Bushfire Data Commons forum

PRESENTED BY

Sheida Hadavi
Adrian Burton

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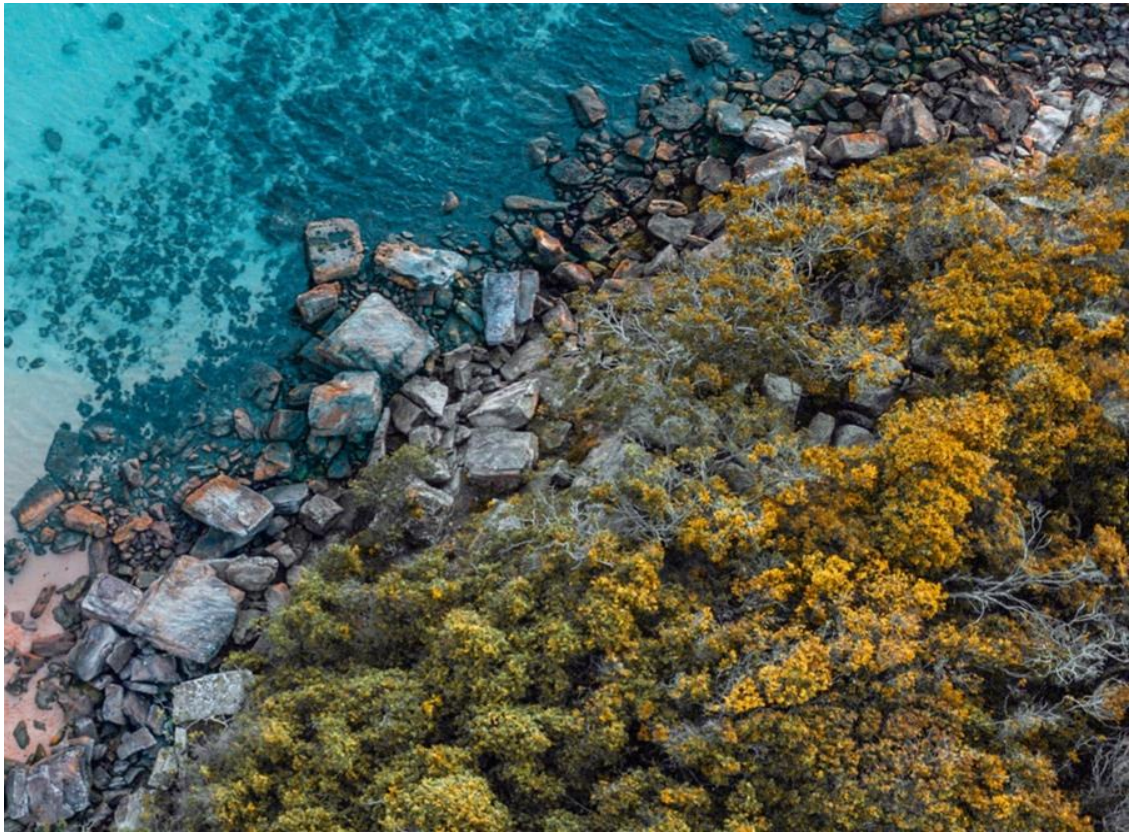
ACKNOWLEDGEMENT OF COUNTRY

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.



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Agenda

- **Welcome and Introduction (ARDC) (10 mins)**
- **Presentations (10 mins each)**
  - BDC007 Natural Hazard Research Australia (NHRA)
  - BDC008 National Air Quality Technical Advisory Group(NATAG), Curtin University
  - BDC009 Australian Institute of Health and Welfare (AIHW)
  - BDC013 University of Melbourne
- **Q&A and discussion (15 minutes)**
- **Presentations (10 mins each)**
  - BDC010 Atlas of Living Australia (ALA)
  - BDC011 Atlas of Living Australia (ALA), BioPlatform Australia (BPA), BioCommons
  - BDC012 Invertebrates Australia
- **Q&A and discussion (15 minutes)**
- **General discussion and closing remarks (ARDC) (10 mins)**

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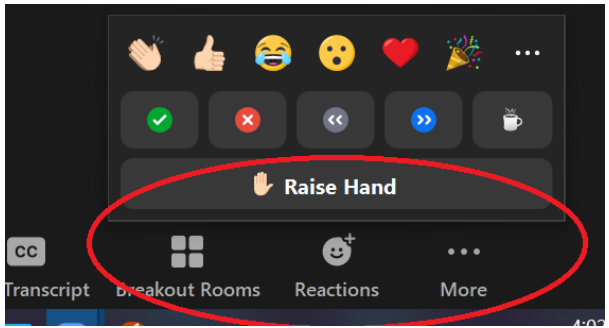
Housekeeping

- This session will not be recorded, but we will share the slides after the event.
- Please mute during presentations, but feel free to leave your camera on, if you are happy to do so and if your bandwidth supports this.
- To ask your questions, please
  - Type your question into chat or
  - Raise your hand during Q&A times if you prefer to ask your question verbally



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Introduction to ARDC

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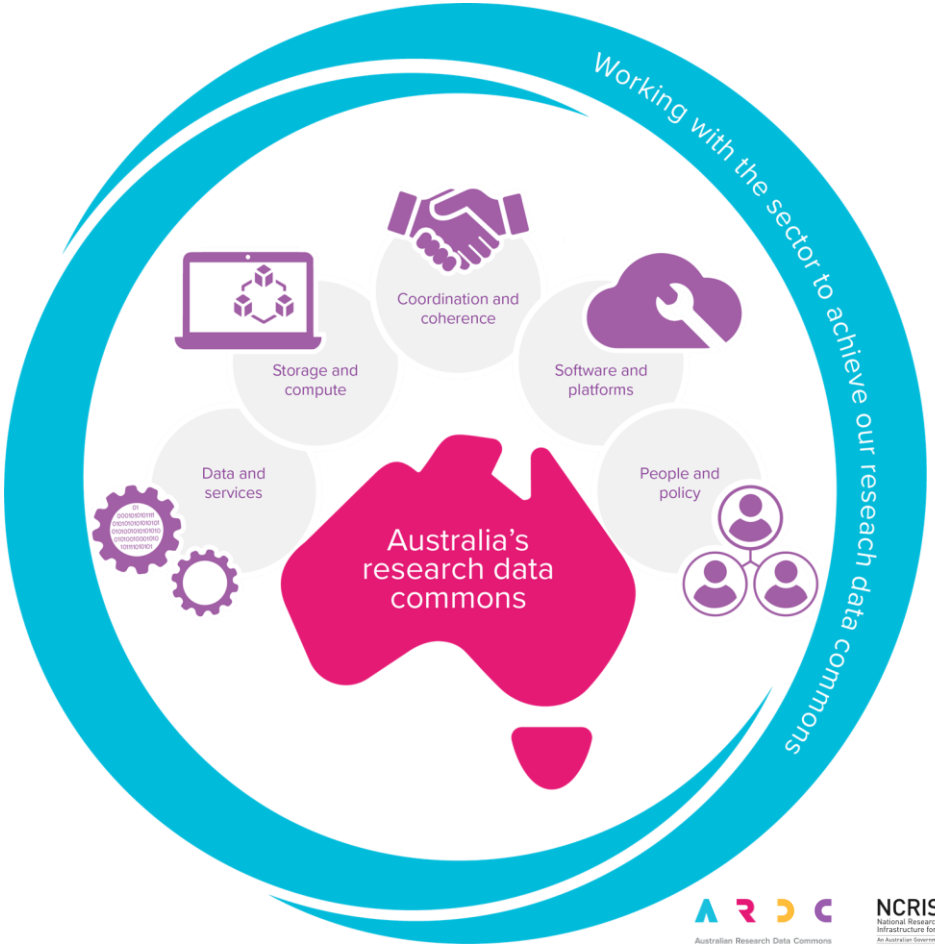

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Australian Research Data Commons

Purpose

To provide Australian researchers with competitive advantage through data.

Mission

To accelerate research and innovation by driving excellence in the creation, analysis and retention of high-quality data assets.

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Translational research data challenges program

START
WITH A SOCIETAL PROBLEM

IDENTIFY
THE DATA CHALLENGE

BUILD
AND APPLY DIGITAL INFRASTRUCTURE

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Bushfire Data Commons

Objective: Establishing a national bushfire data infrastructure for translational research, to improve bushfire management and understand risk.

- **Bushfire data challenges in 2 areas:**
  - Understanding bushfire behaviour
  - Understanding bushfire impact

Collaboration and alignment with existing and emerging initiatives.

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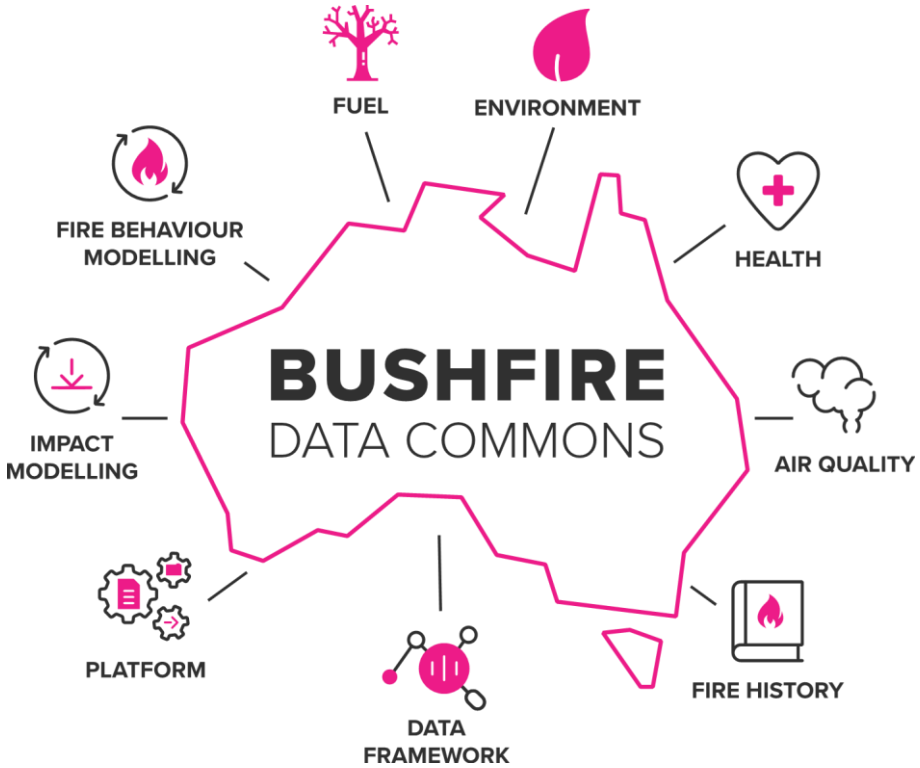
Bushfire Data Commons Outputs and Outcomes



Research resilience, response and recovery

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Bushfire Data Commons Forum

- **Second Bushfire Data Commons Forum today:**
  - Understanding Bushfire Impact (7 projects)
- **Previous Bushfire Data Commons Forum in April 2022:**
  - Understanding Bushfire Behaviour (6 projects)
- **Purpose of the forum:**
  - Part of the overall program coordination efforts
  - Connect partners to each other
  - Enable external stakeholders to learn about projects and provide insights and suggestions
  - Create collaborations and coordination between projects and with external stakeholders

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Bushfire Data Challenges

Disaster resilience & risk reduction

Bushfire

- AFAC
- NCRIS
- NHRA
- OCS

- Access
- Interoperability
- Scale
- Governance

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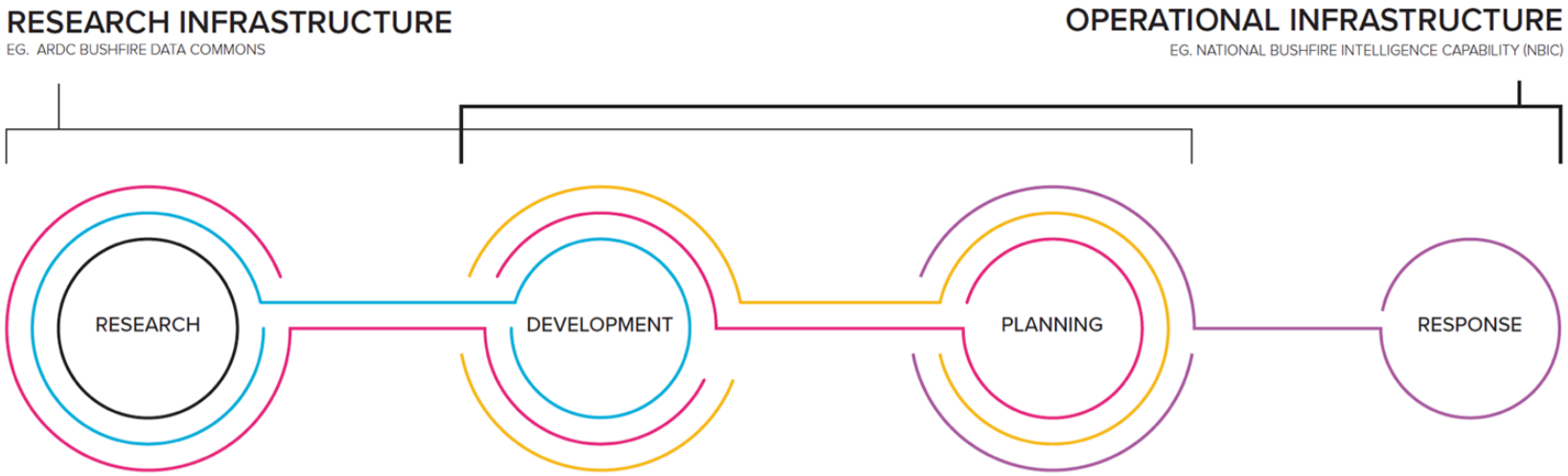
Operations and infrastructures scope



NHRA, Universities

NHRA: National Hazard Research Australia
Universities

NESP, NCRIS, CSIRO

NESP: National Environmental Science Program
NCRIS: National Collaborative Research Infrastructure Strategy
CSIRO: Commonwealth Scientific and Industrial Research Organisation

GA, BOM

GA: Geoscience Australia
BOM: Bureau of Meteorology

AFAC

AFAC: Australasian Fire and Emergency Service Authorities Council

State & Australian Government departments and agencies

EMA: Emergency Management Australia
NRRA: National Resilience and Recovery Agency

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List of Projects, Understanding Bushfire Behaviour:

1. Aggregated and harmonised burnt extent bushfire history data on a national scale
   Partners: GeoScience Australia, EMSINA
2. Aggregating and harmonising fuel data on a national scale
   Partners: TERN, DAWE
3. Improving remote sensing fuel data on a national scale
   Partner: The Australian National University (ANU)
4. A fire behaviour modelling platform
   Partner: CSIRO
5. Framework for sharing bushfire data and tools between jurisdictional agencies
   Partners: National Council for Fire & Emergency Services (AFAC)
6. Aggregated and Harmonised Fuel Data on a National Scale
   Lead by: Australasian Fire and Emergency Service Authorities Council (AFAC)

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List of Projects (Understanding Bushfire Impact)

7. Bushfire Research Data National Collection; lead by: Natural Hazards Research Australia (NHRA)
8. Assessing the Impact of Bushfire Smoke on Health; lead by: National Air Quality Technical Advisory Group (NATAG)
9. Aggregating and Integrating Data on Health Outcomes Associated with Bushfires at a National Scale; lead by: Australian Institute of Health and Welfare (AIHW)
10. Curated Biodiversity Data for Rapid Assessment of Bushfire Impacts; lead by: Atlas of Living Australia (ALA)
11. Establishing an Australian Reference Genome Atlas (ARGA) and a Leadership Application in Bushfire Data; lead by: Atlas of Living Australia (ALA)
12. Development of a traits database and vulnerability assessment framework to assess fire susceptibility of Australian invertebrate species; lead by: Invertebrates Australia
13. Bushfire Data Access and Impact Modelling Platform; lead by: University of Melbourne

