



COMMONWEALTH OF VIRGINIA  
STANDARD CONTRACT

Contract No. UCPJMU6827

This contract entered into this 21<sup>st</sup> day of February, 2024, by Bridgewater Educational Consulting, hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From February 21, 2024 through February 20, 2025 with four (4) one-year renewal options.

The contract documents shall consist of:

- (1) This signed form;
- (2) The following portions of the Request for Proposal RFP FDC-1189 dated October 2, 2023
  - (a) The Statement of Needs,
  - (b) The General Terms and Conditions,
  - (c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions;
  - (d) Addendum No. One October 24, 2023
- (3) The Contractor's Proposal dated November 2, 2023 and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
  - (a) Negotiations Summary, dated January 18, 2024

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:

By: Elizabeth A. Day  
(Signature)

Elizabeth A. Day  
(Printed Name)

Title: Owner / Manager

PURCHASING AGENCY:

By: [Signature]  
(Signature)

Doug Chester  
(Printed Name)

Title: Buyer Senior

**RFP # FDC-1189 Sponsored Programs Evaluation Services  
Negotiation Summary for BridgeWater Education Consulting, LLC**

**January 18, 2024**

1. Parties agree that this Negotiation Summary modifies RFP# FDC-1189 and the Contractor's initial response to RFP# FDC-1189, and in the event of conflict this negotiation summary shall take precedence.
2. Contractor's pricing schedule for the Purchasing Agency is as follows:

<b>Roles</b>	<b>Hourly Rate*</b>
Elizabeth A. Day	\$110.00
Janice O. Easton	\$90.00
Mary D. Rush	\$30.00

\*Hourly rates are in effect for any location where work for this contract is conducted.

3. BridgeWater Education Consulting, LLC and JMU will engage in discussions regarding projects as the need arises. Both parties will collaboratively establish a clear scope of work, and a consensus will be reached on the applicable hourly rate(s) and reimbursable expenses for the project as may be mutually agreed upon in advance. The Contractor shall not be reimbursed for, nor will James Madison University purchase, any operational needs or expenses of the Contractor, which includes, but is not limited to, office supplies and equipment, computers and accessories, and office furniture.
4. Billable hours shall be for actual work hours on authorized projects/tasks rounded to the quarter hour. Contractor shall not bill or be compensated for travel time.
5. Should travel be required during the term of this contract, all travel Contractor billing for travel related expenses must invoice in accordance with the U. S. General Services Administration (GSA) for lodging, meals and incidental expenses at the time of travel, which can be referenced at: <http://www.jmu.edu/finprocedures/4000/4215mie.shtml>.

Transportation for air travel and car rental will be paid at cost with Contractor providing a documented receipt to the University. Contractor shall book air travel and car rental to ensure expenses remain economical. Air fare shall be reimbursed for coach/standard with no upgrades and car rental shall be reimbursed for standard with no upgrades.

6. Contractor shall provide detailed invoicing to include project title, number of hours worked onsite and/or offsite, role of individual(s) performing the work, and specific tasks performed.
7. The University may also request that these services be provided as a fixed-fee project, as would be mutually agreed to prior to services being rendered, with deliverables billed upon completion of milestones.
8. The Purchasing Agency reserves the right to reject any assigned personnel at any time with or without cause. Contractor shall provide a suitable replacement within a timely manner.
9. Contractor has disclosed all potential fees. Additional charges will not be accepted.

# **BridgeWater Education Consulting, LLC**

**Response to James Madison University's  
Request for Proposal for Sponsored  
Programs Evaluation Services**

**RFP# FDC-1189**

**October 27, 2023**



**REQUEST FOR PROPOSAL**  
**RFP# FDC-1189**

**Issue Date:** October 2, 2023

**Title:** Sponsored Programs Evaluation Services

**Issuing Agency:** Commonwealth of Virginia  
James Madison University  
Procurement Services MSC 5720  
752 Ott Street, Wine Price Building  
First Floor, Suite 1023  
Harrisonburg, VA 22807

**Period of Contract:** From Date of Award Through One Year (Renewable)

**Sealed Proposals Will Be Received Until 2:00 PM on November 2, 2023 for Furnishing The Services Described Herein.**

*SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.*

All Inquiries for information and clarification should be directed to: Doug Chester, Buyer Senior, Procurement Services, [chestefd@jmu.edu](mailto:chestefd@jmu.edu); 540-568-4272; (Fax) 540-568-7935 not later than five business days before the proposal closing date.

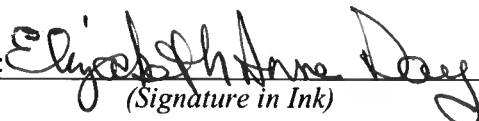
**NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.** In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

BridgeWater Education Consulting, LLC

3665 Sandpiper Road, Lot 115

Virginia Beach, VA 23456

By:   
(Signature in Ink)

Name: Elizabeth Anne Day  
(Please Print)

Date: November 2, 2023

Title: Sr. Education Consultant, Manager

Web Address: None

Phone: (540) 421-1151

Email: BethDay60@gmail.com

Fax #: None

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1 \_\_\_\_\_ #2 \_\_\_\_\_ #3 \_\_\_\_\_ #4 \_\_\_\_\_ #5 \_\_\_\_\_ (please initial)

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

X YES; ☐ NO; IF YES ⇒⇒ X SMALL; X WOMAN; ☐ MINORITY IF MINORITY: ☐ AA; ☐ HA; ☐ AsA; ☐ NW; ☐ Micro

**Note:** This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia*, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

# ***REQUEST FOR PROPOSAL***

***RFP # FDC-1189***

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## **I. Proposal for Providing Externally Funded Evaluation Services to JMU - Approach**

**Describe in detail your firm's approach to each of the following items. Failure to provide responses to the items listed below may result in rejection of the proposal.**

### **A. Describe in detail the firm's qualifications and expertise in providing evaluation services to organizations similar in size and scope to James Madison University.**

BridgeWater Education Consulting, LLC (BWEC) has provided evaluation services for 28 projects (many multi-year) at 11 different colleges or universities, six government agencies, and two foundations or professional societies. (See table I.C. for detailed project descriptions). Seven of these projects were with JMU faculty or staff. Day has also worked at JMU's Center for Assessment and Research Studies (CARS), Office Environmental Stewardship and Sustainability (OESS), and the Valley Scholars program as an assessment specialist or evaluator (hourly employee). Day has contributed to numerous proposal submissions as an external evaluator from JMU faculty as well. Therefore, she is very familiar with externally funded projects at JMU and JMU's assessment practices. Other universities of similar size to JMU that BWEC has provided evaluation services for include: University of South Florida, Savannah State University, University of Maryland, University of Hawaii, and University of South Carolina. National Oceanic and Atmospheric Administration, American Meteorological Society, Virginia Institute of Marine Science are also large organizations where projects of similar size and scope as those likely to emanate from JMU were evaluated by BWEC.

### **B. Provide a detailed description of the firm's areas of expertise (i.e. biology, education, human services). Include general and specific evaluation design specialties/expertise.**

BWEC's areas of expertise are a compilation of those by Day and her team. These areas of expertise include science (DNA coding, forestry, wildlife ecology, conservation, oceanography, physics, chemistry, biology, geology, ecology, coastal processes, atmospheric and climate science, fisheries science and management, field and laboratory research, and project design and methods), psychology, counseling, communication, education (formal and informal science education, K-12, English language learning, and higher education), all areas of student affairs, K-12 teacher professional development, informal (free-choice) education, statistics, measurement, qualitative methods, quantitative methods, education project design, implementation, and evaluation, and education research design. Day has earned degrees in marine science; conducted natural science and science education research; authored an education project design, implementation, and evaluation manual; taught a graduate level evaluation design course; conducted numerous workshops (project evaluation and teacher professional development); and designed and implemented informal education programs (multi-day sleep-over camps to one-day events). Additionally, she has conducted both natural science and education research, developed online and in-person evaluation courses, conducted trainings, developed websites, organized conferences, and written numerous grant proposals. Easton has earned degrees in wildlife ecology, extension education, forest resources and conservation and extension education evaluation. Thelk has advanced degrees in psychology, counseling, and assessment and measurement; she currently directs assessment and evaluation. Rush has a bachelors and a master's degree in education and experience teaching teachers, adults and learners in informal education facilities, K-6 students (all subjects), and English to English language learners. Additionally, Easton, Thelk, and Rush have experience transcribing qualitative data and performing data input of qualitative and quantitative data.

Day and Easton have prepared more than 110 project evaluation reports as external evaluators. The breadth and depth of these projects ranges from simple to complex and small to large. These projects usually require qualitative and quantitative approaches and include multiple audiences, inputs, outputs, and outcomes. The specific evaluation approach is dependent on the client's specific interests and needs. For instance, a needs assessment requires a different design than a project in the formative stages where clients are interested in project improvement or a project that is ending, thus requiring summative approaches. Additional detail is included on BWEC's table of past projects.

Compliance with regulatory requirements is of utmost importance to the BWEC team. Day is current with CITI Program certification in responsible conduct of human subjects' research. Her current certificate should be on file with JMU's Sponsored Programs Office. Regular renewal of CITI certification will continue. Although not anticipated for providing evaluation services, biosecurity training will be completed by BWEC team members as needed for a specific project. Additionally, if any projects involve research on animals, Day will take any needed animal care training and will coordinate research and data collection with JMU's Institutional Animal Care and Use Committee.

**C. Describe in detail the firm's prior evaluations of externally-funded projects, specifically any evaluations provided for governmental entities and institutions of higher education. Include a list of projects, funding agency, contact information to include name, phone number, and email address, and nature of the project as well as any additional information that would be helpful in evaluating the capacity and complexity of past projects.**

The following table of past evaluations (Appendix A: Table I. C. Past Evaluation Projects) provides detail for all the evaluations BWEC has conducted for externally funded projects.

**D. Describe any innovative or creative design approaches or strategies.**

Design approaches are always directed by the specific learning objectives of a project. Frequently projects require determination of change over time or achievement of specific outcome levels. Some of the more innovative approaches BWEC has employed to collect evaluation data include video journaling in response to specific prompts using cell phones, eliciting photographic responses with captions to professional and/or personal development questions, social network analysis (SNA), and comparing end-of-course plans of work to actual implementation results one to 1.5 years after a course has ended. Interviews and focus groups are often conducted to determine outcomes and impacts on individuals and small groups. Nearly all of our evaluations use a mixed methods approach requiring both quantitative and qualitative data collection methods.

**E. Describe in detail the firm's evaluation planning and implementation methodology to include the following:**

**1. Allocation of staff**

Day will always be the point-of-contact for each project and will allocate work to team members as dictated by a specific project's needs. Areas where sub-contracting is most common are quantitative data analysis (Thelk) and qualitative data analysis (Easton), instrument design support (Easton), and data input (Rush). In most cases, all instrument implementation and data analysis will be led by Day. The level of allocation of instrument design and implementation, data input, and analysis tasks to team members will depend on workflow and time constraints.

**2. Management methods**

Day will be the point of contact between JMU and BWEC. Ideally, BWEC will become engaged in a project at the proposal writing stage. Initial meetings with proposal writing teams or project management teams should occur early enough in the proposal development process to allow Day to have input when developing learning objectives, evaluation related aspects of any logic models, and contribute to evaluation plan descriptions. Once a project is funded, Day will coordinate instrument development, and implementation protocols with project PIs. Data collection will occur according to the evaluation plan (agreed upon by BWEC and Project PI), and collected data will be reviewed for accuracy, cleansed (if needed), and analyzed based on data type. Aspects of instrument implementation, data collection, data input into a usable format, and data analysis may be allocated to team members or conducted by Day. All data interpretation, key findings, and recommendations will be conducted or developed by Day. Periodic annual and summative reports will be written by Day with support from evaluation team members. Reports will be provided to project PIs and anyone else they designate. BWEC will provide support disseminating information from any projects if requested by the PI. BWEC will not disseminate information from any projects without the consent of the PI and only in collaboration with the PI and/or project team. Invoices will be prepared by Day and sent to JMU as specified in the contract.

**3. Systems to ensure maintenance of complete and accurate records**

Records of each project (active and completed) under this contract will be maintained on BWEC's computer managed by Day. Project related files will be updated daily. Proposals, instruments, data, analyses, reports, agreements and invoices will be maintained in a folder specific to each project. Excel files will be used to maintain accurate accounting records, billing statuses, and project balances. BWEC is committed to complying with the JMU IRB Data Management Security Tips found at: <http://www.jmu.edu/researchintegrity/irb/irbdatasecurity.shtml>.

**4. Processes in place to protect personally identifiable information**

Identifying information will only be collected if it is integral to the research design. When working with human subjects, HIPPA compliance will be adhered to. Computers used by BWEC evaluators are password protected, and the cloud will not be used to store identifiable data. Paper copies of surveys and consent forms, when used, will be transported in a locked briefcase and stored in a locked file cabinet in BWEC's office. The IP address capture feature of online surveying tools will be disabled prior to launching data collection. All laptops, iPads, tablets, portable media such as USB

drives, or devices that are used to collect or store personal identifiable information (PII) for research purposes will use encryption. Responses from any individual will never be shared with any members of the project management team. Once a project is completed, and data and confidential information will be retained and protected for the length of time required by the funding agency. Data and confidential information will be disposed of using a cross-cut shredder or a data erasing software program designed to completely remove sensitive data from BWEC hard drives (e.g., Eraser and SDelete). All of these methods will serve to ensure that identifying information is kept secure. In addition, BWEC has assisted PIs as they have applied for and obtained IRB approval at multiple universities including JMU.

#### **5. Potential use of subcontractors**

BWEC is a small firm with one full-time employee. Subcontractors (referred to as team members here) are occasionally used to support aspects of larger projects. Day will always be the point-of-contact for each project and will allocate work to team members as dictated by a specific project's needs. Areas where team member support is most common are quantitative data analysis (Thelk) and qualitative data analysis (Easton), instrument design support (Easton), and data input (Rush). Team members will be paid as sub-contractors as no team members are full-time BWEC employees.

#### **6. Commitment to project completion within time and budget constraints**

BWEC is very committed to finishing projects on time and on budget 100% of the time. Exceptions to this commitment will only occur if extreme circumstances beyond BWEC's control cause missed deadlines or cost over-runs. Changes to the agreed upon scope of work or timetable for a specific project may require additional time and/or a budget increase. Based on past experience, these situations are very uncommon.

#### **F. Describe your firm's quality control process, including mechanisms to detect and reduce fraud and errors in data collection.**

To reduce fraud and detect and prevent errors in data collection, web-based data collection platforms (Survey Monkey, Qualtrics, etc.) will be used whenever possible. This will reduce errors that may occur during data input. When data input is conducted manually, every effort will be made to carefully input the responses using standardized protocols. SA team member other than the person recording the data will check the data for anomalies, responses outside the expected range, and non-sensical responses. Original data will be compared to data files and spot checked for accuracy. These measures are necessary to ensure reliability and validity of project outcomes and recommendations.

#### **G. Describe your firm's software used for statistical analysis of data.**

A variety of software may be used for statistical analysis of data. The specific software used will depend on the complexity of data analysis and size of data files. GraphPad will typically be used for simple descriptive statistics for small sample sizes. Excel will be used most frequently for the majority of data analysis. SPSS will be used for more specialized and very large data analysis tasks. Should a project require specialized data analysis, additional software will be acquired to conduct the needed data analysis (e.g. Social Network Analysis).

#### **H. Provide the names, titles, and resumes of key management personnel that may be assigned to perform work for James Madison University.**

Elizabeth A. Day is the Owner of BWEC and Senior Education Consultant. Day will lead all work for James Madison University through this contract. See Attachment C for Day's resume.

#### **I. Provide a sample evaluation plan, evaluation report, or executive summary for a recent project for which the firm provided evaluation services.**

See Attachment D for Evaluation Plan for AMS *DataStreme* Courses 2017-2023.

See Attachment E for Evaluation Reports for AMS *DataStreme* Courses 2022-2023.

ATTACHMENT A  
OFFEROR DATA SHEET

TO BE COMPLETED BY OFFEROR

1. **QUALIFICATIONS OF OFFEROR:** Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
2. **YEARS IN BUSINESS:** Indicate the length of time you have been in business providing these types of goods and services.

Years 17 Months 7

3. **REFERENCES:** Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing or has recently served. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #
DNA Learning Center	4 years	334 Main St, Cold Spring Harbor, NY 11724	David Micklos; (516) 367-5172
American Meteorological Society	11 years	1200 New York Ave NW, Suite 450 Washington, DC 20005	Elizabeth Mills; 202) 737-1043
James Madison University; Department of Graduate Psychology	4 years	Department of Graduate Psychology, Johnston Hall MSC 7401 Harrisonburg, VA 22807	Debi Kipps-Vaughn; (540) 568-4557
Eastern Mennonite University	5 years	1200 Park Road Harrisonburg, VA 22802	Paul Yoder; (540) 432-4147
National Marine Sanctuaries Program for NOAA, Office of Ocean Exploration and Research	11 years	1315 East-West Highway Silver Spring, MD 20910	Paula Keener; (843) 762-8818

4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.

Elizabeth Anne Day

BridgeWater Education Consulting, LLC

3665 Sandpiper Road

Virginia Beach, VA 23456

5. **RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA:** Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

[ ] YES [ X ] NO

IF YES, EXPLAIN: \_\_\_\_\_

## ATTACHMENT B

### Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

**Offeror Name:** BridgeWater Education Consulting, LLC\_ **Preparer Name:** Elizabeth A. Day

**Date:** 11/02/2023

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)?

Yes \_\_\_\_\_ No X (Applied for 10/2023)

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No X (Applied for 10/2023)

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No X

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)?

Yes \_\_\_\_\_ No X (Applied for 10/2023)

If yes, certification number: \_\_\_\_\_ Certification date: Application submitted 08/08/2018\_

**Instructions:** *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWaMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

**Small Business:** "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

**Woman-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

**Minority-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

**Micro Business** is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees AND no more than \$3 million in average annual revenue over the three-year period prior to their certification.

**All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).**

**RETURN OF THIS PAGE IS REQUIRED**

### ATTACHMENT B (CNT'D)

Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Procurement Name and Number: \_\_\_\_\_

Completed: \_\_\_\_\_

Date Form

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses for this Proposal and Subsequent Contract

Offeror / Proposer:

BridgeWater Education Consulting, LLC  
Firm

3665 Sandpiper Road, #115, Virginia Beach, VA 23456  
Address

Elizabeth A. Day/ (540) 421- 1151  
Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)
Amy Thelk 802 Alleghany Avenue Staunton, VA 24401	Amy Thelk (540) 849-0183	None	Data analysis, instrument implementation	Contingent of future contracts	
Janice Easton Evaluation by Design 21404 NW County Rd. 236 High Springs, FL 32643	Janice Easton (352) 575-8174	None	Instrument development, data analysis	Contingent of future contracts	
Mary Rush 976 Crescent Street Saluda, NC 28773	Mary Rush (980) 345-6760	None	Data transcription, data analysis	Contingent of future contracts	

*(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)*

**RETURN OF THIS PAGE IS REQUIRED**

## ATTACHMENT C – Resume of Key Management Personnel

# Elizabeth A. Day

3665 Sandpiper Road, Lot 115, Virginia Beach, VA 23456  
(540) 421-1151; bethday60@gmail.com

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### Summary of Qualifications

Driven and curious professional with over three decades of federal and state funded program administration and higher education experience involving K-12, post-secondary, higher and adult education program implementation, assessment and evaluation, proposal development, experimental design, statistical analysis, consulting, leadership, and reporting. Skilled at seeing challenges as opportunities to collect meaningful evidence that drives successful and purposeful outcomes. Facilitates effective communication strategies to build rapport across diverse teams. Seeking opportunities that utilize experience to support leaders in executing impactful change.

