

26 October 2026

Climate, AI and data systems

Partnerships to respond to current and emerging challenges impacting the resilience and sustainability of Pacific agrifood systems

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Australia's National Science Agency

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Agrifood systems



- Agronomy and crop performance
- Temperature and rainfall information
- Crop rotations and companion cropping
- Soil nutrients and soil moisture
- Expert knowledge, access to information
- Farm infrastructure and equipment, technologies
- Supporting infrastructure, access to markets, ports, traders, social & cultural systems around food

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Building the Foundation for Pacific Food Security:
Regional Soil Data Infrastructure & Capability

What We're Doing

- Developed the Pacific Soils Portal, consolidating decades of regional soil data for governments, researchers and land managers across PICTs
- Co-designed rapid soil assessment and decision-support tools with in-country partners through the Pacific Soil Partnership (PSP)
- Delivered in collaboration with SPC, ACIAR and Manaaki Whenua across Fiji, Samoa, Tonga and Vanuatu

Key Outcomes

- Pacific Soils Portal operational and actively supporting agricultural planning, climate adaptation and food security policy
- National capacity strengthened in soil data collection, interpretation and management across partner countries
- Pacific-wide soils work plan aligned with FAO Global Soil Partnership, enabling coordinated regional investment



Pacific's Opportunity & Next Steps

Program runs to 2027 with clear pathway to scale - expanding digital soil mapping into climate risk assessments, integrating soil data into national policy, and broadening country participation.



2-Pacific Soils Data Management and Access

Connecting soil legacy information, modern cost-effective soil sensing technology and local capability to support better land and agricultural decisions.

Recover, safeguard and translate soil information and knowledge

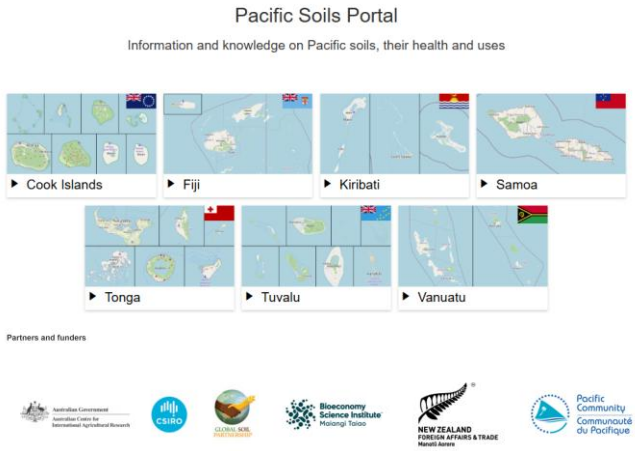
Pacific Soil Portal (PacSoP) makes legacy soil surveys and maps from the region accessible and translates the information into practical guidance (e.g. land and crop suitability).

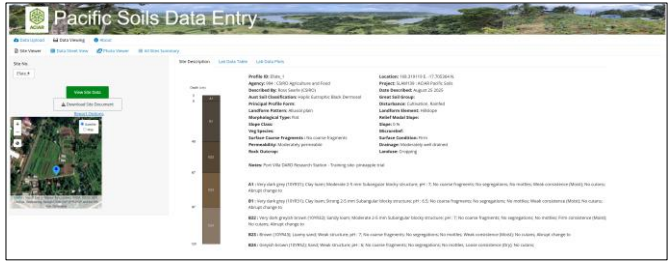
Standardized soil data entry and management

Pacific Soils Data Entry tool enables standardized soil and site data ingestion, management and interpretation. Links with PacSoP.

Rapid and cost-effective soil information

MIR/NIR spectroscopy, reference laboratory data and local calibration accelerate estimation of priority soil properties such as soil organic carbon.





FROM SOIL AND SITE DATA TO INFORMED DECISIONS

Land-use planning • Nutrient management • Climate resilience • Targeted research

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Healthy Food Systems in Timor-Leste and Pacific



What We're Doing

- Co-developing methods and tools to assess food environments and how climate change may impact
- Participatory mapping of food environments with communities across urban, peri-urban, rural and remote sites.
- In-depth survey of retail vendors to assess food availability, access, safety and hygiene.

