Understanding the consequences of sea level rise in the South Pacific

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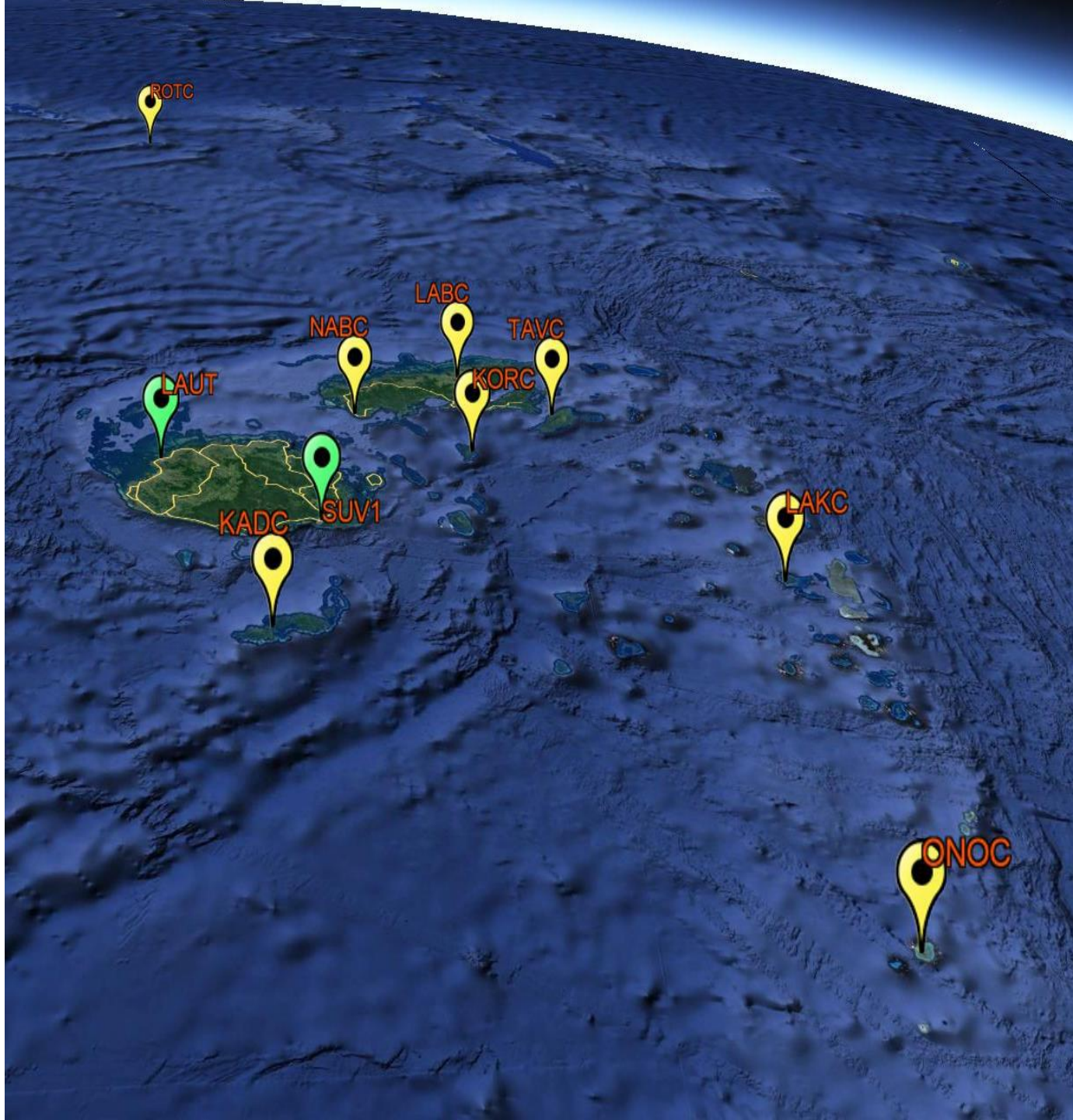


There are more than **1500 Islands** in our Pacific island countries.

1

The average island is **90 km^2 in size** and you could walk around it in one day.

2

50% of the population in the Pacific live within 5 km of the coast.

