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City of Jacksonville, Florida

Procurement Award Form (PAF)

Part 1 – Form Type: JPAC 126.204 (a) New Award, Renewals, Waive Technical Defects, Price Increases, NTE Increases.

Goods and/or Services: Citywide Probabilistic and Compound Flood Modeling

Requested Action and Justification:

Recommend approval to exercise the second and final renewal option with The Water Institute. Period of service will be from August 14, 2026 through August 13, 2027. Total not-to-exceed expenditure of $2,750,000.00 will remain the same.

To be executed by formal contract amendment through the Office of General Council.

Supplier:	The Water Institute	**Basis of Award:**	Highest Evaluated	**BID Opening Date:**	07/19/2023

POA #:	70647-23	**PO #:**	676432-24	**Change Order #:**	N/A
Solicitation #:	RFP-NONCON ESC 0404 23	**Contract #:**	70647-23	**Contract ADM #:**	1
Term:	1 year	**Options:**	2, 1-year renewal	**Options Used:**	1

Federally Funded:	No	**JSEB Rec:**	Encouragement
Licenses Verified:	Yes	**JSEB %:**	0
Bonds Required:	No	**Bonds Waived Pursuant To:**	N/A

Fund:	32111	**Center:**	153101	**Acct:**	565051	**Proj:**	010384	**Activity:**	00000000	$ 0
Fund:		**Center:**		**Acct:**		**Proj:**		**Activity:**		$
Fund:		**Center:**		**Acct:**		**Proj:**		**Activity:**		$

New NTE/GMP:	$ 2,750,000.00	**Contingent Amt:**	$ 0	**DMP/ODPO Amt:**	$ 0

Using Agency/BU:	PDOD:OFFICE OF THE DIRECTOR		
Concurrence:	Signed by: Helena A. Parola 3E8A133516E44AA...	**Title:**	DIRECTOR OF PLANNING AND DEVELOPMENT 8/10/2026
Concurrence:	Signed by: Corlianese, Anne C0C6F89756B5449...	**Title:**	CHIEF RESILIENCY OFFICER 8/10/2026
Concurrence:		**Title:**	
Concurrence:		**Title:**	

Procurement Analyst/Buyer:	Signed by: Ruth Keith C58E7E28D7B54E9...	**Chief of Procurement:**	Signed by: Robert Waremburg, for Dustin Freeman 8/11/2026
Name:	Ruth Keith	**Name:**	Dustin L. Freeman 4812CA1D131247A...

Part 2 – JPAC Action: All award actions subject to lawfully appropriated funds.		**Part 3 – Final Awarding Authority Action:**	
Members who approve:		**Action:**	
Members who disapprove:		**Signature:**	
Date:		**Date:**	

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PAF Instructions
Part 1 (using agency)

Form Type: This form will be used for both Administrative Awards and JPAC Requests. Select type from dropdown options.

Goods and/or Services: Enter a brief description of the types of goods and services included in the request.

Requested Action and Justification: Enter a brief description of the requested action or authority being sought. i.e.; *Request permission to award the lowest, responsive responsible bidder for an ITB or award the highest ranked supplier for an RFP.* This block should also be used for additional information such as additional 4th account strings, or other information essential for contract execution.

Supplier: Enter awarded supplier name**.** If multiple, include in "Requested Action and Justification" box.

Basis of Award: Select from Lowest Price Technical Acceptable (LPTA), Highest Price Technical Acceptable (HPTA) or N/A.

Bid Opening Date: The date bids were unsealed by Procurement.

POA #: This is your 1Cloud generated Agreement number. Select Type, Enter Number.

PO #: Enter the PO number or agreement release number.

Change Order #: Provide the applicable change order number represented by this request.

Solicitation #: Select Prefix type, Enter Number, and Year.

Contract #: This number should be the same as your POA number (unless procured prior to 2020)

Contract Amendment #: Provide the applicable amendment number represented by this request.

Term: Select the Period of Performance or Term for the initial period.

Options: Period of time for each renewal or option.

Options Used: Prior to this request, enter how many options were already used.

Federally Funded: Select yes or no from dropdown if Federal Funds will be used.

JSEB Rec: Select Encouragement or JSEB Set Aside Option.

JESB %: If JSEB Participation, enter the percentage.

Bonds Waived Pursuant to: Select option from Drop down.

Funding Sources: Fund/Center/Account/Project/Activity, all fields are required even if zeros.

New NTE/GMP: Enter the new total not to exceed amount. Note, this should match the contract maximum indebtedness, if applicable**.**

Contingent Amount: If your agency requests an allowance for unforeseen additional expenses, then specify the amount of your requested increase and new NTE that represents the contingency allowance. This is over and above any quote.

DMP/ODPO Account: Enter the Direct Materials Purchase/Owner Direct Purchase Order Account. Used mainly for CIP (Capital Improvement/Construction) Projects

Using Agency/BU: Select one from the dropdown list.

Concurrence: Using Agency internal routing requirements for Electronic Signatures (follow Proc Manual for threshold requirements)

Title: Title of person electronically signing form.

Attachments: Included any supplemental information to the Procurement Award Form. i.e.; *Scope of work, previous awards*.

**Any field where there is no data available, or no entry is required, either leave it blank or enter N/A. Any fields where there is known data, include for informational purposes. Any changes to an original award should contain the data that is being changed and any other relevant data required for JPAC review and approval.*

Docusign Envelope ID: 4B63CAE9-4752-4210-9E50-E40E808FD8AD

A NEW DAY.

City of Jacksonville, Florida

Donna Deegan, Mayor

Planning Department
Ed Ball Building
214 North Hogan Street, Suite 300
Jacksonville, FL 32202
(904) 255-7800
jacksonville.gov

M E M O R A N D U M

TO: **Dustin Freeman, Chief, Procurement Division**

THRU: **Helena Parola, Director, Planning Department**

FROM: **Anne Coglianese, Chief, Office of Resilience**

SUBJECT: **Request for No-Cost Extension for the *Citywide Probabilistic and Compound Flood Modeling* (PO 676432-24)**

DATE: **8/1/2026**

The Office of Resilience requests approval from the Procurement Division for a No-Cost Contract Extension (NCE) for the Citywide Probabilistic and Compound Flood Modeling contract (PO 676432-24). The original agreement includes the option for two one-year extensions, and the Office of Resilience seeks to activate the second of these extensions.

The current contract is scheduled to conclude in August 2026. A one-year extension is necessary to complete the project in full and fulfill the intended scope. Throughout the contract period, The Water Institute has consistently met all deliverable deadlines and demonstrated a high level of responsiveness, technical rigor, and professionalism.

The project team is now advancing through final quality-control checks of all model outputs and developing communications materials and takeaways tailored for a broad array of City stakeholders. The extension will allow the team to work methodically with City staff to review modeling results, ensure accuracy, and develop clear, well-constructed explanations and narratives that will support City decision-making for years to come.

This additional year will also enable essential coordination with the City's new adaptation planning initiative and the NFWF-funded green infrastructure project, ensuring alignment across major resilience efforts. The no-cost extension will provide a seamless transition into the rollout and implementation of the model.

This project delivers the most advanced flood modeling data available in the United States, equipping Jacksonville with detailed insights into its most flood-prone areas and guiding strategic capital project development. The model supports a real-time forecasting system capable of anticipating flood locations ahead of storms, improving emergency response and evacuation planning. The contract also includes full support for all tools through the testing phase, which will be critical during beta testing of the real-time forecasting system in the Emergency Operations Center this hurricane season.

Attachments: IF ONLY ONE ATTACHMENT, LIST IT HERE
IF MULTIPLE ATTACHMENTS, START LISTING THEM ON THIS LINE

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City of Jacksonville, Florida
Procurement Award Form (PAF)

Part 1 – Form Type: JPAC Award Request: Renewals, Extensions, and Unit Price Increases

Goods and/or Services: Citywide Probabilistic and Compound Flood Modeling

Requested Action and Justification:

Recommend approval to utilize the first of the two (2) one-year renewals with The Water Institute. Period of service will be from August 14, 2025 through August 13, 2026. Total not to exceed expenditure of $2,750,000.00 will remain the same.

To be executed by formal contract amendment through the Office of General Counsel.

Supplier:	The Water Institute	**Basis of Award:**	Highest Evaluated	**BID Opening Date:**	07/19/2023

POA #:	70647-23	**PO #:**	676432-24	**Change Order #:**	N/A
Solicitation #:	RFP-NONCON ESC 0404 23	**Contract #:**	70647-23	**Contract Amd #:**	1
Term:	2 years	**Options:**	2, 1-year	**Options Used:**	0

Federally Funded:	No	**JSEB Rec:**	Encouragement	**Bonds Waived Pursuant To:**	N/A
Licenses Verified:	Yes	**JSEB %:**	0		

Fund:	32111	**Center:**	153101	**Acct:**	565051	**Proj:**	010384	**Activity:**	00000000	**$**	
Fund:		**Center:**		**Acct:**		**Proj:**		**Activity:**		**$**	
Fund:		**Center:**		**Acct:**		**Proj:**		**Activity:**		**$**	

New NTE/GMP:	$ 2,750,000	**Contingent Amt:**	$ 0	**DMP/ODPO Amt:**	$ 32111

Using Agency/BU:	PDOD:OFFICE OF THE DIRECTOR			
Concurrence:	Juliana E. Fonda	**Title:**	ACTING DIR OF PLANNING AND DEVELOPMENT	7/24/2025
Concurrence:	Lynette Bane	**Title:**	CHIEF RESILIENCY OFFICER	7/28/2025
Concurrence:		**Title:**		
Concurrence:		**Title:**		

Procurement Analyst/Buyer:	Ruth Keith	**Chief of Procurement:**	8/5/2025
Name:	Ruth Keith	**Name:**	Dustin L. Freeman

Part 2 – JPAC Action: All award actions subject to lawfully appropriated funds.		**Part 3 – Final Awarding Authority Action:**	
Members who approve:	3	**Action:**	Approved
Members who disapprove:	0	**Signature:**	Karen Bowling, Chief Administrative Officer, For Mayor Donna Deegan, Under Authority Of Executive Order No. 2023-02
Date:	8/8/2025	**Date:**	8/8/2025

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SUBJECT: A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

BID #: ESC-0404-23 **OPEN DATE: 2023-07-19**

COMPETITIVE SEALED PROPOSAL EVALUATION COMMITTEE

KIND AND BASIS OF CONTRACT: COMPETITIVE SEALED PROPOSAL SUPPLY CONTRACT – PERIOD OF SERVICE WILL BE TWO (2) YEARS FROM THE DATE OF CONTRACT EXECUTION, WITH TWO (2) ONE (1) YEAR RENEWAL OPTIONS

AGENCY: PLANNING AND DEVELOPMENT DEPARTMENT

BASIS OF AWARD: HIGHEST SCORING RESPONSIVE, RESPONSIBLE BIDDER BASED ON THE EVALUATION CRITERIA

NUMBER OF BIDS INVITED: 21 **NUMBER RECEIVED:** 1 **OTHER:** 0

SUMMARY OF BIDS AND RECOMMENDED ACTIONS:
Recommend approval of award to the sole responsive, responsible bidder, THE WATER INSTITUTE in the amount of $2,750,000.00 for A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM. Period of service will be two (2) years from the date of contract execution, with two (2) one (1) year renewal options.

Funding Source: 32111.153101.565051.010384.00000000.00000.0000000, to be executed by formal contract through the Office of General Counsel and process by purchase order(s).

