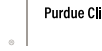


More Inclusive, More Practical: Climate Change Communication Research to Serve the Future

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Introduction

Climate change impacts such as heat waves, rising sea levels, and other extreme weather events are being felt around the world.^[1] As one of the greatest challenges of our time, climate change has become the most-researched topic within environmental communication.^[2] Understanding the current scope of climate change communication research sheds light on where we have been, where we are now, and what environmental communication work still needs to be done to meet the needs created by climate change. The topics and regions of the world we choose to research have important implications for how we, as a global community, can effectively respond and adapt to climate change.

Action Required for the Future



We urgently need research that addresses immediate mitigation and adaptation concerns in local communities.

Climate change will no longer wait, governments around the world are failing to act, and research to date is disproportionately focused on public belief in and information consumption of climate change.



We urgently need research in the African continent, the Caribbean, the Middle East, Latin America and certain parts of Asia.

Research to date is disproportionately focused on North America, Europe and Australia.

Setting the Stage

Climate change communication research is vital for shaping and organizing activities necessary for climate change mitigation and adaptation. The purpose of this study was to review existing climate change research to date and evaluate the extent to which this research is on target to advance necessary climate change responses recommended by climatological experts. While the physical sciences are adept at defining which strategies are necessary to slow the impacts of climate change, large-scale climate change mitigation and adaptation will only come to fruition when social scientists in communication and other fields study how to implement these strategies in effective and equitable ways.

In 2019, the American Meteorological Society (AMS) released a statement summarizing how human influence has impacted our climate by causing a warming of the atmosphere and oceans. Projected warming over the next century places global temperatures in a range not seen in millions of years of geologic history.^[3] The report concludes with recommendations for how to most productively respond to climate change, serving as a guidepost for future research that addresses the most pressing climate change challenges. These necessary climate change responses are outlined in Table 1.




2019 American Meteorological Society Recommended Responses to Climate Change		Questions to Guide Communication Research
Reduce greenhouse gas emissions		<i>How can we encourage people to engage in pro-environmental behaviors that reduce greenhouse gas emissions?</i> <i>How can we implement policy that reduces greenhouse gas emissions?</i>
Remove existing gases from the atmosphere		<i>How can we implement policy that supports efforts to remove existing gases from the atmosphere?</i> <i>How can we assist in improving scientific innovation leading to the development of necessary technologies?</i>
Adapt to current and future changes		<i>What do societies need to adapt to climate change impacts?</i> <i>How can we support adaptation to climate change impacts in societies?</i>

Table 1. American Meteorological Society Recommended Responses to Climate Change

Where We Have Been:

Climate Change Communication Research To date

We conducted a systematic review of climate change communication research from 1994 through early 2019 in order to evaluate the focus of research in this field to date. Using the National Communication Association's (NCA) list of journals publishing communication research^[4], the search term 'climate change' generated 160 journal articles drawn from 123 academic journals. The query consisted only of the term 'climate change' rather than the more outdated term 'global warming' in order to capture research focused on mid- to current climate change trends. Findings were drawn from an analysis of these articles.^[5]

Climate change communication research to date was found to focus on five primary topics:

1. **Public Knowledge of Climate Change (46%)**. Factors influencing knowledge acquisition of climate change. Factors influencing engagement with climate change informational content.
2. **Public Belief in Climate Change (41%)**. Factors influencing public belief in the veracity of climate change. Persuasive rhetoric and techniques to increase public belief in the existence of climate change.
3. **Public Action on Climate Change (Adaptation) (5%)**. Factors influencing and predicting environmental behavior, specifically adjusting to the impacts (current or future) of climate change.
4. **Public Action on Climate Change (Mitigation) (25%)**. Factors influencing and predicting environmental behavior, specifically reducing or stabilizing the levels of heat-trapping greenhouse gases in the atmosphere and its subsequent impacts on the environment.
5. **Governmental Communications (14%)**. Governmental framing, rhetoric and messaging around climate change as a phenomenon. Analysis of policy debates.

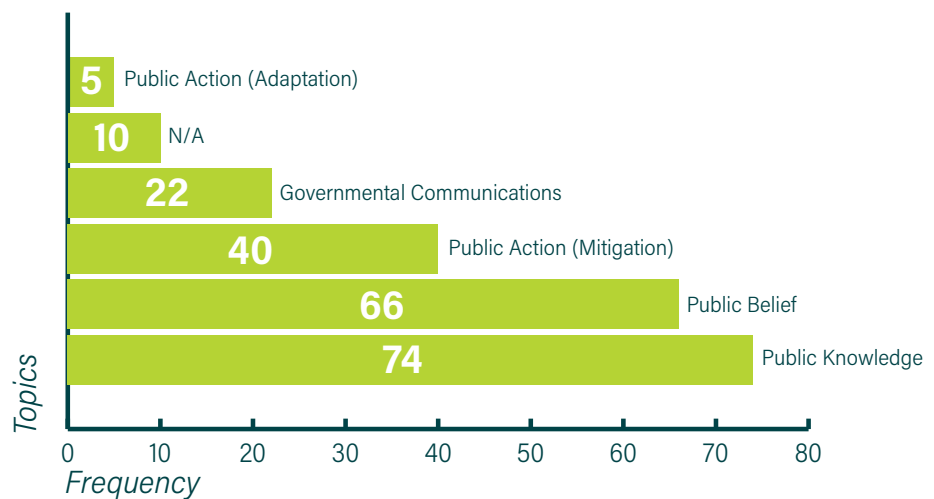


Figure 1. Frequency of Climate Change Topic in Selected Climate Change Communication Articles
Note: Studies addressing multiple topics were coded for each topic contained in the study.

