



Welcome Aboard *RV Investigator* 28 June-13 August 2021



The voyage: at a glance

- 6 weeks (45 days)
- 12,500 km from Darwin to Fremantle via Cocos (Keeling) and Christmas Island
- Why? Find out what lives on underwater mountains or 'seamounts'



The why, who, and where of the trip:



Why? The Science

This trip is all about understanding the seamounts (underwater mountains) near Christmas and Cocos (Keeling) Island and the unique ecosystems present on these features. Seamounts provide ecological hotspots, but little is known about the inhabitants of these isolated environments.



© CSIRO

One of the ship's many labs - it won't look this empty once we're on board!

Main Goals

- Learn about the size and shape of the seamounts
- Describe the biological inhabitants of the seamounts
 - Determine which species live there, where they came from, and if they have special evolutionary characteristics.
- Collect samples for scientific research and display (we have several museum experts on board!)



Who? Meet your hosts, BushBlitz!

We're a partnership between the Australian Government, BHP, and Earthwatch Australia dedicated to discovering and describing our country's biodiversity! This is our first completely underwater expedition! We're teaming up with Museums Victoria, CSIRO, and Parks Australia to spend 45 days on the seamounts of Australia's Indian Ocean Territories to discover the species that live there!

Where will you go?

From Darwin, Research Vessel (RV) *Investigator* will make the long trek out to Christmas Island. Did you know this will take about a week? Plenty of time for you and the other scientists to find your sea legs, get used to your assigned shift, and get settled into life on the ship.



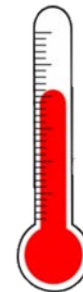
What will the weather be like?

Notice how far north you'll be during the trip. Even though you're going in the middle of winter, you're headed to the tropics so it shouldn't be that cold outside! But make sure to still bring some warm clothes for chilly nights (and if the AC is on high inside). Also remember you need long sleeves and long pants so you can go out onto the work deck.



Summer is rainy season for this region, so it shouldn't rain too much:

- July average: 94 mm
- August average: 40 mm



High 26°C
Low 22°C

You'll have about 12 hours of daylight each day

- Sunrise ~6 am
- Sunset ~6 pm





But first, there are a few things we have to do before we go.

1) Get a check up

You'll be days away from medical care, therefore you need to make sure you're healthy before you leave! The doc will check your vitals, your eyesight, your hearing, and your balance to make sure you'll be healthy and happy when you're out at sea! Don't worry if something does happen, there is always a medical officer on board. The ship even has a hospital!



2) Talk to your family and friends

Once you're on the ship, you can't get off! This means you can't get home in a hurry or even swing by for special events. Going to sea sometimes means missing holidays or birthdays. Don't worry, you celebrate on board, but it is important no one expects you home for dinner. Figure out the best time to phone home – remember, you'll have some wi-fi but sometimes it won't work and there is no mobile phone reception!

3) You need ID

You will be passing into international waters – so you will need a passport!



4) Find your suitcase

Remember, you'll be gone for 45 days! A good starting rule is if you use it during a typical week, you'll probably want it on board (No, don't bring the TV – they have movies on board!)

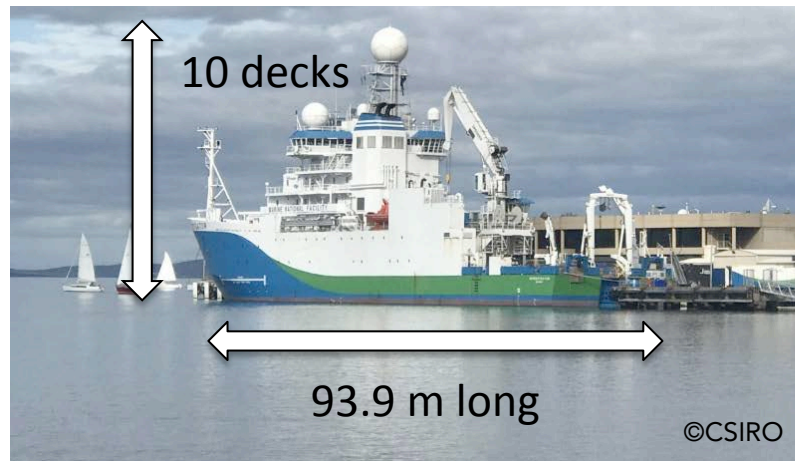
Medications? Book? Favorite music? Chocolate? And don't forget your personal protective equipment! They have lifejackets and hardhats, but be sure to bring your steel-capped boots, sun protection, and long sleeves for the back deck!



Meet the Ship! RV Investigator



You'll be sailing on Australia's premiere blue-water research vessel!



What do you need to know?

Life at sea is probably a bit different than anything you've experienced before. Understanding a few of the key differences will make your transition a lot easier!



The ship never sleeps, but the scientists do! You'll be put on a 12 hour shift to allow operations to continue both day and night. At the beginning and end of your shift, its important to talk to the person doing your job on the other shift, to learn what happened while you slept and what is up next! Don't be late to your shift- the other person has to stay up until you're on duty!



The Operations Room – this is really the center of science operations, from here you can see the status of all the instruments and even control some of the sampling! And there is always someone on duty.



Seasickness is real, but it will pass. Seasickness is nothing to be ashamed of! Lots of people struggle with the initial adjustment to life on a moving ship! But don't worry, most people get used to the movement of the ship within a couple of days. If you think you might get seasick be sure to bring seasickness tablets and start taking them **BEFORE** we leave the wharf!



And, once you're feeling better you might even feel up to a session in the ship's gym. Maintaining an exercise routine helps you stay healthy and happy.