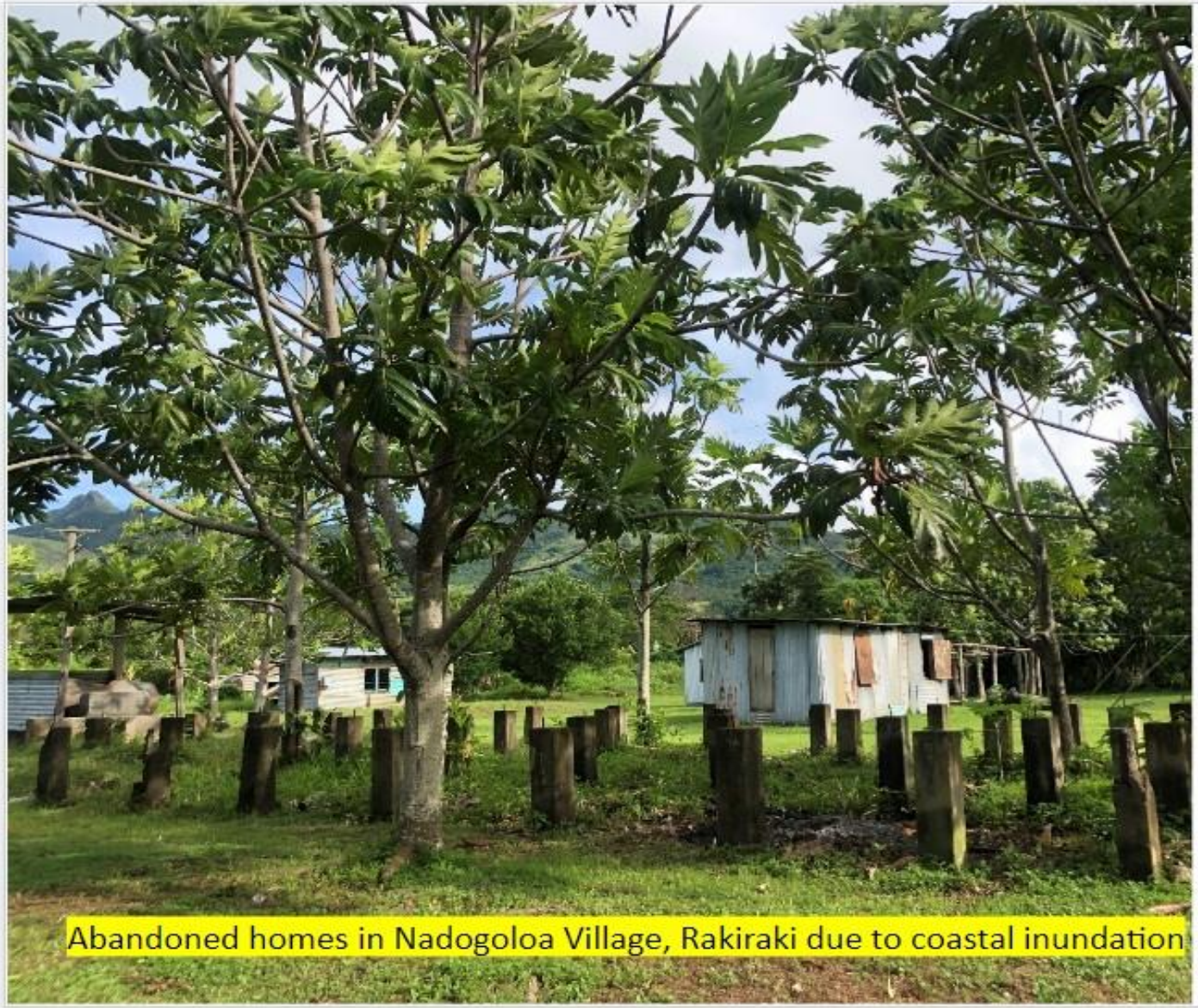
3

50% of all islands are highly or very highly sensitive to future climate-ocean processes and sea-level rise.

4

Coastal change has the potential to severely impact island populations and economies.

5



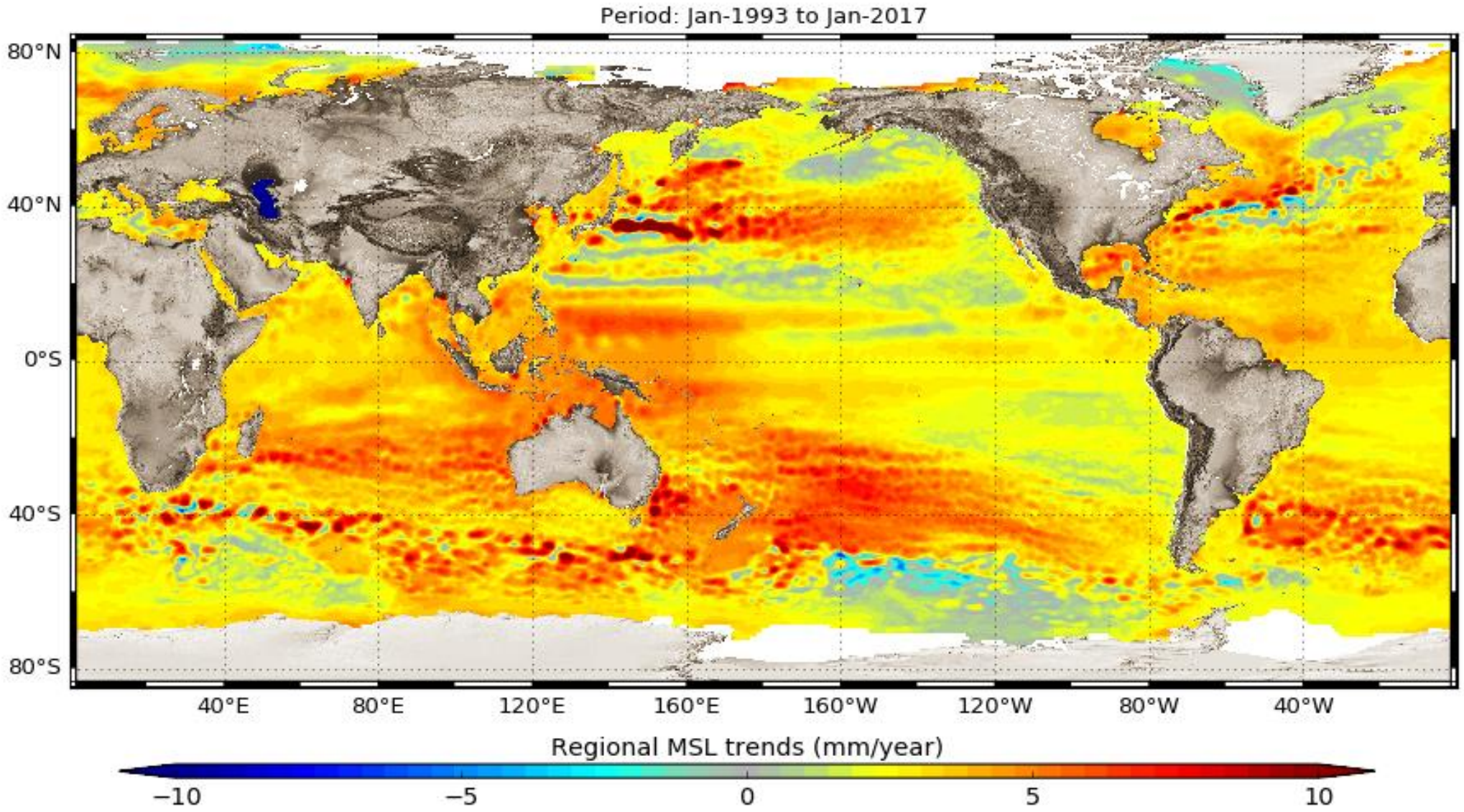
Abandoned homes in Nadogoloa Village, Rakiraki due to coastal inundation

