

ARGA's User Interface: giving genomic data repositories a glow-up

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Atlas of Living Australia
Australian BioCommons
Bioplatforms Australia



Acknowledgement of country



Genomic data in life science

Genomic data is very useful to life science researchers and can help give insight into a species’:

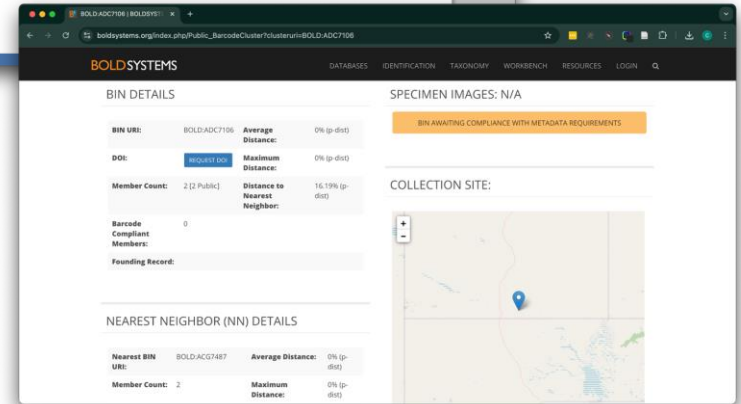
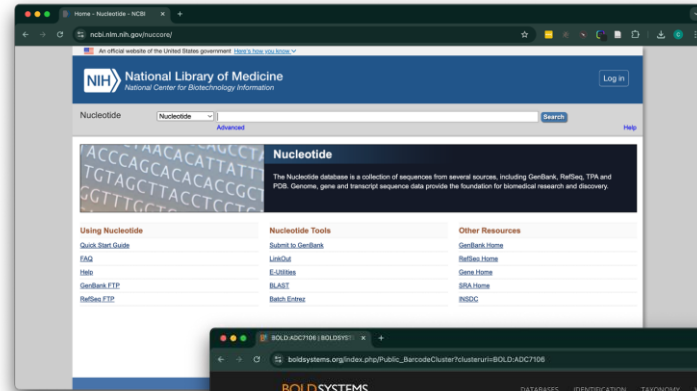
- evolutionary history
- taxonomy
- conservation



