REQUEST FOR QUOTATION (RFQ)

RFQ Reference: **RFQMUS2021-013: Procurement of modelling software for hydrodynamics simulation around Mauritius, Rodrigues and Seychelles**	Date: 19 October 2021

SECTION 1: REQUEST FOR QUOTATION (RFQ)

UNDP kindly requests your quotation for the provision of goods, works and/or services as detailed in Annex 1 of this RFQ.

This Request for Quotation comprises the following documents:

Section 1: This request letter

Section 2: RFQ Instructions and Data

Annex 1: Schedule of Requirements

Annex 2: Quotation Submission Form

Annex 3: Technical and Financial Offer

When preparing your quotation, please be guided by the RFQ Instructions and Data. Please note that quotations must be submitted using Annex 2: Quotation Submission Form and Annex 3 Technical and Financial Offer, by the method and by the date and time indicated in Section 2. It is your responsibility to ensure that your quotation is submitted on or before the deadline. Quotations received after the submission deadline, for whatever reason, will not be considered for evaluation.

Thank you and we look forward to receiving your quotations.

Issued by:

Signature: _____

Name: Sameer Khudaroo

Title: for Operations Manager, Mauritius and Seychelles

Date: 19 October 2021

SECTION 2: RFQ INSTRUCTIONS AND DATA

Introduction	Bidders shall adhere to all the requirements of this RFQ, including any amendments made in writing by UNDP. This RFQ is conducted in accordance with the UNDP Programme and Operations Policies and Procedures (POPP) on Contracts and Procurement Any Bid submitted will be regarded as an offer by the Bidder and does not constitute or imply the acceptance of the Bid by UNDP. UNDP is under no obligation to award a contract to any Bidder as a result of this RFQ. UNDP reserves the right to cancel the procurement process at any stage without any liability of any kind for UNDP, upon notice to the bidders or publication of cancellation notice on UNDP website.
Deadline for the Submission of Quotation	**Monday 08 November 2021 (16 00 pm Mauritius time)** If any doubt exists as to the time zone in which the quotation should be submitted, refer to http://www.timeanddate.com/worldclock/.
Method of Submission	Quotations must be submitted as follows: ☒ Dedicated Email Address Bid submission address: **procurement.mu@undp.org** ▪ File Format: PDF format ▪ File names must be maximum 60 characters long and must not contain any letter or special character other than from Latin alphabet/keyboard. ▪ All files must be free of viruses and not corrupted. ▪ Max. File Size per transmission: 30 MB ▪ Mandatory subject of email: **RFQMUS2021-013: Procurement of modelling software for hydrodynamics simulation around Mauritius, Rodrigues and Seychelles under the UNDP supported 'AF- Restoring Marine Ecosystem Services by Rehabilitating Coral Reefs to Meet a Changing Climate Future' project** ▪ Multiple emails must be clearly identified by indicating in the subject line "email no. X of Y", and the final "email no. Y of Y. ▪ It is recommended that the entire Quotation be consolidated into as few attachments as possible. ▪ The bidder should receive an email acknowledging email receipt.
Cost of preparation of quotation	UNDP shall not be responsible for any costs associated with a Supplier's preparation and submission of a quotation, regardless of the outcome or the manner of conducting the selection process.
Supplier Code of Conduct, Fraud, Corruption,	All prospective suppliers must read the United Nations Supplier Code of Conduct and acknowledge that it provides the minimum standards expected of suppliers to the UN. The Code of Conduct, which includes **principles on labour, human rights, environment and ethical conduct** may be found at: https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct Moreover, UNDP strictly enforces a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical or unprofessional practices, and obstruction of UNDP vendors and requires all bidders/vendors to observe the highest standard of ethics during the procurement process and contract implementation. UNDP's Anti-Fraud Policy can be found at http://www.undp.org/content/undp/en/home/operations/accountability/audit/office_of_audit_andinvestigation.html#anti
Gifts and Hospitality	Bidders/vendors shall not offer gifts or hospitality of any kind to UNDP staff members including recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to extravagant lunches, dinners or similar. In pursuance of this policy, UNDP: (a) Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question; (b) Shall declare a vendor ineligible, either

