AI for the Environment Hackathon Festival

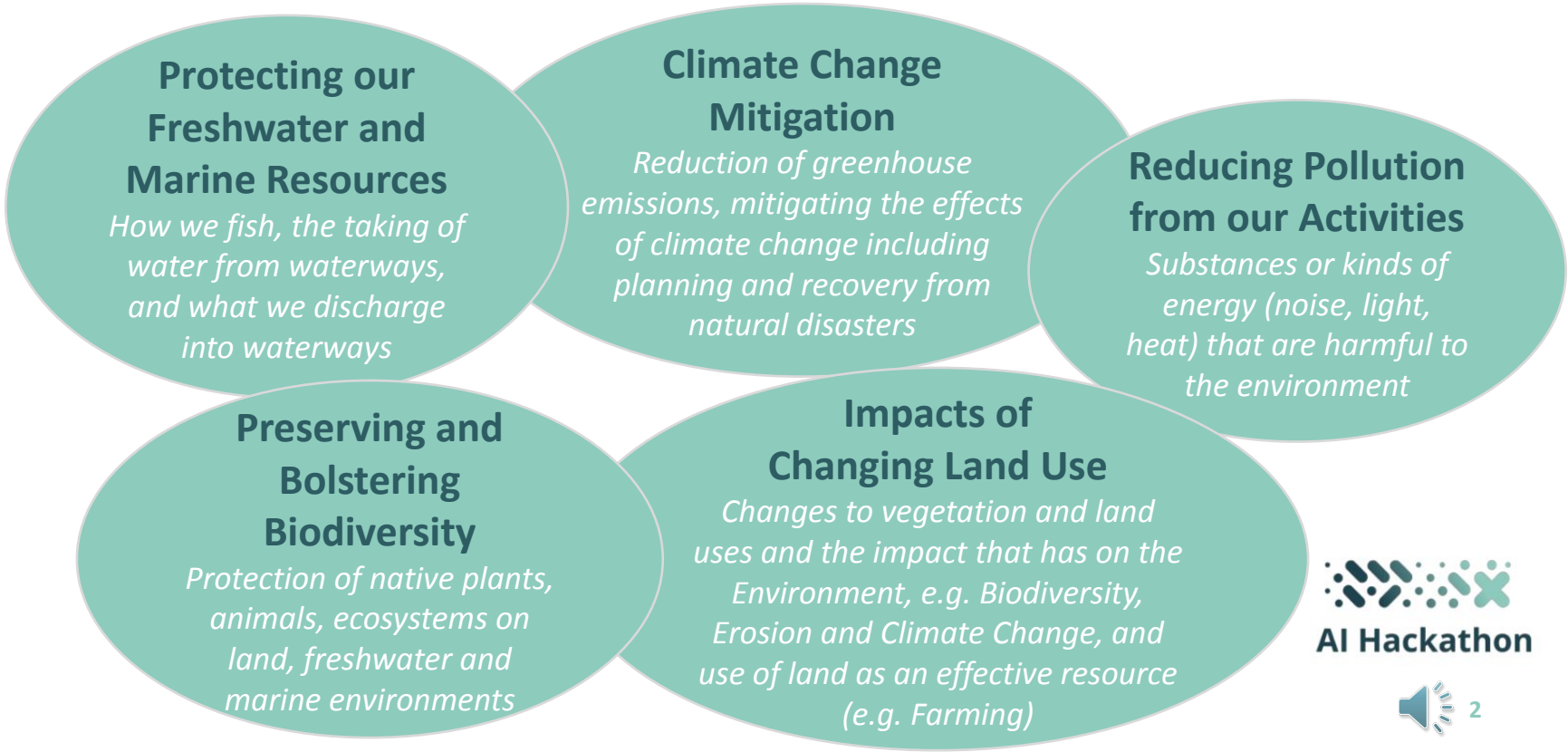
Problems to solve

PROBLEMS TO SOLVE

Our problems to solve are based on the 5 Key Environmental Outcomes (AI for the Environment Report 2022). We have expanded these to make them more relevant to all participants in 2023.

Participants are welcome to bring their own problems to solve. If you do, we recommend letting us know so that we can do our best to help with data sets and technology support.

However, in case you are looking for ideas, we have found these ones for you – and some of the organisations involved will provide subject matter experts to help on the day.



Protecting our Freshwater and Marine Resources

How we fish, the taking of water from waterways, and what we discharge into waterways

How we monitor the impact of Marine Activities like energy exploration and mining

Invasive species: use robotics, drones to monitor pest species

How we fish and farm: measure and count fish on vessels, monitor farm emissions

Discharge of waste: monitor sediment and contaminant levels in water discharge

AI Hackathon

Preserving and Bolstering Biodiversity

Protection of native plants, animals, ecosystems on land, freshwater and marine environments

Outcomes | Proving and Celebrating the impact of community work is often as important as the work itself

Cacophony + | *Cacophony is an opensource project https://cacophony.org.nz/ Its aims include measuring the outcomes of pest eradication efforts in birdsong.*
How can we use AI to supercharge programmes like this?