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Australian Research Data Commons

Assessing the Impact of Bushfire Smoke on Health

Lead Organisations:

NATAG Public Sector (chaired by NSW Department of Planning and Environment) and
CAR University Sector (chaired by Curtin University)

19 July 2022

NSW GOVERNMENT Planning and Environment

CAR Centre for Air pollution, energy and health Research
An NHMRC Centre of Research Excellence

PRESENTED BY

Ivan Hanigan (co-lead with Matthew Riley)

ivan.Hanigan@curtin.edu.au

Curtin University

CC BY

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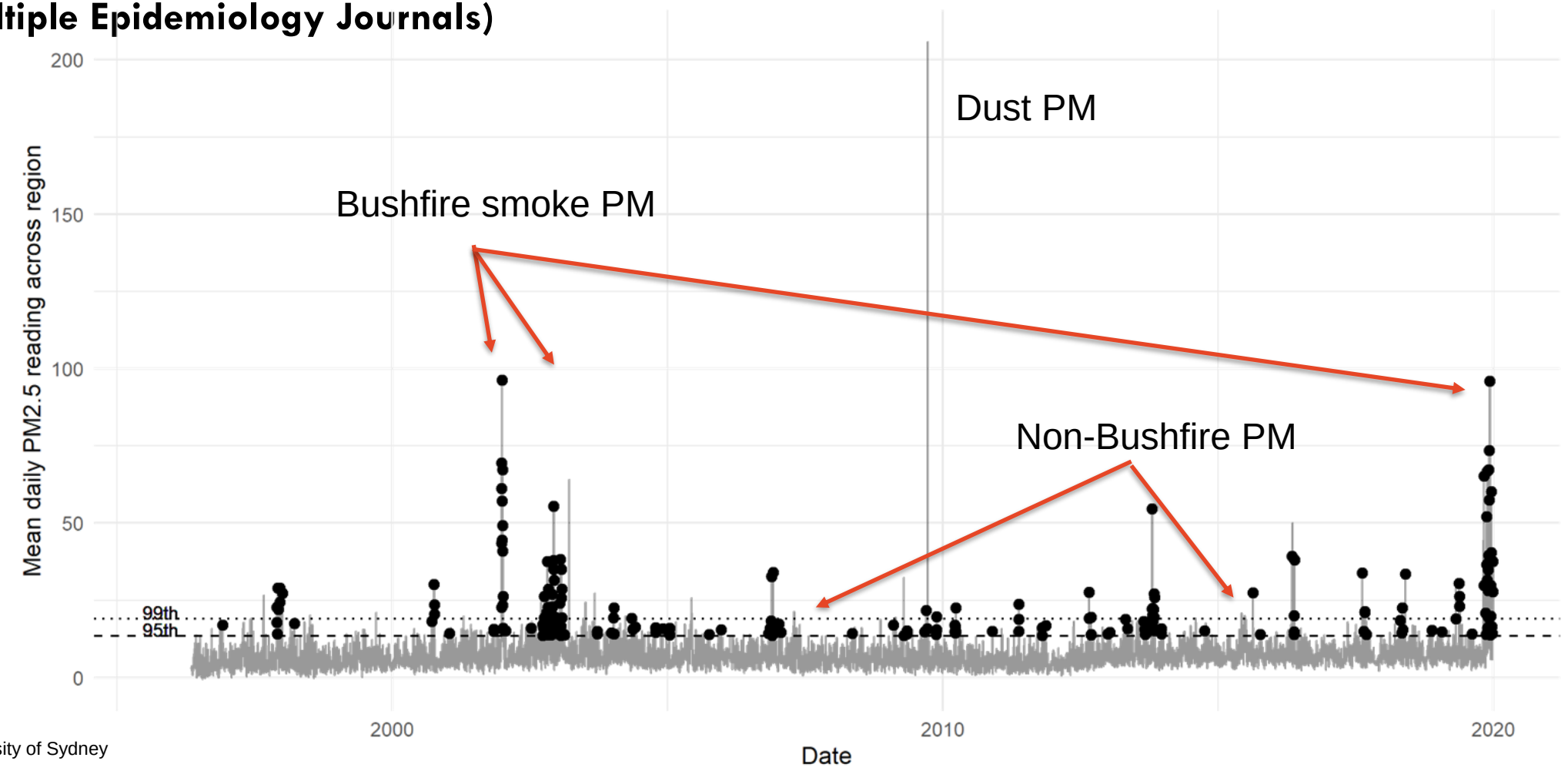
Project objective and vision

a) Validated "exposure" to bushfire events for health research

b) Near-real-time public health warning system

- **E.g. Valid Fire Events of Airborne Particles (PM2.5) used in health studies for Sydney (Published in multiple Epidemiology Journals)**



Partners

Government Enviroment Agencies
National Air Quality Advisory Group (NATAG), led by NSW DPE.

Building on the ARDC funded CARDAT "National AP monitor DB" derived from monitors from NSW DPIE, Vic EPA, Qld DES, SA EPA, WA DEWR, Tas EPA, NT EPA, and ACT Health (DOI: 10.17605/OSF.IO/JXD98)

University Sector (Population Health)
Ivan Hanigan (Curtin)
Geoffrey Morgan (U-Sydney)
Fay Johnston (U-Tas)

Australian Research Data Commons

NSW GOVERNMENT Planning and Environment

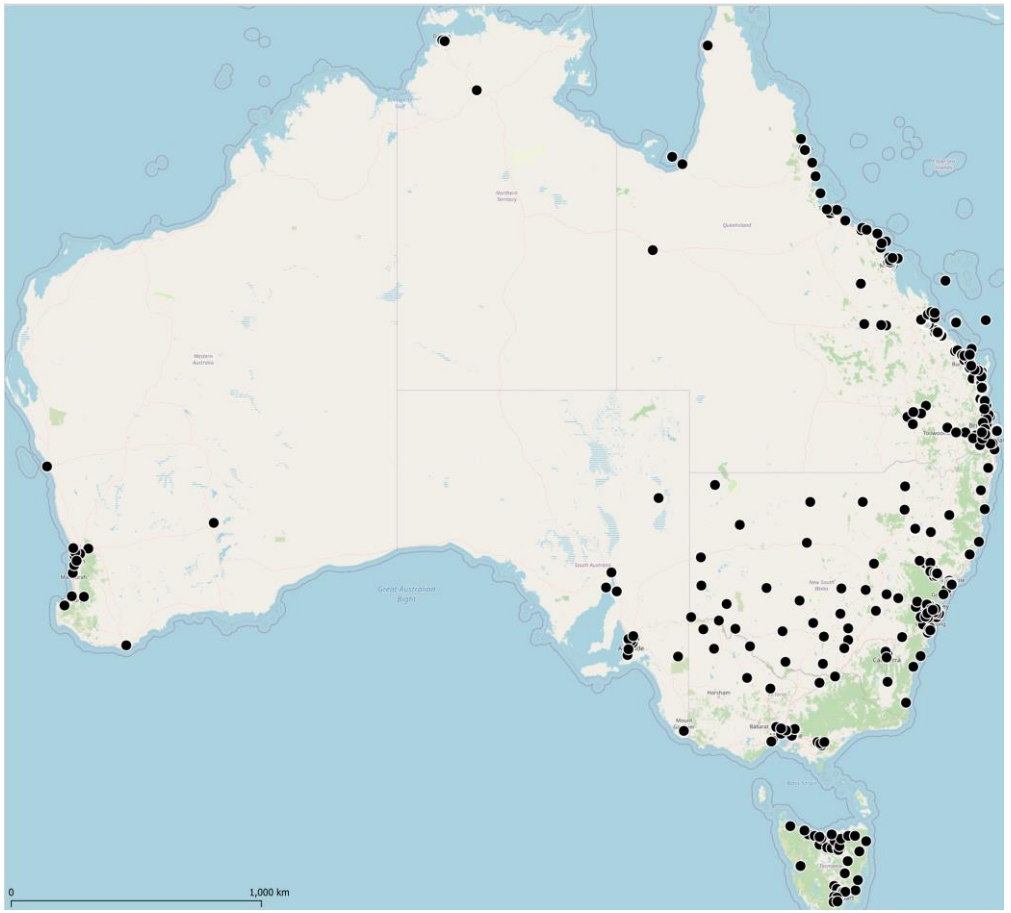
Curtin University

CAR Centre for Air pollution, energy and health Research

Research infrastructure with impact: National Air pollution monitor network of hourly/daily observations

derived from regulatory monitor data from NSW DPIE, Vic EPA, Qld DES, SA EPA, WA DEWR, Tas EPA, NT EPA, and ACT Health [accessed YYYY-MM-DD]. Downloaded from the Centre for Air pollution, energy and health Research DOI 10.17605/OSF.IO/JXD98

State	Start date	Pollutants
NSW	1972	PM2.5, PM10, NO2, O3
VIC	1979	PM2.5, PM10, NO2, O3
QLD	2006	PM2.5, PM10, NO2, O3
WA	1997	PM2.5, PM10, NO2, O3
SA	2002	PM2.5, PM10, NO2, O3
TAS	2006	PM2.5, PM10
NT	2011	PM2.5, PM10, NO2, O3
ACT	1996	PM2.5, PM10, NO2, O3



In Partnership with ARDC Bridges Program (NCRIS) “Air Health Data National Data Asset” project (https://doi.org/10.47486/PS022)

Work packages (and progress)

Work package 1

This package will design system architecture to be Findable, Accessible, Interoperable and Reuseable (FAIR).

Work package 2

The package will design and deliver a universal API to Australian air quality data.

Work package 3

We will build predictive statistical and machine learning models with satellite images and land-based data to estimate the proportion of the PM that is fire smoke to delineate the extent of each plume. Uncertainty in model and data types will be blended using Bayesian spatiotemporal methods.

Progress

Head agreement signed and project plan approved.

Next steps: Steering committee, partner workshops, recruitment etc.

Challenges and opportunities: TBC e.g. Big data (near-real-time satellites!)

Obvious 20/10/2013

Ambiguous 04/11/2016

Use Cases: Airborne Particles (PM2.5) and Fire Smoke Model workflow

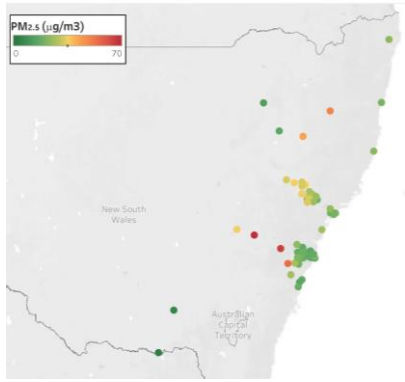
Daily $PM_{2.5}$ Observations

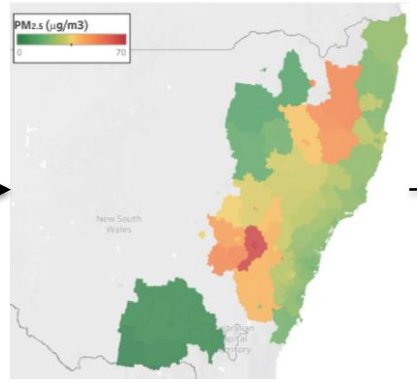
Other covariates (e.g. Satellite)

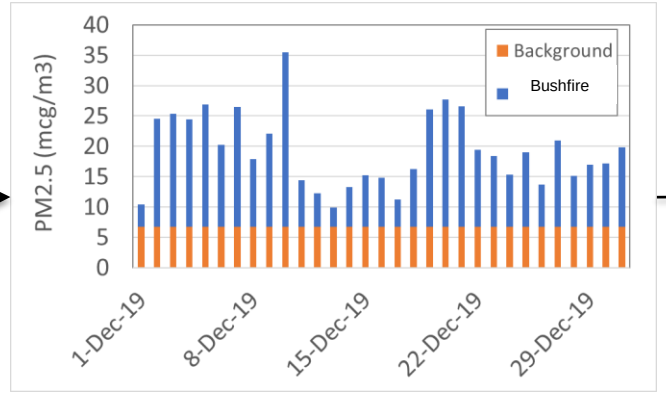
Predicted Daily $PM_{2.5}$

$PM_{2.5}$ Decomposition

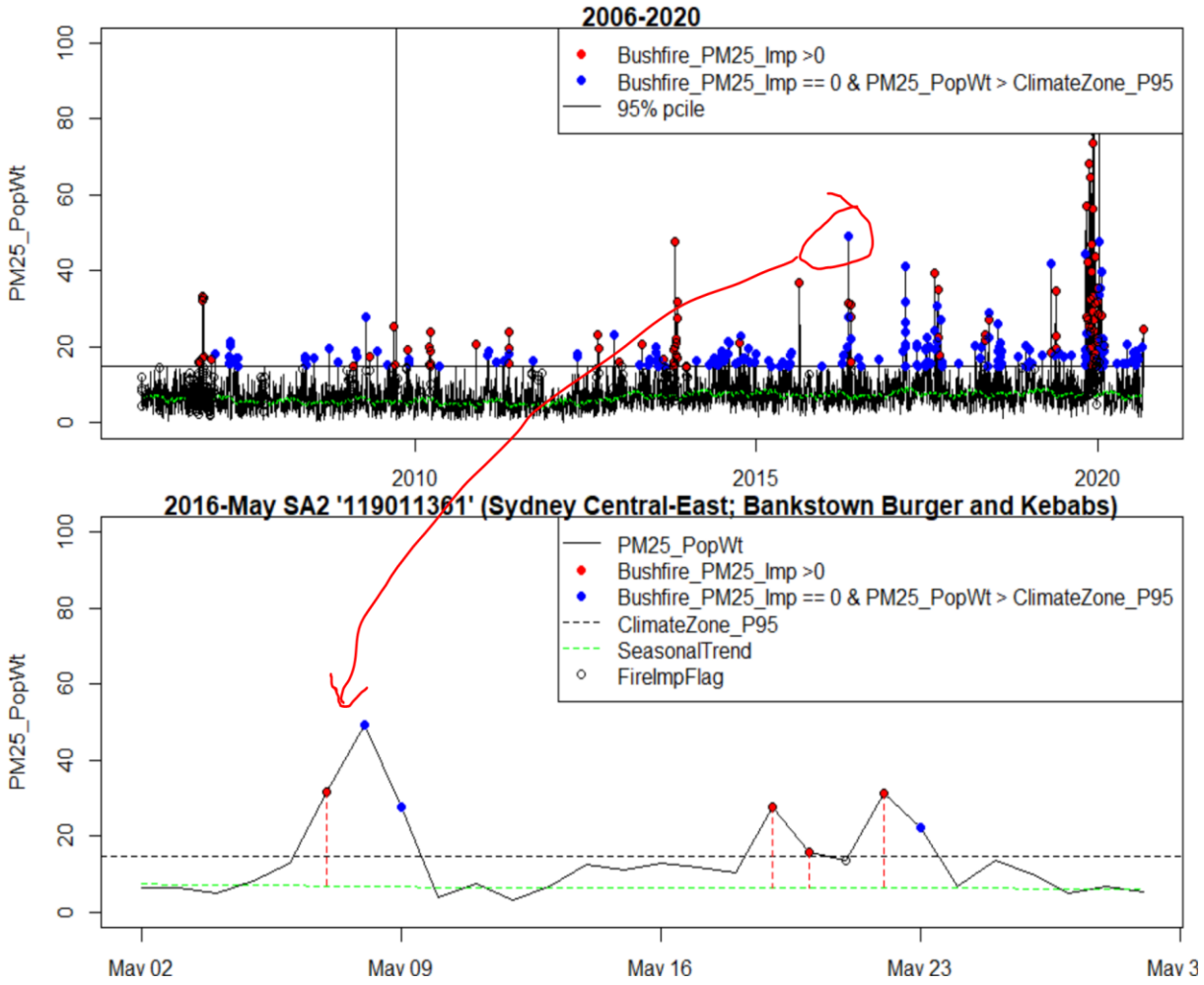
Validation "ground truthing"