Attachments: Recommendation Memo, Bid Tabulation Sheet, Scoring Matrix, Description of Services

Analyst: _____ RUBEN OLA

RESPECTFULLY SUBMITTED: _____ DUSTIN FREEMAN, CHIEF PROCUREMENT DIVISION

CONCURRENCE BY: William Killingsworth, Director of Planning and Development Department

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(ALL AWARD ACTIONS SUBJECT TO LAWFULLY APPROPRIATED FUNDS)
ACTION OF CSPEC COMMITTEE ON RECOMMENDATIONS ABOVE

MEMBERS APPROVING 4 MEMBERS DISAPPROVING 0 DATE: 7/27/2023

OTHER: _____

ACTION OF AWARDING AUTHORITY DATE 7/28/23

APPROVED ✓ DISAPPROVED _____

OTHER _____

SIGNATURE OF AUTHENTICATION _____

Karen Bowling
Chief Administrative Officer
For: Mayor Donna Deegan
Under Authority Of:
Executive Order No: 2023-02

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ONE CITY. ONE JACKSONVILLE

City of Jacksonville, Florida

Donna Deegan, Mayor

Planning and Development Department
214 North Hogan Street #300
Jacksonville, FL 32202
(904) 630-CITY
www.coj.net

TO: **Dustin Freeman, Chairman**
Competitive Sealed Proposal Evaluation Committee (CSPEC)

FROM: **Anne Coglianese, Chief Resilience Officer**
Planning and Development Department

THRU: **William B. Killingsworth, Director**
Planning and Development Department

RE: **RFP ESC-0404-23 - Citywide Probabilistic Compound Flood Model & Real-Time System**

DATE: **July 20, 2023**

The Planning and Development Department received one (1) proposal for the **Citywide Probabilistic Compound Flood Model & Real-Time System** and it was deemed responsive, qualified and available to provide the services required.

The only received proposal was evaluated using the selection criteria outlined in the Purchasing Code as augmented by the RFP.

Based on the above, the following company was determined to be qualified and available to perform the required services and that company is:

1) The Water Institute

The Planning and Development Department respectfully requests authorization to award services to this company and proceed with contract negotiations.

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Requisition PDOD-500142-23

Requisitioning BU	PDOD: Office of the Director	**Requisition Amount**	0.01 USD
Entered By	Robert Blanco	**Justification**	
Status	Approved	**Funds Status**	Reserved
Description	A Citywide Probabilistic Compound Flood Model & Real-Time Forecasting System		
Emergency Requisition	No		

Lines

Line	Item	Description	Category Name	Quantity	UOM	Price	Amount (USD)	Status	Funds Status
1		A Citywide Probabilistic Compound Flood Model & Real-Time Forecasting System	961.95 Modeling Services			USD	0.01	Approved	Reserved

Requester	Robert Blanco	**Supplier**	
Urgent	No	**Supplier Site**	
Requested Delivery Date	6/21/23	**Supplier Contact**	
Deliver-to Location	Ed Ball 3rd Floor Charge	**Contact Phone**	
Deliver-to Address	214 North Hogan Street, 3rd Floor, Jacksonville, FL 32202, Duval, United States	**Charge Account**	32111.153101.565051.010384.00000000.00000.0000000
Note to Buyer			

I CERTIFY THAT FUNDS FOR THIS PURCHASE WERE AUTHORIZED AND PROVIDED FOR IN THE CURRENT BUDGET.

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Ola, Ruben

From: Ola, Ruben
Sent: Monday, July 24, 2023 11:11 AM
To: Coglianese, Anne; Blanco, Bob
Cc: Waremburg, Robert
Subject: RE: For Agency Evaluation and Review: ESC-0404-22 A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Good Morning,

We need the memo this morning so we can forward for CPSEC agenda this Thursday.
Thanks,

Ruben Ola, Purchasing Analyst
City of Jacksonville
Procurement Division
Finance and Administration Department
214 N. Hogan Street, Suite 800
Jacksonville, FL 32202
Phone: 904.255.8823
Fax: 904.255.8837
Email: rubeno@coj.net

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From: Ola, Ruben
Sent: Friday, July 21, 2023 3:17 PM
To: Coglianese, Anne <ACoglianese@coj.net>
Cc: Waremburg, Robert <RWaremburg@coj.net>; Blanco, Bob <RBlanco@coj.net>
Subject: RE: For Agency Evaluation and Review: ESC-0404-22 A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Good Afternoon,

This is just to follow up the agency recommendation memo so this can go to CSPEC award next week.

Thanks,

Ruben Ola, Purchasing Analyst
City of Jacksonville
Procurement Division
Finance and Administration Department
214 N. Hogan Street, Suite 800
Jacksonville, FL 32202
Phone: 904.255.8823
Fax: 904.255.8837

Docusign Envelope ID: 4B63CAE9-4752-4210-9E50-E40E808FD8AD

Email: rubeno@coj.net

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From: Coglianese, Anne <ACoglianese@coj.net>
Sent: Thursday, July 20, 2023 12:00 PM
To: Ola, Ruben <RubenO@coj.net>
Cc: Waremburg, Robert <RWaremburg@coj.net>; Blanco, Bob <RBlanco@coj.net>
Subject: Re: For Agency Evaluation and Review: ESC-0404-22 A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Hi Ruben — Bob Blanco should be sending it very soon. The memo/letter is written and signed by me already but Bob is trying to track down Bill Killingsworth for his signature as well.

Anne Coglianese
Chief Resilience Officer
City of Jacksonville
acoglianese@coj.net
Office (904) 255-7939
Cell (904) 625-8162

On Jul 20, 2023, at 11:04 AM, Ola, Ruben <RubenO@coj.net> wrote:

Good Morning Anne,

Attached is the final scoring matrix and bid tabulation sheet. I need the agency memo so I can submit in CSPEC agenda.

Thanks!

Ruben Ola, Purchasing Analyst
City of Jacksonville
Procurement Division
Finance and Administration Department
214 N. Hogan Street, Suite 800
Jacksonville, FL 32202
Phone: 904.255.8823
Fax: 904.255.8837
Email: rubeno@coj.net
<image001.jpg>
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From: Coglianese, Anne <ACoglianese@coj.net>
Sent: Wednesday, July 19, 2023 6:25 PM
To: Ola, Ruben <RubenO@coj.net>; Enz, Jill <JEnz@coj.net>; Smith, Robin <RobinSmith@coj.net>

Docusign Envelope ID: 4B63CAE9-4752-4210-9E50-E40E808FD8AD

Subject: RE: For Agency Evaluation and Review: ESC-0404-22 A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Thanks, Ruben! You should have just received a separate email from me with my scores.

Robin and Jill – If there's anyway you can prioritize reviewing and scoring this RFP tomorrow morning, that would be great. If Ruben can combine our scores before noon then this can get on next week's CSPEC agenda.

Thanks all!

Anne Coglianese
Chief Resilience Officer
City of Jacksonville
acoglianese@coj.net
Office (904) 255-7939
Cell (904) 625-8162

From: Ola, Ruben <RubenO@coj.net>
Sent: Wednesday, July 19, 2023 3:57 PM
To: Coglianese, Anne <ACoglianese@coj.net>; Enz, Jill <JEnz@coj.net>; Smith, Robin <RobinSmith@coj.net>
Subject: For Agency Evaluation and Review: ESC-0404-22 A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Good Afternoon,

In reference to the above subject solicitation, attached are the electronic copies of solicitation document, bid tabulation sheet, scoring matrix and contractor's proposal for agency evaluation and review. Three (3) duplicate copies of proposal documents are now available for pick-up in the Procurement Division Office, Room 836.

To better serve all our customers and continue to improve our Procurement Formal award cycle time, we ask the completion of evaluation and return a letter of recommendation to Procurement Division normally within 7 days from the date of this notification. Please note that deadline to submit a recommendation to Procurement Office for CSPEC/General Government Awards Committee is no later than 12:00noon of Thursday prior to the next regularly scheduled Thursday meeting.

If you have question or need additional information, I can be reached at (904) 255-8823 or e-mail at rubeno@coj.net.

Thank you.

Ruben Ola, Purchasing Analyst
City of Jacksonville
Procurement Division
Finance and Administration Department
214 N. Hogan Street, Suite 800
Jacksonville, FL 32202
Phone: 904.255.8823
Fax: 904.255.8837
Email: rubeno@coj.net

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<ESC-0404-23 BID TABULATION SHEET AND SCORING MATRIX.xlsx>

SCORING MATRIX ESC-0404-23

A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

Total Points	20 Points	60 Points	20 Points	OVERALL	Rank
Criteria	FORM 1 – PRICE SHEET (A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM) (The contractor submitting the lowest cost to the City shall receive the maximum number of points for cost, 20 points. Each subsequentially higher cost shall be divided into the lowest cost received and the products score % will be multiplied by the maximum points available to render the points.) Score = (Lowest Bid/The Bid) X 20)	SUPPLIERS EXPERIENCE Proposals must include a minimum of one prior project where all elements of this RFP have been successfully demonstrated. Reference information must be provided with RFP submission. 1. Developed a fully probabilistic compound flood model for a government entity similar to Jacksonville's geographic size or larger. 2. The project area must have included a hydrologic system with a minimum of 500 linear miles of shoreline. 3. Prior project must have included surge, tidal, pluvial, and fluvial datasets within a single model framework. 4. The firm must have produced a minimum of 10,000 mapped scenario runs. 5. The prior project must have had a catalog/repository component developed by the firm. 6. A real-time forecasting system must have been successfully used in conjunction with the model	PROJECT WORK PLAN/ABILITY TO PERFORM SCOPE 1. Proposals must include a work plan that includes all items requested in the scope of work. 2. Must reference team/staff who will be working on the project and their qualifications. 3. Must indicate that an initial 100 model runs can be completed in the first 6 months of the contract, and produce a minimum of 10,000 model runs for the city before the end of the contract period. 4. Must be able to leverage high performance computing to provide the city with expedient results of model runs	Total Points (100)	
THE WATER INSTITUTE					1.00
Reviewer 1: ANNE COGLIANESE	20.00	60.00	20.00	100.00	
Reviewer 2: JILL ENZ	20.00	57.00	19.00	96.00	
Reviewer 3: ROBIN SMITH	20.00	60.00	20.00	100.00	
Average	20.00	59.00	19.67	98.67	
Reviewer 1: NAME					
Reviewer 2: NAME					
Reviewer 3: NAME					
Average					

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REQUEST FOR PROPOSAL

A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM
For
City of Jacksonville, Florida

SECTION 1
(Specific Information Regarding this RFP)

1.1 Introduction

The City of Jacksonville ("**Buyer**") intends to hire one or more firms (**Bidders**) to provide the services described in Section 1.2 of this Request for Proposal ("**RFP**"). Persons interested in submitting a response to this RFP (a "**Response**") should carefully review this RFP for instructions on how to respond and for the applicable contractual terms. This RFP is divided into the following sections:

Section 1	Specific Information Regarding This RFP
Section 2	General Instructions
Section 3	General Terms and Conditions of Agreement
Section 4	Description of Services and Deliverables
Section 5	Program Requirements
Section 6	General Terms and Conditions
Section 7	Instructions for responding to the RFP
Attachment A	Response Format
Attachment B	Evaluation Criteria
Attachment C	Equal Business Opportunity Program (Encouragement Plan)
Attachment D	Service Contract
Attachment E	Disqualified/Probationary Suppliers List
Attachment F	Indemnification
Attachment G	Insurance Requirements
Attachment H	Protest Procedures
Attachment I	Federal Funding Provisions
	Fed Form 1-Certification Regarding Debarment, Suspension, and Other Responsibility Matters Primary Covered Transactions
	Fed Form 2-Certification Regarding Lobbying
Form 1	Price Sheet
Form 2	Conflict of Interest Certificate
Form 3	Project References
Form 4	No Bid Form

In the event of conflicting provisions, the following sections of this RFP will have priority in the order listed: Section 1, Section 4, Section 2, Section 3, the Attachments, and the Forms.

1.2 Scope of Services.

The services sought under this RFP are generally described as follows: A Citywide Probabilistic Compound Flood Model & Real-Time Forecasting System, in conjunction with the City of Jacksonville (COJ) is currently accepting bids to obtain information about your firm and its ability to provide these services and to obtain pricing commitments as listed in the RFP, see Section 4.

1.3 Term of Agreement.

The term of the agreement will be two (2) years from the date of contract execution, with two (2) one (1) year renewal options.

