

2022 NSW Flood Inquiry

Social, Search & Submissions
Analytics Summary

NSW Flood Inquiry Analytics

Analysis of public responses to the 2022 New South Wales Floods using three different data large scale sets:

- NSW Floods-related social media posts
- NSW Floods related web search data
- NSW Floods Inquiry submissions

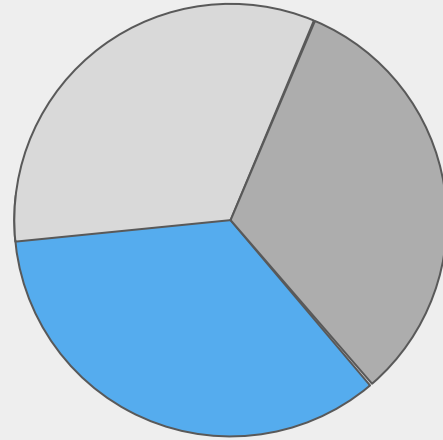
- Analysis of social media covered
 - NSW-Floods related tweets (55,778)
 - Links to 3rd party websites (40,276)
 - Photographs (14,023)
 - Videos (2,625)
- Analysis of search data covered
 - NSW-Floods related web search volumes
 - Google searches (90 Million)
 - Web search users (6.8 million)
 - Across NSW (78 NSW Towns)
- Analysis of submission data covered
 - NSW-Floods inquiry submissions (1,450)
 - Total text submitted (2 million words)
 - Transcripts of public hearings (83)
 - Across NSW (148 Postcodes)

Social Analytics

From Twitter Social media posts



Public Submissions



Search

Social

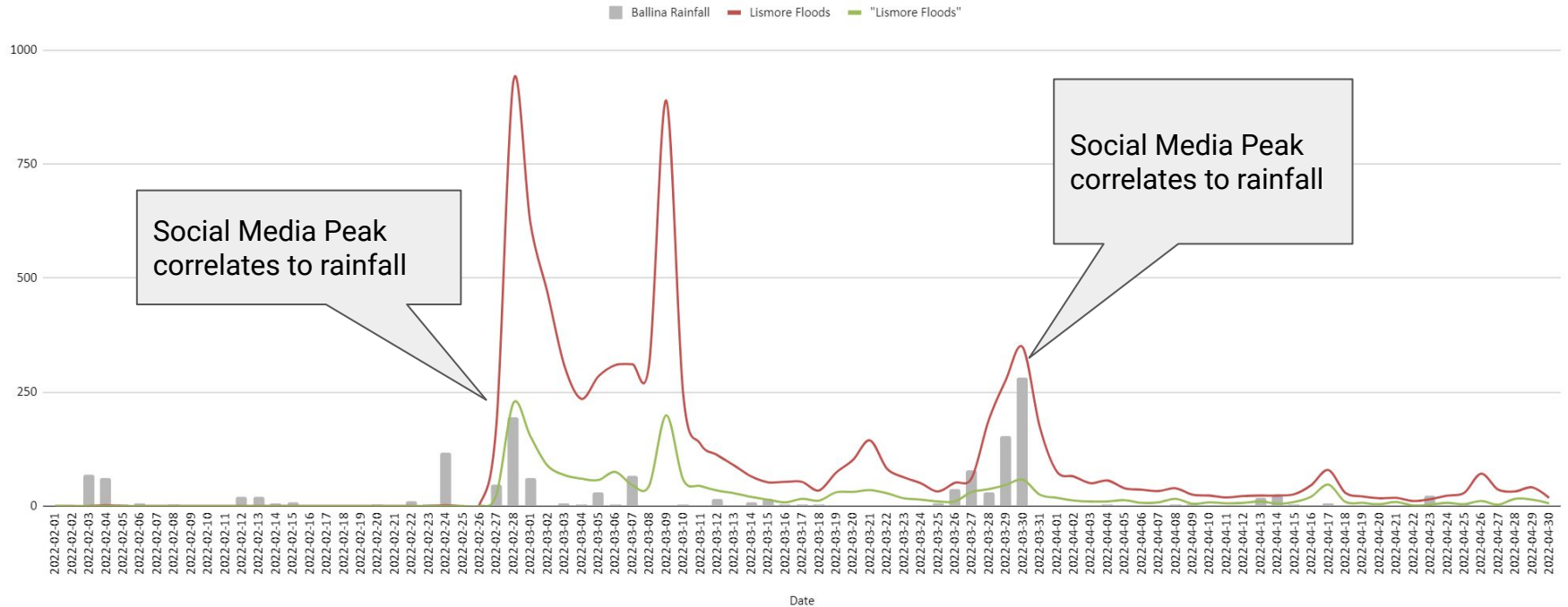
Social Final Corpus (55k)

Data Dimensions	
Words & Phrases (n-grams)	915, 983
Social media posts (Tweets)	55,778
Users	18,773
Links	40,276
Images	14,023
Videos	2,625
Timeframe	Jan–Apr 2022
Geolocation data (Lon/Lat)	1,437

Glossary of NSW Flood Related Terms
#NSWFloods, Flooding NSW, Floods NSW, NSW Floods 2022, Lismore Floods, Lismore Floods 2022, Sydney Storm, Sydney Floods, Sydney Floods 2022, NSWFloods2022, #LismoreFloods, LismoreFloods2022, #SydneyStorm, #SydneyFloods, #SydneyFloods2022, #rainbomb, NSW Floods, NSW Floods 2022, Lismore Floods, Lismore Floods 2022, Sydney Storm, Sydney Floods, Sydney Floods 2022, rain bomb.

