

# Framing Global Climate Change in Newspapers, 2000-2015: A Five Nation Study

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## Research Article

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1 1.0 Introduction

2 Media coverage of global climate change (GCC) was a heated topic through the  
3 first two decades of the 2000s among academics, media watchers, journalists, and publics  
4 with labels such as “inept”, “tremendously challenging”, “enjoyable”, and “dangerous”  
5 among others. For some media watchers: “[I]n New Zealand we just see lots of inept  
6 media, and issues that complex just getting brushed to the side because no one  
7 understands how to cover them properly.... There needs to be that climategate hook or  
8 some personality conflict, drama... to make a climate change story work in New  
9 Zealand” (Personal Interview, New Zealand Science Media Centre staff). For journalists:  
10 “It’s tremendously more challenging. I would put it at the absolute head of the list of  
11 difficulty for journalists.... [T]his is on the short list of the hardest to write about  
12 accurately and engagingly” (Personal Interview, US Journalist). For other journalists: “I  
13 enjoy it the most because there are so many dimensions to it.... So you’re talking about  
14 energy technology, international law, high physics, just everything. It is a great topic”  
15 (Personal Interview, UK Journalist). Some journalists faced other challenges. “...[I]t’s  
16 probably nastier. It’s brought in a nastiness that I’ve never seen before covering politics.  
17 There’s a really well-organized anti-climate change lobby out there and they’re quite  
18 sinister and they all hook up on the internet and there are some real freaks out there... the  
19 hate mail is worse than I’ve ever gotten. And there are academics in this country that get  
20 death threats.... [People are] bombarding me with email and letters and stuff. It can get  
21 quite nasty.” (Personal Interview, Australian Journalist). Consistent with the Media  
22 Centre quote above, academic studies of GCC journalism sometimes explicitly or  
23 implicitly judged it based on its (in)accurate representation of “the science”. Journalists  
24 were either doing a good job of communicating the threat because they understood “the  
25 science”, or a poor job, perhaps influenced by or overly attending to conservative  
26 commentators, fossil fuel interests, or skeptics.

27 Research reported here starts from a different standpoint, captured in these two  
28 simple points: (1) GCC is complex and heterogeneous. Diversity in coverage is  
29 necessary and should be expected. (2) GCC action asks much of publics and their  
30 political representatives, thus resistance should be anticipated. Under these conditions, as  
31 Hulme (2009) developed, one should expect disagreement, diversity of viewpoints and  
32 subject matter, and a full range of relevant orientations and information, each potentially  
33 represented competently by journalists with varying degrees of understanding of “the  
34 science”. From this standpoint, a key question is whether a legitimate range of GCC  
35 dimensions was proportionately and continually represented in media accounts during  
36 this time period.

37  
38 2.0 Theory and Past Research

39  
40 2.1 *Crisis Theory for a GCC Crisis*: Theoretical orientations to GCC  
41 communication are sometimes narrowly construed or non-existent. This paper starts  
42 more abstractly for its value in generating often ignored questions and potential  
43 interdisciplinary relevance. Much social science research on the environment has  
44 adopted Schnaiberg’s (1980) “treadmill of production” theory as a starting point. The  
45 basic idea is that acceleration of economic growth after World War II led to expanding  
46 use of natural resources and generation of waste. Unless forced otherwise, capitalism

47 treated environmental fallout as an externality in economic decision-making in favor of  
48 profits and competitive advantages. The state largely, but not exclusively, supported this  
49 treadmill, assuming it generated economic stability. A treadmill of production was  
50 accompanied by a complementary “treadmill of consumption” built over time through  
51 advertising and marketing, improvements in the means of consumption, credit  
52 accessibility, defensive consumption for social positioning (Curran 2017), and so on.  
53 Labor, as well, adopted the growth model under the cultural influence of a work-and-  
54 spend cycle (Schor 1991) that equated capitalist growth with job security and  
55 environmental regulation with job loss.

