



**THIS IS NOT  
AN ORDER**

**REQUEST FOR BIDS/PROPOSALS COVERSHEET**  
**THE UNIVERSITY OF SOUTHERN MISSISSIPPI**  
**Procurement and Contract Services**  
**118 College Drive #5003, Hattiesburg, Mississippi 39406-0001**

**Date:** June 3, 2024

**BID No. 24-34**

THE UNIVERSITY OF SOUTHERN MISSISSIPPI is considering the purchase of the following item(s). We ask that you submit your bid and retain one copy for your files. Right is reserved to accept or reject any part of your bid. Your quotation will be given consideration if received in Bond Hall, Room 214 on or before:

2:00 p.m. CT

June 18, 2024

**Buyer:** Amber Floyd

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

TERMS - Bidder should state terms of sale. Our terms are 2% ten days, net 45 days.

These terms will apply per Mississippi law.

AWARDING CONTRACT - Cash terms will not be used as a basis for awarding contracts; however, the University will accept cash discounts when earned.

**NOTE: If you cannot quote on the exact material shown, please indicate any exception giving brand name and complete specifications of any alternate. If additional space is required, use a separate sheet or letter of transmittal.**

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL NET PRICE
		<b>BID 24-34 Uncrewed Aerial System</b>  <b>RFx # 3160006637</b>		
		<small>PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. RFP NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.</small>		

We quote you as above - F.O.B. The University of Southern Mississippi.  
Shipment can be made in \_\_\_\_\_ days from receipt of order. DATE \_\_\_\_\_  
Return quotation to Procurement Services at above address.

**Signature Required** \_\_\_\_\_



## Specifications of an Uncrewed Aerial System (UAS)

### I. Background

The University of Southern Mississippi requires an Uncrewed Aerial System (UAS) system and accompanying software to conduct research in elevation, terrain and shoreline mapping, coastal flooding, land cover, and disaster monitoring.

### II. Purpose

The purpose of the UAV system is to collect geospatially referenced, high resolution imagery that, when appropriately processed, can produce georeferenced digital orthophoto mosaic and LiDAR datasets. From these, it will be possible to resolve precise and accurate elevation, shoreline identification, land cover makeup and change, thus leading to accurate elevation, shoreline, and land cover modeling.

### III. General Performance Specifications

The UAS system must be capable of extended flight times (~45 minutes or greater), beyond visual line of sight (BVLOS) and capture of still and video imagery and LiDAR. Preference will be given to systems with higher resolution cameras and LiDAR, superior positioning, ease of use, and ability to take off and land in confined areas (i.e. ~5 m x 5 m). Responses should include a table indicating the tradeoff between flying height, resolution and overall area mapped.

### IV. UAS Specific requirements

**1. Vehicle Type:** In order to match the flight time, takeoff and landing area requirements we expect that the airframe will be a fixed wing vertical takeoff and landing (VTOL) style uncrewed system. It must have the following capabilities:

- a. Be Defense Innovation Unit Blue UAS approved, NDAA compliant, and remote ID ready
- b. Be capable of being operated by a single operator.
- c. Be capable of both direct operation / radio control flight and pre-planned automated flight, including the ability to plan flight missions independently of the vehicle, and then upload them to the vehicle's flight controller.

- d. Return to home / return to operator override function and failsafe in the event of loss of communication and/or low battery. The vehicle must return home when battery level is critical.
- e. The vehicle must be able to withstand continued operation deployed in a marine setting (e.g. minor salt spray and sand exposure).
- f. Maintain safe operation under moderate (25 mph) wind conditions (typical in marine environments).
- g. Log all telemetry data on the vehicle in a documented format that can be ingested and read by other computer software.
- h. Ability to achieve Precise Point Kinematic (PPK)

**2. Payloads (Camera / LiDAR):** There must be an assortment of camera and LiDAR payloads capable of being mounted on the vehicle to fulfill the intended purpose of the UAS. The cameras must be sensitive to visible and near-infrared light (RGB, NRGB), able to be mounted to acquire nadir or nearly nadir images for use in automatic photogrammetry software for the creation of digital orthophoto mosaics, terrain models at high resolution in both terrestrial and marine environments while maximizing coverage area (wide Field of View, FOV) and minimizing solar hotspots in the imagery (narrow FOV). These camera systems will ideally be upgradable and replaceable and be able to generally perform the following.

- a. Geotagging of image locations such that they will be ready to be processed by photogrammetry software.
- b. Sufficient vibration reduction to obtain a clear image, free of distortions such as rolling shutter effects even at speed, particularly in overcast conditions (lower light than full sun which is frequent in marine environments).

The following minimum specifications shall ensure that the camera and LiDAR systems perform the tasks necessary to satisfy USM’s project objectives.

**a. Ultra-high resolution wide FOV RGB camera (1)**

General Specifications	
RGB Camera System	Description/Value
Sensor Type	Full frame
Number of spectral bands	3 (Red, Green, Blue)
Field of view	> 50°
Ground sampling distance	< 1 cm
Megapixel	> 50
Max coverage @ 400 ft. AGL	> 300 ha

**b. High resolution narrow FOV RGB camera (2)**

General Specifications
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<b>RGB Camera System</b>	<b>Description/Value</b>
Sensor Type	Full frame
Number of spectral bands	3 (Red, Green, Blue)
Field of view	< 50°
Ground sampling distance	< 1 cm
Megapixel	> 40
Max coverage @ 400 ft. AGL	> 200 ha