Key Outcomes

- Key leverage points in food environments for improving nutrition and food security identified
- Directly supporting implementation of Timor-Leste's national food security strategy (CNAP)
- Proven research model that can be applied by local researchers to any country context to understand local food environments and intervention options

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Pacific vision for Adapted Crop and Soils

What We're Doing

- Pacific regional capability that brings together information on crops, soils and climate to support evidence-based decision making
- crops are likely to perform under future climate conditions, and where soil constraints may limit productivity
- provides the data foundation upon which AI-enabled analytics and predictive food system intelligence can be built.



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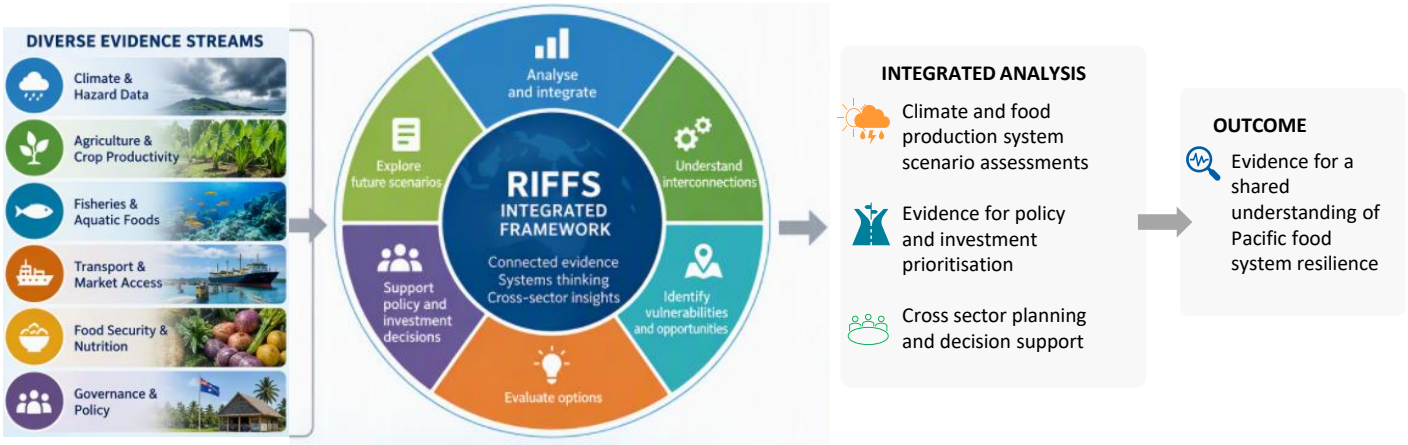
Resilient Infrastructure for Future Food Systems (RIFFS): Supporting resilient, nutritious and sustainable food systems

By connecting evidence across climate, agriculture, fisheries, transport, governance and nutrition to support more informed food system decisions.



Bringing together multiple dimensions of the food system to understand how risks, opportunities and interventions interact.

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Developing a climate information tool - Samoa

Pacific-led request for a user-friendly information system that supports agri-food system planning and policies

- Request from Pacific Heads of Agriculture
- To support cross-ministerial implementation of Samoa Food System Pathway 2030 Action Plan

Collaboration with Samoa MAF, SPC, FAO

- Input from several ministries, bureau of statistics, private and community orgs, NGOs
- CSIRO and ANU provided climate, data, agricultural, behavioural science
- Systems analysis, software and UX/UI design



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Downscaling climate projections

- Global climate model outputs (used in the IPCC reports) are low-resolution (200 km x 200 km)
- Decisionmakers often need information at a much finer scale
- The ASCE combines downscaled global climate projections with Samoa's own agricultural and socio-economic data to support risk assessment and scenario planning



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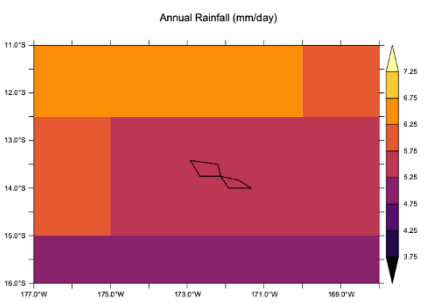
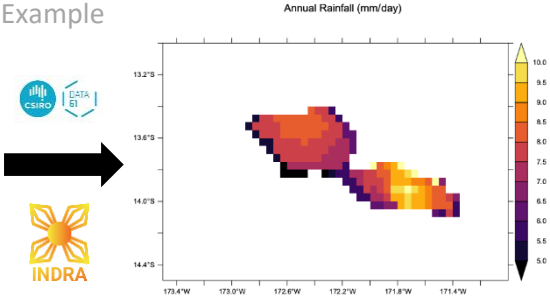


