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The Atlas Aspect of the Atlas of Living Australia

ATLAS OF LIVING AUSTRALIA
sharing biodiversity knowledge

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The Atlas is funded by the Australian Government under the National Collaborative Research Infrastructure Strategy and further supported by the Super Science Initiative of the Education Investment Fund

Partnerships

- Integrated Marine Observing System
- BioMaps
- Terrestrial Ecosystem Research Network
- Australia's Virtual Herbarium
- Online Zoological Collection of Australian Museums
- Oceanographic Biogeographic Information System
- Birds Australia
- Australian Biosecurity Intelligence Network
- International projects (GBIF, EoL, 4D4Life, DataONE, MoL…)
- …The natural resources community

Benefit of Collections

"By reducing the costs of studying vectors of human disease, biological invasions, and global climate change, biological collections provide direct financial and social benefits to society" (Suarez and Tsutsui 2004)

Benefit Areas (Chapman 2005)

- Taxonomy (research, guides, phylogenies…)
- Biogeographic studies (distributions and modelling)
- Species diversity (populations, richness, density, interactions)
- Life history (phenologies…)
- Endangered, migratory and invasive species
- Climate change
- Ecology, evolution and genetics (classifications, habitat loss…)
- Environmental regionalisations
- Conservation planning (assessment, sustainability…)
- Natural resource management
- Agriculture, forestry, fishing and mining
- Health and public safety (diseases, bioterrorism, contaminants…)
- Bioprospecting (pharmaceuticals)
- Forensics
- Border control and wildlife trade (quarantine, monitoring...)
- Education and public outreach (public awareness, databases…)
- Ecotourism (training guides…)
- Art and history (history of science, indigenous art, stamps…)
- Society and politics (ethnobiology, data repatriation, collecting…)
- Recreation (hunting, fishing, bushwalking…)
- Human infrastructure and planning (risk assessment, landscaping, timbers…)

The community wants…

1. A “one-stop shop” for biological data

2. The integration of all sources of collection, observation & ecological survey datasets and environmental data

3. Well-established, peer-reviewed analysis and modelling techniques

So Far…

1. Data amalgamation

   A. ~20 million biological records (points…) from museums, herbaria, systematic surveys, *ad hoc* observations
   B. ~250 environmental and contextual data layers (grids and polygons) from CSIRO, ANU, GA, BRS, BoM…

2. Data integration using international standards and support for data downloads

3. The core of a spatial analysis toolkit of robust, efficient and easy to use methods helping with “what is where?”

Workshop 1: Use Cases

1. Estimating the spatial distribution of biodiversity

2. Differences in biodiversity over space and time

3. Prioritizing management actions based on biodiversity estimates and scenario analyses

4. Identifying gaps and errors in biodiversity information relating to spatial, temporal, taxonomic and environmental factors

Workshop 2: 'Environmental' data

Classification 1	Example	Type
Biodiversity	Bio-regionalizations	Contextual
Climatic	Precipitation of driest ¼	Environmental
Hydrology	Runoff	Environmental
Land management	Added phosphorus	Environmental
Land use	Tenure	Environmental
Political	Local government areas	Contextual
Social	Population density	Environmental
Substrate	Erosivity	Environmental
Topography	Digital elevation model	Environmental
Vegetation	Classification	Contextual

User Needs Analysis

1. “Where does this species occur?”

2. “What species occur in this area?”

