



# Following socio-environmental conflict narratives about energy transition in Chile

## A spatio-temporal analysis using dynamic topic modeling

Jonas Rieger, Felipe Muñoz, Lars Grönberg, Kai-Robin Lange, Iván Ojeda-Pereira, Darío Briceño, Christian Nass, Carsten Stahl, José Cassola, Carolina Rojas-Córdova, Brian Keith-Norambuena, Marcelo Lufin, Fernando Campos-Medina, Sebastián Herrera-León

Energy Transition

Global Issue

Environmental/Economic/Social Conflicts

Energy Policy

Public/Media Debate

Public Perceptions

Narrative (Shift)

(Dynamic) Topic Model

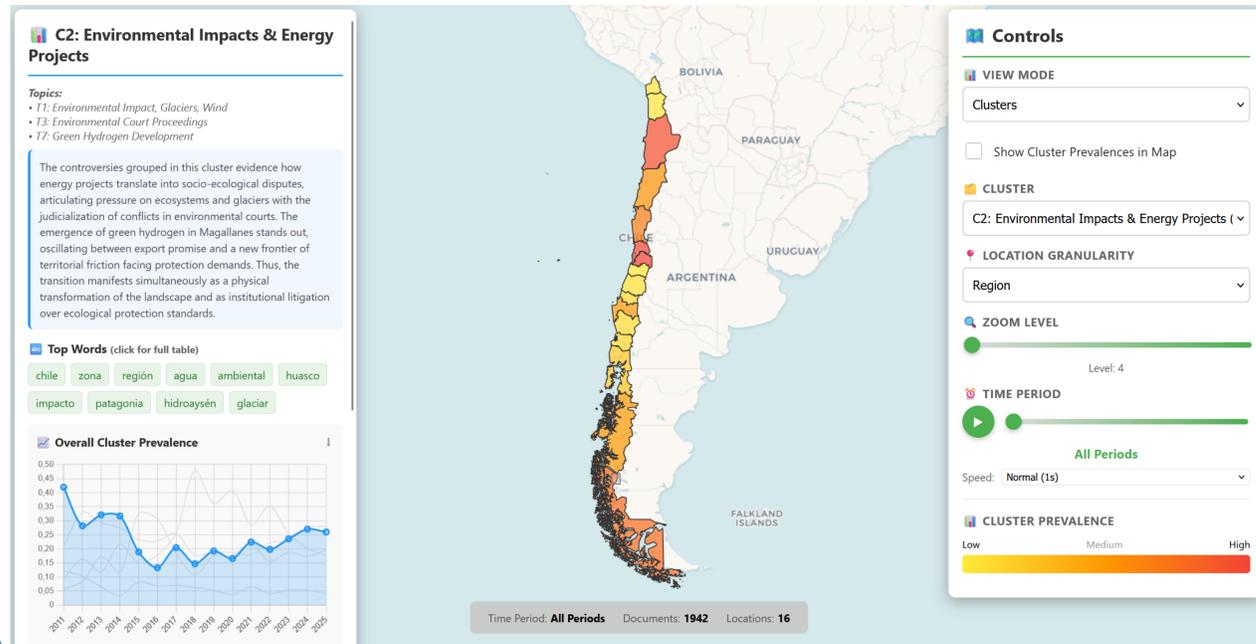
Spatial

Temporal

OpenStreetMap

Dashboard

### Dashboard



#### Framework:

- ▶ typical preprocessing, cf. GitHub repository
- ▶ RollingLDA from 2011 to 2025 (warm-up until 2020) with  $K = 12, \alpha = 0.05$  after manual inspection
- ▶ leave-one-out cosine word impacts to identify changes
- ▶ manual definition of clusters as sets of topics

