

Monitoring the changes in the largest oceanic ecosystem



annual
schedule
of 2 to 2.5
months



20-30

Pelagic net tows

20

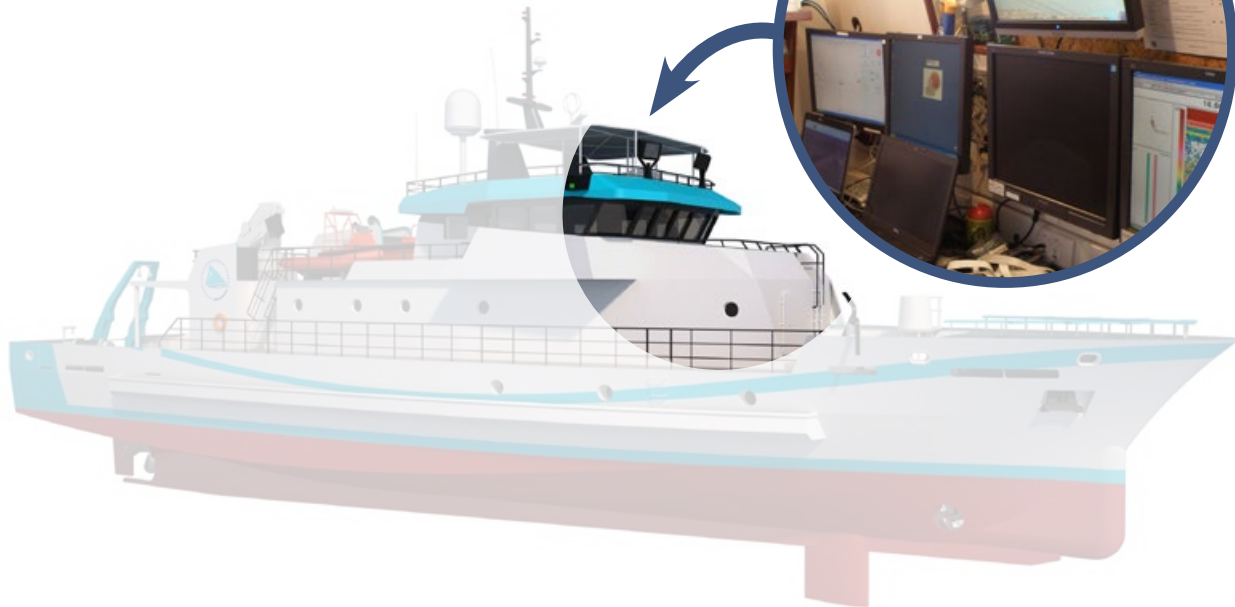
Water sampling
stations

**1000-
1500**

nautical miles of
acoustic monitoring

Implementing annual pelagic ecosystem monitoring research cruises

Dedicated research cruises that collect information on physical oceanography and the lower levels of the food web, such as plankton and tuna prey (micronekton), to monitor ecosystem change, discover new species, and map the vast ocean biodiversity and its genetic resources.



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Implementing annual pelagic ecosystem monitoring research cruises

The Pacific Ocean is the world's single largest natural feature, occupying approximately one third of the world's surface area, with the central Pacific as its most remote wilderness. Given the importance of this resource as one of the last natural food production systems on the planet, the scientific advice provided to its managers requires constant monitoring. This involves gathering information on the ecosystem to identify what has happened in the recent past to bring us to the present, and our likely trajectory in the future. These observations are contributing to validate/parameterize models to understand the link between tuna fisheries and their ecosystem, and to forecast changes in tuna linked with short- to medium-term climate variability (e.g. ENSO) and longer-term climate change. Those changes could potentially redistribute some tuna species stock away from the western and central Pacific. This is just one uncertainty in the future of the Pacific island nations and territories, meaning that adaptive management based on the best science available is of the utmost importance to their future economies and resources.

ECOSYSTEM COMPARTMENTS	INSTRUMENTS/GEAR	DATA/SAMPLES COLLECTED
Physical oceanography	Hull instruments/probes (e.g. ADCP) Instruments/probes lowered at depth (e.g. CTD)	Surface and at depth: <ul style="list-style-type: none"> • temperature • salinity • currents
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"> • oxygen • pH • nutrients (e.g. nitrates, nitrites, phosphates)
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"> • primary production • chlorophyll a • pigment profiles • species composition • diversity • particulate organic matter • isotope characterisation...
Biology of the mid-trophic level of the food web: zooplankton and micronekton	Hull-mounted echo sounder (e.g. EK80) Acoustic profilers (e.g. TAPS, WBAT) Zooplankton net Micronekton net DNA sampler	Surface and at depth: <ul style="list-style-type: none"> • acoustic estimates • biomasses • species composition • diversity • isotope characterisation • contaminants • fatty acids... • tuna larvae sampling • species barcoding



Micronekton net



Micronekton species