



# The resilience of deep-sea benthic communities to the effects of sedimentation

*Tēnā koutou katoa, nau mai hoki māi ki tō tātou pānui. Ma te waka eke noa, kia mahitahi ai!*



## The Voyage

The ROBES programme has two components, a field survey experiment with in situ observations of a sediment plume, and laboratory-based experiments. Here we describe some key results from the benthic impact survey carried out in May-June 2018 on the Chatham Rise using NIWA's research vessel *Tangaroa*.

## Initial survey results

Baseline data were collected on bathymetry, topography, water column characteristics, sediment composition, and faunal community structure and abundance prior to disturbance, and then up to twice post-disturbance. There were 254 discrete sampling events. Key elements included:

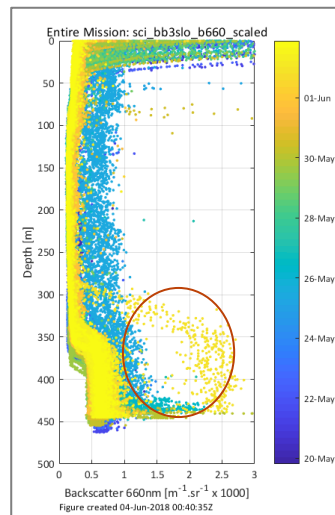
- A "Benthic Disturber" was used to create a sediment plume on 3 occasions with towing periods between 12 and 30 hours.



- Current flow was assessed using the vessel, moored current profilers, and NIWA's underwater glider.
- Water column data were collected from a conductivity temperature depth (CTD)-rosette, multibeam echo-sounder, and fisheries acoustics sounders.
- Several sounder transect surveys were run to map the area of disturbance pre- and post-disturbance, and a CTD grid was completed immediately after disturbance events to sample the plume.



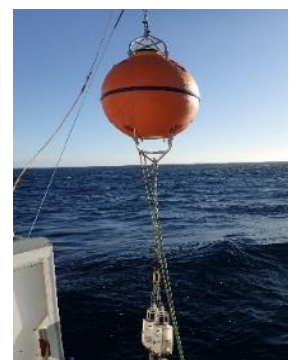
- Three new benthic landers were deployed downstream of the disturbance site with an array of sensors, including sediment traps.
- Detailed sediment sampling with a multicorer (supporting onboard respiration experiments as well as sediment profile data), and extensive deep towed imaging system (DTIS) towed camera stations were completed.
- The Disturber produced less extensive sediment plumes than expected as it did not stir up the heavier sandy component of sediments in the area.
- There was little immediate visual impact on the seabed as the fine sediments appeared to disperse rapidly in the relatively fast bottom current conditions.
- However, a plot of optical backscatter data collected by the glider, shows a plume extending from the seafloor at 450 m to 300 m (circled)



- Live deep-sea sponges were also collected for sedimentation experiments back at the laboratory.



- Three mooring arrays were re-deployed at the end of the survey for a further 12 months to monitor current and sediment dynamics.



## Next steps

The survey collected a large amount of oceanographic, sedimentological, and biological data that provided significant insights into plume effects and will support a wide variety of analyses in the coming months.