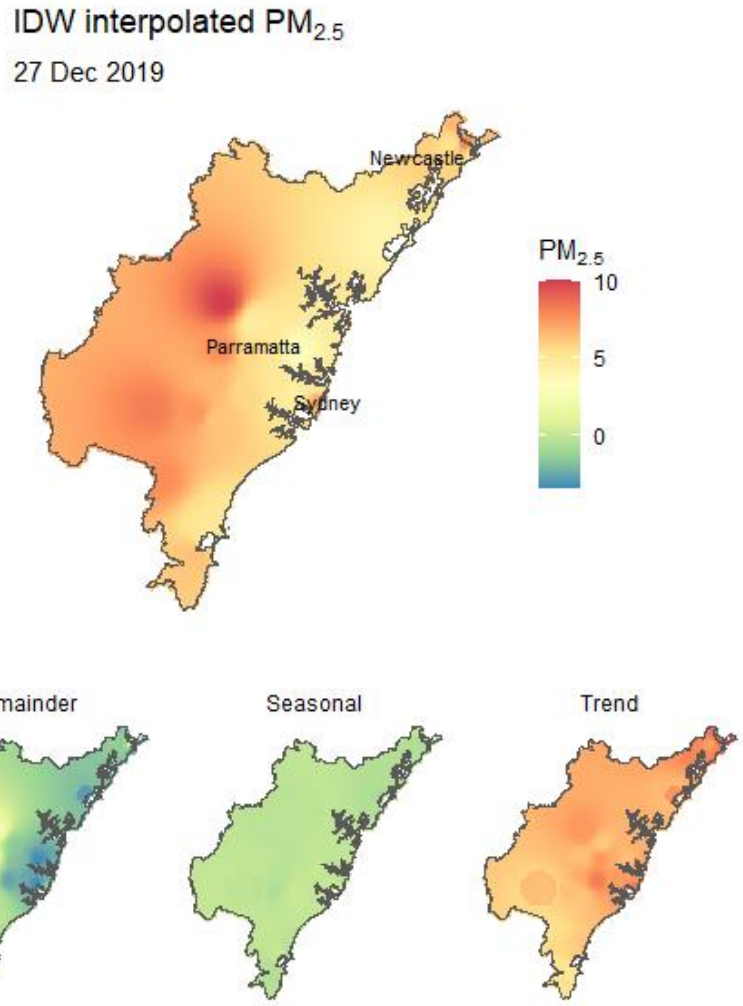




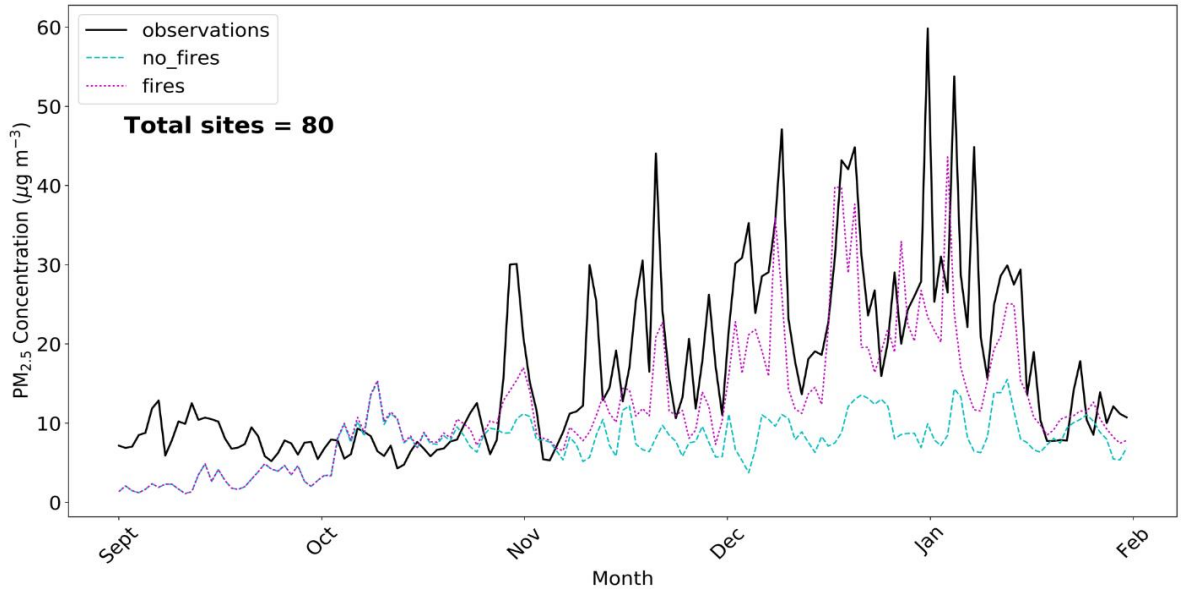


Use Cases: $PM_{2.5}$ Decomposition
Seasonal and Trend Decomposition using Loess

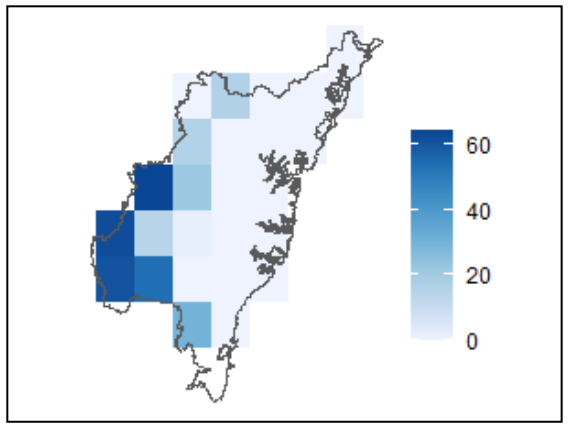




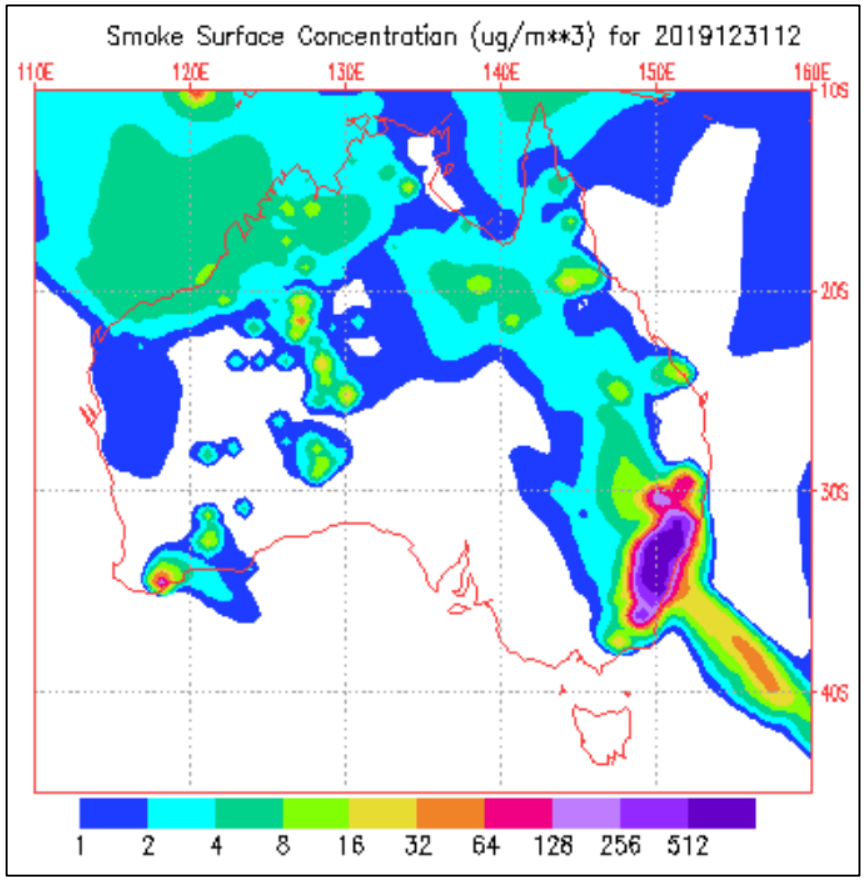
Use Cases: Validation “Ground Truthing”



CTM output: All sources vs. No fires Graham et al. (2021)