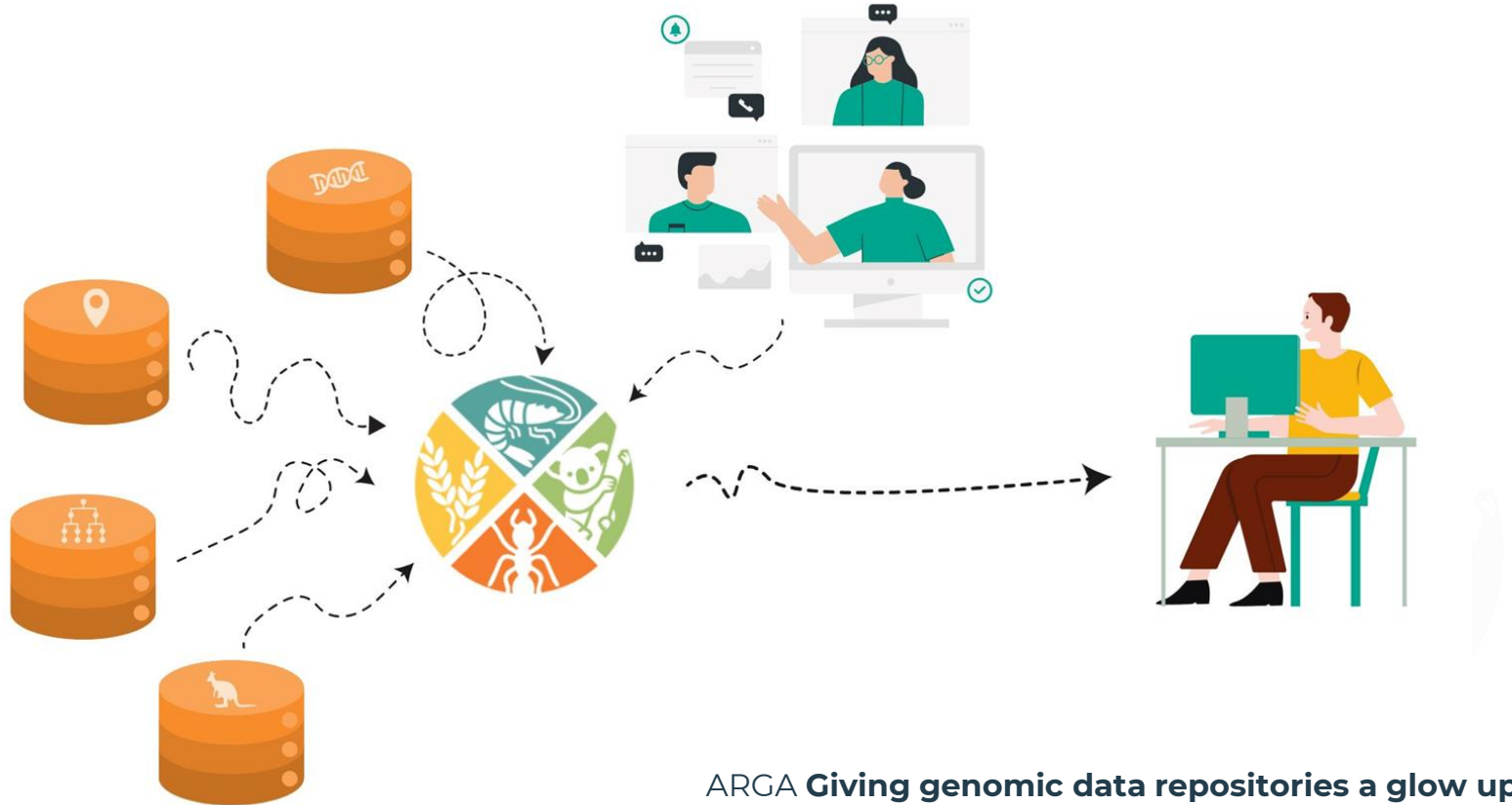
Current repositories are confusing

Many existing genomics data repositories are not designed with user experience in mind which results in:

- lack of intuitive search functionality
- overabundance of technical jargon
- cluttered interfaces
- lack of visual guidance and tutorials
- limited data visualisation



ARGA's User-Centric design



ARGA's User-Centric design

The user interface of ARGA was developed using a Next-JS front-end framework + Mantine component library to prioritise:

- Intuitive navigation
- Effective organisation + presentation of data
- Visually appealing and minimalist design



Mantine

Intuitive navigation

The screenshot shows the ARGA (Australian Reference Genome Atlas) website. The header includes the ARGA logo and navigation links for APP HOME, DATA SOURCES, and PROJECT HOME. The main content area features a section titled "deepen discovery — trawl traits — curate collections" with a description of the atlas's purpose and a list of data types. A search bar is provided for finding data. To the right, a "Data summary" box contains a gauge chart showing 1% of species with genomes, a taxonomic breakdown table, and a horizontal bar chart of species with genomes.

deepen discovery — trawl traits — curate collections

For plants, animals, microbes and other species endemic or relevant to Australia, the Australian Reference Genome Atlas (ARGA) locates and aggregates genomic data, including:

- reference genome assemblies • genome annotations • population and variant sets • DNA barcodes • coding and non-coding DNA sequences • raw genomics data

Search by species, higher classification, data type or ecological and phenotypic traits. Get started by entering any word in the search bar below, or scroll down to browse pre-filtered groupings.