Key Findings

The two most-studied topics within communication to date are **public knowledge of climate change** (46%) and **public belief in climate change** (41%).

The two least common topics within communication to date are **governmental communications** (14%) and **public action on climate change (adaptation)** (3%).

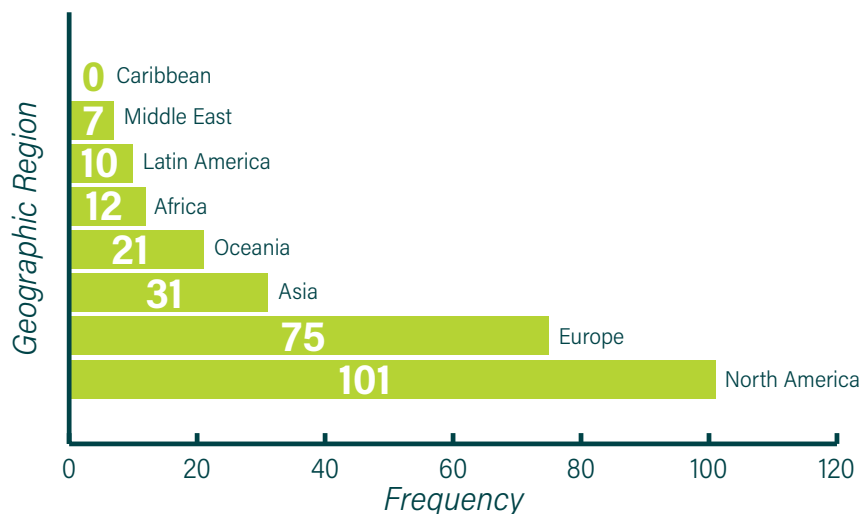


Figure 2. Frequency of Region as Data Source in Selected Climate Change Communication Articles
 Note: If a study had multiple geographic locations, each was noted individually.

Geographic Regions Studied To date

The research studies we found were focused on climate change communication issues within specific geographic regions. We identified the focal region of each study by determining the geographic location of the research participants or geographic location of the collected data. Geographic locations were coded by country.

Key Findings

Research is disproportionately focused on North America and Europe (176 studies), whereas less than a third of research draws data from the rest of the world (81 studies).

Africa, the Caribbean, the Middle East, Latin America, and other regions are starkly underrepresented in the environmental communication research literature.

Recommended Future Directions for Climate Change Communication Research: *Expanding and Exploring*

Future Topics of Study

The majority of climate change communication research to date is centered on understanding factors that may influence public engagement with and acquisition of knowledge of climate change, as well as factors influencing belief in the veracity of climate change and what techniques may influence belief in climate change. Considering that 67% of United States adults believe that the federal government should be doing more to address climate change impacts and 62% believe that climate change is affecting their local community, research about climate change knowledge and denial should no longer be the dominant focus of climate change communication researchers.^[6] A broad national study in 2018 demonstrated that a large majority of Americans think climate change is happening, outnumbering those who do not by more than 5 to 1, and a majority of Americans understand that climate change is caused mostly by human activities.^[7] Global trends reflect similar perceptions. Majorities in 40 nations polled by Pew Research Center report climate change as a serious problem, with a global median of 54% believing it to be a very serious problem.^[8]

Of the articles we analyzed, 25% (n = 40) addressed environmental behavior around mitigation. Yet only five addressed environmental behavior around adaptation, representing only 3% of the articles surveyed. Changing climates around the world already impact millions of people^[9], and as such, adaptation is and will increasingly become a more crucial component of climate change research agendas. With the increasing intensity of climate change disruptions globally and the current lack of climate change communication research in this area, future scholarship needs to shift toward studies that address a range of initiatives around practical adaptation strategies since mitigation is no longer an option for many communities already impacted by climate change.

Key Take-Away for the Future

We encourage researchers to respond to the latest AMS 2019 scientific recommendations for climate change responses and urgently target efforts to investigate how communication research can support practical and immediate efforts to address (1) the reduction of greenhouse gas emissions, (2) the removal of existing gases from the atmosphere and (3) adaptation to current and future climate changes.



Overcome Geographical Blind Spots in Climate Change Research

Over half of the total articles analyzed drew data from the United States and nearly half from Europe. By contrast, only 6% of the articles studied Latin America and the Caribbean, which are regions that are especially impacted by climate change due to their geographical contexts.^[10] Climate change researchers have demonstrated the importance of tailoring adaptation strategies to localized environments. Because of this, the geographical regions chosen for research essentially become the parts of the world that can benefit from this research. This means that regions of the world understudied by climate change communication researchers will likely lag in climate change adaptation. Furthering this disparity is the fact that many of the regions that have contributed little to global greenhouse gas emissions, such as the Caribbean, are particularly vulnerable to impact due to their unique geographies.^[11] The United States has emitted 15% of global CO₂ emissions from fossil-fuel burning and some industrial processes^[12], yet represents far less than 1% of the entire global population.^[13] Climate change communication researchers must address these disparities in their work by studying climate change adaptation in areas of the world most vulnerable to and least responsible for climate change.

Key Take-Away for the Future



We recommend greater support for research on climate change communication within underrepresented regions that are particularly hard hit by climate change, namely the African continent, the Caribbean, the Middle East, and Latin America.

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