meetings as needed.
- 3.3.2.3.2** The successful Respondent shall provide Weekly Progress Reports that shall contain, at a minimum, the following information:
- An assessment of the Project's actual progress as compared to the Performance Schedule (details must include any deficiencies and the recovery actions completed and planned).
 - An updated Gantt chart showing task percent complete, current date, and estimated schedule to completion by task.
 - Labor resource planned and actual (show - prior months, past month, current month, months to completion).
 - Anticipated date of next pre-submittal meeting or deliverable.
- 3.3.2.3.3** GIS Geodatabase from the Photointerpretation – The DISTRICT will require final products as an ESRI file-based geodatabases (.GDB) secured using SHA-1.
- 3.3.2.3.4** Metadata - The successful Respondent shall deliver metadata in an ESRI ArcCatalog compatible XML format. Metadata must be compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata. All metadata must pass through the USGS metadata parser at <http://geo-nsdi.er.usgs.gov/validation/> with no errors.
- 3.3.2.3.5** Updated Photointerpretation Key – A photointerpretation key for all FLUCCS codes will be created to identify the various photo signatures associated with the project. A single PI key will be used for both Springs Coast and Suncoast regions. However, not all FLUCCS codes may be used in both regions. This key will be provided in both ESRI Story Map and pdf formats. The key will include the current FLUCCS definitions; two (2) representative aerial images of each unique habitat (FLUCCS code) for both the Springs Coast and Suncoast regions; and two (2) representative in-field images of each unique habitat (FLUCCS code) for both the Springs Coast and Suncoast regions and where possible, full motion video. See EXHIBIT "B": SWFWMD Full Motion Video Specification 1.1 for detail concerning the use of full motion video. The District will provide the successful Respondent access to its ArcGIS Online for completion of the Story Map.
- 3.3.2.3.6** Final Report from the Photointerpretation - The successful Respondent shall prepare a brief final report that documents methods and logic employed to create the mapping products. The report must include the following items:
- Executive Summary
 - Introduction
 - Project Area Description
 - Source data issues and resolutions
 - Mapping methods and processing documentation
 - Updated Photointerpretation Key
 - Draft and Final Maps
 - Problems Encountered During Photointerpretation
 - Project Metadata
 - Acreage Analysis Results
 - Change Analysis
 - Conclusion

3.3.2.3.7 Final Acreages Photointerpretation Spreadsheet – A tabular summary of estimated seagrass and other FLUCCS code acreages by bay segment and waterbody.

3.3.2.3.8 Deliverables

1. Springs Coast Area
 - Area-wide final draft map and field verification results
 - Waccasassa Bay final draft map and field verification results
 - Withlacoochee River final draft map and field verification results
 - Crystal Bay final draft map and field verification results
 - Homosassa River final draft map and field verification results
 - Chassahowitzka River final draft map and field verification results
 - Weeki Wachee River final draft map and field verification results
 - Pithlachascotee River final draft map and field verification results
2. Suncoast Area
 - St. Joseph Sound / Clearwater Harbor final draft map and field verification results
 - Tampa Bay final draft map and field verification results
 - Sarasota Bay final draft map and field verification results
 - Lemon Bay final draft map and field verification results
 - Charlotte Harbor final draft map and field verification results
3. Final Geodatabase:
 - Final 2020 Seagrass Map feature class
 - Topology for Final 2020 Seagrass Map feature class
 - Suncoast: 2018 to 2020 Change Analysis feature class
 - Springs Coast: Final 2016 to 2020 Change Analysis feature class
4. Updated Photointerpretation Key
 - GIS-based photointerpretation key with minimum of five representative locations for each FLUCCS code to include photographs and full motion video
 - Hard copy version of updated photointerpretation key including representative locations with photographs for each FLUCCS code
5. Final Report and Acreage Estimates Spreadsheet
6. FDGC compliant metadata for each feature class
7. Working Classification Model as an .XML.

3.3.3 Section Three - Field Work

The purpose of this Section is to describe the necessary field work to support the tasks associated with Sections One and Two of the Scope of Work Part of this solicitation. The two phases of field work to be completed are the Ground Truth phase and Accuracy Assessment phase. The successful Respondent shall use underwater photography and video where appropriate to characterize field sites. All video associated with the ground truth tasks and accuracy assessment shall be georeferenced for inclusion into ESRI ArcGIS via the Full Motion Video (FMV) extension (See Exhibit B of Attachment 1, Full Motion Video Specifications). The successful Respondent may choose to employ unmanned aircraft systems (UAS) to augment data collection. The successful Respondent shall follow the District's guidelines and specifications documents regarding the operations of unmanned aircraft systems (UAS) if the proposal includes the use of such systems. The successful Respondent must clearly identify in the proposal if such systems will be used.

3.3.3.1 Section Three, Task 1 –Ground Truth

The objective of ground truth fieldwork is to verify photo signatures that are representative, unique, and/or problematic on the 2020 aerial imagery. Ground truth locations will be selected by the lead photointerpreter and field work can be done without the use of a subcontractor. A minimum of two successful Respondent staff with seagrass identification experience, inclusive of the captain, shall be in attendance for all ground truth activities unless alternative arrangements are approved by the District Project Manager. The successful Respondent must be able to accommodate District staff on the vessel as needed. The successful Respondent or it's subcontractor shall provide necessary field equipment (boat, WAAS or equivalent enabled GPS navigation device, and underwater video equipment) and crew (minimum of two crew members with seagrass identification experience, inclusive of the captain).

3.3.3.2 Section Three, Task 2 –Independent Accuracy Assessment

The successful Respondent will, independent of the photointerpretation team, create a testing dataset for comparison to the final seagrass polygon map. This post map production thematic classification accuracy assessment will quantify how accurately seagrass map polygons were identified in the map product. Accuracy assessment sampling locations shall be selected by a second party photointerpreter qualified in seagrass mapping who did not participate in the photointerpretation and in coordination with the District . Site selection should be statistically valid and shall follow the National Standards for Spatial Data Accuracy (NSSDA) specifications (<https://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3>). Before the District can accept the final map product, an overall minimum accuracy of 90 percent for FLUCCS Level III classes must be achieved. It is the successful Respondent's responsibility to ensure that the final seagrass map deliverable meets this specification. The successful Respondent or it's subcontractor shall provide necessary field equipment (boat, WAAS or equivalent enabled GPS navigation device, and underwater video equipment) and crew (minimum of two crew members with seagrass identification experience, inclusive of the captain). successful Respondent must be able to accommodate District staff on the vessel as needed. Data collection under this task should occur concurrently with the image acquisition window (December 1, 2019 – February 28, 2020).

3.3.3.3 Section Three, Task 3 – Field Data Reporting

The successful Respondent shall record field data for all sites visited during both the accuracy assessment and ground truth phases. Location and bottom characterization information shall be recorded in ESRI Survey123. The DISTRICT will provide the successful Respondent either access to the required survey template or the source data to create an identical survey.

3.3.3.3.1 Deliverables

1. GIS Geodatabase from the accuracy assessment shall be interpreted by a second party photointerpreter qualified in seagrass mapping who did not participate in the photointerpretation - Final products will be provided as an ESRI file-based geodatabases (.GDB) secured using SHA-1.
2. Geodatabase from the ground truth interpreted by the successful Respondent - Final products will be provided as an ESRI file-based geodatabases (.GDB) secured using SHA-1.
3. Metadata - The successful Respondent shall deliver metadata records for the 2020 Seagrass Field Data Collection. All metadata must be delivered in an ESRI-ArcCatalog compatible XML format. Metadata must be compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata. All metadata must pass through the USGS metadata parser at <http://geo-nsdi.er.usgs.gov/validation/> with no errors.
4. All data collected by the successful Respondent including all photographs and video files produced during field operations shall be submitted to the DISTRICT.

PART IV - INSURANCE REQUIREMENTS

- 4.1 INSURANCE REQUIREMENTS.** See Insurance Requirement provision in the attached Sample Agreement.

PART V - EVALUATION PROCEDURES

- 5.1 EVALUATION AND FINAL SELECTION.** Timely submitted responsive proposals will be evaluated by an Evaluation Committee consisting of three (3) or more representatives of the District. Each representative will score each proposal using the criteria described in Paragraph 5.2 below. Evaluation Committee members will meet at a public meeting to finalize the preliminary rankings of the proposals. Individual raw scores will be ranked with the top ranked Respondent receiving the rank of one (1). The individual rankings will be totaled. The preliminary ranking of Respondents will be determined by the lowest total of the combined individual rankings. In the event of a tie, the raw scores of the tied Respondents will be totaled and the ranking will be determined based upon the highest cumulative raw score for the tied Respondents. The Respondents with the highest preliminary ranked proposals will be required to participate in oral presentations, with the number of Respondents required to participate in oral presentations being determined solely by the Evaluation Committee (but not less than three). If oral presentations are not necessary, the Evaluation Committee will finalize the ranking of the proposals at the public meeting.

Following oral presentations, Evaluation Committee members will finalize their evaluations at a public meeting. Individual raw scores will be ranked with the top ranked Respondent receiving the rank of one (1).

The District anticipates that on, or shortly after July 1, 2019, the Notice of Intended Decision will be posted listing three (3) or more of the highest ranked Respondents, as determined by the District in its sole discretion. After the District's decision becomes final, the District will commence negotiations with the highest ranked Respondent. The District shall not engage in negotiations with the Respondents simultaneously. If the District is unable to negotiate a satisfactory Agreement with the highest ranked Respondent at a fee schedule that the District determines to be fair, competitive and reasonable for the scope and complexity of the professional services required under this solicitation, negotiations with that Respondent will be terminated and the District will undertake negotiations with the next highest ranked Respondent.

- 5.2 EVALUATION METHOD AND CRITERIA.** Proposals will be evaluated by the following criteria:

<u>Category</u>	<u>Point Range</u>
Organization Profile and Qualifications/Professional Qualifications	<u>0 – 23</u>
Respondent has: Established resources, equipment, and qualified staff to complete the project (10); Positive feedback from references on similar past projects (13).	
Methodology / Approach	<u>0 – 50</u>
Respondent has: A detailed solicitation response that is clear and concise, structured and organized, easy to read and navigate, that outlines their methodology and approach to completing the Project and all requirements of this solicitation (20), Respondents who do the Photointerpretation line work in-house (10); Demonstrated the ability to meet Project work schedule and time requirements for completion of the Project (15); and availability to complete the Project based on their recent, current and projected workloads (5).	
Technical Knowledge	<u>0 - 25</u>
Respondent has: A clear understanding of project goals and objectives (20); Quality, creativity and depth in their solicitation response (3); and Effective project management, controls and communications (2).	
Volume of Work	<u>0 - 2</u>

Volume of work previously awarded:

<u>Points</u>	<u>Dollar Volume</u>
2	0 – 1,000,000
1	1,000,001 – 2,000,000
0	2,000,001+

**ATTACHMENT 1
SAMPLE AGREEMENT**

AGREEMENT NO. _____

AGREEMENT
BETWEEN THE
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
AND
CONSULTANT FIRM
FOR
DISTRICTWIDE SEAGRASS MAPPING PROJECT(W331/B017)

This AGREEMENT is made and entered into by and between the SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT, a public corporation of the State of Florida, whose address is 2379 Broad Street, Brooksville, Florida 34604-6899, hereinafter referred to as the "DISTRICT," and the CONSULTANT FIRM, a private, for profit corporation, of the State of Florida, whose principal address is _____, hereinafter referred to as "CONSULTANT."

WITNESSETH:

WHEREAS, the DISTRICT desires to engage the CONSULTANT to provide Districtwide Seagrass Mapping, hereinafter referred to as the "PROJECT"; and

WHEREAS, the DISTRICT has selected the CONSULTANT in accordance with the DISTRICT'S procurement policy and provisions of the Florida Consultants' Competitive Negotiation Act (CCNA); and

WHEREAS, CONSULTANT represents that it possesses the requisite skills, knowledge, expertise and resources and agrees to provide the desired services to the DISTRICT.

NOW THEREFORE, the DISTRICT and the CONSULTANT, in consideration of the mutual terms, covenants and conditions set forth herein, agree as follows:

1. INDEPENDENT CONSULTANT.

Neither the DISTRICT nor any of its employees shall have any control over the conduct of the CONSULTANT or any of the CONSULTANT'S employees, subcontractors or agents, except as set forth in this Agreement, and the CONSULTANT expressly warrants not to represent at any time or in any manner that the CONSULTANT or the CONSULTANT'S employees, subcontractors or agents, are in any manner agents or employees of the DISTRICT. It is understood and agreed that the CONSULTANT is and shall at all times remain as to the DISTRICT, a wholly independent contractor and that the CONSULTANT'S obligations to the DISTRICT are solely as prescribed by this Agreement.

2. PROJECT MANAGER AND NOTICES.

Each party hereby designates the individual set forth below as its respective Project Manager for matters arising under this Agreement. Project Managers shall assist with PROJECT coordination and shall be each party's prime contact person. Notices and reports shall be sent to the attention of each party's Project Manager by U.S. mail, postage paid, by nationally recognized overnight courier, or personally to the parties' addresses as set forth in the introductory paragraph of this Agreement. Notice is effective upon receipt.

Project Manager for the DISTRICT: _____

Project Manager for the CONSULTANT: _____

Any changes to the above representatives or addresses must be provided to the other party in writing.

- 2.1 The DISTRICT'S Project Manager is hereby authorized to approve requests to extend a PROJECT task deadline set forth in this Agreement. Such approval must be in writing, explain the reason for the extension and be signed by the Project Manager and his or her Bureau Chief, or Director if the Bureau Chief is the Project Manager, unless the DISTRICT'S Signature Authority provides otherwise. The DISTRICT'S Signature Authority supersedes the approval requirements provided in this provision. The DISTRICT'S Project Manager is not authorized to approve any time extension which shall result in an increased cost to the DISTRICT, or exceed the expiration date of the contract term set forth in Paragraph 6, Contract Period.
- 2.2 The DISTRICT'S Project Manager is authorized to adjust a line item amount of the Project Budget developed in accordance with this Agreement. The authorization must be in writing, explain the reason for the adjustment, and be signed by all appropriate DISTRICT staff in accordance with the DISTRICT'S Signature Authority. The DISTRICT'S Project Manager is not authorized to make changes to the General Scope of Work, and is not authorized to approve any increase in the not-to-exceed amount. The parties acknowledge that the execution of this Agreement does not guarantee that a Notice to Proceed will be issued to the CONSULTANT.

3. SCOPE OF WORK.

The professional services that may be required under this Agreement are set forth in Exhibit "A," Scope of Work, Exhibit "B," Full Motion Video Specifications and Exhibit "C," Guidelines and Specifications for the Use of Unmanned Aircraft Systems. As needed, the DISTRICT will provide the CONSULTANT with the proposed Scope of Work and general timeline for the professional services the DISTRICT requires the CONSULTANT to perform. Upon receipt of said Scope of Work, the CONSULTANT shall provide the DISTRICT with a proposal that includes a detailed Scope of Work to

be performed, including deliverables, an itemized project budget spreadsheet, and a project and staffing schedule that conforms to the DISTRICT'S PROJECT and schedule requirements. A not-to-exceed price will be negotiated based on the Fee Schedule (hourly labor rates and unit pricing) set forth in Exhibit "B" of this Agreement. Final payment in all cases will be subject to successful completion of the PROJECT and the DISTRICT'S acceptance of deliverables and PROJECT milestones, in accordance with the terms of this Agreement. The parties acknowledge that the execution of this Agreement does not guarantee that a Notice to Proceed will be issued to the CONSULTANT.

- 3.1 Upon written approval of the Scope of Work, cost, deliverables, and performance schedule, a Notice to Proceed will be issued to the CONSULTANT. The Notice to Proceed must be approved in writing by the Project Manager, his or her Manager and Bureau Chief and all other DISTRICT staff required in accordance with the DISTRICT'S Signature Authority. The CONSULTANT shall commence work upon receipt of a Notice to Proceed and shall satisfactorily complete all work in accordance with the performance schedule. Any Agreement modification(s) must be approved in writing by all appropriate DISTRICT staff in accordance with the DISTRICT'S Signature Authority and the CONSULTANT prior to being performed by the CONSULTANT.
- 3.2 The parties agree that time is of the essence in the performance of the Agreement.
- 3.3 The DISTRICT and the CONSULTANT hereby recognize the specialized expertise of the CONSULTANT'S key employees and subconsultants (_____), listed in the CONSULTANT'S proposal to RFP 1908, as part of the PROJECT team. Both parties further agree that replacement of key team members or subconsultants must be with equal or more qualified persons, and must be approved in writing by the DISTRICT Project Manager before a new member works on the PROJECT.
- 3.4 In addition to the work set forth in this Agreement, the CONSULTANT shall perform the following:
 - 3.4.1 The CONSULTANT shall secure at its own expense, all personnel, facilities and equipment required to perform the work necessary to complete this Agreement.
 - 3.4.2 The CONSULTANT shall maintain an adequate and competent staff licensed within the State of Florida.
 - 3.4.3 The CONSULTANT shall comply with all federal, state and local law, statutes, rules, regulations, ordinances, orders and decisions in effect at the time of the execution of this Agreement and during its entire duration.