56 Within this research program capitalist growth is largely to blame for  
57 environmental crises. Little can counter the structural forces of capitalism other than  
58 environmental regulation forced through social movement activity. The media receives  
59 minimal attention, other than how it is controlled by economic interests, perpetuates  
60 capitalist ideology, and stimulates consumerism. Though focusing on economic rather  
61 than environmental crises, Jürgen Habermas provides additional insight. For Habermas  
62 (1975 [1973]), capitalist economic crises identified by Marx are conceptualized as system  
63 crises where fewer possibilities for problem solving exist than are necessary for economic  
64 stability (pg. 2). Crises in “liberal capitalism” of the 19<sup>th</sup> century appeared as economic  
65 steering problems. If unresolved they migrated to the public sphere where legitimacy of  
66 the economic system may be questioned. In “organized capitalism” of the 20<sup>th</sup> century,  
67 the state intervened in the economy to handle unresolved economic crises, preventing  
68 social upheaval. Economic crises were transferred to the state and citizens looked there  
69 for solutions. If the state failed to meet expectations, legitimation crises of the state  
70 emerged where authority and validity were challenged (Habermas 1975 [1973]). The  
71 state may then transfer these crises to the lifeworld where people blame each other and  
72 themselves undermining its legitimacy. The solution for Habermas is improvements in  
73 communicative norms, following his theory of universal pragmatics, and development of  
74 public spheres where consensus forming values and rational decisions are  
75 intersubjectively accomplished freeing the lifeworld from colonization by the system  
76 (Habermas (1984 [1981])).

77 Critiques of Habermas’ optimism for communicative rationality are well known,  
78 but his attention to it and the public sphere highlights the media’s importance in  
79 clarifying and situating economic and environmental crises (Matthews 2017). The media  
80 not only informs but also helps form publics and their opinions (Irwin 2001). Drawing  
81 from Habermas two general but important questions emerge: (1) how effectively did the  
82 media represent GCC’s diverse dimensions and (2) where did it largely locate the crisis?  
83 What form(s) a GCC crisis took and where it was situated likely had significant effects  
84 on how publics reacted and whom they blamed. Was GCC located primarily in the  
85 economic or political system? Or was it transferred to the lifeworld where individuals  
86 and publics were held responsible, necessitating personal change? Or was there been  
87 good balance across the system and the lifeworld? Did the media contribute to a public  
88 sphere where a full range of discussion points were available for rational evaluation and  
89 decision making?

90 2.2 *GCC in the Media*: A litany of social science research has examined media  
91 framing and discourses of GCC (e.g., Antilla 2005; Boykoff 2007; Boykoff 2008;  
92 Boykoff & Boykoff 2005; Boykoff & Boykoff 2007; Brown, Budd, Bell, & Rendell

93 2011; Carvalho & Burgess 2005; Cherry, Hopfe, MacGillivray, & Pidgeon 2015; Corbett  
94 & Durfee 2004; Dirikx & Gelders 2010; Engesser & Brüggemann 2016; Hart 2011;  
95 Howard-Williams 2009; Matthews 2017; Moser 2010; Moser & Dilling 2007; Nisbet  
96 2009; Palfreman 2006; Spence & Pidgeon 2010; Takahashi & Meisner 2013; Painter  
97 2013; Trumbo 1996; Whitley & Kalof 2014; Young & Dugas 2011; Zehr 2000). This  
98 corpus is reflective of both the amount of media attention to GCC (e.g., Boykoff 2011;  
99 Schmidt, Ivanova, & Schäfer 2013) and its assumed importance in shaping public  
100 attitudes, beliefs, and potentially behavior. Common themes are apparent such as  
101 framing around scientific uncertainty (e.g., Antilla 2005; Boykoff 2007; Boykoff &  
102 Boykoff 2007; Corbett & Durfee 2004; Morton, Rabinovich, Marshall, & Bretschneider  
103 2011; Painter 2013; Post 2016; Zehr 2000), apocalyptic or “pandora’s box” framing (e.g.,  
104 Feinberg & Willer 2011, Foust & Murphy 2009, Nerlich & Jaspal 2014, Palfreman 2006,  
105 Russill 2016, Ungar 1992), attention to skeptics (e.g., Boykoff & Boykoff 2004; Jaspal,  
106 Nerlich, & van Vuuren 2016), emotion-laden framing (e.g., Höijer 2010; Myers, Nisbet,  
107 Maibach, & Leiserowitz 2012), development of knowledge gaps (e.g., Cherry et al. 2015;  
108 Nisbet, Cooper, & Ellithorpe 2015), health impacts (e.g., Myers et al. 2012), GCC  
109 imaging (e.g., Hart & Feldman 2016; O’Neill 2013; O’Neill, Boykoff, Niemeyer, & Day  
110 2013), and so on. Congruence occasionally emerges with the adoption of previously  
111 developed frame typologies, but many researchers develop unique ones producing results  
112 that stand somewhat independently as “news” about media coverage.