1.4 Minimum Vendor Requirements

Contractors must satisfy the following minimum requirements in order to have their Responses evaluated. By submitting a Response, Contractor warrants and represents that it satisfies these requirements. Failure

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to meet these requirements will result in the Response not being evaluated and being rejected as non-responsive:

a) The Contractor shall provide all business licenses required by local, state, and federal law as applicable.
b) Has developed a fully probabilistic compound flood model for a government entity similar to Jacksonville's geographic size or larger. The project area must have included a hydrologic system with a minimum of 500 linear miles of shoreline.
c) The contractor must have produced a minimum of 10,000 mapped scenario runs and prior project must have had a catalog/repository component developed by the firm.
d) Contractor had a real-time forecasting system that has been successfully used in conjunction with the model.
e) Contractor shall provide a list (Form 3–Project References) for a minimum of one (1) successful Citywide Probabilistic Compound Flood Model & Real-Time Forecasting System. Include the name of the agency, agency's contact name, phone number, and e-mail address, quantity, and scope of the project.

1.5 Equal Business Opportunity Program.

It is an official policy of the City of Jacksonville to encourage the maximum participation of Jacksonville Small and Emerging Businesses (JSEBs) in its contract awards based upon availability. To participate as a JSEB on Buyer projects, a company must be certified as a JSEB with the City's Equal Business Opportunity Office.

This RFP and the resulting Contract are subject to requirements of the Equal Business Opportunity Program Encouragement Plan, which is fully described on Attachment C to this RFP.

Contractors may contact Buyer's Equal Business Opportunity Office at 904-255-8840 or find the JSEB directory on Buyer's website. Please contact the Contact Person identified in Section 1.12 if you are uncertain of Buyer's website address or if you experience problems accessing it.

1.6 Documents Available for Inspection.

N/A

1.7 Federal Funds.

Federal funds will not be used as part of this solicitation.

1.8 Pre-Proposal Meeting.

N/A

1.9 Response Due Date.

The deadline for submitting responses to this RFP is **July 19, 2023, 2:00pm**. Please see Sections 2.3 and 2.4 for more details.

1.10 Response Delivery Location.

Responses must be delivered to the following location:

City of Jacksonville
Procurement Division
Attention: Bid Room
214 N. Hogan Street, Room 105
Jacksonville, Florida 32202

1.11 Response Opening.

Responses received shall be publicly announced and recorded at 2:00 PM on the Response Due Date in meeting room #110, 1st Floor, Ed Ball Bldg, 214 N. Hogan Street.

1.12 Contact Person.

If any questions arise during the request for proposal period of this Project, contact Ruben Ola, Purchasing Analyst Procurement Division, at RubenO@coj.net.

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All copies are to be placed in a sealed package. The outside must be marked with (i) the RFP title and number, and (ii) Contractor's name, address, contact person, and telephone number.

It is the sole responsibility of each Contractor to assure all copies are EXACT duplicates of the original Response. Photocopies or CD copies will be used for the purpose of evaluating the Responses. Any information contained in the original Response which has not been transferred to the CDs or photocopies will NOT be considered. The original document will be used solely for official record keeping and auditing purposes.

2.5 Evaluation of Responses.

A. Buyer will determine the qualifications, interest and availability of Contractors by reviewing all Responses and, when deemed necessary in the sole discretion of Buyer, by conducting formal interviews of selected Contractors.

B. Before making an award, Buyer reserves the right to seek clarifications, revisions, and information it deems necessary for the proper evaluation of Responses. Failure to provide any requested clarifications, revisions or information may result in rejection of the Response.

C. Buyer reserves the right to accept or reject any and all Responses, or separable portions thereof, and to waive any minor irregularity, technicality, or omission if Buyer determines that doing so will serve Buyer's best interests. Buyer may reject any Response not submitted in the manner specified by the RFP.

2.6 Award of Contract.

A. The process for contract award is set forth in Jacksonville Ordinance Code Sections 126.204. Generally, Buyer will award the Contract to the responsible and responsive proposer whose Response is determined in writing to be the most advantageous to the City of Jacksonville, based solely on the relative importance assigned to price and of the criteria set forth in Attachment B. The award may be contingent on the outcome of direct negotiations under Section 126.201(d)(4) and 126.201(n), *Ordinance Code*. If an agreement cannot be reached with the highest ranked Contractor, Buyer reserves the right to make an award to the next highest ranked Contractor or subsequent Contractor(s) until an agreement is reached.

B. Buyer may make an award within sixty (60) days after the date of the Responses are due, during which period the Responses shall remain firm and shall not be withdrawn. Any Response that expresses a shorter duration may, in Buyer's sole discretion, be accepted or rejected. If award is not made within sixty (60) days, the Response shall remain firm until either the Contract is awarded or Buyer receives from Contractor written notice that the Response is withdrawn. [Note: Withdrawal of a Response may be requested within 72 hours (excluding State holidays, Saturdays and Sundays) after the date and time Responses are due. Buyer will not accept an amended Response after the date and time Responses are due.]

C. Except as may otherwise be expressly set forth in the RFP, Buyer intends to award one contract, but reserves the right to enter into a contract with multiple Contractors or to reject all Responses.

D. Based on the evaluation results, Buyer shall electronically post a notice of intended award at Buyer's website. Please contact the Contact Person if you are uncertain of Buyer's website address or if you experience problems accessing it. Any person who is adversely affected by the decision shall file with Buyer a notice of protest in accordance with the Protest provisions of the RFP. Buyer does not intend to provide tabulations or notices of award by telephone.

2.7 Terms of Agreement. After award to the successful Contractor, Buyer and Contractor will promptly enter into a written agreement (the "Contract") incorporating the terms of the RFP, the successful Response, and other terms and conditions as may be agreed to between the parties. To the extent the Response contains exceptions to or modifications of the RFP, such exceptions or modifications are stricken unless Buyer affirmatively accepts the exceptions or modifications in the Contract. The Contract will be substantially in

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the form set forth in an attachment to the RFP. Buyer will not be obligated to pay Contractor for the RFP services until the Contract is signed by both parties. Buyer retains the right to reject all bids and/or amend its notice of award at any time prior to the full execution of the Contract.

If the successful Contractor fails to perform the Services as agreed, Buyer reserves the right to (i) issue a new solicitation for the Services; (ii) reopen the RFP for the purpose of awarding a second contract to another Contractor in accordance with the criteria and processes set forth herein; and/or (iii) take such other actions permitted by law.

2.8 **Public Meetings and Special Accommodations**. Any meetings of the RFP evaluation committee (i.e., the Competitive Sealed Proposal Evaluation Committee), shall be noticed on Buyer's website and shall comply with Florida's Open Meetings Laws. Please contact the Contact Person if you are uncertain of Buyer's website address or if you experience problems accessing it. Persons requiring a special accommodation because of a disability should contact the Contact Person identified in Section 1 at least forty-eight (48) hours prior to the meeting.

2.9 **Ex-Parte Communications**. Communications regarding the RFP by a potential vendor, service provider, bidder, lobbyist or consultant to city employees, staff, or hired consultants are prohibited. This prohibition includes communications with the Buyer's Office of General Counsel unless the Contact Person has authorized those communications in advance. Violations may result in the rejection/disqualification of a Response.

These prohibitions on ex-parte communications do not apply to the following:

- communications regarding the RFP to the Chief of the Procurement Division or the Contact Person, provided the communication is limited strictly to matters of process or procedure already contained in the RFP.
- communications with the city employee responsible for administering the Jacksonville Small Emerging Business Program, provided the communication is limited strictly to matters of programmatic process or procedures.
- communications at any pre-proposal conferences.
- communications with the Office of Inspector General and his/her staff regarding any perceived inefficiency, misconduct or abuse by City employees.
- presentations before publicly noticed committee meetings.
- contract negotiations during any duly noticed public meeting.
- any duly noticed site visits to determine competency of contractors during the period between RFP opening and issuance of the Chief of Procurement Division's written recommendation.
- communications that are necessary for, and solely related to, the ordinary course of business concerning Buyer's existing contract(s) for the materials or services addressed in the RFP.

The period for these prohibitions commences upon the advertisement of the RFP and terminates after the Chief of the Procurement Division issues a written recommendation to the corresponding awarding committee. If the awarding committee refers the Chief's recommendation back for further review, the prohibitions shall be reinstated until such time as the Chief issues a subsequent recommendation.

2.10 **Cost of Developing RFP Response**. All costs related to the preparation of Responses and any related activities are the sole responsibility of Contractor. Buyer assumes no liability for any costs incurred by Contractors throughout the entire selection process.

2.11 **Response Ownership**. All Responses, including attachments, supplementary materials, addenda, etc., shall become property of Buyer and shall not be returned to Contractor. Buyer will have the right to use any and all ideas or adaptation of ideas presented in any Response. Acceptance or rejection of a Response shall not affect this right.

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Section 4
Description of Services and Deliverables

I. BACKGROUND AND CONTEXT:

The City of Jacksonville is seeking contractor for the services to develop and implement a city-wide probabilistic compound flood model and real-time forecasting system. The location of the city along the Atlantic Ocean, Saint John's River and tributaries, and Intracoastal Waterway, makes Jacksonville uniquely vulnerable to the impacts of storm events, as evidenced during Hurricane Matthew in 2016 and Hurricane Irma in 2017. The city is also facing increased flood risks from extreme high tide events, exacerbated by sea-level rise, and extreme precipitation events, which can lead to localized stormwater flooding and tributary flooding. Jacksonville's flood challenges become even more difficult when one or more of these flooding types happen simultaneously and when water movements are influenced by wind direction. Climate change is causing these hydrologic issues to occur more frequently and with more interaction between flood types. In order for the City of Jacksonville to adequately prepare for current and future flood challenges, the city needs a model that includes all flooding factors present in the city and produces outcomes that match the complexity of the city's hydrologic system.

II. SCOPE OF SERVICES:

The City of Jacksonville is seeking a qualified firm to lead the development and implementation of a fully probabilistic compound flood model and associated flood forecasting system. Requirements of this contract includes:

1. Developing probabilistic compound flood model, tailored to Jacksonville's geographic and hydrologic system(s). The model must include coastal, tidal, pluvial, and fluvial flood conditions, as well as wind factors, integrated into a single model.
2. Developing a numerical model/probabilistic framework to determine which storm scenarios should be run through the model.
3. Producing an initial 100 model runs in the first 6 months of the contract, and producing a minimum of 10,000 model runs for the city before the end of the contract period.
4. Leverage high performance computing to provide the city with expedient results of model runs.
5. Building a model repository, ideally cloud-based.
    a. Neither the model nor the repository will be proprietary to the firm selected for this contract and both must be available for the city and its contractors to use independently for project design and implementation on completion of this contract
6. Providing a real-time forecasting system that connects NOAA meteorological data to the compound flood model developed under this contract to provide accurate flood information in advance of storm events.
    a. This forecasting system should be ready for testing during the 2024 hurricane season.
7. Training relevant city-staff on use of model repository and real-time forecasting system

III. PROJECT WORK PLAN/OTHER REQUIREMENTS:

1. Proposals must include a work plan that includes all items requested in the scope of work.
2. Must reference team/staff who will be working on the project and their qualifications.
3. Must be able to leverage high performance computing to provide the city with expedient results of model runs

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Attachment B

Evaluation Criteria

Evaluation shall determine qualifications, interest, and availability by reviewing all written responses received that express an interest in performing these services, and when deemed necessary, by conducting formal interviews of selected respondents that are determined to be best qualified based upon the evaluation of written responses. The determinations shall be based upon the following criteria, and respondents are requested to provide, as a minimum, the information listed under each criterion. Failure to provide adequate information on any criterion will result in lower scores and could result in rejection of the proposal as non-responsive. The response to each of the criterion will be evaluated relative to the other responses received and awarded a score of 1 through 10 points. Respondents are encouraged to arrange their responses in a format that will offer ready review and evaluation of each criterion. Please note that **100 points** is the maximum total.

