

Developing a Learning Progression for Sea Level Rise, a Major Impact of Climate Change

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Abstract

We present research from an investigation on developing a learning progression (LP) for sea level rise (SLR), a major effect of global climate change. We began our research by drafting a hypothetical LP for sea level rise, informed by extant knowledge of the topic in the scientific community, in science education literature, and in science education policy documents such as the Next Generation Science Standards. *Causes and mechanisms, scale and representations, and impacts* made up the three components of the LP. Our confidence in our hypothetical LP was greater for the lower and upper anchors than for the levels between them. For all levels, however, we remained tentative due to the limitation of empirical data from learners. We next developed an assessment instrument as well as an online activity as a way to elicit learners' thinking about sea level rise. These instruments were administered to middle school students (N=95) and undergraduate pre-service teachers (N=77). An analysis of the data suggested that our hypothetical LP for sea level rise was a necessary first step, but it underscored the necessity of probing learners' thinking of the construct to develop a robust understanding of learners' conceptual understanding overtime of SLR. The assessment data provided essential information about learner understanding of the construct of sea level rise that assisted us in moving our SLR LP from a hypothetical state to a more stable state, which we term as "conditional." The development of a conditional SLR LP, along with the accompanying assessment instruments, contributes to research and thinking about learning progressions and climate change education.

Keywords: learning progressions, sea level rise, climate change

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