Search for data

Q e.g. sequence accession, species name

Data summary

Percentage of species with genomes

1%

Taxonomic breakdown

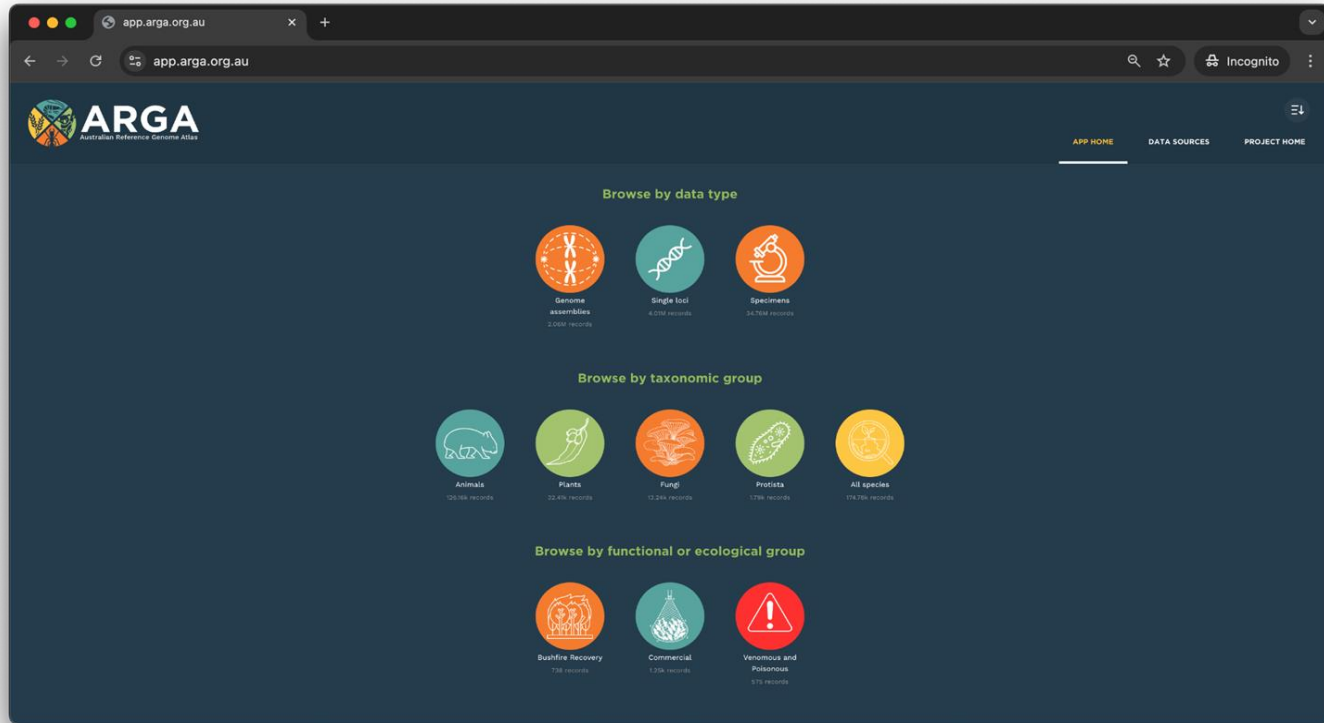
Number of species/OTUs	174,782
Species with genomes	2,069
Species with data	38,844

Species with genomes

Aspergillus fumigatus	~280
Aspergillus flavus	~220
Arabidopsis thaliana	~180
Botryosphaeria dothidea	~140
Rhodotorula mucilaginosa	~120
Solanum lycopersicum	~100
Venturia inaequalis	~80
Aureobasidium pullulans	~70
Hordeum vulgare	~60
Clavipora lusitaniae	~50

Note: these statistics summarise the content indexed within ARGA. The values relate to the species deemed relevant to Australia (either by endemism or economic and social value), and for repositories that are indexed by ARGA. The values may not be indicative of global values for all research.

Effective organisation + presentation of data



Effective organisation + presentation of data

app.arga.org.au/kingdom/Animalia

ARGA
Australian Reference Genome Atlas

APP HOME DATA SOURCES PROJECT HOME

Browse species (20151 results) Filters: ANIMALIA

Higher classification filters
Limit data based on taxonomy
Kingdom: Animalia
+ Add filter

Data types
Only show species that have specific types of data

Vernacular group
Birds, Flowering plants, Bacteria, etc.