113 An important development, not explored here, is research measuring actual  
114 impacts of media framing on public perceptions, knowledge, and behavior (e.g., Happer  
115 & Philo 2013; Nisbet 2009; Nisbet et al. 2015; O’Neill et al. 2013; Sambei & Aoyagi-  
116 Usui 2009; Zhao, Rolfe-Redding, & Kotcher 2016; Zia & Todd 2010). Questions often  
117 focus on the limited success of GCC communications and recommendations for  
118 improvement (see Bolsen & Shapiro 2017 for a review). While this agenda is fruitful, it  
119 potentially oversimplifies publics and GCC as societal phenomena. Publics bring  
120 different cognitive and social frames to the problem (Asiyambi 2015; Asplund 2016;  
121 Corner, Markowitz, & Pidgeon 2014; Doran, Böhm, Pfister, Steentjes, & Pidgeon 2019;  
122 Leiserowitz 2005; Metag, Fuchsli, & Schäfer 2017; Pidgeon 2012; Weber & Stern  
123 2011), which Hulme (2009) generalized with the question: “why we disagree about  
124 climate change”. Other important developments include research on longitudinal change  
125 in GCC framing (e.g., Hansen (2015, 2016; Whitley & Kalof 2014; Young & Dugas  
126 2011), variation across content sources (e.g., Carvalho 2007; Carvalho & Burgess 2005;  
127 Feldman, Hart, & Milosevic 2017; Feldman, Maibach, Roser-Renouf, & Leiserowitz  
128 2012; Nisbet et al. 2015; Takahashi & Meisner 2013; Young 2013), and cross-national  
129 comparisons (e.g., Boykoff 2007, Carvalho 2007, Dirikx & Gelders 2010, Grundmann &  
130 Scott 2014, O’Neill 2013, Schmidt et al. 2013).

131 The journalistic balancing norm -- where views of mainstream and skeptic GCC  
132 scientists are elicited for a “balanced” account – is critiqued in this literature for its  
133 alleged undo attention to a minority of skeptics and generation of controversy. Boundary  
134 work sometimes pervades the critique, where skeptics are situated outside a legitimate  
135 GCC scientific community by emphasizing their insufficient credentials or representing  
136 them as ideologically driven by fossil fuel interests (e.g., Oreskes and Conway 2010).  
137 Even journalists from the elite press have acknowledged the balancing problem from

138 earlier GCC reporting and mostly discontinued it despite the marketability of controversy  
139 (Boykoff 2007; Schmid-Petri, Adam, Schmucki, & Häussler 2017).

140 However, GCC balancing might be conceptualized differently: as attending to and  
141 balancing across a range of relevant dimensions, such as those depicted by the news  
142 frames elaborated below. For the media to effectively serve as a 4<sup>th</sup> estate, good balance  
143 is necessary, enabling publics to see GCC as a multi-faceted set of problems and  
144 opportunities. This variation would not just align to different publics and stakeholders,  
145 but also *a public* to keep it broadly informed. Diversity across the range of issues moves  
146 closer to, though inevitably short of, Habermas' goal of generating a public sphere.

147 This conceptualization leads to a hypothesis that the range of coverage and  
148 balance increased over time. GCC infiltrates many social spaces including science,  
149 environment, politics and policy, formal and informal education, social inequality, and so  
150 on. As GCC evolved as a news issue, so might the range of stories as journalists became  
151 more informed about novel aspects (as reflected in the UK journalist's interview account  
152 above). The relevance of GCC across these social spaces is not linear, thus one would  
153 not expect media coverage to have proceeded linearly. GCC scientific research and  
154 political deliberations are as relevant to the public interest today as they were 20 years  
155 ago, as are other dimensions like social inequality and public knowledge.

