

A BRIEF TEXT ANALYSIS OF THE MURRAY-DARLING BASIN COMMISSION REPORT



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KEYWORDS

Murray-Darling Basin Royal Commission Report; Topic Modelling; Keyword Proximity map; Named Entity.

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AIM

To undertake a brief topic modelling of the new Murray-Darling Basin Commission Report.

Our aim excludes political, social and economic commentary.

METHOD

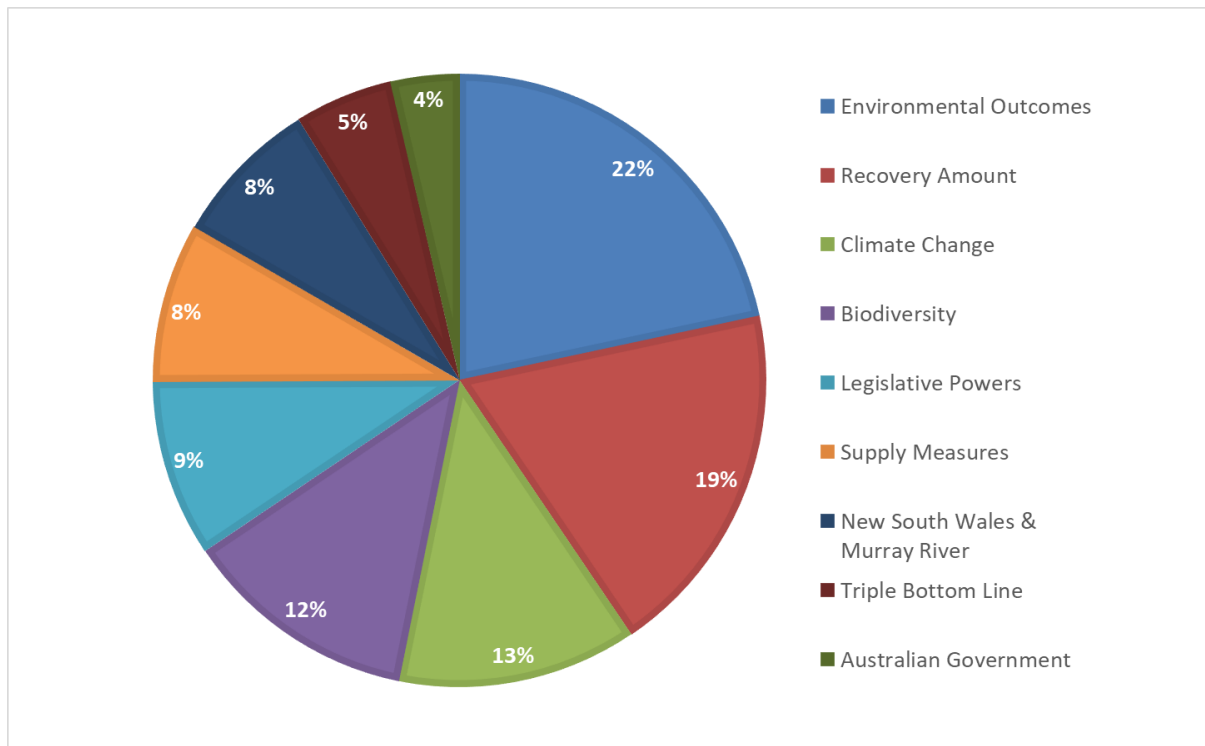
We imported the pdf version of the Murray-Darling Basin Commission Report (the report) into QDA Miner and undertook text analysis in WordStat, as previously reported (Nyakuengama, 2018).

In particular, we undertook keyword frequency analysis, produced a wordcloud, undertook topic modelling and some cluster analysis of keywords.

RESULTS

Below are the results from our study.

KEY TOPICS



Interpretation

The top 5 topics identifiable in the report are Environmental Outcomes, Recovery Amount, Climate Change, Biodiversity and Legislative Powers.