	indefinitely or for a stated period, to be awarded a contract if at any time it determines that the vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a UNDP contract.
Conflict of Interest	UNDP requires every prospective Supplier to avoid and prevent conflicts of interest, by disclosing to UNDP if you, or any of your affiliates or personnel, were involved in the preparation of the requirements, design, specifications, cost estimates, and other information used in this RFQ. Bidders shall strictly avoid conflicts with other assignments or their own interests, and act without consideration for future work. Bidders found to have a conflict of interest shall be disqualified. Bidders must disclose in their Bid their knowledge of the following: a) If the owners, part-owners, officers, directors, controlling shareholders, of the bidding entity or key personnel who are family members of UNDP staff involved in the procurement functions and/or the Government of the country or any Implementing Partner receiving goods and/or services under this RFQ. The eligibility of Bidders that are wholly or partly owned by the Government shall be subject to UNDP's further evaluation and review of various factors such as being registered, operated and managed as an independent business entity, the extent of Government ownership/share, receipt of subsidies, mandate and access to information in relation to this RFQ, among others. Conditions that may lead to undue advantage against other Bidders may result in the eventual rejection of the Bid.
General Conditions of Contract	Any Purchase Order or contract that will be issued as a result of this RFQ shall be subject to the General Conditions of Contract Select the applicable GTC: ☒ General Terms and Conditions / Special Conditions for Contract. Applicable Terms and Conditions and other provisions are available at UNDP/How-we-buy
Special Conditions of Contract	☒ Cancellation of PO/Contract if the delivery/completion is delayed by 120 days
Eligibility	A vendor who will be engaged by UNDP may not be suspended, debarred, or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization. Vendors are therefore required to disclose to UNDP whether they are subject to any sanction or temporary suspension imposed by these organizations. Failure to do so may result in termination of any contract or PO subsequently issued to the vendor by UNDP. It is the Bidder's responsibility to ensure that its employees, joint venture members, sub-contractors, service providers, suppliers and/or their employees meet the eligibility requirements as established by UNDP. Bidders must have the legal capacity to enter a binding contract with UNDP and to deliver in the country, or through an authorized representative.
Currency of Quotation	Quotations shall be quoted in **Mauritian Rupees (MUR) (for local bidders) or United States Dollars (USD)**
Joint Venture, Consortium or Association	If the Bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for the Bid, they shall confirm in their Bid that : (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, which shall be evidenced by a duly notarized Agreement among the legal entities, and submitted with the Bid; and (ii) if they are awarded the contract, the contract shall be entered into, by and between UNDP and the designated lead entity, who shall be acting for and on behalf of all the member entities comprising the joint venture, Consortium or Association. Refer to Clauses 19 – 24 under Solicitation policy for details on the applicable provisions on Joint Ventures, Consortium or Association.
Only one Bid	The Bidder (including the Lead Entity on behalf of the individual members of any Joint Venture, Consortium or Association) shall submit only one Bid, either in its own name or, if a joint venture, Consortium or Association, as the lead entity of such Joint Venture, Consortium or Association. Bids submitted by two (2) or more Bidders shall all be rejected if they are found to have any of the following:

	a) they have at least one controlling partner, director or shareholder in common; or b) any one of them receive or have received any direct or indirect subsidy from the other/s; or b) they have the same legal representative for purposes of this RFQ; or c) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about, or influence on the Bid of, another Bidder regarding this RFQ process; d) they are subcontractors to each other's Bid, or a subcontractor to one Bid also submits another Bid under its name as lead Bidder; or e) some key personnel proposed to be in the team of one Bidder participates in more than one Bid received for this RFQ process. This condition relating to the personnel, does not apply to subcontractors being included in more than one Bid.
Duties and taxes	Article II, Section 7, of the Convention on the Privileges and Immunities provides, inter alia, that the United Nations, including UNDP as a subsidiary organ of the General Assembly of the United Nations, is exempt from all direct taxes, except charges for public utility services, and is exempt from customs restrictions, duties, and charges of a similar nature in respect of articles imported or exported for its official use. All quotations shall be submitted net of any direct taxes and any other taxes and duties, unless otherwise specified below: All prices must ☒ **be exclusive of VAT and other applicable indirect taxes**
Language of quotation	**English** Including documentation including catalogues, instructions and operating manuals.
Documents to be submitted	Bidders shall include the following documents in their quotation: ☒ Annex 2: Quotation Submission Form duly completed and signed ☒ Annex 3: Technical and Financial Offer duly completed and signed and in accordance with the Schedule of Requirements in Annex 1 ☒ Company Profile. ☒ Registration certificate; ☒ List and value of projects performed for the last 3 years plus client's contact details who may be contacted for further information on those contracts; ☒ List and value of ongoing Projects with UNDP and other national/multi-national organization with contact details of clients and current completion ratio of each ongoing project; ☒ Statement of satisfactory Performance (Certificates) from the **top 3 clients** in terms of Contract value in similar field; ☒ Completed and signed CVs for the proposed key Personnel for training ☒ Other 1) Brochures or data sheets. 2) Written Self-Declaration of not being included in the UN Security Council 1267/1989 list, UN Procurement Division List or other UN Ineligibility List.
Quotation validity period	Quotations shall remain valid for **120** days from the deadline for the Submission of Quotation.
Price variation	No price variation due to escalation, inflation, fluctuation in exchange rates, or any other market factors shall be accepted at any time during the validity of the quotation after the quotation has been received.
Partial Quotes	☒ Not permitted
Alternative Quotes	☒ Not permitted
Payment Terms	The payment schedule will be as follows:-

Deliverable	Percentage
Supply and installation of software	70% within 30 days upon UNDP's acceptance of the software and receipt of invoice
Completion of training and finalisation of maintenance and support agreement	30% within 30 days upon satisfactory completion of training and finalisation of

		maintenance and support agreement and receipt of invoice
Conditions for Release of Payment	☒ Complete Installation ☒Passing all Testing [Testing will be carried out by the vendor's local representatives under the supervision of representatives of the Mauritius Oceanography Institute MOI] ☒ Completion of Training on Operation and Maintenance ☒ Written Acceptance of Goods, Services and Works, based on full compliance with RFQ requirements	
Contact Person for correspondence, notifications and clarifications	E-mail address: sevika.varaden@undp.org and deepa.seeburn@undp.org Attention: Quotations shall not be submitted to this address but to the address for quotation submission above. Otherwise, offer shall be disqualified. Any delay in UNDP's response shall be not used as a reason for extending the deadline for submission, unless UNDP determines that such an extension is necessary and communicates a new deadline to the Proposers.	
Clarifications	Requests for clarification from bidders will not be accepted any later than **Wednesday 27 October 2021** days before the submission deadline. Responses to request for clarification will be communicated by **email by Friday 29 October 2021**	
Evaluation method	☒ The Contract or Purchase Order will be awarded to the lowest price substantially compliant offer	
Evaluation criteria	☒Full compliance with all requirements as specified in Annex 1 ☒Full acceptance of the General Conditions of Contract ☒Comprehensiveness of after-sales services ☒Earliest Delivery /shortest lead time	
Right not to accept any quotation	UNDP is not bound to accept any quotation, nor award a contract or Purchase Order	
Right to vary requirement at time of award	At the time of award of Contract or Purchase Order, UNDP reserves the right to vary (increase or decrease) the quantity of services and/or goods, by up to a maximum twenty-five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.	
Type of Contract to be awarded	☒ Purchase Order	
Expected date for contract award.	Friday 10 December 2021	
Publication of Contract Award	UNDP will publish the contract awards valued at USD 100,000 and more on the websites of the CO and the corporate UNDP Web site.	
Policies and procedures	This RFQ is conducted in accordance with UNDP Programme and Operations Policies and Procedures	
UNGM registration	Any Contract resulting from this RFQ exercise will be subject to the supplier being registered at the appropriate level on the United Nations Global Marketplace (UNGM) website at www.ungm.org. The Bidder may still submit a quotation even if not registered with the UNGM, however, if the Bidder is selected for Contract award, the Bidder must register on the UNGM prior to contract signature.	