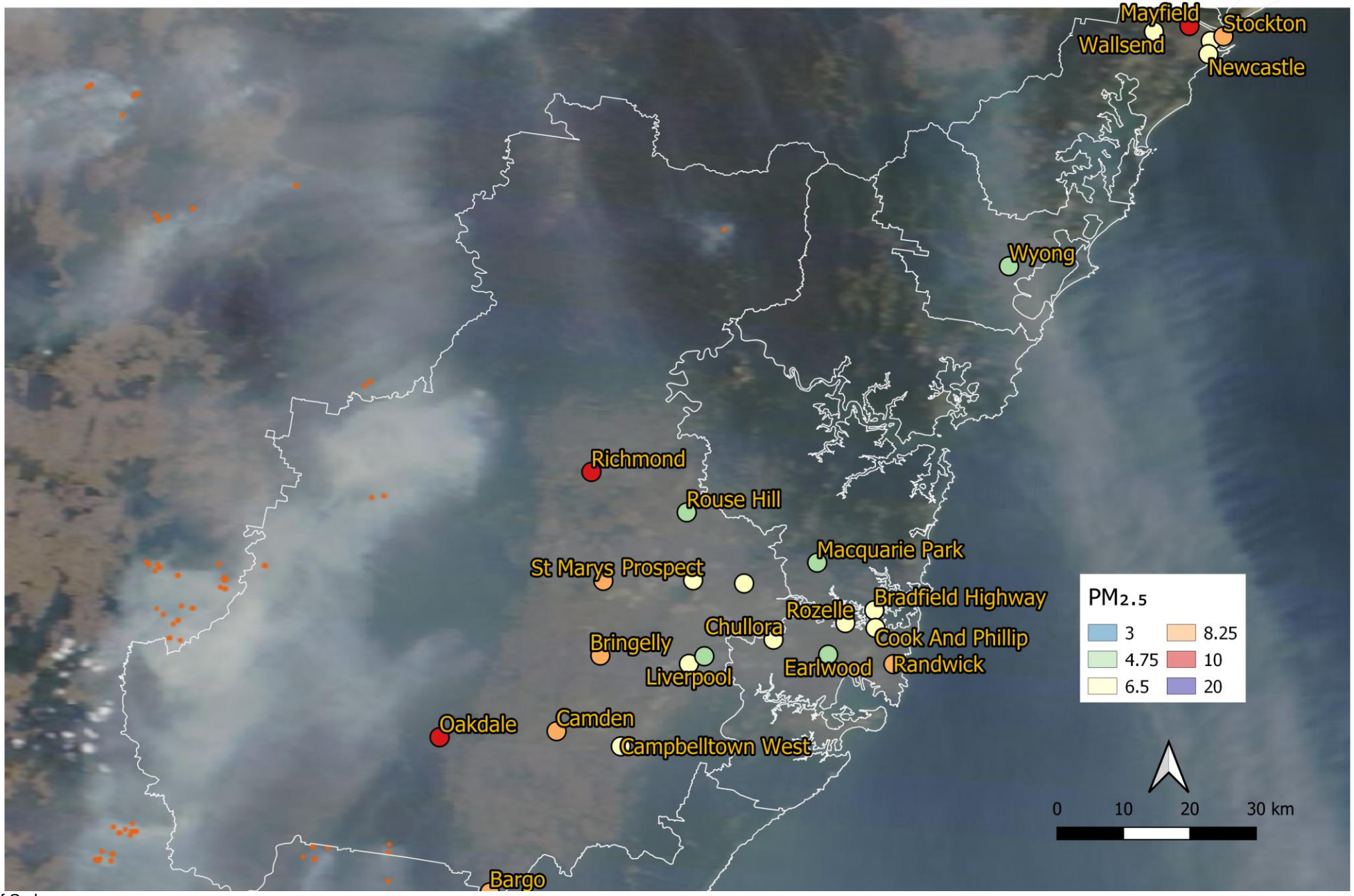


Global fire atlas - carbon emissions
Suggesting fire smoke – a bit too coarse

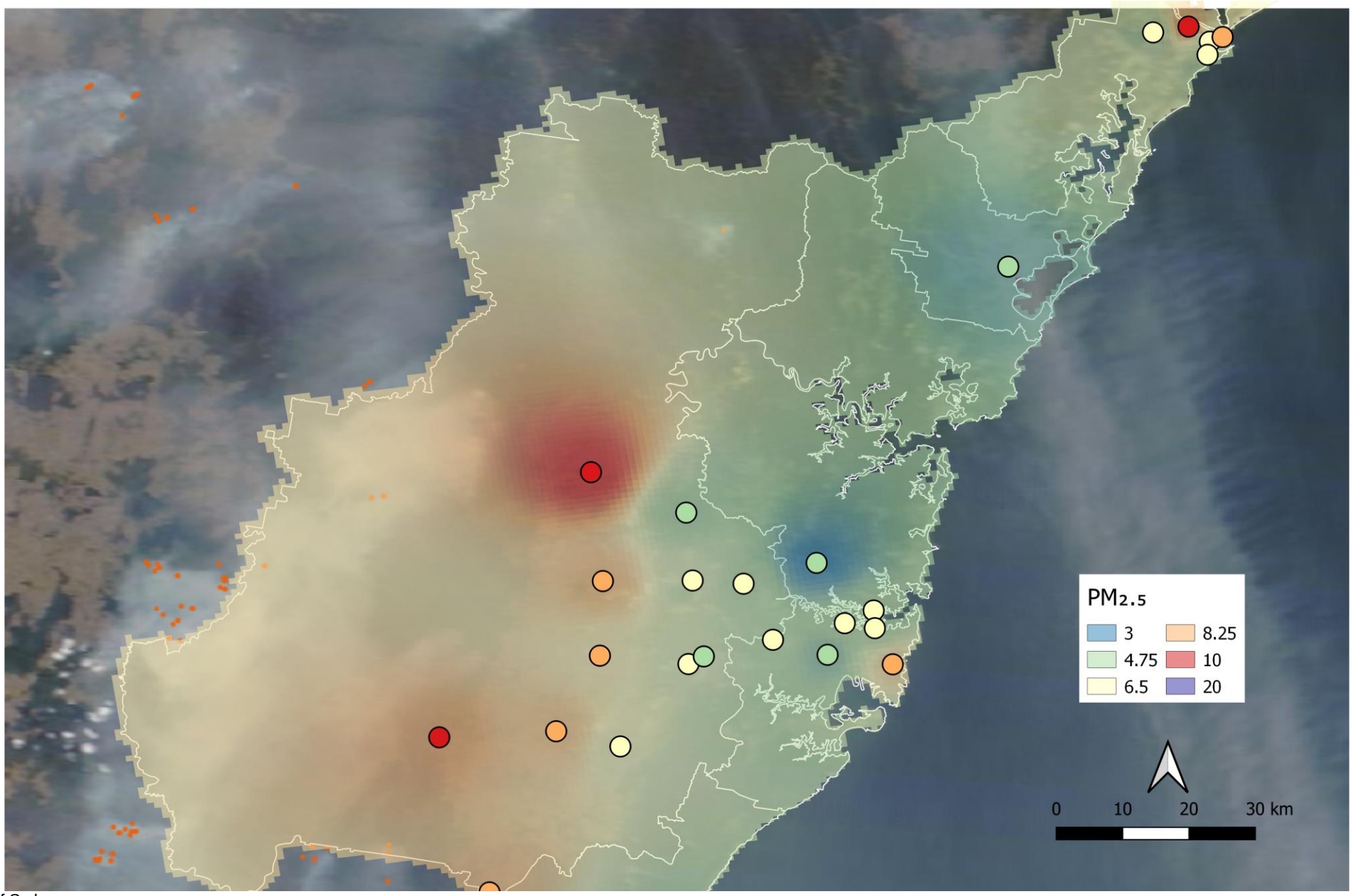


NAAPS (Navy Aerosol Analysis and Prediction System) Global Aerosol Model

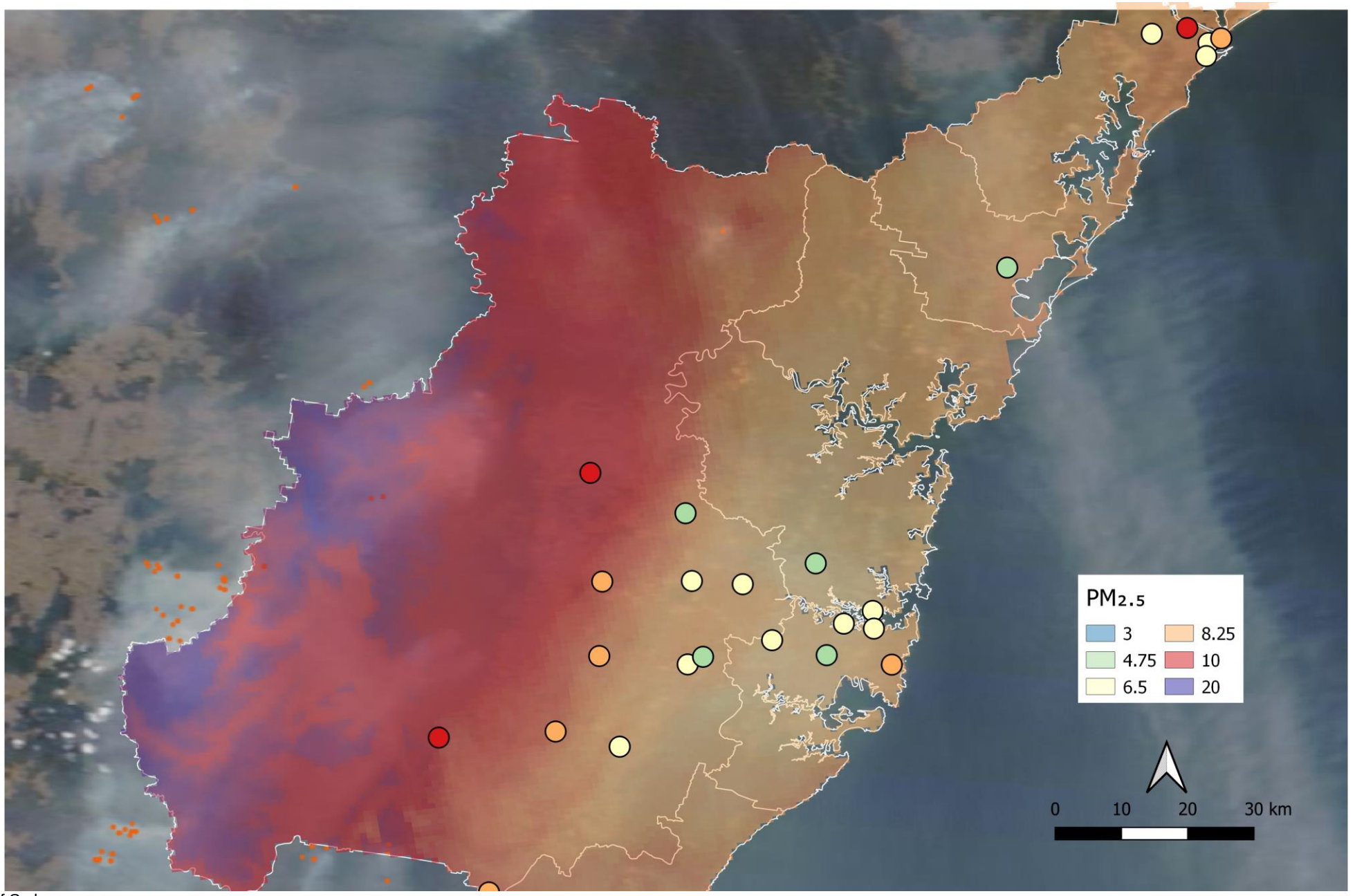
Sydney GMR – 27th December, 2019



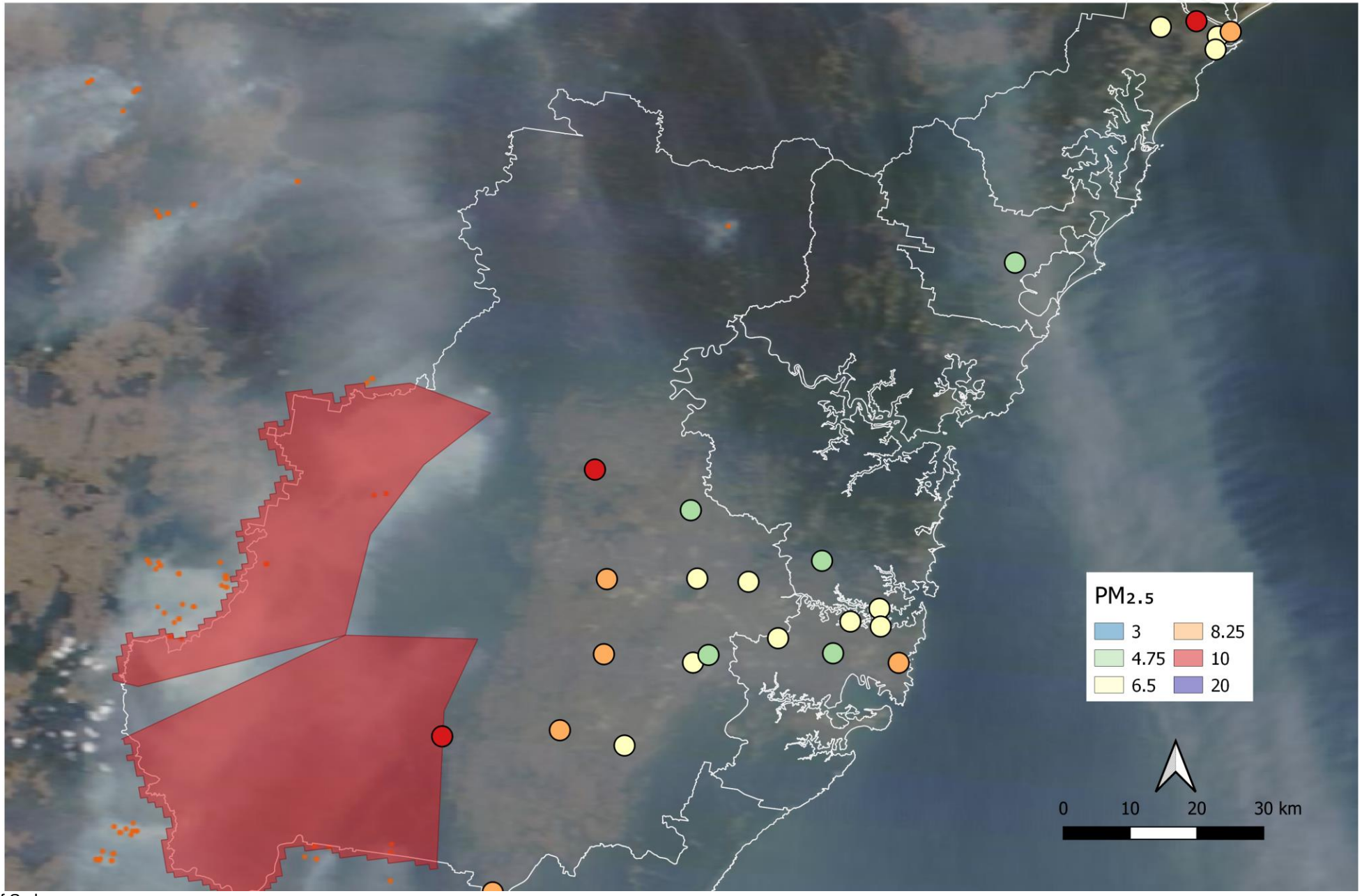
Inverse Distance Weighting – 27th December, 2019



Random Forest – 27th December, 2019



Hand digitised smoke plumes– 27th December, 2019



Satellite data

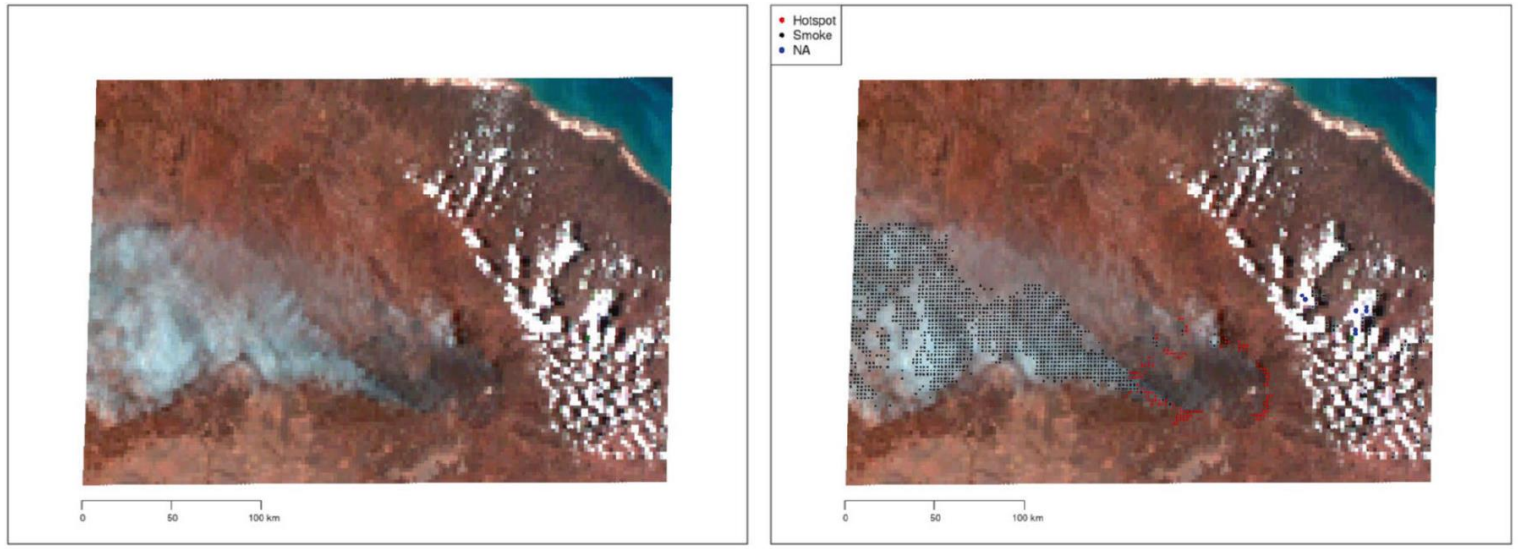


Fig. 1 Satellite imagery and target data. Raw data from the Himiwari-8 satellite on 2015-09-11 0650 UTC over the Norther Territory of Australia on a 161 × 105 pixel grid (left). Smoke classification from a cloud-masking algorithm [9, 21] and hotspot locations from the NOAA VIIRS satellite (right).

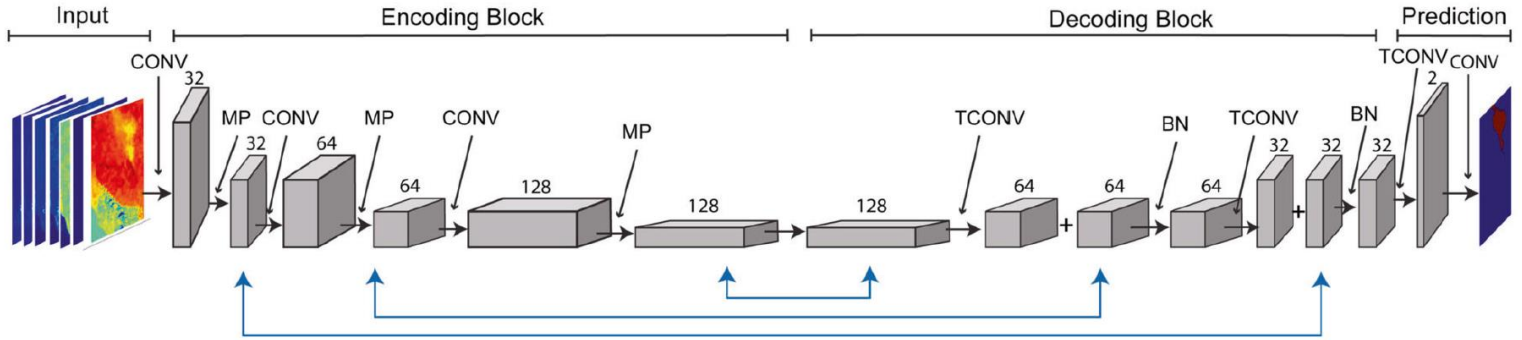
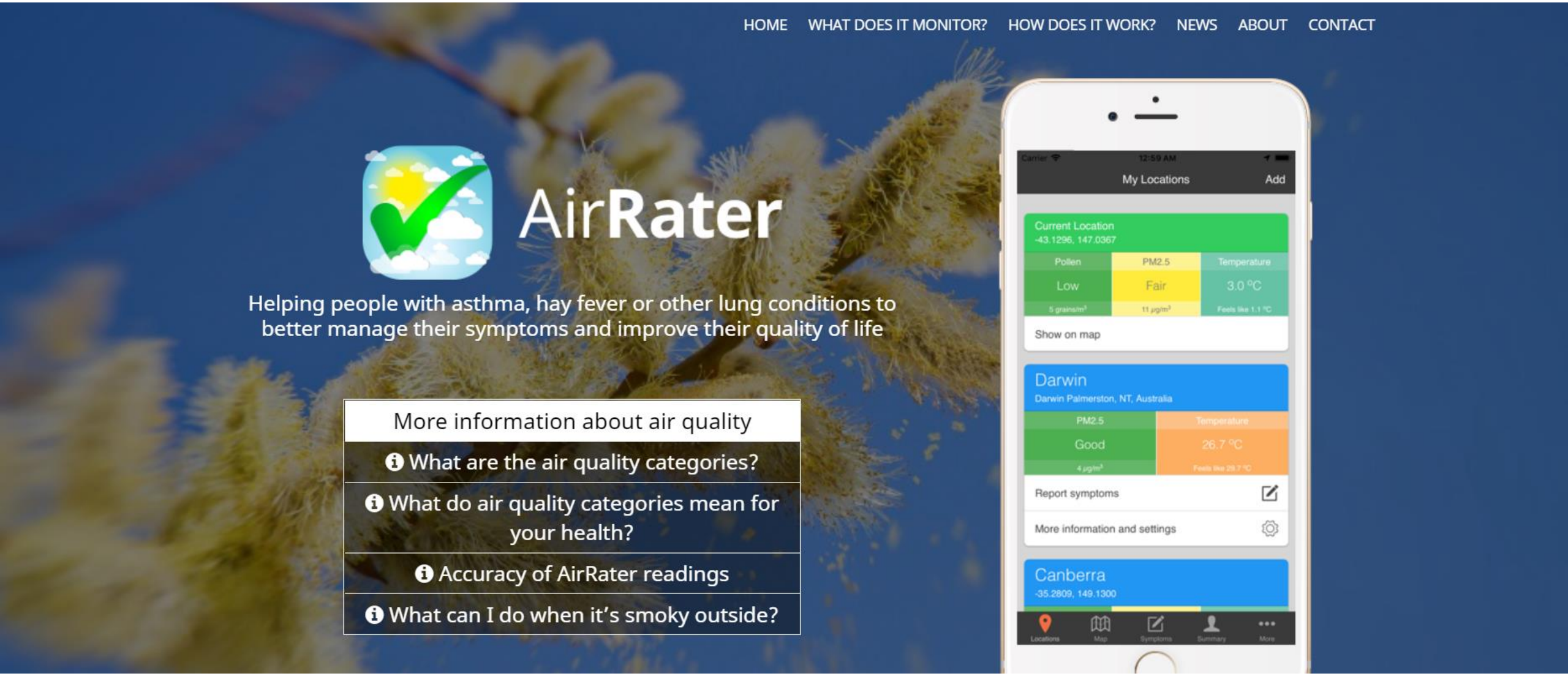