- 3.4.4 The CONSULTANT shall at all times, keep the DISTRICT advised as to the status of this PROJECT including but not limited to the progress on individual tasks within the Scope of Work. The DISTRICT and its authorized representatives shall have the right to visit any work site and the office of the CONSULTANT at any reasonable time for purposes of inspection.
- 3.4.5 The CONSULTANT shall cooperate with other engineers, consultants, construction contractors and suppliers retained by the DISTRICT as needed.

4. COMPENSATION.

The DISTRICT agrees to pay the CONSULTANT on a cost reimbursement basis for work performed under this Agreement in accordance with the Local Government Prompt Payment Act, Part VII of Chapter 218, Florida Statutes (F.S.), upon receipt of a proper invoice, as defined in subparagraph 4.2 of this Agreement for work satisfactorily performed by CONSULTANT. Invoices shall be submitted by the CONSULTANT to the DISTRICT electronically at invoices@WaterMatters.org, or at the following address:

Accounts Payable Section
Southwest Florida Water Management District
Post Office Box 1166
Brooksville, Florida 34605-1166

- 4.1 The DISTRICT'S performance and payment pursuant to this Agreement are contingent upon the DISTRICT'S Governing Board appropriating funds in its approved budget for the PROJECT in each Fiscal Year of this Agreement.
- 4.2 All invoices must include the following information: (1) the CONSULTANT'S name, address and phone number (include remit address, if different than principal address in the introductory paragraph of this Agreement); (2) the CONSULTANT'S invoice number and date of invoice; (3) DISTRICT Agreement number; (4) Dates of service; (5) the CONSULTANT'S Project Manager; (6) DISTRICT'S Project Manager; (7) Progress Report with the CONSULTANT Project Manager's assessment of the PROJECT'S actual progress as compared to the performance schedule in the Agreement (details must include any deficiencies and the recovery actions completed and planned); and (8) Supporting documentation necessary to satisfy auditing purposes, for cost and PROJECT completion (based upon the cost and performance schedule in the Agreement). The final invoice will include information relating to the amount of expenditures made to disadvantaged business enterprises (based on the requirements contained in Paragraph 22). Invoices that do not conform to this provision will not be considered a proper invoice.

- 4.3 If an invoice does not meet the requirements of this Agreement, the DISTRICT shall, within ten (10) days after the improper invoice is received, notify the CONSULTANT in writing that the payment invoice is improper and indicate what corrective action on the part of the CONSULTANT is needed to make the invoice proper. Prior to providing this notice, the DISTRICT'S Project Manager must consult with and obtain concurrence from his or her Bureau Chief. If a corrected invoice is provided to the DISTRICT that meets the requirements of this Agreement, the corrected invoice will be paid within forty-five (45) days after the date the corrected invoice is received by the DISTRICT.
- 4.4 In the event any dispute or disagreement arises during the course of the PROJECT, the CONSULTANT shall fully perform the PROJECT work in accordance with the DISTRICT'S written instructions and may claim additional compensation. The CONSULTANT is under a duty to seek clarification and resolution of any issue, discrepancy, or dispute by submitting a formal request for additional compensation, schedule adjustment or other proposed dispute resolution to the DISTRICT'S Project Manager no later than ten (10) days after the precipitating event. Disputes shall be resolved in accordance with the DISTRICT'S dispute resolution procedure. No PROJECT work shall be delayed or postponed pending resolution of any disputes or disagreements. This paragraph shall survive the termination or expiration of this Agreement.
- 4.5 By October 5th of each year of the Agreement, the CONSULTANT must provide the following documentation to the DISTRICT for all work performed through September 30th: i) invoices for completed, accepted and billable tasks, and ii) an estimate of the dollar value of work performed, but not yet billable.
- 4.6 Each CONSULTANT invoice must include the following certification, and the CONSULTANT hereby delegates authority by virtue of this Agreement to its Project Manager to affirm said certification:
- "I hereby certify that the costs requested for payment, as represented in this invoice, are directly related to the performance under the _____ agreement between the Southwest Florida Water Management District and Consultant Firm (Agreement No. _____), are allowable, allocable, properly documented, and are in accordance with the approved Project Budget."
- 4.7 The DISTRICT may, in addition to other remedies available at law or equity, retain such monies from amounts due the CONSULTANT as may be necessary to satisfy any claim for damages, penalties, costs and the like asserted by or against the DISTRICT. The DISTRICT may set off any liability or other obligation of the CONSULTANT or its affiliates to the DISTRICT against any payments due the CONSULTANT under any agreement with the DISTRICT. This paragraph shall survive the expiration or termination of this Agreement.

5. SUSPENSION OF PROJECT – EXTRA WORK.

- 5.1 The DISTRICT shall have the absolute right to terminate or suspend this Agreement, or modify the Agreement upon mutual agreement, at any time and for any reason upon reasonable notice, and such action on its part shall not be deemed a default or breach of this Agreement. Suspensions or termination of this Agreement, or modifications to the Agreement by the DISTRICT, shall be in writing.
- 5.2 If the CONSULTANT is of the opinion that any work the DISTRICT directs it to perform substantially increases the work of the CONSULTANT beyond the original Scope of Work (“Extra Work”), the CONSULTANT shall within ten (10) days of such direction, notify the DISTRICT in writing of this opinion. The DISTRICT shall within twenty (20) days after receipt of such notification, fairly judge as to whether or not such work in fact increases the work of the CONSULTANT beyond the Scope of Work and constitutes Extra Work. If the DISTRICT determines such service does constitute Extra Work, it shall provide extra compensation to the CONSULTANT negotiated by the DISTRICT and the CONSULTANT based upon provisions of Paragraph 4, Compensation, above.
- 5.3 In the event this Agreement is entirely or partly suspended, delayed, or otherwise hindered by any cause whatsoever, the CONSULTANT shall make no claim for additional compensation or damages owing to such suspensions, delays or hindrances. Such suspensions, delays or hindrances may only be compensated for by an extension of time, as the DISTRICT may decide, however such extension shall not operate as a waiver of any other rights of the DISTRICT. Upon resumption of the Agreement, the CONSULTANT shall resume its service until the Scope of Work is completed in accordance with the Agreement, and the time for completion of the work, which was suspended, shall be extended for the duration of the suspension.
- 5.4 If, in the opinion of the DISTRICT, the progress of assigned PROJECT tasks during any period is substantially less than the amount which is necessary to meet the PROJECT schedule, the DISTRICT may require the CONSULTANT to take whatever action is necessary, in the opinion of the DISTRICT, to put the PROJECT back on schedule. Such action shall not constitute Extra Work unless the delays were caused by circumstances beyond the control of the CONSULTANT or its agents, employees or subcontractors.
- 5.5 In the event of claims by others against the DISTRICT in connection with the work being conducted under this Agreement, the CONSULTANT shall provide to the DISTRICT such technical assistance that the DISTRICT may request. Such assistance shall constitute Extra Work, unless such claims are caused by the failure of the CONSULTANT, its agents, employees, or subcontractors to comply with the terms and conditions of this Agreement.

5.6 If the DISTRICT requires the CONSULTANT to assist with an audit of Agreement costs, such assistance shall not be considered Extra Work.

6. CONTRACT PERIOD.

This Agreement will be effective upon execution by both parties and will remain in effect through September 31, 2021, unless terminated pursuant to the provisions of this Agreement, or as amended or renewed in writing by the parties.

7. PROJECT RECORDS AND DOCUMENTS.

7.1 The CONSULTANT, upon request, shall permit the DISTRICT to examine or audit all PROJECT related records and documents during or following completion of the PROJECT at no cost to the DISTRICT. Payments made to the CONSULTANT under this Agreement shall be reduced for amounts found to be not allowable under this Agreement by an audit. If an audit is undertaken by the DISTRICT, all required records shall be maintained until the audit has been completed and all questions arising from it are resolved. The CONSULTANT shall maintain all such records and documents for at least five (5) years following completion of this Agreement. If this Agreement identifies federal or state funding, or environmental data is collected in accordance with the Reports Paragraph, records and documents must be maintained for at least five (5) years following completion of the work.

7.2 Each party shall allow public access to PROJECT documents and materials made or received by either party in accordance with the Public Records Act, Chapter 119, F.S. to the extent required by Section 119.0701, F.S., the CONSULTANT shall (1) keep and maintain public records required by the DISTRICT in order to perform the service; (2) upon request from the DISTRICT'S custodian of public records, provide the DISTRICT with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided by law; (3) ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the term of this Agreement and following completion of the Agreement if the CONSULTANT does not transfer the records to the DISTRICT; and (4) upon completion of this Agreement, transfer, at no cost to the DISTRICT, all public records in possession of the CONSULTANT or keep and maintain public records required by the DISTRICT to perform the service. If the CONSULTANT transfers all public records to the DISTRICT upon completion of this Agreement, the CONSULTANT shall destroy any duplicate public records that are exempt or confidential and exempt from public records requirements. If the CONSULTANT keeps and maintains public records upon completion of this Agreement, the CONSULTANT shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the DISTRICT,

upon request from the DISTRICT'S custodian of public records, in a format that is compatible with the information technology systems of the DISTRICT.

- 7.3 **IF THE CONSULTANT HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS by telephone at 352-796-7211, ext. 5555, by email at RecordsCustodian@swfwmd.state.fl.us, or at the following mailing address:**

**Public Records Custodian
Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34604-6899**

Any changes to the above contract information will be provided to the CONSULTANT in writing.

- 7.4 This paragraph shall survive the expiration or termination of this Agreement.

8. **OWNERSHIP OF REPORTS, DOCUMENTS AND OTHER MATERIALS.**

The CONSULTANT will provide the DISTRICT with any and all reports, models, studies, maps or other documents resulting from the PROJECT at no cost to the DISTRICT. Additionally, two (2) sets (three (3) if cooperator copy is required, electronic and hardcopy, of any final reports must be submitted to the DISTRICT as Record and Library copies.

- 8.1 All original documents prepared by the CONSULTANT are instruments of service and shall become property of the DISTRICT. The use of data gathered under this Agreement, excluding the data in the public domain, shall not be used in connection with other contracts or for other clients of the CONSULTANT without the written permission of the DISTRICT. The CONSULTANT will provide the DISTRICT with reproducible copies of all reports and other documents. Copies of electronic media used to store data shall be provided to the DISTRICT in a format suitable for hard copy print out. Reports, documents and maps obtained from other agencies in the course of executing the PROJECT will be considered the property of the DISTRICT and will be delivered by the CONSULTANT to the DISTRICT upon the DISTRICT'S request and/or completion of the PROJECT. The CONSULTANT shall retain ownership and property interest in its pre-existing intellectual property and pre-existing work products.
- 8.2 Copies of all technical data and working papers regarding the PROJECT shall be made available to the DISTRICT if requested by the DISTRICT.

- 8.3 All tracings, plans, specifications, maps, evaluations, reports and technical data including working papers prepared or obtained under this Agreement, shall become property of the DISTRICT without restriction or limitation of use, and shall be made available upon request to the DISTRICT at any reasonable time. The CONSULTANT may retain copies thereof for their files and internal use. Any use by the DISTRICT of such materials obtained under this Agreement for any purpose not within the Scope of Work of the CONSULTANT pursuant to this Agreement or use of incomplete materials obtained from the CONSULTANT by the DISTRICT shall be made at the risk of the DISTRICT and made without liability to the CONSULTANT. However, this does not constitute a disclaimer of the professional competency of the original work as used within the Agreement.
- 8.4 All final plans, contract documents and/or such other documents that are required by Florida law to be endorsed and are prepared by the CONSULTANT in connection with the Agreement shall bear the certification of a person in the full employment of the CONSULTANT or duly retained by the CONSULTANT, and duly licensed and with current registration in the State of Florida.
- 8.5 The CONSULTANT shall make any patentable product or result of the Scope of Work and all information, design, specifications, data, and findings available to the DISTRICT if requested by the DISTRICT. No material prepared in connection with the PROJECT will be subject to copyright by the CONSULTANT. The DISTRICT shall have the right to publish, distribute, disclose and otherwise use any material prepared by the CONSULTANT pursuant to the Agreement. Any use of materials or patents obtained by the DISTRICT under this Agreement for any purpose not with the Scope of Work of the CONSULTANT pursuant to this Agreement shall be at the risk of the DISTRICT.
- 8.6 For a period of five (5) years after completion of the Agreement, the CONSULTANT agrees to provide the DISTRICT with copies of any additional materials in its possession resulting from the performance of this Agreement. However, this provision shall not be considered a waiver of any claim of attorney/client privilege to which the CONSULTANT is entitled. The CONSULTANT shall not publish, copyright, or patent any of the data furnished or developed pursuant to the Agreement without first obtaining the DISTRICT'S written consent.
- 8.7 The provisions of this Ownership of Reports, Documents and Other Materials Paragraph shall survive the expiration or termination of this Agreement.

9. CONSULTANT'S ACKNOWLEDGMENTS AND REPRESENTATIONS.

The CONSULTANT acknowledges and explicitly represents to the DISTRICT the following:

- 9.1 The CONSULTANT is duly authorized to conduct business in the State of Florida.
- 9.2 The CONSULTANT will abide by and assist the DISTRICT in satisfying all applicable federal, state and local laws, rules, regulations and guidelines (including but not limited to the Americans with Disabilities Act) relative to performance under this Agreement. The CONSULTANT will not discriminate against any employee or applicant for employment because of race, color, religion, sex, handicap, disability, marital status or national origin. The CONSULTANT will obtain and maintain all permits and licenses necessary for its performance under this Agreement.
- 9.3 The CONSULTANT has familiarized itself with the nature and extent of this Agreement, work expected to be performed under this Agreement, and federal, state and local laws, statutes, rules, regulations, ordinances, order and decisions, that may affect the CONSULTANT'S performance of this Agreement.
- 9.4 The CONSULTANT has reviewed this Agreement (including its Exhibits) and all available information and data shown or indicated in this Agreement and has given the DISTRICT written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in this Agreement or information or data, and the written resolution thereof by the DISTRICT is acceptable to the CONSULTANT.
- 9.5 The CONSULTANT shall obtain and review all information and data which relates to the Agreement or which the CONSULTANT may reasonably anticipate may affect cost, scheduling, progress, performance or furnishing of any Scope of Work, including but not limited to, information and data indicated in this Agreement or related to work under separate agreements, to the extent such work may interface with the CONSULTANT'S work provided pursuant to this Agreement.

10. STANDARD OF PERFORMANCE.

The CONSULTANT shall perform and complete all assigned PROJECT tasks in a timely manner in accordance with the standard of care, skill and diligence customarily provided by an experienced professional organization rendering the same services, and in accordance with sound principles and practices. The DISTRICT shall decide all questions, difficulties and disputes of any nature whatsoever that may arise under or by reason of this Agreement, the prosecution and fulfillment of the work called for hereunder, or the character, quality, amount, or value thereof. The decision of the DISTRICT upon all such claims, questions, or disputes shall be reasonable and in adherence with sound principles and practices applicable to the professional services.

11. INDEMNIFICATION.

The CONSULTANT agrees to, indemnify and hold harmless the DISTRICT and all DISTRICT officers and employees, from liabilities, damages, losses, and costs, either at law or in equity, including, but not limited to reasonable attorney fees and costs and attorney fees and costs on appeal, as a result of any negligent or reckless act or omission or any intentionally wrongful conduct by the CONSULTANT and other persons employed or utilized by the CONSULTANT in the performance of this Agreement. This paragraph shall survive the expiration or termination of this Agreement.

PURSUANT TO SECTION 558.0035, F.S., AN INDIVIDUAL EMPLOYEE OR AGENT MAY NOT BE HELD INDIVIDUALLY LIABLE FOR NEGLIGENCE IF THE CONSULTANT MAINTAINS THE PROFESSIONAL LIABILITY INSURANCE REQUIRED UNDER THIS AGREEMENT AND ANY DAMAGES ARE SOLELY ECONOMIC IN NATURE AND THE DAMAGES DO NOT EXTEND TO PERSONAL INJURIES OR PROPERTY NOT SUBJECT TO THIS AGREEMENT. THIS PROVISION APPLIES TO ARCHITECTS, INTERIOR DESIGNERS, LANDSCAPE ARCHITECTS, ENGINEERS, SURVEYORS AND GEOLOGISTS, LICENSED IN THE STATE OF FLORIDA.