156 A second hypothesis is to expect variation in media coverage across nations as  
157 they grappled with different environmental impacts, global political positions, scientific  
158 contributions, adaptive requirements, and publics. Much overlap is expected as well, as  
159 some issues were more globally conventional and wire services reached more than one  
160 nation. But variation might be anticipated, for example, between India and the U.S. in  
161 their focus on social inequality or technological development, or between Australia and  
162 New Zealand in their attention to different causal factors. Media may have located a  
163 GCC crisis in different places across nations based on national contributions to  
164 greenhouse gas emissions, political efforts to avert or adapt, and impacts on or  
165 engagement of its residents.

166 The basic research questions then are whether the media delivered balance across  
167 a range of news frames over time and across nations, yet also exhibited some cross-  
168 national variation to account for nation-specific concerns. Or was there a detectable  
169 imbalance in media coverage such that a GCC crisis was locatable within a particular  
170 sphere such as the economic or political system or the lifeworld? To address these  
171 questions, results are used from an analysis of newspaper articles on GCC from 2000-  
172 2015 in five nations: Australia, India, New Zealand, UK, and US. These five nations  
173 were chosen both for the convenience of English language presses and their different  
174 situations *vis-à-vis* GCC causes, effects, and policies.

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### 3.0 Methods

177 Newspaper articles were used due to accessibility and comparability over 16 years  
178 across five nations. Headline search terms “global warming” or “climate change” were  
179 used on *LexisNexis* (now *Nexis Uni*) to identify GCC articles in ten national newspapers  
180 (“elite press”), two from each nation. *Factiva* filled small gaps in coverage. Headline-  
181 only searches inevitably excluded some GCC relevant articles, but effectively reduced the  
182 sample to what readers would more readily identify as GCC relevant. Additional  
183 sampling (e.g., one of every three chronological articles) was used for newspapers like

184 *The Guardian* where population size was overwhelming. Across the ten newspapers,  
185 approximately 3500 articles were read by the author. Analysis was interpretive but  
186 performed with care and consistency. Nonetheless, percentages below might vary  
187 slightly across researchers, so very small differences across frames, nations, and time  
188 should not be overemphasized. Using both Goffman (1974) and Entman (1993), frames  
189 were identified by how articles were structured to promote interpretations/dimensions of  
190 GCC for accomplishing purposes of defining problems, identifying causes, making moral  
191 judgments, or suggesting remedies (see also Lindström & Marais 2012, Tuchman 1978).

192 Due to the large sample size, which prevented extensive rereading and reanalysis  
193 that inductive approaches require, a mostly deductive approach was used starting with a  
194 typology of common GCC news frames and “subframes” (subsets of more general news  
195 frames). Boykoff’s (2008, 2011) GCC news frames were adapted and expanded upon  
196 with: causal factors (e.g., fossil fuels, capitalism, natural phenomena) (e.g., Rowe 2009);  
197 adaptive or mitigating technologies; and public GCC knowledge, norms, values, or  
198 education. While not the central focus of this paper, “subframes” added more granularity  
199 (e.g., the economic costs of GCC, economic costs of GCC policies, and economic  
200 opportunities of mitigation or adaptation as subframes of the economics news frame).  
201 Table 1a lists the basic news frames used in the analysis; table 1b lists frames and  
202 subframes. Other framing typologies were certainly relevant, but this typology permitted  
203 a generalizable analysis across 16 years and five nations.

204 The frame, rather than the article, was the unit of analysis. Articles could contain  
205 more than one frame. In most cases, subframes rather than the more general frame were  
206 coded (e.g., an article framing GCC as an issue of international political deliberation was  
207 coded there rather than the “political” news frame). Each of these subframe codes could  
208 later be collapsed into the larger general frame, which was done for this paper.  
209 Newspaper content data were supplemented by personal interviews with journalists and  
210 other media watchers in all five nations for further information and triangulation.

