

# Deep sea ecosystem monitoring



3 weeks  
per year



continuous  
acoustic  
monitoring

1

fishing survey in  
priority area

## Preserving deep coastal resources

To evaluate deep-sea fisheries resource sustainability by acquiring samples and fisheries-independent data (Schedule every other year a 1.5 month cruise, could be combined within ecosystem monitoring missions)

Deepwater fisheries are an important resource in a number of Pacific Island countries and territories. Equipped with hydraulic reels, the vessel fishing capabilities allows fish to be caught and detailed information obtain on the biology of the populations, such as age, growth rates, mortality rates, maturity schedules and stock structure and connectivity throughout the region. The size of the vessel allows the exploration of coastal areas but also remote seamounts that have received little historical fishing pressure.



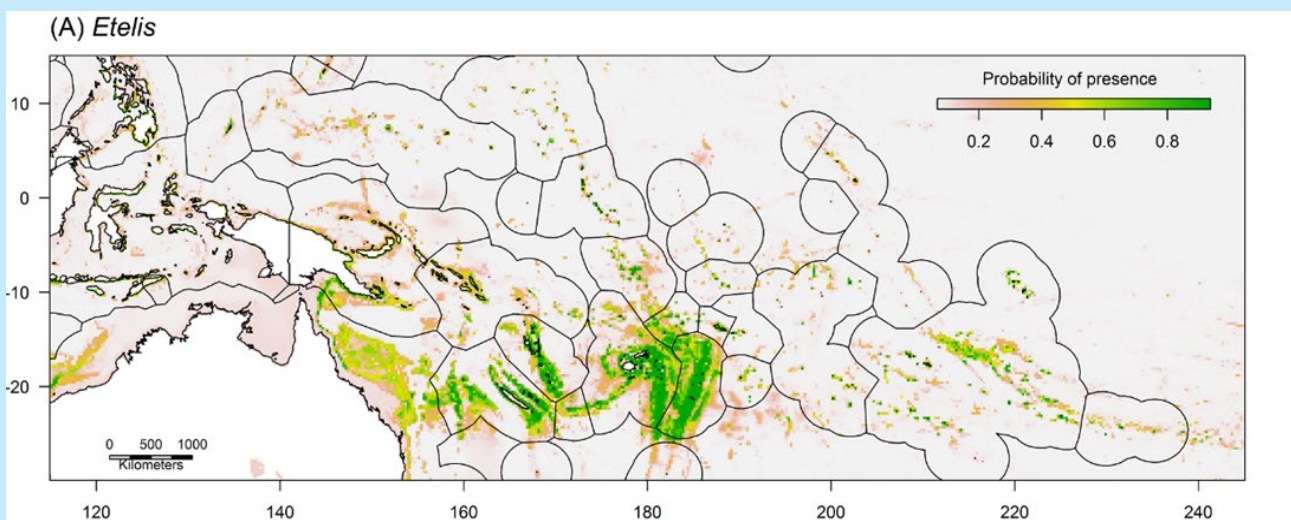
Deep-sea snappers (*Etelis* species)



Deepwater fisheries (e.g. snappers) are a significant resource for many Pacific Island countries and territories. However, there is limited information on the extent of suitable habitats, the biology of those species, and fishing data. The fragility of deepwater resources means that potential exploitation needs to be progressed in a precautionary way using the best available science. Current limitation in knowledge have impeded the potential expansion of these fisheries and their sustainable management.

The research vessel equipped with appropriate sounders offer the potential to conduct the comprehensive surveys needed to create detailed maps of deepwater habitat's throughout the Pacific.

ECOSYSTEM COMPARTMENTS	INSTRUMENTS / GEAR	DATA/SAMPLES COLLECTED
Physical oceanography	Hull instruments/probes (e.g. ADCP) Instruments/probes lowered at depth (e.g. CTD)	Detailed bathymetry Surface and at depth: <ul style="list-style-type: none"> <li>• temperature</li> <li>• salinity</li> <li>• currents</li> </ul>
Chemistry	Instruments/probes lowered at depth (e.g. CTD) Water samplers lowered at depth (e.g. rosette)	Surface and at depth: <ul style="list-style-type: none"> <li>• oxygen</li> <li>• pH</li> <li>• nutrients (e.g. nitrates, nitrites, phosphates)</li> </ul>
Biology of the base of the food web: phytoplankton/microbial loop	Water samplers lowered at depth (e.g. rosette)	Surface and at depth: <ul style="list-style-type: none"> <li>• primary production</li> <li>• chlorophyll a</li> <li>• pigment profiles</li> <li>• species composition</li> <li>• diversity</li> <li>• particulate organic matter</li> <li>• isotope characterisation...</li> </ul>
Deep-sea fish biology	Hull-mounted echo sounder (e.g. EK60) In situ echo sounder (e.g. WBAT) Baited camera	<ul style="list-style-type: none"> <li>• biomass acoustic estimates</li> <li>• spatial distribution acoustic estimate</li> </ul>
Deep-sea snappers and other species	Vertical longlines, hydraulic reels	<ul style="list-style-type: none"> <li>• CPUE</li> <li>• biological samples to determine various parameters such as age, reproductive status, isotope levels, fatty acids, contaminants levels</li> <li>• species composition diversity</li> </ul>



Example of computerised favourable oceanographic factors used to create a map of predicted deepwater snapper habitat distribution. These predictions need RV surveys to be confirmed.