

Dynamic Geography of the Population and Economic Response to Sea Level Rise

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Abstract

Sea level rise and ensuing permanent coastal inundation will cause spatial shifts in population and economic activity over the next 200 years. Using a highly spatially disaggregated, dynamic model of the world economy that accounts for the dynamics of migration, trade, and innovation, this talk estimates the consequences of probabilistic projections of local sea level changes under different emissions scenarios. Under an intermediate greenhouse gas concentration trajectory (Representative Concentration Pathway [RCP] 4.5), permanent flooding is projected to reduce global real GDP by an average of 0.22 percent in present value terms, with welfare declining by as much as 0.76 percent as people move to places with less attractive amenities. By the year 2200, a projected 0.79 percent of world population will be displaced (with a 95 percent credible interval 0.20 percent-1.51 percent). Losses in many coastal localities are more than an order of magnitude larger, e.g., 10 percent of $1^\circ \times 1^\circ$ coastal cells lose more than 8 percent of real GDP in present discounted value terms.