Floods-related social media correlates to rainfall

Northern Rivers Rain and Social Media

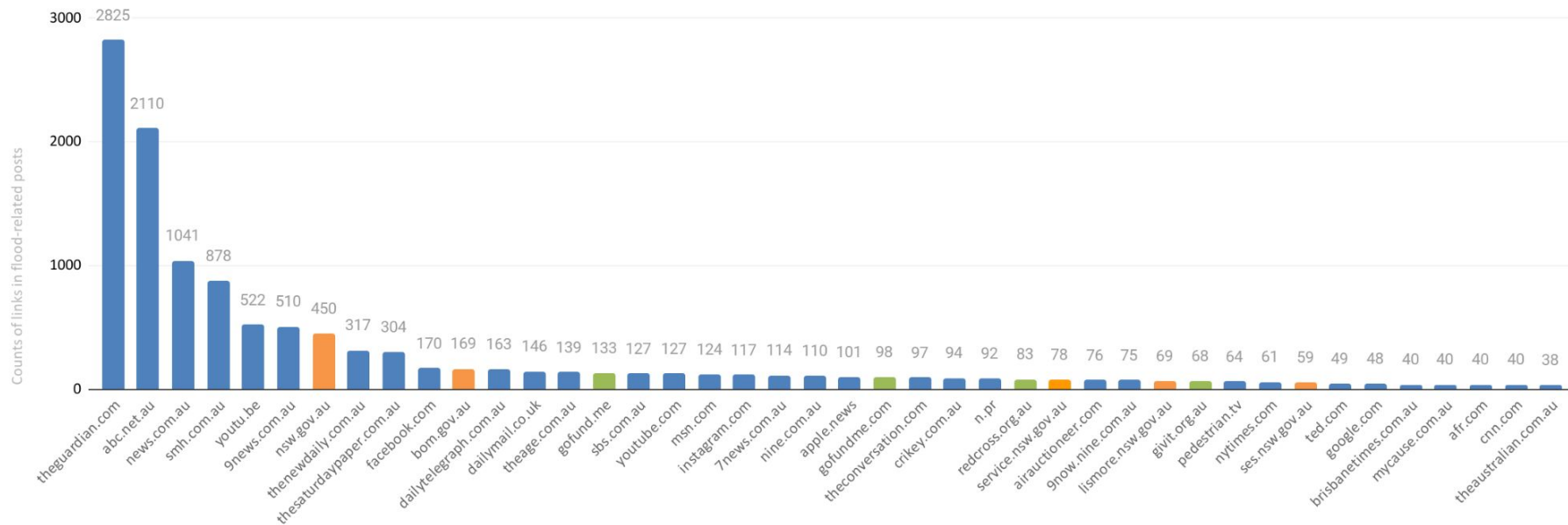


Mainstream news outlets most linked-to

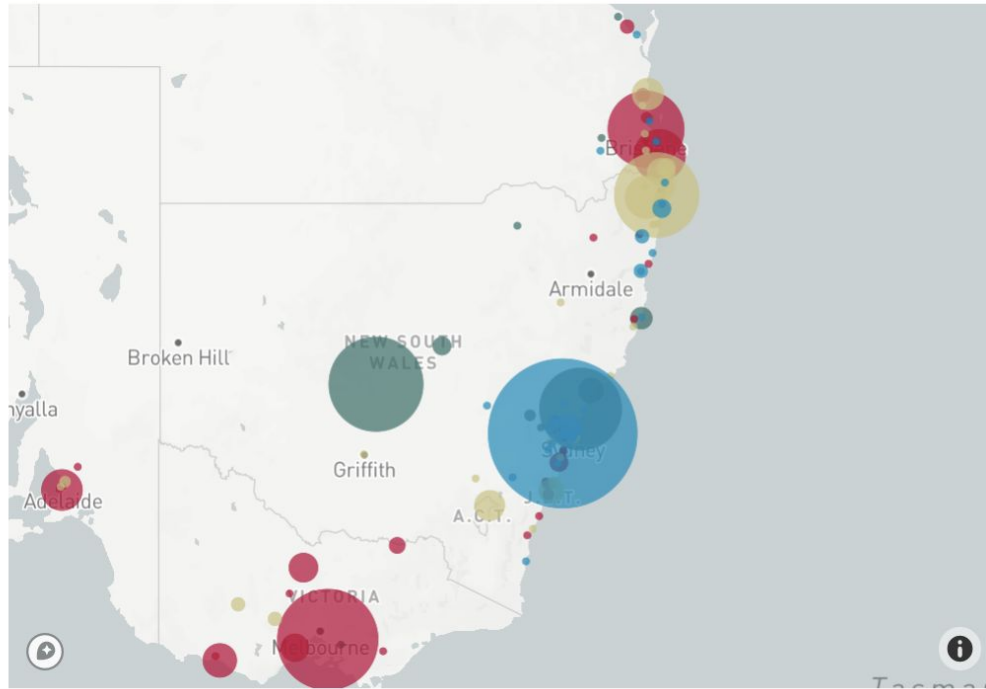
Few people linked to SES as a source of information with just over one in a thousand links (0.13%)

Key NSW Floods-related information and media sources

Top domains linked to from unique flood related posts in Social Media (Twitter) Feb-April-May 2022.