12. INSURANCE REQUIREMENT.

The CONSULTANT must maintain during the entire term of this Agreement, insurance in the following kinds and amounts or limits with a company or companies authorized to do business in the State of Florida and will not commence work under this Agreement until the DISTRICT has received an acceptable certificate of insurance showing evidence of such coverage. Certificates of insurance must reference the DISTRICT Agreement Number and Project Manager.

12.1 Liability insurance on forms no more restrictive than the latest edition of the Commercial General Liability policy (CG 00 01) of the Insurance Services Office without restrictive endorsements, or equivalent, including aircraft liability, as applicable, with the following minimum limits and coverage:

Per occurrence	\$1,000,000
----------------	-------------

12.2 Vehicle liability insurance, including owned, non-owned and hired autos with the following minimum limits and coverage:

Bodily Injury Liability per Person	\$100,000
------------------------------------	-----------

Bodily Injury Liability per Occurrence	\$300,000
Property Damage Liability	\$100,000
or	
Combined Single Limit	\$500,000

- 12.3 Aviation Liability insurance on an “occurrence” basis, including products and completed operations, property damage and bodily injury with the following minimum limits and coverage.

Per occurrence of \$1,000,000
Aggregate of \$2,000,000

Alternatively, this coverage may be provided by endorsement to a Commercial General Liability policy as follows:

Liability insurance on forms no more restrictive than the latest edition of the Commercial General Liability policy (CG 00 01) of the Insurance Services Office, including products and completed operations, property damage and bodily injury with limits no less than \$1,000,000 per occurrence and \$2,000,000 in aggregate.

- 12.4 The DISTRICT and its employees, agents, and officers must be named as additional insureds on the general liability policy to the extent of the DISTRICT'S interests arising from this Agreement.
- 12.5 The CONSULTANT must carry workers' compensation insurance in accordance with Chapter 440, F.S., if applicable. If the CONSULTANT does not carry workers' compensation coverage, the CONSULTANT must submit to the DISTRICT both an affidavit stating that the CONSULTANT meets the requirements of an independent CONSULTANT as stated in Chapter 440, F.S. and a certificate of exemption from workers' compensation coverage.
- 12.6 Professional liability (errors and omissions) insurance in a minimum amount of One Million Dollars (\$1,000,000).
- 12.7 The CONSULTANT must notify the DISTRICT in writing of the cancellation or material change to any insurance coverage required by this Agreement. Such notification must be provided to the DISTRICT within five (5) business days of the CONSULTANT'S notice of such cancellation or change from its insurance carrier.
- 12.8 The CONSULTANT must obtain certificates of insurance from any subcontractor otherwise the CONSULTANT must provide evidence satisfactory to the DISTRICT that coverage is afforded to the subcontractor by the CONSULTANT'S insurance policies.

13. TERMINATION WITHOUT CAUSE.

This Agreement may be terminated by the DISTRICT without cause upon written notice to the CONSULTANT. Termination will be effective on the date provided in the notice. In the event of termination under this paragraph, the CONSULTANT shall be entitled to compensation for all services provided to the DISTRICT up to the date of termination which are within the Scope of Work, documented in the Budget, and are allowed under this Agreement. If the Agreement is so terminated, the CONSULTANT must promptly deliver to the DISTRICT copies of all then completed deliverable items and all tracings, drawings, survey notes and other documents that directly support the deliverables prepared by the CONSULTANT. This paragraph shall survive the termination or expiration of this Agreement.

14. DEFAULT.

Either party may terminate this Agreement upon the other party's failure to comply with any term or condition of this Agreement, as long as the terminating party is not in default of any term or condition of this Agreement at the time of termination. To effect termination, the terminating party shall provide the defaulting party with a written "Notice of Termination" stating its intent to terminate and describing all terms and conditions with which the defaulting party has failed to comply. If the defaulting party has not remedied its default within thirty (30) days after receiving the Notice of Termination, this Agreement shall automatically terminate. In addition, the initiation, either by the CONSULTANT or against the CONSULTANT, of proceedings in bankruptcy, or other proceedings for relief under any law for the relief of debtors, or the CONSULTANT becoming insolvent, admitting in writing its inability to pay its debts as they mature or making an assignment for the benefit of creditors shall constitute a default by the CONSULTANT entitling the DISTRICT to terminate this Agreement as set forth above. The parties agree that this Agreement is an executory contract. If, after termination by the DISTRICT, it is determined that the CONSULTANT was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the DISTRICT. The rights and remedies in this provision are in addition to any other rights and remedies provided by law or this Agreement.

15. RELEASE OF INFORMATION.

The CONSULTANT agrees not to initiate any oral or written media interviews or issue press releases on or about the PROJECT without providing notices or copies to the DISTRICT'S Project Manager and Public Affairs Bureau Chief no later than three (3) business days prior to the interview or press release.

16. ASSIGNMENT.

Except as otherwise provided in this Agreement, the CONSULTANT may not assign any of its rights or delegate any of its obligations under this Agreement without the prior written consent of the DISTRICT.

17. EMPLOYMENT ELIGIBILITY VERIFICATION.

CONSULTANT must utilize the U.S. Department of Homeland Security's Employment Verification (E-Verify) Program to verify the employment eligibility of the CONSULTANT employees performing work directly associated with this Agreement in accordance with the terms and conditions applicable to the E-Verify Program. If CONSULTANT uses subcontractors to furnish services directly associated with this Agreement, performed in the United States, in an amount greater than \$3,000, the CONSULTANT must include the requirements of this provision (appropriately modified for identification of the parties) in each subcontract. Information on registration for and use of the E-Verify Program can be obtained via the Internet at the Department of Homeland Security Web site: <http://www.dhs.gov/E-Verify>.

18. GOVERNING LAW.

This Agreement is governed by Florida law and venue for resolving disputes under this Agreement, if in state court will be in Hillsborough County, Florida, and if in federal court, will be in the Middle District of Florida, Tampa Division.

19. REMEDIES.

Unless specifically waived by the DISTRICT, the CONSULTANT'S failure to timely comply with any obligation in this Agreement shall be deemed a breach of this Agreement and the expenses and costs incurred by the DISTRICT, including attorneys' fees and costs and attorneys' fees and costs on appeal, due to said breach shall be borne by the CONSULTANT. Additionally, the DISTRICT shall not be limited by the above but may avail itself of any and all remedies under Florida law for any breach of this Agreement. The DISTRICT'S waiver of any of the CONSULTANT'S obligations shall not be construed as the DISTRICT'S waiver of any other obligations of the CONSULTANT. This paragraph shall survive the termination or expiration of this Agreement.

20. ATTORNEY FEES.

Should either party employ an attorney or attorneys to enforce any of the provisions of this Agreement, or to protect its interest in any matter arising under this Agreement, or to recover damages for the breach of this Agreement, the party prevailing is entitled to receive from the other party all reasonable costs, charges and expenses, including attorneys' fees, expert witness fees, fees and costs on appeal, and the cost of

paraprofessionals working under the supervision of an attorney, expended or incurred in connection therewith, whether resolved by out-of-court settlement, arbitration, pre-trial settlement, trial or appellate proceedings, to the extent permitted under Section 768.28, F.S. This paragraph does not constitute a waiver of the DISTRICT'S sovereign immunity or extend the DISTRICT'S liability beyond the limits established in Section 768.28, F.S. This paragraph shall survive the expiration or termination of this Agreement.

21. SUBCONTRACTORS.

The CONSULTANT shall be solely responsible for the employment, direction, supervision, compensation and control of any and all subcontractors, consultants or other persons employed by the CONSULTANT. The CONSULTANT shall cause all subcontractors, consultants or other persons employed by the CONSULTANT to abide by the terms and conditions of this Agreement and all applicable law as their work or services affect the DISTRICT. Nothing in this Agreement will be construed to create, or be implied to create, any relationship between the DISTRICT and any subcontractor of the CONSULTANT.

22. DISADVANTAGED BUSINESS ENTERPRISES.

The DISTRICT expects the CONSULTANT to make good faith efforts to ensure that disadvantaged business enterprises, which are qualified under either federal or state law, have the maximum practicable opportunity to participate in contracting opportunities under this Agreement. Final invoice documentation submitted to the DISTRICT must include information relating to the amount of expenditures made to disadvantaged businesses by the CONSULTANT, to the extent the CONSULTANT maintains such information.

23. THIRD PARTY BENEFICIARIES.

Nothing in this Agreement will be construed to benefit any person or entity not a party to this Agreement.

24. CONFLICTING EMPLOYMENT.

The CONSULTANT certifies that it does not at the time of execution of this Agreement have any retainer or employment agreement, oral or written, with any third party that directly conflicts with any interest or position of the DISTRICT relating to the services provided by the CONSULTANT under this Agreement. The CONSULTANT further agrees that it shall not accept during the term of this Agreement any retainer or employment from a third party whose interests are in direct conflict with those of the DISTRICT regarding the work being performed under this Agreement. In the event the CONSULTANT is faced with an employment opportunity that appears to be a direct conflict with the work the CONSULTANT is performing under this Agreement, the CONSULTANT shall provide the DISTRICT with notice of the employment opportunity.

If the DISTRICT determines that the employment would be a direct conflict with the work the CONSULTANT is performing under this Agreement, the CONSULTANT and the DISTRICT shall have the opportunity to decide whether or not the CONSULTANT will decline the employment opportunity or will accept the employment opportunity and terminate this Agreement.

25. PUBLIC ENTITY CRIMES.

Pursuant to Subsections 287.133(2) and (3), F.S., a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, F.S., for Category Two, for a period of 36 months following the date of being placed on the convicted vendor list. By signing this Agreement, the CONSULTANT warrants that it is not currently on a suspended vendor list and that it has not been placed on a convicted vendor list in the past 36 months. The CONSULTANT further agrees to notify the DISTRICT if placement on either of these lists occurs.

26. SCRUTINIZED COMPANIES.

Pursuant to Section 287.135, F.S., a company that, at the time of submitting a bid or proposal for a new contract or renewal of an existing contract, is on the Scrutinized Companies that Boycott Israel List, or is engaged in a boycott of Israel, is ineligible to, and may not bid on, submit a proposal for, or enter into or renew a contract with an agency or local governmental entity for goods or services in any amount. If the goods or services are in the amount of \$1 million dollars or more, the company must also not be on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or be engaged in business operations in Cuba or Syria.

By signing this Agreement, the CONSULTANT certifies that it is not on any of the lists or engaged in any of the prohibited activities identified above, as applicable based upon the amount of this Agreement. The CONSULTANT agrees to notify the DISTRICT if it is placed on any of the applicable lists or engages in any of the prohibited activities during the term of this Agreement. The DISTRICT may immediately terminate this Agreement at its option if the CONSULTANT is found to have submitted a false certification, is placed on any of the applicable lists or engages in any prohibited activities.

27. 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 Agreement 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 other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this provision, the DISTRICT shall have the right to terminate this Agreement without liability and, at its discretion, to deduct from the Agreement price, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration.

28. TRUTH-IN-NEGOTIATIONS.

The CONSULTANT certifies that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting. The original Agreement Fee Schedule and any additions thereto shall be adjusted to exclude any significant sums by which the DISTRICT determines the Agreement Fee Schedule price was increased due to inaccurate, incomplete, or non-current wage rates and other factual unit costs. Any such adjustments will be made within one (1) year following the end of this Agreement.

29. ENTIRE AGREEMENT.

This Agreement and the attached exhibits listed below constitute the entire agreement between the parties and, unless otherwise provided herein, may be amended only in writing, signed by all parties to this Agreement.

30. SEVERABILITY.

If any provision or provisions of this Agreement shall be held to be invalid, illegal, or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

31. AGREEMENT DOCUMENTS.

The following documents are attached or incorporated herein by reference and made a part of this Agreement. In the event of a conflict of contract terminology, priority shall first be given to the language in the body of this Agreement, then to the DISTRICT'S RFP 1908, then to Exhibit "A," then to Exhibit "B," then to Exhibit "C," then to Exhibit "F," then CONSULTANT'S Proposal to RFP 1908, then to Exhibit "D," and then to Exhibit "E."

Exhibit "A"	Scope of Work
Exhibit "B"	Full Motion Video Specifications
Exhibit "C"	Guidelines and Specifications for the Operation of Unmanned Aircraft Systems
Exhibit "D"	Fee Schedule
Exhibit "E"	Key Team Members
Exhibit "F"	Deliverable Acceptance and Performance Evaluation
RFP 1908	Districtwide Seagrass Mapping Project
CONSULTANT'S Proposal to RFP 1908	

The remainder of this page intentionally left blank.

IN WITNESS WHEREOF, the parties hereto, or their lawful representatives, have executed this Agreement on the day and year set forth next to their signatures below.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

By: _____
Amanda Rice, P.E. Date
Assistant Executive Director

CONSULTANT FIRM

By: _____
Name, Title Date
Authorized Agent for Company

AGREEMENT
BETWEEN THE
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
AND
CONSULTANT FIRM
FOR
DISTRICTWIDE SEAGRASS MAPPING PROJECT(W331/B017)

EXHIBIT "A"
SCOPE OF WORK
SEAGRASS IMAGERY SPECIFICATIONS

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Table of Contents

1	INTRODUCTION	2
2	PROJECT AREA	2
3	ORTHOPHOTO SPECIFICATIONS	2
3.1	Sensor.....	2
3.2	Image Resolution	2
3.3	Horizontal Accuracy	2
3.4	Horizontal and Vertical Datum.....	3
3.5	Photogrammetric Mapping Survey Control	3
3.6	Flight Season	3
3.7	Mission Planning	4
3.8	Image Quality.....	4
3.9	Ortho-imagery Processing.....	5
3.9.1	Special Consideration.....	5
3.9.2	Color Balancing	5
3.9.3	Preliminary Ortho-Imagery.....	5
4	PROJECT MANAGEMENT AND REPORTING	5
5	INFORMATION PROVIDED BY THE DISTRICT AND COUNTIES.....	6
5.1	Digital Elevation Models	6
5.2	Historical Images.....	6
6	ORTHOPHOTO DELIVERABLES.....	6
6.1	File Formats and Image Types.....	7
6.2	Metadata	8
6.3	Image Outline Feature Class and Flight Line Feature Class	8
6.4	Survey Report	8
6.5	Secure Hash Standard (SHA.....	9
6.6	Media	9
7	ORTHOPHOTO PROJECT SCHEDULE.....	10
	ATTACHMENT A – SEAGRASS MAPPING AREAS OF INTEREST	11
	Refer to Figure 1 of RFP 1908 Districtwide Seagrass Mapping Project.....	11
	ATTACHMENT B –PASSES/AREAS OF SPECIAL CONCERN	12
	Refer to Figure 3 of RFP 1908 Districtwide Seagrass Mapping Project.....	12
	ATTACHMENT C – DELIVERABLE SUMMARY TABLE	13
	ATTACHMENT D – REQUIRED TIFF AND GEOTIFF TAGS AND KEYS AND SAMPLE VALUES	15
	ATTACHMENT E – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES.....	15

Revision History

Revision	Date	Description	Author
1.0	August, 2010	Original Document	Kristen Kaufman
1.01	August, 2012	Updates by Mapping & GIS	Kristen Kaufman, April Davis
2.0	Feb, 2018	Update to Specifications format, digital cameras, District file nomenclature	Al Karlin
2.1	Feb, 2019	Update to Specifications format, flight window, and inclusion of Springs Coast AOI with Suncoast AOI.	Chris Anastasiou, Aaron Brown

1 INTRODUCTION

The Southwest Florida Water Management District (District) uses digital orthophotos, captured for the specific purpose of viewing through estuarine water columns, to support the geospatial mapping of seagrass habitats and other benthic features. This project is a continuation of previous efforts to determine the status and trends of seagrass resources in the coastal waters of the District. This document defines the specifications and technical aspects for developing project specific 2019 – 2020 digital orthophotos. All final data will be stored in the District's ArcSDE database and will be made available to internal and external customers through client applications such as ESRI ArcGIS, ERDAS-Imagine, Harris-ENVI, Trimble/INPHO-eCognition and/or other similar software. All data will be the property of the District and will be considered a public record as defined by applicable Florida Statutes (1B-26).

