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USING EARTH ROTATION TO DETECT CLIMATE CHANGE

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The ongoing melting of ice sheets and glaciers is monitored by a range of observing systems that detect changes in ice elevation, crustal motion, and perturbations in the Earth's gravitational field. Satellite and astronomical measurements of Earth rotation changes can also play a role since ice mass changes perturb both the rotation period of the Earth and the orientation of the rotation axis relative to the surface (so-called polar wander). However, rotation studies have been hindered by enigmatic observations and inaccurate theoretical treatments of the general rotational stability of terrestrial planets. I'll describe a series of recent advances that have overcome these obstacles and discuss how a remarkably diverse range of observations - including ancient eclipse records - are now providing powerful, integrated constraints on ice sheets and sea level change in our progressively warming world.