Evaluation Criteria	Max. Points
FORM 1 - PRICE SHEET (A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM) (The contractor submitting the lowest cost to the City shall receive the maximum number of points for cost, 20 points. Each subsequentially higher cost shall be divided into the lowest cost received and the products score % will be multiplied by the maximum points available to render the points.) Score = (Lowest Bid/The Bid) X 20)	20
SUPPLIERS EXPERIENCE Proposals must include a minimum of one prior project where all elements of this RFP have been successfully demonstrated. Reference information must be provided with RFP submission. 1. Developed a fully probabilistic compound flood model for a government entity similar to Jacksonville's geographic size or larger. 2. The project area must have included a hydrologic system with a minimum of 500 linear miles of shoreline. 3. Prior project must have included surge, tidal, pluvial, and fluvial datasets within a single model framework. 4. The firm must have produced a minimum of 10,000 mapped scenario runs. 5. The prior project must have had a catalog/repository component developed by the firm. 6. A real-time forecasting system must have been successfully used in conjunction with the model	60
PROJECT WORK PLAN/ABILITY TO PERFORM SCOPE 1. Proposals must include a work plan that includes all items requested in the scope of work. 2. Must reference team/staff who will be working on the project and their qualifications. 3. Must indicate that an initial 100 model runs can be completed in the first 6 months of the contract, and produce a minimum of 10,000 model runs for the city before the end of the contract period. 4. Must be able to leverage high performance computing to provide the city with expedient results of model runs	20
TOTAL POINTS	100

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#70647-23

CONTRACT
BETWEEN
CITY OF JACKSONVILLE
AND
THE WATER INSTITUTE
FOR
CITYWIDE PROBABLISTIC AND COMPOUND FLOOD MODEL AND REAL TIME FORECASTING SYSTEM

This Contract is made and entered into as of the _14th _ day of August, 2023 (the "**Effective Date**"), by and between the **CITY OF JACKSONVILLE**, a consolidated municipal corporation and political subdivision existing under the Constitution and the laws of the State of Florida (the "**City**"), and **THE WATER INSTITUTE**, a Non-Profit_ corporation authorized to do business in the State of Florida with its principal offices at _1110 River Road South, Suite 200, Baton Rouge, Louisiana 70802 (the "**Contractor**").

WHEREAS, City issued a Request for Proposals No. ESC-0404-23 for (the "**RFP**"); and

WHEREAS, based on Contractor's response to the RFP (the "**Response**"), City has negotiated and awarded this Contract to Contractor, as approved by City's Procurement Division on July 27, 2023;

NOW THEREFORE, in consideration of the mutual covenants contained below, the parties agree as follows:

1. **Performance of Services**. Contractor shall perform the services as specified in the RFP, the Response, and in **Exhibit A** of this Contract (the "**Services**").

2. **Compensation**. Contractor will invoice City on a monthly basis, and City will pay Contractor for the Services, using the rates specified in **Exhibit B** attached hereto.

3. **Maximum Indebtedness**. As required by Section 106.431, *Ordinance Code,* the City's maximum indebtedness for all products and services under this Contract shall be a fixed monetary amount not to exceed **TWO MILLION SEVEN HUNDRED FIFTY THOUSAND DOLLARS ($2,750,000.00)**. All amounts payable by the City under this Contract are subject to the availability of lawfully appropriated funds therefor.

4. **Term of Contract**. The term of this Contract shall commence on the Effective Date and shall continue until the second (2nd) anniversary of the Effective Date (the "**Term**"), unless sooner terminated by either party in accordance with the terms of the RFP. City shall have the option, in its sole discretion, to renew this Contract for two (2) additional terms of up to one (1) year each.

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5. **Incorporation of Documents**. This Contract consists of the following documents which are hereby incorporated as if fully set forth herein and which, in the case of conflict, shall have priority in the order listed:

- This document, as modified by any subsequent signed amendments
- Any amendments to the RFP
- The RFP as originally issued
- The Response, provided that any terms in the Response that are prohibited under the RFP shall not be included in this Contract

5.1. Indemnification Exception. The Contractor shall be bound to Attachment F in the RFP, with the exception of its subcontractor, Deltares USA. Attachment F, Indemnification shall apply to Deltares USA with respect to claims brought by the City, Contractor, or other subcontractors contractually obligated under the RFP, and excludes claims brought by third parties.

6. **Notices**. All notices under this Contract shall be in writing and shall be delivered by certified mail, return receipt requested, or by other recognized method of delivery with confirmation of receipt to the following:

As to the City:
City of Jacksonville
Planning and Development Department
214 N. Hogan Street, # 300
Jacksonville, Florida 32202
Attn: Anne Coglianese, Chief Resilience Officer

As to the Contractor:
The Water Institute
1110 RIVER RD S STE 200
BATON ROUGE LA 70802
Attn: Danielle Johnson, Director of Grants and Contracts

7. **Contract Managers**. Each party will designate a Contract Manager during the term of this Contract whose responsibility shall be to oversee the party's performance of its duties and obligations pursuant to the terms of this Contract. As of the Effective Date, City's Contract Manager is Anne Coglianese, acoglianese@coj.net, 904-255-7939, and the Contractor's Contract Manager is Danielle Johnson, djohnson@thewaterinstitute.org, 225-300-6715. Each party shall provide prompt written notice to the other party of any changes to the party's Contract Manager or

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his or her contact information; provided, such changes shall not be deemed Contract amendments and may be provided via email.

8. **Entire Agreement**. This Contract constitutes the entire agreement between City and Contractor for the Services to be performed and furnished by the Contractor. No statement, representation, writing, understanding, agreement, course of action or course of conduct, made by either party or any representative of either party, which is not expressed herein shall be binding. Contractor may not unilaterally modify the terms of this Contract by affixing additional terms to materials delivered to the City (e.g., "shrink wrap" terms accompanying or affixed to a deliverable) or by including such terms on a purchase order or payment document. Contractor acknowledges that it is entering into this Contract for its own purposes and not for the benefit of any third party.

9. **Amendments**. All changes to, additions to, modifications of, or amendment to this Contract, or any of the terms, provisions, and conditions hereof, shall be binding only when in writing and signed by the authorized officer, agent or representative of each of the parties hereto.

10. **Counterparts**. This Contract, and all amendments thereto, may be executed in several counterparts, each of which shall be deemed an original, and all of such counterparts together shall constitute one and the same instrument. The parties further agree that electronic transmission of all signatures, with originals to follow, shall constitute and be evidence of an executed Contract.

[Signature page follows immediately.]

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IN WITNESS WHEREOF, the parties have executed this Contract the date set forth above.

WITNESS:

Brett McMann

THE WATER INSTITUTE

By: Danielle Johnson

Print Name: Danielle Johnson

Title: Director of Grants and Contracts

ATTEST:

By: James R. McCain, Jr.

James R. McCain, Jr.

Corporation Secretary

CITY OF JACKSONVILLE

By: Karen Bowling

Donna Deegan

Mayor

Karen Bowling

Chief Administrative Officer

For: Mayor Donna Deegan

Under Authority Of:

Executive Order No: 2023-02

Form Approved:

Office of General Counsel

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Encumbrance and funding information for internal City use:

Account or PO Number:

Amount.....$2,750,000.00

This above stated amount is the maximum fixed monetary amount of the foregoing contract. It shall not be encumbered by the foregoing contract. It shall be encumbered by one (1) or more subsequently issued purchase(s) that must reference the foregoing Contract. All financial examinations and funds control checking will be made at the time such purchase order(s) are issued.

In accordance with Section 24.103(e), of the Ordinance Code of the City of Jacksonville, I do hereby certify that there is an unexpended, unencumbered and unimpounded balance in the appropriation sufficient to cover the foregoing agreement; provided however, this certification is not nor shall it be interpreted as an encumbrance of funding under this Contract. Actual encumbrance[s] shall be made by subsequent purchase order[s], as specified in said Contract.

Anna Brosche

Director of Finance
City Contract Number: 70647-23

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Exhibit A
(The "Services")

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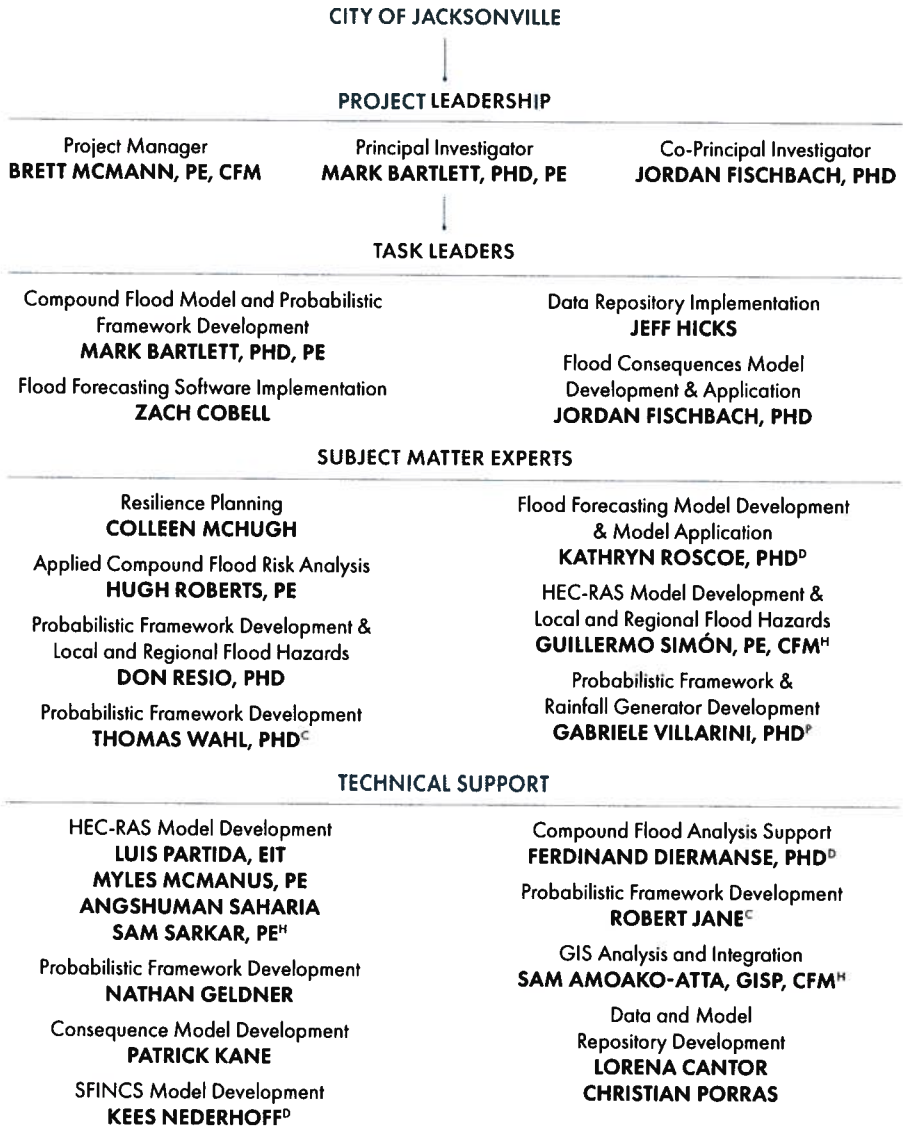
5.3 PROJECT WORK PLAN / ABILITY TO PERFORM SCOPE

1. Project Team

The Institute and Halff are currently supporting the development of Jacksonville's first-ever resilience strategy. This ongoing effort has provided the Institute team with deep working knowledge of both the current best available flood risk information and key data gaps. In addition, this integrated planning work will allow the team of the Institute, Halff, Deltares, Princeton, UCF, and our SME collaborators to maximize the utility of recent flood risk assessments for the City in informing and refining the compound flood model. In turn, the Institute's transdisciplinary team also brings the unique ability to analyze and translate model outputs into policy and project application that will advance implementation of Jacksonville's resilience strategy. The Institute team can ensure that the new flood risk assessment informs plan implementation, risk communication, and other urgent near-term priorities identified to improve Jacksonville's resilience. Our full project team is shown in Figure 4.