KEY TOPICS & KEYWORDS

KEY TOPICS	KEYWORDS
Environmental Outcomes	ENHANCED; OUTCOMES; ENVIRONMENTAL; OBJECTS; PURPOSES; ACHIEVE; ADDITIONAL; GL; ACHIEVING; REFERRED; ACT; CONSTRAINTS; WATER; PLAN; RECOMMENDATIONS; ECONOMIC; AMENDMENTS; NEEDED; SOCIAL; DELIVERY; ACHIEVED; EQUIVALENT; WATER ACT; ENVIRONMENTAL OUTCOMES; ENVIRONMENTAL WATER; OBJECTS AND PURPOSES; WATER RECOVERY; ENHANCED ENVIRONMENTAL OUTCOMES; KEY ENVIRONMENTAL;
Recovery Amount	ESLT; SDL; RECOVERY; MDBA; REQUIREMENTS; AMOUNT; KEY; TARGETS; GL; MODELLING; ASSETS; BASED; METHOD; SITE; ENVIRONMENTAL; HYDROLOGICAL; WIDE; RANGE; SITES; ECOSYSTEM; FUNCTIONS; DETERMINED; ECOLOGICAL; DETERMINE; DETERMINING; SDLS; FLOW; REDUCTION; DETERMINATION; LEVEL; SPECIFIC; GUIDE; SETTING; ENVIRONMENTAL OUTCOMES; RECOVERY AMOUNT; WATER RECOVERY; ENVIRONMENTAL WATER; KEY ENVIRONMENTAL; WIDE SDL; DETERMINATION OF THE ESLT;
Climate Change	CLIMATE; CHANGE; PROJECTIONS; FUTURE; AVAILABILITY; TEMPERATURE; RAINFALL; HISTORICAL; TERM; AVERAGE; LONG; DATA; KNOWLEDGE; VARIABILITY; RESEARCH; EASTERN; GLOBAL; CSIRO; ADAPTATION; PAST; SCIENTIFIC; RISK; DECLINE; WITNESSES; SOUTHERN; CLIMATE CHANGE; WATER AVAILABILITY; CLIMATE CHANGE PROJECTIONS; SCIENTIFIC KNOWLEDGE;
Biodiversity	BIODIVERSITY; CONVENTION; BIOLOGICAL; ECOSYSTEMS; PRINCIPLES; DIVERSITY; ESD; SUSTAINABLE; CONSERVATION; RESOURCES; ECOSYSTEM; INTERNATIONAL; OBLIGATIONS; PRINCIPLE; RAMSAR; WATER; RESTORE; RELEVANT; REQUIRES; AGREEMENTS; SPECIAL; WETLANDS; PARA; VALUES; DECISION; NATIONS; ENSURE; MAKING; SPECIES; DEFINED; WATER ACT; WATER RESOURCES; BIODIVERSITY CONVENTION; WATER RESOURCE; INTERNATIONAL AGREEMENTS; RAMSAR CONVENTION; RELEVANT INTERNATIONAL AGREEMENTS; BIOLOGICAL DIVERSITY; ENVIRONMENTALLY SUSTAINABLE; SPECIAL MEASURES; SUSTAINABLE DEVELOPMENT; GIVING EFFECT;
Legislative Powers	AFFAIRS; CONSTITUTIONAL; POWER; COMMITTEE; LEGAL; SENATE; PARLIAMENT; REFERENCES; COMMONWEALTH; LEGISLATIVE; CONSTITUTION; ACT; REFERRAL; POWERS; STATE; REGIONAL; PROVISIONS; SEC; LAW; STATES; AGS; ADVICE; MATTERS; WATER ACT; LEGISLATIVE POWER; REFERENCES COMMITTEE; EXTERNAL AFFAIRS; RURAL AND REGIONAL AFFAIRS; LEGAL AND CONSTITUTIONAL AFFAIRS; PROVISIONS OF THE WATER ACT; LEGAL ADVICE; COMMONWEALTH PARLIAMENT; SENATE RURAL AND REGIONAL AFFAIRS; LAW WITH RESPECT; COMMONWEALTH LEGISLATIVE POWER; COMMONWEALTH POWERS; SENATE LEGAL AND CONSTITUTIONAL AFFAIRS;
Supply Measures	SUPPLY; PROJECT; MEASURE; PROJECTS; BUSINESS; HYDRO; CUES; LAKES; MENINDEE; MEASURES; CASES; CASE; IMPLEMENTED; ECOLOGICAL; EQUIVALENT; CONSULTATION; EVIDENCE; COMMISSIONER; SUPPLY MEASURE; MENINDEE LAKES; SUPPLY MEASURE PROJECTS; SUPPLY MEASURES; MENINDEE LAKES PROJECT; BUSINESS CASE; BUSINESS CASES; CUES PROJECT; SUPPLY MEASURE PROJECT; EQUIVALENT ENVIRONMENTAL OUTCOMES;
New South Wales & Murray River	SOUTH; RIVER; WALES; VICTORIA; AVERAGE; CENTURY; DIVERSIONS; WATERS; AUSTRALIA; MURRAY; IRRIGATION; INCREASE; INCREASED; FLOWS; QUEENSLAND; RAINFALL; YEARS; TEMPERATURE; ANNUAL; EARLY; REGULATION; DROUGHT; DECLINE; LARGE; SOUTH WALES; SOUTH AUSTRALIA; RIVER MURRAY; SOUTH AUSTRALIAN; SOUTH WALES AND VICTORIA; RIVER MURRAY WATERS; SOUTH AUSTRALIAN GOVERNMENT;
Triple Bottom Line	BOTTOM; TRIPLE; LINE; APPROACH; SOCIAL; ECONOMIC; ESLT; TRIPLE BOTTOM LINE; TRIPLE BOTTOM LINE APPROACH; SOCIAL AND ECONOMIC; ECONOMIC AND SOCIAL; SOCIAL AND ENVIRONMENTAL OUTCOMES; ECONOMIC AND SOCIAL OUTCOMES; SOCIAL AND ECONOMIC OUTCOMES; CONSTRUCTION OF THE WATER ACT;
Australian Government	AU; WWW; GOV; HTTPS; MEDIA; RELEASE; RCE; BURKE; MINISTER; MEDIA RELEASE; AU GOV;

