

The aquavan is heading to Gore and Invercargill, bringing live marine critters and touch pools to schools and communities. The aim of the project is to create awareness and understanding of the connectivity between river health and the coastal environment, in a dynamic hands-on way.



The Aquavan

Specially designed to transport marine species, the van is equipped with chilled re-circulating seawater tanks. During visits a mobile touch tank will support encounters with a diversity of live marine animals, alongside other fun activities to show how the health of our catchments, rivers, and coasts are all interconnected.



The Schools and Communities

The programme is targeted at upper Primary and Intermediate level in the Gore and Invercargill areas. Classes are expected to complete pre and post trip activities as part of the programme.



The Programme

Through fun hands on activities, students will be engaged in learning more about impact we have on our coastal and freshwater environments, what's happening in our catchments, and how we can all help look after our water and waterways. The marine animals and plants will provide a focus for discovery learning and stimulus for discussion about environmental issues and responsibilities.



The Route

The Aquavan will be visiting the Mataura and Oreti River catchments.

Event Info

Thursday 11 March, 6pm to 8pm Gore Town and Country Club Saturday 20 March, 10am to 3pm ILT Stadium Southland Foyer

Bring the family and come along and have some fun!

For further details contact Sarah Thorne 021 588 5200 sarah@thrivingsouthland.co.nz

















Greetings from the Aquavan Crew,

We are looking forward to visiting Southland and meeting you and your students. We will plan to arrive at the venue an hour in advance of the first scheduled class to set up.

The only extra equipment you need to bring on the day of your Aquavan session is a Teacher's laptop. We can then set up Story Map link with log-ins etc... for follow-up activities.

As part of the programme the senior students will help build a Story Map (<u>https://storymaps.arcgis.com</u>) connecting their river with the sea, learning about their river's catchment on the way. We hope that you will follow up the Aquavan visit with some further study and environmental action and add to this Story Map. You might want to meet your local Catchment Group and see if you could work together on an activity or project: <u>https://www.thrivingsouthland.co.nz/catchment-groups/</u>

To help with the building of the story map, it would be useful if you (or students) could take some photos of your local area:

- High point of land
- Local stream (and/or river, lake)
- People using the local stream
- Historic photos of the stream could be useful for post-trip study

In response to last year's programme, we have found it beneficial for teachers involved to **attend a PLD session** prior to our visit. This will cover the themes of our programme and technology we introduce (ESRI Story Map ArcGIS and KineMaster). Teachers are expected to attend this in order for their class to partake in the visit.

We are able to offer this programme to Gore and Invercargill Schools thanks to the Ministry of Primary Industries, Sustainable Landuse Package.

Please do not hesitate get in touch if you have any further questions with Adelle Heineman or the other NZ Marine Studies Centre educators. We are excited to be supported by Thriving Southland, Environment Southland, Hokonui Runanga, Waihopai Runanga, Rotary and the Gore-Waimumu and Waihopai Catchment Groups on the Aquavan programme.

See you soon!

Adelle Heineman, NZ Marine Studies Centre, Curator (027 453 2489) Aaron Heimann, NZMSC Interpreter (021 235 7198)





<u>Aquavan – Discovering our coastal connections</u>

Pre-Trip Activities

• Explore your local waterways

As a class, or as homework, have your students complete the Local Waterway Scavenger Hunt (attached) in the school yard or local area. The key is to be outside to do the activity!

- Tick when items found and observations described.
- Please have photos on data stick for use during the Aquavan programme (we will upload a copy and add them to your storymap!).

• Map your local waterways

Find a map of the local region to investigate the streams, rivers and the coastal environment. Google maps and aerial photos may also be useful.

- Colour the river water light blue and sea water dark blue.
- Add arrows to show the direction the water in the streams and rivers is flowing.
- Where are the hills or areas of high ground? Colour these areas brown.
- What is the source of the water in the river? (think about the water cycle).

• Map your catchment

- Brainstorm the term 'catchment'.
- Use another colour to predict the catchment area within the catchment boundary.
- Where does the water from your catchment go?
- Make a model of your catchment and what is special in it.

• Get to know your local Catchment Group?

- Invite members of your local Catchment Group to visit your school. Show them your work and ideas, and interview them on what they do.
- Brainstorm some projects and activities that you could do together.

• Why are your waterways important?

