

ICG-PTWS  
11<sup>h</sup>-15<sup>th</sup> September,  
2023

Nuku'alofa, Tonga

## 3.6 National Progress report



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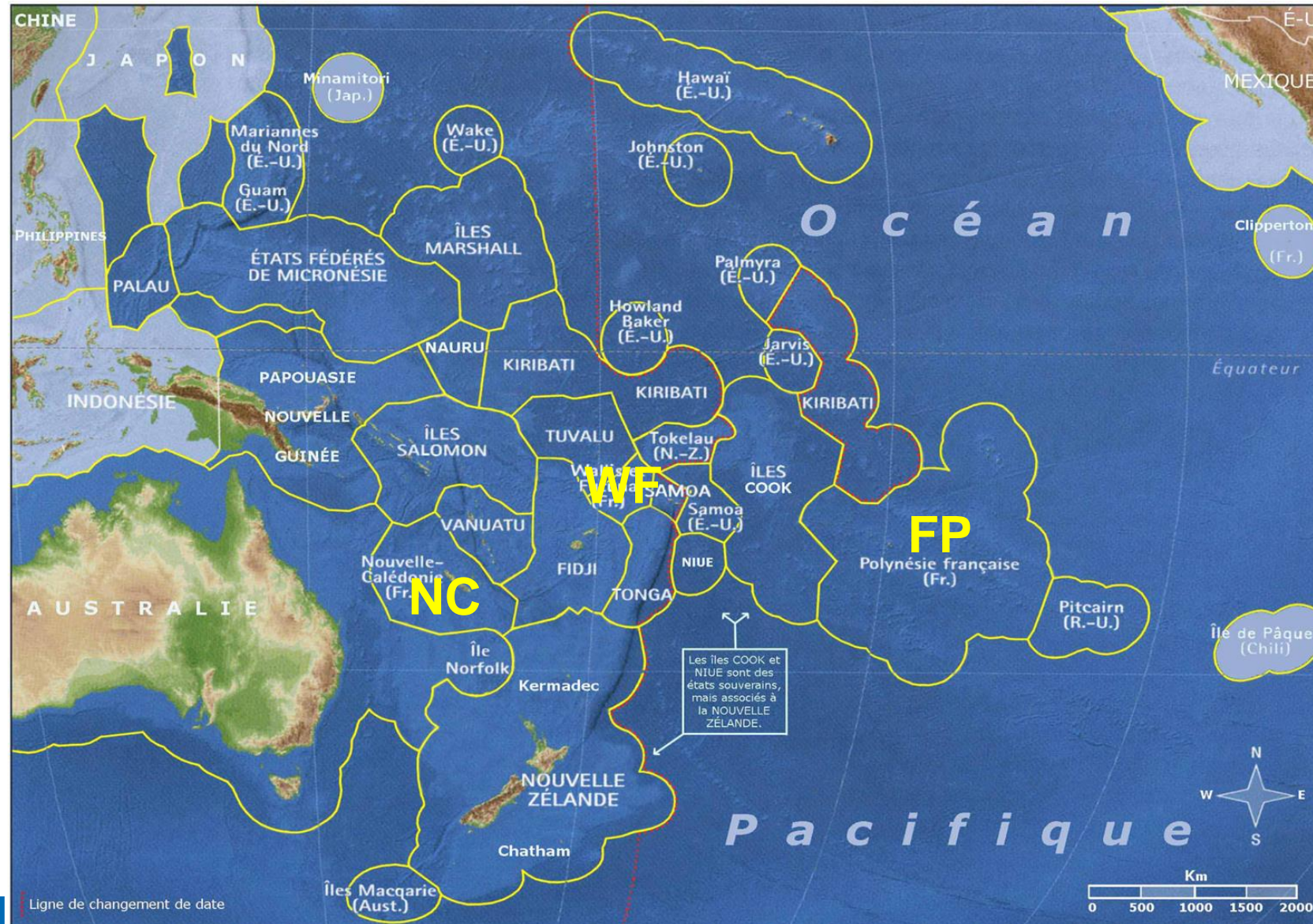
France

