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# Aurora Basin, the weak underbelly of East Antarctica

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Containing ~52 m sea level rise equivalent ice mass (SLRe), the East Antarctic Ice Sheet (EAIS) is a major component of the global sea level budget; yet, uncertainty remains in how this ice sheet will respond to enhanced atmospheric and oceanic thermal forcing through the turn of the century. To address this uncertainty, we model the most dynamic catchments of EAIS out to 2100 using the Ice Sheet System Model. We employ three basal melt rate parameterizations to resolve ice-ocean interactions and force our model with anomalies in both surface mass balance and ocean thermal forcing from both CMIP5 and CMIP6 model output. We find that this sector of EAIS gains approximately 10 mm SLRe by 2100 under high emission scenarios (RCP8.5 and SSP585), and loses mass under low emission scenarios (RCP2.6). All basins within the domain either gain mass or are in near mass balance through the 86-year experimental period, except the Aurora Subglacial Basin. The primary region of mass loss in this basin is located within 50 km upstream of Totten Glacier's grounding line, which loses up to 6 mm SLRe by 2100. Glacial discharge from Totten is modulated by buttress supplied by a 10 km ice plain, located along the southern-most end of Totten's grounding line. This ice plain is sensitive to brief changes in ocean temperature and once ungrounded, glacial discharge from Totten accelerates by up to 70% of it present day configuration. In all, we present plausible bounds on the contribution of a large sector of EAIS to global sea level rise out to the end of the century and target Totten as the most vulnerable glacier in this region. In doing so, we reduce uncertainty in century-scale global sea level projections and help steer scientific focus to the most dynamic regions of EAIS.