- Make a list of how your waterways are used.
- Interview parents and local farmers (often members of your local Catchment Group), council or DOC staff and other stakeholders to find out why they think waterways are important. You may also ask what their concerns are and gather their ideas for better management.

• What animals and plants live in your waterways?

- a. Do some research on local freshwater species
- b. What adaptations, or special features, do these animals have to live in water?
- c. Check out these freshwater colouring-in sheets: https://www.taupofortomorrow.co.nz/freshwater-colouring-in
- d. Look at the amazing activities and information in the Junior Landcare Guide: <u>https://www.landcare.org.nz/file/junior-landcare-handbook-2020/open</u> and other amazing school resources: https://www.landcare.org.nz/resource-item/hooked-on-native-fish

- How does freshwater (from rivers and lakes) differ from seawater (from the ocean)?
 - a. Brainstorm ideas.
 - b. Where does the freshwater meet seawater? How does the water change?
 - c. Investigate what the term estuary means.

• How does the community change from freshwater to seawater?

- a. What animals and plants live in the estuary?
- b. What animals and plants live in the sea?
- c. Are there any animals that can live in freshwater and the sea?
- d. Add them to your map (use drawings or symbols to show where they live)







water is being used for? Observe two things Photograph it.



water from your river Where does the /stream go?

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Find (or describe) 2 animals that live in water.



something and add your observations.

don't belong in our Find 2 things that stream/river.

roots. How long do you Find something with



Find some water.

Where?

Taste some water. Describe.

Name the highest point of land? Photograph it.

Name your closest river/stream. Photograph it.



What direction is the river flowing?

Name 2 other things that Find a water drain

go down the drain)



Find two things that absorb water.

Find two types of



is moved by rainwater. Find something that



has been worn away by Find something that

















puddles form. What is Find a place where its shape?



water in the puddles

goż

Where does the

















Discovering our Local Waterways



Sea Slugs/Rori





Duck's Bill Limpet Scutus breviculus

Blue Mussel



Bivalves/Angarua

Oyster Ostrea chilensis

Snails/Pūpū



Cat's Eye Snail Lunella smaragda



Swollen Trumpet Snail Argobuccinum pustulosum

Sea Squirts



Chitons/Papatua



Butterfly Chiton Cryptoconchus porosus

Green Chiton Chiton glaucus



Snakeskin Chiton Sypharochiton pelliserpentis

Seaweeds/Rimurimu



Neptune's Necklace . Hormosira banksii



Encrusting Coralline Algae Corallina sp.

Sea Stars/Papatakaroa



Spiny Sea Star Coscinasterias muricata Three and Three Star Allostichaster insignis

Apricot Sea Star Sclerasterias mollis

Cushion Star Patiriella sp.

Sea Urchins/Kina



Kina Evechinus chloroticus

Sea Cucumbers/Rori



Sea Cucumber Austrostichopus mollis

Worms/Noke Moana



Blue Tube Worms Spirobranchus cariniferus







marine.ac.nz

Anemones/Kotore Moana

Biscuit Star

Pentagonaster pulchellus



Jewel Anemones Corynactis haddoni



Apricot Anemone Bunodactis chrysobathys

Crabs/Pāpaka



Hermit Crab Pagurus sp.

Camouflage Crab Notomithrax sp.

Barnacles/Tio Tio



Modest Barnacles Austrominius modestus



Plicate Barnacles Epopella plicatus



Freshwater Resources

- Enviroschools resources <u>www.enviroschools.org.nz</u>
 - Water of Life teaching unit
 - WaiRestoration resource
- Environment Southland resources
 - Education What we offer <u>https://www.es.govt.nz/environment/education/what-we-can-offer</u>
 - Environmental Education <u>https://www.es.govt.nz/environment/education/backyard-activities</u>
 - The water story <u>http://waterstory.es.govt.nz/</u>
 - Stream connections educational resource <u>https://www.es.govt.nz/repository/libraries/id:26gi9ayo517q9stt81sd/hierar</u> <u>chy/environment/education/what-we-can-offer/documents/stream-</u> <u>connections-all-pages1.pdf</u>
 - Environmental data about rivers http://envdata.es.govt.nz/index.aspx
 - Community groups <u>http://envdata.es.govt.nz/index.aspx</u>
- Environment Canterbury Resources
 - <u>https://www.ecan.govt.nz/get-involved/youth-engagement-and-education/education-programmes/programmes/</u>
 - o Waitahu Wai programme
 - Stormwater programme
 - Stormwater animation, making a positive difference to health of our waterways, Caring for Inanga/whitebait spawning sites <u>https://www.ecan.govt.nz/your-region/your-environment/water/whatshappening-in-my-water-zone/banks-peninsula-water-zone/make-a-positivedifference-2/</u>

