

## Expressions of Interest

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Date: 16-06-2022

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To: xxx

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From: Pacific Catastrophe Risk Insurance Company

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Subject: CALL FOR EXPRESSIONS OF INTEREST (EOI) ON DEVELOPMENT /  
UTILIZATION OF A NEW SOFTWARE PLATFORM FOR RE-HOUSING OF EXISTING  
PCRAFI MODELS AND PRODUCTS

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**Closing Date for Expressions of Interest: July 8, 2022 at 4pm (Cook Islands)**

**Contract Type/Period: Lump-Sum to 30 November 2022**

**Selection Method: Consultant Qualification Selection (Firm)**

Pacific Island Countries (PICs) are threatened by many types of natural hazards including, tropical cyclones, earthquakes, intense rainfall, and drought; being geographically small means that the entire country or very large parts often suffer during extreme events, negatively affecting the entire national economy.

The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) insurance program was designed to provide climate and disaster risk insurance to member countries in the Pacific region. The primary aim of such insurance is to provide a quick injection of financing to help participating governments deliver relief and early recovery efforts as quickly as possible after a disaster. During its pilot phase, which started in January 2013, the PCRAFI insurance program provided parametric earthquake and tropical cyclone insurance solutions that increased the financial response capacity of Pacific Island Countries and Territories (PICs), helping them to meet post-disaster funding needs without compromising their fiscal balances and development objectives.

Following a successful pilot of the PCRAFI insurance program and the endorsement by the Forum Economic Ministers Meeting in 2015, an insurance vehicle was established by legal statute in the Cook Islands on 10 June 2016, to provide a disaster risk insurance program to PICs on a long-term basis. The vehicle was established as a “group captive” insurer, the Pacific Catastrophe Risk Insurance Company (PCRIC), which is fully owned by the Pacific Catastrophe Risk Insurance Foundation (PCRIF). PCRIF is a self-standing Foundation with a Council of Members (CoM) comprising member PIC representatives, and representation of donors which provided grant capitalization.

## Assignment Description

The PCRIC’s current risk modelling capabilities (and insurance product offering and re-insurance strategy) rely on models developed in 2010-2011 by AIR Worldwide for Tropical Cyclones (including damages from wind, storm surge and rainfall) and Earthquakes (including earthquake-induced tsunamis). *[Note: AIR, re-branded in 2022 as Verisk Extreme Event Solutions]*

AIR’s Tropical Cyclones (TC) and Earthquakes (EQ) models were developed as part of the World Bank / PCRAFI project to perform the initial risk assessment and analysis for the region including the creation of country risk profiles which have formed the basis of PCRICs parametric insurance policies. AIR continue to act as the PCRIC’s Calculation Agent in executing the post event loss calculation process following catastrophe events impacting the PCRIC’s policy holders - an essential component of the company’s current parametric products.

While PCRIC are the principle current user of the output of AIR models, under the World Bank contract agreed with AIR for the PCRAFI project, AIR retain ownership of the model and associated intellectual property (as well as all the development files, code, and data) -- **only specific limited and derived data was provided to PCRAFI and PCRIC**. PCRICs sole access to the model output is via a simple data viewer tool provided under the PCRAFI project.

The PCRIC is now requesting the support of a suitably experienced and qualified, firm (or consortium of firms), 'the Consultant', to develop;

1. An aggregated loss model, based on the output of the original PCRAFI project.
2. Associated software to support greater flexibility and a broader use of the modelling.
3. An update view of exposure data for the PICs covered by this model which can be analysed with the framework of #1 & #2

*Note: In these terms of reference, Pacific Island Countries (PICs) refers to those included in the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI): the Cook Islands, the Republic of Fiji, the Republic of Kiribati, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Nauru, Niue, the Republic of Palau, the Independent State of Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu, and the Republic of Vanuatu.*

## Component 1: Development of an Aggregated Loss Model for PIC based on PCRAFI data.

### Objectives

Based on a combination of the original detailed (latitude-longitude location specific) exposure data and aggregate loss output (by Peril, Occupancy, and various Geographic Aggregation levels) the consultant will create a simplified damage ratio / aggregate loss model.