GCM grid: low resolution

Example



Downscaled grid: high resolution

Agrifood Systems and Climate Explorer for Samoa: Prototype

Click to Launch Demo

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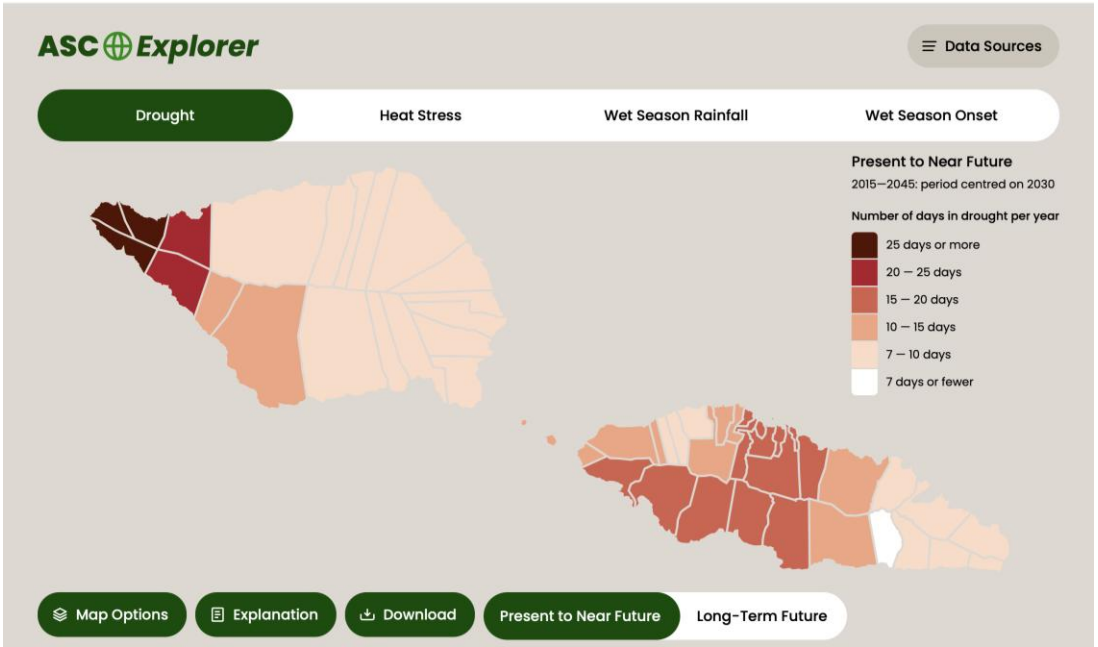
Designing a climate information tool

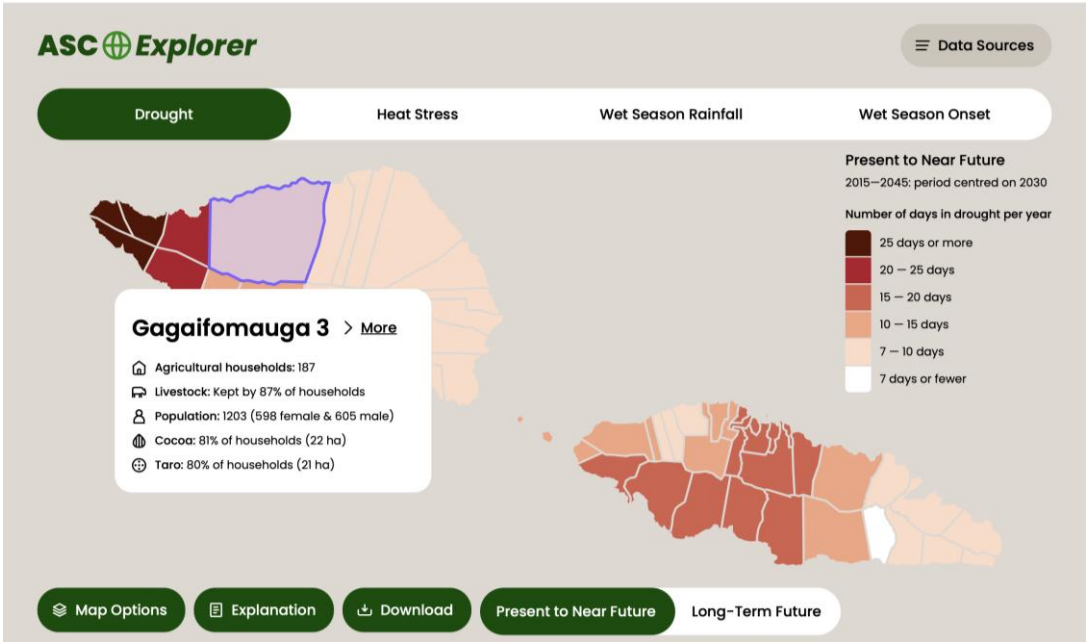
- × Scale of climate data
- × Data heavy & reliant on internet
- × Lack of access, or unable to update data sources
- × Too technical
- × Lack of relevance to tasks at hand

