Northland's Coast and Us

Our estuaries

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What is an estuary?

Locate and explore an estuary near you.

A sheltered, semi-enclosed body of water where fresh and salt water mix

- Usually has large sand and mud flats that are exposed at low tide and covered at high tide
- An estuary is constantly changing and reshaping

Tinopai Estuary

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What is an estuary?

An estuary is rich in nutrients that are carried into it from the land by rivers and streams, and from the sea by the tides. Tidal movements shift nutrients between the estuary and the open sea.

Ngunguru Estuary

Be an estuary detective. Find out about the nutrients entering a local estuary.

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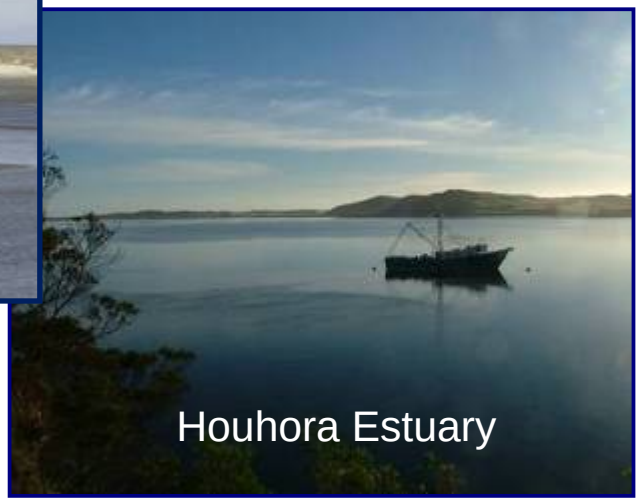
Where are Northland's estuaries?

Estuaries can be found all around Northland's coast.



Use photos to compare and contrast a local estuary with others in Northland.

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How were Northland's estuaries formed?

Interview local experts to determine how your local estuary was formed.

Estuaries are often drowned river valleys.

Most Northland estuaries were formed about 10,000 years ago when sea levels rose as ice melted after the last Ice Age.

Kaipara Harbour. Photo: Te Ara

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Why are estuaries important?

Shelter, food and a nursery for birds and marine creatures.

Investigate the birds and marine life that use your nearest estuary. How can you help protect them?

Dolphins in Te Puna Inlet

Godwits at Marsden Bay

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Why are estuaries important?

Why do estuaries suit these activities?

Recreation such as boating, swimming fishing and marine farming


Houhora


Whananaki


Oyster farm, Hāparua Inlet

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Why are estuaries important?

Which major Northland towns are in estuaries? Use old photographs to make a model of a local estuary in times past.

Northland's estuaries and harbours were often sites of early Maori and European settlement because of their natural shelter for water craft.


Tōtara North


Mangonui.
Photo: NZ Pictures.co.nz

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How does an estuary work?

Salt water from the sea and fresh water from the land are constantly mixing. Sometimes salt water and fresh water are found in separate layers. When the tide is not moving much, fresh water flows above the more dense salt water to form a wedge-shaped bottom layer.

Sample the water in various parts of your estuary to test for salt or fresh water content.

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How does an estuary work?

This separation between fresh and salt water breaks down on an outgoing low tide when the waters swirl around more. This mixing creates zones of brackish or diluted sea water.

Create a dance to show the mixing of estuary waters.

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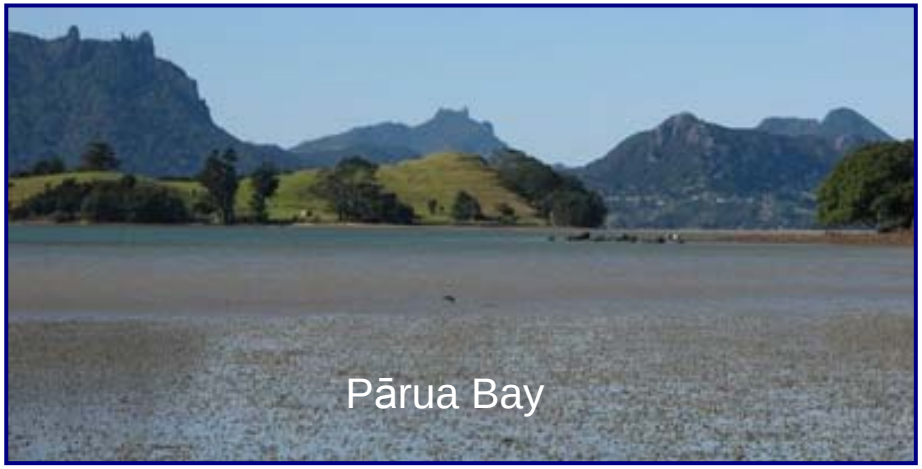
How does an estuary work?