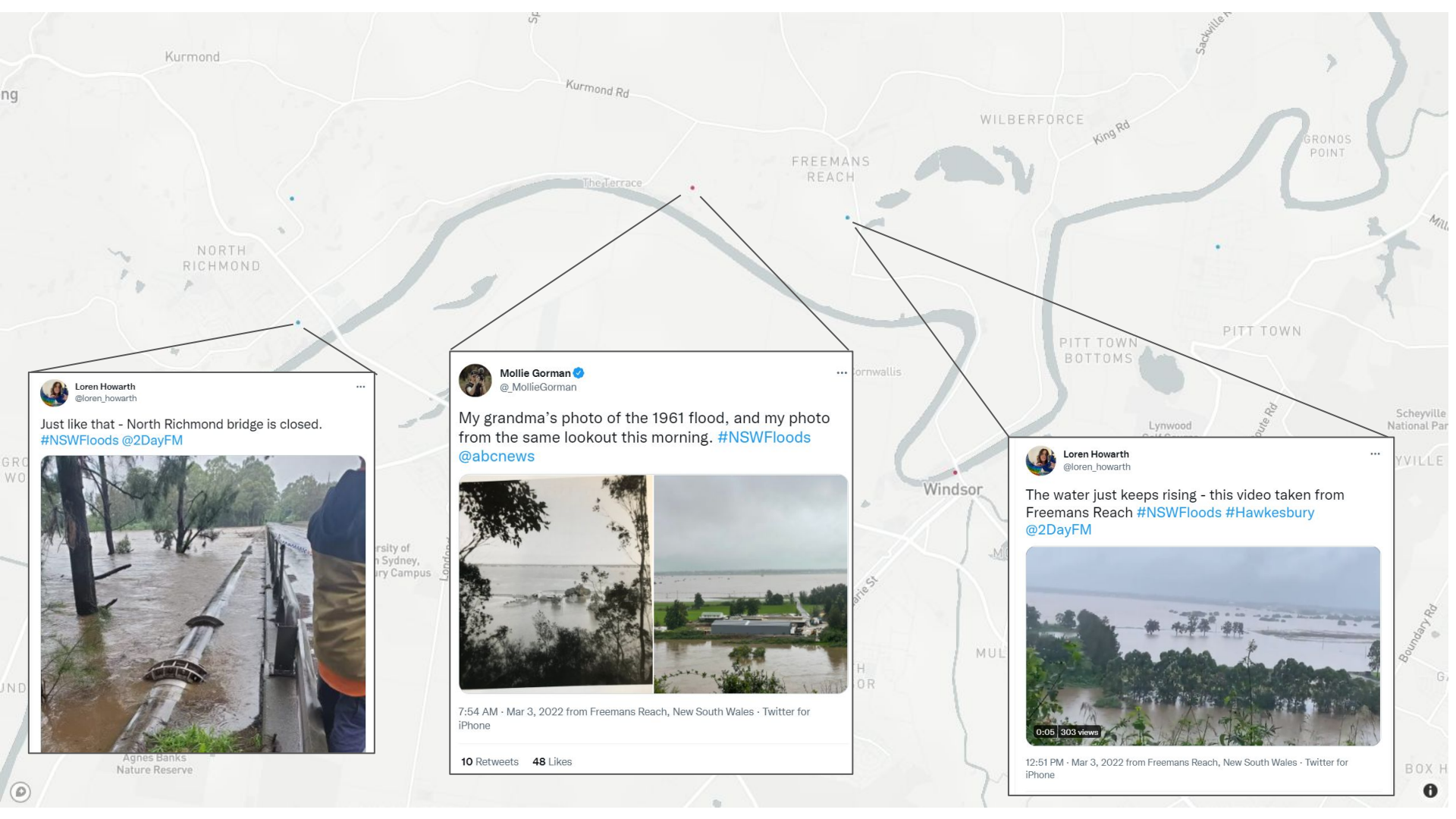


Geo-Map



Topics

- Topic A: Locals Take Charge (Northern Rivers)
- Topic B: Election & Politics
- Topic C: Spam
- Topic D: Specific Local Problems & Solutions
- Topic E: Causes & Consequences (Sydney)



Loren Howarth
@loren_howarth

Just like that - North Richmond bridge is closed.
[#NSWFloods @2DayFM](#)



Agnes Banks Nature Reserve



Mollie Gorman
@MollieGorman

My grandma's photo of the 1961 flood, and my photo from the same lookout this morning. [#NSWFloods @abcnews](#)



7:54 AM · Mar 3, 2022 from Freemans Reach, New South Wales · Twitter for iPhone

10 Retweets 48 Likes



Loren Howarth
@loren_howarth

The water just keeps rising - this video taken from Freemans Reach [#NSWFloods #Hawkesbury @2DayFM](#)



0:05 303 Views

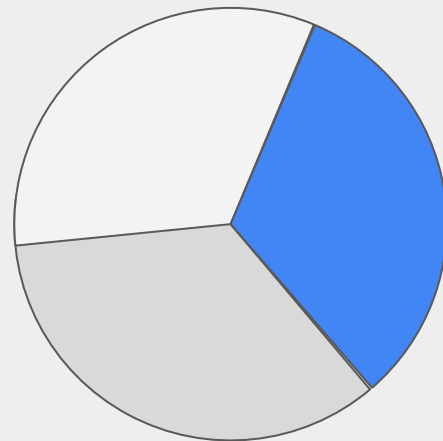
12:51 PM · Mar 3, 2022 from Freemans Reach, New South Wales · Twitter for iPhone

Search Analytics

Using Google Search Traffic Data



Public Submissions



Search

Social

Search Analytics Scope

Data Dimensions	
Search Geographic Scope	NSW
Locations	78 Towns
Searches (Google searches)	31 Million per Month (estimated)
Users	6.8 million (Estimated)
Timeframe	Jan–Apr 2022
Flood Related Glossary (Google News)	593
NSW Flood Correlated Glossary	246

NSW Towns with relative search volume data (n=78)