KEY MESSAGES

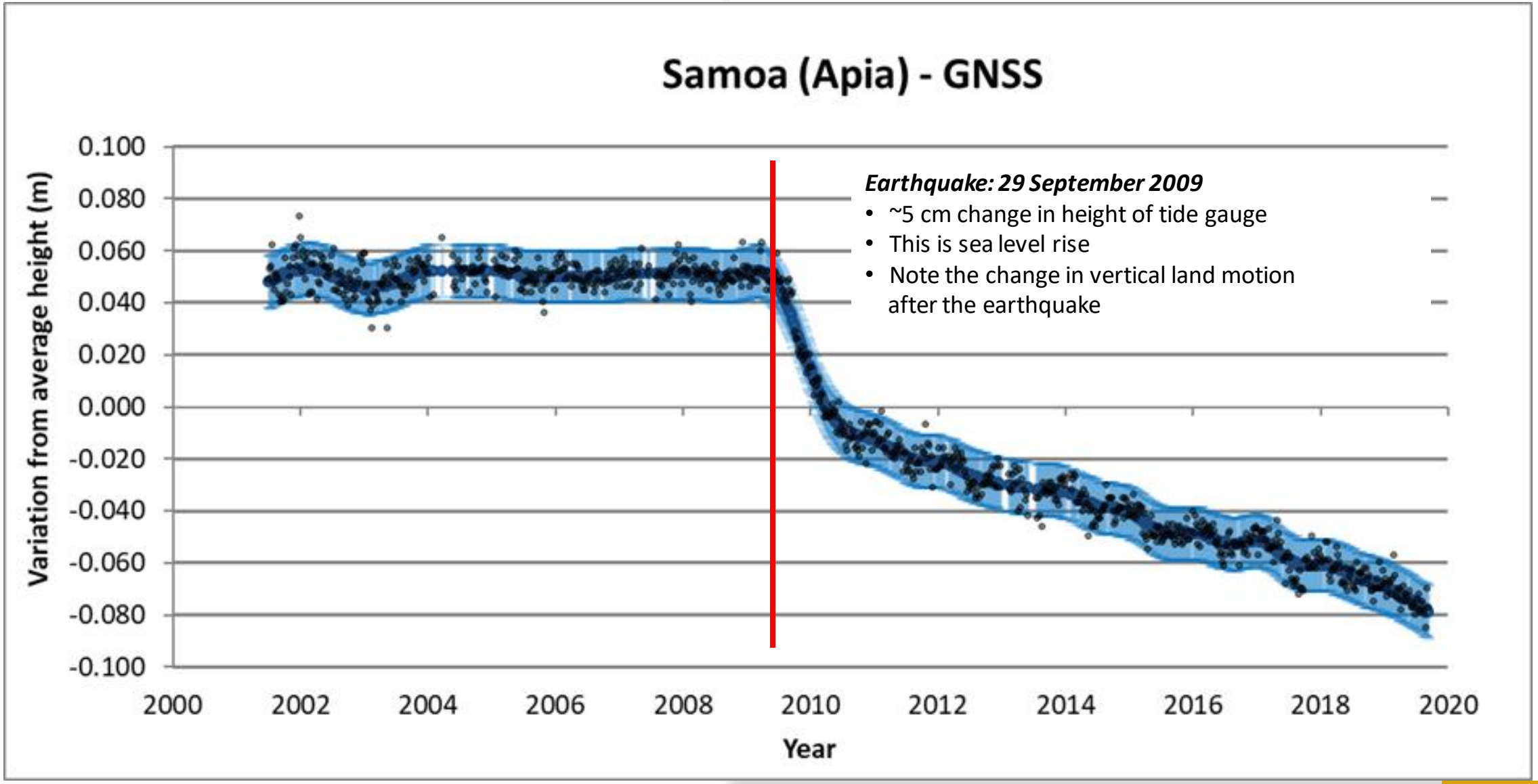
- Long-term warming is expected to be below the global average in Fiji, ranging between 0.6°C and 2.6°C by the 2090s when compared with the 1986–2005 baseline. The range of possible temperature rises highlights the significant differences between 21st century emissions pathways, while uncertainty remains high.
- Fiji has a high degree of vulnerability to climate extremes such as drought and extreme rainfall and any increases in the frequency and intensity of such events could represent a major threat to livelihoods, infrastructure, and human wellbeing.
- Considerable uncertainty surrounds projections of future precipitation trends and extreme climate events; further research is required to constrain the wide range of current estimates.
- The frequency of tropical cyclones affecting Fiji is projected to decrease, though the magnitude of the decrease remains uncertain and the intensity (wind speed) of cyclones may increase.
- Sea-level rise will have a range of impacts on Fiji's islands, including potential inundation, coastal erosion, and saline intrusion, the risks of storm surges and king tides may also be exacerbated.
- Fiji has significant assets and infrastructure with high exposure to climate-related damage.
- Degradation of key natural resources is inevitable, coral reefs and associated fisheries are under significant threat, with declines in soil and water quality are likely.
- The various projected impacts of climate change are likely to affect Fiji's poor, marginalized, and remote communities most significantly.