1. Where Does this Occur?

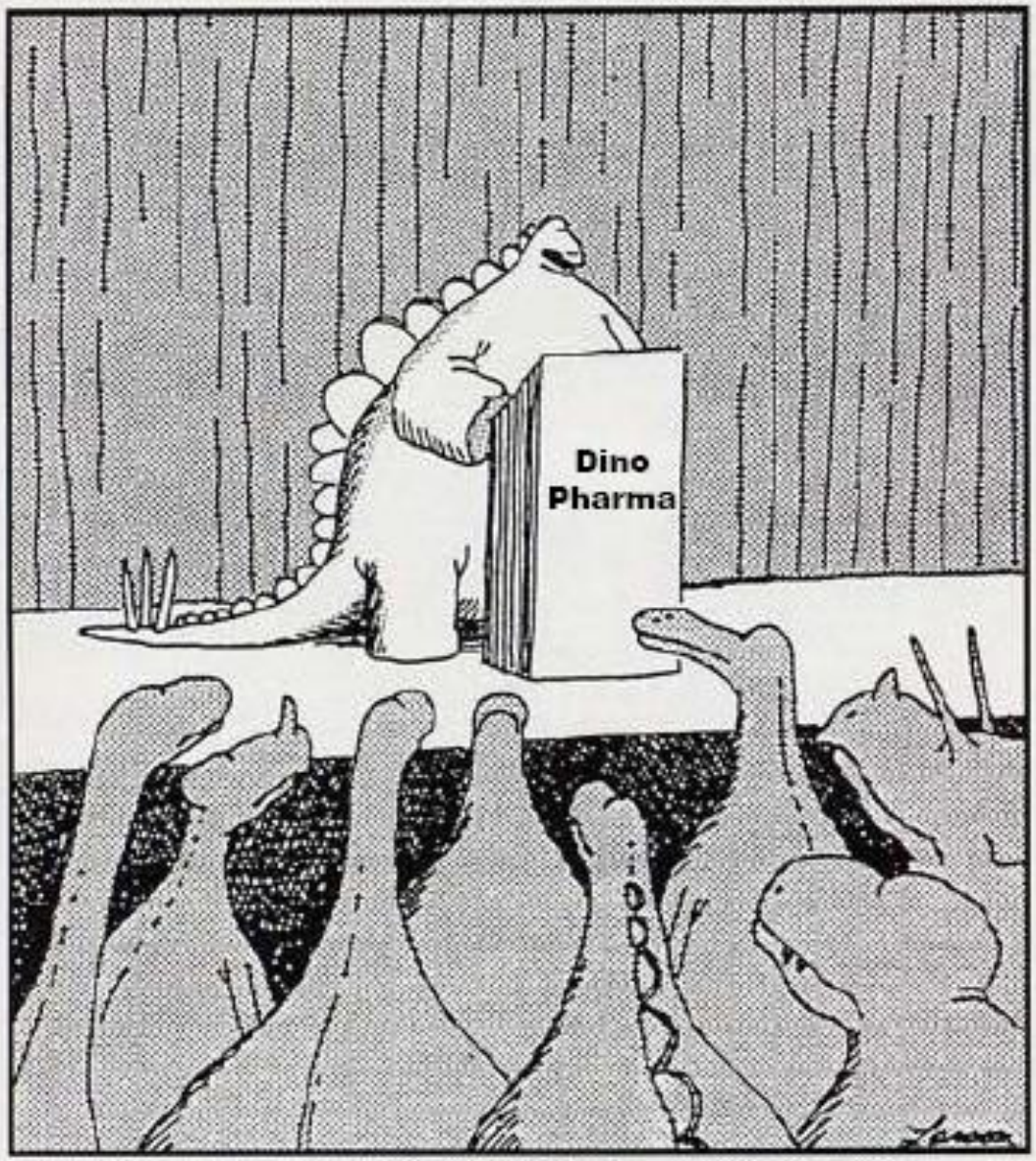
- Map Tab
  - Organisms (species, genus, family, class)
    - Example: Sarcophilus harissii (Tasmanian devil)
  - Features (~340,000 gazetteer features)
    - Example: Albany
  - Environmental layer (gridded – continuous)
    - Example: annual mean temperature
  - Contextual layer (polygon – class)
    - Example: land-use classes

2. What Occurs in this Area?

- Analysis Tab
  - Part 1 – ‘Area’?
    - User-digitized rectangle, polygon, point/radius
    - Predefined polygon
    - Environmental envelope
    - …Street address and radius
  - Part 2 – Analysis
    - Sampling (checklists, observations with environmental data)
    - Interpolation/Prediction (MaxEnt)
    - Environmental classification/domains (PATN’s Aloc)

Ahead…

- Display, manipulate species attributes, e.g. date, validity, status...
- Faceted search across all biotic dimensions
- Import observations (latitude/longitude) for analysis
- Export of shapefiles, KML (Google Earth)…
- Logins: Scenarios, sightings, annotations, relationships, pictures…
- Access to THREDDS datasets
- Tools: data validation, survey gap analysis, Generalised Dissimilarity Modelling, public web services…



"The picture's pretty bleak, gentlemen. . . .
The world's climates are changing, the mammals
are taking over, and we all have a brain
about the size of a walnut."

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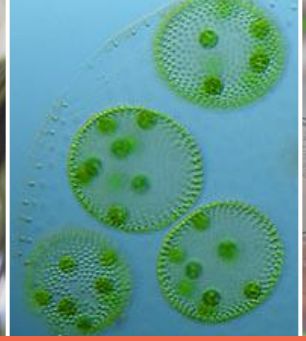


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The Atlas of Living Australia Participants

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Australian museum
nature culture discover

MUSEUMVICTORIA

Queensland Government

qm queensland museum
www.qm.qld.gov.au

Tasmanian Museum & Art Gallery

Tasmania
Explore the possibilities

Australian Government
Department of the Environment, Water, Heritage and the Arts

ABRS

CSIRO

Australian Government
Department of Agriculture, Fisheries and Forestry

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

CHAH
Council of Heads of Australasian Herbaria

Southern Cross UNIVERSITY
A new way to think

The Council of Heads of Australian Faunal Collections (CHAFC)

The Council of Heads of Australian Entomological Collections (CHAEC)

The Council of Heads of Australian Collections of Microorganisms

The Council of Heads of Australasian Museum Directors (CAMD)

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An Australian Government Initiative

National Collaborative Research Infrastructure Strategy

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