Interpretation

Keywords are related to topics and ideas in a report. Above are the most the keywords found under the key topics discussed in the report.

WORDCLOUD



Interpretation

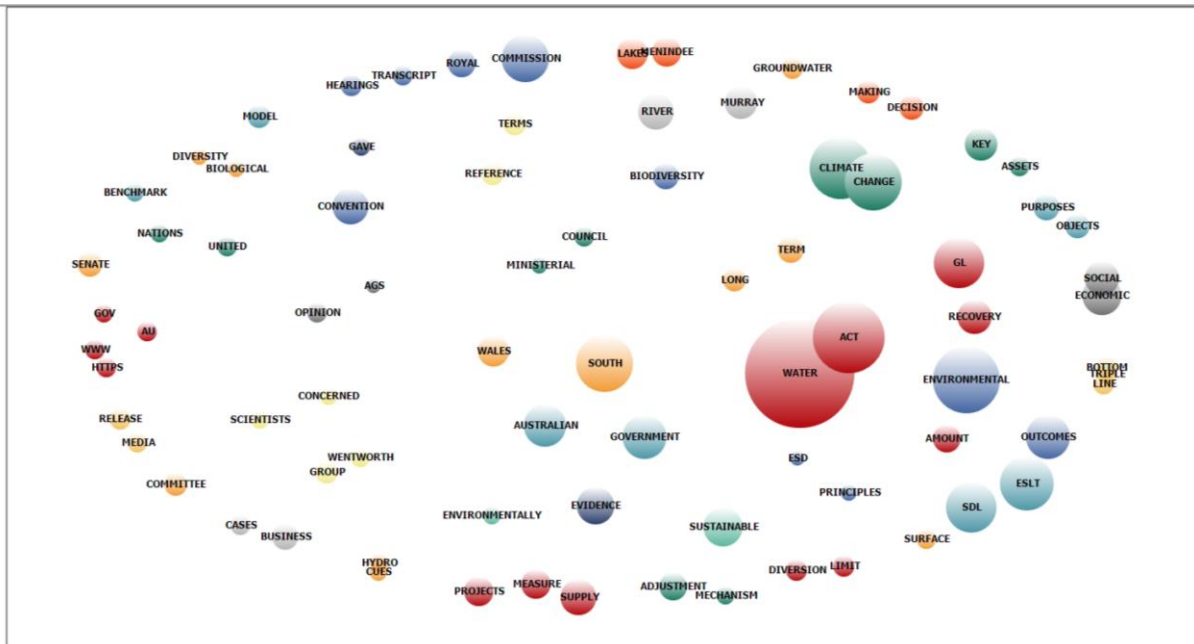
This refined wordcloud shows the most frequently mentioned words in the report.

Water is, by far, the most commonly mentioned word in the report. Words such as Environmental (outcome), Plan, ACT, Climate Change and MDBA are the most common keywords in the report.