- ✓ Downscaled to district-level
- ✓ Lightweight application
- ✓ Tool integrates data regularly collected by MAF
- ✓ Translated metrics
- ✓ Explicitly co-designed to aid in FSP implementation

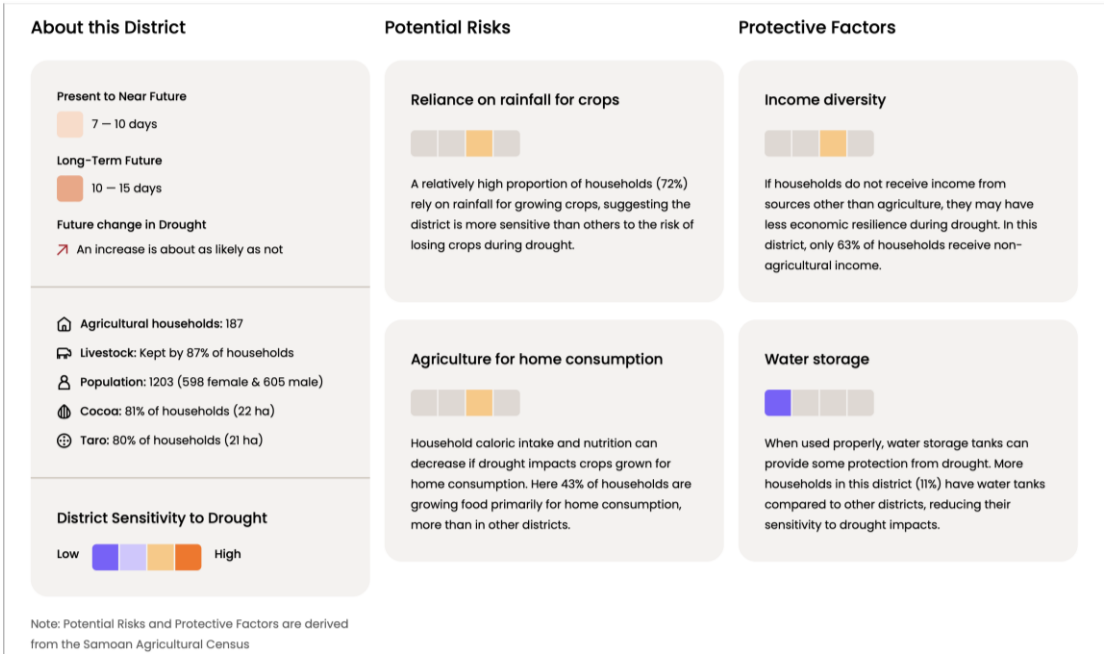
Hazard information: Relevant and usable metrics



Exposure information: Leverages existing data collection programs



Vulnerability information: Analysis & scenario planning




Climate, AI & Data Systems for Pacific Food Security
Building Pacific-led intelligence to anticipate risk, target investment and strengthen resilience
Climate Insights
Model climate impacts on critical crops, soil and food systems through PACS (Pacific Adapted Crops & Soils)
AI & Predictive Analytics
Combine satellite, trade, production and consumption data to identify emerging risks and opportunities.
Integrated Data Systems
Connect food trade, nutrition, production, food environment, soil and climate datasets for decision-making.
Drawing on PACS and the Pacific Food Systems Data Research Agenda

Food system and supply chain intelligence

CSIRO can connect climate analytics, supply chain mapping and modelling, food-security assessment and whole-of-system synthesis to show what may happen, how impacts could cascade, who may be affected and where government action would add value.