Figure 4. Project Team



LEGEND:
C - UNIVERSITY OF CENTRAL FLORIDA | D - DELTARES | H - HALFF ASSOCIATES, INC.
P - PRINCETON UNIVERSITY

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Qualifications of Key Personnel

Summarized below are qualifications of our key personnel who are comprised of project leadership, task leaders, and subject matter experts, as reflected in Figure 4. Project Team. Technical support personnel are available as additional capacity and resource for this project. Resumes for our key personnel are included in Appendix B.

MARK BARTLETT, PHD, PE

Principal Investigator
Task Leader, Compound Flood Model and Probabilistic Framework Development

Mark brings 18 years of experience in flood hydrology and hydraulics, statistics, and data science and machine learning. Mark's work spans from developing a rapid flood forecasting tool that can be replicated across landscape types and locations to creating data models for agricultural purposes. Recently, he worked on the methodologies that advance the FEMA initiative known as The Future of Flood Risk Data (FFRD). Currently, Mark is executing the compound flooding methodology for Louisiana, which he developed with other experts at the Institute. He is also providing guidance on where machine learning and advanced statistical methods may enhance real-time forecasting.

As the PI and Task Leader for Compound Flood Model and Probabilistic Framework Development, Mark will oversee the research and development of the compound flood model and probabilistic framework. He will ensure that all modeling components developed by staff at the Institute, Halff, and Deltares are successfully functional and integrated, and that the resulting model, framework, and outputs meet high quality standards.

JORDAN FISCHBACH, PHD

Co-Principal Investigator
Task Leader, Flood Consequences Model Development and Application

Jordan is currently working on the City of Jacksonville's resilience strategy. He will connect and apply the technical knowledge gained from that project with the development of the compound flood model, real-time forecasting system, and data repository. Jordan also brings 13 years of experience developing and applying probabilistic flood risk analysis for the 2012, 2017, and now 2023 Louisiana Coastal Master Plans, as well as translating model outputs into decision-relevant metrics in the context of long-term planning under uncertainty.

As co-PI, Jordan will serve as a key point of contact with the City of Jacksonville, oversee the development of consequence analysis in support of model development, and lead the translation of model results to support a range of city needs related to flood mapping, resilience plan implementation, and risk reduction project planning.

BRETT MCMANN, PE, CFM

Project Manager

Brett currently leads all of the Institute's efforts on the LWI program, which includes successful development of a compound flood model and real-time forecasting system. Combined with his over 12 years of experience in the planning and design of flood protection and ecosystem restoration projects along the East and Gulf coasts, Brett brings both project management and technical expertise to his role as Project Manager.

As Project Manager, Brett will work closely with Mark, Jordan, and the City of Jacksonville to set a clear project charter, meet agreed schedule milestones, manage cost, and proactively and regularly communicate with the team on project developments.

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ZACH COBELL

Task Leader, Flood Forecasting Software Implementation

Zach is the lead developer of FloodID, jointly developed with meteorologists, coastal hydrologists, and inland watershed hydrologists to forecast coastal and compound flooding for pre-, during, and post-storm conditions. Since 2010, Zach has helped lead numerical modeling studies throughout the United States, including the storm surge and wave analysis for both the 2012, 2017, and 2023 Louisiana Coastal Master Plans. He has also worked extensively on optimization of numerical models in high performance computing environments and serves as the maintainer of the ADCIRC hydrodynamic model. Zach also works closely with AWS to optimize numerical models on cloud infrastructure.

JEFF HICKS

Task Leader, Data Repository Implementation

Jeff Hicks has more than 15 years of experience scaling environmental applied research into robust data-driven decision support applications. He leads the development of EnDMC, a web-based platform specifically designed to store models, configuration, simulation outputs, and related metadata in an organized and discoverable way. Through his work on Climate.gov, the U.S. Climate Resilience Toolkit, and the National Climate Assessment, Jeff helped to develop many foundational climate change indicators and decision support tools used nationally for decisions in government and beyond. Jeff has also led development of several high-profile environmental planning and assessment applications for the NOAA, National Aeronautics and Space Administration, and the U.S. Forest Service.

COLLEEN MCHUGH

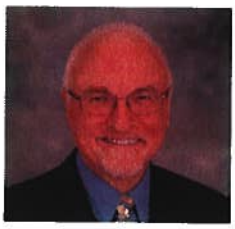
Subject Matter Expert (SME), Resilience Planning

Colleen is the Institute's project lead for the development of resilience plans for Jacksonville, as well as for Mobile and Houston. She brings more than 10 years of experience in climate and resilience planning and implementation at the local, state, and federal level. Prior to joining the Institute, Colleen spent five years working in the public sector in New Orleans, advancing resilience and sustainability projects and programs that have become national best practices. Colleen will work closely with the team to facilitate transfer of knowledge between this project and Jacksonville's resilience strategy.

HUGH ROBERTS, PE

SME, Applied Compound Flood Risk Analysis

Hugh has nearly 20 years of experience working on essential questions of urban and coastal resilience. Hugh has led numerical modeling-based studies throughout the country to assess coastal and fluvial flood risks, support the design of ecosystem restoration and flood protection projects, and evaluate environmental impacts. For LWI, he is team lead for the development of model guidelines and standards for compound flooding effects in the flood transition zone. He also served as flood risk and mitigation team lead for the 2023 Coastal Master Plan.



DON RESIO, PHD

SME, Probablistic Framework Development & Local and Regional Flood Hazards

Don, a leading expert in compound flooding probabilistic methods, is a Senior Fellow at the Institute, based in Jacksonville, and is the former Director of Taylor Engineering Research Institute at the University of North Florida. He has been a leader in meteorological and oceanographic research for over 40 years and his efforts have contributed significantly to improving the predictive state of the art for winds, waves, currents, surges, and coastal evolution due to storms, as well as improved methods for the quantification of risk incorporating both aleatory and epistemic uncertainty into a consistent physical framework for coastal hazards.

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THOMAS WAHL, PHD (UNIVERSITY OF CENTRAL FLORIDA)
SME, Probabilistic Framework Development

Thomas specializes in integrated coastal vulnerability and risk assessments through stochastic and numerical modelling of tides, storm surges, waves, and river flows and their associated impacts. He has collaborated with federal agencies and local water management districts to advance the frontier of compound flood hazard assessments, which resulted in over 25 papers published on the topic, including a seminal paper in Nature Climate Change in 2015 on non-stationarity in compound flood potential. Thomas was the recipient of the 2023 Walter L. Huber Civil Engineering Research Prize of the American Society of Civil Engineers (ASCE) Award for his "pioneering work on coastal compound flooding and developing innovative multivariate design concepts." He is a member of the subcommittee on Hydroclimatology and Engineering Adaptation (HYDEA) of the ASCE Committee on Adaptation to a Changing Climate (CACC), which is currently in the process of developing a Manual of Practice on compound flood assessment.

KATHRYN ROSCOE, PHD (DELTARES)
Flood Forecasting Model Development and Model Application

Kathryn specializes in probabilistic risk analysis, with a focus on direct and indirect (accessibility) impacts. She is the product owner of the planning tools at Deltares and leads the development on FloodAdapt for the Department of Homeland Security, a decision-support system that brings the compound flood model SFINCS and the impact model Delft-FIAT to non-technical end-users for improved adaptation planning in coastal areas. She focuses on implementation of research into decision-support systems, focusing on the inclusion of social vulnerability and equity methods, equitable benefit-cost analysis and the inclusion of cascading (accessibility) impacts of flooding. She has carried out probabilistic compound flood risk analyses and developed tools for the Netherlands, Miami, Broward County, the South Florida Water Management District, Calcasieu Parish, and Charleston.

GUILLERMO SIMÓN, PE, CFM (HALFF ASSOCIATES, INC.)
SME, HEC-RAS Model Development & Local and Regional Flood Hazards

Guillermo has more than 20 years of experience in the fields of coastal engineering and surface hydrology and hydraulics. He works with the Institute on the development of Jacksonville's resilience strategy as Technical Advisor, providing local knowledge and experience. He served as project manager for the development of the 30% stream restoration design of Hogans Creek in downtown Jacksonville, FL. He also served as senior engineer for the review of the City's Master Stormwater Management Plan (MSMP) data to develop FEMA flood maps.

GABRIELE VILLARINI, PHD (PRINCETON UNIVERSITY)
SME, Probabilistic Framework & Rainfall Generator Development

Gabriele's research interests focus on flood hydrology, extreme events, hydroclimatology, climate predictions and projections. He has been funded by multiple federal and state organizations, including USACE, NSF, USGS, and NOAA. He developed a probabilistic model to describe the rainfall associated with tropical cyclones making landfall along the Louisiana coast, and performed analyses associated with non-tropical storms influencing the same area. Moreover, he developed a novel approach for the joint modeling of surge-rainfall occurrence through bivariate statistical methods, leading to the estimation of rainfall-surge pairs for a series of return periods capturing the surge-rainfall relationship.

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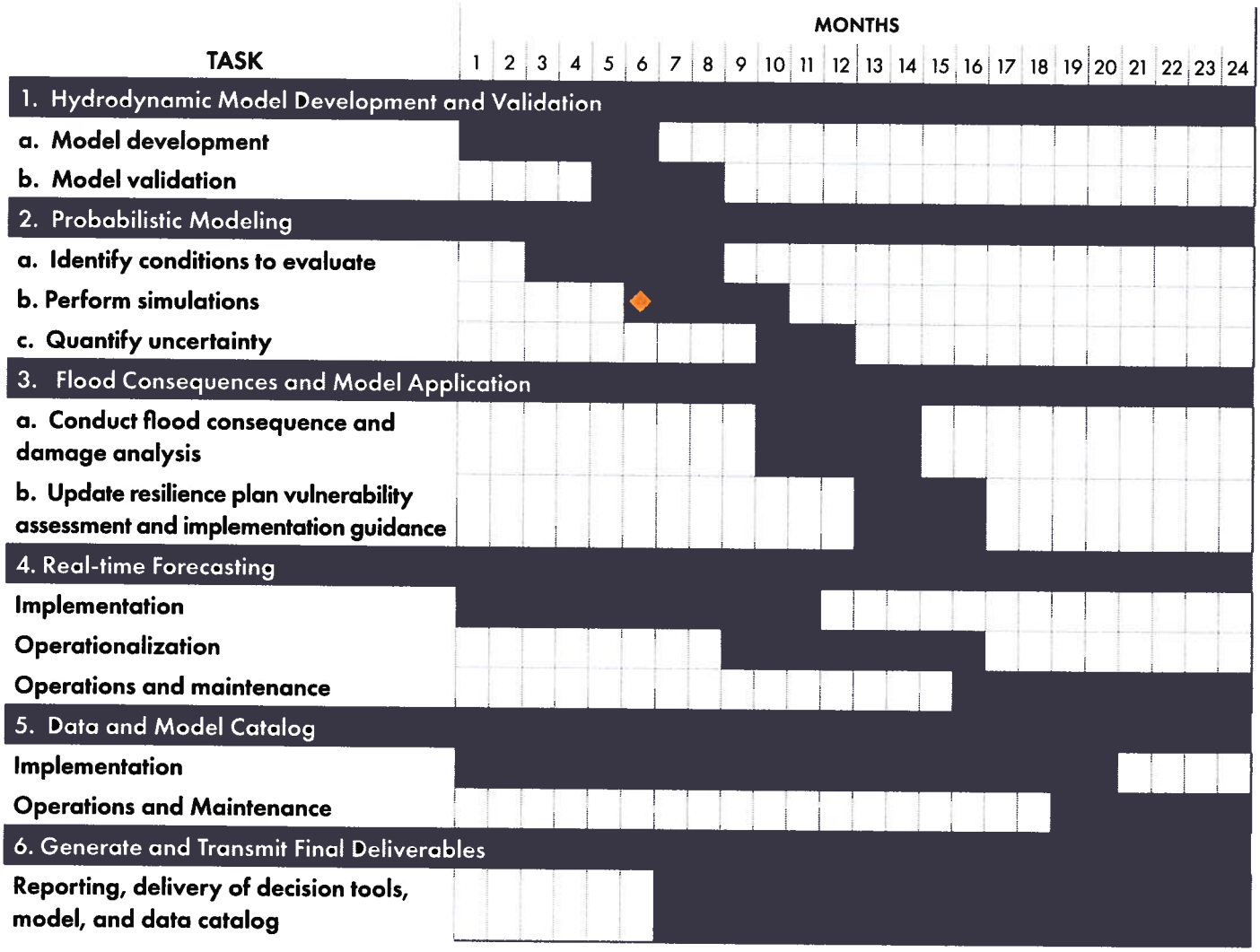
2. Approach Overview

The purpose of this analysis is to assist the City of Jacksonville in the comprehensive assessment of flood risk hazards from the combination of coastal, fluvial, and pluvial flood risk. The proposed analysis consists of six tasks, summarized in Figure 5. Project Schedule. Each of these tasks is described further in the remainder of this section.