Note

To avoid bias from title words of report which were mentioned several times over, we excluded the words *Murray*, *Darling* and *Basin* from our analyses.

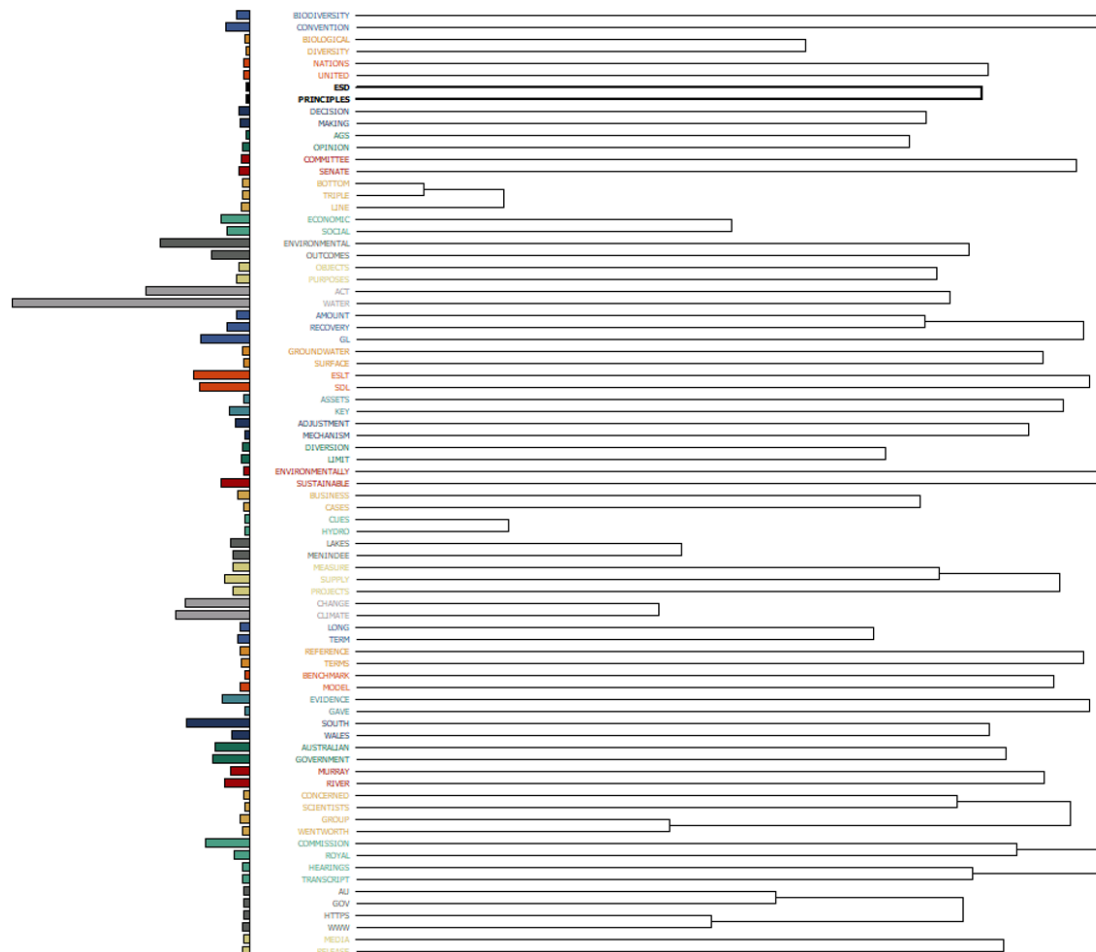
KEYWORD PROXIMITY MAPPING



Interpretation

The juxtapositions of keywords in the report are shown above. The size of the bubbles represents the relative frequency of the keywords. Bubbles of the same colour have keywords from the same cluster. The relative distance between any two bubbles/keywords represents the relatedness of keywords.

