**ACTIVITY: Identifying marine stressors**

**Activity idea**

In this activity, students use online or paper resources to identify potential human-induced marine stressors. Students can then use this information to consider steps they can take as individuals or as part of the school or community to help reduce the stress.

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

* identify marine stressors linked to human activities
* use online resources to learn more about marine stressors
* identify actions they can take to minimise stressors.

[Background information for teachers](#Introduction)

[Student instructions](#student)

**Background information for teachers**

Most students are aware of stress and resilience when discussed in human terms. We know that, no matter how resilient a person tries to be, stresses can build up and cause health problems. These concepts can also be applied to ecosystems.

At the moment, New Zealand is managing its marine resources at limits set by a single stressor in isolation such as sediment loading. This puts the resiliency of an ecosystem to cope with change at risk when affected by additional stressors such as harvesting or climate change.

This activity is an introduction to marine and coastal stressors and provides very simple descriptions for each stressor. Deepen and support student understanding and engagement with some of the related resources listed in the student instructions.

Encourage students to consider actions they can take to minimise stressors, both as individuals and as a community. Related resources for taking action are also included in the student instructions.

**Student instructions**

***Online resource instructions***

1. Use the [interactive diagram](https://www.sciencelearn.org.nz/labelling_interactives/2-marine-stressors) to identify and label the different marine and coastal stressors.
2. Hover over the labels for more information about the stressor.
3. To check your answers, use the reset incorrect button.
4. Find out more about individual stressors by reading or viewing some of the articles and media listed under additional resources on the next page.

***Paper-based resource instructions***

1. Cut up and match the marine stressor labels with the descriptions of the stressors.
2. Use this information to label the stressors on the marine stressors diagram.

**Marine stressors**

|  |  |  |
| --- | --- | --- |
| Climate change | Contaminants | Modifying estuaries |
| Offshore activity | Overharvesting | Nutrients |
| Sediment |

**Descriptions**

|  |  |  |
| --- | --- | --- |
| Commercial fishing, dredging and oil exploration can affect fish stocks and degrade habitats. | Depleting fish and shellfish stocks affects food webs and can impact water quality. | Erosion from land clearance can cloud the water and smother sea life. |
| Increasing CO2 levels can lead to ocean acidification. Warming seas affect habitats. | Nutrients from fertilisers and animal effluent can impact water quality. | Removing vegetation (like mangroves), land reclamation and stopbanks can affect habitats. |
| Sewage, stormwater, spills, rubbish and other urban activities can impact water quality. |

**Additional resources**

***General resources on marine stressors***

[Ecosystem tipping points and stressors](https://www.sciencelearn.org.nz/resources/2579-ecosystem-tipping-points-and-stressors) – article

[Investigating marine and coastal tipping points](https://www.sciencelearn.org.nz/resources/2580-investigating-marine-and-coastal-tipping-points) – article

[Resilience to stress](https://www.sciencelearn.org.nz/resources/1129-resilience-to-stress) – article

[Human impacts on marine environments](https://www.sciencelearn.org.nz/resources/144-human-impacts-on-marine-environments) – article

***Climate change***

[The ocean and the carbon cycle](https://www.sciencelearn.org.nz/resources/689-the-ocean-and-the-carbon-cycle) – article

[Ocean acidification](https://www.sciencelearn.org.nz/videos/30-ocean-acidification) – video

[Climate change, melting ice and sea level rise](https://www.sciencelearn.org.nz/resources/2277-climate-change-melting-ice-and-sea-level-rise) – article

***Nutrients***

[Estuaries and farmland run-off](https://www.sciencelearn.org.nz/resources/138-estuaries-and-farmland-run-off) – article

***Contaminants***

[Oceans of rubbish](https://www.sciencelearn.org.nz/resources/2074-oceans-of-rubbish) – article

[Estuaries and farmland run-off](https://www.sciencelearn.org.nz/resources/138-estuaries-and-farmland-run-off) – article

[Ihumatao – past and present](https://www.sciencelearn.org.nz/resources/1687-ihumatao-past-and-present) – article

***Offshore activity***

[Resilience to stress](https://www.sciencelearn.org.nz/resources/1129-resilience-to-stress) – article

[Fisheries in New Zealand – timeline](https://www.sciencelearn.org.nz/resources/1865-fisheries-in-new-zealand-timeline) – media

[Pollution from Rena](https://www.sciencelearn.org.nz/resources/1138-pollution-from-rena) – article

[Ecosystem overfishing](https://www.sciencelearn.org.nz/images/1276-ecosystem-overfishing) – diagram

***Overharvesting***

[Revive Our Gulf](https://www.sciencelearn.org.nz/videos/730-revive-our-gulf) – video

[Reviving toheroa](https://www.sciencelearn.org.nz/resources/1048-reviving-toheroa) – article

[Understanding kaitiakitanga](https://www.sciencelearn.org.nz/resources/2544-understanding-kaitiakitanga) – article

***Sediment***

[Estuaries and farmland run-off](https://www.sciencelearn.org.nz/resources/138-estuaries-and-farmland-run-off) – article

[Human impacts on the Bay of Plenty](https://www.sciencelearn.org.nz/resources/1137-human-impacts-on-the-bay-of-plenty) – article

***Modifying estuaries***

[Human impact on estuaries](https://www.sciencelearn.org.nz/resources/1231-human-impact-on-estuaries) – article

[Estuaries and farmland run-off](https://www.sciencelearn.org.nz/resources/138-estuaries-and-farmland-run-off) – article

***Ideas for taking action***

[Carbon dioxide emissions calculator](https://www.sciencelearn.org.nz/resources/1588-carbon-dioxide-emissions-calculator) – activity

[Environmental thinking and planning with ecosystem-based management](https://www.sciencelearn.org.nz/resources/2505-environmental-thinking-and-planning-with-ecosystem-based-management-ebm) – activity

[Estuaries – a Māori perspective](https://www.sciencelearn.org.nz/resources/1241-estuaries-a-maori-perspective) – activity

[Ethics thinking toolkit](https://www.sciencelearn.org.nz/resources/2363-ethics-thinking-toolkit) – activity

**Marine stressors diagram**