Source: Fiji Climate Risk Country Profile, World Bank 2021.

Sea level rise



Sea level rises and rises



Impacts from extreme events

TC Ian-2014

TC PAM-2015

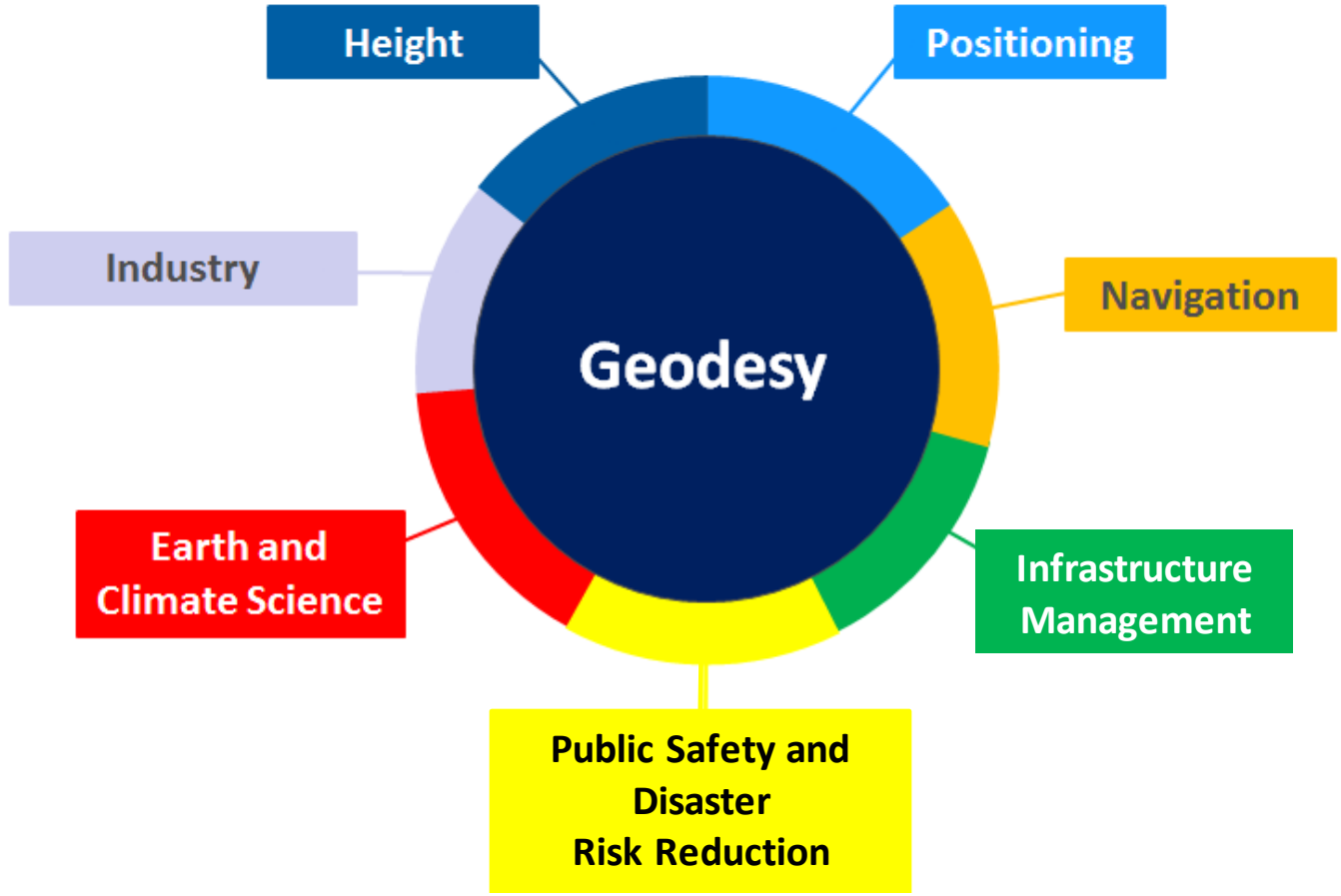
TC WINSTON-2016

TC GITA-2018

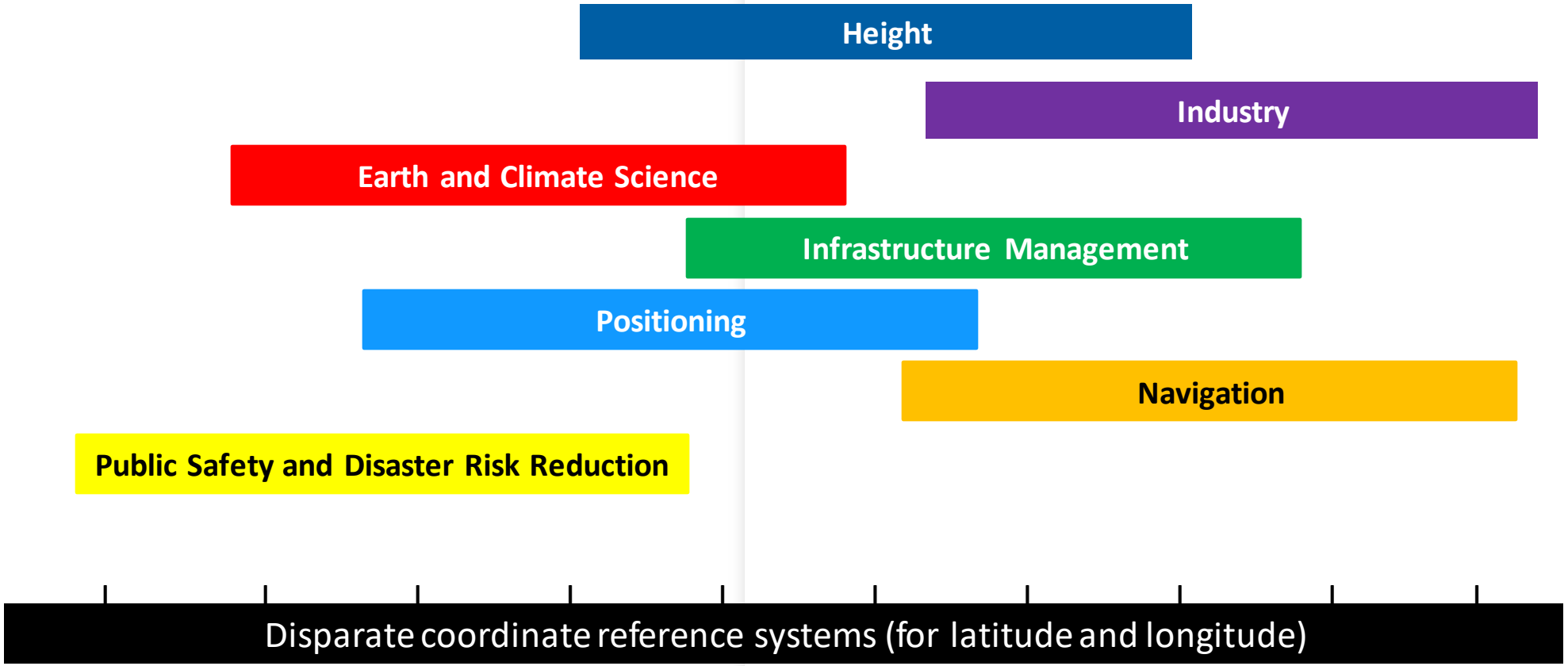
TC PAM : Before / After
using Aerial photograph taken during LiDAR campaign (2012)