# FRANCE - FRENCH POLYNESIA (FP), NEW CALEDONIA (NC), WALLIS & FUTUNA (WF)



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## CONTRIBUTION of France to PTWS mandate and ICG/PTWS activities

### → *Working groups and Task teams*

- ◆ WG-2 - Tsunami detection, warning and dissemination
- ◆ WG-3 - Disaster risk management and preparedness
- ◆ TT Ocean Decade **Co-Chair**
- ◆ TT - Pacific Island Countries and Territories (PICT) **Chair Pacwave22 PICT**
- ◆ TT - PacWave
- ◆ TT - Tsunami Ready
- ◆ HTHH

PTWS Post-event Brief I II III

15 January 2022, Hunga-Tonga-Hunga-Ha'apai Volcanic Eruption and Tsunami

TT PTWS HTHH **Chair**

### → *NTWC : CPPT (French Polynesia)*

### → *ICG/PTWS XXX National reports*

### → *Bilateral scientific and technical collaborations (tide gauges, seismology - moment tensor...)*

# EVENTS IMPACTING FRENCH POLYNESIA AND/OR NEW CALEDONIA



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Mw	Time (UTC)	Date	Location	Depth (km)	FP - Actions	NC - Actions
7.4	17:41	March 4 2021	Kermadec Islands Region	10	No Threat	-
8.1	19:28	March 4 2021	Kermadec Islands Region	10	Minor Tsunami Threat	Triggering of sirens
8.3	18:33	December 12 2021	South Sandwich Islands	131	No Threat	-
-	<i>04:27</i>	<i>January 15 2022</i>	<i>Tonga</i>	-	<i>No Threat</i>	<i>Volcanic eruption</i>
7.2	05:44	March 31 2022	Southeast of Loyalty Islands	10	-	Press release (ASM)
7.5	18:05	September 19 2022	Near the coast of Michoacan Mexico	10	No Threat	Press release (ASM)
-	-	February 1 2023	Vanuatu East EPI	-	-	Press release (ASM)
7.7	02:57	May 19 2023	Southeast of Loyalty Islands	10	No Threat	Triggering of sirens

ASM - Abnormal sea movements



# FP1 - French Polynesia Tsunami Detection and Forecast System

- Data Acquisition system and Earthquakes détections based on SeisComP
- Internally developed Seiscomp modules (Bulletins, SMS, Maps)
- Automatic Wphase Results (regional and global resultats) and PDFM
  - SeiscomP module **scwphase**
- Tsunami warning based on forecast results
  - Code **Taitoko**
  - New HPC since 2020, improvement in execution times, sites forecast
- Bulletins with forecast results maps are transfered to NDMO

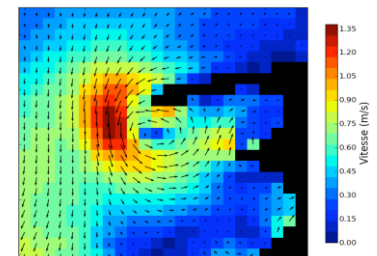
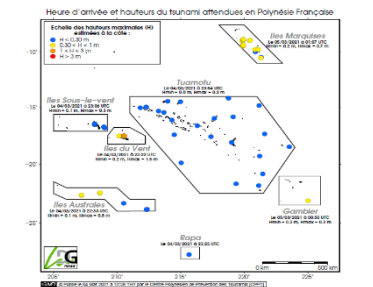
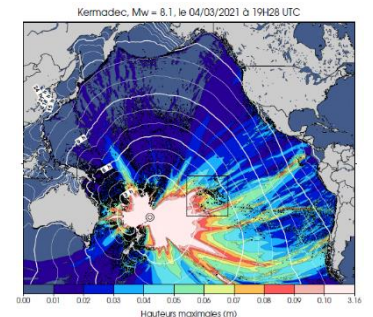
## Upcoming Improvements

- Increase tsunami forecast **sites** (new bathymetry) and **informations** (arrival times for max tsunami height and end of impact)
- Tsunami **current** forecast in major harbor
- **GPU R&D** to improve efficiency, results delivery, energy savings
- French Polynesia Seismic **Network Update** (Seedlink acquisition, sensors)