ANNEX 1: SCHEDULE OF REQUIREMENTS

Technical Specifications for Goods:

The modelling software will be used under the UNDP funded project "Restoring Marine Ecosystem Services by Rehabilitating Coral Reefs to Meet a Changing Climate Future and Mainstreaming Biodiversity into the Management of the Coastal Zone in the Republic of Mauritius" with following aims:

1. To simulate waves and flow around Mauritius, Rodrigues and Seychelles Islands on large scales (outside the reef edge) and in coast-near scales (in the lagoon areas);
2. To simulate the sedimentation transport inside the lagoons;
3. To simulate wave current pattern on the flat and shallow parts of lagoon areas as a result of wave breaking over the reef edge and in deep trenches/areas inside the lagoon of Mauritius, Rodrigues and Seychelles Islands;
4. To simulate large scale ocean currents under forcing conditions and large global wind fields.

In order to achieve the above aims, we are proposing the use of a single software which will provide accurate models of international standards. The modelling software should be well suited to achieve all the objectives set in this project with regards to oceanographic simulation modelling. Furthermore, the modelling software should comprise of a set of modules that has the different functionalities.

The requirements of the different modules are as follows: -

Modules	Minimum requirements of the Modelling Software
1	- Generate spectral wind-wave model based on unstructured meshes. - Simulate the growth, decay and transformation of wind-generated waves and swell in offshore and coastal areas. - Use the wave action conservation equation in the frequency domain by introducing the zeroth and first moment of the wave action spectrum as dependent variables following Holthuijsen (1989). - The full spectral formulation should be based on the wave action conservation equation, where the directional-frequency wave action spectrum is the dependent variable. - The modules should include the following physical processes: - Wave growth by action of wind - Non-linear wave-wave interaction - Dissipation due to depth-induced wave breaking - Wave-current interaction - Effect of time-varying water depth and flooding and drying - The discretization of the governing equation in geographical and spectral space should be performed using cell-centered finite volume method. - The time integration should be per4formed using a fractional step approached where a multi-sequence explicit method is applied for the propagation of the wave.
2	Module is based on the numerical solution of time domain formulations of Boussinesq type equations, including nonlinearity as well as frequency dispersion. The module should solve the Boussinesq type equations using a flux-formulation with improved linear dispersion characteristics Simulate of the propagation of directional wave trains travelling from deep to shallow water using a ratio of maximum depth to deep-water wave length approximately equals to 0.5. The module should be able to model phenomena like as wave grouping, surf beats, generation of bound sub-harmonics and super-harmonics and near-resonant triad interactions.

Modules	Minimum requirements of the Modelling Software
	The module should be able to solve the enhanced Boussinesq equations [Madsen et al,1991] by: o an implicit finite difference technique with variables defined on a space-staggered rectangular grid. o a standard Galerkin finite element method with mixed interpolation for variables defined on an unstructured (or a structured) grid. o The module should consider porosity for the simulation of partial reflection from and transmission through piers and breakwaters. The module should be capable of reproducing the combined effects of most wave phenomena of interest such as: o Directional spreading o Frequency spreading o Wave breaking o Diffraction o Refraction o Shoaling… •The model should be able to extend into the surf zone by inclusion of wave breaking and moving shoreline.
3	Modules should be able to: Calculate the sediment transport rates using two different models types: o Pure current o Combined current and waves The sediment transport calculations should be based on the hydrodynamics conditions and sediment properties under both pure current and combined current and waves conditions The sand transport calculation should be carried out using both horizontal and vertical component velocity and should consider inertial effect.
4	Model erosion, transport and deposition of sand under the action of currents and waves or pure current. The module is based on a flexible mesh approach. Module should be based on the numerical solution of a two-dimensional shallow water equations - the depth-integrated incompressible Reynolds averaged Navier-Stokes's equations. The model should consist of continuity, momentum, temperature, salinity and density equations, in the horizontal domain and in both Cartesian and spherical coordinates. In the spatial domain, discretization is performed using a cell centered finite volume and by subdivision of the continuum into non-overlapping element/cells.