Measure – Map – Monitor

Geodesy provides a foundation and framework for the collection, management and use of national geospatial information and global monitoring of the Earth.



Coordinate Reference Systems issues



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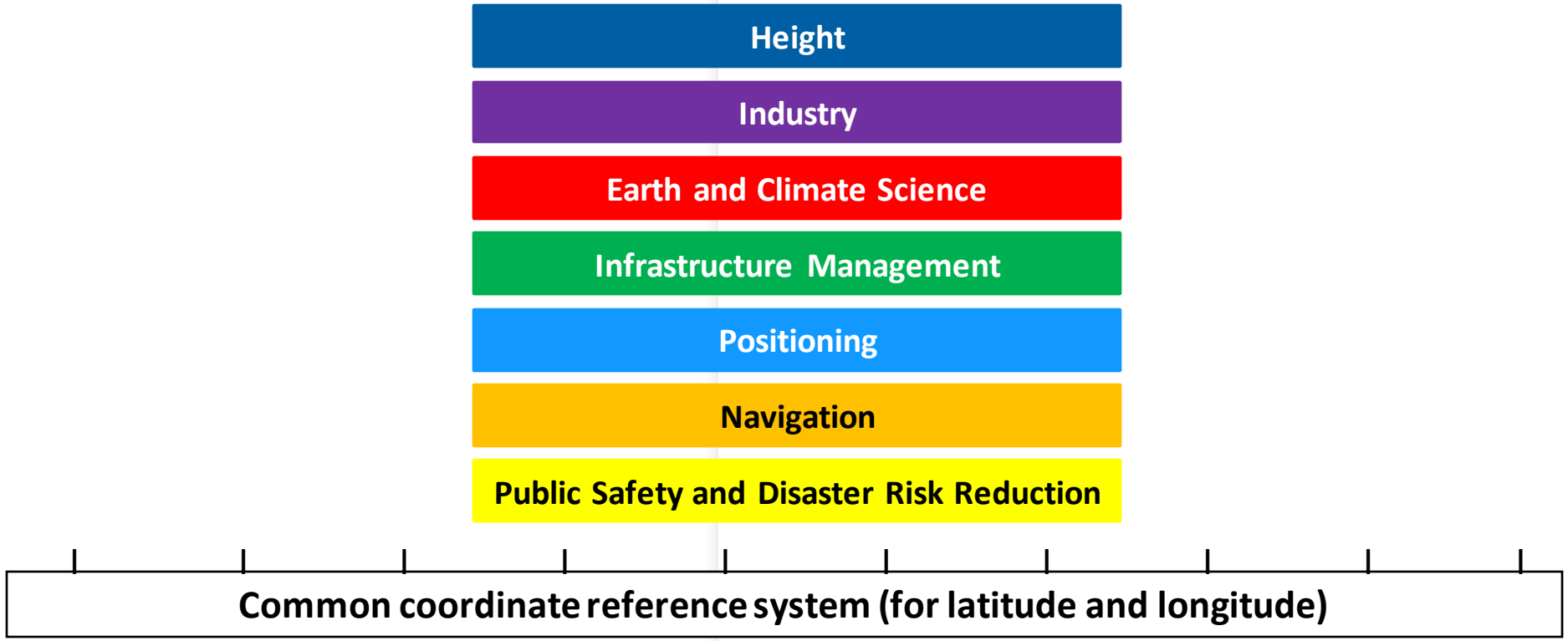