Regions
Ecological and administrative boundaries

Bushfire traits
Bushfire vulnerability and recovery

No image available

Eucymatops scotodes
Genome Genetic loci

Aasaba fossicollis
Genome Genetic loci

Aasaba nodosus
Genome Genetic loci

Aacanthocnema dobsoni
Genome Genetic loci

Aacanthocnema huageliana
Genome Genetic loci

Aacanthocnema luehmannii
Genome Genetic loci

Effective organisation + presentation of data

The screenshot displays the ARGA (Australian Reference Genome Atlas) website interface for the species *Rhincodon typus*. The browser address bar shows the URL `staging.arga.org.au/species/Rhincodon_typus/summary`. The page features a dark blue header with the ARGA logo and navigation links for `APP HOME`, `DATA SOURCES`, and `PROJECT HOME`. Below the header, the species name *Rhincodon typus* is prominently displayed, accompanied by a green checkmark indicating that a reference genome is available. A horizontal menu allows users to navigate between different data sections: `Summary`, `Data distribution`, `Taxonomy`, `Genome assemblies`, `Genomic components`, `Single locus data`, and `Specimens`. The `Summary` section is active, showing a large image of a whale shark and a detailed `Data Summary` table. This table is organized into several categories, each with a list of data types and their corresponding counts or status. For example, under `Whole genome data`, there are 4 whole genome assemblies, while other categories like `Genomic components` and `Partial genomic data` show 72 single loci. The `External Resources` section includes `Species information` (with a link to ALA) and `Taxonomy`. The overall design is clean and user-friendly, with clear navigation and a structured presentation of genomic data.

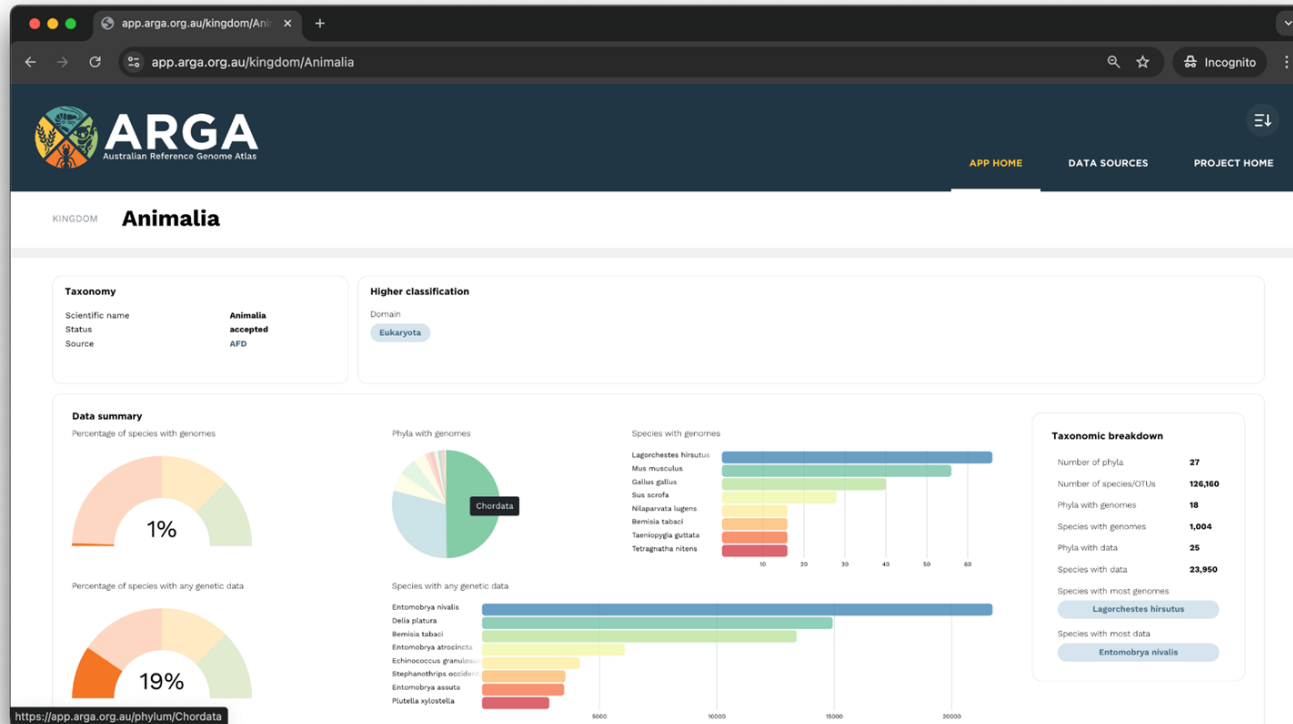
Category	Data Type	Count/Status
Whole genome data	Whole genome assemblies	4
	Partial genome assemblies	No data
	Genome annotations	No data
	Organelle genome assemblies	No data
Genomic components	Sequence read files	No data
	Sequence alignment files	No data
	Partial genomic data	
Single locus data	Single loci	72
	Genetic variant sets	No data
	Specimens	Registered collections
Other		No data
Protocols	Methods	No data
	Primers	No data
	Assays	No data
Publications	Genomics papers	No data
	Other papers	No data

