A BIBLIOMETRIC ANALYSIS OF CLIMATE ENGINEERING RESEARCH

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INTRODUCTION

The increasing interest in climate engineering (CE), or geoengineering, creates the need to understand the state of published research on CE to inform current policy discussions, suggest future research directions, and monitor developments in CE research. To address this need, we analyze CE publications using bibliometric techniques to identify the publication trends, geographic distribution, intellectual structure, and collaborative network of published CE research.

For the purposes of this analysis, we define CE as the deliberate, large-scale manipulation of Earth’s climate system to mitigate the effects of climate change. We include methods such as capture of CO₂ from the atmosphere, biochar, solar radiation management (SRM), soil carbon sequestration, ocean fertilization, and global-scale afforestation in this definition, but exclude industrial carbon capture and storage.

METHODS

To identify CE publications, we searched the Web of Science, Science Citation Index Expanded database (WoS) for terms related to various CE methods and traced the citations made and received by highly cited and review articles on CE. Our search results were then manually verified for accuracy, resulting in a final set of 750 articles published between 1988 and 2011.

We then downloaded the publication metadata for these articles and analyzed it using the Sci2 Tool, a scientometric analysis software package.

CONCLUSIONS

Publications on CE have doubled in the last 5 years and include a higher percentage of non-research articles than other related disciplines. Countries producing CE publications seem biased toward Northern Hemisphere and English-speaking countries. The majority of CE publications concern CO₂ removal techniques, particularly ocean fertilization and land-based methods. CE publications, except those on ocean fertilization, tend to be produced with little collaboration between research groups.