Recording | Having an (Inter)national way to record nature is essential and there are some good systems (e.g. https://inaturalist.nz) for recording what we see, but we cannot record the absence of something, e.g. when we have removed or prevented an invasive species form taking hold.

Te Korowai o Waiheke | In 2022 teams produced (Rat)FRT solutions. In 2023 the challenge is to develop a toolset that alerts the team when a new predator arrives in a previously cleared area.

AI Hackathon

Impacts of Changing Land Use

Changes to vegetation and land uses and the impact that has on the Environment, e.g. Biodiversity Erosion and Climate Change, and use of land as an effective resource (e.g. Farming)

Climate Change | monitor carbon sequestration in woody vegetation or blue carbon

Forestry | carbon accounting and riparian planting monitoring

Erosion | measure landslip faces in imagery or sediment sources in cities

Re-Food | Emily King's new book 'Re-Food' challenges us to find new ways to address our failure to successfully feed our population and to make sure the food we feed people is nourishing. Think about the impacts of data gaps for food wastage; new farming techniques; new foods

AI Hackathon

Reducing Pollution from our Activities

Substances or kinds of energy (noise, light, heat) that are harmful to the environment

Monitor noise pollution in cities, near airports

Monitor air quality near industrial areas

AI Hackathon

Climate Change Mitigation

Reduction of greenhouse emissions, mitigating the effects of climate change including planning and recovery from natural disasters

Monitoring ecosystem change in context of climate change and extreme events

Predicting GHG emissions based on sector activity data

Evaluating risk factors for transport and logistics

Emergency Recovery | Frequency and violence of events is increasing

Impact on environment –land, waterways, biodiversity

How do we:

- Improve our ability to respond and regenerate?
- Improve our preparedness?

AI Hackathon

Detailed Problem

Te Korowai o Waiheke

TOWARDS PREDATOR FREE WAIHEKE

Making Waiheke Island the world's first predator-free urban island

Imagine Waiheke Island being a haven for unique and ancient species of birds, lizards, insects and plants, a place of exceptional beauty for both current and future generations!

Te Korowai o Waiheke is a charitable trust established by the local community to eradicate predators from our beautiful island. The first stage of the Te Korowai o Waiheke project is a stoat eradication island-wide. The second is a series of rat pilot operational trials to understand how to remove rats from the whole of Waiheke.

https://tekorowaiowaiheke.org/

Problem Statement

As the Te Korowai o Waiheke project (and other **Predator Free 2050 Projects**) progress – it is important to measure the 'impact' of the work to remove predators.

The Key Outcome to be measured is the impact on the presence and abundance of native wildlife – especially birds.

There are a number of initiatives that try to do this – including the New Zealand Garden Bird Survey, The Great Waiheke kākā count and The Great Kererū count.

All of these depend on people getting outside and listening at set times of the year. This is good for community involvement but brings a number of issues:

- The Counts depend on the 'skill' and 'experience' of whoever is trying to identify birdsong. Which brings a lot of variation.
- The time people can be outside is limited – and weather dependent
- It's resource-heavy, taking people from the project's core work.

AI Hackathon

Desired Outcomes

- Remote Monitoring of birdsong with microphone/recorder.
- Automatic identification of the bird species via AI – added to a count.
- Priority would be 'Indicator Species' which could help simplify the project's POC. An indicator species is one that is directly affected the most by the presence of predators.
- Indicator Species : Kākā, Kererū, Ruru, Pīwakawaka, Tūī
- Consistency of counts enabling year on year comparisons.

Source Data

- Curently confirming access to sound recordings from The Cacaphony Project which is open source. https://cacophony.org.nz/
- Sample sound files can be found at https://nzbirdsonline.org.nz

AI Hackathon

CRITERIA

Your pitches will be judged against the following criteria:

Meeting the innovation brief:

1. You must be solving an environmental problem that is aligned to the 5 key areas outline in this brief
2. Your pitch must involve a technology innovation – this includes innovative use of existing technology.
3. The technology used must include elements of AI. You must explain what these are and how they are used.
4. If you have completed any work prior to the event, you must disclose what work was and your starting point.

Problem and Solution:

1. Demonstrate that you understand the problem you are solving
2. Explain how your solution solves it
3. Be clear and concise

Will your solution work?

1. Is it technically feasible?
2. Will it solve the problem?

Our judging panel are very experienced practitioners from business and academia and will not hesitate to disqualify teams for non-compliance.

AI Hackathon

Rules of Engagement

We are inclusive organisations, we welcome people from all genders, ethnicities and backgrounds. We ask that you:

- **Be welcoming** to each other and treat everyone with respect
- **Be open** to learning new things and form new friendships
- **Be fair.** You can pre-plan with your team, but keep to the spirit of the event by collaborating and developing your ideas at the event itself
- **Be respectful**. Our hosts are welcoming you into their environments, please follow their guidance and rules

Intellectual Property

Neither the AI Forum nor any of the sponsors have any interest in IP created at the event – whatever you create is your own.

Please be mindful of what others have created – legally you must comply with the terms and conditions of any IP ownership rights that exist regarding the things that you use. Any rights infringements are at the participants' own risk.


AI Hackathon
AI for the Environment Hackathon Festival
Stay up to date with the latest information: www.aihackathon.nz