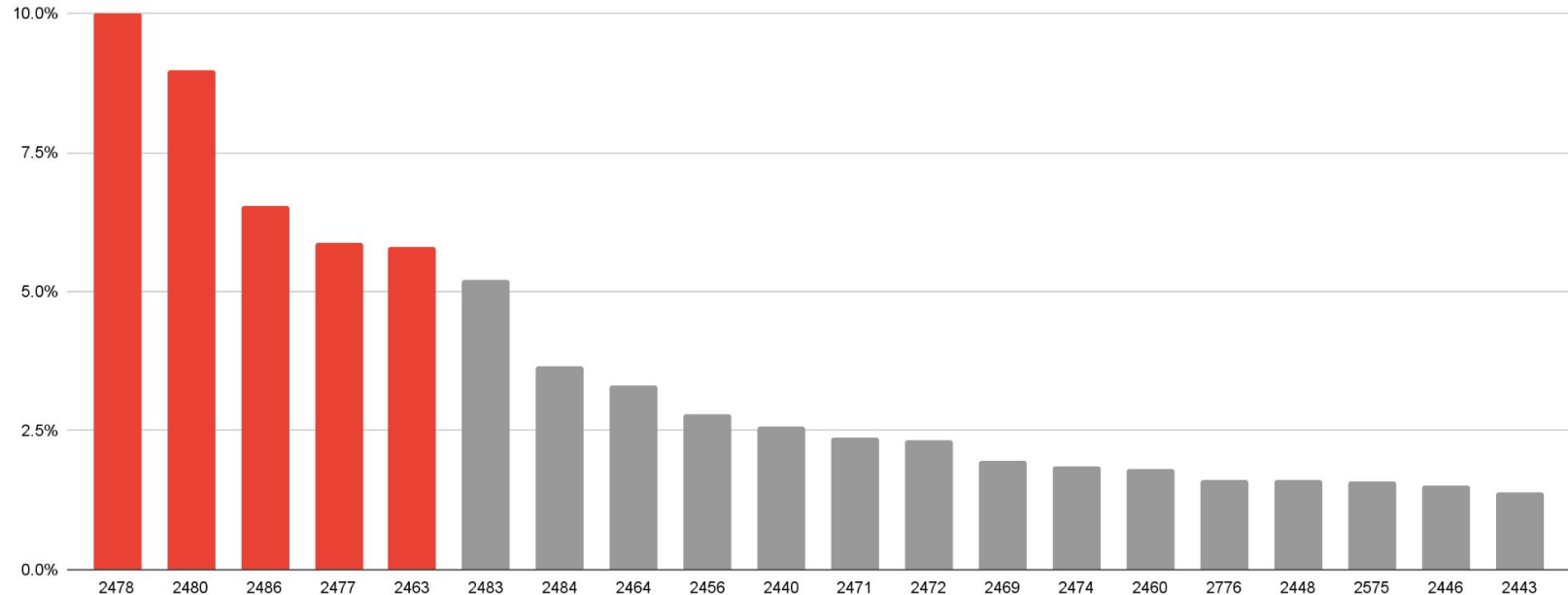
Cumbalum, Coraki, Cobaki Lakes, Woodburn, Skennars Head, Goolmangar, Wollongbar, Tuckombil, Fernvale, Federal, Woombah, West Ballina, Caniaba, Freeburn Island, Kilgra, Lennox Head, Lismore, Mooball, Ballina, Uralba, Townsend, Falconbridge, Sandy Beach, Crabbes Creek, Tweed Heads South, Yamba, Ashby, The Pocket, Banora Point, MacLean, Laurieton, Crescent Head, James Creek, Lindendale, Tahmoor, Skinners Shoot, Bilambil Heights, Tugrahakh, Tenterfield, Wirrimbi, Mungay Creek, Tweed Heads, Arrawarra, Bulga, Bowral, Wauchope, Lake Cathie, Bucca, Port Stephens, Cuttabri, Lawrence, Huskisson, North Tumbulgum, Cobar, Picton, Yerrinbool, Bundanoon, Rainbow Flat, Nobbys Creek, Womerah, Glen Innes, Valla Beach, Tuncurry, Valla, Nattai, Clarence Town, Byangum, Ramornie, Mollymook Beach, Hill Top, Kew, Springwood, Chinderah, Burringbar, Duns Creek, Pappinbarra, Nana Glen, Ravensworth.

Flood-Related Search by Location

Postcode analysis

Highest Flood-Related Search Postcodes

Postcode analysis of areas with highest flood-related web search activity. (Google search volumes in NSW Feb-April 2022).

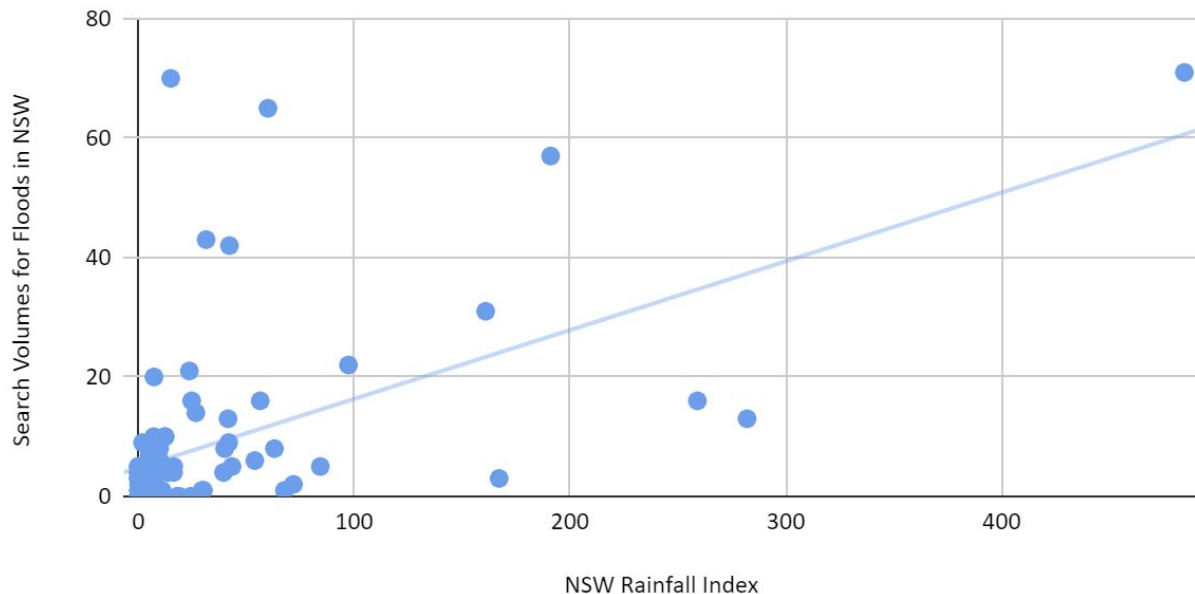


Search volumes correlate to rainfall

Peaks of web searches for NSW Floods correlate with the same days rainfall in NSW.

Daily volume of web queries rise and fall with daily rainfall

Search volumes for Floods in NSW are correlated with NSW Rainfall Index.