Estuary water contains sediments like sand and mud from the sea and rivers. These sediments settle to form sand and mud flats.



Pārua Bay

Visit your local estuary at low tide and examine the mud flats.

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How does an estuary work?

Take a boardwalk through a Northland mangrove forest.

Mangrove forest, Hātea River inlet

These sand and mud flats create rich environments for millions of creatures and plants. Mangroves are one such plant. They take root and help stabilise the sediment.

How does an estuary work?

Seagrass may also establish on mud flats, starting a chain of events that leads to the creation of a salt marsh.

Locate a salt marsh in your local estuary. How can you help protect this special environment?

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Why is an estuary so productive?

Estuaries are rich in nutrients, encouraging thousands of different sorts of life forms.

Whananaki Estuary Monitoring

Why is an estuary so productive?

Estuary plants and phytoplankton absorb nutrients at a fast rate, growing rapidly and producing lots of food for estuary creatures.

Aurere Estuary

Create a food web using the plants and animals in an estuary.

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Why is an estuary so productive?

Estuary water temperature helps plants grow. Plants photosynthesise during the day, producing oxygen for estuary creatures. At night, plants respire and use the available oxygen themselves.


One Tree Point

Take the water temperature in various parts of your estuary. Discuss any differences in temperature.

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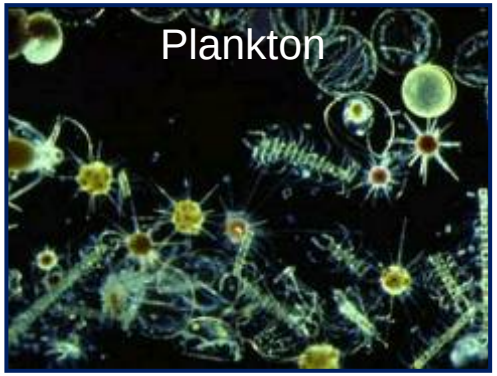
What is found in Northland estuaries?

An estuary contains hundreds of different creatures including

- plants
- birds
- fish
- crabs
- snails
- marine mammals
- plankton
- shellfish
- detritus (dead organic matter)



Take a sound log in your estuary at different times of the day. What creatures can you hear?

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What plants are found in Northland estuaries?

There are many specially adapted plants living in Northland estuaries. Estuaries are harsh environments for plants. Northland estuary plants include mangroves, seagrass, glasswort and sea rushes.

Mangroves and seagrass, Pārengarenga

Choose a plant living in an estuary and investigate how it has adapted to this environment.

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What plants are found in Northland estuaries?

Mangroves (manawa)

- grey trunks, olive-coloured leaves and yellow flowers
- vertical breathing roots (pneumataphores) that take in air at low tide
- mangroves drop young plants (propagules) into the sea where they grow or float away to start new colonies

Debate the mangrove's positive and negative impacts.

What plants are found in Northland estuaries?

Locate a seagrass meadow near you.

Seagrass (karepo/nana)

- the only flowering plant living in the sea
- small, dark green, grassy plants with ribbon-like leaves
- lives on tidal flats
- forms large meadows from just above low tide level to full submersion in sea water
- provides an important nursery area for young fish
- stabilises sediment
- seagrass regeneration projects are contributing to the regrowth of this plant

Seagrass trials at One Tree Point

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What plants are found in Northland estuaries?

Glasswort (ureure)

- a succulent herb with jointed, green stems
- grows in salt marshes and meadows
- forms a low, dense mat
- roots help bind underlying mud and silt, encouraging sediment to settle

Locate and sketch glasswort in an estuary.

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What plants are found in Northland estuaries?

Sea rushes

- wiry, erect stems, pale sheaths
- grows estuary banks
- pioneer estuary plant leading the way for other bigger plants to become established

What is a pioneer plant?

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What birds are found in Northland estuaries?

Estuaries are home to many different birds. These include shags, kingfishers, oystercatchers, banded dotterels, herons and spoonbills.

Locate and name the birds in your local estuary, as these students are doing.

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What birds are found in Northland estuaries?

Thousands of wading birds migrate from around the world to spend the New Zealand summer in Northland's estuaries. Eastern bar-tailed godwits and lesser knots are the most common.

Start an annual community event to celebrate the arrival or departure of migratory birds in an estuary near you.