2 PROJECT AREA

The project area is comprised of a collection of 5000 by 5000 foot cells that serve as the tiling scheme for orthophoto and topographic data deliverables. The orthophoto area to be mapped consists of 4284 cells (approximately 3813 square miles) defined in ATTACHMENT A – SEAGRASS MAPPING AREAS OF INTEREST and in the ArcGIS Shapefiles *SpringsCoast_Tiles_2020.shp* and *SunCoast_Tiles_2020.shp* delivered under separate cover.

3 ORTHOPHOTO SPECIFICATIONS

All work must be under the supervision of a Florida licensed Professional Surveyor and Mapper and in accordance with Florida Statute 472 and Chapter 5J-17, Florida Administrative Code.

3.1 Sensor

All imagery will be collected using a digital airborne imaging sensor. The sensor must have a valid United States Geological Survey (USGS) Sensor/Camera calibration report. The District has a preference for push-broom, multi-spectral sensors for this project. However, as technology advances, other sensor-types may be applicable.

3.2 Image Resolution

All imagery will have a ground sampling resolution not to exceed 0.9 feet. The CONSULTANT will deliver images that have been resampled to 1.0 foot pixels as defined in Section 5: Orthophoto Deliverables of this document.

3.3 Horizontal Accuracy

Ortho-imagery shall be tested to meet the 95% confidence interval (60cm RMSE_x and 60cm RMSE_y; 67.08cm RMSE_r) with an Ortho-imagery Mosaic Seamline Mismatch less than 60 cm as specified in the ASPRS Positional Accuracy Standards for Digital Geospatial Data, Edition 1, Version 1.0, (http://www.asprs.org/a/society/committees/standards/ASPRS_Positional_Accuracy_Standards_Edition1_Version100_November2014.pdf). Verification will follow methods as outlined in FGDC Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA; <https://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3>). A minimum of thirty (30) independent image checkpoints within the project area will be used for verification. Check points will be distributed so that points are spaced at intervals of at least twenty-five (25) percent of the diagonal distance across the dataset and at least twenty (20) percent of the points are located in each quadrant of the dataset. The Consultant is not expected to correct for "building lean" in urban areas.

3.4 Horizontal and Vertical Datum

Horizontal Datum will be referenced to the Florida State Plane Coordinate System, West Zone (0902), Units US Survey Feet, North American Datum of 1983 (2011) including the most recent NSRS adjustment.

Vertical Datum will be referenced to the North American Vertical Datum of 1988 (NAVD 88), Units US Survey Feet, using the most recent geoid model (GEOID12b) to compute orthometric heights based on GPS derived ellipsoid heights.

The coordinate system will be reported as the European Petroleum Survey Group (EPSG) code 6443.

3.5 Photogrammetric Mapping Survey Control

The photogrammetric ground control must be adequate to support the accuracy specifications identified for this project. The Consultant will submit a survey report that documents and certifies the procedures and accuracies of the horizontal and vertical control, aircraft positioning systems and aerial triangulation utilized in the photogrammetric mapping project.

All newly-established horizontal and vertical control will be based on redundant, interconnected and direct ties to existing National Geodetic Survey (NGS) control stations, National Spatial Reference System (NSRS). The photogrammetric ground control network will meet or exceed the five (5) centimeter Local Network Accuracy Standard as set forth by the FGDC Geospatial Positioning Accuracy Standards, Part 2: Standards for Geodetic Networks (<https://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part2>). The procedures used to establish vertical photogrammetric ground control using differential leveling will meet or exceed Third Order Vertical Control Accuracy Standards. The photogrammetric mapping Consultant will meet or exceed FEMA FLOOD HAZARD MAPPING PROGRAM, GUIDELINES AND SPECIFICATIONS FOR FLOOD HAZARD MAPPING PARTNERS, Appendix A, section A.5 Ground Control, and section A.6 Ground Surveys (<https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>)

The Consultant shall calibrate the Geoid model by performing GNSS occupations of existing

NAVD88 NGS 1st and/or 2nd Order control stations throughout the project area.

The photogrammetric mapping Consultant will coordinate with District staff in planning procedures and methodology used for all horizontal and vertical control surveys.

3.6 Flight Season

The flight season will be from November 1, 2019 through February 28, 2020. To the greatest extent possible, the CONSULTANT should attempt to obtain imagery over a time period no longer than three consecutive weeks and prior to December 31, 2019. The CONSULTANT must receive written approval from the District before collecting any imagery outside of this flight window.

3.7 Mission Planning

The CONSULTANT will coordinate all efforts to monitor water conditions prior to acquisition of imagery. Dates of the flight window provided by the CONSULTANT will be used to coordinate sampling efforts. As discussed above, the CONSULTANT will be responsible for the flight mission and will coordinate with pilots to track and monitor atmospheric conditions including cloud cover, wind, and visibility prior to and during day(s) of flight. The District project manager will provide CONSULTANT with potential on-site cooperators for the purpose of daily water clarity monitoring and reporting. The CONSULTANT will be responsible for coordinating the on-site cooperators via phone calls each flight morning. A determination will then be made as to whether the imagery will be flown. Flight mission planning should include a review of daily MODIS imagery to assist with identifying issues with water clarity, wave height, and cloud cover. The imagery is available at the Internet sites: <https://modis.gsfc.nasa.gov/gallery/showall.php> and at: <https://coastal.er.usgs.gov/flibay/>

Monitoring of Water Quality and Flight Conditions

The following parameters will be monitored to determine whether the stated required conditions are being met during the flight window:

- TIDAL CONDITION - Unless agreed to beforehand by the District's project manager, tidal stage shall be low tide and no greater than mean tide level; consideration of incoming and outgoing tides will need to be made when preparing to fly passes and inlet systems. The District will provide the CONSULTANT with a map and description for Special Environmental areas, such as the Waccasassa basins and barge canal where clarity is sensitive to wave height, winds, and incoming tides; see ATTACHMENT B – PASSES/AREAS OF SPECIAL CONCERN. The CONSULTANT'S flight crew will be asked to monitor clarity during flight missions and adjust imagery capture accordingly if poor conditions are encountered.
- WAVE HEIGHT – Unless agreed to beforehand by the District's project manager, wave heights shall be less than 2 feet;
- WIND CONDITION - Unless agreed to beforehand by the District's project manager, wind speed shall be less than 10 knots;
- WATER CLARITY – Suncoast: Unless agreed to beforehand by the District's project manager, Secchi disk depths shall be 2 meters or greater for at least one location per estuary flown; For Springs Coast: use of DISTRICT approved methods including remote sensing imagery or other means of measuring water clarity over large open-water areas shall be used to infer optimum Secchi disk readings of two meters or greater.

- SUN ANGLE – Sun angle at the time of image acquisition shall be between 30 and 45 degrees;

3.8 Image Quality

All images will be obtained under cloud free conditions and will be free of obscuring haze, smoke or other atmospheric conditions. Radiometric and color balancing of the imagery is described in Section 5: Orthophoto Deliverables of this document. All images must be collected with a sun angle no less than 30° and no greater than 45° and between 10:00 AM to 2:30 PM to minimize shadows.

3.9 Ortho-imagery Processing

The CONSULTANT shall utilize DISTRICT source data, such as existing Digital Elevation Models (DEM), breaklines or Lidar data available for each estuaries AOI's. The CONSULTANT shall use a systematic approach to produce the digital ortho-imagery. This approach shall have QA/QC procedures integrated throughout the entire process. The methods used by the CONSULTANT for digital ortho-imagery processing takes place as follows: the CONSULTANT shall match the existing DEM data to a photo image to create a digital ortho-image. The relevant DEM data shall be merged with the orientation parameters and the new digital imagery. A complete differential rectification is carried out with a set of algorithms that remove image displacement due to topographic relief and the tip and tilt of the aircraft at the moment of exposure.

3.9.1 Special Consideration:

Special consideration shall be made during the image post-processing to enhance the visibility of underwater features while still preserving the image fidelity of topographic features. Where applicable, two separate radiometric adjustment efforts shall be employed to emphasize visually seamless color balancing, tone, and contrast across both estuarine and topographic extents. Prior to finalizing the image post-processing, the CONSULTANT shall submit samples to the DISTRICT for approval from various areas within each individual waterbody.

3.9.2 Color Balancing:

The CONSULTANT shall use software for color balancing, tone/contrast adjustments, and image mosaicking for each Suncoast estuary (five Gulf Coast estuaries: Tampa Bay, St. Joseph Sound/Clearwater Harbor, Sarasota Bay, Lemon Bay, Charlotte Harbor and the entire Springs Coast region). All images within each Suncoast estuary and the Springs Coast region shall be merged to help eliminate mismatches between tiles in contrast and tonal quality. Tiles shall then be clipped from the mosaicked image. All adjacent tiles shall edge match with surrounding tiles. Tiles are then run through a visual QA/QC to ensure that no errors were introduced during previous steps.

3.9.3 Preliminary Ortho-Imagery:

Preliminary ortho-imagery shall be made available for viewing by the DISTRICT via a web-based viewing/QC vehicle. The CONSULTANT shall use the web-based vehicle to host the digital ortho-imagery for QC purposes.

4 PROJECT MANAGEMENT AND REPORTING

The CONSULTANT will provide the following minimum project management and tracking reports:

Except where noted all reporting will be done on a bi-weekly basis. The reports via email will document the percent complete on the following minimum items:

- o Geodetic Control Survey;
- o Image Acquisition Status – **Daily Status Reports are Required;**
- o Aerial Triangulation;
- o Horizontal Accuracy Assessment;
- o DEM Creation Status; and
- o Orthophoto Production Status.

5 INFORMATION PROVIDED BY THE DISTRICT AND COUNTIES

Upon request the District will provide the following information to the CONSULTANT.

5.1 Digital Elevation Models

The Digital Elevation Model (DEM) must be adequate to support accuracy specifications identified for this project. The CONSULTANT will submit information in the final survey report and metadata which documents the source and accuracy of the DEM utilized in the photogrammetric mapping project.

The District will provide the CONSULTANT with any DEMs or Light Detection and Ranging (LiDAR) data available from past projects and overflights. In areas where no breakline data exist, the CONSULTANT is responsible for processing breaklines necessary to accurately compile orthorectified imagery.

5.2 Historical Images

To maintain consistency between images collected during different years, the District will provide historical examples of imagery to the CONSULTANT to assist in color balancing.

6 ORTHOPHOTO DELIVERABLES

All deliverables will be the property of the District and are considered a public record. The CONSULTANT must receive written permission from the District prior to releasing data to any party. Under this work order the CONSULTANT will deliver only the ortho-corrected natural color imagery. The CONSULTANT will keep a copy of the original data for a period of five (5) years and must contact the District before destroying the data. Refer to ATTACHMENT C – DELIVERY SUMMARY TABLE for an overview of all required deliverables.

QA/QC of the preliminary imagery shall be accomplished using the web-based redline tool. This shall allow the DISTRICT to easily QA the ortho-imagery for each estuary for color balancing, seamlines and image quality. Any issues or errors within the data can be identified and logged into the redline tool. Once all edits are completed, reviewed and approved, final ortho-imagery shall be delivered in GeoTIFF format. The CONSULTANT shall provide the DISTRICT the following imagery deliverables as either preliminary or final data as specified:

- Project wide preliminary georeferenced Level 02 imagery via the CONSULTANT's web-based image hosting service. Uploaded to the web service as acquired in the field, imagery shall be made available to the DISTRICT for immediate review and acceptance of water clarity and image quality.
- Preliminary color balancing samples (Level 02) delivered by waterbody.
- Final 32 bit natural color (RGBi) 1-foot resolution ortho-imagery strips in GeoTIFF format.
- Final 32 bit natural color (RGBi) 1-foot resolution ortho-imagery tiled to Florida 2014 Statewide Grid in GeoTIFF format. The final imagery shall be checked against existing

control features to verify horizontal accuracy that meets or exceeds a horizontal accuracy of 3.46 feet at the 95 percent confidence interval (2.0 feet RMSE) as specified in the FGDC Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy.

- Image Cutline, Flight Line, and Image Strip Feature Classes
- Metadata
- Final report of survey that documents and certifies the procedures and is compliant with relevant Minimal Technical Standards for Professional Surveying and Mapping done in Florida.

The CONSULTANT will document all data deliveries with an itemized transmittal letter.

6.1 File Formats and Image Types

Clarity and quality of the imagery is of the highest importance to the District. For all 32-bit images, coloration should be equivocal to conventional natural color film products. The District anticipates when creating "batch runs" by water body for color balancing, and/or mosaicing of images. Color balancing is to include two individual balancing efforts of water features and land features in order to enhance benthic features while maintaining natural coloring of land features. The CONSULTANT will submit samples from several different areas for multiple image types (natural shoreline and nearshore water, tidal flats and nearshore water, hardened shoreline and nearshore water, and bridges) for approval prior to completing radiometric processing of the entire dataset.

Imagery will be delivered as uncompressed GeoTIFF images with valid projection header information. Refer to ATTACHMENT D – REQUIRED TIFF AND GEOTIFF TAGS AND KEYS AND SAMPLE VALUES for details. One GeoTIFF file per 5000 x 5000 foot tile is required.

Natural Color Imagery – The natural color, RGB, bands will be color balanced across the entire study area to the greatest extent possible to allow viewing of the image tiles as a visually seamless mosaic. Care should be taken during radiometric processing to avoid loss of detail in shadows and overexposure on bright surfaces such as bare ground and light colored building roofs.

The orthoimages delivered according to the tiling scheme are based on the scheme defined in Section 2: Project Area. Tiles will be contiguous and non-overlapping and will be suitable for creating a seamless image mosaic that includes no data void cells or gaps. Tile naming convention is as follows:

SCSGOPYYYY_SPW_bit.TIF

Where: SC stands for Suncoast/Springs Coast
SG stands for Seagrass
OP stands for Orthophoto
YYYY is the year
SPW is the appropriate cell number values found in the
Seagrass_Index_Grid_West_Florida.
Bit is the number of bits in the imagery (32)

e.g.: SCSGOP2020_412279_32.TIF

6.2 Metadata

Metadata must be delivered for the DEM used for orthophoto production, the cutline feature class,

and project wide for the orthophotos in an ArcCatalog compatible XML format. Templates for each deliverable that requires metadata are provided as template and in an XML file to be delivered to the selected CONSULTANT.

Metadata must be compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata. All metadata must pass through the USGS metadata parser at <http://mrddata.usgs.gov/validation/> with no errors.

Metadata and the image collection date(s) must apply to each individual tile. The image collection date(s) must be populated in the following field:

- o *Time Period for Which the Data is Relevant:* e.g. 20200105

Preliminary metadata should be delivered with each interim data deliverable. The District and CONSULTANT will jointly finalize metadata requirements. Upon acceptance metadata will be uploaded on a USB or Firewire drive containing the final deliverables. Refer to Section 5.6: Media for additional details.

6.3 Image Cutline Feature Class and Flight Line Feature Class

The DISTRICT will provide a non-populated ESRI file-GeoDatabase template to contain the cutline feature classes:

- 1- Springs_Coast_Seagrass2000_Cutlines and Sun_Coast_Seagrass2020_Cutlines: to contain non-overlapping polygons with no data voids for the project area. Each polygon will delineate image capture dates used to seam together flightlines for the production of orthophotos, and
- 2- A second feature class named Springs_Coast_Seagrass2000_Flightlines and Sun_Coast Seagrass 2020_Flightlines to contain the point location of each individual photo frame (if frame sensor is used) or polygons showing the push-broom strips (if a push-broom sensor is used) and will display the frame number (or strip number) and the flight date and time for each frame (or strip) in the attribute table.

The Seagrass2020_Cutlines feature class should conform to project boundary and must have one date field named FLIGHTDATE that identifies the date the imagery was collected. The FLIGHTDATE attribute field should be populated as YYYYMMDD. The Seagrass2020_Flightlines feature class must have the FLIGHTDATE field specified above as well as FLIGHTTIME field. Metadata must accompany the image cutline feature class.

6.4 Survey Report

The CONSULTANT will prepare a survey report that documents all photogrammetric ground control, aircraft global positioning system, aerial triangulation, DEM creation, photo identification (horizontal and vertical) check points and orthorectification processes utilized in the project. The survey report must also include an accuracy report and statement compliant with FGDC Geospatial Positioning Accuracy Standards, National Standard for Spatial Data Accuracy (NSSDA). The survey report must include a map delineating flight line locations and flight dates. This report must be compliant with relevant Minimal Technical Standards for Professional Surveying and Mapping done in Florida and delivered in hardcopy and PDF formats.

The CONSULTANT will deliver two (2) hardcopies of this report and one (1) PDF of the final survey reports on the USB drive containing the final deliverables. The survey report must include items outlined in ATTACHMENT E – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES.