211 For example, a 1 April 2014 article in *The Guardian* titled “Frame climate change  
212 as a food issue, experts say” used an IPCC report and interviews with World Bank and  
213 Oxfam experts to emphasize how impacts of GCC on food production and talk about the  
214 phenomenon might change people’s beliefs and behavior regarding GCC (Goldenberg  
215 2014). Two subframes were central to the article: “environmental impacts on  
216 agriculture” and “public beliefs and behavior”. Each was coded and then, for this paper,  
217 collapsed into two general news frames of environmental effects and public  
218 understanding, knowledge, and education.

219 Table 2 lists newspapers used for this paper. Some mix across ideological divides  
220 and between mainstream and financial newspapers was included to detect any significant  
221 framing differences, though this was not of central interest in the project. For example, in  
222 Australia the politically liberal-leaning *Sydney Morning Herald* and Rupert Murdoch’s  
223 News Corp *The Australian* were used. In the U.K., *The Guardian* and the *Financial*  
224 *Times* were used.

225

226

#### 4.0 Results

227

228

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Tables 3a-e depict the relative representation of news frames during three time-  
periods (2000-05, 2006-10, and 2011-15) in each of the ten newspapers. Data were  
gathered by year but collapsed into 5-6 year intervals to peripheralize effects of any one

230 national or global event and to clarify change. Table 3 entries indicate the percentage  
231 presence of each frame relative to the total number of detected frames within that  
232 newspaper and time-period. In other words, percentages represent the relative emphasis  
233 on each frame within overall GCC coverage. Focusing on relative representation rather  
234 than total representation, in my view, better captured the likely impact on readership.  
235 GCC competes with other newsworthy items for the limited “carrying capacity” of public  
236 attention (Hilgartner & Bosk 1988). To the extent that publics read GCC articles, they  
237 would have attended to the relative emphasis on one or another frame, rather than the  
238 total amount of frame coverage a significant portion of which would have been ignored in  
239 favor of other newsworthy issues.

240 Tables 3a-e show diverse frames in each newspaper across the three time-periods,  
241 indicating that journalists addressed a range of GCC dimensions expected from effective  
242 media coverage. Separate sub-frame data (not included here) accentuates that range.  
243 That said, the political frame stands out as the most dominant across time-periods,  
244 newspapers, and nations, especially in the US and UK. This result is consistent with  
245 research showing overall coverage mirroring major national and international political  
246 meetings (e.g., Boykoff 2011, Schmidt et al. 2013) and likely reflects the popularity of  
247 policy topics. But its broader significance should not be ignored.

248 With a couple of exceptions (e.g., *Financial Times*) both the environmental  
249 effects and science frames are next, alternating in dominance across newspapers and  
250 nations. These two frames have a symbiotic relationship since scientific research is often  
251 tapped to identify or explain environmental impacts. Methodologically, if an article  
252 focused primarily on an environmental effect, it was coded there. If it focused on  
253 scientific research or scientists, with environmental effects casually mentioned as an  
254 outcome, it was coded as a science frame. Many articles included both frames.

255 Despite the centrality of economics in environmental decision-making, this frame  
256 was less dominant than the above three. The *Financial Times* aside, economic framing  
257 consisted of roughly 10% or less of total frames across the three time periods. An  
258 additional exception was the New Zealand newspapers for the 2000-05 and 2006-10  
259 time-periods (but not 2011-15) where the special relationship of the agricultural economy  
260 and GCC likely increased economic framing. Personal interviews with New Zealand  
261 GCC journalists and policy actors found them very attuned to economic implications of  
262 mitigation policies. One would predict that *The Australian* would be very attentive to the  
263 economic costs of GCC policies, especially around passage of the Clean Energy Act in  
264 2011. One does see more attention than in the *Sydney Morning Herald*, but not much  
265 more. Subframe data indicate that more attention was given to “policy impacts on the  
266 economy” in *The Australian* than the *Sydney Morning Herald*, but also on “economic  
267 opportunities of mitigation policies” which is often found in environmentalists’  
268 discourse. Economic framing was very limited in the two India newspapers.

269 Socio-cultural framings, captured in the analysis by the public  
270 understanding/knowledge/education and social inequality frames, were less prevalent.  
271 Two exceptions were *The Guardian* and *Hindustan Times*. Both highlighted public  
272 aspects of GCC in the 2006-10 and 2011-15 time-periods, but content varied. The  
273 *Hindustan Times* often depicted GCC educational events at a university or secondary  
274 school in short, announcement type articles. *The Guardian* attended to public  
275 knowledge, beliefs, and values and was more attuned to social science research on the

276 topic. The social inequality frame received less attention, even in the two India  
277 newspapers where higher levels were expected.