Search: a window on real-world issues

Insights into behaviours in lead-up-to, during and after periods of peak rain from **NSW Rainfall Index**.

BEFORE Peak Rainfall Search terms correlated with NSW Rainfall Index as leading indicators (days ahead)	DURING Peak Rainfall Search terms correlated with NSW Rainfall Index (Coincident with flooding)	AFTER Peak Rainfall Search terms correlated with NSW Rainfall Index as lagging indicators (days behind)
insurer (-8) severe thunderstorm (-4) flash flooding (-2) rainfall (-1)	levee river / rivers floods dams underwriting	submerged* (1) sandbags* (2) evacuations* (2) uninsured (4) mudslides (4) sandbag (5) Flood Insurance (7) weir (8) landslides (8) dam (8) culvert (8) silt (9) roadwork (36) planting trees (52) cleanup (55) rebuilding (61)

Search offers unique insights

By analysing search patterns before, during and after the NSW Floods we can gain insights into questions, behaviours and thoughts of many people affected by them.

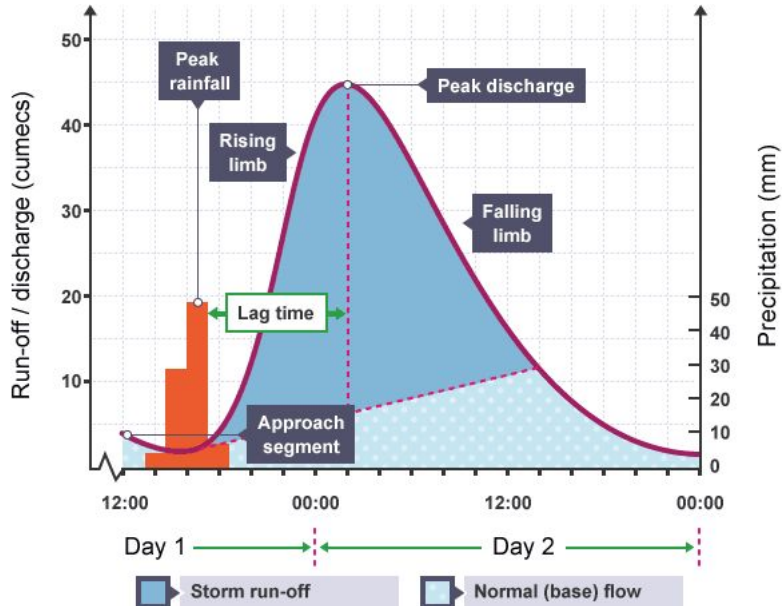
For each search term the days ahead or days behind represents the peak correlation with the NSW Rainfall Index.

* Note as peak flooding lags peak rainfall by around one to two two days submerged, sandbags and evacuations are likely to have peaked as search terms during the peak flooding.

Note Rainfall > Flooding Lag

Peaks in **NSW Rainfall Index** does not reflect peaks in flooding and there may be some lag.

Storm Hydrograph (example only)



Delay between rain and flood

Storm hydrographs like the example allow us to investigate the relationship between a rainfall event and discharge.

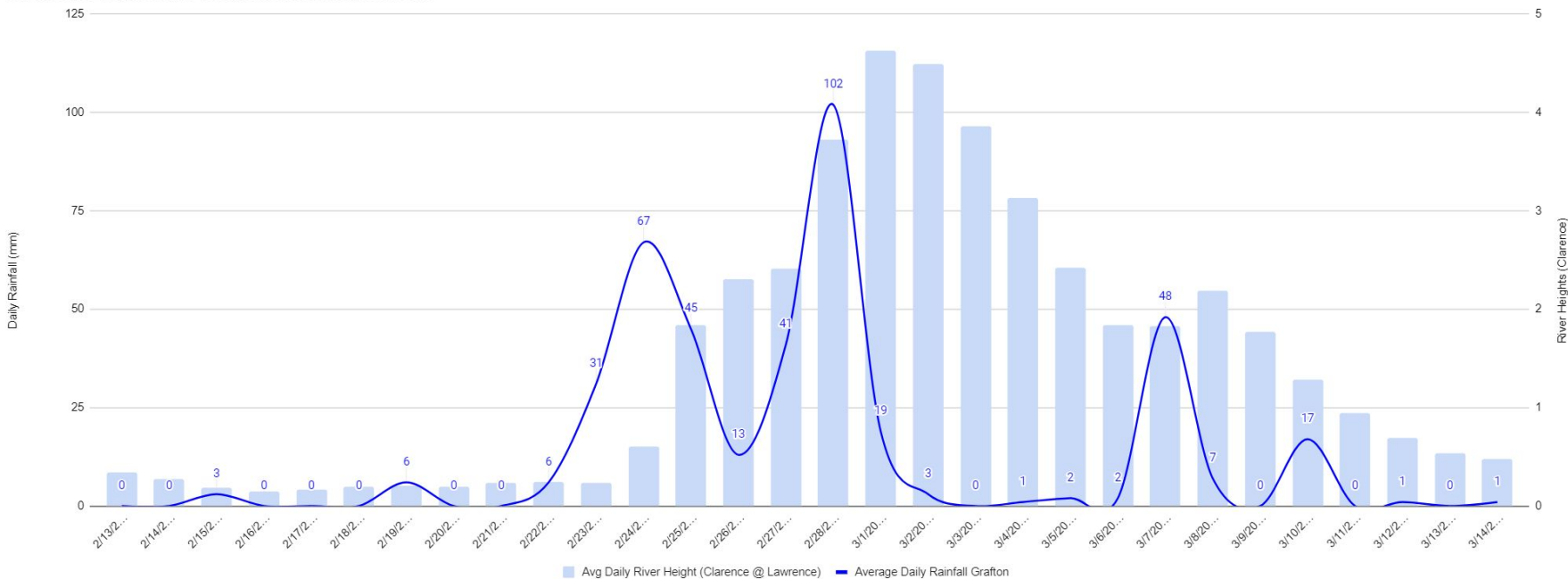
Source Image: [BBC](#).

