

# Activity 9: Visiting estuaries



Let's visit a local estuary to observe and investigate its biodiversity.



## CURRICULUM LINKS

Learning areas	Learning intentions	Success criteria
<p><b>Science: Levels 1–4</b></p> <ul style="list-style-type: none"><li>Living world: Evolution.</li><li>Nature of Science: Investigating in Science; Participating and contributing.</li><li>Health: Personal health and physical development: Safety Management.</li></ul> <p><b>Science capabilities</b></p> <ul style="list-style-type: none"><li>Gather and interpret data.</li><li>Use evidence.</li><li>Critique evidence.</li><li>Interpret representations / make meaning.</li><li>Engage with science.</li></ul> <p><b>Te Marautanga o Aotearoa</b></p> <ul style="list-style-type: none"><li>Pūtaiao: The natural world.</li></ul>	<p><b>Students are learning to:</b></p> <ul style="list-style-type: none"><li>make predictions, find evidence and make observations to support or challenge their ideas</li><li>understand and manage risks in the outdoors.</li></ul>	<p><b>Students can:</b></p> <ul style="list-style-type: none"><li>record predictions and observations about life in the estuary</li><li>contribute to safety planning using school templates and policies.</li></ul>

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# BACKGROUND NOTES


## WHAT ARE THE BENEFITS OF VISITING AN ESTUARY FOR STUDENTS?

Visiting an estuary will bring an authentic, real-life context to your inquiry. Students are likely to see more biodiversity and life in estuaries than in most coastal environments. There are many opportunities for learning and for investigating a range of environments at an estuary – students could visit the sandy shore, mangrove forest, seagrass meadow, streams or other parts of the estuary.

The experience will be a great platform for meaningful follow-up action for the environment, and will enable students to see, experience and understand the estuary. Outdoor learning also provides physical, social and wider benefits for students.

If there is no estuary near your school, you could investigate a marine reserve or stream instead. See DOC's online education resources:

 *Protecting Our Marine World*

 *Habitat Heroes: Explore your local stream resource.*



Students from Long Bay Primary School experiencing Long Bay Estuary. Photo: John Keoghan, Long Bay Primary School

## EXPERIENTIAL LEARNING

Experiential learning is a process that involves students having direct experiences in their environment and then reflecting on their experiences to better understand the world around them. Key elements of the process are experience and reflection.

Experiential visits can bridge the gap between students, their classrooms and the community. They also allow students to apply knowledge and skills that have been learned in the classroom in a real-life context.



Finding mud crabs. Photo: Shan Walker, EfS Initiatives



## Surveying biodiversity in an estuary

An estuary biodiversity survey is a scientific study of a small area of the estuary. Biodiversity surveys can give us information about how an estuary is functioning and provide clues about its health.

Finding out about the condition of your estuary and the state of its biodiversity is the first step towards understanding how you can help enhance the health of the area.

You will need to plan your survey to suit the local climate, weather patterns and tides. Aim to arrive before low tide so that your sandy shore estuary surveys can be conducted at the low tide mark. Check tide times before you plan your visit.

## SAFETY MANAGEMENT AT ESTUARIES

Estuaries can be relatively dangerous places at times. Changeable tides, water movement, strong currents, large waves, sharp shells, slippery rocks or thick mud can be hazards for students.

Staff, students and the Board of Trustees of a school will need to consider many factors **before** conducting a visit outside the school, including safety, logistics, students' needs, adequate supervision / student:teacher ratios and equipment requirements. Identifying and managing risks before a trip is essential, so a prior site visit is highly recommended.

Information about safe practice in the outdoors can be found in the Education Outside the Classroom (EOTC) section of the Te Kete Ipurangi (TKI) website.

 EOTC Guidelines


This site includes information on planning, staffing and supervision, emergency preparedness, legal responsibilities, and accepted best practice for EOTC.

## ANSWERING INQUIRY QUESTIONS AT AN ESTUARY

Your investigations will depend on your students' inquiry questions and research. Identify any gaps in knowledge or opportunities for data collection or observation that would relate to the questions you have been exploring.