Modules	Minimum requirements of the Modelling Software
	For convective flux, Riemann solver approximation can be used to handle discontinuous solution and use unstructured grid, comprising of triangles or quadrilateral element.
5	The modules should : (i) have all pre-processing and post-processing tools. (ii) contain editors and viewers for the binary result files as well as the graphical user interface for our model setup files.
6	•A pre-processing facility for extraction of the extreme value series from the record of observations. Support of two different extreme value models, the annual maximum series model and the partial duration series model. Support of a large number of probability distributions, including exponential, generalised Pareto, Gumbel, generalised extreme value, Weibull, Frechét, gamma, Pearson Type 3, Log-Pearson Type 3, log-normal, and square-root exponential distributions. Three different estimation methods: method of moments, maximum likelihood method, and method of L-moments. Three validation tests for independence and homogeneity of the extreme value series. Calculation of five different goodness-of-fit statistics. Support of two different methods for uncertainty analysis, Monte Carlo simulation and Jack knife resampling. •Comprehensive graphical tools, including histogram and probability plots.
7	The module should be able to: •Extract depth data from C-MAP Professional+ Electronic Chart Database •Extract predicted tidal elevation from numerous tidal stations •Extract Mean Sea Level (MSL) relative to chart datum from several stations •Analysing and planning the set-up of models in coastal and marine areas •Export bathymetric information (land contours, water points and mean sea level (MSL)) to xyz files •Interpolate the bathymetry and export mesh. •Filter data into a defined grid with one single data point per grid cell •Export tidal information to a dfs0 file or an ascii file •Enhance resolution of a map
Training	**Online training** for 3 persons on:

Modules	Minimum requirements of the Modelling Software

	• The use of the different modules including geodesy, regular or irregular mesh generation, use of the different modules.
	• Adaptation of models to local projects
	• Any relevant trainings in line with the aims.
	   i. To simulate waves and flow around Mauritius, Rodrigues and Seychelles Islands on large scales (outside the reef edge) and in coast-near scales (in the lagoon areas);
	   ii. To simulate the sedimentation transport inside the lagoons;
	   iii. To simulate wave current pattern on the flat and shallow parts of lagoon areas as a result of wave breaking over the reef edge and in deep trenches/areas inside the lagoon of Mauritius, Rodrigues and Seychelles Islands;
	To simulate large scale ocean currents under forcing conditions and large global wind fields.

License	One year license for one user.
Support	First year support and Maintenance Agreement (SMA)

Delivery Requirements

Delivery Requirements	
Delivery date and time	Bidder shall deliver the goods **within 30 days of issuance of PO**
Delivery Terms (INCOTERMS 2020)	DAP
Customs clearance (must be linked to INCOTERM	All shall be done and costs borne by Supplier/bidder
Exact Address(es) of Delivery Location(s)	**Mauritius Oceanography Institute (MOI)** **Morcellement de Chazal,** **Albion** **Mauritius**
Distribution of shipping documents (if using freight forwarder)	Not applicable
Packing Requirements	Not applicable
Training on Operations and Maintenance	As specified in the technical specifications
Warranty Period	Not applicable
After-sales service and local service support requirements	As specified in the technical specifications
Preferred Mode of Transport	Not Applicable

ANNEX 2: QUOTATION SUBMISSION FORM

Bidders are requested to complete this form, including the Company Profile and Bidder's Declaration, sign it and return it as part of their quotation along with Annex 3: Technical and Financial Offer. The Bidder shall fill in this form in accordance with the instructions indicated. No alterations to its format shall be permitted and no substitutions shall be accepted.

Name of Bidder:	Click or tap here to enter text.	
RFQ reference:	**RFQMUS2021-RFQMUS2021-013: Procurement of modelling software for hydrodynamics simulation around Mauritius, Rodrigues and Seychelles**	Date: Click or tap to enter a date.