Figure 5. Project Schedule



Milestones:

- Produce an initial 100 model runs in the first 6 months of the contract.
- Produce a minimum of 10,000 model runs for the city before the end of the contract period.
- Forecasting system should be ready for testing during the 2024 hurricane season.

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Task 1 – Hydrodynamic Model Development and Validation

The complexity of the natural environment surrounding Jacksonville can lead to different types of compound flood hazards. As such, robust tools are needed to establish and evaluate those risks and accurately inform planning. At present, existing models address processes related to flooding from undersized stormwater infrastructure or high tributary flows in selected regions of the city. While such models can address the sizing of stormwater infrastructure and planning for small flood events, they lack the ability to comprehensively address the flooding hazard resulting from extreme weather conditions with multiple, compounding flood effects from the simultaneous combination of excessive rainfall, river and/or tributary flow, and storm surge. Moreover, there are watersheds both near and further from the Jacksonville that, under certain conditions, could contribute to flooding in the city.

However, the existing models and tools developed for the City cannot holistically evaluate these conditions because they are not designed to characterize extreme simultaneous weather conditions and the resulting 2D spatial patterns of flood depth. In order to fully capture 2D flood dynamics, the Institute proposes to instead use HEC-RAS 2D for detailed flood mapping and risk analysis.

HEC-RAS 2D is the standard model used and accepted by FEMA and USACE for 2D flood analysis and it can be used to satisfy regulatory requirements. However, it can take a longer time to run in comparison to a simpler model. Consequently, for the purpose of both initial testing and eventual use in real-time forecasting, the Institute proposes to use a recently developed, faster, and less complex (but still reasonably accurate) 2D software called SFINCS, for which Deltares has already built a model for the Jacksonville region (see Figure 6).

In summary, this two-pronged approach for model development involves:

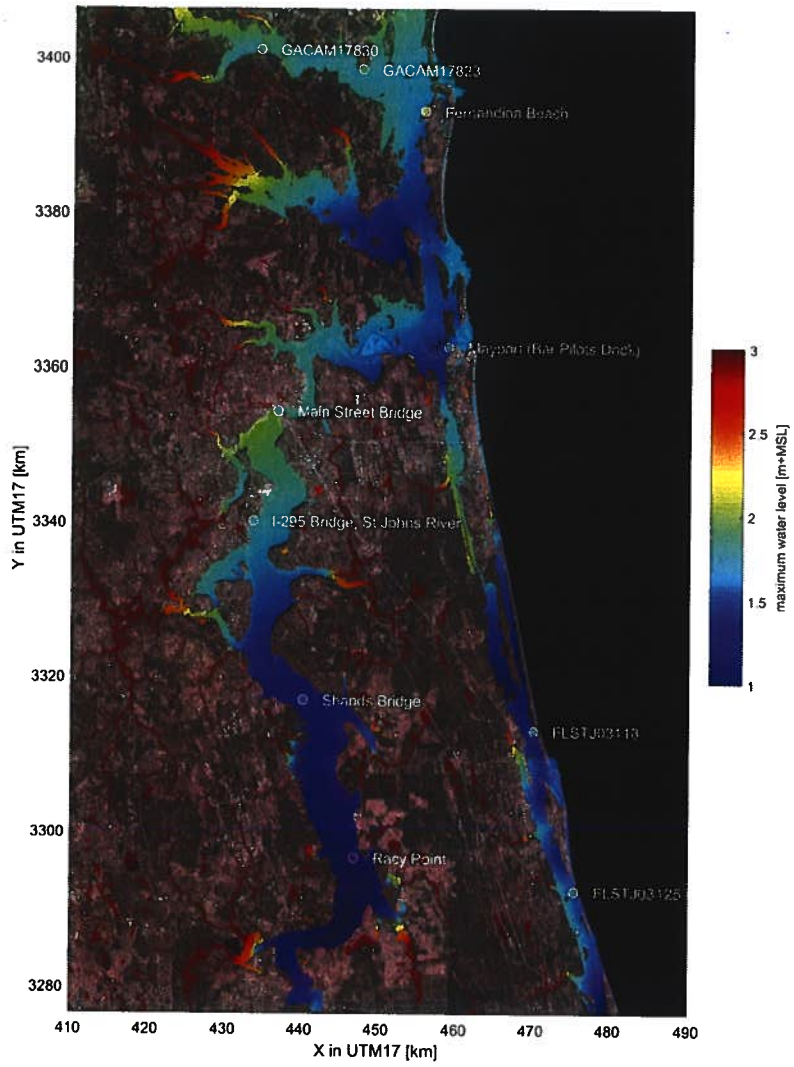

Figure 6. SFINCS model for Jacksonville, FL, during Hurricane Irma (2017) (Leijnse et al., 2020)

- Using the existing Deltares SFINCS model to investigate the inputs and boundary conditions governing flood response. Since the Deltares SFINCS model is already optimized for a preliminary and high-level investigation, it will be used to run a series of initial sensitivity tests that will allow the modeling team to determine the areas requiring more detail (for the HEC-RAS 2D model) as well as to optimize the sets of antecedent and boundary conditions to run with the detailed HEC-RAS 2D model.

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- Once the initial SFINCS sensitivity testing is complete, Halff will build and validate a new, higher resolution HEC-RAS 2D model to evaluate compound flooding in the City of Jacksonville.

1a. Hydrodynamic Model Development

The Institute is recommending a suite of modeling software based on the terrain, stormwater infrastructure, and the requirements for capturing the different aspects of compound flooding from pluvial, fluvial, and storm surge mechanisms. Deltares will lead initial sensitivity testing using SFINCS in order to best identify which inputs matter most (tide, precipitation, antecedent base flows or soil moisture, etc.). Halff will lead the HEC-RAS model construction, calibration, and validation under the Institute's supervision. Halff is uniquely positioned, with longstanding local presence and knowledge, to ensure that model inputs and outputs accurately represent the current understanding and state of the science for the City.

The hydrology component will represent stream and river flows that feed into the hydraulic component of compound flooding. The hydraulic model development will be informed by the structures and details from past models and modeling efforts. The models will replicate or improve existing model performance in capturing flood events at the coastal boundary, riverine boundary, and along the smaller localized flow paths of pluvial flooding from intense rainfall.

1b. Hydrodynamic Model Validation

The models will be validated against existing observations (high water marks, gauge records) and recent modeling efforts conducted in support of city-level (e.g., stormwater master plan) or regional risk assessments (e.g., SACS). In addition, Deltares will provide early model sensitivity analysis using the reduced-complexity SFINCS software to help the team identify areas in need of specific care in model construction or updating.

Based on this validation, the Institute and its partners at Halff will revise the models. Revisions could include but are not limited to adjusting the surface roughness coefficient, adding additional hydraulic structures, adjusting antecedent conditions, and adjusting the model computational mesh. Typically, validation and calibration of models is done for a few select events, in a so-called deterministic approach.

In pioneering a probabilistic approach to flood risk, the Institute approaches model validation such that model parameters are not over-calibrated for a single event but are calibrated to reasonably represent the flood response over a spectrum of probabilistic events.

Team members with subject matter expertise in 2D flood modeling and local flood knowledge will provide quality assurance oversight and review of model validation results.

Task 2 – Probabilistic Modeling

Probabilistic modeling consists of characterizing the likelihood of the co-occurring weather and ground conditions (e.g., rainfall, storm surge, soil moisture, and river flow) that determine the severity of flooding and in turn modeling those conditions to understand the likelihood (i.e., the risk) of flooding depths. To do this we first identify the weather conditions to evaluate, which includes quantifying the probability of these conditions. These conditions are then run through the flood model in the perform simulations task (Task 2b). Accordingly, the simulation results are used to identify the risk (i.e., the likelihood) of flooding based on the probability of the weather conditions.

For this task, the Institute has enlisted the expertise of Gabriele Villarini, Ph.D., Thomas Wahl, Ph.D., and Don Resio, Ph.D., who will guide the following:

- **Gabriele Villarini**: Extreme value analysis and the generation of equiprobable rainfall fields associated with a storm type.
- **Thomas Wahl**: Characterization of the joint probability of different flooding components, e.g., river flow, tide level, and rainfall in the context of the local Jacksonville area.
- **Don Resio**: The extension of the joint-probability method to rainfall and river/stream flow components of flooding. Dr. Resio created the original joint-probability method (JPM) for characterizing hurricanes and the associated flooding.

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2a. Identify Conditions to Evaluate

In identifying the conditions to evaluate for flood risk, the Institute will leverage analysis of existing (if available) and future conditions. In both cases, the Institute will identify gaps in the existing and future conditions. In the process of preparing the final conditions for evaluation we will leverage the following:

- The 2020, 2040, 2070 riverine analysis conducted in support of the City using the EPA Stormwater Management Model (SWMM) platform by CDM Smith.
- The USACE South Atlantic Coastal Study (USACE SACS) analysis for historic and tropical storm conditions at the downstream boundary and future climate conditions (e.g., RCP 8.5-2050, RCP 8.5-2085).
- Additional sea level rise (SLR) scenarios in coordination with state resilience requirements.
- Analysis of variable (non-spatially constant) tidal flooding for present and future conditions.
- Existing coastal storm surge model output (USACE SACS) for watersheds surrounding the City of Jacksonville, including St. John's River, Trout River, Broward River and Dunn Creek, and other watersheds/basins with known compound flooding hazards.

This task will identify the final methods and data used to characterize pluvial, fluvial, and storm surge conditions and includes:

- Establishing conditions (e.g., soil moisture, etc.) antecedent to storm events.
- Creating storm event (tropical and non-tropical) rainfall fields.
- Selecting initial and boundary conditions (inland stream flows and coastal water levels) for all selected storms.

Different from a deterministic approach, the Institute and its partner experts will establish the storm conditions as a joint probability distribution. As part of this task, the Institute, with support from Deltares, will optimize the sampling of storms (from the joint distribution) to reasonably capture the full spectrum of flood risk across different flooding mechanisms and storm types (e.g., tropical and non-tropical events).

2b. Perform Simulations

The model suite will be run over the storm conditions for evaluating compound flooding. The Institute will lead all production run simulations. The models will be executed with an automated procedure that populates models with the storm conditions and in turn runs the models in parallel across multiple compute resources in a cloud compute environment: ideally a National Science Foundation High Performance Compute Center (NSF-HPC), or if unavailable on paid cloud service such as Google Cloud or Microsoft Azure (see separate discussion of Cost Assumptions). Following past modeling efforts, the Institute will work on a grant application to explore (no cost) access to an HPC for running the model simulations. For each model run, a QA/QC notebook (in html format) will document the model performance and results. These notebooks may be viewed with any web browser. In addition, metadata (i.e., data about the QA/QC data) will be aggregated to identify outlier model runs that require reworking to remove erroneous results. These QA/QC data aggregation procedures have been developed and automated by the Institute for efficiently checking performance across hundreds of thousands of modeling results.