278 Technological framings were few and focused on mitigation rather than  
279 adaptation. This frame was coded if articles highlighted any technological intervention  
280 whether large, complex, and system wide or smaller for home or personal use.  
281 Surprisingly, neither received much attention despite social science research indicating  
282 that messaging with technological or other solutions is more effective (e.g., Hart &  
283 Feldman 2014; Kahan, Jenkins-Smith, & Braman 2011; Nisbet 2014; Nisbet & Newman  
284 2015).

285 Also highly significant was the relative absence of the causal factors frame across  
286 time-periods, nations, and newspapers. Perhaps journalists assumed public familiarity  
287 with causes by the early 2000s. However, surveys of public understanding in the US and  
288 UK during these time-periods showed that publics were *not* generally aware of how  
289 lifestyles and a capitalist economy were causally linked (e.g., Pew Research Center 2009,  
290 2016; Reynolds, Bostrom, Read, & Morgan 2010; Weber and Stern 2011). Subframe  
291 data indicated slightly more attention to fossil fuels than other causal factors such as  
292 capitalism/consumption, population growth, land use change, and natural phenomena.  
293

## 294 6.0 Discussion and Conclusions

295 The dominance of political framing should not be taken for granted, as it often is  
296 under a linear science-to-policy progression. Some journalists shared this view. A New  
297 Zealand journalist explained in a personal interview: "...there's a change that starts with  
298 reality [and]... the state of the science.... It is public and the level of public  
299 understanding of the science. Then there's flowing through to the political will to act,  
300 then the actual policy outcomes of that debate and finally the impact that that has on the  
301 economy and business and incentives." Other journalists indicated their newspapers  
302 covered the gamut of GCC issues, but policy issues are "where the debate is," or "the  
303 politics get the most coverage because that's where it starts and finishes" (Personal  
304 Interview, Australian Journalist). Scholarly research on media representations also might  
305 have been affected by this assumption as it gravitated to reasons for political inaction  
306 (ineffective communication, fossil fuel industry manipulation, etc.) rather than focusing  
307 on its construction *as political*.

308 An alternative assumption, however, is that GCC is *at all times* about science,  
309 environment, politics, economics, social inequality, public values, and so on. Imbalance  
310 across those frames in media accounts, then, raises questions and holds consequences.  
311 For instance, the dominance of political framing was congruent with and likely partially  
312 responsible for survey data indicating that the public viewed GCC as a problem for the  
313 state, but simultaneously didn't trust their government's efforts nor wish to absorb costs  
314 (Pidgeon 2012). This public positioning of the problem as political also created a  
315 quandary for politicians, many desiring to pass strict regulations but recognizing the  
316 likelihood of political pushback. For example, Australian Prime Ministers Kevin Rudd  
317 and Julia Gillard paid this price following their government's imposition of a carbon tax.  
318 The combination of economic impacts and causal factors framing was much less  
319 prevalent than political framing, placing GCC mostly in the realm of the political system  
320 rather than an outcome of economic activity.

321 From a theoretical standpoint, political frame dominance and limited attention to  
322 causal factors and economy indicate that GCC was represented mostly as a crisis of state.  
323 What could easily have been represented as an outcome of capitalism and its  
324 externalization of environmental damage, or population growth, instead was transferred  
325 to the state where policy actors appeared accountable. Explanations for this centering  
326 cannot be placed in journalists' assumptions that publics were already well-informed  
327 about causes and consequences due to clear survey data indicating the opposite. Also,  
328 causes and economic impacts are complex, varied, newsworthy, and not at all obvious.  
329 For example, when journalists did attend to causal factors, there was significant cross-  
330 national difference across subframes that reflected nation-specific differences. For  
331 example, agriculture as a cause received attention in methane emitting New Zealand  
332 while largely absent elsewhere.

