



**Australian Government**  
**Australian Radiation Protection  
and Nuclear Safety Agency**



# **ARPANSA's Marshall Islands Fish Monitoring Program**

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# **ARPANSA-IAEA-Marshall Islands Collaboration**

***ARPANSA's Marshall Islands Fish Monitoring Program  
Capacity Building in Australasia – Collaborations and Future  
Possibilities***

**Liesel Green & Marcus Grzechnik**

# IAEA Project – Developing a National Radioactivity Monitoring Capacity

The Marshallese Government requested the assistance of IAEA for developing capacity for:

- Environmental radioactivity monitoring
- Radiation dose assessments
- Provision of public information



# Status of Ongoing TC Programme 2020-2021

- Building Core Capacities to Control Contaminants and Other Residues in Food — Phase I

MHL5002



- Improving the Quality of Radiology Services  
*(Pending Closure)*

MHL6001



- Improving the Quality of Clinical Services in Radiology - Phase II (2018-21)

MHL6002



- Developing a National Radioactivity Monitoring Capacity  
*(Pending Closure)*

MHL7001



- Establishing Technical Capabilities for Groundwater Resources Management *(Pending Closure)*

MHL7002



- Developing National Radioactivity Monitoring Capacity - Phase II (2018-21)

MHL7003



- Strengthening the National Infrastructure for Radiation Safety (2018-21)

MHL9004



# Training Program - MHL 7003 Phase II

Aim: Build on the IAEA training conducted in 2017

ARPANSA Training 1: 2-5 March 2021

- Radiation Protection in Marshall Islands (Existing exposure situation)
- Monitoring Strategy
- Radiation and application to Dose
- Environmental Sampling Techniques
- Gamma Spectrometry
- Laboratory Quality System



# Training Program - MHL 7003 Phase II

## ARPANSA Training 2: 21-23 September 2021

- Radioecology
- Dose Calculations
- Seawater Measurements for Radiocaesium
- Exposure due to Radionuclides in Food
- **Visual Sample Plan** Item Sampling, Fish Sampling
- Stakeholder Engagement and Communication Planning
- Fish Market Monitoring Program
- Draft project documents

The screenshot shows the 'Item Sampling' software window with the following settings:

- Item Sampling** | Arrangement
- None of the items in my sample can be unacceptable
- I want to account for prior belief in my design
- I don't want to include targeted samples in my design
- I do not want to account for a measurement technique that may result in false negatives.
- Unacceptable items may be misclassified as acceptable up to 0.0% of the time.
- I need to sample from a population of 2000 items.
- Before any sampling takes place, I expect that a(n) High (90%) (90.00%) percentage of the items in the population are acceptable.
- I want 95.000% confidence that at least 90.000% of the items are acceptable.
- Number of items that must be randomly selected and examined: 20
- If all 20 randomly selected items are acceptable, then I am 95% confident that at least 90% of the items are acceptable.
- If any of the random samples are unacceptable, then the confidence statement above no longer applies and I must assume that at least some portion of the items are unacceptable.
- Calculate number of samples  Calculate % confidence based on number of samples
- Buttons: OK, Cancel, Apply, Help

# Fish Market Monitoring



ARPANSA is providing assistance and capacity building in the development of a project plan that can be expanded to other environmental assessments conducted by Marshall Islands Marine Resource Authority (MIMRA) and the Marshall Islands EPA

- Development of strategy
- Sample and analysis considerations
- Logistics - local conditions and shipping samples to ARPANSA
- Information and data management
- Public information



# Fish Market Monitoring (cont.)



- Expertise of staff in MIMRA and the Marshall Islands EPA to develop target species and sampling procedures
- Build on the Marshall Islands EPA methods developed during the TCP
- ARPANSA to provide support to both documenting and developing the program
- ARPANSA to provide support through:
  - *Verification of screening measurements conducted by MIMRA/EPA laboratories*
  - *Additional analysis of samples for Pu and Po at ARPANSA*

## Target species

kūro, jilo, Paan, merã, kupañ, Orange spine unicorn fish and Humpback red snapper

## Target radionuclides

$^{239+240}\text{Pu}$ ,  $^{241}\text{Pu}$ ,  $^{241}\text{Am}$ ,  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  and  $^{210}\text{Po}$ ,  $^{210}\text{Pb}$

# Australasian Radioanalytical Laboratory Network



**National capacity building activities**

Gamma spectrometry capability exercise  
2013 – 2015 – 2018 – 2021

Gross alpha & gross beta capability exercise  
2020 - ongoing

Is there scope for further expansion and increased activities?



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# THANK YOU

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