2c. Quantify Uncertainty

This task will quantify uncertainties and biases. Individual hydrologic, hydraulic, and coastal hydrodynamic numerical models, even when calibrated and validated with (limited) historical data, have underlying uncertainties and potential biases in the inundation response. The Institute will lead this subtask. Uncertainties and biases result from input data, initial and boundary conditions, as well as the numerical representation of complicated physical flooding mechanisms that interact within zones subject to compound flooding. Random uncertainties (e.g., associated with tidal phasing relative to landfall timing) also need to be accounted for to accurately characterize flooding during tropical cyclones. One of the strengths of the probabilistic framework is the ability to incorporate these uncertainties and biases while preserving the probabilistic inundation response.

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Task 3 – Flood Consequences and Model Application

The flood inundation results from the tropical and non-tropical storms events will be combined to generate AEPs of the total compound flood hazard. Task 3 performs that integration while preserving the disparate drivers, physical mechanisms and probabilities governing flooding from tropical cyclones and non-tropical events. The Institute will apply its pioneering methodology to propagate the joint probability of the storm conditions (as well as model uncertainties and biases) into the resulting probability of flood risk at different return intervals (e.g., 100-year event, etc.).

The resulting analysis provides a heatmap (i.e., the probability of flooding) from compounding flood processes (pluvial, fluvial, and coastal), as well as the depth of flooding (rasters) at select return periods of interest (e.g., 50 percent/2-year, 20 percent/5-year, 10 percent/10-year, 1 percent/100-year, 0.2 percent/500-year). These results will be provided for multiple future climate change conditions identified in consultation with the City.

3a. Conduct Consequence and Damage Analysis

Hydrology and hydraulics models are responsible for simulating the way storms interact with the built environment physically, but there remains a question of how the physical effects translate into policy-relevant outcomes, like the dollar valuation of damage to structures. Assessing the outcomes of a modeled storm is the domain of flood consequence models, which take representations of a flood hazard and translate them into outcomes that are meaningful for decision makers and planners.

To address this need, the Institute team will estimate the asset damage and other direct monetized consequences of flooding from the statistical summaries of compound flood risk developed in the previous task. This will entail:

- Drawing on the National Structure Inventory to assemble and update the asset inventory with best available data (e.g., parcels, building footprints, first floor elevations).
- Updating the existing consequence modeling framework developed by the Institute in support of the LWI Program and adding appropriate assumptions for compound flooding in Jacksonville.
- Evaluating flood damage and other direct flood consequences for all flood hazard scenarios considered and estimated in Task 2.
- Compiling results in summary datasets and developing a simple interactive dashboard for results display.

3b. Translate Outputs to Guide Resilience Strategy Implementation

In this task, the Institute will update the analysis conducted in support of Jacksonville's resilience strategy and use the analysis results to inform the City's next steps in implementation and communication. Specifically, for this task we envision:

- Summarizing compound flood risk outputs as specified in state resilience requirements.
- Updating resilience strategy alternatives analysis results with additional compound flood scenarios.
- Providing additional analysis to support strategic implementation of specific resilience actions (for example, green infrastructure investments and shoreline protection decisions).

Downtown Jacksonville at the height of storm surge flooding on Monday, September 11, 2017 [Hurricane Irma]. Image credit: Jacksonville Sheriff's Office

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Task 4 – Develop and Operate a Real-Time Flood Forecasting System

The State of Louisiana funded the Institute to manage and coordinate a program to design, develop, maintain, and operate FloodID system. The FloodID system will support emergency management decision-makers tasked with responding to flood event-related emergencies. The system design is user-centric, informed by emergency manager-defined decision support needs.

The forecast system is designed to be extensible, both in terms of new capabilities/functionalities and geographic footprint. Though initially developed for Louisiana, the system was designed with the intention of expanding the geographic footprint of its application. This was done in large part at the request of funding partners in Louisiana such that emergency managers elsewhere can benefit from the initial system development.

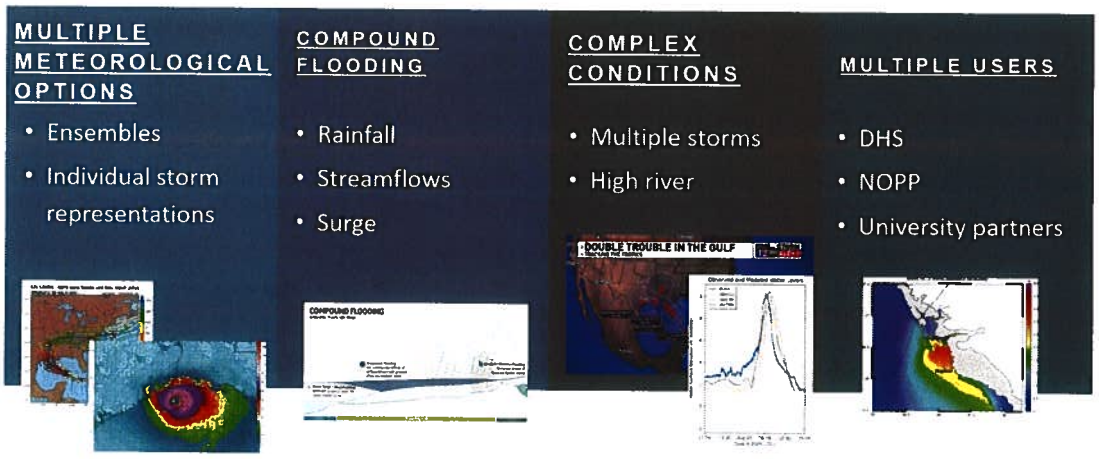
In this task, the Institute would extend the FloodID system to leverage the compound flood modeling for the City of Jacksonville. As noted in the Cost Assumptions attached to Section 5.1 Price Sheet, there are several options available for implementation, as well as ongoing operations. The Institute will lead all development tasks specific to integration of the model results with decision support dashboards and tools. Deltares will lead the hydrodynamic model development and updates to the SFINCS model, which will serve as the computational basis for the real time forecasting system's hydrodynamic component.

Implementation

To expand the flood forecasting system to Jacksonville, the Institute will perform the following steps.

- Deltares will lead updates and modifications to its existing SFINCS model to serve as the basis for the real time forecasting system. As previously noted, SFINCS is a reduced physics model capable of resolving large-scale flood prediction at high speed and has already been successfully developed and applied for the Jacksonville area. The SFINCS real time forecasting model and the full-physics, more detailed HEC-RAS model developed for Task 1 will be used to complement one another, identify areas to focus model refinement, and provide the City the added benefit of access to both tools with varying levels of detail.
- The Institute and Deltares will jointly identify and retrieve the various FEMA and USACE storm surge models (e.g., ADCIRC models) that are both available in the region and suitable for real-time application in terms of accuracy and runtime. These models are expected to be relatively easy to update for forecasting purposes.
- The Institute will process forecast data (e.g., rainfall) into derivative data required for forecasting purposes. For example, the long-term rainfall time series will inform the soil moisture wetness that governs the intensity of pluvial flooding from rainfall.

FloodID Extensible Design



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- The Institute will lead the integration of the Deltares SFINCS into the flood forecasting model controller, including identifying locations to automatically extract data from observation stations or river forecast stations to inform the models at model boundaries.
- The Institute will lead development of up to three decision support dashboards that draw on Jacksonville-specific datasets to assess the impact of forecast storms on City operations and infrastructure, and to inform post-storm mitigation grant applications. City staff will be consulted to provide necessary datasets for inclusion into the dashboards and so that the dashboards align with City-specific emergency procedures and action thresholds. Dashboards that can be deployed include roadway inundation, critical infrastructure exposure and access limitation, and damage to buildings and contents.
- At the conclusion of the work, the Institute will train City-designated staff on the use and interpretation of the results dashboards. Training will consist of a user's manual and one in-person and/or virtual training session for City personnel. User Acceptance Testing (UAT) with the City user(s) will conclude with the City explicitly accepting delivery of the dashboard system. The Institute assumes that Institute staff will operate the real time forecasting system during approaching tropical events for one year on behalf of the City after acceptance.

Operations and Maintenance

As noted in the Cost Assumptions attached to Section 5.1 Price Sheet, there are multiple options for operating and maintaining a flood forecast system. Note that experienced emergency managers, including meteorologists to guide decision making, are expected to be the users of the system. The Institute has assumed in this proposal that Institute staff would work with city emergency management personnel to operate the system. Institute staff would ensure the automated system is active during severe landfalling events only. If the system would instead be operated year-round, periodic system checks would be necessary.

Decision Support Tools

ROADWAY INUNDATION

RESPONSE INFRASTRUCTURE

DIRECT DAMAGES

SEARCH AND RESCUE

H-HOUR

R-HOUR

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Task 5 – Develop Data and Model Catalog to Support Future Project Design and Evaluation

To address common needs identified across multiple environmental modeling efforts, the Institute has developed EnDMC, a web-based platform specifically designed to store models, configuration, simulation outputs, and related metadata in an organized and discoverable way.

In this task, the Institute will work with the City to implement EnDMC to allow for model and data input and access by City staff, contractors, and other relevant technical users. Similar to the real-time flood forecasting system, there are several options available for implementation, with hosting either in a City-managed or Institute-managed cloud. Considerations are expanded upon in the Cost Assumptions attachment.

Implementation

Institute staff will work closely with City Information Technology (IT) to perform the following subtasks to ensure a successful deployment:

- The Institute will inventory programs for data capture, and then generate process and advisory strategies. Data capture programs would include modeling efforts to be captured in the City's catalog. The Institute will also make recommendations for data governance and for propagating requirements to future modeling efforts.
- The Institute will work with the City's IT staff to determine an appropriate hosting provider and, if not in an Institute-managed deployment, support City IT in a City-managed deployment. The EnDMC deployment will be tailored to Jacksonville through naming and styling, configuration to use City-provided email notification, and accompanied with maintenance documentation.

An initial beta version will be deployed for City review and testing, from which the Institute will iterate with the City to optimize the system until it is ready for handoff and operationalization. During the beta testing phase, we assume a scenario where 10 terabytes (TB) of data is downloaded twice per month and a number of virtual machines required at AWS to deploy the software. In this proposal, the Institute has assumed it will operate and maintain the system for the City for one year after delivery.

Operations and Maintenance

Deploying, operating, and maintaining EnDMC for use in client deployments has several practical considerations that will influence the scope and fee. The Institute assumes it will provision the necessary infrastructure to deploy EnDMC. In this pathway, operations and maintenance are greatly simplified in that the Institute can perform maintenance and updates directly onto the deployed application. Additionally, the Institute is in the process of establishing an Open Data Lake under AWS's Open Data Initiative. Should our grant proposal to AWS succeed, it would would provide storage and data egress at no charge, potentially saving the City tens of thousands of dollars per year. The only grant maintenance required would be for the City to renew the grant every 2 years beyond the initial 2-year duration.

While the maintenance and operation of EnDMC in this pathway is under Institute stewardship, the City has transparent access and administration over their instance. The data object store can easily be transferred to the City if desired to mitigate any concerns related to vendor lock.

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Task 6 – Generate and Transmit Final Deliverables

In this final task, the Institute will develop and transmit a series of deliverables for future City use, as summarized in Table 1. Deliverables.

