

Visualizing Climate Change in Canadian Newsprint Media

Daniel Graham¹, Conny Davidsen², and Dan Jacobson³

¹ Geography, University of Calgary, drgraham@ucalgary.ca

² Geography, University of Calgary, davidsen@ucalgary.ca

³ Geography, University of Calgary, dan.jacobson@ucalgary.ca

Abstract

Climate change issues have gained substantial ground on the world stage over the past decade. Especially Canada has gained a pivotal global position, making its domestic climate change discourse a key issue. Newsprint media are a wide-reaching form of public communication that is readily available in digital archives. Growing volumes of information create a need to develop more effective techniques to mine and display discourse-relevant patterns. Thirty environmental keywords were searched through major newspapers in 15 Canadian cities for the period of 1999 – 2009 for a general coverage of key climate change debates. A subset of nine keywords was chosen for this paper to present the core findings in problem identification, renewable energy, and carbon based solution discourses. The cartographic techniques open the discussion on the communicative interface of mapping and ‘meaning’ in visualized media discourses. The research contributes to a concept development for utilizing visualization techniques to enhance understanding of spatial and thematic discourse dynamics across the media.

Background and Relevance

Science is reconstructed in the media; it is in this way that public knowledge and opinions are influenced by the media (Carvalho, 2007; Speth, 2008; Zehr, 2000). Ideology in journalism often leads to polemic coverage of scientific news. Science is supposed to be a mirror of the physical entity that it is examining but this is often not the case when science is interpreted, generalized and simplified by the media. Values and worldviews are integrated into news media stories that affect public opinion and understanding of the issues being covered (Carvalho, 2007).

Foucault already noted that social position and political change are channeled through knowledge (Foucault, 1972). Statements “must be viewed within the context of power as objects and weapons of political struggle” (Kennedy, 1979, pp. 286). The agendas pushed by media conglomerates are very important to the way climate change is presented to the public. The recent acceptance of anthropogenic climate change (ACC) into popular culture (in part by Al Gore) has helped facilitate a shift away from skeptical journalism (Carvalho, 2007). Journalist coverage of scientific news can insinuate that there is disagreement in the academic community when there is none. Foucault identifies a need to develop knowledge without reductionist tendencies toward political, economic, and social interests of the stakeholders (Foucault, 1972). There is also a need to understand what role discourse plays in the transformation of social norms (Kennedy, 1979). The media does not necessarily convey the ideology of environmental

actors but does integrate points of view and ideological standpoints that affect how the issue is digested by the public (Carvalho, 2007).

Spatialization is a geographic visualization of non-spatial data used to enhance cognitive understanding of phenomena (Fabrikant, 2008). It typically relies on dimension reducing techniques and layout algorithms to project similarity in non-spatial data into distance (Börner *et al.*, 2002). Spatialization conforms to Tobler’s first law of geography that all objects are related but closer objects are more related to each other than distant objects (Tobler, 1970). A visualization of similarity in geographic data can be created by transforming geographic space into synthetic (metaphorical) space (Spielman & Thill, 2007). Tobler’s first law of geography has been adapted by Montello *et al.* (2003) for spatialization by asserting people believe closer things are more related. The purpose behind creating a physical visualization in any discipline is that it is easier to understand and learn by expert and non-expert users (Fabrikant & Battenfield, 2001). One of the key directions today for visualization of the spatial metaphor is data mining large volume databases to further the ease of access and understanding for all users (Skupin & Fabrikant, 2003; Spielman & Thill, 2007; Wise, 1999). Spatio-temporal data pose many interesting and unsolved problems that geographers are applying cartographic techniques to better understand (Fabrikant, 2008).

Methods and Data

Keyword Development

Mainstream media reporting on climate change is less likely to use technical terminology than would a peer review publication. A variety of keywords were chosen in order to generalize the problem identification discourse into something tangible that can be captured in a news archive. The keywords were selected in such a way as to minimize ambiguity and retain climate change context. It is also important that the keyword terminology is likely to be used in newsprint language. General, but specific terms were selected that represent the core issues of problem identification, renewable energy, and carbon focused solutions.

The keywords selected for this paper were:

Problem Identification	Renewable Energy	Carbon Focused Solutions
Climate Change	Hydro Power	Carbon Capture
Greenhouse Gas	Solar Power	Green Economics
Emissions	Wind Power	Carbon Trade

These keywords capture the essence of the emerging struggles over climate change over the past decade as it has become a major issue both nationally and globally.

Data Collection

Newsprint is a widely accessible means of media communication around the world. In recent years, in terms of newspaper history, most newspapers have publicly accessible archives. The search engine accommodates Boolean search expressions which enables precise archive data mining. Canadian Newsstand contains 300 newspapers from Canadian publishers with coverage from 1977 to present. The database is hosted by ProQuest, a major international information service provider of such trademarks as RefWorks, CSA, eLibrary, and Chadwyck-Healey. Other forms of media, although important, were excluded for a number of problems with each. Radio and television transcripts, magazines, and NGO news releases were initially included in the research design. By specifically using Canadian Newsstand, search techniques were standardized and consistent for recording keywords. Since the other forms of media are unstandardized and in many cases unavailable, it was decided not to include them at this phase of the research.

By hosting all of the newspapers used for this study in a single database it allowed for systematic and consistent search results that would otherwise be encountered by using multiple data hosts. Cross comparability was a key objective of compiling the keyword dataset. Database queries count the number of articles that the keywords appear in, not the absolute number of times the keyword was used. By counting keywords this way, each article is a separate entity with which an idea regarding climate change is presented.

Geographic visualizations, spatializations, and graphs were utilized to examine the collected data for trends and anomalies. Connections to place and time were able to be uncovered in the data and presented by using the fore mentioned toolsets.

Results

From the problem identification phase of this research, it look as if “climate change” and “emissions” are the favored topics in the climate change discourse. These keywords are subject to a common temporal trend of a peak in 2002, a valley between 2003 and 2005, followed by another peak in 2007.

The data collected here indicates that much of the development in media coverage of the carbon debate has occurred over the latter portion of the decade with relatively little coverage of most of the issues in the early part of the decade. Alberta has consistently appeared as the more active region for carbon related keywords throughout the study period.

Wind Energy was the most prevailing form of renewable energy according to the data collected. In terms of the media relevance, these keywords are indicative as a snapshot of the holistic discourse which suggests that the media had a higher than normal focus on wind power.

The data indicates that there has been steadily increasing diffusion of carbon sequestration in the media over the study period. Studies (primarily Sharpe *et al.* 2009) suggest that the public is in favor of solutions that remove carbon from the atmosphere despite it being catastrophically expensive to undertake in its current phase of development.

Conclusions

The variety of visualization techniques used in this research was useful for exploring and offering meaningful explanation of otherwise invisible patterns in the media. The current capitalism market is relying on economic incentives to promote a green shift in society. The hopefuls want to encourage renewable energy and sustainable development while simultaneously discouraging consumption and pollution. Since most environmental reform policies have been fought based on economic interests, Canada has been slow to react to climate change. The data used in this study presents solid evidence of the widespread media coverage of problem identification. While most of the data has created a whirlwind artificial peak in 2002, the mid-decade span was comparably less prevalent until 2007. More research is needed to hypothesize the cause for this valley. A societal transition is needed to unite development and environmental regulation. By exploring the messages in Canadian media, policy makers and environmental researchers are better able to adjust their actor roles for the public good. Cultural norms have changed radically over the last hundred years for the better so it is possible to look beyond short term economic gain for long term environmental loss; there needs to be a widespread willingness at all levels.

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