- Awarded over 30 grants and contracts totaling \$1.5M for professional services (projects valued at approximately \$20M)
- Published over 15 peer reviewed articles and manuals
- Authored over 110 assessment and evaluation reports provided to project managers
- Conducted 75 professional development workshops and produced over 43 conference presentations

**Specialties:** Program Development and Design, Public Presentations, Grant Writing, Group Facilitation, Assessment Design, Qualitative and Quantitative Data Collection, Analysis, and Interpretation, Comprehensive Reporting

**Proficiencies:** Microsoft Office Platform (Excel, Word, PowerPoint), SPSS, Qualtrics, SurveyMonkey, Google Platform, Canvas, and Moodle

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### Education

<b>University of South Carolina</b> , Columbia SC Doctor of Philosophy, Marine Science	Graduated 1999
<b>State University of New York</b> , Stony Brook NY Master of Science, Marine Environmental Science	Graduated 1987
<b>University of South Carolina</b> , Columbia SC Bachelor of Science, Marine Science	Graduated 1983

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### Professional Experience

<b>BridgeWater Education Consulting, LLC</b> , Bridgewater, VA <b>Senior Education Consultant and Owner/Manager</b>	2006-present
<ul style="list-style-type: none"><li>○ Provide quality assessment and evaluation services for projects ranging from \$5K - \$8M in scope</li><li>○ Collaborate with more than 25 coordinators on over 33 projects to acquire and evaluate project-related evidence to drive decision making and successful outcomes</li><li>○ Customize assessments and data collection protocols to meet clients' specific needs</li><li>○ Conduct professional development workshops and seminars on program evaluation and STEM topics</li></ul>	
<b>James Madison University</b> , Harrisonburg, VA <b>Valley Scholars; Program Evaluator</b> (2017-present)	2007-2019
<ul style="list-style-type: none"><li>○ Partner with program director to design and implement program specific assessment plan</li><li>○ Document findings in written reports</li></ul>	

- Fulfilled funder's requests for additional grant-related information

**Office of Environmental Stewardship and Sustainability; Evaluator (2016-2017)**

- Collaborated with program director to revise and nationally implement the "Faculty use of Science on a Sphere as a Pedagogical Tool" survey
- Conducted literature review, redesigned survey, implemented data collection and analysis, and interpreted qualitative and quantitative data
- Edited conference presentation and authored draft publication for professional journal

**Political Science Department; Adjunct Professor (2015)**

- Taught Program Evaluation course to Master of Public Administration Degree candidates
- Designed project-based introduction to project evaluation learning modules administered through JMU's CANVAS course management system
- Coached students on aspects of evaluation development for individual projects

**Center for Assessment Research Studies; Assessment Specialist (2007-2015)**

- Coordinated with student affairs professionals to achieve each stage of JMU's assessment process for programs administered by the following eight entities: Center for Multicultural Student Services, Centennial Scholars Program, Counseling and Student Development Center, University Health Center, Judicial Affairs, University Unions, University Recreation Center, and Career and Academic Planning
- Advised over 40 student affairs professionals on assessment design process; outcome and instrument development; qualitative and quantitative data collection, analysis and interpretation; outcome reporting, and use of results
- Mentored five graduate students and professionals in assessment processes, client interactions, and reporting

**National Oceanic and Atmospheric Administration (NOAA), Washington, DC 2000-2008**

**Office of Education; Grants Program Development Specialist (2006-2008)**

- Coordinated NOAA's Environmental Literacy Grants Program review process
- Identified, selected and assigned external panelists and mail reviewers to submitted proposals
- Notified awardees and unsuccessful proposers of selection outcomes

**National Sea Grant College Program (NSGCP); Management and Program Analyst: Education Program Leader (2000-2005)**

- Collaboratively engineered federal marine and Great Lakes education policy
- Created and enhanced opportunities for scientists, marine educators and students nationwide
- Served on numerous proposal review panels, administered four-six NSGCP state-level programs annually, and strengthened network-wide program evaluations as a team member
- Provided leadership for NOAA's Education Council, and initiated development and design of two of NOAA's premier education funding programs

**The National Science Foundation (NSF), Arlington, VA 1999-2000**

**Division of Ocean Sciences; Knauss/Sea Grant Fellow (1999-2000) and Ocean Science Education Programs, Assistant Program Director (2000)**

- Provided guidance and grant program administration expertise to Ocean Science Education programs
- Spearheaded development of the Centers for Ocean Science Education Excellence (COSEE) program
- Represented division in national level, inter-agency funding and science education initiatives for educators and scientists

# ATTACHMENT D – Evaluation Plan for AMS DataStreme Courses 2017-2023

## Attachement D: Evaluation Plan for AMS DataStreme Courses

Focusing the Evaluation			Collecting the Information		Analyzing and Reporting		
Evaluation Questions	Indicators	Sources	Methods	Managing	Analysis	Reporting	Use
<i>What do you want to know?</i>	<i>How will you know it?</i>	<i>Who will have the information?</i>	<i>How will you gather the data?</i>	<i>When will the information be collected?</i>	<i>How will the data be analyzed?</i>	<i>To whom and how will the results be communicated?</i>	<i>How will the results be used?</i>
Have LIT Members acquired the <u>knowledge</u> they need to serve as a LIT Member?	Responses to questionnaire/survey	LIT Members	Using Survey Monkey	Post LIT training	Descriptive statistics  Content analysis	AMS Management team  NOAA, and NASA program officers	Program improvement  Reporting to funding agencies
Have LIT Members acquired the <u>skills</u> they need to serve as a LIT Member?	Responses to questionnaire/survey	LIT Members	Using Survey Monkey	Post LIT training	Descriptive statistics  Content analysis	AMS Management team  NOAA, and NASA program officers	Program improvement  Reporting to funding agencies
Have LIT Members acquired the <u>confidence</u> they need to serve as a LIT Member?	Responses to questionnaire/survey	LIT Members	Using Survey Monkey	Post LIT training	Descriptive statistics  Content analysis	AMS Management team  NOAA, and NASA program officers	Program improvement  Reporting to funding agencies

Have LIT Members acquired the <u>motivation</u> they need to serve as a LIT Member?	Responses to questionnaire/survey	LIT Members	Using Survey Monkey	Post LIT training	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
Do LIT Members <u>aspire</u> to be <u>leaders</u> in climate, atmospheric and ocean science education?	Responses to questionnaire/survey	LIT Members	Using Survey Monkey	Post LIT training	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
How many <i>DataSreme</i> courses are lead for K-12 teachers?	Number of courses	AMS Management Team	Review of course records	Annually after the spring semester	Counts	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
What is the level of participation in <i>DataSreme</i> courses?	Number of participants in various groups/categories	AMS Management Team	Review of course records	Annually after the spring semester	Counts Descriptive statistics	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
In what ways do LIT Members model best practices in science	Responses to questionnaire/survey	LIT Members K-12 Teachers	Using Survey Monkey	Post each <i>DataSreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies

education pedagogy?									
Have K-12 teachers developed the <u>knowledge</u> needed to teach climate, atmospheric and ocean sciences?	Responses to questionnaire/survey Increased scores on content test	LIT Members K-12 Teachers	Using Survey Monkey	Post each <i>DataStreme</i> course Pre- Post- each <i>DataStreme</i> course	Descriptive and comparative statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		
Have K-12 teachers developed the <u>skills</u> needed to teach climate, atmospheric and ocean sciences?	Responses to questionnaire/survey Increased scores on pedagogy assessment	LIT Members K-12 Teachers	Using Survey Monkey	Post each <i>DataStreme</i> course Pre- Post- each <i>DataStreme</i> course	Descriptive and comparative statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		
Are K-12 teachers <u>confident</u> enough to teach climate, atmospheric and ocean sciences?	Responses to questionnaire/survey Increased scores on confidence survey Plan of Action/ POA follow-up	LIT Members K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course Pre- Post- each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive and comparative statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		

Are K-12 teachers <u>motivated</u> to teach climate, atmospheric and ocean sciences?	Responses to questionnaire/survey Plan of Action/ POA follow-up	LIT Members K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course Pre- Post- each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
Do K-12 teachers <u>aspire</u> to be <u>leaders</u> in climate, atmospheric and ocean science education?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
Do K-12 teachers <u>aspire</u> to be <u>role models</u> in climate, atmospheric and ocean science education?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
What is the impact of K-12 teacher participation in <i>DataStreme</i> courses on their <u>peers</u> ?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies

				<i>DataStreme</i> course					
What is the impact of K-12 teacher participation in DataStreme courses on their students?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		
What is the impact of K-12 teacher participation in DataStreme courses on their administrators?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		
How have K-12 teachers <u>implemented</u> the acquired content and skills in their classrooms?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		
How have K-12 teachers <u>transferred</u> the acquired content and skills to other teachers in their	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies		

schools or regions?				<i>DataStreme</i> course			
How have peer-trained teachers implemented the content and skills learned from <i>DataStreme</i> course participants?	Responses to questionnaire/survey Plan of Action/ POA follow-up	K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
What percent of course participants have earned course credit for completing a <i>DataStreme</i> course?	Percent of total number of participants	AMS Management Team	Course records	Annually after the spring semester	Counts Descriptive statistics	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies
Is a community of Earth System educators with strong backgrounds in pedagogy and content teaching climate, atmospheric, and ocean science?	Responses to questionnaire/survey Plan of Action/ POA follow-up	LIT Members K-12 Teachers	Using Survey Monkey Electronic submission	Post each <i>DataStreme</i> course One year after each <i>DataStreme</i> course	Descriptive statistics Content analysis	AMS Management team NOAA, and NASA program officers	Program improvement Reporting to funding agencies

## ATTACHMENT E – Evaluation Reports for AMS *DataStreme* ATM Course-2022-2023

See attached evaluation reports. The attached evaluation reports are consistent with the evaluation plan in Attachment D. Multiple reports are provided that address all aspects of evaluation identified in the evaluation plan for the AMS *DataStreme* course. These reports are for *DataStreme Atmosphere* (ATM). The other course evaluations described in the evaluation plan (OCE and ECS) mirror the ATM course. The specific reports provided are:

- Pre/posttest pedagogical question analysis - ATM 2022/2023
- Pre/post ATM Test Analysis-2022/2023
- DataStreme Atmosphere Cognate Item Analysis - 2022/2023
- End of Course-ATM - 2023
- Atmosphere Plan of Action & Atmosphere Plan of Action Follow-up - 2023

These reports are the complete suite of reports for one year of AMS's *DataStreme Atmosphere* course.

## ATTACHMENT E – Evaluation Reports for AMS *DataStreme* ATM Course-2022-2023

### Pre/posttest Pedagogical Question Analysis 2022/2023

#### Pre-Post Assessment Comparisons – ATM Fall 2022/Spring 2023

The following tables (Pedagogy, Confidence, and Motivation/Aspiration) present the 69 pre-responses and 66 post-responses to each item on the pre and post *DataStreme* Atmosphere affective assessment. Scores on the Pedagogy survey could range from 1-5 where 1 = Minimal, 2 = Rudimentary, 3 = Adequate, 4 = Superior, and 5 = Exemplary. Scores on the Confidence and Motivation/Aspiration surveys could also range from 1-5 where 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, and 5 = Strongly Agree. The number and percent of responses for each item at each level are presented in the following tables. Additionally, the frequencies and percent for the two highest levels (Superior and Exemplary or Agree and Strongly Agree) are combined and presented in the last column.

Means, standard deviations and number of respondents for each item (pre- and post-) are also presented in the following tables. Responses to each item were compared using a two-tailed t-test (*t*-test calculator used: <http://www.graphpad.com/quickcalcs/ttest1/?Format=SD>). Statistically significant results ( $p \leq 0.05$ ) of each comparison are indicated by an “\*\*\*”.

The magnitude of pre- to post- differences are indicated by Cohen's *d*. Cohen's *d* uses the difference in means and standard deviation of the means to determine an effect size (the size of the effect indicated by the significance test) represented by the number of standard deviations the post- mean is different from the pre- mean. Standard interpretation of Cohen's *d* is: *d* of 0.2 = small ( $\leq 0.40$ ), 0.5 = medium (0.41-0.79), and 0.8 = large ( $\geq 0.80$ ) (effect size calculator used: <https://www.socscistatistics.com/effectsize/Default3.aspx>)

#### **PEDAGOGY (Outcome Type: Skills)**

**Pre N=69, Post N=66**

How would you gauge your current ability to:

Item	1 Minimal		2 Rudimentary		3 Adequate		4 Superior		5 Exemplary		4 + 5 Superior + Exemplary	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1. use weather-related science content to stimulate student interests? *** P < 0.0001 Pre mean = 2.53 Pre SD = 0.77 Post mean = 3.68 Post SD = 0.73 Effect Size = 1.53 (Large)	6 8.7%	0 0.0%	25 36.2%	3 4.5%	34 49.3%	22 33.3%	3 4.3%	34 35.9%	1 1.4%	7 10.3%	4 5.8%	41 46.2%
2. use weather-related science content to increase student science knowledge? *** P < 0.0001 Pre mean = 2.54 Pre SD = 0.76	6 8.7%	0 0.0%	25 36.2%	2 3.0%	33 47.8%	25 37.9%	5 7.2%	34 35.9%	0 0.0%	5 7.6%	5 7.2%	39 59.1%

Post mean = 3.64 Post SD = 0.67 Effect Size = 1.54 (Large)												
3. use weather-related science content to expand student experiences? *** P < 0.0001 Pre mean = 2.49 Pre SD = 0.78 Post mean = 3.67 Post SD = 0.68 Effect Size = 1.61 (Large)	6 8.7%	0 0.0%	29 42.0%	2 3.0%	28 40.6%	24 36.4%	6 8.7%	34 51.4%	0 0.0%	6 9.1%	6 8.7%	40 60.6%
4. use meteorological examples to facilitate student knowledge of how science is conducted? *** P < 0.0001 Pre mean = 2.36 Pre SD = 0.82 Post mean = 3.55 Post SD = 0.78 Effect Size = 1.49 (Large)	10 14.5%	0 0.0%	29 42.0%	6 9.1%	25 36.2%	25 37.9%	5 7.2%	32 48.5%	0 0.0%	6 9.1%	5 7.2%	38 57.6%
5. use current meteorological data (including information from the internet) in your instruction? *** P < 0.0001 Pre mean = 2.37 Pre SD = 0.81 Post mean = 3.68 Post SD = 0.75 Effect Size = 1.68 (Large)	10 14.5%	0 0.0%	27 39.1%	3 4.5%	27 39.1%	23 34.8%	5 7.2%	32 48.5%	0 0.0%	8 12.1%	5 7.2%	40 60.6%
6. assist colleagues in teaching weather using meteorological data and information from the internet? *** P < 0.0001	15 21.7%	0 0.0%	31 44.9%	4 6.1%	20 29.0%	27 40.9%	3 4.3%	28 42.4%	0 0.0%	7 10.6%	3 4.3%	35 53.0%

Pre mean = 2.16 Pre SD = 0.82 Post mean = 3.58 Post SD = 0.77 Effect Size = 1.79 (Large)												
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Pedagogy mean scores can be represented using the following ranges: Minimal,  $\leq 1.49$ ; Rudimentary, 1.50-2.49; Adequate, 2.50-3.49; Superior, 3.50-4.49; Exemplary,  $\geq 4.50$ .

The table above shows a significant pre- to post- increase on all pedagogy items at the  $p < 0.05$  level. Additionally, on the pre-survey, no more than six of 69 (8.7%) participants rated their pedagogical abilities in the Superior or Exemplary levels. On the post-survey, at least 35 of 66 (53.0%) participants rated their pedagogical abilities as Superior or Exemplary.

The effect size was large for each item meaning the increase in ratings pre- to post- was meaningful as well as significant. Pre- mean ratings on items 13, 4, 5 & 6 were in the "Rudimentary" range while the pre-mean rating for items 1 and 2 were in the "Adequate" range. All post means increased to the "Superior" range. This shows a clear shift toward improved confidence in participants' ability in these pedagogy related areas at the end of DataStreme Atmosphere.

### CONFIDENCE (Outcome Type: Attitude)

Pre N=69, Post N=66

Item	1 Strongly Disagree		2 Disagree		3 Uncertain		4 Agree		5 Strongly Agree		4 + 5 Agree + Strongly Agree	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1. I feel confident that I can teach weather subject materials. *** P < 0.0001 Pre mean = 3.46 Pre SD = 1.09 Post mean = 4.44 Post SD = 0.56 Effect Size = 1.13 (Large)	6 8.7%	0 0.0%	7 10.1%	0 0.0%	12 17.4%	2 3.0%	37 53.6%	33 50.0%	7 10.1%	31 47.0%	44 63.8%	64 97.0%
2. I am confident that I will be able to answer students' questions about weather topics. *** P < 0.0001 Pre mean = 3.22 Pre SD = 0.92 Post mean = 4.26 Post SD = 0.54 Effect Size = 1.38 (Large)	4 5.8%	0 0.0%	8 11.6%	0 0.0%	29 42.0%	3 4.5%	25 36.2%	43 65.2%	3 4.3%	20 30.3%	28 40.6%	63 95.5%
3. When the science grades of students improve, it is often due to	1 1.4%	0 0.0%	3 4.3%	5 7.6%	22 26.1%	7 10.6%	28 33.3%	26 39.4%	15 21.7%	28 42.4%	38 55.1%	54 81.8%

their teacher having acquired more content knowledge. *** P = 0.0112 Pre mean = 3.77 Pre SD = 0.89 Post mean = 4.17 Post SD = 0.90 Effect Size = 0.45 (Medium)													
4. Students learn more when they discuss the results of weather-related science investigations with their classmates. P = 0.9139 Pre mean = 4.43 Pre SD = 0.55 Post mean = 4.44 Post SD = 0.61 Effect Size = 0.02 (Small)	0 0.0%	0 0.0%	0 0.0%	1 1.5%	2 2.9%	1 1.5%	36 52.2%	32 48.5%	31 44.9%	32 48.5%	67 97.1%	64 97.0%	
5. Making connections between newly learned weather information and other aspects of students' lives helps students learn. P = 0.3298 Pre mean = 4.61 Pre SD = 0.49 Post mean = 4.70 Post SD = 0.50 Effect Size = 0.18 (Small)	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 1.5%	27 39.1%	18 27.3%	42 60.9%	47 71.2%	69 100.0%	65 98.5%	
6. I understand science concepts well enough to effectively teach weather-related science subject material. *** P < 0.0001 Pre mean = 3.50 Pre SD = 0.88 Post mean = 4.44 Post SD = 0.59	2 2.9%	0 0.0%	6 8.7%	0 0.0%	20 29.0%	3 4.5%	33 47.8%	31 47.0%	8 11.6%	32 48.5%	41 59.4%	63 95.5%	

Effect Size = 1.25 (Large)													
7. In general, students are curious about weather-related science topics. P = 0.3959 Pre mean = 4.12 Pre SD = 0.74 Post mean = 4.23 Post SD = 0.78 Effect Size = 0.14 (Small)	0 0.0%	0 0.0%	2 2.9%	2 3.0%	9 13.0%	8 12.1%	37 53.6%	29 43.9%	21 30.4%	27 40.9%		58 84.1%	56 84.8%
8. Knowing students misconceptions about weather topics will help me become a better teacher. P = 0.2417 Pre mean = 4.48 Pre SD = 0.58 Post mean = 4.59 Post SD = 0.53 Effect Size = 0.20 (Small)	0 0.0%	0 0.0%	0 0.0%	0 0.0%	3 4.3%	1 1.5%	30 43.5%	25 37.9%	36 52.2%	40 60.6%		66 100.0%	65 98.5%

**MOTIVATION/ASPIRATION (Outcome Type: Behavior)**

[illegible]

<p>1. I intend to incorporate weather content into my instruction during the coming school year. ***  P = 0.0320  Pre mean = 4.33  Pre SD = 0.83  Post mean = 4.60  Post SD = 0.52  Effect Size = 0.39 (Small)</p>	1 1.4%	0 0.0%	1 1.4%	0 0.0%	7 10.1%	2 3.0%	25 36.2%	23 34.8%	35 50.7%	41 62.1%	60 87.0%	64 97.0%
<p>2. I intend to use activities learned in my LIT to help students learn weather content.  P = 0.6982  Pre mean = 4.39  Pre SD = 0.71  Post mean = 4.34  Post SD = 0.73  Effect Size = 0.07 (Small)</p>	1 1.4%	0 0.0%	0 0.0%	1 1.5%	3 4.3%	7 10.6%	32 46.4%	26 39.4%	33 47.8%	32 48.5%	65 94.2%	58 87.9%
<p>3. I will find ways to relate meteorological science to my specific content area.  P = 0.7620  Pre mean = 4.42  Pre SD = 0.67  Post mean = 4.45  Post SD = 0.64  Effect Size = 0.05 (Small)</p>	1 1.4%	0 0.0%	0 0.0%	0 0.0%	1 1.4%	5 7.6%	34 49.3%	26 39.4%	33 47.8%	35 53.0%	67 97.1%	61 92.4%
<p>4. I look forward to sharing my newly learned weather lessons with other teachers.  P = 0.8738  Pre mean = 4.38  Pre SD = 0.64  Post mean = 4.39  Post SD = 0.60  Effect Size = 0.02 (Small)</p>	0 0.0%	0 0.0%	0 0.0%	0 0.0%	6 8.7%	4 6.1%	31 44.9%	32 48.5%	32 46.4%	30 45.5%	63 91.3%	62 93.9%

5. I hope participating in DataStreme Atmosphere will result in opportunities for me to be a leader among my peers. P = 0.5417 Pre mean = 4.42 Pre SD = 0.67 Post mean = 4.35 Post SD = 0.69 Effect Size = 0.10 (Small)	0 0.0%	0 0.0%	1 1.4%	0 0.0%	4 5.8%	8 12.1%	29 42.0%	27 40.9%	35 50.7%	31 47.0%	64 92.8%	58 87.9%
6. I hope my peers will incorporate more weather science in their instruction as a result of my example. P = 0.6994 Pre mean = 4.26 Pre SD = 0.61 Post mean = 4.30 Post SD = 0.66 Effect Size = 0.06 (Small)	0 0.0%	0 0.0%	0 0.0%	0 0.0%	6 8.7%	7 10.6%	39 56.5%	32 48.5%	24 34.8%	27 40.1%	63 91.3%	59 89.4%
7. I intend to model best instructional practices to my peers through my instruction of weather science. P = 0.1680 Pre mean = 4.46 Pre SD = 0.51 Post mean = 4.32 Post SD = 0.61 Effect Size = 0.25 (Small)	0 0.0%	0 0.0%	0 0.0%	0 0.0%	4 5.8%	5 5.1%	29 42.0%	35 43.6%	36 52.2%	26 51.3%	65 94.2%	61 92.4%

Motivation/aspiration mean scores can be represented using the following ranges: Strongly Disagree,  $\leq 1.49$ ; Disagree, 1.50-2.49; Uncertain, 2.50-3.49; Agree, 3.50-4.49; Strongly Agree,  $\geq 4.50$ .