Visually appealing + minimalist design

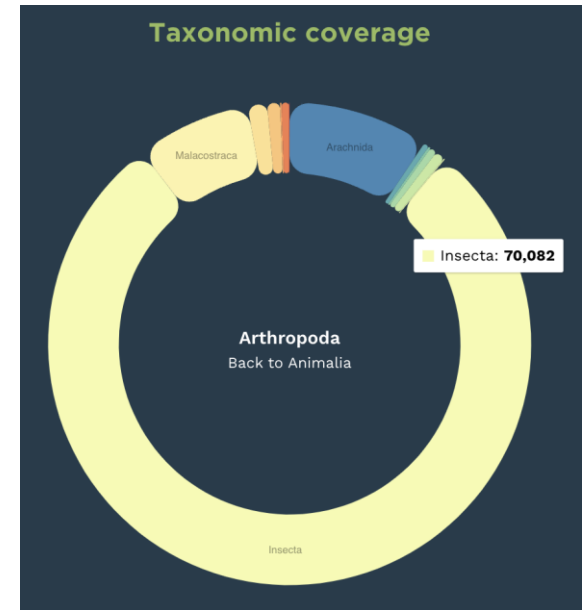
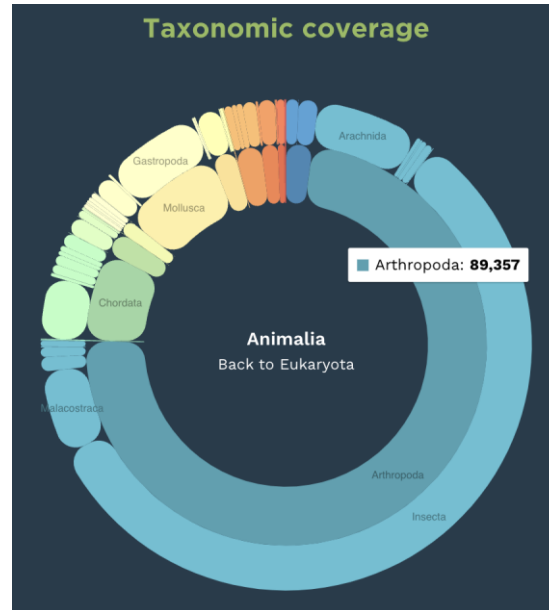
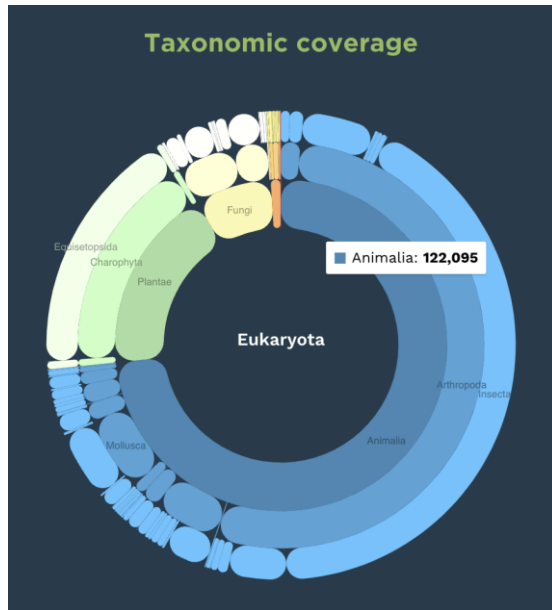
The screenshot shows the ARGA (Australian Reference Genome Atlas) website interface. The search bar contains "Rhincodon typus" and the results page displays 173 search results. The results are organized into a table with columns for Species Report, Genome Assembly, and Locus. The Species Report section shows taxonomic classification and counts for Assemblies (4) and Other data (72). The Genome Assembly section lists three entries with their respective accession numbers, representation (Full), assembly type (haploid), assembly level (Scaffold or Chromosome), data source (NCBI Genbank or NCBI RefSeq), and release date. The Locus section shows one entry with accession number FJ519250, gene name COI-5P, and no data for sequence length and source molecule.

