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## Statistical Approaches for Modeling Ice Sheet Interconnectivity

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The greatest sources of uncertainty for future sea-level rise are the Greenland and Antarctic ice sheets. An important aspect of this uncertainty is the potential interconnectivity between them, which may amplify underlying instabilities in individual ice sheets. We explore these connections empirically by modelling the ice sheets as a cointegrated system. We consider two specifications which allow the ice sheets to follow either an  $I(1)$  or an  $I(2)$  process in order to disentangle the long-run theory consistent relationships in the data. We examine the stability of these relationships over time both in and out of sample and examine how a sudden loss of ice in Greenland propagates through the system. We show that a 1 Gigatonne loss of ice leads to a large and persistent loss of ice in West Arctica which is partially offset by an accumulation of ice in East Antarctica. Accounting for the long-run interactions between the ice sheets helps to improve our understanding of future instabilities and provides useful projections of the future paths of the ice sheets.