The table above shows one significant pre- to post- increase on Item 1 of the motivation/aspiration items at the  $p < 0.05$  level. The remaining six items (2, 3, 4, 5, 6, & 7) did not show a significant pre- to post- increase. Mean ratings for Item 1 increased from "Agree" to "Strongly Agree". The remaining items all exhibited mean scores on both the pre and post assessments in the "Agree" range.

Participants rated their motivation/aspiration high on all items with between 60 and 67 of 69 (87.0% - 97.1%) participants selecting Agree or Strongly Agree on the pre-survey and 58 to 64 of 66 (87.9% - 97.0%) on the post-survey. More than 87% of participants rated all items on the pre-survey at the "Agree" level. These are very high pre-survey ratings. Ratings this high on pre-surveys set up a situation known as a "ceiling effect" where pre- ratings or scores are so high that they limit the possible increase in

post- ratings or scores. Therefore, the change in scores on these seven motivation/aspiration items was small from pre- to post-during DataStreme Atmosphere.

Overall, the greatest change from pre- to post- was on the ATM pedagogy items. Additionally, five confidence and one motivation/aspiration items showed a significant increase. There is the possibility of a “ceiling effect” on the items with no significant pre- to post- change because the pre- ratings were high (> 4.12%) thereby limiting much possible increase in post- ratings. The least change occurred on the motivation/aspiration items. Participants rated their motivation/aspiration very high (>87.0% “Agree” or “Strongly Agree”) on the pre-survey with a little change (>87.9% Agree or Strongly Agree) on the post-survey.

### **Pre/post ATM Test Analysis-2022/2023**

**Test analysis:** The pre and post cognate tests for Project Atmosphere were completed by 20 participants. The pre-test mean score was 61.50% (18.45 pts) with a standard deviation of 14.03% (4.21 pts) and a range of 30.00% (9 pts) – 80.00% (24 pts) on the 30-item test. On the post-test the mean score was 80.50% (24.15 pts) with a standard deviation of 10.40 (3.12 pts) and a range of 53.33% (16 pts) – 100.00% (30 pts) on the 30-item test. These results show a significant pre to post increase in mean scores of 19.00% (5.70 pts) at the  $P=0.05$  level.

## **DataStreme Atmosphere Cognate Item Analysis - 2022/2023**

### **Overview**

**Test analysis:** The pre cognate test for DataStreme Atmosphere was completed by 69 participants and post cognate tests for DataStreme Atmosphere was completed by 66 participants. The pre-test mean score was 48.19% (17.35 pts) with a standard deviation of 15.17 (5.46 pts) and a range of 19.44% (7 pts) – 80.56% (29 pts) on the 36-item test. On the post-test the mean score was 71.58% (25.77 pts) with a standard deviation of 13.33 (4.80 pts) and a range of 25.0% (9 pts) – 94.44% (34 pts) on the 36-item test. These results show a significant pre to post increase in mean scores of 23.39% (8.42 pts) at the  $p \leq 0.0001$ .

**Item analysis:** Table 1 presents the average pre and post-test average scores or grades, and standard deviations for each of 36 items.

High pre-test mean scores indicate easy items that most participants got correct prior to the course. A high pre-test mean score indicates that either the content tested by a specific item was known by most course participants or the correct answer is so obvious and easy that participants could select it without knowing the content. Items where the pre-test mean score is greater than 50.0% are considered easy and are indicated with “^”. A good item is indicated by a low(ish) pre-score and high(er) post-score. The mean score should increase between the pre and post administrations of the test. This indicates participants learned information during the time between pre and post-tests and is indicated with “\*”. Details of each item will be discussed in the “Specific Items” section.

The standard deviation indicates how much scores vary from the average, ranging from 0% to 100%. A high standard deviation indicates that scores are spread out from the average, whereas a low standard deviation indicates that scores are close to the average. From pre to post-tests we would expect the standard deviation to decrease as more participants achieve a similarly high score on the post-test if they learned the content assessed by the test. The best indicators of question performance are changes in pre and post scores and standard deviations.

In Table 1, based on the above criteria, items showing “Good” pre to post increases are indicated by “\*”. Most (22; 61.1%) items meet the criteria for “Good” items. Items with high pre-test scores are considered to be too easy and are indicated by “^”. There are 18 (50.0%) easy items. Items where the post-test scores remained below 75% are considered to be difficult on the post-test. On the post-test, 19 (52.8%) items were difficult. Items can be both easy on the pre-test and difficult on the post-test

Table 1: Pre and post-test average scores and standard deviations. Pre N= 69; Post N=66

Question #	Average Score (%)		Standard Deviation (%)	
	Pre	Post	Pre	Post
*1	49.3	80.3	49.4	35.5
^2	73.9	87.9	43.0	30.8
*3	43.5	78.8	47.3	38.0
#*4	42.0	71.2	49.2	44.9
*^5	78.3	98.5	38.8	8.3
*^6	56.5	83.3	49.5	37.2
#7	30.4	48.5	45.9	49.9
^8	59.4	75.8	49.6	42.7
#^9	56.5	72.7	49.7	43.9
#10	18.8	22.7	38.3	41.9
#*11	18.8	53.0	37.9	48.1
*^12	66.7	87.9	46.7	32.3

*^13	59.4	81.8	49.2	37.8
#*14	42.0	71.2	48.3	44.6
#*15	33.3	72.7	45.8	44.5
^16	59.4	75.8	47.6	42.7
#17	49.3	68.2	49.9	45.4
^18	58.0	77.3	46.5	41.9
#*19	43.5	69.7	49.4	43.8
#^20	63.8	72.7	48.2	44.1
#*21	31.9	57.6	46.8	48.9
*^22	52.2	90.9	48.2	28.2
*^23	59.4	81.8	49.4	38.4
#*24	20.3	59.1	39.2	49.0
#*25	20.3	57.6	40.4	49.4
^26	63.8	81.8	48.6	38.6
#*^27	52.2	72.7	49.6	44.4
*28	30.4	77.3	45.2	41.9
^29	68.1	84.8	46.4	35.6
*30	42.0	78.8	48.9	40.2
#31	17.4	34.8	37.1	47.3
#*^32	53.6	74.2	49.5	43.5
#*33	47.8	74.2	49.2	43.4
#^34	60.9	66.7	48.2	46.9
#*35	18.8	50.0	39.5	50.0
^36	73.9	83.3	43.9	37.3

Table 2 presents the number and percent (%) of participants choosing each option for each item on pre and post-tests, and proportion of possible choices represented by each choice.

In Table 2, the same symbols are used as in Table 1. In addition, an even distribution of the number of participants selecting each choice on the pre-test indicates the choices are good distractors. When a distractor is rarely chosen or not chosen on the pre-test, it is not a good distractor and should be eliminated or replaced. Ideally, the distribution of participants choosing any specific distractor should approximate the number of participants who would select that choice if their distribution across distractors was left to chance. This does not occur on any of these items. Items where there is some distribution (even though it may be weak) across all choices on the pre-test are identified with an “@”. Based on these criteria, 32 items (88.89%) showed adequate distribution across the choices. On the post-test, most participants should choose the correct answer if they successfully learned the content. Items where the correct response was selected  $\leq 75.0\%$  of the time are defined as difficult and are indicated with “#”. This occurred on 19 (52.8%) items. This means that on these items, even after instruction in the course,  $\geq 25.0\%$  of participants chose the incorrect response on the post test.

Table 2: Number (%) of participants choosing each option for each item on pre and post-tests and proportion of possible choices represented by each choice. Pre N= 69; Post N=66

Question #/ Choice	A		B		C		D		E	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
@*1	18 (26.1%)	8 (12.1%)	7 (10.1%)	4 (6.1%)	*34 (49.3%)	*53 (80.3%)	10 (14.5%)	0 (0.0%)	-	-
@^2	5 (7.2%)	1 (1.5%)	8 (11.6%)	1 (1.5%)	5 (7.2%)	5 (7.6%)	*51 (73.9%)	*58 (87.9%)	-	-
*3	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (5.8%)	0 (0.0%)	*30 (43.5%)	*52 (78.8%)	24 (34.8%)	14 (21.2%)

#*4	*29 (42.0%)	*47 (71.2%)	10 (14.5%)	2 (3.0%)	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	29 (42.0%)	17 (25.8%)
*^5	5 (7.2%)	0 (0.0%)	5 (7.2%)	1 (1.5%)	*54 (78.3%)	*65 (98.5%)	2 (2.9%)	0 (0.0%)	-	-
@*^6	*39 (56.5%)	*55 (83.3%)	23 (33.3%)	8 (12.1%)	6 (8.7%)	3 (4.5%)	1 (1.4%)	0 (0.0%)	-	-
#7	*21 (30.4%)	*32 (48.5%)	2 (2.9%)	1 (1.5%)	0 (0.0%)	0 (0.0%)	46 (66.7%)	33 (50.0%)	-	-
@^8	8 (11.6%)	9 (13.6%)	20 (29.0%)	7 (10.6%)	*41 (59.4%)	*50 (75.8%)	-	-	-	-
@#^9	*39 (56.5%)	*48 (72.7%)	3 (4.3%)	0 (0.0%)	26 (37.7%)	18 (27.3%)	1 (1.4%)	0 (0.0%)	-	-
@#10	*13 (18.8%)	*15 (22.7%)	23 (33.3%)	33 (50.0%)	26 (37.7%)	9 (13.6%)	6 (8.7%)	8 (12.1%)	1 (1.4%)	1 (1.5%)
@#*11	12 (17.4%)	3 (4.5%)	15 (21.7%)	9 (13.6%)	11 (15.9%)	3 (4.5%)	*13 (18.8%)	*35 (53.0%)	18 (26.1%)	16 (24.2%)
@*^12	*46 (66.7%)	*58 (87.9%)	9 (13.0%)	8 (12.1%)	6 (8.7%)	0 (0.0%)	8 (11.6%)	0 (0.0%)	-	-
@*^13	*41 (59.4%)	*54 (81.8%)	22 (31.9%)	12 (18.2%)	6 (8.7%)	0 (0.0%)	-	-	-	-
@#*14	30 (43.5%)	17 (25.8%)	6 (8.7%)	1 (1.5%)	*29 (42.0%)	*47 (71.2%)	4 (5.8%)	1 (1.5%)	-	-
@#*15	43 (62.3%)	18 (27.3%)	3 (4.3%)	0 (0.0%)	*23 (33.3%)	*48 (72.7%)	-	-	-	-
@^16	*41 (59.4%)	*50 (75.8%)	10 (14.5%)	3 (4.5%)	18 (26.1%)	13 (19.7%)	-	-	-	-
@#17	*34 (49.3%)	*45 (68.2%)	12 (17.4%)	1 (1.5%)	23 (33.3%)	20 (30.3%)	-	-	-	-
@^18	1 (1.4%)	1 (1.5%)	8 (11.6%)	1 (1.5%)	1 (1.4%)	0 (0.0%)	19 (27.5%)	13 (19.7%)	*40 (58.0%)	*51 (77.3%)
@#*19	7 (10.1%)	10 (15.2%)	18 (26.1%)	6 (9.1%)	14 (20.3%)	4 (6.1%)	*30 (43.5%)	*46 (69.7%)	-	-
@#^20	14 (20.3%)	10 (15.2%)	4 (5.8%)	1 (1.5%)	*44 (63.8%)	*48 (72.7%)	2 (2.9%)	3 (4.5%)	5 (7.2%)	4 (6.1%)
@#*21	9 (13.0%)	6 (9.1%)	*22 (31.9%)	*38 (57.6%)	9 (13.0%)	6 (9.1%)	29 (42.0%)	16 (24.2%)	-	-
@*^22	1 (1.4%)	0 (0.0%)	*36 (52.2%)	*60 (90.9%)	18 (26.1%)	2 (3.0%)	14 (20.3%)	4 (6.1%)	-	-
@*^23	7 (10.1%)	0 (0.0%)	17 (24.6%)	9 (13.6%)	4 (5.8%)	3 (4.5%)	*41 (59.4%)	*54 (81.8%)	-	-
@#*24	15 (21.7%)	3 (4.5%)	16 (23.2%)	6 (9.1%)	24 (34.8%)	18 (27.3%)	*14 (20.3%)	*39 (59.1%)	-	-
@#*25	20 (29.0%)	5 (7.6%)	31 (44.9%)	20 (30.3%)	*14 (20.3%)	*38 (57.6%)	4 (5.8%)	3 (4.5%)	-	-
@^26	1 (1.4%)	0 (0.0%)	*44 (63.8%)	*54 (81.8%)	5 (7.2%)	0 (0.0%)	9 (13.0%)	6 (9.1%)	10 (14.5%)	6 (9.1%)
@#*^27	12 (17.4%)	7 (10.6%)	*36 (52.2%)	*48 (72.7%)	15 (21.7%)	10 (15.2%)	10 (14.5%)	1 (1.5%)	-	-
@*28	9 (13.0%)	0 (0.0%)	*21 (30.4%)	*51 (77.3%)	13 (18.8%)	4 (6.1%)	26 (37.7%)	11 (16.7%)	-	-
@^29	8 (11.6%)	1 (1.5%)	*47 (68.1%)	*56 (84.8%)	14 (20.3%)	9 (13.6%)	-	-	-	-
@*30	13 (18.8%)	4 (6.1%)	8 (11.6%)	2 (3.0%)	19 (27.5%)	8 (12.1%)	*29 (42.0%)	*52 (78.8%)	-	-

@#31	35 (50.7%)	25 (37.9%)	4 (5.8%)	4 (6.1%)	*12 (17.4%)	*23 (34.8%)	7 (10.1%)	7 (10.6%)	11 (15.9%)	7 (10.6%)
@#^32	8 (11.6%)	5 (7.6%)	*37 (53.6%)	*49 (74.2%)	22 (31.9%)	9 (13.6%)	2 (2.9%)	3 (4.5%)	-	-
@#*33	*33 (47.8%)	*49 (74.2%)	30 (43.5%)	14 (21.2%)	5 (7.2%)	2 (3.0%)	1 (1.4%)	1 (1.5%)	-	-
@#^34	*42 (60.9%)	*44 (66.7%)	7 (10.1%)	9 (13.6%)	20 (29.0%)	13 (19.7%)	-	-	-	-
@#*35	25 (36.2%)	21 (31.8%)	*13 (18.8%)	*33 (50.0%)	3 (4.3%)	0 (0.0%)	28 (40.6%)	12 (18.2%)	-	-
@^36	5 (7.2%)	1 (1.5%)	6 (8.7%)	4 (6.1%)	*51 (73.9%)	*55 (83.3%)	7 (10.1%)	6 (9.1%)	-	-
<b>Proportion of choices</b>	<b>11/36=0.31</b>		<b>8/36=0.22</b>		<b>9/36=0.25</b>		<b>7/29=0.24</b>		<b>1/8=0.13</b>	

Note: In Table 1 and Table 2, only first attempts with scores between 0% and 100% on a question are included in that question's statistics.

### Specific Items

A discussion of the strengths and weaknesses of each item and possible remedies for problems are described below each item. The correct response for each item is identified with an “\*”.

**Question 1. Viewed from above in the Northern Hemisphere, surface winds in a low-pressure system blow \_\_\_\_\_.**

- a. clockwise and inward
- b. clockwise and outward
- \*c. counterclockwise and inward
- d. counterclockwise and outward

@*1	18 (26.1%)	8 (12.1%)	7 (10.1%)	4 (6.1%)	*34 (49.3%)	*53 (80.3%)	10 (14.5%)	0 (0.0%)	-	-
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This is a good item; 49.3% of respondents chose the correct answer on the pre-test and 80.3% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content. The high percent of correct responses on the post- test indicates that participants are learning the content represented by this item.

**Question 2. In hydrostatic equilibrium, the downward directed force of gravity is balanced by the vertical \_\_\_\_\_.**

- a. centripetal force
- b. Coriolis force
- c. density gradient force
- \*d. pressure gradient force

@^2	5 (7.2%)	1 (1.5%)	8 (11.6%)	1 (1.5%)	5 (7.2%)	5 (7.6%)	*51 (73.9%)	*58 (87.9%)	-	-
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This is an easy item; 73.9% of respondents chose the correct answer on the pre-test and 87.9% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item could be improved by increasing the difficulty. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 3.** \_\_\_\_\_ is often associated with a front.

- a. Cloudiness
- b. Descending air
- c. Precipitation
- \*d. Both a and c are correct
- e. All of the above are correct

*3	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (5.8%)	0 (0.0%)	*30 (43.5%)	*52 (78.8%)	24 (34.8%)	14 (21.2%)
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This is a good item; 43.5% of respondents chose the correct answer on the pre-test and 78.8% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is **NOT** adequate distribution of responses across the four incorrect possible responses.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content. The high percent of correct responses on the post- test indicates that participants are learning the content represented by this item.

**Question 4.** Water vapor is \_\_\_\_\_.

- \*a. an invisible gas
- b. concentrated within the lower stratosphere
- c. the principal gas in the ionosphere
- d. uniformly distributed within the atmosphere
- e. visible in clouds

##4	*29 (42.0%)	*47 (71.2%)	10 (14.5%)	2 (3.0%)	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	29 (42.0%)	17 (25.8%)
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This is a good but difficult item; 42.0% of respondents chose the correct answer on the pre-test and 71.2% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is **NOT** adequate distribution of responses across the four incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 5.** Most weather is confined within the troposphere but can reach into the lowest level of the \_\_\_\_\_.

- a. ionosphere
- b. mesosphere
- \*c. stratosphere
- d. thermosphere

*^5	5	0	5	1	*54	*65	2	0	-	-
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	(7.2%)	(0.0%)	(7.2%)	(1.5%)	(78.3%)	(98.5%)	(2.9%)	(0.0%)		
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This is an easy item; 78.3% of respondents chose the correct answer on the pre-test and 98.5% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the four incorrect possible responses. **Recommendations:** This item could be improved by increasing the difficulty. The high percent of correct responses on the post- test indicates that participants are learning the content represented by this item.