Mahinga kai http://www.canterburywater.farm/fep/mahinga-kai/

- New Zealand Landcare Trust school resources
 - Junior Landcare Guide: <u>https://www.landcare.org.nz/file/junior-landcare-handbook-2020/open</u>
 - Hooked on Native Fish: <u>https://www.landcare.org.nz/resource-item/hooked-on-native-fish</u>
 - Invertebrate Identification Challenge: <u>https://www.landcare.org.nz/file/invertebrate-identification-challenge/open</u>
 - Native Fish Identification Challenge: <u>https://www.landcare.org.nz/file/native-fish-identification-challenge/open</u>
 - NZLT Kids Activity Sheets: https://www.landcare.org.nz/file/nzlt-kids-activity-sheets/open
 - Stream Macroinvertebrate Identification Challenge: <u>https://www.landcare.org.nz/file/stream-macroinvertebrate-identification-challenge/open</u>
- Whitebait Connections –
 <u>https://www.whitebaitconnection.co.nz/</u>
- EOS Ecology Whaka Inaka project

https://www.eosecology.co.nz/Our-News/Whaka-Inaka-Causing-Whitebait.asp

- Catchments Otago
 - Information about scientific studies <u>http://www.catchmentsotago.org/</u>
 - Fish Species in Lake Wanaka poster http://www.catchmentsotago.org/resources/
 - Zooplankton and Algae in Lake Wanaka poster <u>http://www.catchmentsotago.org/resources/</u>
- Department of Conservation resources
 - o https://www.doc.govt.nz/get-involved/conservation-education/resources/
 - Awesome Eel activity sheet <u>https://www.doc.govt.nz/Documents/conservation/native-animals/Fish/awesome-eels-activity-sheet.pdf</u>
- LAWA (NZ Water quality data) <u>www.lawa.org.nz</u>
- Waicare Education Resources:
 - <u>https://waicare.org.nz/Resources/forteachers.aspx</u>

Marine Resources

- NZ Marine Studies Centre resources, <u>www.marine.ac.nz/resources</u>
- Marine Metre Squared citizen science project and resources, including seashore species guides <u>www.mm2.net.nz/resources</u>
- LEARNZ virtual field trip videos Sustainable Seas http://www.learnz.org.nz/sustainableseas181/videos
 - The value of estuaries
 - Ecosystem services what role cockles play in the ecosystem
 - \circ Cockle sampling and habitat comparison with Brooklyn School
 - Impacts on estuarine ecosystems
- Environment Canterbury resources
 - Mahinga Kai <u>http://www.canterburywater.farm/fep/mahinga-kai/</u>
- Department of Conservation resources
 - o <u>https://www.doc.govt.nz/get-involved/conservation-education/resources/</u>
- Young Ocean Explorers web site
 - o http://www.youngoceanexplorers.com/
- Information about tipping points and the health of our estuaries
 - <u>https://www.radionz.co.nz/national/programmes/ourchangingworld/audio/</u> 2018634881/tipping-points-and-the-health-of-estuaries
- Collins Field Guide to the New Zealand Seashore Book and Teacher Notes
 <u>https://www.thenile.co.nz/books/rod-morris/collins-field-guide-to-the-new-zealand-seashore/9781775540106</u>
- Science Learning Hub Estuaries, food webs, human impacts etc. <u>https://www.sciencelearn.org.nz/topics/estuaries</u>
- Newspaper articles about sources of sediment in the marine environment
- <u>https://www.stuff.co.nz/environment/105679742/coastal-pollution-flows-into-orewa-waterways?cid=facebook.post.105679742</u>

FREE CLASS TRIP to the NZ Marine Studies Centre for your School

We expect that your class will follow-up the *Aquavan, Discovering Our Coastal Connections* and learn more about the pathways from their community to the sea and how the marine environment may be affected by activities on land. We hope the students are able to identify some environmental actions that they can do in their school, home and community.