Fig. 2 Deep fully convolutional network architecture. Outputs from convolution (TCONV), and batch normalization (BN). The last con-

International collaborators Larsen and Reich (Uni North Carolina) and Rappold (USA EPA) along with CSIRO (Qin, Cope):

Larsen, A., Hanigan, I.C., Reich, BJ, Qin, Y, Cope, M, Morgan, GG, Rappold, AG. (2020). A deep learning approach to identify smoke plumes in satellite imagery in near-real time for health risk communication. Journal of Exposure Science & Environmental Epidemiology, https://doi.org/10.1038/s41370-020-0246-y

Stakeholders and beneficiaries: E.g. App developers



Australian Government
Australian Institute of Health and Welfare

Aggregating and integrating data on health outcomes associated with bushfires at a national scale

Dr Vanessa Prescott
Head, Prevention and Environmental Health Unit, AIHW

ARDC Bushfire Data Challenges Forum – 19 July 2022

AIHW
Stronger evidence,
better decisions,
improved health and welfare

Project objective and vision

- **Background:** This project builds on previous reports on short-term health impacts of 2019–20 bushfires on health.
- **Aim:** Develop an accessible data asset of bushfire-related health service use, to allow analysis of effects of bushfires on health – longer time series.
- **Objectives:**

→Identify bushfire-related health service use of interest to policy makers and the research community.

→Identify available data sources and the level of temporal and spatial scale appropriate for reporting

→Explore options on how best to deliver data to our stakeholders.

Project Partners

→ Queensland University of Technology

→NHMRC Centre for Air pollution, energy and health Research (CAR)

→FrontierSI

→Healthy Environments and Lives National Research Network (HEAL)

Noted project stakeholders and beneficiaries

→AusEnHealth

→NHMRC Centre for Air pollution, energy and health Research (CAR)

→WHO Collaborating Centre for Environmental Health Impact Assessment, Curtin University

→Climate, Air Quality Research (CARE) Unit, Monash University

→NHMRC funded Healthy Environments and Lives National Research Network (HEAL)

→National Recovery and Resilience Agency (NRRA)

→Australian Climate Service/Australian Bureau of Statistics

→Climate and Atmospheric Science – Department of Planning, Industry and Environment (NSW)

Use case

- →Health impact assessment
  - →combine health data with environmental data to assess health impact
- →Planning for prevention, adaptation and disaster response
  - →e.g. identify patterns of service use to prepare for future events
- →Decision support and analysis platforms
  - →Incorporate data into existing platforms
- →Environmental Economic Accounting (EEA)
  - →evidence drawn from data could inform EEA in future

Work packages

→**Work package 1: Identify bushfire-related health outcomes**

- → bushfire-related health service use of interest to policy makers and the research community
- → information on bushfire-related health service use already available in the Australian context

→**Work package 2: Assess data availability for inclusion in the final dataset**

- → Available datasets that report on the events identified in WP1.
- → Temporal and spatial scale at which data are available for reporting within the constraints of data governance, privacy and confidentiality guidelines.
- → Length of time series appropriate for reporting, while factoring in issues such as changes in coding standards over time.

→**Work package 3: Produce final data asset and investigate governance arrangements and systems for sharing data while upholding privacy and confidentiality**

- → Produce the final data asset identified as part of WP2.
- → Explore options on how best to deliver data to our stakeholders

Next steps

→Finalise project plan

→Form and convene advisory group

→Incorporate advice from advisory group into analysis plan

→Undertake analyses of data sources to determine reporting constraints and opportunities (exploratory work has commenced)

Opportunities and challenges

→This project may be useful as a proof-of-concept for similar projects relating to environmental health and health data

→Privacy and confidentiality rules can limit the extent to which fine grained (temporal/spatial) data may be reported

→Coding and administrative changes may affect comparability across a given time series.

Further information

→**Contact details:**

→healthpreventiondata@aihw.gov.au

→**Related reports:**

→Australian bushfires 2019–20: exploring the short-term health impacts, Summary - Australian Institute of Health and Welfare (aihw.gov.au)

→Data update: Short-term health impacts of the 2019–20 Australian bushfires, About - Australian Institute of Health and Welfare (aihw.gov.au)

Atlas of Living Australia
ala.org.au
sharing biodiversity knowledge

Curated biodiversity data for rapid assessment of bushfire impacts

Martin Westgate | Team Leader: Science & Decision Support

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CSIRO

The ALA is made possible by contributions from its many partners. It receives support through the Australian Government through the National Collaborative Research Infrastructure Strategy (NCRIS) and is hosted by CSIRO.

Data quality | history

Data quality or fitness for purpose can be hard to assess and poor in some cases, including reliability of taxonomic names, lack of absence data or information about the quality of species identifications.

Page 8, ‘Top 5 weaknesses’

Reputational risk through poor data quality or failure to engage more with subject matter experts in taxonomy and ecological sciences.

Page 12, ‘Top 5 threats’

Data quality | work programs

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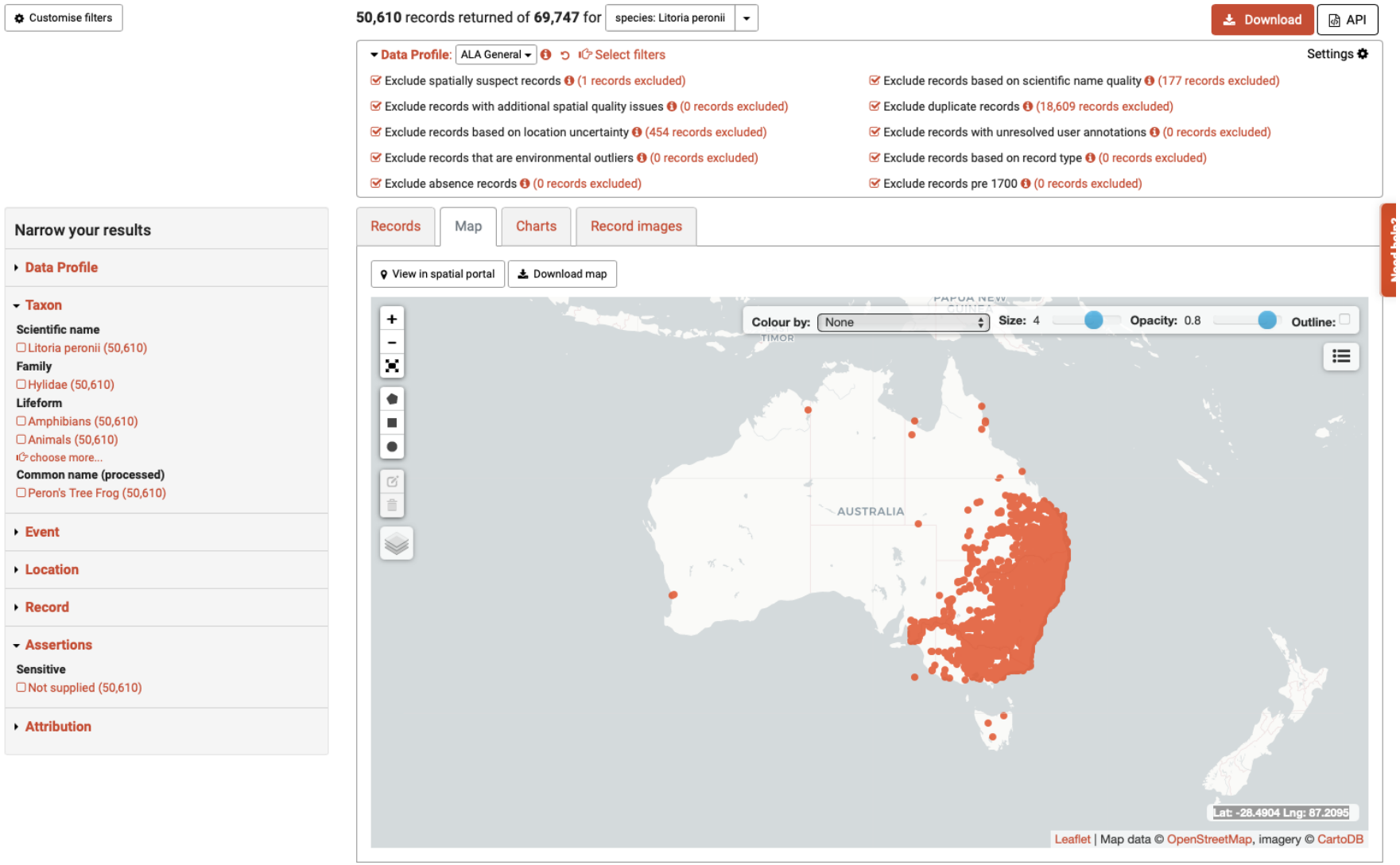

Focus areas

- Outlier detection
- Taxonomic names
- User validation
- ‘Round-tripping’
- Documentation

Project partners

Atlas of Living Australia
ala.org.au

ARTICLE

https://doi.org/10.1038/s41467-021-21266-5 OPEN

Check for updates

Implications of the 2019–2020 megafires for the biogeography and conservation of Australian vegetation

Robert C. Godfree[1✉], Nunzio Knerr[1], Francisco Encinas-Viso[1], David Albrecht[2], David Bush[3], D. Christine Cargill[2], Mark Clements[2], Cécile Gueidan[1], Lydia K. Guja[2], Tom Harwood[4], Leo Joseph[5], Brendan Lepschi[2], Katharina Nargar[6], Alexander Schmidt-Lebuhn[1] & Linda M. Broadhurst[1]

Project partners

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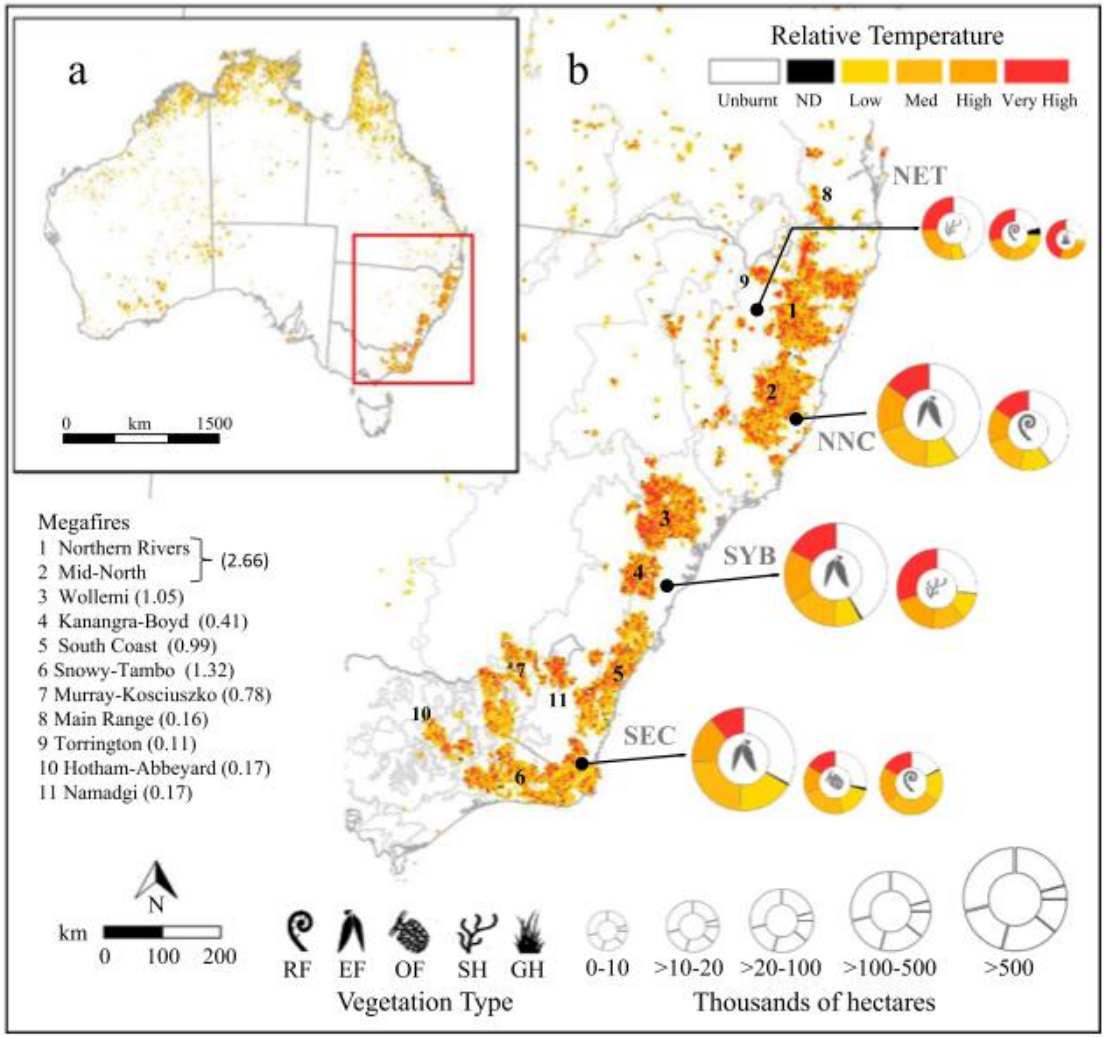
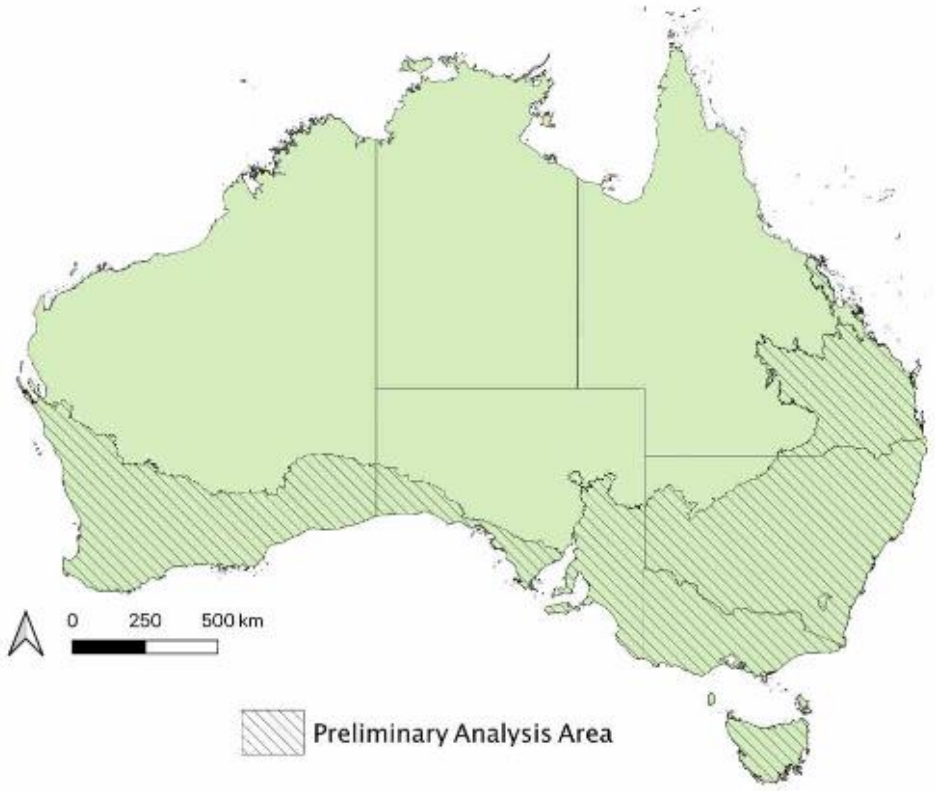
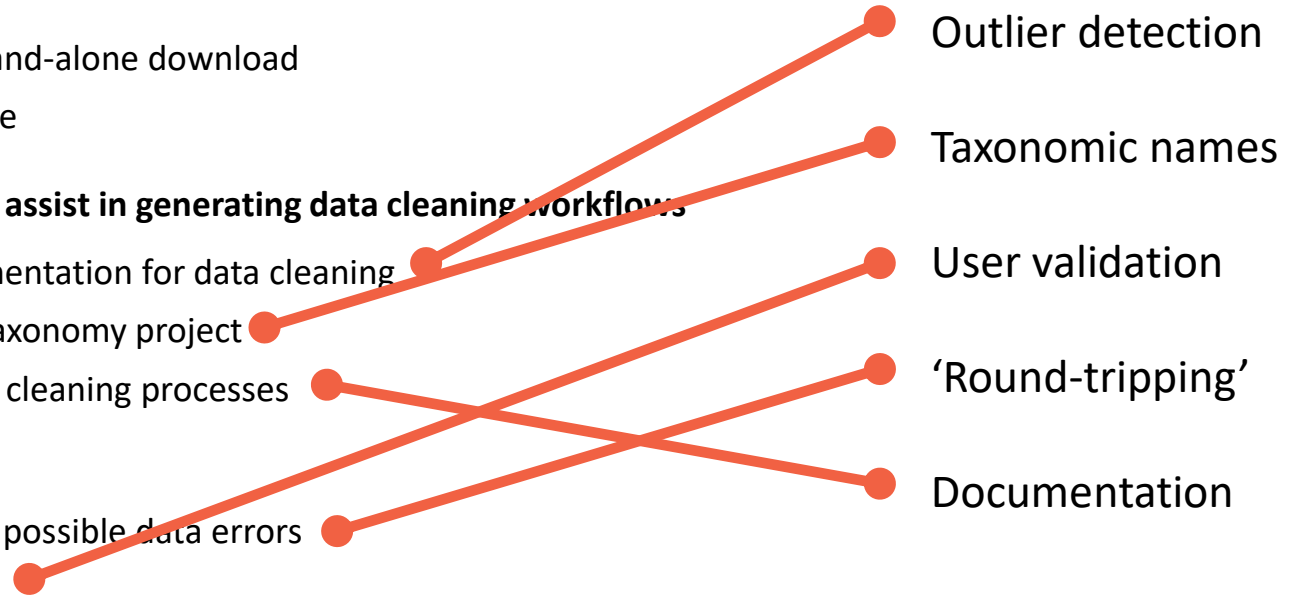