## STUDENTS AS SCIENTISTS

A site visit enables students to feel like they are 'real-life scientists'. Scientists make predictions and then test these by making observations, gathering and interpreting data, looking for patterns and trends, and critiquing their evidence. Students should be encouraged to engage in these science capabilities before, during and after the visit as part of their inquiry. For further information, visit the *Introducing five science capabilities* page on the TKI website.

 Introducing five science capabilities




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## FEATURED PROJECTS AND CITIZEN SCIENCE

Citizen science is a collaboration between volunteers (the public) and scientists for data collection, monitoring and research, and can be led by communities. Anyone can be a citizen scientist. Citizen science enables students to participate as part of the scientific community and contribute to increasing our knowledge about New Zealand's environment and biodiversity. Using citizen science, students can increase knowledge of the marine biodiversity in their estuary and record information in a digital format. This participation contributes to the big picture of our biodiversity knowledge and conservation in New Zealand.

For details about current estuaries projects that are suitable for New Zealand primary students, visit the DOC website.

 Featured estuary projects

## DATA COLLECTION

Data collection and observations will also depend on the direction of your students' inquiry. For example, if students are interested in a local species of concern, you may wish to gather data on the number (abundance) of this species. It may be difficult for school students to gather data in the field for some inquiry questions, so teachers may need to provide guidance about what kinds of relevant data can be collected. Observation and data collection are important aspects for developing science capabilities.

### Marine Metre Squared (Mm2)

 [www.mm2.net.nz](http://www.mm2.net.nz)

The Marine Metre Squared (Mm2) project is an example of a leading marine citizen science project in New Zealand that is organised by the University of Otago's New Zealand Marine Studies Centre.

This project makes it easy to collect data on the distribution and abundance of species and the overall biodiversity in your estuary.

The survey can be adapted for any age group – for example, younger students may focus on one or two species in a small area, while more experienced students could compare a number of metre squared surveys across their study areas.

Both rocky shore and sandy shore surveys (used for estuaries) are available for northern and southern New Zealand. Guides are also available in te reo Māori. We suggest using the Mm2 sandy shore survey method for collecting data on the biodiversity on your sandy or muddy shore, unless there is another more suitable and relevant method for your inquiry.

Recording sheets and associated resources can be found on the Mm2 website.

 Marine Metre Squared – Resources



There are several possibilities for data collection and investigation using Mm2.

- Identifying if you have a particular species in your estuary environment (noting the presence or absence of a particular species) – eg *Do we have any mud snails living in our estuary?*
- Finding out about the habitats of particular estuary animals (surveying different areas to see where animals live) – eg *Which area of the estuary do mud crabs prefer to live in?*
- Examining whether your estuary has high or low biodiversity – eg *How many different species of mud crabs, or animals and plants in general, can we find in our estuary? How does this compare to other estuaries in New Zealand? Compare your data with data collected by other students in other regions.*
- Monitoring the abundance (number) of different animals over time – eg *Have the number of cockles decreased since development occurred near our estuary?*
- Determining whether the substrate (sand and mud) in your estuary is healthy and oxygenated and comparing the biodiversity between areas – eg *Are the living things you find in an oxygenated area the same as in a less oxygenated area?*



Sandy shore observations. Photo: Shan Walker, EfS Initiatives

## iNaturalist NZ

### iNaturalist NZ

iNaturalist NZ (formerly NatureWatch NZ) is a citizen science website and information hub that allows the public to share their data and interact with real scientists and experts. Students can record their observations and photos of the animals and plants they discover on the website to share this information with the science community.






You can create your own ‘place’ (your estuary) on iNaturalist NZ and make virtual borders around the area. An excellent feature of the app/website is that experts can comment on your photos and observations and confirm or correct plant and animal identifications. For video tutorials on how to use iNaturalist, visit the iNaturalist website.