Rainfall > Flooding Lag

River heights in the Clarence peaked one to two days after rainfall peaks in that area (Grafton).

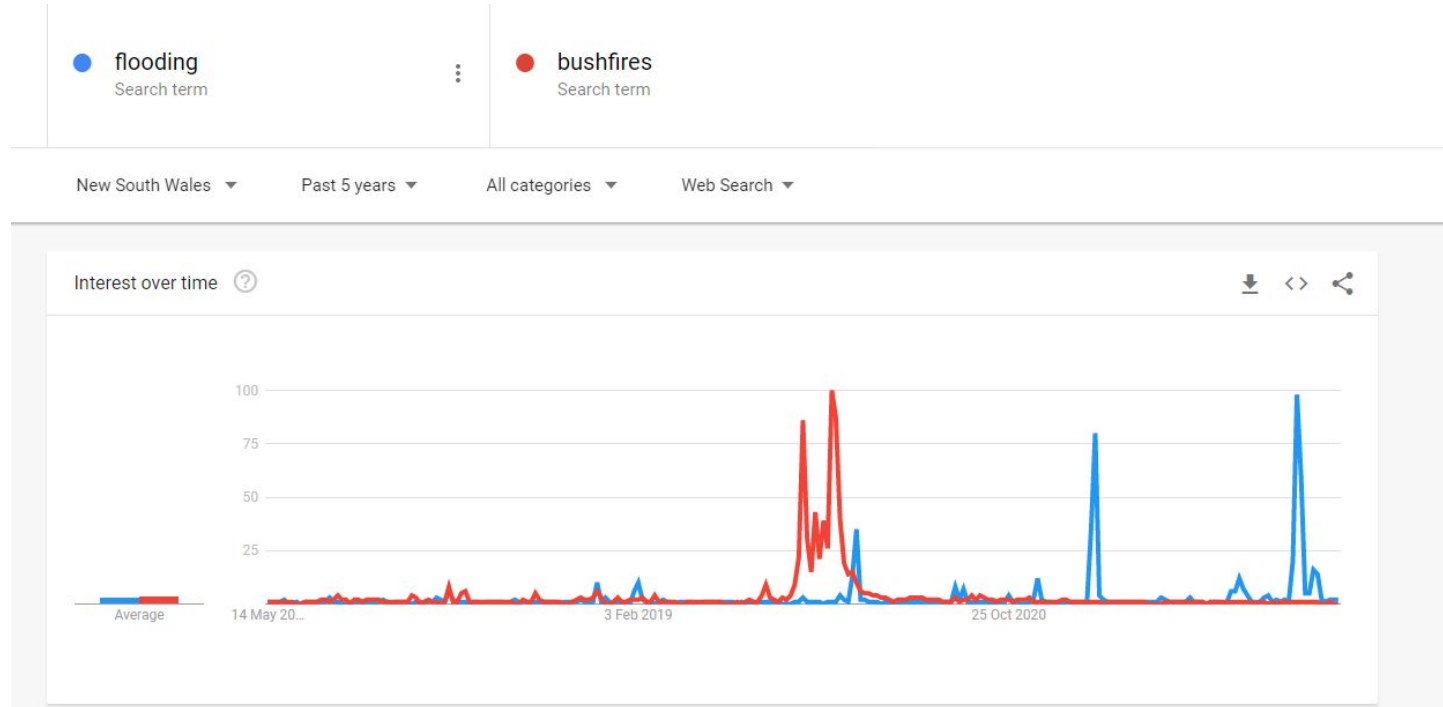
Grafton: Rainfall peaked one to two days ahead of flooding

Clarence River Heights Peaked 1-2 days after peak rainfall. Data: BoM.



Search Volumes Scale Comparisons

Total attention given to 2022 floods is similar in scale to that of the Christmas 2019 bushfires.



Similar in scale to bushfires in NSW.

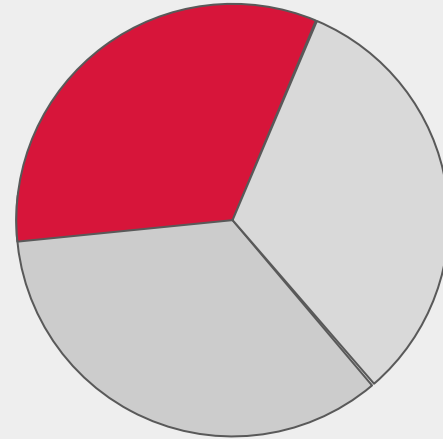
[Link](#)