**Question 6. The majority of national satellite weather images on weather websites and TV weather reports are obtained from \_\_\_\_\_ .**

- \*a. geostationary satellites
- b. low-Earth orbiting satellites
- c. polar orbiting satellites
- d. the International Space Station

@*^6	*39 (56.5%)	*55 (83.3%)	23 (33.3%)	8 (12.1%)	6 (8.7%)	3 (4.5%)	1 (1.4%)	0 (0.0%)	-	-
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This is an easy but good item; 56.5% of respondents chose the correct answer on the pre-test and 83.3% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item is fine as it is. The high percent of correct responses on the post test indicates that participants are learning the content represented by this item. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 7. Infrared satellite sensors provide key information about a cloud's \_\_\_\_\_ .**

- \*a. temperature
- b. thickness
- c. relative humidity
- d. all of the above are correct

#7	*21 (30.4%)	*32 (48.5%)	2 (2.9%)	1 (1.5%)	0 (0.0%)	0 (0.0%)	46 (66.7%)	33 (50.0%)	-	-
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This is a difficult item; 30.4% of respondents chose the correct answer on the pre-test and 48.5% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. In addition to being an easy item (<50.0% on pre-test), there is **NOT** adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item could be improved with better distractors or different wording. Additionally, attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 8. The tropopause is typically at its highest altitude above the \_\_\_\_\_ .**

- a. middle latitudes
- b. polar regions
- \*c. tropics

@^8	8 (11.6%)	9 (13.6%)	20 (29.0%)	7 (10.6%)	*41 (59.4%)	*50 (75.8%)	-	-	-	-
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This is an easy item; 59.4% of respondents chose the correct answer on the pre-test and 75.8% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item could be improved by increasing the difficulty. The high percent of correct responses on the post- test indicates that participants are learning the content represented by this item. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 9.** Wien's displacement law states, as the surface temperature of an object increases, the wavelength, at which radiation emitted by that surface is most intense, \_\_\_\_\_.

- \*a. decreases
- b. increases
- c. oscillates
- d. remains the same

@#^9	*39 (56.5%)	*48 (72.7%)	3 (4.3%)	0 (0.0%)	26 (37.7%)	18 (27.3%)	1 (1.4%)	0 (0.0%)	-	-
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This is an easy item; 56.5% of respondents chose the correct answer on the pre-test and 72.7% of respondents chose the correct answer on the post-test. This is an **NOT** adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses on the pre-test. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 10.** During which phase change of water is the most energy released to the environment?

- \*a. deposition
- b. condensation
- c. evaporation
- d. freezing
- e. transpiration

@#10	*13 (18.8%)	*15 (22.7%)	23 (33.3%)	33 (50.0%)	26 (37.7%)	9 (13.6%)	6 (8.7%)	8 (12.1%)	1 (1.4%)	1 (1.5%)
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This is a difficult item; 18.8% of respondents chose the correct answer on the pre-test and 22.7% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the four incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 11.** \_\_\_\_\_% of the atmosphere is located below the altitude where the pressure is 300 mb.

- a. 10

- b. 30
- c. 50
- \*d. 70
- e. 90

@#*11	12 (17.4%)	3 (4.5%)	15 (21.7%)	9 (13.6%)	11 (15.9%)	3 (4.5%)	*13 (18.8%)	*35 (53.0%)	18 (26.1%)	16 (24.2%)
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This is a good but difficult item; 18.8% of respondents chose the correct answer on the pre-test and 53.0% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is an adequate distribution of responses across the four incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 12.** Sinking air warms by the process of \_\_\_\_\_.

- \*a. compression
- b. expansion
- c. condensation
- d. friction

@*^12	*46 (66.7%)	*58 (87.9%)	9 (13.0%)	8 (12.1%)	6 (8.7%)	0 (0.0%)	8 (11.6%)	0 (0.0%)	-	-
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This is an easy but good item; 66.7% of respondents chose the correct answer on the pre-test and 87.9% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses on the pre-test.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 13.** With an increase in altitude, air pressure decreases \_\_\_\_\_ in cold air versus warm air.

- \*a. faster
- b. slower
- c. similarly

@*^13	*41 (59.4%)	*54 (81.8%)	22 (31.9%)	12 (18.2%)	6 (8.7%)	0 (0.0%)	-	-	-	-
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This is an easy but good item; 59.4% of respondents chose the correct answer on the pre-test and 81.8% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses on the pre-test.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 14. What process is key to the formation of clouds?**

- a. Compressional cooling
- b. Compressional warming
- \*c. Expansional cooling
- d. Expansional warming

@#*14	30 (43.5%)	17 (25.8%)	6 (8.7%)	1 (1.5%)	*29 (42.0%)	*47 (71.2%)	4 (5.8%)	1 (1.5%)	-	-
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This is a good item; 42.0% of respondents chose the correct answer on the pre-test and 71.2% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did NOT adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 15. At the same pressure, warm and humid air is \_\_\_\_\_ equally warm and dry air.**

- a. denser than
- b. about as dense as
- \*c. less dense than

@#*15	43 (62.3%)	18 (27.3%)	3 (4.3%)	0 (0.0%)	*23 (33.3%)	*48 (72.7%)	-	-	-	-
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This is a good item; 33.3% of respondents chose the correct answer on the pre-test and 72.7% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did NOT adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 16. Air that is saturated with water vapor has a relative humidity of 100%. If that air is heated without adding or removing water vapor, the relative humidity is \_\_\_\_\_.**

- \*a. decreases
- b. increases
- c. does not change

@^16	*41 (59.4%)	*50 (75.8%)	10 (14.5%)	3 (4.5%)	18 (26.1%)	13 (19.7%)	-	-	-	-
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This is an easy item; 59.4% of respondents chose the correct answer on the pre-test and 75.8% of respondents chose the correct answer on the post-test. This is NOT an adequate pre to post increase. However, there is adequate distribution of responses across the two incorrect possible responses.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 17.** If an airplane is flown from Miami to Minneapolis in winter at a constant-pressure level, without the pilot making any corrections, the plane will be at \_\_\_\_\_ altitude in Minneapolis.

- \*a. a lower
- b. the same
- c. a higher

@#17	*34 (49.3%)	*45 (68.2%)	12 (17.4%)	1 (1.5%)	23 (33.3%)	20 (30.3%)	-	-	-	-
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This is a difficult item; 49.3% of respondents chose the correct answer on the pre-test and 68.2% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 18.** Hygroscopic nuclei \_\_\_\_\_.

- a. are relatively abundant downwind of urban-industrial areas
- b. favor cloud formation at a relative humidity slightly less than 100%
- c. have numerous natural and human related sources
- d. both a and c are correct
- \*e. all of the above are correct

@^18	1 (1.4%)	1 (1.5%)	8 (11.6%)	1 (1.5%)	1 (1.4%)	0 (0.0%)	19 (27.5%)	13 (19.7%)	*40 (58.0%)	*51 (77.3%)
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This is an easy item; 58.0% of respondents chose the correct answer on the pre-test and 77.3% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the four incorrect possible responses.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 19.** Of the following cloud types, which one is warmest?

- a. Altostratus
- b. Cirrostratus
- c. Cirrus
- \*d. Stratus

@#*19	7 (10.1%)	10 (15.2%)	18 (26.1%)	6 (9.1%)	14 (20.3%)	4 (6.1%)	*30 (43.5%)	*46 (69.7%)	-	-
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This is a good and difficult item; 43.5% of respondents chose the correct answer on the pre-test and 69.7% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 20. Cold cloud precipitation formation requires \_\_\_\_\_.**

- a. temperatures above freezing and a mixture of water droplets and ice crystals
- b. temperatures above freezing and water droplets alone
- \*c. temperatures below freezing and a mixture of supercooled droplets and ice crystals
- d. temperatures below freezing and ice crystals alone
- e. temperatures below freezing and supercooled droplets alone

@#^20	14 (20.3%)	10 (15.2%)	4 (5.8%)	1 (1.5%)	*44 (63.8%)	*48 (72.7%)	2 (2.9%)	3 (4.5%)	5 (7.2%)	4 (6.1%)
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This is an easy item; 63.8% of respondents chose the correct answer on the pre-test and 72.7% of respondents chose the correct answer on the post-test. This is an **NOT** adequate pre to post increase. However, there is adequate distribution of responses across the four incorrect possible responses on the pre-test. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 21. Weather radar gathers information about precipitation in clouds by measuring the \_\_\_\_\_.**

- a. absorption characteristics of falling precipitation
- \*b. amount of microwave energy scattered back by the precipitation
- c. amount of solar energy reflected by the falling precipitation
- d. amount of infrared energy emitted by the precipitation particles

@#*21	9 (13.0%)	6 (9.1%)	*22 (31.9%)	*38 (57.6%)	9 (13.0%)	6 (9.1%)	29 (42.0%)	16 (24.2%)	-	-
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This is a good and difficult item; 31.9% of respondents chose the correct answer on the pre-test and 57.6% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 22. The balance between which set of forces produces the geostrophic wind?**

- a. Centripetal force and friction
- \*b. Coriolis effect and horizontal pressure gradient force
- c. Coriolis effect and centripetal force
- d. Gravity and the vertical pressure gradient force

@^*22	1 (1.4%)	0 (0.0%)	*36 (52.2%)	*60 (90.9%)	18 (26.1%)	2 (3.0%)	14 (20.3%)	4 (6.1%)	-	-
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This is an easy but good item; 52.2% of respondents chose the correct answer on the pre-test and 90.9% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses on the pre-test.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 23.** A vertical air pressure gradient is directed from the \_\_\_\_\_ to the \_\_\_\_\_.

- a. mesosphere ... stratosphere
- b. stratosphere ... troposphere
- c. thermosphere ... troposphere
- \*d. troposphere ... stratosphere

@*^23	7 (10.1%)	0 (0.0%)	17 (24.6%)	9 (13.6%)	4 (5.8%)	3 (4.5%)	*41 (59.4%)	*54 (81.8%)	-	-
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This is an easy but good item; 59.4% of respondents chose the correct answer on the pre-test and 81.8% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses on the pre-test.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 24.** In the Northern Hemisphere, the Coriolis Effect acts to the \_\_\_\_\_ of the direction wind is moving and has maximum effect at or near the \_\_\_\_\_.

- a. left ... equator
- b. left ... North Pole
- c. right ... equator
- \*d. right ... North Pole

@#*24	15 (21.7%)	3 (4.5%)	16 (23.2%)	6 (9.1%)	24 (34.8%)	18 (27.3%)	*14 (20.3%)	*39 (59.1%)	-	-
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This is a good and difficult item; 20.3% of respondents chose the correct answer on the pre-test and 59.1% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did NOT adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 25.** An extratropical low-pressure system would be considered a \_\_\_\_\_ system.

- a. microscale
- b. mesoscale
- \*c. synoptic scale
- d. planetary-scale

@#*25	20 (29.0%)	5 (7.6%)	31 (44.9%)	20 (30.3%)	*14 (20.3%)	*38 (57.6%)	4 (5.8%)	3 (4.5%)	-	-
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This is a good and difficult item; 20.3% of respondents chose the correct answer on the pre-test and 57.6% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses.

Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 26.** Which one of the following westerly wave patterns favors the maximum north-south exchange of air masses?

- a. Blocking flow
- \*b. Meridional flow
- c. Split flow
- d. Zonal flow
- e. None of the above is correct

@^26	1 (1.4%)	0 (0.0%)	*44 (63.8%)	*54 (81.8%)	5 (7.2%)	0 (0.0%)	9 (13.0%)	6 (9.1%)	10 (14.5%)	6 (9.1%)
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This is an easy item; 63.8% of respondents chose the correct answer on the pre-test and 81.8% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the four incorrect possible responses.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 27.** Long-term average (neutral) conditions in the eastern tropical Pacific Ocean are associated with relatively \_\_\_\_\_ waters off the coastline of Peru and oceanic \_\_\_\_\_.

- a. cool ... downwelling
- \*b. cool ... upwelling
- c. warm ... downwelling
- d. warm ... downwelling

@#*^27	12 (17.4%)	7 (10.6%)	*36 (52.2%)	*48 (72.7%)	15 (21.7%)	10 (15.2%)	10 (14.5%)	1 (1.5%)	-	-
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This is an easy item; 52.2% of respondents chose the correct answer on the pre-test and 72.7% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is except choices "C" and "D" are the same. This needs to be corrected prior to any future administrations of this test. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 28.** Air masses are distinguished from one another on the basis of \_\_\_\_\_.

- a. pressure and humidity
- \*b. temperature and humidity
- c. temperature and pressure
- d. temperature, pressure, and humidity

@*28	9 (13.0%)	0 (0.0%)	*21 (30.4%)	*51 (77.3%)	13 (18.8%)	4 (6.1%)	26 (37.7%)	11 (16.7%)	-	-
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This is a good item; 30.4% of respondents chose the correct answer on the pre-test and 77.3% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses. The high percent of correct responses on the post- test indicates that participants are learning the content represented by this item.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 29. At a weather station in the warm sector of an approaching extratropical cyclone, dewpoints would typically be \_\_\_\_\_ other sectors of the cyclone.**

- a. about the same as
- \*b. higher than
- c. lower than

@^29	8 (11.6%)	1 (1.5%)	*47 (68.1%)	*56 (84.8%)	14 (20.3%)	9 (13.6%)	-	-	-	-
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This is an easy item; 68.1% of respondents chose the correct answer on the pre-test and 84.8% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item is fine as it is. However, more attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 30. Viewed from above, cold and warm fronts in the Northern Hemisphere rotate \_\_\_\_\_ around centers of low pressure, with cold fronts typically advancing \_\_\_\_\_ rapidly than warm fronts.**

- a. clockwise ... more
- b. clockwise ... less
- c. counterclockwise ... less
- \*d. counterclockwise ... more

@*30	13 (18.8%)	4 (6.1%)	8 (11.6%)	2 (3.0%)	19 (27.5%)	8 (12.1%)	*29 (42.0%)	*52 (78.8%)	-	-
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This is a good item; 42.0% of respondents chose the correct answer on the pre-test and 78.8% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 31. Which one of the following atmospheric elements is not key to formation of severe thunderstorms?**

- a. A capping inversion for part of the day
- b. A lifting mechanism, such as a front
- \*c. Horizontal convergence in the upper troposphere
- d. Moisture in the low to mid-troposphere
- e. Winds in the troposphere with significant changes in direction with height

@#31	35	25	4	4	*12	*23	7	7	11	7
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	(50.7%)	(37.9%)	(5.8%)	(6.1%)	(17.4%)	(34.8%)	(10.1%)	(10.6%)	(15.9%)	(10.6%)
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This is a difficult item; 17.4% of respondents chose the correct answer on the pre-test and 34.8% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the four incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, most participants are **NOT** learning this content. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 32.** Trees in the path of an intense derecho would likely fall \_\_\_\_\_.

- a. in different directions similar to that of a tornado
- \*b. in the same direction due to non-rotating winds
- c. outward from a certain point similar to that of a microburst
- d. none of the above is correct

@#*^32	8 (11.6%)	5 (7.6%)	*37 (53.6%)	*49 (74.2%)	22 (31.9%)	9 (13.6%)	2 (2.9%)	3 (4.5%)	-	-
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This is an easy item; 53.6% of respondents chose the correct answer on the pre-test and 74.2% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses. However, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 33.** What percentage of U.S. tornadoes reach EF5 strength?

- \*a. 0.1%
- b. 1%
- c. 5%
- d. 10%

@#*33	*33 (47.8%)	*49 (74.2%)	30 (43.5%)	14 (21.2%)	5 (7.2%)	2 (3.0%)	1 (1.4%)	1 (1.5%)	-	-
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This is a difficult item; 47.8% of respondents chose the correct answer on the pre-test and 74.2% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses. However, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, many participants are **NOT** learning this content. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 34.** Tornadoes are typically more frequent in "areas of the lower Mississippi Valley \_\_\_\_\_ the Southern Plains.

- \*a. earlier in the year than
- b. in the same time of the year as

c. later in the year than

@#^34	* 42 (60.9%)	*44 (66.7%)	7 (10.1%)	9 (13.6%)	20 (29.0%)	13 (19.7%)	-	-	-	-
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This is an easy item; 60.9% of respondents chose the correct answer on the pre-test and 66.7% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. However, there is adequate distribution of responses across the two incorrect possible responses. Additionally, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 35. Three conditions required for hurricane formation are \_\_\_\_\_.**

- a. adequate Coriolis Effect, relatively high sea-surface temperatures, and strong winds aloft
- \*b. adequate Coriolis Effect, relatively high sea-surface temperatures, and weak winds aloft
- c. adequate Coriolis Effect, relatively low sea-surface temperatures, and strong winds aloft
- d. intense Coriolis Effect, relatively high sea-surface temperatures, and strong winds aloft

@#*35	25 (36.2%)	21 (31.8%)	*13 (18.8%)	*33 (50.0%)	3 (4.3%)	0 (0.0%)	28 (40.6%)	12 (18.2%)	-	-
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This is a difficult item; 18.8% of respondents chose the correct answer on the pre-test and 50.0% of respondents chose the correct answer on the post-test. This is an adequate pre to post increase. Additionally, there is adequate distribution of responses across the three incorrect possible responses. However, participants found this item difficult on the post-test indicating they did **NOT** adequately learn the material.

**Recommendations:** This item is fine as it is. However, many participants are **NOT** learning this content. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Question 36. Because of the ocean's great thermal inertia, Atlantic basin hurricanes and tropical storms are most likely to form in \_\_\_\_\_.**

- a. June
- b. July
- \*c. September
- d. November

@^36	5 (7.2%)	1 (1.5%)	6 (8.7%)	4 (6.1%)	*51 (73.9%)	*55 (83.3%)	7 (10.1%)	6 (9.1%)	-	-
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This is an easy item; 73.9% of respondents chose the correct answer on the pre-test and 83.3% of respondents chose the correct answer on the post-test. This is **NOT** an adequate pre to post increase. Although this item is easy (>50.0% on pre-test), there is adequate distribution of responses across the three incorrect possible responses.

**Recommendations:** This item is fine as it is. More attention to this content may result in higher post-test scores indicating more participants learned this content.

**Summary:**

The primary problem identified through analysis of this test is participants are **NOT** learning the material covered by this test. The following analysis and the low post-test mean score of 71.6% support this statement.

Most (22; 61.1%) items exhibit a good pre to post increase. An adequate increase from pre-test to post-test is defined as an increase of at least 20.0%. These item numbers are: 1, 3, 4, 5, 6, 11, 12, 13, 14, 15, 19, 21, 22, 23, 24, 25, 27, 28, 30, 32, 33, and 35. Additionally, these (14; 38.9%) items 2, 7, 8, 9, 10, 16, 17, 18, 20, 26, 29, 31, 34, and 36 showed a low pre to post increase.

An additional 18 (50.0%) items are very easy (>50.0% mean pre-test score). These items are: 2, 5, 6, 8, 9, 12, 13, 16, 18, 20, 22, 23, 26, 27, 29, 32, 34, and 36. Some items (8; 22.2%) are both too easy and showed a good pre- to post- increase. These items are: 5, 6, 12, 13, 22, 23, 27, 32.

Items that are difficult for participants on the post-test are defined as those with a post-test score of  $\leq 75.0\%$ .

The following items (19; 52.8%) are difficult on the post-test: 4, 7, 9, 10, 11, 14, 15, 17, 19, 20, 21, 24, 25, 27, 31, 32, 33, 34, and 35.

There are also 18 (50.0%) items that are easy on the pre-test. These are: 2, 5, 6, 8, 9, 12, 13, 16, 18, 20, 22, 23, 26, 27, 29, 32, 34, and 36.

Some (5; 13.9%) items are both easy on the pre-test and difficult on the post-test. These items are: 9, 20, 27, 32, and 34.

Additionally, these (24; 66.7%) items (1, 2, 3, 5, 6, 8, 9, 10, 11, 13, 14, 18, 19, 20, 22, 23, 26, 27, 29, 31, 32, 33, 34, and 36) showed a low or no pre to post increase.

Items (32; 88.9%) that showed an adequate distribution across all distractors are: 1, 2, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36.

Most (35; 97.2%) items identified content that may require more attention. These are: 1, 2, 4, 5, 6, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, and 36.

