

The ARDC's Food Security Data Challenges program - Creating innovative solutions to support Australia's Food Security

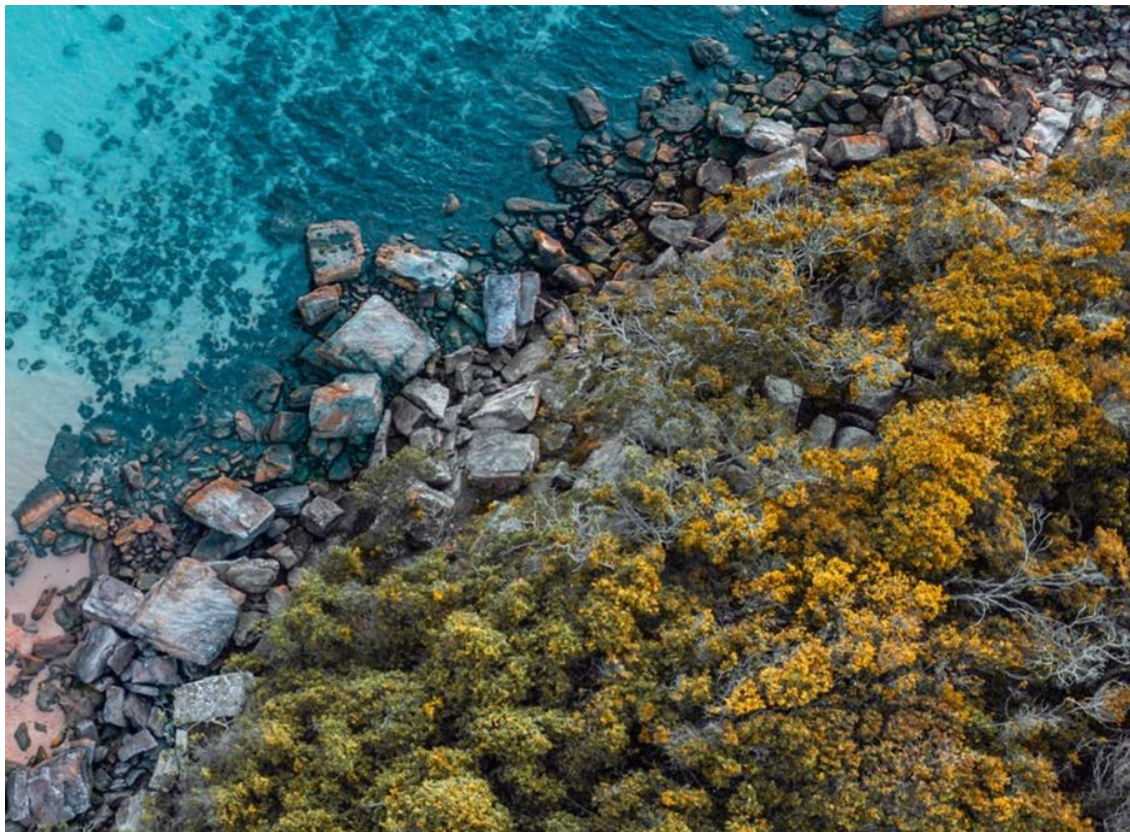
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ACKNOWLEDGEMENT OF COUNTRY

We acknowledge and celebrate the First Australians on whose traditional lands we meet, and we pay our respect to their elders past, present and emerging.



Agenda

- The ARDC's Food Security Data Challenges program
 - Overview
 - Outcomes (so far) and Lessons Learned
- Building on existing infrastructure - Enhancing Models for Rapid Decision-Support in Emergency Animal Disease Outbreaks (HASTE) and the Biosecurity Commons
 - Overview
 - Outcomes (so far) and Lessons Learned
- Further Information

Translational Research Data Challenges Program



START
WITH A SOCIETAL
PROBLEM



IDENTIFY
THE DATA
CHALLENGE



BUILD
AND APPLY DIGITAL
INFRASTRUCTURE



Food Security Data Challenges

- Societal problem: Food security
 - Topics: Food Equity, Agriculture, Biosecurity, ...
 - Data Challenges: Data Sharing, Sensitive Data, Vocabularies, Traceability, ...
- Goal: Develop innovative digital infrastructure solutions to current data challenges in food security research, with the aim of improving Australia's production, consumption and distribution of safe and high-quality food.