The following supporting materials must be delivered with the survey report:

- Final deliverable file stating filename with extension and delivery date in the appendix of the survey report.
- Ground control layout map containing all check points, horizontal and vertical control.
- Digital copy of the final GPS least squares adjustment.
- Surveyed image checkpoints used for accuracy testing in one (1) file geodatabase named *SWFWMD_Seagrass2020_GroundControl* with a feature class also named *SWFWMD_Seagrass2020_GroundControl* feature class (point) format and excel format. The minimum required fields are listed in TABLE 1 – GROUND SURVEY CONTROL POINTS FIELD PROPERTIES.

TABLE 1 – GROUND SURVEY CONTROL POINTS FIELD PROPERTIES

Field Name	Date Type	Description
CONTROLPTNAME	Text	Control point designation.
LATITUDE	Double	Geographic Y-coordinate specifying vertical position.
LONGITUDE	Double	Geographic X-coordinate specifying horizontal position.
ELLIPSOIDHEIGHT	Double	Height above or below the reference ellipsoid.
NORTHING	Double	State Plane Y-coordinate in US Survey Feet.
EASTING	Double	State Plane X-coordinate in US Survey Feet.
NAVD88HEIGHT	Double	Orthometric height in US Survey Feet.
DESCRIPTION	Text	Additional information or details pertaining to the control point.

6.5 Secure Hash Standard (SHA)

All final deliverables will have computed a fixed-length digital representation of the file using a Secure Hash Algorithm (SHA). The CONSULTANT is required to use SHA-1, and will provide a digital comma delimited text document containing the hash outputs on the final drive.

6.6 Media

All imagery will be delivered on portable USB or firewire drives that are labeled with:

- o Project Title;
- o Agreement Number;
- o Work Order Name;
- o Work Order Number;
- o CONSULTANT Name; and
- o Project Managers Names.

The CONSULTANT will document all data deliveries with an itemized transmittal letter.

The District will accept preliminary data deliverables for the purpose of quality assurance and quality control. Upon acceptance of the deliverables, one (1) drive capable of holding all deliverables will become the property of the District, and preliminary drives will be returned to the CONSULTANT.

7 ORTHOPHOTO PROJECT SCHEDULE

All final deliverables must be received within one hundred fifty (150) calendar days from the successful collection of aerial imagery. The CONSULTANT will submit a proposed project schedule and cost plan. The CONSULTANT will notify the District when aerial images have been collected. Orthophoto data may be delivered incrementally as completed. The District will have thirty (30) calendar days to inspect and accept each incremental delivery. All data and products generated for this project must be delivered to the District with project title, agreement number, work order name, work order number, CONSULTANT name, and project manager's names, in addition to fully complying with the standards identified in the preceding sections.

(THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.)

ATTACHMENT A – SEAGRASS MAPPING AREAS OF INTEREST

Refer to Figure 1 of RFP 1908 Districtwide Seagrass Mapping Project

ATTACHMENT B –PASSES/AREAS OF SPECIAL CONCERN

Refer to Figure 3 of RFP 1908 Districtwide Seagrass Mapping Project

ATTACHMENT C – DELIVERABLE SUMMARY TABLE

Copies	Description	Resolution (FT)	Datum (SPF - W)	Format
1	32 Bit Cells, District Tiles Red, Green, Blue, Near Infrared bands	1.0	NAD83/2011	GeoTIFF
1	32 Bit individual photo frames	1	NAD83/2011	GeoTIFF
2	Survey Report			Hardcopy (or PDF, electronically signed in compliance with 5J- 17 F.A.C.)
1	Survey Report			PDF
1	Metadata File for Cutline Feature Class, the DEM, and Project Wide Orthophotos			ArcGIS XML
1	Cutline Feature Class and Flight Line Feature Class		NAD83/2011	ArcGIS Feature Class
1	DEM for orthophoto generation		NAD83/2011	LAS 1.4
1	Secure Hash Algorithm Output File			Comma Delimited Text File

ATTACHMENT D – REQUIRED TIFF AND GEOTIFF TAGS AND KEYS AND SAMPLE VALUES

TIFF Tags Required				
Tag Name	Decimal	Hex	Type	Sample Value
ImageWidth	256	100	Short or Long	5000
ImageLength	257	101	Short or Long	5000
BitsPerSample	258	102	Short	8 8 8
Compression	259	103	Short	1
PhotometricInterpretation	262	106	Short	2
Orientation	274	112	Short	1
StripOffsets	273	111	Short or Long	8 510008 . . .
SamplesPerPixel	277	115	Short or Long	3
RowsPerStrip	278	116	Short or Long	34
StripByteCounts	279	117	Short or Long	510000 510000 . . .
ImageDescription	270	10E.H	ASCII	Southwest Florida Water Management District Digital Orthophoto
DocumentName	269	10D.H	ASCII	<Cell Number> <Zone> <State>
Tiff Tags Defined by GeoTIFF				
Tag Name	Decimal	Hex	Type	Sample Value
ModelPixelScaleTag	33550	830E	Double	1.0 1.0 0
ModelTiePointTag	33922	8482	Double	0 0 0 525000 188000 0
GeoAsciiParamsTag	34737	87B1	ASCII	Southwest Florida Water Management District One Foot Resolution <start flight date> - <end flight date> NAD 83/2011 (NSRS 2011) State Plane Florida West FIPS 0902 Feet
GeoKeyDirectoryTag	34735	87AF	ASCII	1 1 0 6 1024 0 1 0 1025 0 1 1 1026 34737 78 0 3072 0 1 26959 3073 34737 53 78 3076 0 1 9003
GeoKeys Defined by GeoTIFF				
Tag Name	Decimal	Hex	Type	Sample Value
GTModelTypeGeoKey	1024	400	Short	0
GTRasterTypeGeoKey	1025	401	Short	1
GTCitationGeoKey	1026	402	ASCII	Southwest Florida Water Management District One Foot Resolution <start flight date> - <end flight data>
ProjectedCSTypeGeoKey	3072	C00	Short	2882
PCSCitationGeoKey	3073	C01	ASCII	NAD 1983/2011 (NSRS 20112007) State Plane Florida West FIPS 0902 Feet
ProjLinearUnitsGeoKey	3076	C04	Short	9003

ATTACHMENT E – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES

PHOTOGRAMMETRIC MAPPING SERVICES

The following outline presents guidance and requirements for professional surveying and mapping in the process of photogrammetric mapping services for the Southwest Florida Water Management District (SWFWMD).

1. GEODETIC (HORIZONTAL AND VERTICAL) GROUND CONTROL SURVEYS

The Professional Surveyor and Mapper (PSM) will prepare a certified report of survey according to: FLORIDA ADMINISTRATIVE CODE, CHAPTER 5J-17, Standards of Practice applicable for this work. The report will include the following items:

- 1.1 DISTRICT Project Title, Agreement Number, TWA Name, TWA Number, CONSULTANT Name, and Project Managers Names
- 1.2 Name and address of corporation (certificate of authorization number)
- 1.3 Surveyor in responsible charge (contact information)
- 1.4 Abbreviations; data sources; etc.
- 1.5 Introduction, purpose, project objective, scope of work, results and conclusions
- 1.6 Describe equipment, hardware and software
- 1.7 Describe the accuracy standards and specifications, procedures and methodology for establishing ground control (including the quality control (QC) check points)
- 1.8 Describe and list the geodetic control (existing and newly-established), displaying the horizontal and vertical coordinates, datums used, geoid model and error estimates (95% confidence level)
- 1.9 Accuracy reporting will be according to FGDC geospatial accuracy standards:
 - 1.9.1 Report the horizontal and vertical (heights) accuracies (local and network) according to: FGDC STANDARDS FOR GEODETIC NETWORKS (FGDC-STD-007.2-1998)
 - 1.9.2 Report the accuracy analysis for the check point data in spreadsheet format according to: FGDC GEOSPATIAL POSITIONING ACCURACY STANDARDS, PART 3: NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- 1.10 List the field and office personnel
- 1.11 Date of field survey
- 1.12 Describing monumentation recovered and set
- 1.13 Professional surveyor and mapper certification will include the following: "THIS PHOTOGRAMMETRIC MAPPING GROUND CONTROL SURVEY IS CERTIFIED TO THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AS MEETING OR EXCEEDING, IN QUALITY AND PRECISION, THE STANDARDS APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE."
- 1.14 Existing geodetic control recovery/to-reach descriptions, sketches, field notes, photographs, etc.
- 1.15 Newly-established photogrammetric control location descriptions, sketches, field notes, photographs, etc.
- 1.16 Copies of Global Positioning System (GPS) data logs and a listing of GPS occupations

- 1.17 All GPS data observed and produced during the survey (digital format), including the raw observation data, processed baselines, loop closures and least squares adjustments (free and fixed)
- 1.18 Report will include a map overlay which will display the following items:
 - 1.18.1 GPS baseline network, indicate repeated measurements
 - 1.18.2 Existing horizontal and vertical geodetic control
 - 1.18.3 Newly-established photogrammetric control
 - 1.18.4 QC check points
 - 1.18.5 Base map features (SWFWMD boundaries, county boundaries, major roads, major hydrography/water bodies, township/range lines, cities)

2. AERIAL TRIANGULATION, DIGITAL ORTHOPHOTOGRAPHY AND LiDAR TOPOGRAPHIC MAPPING REPORT

The PSM will prepare a certified report of survey according to: FLORIDA ADMINISTRATIVE CODE, CHAPTER 5J-17. The report will contain the following items:

- 2.1 SWFWMD project title and reference number
- 2.2 Name and address of corporation (certificate of authorization number)
- 2.3 Surveyor in responsible charge (contact information)
- 2.4 Abbreviations, definitions; data sources; etc.
- 2.5 Introduction, purpose, objectives
- 2.6 Scope of work
- 2.7 Describe all equipment, software, etc.
- 2.8 Imaging sensor description and calibration report
- 2.9 Airborne GPS report
- 2.10 Aerial triangulation control coordinates and aerial triangulation blocks along with statistical summaries
- 2.11 Digital orthophoto image acquisition dates and logs
- 2.12 Digital orthophoto image production specifications
- 2.13 Digital elevation model acquisition (identify source and accuracy)
- 2.14 Digital orthophotography image accuracy analysis (photo id QC vs photogrammetric derived) according to: FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- 2.15 LiDAR data acquisition dates and logs
- 2.16 LiDAR sensor description and calibration report
- 2.17 LiDAR specifications and procedures
- 2.18 LiDAR QC accuracy analysis according to: FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- 2.19 List the field and office personnel
- 2.20 The following Professional surveyor and mapper certification:
 "THIS PHOTOGRAMMETRIC MAPPING DATA AND REPORT IS CERTIFIED TO SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AS MEETING OR EXCEEDING, IN QUALITY AND PRECISION, THE STANDARDS APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE."
- 2.21 FGDC Metadata in digital XML file format

- 2.22 Photogrammetric identification quality control point sketches, descriptions, photographs
- 2.23 Report will include a map overlay which will display the following items:
 - 2.23.1 Ground control
 - 2.23.2 Aerial triangulation blocks
 - 2.23.3 Digital ortho image cut lines and dates associated with the strips
 - 2.23.4 Digital ortho image tile limits and layout
 - 2.23.5 Digital orthophotography QC Check Point Locations
 - 2.23.6 LiDAR QC accuracy locations
 - 2.23.7 Base map features such as: USGS quad, SWFWMD boundaries, county boundaries, major roads, major hydrography/water bodies, township/range lines, basin boundaries, cities

(THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK)

AGREEMENT NO. _____

Exhibit "B"
Full Motion Video Specifications

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
Mapping and GIS Section

PROJECT TITLE: **FY 20__ Full Motion Video (W331/B017)**

AGREEMENT NO.:

CONSULTANT NAME:

PROJECT MANAGERS: _____, **District**
 _____, **Consultant**

REVISION HISTORY

Revision	Date	Description	Author
V1.0	11 July 2016	Original Document	Al Karlin
V1.1	29 July 2016	ESRI Comments included into document	Al Karlin, Jeff Liedtke (Ersi)

Full Motion Video Specifications

Contents

1	INTRODUCTION	3
2	GENERAL INFORMATION	3
	2.1 PROJECT AREA	3
	2.2 FILE NAMING CONVENTIONS	3
	2.3 PROJECT-LEVEL METADATA	3
	2.4 HORIZONTAL AND VERTICAL DATUM	4
	2.5 PHOTOGRAMMETRIC MAPPING SURVEY CONTROL	4
	2.6 PROJECT REPORTS	4
3	FULL MOTION VIDEO SPECIFICATIONS	5
	3.1 SENSOR/CAMERA SYSTEM	5
	3.2 ACQUISITION PLATFORMS	6
	3.3 APPROVED COMPRESSION TYPES	7
	3.4 CAPABILITIES OF THE FULL MOTION VIDEO APPLICATION	7
4	ACCURACY REQUIREMENTS	8
	4.1 HORIZONTAL ACCURACY STANDARDS	8
	4.2 TESTING HORIZONTAL ACCURACY	8
5	PROJECT MANAGEMENT AND REPORTING	9
	5.1 FILE FORMATS AND IMAGE TYPES	9
	5.2 MEDIA	9
	5.3 METADATA	10
	5.4 SURVEY REPORT	10
	ATTACHMENT A – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES	
	PHOTOGRAMMETRIC MAPPING SERVICES	11
	ATTACHMENT B – PHOTOGRAMMETRIC SYSTEMS CURRENTLY MEETING THE	
	ESRI DATA STANDARDS	14

1 INTRODUCTION

The Southwest Florida Water Management District occasionally uses digital videography to support regulatory, land management and acquisition, planning, engineering and habitat restoration projects. This document defines the technical specifications for developing a "Full Motion Video" (FMV) digital file for the District's video databases.

It is the intent of the District that FMV data be visualized in the ESRI-ArcGIS/ArcPro environment. Thus, the data collected must be compliant with the metadata specifications and guidelines as in the Motion Imagery Standards Board (MISB: <http://www.gwg.nga.mil/misb/>)

All final data will be stored in the District's database and will be made available to internal and external customers through client applications such as ArcGIS Desktop and ArcGIS-Pro. All data will be the property of the District and will be considered a public record as defined by applicable Florida Statutes.

2 GENERAL INFORMATION

2.1 PROJECT AREA

The typical SWFWMD aerial image or LiDAR project area is comprised of a collection of 5000' by 5000' foot cells that serve as the tiling scheme for aerial image data deliverables (<http://dor.myflorida.com/dor/property/gis>). As each tile represents almost a square mile of earth's surface, this area may be too large for video missions. Where applicable, an entire tile should be imaged. Where it is not feasible to image an entire tile for the project, the FMV area to be mapped should be specified by an ESRI Shapefile delimiting the area and be as rectangular as possible. The area to be mapped should represent a sub-area within one (or more) of the standard tiles. If the area to be mapped extends over multiple tiles, the project should be sub-divided into files corresponding to the tiling scheme.

2.2 FILE NAMING CONVENTIONS

The goal of the file naming convention is to represent the nature, fiscal year and geography of the file. As such, video files should be named as follows:

FMVYYYY_SPW.EXT

Where: *FMV* stands for Full Motion Video
 YYYY is the fiscal year
 SPW is the appropriate cell number value from the Project shapefile
 EXT is the appropriate extension for the file-type.

2.3 PROJECT-LEVEL METADATA

Project-level metadata must be delivered with each project. The Project-level metadata is independent of the FMV MISB Metadata. The intent of the Project-level metadata is to describe the project rather than the video data. Details of the equipment, flight conditions, flight date/times, etc. will be recorded in this file. As it is the intent to couple this file to the video, an Extensible Markup Language (.XML) template will be provided. The Project-level metadata will be supplied as both .XML and as an ASCII text-file compliant with FGDC Metadata Standards.

2.4 HORIZONTAL AND VERTICAL DATUM

Horizontal Datum will be referenced to the Florida State Plane Coordinate System, West Zone (0902), Units US Survey Feet, North American Datum of 1983 (2011) including the most recent NSRS adjustment.

Vertical Datum will be referenced to the North American Vertical Datum of 1988 (NAVD 88), Units US Survey Feet, using the most recent geoid model (ex. GEOID12B) to compute orthometric heights based on GPS derived ellipsoid heights.

2.5 PHOTOGRAMMETRIC MAPPING SURVEY CONTROL

The photogrammetric ground control must be adequate to support the accuracy specifications identified for this project. The Consultant will submit a survey report that documents and certifies the procedures and accuracies of the horizontal and vertical control, aircraft positioning systems and aerial triangulation utilized in the photogrammetric mapping project.