Ideally, the mean post-test score should exceed 90.0%, or a grade of "A", but this "grade" should be decided by the course instructors. Items (34; 94.4%) where the content was **NOT** acquired at a 90.0% level are: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36. If content mastery is desired at a 90.0% level, more attention should be paid to the content covered by these items. If a 70.0% score (grade of "C") is adequate to define mastery, then the content addressed in these (11; 30.6%) items needs more attention. They are: 7, 10, 11, 17, 19, 21, 24, 25, 31, 34, and 35.

Specific suggestions are made for each item in the above discussions. In general, this test is functioning moderately well. The many easy items should be examined to determine if these items can be made more difficult. However, these decisions should be made by the instructors and AMS Staff.

### End of Course-ATM - 2023

For the following, please rate the general course areas:

N=35

	Very Dissatisfied 1	Dissatisfied 2	Neutral 3	Satisfied 4	Very Satisfied 5	Satisfied + Very Satisfied 4 + 5
1. Course as a whole Mean=4.49	1 2.9%	0 0.0%	0 0.0%	14 40.0%	20 57.1%	34 97.1%
2. Course science content Mean=4.63	1 2.9%	0 0.0%	0 0.0%	9 25.7%	25 71.4%	34 97.1%
3. Course study materials Mean=4.14	1 2.9%	2 5.7%	2 5.7%	11 31.4%	18 51.4%	29 82.9%
4. Delivery utilizing web- based learning system Mean=4.20	1 2.9%	2 5.7%	4 11.4%	10 28.6%	18 51.4%	28 80.0%
5. Weekly mentoring process Mean=4.11	0 0.0%	1 2.9%	6 17.1%	11 31.4%	16 45.7%	27 77.1%
6. Mentoring through LITs/ mentor teams Mean=4.26	0 0.0%	1 2.9%	7 20.0%	9 25.7%	18 51.4%	27 77.1%

In all of the six areas indicated in this item regarding the course, respondents mean ratings were equal to or exceeded 4.1 meaning they were “Satisfied” or “Very Satisfied” on average with the course components. Additionally, at least 77.1% of respondents selected “Satisfied” or “Very Satisfied” in response to these areas of the course.

	Very Low 1	Low 2	Moderate 3	High 4	Very High 5	High + Very High 4 + 5
7. Your level of enthusiasm for the course. N=35 Mean=4.20	0 0.0%	0 0.0%	5 14.3%	18 51.4%	12 34.3%	30 85.7%

At the end of the course, participants' level of enthusiasm was a mean of 4.20 (> “High”). Additionally, more than 85.0% of participants selected “High” or “Very High” in response to this item.

	Poor 1	Fair 2	Good 3	Very Good 4	Excellent 5	Very Good + Excellent 4 + 5
8. The course's value to enhance your teaching. N=35 Mean=4.26	0 0.0%	0 0.0%	7 20.0%	12 34.3%	16 45.7%	28 80.0%

At the end of the course, participants' perception of the value of the course to enhance their teaching was high (mean=4.26). Additionally, more than 83% of participants selected "Very Good" or "Excellent" in response to this item.

	The worst	Among the worst	Neither worse nor better	Among the best	The best	Among the best + The best
	1	2	3	4	5	4 + 5
9. Compared to other teacher professional development experiences you have had, this one is: N=65 Mean=3.94	0 0.0%	0 0.0%	5 14.3%	27 77.1%	3 8.6%	30 85.7%

At the end of the course, participants' perception of the course compared to other teacher professional development experiences they have had was "Among the best" (mean=3.94). Additionally, more than 85.0% of participants selected "Among the best" or "The best" in response to this item.

10. As of yet, approximately how many teachers or colleagues have been impacted by your course experience? (Please enter one number and not a range.) N=34

The approximate number of teachers impacted by all participant's in the course was 104. This is an average of 3.06 teachers on average with a range 0-10 teachers.

11. To date, approximately how many students have been impacted by your course experience? (Please enter one number and not a range.) N=35

The approximate number of students impacted by each participant's course experience was 2,236. This is an average of 63.89 students on average with a range 0-187 students.

### **Atmosphere Plan of Action & Atmosphere Plan of Action Follow-up - 2023**

Responses to the Atmosphere Plan of Action Fall 18/Spring 2019 End of Course (POA EOC) and Atmosphere Plan of Action Follow-up Fall 2019/Spring 2020 (POA F-U) surveys are presented below. End of course POA items are listed; POA follow-up edits are in parentheses (). The POA EOC survey contained one more item than the POA F-U survey. The POA EOC item numbers are listed first where the item numbers were not the same.

**Q1. My email address for future contact is:** EOC POA N=55; POA F-U N=19  
Responses not reported to protect anonymity of respondents.

**Q2. Courses you do or may teach (have taught) which will involve(ed) DataStreme Atmosphere material:**

Responses	EOC POA N= 55	POA F-U N= 19
K-12 General Science	16 (29.1%)	7 (36.8%)
Physical Science	9 (16.4%)	2 (10.5%)
Earth Science	26 (47.3%)	11 (57.9%)
Environmental Science	16 (29.1%)	3 (15.8%)
Physics	7 (12.7%)	1 (5.3%)
Chemistry	9 (16.4%)	1 (5.3%)
Mathematics	3 (5.5%)	2 (10.5%)
Oceanography	5 (9.1%)	1 (5.3%)
Biology/Life Science	9 (16.4%)	0 (0.0%)
Other	10 (18.2%)	5 (26.3%)
	<ul style="list-style-type: none"><li>• AP research</li><li>• AP statistics</li><li>• Aquatic Science</li><li>• Earth and Space Systems</li><li>• STEM</li><li>• Forensics</li><li>• 8<sup>th</sup> Grade Earth Science</li><li>• ELA Literacy</li><li>• Agricultural Science</li><li>• ESA/Reading</li><li>• Atmospheric Science</li><li>• Natural Disasters</li><li>• Environmental Science/College</li></ul>	<ul style="list-style-type: none"><li>• STEM - 2</li><li>• Earth Explorations</li><li>• Aquatic Science</li><li>• HS meteorology Elective</li><li>• Atmospheric Science (Dual Enrollment)</li></ul>

General Science and Earth Science were taught by at least 29% of respondents on both surveys. Additionally, Environmental Science was taught by at least 29% of respondents on the Plan of Action. Three of the five "Other" topics provided on the POA F-U survey were also included on the EOC POA survey along with 10 additional courses.

**Q3. Topics from DataStreme Atmosphere that you intend to include (included) in the courses identified above in #2:**

Responses	EOC POA N= 55	POA F-U N= 19
Weather in General	36 (65.5%)	14 (73.7%)
Meteorology	23 (41.8%)	8 (42.1%)

Pressure Systems	29 (52.7%)	12 (63.2%)
Wind Patterns	25 (45.5%)	8 (42.1%)
Atmospheric Circulation	26 (47.3%)	11 (57.9%)
Coriolis Effect	27 (49.1%)	8 (42.1%)
Severe Weather	29 (52.7%)	7 (36.8%)
Thunderstorms/Tornadoes	29 (52.7%)	10 (52.6%)
Hurricanes	27 (49.1%)	10 (52.6%)
El Nino/La Nina	22 (40.0%)	4 (21.1%)
Climate/Climate Change	35 (63.6%)	12 (63.2%)
All	25 (45.5%)	7 (36.8%)
Other	4 (7.3%)	1 (5.3%)
	<ul style="list-style-type: none"> <li>• Cloud Formations – 2</li> <li>• Cloud Types</li> <li>• Wein’s Law</li> <li>• Adiabatic process</li> <li>• Doppler radar</li> <li>• Station Models</li> <li>• Electromagnetic radiation and latent heat</li> </ul>	<ul style="list-style-type: none"> <li>• This applies to my Atmospheric Science class.</li> <li>• Several of these topics are taught in Earth Science.</li> </ul>

All of the topics listed were selected by > 21.0% of participants on the POC POA and the POA F-U surveys. More “Other” topics were provided on the POC POA survey than on the POA F-U survey where the “Other” responses were more general.

**Q4. Approximate number of students that will be (were) involved in and experience (in courses with) DataStreme Atmosphere topics:**

Responses	EOC POA N= 55	POA F-U N= 18
1-25	3 (5.5%)	2 (11.1%)
26-50	8 (14.5%)	1 (5.6%)
51-100	22 (40.0%)	7 (38.9%)
101-150	18 (32.7%)	4 (7.3%)
151-200	2 (3.6%)	2 (11.1%)
201-250	1 (1.8%)	0 (0.0%)
251-300	0 (0.0%)	0 (0.0%)
> 300	1 (1.8%)	2 (11.1%)

The approximate median number of students who will be (were) involved in and experience DataStreme Atmosphere topics at the end of the course was 51-100, and 51-100 on the follow-up survey as well.

**Q5. DataStreme Atmosphere course website products I use or intend to use (used):**

Responses	EOC POA N = 55	POA F-U N = 19
NWS Surface weather maps	41 (74.5%)	13 (68.4%)
NWS Satellite images and animations	40 (72.7%)	14 (73.7%)
NWS Radar images and animations	43 (78.2%)	11 (57.9%)
NOAA / NWS websites and links	44 (80.0%)	11 (57.9%)
Hand twist model	43 (78.2%)	6 (31.6%)
NWS Data and information	40 (72.7%)	4 (21.1%)
NWS Meteograms / charts	24 (43.6%)	2 (10.5%)
NWS Upper air maps	18 (32.7%)	3 (15.8%)
NWS Stüve diagrams	18 (32.7%)	1 (5.3%)

Other website links	18 (32.7%)	2 (10.5%)
Weather and climate news	42 (76.4%)	8 (42.1%)
Other	5 (9.1%)	1 (5.3%)
	<ul style="list-style-type: none"> <li>• All listed products</li> <li>• Local weather sites</li> <li>• Some of the stories and links in the textbook.</li> <li>• There is so much real time data out there that I want to use in my teaching.</li> <li>• The weather cyclor</li> </ul>	<ul style="list-style-type: none"> <li>• El Nino slider</li> <li>• Weather slider</li> <li>• Weather Cyclor</li> <li>• Pressure Blocks</li> </ul>

Website products respondents most commonly (>50%) indicated they intend to use are: NWS Surface weather maps, NWS Satellite images and animations, NWS Radar images and animations, NOAA / NWS websites and links, Hand twist model, NWS Data and information, and weather and climate news. This list was shortened by the follow-up time frame to: NWS Surface weather maps, NWS Satellite images and animations, NWS Radar images and animations, and NOAA / NWS websites and links.

**Q6. Is (Was) course content part of local, district, state, or national accountability or teaching standards?**

EOC POA N= 55

Type of Standards	Yes	No	NA	TOTAL
National Standards	42 (76.4%)	8 (14.5%)	5 (5.5%)	55 (20.0%)
State Standards	51 (92.75)	3 (5.5%)	1 (1.8%)	55 (20.0%)
District/Local Standards	42 (76.4%)	8 (14.5%)	5 (5.5%)	55 (20.0%)
School Standards	41 (74.5%)	10 (18.2%)	4 (7.3%)	55 (20.0%)
Earth Science/Next Generation Standards	43 (78.2%)	7 (12.7%)	5 (5.5%)	55 (20.0%)
<b>TOTAL</b>	<b>219 (79.6%)</b>	<b>36 (13.1%)</b>	<b>20 (7.3%)</b>	<b>275 (100.0%)</b>

NA/none – 3

- In chemistry, no need to directly teach weather or climate, for NGSS need to incorporate cross cutting concepts, so these topics covered will create real world connections which are required in NSGS.
- I teach AP environmental class so the curriculum would apply to those standards.
- I'm unaware of any national standards other than NSGS.

POA F-U N= 19

Type of Standards	Yes	No	NA	TOTAL
National Standards	8 (42.1%)	5 (26.3%)	6 (31.6%)	19 (20.0%)
State Standards	18 (94.7%)	1 (5.3%)	0 (0.0%)	19 (20.0%)
District/Local Standards	13 (68.4%)	2 (10.5%)	4 (21.1%)	19 (20.0%)
School Standards	11 (57.9%)	3 (15.8%)	5 (26.3%)	19 (20.0%)
Earth Science/Next Generation Standards	14 (73.7)	3 (15.8%)	2 (10.5%)	19 (20.0%)
<b>TOTAL</b>	<b>64 (67.4%)</b>	<b>14 (14.7%)</b>	<b>17 (17.9%)</b>	<b>95 (100.0%)</b>

As reported by an average of at least 79% of respondents on the EOC survey and 67% of respondents on the Follow-up survey, course content was part of National, State, District/Local, School and/or Earth Science/Next Generation Standards.

**Q7. Ways in which the DataStreme Atmosphere course has affected my teaching:**

Responses	EOC POA N= 55	POA F-U N= 19
My curriculum has not yet covered this subject	3 (5.5%)	0 (0.0%)
This information enhanced my content knowledge	54 (98.2%)	18 (94.7%)
The information is a valuable teaching resource	45 (81.8%)	15 (78.9%)
I have more confidence to teach this subject matter	44 (80.0%)	14 (73.7%)
The course improved my ability to explain the content and concepts	45 (81.8%)	15 (78.9%)
This course improved my ability to relate the content to the real world	44 (80.0%)	13 (68.4%)
This course improved my ability to increase my students' interest	40 (72.7%)	11 (57.9%)
The material is used across the curriculum in my teaching	27 (49.1%)	12 (63.2%)
I have increased the use of current data and Internet information in my teaching	37 (67.3%)	13 (68.4%)
Other	4 (7.3%)	1 (5.3%)
	<ul style="list-style-type: none"><li>• I help write the curriculum for our Earth and Environmental Systems class. It will be used to enhance that content.</li><li>• This course has helped me get more excited about the topic by improving my understanding and broadening my experience of it. This will lead to improved teaching.</li><li>• I anticipate using this content throughout my instruction.</li></ul>	<ul style="list-style-type: none"><li>• Networking has been a huge part of what has helped me. I have reached out to both my advisor and my instructors from Project Atmosphere.</li></ul>

On the EOC survey, only 5.5% of participants indicated that their curriculum had not yet covered DataStreme Atmosphere material. On the F-U survey this result dropped to 0%. Results related to how DataStreme Atmosphere affected participants' instruction were fairly consistent between the EOC and F-U surveys. At least 49% of respondents reported the information enhanced my content knowledge, the information is a valuable teaching resource, I have more confidence teaching this subject matter, the course improved my ability to explain the content and concepts, relate the content to the real world, and increase my students' interest, and the material is used across the curriculum in my teaching, and I have increased the use of current data and internet information in my teaching.

**Q8. Ways I hope to influence (think I have positively influenced) students' attitudes toward science:**

Responses	EOC POA N= 55	POA F-U N= 18
Made science real/showing the relevance to the real world	52 (94.5%)	18 (100.0%)
Sparked students' interest and inspiring them	47 (85.5%)	12 (66.7%)

Incorporated hands-on activities	48 (87.3%)	11 (61.1%)
Made course content more exciting and enjoyable	49 (89.1%)	10 (55.6%)
Increased curiosity and self-reflecting ability	43 (78.2%)	10 (55.6%)
Combined science content with other subjects	34 (61.8%)	7 (38.9%)
Other	2 (3.6%)	0 (0.0%)
	<ul style="list-style-type: none"> <li>• Writing higher level experiences that challenge the students</li> <li>• Atmospheric Science is so cool to teach because it is so dynamic, and we have 'to adjust to it every day.</li> </ul>	

Of all the ways respondents indicated they have influenced student's attitudes about science, almost all were indicated by > 55% on both surveys (combined science content with other subjects was only selected by 38.9% of respondents on the F-U survey).

**Q9. Ways I anticipate impacting (think I have positively impacted) students' science related skills:**

Responses	EOC POA N= 55	POA F-U N= 18
Improved data acquisition and collection skills	43 (78.2%)	11 (61.1%)
Used hands-on activities	48 (87.3%)	10 (55.6%)
Improved critical thinking skills	48 (87.3%)	13 (72.2%)
Improved analytical skills	44 (80.0%)	11 (61.1%)
Improved interpretational skills	43 (78.2%)	9 (50.0%)
Improved ability to relate results to real world and current events	46 (83.6%)	16 (88.9%)
Improved ability to relate results to other subjects	28 (50.9%)	4 (22.2%)
Improved data analysis skills	41 (74.5%)	10 (55.6%)
Improved presentation and illustration skills	24 (43.6%)	2 (11.1%)
Encouraged students to challenge or inquire about others' ideas	30 (54.5%)	7 (38.9%)
Improved research and investigative skills	35 (63.6%)	3 (16.7%)
Other	0 (0.0%)	0 (0.0%)

At least 43% of participants anticipate impacting students' science related skills in all the identified ways on the EOC POA. A lower percentage of respondents (by at least 15%) indicated they have impacted student's science related skills on the F-U survey than the EOC survey except on improved ability to relate results to real world and current events. At least 11% of participants impacted students' science related skills in all the identified ways on the POA F-U.

**Q10. Ways I anticipate impacting (think I have positively impacted) students' science knowledge:**

Responses	EOC POA N= 55	POA F-U N= 18
Provided more in-depth content knowledge	48 (87.3%)	16 (88.9%)
Improved content utilization skills	33 (60.0%)	8 (44.4%)
Used demonstrations	46 (83.6%)	13 (72.2%)
Used hands-on activities	46 (83.6%)	11 (61.1%)
Employed real-time weather data	45 (81.8%)	14 (77.8%)
Used AMS DataStreme, NOAA and NASA resources	47 (85.5%)	15 (88.3%)

Offered content related lessons	29 (52.7%)	8 (44.4%)
Used real world examples	48 (87.3%)	15 (83.3%)
Employed scientific inquiry	38 (69.1%)	7 (38.9%)
Related weather across the curriculum / disciplines	26 (47.3%)	5 (27.8%)
Other	0 (0.0%)	0 (0.0%)

At least 47% of participants anticipate impacting students' science knowledge in all the identified ways. There was at least a 11% difference between the percentage of respondents who indicated they have impacted student's science knowledge on the F-U survey compared to the EOC survey except on these items: provided more in-depth content knowledge, employed real-time weather data, used AMS DataStreme, NOAA and NASA resources, offered content related lessons, and used real world examples. At least 27% of participants impacted students' science Knowledge in all the identified ways on the POA F-U.

**Q11. Ways I can assist (have assisted) my students with career information from DataStreme:**

Responses	EOC POA N= 55	POA F-U N= 18
Provided more in-depth information and discussion	49 (89.1%)	11 (61.1%)
Presented weather/meteorology career opportunities	39 (70.1%)	7 (38.9%)
Directed students to NOAA or AMS DataStreme websites or LIT members	33 (60.0%)	4 (22.2%)
Invited guest speakers	32 (58.2%)	5 (27.8%)
Encouraged students to research various careers	36 (65.5%)	8 (44.4%)
Arranged field trips and visits	25 (45.5%)	1 (5.6%)
Other	0 (0.0%)	0 (0.0%)

At least 45% of participants believe they can assist their students with career information in all the identified ways. A lower percentage of respondents (by at least 21%) indicated they have assisted their students with career information from DataStreme on the F-U survey (5%-61%) than the EOC survey (45%-89%).

**Q12. Resources and information I have provided to colleagues:**

Responses	EOC POA N= 55	POA F-U N= 18
Website information and online links	50 (90.1%)	16 (88.9%)
Content knowledge through discussions	44 (80.0%)	13 (72.2%)
Documents and materials	37 (67.3%)	8 (44.4%)
WeatherCycler	34 (61.8%)	5 (27.8%)
Hand twist model	37 (67.3%)	6 (33.3%)
Stüve diagrams	19 (34.5%)	1 (5.6%)
Pressure blocks	27 (49.1%)	8 (44.4%)
Cloud in a bottle	33 (60.0%)	3 (16.7%)
Surface weather maps, charts, graphs	42 (76.4%)	8 (44.4%)
Weather forecasting techniques	28 (50.9%)	4 (22.2%)
Satellite images / animations	36 (65.5%)	8 (44.4%)
Content lessons plans	29 (52.7%)	4 (22.2%)
AMS and DataStreme course information – recommendations	35 (63.6%)	12 (66.7%)
Suggested AMS DataStreme, NOAA, other websites	39 (70.9%)	9 (50.0%)
Professional development opportunities	24 (43.6%)	6 (33.3%)
Tools and models (shared)	27 (49.1%)	5 (27.8%)
Content lesson plans (helped design or shared)	21 (38.2%)	5 (27.8%)

Other	0 (0.0%)	0 (0.0%)
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Resources and information that were provided to colleagues at similar levels (< 10% difference) based on EOC and F-U surveys were: website information and online links, content knowledge through discussions, pressure blocks, and AMS and DataStreme course information – recommendations. Respondents provided these resources and information to colleagues on the F-U survey at a lower level than on the EOC survey (at least 10%): Documents and materials, WeatherCycler, hand twist model, Stüve diagrams, cloud in a bottle, surface weather maps, charts, graphs, weather forecasting techniques, satellite images / animations, content lessons plans, suggested AMS DataStreme, NOAA, other websites, professional development opportunities, sharing tools and models, and helped design or shared content lesson plans. The level of sharing with colleagues ranged from 34%-90% on the EOC survey to 5%-88% on the F-U survey based on the specific resource being shared.