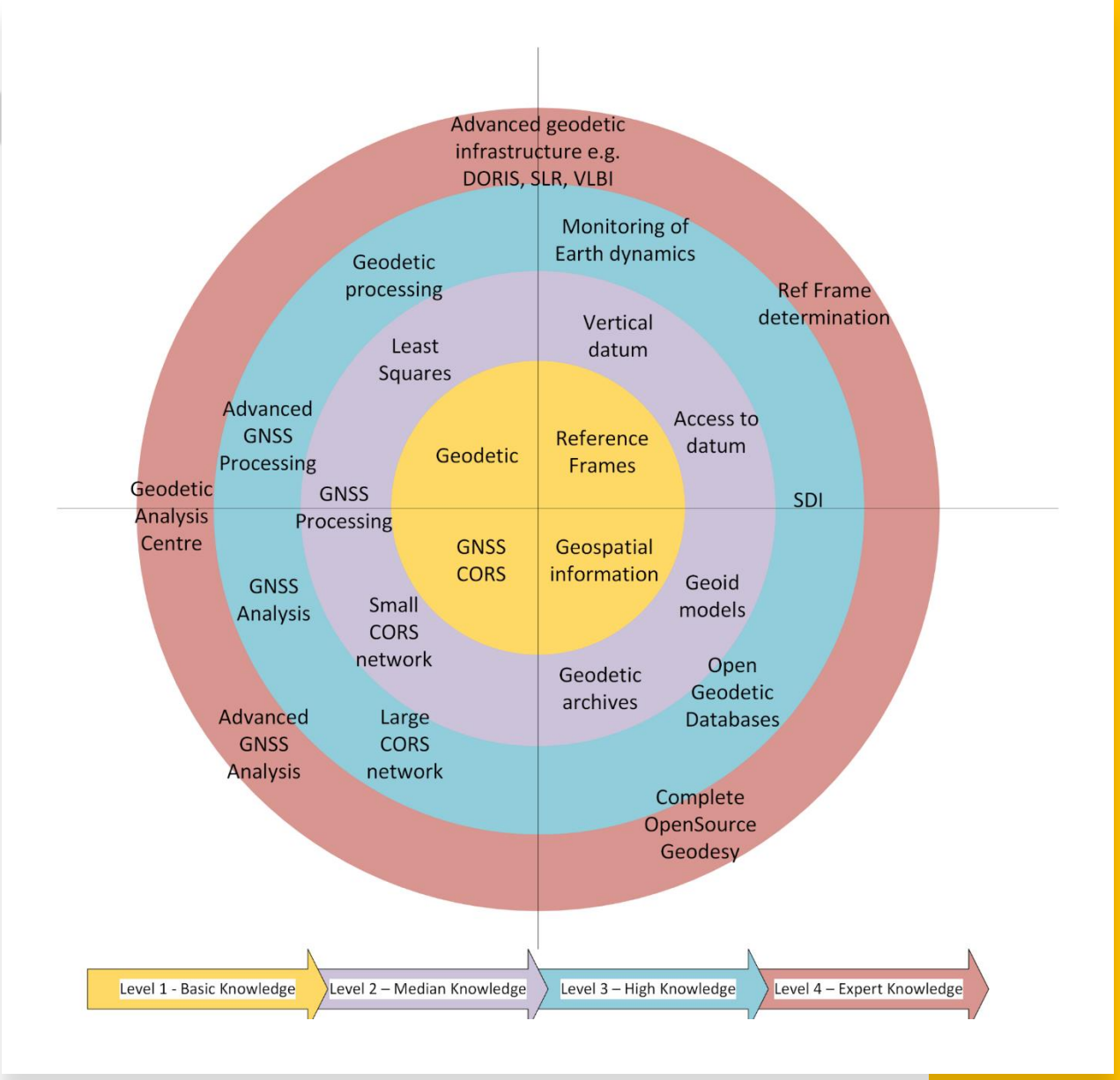
United Nations General Assembly Resolution