Submissions Analytics

From Public Submissions
to NSW Floods Inquiry



Public
Submissions

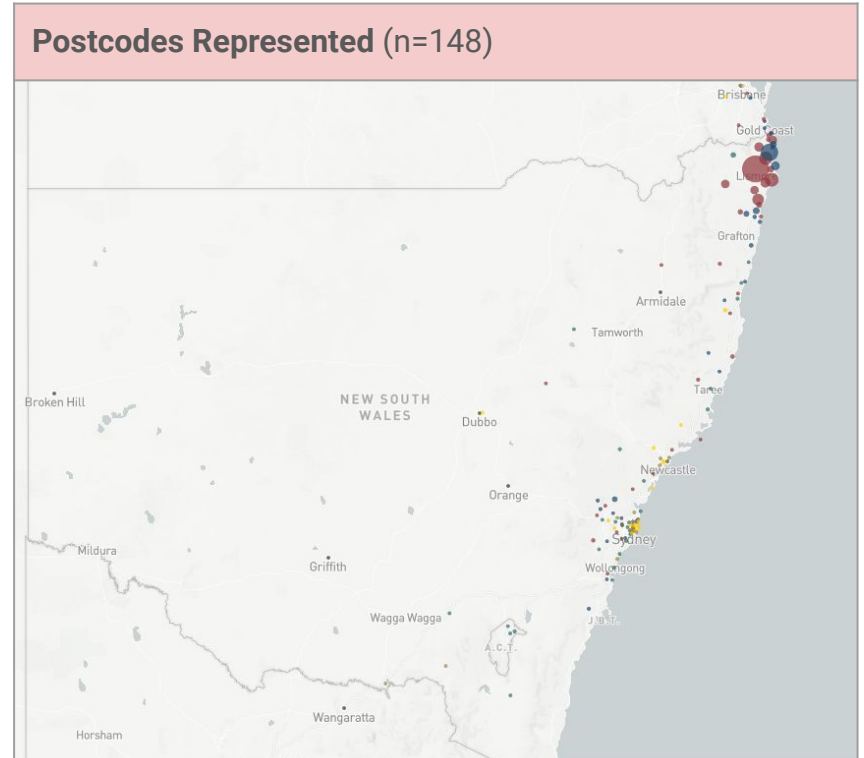


Search

Social

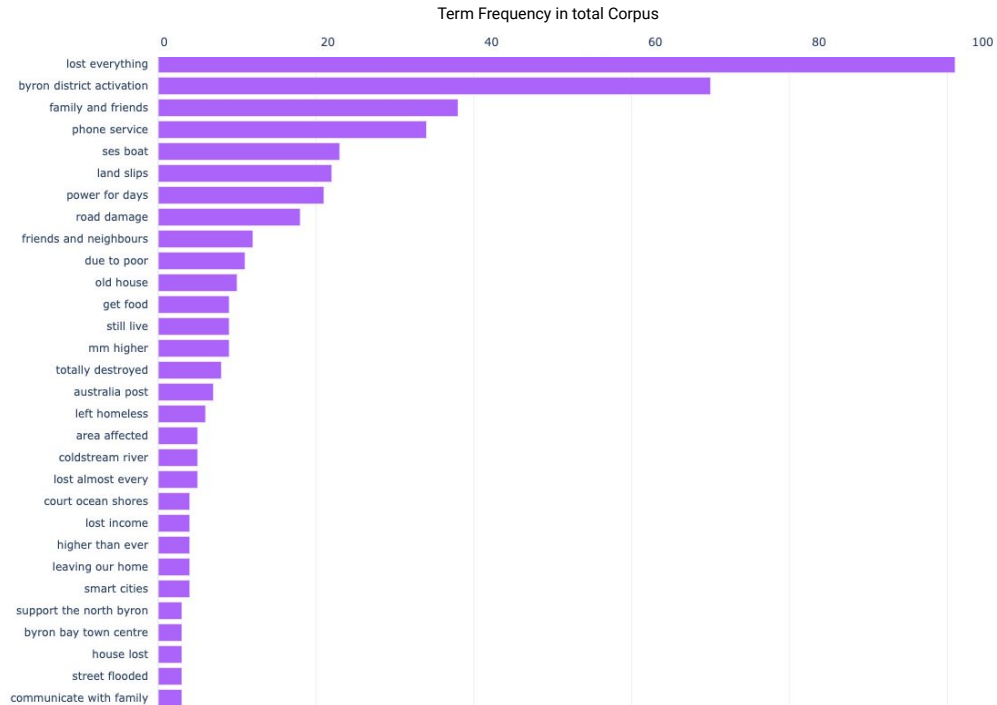
NSW Floods Submission Analytics Scope

Data Dimensions	
Total words & phrases (n-grams)	2,161,307
Total submissions analysed	1,450
Images, videos and photos	650+
Includes transcripts from public hearings (five)	83
Submissions from individuals	> 75%
Postcodes represented	148 (125 in NSW)



Key Issues* via Combined N-Grams

Infrastructure, services and challenges key issues



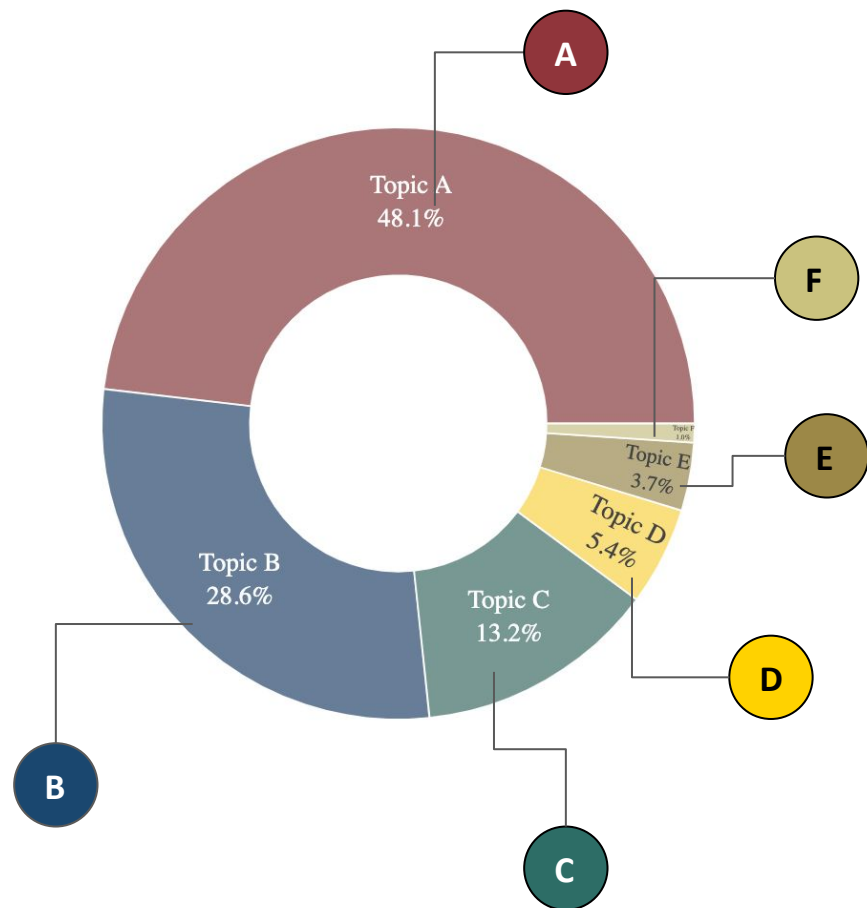
*Filtered by Largest Statistically Improbable Phrase Scores - considers number unique authors and term frequency in combination.