All newly-established horizontal and vertical control will be based on redundant, interconnected and direct ties to existing National Geodetic Survey (NGS) control stations, National Spatial Reference System (NSRS). The photogrammetric ground control network will meet or exceed the five (5) centimeter Local Network Accuracy Standard as set forth by the FGDC Geospatial Positioning Accuracy Standards, Part 2: Standards for Geodetic Networks

(<https://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part2>). The procedures used to establish vertical photogrammetric ground control using differential leveling will meet or exceed Third Order Vertical Control Accuracy Standards. The photogrammetric mapping Consultant will meet or exceed FEMA FLOOD HAZARD MAPPING PROGRAM, GUIDELINES AND SPECIFICATIONS FOR FLOOD HAZARD MAPPING PARTNERS, Appendix A, section A.5 Ground Control, and section A.6 Ground Surveys (<https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>).

The Consultant shall calibrate the Geoid model by performing GNSS occupations of existing NAVD88 NGS 1st and/or 2nd Order control stations throughout the project area.

The photogrammetric mapping Consultant will coordinate with District staff in planning procedures and methodology used for all horizontal and vertical control surveys.

2.6 PROJECT REPORTS

The consultant will prepare the following reports that document the project:

1. **Flight Reports and Logs:** These reports will be compiled daily during the data acquisition phase of the project. The reports will document where the data were captured and local, daily weather conditions.
2. **Survey Control Report:** This report will document any ground survey control and/or any ground accuracy check points used in the rectification of the video. If new monuments are used for the project, the survey report for those monuments will be governed by the Standards of Practice defined in Chapter 5J-17 of the Florida Administrative Code.
3. **A FMV Project Report:** This report documents the details of the project. IT should include any technical information regarding the cameras, sensors, aerial platforms and processing techniques used for the project. A project plan and budget information should also be included.

All reports will be delivered in Adobe Page Format Description (.PDF) format. Survey Reports may be signed/sealed by acceptable electronic methods or the raised seal must be visible on the .PDF page.

3 FULL MOTION VIDEO SPECIFICATIONS

Note: All work must be under the supervision of a Florida licensed Professional Surveyor and Mapper and in accordance with the Standards of Practice defined in Chapter 5J-17, Florida Administrative Code. When an Unmanned Aerial Vehicle (UAV) is to be used for a mission, the UAV and operator must conform to FAA Certification under Rule 107 and/or Section 333 of the Federal Aviation Authority Code.

3.1 SENSOR/CAMERA SYSTEM

All imagery will be collected using an approved digital video camera (DVC) capable of capturing HD video (1920 x 1080) with an option to record at 4K and reduced resolutions. The minimum capture rate is 30 frames per second (fps) at 4K, 60 or greater fps capture rates for 1920 x 1080 format video, and will be compliant with the H.264 codec.

The most common applications will require 3-band natural color (RGB) video imagery. Specialized applications may require 3-band color infrared (NIR, R, G or B), thermal infrared (e.g., FLIR) or other spectral bands comprising 3-band or single band video imagery.

The sensor/camera shall be synchronized to an on-board Global Satellite Positioning (GPS) system, an inertial measurement unit (IMU) including altimeter for flying height and compass for heading. In some systems, the required metadata may be captured by instruments integrated into the drone system. Other systems capture the required metadata independent of the drone. The District will accept systems that produce the required metadata either as part of the overall drone system that includes the drone platform, 3-axis gimbal, DVC sensor and associated telemetry, or sensor systems independent of the drone platform. However, preference will be given to those systems that either

- 1) Multiplex and encode the required metadata directly into the video stream, or,
- 2) Produce the required metadata synchronized with the video stream in a CSV (comma separated value) file.

The Camera/GPS/IMU System must be capable of producing non-destructive metadata and comply with MISB Standard MISB ST 0601.9.

The minimum videography metadata collected into a CSV file with the following field headings shall include:

From the GPS:

- UNIX Time Stamp: Coordinated Universal Time (UTC) represented in the number of microseconds elapsed since midnight (00:00:00), January 1, 1970. Derived from the POSIX IEEE 1003.1 standard. Resolution: 1 microsecond.
- Sensor Latitude: The latitudinal position of the sensor aboard the imaging platform. Based on WGS84 ellipsoid.
- Sensor Longitude: The longitudinal position of the sensor aboard the sensor platform. Based on WGS84 ellipsoid.
- Sensor Altitude: The height above or below mean sea level of the sensor aboard the sensor platform

From the IMU measuring platform orientation:

- Platform Heading: Sensor platform heading angle. Relative between longitudinal axis and True North measured in the horizontal plane.
- Platform Pitch: Sensor platform pitch angle determined by the rotation around the side-to-side axis of the collection platform, also described as nose up or nose down.
- Platform Roll: Sensor platform roll angle determined by the rotation around the front-to-back axis of the collection platform. This occurs when one airplane wing is higher or lower relative to the other wing.

From the IMU measuring sensor orientation when the sensor is mounted on a 3-axis gimbal:

- Sensor Relative Azimuth: Relative rotation angle of sensor to platform longitudinal axis. Rotation angle between platform longitudinal axis and camera pointing direction as seen from above the platform, in nano degrees.
- Sensor Relative Elevation: Relative Elevation Angle of sensor to platform longitudinal-transverse plane. Negative angles down, in nano degrees.
- Sensor Relative Roll: Relative roll angle of sensor to sensor platform. Twisting angle of camera about lens axis. Top of image is zero degrees. Positive angles are clockwise when looking from behind the camera.

From the Camera manufacturer, and sensor internal electronics:

- Horizontal FOV: Horizontal field of view of selected imaging sensor, in milli degrees. This value will vary according to zoom level of the sensor.

3.2 ACQUISITION PLATFORMS

Most District applications for FMV will make use of either Unmanned Aerial Vehicles (UAVs) or manned rotary winged (helicopter) vehicles. When employing UAV technology, the operators must operate in compliance with the Federal Aviation Authority Rule 107 and/or Section 333 of the FAA Code.

Both UAV and Manned aircraft shall support a 3-axis gimbal for mounting the sensor. The orientation parameters of the gimbal shall be recorded relative to the platform and synchronized with the platform metadata and video stream.

3.3 APPROVED COMPRESSION TYPES

The following compression types have been approved by the Motion Industry Standards Board; H.264, MPEG-2, and JPEG2000. The District prefers H.264 (MPEG-4 Part 10, Advanced Video Coding (MPEG-4 AVC)). Advantages include 8, 10, 12 bit depth, good quality-to-bit-rate ratio, motion compensation and ability for lossless macroblock representation mode allowing perfect representation of specific regions. It is easily convertible to other 8-bit video formats including MPEG-2, MPEG-4 Transport Stream and other stand video formats. Additional formats supported by ESRI Full Motion Video will be accepted. These include, but are not limited to: MPEG-2 Program Stream, MPEG-4, VOB and ESD.

3.4 CAPABILITIES OF THE FULL MOTION VIDEO APPLICATION

The FMV application shall provide the following capabilities:

- Integration with ArcGIS Desktop
- Work with Motion Imagery Standards Board (MISB) compliant video data
- A video player for display and analysis of live stream and archived video data
- Display the footprint of the video frame on the map display in ArcMap in a unique identifying color
- Display the metadata associated with the video data as the video plays
- DVR functionality to include:
 - o Play MISB and non-MISB compliant videos
 - o Fast forward and step forward
 - o Fast rewind and step backward
 - o Roam and zoom the video as it plays
 - o Interactively clip segments of a video and save as a separate file
- Capture individual video frames in the following formats:
 - o .jpg, .jp2000, .ntf, .png, .tif
- Capture groups of video frames to disk
- Create Powerpoint report from a captured video frame with one button click
- Create mosaic datasets from captured groups of video frames from live stream and archived videos.
 - o Includes mosaic dataset attributes, footprints, overviews and boundary
- Search through an archive of videos stored on disk, and identify specific segments within a video file based on geographic location, specific feature class and timeframe.
 - o Clip and save the video segments identified in the video search above to disk
- Create MISB-compliant videos from separate video and metadata files.
- Extract metadata from MISB-compliant videos
- Support live video streaming data from:
 - o UDP multicast address and port
 - o RTSP connection for a specified file on a server
 - o MJPEG over HTTP
- Live stream capabilities include the ability to:
 - o Record a live stream to disk
 - o Review the previous 30 seconds of video
 - o Save a video clip of the previous 30 seconds
 - o Create a Powerpoint report from a captured video frame
- Measure features in 2 dimensions in the video player and on the map

4 ACCURACY REQUIREMENTS

At the time of writing this document version, there are no specific American Society of Photogrammetry and Remote Sensing (ASPRS), National Standard for Spatial Data Accuracy (NSSDA), or Federal Geodetic Data Committee (FGDC) spatial accuracy standards for videography. While the ASPRS Positional Accuracy Standards for Digital Geospatial Data, 2014 (http://www.asprs.org/wp-content/uploads/2015/01/ASPRS_Positional_Accuracy_Standards_Edition1_Version100_November2014.pdf) replaces previous standards and addresses digital orthophotography and LiDAR technologies, there are no references for digital videography. However, as the SWFWMD anticipates using FMV data for areal and other spatial estimations, and some level of certification of accuracy is required, the District will use the ASPRS standards **as guidelines** for accuracy standards as modified below.

4.1 HORIZONTAL ACCURACY STANDARDS

This standard follows the ASPRS standards in defining horizontal accuracy classes in terms of Root Mean Square error (RMSe); RMSe_x (Easting) and RMSe_y (Northing). As the District anticipates the videography to have Ground Sample Distances (GSD) values between 5cm – 15 cm, a range of acceptable accuracies will be defined based on anticipated, nominal GSD:

Where X is the nominal GSD,
R is the radial RMSe:

RMSe_x and RMSe_y ≤ X
RMSe_r ≤ 1.414 * X
Horizontal Accuracy at the 95% confidence ≤ 2.448 * X

The District will accept that the nominal GSD = X +/- 1 and make appropriate adjustments for error estimations.

4.2 TESTING HORIZONTAL ACCURACY

The SWFWMD requires that the accuracy be “tested for” by using ground check points (photo identifiable) in the same manner as described by the NSSDA for traditional ortho-imagery. That is, there be at least 20 photo-identifiable locations that have been surveyed to an accuracy at least 3 times that of the expected accuracy (of the video imagery). The Root Mean Square (RMSe) error in both the Northing (Y) and Easting (X) directions be computed and the radial RMSe not to exceed a range of values at the 95% confidence level as indicated above.

5 PROJECT MANAGEMENT AND REPORTING

The Consultant will provide the following minimum project management and tracking reports:

Except where noted all reporting will be done on a bi-weekly basis. The reports via email will document the percent complete on the following minimum items:

- o Geodetic Control Survey;
- o Photo-ID Survey;
- o Image Acquisition Status – Daily Status Reports are Required;

- o Horizontal Accuracy Assessment; and
- o FMV/MISB Metadata Production Status.

5.1 FILE FORMATS AND IMAGE TYPES

The following compression types have been approved by the Motion Industry Standards Board; H.264, MPEG-2, and JPEG2000. The District prefers MPEG-2 as this compression is widely supported, and incurs a lower cost than the current alternatives. Additional formats supported by ESRI Full Motion Video will be accepted. These include, but are not limited to: MPEG-2 Program Stream, MPEG-4, VOB and ESD.

5.2 MEDIA

All imagery will be delivered on portable USB devices that are labeled with:

- o Project Title;
- o Agreement Number;
- o Work Order Name;
- o Work Order Number;
- o Consultant Name; and
- o Project Managers Names.

The Consultant will document all data deliveries with an itemized transmittal letter.

The District will accept preliminary data deliverables for the purpose of quality assurance and quality control. Upon acceptance of the deliverables, one (1) USB device capable of holding all deliverables will become the property of the District, and preliminary USB devices will be returned to the Consultant.

5.3 METADATA

The District recognizes that ESRI FMV 1.2 contains tools to construct “pseudo” MISB Metadata (Extract Metadata from Video and Extract Video Extent), however, the District requires the vendor to encode the MISB Metadata into the video as a final deliverable. Video streams that are not fully MISB and ESRI-FMV compliant will not be accepted.

5.4 SURVEY REPORT

The Consultant will prepare a survey report that documents all photogrammetric ground control, aircraft global positioning system, and photo identification (horizontal and vertical) check points utilized in the project. The survey report must also include an accuracy report and statement compliant with FGDC Geospatial Positioning Accuracy Standards, National Standard for Spatial Data Accuracy (NSSDA) and ASPRS Accuracy Class. The survey report must include a map delineating flight line locations and flight dates. This report must be compliant with relevant Standards of Practice defined in Chapter 5J-17, Florida Administrative Code and delivered in hardcopy and PDF formats.

The Consultant will deliver two (2) hardcopies of this report and one (1) PDF of the final survey reports on USB or DVD media containing the final deliverables. The survey report must include items outlined in ATTACHMENT A – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES.

The following supporting materials must be delivered with the survey report:

- Final deliverable file listing stating filename with extension and delivery date in the appendix of the survey report.
- Ground control layout map containing all check points, horizontal and vertical control.
- Digital copy of the final GPS least squares adjustment.
- Surveyed image checkpoints used for accuracy testing in an Excel spreadsheet with the photographs of the checkpoints as .JPG images with filenames that match the checkpoint PointID name. The fields in the Excel spreadsheet should be; ***PointID, Northing, Easting, NAVD88, and Description.***

(THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK)

ATTACHMENT A – SWFWMD SURVEYING AND MAPPING REPORT GUIDELINES PHOTOGRAMMETRIC MAPPING SERVICES

The following outline presents guidance and requirements for professional surveying and mapping in the process of photogrammetric mapping services for the Southwest Florida Water Management District (SWFWMD).

1. GEODETIC (HORIZONTAL AND VERTICAL) GROUND CONTROL SURVEYS

The Professional Surveyor and Mapper (PSM) will prepare a certified report of survey according to: FLORIDA ADMINISTRATIVE CODE, CHAPTER 5J-17, Standards of Practice applicable for this work. The report will include the following items:

- 1.1 DISTRICT Project Title, Purchase Order Number, TWA Name, TWA Number, CONSULTANT Name, and Project Managers Names
 - 1.2 Name and address of corporation (certificate of authorization number)
 - 1.3 Surveyor in responsible charge (contact information)
 - 1.4 Abbreviations; data sources; etc.
 - 1.5 Introduction, purpose, project objective, scope of work, results and conclusions
 - 1.6 Describe equipment, hardware and software
 - 1.7 Describe the accuracy standards and specifications, procedures and methodology for establishing ground control (including the quality control (QC) check points)
 - 1.8 Describe and list the geodetic control (existing and newly-established), displaying the horizontal and vertical coordinates, datums used, geoid model and error estimates (95% confidence level)
 - 1.9 Accuracy reporting will be according to FGDC geospatial accuracy standards:
 - 1.9.1 Report the horizontal and vertical (heights) accuracies (local and network) according to: FGDC STANDARDS FOR GEODETIC NETWORKS (FGDC-STD-007.2-1998)
 - 1.9.2 Report the accuracy analysis for the check point data in spreadsheet format according to: FGDC GEOSPATIAL POSITIONING ACCURACY STANDARDS, PART 3: NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
 - 1.10 List the field and office personnel
 - 1.11 Date of field survey
 - 1.12 Describing monumentation recovered and set
 - 1.13 Professional surveyor and mapper certification will include the following: "THIS PHOTOGRAMMETRIC MAPPING GROUND CONTROL SURVEY IS CERTIFIED TO THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AS MEETING OR EXCEEDING, IN QUALITY AND PRECISION, THE STANDARDS APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE."
 - 1.14 Existing geodetic control recovery/to-reach descriptions, sketches, field notes, photographs, etc.
 - 1.15 Newly-established photogrammetric control location descriptions, sketches, field notes, photographs, etc.
-
- 1.16 Copies of Global Positioning System (GPS) data logs and a listing of GPS occupations
 - 1.17 All GPS data observed and produced during the survey (digital format), including the raw observation data, processed baselines, loop closures and least squares adjustments

(free and fixed)

- 1.18 Report will include a map overlay which will display the following items:
 - 1.18.1 GPS baseline network, indicate repeated measurements
 - 1.18.2 Existing horizontal and vertical geodetic control
 - 1.18.3 Newly-established photogrammetric control
 - 1.18.4 QC check points
 - 1.18.5 Base map features (SWFWMD boundaries, county boundaries, major roads, major hydrography/water bodies, township/range lines, cities)

2. AERIAL TRIANGULATION, DIGITAL ORTHOPHOTOGRAPHY AND LiDAR TOPOGRAPHIC MAPPING REPORT

The PSM will prepare a certified report of survey according to: FLORIDA ADMINISTRATIVE CODE, CHAPTER 5J-17, Standards of Practice. The report will contain the following items:

- 2.1 SWFWMD project title and reference number
- 2.2 Name and address of corporation (certificate of authorization number)
- 2.3 Surveyor in responsible charge (contact information)
- 2.4 Abbreviations, definitions; data sources; etc.
- 2.5 Introduction, purpose, objectives
- 2.6 Scope of work
- 2.7 Describe all equipment, software, etc.
- 2.8 Imaging sensor description and calibration report
- 2.9 Airborne GPS report
- 2.10 Aerial triangulation control coordinates and aerial triangulation blocks along with statistical summaries
- 2.11 Digital orthophoto image acquisition dates and logs
- 2.12 Digital orthophoto image production specifications
- 2.13 Digital elevation model acquisition (identify source and accuracy)
- 2.14 Digital orthophotography image accuracy analysis (photo id QC vs photogrammetric derived) according to: FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- 2.15 LiDAR data acquisition dates and logs
- 2.16 LiDAR sensor description and calibration report
- 2.17 LiDAR specifications and procedures
- 2.18 LiDAR QC accuracy analysis according to: FGDC NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (FGDC-STD-007.3-1998)
- 2.19 List the field and office personnel
- 2.20 The following Professional surveyor and mapper certification "THIS PHOTOGRAMMETRIC MAPPING DATA AND REPORT IS CERTIFIED TO SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AS MEETING OR EXCEEDING, IN QUALITY AND PRECISION, THE STANDARDS APPLICABLE FOR THIS WORK, AS SET FORTH IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE."
- 2.21 FGDC Metadata in digital XML file format

- 2.22 Photogrammetric identification quality control point sketches, descriptions, photographs
- 2.23 Report will include a map overlay which will display the following items:
 - 2.23.1 Ground control
 - 2.23.2 Aerial triangulation blocks
 - 2.23.3 Digital ortho image cut lines and dates associated with the strips
 - 2.23.4 Digital ortho image tile limits and layout
 - 2.23.5 Digital orthophotography QC Check Point Locations
 - 2.23.6 LiDAR QC accuracy locations
 - 2.23.7 Base map features such as: USGS quad, SWFWMD boundaries, county boundaries, major roads, major hydrography/water bodies, township/range lines, basin boundaries, cities

(The remainder of this page intentionally left blank)

ATTACHMENT B – PHOTOGRAMMETRIC SYSTEMS CURRENTLY MEETING THE ESRI DATA STANDARDS

While the SWFWMD DOES NOT recommend or certify any hardware, aerial platforms or digital cameras for the capture of Full Motion Video, at this time, the District does recognize that the following equipment has the capability of meeting the Esri specifications for the FMV Extension.

Digital Video Cameras

- o GoPro Hero 4 Black (4K and less resolution at a minimum of fps of 30 (4K) or greater for smaller formats)
- o Sony FDR-AX33 (4K and less resolution at a minimum of fps of 30 (4K) or greater for smaller formats)
- o Sony FDR-X1000V (4K and less resolution at a minimum of fps of 30 (4K) or greater for smaller formats)
- o Olympus Stylus Tough TG-Tracker (4K and less resolution at a minimum of fps of 30 (4K) or greater for smaller formats)
- o VIRB XE and Elite (HD 1920 X 1080 at 30fps, digital stabilization)
- o Aeryon SR-EO/IR Imaging Payload (HD 1920 X 1080 at 30fps, integrated into Aeryon Scout or SkyRanger drones)

Drones

- o DJI Inspire 1 4K (includes 4K DVC, approx. 18 minutes of total flight time)
- o DJI Phantom 4 (includes 4K DVC, approx. 28 minutes of total flight time)
- o DJI S900 Hexacopter (18 min operation, sans DVC)
- o 3DR Solo Quadcopter (25min operation (20 min with payload), sans DVC, integrated for use with GoPro Black, Smart Shots synchronization of GPS, IMU and video stream including gimbal parameters, output to CSV file)
- o Aeryon SkyRanger (50 minutes of flight time with sensor payload. Integrated with sensor and outputs MISB-compliant metadata multiplexed in to the video stream)
- o Aeryon Scout (50 minutes of flight time with sensor payload. Integrated with sensor and outputs MISB-compliant metadata multiplexed in to the video stream)

Exhibit "C"
Guidelines and Specifications for the
Operation of
Unmanned Aircraft Systems (UAS)

Table of Contents

GLOSSARY OF TERMS	72
GENERAL USES FOR UNMANNED AIRCRAFT SYSTEMS (UAS)	73
UAS should be used for and when:	73
Good projects for UAS would include:	73
UAS should not be used for or when:	73
Poor projects for UAS would include:	73
GENERAL RISK FACTORS	74
GENERAL REQUIREMENTS	74
FAA Authorization	74
Part 107	74
Operational Limitations	74
Remote Pilot Certification	75
UAS Aircraft Requirements	76
Documentation	76
Site Review/Preparation	76
MAPPING REQUIREMENTS	76
UAS Type	76
Rotorcraft	76
Multi Rotors	77
Fixed Wing	77
Hybrid (VTOL)	77
Sensors	77
RGB Cameras	77
Multispectral Sensors	77
Thermal Sensors	78
LiDAR Sensors	78
Appendix A: Consultant UAS Operation Checklist	80

GLOSSARY OF TERMS

- Aircraft: any contrivance invented, used, or designed to navigate, or fly in, the air
- Airport: a landing area used regularly by aircraft for receiving or discharging passengers or cargo
- ATO: Air Traffic Organization
- ATC: Air Traffic Control
- Calibration: The science of determining and compensating for error in a Camera or Lens
- COA: Certificate of Waiver or Authorization (COA)
- FAA: Federal Aviation Administration
- Fixed Wing: Aircraft with one or more fixed wings with a motor forward of or behind the wings
- FLIR: Forward-Looking InfraRed (Camera)
- IMU: Inertial Measurement Unit
- INS: Inertial Navigation System
- Launch area: Open area, field, parking lot, or airport used, or intended to be used, for the launching of aircraft
- Landing area: Open area, field, parking lot, or airport used, or intended to be used, for the landing of aircraft
- LiPo: Lithium Polymer (battery type)
- Multi Rotor: Multi Rotor VTOL Aircraft. Usually with, 4, 6, or 8 rotors
- Operations Area: Geographic area where UAS mission will take place
- Part 107 (14 CFR): Federal Regulations governing use of UAS
- Remote Pilot: Pilot in Command as used in 14 CFR Part 107
- Rotorcraft: Single rotor Aircraft (Helicopter)
- Sectional Aeronautical Charts: Designed for visual navigation of slow to medium speed aircraft, these are to be used when submitting COA applications (or Waiver requests) and communicating operations area with the ATC and FAA
- SOP: Standard Operational Procedures
- UAS: Unmanned Aircraft System
- UAV: Unmanned Aerial Vehicle
- VO: Visual Observer
- VTOL: Vertical Take Off and Landing
- Waiver: Authorization beyond approved use under 14 CFR Part 107
- Sensors: Can Include, Multi Spectral or Thermal Cameras, or LiDAR, etc.
- Payload: Item or Items (sensors) carried by UAS

GENERAL USES FOR UNMANNED AIRCRAFT SYSTEMS (UAS)

Unmanned Aircraft Systems (UAS) are well suited for mapping small areas at very high resolution. In addition, UAS can be used for real time monitoring of events such as chemical or hazardous waste spills, breaches, flooding and so on.

UAS should be used for and when:

- Taking photographs or video to create a record in time.
- Creating planimetric and topographic maps (supporting a 1' or larger contour interval).
- Monitoring hazards.
- Small amounts of ground (<50 acres for rotary/ <1500 acres for fixed wing).
- Visual line of sight can be maintained.
- Operations can be conducted in Class G airspace under 400'.
- Operations in airspace other than Class G can be attained with FAA Approval (Waiver).

Good projects for UAS would include:

- Mapping of a site where the ground is clearly visible from the sky.
- Recording/documenting ground conditions at a development site.
- Monitoring small areas or projects over time.
- Recording/documenting water levels at difficult or hazardous to reach locations.
- Inspecting a structure for defects, cracks, or workmanship.
- Observing a lake-level gauge or staff gauge that is inaccessible resulting from storm water inundation.
- Assessing a site for ERP suitability.
- Assessing the use of equipment to treat (ex. mow) an area.
- Assessing the level of completion of a project site.
- Document the state/status of a development site.
- Emergency documentation following a storm event.
- Mapping Submerged Aquatic Vegetation (SAV).
- "Ground-truthing" seagrass imagery.
- Mapping invasive plant patches.
- Measuring vegetation changes on a site.
- Replacing existing Lidar surface data where land development has altered the terrain.
- Monitoring/measuring dirt piles.
- Mapping habitat or Florida Land Use Cover and Forms Classification System.
- Assisting with prescribed burns.
- Assessing condition of SWFWMD-owned Conservation Easements.

UAS should not be used for or when:

- Topographic mapping at very high accuracy (supporting contour intervals less than 1').
- Topographic mapping in areas where dense vegetation impedes a clear view of the ground.
- Covering large amounts of ground (greater than 5000 acres).
- When visual line of sight cannot be maintained.
- Where airspace approval has not been granted by the FAA.

Poor projects for UAS would include:

- Mapping sites with a significant amount of vegetation or ground cover.

- Mapping sites where airspace access is extremely complex.
- Mapping sites where the population is dense (ex. over people) or where local prohibitions are in effect.
- Mapping sites with rapidly changing weather conditions.
- Mapping sites where active construction is occurring.

GENERAL RISK FACTORS

Battery Ignition – Lithium Polymer (LiPo) batteries are the most common energy source for commercial-grade UASs. These batteries are known to generate large amounts of heat as they discharge. When not carefully monitored, the heat may build up resulting in ignition.

Weather Conditions – Weather conditions may be unpredictable or variable during a mission. What may start out as a calm day, may turn windy toward the end of the mission. Smaller, less stable UASs may not be able to maneuver through changing weather conditions resulting in unforeseen flight patterns, holding patterns and even crash-landings.

Land Cover Conditions – Most UASs are designed for flight over “urban-type” land covers, those where the major features are asphalt, low grass (manicured lawns), and/or water. The land covers typically of interest to the Southwest Florida Water Management District (SWFWMD) include, wetlands, overgrown fields, tall brush, and covers difficult for people to walk through. A “crash” in these habitats may result in unforeseen events (ex. brush fires, loss of vehicle, etc.)

Personal Privacy - While FAA Rule 107 specifically prohibits use of UASs over non-participating people, it provides waivers for UAS use in populated areas.

GENERAL REQUIREMENTS

In order for Consultants to operate UAS for SWFWMD projects, they must operate in compliance with FAA rules and regulations and Florida law. They must also meet the SWFWMD’s insurance requirements and operate under the guidelines in this document.

FAA Authorization

All UAS operations must follow FAA approved guidelines for operation. The FAA grants permission to operate UAS through two different means: Section 333 exemption and more recently its replacement Part 107. Since the Section 333 exemption is being phased out, this document will reference operations under Part 107. These requirements will be adjusted as Part 107 is modified.

Part 107

Operational Limitations

UAS operations under Part 107 must adhere to the operational limitations identified in the regulations, including, but not limited to:

- Unmanned aircraft must weigh less than 55 lbs. (25 kg).
- Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer.

- At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
- Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.
- Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.
- Must yield right of way to other aircraft.
- May use visual observer (VO) but not required.
- First-person view camera cannot satisfy “see-and-avoid” requirement but can be used as long as requirement is satisfied in other ways.
- Maximum groundspeed of 100 mph (87 knots).
- Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.
- Minimum weather visibility of 3 miles from control station.
- Operations in Class B, C, D and E airspace are allowed with the required Air Traffic Control (ATC) permission.
- Operations in Class G airspace are allowed without ATC permission.
- No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time.
- No operations from a moving aircraft.
- No operations from a moving vehicle unless the operation is over a sparsely populated area.
- No careless or reckless operations.
- No carriage of hazardous materials.
- Requires preflight inspection by the remote pilot in command.
- A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.
- Foreign-registered small unmanned aircraft are allowed to operate under Part 107 if they satisfy the requirements of Part 375.
- External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.

* The entire summary can be found here: https://www.faa.gov/uas/media/Part_107_Summary.pdf

Pursuant to Part 107, the Consultant may deviate from the Operational Limitations after obtaining a waiver from the FAA.

Remote Pilot Certification

Any person operating a small UAS must either hold a remote pilot certificate with a small UAS rating or be under the direct supervision of a person who does hold a remote pilot certificate (remote pilot in command). A remote pilot certificate must be on the person operating the small UAS at all times when UAS operations occur. A remote pilot must:

- Make available, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under Part 107.
- Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500.
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation.

- Ensure that the small unmanned aircraft complies with the existing registration requirements specified in 14 CFR 91.203(a)(2).

UAS Aircraft Requirements

The UAS must be registered with the FAA and the identification number must be affixed to the UAS in a location accessible to others. Prior to any mission the UAS must undergo pre-flight check to ensure the UAS is in condition for safe operation.

Documentation

SWFWMD requires the documents identified in Appendix A: Consultant UAS Operation Checklist, prior to commencement of any UAS operation.

Site Review/Preparation

The Consultants accessing SWFWMD lands must operate pursuant to Part 107 operational limitations and Florida law. Prior to any UAS operation, the Consultant must do the following:

- Review the physical characteristics of area in question for suitability in UAS operation.
- Review the surrounding airspace for suitability in operation.
- Acquire any necessary waivers and/or special use agreements for operations.
- Develop and provide a mission plan including proposed flight layout to SWFWMD for review.
- Obtain a Special Use Authorization, if necessary.

MAPPING REQUIREMENTS

Any mapping mission must be under the direct supervision of a Florida Licensed Surveyor or Professional Survey Mapper, pursuant to Chapter 472, Florida Statutes, and Chapter 5J-17, Florida Administrative Code. Each mission is unique and the accuracies desired and deliverables should be discussed prior to determining the appropriate UAS and sensor combination.

UAS Type

UAS types include Rotorcraft, Multi Rotors, Fixed Wings, and Hybrids (VTOL systems). Each has its unique characteristics, benefits and limitations. It is the Consultant's responsibility to determine and use the appropriate system given the mission type. Below is more detailed information on the typical capabilities of each type of UAS.

Rotorcraft

Rotorcraft (helicopters) are best used for operations where hover capabilities are required such as inspection of utility poles, cell towers and or powerlines. Due to their hover capabilities and ability to carry larger payloads they are also well suited for LiDAR acquisition. However, rotorcraft consume a lot of power and as a result are only suitable for mapping smaller areas < 50 acres.

Multi Rotors

Multi Rotors are by far the most popular systems. These have similar maneuvering capabilities of Rotorcraft and are suited for similar use. However, Multi Rotors are much less expensive and easier to operate. Typically, they fly for approximately 20 to 26 minutes per battery and as a result are best suited for mapping smaller areas < 50 acres.

Fixed Wing

Fixed wing UAS are best suited for mapping larger areas up to 1500 acres. They are typically battery operated and fly up to 40 minutes per charge. Fixed wing UAS can be limited by the requirements for launch and landing areas.

Hybrid (VTOL)

Hybrid systems have the VTOL capabilities of Rotorcraft allowing them to launch and land within a small footprint, but transition to fixed wing flight midair allowing them to cover larger areas similar to fixed wing UAS. Typically, they fly for 40 minutes and can map areas up to 400 acres per battery.

Sensors

UAS offer the ability to fly much lower than conventional aircraft, and in some cases, have hot swappable sensors. Sensors range from RGB cameras to Multispectral sensors containing red, green and blue (RGB) and Near IR bands, and LiDAR. For mapping purposes, the UAS must be able to geotag the imagery being captured either through post processing from the UAS to the images or directly within the camera being used to acquire the imagery. LiDAR requires an Inertial Measurement Unit (IMU) of a quality and accuracy to support desired mapping accuracy.

RGB Cameras

RGB cameras often serve a dual purpose in UAS providing still imagery and video. The SWFWMD requires the camera to be a minimum of 20 megapixels and support 4k video. RGB cameras should be of a quality to suitably produce mapping deliverables at the scale desired. GoPro (or fish eye) lens cameras should not be considered. RGB cameras, while not metric should go through some form of calibration prior to creation of deliverables. This calibration report must accompany final deliverables. Note: This is not necessary when being used for video capture.

Multispectral Sensors

Multispectral sensors can be used to determine plant health, moisture content, and determine drainage/water run-off. There are many systems available. Consultants should provide specific information about their systems and particular benefits for the SWFWMD to determine their appropriate use on a given task. Multispectral sensors typically have a calibration target captured at the beginning and end of each mission to validate data.