### iNaturalist NZ video tutorials



# LEARNING EXPERIENCE 9: VISITING ESTUARIES

## Resources for this activity

- DOC's Experiencing estuaries map.  
 Experiencing Estuaries
- DOC's Monitoring estuaries map.  
 Monitoring estuaries
- *Estuary animal investigators* Google slideshow.  
 Estuary animal investigators
- EOTC Toolkit.  
 Tool Kit for EOTC Management
- Marine Metre Squared (Mm2) project website.  
 Marine Metre Squared
- Example health and safety considerations.  
*Health and safety considerations for school estuary visits*  
(pages 16–19).

## Vocabulary

Experience, risk, safety, evidence, observations, critique, location, monitor, survey, biodiversity, behaviour.



Focus question  
What can we experience at our local estuary and what data can we collect there?

## Links

**To open the links throughout this resource without losing your place in the document, follow either of these steps:**

- Right click on the link and click **Open Hyperlink**. Now the link will be opened in new tab.
- Hit the **Ctrl** key while you left click the link. This will also force the browser to open the page in a new tab.

Either of these methods will open the link in a new tab leaving the teaching resource open.






## PRIOR TO YOUR VISIT

*Note: These learning experiences are suggestions only. Teachers are encouraged to adapt and change the material to suit their students' needs and interests.*


### Reflect on your inquiry so far


- Reflect on your students' inquiries and identify any gaps in your students' knowledge, as these could help to determine the focus of your visit. Brainstorm ideas and questions for investigation.
- Select a question or idea, or several questions, to investigate during your visit. What observations or data would help to answer the question(s) or support/challenge the idea(s)?
- Students can make predictions about their area of inquiry/interest (eg 'we think that the estuary will have a wide range of biodiversity because the area is surrounded by native forest', or 'we think there will be a lot of cockles at our estuary and that they will be most common on the low tide margin').


### Decide on a location and structure for your visit

- Decide on a suitable location (with access) for your estuary visit by viewing the DOC Experiencing estuaries map.  
 Experiencing estuaries map
- There are site visit notes in development to support school visits to:

Name of estuary	Location
Whangateau Estuary Manukau Harbour	Auckland
Pūkoro Kororo Miranda	Thames
Ohiwa Harbour	Whakatane
Ihutai/Avon-Heathcote Estuary	Christchurch
Ōkārito Lagoon	Weheka/Fox Glacier
Otago Harbour	Dunedin

Visit the  *Protecting our Estuaries* resource homepage to download these.



If there is no estuary near your school, visit a valued marine environment instead to investigate your inquiry question. For guidance, see DOC's resource  *Protecting our marine world*.

- Decide on a format for collecting data, recording information and making observations (eg Mm2 survey, habitat observations, bird survey).
- Find out who is monitoring your local estuaries and how you might contribute to this monitoring by viewing the Monitoring estuaries interactive map.  
 Monitoring estuaries




Students observing their finds. Photo: Shan Walker, EfS Initiatives




- Find out about community groups that are involved in conserving estuaries in your area by visiting the Nature Space website.  
 Nature Space
- For further information on estuary surveying in your area, check the Mm2 project website.  
 Marine Metre Squared


## Find out how to observe animals in estuaries

- Help students to look for the subtle signs of animals and other living things in estuaries by viewing the Google slideshow.  
 Estuary animal investigators

## THINK ABOUT SAFETY AND RISKS

- It is recommended that the teacher visits the site before the trip to undertake a risk assessment. Use the list of potential risks that was developed by students (see below) as a basis for this assessment and report back to students about your findings.
- Consider what students and teachers will need to think about to make sure they are safe in the location you are visiting. Also think about how you can keep the animals at the site safe from harm.
- Ask students which risks or potential problems they could encounter in an estuary. Consider factors such as weather, tides, currents, slips, mud, sharp shells, terrain to get onto the beaches, natural disasters, risks associated with people and becoming lost. Use the list provided in *Example health and safety considerations for school estuary visits* (pages 16–19) to help generate ideas.
- Create a list of potential risks at the estuary you will be visiting, eg slipping hazards, sharp objects, large waves, strong currents and contamination from microorganisms such as *Escherichia coli*. Contact your council and local DOC office and look out for signs at your location to identify hazards and risks.
- Decide on how you will **minimise** or **eliminate** any risks that are present and record your thinking on your Safety Action Plan (SAP) or Risk Assessment Matrix (RAM) forms.
- Complete health and safety planning and any necessary paperwork. Work through this with students using the appropriate forms from your school or from the EOTC Toolkit.  
 Tool Kit for EOTC Management
- Inform parents about the visit and ask for volunteers to help with supervision.