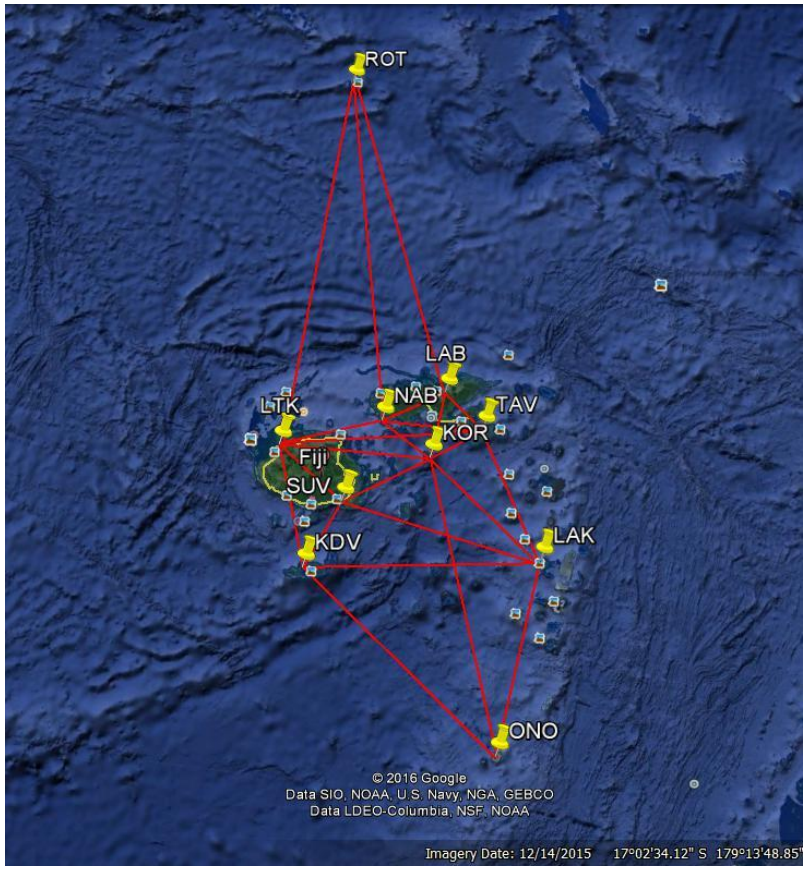
Pacific Geospatial and Surveying Council

Sustainable development in the Pacific enabled by world class geospatial information and surveying services

Modernising the Fiji Geospatial Reference System

- Modernise Fiji's Geodetic Reference Frame
- Define the geodetic infrastructure aligned to Global Geodetic Reference Frame (GGRF)
- Compatible with IGS and positioning technology
- Near real time positioning for disaster risks and hazards
- Monitoring Earth dynamics
- Enhance geospatial capacity and capability