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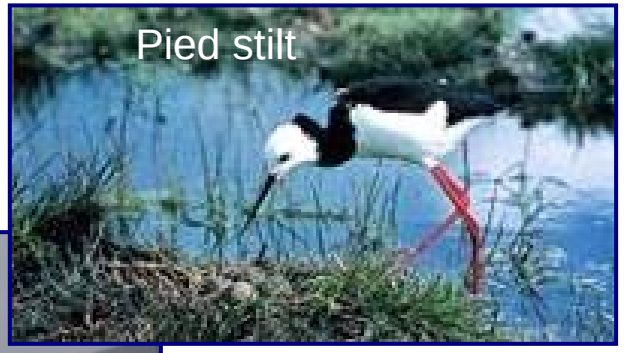
What birds are found in Northland estuaries?

Wading birds that breed in and around Northland estuaries include oystercatchers, herons, banded and New Zealand dotterels and pied stilts.



Make signs to keep people and their dogs away from nesting estuary birds. Ask permission to put them up on or near your estuary.

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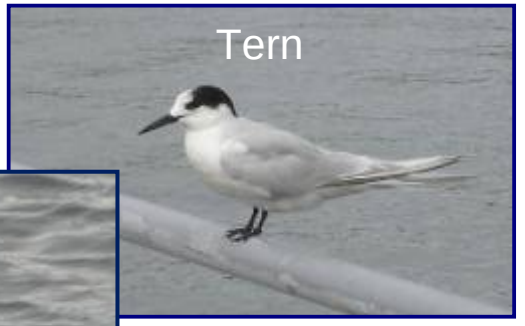
What birds are found in our estuaries?

Other estuary birds include gulls, shags and terns.

Invent a puppet show to demonstrate how estuary birds interact with each other and their environment.



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Select an estuary fish. What parts of its life cycle are spent in estuaries?

What fish are found in our estuaries?

At least 30 fish species use estuaries at some stage of their life cycle. These include

- flounder
- gurnard
- kahawai
- mullet
- parore
- red cod
- trevally


Kahawai
Photo: Wade Doak


Trevally
Photo: Keith Cardwell


Flounder
Photo: Jenny and Tony Enderby


Yellow-eyed mullet
Photo: Jenny and Tony Enderby

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What small creatures are found in our estuaries?

A large number of Northland estuary creatures live in the mud. They include cockles, pipi, crabs, worms and snails.


Cockles


Worms

Monitor estuary creature populations.

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Why are Northland's estuaries special to Maori?

As a source of identity – a sense of place.

Estuaries have high value to Māori, providing fish, shellfish, birds, flax and other traditional items.


Pārengarenga

Visit or stay at a marae at an estuary near you. Ask about the meaning of that estuary to local Maori.

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What threatens Northland's estuaries?

Estuaries are easy to access meaning people and industries have had a major impact.

This includes reclamation, port or road construction, over-harvesting of estuary creatures and flood prevention works and more.

Research how local estuary use has changed overtime.

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What threatens Northland's estuaries?

- stormwater
- pesticides
- leached nutrients from farm fertiliser
- oils and dispersants
- urban runoff

Switch to eco-friendly cleaners to help protect Northland estuaries.

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What threatens Northland's estuaries?

Survey industries alongside an estuary near you. What are they doing to protect the estuary from pollution?

- anti-fouling paints from the ship industry
- heavy metals from rubbish and roads
- oil and bilge spills at boat ramps or refuelling depots
- sewage from leaks, floods or faulty sewerage systems

Paint discharge
Whāngārei Harbour

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What threatens Northland estuaries?

Keep an eye out for marine pests in your estuary. Report their location to the Northland Regional Council 0800 002 004 or Biosecurity NZ 0800 80 99 66.

Marine pests such as the Asian paddle crab, and sea squirt have been found in Northland estuaries. Ships bring the danger of marine pests through ballast water spills, discharges and other means.

Asian paddle crab

Sea squirt

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What does Northland Regional Council do to help?

The Northland Regional Council contributes to sustainable management of estuaries by helping keep them clean, free of pests and weeds, by enforcing marine pollution regulations and much more.

Go to www.nrc.govt.nz to see what the council does to look after estuaries.




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How can you look after Northland's estuaries?

- Keep oil, paint, detergents and other pollutants out of drains
- Fence off streams from stock
- Replant native coastal vegetation to prevent erosion and fertiliser leaching into the water
- Make sure boats don't spill fuel or sewage into the harbour


Whāngārei Town Basin

Refuel your boat with care. Keep fuel out of the water.

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How can you look after Northland's estuaries?

Call the Northland Regional Council environmental hotline 0800 504 639 to report estuary issues.

- Start an estuary care group
- Spread the word about caring for estuaries
- Stick to the rules when catching fish and gathering shellfish
- Hold a community estuary clean up day
- Call the Northland Regional Council environmental hotline to report estuary pollution

Onerahi

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Our estuaries

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