## Minimise your impact on your estuary

- Think about creating a care code or kaupapa to make sure that students reduce their impact on the environment they are visiting. For further information, visit the Care codes section of the DOC website.  
 Know before you go care codes



## DURING YOUR VISIT

### Karakia

This karakia (prayer) may be said at the start of each data gathering session to acknowledge our whakapapa (genealogy) and connection with the environment, including Tangaroa, the atua (supernatural beings who existed before humans) and moana (the sea).



*Ko Rangi  
Ko Papa  
Ka Puta ko Rongo  
Ko Tanemahuta  
Ko Tawhirimatea  
Ko Tangaroa  
Ko Haumietiketike  
Ko Tumatauenga  
Ko te Rangi ki runga  
Ko te Papa ki raro  
Ka Puta te ira tangata  
Ki te whaiao, ki te ao marama  
Tihei mauri ora*

### Gathering data on the biodiversity in your estuary



- Review the question(s) relating to your inquiry that you would like to answer during your visit – eg Are there cockles in our estuary? How many cockles are there and how big are they? Where do you find cockles?
- Decide how you will gather data or observations to answer the question(s) – eg perform sandy shore surveys at the high, mid and low tide marks, and count and measure the cockles in each quadrat (or quarter of a quadrat and multiply by 4 if there are lots of them).

### Mm2 survey

Citizen science on the rocky and sandy shore

Carry out your sandy or muddy shore survey using the resources and materials provided by the New Zealand Marine Studies Centre's Mm2 project.

 Marine Metre Squared – Resources



Okiwi School students monitoring shellfish on Great Barrier Island (Aotea Island). Photo: Rebecca Gibson



## Sandy and muddy shore guides

These handy guides to the common animals and plants living on the sandy and muddy seashores and estuaries of northern and southern New Zealand are available from the New Zealand Marine Studies Centre in card or waterproof versions.





## Te reo Māori shore guides

Te Reo versions of all of the shore guides may be downloaded in PDF format. Card versions are also available from the New Zealand Marine Studies Centre.

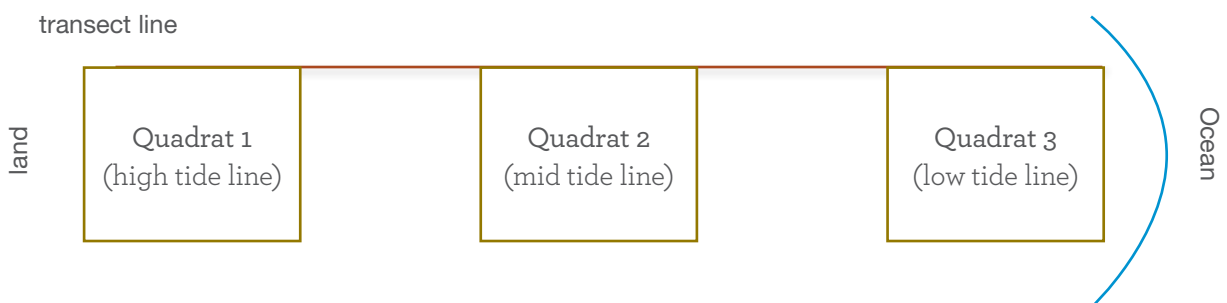
## Further information on seashore animals

For further details about individual seashore species, see:

- The Marine Life Database.  
 [www.marinelife.ac.nz](http://www.marinelife.ac.nz)
- *Collins Field Guide to the New Zealand Seashore* by Sally Carson and Rod Morris (Harper Collins, 2017).  
 Collins Field Guide to the New Zealand Seashore by Sally Carson and Rod Morris

## Using quadrats for surveys




- A quadrat is a square that is used to sample a known area.
- Younger students may only survey one quadrat or a small part of a larger quadrat (eg 10 cm x 10 cm).
- More capable students could survey multiple 1 m x 1 m quadrats along a transect (a straight line that spans multiple features of interest). For example, students could survey one quadrat at the low tide line, one at the mid tide line and one at the high tide line and compare the biodiversity and numbers of key species. The spacing of your surveys will depend on the size of the beach.








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- Groups of 3–5 students can survey one quadrat each and then report back to the group about what they found. Ensure that care is taken with living creatures. Minimise disturbance to the animals and try to put them back where you found them within a reasonable timeframe. First survey the surface creatures and then dig up several core samples using your pipe or tin (see  *Activity 8: Healthy estuaries*). Place the sand back where you found it after your survey.
- For another example of using quadrats and transects to survey shellfish, see the Science Learning Hub's *Reviving toheroa* resource.
  -  Reviving toheroa
- Add your survey results to the Mm2 project website.
  -  Marine Metre Squared

## Other possible surveys in your estuary

### Bird observations

- Record any birds you see and add them to eBird or iNaturalist back in the classroom.
  -  eBird by the Cornell Lab of Ornithology
  -  iNaturalist NZ
- If you are surveying in Taranaki, you can also contribute to Project Hotspot. Look out for reef herons and photograph their legs, and upload your photos on the project website.
  -  Project Hotspot- Reef Heron sightings

## ADDITIONAL EXPERIENCES DURING YOUR ESTUARY VISIT



Experiencing Marine Reserves (EMR) is a national programme of experiential learning about marine conservation. EMR specialises in leading safe snorkelling excursions in marine reserves, estuaries and other sites. There are EMR opportunities in Northland, Auckland, Coromandel, Gisborne, Taranaki, Wellington, Nelson and Otago. For an example of a snorkelling experiences in Whangateau Harbour, watch this video.

 Whangateau Harbour EMR Valentine's Day 2016

EMR expert facilitators also deliver Community Guided Kayak Days, an example of which can be viewed in the following video.

 Okura Kayak Day 2018

Please contact [info@emr.org.nz](mailto:info@emr.org.nz) for more information.



Tapotupotu Snorkel Day. Photo: Samara Nicholas, EMR (all rights reserved)



## REFLECTING ON LEARNING

- Before leaving the estuary, ask your students to share their highlights of the day. Students could also share their ideas about the animals they have seen and one thing they will remember from the visit.
- To encourage discussion, ask them questions – eg Were their predictions correct? Was the estuary different from what they imagined? Did they answer their original question(s)? What further information do they need?
- Repeating your surveys and looking at other results will help you to analyse your findings and critique your evidence. See the Mm2 website for more information.

 Marine Metre Squared

## AFTER YOUR VISIT – EXTENDING LEARNING

- Make a video of your visit and add it to DOC's *Our Estuaries Hub* database by emailing [ourestuaries@doc.govt.nz](mailto:ourestuaries@doc.govt.nz). Your video could also be featured on the *Experiencing estuaries map*.

 Experiencing estuaries


- For ideas about making a video/short film and supporting resources, visit the EOTC section of the TKI website.

 EOTC activity ideas – Filmmaking Modules

- Share your experience of estuaries on social media – eg see the Estuaries on social media section of the DOC website.


 Estuaries on social media

- Discuss what you could continue to monitor over time. Plan to repeat your surveys in the future and note any changes. This will allow you to determine what is 'normal' for your estuary.

- Ask students to consider what changes they saw that were due to human activity. Note these down for referring to later in your inquiry (see  *Activity 12: Environmental action for estuaries*).