Thermal Sensors

The use of Thermal Sensors (FLIR) may be required. FLIR sensors capture heat signatures with still and/or video imagery. Since these are extremely effective at night, the UAS operator must have a waiver of authorization to operate beyond daylight hours.

LiDAR Sensors

LiDAR sensors in combination with their IMU/INS should be able to produce deliverables meeting USGS LiDAR Base Specifications for QL 2 Lidar which can be found here <https://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf>. LiDAR systems should be bore-sighted and/or calibrated prior to processing deliverables. This report must accompany final deliverables.

(REMAINDER OF THIS PAGE IS INTENTIONALLY BLANK)

Appendix A: Consultant UAS Operation Checklist

The SWFWMD requires its Consultants to provide the following items prior to any UAS operation.

	UAS FAA registration and Photo of UAV showing tail number or serial number
	Proof of UAS Insurance
	FAA Remote Pilot Certificate of Pilot in Command
	Remote Pilot in Command Driver's License
	An Operations Manual which includes: • Standard Operating Procedures • Operating Instructions for UAS being employed • Safety Mitigation Plan • Pilot Log Sheet(s) (To be provided after mission is complete) • Maintenance Log(s)
	Mission Specific Plan of Operation
	FAA Approved Waivers (as needed)
	SWFWMD Task Work Assignment (executed)
	SWFWMD Special Use Authorization (as needed)

AGREEMENT NO. _____

Exhibit "D"

FEE SCHEDULE

[illegible]

EXHIBIT "E"
Key Team Members

NAME OF KEY PERSONNEL	POSITION TITLE	JOB CLASSIFICATION
-----------------------	----------------	--------------------

Section One – Imagery Acquisition

Name of Primary Firm

Jonathon Doe	Senior Ecologist/Principal	Project Management Professional 10
James Doe	Managing Engineer	Project Management Professional 7
Joseph Doe	Project Engineer	Project Management Professional 2

APPROVED SUBCONTRACTORS

Name of Subcontractor

Robert Jones	General Manager	Project Management Professional 8
Rick Jones	Professional Engineer	Engineer 3
Roger Jones	Data Modeler	Data Modeler 2

Section Two – Imagery Acquisition

Name of Primary Firm

Jonathon Doe	Senior Ecologist/Principal	Project Management Professional 10
James Doe	Managing Engineer	Project Management Professional 7
Joseph Doe	Project Engineer	Project Management Professional 2

APPROVED SUBCONTRACTORS

Name of Subcontractor

Robert Jones	General Manager	Project Management Professional 8
Rick Jones	Professional Engineer	Engineer 3
Roger Jones	Data Modeler	Data Modeler 2

Section Three – Field Work

Name of Primary Firm

Jonathon Doe	Senior Ecologist/Principal	Project Management Professional 10
James Doe	Managing Engineer	Project Management Professional 7
Joseph Doe	Project Engineer	Project Management Professional 2

APPROVED SUBCONTRACTORS

Name of Subcontractor

Robert Jones	General Manager	Project Management Professional 8
Rick Jones	Professional Engineer	Engineer 3
Roger Jones	Data Modeler	Data Modeler 2

EXHIBIT "F"
DELIVERABLE ACCEPTANCE AND PERFORMANCE EVALUATION

- A. DELIVERABLE ACCEPTANCE DETERMINATION. PROJECT deliverables are outlined in the DISTRICT'S Agreement. The DISTRICT'S Project Manager shall evaluate the CONSULTANT'S deliverables and determine if the deliverables are acceptable. Deliverables shall only be accepted when they are in compliance with the Agreement and approved by the DISTRICT'S Project Manager at the pre-submittal meeting. Deliverables that are not acceptable shall be returned to the CONSULTANT to address deficiencies. If an acceptable deliverable cannot be provided within an identified time frame, other action shall be taken as deemed necessary by the Project Manager including suspension as specified in Paragraph 5, or Agreement termination as specified in Paragraphs 13 and 14 of the Agreement.
- B. PERFORMANCE EVALUATION. The DISTRICT shall evaluate the CONSULTANT'S performance throughout the Agreement in four performance categories: Performance Schedule, Communications, Staff Assignments and Technical Quality, and Project Management. Performance evaluation ratings of Exceptional, Very Good, Satisfactory, Marginal and Unsatisfactory shall be assigned to the CONSULTANT for each performance category at the completion of the Agreement. Each invoice submission must include an Agreement progress report with the CONSULTANT'S Project Manager's assessment of the PROJECT'S actual progress as compared to the approved performance schedule. Details must include any deficiencies and the recovery actions completed and planned.

The performance evaluations shall be furnished to the CONSULTANT. A Marginal or Unsatisfactory rating in any of the areas may result in re-evaluation of eligibility for future assignments, and termination of this Agreement.

The performance evaluation criteria are broadly defined as follows:

1. Performance Schedules - The CONSULTANT is expected to adhere to the performance schedule negotiated in the Agreement.
2. Communications - The CONSULTANT'S Project Manager is expected to respond in a timely manner to inquiries and requests made by the DISTRICT'S Project Manager, and is expected to set aside time for review and discussion of deliverables. The parties should engage in free and open discussion of PROJECT issues to insure expeditious resolution of such issues.
3. Staff Assignments and Technical Quality - Team members presented in the CONSULTANT'S response to the DISTRICT'S solicitation 1908 are expected to be utilized in such a manner as to result in efficient workflow, quality deliverables and on-time performance. Reassignments should be minimal and positively influence performance. Staffing adjustments to address turnovers or performance deficiencies are to be handled expeditiously, maintaining on-time performance. Replacement of team members is subject to the terms and conditions of this Agreement.
4. Project Management - An Agreement that is completed on time, within budget, and with consistently acceptable deliverables is demonstration of a well-managed project.

**ATTACHMENT 2
PUBLIC ENTITY CRIMES STATEMENT
FOR
DISTRICTWIDE SEAGRASS MAPPING PROJECT
RFP 1908**

**Sworn Statement Under Section 287.133(3)(a),
Florida Statutes, on Public Entity Crimes**

This Statement must be signed in the presence of a Notary Public or other officer authorized to administer oaths:

1. This sworn statement is submitted to Southwest Florida Water Management District by

(print individual's name and title)

for

(print name of entity submitting sworn statement)

Whose business address is

and (if applicable) its Federal Employer Identification Number (FEIN) is _____
_(if the entity has no FEIN, include the Social Security number of the individual signing this sworn statement):

2. I understand that a "public entity crime" as defined in Section 287, 133(l)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
3. I understand that "convicted" or "conviction" as defined in Section 287. 133(l)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that an "affiliate" as defined in Section 287. 1 33(l)(a), Florida Statutes, means:
- a. A predecessor or successor of a person convicted of a public entity crime; or
 - b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.
5. I understand that "person" as defined in Section 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.
6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. [indicate which statement applies]
- ☐ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives; partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity, has been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- ☐ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members or agents who are active in the management of the entity, or an affiliate of the entity, has been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- ☐ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity, has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. [attach a copy of the final order]

I understand that the submission of this form to the contracting officer for the public entity identified in paragraph (1) above is for the public entity only and, that this form is valid through December 31 of the calendar year in which it is filed. I also understand that I am required to inform the public entity prior to entering into a contract in excess of the threshold amount provided in Section 287.017, Florida Statutes for CATEGORY TWO of any change in the information contained in this form.

CONTRACTOR: _____
(Signature) Date

STATE OF FLORIDA COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of _____,
201__ by _____ as _____
of _____, a _____ corporation,
on behalf of the corporation. He/she is personally known to me or has produced
_____ as identification.

Name typed/printed: _____

Notary Public, State of Florida Commission No: _____

My Notary Commission Seal:

ATTACHMENT 3
CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS
FOR
RFP 1908 - SEAGRASS MAPPING PROJECT

The Respondent certifies that it will or will continue to provide a drug-free workplace by:

1. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Respondent's workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Establishing an ongoing drug-free awareness program to inform employees about:
 - 2.1 The dangers of drug abuse in the workplace.
 - 2.2 The Respondent's policy of maintaining a drug-free workplace.
 - 2.3 Any available drug counseling, rehabilitation, and employee assistance programs.
 - 2.4 The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
3. Making it a requirement that each employee to be engaged in the performance of the work be given a copy of the statement required by paragraph 1.
4. Notifying the employee in the statement required by paragraph 1 that, as a condition of employment under the proposal, the employee will:
 - 4.1 Abide by the terms of the statement.
 - 4.2 Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.
5. Notifying the District in writing, within ten calendar days after receiving notice under subparagraph 4.2 from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every Federal agency on whose activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant.
6. Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph 4.2, with respect to any employee who is so convicted:
 - 6.1 Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended.
 - 6.2 Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

7. Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs 1 through 6 above.

The Respondent may insert in the space provided below the site(s) for the performance of work done in connection with this specific proposal:

Place of Performance (Street address, city, county, state, zip code)

Company:

By:

Signature of Authorized Representative Date

Figure 1. Seagrass Mapping Areas of Interest

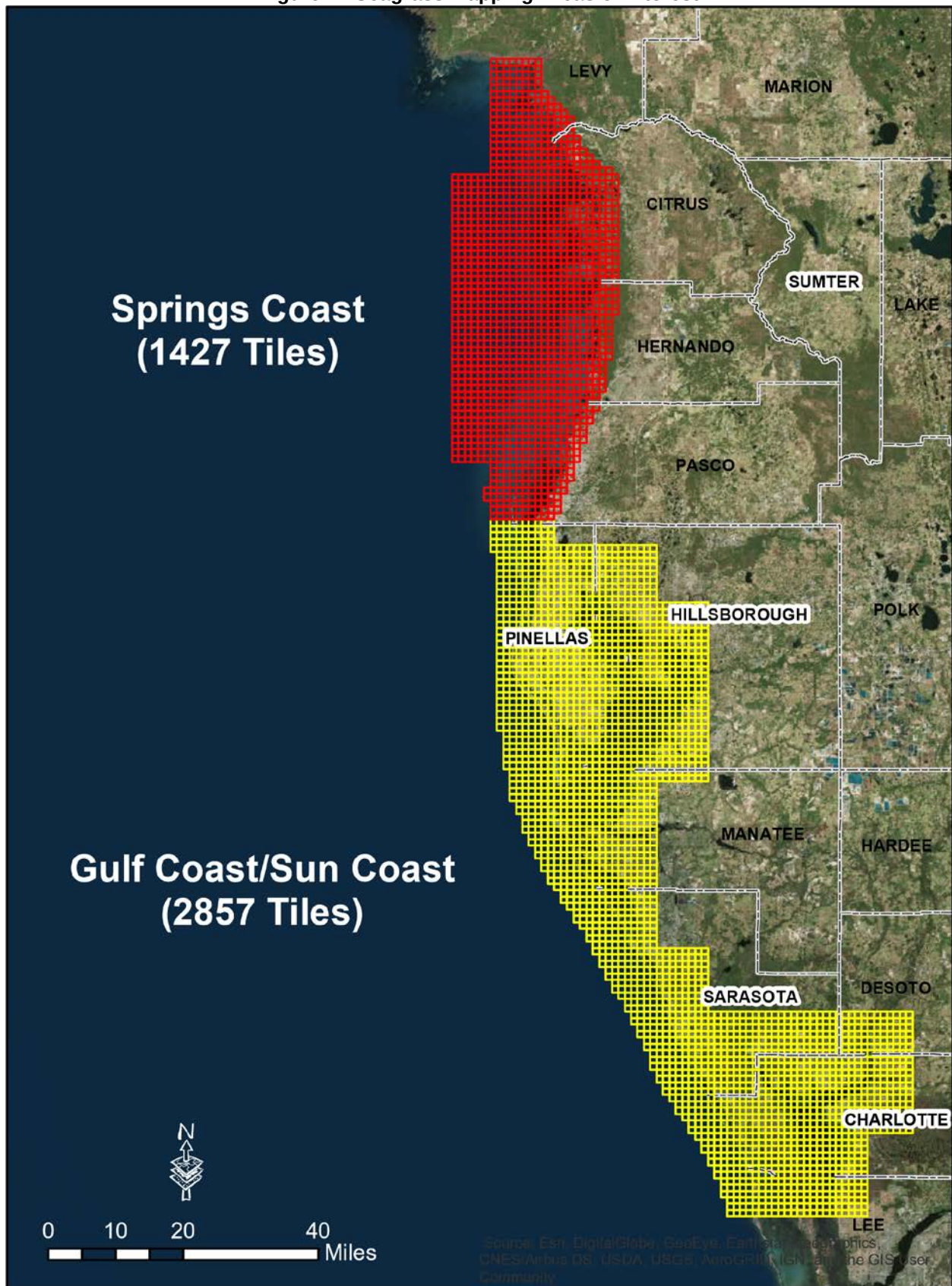


Figure 2. Estuaries of the Springs Coast and Suncoast

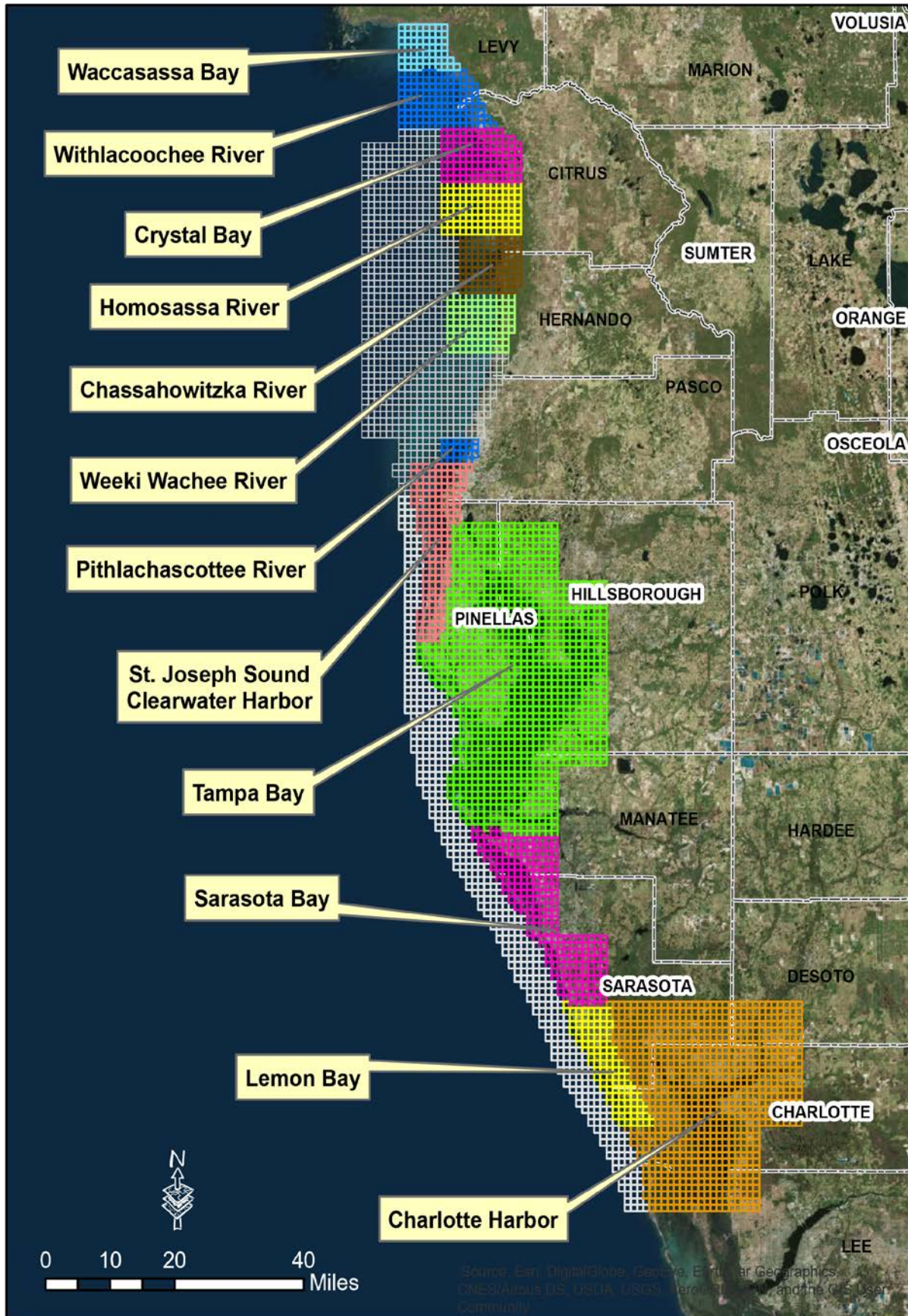


Figure 3. Passes/Areas of Special Concern