333 Empirical research on the politicization of GCC and the media's attention to  
334 political divergence, while accurate especially in the US, largely ignores the prior  
335 questions of why and how it was represented as mostly political. Partly due to linear  
336 science-to-politics thinking and partly due to journalists' interest in politics, GCC became  
337 primarily a political problem. Once there, some mainstream journalists felt pressure to  
338 adhere to the scientific consensus construction to avoid being perceived as supportive of  
339 sceptics. In a personal interview, one young New Zealand journalist described the fear of  
340 getting something scientifically wrong because of the angry letters it would yield. This  
341 stance ironically may have moved GCC *further away* from the normal debate and  
342 disagreement central to scientists' work. In the political sphere, as would be predicted,  
343 GCC was subjected to the typical political ideological and power wielding maneuvering  
344 that other issues with similar socio-cultural and economic implications experience.

345 The high percentages of science and environmental effects frames are consistent  
346 with assumptions that science is the main source of GCC information and environmental  
347 impacts (not socio-cultural) the main effects. These frames fit the science and  
348 environment background of many elite press GCC journalists looking for novel and  
349 relevant topics. While a dominant frame across nations, environmental effects subframes  
350 varied with nation-specific factors. For example, fire and drought subframes were more  
351 prevalent in Australia; agriculture and fisheries were more prevalent in India. There also  
352 was cross-national consistency, with extreme weather events forming a common  
353 environmental subframe across all five nations. Most science framing focused on new  
354 reports or studies with much less attention on scientists and scant attention on science  
355 funding and infrastructure (with some variation across nations). This emphasis  
356 contrasted with some researchers' and media watchers' claims that scientific controversy  
357 was overemphasized. It did receive attention in *The Australian* after about 2009, but in  
358 general, stories were framed around research results and reports rather than the people  
359 and resources responsible for them.

360 Economic framing had a significant but not overwhelming presence, even in the  
361 US where policymakers placed environmental problems and solutions in cost-benefit  
362 frameworks. Subframe data indicate some variability across nations on the important  
363 distinction between economic impacts of GCC or costs of GCC policies. The latter  
364 assume domestic policy of some sort, so this subframe was more prevalent in Australia  
365 and New Zealand where mitigation policies were passed. Another notable point is that  
366 economic frames almost exclusively focused on mitigation rather than adaptation.

367 A few exceptions aside, less attention was given to public dimensions and civil  
368 society activity than to politics, economy, science, and environmental impacts. Even less  
369 attention was given to social inequality, which many social scientists consider key to  
370 GCC and GCC policy. Exceptions included *The Guardian* and *Hindustan Times*. As  
371 predicted, social inequality frames were more prevalent in the two India newspapers, but  
372 less than expected given India's global position as a low per capita emitter and  
373 vulnerability to impacts.

374 Minimal attention to public and social inequality frames placed GCC largely  
375 outside the lifeworld. The GCC crisis remained highly centered in the state without  
376 transfer to the lifeworld where public and private blame and responsibility might become  
377 more salient. Some newspaper accounts emphasized, and occasionally deplored, the lack  
378 of public scientific knowledge or the public's perceptions about GCC and GCC policy,  
379 but minimally associated lifeworld activity as cause or solution. At best, the occasional  
380 article included a "what you can do" list to reduce emissions. Social scientists also have  
381 lamented a lack of public knowledge and concern about GCC. Research emphasizes how  
382 communication can become more effective, perhaps by using more emotional language  
383 or visual imagery, explaining scientific uncertainty better, providing means for action,  
384 and so on. What is largely missing from this research is the prior point that GCC has  
385 been minimally framed as a public or private lifeworld problem. Why *should* publics feel  
386 responsible? Due to the lack of lifeworld attention in newspaper accounts, coupled with  
387 what GCC solutions will require of us individually and collectively, we should not be  
388 surprised with Norgaard's (2006a, 2006b) findings of implicatory denial among  
389 Norwegians who otherwise tend to be environmentally informed and conscientious. That  
390 denial is likely in other nations as well and its causes may extend beyond the  
391 overwhelming and numbing nature of the problem.