## OTHER RESOURCES RELATING TO VISITING ESTUARIES

- New Zealand Marine Studies Centre's *What's on your Mudflat?* video (2 min 12 s).

 What's on your Mudflat?

- This video shows a scientist beginning an Mm2 survey and talking about looking carefully on the surface for signs of animals, eg mounds or burrows that indicate ghost shrimps.

- Guardians of Pāuatahanui Inlet's ideas for activities while at the estuary.

 Guardians of Pāuatahanui- Let's visit the inlet

- New Zealand Marine Studies Centre's *Interpreting Marine Metre Squared results* video (17 min).

 Interpreting Marine Metre Squared survey results




- Environment Southland's *Enviroteach* newsletter, February 2015.
  - 🔗 [Enviroteach, February 2015](#)
- LEARNZ *Harbours and Estuaries* virtual field trip.
  - ▶ [LEARNZ Harbours and Estuaries virtual field trip](#)
- *Collins Field Guide to the New Zealand Seashore* by Sally Carson and Rod Morris (Harper Collins, 2017).
  - 🔗 [Collins Field Guide to the New Zealand Seashore by Sally Carson and Rod Morris](#)







EXAMPLE HEALTH AND SAFETY CONSIDERATIONS FOR SCHOOL ESTUARY VISITS	
<p><i>Note: These are general ideas and example risks only, there may be unique risks present at your site. A site visit by a teacher who will be attending your visit is recommended before you write your health and safety plans to determine site specific risks for your group. Follow the protocols and policies of your school and BOT for your own detailed health and safety planning.</i></p>	
<p><b>Weather</b></p>	<p>Check the forecast the night before and the morning of your trip. Look at wave height, wind and rain predictions to decide whether the weather will enable your trip or not.</p> <p>Check both the marine and land forecasts.</p> <p>If the weather is marginal, you may need to change your plans. Also make sure there is adequate shelter available for the size of your group.</p> <p>Example risk factors: Storms, heavy rain, wave height and wind direction.</p>
<p><b>Clothing, sun safety and wet weather gear</b></p>	<p>It is recommended that students be prepared for a variety of weather conditions in estuaries. Example of clothing requirements: raincoat, full shoes, hat/sunhat, jumper, sunglasses, cool clothes that provide sun protection, waterproof gear and shoes such as gumboots. Discuss this aspect with students (and where possible, parents) well before the day.</p> <p>If some students don't own suitable clothing, try to make provisions for them before the visit: could they borrow something or use school gear? Is it possible to take spare shoes/gumboots?</p> <p>Keep safe from the sun with hats, protective clothing, and/or sunblock. Taking extra sunblock with you is suggested, for additional applications and in case any students forget hats. Seek shelter and shade when possible on hot, summer days.</p> <p>Footwear is of particular importance at estuaries. Often students will get muddy and wet. They could be advised to bring gumboots or old shoes. Ensure students have full shoes without holes in the soles.</p> <p>Jandals, sandals or open shoes are not suitable in this environment. Ensure students bring adequate clothing and equipment to keep them dry if it rains.</p> <p>Example risk factors: Exposure, sunburn, students getting wet and cold, sharp objects, deep mud, very soft sand, sharp shells, messy debris</p>



