**ACTIVITY: Hubbub Estuary**

**Activity idea**

In this activity, students become aware of the importance of estuaries. They identify some possible impacts on estuaries and possible actions that can be taken to protect them.

By the end of this activity, students should be able to:

* explain the value of estuaries
* identify some key threats to New Zealand estuaries
* identify some possible solutions for threats to estuaries.

[Introduction/background notes](#Introduction)

[What you need](#need)

[What to do](#Do)

Student handout: [Hubbub Estuary](#handout)

**Introduction/background**

People like to live near estuaries. This means that people and industry can have a major impact on estuaries. Many estuaries have been significantly changed by port or road construction and land reclamation. Other effects on estuaries include deforestation, farming, horticulture, erosion, urban and industrial development and excessive harvesting of marine animals such as shellfish, kina, crabs and flounder. Such impacts may threaten the balance of estuary ecosystems.

Estuaries are an important resource. They are breeding grounds for the ocean’s fish, maintain the health of coastal fisheries and water, are a buffer between land and sea, have commercial value to the fishing industry, are harbours for ships and boats coming in to land, have cultural significance for Māori, attract tourists and are a place for recreation and tranquillity.

This activity helps students to become aware of the importance of estuaries. They identify some possible impacts on estuaries and possible action that can be taken to protect them.

Possible impacts on the [Hubbub Estuary](#handout) in the student handout are:

1. Deforestation for farms and housing.

2. Land slips (erosion) - leads to sedimentation.

3. Coastal housing development - could lead to sedimentation and pollution (through run off).

4. Reclaiming land through drainage.

5. Removing saltmeadow for farmland.

6. Industrial development. Run-off from industry and farms carries pollutants into the estuary.

7. Reclaiming land for roading. Pollution such as heavy metals could be washed off the roads into the estuary.

8. Bridges - restricts natural estuary tidal flows inland.

9. Rubbish dumped - unsightly and can leach dangerous pollutants into the estuary.

10. Cows grazing near the estuary - effluent leaches into the water, polluting the water.

11. Accidental chemical spills - heavy metals and PAHs get into the water and possibly into the food web.

12. Fertilising farmland - over fertilising could lead to nutrients leaching into the estuary causing eutrophication

The types of pollution that could get into this estuary are leached nutrients from farm fertiliser, pesticides, PAHs and heavy metals in oils and dispersants from industrial and urban run-off.

**What you need**

* Access to the articles [Human impact on estuaries](https://www.sciencelearn.org.nz/resources/1231-human-impact-on-estuaries), [Valuing estuaries](https://www.sciencelearn.org.nz/resources/1232-valuing-estuaries) and [Protecting estuaries](https://www.sciencelearn.org.nz/resources/1233-protecting-estuaries)
* Access to the video clips [Estuaries in New Zealand](https://www.sciencelearn.org.nz/videos/649-estuaries-in-new-zealand) and [Estuary issues and protection](https://www.sciencelearn.org.nz/videos/650-estuary-issues-and-protection)
* Copies of the student handout [Hubbub Estuary](#handout)

**What to do**

1. In small groups, have students read and discuss [Valuing estuaries](https://www.sciencelearn.org.nz/resources/1232-valuing-estuaries) and [Human impact on estuaries](https://www.sciencelearn.org.nz/resources/1231-human-impact-on-estuaries) and watch and discuss the video clips [Estuaries in New Zealand](https://www.sciencelearn.org.nz/videos/649-estuaries-in-new-zealand) and [Estuary issues and protection](https://www.sciencelearn.org.nz/videos/650-estuary-issues-and-protection).
2. As a class, discuss impacts on estuaries and what it may mean for the estuary, for the greater environment and for people.
3. Distribute copies of the student handout [Hubbub Estuary](#handout). In small groups, have students identify the threats to the Hubbub Estuary and list them.
4. Discuss the threats as a class.
5. As a class, read [Protecting estuaries](https://www.sciencelearn.org.nz/resources/1233-protecting-estuaries).
6. Have groups go back to Hubbub Estuary and see if they can come up with a possible solution for each threat that might help to protect the estuary.

**Student handout: Hubbub Estuary**