392 In conclusion, several main points are worthy of further emphasis and  
393 development. One is the meaning of media balancing in GCC reporting. Rather than  
394 scientific consensus/skeptic balance, a different and in my view more productive  
395 approach is locating it across diverse frames, such as those in the typology considered  
396 here. This approach is simple but underutilized in the literature, even though it is  
397 consistent with some journalists' and editors' thinking about GCC reporting. "If you're  
398 trying to judge what we do as a ...whole ...on... climate change, then I think we... cover  
399 the landscape pretty well. If you're judging an individual story, then yes, it's going to  
400 have boundaries around it" (Personal Interview, U.S. Journalist). From this standpoint,  
401 the data indicate the elite press in these five nations did address the range of frames  
402 examined here. All frames appeared from time to time. Friedman (2015) called attention  
403 to "environmental mainstreaming" in the media -- the tendency to spread environmental  
404 topics across politics, business, science, health, lifestyle, and technology sections rather  
405 than maintaining a separate beat. This practice has been criticized due to its associated  
406 decline in journalists with environmental (and science) specialties. While there is  
407 agreement that the latter is a problem, there also may be significant benefits to balancing  
408 GCC and other environmental issues across those sections even when non-specialists  
409 write the stories. GCC is also about these other topics and need integration with them.

410 The results also indicate imbalance. Political, environmental impacts, science,  
411 and economic framings received more attention than causal factors, public  
412 knowledge/values/education, social inequality, and technological solutions framings.

413 This imbalance and dominance of political framing suggest that GCC was represented  
414 more as a crisis of state than economy or lifeworld. This imbalance likely made it  
415 challenging for political, corporate, and environmental leaders to hold the economic  
416 system and personal lifestyles accountable. Instead, political leaders found themselves  
417 accountable within international and domestic political cultures ill equipped to respond.  
418 For as Sonnett (2010) has pointed out, political discourses about risks of GCC are more  
419 reactive compared to prescriptive scientific and environmentalist discourse.

420 Second, while some variation in frame dominance occurred across the five nations  
421 and newspapers, the results indicate more overlap than difference. Differences were  
422 mostly indicative of national priorities or newspaper emphasis rather than directly due to  
423 ideology. For example, if one brackets out the question of whether scientific certainty or  
424 uncertainty was emphasized or whether GCC policies were defended or attacked,  
425 newspapers such as the *Sidney Morning Herald* and *The Australian* were more similar  
426 than different. In fact, the latter gave more coverage to scientific research and the  
427 scientific process from 2006-15, albeit emphasizing uncertainties in that science. As this  
428 Australian social scientist described *The Australian*: “[T]he actual underlying quality of  
429 the reporting is usually quite high. It just often has a very strong political lens on it. And  
430 you could probably make the argument on the other side as well -- that much of the  
431 Fairfax press reporting has a sort of political tint to it or hints in terms of supporting the  
432 government’s position.... [M]uch of what *The Australian* has been doing is quite a  
433 political type of reporting that supports the Abbott kind of opposition on things, but at a  
434 level of debate that is actually well informed” (Personal Interview, Australian Social  
435 Scientist). The results suggest that ideological difference in GCC reporting in the elite  
436 press might have been less significant for long-term (in)action than was (im)balance  
437 across frames.

438 Third, journalists sometimes responded defensively in personal interviews to  
439 questions posed about framing and related matters, sometimes emphasizing the  
440 constraints of the medium. Part of this defensiveness, I suspect, was in response to  
441 academic criticisms leveled at GCC journalism, which occasionally held it accountable  
442 for public and political inaction. Another important reason, however, is that “framing” is  
443 not part of journalists’ lexicon or way of thinking about their job. Rather, they view  
444 themselves as “just following the story.” However, from a content analytical side,  
445 “following the story” led to the dominance of political framing and neglect of causal  
446 factors and lifeworld implications. To some extent it is a chicken-or-egg question of  
447 whether this content was more reflective of journalistic practice, society’s orientation and  
448 apathy to the issue, or political actors’ efforts to politicize the issue as suggested by  
449 Matthews (2017) in the UK context. But journalists and editors make choices and  
450 actively shape the news they report. Balance or imbalance across frames had  
451 consequences and, in my view, was more consequential to stagnation about GCC  
452 solutions during this time period than media attention to skeptical or contrarian views.

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459 All data from newspaper analysis available from author by request.

## Supplementary Files

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