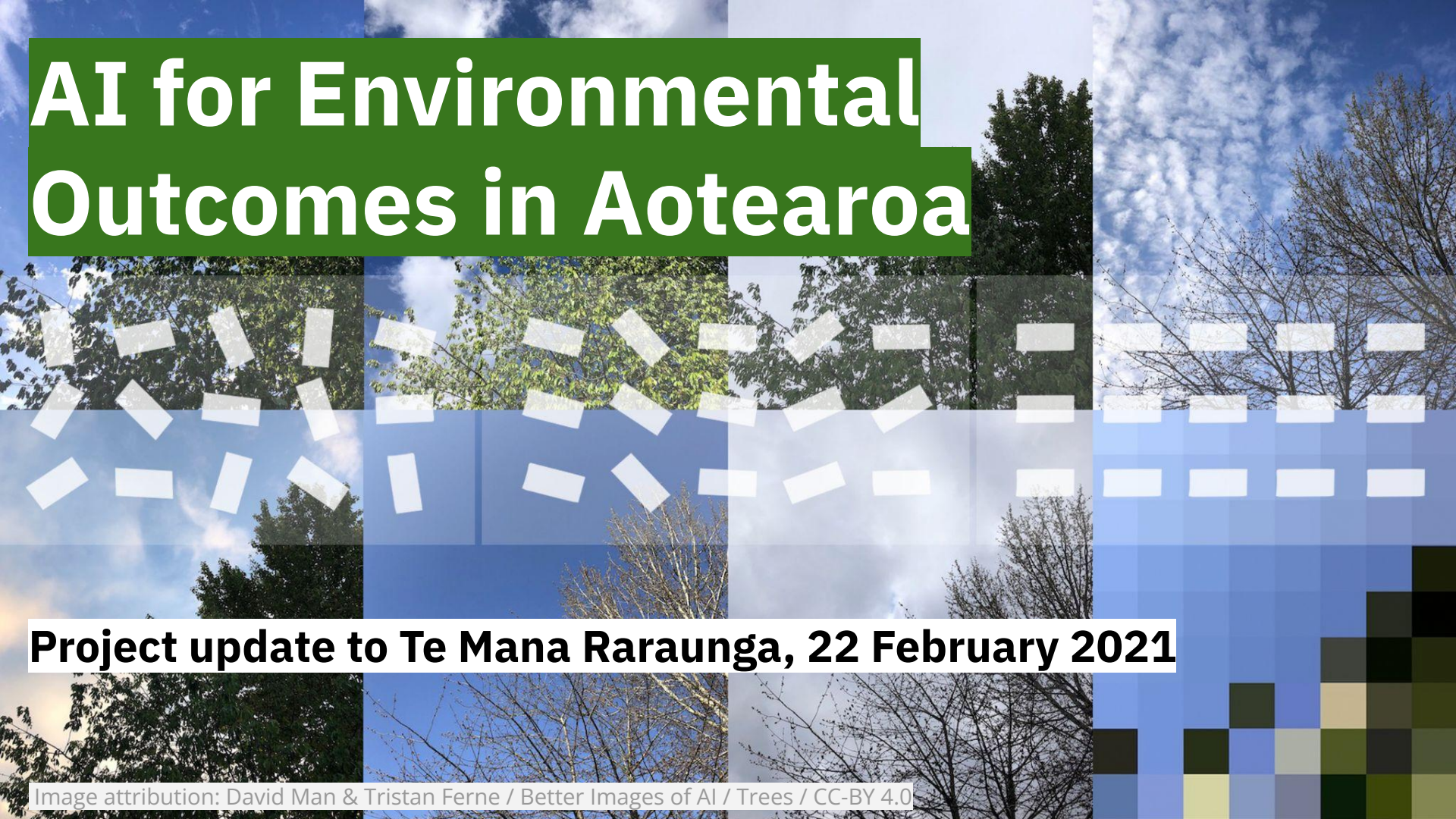
AI for Environmental Outcomes in Aotearoa

Project update to Te Mana Raraunga, 22 February 2021



This project is led by the AI Forum for New Zealand, with funding from Stats NZ and the Ministry for the Environment.

Research and writing partners on the project are Antistatic (Kelly and Anna Pendergrast) and Victor Anton (Wildlife.AI), with Temuera Hall consulting on te ao Māori and mātauranga elements.

Why focus on AI and environmental outcomes:

- a gap in the research - other sectors focused on
- many pressing interlinking environmental issues
- monitoring and reporting context.

Three key components of our research to date:

- 10 detailed interviews with 20 experts
- A survey to understand current projects
- A broad review of literature.

We have interviewed people from:

- Government agencies (DOC, MfE, Stats NZ)
- Crown Research Institutes (Manaaki Whenua, NIWA)
- University researchers (Waikato, Auckland)
- Private sector (Dragonfly Data Science, Qrious)

Interviewees have a broad range of experience:

- Māori perspectives on data collection, storage and use
- National environmental monitoring and reporting
- AI research, development and implementation
- High performance computing

Some preliminary findings from interviews

Observations about the sector:

- **There are many examples for AI being used for environmental outcomes.** Many are still one-offs or pilots. The majority of projects we learned about focused on preserving biodiversity or understanding land use changes. The most common types of projects were: species recognition or ID for biodiversity outcomes, and remote sensing to identify land use changes.
- **There is considerable AI research happening, and world-leading work on indigenous data sovereignty.** The link between this research and practical implementation is still emergent.
- **Collaboration is happening between organisations and sectors,** but commercial imperatives, limited capacity, and academic research practises mean it can be hard for groups to collaborate effectively across sectors.
- **Funding for AI capability development and deployment is relatively fragmented.**
- **Operationalising AI is a challenge.** There are big up-front costs, data management requirements and big learning curves needed to implement AI in an organisation in an embedded and ongoing way.

Observations about environmental data:

- **The national-level environmental monitoring and reporting approach in Aotearoa is fragmented and based on passive data collection.** Collection is often done at a council level for local needs and there are data gaps, which have an impact on how we understand our environment at a national level.
- **Organisations want to embrace the opportunities for technology to aid data collection e.g. using satellite imagery, sensors and drones.** However, these can be expensive and incorporating into established scientific methodologies and ensuring accuracy can be challenging.
- **A lot of historic environmental data exists in books, papers, and other non-digitised formats.** People are excited about the opportunities to glean new insights from this data with the help of machine learning tools, but work is still nascent.
- **Practitioners are coming to terms with the ethics and privacy issues of using large environmental data sets and combining data sets.** Norms and best practices are more established when it comes to personal data, and are more legislatively embedded.

What we're hearing about Māori data and perspectives:

- **Many organisations are aware of the need to ensure that data and AI practices reflect that environmental data is a taonga, and to take into account mātauranga Maori.** While they see this is a huge opportunity and responsibility, it is not always reflected in projects and capability is still nascent in many areas.
- **Government departments are committed to engaging and partnering with Māori on projects.** However, they have identified both limited capacity for experts to engage, multiple consultations happening at once and limited in-house understanding of the issues as barriers.
- **There is a lot of excitement about the opportunity of combining datasets and acquiring more data to understand the environment.** This might not always be congruent with what data is appropriate to share and hold at a national or government level.
- **There is an awareness of, and interest in, figuring out how environmental indicators and data collection can incorporate mātauranga.** However, expanding outside of the standard biophysical indicators of contemporary environmental science, and entrenched Western science conventions, is a challenge.

Questions?

We welcome further thoughts, links, and suggestions as we continue analysis and drafting. You can email researchers Kelly and Anna Pendergrast directly at **hello@antistaticpartners.com**