#### Features:

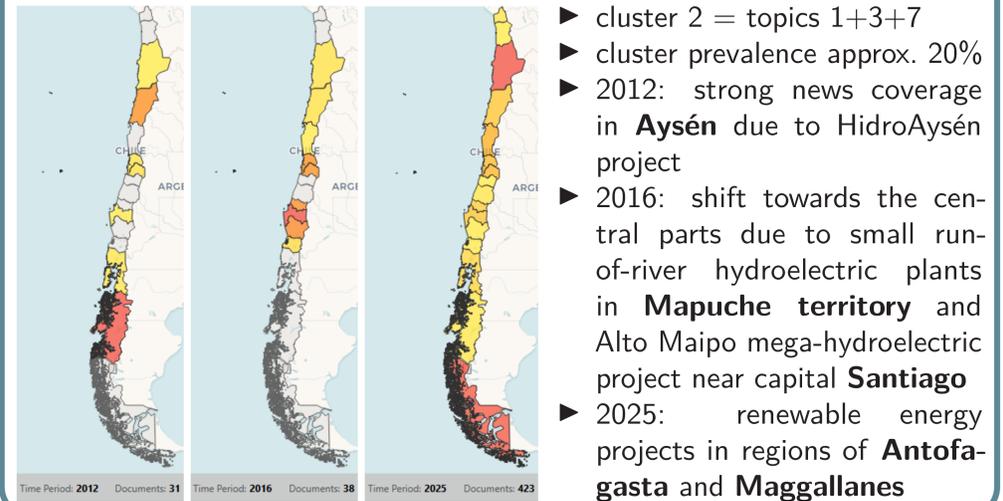
- ▶ top words per topic\*
  - ▶ number of documents\*
  - ▶ (overall) topic prevalence\*
  - ▶ (overall) cluster prevalence\*
  - ▶ Gini coefficient: inequality of topic prevalence\*
  - ▶ interactive filtering by space and time
  - ▶ option to download individual graphics and tables
- \*across locations (spatial) and over time (temporal)

### Topics & Clusters

T	Label	Top-5 Words
1	Environm. Impact, Glaciers & Wind	glaciar, impacto, zona, agua, ambiental
2	Hydroelectric & Indigenous Rights	maipo, río, mapuche, agua, comunidad
3	Environmental Court Proceedings	dominga, huasco, comité, ambiental, ...
4	Coal & Decarbonization	energía, carbón, central, descarbonización,
5	Local Impacts & Communities	gente, pueblo, cielo, lumínico, comunidad
6	Industrial Pollution & Sacrifice Zones	quintero, contaminación, puchuncaví, ...
7	Green Hydrogen Development	hidrógeno, hidroaysén, verde, patagonia, ...
8	Environmental Impact Assessment	ambiental, resolución, tribunal, evaluación,
9	Governm. & Environm. Legislation	ley, gobierno, comisión, derecho, política
10	General Word & Concepts	artículo, resumen, autor, investigación, ...
11	Lithium Mining	litio, salar, sqm, atacama, comunidad
12	Copper Mining & Water	minera, pelambres, agua, minero, cobre

C	Label	Topics Included
1	Water Resources & Mining Operations	T2, T11, T12
2	Environmental Impacts & Energy Projects	T1, T3, T7
3	Industrial Pollution & Decarbonization	T4, T6
4	Environmental Institutions	T8, T9
5	Local Impacts & Communities	T5

### Analysis



### Challenges & Next Steps

- ▶ integrate high-quality digital archives from selected Chilean newspapers (24 Horas, Diario Financiero, El Mercurio, La Nación, La Tercera, Pulso) to enhance and complement the existing dataset
- ▶ extend framework with deep learning approaches (distilled LLMs, NTMs)
- ▶ develop **metadata-aware topic model** to directly incorporate temporal and spatial information into modeling
- ▶ improve RollingLDA for **emerging and fading topics**
- ▶ enhance visualizations to capture **narrative evolution**
- ▶ incorporate combination of automated measures and human coder studies (incl. **annotator disagreement**) to validate results

### Data

- ▶ 1,996 Chilean news on socio-environmental conflicts in energy transition
- ▶ custom web scraper using Google News using 651 keyword combinations
- ▶ exclusion criteria: duplicates, non-conflict content, corporate/institutional announcements, non-Chilean context
- ▶ 24,051 scraped, 3,268 validated, 1,996 usable (61%), cf. GitHub repository



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GitHub Repository:  
<https://github.com/JonasRieger/t2s2026>

on the basis of a decision by the German Bundestag