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# FP2 – French Polynesia Sharing and Collaborations

- Sharing Wphase SeiscomP module **scwphase**
- Sharing CPPT WPhase Results (<https://seismicportal.eu>)
- Collaboration with GNS and GA on sharing and comparing Wphase Solutions for improvements and uncertainties reduction
- *A new dedicated South-West Pacific W-Phase Quick Inversion available at OT+10min testing at CPPT.*



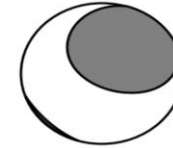
- More involved in ICG/PTWS Task Teams, Working Groups,
  - PICT / PACWAVE22 / WG2
  - Tsunami Ready Recognition Programme

- **2 new Tide Gauges**
  - New tide Gauges in Ua Pou - Marquesas Islands
  - Upcoming by the end of 2024 at Raivavae – Australes Islands (UPF)

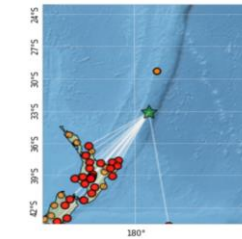
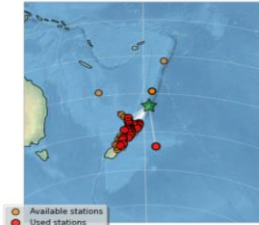
- **3 Seismic Station Sharing via Geoscope Network G**
  - TAOE (Marquesas), PPT (Tahiti)
  - Upcoming a shared T360 Station in 2024 - Tubuai – Australes Islands

Mw=6.65, South of Kermadec Islands  
 Event Time: 2023-09-08 09:09:48 UTC  
 Epicenter : 33.1275 178.616W 12.0km  
 Centroid : 33.1275 178.616W 12.0km

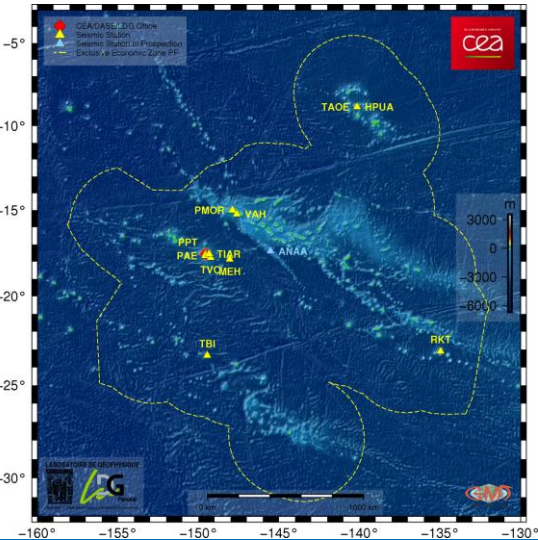
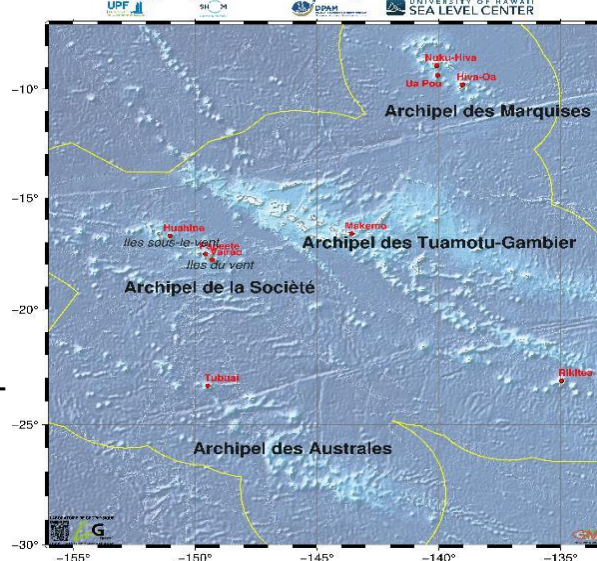
CENTROID-MOMENT-TENSOR SOLUTION  
 AUTO WPHASE INVERSION - 07+8MIN  
 CPPT EVENT: C2023090809093A  
 DATA: NZ  
 TIMESTAMP: 0-20230908091026  
 WPHASE WAVES: 29S, 29C, T= 59  
 CENTROID LOCATION:  
 ORIGIN TIME: 09:09:49.0 0.0  
 LAT:33.135 0.00;LON:178.62W 0.00  
 DEP: 12.0 0.0;TRILANG HDRU: 21.0  
 MOMENT TENSOR: SCALE 10\*\*26 D-CM  
 RR=-0.550 0.000; TT=-0.262 0.000  
 PP=-0.288 0.000; RT= 0.939 0.000  
 RS=-0.617 0.000; TP=-0.475 0.000  
 PRINCIPAL AXES:  
 1. (T) VAL= 1.504;PLG=50;AZM= 38  
 2. (N) -0.513 26 273  
 3. (P) -0.891; 29; 168  
 BEST DBLE.COUPLE:M0= 1.20\*10\*\*26  
 NP1: STRIKE=211;DIP=29;SLIP= 25  
 NP2: STRIKE= 99;DIP=79;SLIP= 116