Project Co-Design

- Extensive consultations and workshops with key parties
- Identification of priority areas and their **data challenges**
- Scoping of 10 projects with partner organisations



Image supplied by Donna Cawthorn

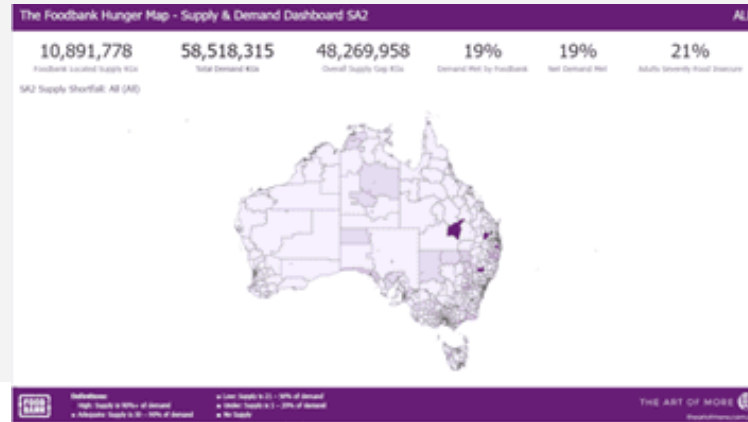


Image supplied by Foodbank Australia



Image supplied by Arbind Agrahari Baniya

Food Security Data Challenges Projects

- Enhancing Models for Rapid Decision-Support in Emergency **Animal Disease Outbreaks**
 - Lead: University of Melbourne
 - Challenge: Real-time integration of models to emergency response decision-making processes in animal disease outbreak response
- Multi-scalar **Crop Characterisation Network (MCCN)**
 - Lead: Australian Plant Phenomics Network (APPN)
 - Challenge: Bring together data to support breed selection and management practices to maximise expected yield in times of climate change

Food Security Data Challenges Projects (cont'd)

- **Data Sharing Initiative**
 - Lead: Federation University
 - Challenge: Growers don't know how to share data or who to trust
- Increasing food security through liberation of **fishing and aquaculture data**
 - Lead: Fisheries Research and Development Corporation (FRDC)
 - Challenge: Segmented, siloed data that cannot be shared securely
- Improving food security through **pathogen resistance tracking and analysis**
 - Lead: Cooperative Research Centre for Solving Antimicrobial Resistance in Agribusiness, Food, and Environments (CRC SAAFE)
 - Challenge: Lack of data infrastructure to support industry and Australia's AMR Monitoring and Evaluation framework and the National AMR Action plan