Topic Modelling


What are the dominant topics?

Using LDA topic modelling, we:

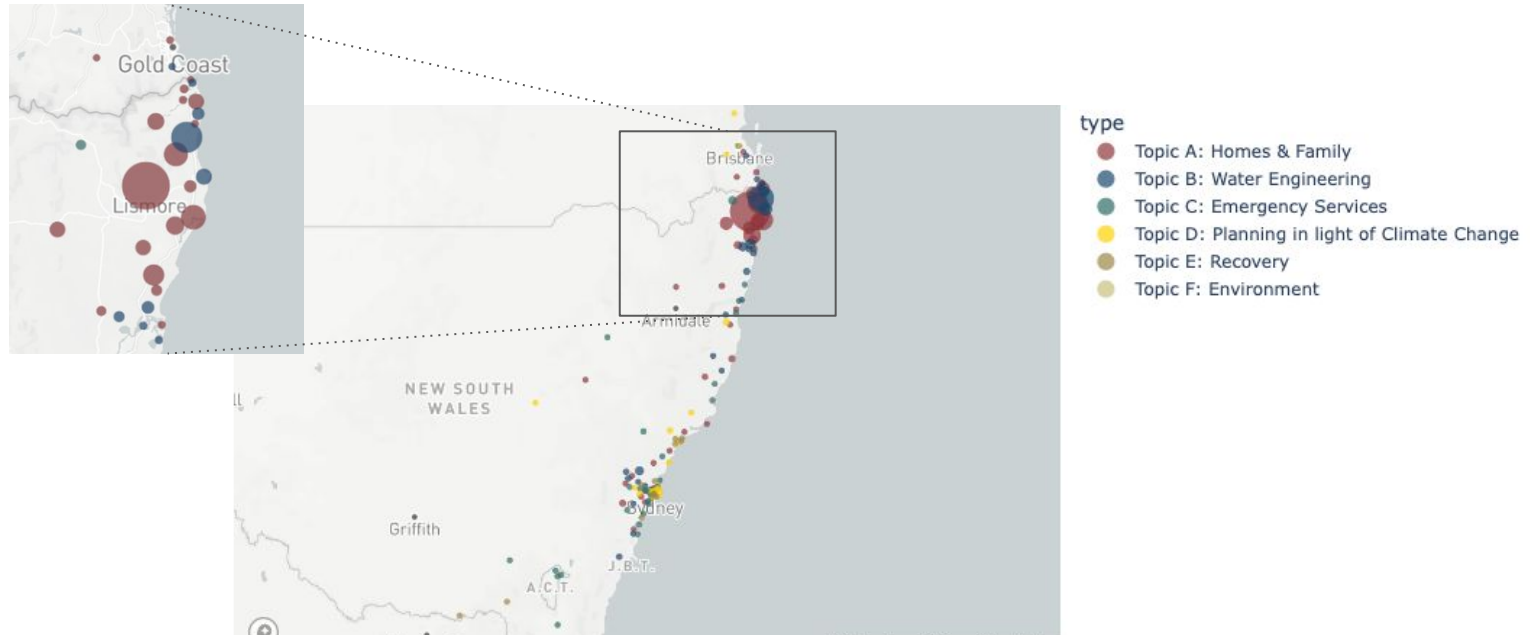
- Determined optimum number of topics based on a consistency score
- Identified common topics among detailed submissions (n = 1,450).
- Found that **six topics** were optimum and labeled them A—F.



Topic themes - Representative Examples

Topic	# Submissions	Topic Title	Most Representative Submissions	Percentage of all keywords in that topic covered
 A	698	Homes & Family	20220519.147	96%
 B	414	Water Engineering	0354 20220504	96%
 C	191	Emergency Services	20220520.97	96%
 D	78	Planning in light of Climate Change	0115 20220409	99%
 E	54	Recovery	0333 20220503	99%
 F	15	Environment	20220624.23	99%

Geographic Analysis - 6 Clusters



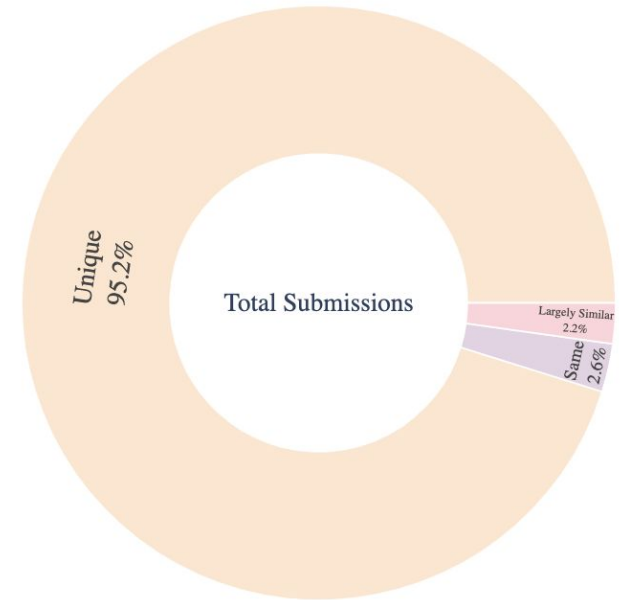
[Interactive figure.](#)

Majority of submissions are unique

Plagiarism analysis based on the detailed submissions (n=1,450)

Our analysis shows there's a high degree of originality in almost all submissions. The percentage of unique submissions (95.6%) is higher than many other public hearings, suggesting there is little to no plagiarism in the Floods Inquiry responses.

- **Identical responses** (similarity close to 1):
 - 2.6% (**38 participants**) of detailed submissions.
- **Largely similar responses** ($0.65 \leq \text{similarity} < 1$):
 - 2.2% (**32 participants**) of responses are similar.
 - There are 12 groups in total (including identical responses).
- **Unique** (similarity < 0.65):
 - Remaining 95.2% (**1,380 participants**) have low similarity.



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More info

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