Project plan

TASK	TITLE
Work package 1: A combined, curated biodiversity data asset for south-eastern Australia	
Milestone 1	Data shared between project partners
Milestone 2	Species occurrence dataset available online as stand-alone download
Milestone 3	Derived species distribution layers available online
Work package 2: Identify and catalogue errors in the ALA records to assist in generating data cleaning workflows	
Milestone 4	Summarize and make available scripts and documentation for data cleaning
Milestone 5	List identified taxonomic problems, pass to ALA taxonomy project
Milestone 6	Updated documentation on ALA data ingestion & cleaning processes
Work package 3: Integrate data curation activities with ALA systems	
Milestone 7	Work with data providers to provide feedback on possible data errors
Milestone 8	Ensure modelled datasets available via BioCache

Focus areas



Project stakeholder and beneficiaries

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Australian researchers

Australian researchers consistently report low data quality from the ALA

Environmental government entities

Improving data quality reduces the effort needed to analyse and interpret biodiversity information

Australian collections, herbaria and museums

ALA will provide feedback to data providers on potential issues with their data and how those issues can be addressed

EcoCommons

EcoCommons provides modelling services that build on data from the ALA: improvements to our data can be rapidly applied to users in research or government

Next steps

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- Host an in-person forum with project partners and collaborators
- Publish combined data set online
- Create best practice data cleaning protocols
- Reach out to data providers to understand how best to provide feedback which will result in change

Challenges and opportunities

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1. Taxonomic misidentification

Extremely difficult to find & correct

2. Technical expansion in a time-poor environment

Basically everyone at the moment

3. Communities for data quality

Serious technical and institutional barriers

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Thank you

Martin Westgate
Team Leader: Science & Decision Support

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t @westgatecology
g: @mjwestgate

NCRIS National Research Infrastructure for Australia
An Australian Government Initiative

CSIRO

The ALA is made possible by contributions from its many partners. It receives support through the Australian Government through the National Collaborative Research Infrastructure Strategy (NCRIS) and is hosted by CSIRO.

Australian Reference Genome Atlas Project

Kathryn Hall*, Sarah Richmond, Nigel Ward and Hamish Holewa

ARDC Bushfire Data Commons Forum, 19 July 2022

ARGA
Australian Reference Genome Atlas

ARGA objectives and vision

The Australian Reference Genome Atlas is an indexing service for discovering, filtering and accessing complex life science data.

For plants, animals, microbiota and other species endemic or relevant to Australia, ARGA will build a platform to locate and aggregate genomic data, including:

- reference genome assemblies
- genome annotations
- population and variant sets
- DNA barcodes
- coding and non-coding DNA sequences

Acknowledging ARGA partnerships

The Australian Reference Genome Atlas (ARGA) is an NCRIS-enabled platform powered by the Atlas of Living Australia (ALA), in collaboration with Bioplatforms Australia and the Australian BioCommons, with investment from the Australian Research Data Commons (ARDC) (https://doi.org/10.47486/DC011). ARGA integrates data sourced from a number of international repositories, including NCBI GenBank, EMBL-ENA and Bioplatforms Australia.

ARGA
Australian Reference Genome Atlas

Atlas of Living Australia
ala.org.au

Australian BioCommons

BIOPLATFORMS AUSTRALIA

ARDC
Australian Research Data Commons

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

ARGA
Australian Reference Genome Atlas

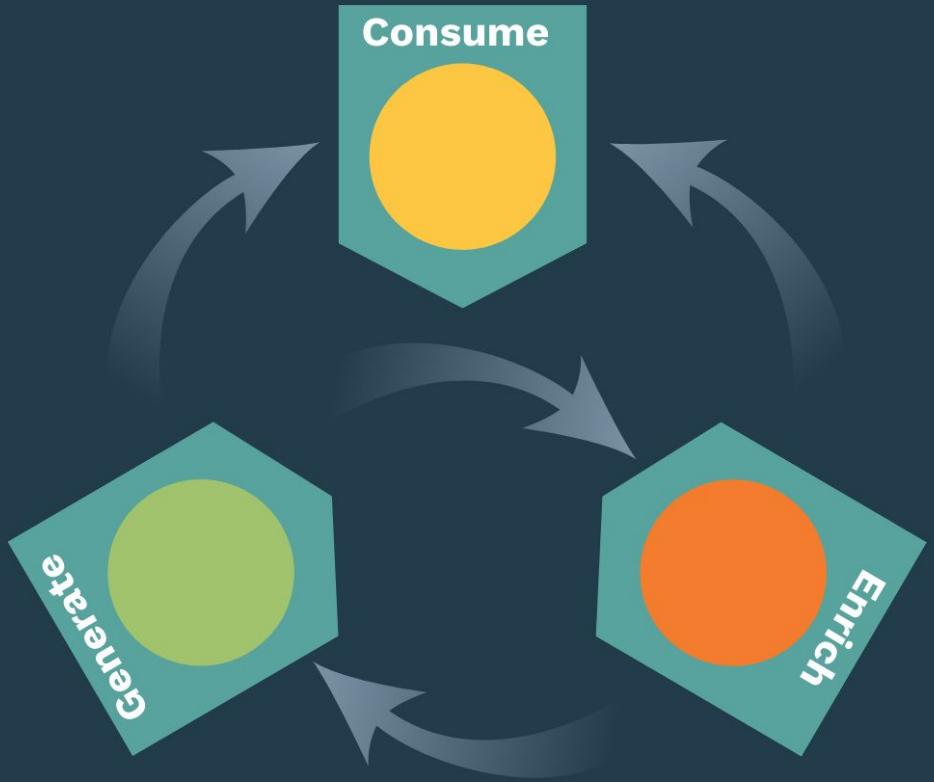
Genomics data cycle

Data that are newly generated by research projects can be consumed by those researchers and also made available for consumption to others.

Genomic data from specimens can also be enriched by intersecting it with other observations, using metadata and processing pipelines.

Enriched data can then be consumed to answer novel questions.

Data enrichment can seed the generation of new data by identifying targets.



ARGA
Australian Reference Genome Atlas

Stakeholders

Data generators

Data consumers

Data enrichers

Life sciences researchers

Industry and applications

Policy and regulators

Touchpoints with ARGA can be categorised by stakeholder interactions with genomics data.

ARGA
Australian Reference Genome Atlas

Data generators

Life sciences researchers

DNA barcoding

Sanger sequencing

High-fidelity single gene reads

Population variants

Whole genome mapping

Next-gen sequencing

eDNA

Policy and regulators

Next-gen sequencing

eDNA

Industry and applications

Whole genome mapping

Next-gen sequencing

Population variants

eDNA

ARGA
Australian Reference Genome Atlas

Data consumers

Life sciences researchers

- Reference genomes
- GenBank and EMBL-ENA
- Consensus sequences
- Literature records
- Genome assemblies
- Variants and SNPs
- BPA and other sources
- Genome maps

Policy and regulators

- Variants and SNPs
- Consensus sequences

Industry and applications

- Consensus sequences
- Variants and SNPs
- Genome assemblies
- Reference genomes
- Genome maps

ARGA
Australian Reference Genome Atlas

Data enrichers

Life sciences researchers

Taxonomy

Species

Evolution and phylogeny

Populations and ecology

Genome evolution

Gene expression

Genes

Transcriptomics

Policy and regulators

Biodiversity monitoring

Biosecurity surveillance

Industry and applications

Phenotype trials

Natural products

Diseases

Environmental degradation

Biochemistry

ARGA
Australian Reference Genome Atlas

Data applications

Life sciences researchers

- Taxonomy
- Ecology
- Evolution

Industry and applications

- Human health
- Pharmaceuticals
- Veterinary health
- Crops and livestock
- Bioproducts
- Environmental resilience
- Conservation

Policy and regulators

- Data-driven planning
- Biosecurity

Genomics data can be used for downstream applications that increase knowledge, prosperity and national security and reputation.

ARGA
Australian Reference Genome Atlas

Key Stakeholder Groups

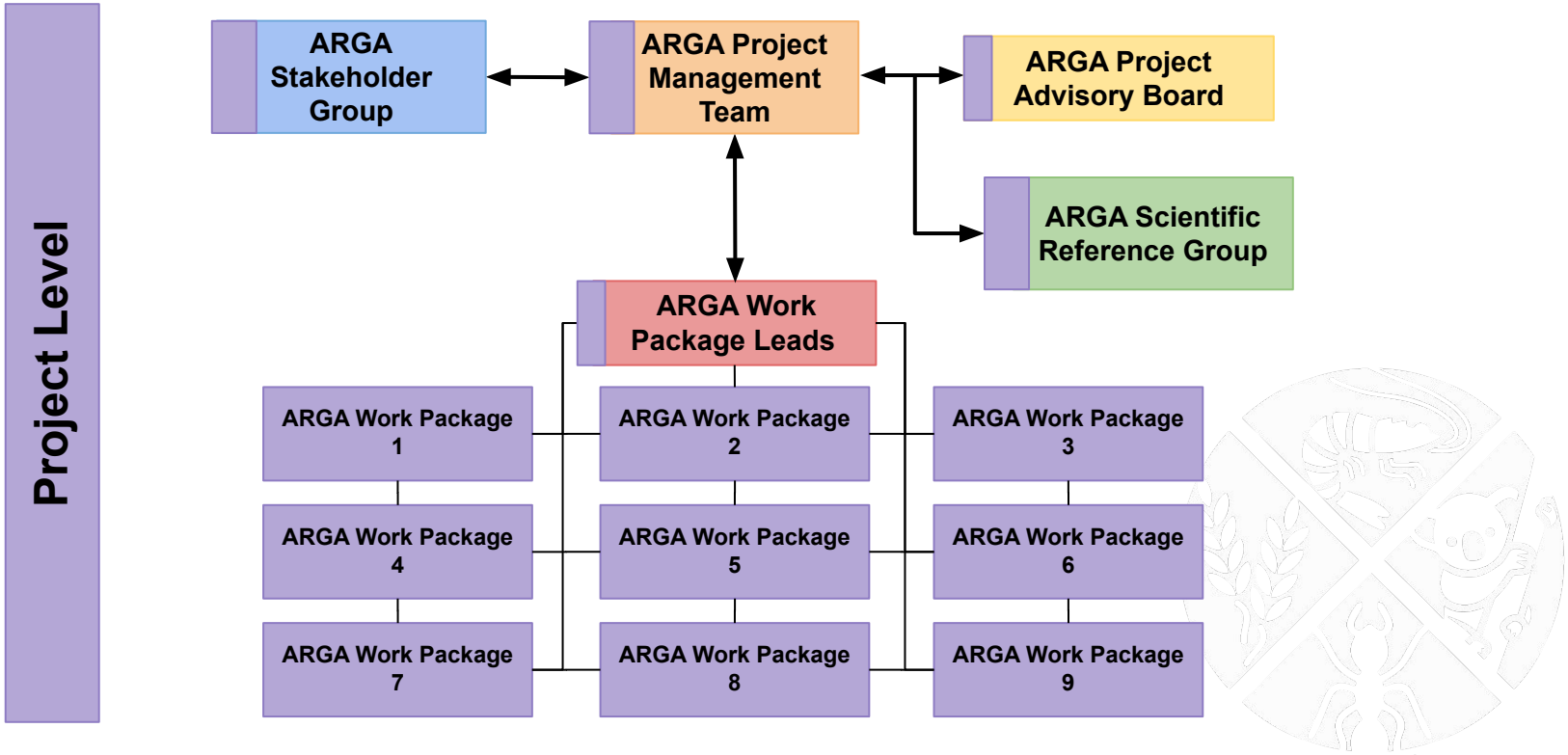
Life sciences researchers

- Great Barrier Reef
- OzMammals
- Threatened Species Initiative
- Reptiles and Amphibians
- Koalas
- Universities
- National Biodiversity DNA Library Initiative
- Museums and Herbaria

Industry and applications

- Plant Protein Atlas
- Australian Gut Metabolome
- Plant Pathogen Omics
- Australian Grasslands
- Wheat
- Wine Yeast
- Environomics
- Pest Genomics Initiative
- Soil Biodiversity