**Q13. Approximate number of colleagues with whom you anticipate sharing (have provided) DataStreme Atmosphere resources:**

Responses	EOC POA N= 55	POA F-U N= 18
1-5	35 (63.6%)	12 (66.7%)
6-10	14 (25.5%)	4 (22.2%)
11-15	4 (7.3%)	0 (0.0%)
16-20	2 (3.6%)	2 (11.1%)
21-25	0 (0.0%)	0 (0.0%)
>25	0 (0.0%)	0 (0.0%)
N/A	0 (0.0%)	0 (0.0%)

The approximate median number of colleagues DataStreme resources were shared with at the end of the course and at the follow-up timepoint was 1-5.

**Q14. Additional ways I plan to transfer (have transferred) my acquired knowledge and skills (from DataStreme Atmosphere) to other teachers:**

Responses	EOC POA N= 55	POA F-U N= 18
Gave informal discussion and workshops	25 (45.5%)	6 (33.3%)
Shared course materials	48 (87.3%)	13 (72.2%)
Suggested professional development	32 (58.2%)	9 (50.0%)
Shared tools and models	45 (81.8%)	8 (44.4%)
Facilitated design, content, cross-curricular format lesson plans	20 (36.4%)	5 (27.8%)
Suggested AMS DataStreme, NOAA and other websites	43 (78.2%)	12 (66.7%)
Recommended DataStreme courses	41 (74.5%)	12 (66.7%)
Shared videos and satellite images	32 (58.2%)	6 (33.3%)
Became involved in team teaching	10 (18.2%)	2 (11.1%)
Other (please specify)	0 (0.0%)	1 (5.6%)
		<ul style="list-style-type: none"> <li>I have worked with our elementary school teachers incorporating more atmospheric science into the elementary curriculum.</li> </ul>

DataStreme Atmosphere course participants indicated they planned to transfer (EOC; 18%-87%) all of the acquired knowledge and skills to other teachers at higher levels than they actually did (F-U; 11%-72%).

**Q15. Have you provided formal workshops to colleagues?**

Responses	EOC POA N= 55	POA F-U N= 18
No	23 (41.8%)	13 (72.2%)
Yes	32 (58.2%)	5 (27.8%)

At the end of the DataStreme Atmosphere course, 58% of respondents had provided workshops to colleagues, this percentage decreased to > 28% by the follow-up time point.

**Q16. If "yes", how many?**

Responses	EOC POA N= 21	POA F-U N= 5
1	15 (71.4%)	2 (40.0%)
2	2 (9.5%)	2 (40.0%)
3	2 (9.5%)	1 (20.0%)
4	0 (0.0%)	0 (0.0%)
5	0 (0.0%)	0 (0.0%)
6 or more	2 (9.5%)	0 (0.0%)

On average, > 80% participants who responded that they had provided formal workshops to colleagues, provided only one or two workshops. Although, a few respondents provided 6 or more at the EOC time point.

**Q17. If "yes", topics presented**

Responses	EOC POA N= 21	POA F-U N= 5
Basics of weather	4 (19.0%)	1 (20.0%)
Using real-time data to teach weather/ meteorology	3 (14.3%)	2 (40.0%)
Forecasting weather	1 (4.8%)	0 (0.0%)
Integrating weather into classroom lessons/ activities	4 (19.0%)	2 (40.0%)
High / Low pressure systems	1 (4.8%)	1 (20.0%)
Cloud in a bottle formation	3 (14.3%)	1 (20.0%)
Relating weather to other disciplines	1 (4.8%)	0 (0.0%)
Wind patterns	3 (14.3%)	0 (0.0%)
Thunderstorms / severe weather	1 (4.8%)	0 (0.0%)
Climate and climate change	3 (14.3%)	2 (40.0%)
Relative humidity	0 (0.0%)	0 (0.0%)
Precipitation	1 (4.8%)	1 (20.0%)
El Niño / La Niña	2 (9.5%)	1 (20.0%)
Setting up a weather station	1 (4.8%)	1 (20.0%)
Other (please specify)	6 (28.6%)	0 (0.0%)
	<ul style="list-style-type: none"> <li>• NGSS in Elementary</li> <li>• Physics</li> <li>• STEM related</li> <li>• Physical Oceanography</li> <li>• Environmental Education</li> <li>• Use of Technology in the science classroom</li> <li>• Biology demos</li> <li>• PIBS</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud identification</li> </ul>

The topics most commonly included (>10% of the time) in formal workshops as reported on both EOC and F-U surveys were: basics of weather, using real-time data to teach weather / meteorology, integrating weather into classroom lessons/ activities, cloud in a bottle formation, and climate and climate change. Additionally, wind patterns, and El Niño / La Niña were included in workshops by at least 25% of participants at the follow-up timepoint.

**Q18. School, district, state curricula that have been impacted with DataStreme Atmosphere course information:**

Responses	EOC POA N= 55	POA F-U N= 18
State	16 (29.1%)	6 (33.3%)
District	25 (45.5%)	9 (50.0%)
School	36 (65.5%)	12 (66.7%)
None	6 (10.9%)	0 (0.0%)
Other (please specify)	1 (1.8%)	0 (0.0%)
	• AP Level	
N/A	9 (16.4%)	1 (5.6%)

DataStreme Atmosphere course information has impacted curricula at all levels. The greatest impacts on curricula were reported at the school level (EOC=65.5%; F-U=66.7%), followed by the district level (EOC=45.5%; F-U=50.0%), and finally the state level (EOC=29.1%; F-U=33.3%).

**Q19. Ways my participation in DataStreme Atmosphere has impacted administrators at my school, district, or state level:**

Responses	EOC POA N= 55	POA F-U N= 18
Sharing information	29 (52.7%)	15 (83.3%)
Raising awareness of DataStreme	23 (41.8%)	7 (38.9%)
Demonstrations	12 (21.8%)	1 (5.6%)
Other (please specify)	3 (5.5%)	0 (0.0%)
	• Writing DataStreme into the curriculum	0 (0.0%)
N/A	13 (23.6%)	2 (11.1%)

Participants report their involvement with DataStreme has impacted administrators at the school, district, and state levels. Participants accomplished this by sharing information (EOC=52.7%; F-U=83.3%), raising awareness of DataStreme (EOC=41.8%; F-U=38.9%), and demonstrations (EOC=21.8%; F-U=5.6%).

**Q20. Science teacher organizations I am active in: N= 55  
EOC POA**

Organization	National	Regional	State	Local	TOTAL
National Science Teachers Assn (NSTA)	24 (43.6%)	5 (9.1%)	20 (36.4%)	14 (25.5%)	<b>63 (25.6%)</b>
National Earth Science Teachers Assn (NESTA)	4 (7.3%)	1 (1.8%)	8 (14.5%)	14 (25.5%)	<b>27 (11.0%)</b>
American Meteorological Society (AMS)	39 (70.9%)	1 (1.8%)	2 (3.6%)	6 (10.9%)	<b>48 (19.5%)</b>
National Education Assn (NEA)	28 (50.9%)	7 (12.7%)	15 (27.3%)	17 (30.9%)	<b>67 (27.2%)</b>
National Weather Assn (NWA)	5 (9.1%)	2 (3.6%)	3 (5.5%)	11 (20.0%)	<b>21 (8.5%)</b>

The Association for Science Teacher Education (ASTE)	5 (9.1%)	1 (1.8%)	4 (7.3%)	10 (18.2%)	20 (8.1%)
<b>TOTAL</b>	<b>105 (42.7%)</b>	<b>17 (6.9%)</b>	<b>52 (21.1%)</b>	<b>72 (29.3%)</b>	<b>246 (100.0%)</b>

Please list other: N = 11 (20.0%)

- Maryland Association of Science Teachers (MAST) - 2
- STANYS - 2
- CCCTA - 1
- AAPT - 1
- CAP - 1
- MTEEA - 1
- ITEA - 1
- Michigan Association of Agriscience Educators – 1
- National Earth Science Teachers Association – 1

At the end of DataStreme Atmosphere, participants were active in an average of 4.7 science teacher organizations. The most frequently selected organizations were national (NSTA; 43.6%, AMS; 70.9%, and NEA; 50.9%) or local (NSTA; 25.5%, NESTA; 25.5%, and NEA; 30.9%) science teacher organizations. State and regional organizations were selected less often.

#### POA F-U N= 14

Organization	National	Regional	State	Local	TOTAL
National Science Teachers Assn (NSTA)	10 (71.4%)	1 (7.1%)	1 (7.1%)	2 (14.3%)	14 (31.8%)
National Earth Science Teachers Assn (NESTA)	3 (21.4%)	1 (7.1%)	1 (7.1%)	1 (7.1%)	6 (13.6%)
American Meteorological Society (AMS)	10 (71.4%)	0 (0.0%)	0 (0.0%)	1 (7.1%)	11 (25.0%)
National Education Assn (NEA)	6 (42.9%)	1 (7.1%)	3 (21.4%)	3 (21.4%)	13 (29.5%)
National Weather Assn (NWA)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
The Association for Science Teacher Education (ASTE)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
<b>TOTAL</b>	<b>29 (65.9%)</b>	<b>3 (6.8%)</b>	<b>5 (11.4%)</b>	<b>7 (15.9%)</b>	<b>44 (100.0%)</b>

Please list other: N = 7 (50.0%)

- AATP
- AAS
- WSST
- NAGT
- North Carolina Science Leadership Association
- Illinois Science Teachers Association
- Maryland Association of Science Teachers

At the follow-up time point after the end of the DataStreme Atmosphere course, participants were active in an average of 3.6 science teacher organizations. The most frequently selected organizations were national (NSTA; 71.4%, and AMS; 71.4%) or local (NSTA; 14.3%, and NEA 21.4%) science teacher organizations. State and regional organizations were selected less often. The primary difference between the data from EOC and F-U surveys was a decrease in the average number of participants who were active in science teacher organizations from 4.7 on the EOC survey to 3.6 on the F-U survey.

**Q21.\* Science teacher organizations I plan to become active in: N= 55**

\* Not on F-U survey

Organization	National	Regional	State	Local	TOTAL
National Science Teachers Assn (NSTA)	12 (21.8%)	4 (7.3%)	5 (9.1%)	11 (20.0%)	32 (17.6%)
National Earth Science Teachers Assn (NESTA)	10 (18.2%)	4 (7.3%)	5 (9.1%)	8 (14.5%)	27 (14.8%)
American Meteorological Society (AMS)	11 (20.0%)	5 (9.1%)	3 (5.5%)	13 (23.6%)	32 (17.6%)
National Education Assn (NEA)	9 (16.4%)	3 (5.5%)	4 (7.3%)	11 (20.0%)	27 (14.8%)
National Weather Assn (NWA)	9 (16.4%)	6 (10.9%)	6 (10.9%)	12 (21.8%)	33 (18.1%)
The Association for Science Teacher Education (ASTE)	11 (20.0%)	4 (7.3%)	5 (9.1%)	11 (20.0%)	31 (17.0%)
<b>TOTAL</b>	<b>62 (34.1%)</b>	<b>26 (14.3%)</b>	<b>28 (15.4%)</b>	<b>66 (36.3%)</b>	<b>182 (100.0%)</b>

Please list other: N = 6 (10.9%)

- STANYS – 2
- LIPTA – 1
- AAAS – 1
- NMST – 1
- Pennsylvania Environmental Education – 1

At the end of DataStreme Atmosphere, participants planned to become active in an average of 3.4 science teacher organizations. The most frequently selected organizations were national (NSTA; 21.8%, AMS; 20.0% and ASTE; 20.0%) or local (NSTA; 20.0%, AMS; 23.6%, NEA; 20.0%, NWA; 21.8%, and ASTE; 20.0%) science teacher organizations. State and regional organizations were selected less often.

**Q22/Q21. Any other general comments you wish to make:**

EOC POA N= 14	POA F-U N= 3
Thanks, I enjoyed participating in some learning!	Wonderful program, Thank you!
Thank you for the opportunity to take another DataStreme course! They are, for the most part, extremely well done and very enjoyable. Thanks!	I have never had more fun teaching weather as this year because I knew the information better and had lots more resources to use to help students grasp it. All because of DataStreme Atmosphere.
I thought this was a great class that was a good introduction to the atmosphere. While weather is not a direct standard in my curriculum, some of the concepts can be incorporated into my physics and astronomy units. I also plan to pique my students' interest and understanding of the weather in general.	Networking with professionals in atmospheric science is so important. I feel I can reach out to folks I have met and get answers. It would be great if the AMS or DataStreme folks could

	enhance this networking opportunity. For myself, I am thinking between schools and regional NWS sites.
Some of the questions on assessments and activities are poorly designed. Please consider including more pictures and better descriptions when you update the course.	
Course work is very valuable for our school and is allowing us to do cross curricular work. Incorporating science into Social Studies and math classes.	
Online classes make learning more convenient and accessible to teachers, but the downside is less real interaction and experience. Some of the best PD experiences have been courses where meeting and collaborating with individuals in real life. This was a great course however!	
Question 34 was unclear.	
I have learned so much through this course... it's amazing! I will be incorporating what I have learned into the "Human Impact on the Environment" unit of our Biology Curriculum in the spring. I am currently in the process of writing a proposal to offer a Meteorology course at my high school for the 2020-2021 school.	
This course has opened the door for me to a subject that I have always felt somewhat unprepared and inadequate in teaching. I look forward to continuing my own education in weather related topics and finding ways to bring this relevant and interesting topic to my students. I feel that this course has been just the first step into a new study.	
Thanks! These courses are great and very helpful for my teaching!	
Great course and I am glad that I was able to learn about meteorology in a manner that allowed the concepts with real-time data and weather. There is so much to analyze and interpret. My students will have plenty to work with and become better mini meteorologists. Thank-you!	
The DataStream Atmosphere class has given me more confidence in teaching weather and climate information to my students. I would have liked to have a physical book or PDF so that I could reference material and concepts without having to look at a book on an electronic shelf that will expire in a year. I often save course material to use later throughout the years, and I am disappointed that I will not have the textbook on my shelf for reference permanently.	
I wish we had the option to purchase the textbook and materials.	
This course was very informative and interesting. Looking forward to sharing this information with colleagues and students.	
I have enjoyed the content presented in this course and have already shared information with my fellow science teachers. I plan to incorporate information I have gained from this course into our school's science curriculum. I know my students will definitely enjoy the hands-on activities and gain valuable information from them.	
This course was recommended to me. I have been very pleased with the content, mentors, and knowledge gained and enjoyed the course very much. I am currently on the process of recruiting other fellow teachers	

to join DataStreme in the fall. I look forward to taking more DataStreme courses. Thank you for creating this wonderful opportunity for teachers. I wish there were more PD opportunities that were of this caliber.	
While many topics in the course were a struggle for me to wrap my head around, I feel like I got a good “first dose” of the information. I’m excited to start incorporating what I’ve learned into my curriculum. Thank you for providing this opportunity to me!	
This was a great course. Personally, I really appreciate the weekly opportunities to analyze current weather maps or diagrams. That whole part of the course will be borrowed for use in my Atmospheric Science course next year. I thought the way it was presented in this course was awesome and relevant. And I strongly believe that if you can connect the theory with experience, students really dig it and learn better.	
Conversations with mentor group were pointless. I was in a group with a colleague. I only talked with my colleague. Also, D2L Brightspace quiz questions should be iPad compatible!	
I really enjoyed this course. As a chemistry teacher who has actually never taken an earth science course, I learned a lot of material that will allow me to integrate real world concepts into my chemistry content that relates to weather.	
Thank you for all of the information and helping me learn! My team leader was great at staying in touch with me throughout the course. I will be taking more and sharing with all my science friends how wonderful this experience was!	
This will help me with my AP Environmental Science Class.	
Thank you for the course. I learned a lot of information that I plan to use to help my students understand more. Thank-you	

## ATTACHMENT F – Pricing Schedule

**The offeror shall provide a pricing structure based on hourly rates for all services included in the proposal.**

BWEC is located in Virginia Beach, VA approximately 200 miles from JMU. Travel time to JMU will be billed at 50% hourly rates. Mileage will be billed at the JMU mileage rate. Lodging will be billed at actual costs. Meals will be billed at JMU meal allowance rates.

Hourly rates are in effect for any location where work for this contract is conducted. The Pricing Schedule is as follows:

Elizabeth A. Day - \$110.00/hour

Janice O. Easton - \$90.00/hour

Amy D. Thelk - \$50.00/hour

Mary D. Rush - \$30.00/hour

Once a project requiring BWEC services has been identified, Day will provide a specific proposal to the PI for conducting evaluation services. Typically, and in compliance with some federal agency expectations, the total for the hourly rate and the time required to conduct the evaluation will be approximately 10% - 15% of the project budget. The exact cost will depend on project complexity and the exact data collection and analysis methods required.

The Contractor **shall not** be reimbursed for, nor will James Madison University purchase, any operational needs or expenses of the Contractor, which includes, but is not limited to, office supplies and equipment, computers and accessories, and office furniture.

The Contractor **shall be** reimbursed for travel expenses required to conduct agreed upon evaluation activities for a contracted project. Reimbursement will be made at rates and amounts consistent with approved Virginia travel reimbursement regulations.



# Request for Proposal

## **RFP# FDC-1189**

**Sponsored Programs Evaluation Services**

**October 2, 2023**



# **REQUEST FOR PROPOSAL**

## **RFP# FDC-1189**

**Issue Date:** October 2, 2023  
**Title:** Sponsored Programs Evaluation Services  
**Issuing Agency:** Commonwealth of Virginia  
James Madison University  
Procurement Services MSC 5720  
752 Ott Street, Wine Price Building  
First Floor, Suite 1023  
Harrisonburg, VA 22807

**Period of Contract: From Date of Award Through One Year (Renewable)**

**Sealed Proposals Will Be Received Until 2:00 PM on November 2, 2023 for Furnishing the Services Described Herein.**

*SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.*

All inquiries for information and clarification should be directed To: Doug Chester, Buyer Senior, Procurement Services, [chestefd@jmu.edu](mailto:chestefd@jmu.edu); 540-568-4272; (Fax) 540-568-7935 not later than five business days before the proposal closing date.

**NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.**

In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

\_\_\_\_\_

By:

\_\_\_\_\_  
(Signature in Ink)

\_\_\_\_\_

Name:

\_\_\_\_\_  
(Please Print)

\_\_\_\_\_

Date:

\_\_\_\_\_

Title:

\_\_\_\_\_

Web Address:

\_\_\_\_\_

Phone:

\_\_\_\_\_

Email:

\_\_\_\_\_

Fax #:

\_\_\_\_\_

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1\_\_\_\_\_ #2\_\_\_\_\_ #3\_\_\_\_\_ #4\_\_\_\_\_ #5\_\_\_\_\_ (please initial)

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

☐ YES; ☐ NO; *IF YES* ⇒ ☐ SMALL; ☐ WOMAN; ☐ MINORITY ***IF MINORITY:*** ☐ AA; ☐ HA; ☐ AsA; ☐ NW; ☐ Micro

**Note: This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia*, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.**

# ***REQUEST FOR PROPOSAL***

***RFP # FDC-1189***

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## **I. PURPOSE**

The purpose of this Request for Proposal (RFP) is to solicit sealed proposals from qualified sources to enter into a contract to provide Sponsored Programs Evaluation Services for James Madison University (JMU), an agency of the Commonwealth of Virginia. Initial contract shall be for one (1) year with an option to renew for four (4) additional one-year periods.