Company Profile

Item Description	Detail
Legal name of bidder or Lead entity for JVs	Click or tap here to enter text.
Legal Address, City, Country	Click or tap here to enter text.
Website	Click or tap here to enter text.
Year of Registration	Click or tap here to enter text.
Legal structure	Choose an item.
Are you a UNGM registered vendor?	☐ Yes ☐ No If yes, insert UNGM Vendor Number
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) *(If yes, provide a Copy of the valid Certificate):*	☐ Yes ☐ No
Does your Company hold any accreditation such as ISO 14001 or ISO 14064 or equivalent related to the environment? *(If yes, provide a Copy of the valid Certificate):*	☐ Yes ☐ No
Does your Company have a written Statement of its Environmental Policy? *(If yes, provide a Copy)*	☐ Yes ☐ No
Does your organization demonstrate significant commitment to sustainability through some other means, for example internal company policy documents on women empowerment, renewable energies or membership of trade	☐ Yes ☐ No

institutions promoting such issues *(If yes, provide a Copy)*	
Is your company a member of the UN Global Compact	☐ Yes ☐ No
Bank Information	Bank Name: Click or tap here to enter text. Bank Address: Click or tap here to enter text. IBAN: Click or tap here to enter text. SWIFT/BIC: Click or tap here to enter text. Account Currency: Click or tap here to enter text. Bank Account Number: Click or tap here to enter text.

Previous relevant experience: 3 contracts				
Name of previous contracts	**Client & Reference Contact Details including e-mail**	**Contract Value**	**Period of activity**	**Types of activities undertaken**

Bidder's Declaration

Yes	No	
☐	☐	**Requirements and Terms and Conditions:** I/We have read and fully understand the RFQ, including the RFQ Information and Data, Schedule of Requirements, the General Conditions of Contract, and any Special Conditions of Contract. I/we confirm that the Bidder agrees to be bound by them.
☐	☐	I/We confirm that the Bidder has the necessary capacity, capability, and necessary licenses to fully meet or exceed the Requirements and will be available to deliver throughout the relevant Contract period.
☐	☐	**Ethics**: In submitting this Quote I/we warrant that the bidder: has not entered into any improper, illegal, collusive or anti-competitive arrangements with any Competitor; has not directly or indirectly approached any representative of the Buyer (other than the Point of Contact) to lobby or solicit information in relation to the RFQ ;has not attempted to influence, or provide any form of personal inducement, reward or benefit to any representative of the Buyer.
☐	☐	I/We confirm to undertake not to engage in proscribed practices, , or any other unethical practice, with the UN or any other party, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UN and we have read the United Nations Supplier Code of Conduct :https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct and acknowledge that it provides the minimum standards expected of suppliers to the UN.
☐	☐	**Conflict of interest:** I/We warrant that the bidder has no actual, potential, or perceived Conflict of Interest in submitting this Quote or entering a Contract to deliver the Requirements. Where a Conflict of Interest arises during the RFQ process the bidder will report it immediately to the Procuring Organisation's Point of Contact.
☐	☐	**Prohibitions, Sanctions:** I/We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/Consortium members or subcontractors or suppliers for any part of the contract is not under procurement prohibition by the United Nations, including but not limited to prohibitions derived from the Compendium of United Nations Security Council Sanctions Lists and have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization.

Yes	No	
☐	☐	**Bankruptcy**: I/We have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against them that could impair their operations in the foreseeable future.
☐	☐	**Offer Validity Period:** I/We confirm that this Quote, including the price, remains open for acceptance for the Offer Validity.
☐	☐	I/We understand and recognize that you are not bound to accept any Quotation you receive, and we certify that the goods offered in our Quotation are new and unused.
☐	☐	By signing this declaration, the signatory below represents, warrants and agrees that he/she has been authorised by the Organization/s to make this declaration on its/their behalf.

Signature: _____

Name: Click or tap here to enter text.

Title: Click or tap here to enter text.

Date: Click or tap to enter a date.

ANNEX 3: TECHNICAL AND FINANCIAL OFFER - GOODS

Bidders are requested to complete this form, sign it and return it as part of their bid along with Annex 2: Quotation Submission Form. The Bidder shall fill in this form in accordance with the instructions indicated. No alterations to its format shall be permitted and no substitutions shall be accepted.