# ADDITIONAL INFORMATIONS :  
 Event ID : cppt2023rplx  
 Double-Couple : 48 %  
 Scalar moment : 1.20\*19 N.m  
 Stations used : 29  
 Phases used : 29  
 Channels used : BHZ,HZ  
 RMS misfit : 43.9 %  
 Azimuthal gap : 296.4 deg  
 Min. distance : 5.1 deg  
 Max. distance : 12.6 deg  
 BP filter : 57 s - 181 s  
 Time shift : 21 s  
 Half duration : (= Time shift)  
 RMS screening : 5.0 3.0 0.9  
 P2P screening : 0.1 3.0  
 Run time : 0.1 min  
 Author : scwphaseNZ@cornaline2  
 Version : 1.1.0



## Marégraphes en Polynésie Française



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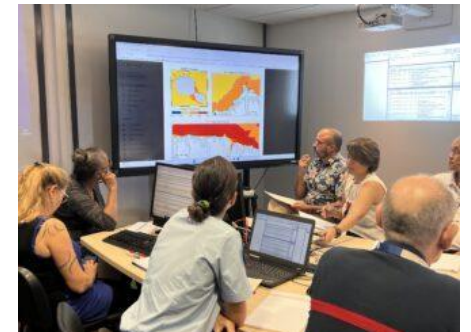
# FP3 – French Polynesia Tsunami Exercises and Education

- **PACWAVE 2022**
  - HTHH Interim Procedures
  - PICT regional cooperation
- Enlarged Tsunami Exercise (**Tsunami Awareness Day** 13th June 2023)
  - Administratives, infrastructures, Emergency services
  - Risk awareness and formation
  - Schools Evacuations
  - Media press conference to improve population awareness
- Raising awareness of the **tsunami ready program** for communities
- Raising awareness on **tsunami risks** in French Polynesia
  - Authorities involved in Risk managements
  - Communities, tsunami warning signage
  - Schools
- Science Day Informations



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## NC1 – Occurrence of events and alert actions on the period 2021-2023

- Reception by the operational room (COG 988) of **96** warnings from IRD/ORSNET and PTWC
- **12** events with action from civil security (12,5%), ranging from press release to triggering sirens
- **3** major events over the 12, with post-event briefs and lessons learned
  - ◆ *March 04, 2021* - Kermadec Islands event - Mw 8.1 - Event combined with Niran cyclone
  - ◆ *January 15, 2022* - Hunga Tonga Hunga Ha'apai (HTHH) event - Volcanic eruption
  - ◆ *May 19, 2023* - Southeast Loyalty Islands event - Mw 7.7