## **II. BACKGROUND**

James Madison University (JMU) is a comprehensive public institution in Harrisonburg, Virginia with an enrollment of approximately 22,000 students and more than 4,000 faculty and staff. There are over 600 individual departments on campus that support seven academic divisions. The University offers over 120 majors, minors, and concentrations. Further information about the University may be found at the following website: <http://www.jmu.edu>.

JMU pursues external funding for a variety of programs and special projects that advance the University's mission. External funding is sought from diverse sources, including federal, state, and local agencies, corporate entities, local and national grant making foundations, and private donors. Types of support received at the University includes grants, cooperative agreements, and contracts. In FY2023, JMU faculty and staff received a total > \$34M in external funding to promote research, instruction, outreach, and other activities. A full-report of FY2023 activity can be found at the following website:

[https://www.jmu.edu/sponsoredprograms/newsletters-and-reports/fy23-ospannualreport\\_final.pdf](https://www.jmu.edu/sponsoredprograms/newsletters-and-reports/fy23-ospannualreport_final.pdf)

Increasingly, more sponsors require robust evaluation or assessment plans in their guidelines to receive funding. As a condition of funding, applicants are required to collect and report performance data to show the efficacy of programs. The University currently receives funding from various federal agencies such as the Department of Health and Human Services, Department of Education, Department of State, National Science Foundation, Department of Energy, National Endowment for the Arts, National Endowment for the Humanities, and Environmental Protection Agency as well as state, local, private, and corporate sponsors.

## **III. SMALL, WOMAN-OWNED AND MINORITY PARTICIPATION**

It is the policy of the Commonwealth of Virginia to contribute to the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities, and to encourage their participation in State procurement activities. The Commonwealth encourages contractors to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Attachment B contains information on reporting spend data with subcontractors.

## **IV. STATEMENT OF NEEDS**

James Madison University seeks to contract with an experienced Contractor(s) to provide evaluation services on an as-needed basis for the various externally-funded programs at the University. Contractors should have expertise in program evaluation and research design, management of complex, multi-site evaluation projects with multiple stakeholders, and scientific research methodologies including the development of surveys and other data collection instruments as well as sampling, testing, and statistical analysis. Contractors should also have experience related to a regulatory environment and compliance, such as the Health Insurance Portability and Accountability Act (HIPAA), and working with Institutional Review Boards or Institutional Animal Care and Use Committees. At the request of the University, Offerors shall create logic models, develop evaluation design plans that include formative and summative assessments and both qualitative and quantitative evaluation methods, create and implement data

collection and sampling plans, conduct analyses, write reports, and disseminate results. Some programs may require evaluators with specific skills related to a particular field (i.e. biology, education, human services, engineering).

**Describe in detail your firm's approach to each of the following items. Failure to provide responses to the items listed below may result in rejection of the proposal.**

- A. Describe in detail the firm's qualifications and expertise in providing evaluation services to organizations similar in size and scope to James Madison University.
- B. Provide a detailed description of the firm's areas of expertise (i.e. biology, education, human services). Include general and specific evaluation design specialties/expertise.
- C. Describe in detail the firm's prior evaluations of externally-funded projects, specifically any evaluations provided for governmental entities and institutions of higher education. Include a list of projects, funding agency, contact information to include name, phone number, and email address, and nature of the project as well as any additional information that would be helpful in evaluating the capacity and complexity of past projects.
- D. Describe any innovative or creative design approaches or strategies.
- E. Describe in detail the firm's evaluation planning and implementation methodology to include the following:
  - 1. Allocation of staff
  - 2. Management methods
  - 3. Systems to ensure maintenance of complete and accurate records
  - 4. Processes in place to protect personally identifiable information
  - 5. Potential use of subcontractors
  - 6. Commitment to project completion within time and budget constraints
- F. Describe your firm's quality control process, including mechanisms to detect and reduce fraud and errors in data collection.
- G. Describe your firm's software used for statistical analysis of data.
- H. Provide the names, titles, and resumes of key management personnel that may be assigned to perform work for James Madison University.
- I. Provide a sample evaluation plan, evaluation report, or executive summary for a recent project for which the firm provided evaluation services.

## V. PROPOSAL PREPARATION AND SUBMISSION

### A. GENERAL INSTRUCTIONS

**To ensure timely and adequate consideration of your proposal, offerors are to limit all contact, whether verbal or written, pertaining to this RFP to the James Madison University Procurement Office for the duration of this Proposal process. Failure to do so may jeopardize further consideration of Offeror's proposal.**

1. RFP Response: In order to be considered for selection, the **Offeror shall submit a complete response to this RFP**; and shall submit to the issuing Purchasing Agency:
  - a. **One (1) original and seven (7) copies** of the entire proposal, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 3.f. below.
  - b. **One (1) electronic copy in WORD format or searchable PDF (*flash drive*)** of the entire proposal, as a single document, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 3.f. below.
  - c. Should the proposal contain **proprietary information**, provide **one (1) redacted hard copy** of the proposal and all attachments with **proprietary portions removed or blacked out**. This copy should be clearly marked "*Redacted Copy*" on the front cover. The classification of an entire proposal document, line-item prices, and/or total proposal prices as proprietary or trade secrets is not acceptable. JMU shall not be responsible for the Contractor's failure to exclude proprietary information from this redacted copy.

No other distribution of the proposal shall be made by the Offeror.

2. The version of the solicitation issued by JMU Procurement Services, as amended by an addenda, is the mandatory controlling version of the document. Any modification of, or additions to, the solicitation by the Offeror shall not modify the official version of the solicitation issued by JMU Procurement services unless accepted in writing by the University. Such modifications or additions to the solicitation by the Offeror may be cause for rejection of the proposal; however, JMU reserves the right to decide, on a case-by-case basis in its sole discretion, whether to reject such a proposal. If the modification or additions are not identified until after the award of the contract, the controlling version of the solicitation document shall still be the official state form issued by Procurement Services.
3. Proposal Preparation
  - a. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in the purchasing agency requiring prompt submissions of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by the purchasing agency. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.
  - b. Proposals shall be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

- c. Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the paragraph number, sub letter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and sub letter should be repeated at the top of the next page. The proposal should contain a table of contents which cross references the RFP requirements. Information which the offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at the appropriate place or be attached at the end of the proposal and designated as additional material. Proposals that are not organized in this manner risk elimination from consideration if the evaluators are unable to find where the RFP requirements are specifically addressed.
  - d. As used in this RFP, the terms “must”, “shall”, “should” and “may” identify the criticality of requirements. “Must” and “shall” identify requirements whose absence will have a major negative impact on the suitability of the proposed solution. Items labeled as “should” or “may” are highly desirable, although their absence will not have a large impact and would be useful, but are not necessary. Depending on the overall response to the RFP, some individual “must” and “shall” items may not be fully satisfied, but it is the intent to satisfy most, if not all, “must” and “shall” requirements. The inability of an offeror to satisfy a “must” or “shall” requirement does not automatically remove that offeror from consideration; however, it may seriously affect the overall rating of the offeror’s proposal.
  - e. Each copy of the proposal should be bound or contained in a single volume where practical. All documentation submitted with the proposal should be contained in that single volume.
  - f. Ownership of all data, materials and documentation originated and prepared for the State pursuant to the RFP shall belong exclusively to the State and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by the offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the offeror must invoke the protection of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data is submitted. The written notice must specifically identify the data or materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret materials submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line-item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and will result in rejection and return of the proposal.
4. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to James Madison University. This provides an opportunity for the Offeror to clarify or elaborate on the proposal. This is a fact-finding and explanation session only and does not include negotiation. James Madison University will schedule the time and location of these presentations. Oral presentations are an option of the University and may or may not be conducted. Therefore, proposals should be complete.

**B. SPECIFIC PROPOSAL INSTRUCTIONS**

Proposals should be as thorough and detailed as possible so that James Madison University may properly evaluate your capabilities to provide the required services. Offerors are required to submit the following items as a complete proposal:

1. Return RFP cover sheet and all addenda acknowledgements, if any, signed and filled out as required.
2. Plan and methodology for providing the goods/services as described in Section IV. Statement of Needs of this Request for Proposal.
3. A written narrative statement to include, but not be limited to, the expertise, qualifications, and experience of the firm and resumes of specific personnel to be assigned to perform the work.
4. Offeror Data Sheet, included as *Attachment A* to this RFP.
5. Small Business Subcontracting Plan, included as *Attachment B* to this RFP. Offeror shall provide a Small Business Subcontracting plan which summarizes the planned utilization of Department of Small Business and Supplier Diversity (SBSD)-certified small businesses which include businesses owned by women and minorities, when they have received Department of Small Business and Supplier Diversity (SBSD) small business certification, under the contract to be awarded as a result of this solicitation. This is a requirement for all prime contracts in excess of \$100,000 unless no subcontracting opportunities exist.
6. Identify the amount of sales your company had during the last twelve months with each VASCUPP Member Institution. A list of VASCUPP Members can be found at: [www.VASCUPP.org](http://www.VASCUPP.org).
7. Proposed Cost. See Section X. Pricing Schedule of this Request for Proposal.

## **VI. EVALUATION AND AWARD CRITERIA**

### **A. EVALUATION CRITERIA**

Proposals shall be evaluated by James Madison University using the following criteria:

	<u>Points</u>
1. Quality of products/services offered and suitability for intended purposes	20
2. Qualifications and experience of Offeror in providing the goods/services	30
3. Specific plans or methodology to be used to perform the services	20
4. Participation of Small, Women-Owned, & Minority (SWaM) Businesses	10
5. Cost	20
<b>TOTAL</b>	<u>100</u>

- B. AWARD TO MULTIPLE OFFERORS:** Selection shall be made of two or more offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation factors included in the Request for Proposals, including price, if so stated in the Request for Proposals. Negotiations shall be conducted with the offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each offeror so selected, the agency shall select the offeror which, in its opinion, has made the best proposal, and shall award the contract to that offeror. The Commonwealth reserves the right to make multiple awards as a result of this solicitation. The Commonwealth may cancel this Request for Proposals or reject proposals at any time prior to an award, and is not required to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous. Should the Commonwealth

determine in writing and in its sole discretion that only one offeror is fully qualified, or that one offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the contractor's proposal as negotiated.

## **VII. GENERAL TERMS AND CONDITIONS**

- A. PURCHASING MANUAL: This solicitation is subject to the provisions of the Commonwealth of Virginia's Purchasing Manual for Institutions of Higher Education and Their Vendors and any revisions thereto, which are hereby incorporated into this contract in their entirety. A copy of the manual is available for review at the purchasing office. In addition, the manual may be accessed electronically at <http://www.jmu.edu/procurement> or a copy can be obtained by calling Procurement Services at (540) 568-3145.
- B. APPLICABLE LAWS AND COURTS: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth. The Contractor shall comply with applicable federal, state and local laws and regulations.
- C. ANTI-DISCRIMINATION: By submitting their proposals, offerors certify to the Commonwealth that they will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act and §10 of the Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 (available for review at <http://www.jmu.edu/procurement>). If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the contract on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender, sexual orientation, gender identity, or national origin and shall be subject to the same rules as other organizations that contract with public bodies to account for the use of the funds provided; however, if the faith-based organization segregates public funds into separate accounts, only the accounts and programs funded with public funds shall be subject to audit by the public body. (*§6 of the Rules Governing Procurement*).

In every contract over \$10,000 the provisions in 1. and 2. below apply:

- 1. During the performance of this contract, the contractor agrees as follows:
  - a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, sexual orientation, gender identity, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
  - b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
  - c. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting these requirements.

2. The contractor will include the provisions of 1. above in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.
- D. ETHICS IN PUBLIC CONTRACTING: By submitting their proposals, offerors certify that their proposals are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor in connection with their proposal, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.
  - E. IMMIGRATION REFORM AND CONTROL ACT OF 1986: By entering into a written contract with the Commonwealth of Virginia, the Contractor certifies that the Contractor does not, and shall not during the performance of the contract for goods and services in the Commonwealth, knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
  - F. DEBARMENT STATUS: By submitting their proposals, offerors certify that they are not currently debarred by the Commonwealth of Virginia from submitting proposals on contracts for the type of goods and/or services covered by this solicitation, nor are they an agent of any person or entity that is currently so debarred.
  - G. ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the Commonwealth of Virginia all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the Commonwealth of Virginia under said contract.
  - H. MANDATORY USE OF STATE FORM AND TERMS AND CONDITIONS RFPs: Failure to submit a proposal on the official state form provided for that purpose may be a cause for rejection of the proposal. Modification of or additions to the General Terms and Conditions of the solicitation may be cause for rejection of the proposal; however, the Commonwealth reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a proposal.
  - I. CLARIFICATION OF TERMS: If any prospective offeror has questions about the specifications or other solicitation documents, the prospective offeror should contact the buyer whose name appears on the face of the solicitation no later than five working days before the due date. Any revisions to the solicitation will be made only by addendum issued by the buyer.
  - J. PAYMENT:
    1. To Prime Contractor:
      - a. Invoices for items ordered, delivered and accepted shall be submitted by the contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the state contract number and/or purchase order number; social security number (for individual contractors) or the federal employer identification number (for proprietorships, partnerships, and corporations).
      - b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.

- c. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the contractor at the contract price, regardless of which public agency is being billed.
- d. The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail, or the date of offset when offset proceedings have been instituted as authorized under the Virginia Debt Collection Act.
- e. **Unreasonable Charges.** Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced charges are not reasonable, the Commonwealth shall promptly notify the contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification. The provisions of this section do not relieve an agency of its prompt payment obligations with respect to those charges which are not in dispute (*Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 § 53; available for review at <http://www.jmu.edu/procurement>*).

2. To Subcontractors:

- a. A contractor awarded a contract under this solicitation is hereby obligated:
    - (1) To pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the Commonwealth for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or
    - (2) To notify the agency and the subcontractors, in writing, of the contractor's intention to withhold payment and the reason.
  - b. The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the Commonwealth, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the Commonwealth.
3. Each prime contractor who wins an award in which provision of a SWAM procurement plan is a condition to the award, shall deliver to the contracting agency or institution, on or before request for final payment, evidence and certification of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the SWAM procurement plan. Final payment under the contract in question may be withheld until such certification is delivered and, if necessary, confirmed by the agency or institution, or other appropriate penalties may be assessed in lieu of withholding such payment.
4. The Commonwealth of Virginia encourages contractors and subcontractors to accept electronic and credit card payments.

- K. PRECEDENCE OF TERMS: Paragraphs A through J of these General Terms and Conditions and the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors, shall apply in all instances. In the event there is a conflict between any of the other General Terms and Conditions and any Special Terms and Conditions in this solicitation, the Special Terms and Conditions shall apply.
- L. QUALIFICATIONS OF OFFERORS: The Commonwealth may make such reasonable investigations as deemed proper and necessary to determine the ability of the offeror to perform the services/furnish the goods and the offeror shall furnish to the Commonwealth all such information and data for this purpose as may be requested. The Commonwealth reserves the right to inspect offeror's physical facilities prior to award to satisfy questions regarding the offeror's capabilities. The Commonwealth further reserves the right to reject any proposal if the evidence submitted by, or investigations of, such offeror fails to satisfy the Commonwealth that such offeror is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.
- M. TESTING AND INSPECTION: The Commonwealth reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.
- N. ASSIGNMENT OF CONTRACT: A contract shall not be assignable by the contractor in whole or in part without the written consent of the Commonwealth.
- O. CHANGES TO THE CONTRACT: Changes can be made to the contract in any of the following ways:
1. The parties may agree in writing to modify the scope of the contract. An increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.
  2. The Purchasing Agency may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt. The contractor shall be compensated for any additional costs incurred as the result of such order and shall give the Purchasing Agency a credit for any savings. Said compensation shall be determined by one of the following methods:
    - a. By mutual agreement between the parties in writing; or
    - b. By agreeing upon a unit price or using a unit price set forth in the contract, if the work to be done can be expressed in units, and the contractor accounts for the number of units of work performed, subject to the Purchasing Agency's right to audit the contractor's records and/or to determine the correct number of units independently; or
    - c. By ordering the contractor to proceed with the work and keep a record of all costs incurred and savings realized. A markup for overhead and profit may be allowed if provided by the contract. The same markup shall be used for determining a decrease in price as the result of savings realized. The contractor shall present the Purchasing Agency with all vouchers and records of expenses incurred and savings realized. The Purchasing Agency shall have the right to audit the records of the contractor as it deems necessary to determine costs or savings. Any claim for an adjustment in price under this provision must be asserted by written notice to the Purchasing Agency within thirty (30) days from the date of receipt of the written order from the Purchasing Agency. If the parties fail to agree on an amount of adjustment, the question of an increase or decrease in the contract price or time for performance shall be resolved in accordance with the procedures for resolving disputes provided by the Disputes Clause of this

contract or, if there is none, in accordance with the disputes provisions of the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors. Neither the existence of a claim nor a dispute resolution process, litigation or any other provision of this contract shall excuse the contractor from promptly complying with the changes ordered by the Purchasing Agency or with the performance of the contract generally.

- P. **DEFAULT:** In case of failure to deliver goods or services in accordance with the contract terms and conditions, the Commonwealth, after due oral or written notice, may procure them from other sources and hold the contractor responsible for any resulting additional purchase and administrative costs. This remedy shall be in addition to any other remedies which the Commonwealth may have.
- Q. **INSURANCE:** By signing and submitting a proposal under this solicitation, the offeror certifies that if awarded the contract, it will have the following insurance coverage at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with § 25 of the Rules Governing Procurement – Chapter 2, Exhibit J, Attachment 1, and 65.2-800 et. Seq. of the Code of Virginia (available for review at <http://www.jmu.edu/procurement>) The offeror further certifies that the contractor and any subcontractors will maintain these insurance coverages during the entire term of the contract and that all insurance coverage will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

**MINIMUM INSURANCE COVERAGES AND LIMITS REQUIRED FOR MOST CONTRACTS:**

1. Workers' Compensation: Statutory requirements and benefits. Coverage is compulsory for employers of three or more employees, to include the employer. Contractors who fail to notify the Commonwealth of increases in the number of employees that change their workers' compensation requirement under the Code of Virginia during the course of the contract shall be in noncompliance with the contract.
  2. Employer's Liability: \$100,000
  3. Commercial General Liability: \$1,000,000 per occurrence and \$2,000,000 in the aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. The Commonwealth of Virginia must be named as an additional insured and so endorsed on the policy.
  4. Automobile Liability: \$1,000,000 combined single limit. *(Required only if a motor vehicle not owned by the Commonwealth is to be used in the contract. Contractor must assure that the required coverage is maintained by the Contractor (or third-party owner of such motor vehicle.)*
- R. **ANNOUNCEMENT OF AWARD:** Upon the award or the announcement of the decision to award a contract over \$100,000, as a result of this solicitation, the purchasing agency will publicly post such notice on the DGS/DPS eVA web site ([www.eva.virginia.gov](http://www.eva.virginia.gov)) for a minimum of 10 days.
- S. **DRUG-FREE WORKPLACE:** During the performance of this contract, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, “drug-free workplace” means a site for the performance of work done in connection with a specific contract awarded to a contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

T. NONDISCRIMINATION OF CONTRACTORS: An offeror, or contractor shall not be discriminated against in the solicitation or award of this contract because of race, religion, color, sex, sexual orientation, gender identity, national origin, age, disability, faith-based organizational status, any other basis prohibited by state law relating to discrimination in employment or because the offeror employs ex-offenders unless the state agency, department or institution has made a written determination that employing ex-offenders on the specific contract is not in its best interest. If the award of this contract is made to a faith-based organization and an individual, who applies for or receives goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the public body shall offer the individual, within a reasonable period of time after the date of his objection, access to equivalent goods, services, or disbursements from an alternative provider.