Name of Bidder:	Click or tap here to enter text.	
RFQ reference:	**RFQMUS2021-013: Procurement of modelling software for hydrodynamics simulation around Mauritius, Rodrigues and Seychelles**	**Date:** Click or tap to enter a date.

Compliance of proposed software with requirements

Modules/ Requirements	Minimum requirements of the Modelling Software	Compliance with requirements (Yes/No)	Remarks

1	• Generate spectral wind-wave model based on unstructured meshes.
	• Simulate the growth, decay and transformation of wind-generated waves and swell in offshore and coastal areas.
	• Use the wave action conservation equation in the frequency domain by introducing the zeroth and first moment of the wave action spectrum as dependent variables following Holthuijsen (1989).
	• The full spectral formulation should be based on the wave action conservation equation, where the directional-frequency wave action spectrum is the dependent variable.
	• The modules should include the following physical processes:
	  6. Wave growth by action of wind
	  7. Non-linear wave-wave interaction
	  8. Dissipation due to depth-induced wave breaking
	  9. Wave-current interaction
	  10. Effect of time-varying water depth and flooding and drying
	• The discretization of the governing equation in geographical and spectral space should be performed using cell-centered finite volume method.
	• The time integration should be per4formed using a fractional step approached where a multi-sequence explicit method is applied for the propagation of the wave.		

2	• Module is based on the numerical solution of time domain formulations of Boussinesq type equations, including nonlinearity as well as frequency dispersion. The module should solve the Boussinesq type equations using a flux-formulation with improved linear dispersion characteristics Simulate of the propagation of directional wave trains travelling from deep to shallow water using a ratio of maximum depth to deep-water wave length approximately equals to 0.5.		

Modules/ Requirements	Minimum requirements of the Modelling Software	Compliance with requirements (Yes/No)	Remarks
	The module should be able to model phenomena like as wave grouping, surf beats, generation of bound sub-harmonics and super-harmonics and near-resonant triad interactions. The module should be able to solve the enhanced Boussinesq equations [Madsen et al,1991] by: o an implicit finite difference technique with variables defined on a space-staggered rectangular grid. o a standard Galerkin finite element method with mixed interpolation for variables defined on an unstructured (or a structured) grid. o The module should consider porosity for the simulation of partial reflection from and transmission through piers and breakwaters. The module should be capable of reproducing the combined effects of most wave phenomena of interest such as: o Directional spreading o Frequency spreading o Wave breaking o Diffraction o Refraction o Shoaling… •The model should be able to extend into the surf zone by inclusion of wave breaking and moving shoreline.		
3	Modules should be able to: Calculate the sediment transport rates using two different models types: o Pure current o Combined current and waves The sediment transport calculations should be based on the hydrodynamics conditions and sediment properties under both pure current and combined current and waves conditions The sand transport calculation should be carried out using both horizontal and vertical component velocity and should consider inertial effect.		
4	Model erosion, transport and deposition of sand under the action of currents and waves or pure current. The module is based on a flexible mesh approach.		

Modules/ Requirements	Minimum requirements of the Modelling Software	Compliance with requirements (Yes/No)	Remarks
	Module should be based on the numerical solution of a two-dimensional shallow water equations - the depth-integrated incompressible Reynolds averaged Navier-Stokes's equations. The model should consist of continuity, momentum, temperature, salinity and density equations, in the horizontal domain and in both Cartesian and spherical coordinates. In the spatial domain, discretization is performed using a cell centered finite volume and by subdivision of the continuum into non-overlapping element/cells. For convective flux, Riemann solver approximation can be used to handle discontinuous solution and use unstructured grid, comprising of triangles or quadrilateral element.		

5	The modules should :
	
	   (i) have all pre-processing and post-processing tools.
	
	   (ii) contain editors and viewers for the binary result files as well as the graphical user interface for our model setup files.		