<p>Tides</p>	<p>Tides can affect many aspects of a visit. Check the tides for the day of your visit well in advance and ensure the expected tide will suit the purpose of your visit and your survey methods: Look up your area on the  MetService website under marine, surf and tides.</p> <p>Consider what the tide will be doing for your sandy shore surveys. The tide should be close to the low tide and preferably on an outgoing tide, so that water will not interfere with your survey.</p> <p>A prior site visit is recommended to check that the chosen tide will easily allow your activities.</p> <p>Example risk factors: Tides interfering with survey, students in the tide, tide cutting off routes.</p>
<p>Physical safety</p>	<p>Is the area safe for children to visit? Are there any hazards present?</p> <p>Do you have procedures that ensure students are not left alone? Will all students have access to first aid?</p> <p>Discuss what to do in certain situations, e.g. encountering unknown dogs, being approached by member of the public.</p> <p>Example risk factors: broken glass, cliffs, slippery rocks, oyster shells, metal, rubbish, toxic discharge, sewage, or waste, lost students, dog attack.</p>
<p>Kaupapa and caring for estuary animals and the environment</p>	<p>Agree on how you will look after the animals and other living things you encounter before your visit. Consider boundaries for play, noise levels and how to behave around animals when they are close.</p> <p>This is particularly important if you are visiting a reserve or sensitive habitat. Special consideration may be needed for endangered animals. The following shorebirds are nationally critical (the highest threat classification): NZ dotterels/turituriwhatu, fairy terns/tara iti and Australasian bittern/matuku horēpo, white heron/kotuku or shore plover/tūturuatu. Take extra care not to disturb these very rare species.</p> <p>Please do not take living things away with you and return objects to where you found them where possible.</p> <p>Example risk factors: Loss of or harm to animals or living things, habitat destruction.</p>



<p>Appropriate adult help and supervision</p>	<p>Example risk factors: students left alone/incidents with supervising adults, students not adequately supervised.</p> <p>Ensure that you have adequate adult helpers attending the trip. Adults should be well informed of their responsibilities before the trip.</p> <p>Decide on appropriate student: adult ratios, considering students with special needs and their requirements and safety. For example, a student with specific special needs or mobility challenges may require 1:1 supervision.</p> <p>Advise adult helpers and staff on your protocols for individual supervision of students, first aid and taking students to the bathroom. Adult helpers should also be familiar with the main points of your health and safety plans.</p>
<p>Equipment</p>	<p><b><i>Special equipment</i></b></p> <p>Think about the following factors: weather, visibility, warmth, protection from elements and risks. Is any specialised equipment needed?</p> <p>Take appropriate equipment for planned activities on site. Students may need special equipment for observations or gathering data.</p> <p>You may also need special equipment for your  Marine Metre Squared project survey: For example: sieves, quadrats/string, buckets, spades, camera/phone/iPad. See Marine Metre Squared for equipment required. Ensure there is enough equipment for multiple groups to work separately or you could have long waiting times.</p> <p><b><i>Considerations for snorkelling</i></b></p> <p>It is preferable to use an experienced provider of LEOTC programmes if planning in the water activities. Providers will have the right equipment and experience for a safe and enjoyable event. Experiencing Marine Reserves (EMR) offer excellent guided snorkelling opportunities in some estuaries across New Zealand, see  Experiencing marine reserves.</p> <p>If students are snorkelling or entering the water, they will need wetsuits and other provisions for safety. Masks, snorkels, fins, and possibly life jackets, boogie boards or floatation devices will also be necessary.</p> <p>Tides and currents are a particular concern for estuary snorkelling.</p>
<p>Site selection</p>	<p>Your survey site should be sheltered and safe for students.</p> <p>Consider a location that has suitable toilets, parking and shelter available nearby.</p> <p>Plan to spend time in spacious locations where your entire group has room to learn and move around along with their adult helpers (taking into account the tides). The teacher and at least one other helper should be familiar with the location, so that if, in an emergency, they can navigate to and from the location and/or provide details of the location to others.</p>



<p>First aid kit and medical supplies</p>	<p>Take a comprehensive first aid kit with you which contains appropriate equipment for your location. Ensure the kit is accessible to all groups with your party or have multiple kits available.</p> <p>Take any medication that students with medical needs may require during the visit, e.g. epipens, inhalers, antibiotics. It is preferable to have an adult who understands the needs of the student accompanying those with severe allergies or medical needs.</p>
<p>Contamination of sediment and water</p>	<p>Ensure students wash hands thoroughly before eating after handling any estuary water or sediment.</p> <p>Check results of recent water quality testing before your trip if possible. If contaminants are commonly found, check with your local council before you visit and minimise contact with sediment and water.</p> <p>Consult your local environmental organisations, council or DOC office for further site specific advice about your local estuary.</p>