## NC2 – Participation at PacWave22 exercise with 3 events

- *October 13, 2022* - PacWave22 Live TSP Communications Test
- *November 9, 2022* - PacWave22-PICT regional exercise with other countries in the Pacific region in order to test 1/ new PTWC products for HTHH volcanic eruption, and 2/ unofficial communication channels (email / WhatsApp / HF radios) -> Production of an internal post-event brief -> Form completed and sent to the Pacific region
- *November 22, 2022* - PacWave22-NC national exercise - Tabletop exercise in relation with the other operational rooms and two municipalities -> Production of an internal post-event brief -> Form completed and sent to the Pacific region



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## NC3 - Collaboration and sharing

### → *Involvement of New Caledonia in Working groups and Task teams*

- ◆ WG-2 - Tsunami detection, warning and dissemination
- ◆ WG-3 - Disaster risk management and preparedness
- ◆ TT - Pacific Island Countries and Territories (PICT)
- ◆ TT - PacWave
- ◆ TT - Tsunami Ready
- ◆ PTWS Post-event Brief I - 15 January 2022, Hunga-Tonga-Hunga-Ha'apai Volcanic Eruption and Tsunami

### → *Sharing of data with ORSNET (Oceania Regional Seismic Network)*

### → *Collaboration in progress with Vanuatu and New Zealand for temporary seismic network (Pacific fund)*

# NC4 - Actions at the national level



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## → *Alert reception - Improvement of products in 2023*

### ◆ PTWC

1. Splitting of the existing polygon that encompasses the entire territory into three polygons
2. Additional ETA points nearby tide gauges spread across the entire territory, instead of a single initial one (offshore Noumea)

### ◆ IRD/ORSNET

1.  $M_w \geq 3$  within a radius of 300 km around Bourail -> local earthquakes
2.  $M_w \geq 6.5$  within a radius of 3000 km around Noumea -> South West Pacific area
3.  $M_w \geq 7.5$  elsewhere, outside the South West Pacific area, beyond 3000 km around Noumea

## → *Monitoring network*

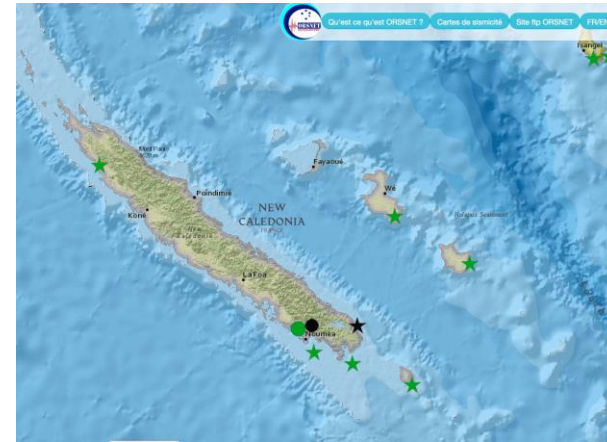
◆ **Tide gauges** - network extension -> 9 gauges total -> international network

◆ **Seismic stations** - consolidation of existing network and extension with one more station -> 8 fully functional stations -> ORSNET Network

## → *Crisis management tools*

### ◆ TsuCAL

- Decision-making tool for tsunami warning management - Operational since June 9, 2023
- Establishment of a tsunami committee of experts since June 15, 2023 with 3 WG



## NC4 - Actions at the national level



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### → *Development plan for warning systems towards population*

#### ◆ Sirens - 73 sirens total

- 2 to 3 sirens per year according budget
- mutualisation with municipality of Noumea with shark risk

#### ◆ FRAAlert

- Warning tool developed by French state
- Available and operational in New Caledonia in 2024
- Text messages sent on individual mobile phones
- Cell-broadcast technology in 4G/5G and geolocated SMS in 2G/3G



### → *Communication strategy*

- ◆ Conference on tsunami risk - September 6 2022 -> next event in October 12 2023 (contribution to tsunami awareness day)
- ◆ Crisis & public communication tools improvement

### → *Involvement in the Tsunami ready program*

- ◆ Work is in progress to put in place the national committee and proceed to meet all 12 indicators
- ◆ 3 municipalities targeted (one on the East Coast, one in the Loyalty Islands and Noumea)



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**Thank you very much for  
your kind attention.**