What CSIRO brings



Climate analytics
What pressures could emerge?



TraNSIT supply chain intelligence
How could disruption cascade?



Food and nutrition security
Who could be affected, and how?



Whole-of-system assessment
Where well coordinated action matter most?

A national preparedness workflow

Evidence and models are connected around a decision need

SEE → MAP → TEST → INFORM

- SEE: Shared situational awareness
- MAP: Dependencies, nodes & exposed places
- TEST: Shocks, cascades & contingencies
- INFORM: Decision-ready intelligence

Decision-ready outputs

- Critical dependencies and exposed supply chains
- Likely impacts on industries, regions and communities
- Tested contingencies and response options

Decision advantage

Common & timely evidence base

NO → **INDUSTRY-LED RESPONSE**
Intelligence shared for commercial decisions and business continuity

YES → **GOVERNMENT-ENABLED RESPONSE**
Systemic impacts, essential supply or cross-jurisdictional coordination

EXAMPLE APPLICATIONS

DROUGHT
Where will supply pressures emerge, and which responses are available?

BIOSECURITY
How could an outbreak affect supply chains and regional economies?

TRADE & ENERGY
Which critical inputs and supply chains are most exposed?

CONCURRENT SHOCKS
Where are risks compounding, and what action should be prioritised?

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Mālō 'aupito

Fa'afetai tele lava

Vinaka vakalevu

Tagio tumas

Larelle.McMillan@csiro.au
Whats app: +61 413 807 786

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Australia's Pre-eminent National Science Organization

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Partnerships and collaboration are key

- In Australia, across government, university and other research institutions to coordinate and work on joint initiatives.
- In the Pacific, with SPC, SPREP and other international organisations active in the region.
- In our pilot activities (country level), with government, civil society, research and other organisations across multiple sectors, including agriculture, health and fisheries.



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Locally sustainable aquaculture, New Caledonia

- Disruptions in soy feed provision from Peru
- Collaboration between IFREMER and the private sector in the region (ADECAL, SICA, SOPAC, Ridley Corp)
- Experiments to find locally sourced suitable feed for prawn farming

Building a platform for industry to look at existing & emerging disruptors



Photo by: Nguyen Dang Hoang Nhu

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Strengthening disaster recovery, Vanuatu

- Focus is on strengthening the food system to improve disaster preparedness and recovery.
- Proposed learning study to understand what is working well in terms of food system resilience, both in peacetime and in disaster response/ recovery.



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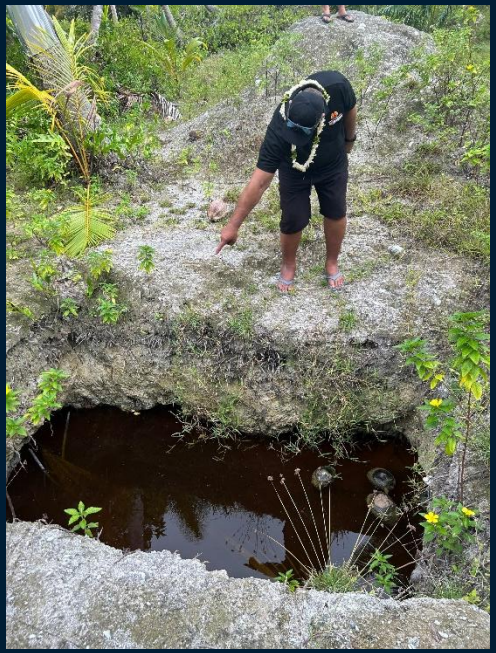
Resilient food systems in Pacific atolls

- KIWA proposal development with MELAD (Kiribati) & DAG (French Polynesia), SPC
- Nature based solutions, traditional knowledge, soil and water management in food systems, knowledge sharing networks
- Building from ACIAR Integrated Food System Analysis



Nature-based Solutions for Pacific atolls food security in response to global drivers of change

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