Tell us what follow-up actions your class has done by October 15 2021 and the whole class may win a trip to **NZ Marine Studies Centre** (Department of Marine Science, University of Otago) in Dunedin (www.marine.ac.nz). Story Map (see attached info) is one way you may want to share your stories, but we welcome any format.

Please share your research, ideas and actions with the NZ Marine Studies Centre and your community.

Tools for Environmental Action

- <u>https://www.doc.govt.nz/get-involved/conservation-education/resources/tools-for-environmental-action/</u>
- <u>http://storymaps.arcgis.com</u> (instructions to use story map attached)

Ideas for Environmental Action

- Do a stream study
- Carry out a Marine Metre Squared survey in your estuary Enter into a national database (www.mm2.net.nz). What did you find and how would these species be affected by an increase in sediment or nutrients? Earn your Kiwi Guardians Medal through completing this activity! <u>https://www.doc.govt.nz/parks-and-recreation/places-to-go/toyota-kiwiguardians/take-action/citizen-scientist/</u>
- Compare historic photos of your river with current photos *Identify what has changed and what is the impact of the change.*
- Make a timeline of your river and its catchment *Draw and write on what has happened and think why these changes have happened over time.*
- Make a model of your catchment as a class or individual Think about what makes it special to you and what you could do to look after your special bits.
- Talk to your local Catchment Group *Come up with ideas to work together on projects and activities.*
- Get involved in local restoration of your wetlands help with replanting projects, raise money for native plants or grow them yourselves.
- Interview the community Do they know their river is connected to the sea? What concerns do they have about the health of the river? What are they doing to look after their river?
- Write an article for the school newsletter or local paper *Highlight a positive action being done by the local farmers, Catchment Groups, community groups etc. to look after the local environment.*
- Write stories or create art works to raise awareness about the issues surrounding river health and highlight how everyone can help look after their waterways. Put up a display at the local library.
- Write a letter to the local council to highlight your concerns (or tell them what you think they are doing well!)
- Do some research to investigate the health of your waterways. *Check out the LAWA web* site to check out water quality in your catchment e.g. 34 monitoring sites in the Waitaki region <u>https://www.lawa.org.nz/explore-data/canterbury-region/river-quality/upper-and-lower-waitaki-catchment/</u>



Portobello Marine Laboratory & NZ Marine Studies Centre at Portobello, Dunedin.

AQUAVAN FOLLOW-UP - STORY MAP

Why use Story Map?

Story Map ArcGIS is an online program that enables data to be displayed in the form of a story. The program is free, does not require any pre-downloaded apps, is easy to use and most importantly it provides access to ArcGIS. GIS stands for 'geographic information system', and is commonly used by scientists to display spatial data on maps. Story Map enables users to connect with scientists, regional councils etc, and access some of their pre-made ArcGIS maps, or you can create your own.

Story Map ArcGIS is easy to use, and is able to integrate both maps and pictures to help explain the scientific issue at hand. It can be a fun, interactive, visual way for students to understand and explain scientific issues within their community. It can also be used as a way to share their data and observations with a range of interest groups.

Story Maps can be kept private (if you have any sensitive data), or shared. It's a great way to share your stories and class activities across the community and with other schools or groups in the same river catchment.

The following is a simple "How to" guide for students and teachers to add their action plans to their Story Map - <u>https://storymaps.arcgis.com/stories/cea22a609a1d4cccb8d54c650b595bc4</u>

Go to Story Map

Go to (<u>https://storymaps.arcgis.com</u>) and sign in for your school. We have already set up accounts for your school and the login information follows the following format.

E.g. Username: (use your school name e.g. SawyersBaySchool) Password: Aquavan1

Coastal Connections Story Map

A Story Map template has been created for you and during the teachers workshop we will show you how to add to it. Then it will become yours to do develop as a class. Feel free to add to or change as you want. We are hopeful you will use it to share your learnings and develop your action plan. Feel free to upload your own photos, art work, interviews, videos, stream monitoring data and more.

Here are previous winners of the Aquavan Programme Story Map Competition:
2018 – Otama Primary <u>https://arcg.is/LLPr8</u>
2019 - Riverton Primary <u>http://bit.ly/30VFEfz</u>
[WORLD IN OUR HANDS - YouTube](<u>https://www.youtube.com/watch?v=SX8J9qfiDLA</u>)

For further support with storymaps contact Aaron Heimann, aaron.heimann@otago.ac.nz