The Geodetic Infrastructure

Next Steps

- Modernise Fiji's Geodetic Reference Frame
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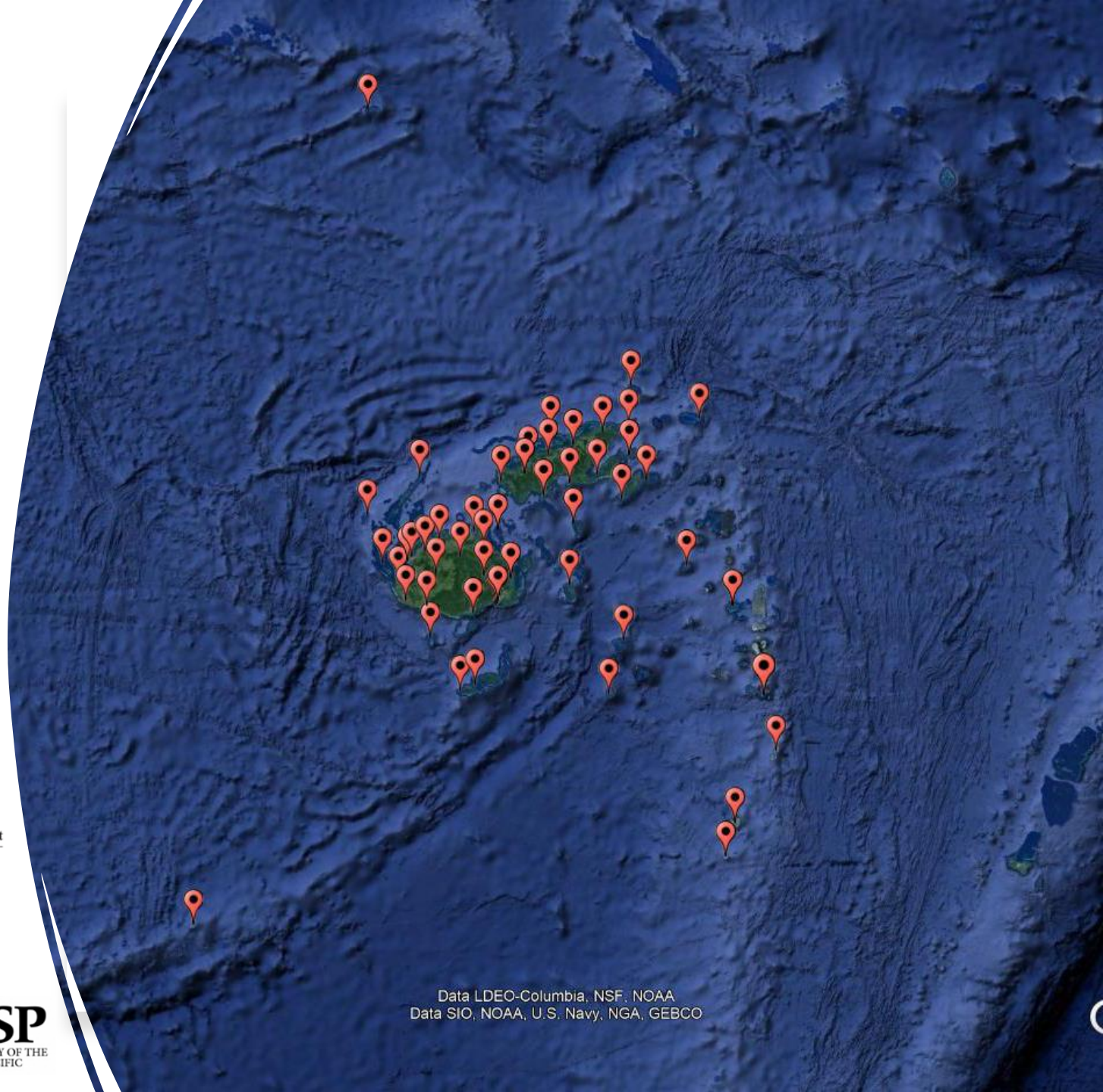
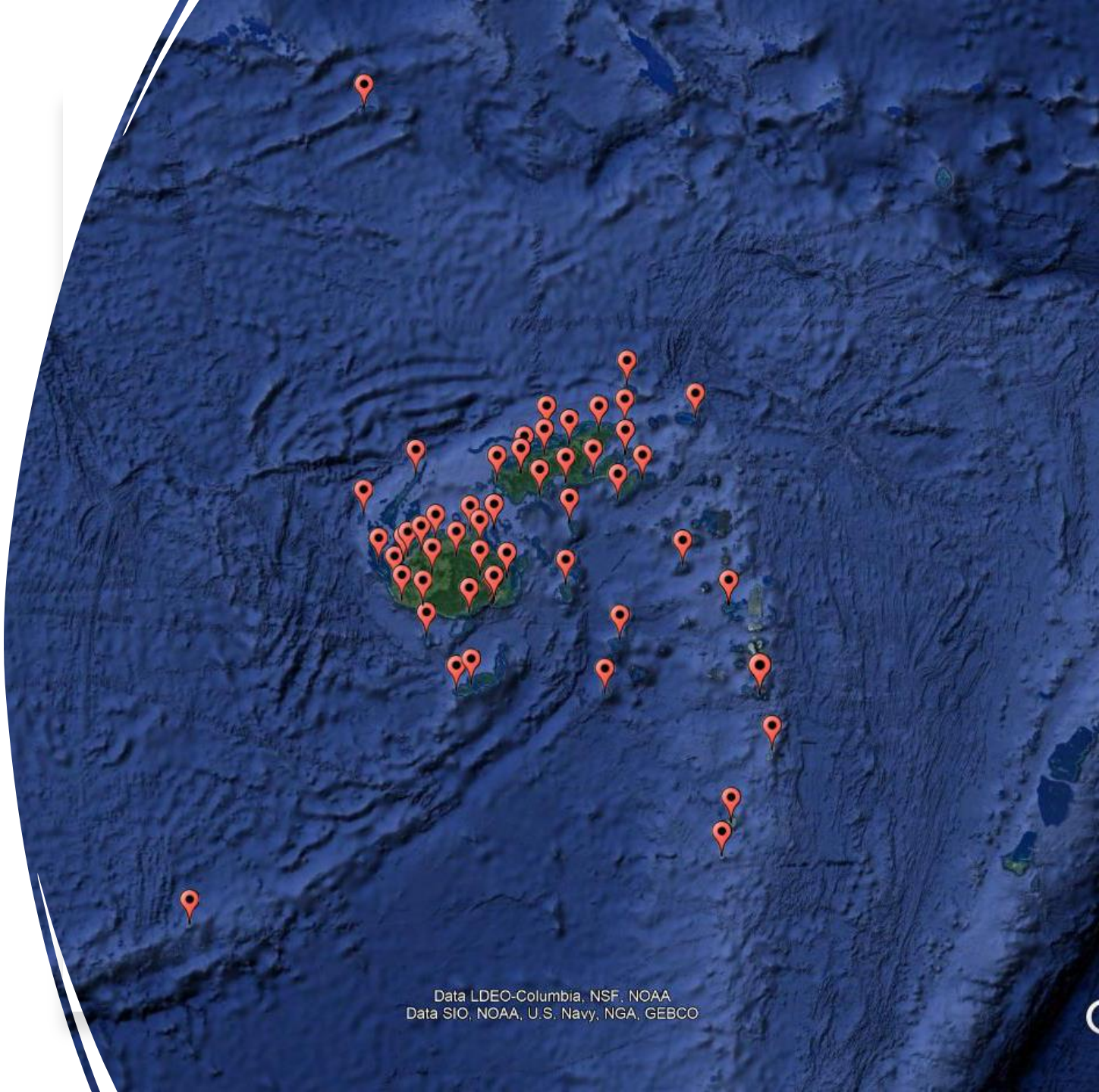


PGSC Pacific Geospatial and Surveying Council
Pacific Community Communauté du Pacifique
Climate and Oceans Support Program in the Pacific
Australian Government Geoscience Australia
Land Information New Zealand Toitū te whenua
SSSI
Survey and Spatial New Zealand
United Kingdom Hydrographic Office
USGS science for a changing world
FIG
UN-GGIM Global Geospatial Information Management
UNOOSA
USP The University of the South Pacific

What we need

- Assistance with development of coordinate reference frames (horizontal and vertical) closely aligned with global navigation systems (e.g. GPS).
- National strategic and implementation plans
- Geodetic infrastructure
- Analysis of data and datum development
- Opportunity to access the SBAS system in the future for improved (cm level) positioning with additional benefits (e.g. integrity, resilience, cheaper access)



Vinaka and Thank You