U. eVA BUSINESS TO GOVERNMENT VENDOR REGISTRATION, CONTRACTS, AND ORDERS: The eVA Internet electronic procurement solution, website portal [www.eVA.virginia.gov](http://www.eVA.virginia.gov), streamlines and automates government purchasing activities in the Commonwealth. The eVA portal is the gateway for vendors to conduct business with state agencies and public bodies. All vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet eprocurement solution by completing the free eVA Vendor Registration. All offerors must register in eVA and pay the Vendor Transaction Fees specified below; failure to register will result in the proposal being rejected. Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:

Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:

1. For orders issued July 1, 2014 and after, the Vendor Transaction Fee is:
  - a. Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$500 per order.
  - b. Businesses that are not Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$1,500 per order.
2. For orders issued prior to July 1, 2014 the vendor transaction fees can be found at [www.eVA.virginia.gov](http://www.eVA.virginia.gov).
3. The specified vendor transaction fee will be invoiced by the Commonwealth of Virginia Department of General Services approximately 60 days after the corresponding purchase order is issued and payable 30 days after the invoice date. Any adjustments (increases/decreases) will be handled through purchase order changes.

V. AVAILABILITY OF FUNDS: It is understood and agreed between the parties herein that the Commonwealth of Virginia shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

W. PRICING CURRENCY: Unless stated otherwise in the solicitation, offerors shall state offered prices in U.S. dollars.

- X. E-VERIFY REQUIREMENT OF ANY CONTRACTOR: Any employer with more than an average of 50 employees for the previous 12 months entering into a contract in excess of \$50,000 with James Madison University to perform work or provide services pursuant to such contract shall register and participate in the E-Verify program to verify information and work authorization of its newly hired employees performing work pursuant to any awarded contract.
- Y. CIVILITY IN STATE WORKPLACES: The contractor shall take all reasonable steps to ensure that no individual, while performing work on behalf of the contractor or any subcontractor in connection with this agreement (each, a "Contract Worker"), shall engage in 1) harassment (including sexual harassment), bullying, cyber-bullying, or threatening or violent conduct, or 2) discriminatory behavior on the basis of race, sex, color, national origin, religious belief, sexual orientation, gender identity or expression, age, political affiliation, veteran status, or disability.

The contractor shall provide each Contract Worker with a copy of this Section and will require Contract Workers to participate in training on civility in the State workplace. Upon request, the contractor shall provide documentation that each Contract Worker has received such training.

For purposes of this Section, "State workplace" includes any location, permanent or temporary, where a Commonwealth employee performs any work-related duty or is representing his or her agency, as well as surrounding perimeters, parking lots, outside meeting locations, and means of travel to and from these locations. Communications are deemed to occur in a State workplace if the Contract Worker reasonably should know that the phone number, email, or other method of communication is associated with a State workplace or is associated with a person who is a State employee.

The Commonwealth of Virginia may require, at its sole discretion, the removal and replacement of any Contract Worker who the Commonwealth reasonably believes to have violated this Section.

This Section creates obligations solely on the part of the contractor. Employees or other third parties may benefit incidentally from this Section and from training materials or other communications distributed on this topic, but the Parties to this agreement intend this Section to be enforceable solely by the Commonwealth and not by employees or other third parties.

## **VIII. SPECIAL TERMS AND CONDITIONS**

- A. AUDIT: The Contractor hereby agrees to retain all books, records, systems, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. The Commonwealth of Virginia, its authorized agents, and/or State auditors shall have full access to and the right to examine any of said materials during said period.
- B. CANCELLATION OF CONTRACT: James Madison University reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

- C. **IDENTIFICATION OF PROPOSAL ENVELOPE:** The signed proposal should be returned in a separate envelope or package, sealed and identified as follows:

From:	_____	_____	_____
	Name of Offeror	Due Date	Time
_____		_____	
Street or Box No.		RFP #	
_____		_____	
City, State, Zip Code		RFP Title	
_____			
Name of Purchasing Officer:			

The envelope should be addressed as directed on the title page of the solicitation.

The Offeror takes the risk that if the envelope is not marked as described above, it may be inadvertently opened and the information compromised, which may cause the proposal to be disqualified. Proposals may be hand-delivered to the designated location in the office issuing the solicitation. No other correspondence or other proposals should be placed in the envelope.

- D. **LATE PROPOSALS:** To be considered for selection, proposals must be received by the issuing office by the designated date and hour. The official time used in the receipt of proposals is that time on the automatic time stamp machine in the issuing office. Proposals received in the issuing office after the date and hour designated are automatically non responsive and will not be considered. The University is not responsible for delays in the delivery of mail by the U.S. Postal Service, private couriers, or the intra university mail system. It is the sole responsibility of the Offeror to ensure that its proposal reaches the issuing office by the designated date and hour.
- E. **UNDERSTANDING OF REQUIREMENTS:** It is the responsibility of each offeror to inquire about and clarify any requirements of this solicitation that is not understood. The University will not be bound by oral explanations as to the meaning of specifications or language contained in this solicitation. Therefore, all inquiries deemed to be substantive in nature must be in writing and submitted to the responsible buyer in the Procurement Services Office. Offerors must ensure that written inquiries reach the buyer at least five (5) days prior to the time set for receipt of offerors proposals. A copy of all queries and the respective response will be provided in the form of an addendum to all offerors who have indicated an interest in responding to this solicitation. Your signature on your Offer certifies that you fully understand all facets of this solicitation. These questions may be sent by Fax to 540/568-7935.
- F. **RENEWAL OF CONTRACT:** This contract may be renewed by the Commonwealth for a period of four (4) successive one-year periods under the terms and conditions of the original contract except as stated in 1. and 2. below. Price increases may be negotiated only at the time of renewal. Written notice of the Commonwealth's intention to renew shall be given approximately 90 days prior to the expiration date of each contract period.
1. If the Commonwealth elects to exercise the option to renew the contract for an additional one-year period, the contract price(s) for the additional one year shall not exceed the contract price(s) of the original contract increased/decreased by no more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.
  2. If during any subsequent renewal periods, the Commonwealth elects to exercise the option to renew the contract, the contract price(s) for the subsequent renewal period shall not exceed the contract price(s) of the previous renewal period increased/decreased by more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index

of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.

- G. SUBMISSION OF INVOICES: All invoices shall be submitted within sixty days of contract term expiration for the initial contract period as well as for each subsequent contract renewal period. Any invoices submitted after the sixty-day period will not be processed for payment.
- H. OPERATING VEHICLES ON JAMES MADISON UNIVERSITY CAMPUS: Operating vehicles on sidewalks, plazas, and areas heavily used by pedestrians is prohibited. In the unlikely event a driver should find it necessary to drive on James Madison University sidewalks, plazas, and areas heavily used by pedestrians, the driver must yield to pedestrians. For a complete list of parking regulations, please go to [www.jmu.edu/parking](http://www.jmu.edu/parking); or to acquire a service representative parking permit, contact Parking Services at 540.568.3300. The safety of our students, faculty and staff is of paramount importance to us. Accordingly, violators may be charged.
- I. COOPERATIVE PURCHASING / USE OF AGREEMENT BY THIRD PARTIES: It is the intent of this solicitation and resulting contract(s) to allow for cooperative procurement. Accordingly, any public body, (to include government/state agencies, political subdivisions, etc.), cooperative purchasing organizations, public or private health or educational institutions or any University related foundation and affiliated corporations may access any resulting contract if authorized by the Contractor.

Participation in this cooperative procurement is strictly voluntary. If authorized by the Contractor(s), the resultant contract(s) will be extended to the entities indicated above to purchase goods and services in accordance with contract terms. As a separate contractual relationship, the participating entity will place its own orders directly with the Contractor(s) and shall fully and independently administer its use of the contract(s) to include contractual disputes, invoicing and payments without direct administration from the University. No modification of this contract or execution of a separate agreement is required to participate; however, the participating entity and the Contractor may modify the terms and conditions of this contract to accommodate specific governing laws, regulations, policies, and business goals required by the participating entity. Any such modification will apply solely between the participating entity and the Contractor.

The Contractor will notify the University in writing of any such entities accessing this contract. The Contractor will provide semi-annual usage reports for all entities accessing the contract. The University shall not be held liable for any costs or damages incurred by any other participating entity as a result of any authorization by the Contractor to extend the contract. It is understood and agreed that the University is not responsible for the acts or omissions of any entity and will not be considered in default of the contract no matter the circumstances.

Use of this contract(s) does not preclude any participating entity from using other contracts or competitive processes as needed.

- J. SMALL BUSINESS SUBCONTRACTING AND EVIDENCE OF COMPLIANCE:
  - 1. It is the goal of the Commonwealth that 42% of its purchases are made from small businesses. This includes discretionary spending in prime contracts and subcontracts. All potential offerors are required to submit a Small Business Subcontracting Plan. Unless the offeror is registered as a Department of Small Business and Supplier Diversity (SBSD)-certified small business and where it is practicable for any portion of the awarded contract to be subcontracted to other suppliers, the contractor is encouraged to offer such subcontracting opportunities to SBSD-certified small businesses. This shall not exclude SBSD-certified women-owned and minority-owned businesses when they have received SBSD small business certification. No offeror or subcontractor shall be considered a Small Business, a Women-Owned Business or a Minority-Owned Business unless

certified as such by the Department of Small Business and Supplier Diversity (SBSD) by the due date for receipt of proposals. If small business subcontractors are used, the prime contractor agrees to report the use of small business subcontractors by providing the purchasing office at a minimum the following information: name of small business with the SBSD certification number or FEIN, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product/service provided. **This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.**

2. Each prime contractor who wins an award in which provision of a small business subcontracting plan is a condition of the award, shall deliver to the contracting agency or institution with every request for payment, evidence of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the small business subcontracting plan. **This information shall be submitted to: JMU Office of Procurement Services, SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.** When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm with the Department of Small Business and Supplier Diversity (SBSD) certification number or FEIN number, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product or service provided. Payment(s) may be withheld until compliance with the plan is received and confirmed by the agency or institution. The agency or institution reserves the right to pursue other appropriate remedies to include, but not be limited to, termination for default.
  3. Each prime contractor who wins an award valued over \$200,000 shall deliver to the contracting agency or institution with every request for payment, information on use of subcontractors that are not Department of Small Business and Supplier Diversity (SBSD)-certified small businesses. When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm, phone number, FEIN number, total dollar amount subcontracted, and type of product or service provided. **This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.**
- K. AUTHORIZATION TO CONDUCT BUSINESS IN THE COMMONWEALTH: A contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law. Any business entity described above that enters into a contract with a public body shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the contract. A public body may void any contract with a business entity if the business entity fails to remain in compliance with the provisions of this section.
- L. PUBLIC POSTING OF COOPERATIVE CONTRACTS: James Madison University maintains a web-based contracts database with a public gateway access. Any resulting cooperative contract/s to this solicitation will be posted to the publicly accessible website. Contents identified as proprietary information will not be made public.
- M. CRIMINAL BACKGROUND CHECKS OF PERSONNEL ASSIGNED BY CONTRACTOR TO PERFORM WORK ON JMU PROPERTY: The Contractor shall obtain criminal background checks on all of their contracted employees who will be assigned to perform services on James Madison University property. The results of the background checks will be directed solely to the Contractor.

The Contractor bears responsibility for confirming to the University contract administrator that the background checks have been completed prior to work being performed by their employees or subcontractors. The Contractor shall only assign to work on the University campus those individuals whom it deems qualified and permissible based on the results of completed background checks. Notwithstanding any other provision herein, and to ensure the safety of students, faculty, staff and facilities, James Madison University reserves the right to approve or disapprove any contract employee that will work on JMU property. Disapproval by the University will solely apply to JMU property and should have no bearing on the Contractor's employment of an individual outside of James Madison University.

- N. INDEMNIFICATION: Contractor agrees to indemnify, defend and hold harmless the Commonwealth of Virginia, its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the contractor/any services of any kind or nature furnished by the contractor, provided that such liability is not attributable to the sole negligence of the using agency or to failure of the using agency to use the materials, goods, or equipment in the manner already and permanently described by the contractor on the materials, goods or equipment delivered.
- O. ADDITIONAL GOODS AND SERVICES: The University may acquire other goods or services that the supplier provides than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services under the same pricing, terms, and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services that are newly introduced during the term of this Agreement. Such additional goods and services will be provided to the University at favored nations pricing, terms, and conditions.
- P. SUBCONTRACTS: No portion of the work shall be subcontracted without prior written consent of the purchasing agency. In the event that the contractor desires to subcontract some part of the work specified herein, the contractor shall furnish the purchasing agency the names, qualifications and experience of their proposed subcontractors. The contractor shall, however, remain fully liable and responsible for the work to be done by its subcontractor(s) and shall assure compliance with all requirements of the contract.
- Q. PRIME CONTRACTOR RESPONSIBILITIES: The contractor shall be responsible for completely supervising and directing the work under this contract and all subcontractors that he may utilize, using his best skill and attention. Subcontractors who perform work under this contract shall be responsible to the prime contractor. The contractor agrees that he is as fully responsible for the acts and omissions of his subcontractors and of persons employed by them as he is for the acts and omissions of his own employees.
- R. CONFIDENTIALITY OF PERSONALLY IDENTIFIABLE INFORMATION: The contractor assures that information and data obtained as to personal facts and circumstances related to faculty, staff, students, affiliates, and research study participants will be collected and held confidential, during and following the term of this agreement, and will not be divulged without the individual's and the agency's written consent and only in accordance with federal law or the Code of Virginia. This shall include FTI, which is a term of art and consists of federal tax returns and return information (and information derived from it) that is in contractor/agency possession or control which is covered by the confidentiality protections of the Internal Revenue Code (IRC) and subject to the IRC 6103(p)(4) safeguarding requirements including IRS oversight. FTI is categorized as sensitive but unclassified information and may contain personally identifiable information (PII). Contractors who utilize, access, or store personally identifiable information as part of the performance of a contract are required to safeguard this information and immediately notify the agency of any breach or suspected breach in the security

of such information. Contractors shall allow the agency to both participate in the investigation of incidents and exercise control over decisions regarding external reporting. Contractors and their employees working on this project may be required to sign a confidentiality statement.

## **IX. METHOD OF PAYMENT**

The contractor will be paid based on invoices submitted in accordance with the solicitation and any negotiations. James Madison University recognizes the importance of expediting the payment process for our vendors and suppliers; we request that our vendors and suppliers enroll in our bank's Comprehensive Payable options: either the Virtual Payables Virtual Card or the PayMode-X electronic deposit (ACH) to your bank account so that future payments are made electronically. Contractors signed up for the Virtual Payables process will receive the benefit of being paid Net 15. Additional information is available online at:

<http://www.jmu.edu/financeoffice/accounting-operations-disbursements/cash-investments/vendor-payment-methods.shtml>

## **X. PRICING SCHEDULE**

The offeror shall provide a pricing structure based on hourly rates for all services included in the proposal. Offers should provide an onsite and offsite hourly rate for the range of personnel to provide labor under any resulting contract. Hourly rates should include all travel, incidentals, and miscellaneous expenses. The Contractor shall not be reimbursed for, nor will James Madison University purchase, any operational needs or expenses of the Contractor, which includes, but is not limited to, office supplies and equipment, computers and accessories, and office furniture.

Specify any associated charge card processing fees, if applicable, to be billed to the university.

## **XI. ATTACHMENTS**

Attachment A: Offeror Data Sheet

Attachment B: Small, Women, and Minority-owned Business (SWaM) Utilization Plan

Attachment C: Standard Contract Sample

## ATTACHMENT A

### OFFEROR DATA SHEET

#### TO BE COMPLETED BY OFFEROR

1. **QUALIFICATIONS OF OFFEROR:** Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
2. **YEARS IN BUSINESS:** Indicate the length of time you have been in business providing these types of goods and services.

Years \_\_\_\_\_ Months \_\_\_\_\_

3. **REFERENCES:** Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #
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4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.


5. **RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA:** Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

[ ] YES [ ] NO

IF YES, EXPLAIN: \_\_\_\_\_


## ATTACHMENT B

### Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

**Offeror Name:** \_\_\_\_\_ **Preparer Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

**Instructions:** *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWAMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

**Small Business:** "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

**Woman-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

**Minority-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

**Micro Business** is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees **AND** no more than \$3 million in average annual revenue over the three-year period prior to their certification.

**All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).**

***RETURN OF THIS PAGE IS REQUIRED***

**ATTACHMENT B (CNT'D)**  
Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Procurement Name and Number: \_\_\_\_\_

Date Form Completed: \_\_\_\_\_

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses  
for this Proposal and Subsequent Contract

Offeror / Proposer:

\_\_\_\_\_  
Firm

\_\_\_\_\_  
Address

\_\_\_\_\_  
Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)

*(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)*

***RETURN OF THIS PAGE IS REQUIRED***

ATTACHMENT C



**COMMONWEALTH OF VIRGINIA  
STANDARD CONTRACT**

Contract No. \_\_\_\_\_

This contract entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_ hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

**SCOPE OF CONTRACT:** The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

**PERIOD OF PERFORMANCE:** From \_\_\_\_\_ through \_\_\_\_\_

The contract documents shall consist of:

- (1) This signed form;
- (2) The following portions of the Request for Proposals dated \_\_\_\_\_:
  - (a) The Statement of Needs,
  - (b) The General Terms and Conditions,
  - (c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions;
  - (d) List each addendum that may be issued
- (3) The Contractor's Proposal dated \_\_\_\_\_ and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
  - (a) Negotiations summary dated \_\_\_\_\_.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

**CONTRACTOR:**

**PURCHASING AGENCY:**

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Printed Name)

\_\_\_\_\_  
(Printed Name)

Title: \_\_\_\_\_

Title: \_\_\_\_\_



October 24, 2023

**ADDENDUM NO.: One**

**TO ALL OFFERORS**

**REFERENCE:** Request for Proposal No: RFP# FDC-1189  
Dated: October 2, 2023  
Commodity: Sponsored Programs Evaluation Services  
RFP Closing On: November 2, 2023

Please note the clarifications and/or changes made on this proposal program:

1. May offerors submit resumes for key management personnel requested under Section IV.H (page 2) as an annex?

Answer: Yes.

2. May offerors submit sample work products requested under Section IV.I (page 2) as an annex?

Answer: Yes.

3. Is the requirement of adding the heading to the top of each page expected for the sample work product? Should annexes be permissible, is the expectation to include the heading at the top of each page if the content carries over multiple pages?

Answer: It is not a requirement but it would be helpful.

4. Per Section 4 in the RFP, areas A and C require firm information, experience, and qualifications, and section H requires staffing information. Can you please confirm that these areas are separate sections or does JMU want these areas combined?

Answer: These are two separate questions and should have a separate response for each

5. What is the average value and duration for JMU evaluations and studies under this contract?

Answer: JMU does not have enough data to provide an answer to the value question. Most grants which utilize professional external evaluators are multi-year, 3 being average, however some projects run as long as 5 years.

6. Will JMU kindly share how many studies it expects to procure per year on average under this contract?

Answer: This is unknown and variable but probably fewer than 20 per year.

7. Can JMU confirm if travel expenses included in the hourly rates should be for travel to JMU?

Answer: Most work is done remotely so travel to JMU or other locations would normally be minimal.

8. Should offerors expect travel to anywhere besides JMU and, if so, how will those costs be covered?

Answer: All costs for the contractor should be rolled into the hourly rate. Travel is not paid separately. Most work is done remotely so travel to JMU or other locations would normally be minimal.

9. At what point is the Contractor brought into the process? To what extent will the Contractor and faculty member submitting the proposal be working together in the planning phase?

Answer: Ideally with the use of pre-vetted contractors, the faculty or staff member would contact the contractor in the planning stages of the funding application to receive guidance on the evaluative aspects of the project in order to incorporate those elements into the proposal.

10. Is the evaluation ever considered a turn-key relationship, where the Contractor is acting as an independent third-party evaluator (or will the Contractor always be working with and/or advising a faculty)?

Answer: Ideally with the use of pre-vetted contractors, the faculty or staff member would contact the contractor in the planning stages of the funding application to receive guidance on the evaluative aspects of the project in order to incorporate those elements into the proposal.

11. Is there a time where the University would contract the Contractor without having had them involved with the development of the evaluation plan?

Answer: It is conceivable that a Contractor could be approached to provide services once a project is designed and funded.

12. What is the percentage of implementation program grants vs. research grant submissions?

Answer: Based on historical data this would break down to approximately 70% implementation or services projects and 30% projects which are categorized as research. Notably many implementation grants also have a research component.

Signify receipt of this addendum by initialing “*Addendum #1*” on the signature page of your proposal.

Sincerely,

Doug Chester  
Buyer Senior  
Phone: 540-568-4272