Species Report	Accepted species name	Kingdom	Phylum	Class	Order	Family	Genus	Assemblies	Other data	view
	<i>Rhincodon typus</i>	Animalia	Chordata	Chondrichth...	Orectolobif...	Rhincodenti...	<i>Rhincodon</i>	4	72	view
Genome Assembly	Accepted species name	Accession	Representation	Assembly type	Assembly level	Data source	Release date	view		
	<i>Rhincodon typus</i>	GCA_012626285.1	Full	haploid	Scaffold	NCBI Genbank	24/07/2020	view		
	<i>Rhincodon typus</i>	GCF_021869965.1	Full	haploid	Chromosome	NCBI RefSeq	03/02/2022	view		
	<i>Rhincodon typus</i>	GCA_021869965.1	Full	haploid	Chromosome	NCBI Genbank	03/02/2022	view		
	<i>Rhincodon typus</i>	GCA_001642345.3	Full	haploid	Scaffold	NCBI Genbank	07/09/2021	view		
Locus	Accepted species name	Accession	Gene name	Sequence length	Source molecule	Data source	Release date	view		
	<i>Rhincodon typus</i>	FJ519250	COI-5P	No data	No data	BOLD	No data	view		

Visually appealing + minimalist design



Visually appealing + minimalist design



Visually appealing + minimalist design

The screenshot displays the ARGA web application interface. The header includes the ARGA logo (Australian Reference Genome Atlas) and navigation links for APP HOME, DATA SOURCES, and PROJECT HOME. The main content area is titled "Data sources indexed in ARGA" and features a section for "Genomics sources". This section includes a sorting menu (Sort by: A-Z, Date, Records) and a table of data sources. Each source is presented in a card format with a dark header and a light body, containing details such as Rights holder, Access rights, Data reuse status, and Number of records.

Source	Rights holder	Access rights	Data reuse status	Number of records
ARGA Genomes	Australian Reference Gen...	Open	Limited	No data
Anemone DB	Anemone Consortium	Restricted	Limited	No data
Australasian Wildlife Genomics Group	Australasian Wildlife Geno...	Open	Limited	No data
Bioplatforms Australia	Bioplatforms Australia	Restricted	None	No data
DNA Zoo	DNA Zoo Consortium	Open	Limited	No data
GenomeArk	GenomeArk and original d...	Open	Limited	No data



Enhances
usability



Increases
engagement



Improves
accessibility

ARGA's difference



Glow up 2.0

On the future makeover agenda:

- usability testing - does ARGA engage the user?
- tests to ensure ARGA fits WCAG standards
- introduce additional data groupings on home page
- single or multiple data download cart system



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



Australian
BioCommons



BIOPLATFORMS
AUSTRALIA



Australian Research Data Commons



National Research
Infrastructure for Australia

An Australian Government Initiative

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