We're all on the same ship. Everyone has those days... you're tired, you didn't sleep well, you need your space. But you're on a ship, with 59 others. Be respectful, give people their space when they need it, and look out for each other! And DON'T talk in the corridors- someone is always trying to sleep!!!!



Bunk Beds! Chances are you will be sharing a room with just one other person. Here's a look at a typical room.



Sleeps 60!

Why up to 60 people? You need an entire community on board! The scientists are just part of the team that makes a voyage work: you also need a voyage manager, engineers, a captain, electricians, cooks, and technicians! This trip you'll have a few less shipmates than normal to allow for social distancing made necessary by Covid-19. Still make sure to meet your shipmates!

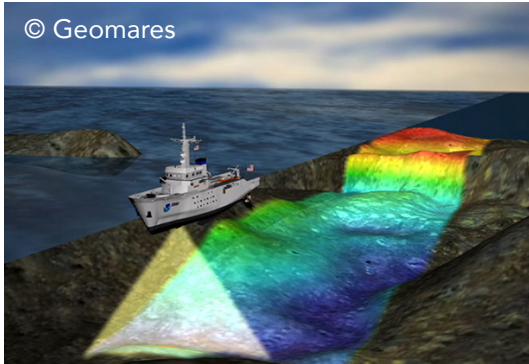
Check back later for our 'meet the scientists' series.



There are recreational areas on board to relax and unwind with your fellow sea-goers when not working. This is the main lounge on board, think of it as a big (ship) family living room. When it is not being used for meetings or presentations, it is a great spot for yoga or movies (and right next to the kitchen!)

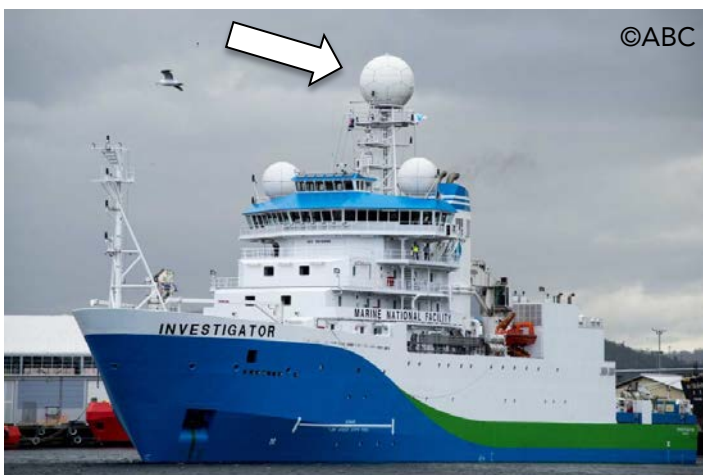
Why RV *Investigator*?

So far you've learned a lot about what you need to do to be happy and healthy during the trip, but now let's talk a little bit about the ship itself and some of the resources on board RV *Investigator* that make this ship so well suited to your scientific objectives.



You can image the seafloor, not with cameras but using sound. The multi-beam allows the ship to understand the shape of the seafloor (the bathymetry). This will be used to look at the geometry of the seamounts and the surrounding seafloor.

You can sample water from any depth. Using the CTD (stands for Conductivity Temperature Depth, three of the water properties this instrument measures) you'll watch water properties change with depth in real time as the instrument is lowered through the water. The CTD is part of a larger bundle as seen here, a 'CTD rosette.' Those bottles can collect water from whatever depth the scientists want! Using the live information from the CTD including salt content (conductivity) and other measurements like dissolved oxygen and chlorophyll, you can make an informed decision of the 'interesting' depths to sample!



You can understand atmosphere and ocean. Look at any photo of RV *Investigator* and you might wonder what is that giant white soccer ball at the top of the ship? Its actually quite important, that 'ball' sends and receives the microwave pulses needed to collect atmospheric data. This helps to predict the weather across Australia!! 7

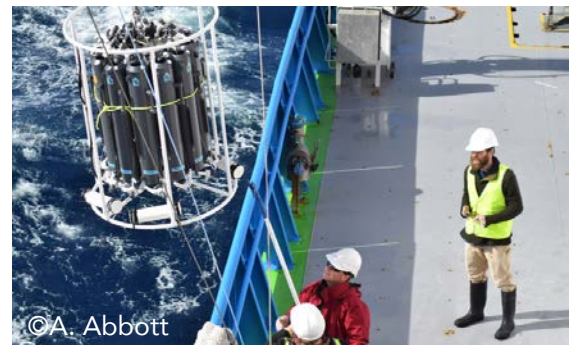
You can watch for whales and other marine mammals. The observation deck, also known as “Monkey Island,” is the ship’s uppermost deck and makes for a great place to watch the horizon.



You can always measure surface seawater. The underway seawater system lets you take a (clean!) sample of surface water at any time, even when the ship is full steam ahead. No need for a bucket over the side, just turn on the special tap.

You don’t have to do the heavy lifting.

Oceanographic equipment is heavy. Fortunately the ship’s many cranes and winches give you the necessary mechanical advantage to be able to send the instruments several km below the waves.



You will be safe. One of the first things you will notice in your room is a large red (or green) bag, a hard hat, and a lifejacket near your bed! What’s in the bag? That’s your immersion suit! Even though the chance of needing to evacuate the ship is extremely low, you need to have and understand how to use the safety gear. While immersion suits aren’t critical in the tropics, you will do drills to learn where to gather and how to put on our lifejackets, in case there is an emergency on board.

About the ship:

RV Investigator, managed by Marine National Facility, is Australia’s only dedicated blue-water research vessel. Funded by the Australian Government and operated by CSIRO, the ship enables multi-disciplinary marine research in and around Australian waters. The Marine National Facility also maintain an excellent website, which includes a virtual tour of your soon to-be home-away-from-home!