KEYWORD DENDROGRAM - SIMILARITY INDEX



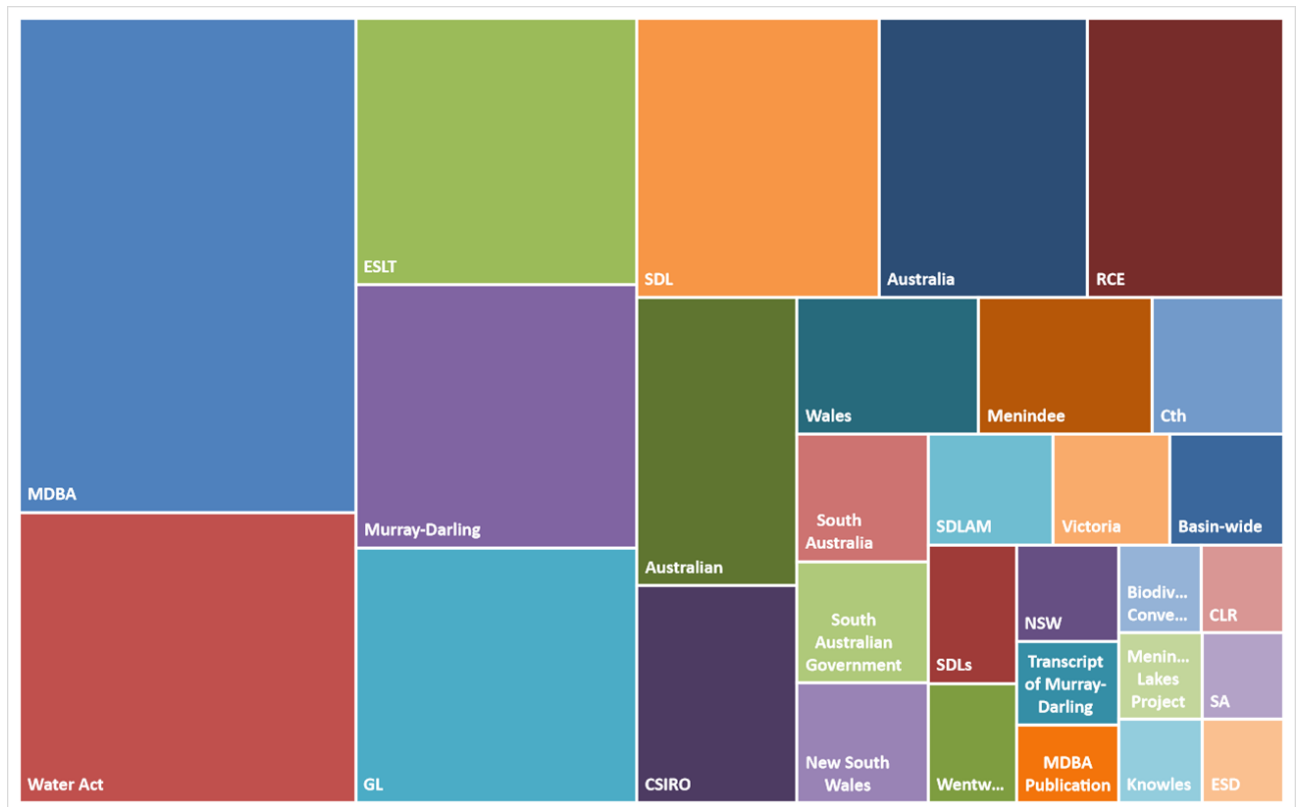
Interpretation

This dendrogram is a cluster-map connecting closely related keywords. The closer the keywords, the lower the similarity index, or distance from the words to their common root.

For example, biodiversity and convention (at the very top of the figure) are related, but the words triple, bottom and line are more tightly related.

Graph bars on the left, represent the relative frequency of the keywords in the report. Keywords like water act, climate change and environmental outcome are abundant in the report.

TOP 30 NAMED ENTITIES (as they appear in report)



Interpretation

Above are the top 30 Named Entities (NEs) in the report. A Named Entity is a predefined category such as person names, organizations, states and territories.

In this report, the MDBA, Water ACT, ESLT and Murray-Darling are among the most commonly mentioned NEs, judging by the size of their individual boxes in this treemap.

NEs in this report would need to be standardized to avoid *Type I* errors (or false positives) during statistical analyses based on them.

CONCLUSION

In this brief text analysis blog, we used a QDA Miner/WordStat to:

- present the key topics contained in the Murray-Darling Basin Royal Commission Report, namely: *Environmental Outcomes, Recovery Amount, Climate Change, Biodiversity and Legislative Powers*;
- show the keywords under each key topic;
- identify closely related keywords using cluster analysis and proximity mapping; and
- display the top 30 Named Entities in the report.

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