ARGA project governance model



ARGA work packages

Work Package 1. ARGA Archive

Work Package 2. ARGA Curation

Work Package 3. ARGA Index

Work Package 4. ARGA Connections

Work Package 5. ARGA Cart

Work Package 6. ARGA Interface

Work Package 7. ARGA Operations

Work Package 8. ARGA Project management

Work Package 9. ARGA Product exposure

Project Plan

Project Timeline and Budget

Progress highlights

Project implementation:

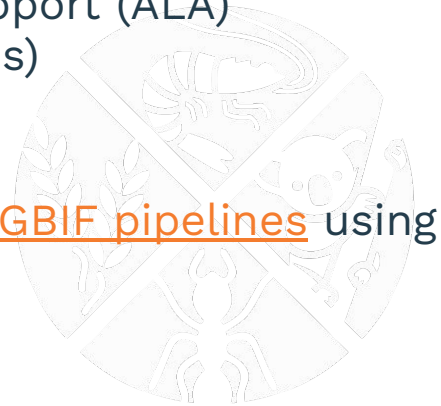
- Report 1 completed (Milestone 1)
- Project Advisory Board and Terms of Reference

Staffing:

- Project Manager, Lead Systems Engineer, Systems Support (ALA)
- UI/UX Designer, Data Engineer (Australian BioCommons)

Work Package 1: ARGA Archive

- Data from NCBI-GenBank ingested and processed via GBIF pipelines using Darwin Core Archives (DwC-A) metadata standards.
- Working prototype interface built using React.js



Next steps for the ARGA project

Staffing:

- Scientific Business Analyst – at market
- Software Engineer – PD drafted

Work Package 1: ARGA Archive

- Continue data ingest and processing from more repositories

Work Package 2. ARGA Curation

- Establish links with bushfires community to explore traits data

Work Package 6. ARGA Interface

- Persona characterisation and testing

Challenges and opportunities

Data sources are complex different scattered clandestine disconnected

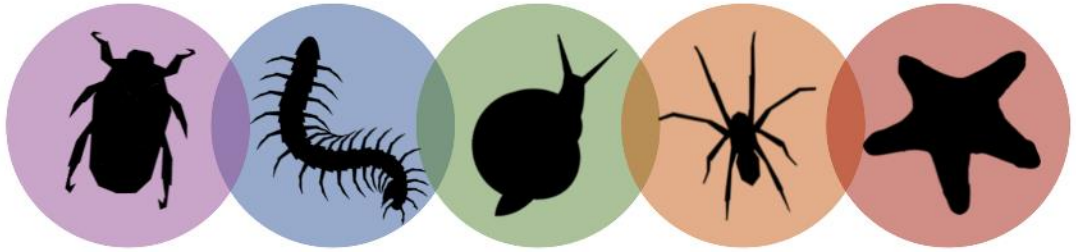
Genomics can improve outcomes for livestock breeding and primary industries research

Bushfires (and another environmental catastrophe) responses can be proactive, not reactive

15,000 life science researchers in Australia can supercharge their searches for relevant data using occurence records and curated traits filters

ARGA

Australian Reference Genome Atlas



INVERTEBRATES AUSTRALIA

InverTraits

Development of a trait database and framework for evaluating fire-susceptibility of invertebrate species

Dr Jess Marsh

Project Manager

Project overview

INVERTEBRATES AUSTRALIA

Species responses to fire vary. Some species have traits that make them highly susceptible to mortality, or less able to recover or adapt

- These species may be in need of conservation response following large-scale fire events
- For many invertebrate species this information has not been collated, is not accessible, or available, and so conservation response has largely not been possible.
- Continuation of NESP 2019-2020 fire-impacted invertebrate project (Marsh *et al.*, 2021; Marsh *et al*., 2022)

Why does this matter?

- Many invertebrates have traits that make them fire-susceptible and thus likely at elevated extinction risk following large-scale fire events.
- Many invertebrates are of ecological importance, performing crucial ecosystem services

T. Latty

T. Latty

T. Latty

K. Umbers

Project aims

INVERTEBRATES AUSTRALIA

1. To build an enduring, living database of fire-relevant ecological and life-history traits for Australian invertebrate species
2. To develop a framework, incorporating traits data, distributional fire overlap mapping, fire-event characteristics, and landscape-scale habitat mapping to:
    1. Evaluate the fire-susceptibility and post-fire recovery ability of invertebrate species
    2. Identify those species likely most at risk
3. To make database and workflows accessible via publication in open access repositories

T. Latty

T. Latty

K. Umbers

T. Latty

T. Latty

K. Umbers

Stakeholders and beneficiaries

INVERTEBRATES AUSTRALIA

Australian state and federal government agencies, conservation bodies, conservation assessors, researchers

Applications:

1) Robust evidence based framework for rapid assessment of species likely to be most imperiled in future fire

- Inform targeted management responses to recover impacted species in future fires.
- Inform fire management planning
- Identify candidates species for conservation assessment
- Provide a central repository of data to assist in preparation of species conservation assessments

2) An open access, living repository to store and grow invertebrate traits data, providing an ongoing national research infrastructure.

Challenges and opportunities

INVERTEBRATES AUSTRALIA

Challenges

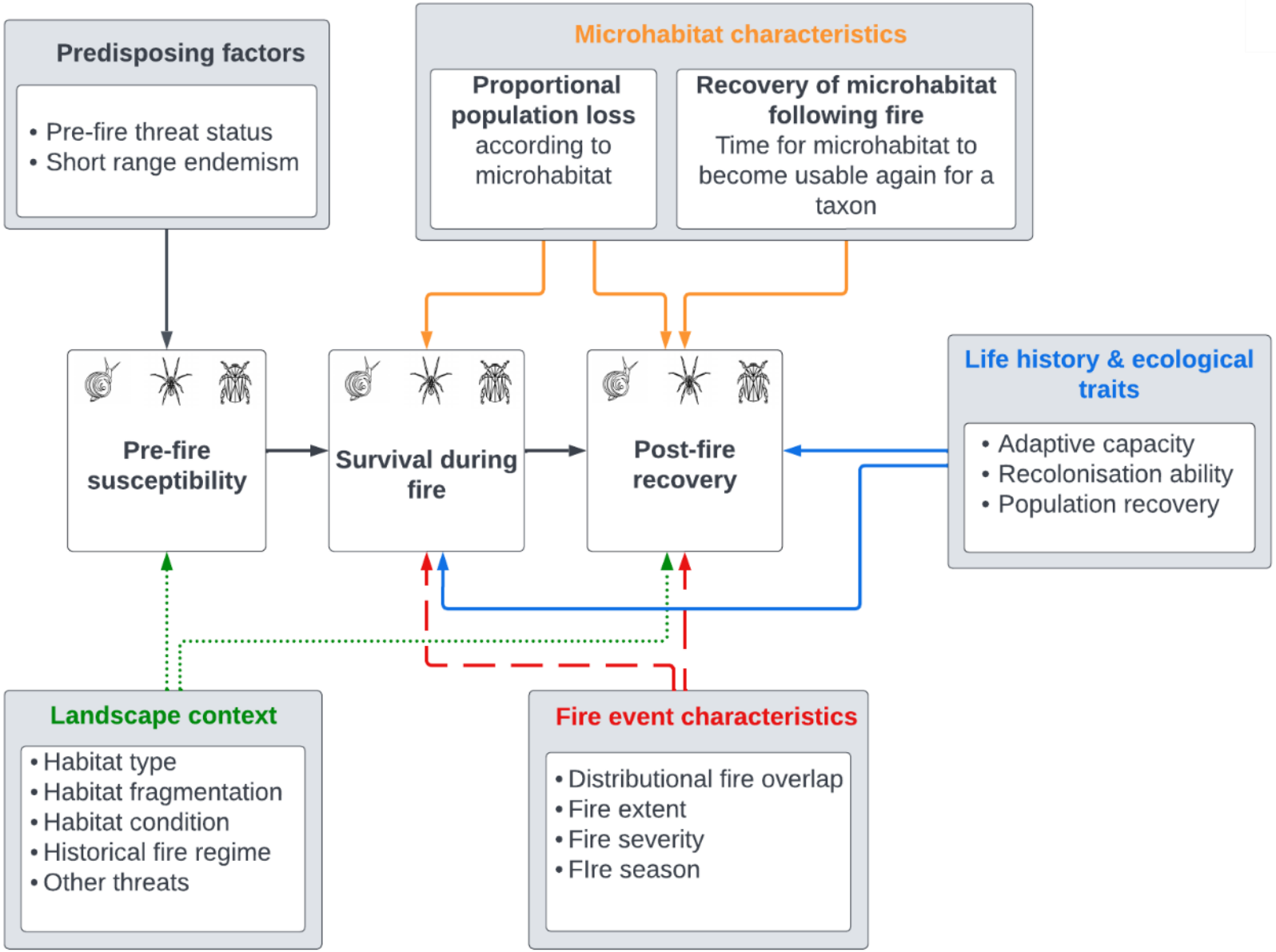
- Large-scale data deficiency
- Traits data often spread throughout a diverse range of disparate sources, with non-standardised vocabularies across taxa

Opportunities

- Science – data and knowledge
- Identify key knowledge gaps - a platform for research
- Biodiversity management – evidence based, informed decision making
- Potential to engage and educate about the importance of invertebrates and their vulnerability

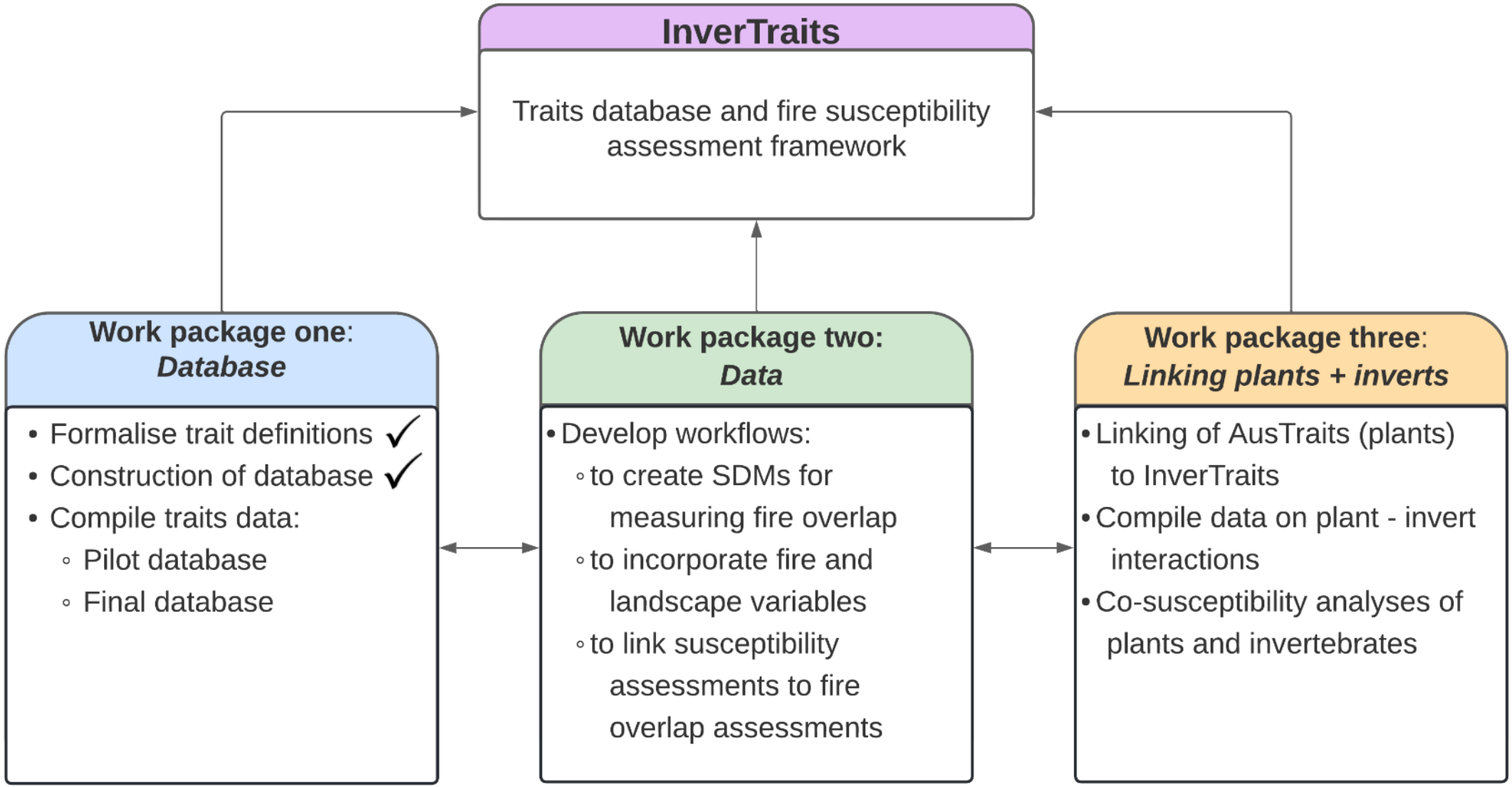
Project objective and vision

INVERTEBRATES AUSTRALIA



Work packages and progress

INVERTEBRATES AUSTRALIA



Project partners

INVERTEBRATES AUSTRALIA

AusTraits

ALA

EcoCommons

Steering committee and advisers

Data contributors

- Invertebrate biologists
- Invertebrate societies
- Fire modelling
- Conservation

K. Umbers

Next steps

INVERTEBRATES AUSTRALIA

WP 1

- Finalise database construction
- Trait data extraction
  - In progress
- Fully working pilot ready by October 2022

WP2

- Mapping of traits values to susceptibility matrix
  - In progress
- Develop workflows for assessing susceptibility

WP 3

- Work with partners to construct develop AusTraits and InverTraits database linkages
- Compile traits data on invertebrate - plant species interactions
  - In progress

T. Latty

Thank you

INVERTEBRATES AUSTRALIA

References

Marsh, J., Bal, P., Fraser, H., Umbers, K., Greenville, A., Rumpff, L., & Woinarski, J. (2021). Assessment of the impacts of the 2019-20 wildfires of southern and eastern Australia on invertebrate species Final Report.

Marsh, J. R., Bal, P., Fraser, H., Umbers, K., Latty, T., Greenville, A., ... & Woinarski, J. C. (2022). Accounting for the neglected: Invertebrate species and the 2019–2020 Australian megafires. *Global Ecology and Biogeography*.

K. Umbers

jessmarsh@invertsau.org

www.invertebratesaustralia.org

THE UNIVERSITY OF MELBOURNE

MELBOURNE RESEARCH

BDC13::Modelling Impact and Risk/Data Access and Modelling Platform

Prof. Richard O. Sinnott,
Professor of Applied Computing Systems
University of Melbourne
rsinnott@unimelb.edu.au

Objective, Partners, Stakeholders

- Objective
  - to develop and support a front-end use-oriented interface and associated data access and integration platform for the BDC portfolio of projects*
- Partners and Stakeholders
  - University of Melbourne
  - All BDC projects*
  - University of Sydney/Wollongong
    - National air quality system
  - CSIRO/UNSW
    - Climate change
  - DELWP, EPA, …
    - Data providers

* where appropriate!