The approach to building the damage ratio / aggregate loss model should be consistent with the approach used by commercial catastrophe model vendors and used within the international reinsurance markets.

The aggregate model should be housed in a software platform (either generally available) or developed by the consultant specifically for this use.

The software specification / design will be agreed as part of assignment however at a minimum should include

- The ability to specify and update exposure information in \$ values or a % of original exposure value at various resolutions up to the loss output resolution of the original PCRAFI model output.
- Include a simple financial model component to allow PCRIC to structure, visualize and sensitivity test PCRIC country policy structures in the software.
- Visualization of the results including (but not limited to) exceedance probability curves, average annual loss statistics, average annual loss maps, sample loss timeseries.
- Export of results and output to standard data formats (e.g., flat files, spreadsheets, databases)

The software should include a UI and, if practical, be suitable for hosting on PCRICs or other website.

The software should be modular and open to future enhancements and continued development by PCRIC or other third parties.

Specifically, the software should allow simple integration with of the output of two further PCRIC projects.

1. The recalibration and update of event frequencies with the existing PCRAFI models
2. The development of a new model / relationship between ground up damages and country emergency costs

Details will be discussed with the successful candidate.

### Key Actions

1. Extract the granular loss output from the existing PCRAFI data visualization tool *[Note PCRIC is discussing with original PCRAFI partners if this data is available in a standard data format, however this cannot be confirmed at this stage. The consultant must be prepared to extract (manually or via other methods) the data from the original PCRAFI tool if required].*
2. Design an aggregate loss model calculation methodology (to be developed in collaboration with PCRIC and agreed by PCRIC before proceeding)
3. Design the software specification (to be developed in collaboration with PCRIC and agreed by PCRIC before proceeding)

4. Develop the software as specified
5. QA and confirm the model can reproduce the original PCRAFI results

### **Expected Outputs**

- A detailed aggregate loss methodology spec (to be agreed by PCRIC, before proceeding).
- A detailed software spec (to be agreed by PCRIC, before proceeding).
- A functioning software tool.
- Software documentation and user guide.
- Delivery of a software demonstration and user training.
- Lead a discussion with PCRIC on how future model update and enhancements can be integrated.

## Component 2: Develop an Updated view of PIC Exposure Information

### Objectives

As a first use case of the new software PCRIC would like to update the existing exposure data developed under the PCRAFI project to a current present-day vintage.

The new exposure should be analysed in the update software / aggregate loss model to calculate updated risk profiles for each of the 14 countries covered by PCRIC.

The exposure development is **not** anticipated to be a detailed ground-up building level assessment. The consultant is expected to use a top-down approach based on publicly available (or commercially licensed) datasets, i.e., national statistics, available satellite data, updated land use land cover information, etc.

The project is expected to focus on trending the exposure information from its circ. 2010 vintage to present day. The consultant is however expect to undertake a high level review of the existing data and correct and adjust the original exposure for any deficiencies.

The output resolution should be consistent with the highest geographic and occupancy classification of the original PCRAFI project / PCAFI data viewer.

### Key Actions

- A high-level review of the existing PCRAFI exposure information.
- Identification of relevant data sources and information to update the exposure.
- Identification or design of a suitable update methodology.
- Carry out the update of the PCRAFI exposure as per the objective above.
- Quantification and documentation of changes in exposure data.
- Analysis of the updated exposure in the software / aggregate model developed in component 1.
- Quantification and documentation of impact in changes in exposure data on PCRICs existing country risk profiles.

### Expected Outputs

- A short presentation / report on the consultants finding from their review of the existing PCRAFI exposure information.
- An updated of PIC exposure database as per the objective above (in a standard data format).
- A technical report on the methodology and data sources used (including recommendations for future updates, maintenance of the data).
- Data files, in a standard data format, for the updated country risk profiles as analyzed in the software / aggregate model developed in component 1.
- A technical report on the impact of the update exposure on PCRICs existing country risk profiles.

