# CONCEPT NOTE
# Science Models to support better decision making for Pacific countries

## Background of SPC and our work

The Pacific region is on the frontline of climate change impact and has some of the most at risk countries to disaster hazards globally. However, better understanding the impact and risk posed by these threats to inform the right decisions for planning, community health, relocation and behavioural change needs must be underpinned with science that supports effective decision making.

The Pacific Community (SPC) is one of the premier scientific and technical development agencies in the region serving 22 Pacific Island Countries and Territories (PICTs).

SPC is proud to be applying our collective capabilities in science, knowledge and innovation to serve the people of the Pacific in reaching their sustainable development goals and aspirations. By placing Pacific people at the centre of our approaches, and with our deep understanding of Blue Pacific contexts and worldviews, we are guided by our Strategic Plan 2022 – 2031 that encompasses the insights and foresight of our members, staff and key stakeholders.

We have a strong comparative advantage in being able to bring a multi-disciplinary approach to addressing some of the region's most complex development challenges, Resilience and climate action, natural resources and biodiversity, food systems, equity, education and social development, sustainable economies and livelihoods, planetary health and transforming institutional effectiveness.

We hold ourselves accountable to the Pacific values enshrined in this Strategic Plan and to serving our Blue Pacific region in progressing our four development goals:

- *Goal 1: All Pacific people benefit from sustainable development*
- *Goal 2: All Pacific communities and cultures are empowered and resilient*
- *Goal 3: All Pacific people reach their full potential and live long and healthy lives*
- *Goal 4: One SPC delivers integrated programmes through streamlined services*

As a member-owned organisation, SPC commits to transforming and adapting as an institution to respond to our members' unique and evolving priorities, including the ongoing impacts of the COVID-19 pandemic. In doing so, we draw on the strength of our diversity, including the vast interdisciplinary expertise and multi-cultural backgrounds of our 650+ staff located across the region

## Science modelling

To support genuine engagement and visualisation of SPC's state-of-the-art scientific modelling, technical assistance and co-developed solutions alongside our Members and to better engage and inform Pacific Leaders on how data can support more accurate and effective decision making, we are calling for preferred suppliers who can develop engaging, dynamic, interactive science showcases that helps us translate this work for our communities, Leaders and region.

These models and science showcases will encompass static and dynamic data sets of existing work led by SPC and our members and showcase the innovative power data storytelling to support decision making.

Climate Change is the single greatest threat facing Pacific communities who endure increasing rates of sea-level rise, storm-driven extreme water levels, marine heatwaves, and ocean acidification. The ocean and Pacific Island Countries and Territories are one Blue Pacific Continent which is inextricably linked to the rich and diverse cultures, communities, and societies of the region.

The Blue Pacific spans 42million km2 accounting for 30 per cent of the world's exclusive economic zones (EEZ)and marine resources. Roughly one-third of all islands in the Pacific region are low-lying reef islands and half of the entire population of the Pacific live within walking distance of the coast.

This reality exposes communities, homes, infrastructure, food systems, and drinking water sources to climate and ocean related risks such as inundation, storm surges, and sea-level rise. Warming oceans, bigger waves, and higher sea levels: the existential threat of climate change on Pacific communities.

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*"We are actually imagining a worst-case scenario where we are forced to relocate or our lands are submerged,"*

*Former Foreign Minister Simon Kofe, Tuvalu*

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Understanding the science and predicted impact of climate change on Pacific nations is therefore critical to inform effective adaptation strategies including the development of risk informed planning, resilient infrastructure, and the protection of the deeply rooted indigenous cultures across the region.

SPC has developed detailed visualised modelling utilising various datasets for national decision makers in areas of water security (groundwater), wave inundation, sea-level rise impacts on communities, asset and infrastructure modelling, food security mapping (including coconut mapping), digital elevation data (DEM), and risk modelling. This data layered together provides holistic based understanding to support effective decision making.

In addition, SPC leads the work of Digital Earth Pacific which supports the development of an operational earth and ocean observation system that takes decades of freely available data and bring it together in a sensible way within the Pacific context. It allows Member States to make more informed decisions based on good information to overcome the challenges we face such as climate change, food security and disasters.

These science models all build upon each other to form holistic based modelling that provides solutions that will help us understand the changes in our environment to support adaptation planning, to increase productivity of agricultural investments and to understand potential impacts by changes in weather.

This work all contributes towards best-practice approaches to visualisation of data to increase understanding to better inform decision making at all levels. Recent studies globally have also shown that visual data greatly informs decision making allowing a wider audience to interact and engage with the scientific information to develop robust local based solutions and greater ownership

## Rationale: data visualisation and storytelling

Recent studies have found that senior decision-makers within "data driven organisations are three times more likely to report significant improvements in decision making compared to other firms that leverage data less".[1]

However, research has also found that while companies invest in visualisation and data tools much of it can be 'low quality and uninterpretable, and sometimes even when the data is healthy, there's simply far too much of it to quantify and interpret into real insights and business results".[2]

Both of these realities are at the core of this concept note to develop science modelling to support the translation of science and technical work and to drive comprehension using visual, analysed and layered datasets that provide a holistic overarching understanding of critical issues and opportunities and promote locally based solutions.

This approach combined with accurate modelling and storytelling is proven to build trust and support increased engagement with different learners including visual, auditory and experience based learners.[3]  Storytelling brings the data to life in ways that decision-makers at every level can connect and increase knowledge or better inform decisions and for this reason the approach of combining science with storytelling is embedded in this concept.

## Modelling examples

Based off the recent learnings of the development of an atoll model for the Republic of the Marshall Islands, two models developed in Tuvalu looking at integrated based programs and data sets and how this information builds upon each other in meaningful ways to create holistic and informed decision-making tools is key.

Data sets to be potentially modelled and included in the elevated projection modelling include:

| Broad examples of data |
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| <ul><li>Inundation modelling</li><li>Historical coastline changes</li><li>LiDAR datasets</li><li>Asset and infrastructure understanding (schools, health centres, runway and airport facilities, and public utilities potentially)</li><li>Adaptation / reclamation data showing interventions and changes in ocean activities as a result of interventions</li><li>Sea-level rise modelling</li><li>Food security datasets</li><li>Potentially – national statistical datasets</li><li>Mangrove mapping and landcover</li><li>Food security data sets</li><li>Fisheries data on the potential impact of climate change and tuna fisheries</li><li>Infrastructure data</li><li>Cultural storytelling and knowledge holders reflecting on the changes they've seen in their homes and planet.</li></ul> |

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[1] Price Waterhouse Coopers (2023) study of more than 1,000 senior executives here
[2] Harvard Business Review here
[3] Harvard Business Review Storytelling here "roughly 40 percent will be predominantly visual learners who learn best from videos, diagrams, or illustrations. Another 40 percent will be auditory, learning best through lectures and discussions. The remaining 20 percent are kinesthetic learners, who learn best by doing, experiencing, or feeling."

The purpose is to develop adaptive models that can be both dynamic and static based data that inform the use of science for decision making in critical areas such as risk management, disaster reduction, water management and broader planning based on future predicted scenarios.

The selected vendors will be competent with science modelling and spatial augmented reality in line with best practice and able to deliver within the timeframe developed with teams.

Examples of models already developed (but please note we are open to virtual, physical and integrated modelling in this submission).

- An example of what this could potentially look like is noted below (vendor dependent and data dependent).



- Virtual data here https://landscapeknowledge.net/funafuti-map/