Work Packages and Progress

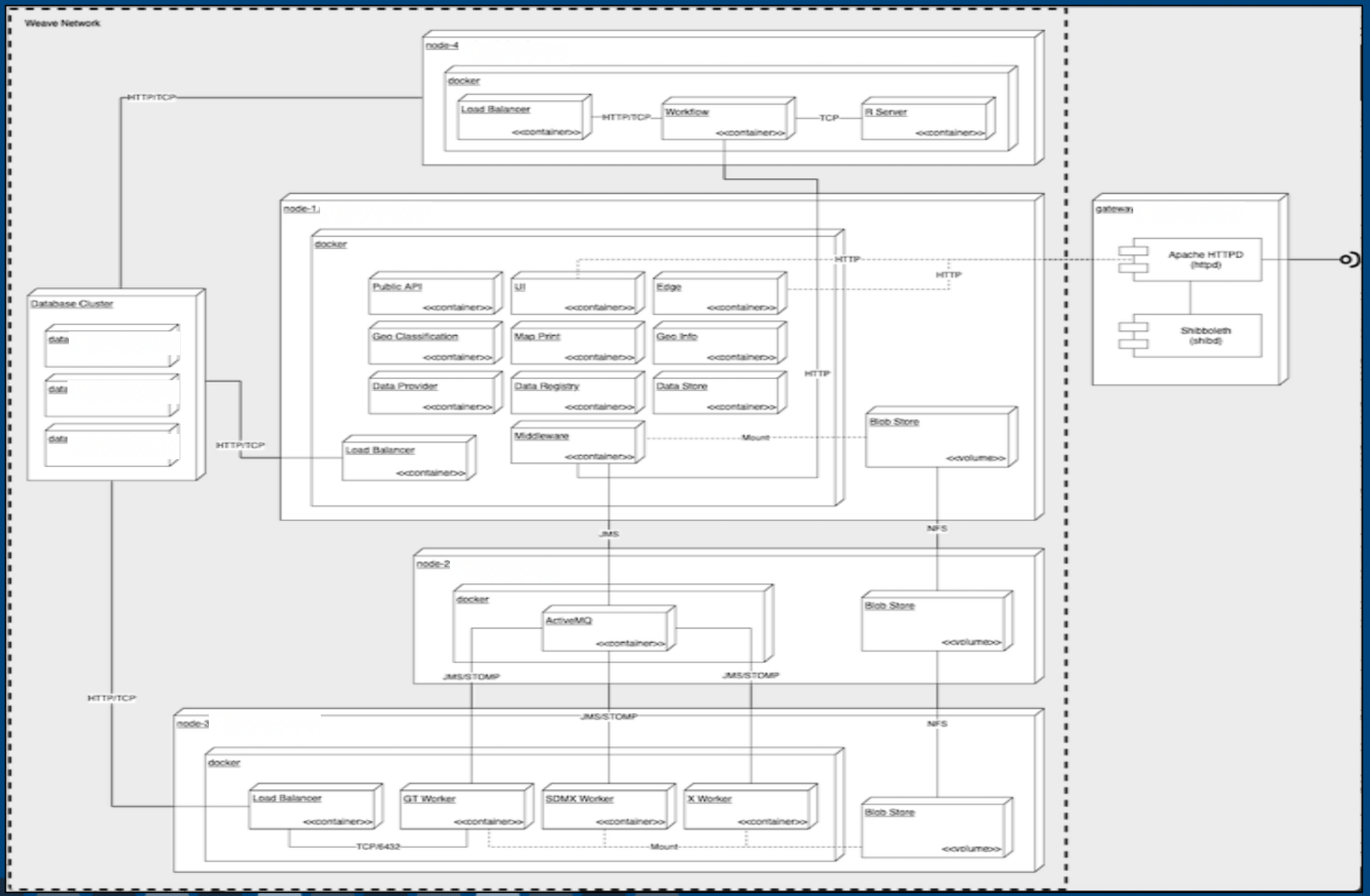
- Work Package 1
  - Platform requirements elicitation (T0-T18)
    - Initial survey…
- Work Package 2
  - Build environment & infra. establishment (T0-12)
    - Completed
- Work Package 3
  - Software development (T0-T18)
    - Ongoing
- Work Package 4
  - Outreach and engagement (T6-T20)
    - Ongoing
- Work Package 5
  - Project Mgt, Coordination and Governance (T0-T20)
    - Ongoing

Core Requirements

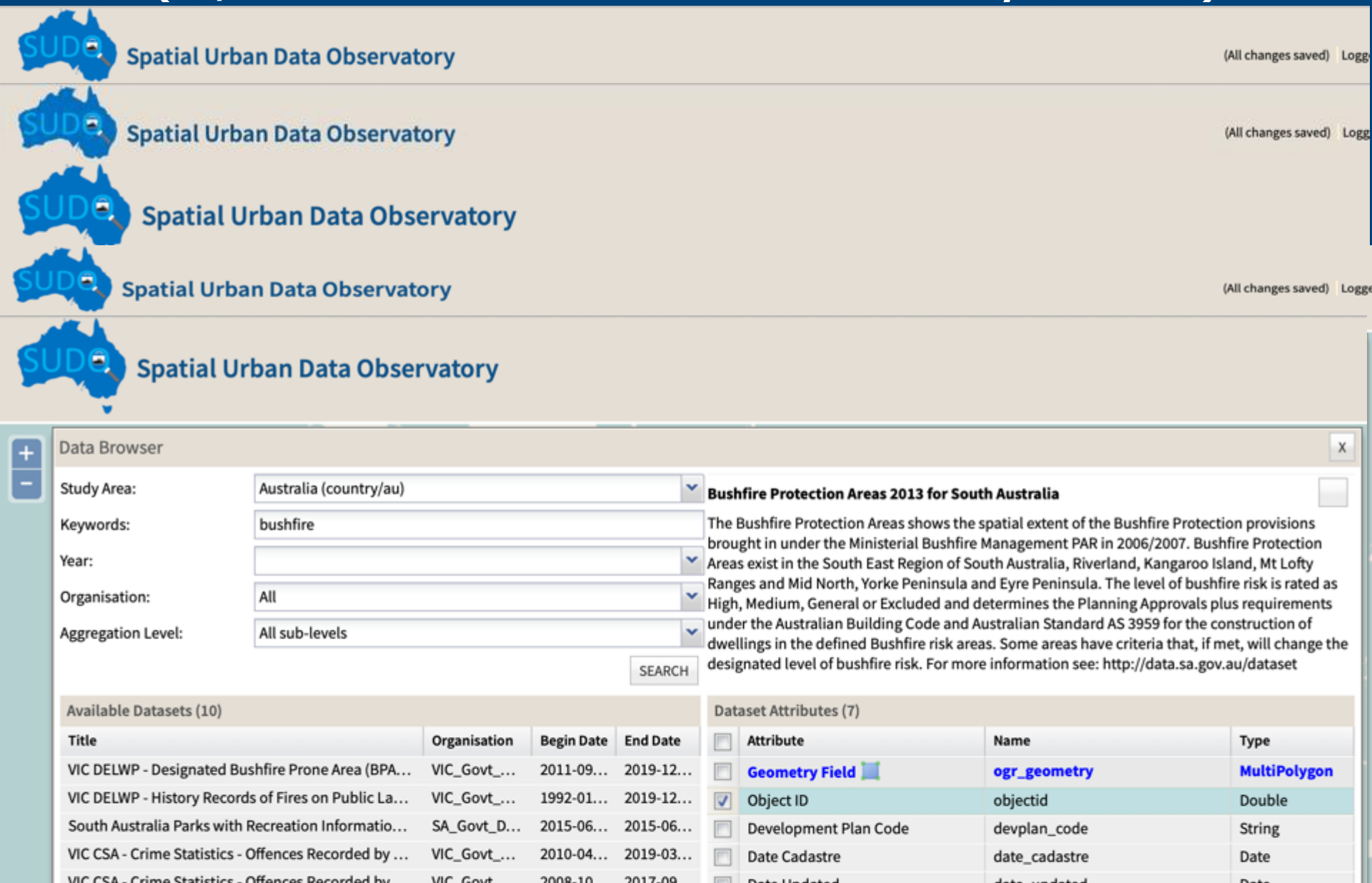
- Access to/use of heterogeneous (spatial) data
  - Details …?
    - Volume, flavour (Vector/Raster/…)
    - Via APIs or other data sharing arrangements
- Security
  - Details …?
- Visualisation and Analytics
  - Details…?
- User base
  - Details…?
    - Public, researchers, government…?

Agile methodology to tease out details

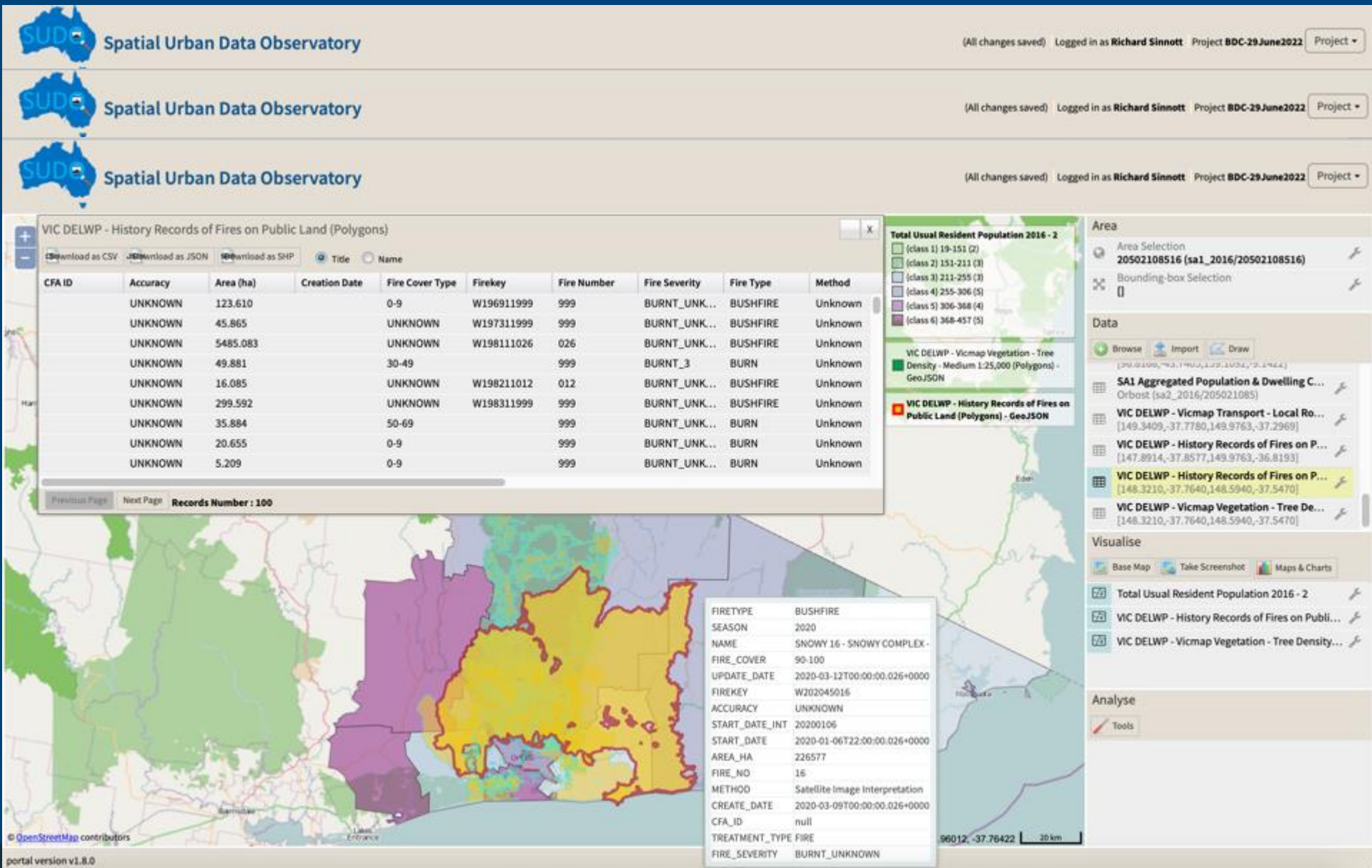
Initial BDC Architecture (Leverage Spatial Urban Data Observatory)



Progress and Leveraging SUDO (6,000+ data sets and many tools)



For example…


Spatial Urban Data Observatory
(All changes saved) Logged in as Richard Sinnott Project BDC-29June2022 Project
Spatial Urban Data Observatory
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Spatial Urban Data Observatory
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VIC DELWP - History Records of Fires on Public Land (Polygons)
Download as CSV Download as JSON Download as SHP Title Name
CFA ID | Accuracy | Area (ha) | Creation Date | Fire Cover Type | Firekey | Fire Number | Fire Severity | Fire Type | Method
UNKNOWN | 123.610 | 0-9 | W196911999 | 999 | BURNT_UNK... | BUSHFIRE | Unknown
UNKNOWN | 45.865 | UNKNOWN | W197311999 | 999 | BURNT_UNK... | BUSHFIRE | Unknown
UNKNOWN | 5485.083 | UNKNOWN | W198111026 | 026 | BURNT_UNK... | BUSHFIRE | Unknown
UNKNOWN | 49.881 | 30-49 | 999 | BURNT_3 | BURN | Unknown
UNKNOWN | 16.085 | UNKNOWN | W198211012 | 012 | BURNT_UNK... | BUSHFIRE | Unknown
UNKNOWN | 299.592 | UNKNOWN | W198311999 | 999 | BURNT_UNK... | BUSHFIRE | Unknown
UNKNOWN | 35.884 | 50-69 | 999 | BURNT_UNK... | BURN | Unknown
UNKNOWN | 20.655 | 0-9 | 999 | BURNT_UNK... | BURN | Unknown
UNKNOWN | 5.209 | 0-9 | 999 | BURNT_UNK... | BURN | Unknown
Previous Page Next Page Records Number : 100
Total Usual Resident Population 2016 - 2
(class 1) 19-151 (2)
(class 2) 151-211 (3)
(class 3) 211-255 (3)
(class 4) 255-306 (5)
(class 5) 306-368 (4)
(class 6) 368-457 (5)
VIC DELWP - Vicmap Vegetation - Tree Density - Medium 1:25,000 (Polygons) - GeoJSON
VIC DELWP - History Records of Fires on Public Land (Polygons) - GeoJSON
FIRETYPE BUSHFIRE
SEASON 2020
NAME SNOWY 16 - SNOWY COMPLEX -
FIRE_COVER 90-100
UPDATE_DATE 2020-03-12T00:00:00.026+0000
FIREKEY W202045016
ACCURACY UNKNOWN
START_DATE_INT 20200106
START_DATE 2020-01-06T22:00:00.026+0000
AREA_HA 226577
FIRE_NO 16
METHOD Satellite Image Interpretation
CREATE_DATE 2020-03-09T00:00:00.026+0000
CFA_ID null
TREATMENT_TYPE FIRE
FIRE_SEVERITY BURNT_UNKNOWN
Area
Area Selection
20502108516 (sa1_2016/20502108516)
Bounding-box Selection
[]
Data
Browse Import Draw
SA1 Aggregated Population & Dwelling C...
Orbost (sa2_2016/205021085)
VIC DELWP - Vicmap Transport - Local Ro...
[149.3409,-37.7780,149.9763,-37.2969]
VIC DELWP - History Records of Fires on P...
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VIC DELWP - History Records of Fires on P...
[148.3210,-37.7640,148.5940,-37.5470]
VIC DELWP - Vicmap Vegetation - Tree De...
[148.3210,-37.7640,148.5940,-37.5470]
Visualise
Base Map Take Screenshot Maps & Charts
Total Usual Resident Population 2016 - 2
VIC DELWP - History Records of Fires on Publi...
VIC DELWP - Vicmap Vegetation - Tree Density...
Analyse
Tools
© OpenStreetMap contributors
96012, -37.76422
20 km
portal version v1.8.0

Next Steps

- Survey
  - https://www.ado.eresearch.unimelb.edu.au/bda-imp/
  - Completion
  - Follow up
- Meetings
  - Zoom
  - Face-to-face
  - eResearch Australasia
- Technical details
  - Understanding data
    - Form, coverage
  - Where can be beneficial