In many parts of the world populations are migrating toward coastal cities and, year-on-year investment in coastal assets and infrastructure is multiplying. Elsewhere, unique coastal habitats are suffering increasingly from coastal flooding. The urgency of producing reliable sea-level projections for future centuries should not be underestimated. But while future contributions to sea-level rise from thermal expansion of warming oceans, the retreat of mountain glaciers, and the contribution of changing terrestrial water storage can be projected with some degree of confidence, projecting the loss from polar ice sheets, which may turn out to be the most significant contribution of all, presents unique difficulties. Short observational records of ice sheets and the lack of well-calibrated geological histories of ice-sheet change, together imply a frustrating paucity of testing data. The long response times of ice sheets mean that century-long ice-sheet change must be treated as “weather” rather than “climate”. And finally, glaciologists are hamstrung by a lack of basic data – parts of Mars are better mapped than the surface of Earth beneath the ice sheets. However, all is not gloom; recent successes mean we now know vastly more about ice-sheet change than we did a decade ago: monitoring of entire ice-sheets is now feasible on month-by-month basis; the specific glaciers that pose the greatest threat have been identified and their specific vulnerabilities are clear. In this talk, I will survey our rapidly-changing understanding of ice-sheets and their potential contribution to sea-level rise and policy-making.