**c. High resolution Near-infrared camera (3)**

<b>General Specifications</b>	
<b>Near-infrared Camera System</b>	<b>Description/Value</b>
Sensor Type	Multi-band
Number of spectral bands	6 (Red, Green, Blue, Rededge, Near-infrared, panchromatic)
Field of view	< 50°
Ground sampling distance	≤ 2 cm
Max coverage @ 400 ft. AGL	> 150 ha

**d. LiDAR sensor (4)**

<b>General Specifications</b>	
<b>LiDAR Camera System</b>	<b>Description/Value</b>
Sensor Type	Scanner
Wavelength	Near-infrared (~905 nm)
Field of view (horizontal)	90° or higher
Field of view (vertical)	40° or higher
Range	> 250 m (with minimum of 80 m 10% reflectivity)
Return mode	≥ 3
Point density @ 145 ft. AGL	> 100 pt/m <sup>2</sup>
IMU	Yes

- 3. Base Station and Communication:** As mentioned above, the system must be capable of both direct operation and pre-planned automated flight. Other required aspects of the communication include:
- a. Ideally the base station software can be used with a variety of platforms and operating systems (e.g. Windows desktop, Android, iOS). Responses should include the platform and operating system requirements for the base station software.
  - b. The base station must report the following telemetry information during operation of the vehicle.
    - Remaining battery life
    - Vehicle speed (ground and air)
    - Vehicle position (including an accuracy and precision estimate)
    - Vehicle altitude

- Vehicle heading
  - Flight operation mode
  - Next waypoint (if in automatic mode).
- c. An operating range of 15 miles.
  - d. The base station should log all telemetry information and be capable of log display in the case of signal failure.
  - e. The user should be able to specify whether the UAV will continue automated flight or return home in the event of signal loss.
4. **Batteries:** The vendor response should include the cost of additional batteries and battery charge time. Batteries for the vehicle must meet the following requirements:
    - a. Have sufficient capacity to power the vehicle for at least 1 hour of operation.
    - b. Must be user replaceable (preference will be given to non-proprietary batteries)
    - c. Charged with a vendor supplied charging device.
  5. **GNSS System:** The vendor response should include the estimated accuracy of the GNSS image geotags for the sensor. We desire the option to purchase a PPK or RTK system. Responses should include the cost of these options as separate line items.
  6. **Storage/Transportation.** The UAV and all its components should be able to be stored securely and checked on an airplane as luggage.

## V. **LiDAR Processing and Viewing Software Requirements**

LiDAR processing software shall provide features to post-process, report, and host data collected through UAS LiDAR acquisition. This includes classification of point clouds, trajectory processing, raw data conversions, colorization, QAQC reporting, and online data hosting and viewing.

### 1. **WARRANTY**

Bidder shall submit a copy of the written warranty. The University is requesting a minimum 1-year warranty period, including parts, travel and labor.

### 2. **TRAINING**

The vendor should include in the response as a separate line item training on the operation, software, maintenance, and troubleshooting of the UAV (in person or virtual).

### 3. **COPIES**

At least one (1) signed original copy of the bid response **MUST** be provided. The University **requires** a portable electronic virus/malware free copy (thumb drive) of the bid response from the responding Vendor to be included in the bid response package. If an electronic copy is not

included, the University reserves the right to request an electronic copy of the **exact** bid response prior to review of the bid.

## **8. MANDATORY LEGAL PROVISIONS**

- Any provisions disclaiming implied warranties **shall** be null and void. See Mississippi Code Annotated Sections 11-7-18 and 75-2-719(4). The Vendor **shall** not disclaim the implied warranties of merchantability and fitness for a particular purpose.
- The Vendor **shall** have no limitation on liability for claims related to the following items:
  - Infringement issues;
  - Bodily injury;
  - Death;
  - Physical damage to tangible personal and/or real property; and/or
  - The intentional and willful misconduct or negligent acts of the Vendor and/or Vendor's employees or subcontractors.
- All requirements that the University pay interest (other than in connection with lease purchase contracts not exceeding five years) are deleted.
- Should any of the terms and conditions in the purchase contract be in conflict with the laws of the State of Mississippi, the laws of the State of Mississippi **shall** supersede and govern. A revision of the terms and conditions will be required to ensure compliance with Mississippi state law.
- The University **shall** not pay any attorney's fees, prejudgment interest or the cost of legal action to or for the Vendor.

## **9. PAYMENT**

The currency used for payment of costs will be in United States dollars. State law requires that the University receive an **original invoice** from the Vendor and that payment of the invoice is processed **within 45 days of receipt** (Miss Code 31-7-305). The invoice should be on the Vendor's letterhead and/or include an original Vendor representative signature.

## **10. PRE-PAYMENTS WITH PRO-RATE REFUND**

State law (Section 31-7-305 of the Mississippi Code Ann.) authorizes the issuance of payment after receipt of the invoice and receipt, inspection, and approval of the goods and/or services. The intent is that goods and services must be received, inspected, and accepted prior to payment. Pursuant to this requirement, where pre-payment has been authorized, all pre-payment contracts will require the following statement in the Termination section: "Upon termination of this Agreement by Licensee or by Licensor, Licensor shall issue Licensee a refund of a proportionate share (based on the number of days in the term year before and after the termination) of the Annual Fees paid with respect to that term year."

## **11. USM TERMS AND CONDITIONS**

The winning Vendor agrees to be bound by the USM Terms and Conditions, which are incorporated herein, and may be found at <https://www.usm.edu/procurement-contractservices/usm-terms-and-conditions>.

## **12. DELIVERY**

Quote the lead time required for delivery of the quoted equipment. Quoted prices should be F.O.B. Destination Freight Allowed.

- The University of Southern Mississippi reserves the right to reject any and all bids.
- The University of Southern Mississippi reserves the right to accept or reject optional line items included in the bid response.