Table 1. Deliverables
Compound flood present and future inundation maps • GIS raster files of heatmaps showing the likelihood of flooding for corresponding return periods. • Maps of spatially explicit surfaces depths for a spectrum of return periods
Detailed digital report • With report appendices • A digital archive of all data and metadata • Models, model output • Maps and scripts used/developed in the study • QA/QC reports for all the models and the models in aggregate
Flood consequence analysis • Dataset of asset damage by structure/parcel (by return period and annual average) • Interactive dashboard with flood damage results
Updated resilience planning analysis • Updated resilience strategy alternatives analysis (as timing allows) • Flood map outputs for state resilience requirements • Analysis to support the implementation of specific resilience actions (as timing allows)
Jacksonville flood forecasting system • Real-time flood forecasting system to be actively operated during times of landfalling tropical events • Up to three dashboards for output interpretation and decision support • Flood forecasting user's manual • One in-person and/or virtual training session on dashboard use and interpretation with City staff administered by the Institute
EnDMC populated with Jacksonville data and compound flood models • EnDMC instance credentials with deployment and maintenance documentation • Usage guidance and training documentation for model uploaders • Guidance memo with program inventory and data governance recommendations

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Exhibit B
("Compensation")

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Exhibit B
Compensation

Item	Description	Price
1	1. Development of compound flood model and probabalistic framework	$ 1,550,000.00
	1.i Water Institute Labor	$ 849,086.00
	1.ii Water Institute Expenses (Travel, etc.)	$ 10,914.00
	1.iii Subconsultant Expenses	$ 690,000.00
2	Computing Costs	$ 150,000.00
3	3. Development of flood forecasting software	$ 650,000.00
	3.i Water Institute Labor	$ 484,086.00
	3.ii Water Institute Expenses (Travel, etc.)	$ 10,914.00
	3.iii Subconsultant Expenses	$ 155,000.00
4	4. Development of data and model repository	$ 400,000.00
	4.i Water Institute Labor	$ 359,086.00
	4.ii Water Institute Expenses (Travel, etc.)	$ 40,914.00
	Grand Total	**$ 2,750,000.00**

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RATE SCHEDULE

Effective August 15, 2022

Positions/Qualifications	Billing Rates
Research Associate I	$117
Research Associate II	$128
Research Scientist I	$138
Research Scientist II	$166
Research Scientist III	$194
Senior Research Scientist	$215
Lead Research Scientist	$265
Project Manager	$175
Senior Project Manager	$225
Project Specialist	$128
Senior Project Specialist	$160
Technical Editor	$110
Intern - Undergraduate Student	$60
Intern - Graduate student	$80

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POSITIONS/QUALIFICATIONS

Research Associate I

Duties include but are not limited to: setup and run simple models; implement field work/data collection/data management practices; laboratory analyses/data processing including basic statistical analysis and drafting of graphs/diagrams; and GIS support.

Research Associate II

Duties include but are not limited to: experimental design and implementation; development, set-up, and run of simple models; GIS and statistical analysis; synthesis of existing information/data; drafting sections of reports; presenting components of work to wider audiences; and project coordination tasks.

Research Scientist I

Duties include but are not limited to: research project design and implementation; perform data collection and analysis; synthesis and deliberation; prepare verbal and written presentation of findings; conduct research with limited oversight; engage with partners and share knowledge; and develop research project deliverables.

Research Scientist II

Duties include but are not limited to: lead project research tasks with minimal oversight; lead the development of research project deliverables; independently communicate with external partners; perform advanced analysis/research; oversight of routine data collection/analyses; routine communication with clients/subcontractors; advanced project troubleshooting; synthesis of findings/results; workload and cost management; develop cost estimates.

Research Scientist III

Duties include but are not limited to: lead project research with minimal input; ensure quality project deliverable development and delivery; provides technical oversight/management of project tasks including staffing; QA/QC; defining level of effort and managing schedule; author project deliverables; independently communicate with external partners; and conduct professional presentations.

Senior Research Scientist

Duties include but are not limited to: strategic guidance of research work; project technical lead; overall management of smaller projects; troubleshooting; management of cost and project staffing; ensure quality product development and delivery.

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Lead Research Scientist

Duties include but are not limited to: responsible for the overall direction, alignment, coordination, execution, troubleshooting, control and completion of program or project level activities; support resolution of potential project conflicts; ensures quality product development and delivery.

Project Manager

Duties include but are not limited to: responsible for the overall direction, coordination, implementation, execution, control and completion of specific tasks within the authorized scope, schedule and budget.

Senior Project Manager

Duties include but are not limited to: responsible for the overall direction, coordination, implementation, execution, control and completion of specific larger, more complex tasks within the authorized scope, schedule and budget.

Project Specialist

Duties include, but are not limited to, project support functions such as: administrative support to ensure execution of task orders; project coordination support such as contracting, subcontracting, invoicing, budget, and meeting coordination; data management; meeting facilitation; and graphic design and multi-media specialist support.

Senior Project Specialist

Duties include, but are not limited to, more complex project support functions such as: management of administrative support to ensure execution of task orders; project coordination such as contracting, subcontracting, invoicing, and cost/budget review; development of data management approaches; meeting facilitation; and advanced graphic design, multi-media, publication layout support.

Technical Editor

Duties include, but are not limited to: prepare a wide range of materials (technical reports, presentations, brochures) for dissemination to technical and non-technical audiences.

Intern - Undergraduate Student

Undergraduate student performing assigned services supporting project tasks.

Intern - Graduate student

Graduate student performing assigned services supporting project tasks.

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INSTITUTE-OWNED EQUIPMENT USE/FEE SCHEDULE

Description	Usage Rates
Multi-beam Sonar System (Reson 7125)	$650/day; $3,500/week; $10,000/month
LiDAR Elevation Mapping System (Dynascan)	$550/day; $3,000/week; $9,000/month
Survey GPS (Trimble - MPS865)	$200/day; $1,400/week; $4,000/month
Survey GPS (Trimble - R-8)	$200/day; $1,400/week; $4,000/month
Single-Beam Fathometer (Ohmex – Sonarmite)	$75/day; $450/week; $1,250/month
Current Meter (Sontek - SL-500)	$175/day; $800/week; $2,500/month
Water Quality Sonde (Xylem-YSI - 600 OMS V-2)	$65/day; $395/week; $1,000/month
Water Quality Sonde (Xylem-YSI - EXO-2)	$125/day; $650/week; $1,750/month
Inertial Navigation System (Applanix - MV5 320)	$550/day; $3,000/week; $9,000/month
Automated Water Sampler (Campbell - AWS w CR800)	$35/day; $200/week; $650/month
Data logger/micro-controller (Campbell - CR800)	$35/day; $200/week; $650/month
Wave and Current Meter- Profiler (Nortek – Aquadopp)	$100/day; $500/week; $1,500/month
Wave and Current Meter- Single Point (Nortek – Vector)	$65/day; $350/week; $850/month
Current Meter- Single Point (Nortek – Vectrino)	$65/day; $350/week; $850/month
Tide and Wave Gauge (Ruskin – RBRsolo)	$45/day; $250/week; $750/month
Tide/Wave Gauge + Turbidity (Ruskin – RBRduo | Tu)	$45/day; $250/week; $750/month
Particle Size Analyzer (Sequoia Scientific – LISST)	$40/day; $200/week; $600/month
Fish Collection Throw Trap	$75/day; $300/week; $1,000/month
Cryo-corer	$100/day; $450/week; $1,000/month
Eijkelkamp Penetrologger	$45/day; $250/week; $750/month
Peat Corer	$30/day; $125/week; $300/month
CPU Computing Charges	$ 0.05/hour

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SUBJECT: A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM

BID #: ESC-0404-23

OPEN DATE: 2023-07-19

COMPETITIVE SEALED PROPOSAL EVALUATION COMMITTEE

KIND AND BASIS OF CONTRACT: COMPETITIVE SEALED PROPOSAL SUPPLY CONTRACT – PERIOD OF SERVICE WILL BE TWO (2) YEARS FROM THE DATE OF CONTRACT EXECUTION, WITH TWO (2) ONE (1) YEAR RENEWAL OPTIONS

AGENCY: PLANNING AND DEVELOPMENT DEPARTMENT

BASIS OF AWARD: HIGHEST SCORING RESPONSIVE, RESPONSIBLE BIDDER BASED ON THE EVALUATION CRITERIA

NUMBER OF BIDS INVITED: 21 **NUMBER RECEIVED:** 1 **OTHER:** 0

SUMMARY OF BIDS AND RECOMMENDED ACTIONS:
Recommend approval of award to the sole responsive, responsible bidder, THE WATER INSTITUTE in the amount of $2,750,000.00 for A CITYWIDE PROBABILISTIC COMPOUND FLOOD MODEL & REAL-TIME FORECASTING SYSTEM. Period of service will be two (2) years from the date of contract execution, with two (2) one (1) year renewal options.

Funding Source: 32111.153101.565051.010384.00000000.00000.0000000, to be executed by formal contract through the Office of General Counsel and process by purchase order(s).

Attachments: Recommendation Memo, Bid Tabulation Sheet, Scoring Matrix, Description of Services

Analyst: _____ RUBEN OLA

RESPECTFULLY SUBMITTED: _____ DUSTIN FREEMAN, CHIEF PROCUREMENT DIVISION

CONCURRENCE BY: William Killingsworth, Director of Planning and Development Department

(ALL AWARD ACTIONS SUBJECT TO LAWFULLY APPROPRIATED FUNDS)
ACTION OF CSPEC COMMITTEE ON RECOMMENDATIONS ABOVE

MEMBERS APPROVING 4 MEMBERS DISAPPROVING 0 DATE: 7/27/2023

OTHER: _____

ACTION OF AWARDING AUTHORITY DATE 7/28/23

APPROVED ✓ DISAPPROVED _____

OTHER _____

SIGNATURE OF AUTHENTICATION Karen E. Bowling

Karen Bowling
Chief Administrative Officer
For: Mayor Donna Deegan
Under Authority Of:
Executive Order No: 2023-02

Docusign Envelope ID: 4B63CAE9-4752-4210-9E50-E40E808FD8AD

Contract Purchase Agreement POA-70647-23

Agreement	POA-70647-23
Agreement Date	01-AUG-2023
Revision	0
Agreement Amount	2,750,000.00 USD
Solicitation Number	ESC-0404-23

Sold To

City of Jacksonville
117 West Duval Street
Suite 375
JACKSONVILLE, FL 32202
US

Supplier

The Water Institute of the Gulf
1110 River Road South
Suite 200
BATON ROUGE, LA 70802

Notes

Supplier Number	Payment Terms	Freight Terms	FOB	Shipping Method
33481	Net 30	Freight Prepaid	FOB Destination	Best Way
Start Date	**End Date**		**Confirm To**	
14-Aug-2023	13-Aug-2025		Ruben Ola rubeno@coj.net	

DRAFT

This Order is subject to the General Conditions attached here to. Manufacturer's Federal excise tax exempt no 59-89-0120K Florida State sales and use tax exemption no. 85-8012621607C-8	Approved by Dustin L. Freeman, Chief of Procurement Division

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Coglianese, Anne - PDOD

Reply Reply all Forward

To: Brett McMann <bmcmann@thewaterinstitute.org>; Boss, Allison - PDOD

Tue 8/4/2026 10:03 AM

Cc: Jordan Fischbach <jfischbach@thewaterinstitute.org>; Muthu Narayanaswamy <mnarayanaswamy@thewaterinstitute.org>

Yes – That shouldn't be an issue. We would also like to have extra time to lean on your expertise through the rollout of this project. I'll have Allison begin the process to file this no-cost extension.

Anne Coglianese
Chief Resilience Officer
City of Jacksonville
acoglianese@coj.net
Office (904) 255-7939
Cell (904) 625-8162

BM

Brett McMann<bmcmann@thewaterinstitute.org>

To: Coglianese, Anne - PDOD; Boss, Allison - PDOD

Mon 8/3/2026 11:08 AM

Cc: Jordan Fischbach <jfischbach@thewaterinstitute.org>; **+1 other**

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The Water Institute team would like to request a one-year no-cost extension to complete the wrap-up of the compound flood study. As you know, we are rapidly progressing through final quality control checks of all the model outputs and developing the communications and takeaways to describe them to a broad array of City stakeholders. The extension will allow the team to methodically work with the City to step through modeling results, ensure accuracy, and develop well-constructed explanations and narratives to best serve City decision makers in the years to come. This extension will also allow for the necessary coordination with the City's new adaptation planning initiative and NFWF-funded green infrastructure project.

Thanks, please let us know of any concerns.

The Water Institute team

Brett McMann, PE, CFM
C (504) 810 – 6271

Welcome to the new Outlook (1/5)