## **Supervision & Reporting**

The Consultant will report to the CEO of PCRIC who will accept the deliverables but will liaise mainly with the Catastrophe Modelling Advisor on day-to-day operations. The Consultant may also work with the Project Coordinator, Insurance Manager, Technical Specialist and Reinsurance Broker and may also interact with the World Bank team providing technical assistance to PCRIC.

## **Institutional Arrangements**

- The Consultant role will work from his/her own office.

## **Selection Criteria**

- The Consultant is expected to have significant expertise of catastrophe risk modeling, including the applications of and development of models, software and exposure database
- The Consultant is expected to have significant expertise in the Pacific Region, including knowledge of relevant databases, information and tools.
- The Consultant will have advanced analytical skills, quantitative financial expertise, a knowledge of parametric insurance, excellent presentation skills and be able to develop strong relationships with the clients.
- The Consultant will closely interact and report to the PCRIC team that will accept the deliverables.
- The Consultant must be willing and able to undertake trips to the Pacific region to consult stakeholders and/or present outputs to clients if required (*but this is not expected for this specific project*)

Candidates are encouraged to explore / propose solutions that leverage existing risk platforms (such as the World Bank Risk Viewer, GNS / NIWA RiskScape Platform, OASIS LMF, or other), especially local or regional developed platforms.

Preference will be given to applications, either from consortiums or individual firms, which leverage or collaborate with existing open platforms. However, this is not a mandatory requirement and alternative solutions will be considered.

## Timetable

The output of assignment must be completed prior to end of November 2022, with an estimated schedule of outputs as follows:

Outputs	Expected Duration / Person-Working Days Assigned	Anticipated Completion date
Component 1: Aggregate Loss Model and Software Specs.	15	No later than 1 month post inception of project
Component 1 Reports, Software & other Deliverables.	65	No later than 4 months post inception of project
Component 2: Presentation of Consultant review of existing PCRAFI exposure data.	10	No later than 1 month post inception of project
Component 2 Reports, Databases & other Deliverables	60	No later than 4 months post inception of project

### *Additional Notes:*

- *The anticipated person-working assigned to each component are listed above with an anticipated completion date as guidance only.*
- *A review meeting for each component as specified in the 'Expected Output' of each component is expected to be held within 1-week of the component deliverable specified above.*
- *Sign-off / acceptance of the deliverables for each component will follow the review meeting.*
- *Component 1 and 2 can be conducted in sequence or parallel depending on the consultant team / capacity*

## Cost Estimate & Payment Schedule

This assignment will be undertaken as a lumpsum contract and will be paid on acceptance of deliverables and an invoice (payable on sign-off of both components).

## Potential for future work

There is a possibility for work as the need arises and additional funds become available. The scope of this future work is expected to be similar to the work conducted under the current assignment but may be revised in the light of the results of the program. Furthermore, the continuation of the future work with the selected firm would depend on the firm's satisfactory implementation of this assignment.

## Note on items that should be included in the Expression of Interest

The procurement method for this activity follows the World Bank procurement regulations for "Consultant Qualification Selection". EOI's should provide enough information to allow the firm most qualified for the job to be identified, but full costing or details of the activity are not required at

this stage. PCRIC will then invite the preferred candidate to submit a technical/financial proposal for negotiation.

EOIs may be submitted via email. While EOIs are to be brief, the following information should be included for use by PCRIC in assessing a firm's ability to meet the requirements of the contract:

- Full contact details
- CV's, including qualifications, experience and references
- Basic information on costing/consulting fees
- Brief overview of current/past assignments, preferably of a similar size scope/seniority
- Declaration of any potential conflicts of interest
- Confirmation of eligibility to apply for World Bank funded contracts

### **Submitting an Expression of Interest**

EOIs should be submitted by email only to the CEO on the emails below arriving no later than 4pm on Friday, 8 July 2022 (Cook Islands Time).

### **Contact**

For further information please contact us at the address below:

**Aholotu Palu, CEO, PCRIC**

[ceo@pcric.org](mailto:ceo@pcric.org) or [aholotupalu@yahoo.co.uk](mailto:aholotupalu@yahoo.co.uk)