6	•A pre-processing facility for extraction of the extreme value series from the record of observations. Support of two different extreme value models, the annual maximum series model and the partial duration series model. Support of a large number of probability distributions, including exponential, generalised Pareto, Gumbel, generalised extreme value, Weibull, Frechét, gamma, Pearson Type 3, Log-Pearson Type 3, log-normal, and square-root exponential distributions. Three different estimation methods: method of moments, maximum likelihood method, and method of L-moments. Three validation tests for independence and homogeneity of the extreme value series. Calculation of five different goodness-of-fit statistics. Support of two different methods for uncertainty analysis, Monte Carlo simulation and Jack knife resampling.		

Modules/ Requirements	Minimum requirements of the Modelling Software	Compliance with requirements (Yes/No)	Remarks
	•Comprehensive graphical tools, including histogram and probability plots.		
7	The module should be able to: •Extract depth data from C-MAP Professional+ Electronic Chart Database •Extract predicted tidal elevation from numerous tidal stations •Extract Mean Sea Level (MSL) relative to chart datum from several stations •Analysing and planning the set-up of models in coastal and marine areas •Export bathymetric information (land contours, water points and mean sea level (MSL)) to xyz files •Interpolate the bathymetry and export mesh. •Filter data into a defined grid with one single data point per grid cell •Export tidal information to a dfs0 file or an ascii file •Enhance resolution of a map		

Training	**Online training** for 3 persons on:
	
	• The use of the different modules including geodesy, regular or irregular mesh generation, use of the different modules.
	• Adaptation of models to local projects
	• Any relevant trainings in line with the aims.
	   iv. To simulate waves and flow around Mauritius, Rodrigues and Seychelles Islands on large scales (outside the reef edge) and in coast-near scales (in the lagoon areas);
	   v. To simulate the sedimentation transport inside the lagoons;
	   vi. To simulate wave current pattern on the flat and shallow parts of lagoon areas as a result of wave breaking over the reef edge and in deep trenches/areas inside the lagoon of Mauritius, Rodrigues and Seychelles Islands;
	
	To simulate large scale ocean currents under forcing conditions and large global wind fields.		

License	One year license for one user.		
Support	First year support and Maintenance Agreement (SMA)		

Currency of the Quotation: Click or tap here to enter text.

INCOTERMS: Click or tap here to enter text.

Item No	Description	UOM	Qty	Unit price	Total price
1.	Click or tap here to enter text.				
2.	Click or tap here to enter text.				
3.	Click or tap here to enter text.				
4.	Click or tap here to enter text.				
5.	Click or tap here to enter text.				
	Total Price				
	Transportation Price				
	Insurance Price				
	Installation Price				
	Training Price				
	Other Charges (specify)				
	Total Final and All-inclusive Price				

Compliance with Requirements

	You Responses		
	Yes, we will comply	**No, we cannot comply**	**If you cannot comply, pls. indicate counter - offer**
Minimum Technical Specifications	☐	☐	Click or tap here to enter text.
Delivery Term (INCOTERMS)	☐	☐	Click or tap here to enter text.
Delivery Lead Time	☐	☐	Click or tap here to enter text.
After-Sales Requirements (Training and support)	☐	☐	Click or tap here to enter text.
Validity of Quotation	☐	☐	Click or tap here to enter text.
Payment terms	☐	☐	Click or tap here to enter text.
Other requirements *[pls. specify]*	☐	☐	Click or tap here to enter text.

Other Information:

Estimated weight/volume/dimension of the Consignment:	Click or tap here to enter text.
Country/ies of Origin: (*if export licence required this must be submitted if awarded the contract*)	Click or tap here to enter text.

I, the undersigned, certify that I am duly authorized to sign this quotation and bind the company below in event that the quotation is accepted.	
Exact name and address of company	Authorized Signature:
Company NameClick or tap here to enter text.	Date:Click or tap here to enter text.
Address: Click or tap here to enter text.	Name:Click or tap here to enter text.

Click or tap here to enter text.	Functional Title of Authorised Signatory:Click or tap here to enter text.
Phone No.: Click or tap here to enter text.	
Email Address: Click or tap here to enter text.	**Email Address:** Click or tap here to enter text.

Click or tap here to enter text.