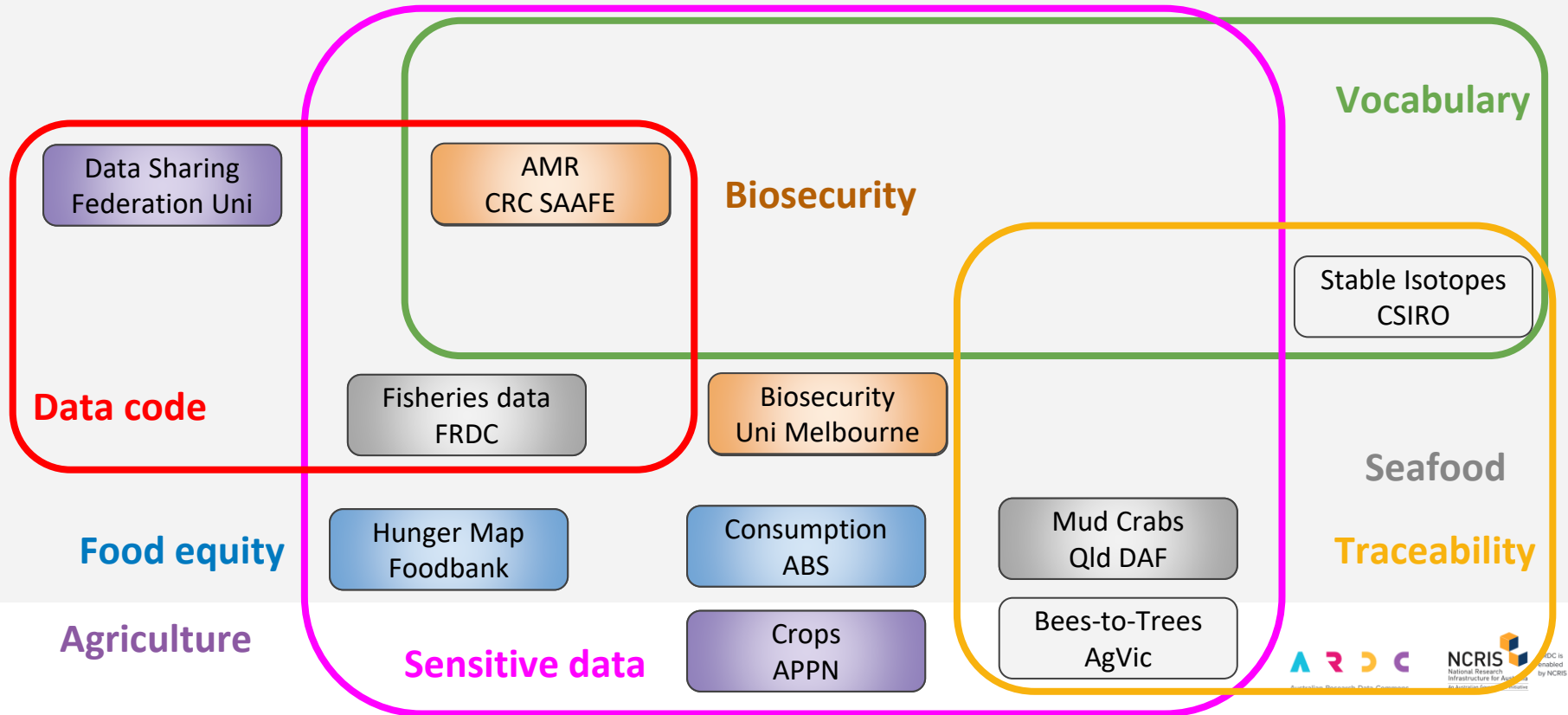
Food Security Data Challenges Projects (cont'd)

- Connecting/Federating **stable isotopic data** resources
 - Lead: CSIRO
 - Challenge: Siloed data on food provenance that does not provide a full picture
- Building a traceability data infrastructure to track provenance and quality in Australian **seafood supply chains**
 - Lead: Queensland Department of Agriculture and Fisheries
 - Challenge: Develop a digital, usable and transferable traceability data infrastructure for the Australian seafood sector
- Implementing GS1 traceability standards for **orchard chemical use and beehive** movements
 - Lead: Agriculture Victoria
 - Challenge: Track the relationship between chemical use in orchards and beehive health

Food Security Data Challenges Projects (cont'd)

- Enhancing the **Apparent Consumption of Foodstuffs** dataset to inform food consumption patterns
 - Lead: Australian Bureau of Statistics (ABS)
 - Challenge: Understanding the consumption of key foods and nutrients for small geographical areas such as LGAs
- Mapping **Food Insecurity** and Food Relief in Australia
 - Lead: Foodbank Australia
 - Challenge: Understanding unserved and underserved food relief demand

Connections between Food Security Data Challenges Projects



Outcomes (so far) and Lessons Learned

- Projects:
 - Certification program against the National Farmers' Federation's Farm Data Code for projects, products and services - 10 certifications so far
 - Digital Data Sharing Agreement tool
 - Vocabulary for stable isotope data
- Program:
 - Co-design process: extensive consultations - a lot of work but necessary and helped build strong relationships with projects
 - Some expected and unexpected connections and synergies between projects (e.g., data codes)
 - Barriers and roadblocks are not technical (surprise!)

Building on existing infrastructure - Enhancing Models for Rapid Decision-Support in Emergency Animal Disease Outbreaks (HASTE)

Aim	Improve Australia's biosecurity response to rapidly emerging threats by creating a framework to test, evaluate and improve epidemiological modelling to support decision-making
Challenge	Real-time decision making in an animal disease outbreak
Data Challenge	Real-time modelling and decision support



Australian Research Data Commons



Australian Government
Department of Agriculture,
Fisheries and Forestry



This project received investment from the NCRIS-enabled ARDC infrastructure under investment identifier: [10.47486/DC110](https://doi.org/10.47486/DC110)



Building on existing infrastructure - Enhancing Models for Rapid Decision-Support in Emergency Animal Disease Outbreaks (HASTE)

Target outcomes:

- Create modelling workflows to answer biosecurity policy questions easily accessed via [Biosecurity Commons](#),
- Conduct a simulation exercise to test response modelling to support biosecurity decisions,
- Create biosecurity emergency response modelling training materials,
- Form a consortium to exist beyond the lifetime of the project.

