

Students' conceptions about the greenhouse effect, global warming, and climate change

Daniel P. Shepardson · Dev Niyogi ·
Soyoung Choi · Umarporn Charusombat

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Abstract The purpose of this study was to investigate students' conceptions of the greenhouse effect, global warming, and climate change. The study was descriptive in nature and reflected a cross-age design involving the collection of qualitative data from 51 secondary students from three different schools in the Midwest, USA. These data were analyzed for content in an inductive manner to identify student's conceptions. The categories that emerged from the students' responses reflected different degrees of sophistication of students' conceptions about the greenhouse effect, global warming, and climate change. Based on these findings we make curricular recommendations that build on the students' conceptions, the IPCC Findings, the NRC (1996) science education standards, and NOAA's climate literacy framework.

1 Introduction

Climate is a component of the National Research Council's (NRC 1996) science education standards and just about every science textbook from fourth grade on addresses climate. Yet, these textbooks appear to be designed with little consideration of students' conceptions and in fact may reinforce certain misconceptions. Furthermore, students' conceptions may or may not fit current scientific perspectives

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D. P. Shepardson (✉) · S. Choi
Department of Curriculum and Instruction, Purdue University,
100 North University Street, West Lafayette, IN 47907-2098, USA
e-mail: dshep@purdue.edu

D. P. Shepardson · D. Niyogi · U. Charusombat
Department of Earth and Atmospheric Sciences,
Purdue University, West Lafayette, IN 47907-2051, USA