What is the Biosecurity Commons?

A cloud-based decision-support platform
for modelling and analysing biosecurity risk and response.



Australian Government
Department of Agriculture,
Fisheries and Forestry



Australian Research Data Commons



Queensland
Government



EcoCommons



Australian Research Data Commons



ARDC is
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Biosecurity Commons Analytical Tools

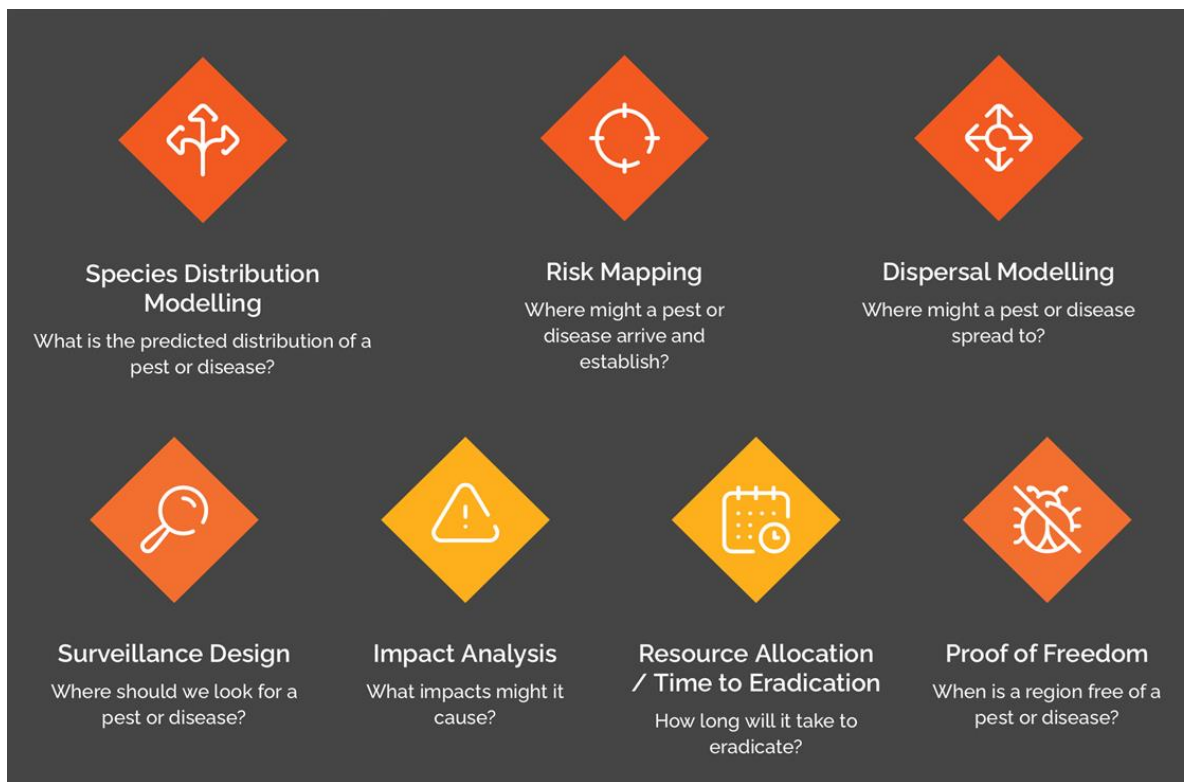
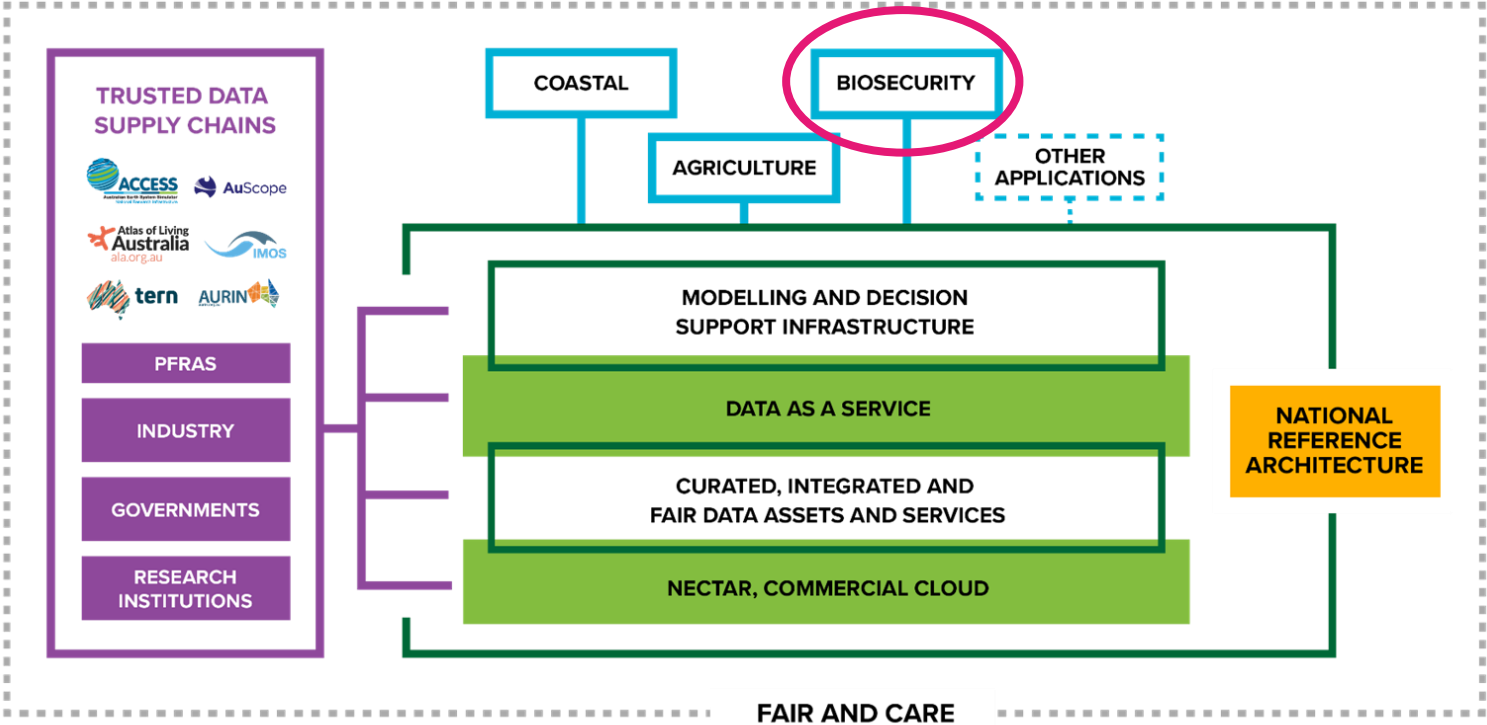


Image supplied by James Camac

Planet Research Data Commons Reference Architecture



Building HASTE on top of Biosecurity Commons

- Biosecurity Commons has a plant biosecurity focus - HASTE is bringing in an application in Animal Health Outbreaks. This will enhance the Biosecurity Commons capability.
- Regular meetings between HASTE and Biosecurity Commons project leads, as well as meetings with key parties, ensure an ongoing communication of requirements, technical aspects, etc.

Outcomes (so far) and Lessons Learned

- Using the Planet RDC infrastructure has allowed the HASTE project to implement and show value much faster.
- The project team has been able to focus on the community needs and research engagement, rather than on infrastructure development.
- HASTE contributes to the 'Commons' through an application in Animal Health Outbreaks - whilst Biosecurity Commons provides the Plant component.
- This infrastructure is leveraged across the whole Planet RDC Program including EcoCommons, and National Machine-based Observation.

Further Information

Food Security Data Challenges Program:

- Overview and links to individual projects:
<https://ardc.edu.au/program/food-security-data-challenges/>
- Enhancing Models for Rapid Decision-Support in Emergency Animal Disease Outbreaks (HASTE) project:
<https://ardc.edu.au/project/enhancing-models-for-rapid-decision-support-in-emergency-animal-disease-outbreaks/>

Biosecurity Commons:

- Homepage: <https://www.biosecuritycommons.org.au/>
- Introductory video: <https://www.youtube.com/watch?v=VWXY2t-UW3U>



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