QSCI 381 Data Display Analysis

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This plot is from a study that uses a weighted consensus to produce regional ice thicknesses for non-ice sheet glaciers. It is a global map overlaid with pie charts of varying size depicting both the total amount of ice as well as the ratio of ice that is currently below sea level. This consensus study attempts to quantify the amount of ice potentially contributing to sea level rise.

This plot is good for relaying the concentration of ice in non-ice sheet glaciers throughout the world. The relative sizes provide at-a-glance information, and the contrasting colors instantly communicate a ratio of above / below sea level. As one who has worked with the dataset that this plot is made from, it is very convenient to have a graphical representation of where each numbered region is, and how much ice contains.

What this plot is missing is a timeline and climate data. The main focus of the study is to produce an estimate of potential sea level rise due to climate change, however, they do not include a timeline or temperature threshold at which said sea level rise will be reached. These points can easily be addressed by overlaying a borrowed glacier-climate model to test a response with given boundary conditions. More can be added by including elevation data to identify which regions are susceptible versus regions contributing.

Sea level rise is an extremely complicated topic, so these simple additions would still not go far enough. These additions would only address the mean global sea level rise, not a geographic distribution of where sea level rise will be concentrated. More information can be added by modeling distributed isostatic rebound in the elastic and viscous mantle due to the reduction in gravitational force on the ocean by the melting ice.
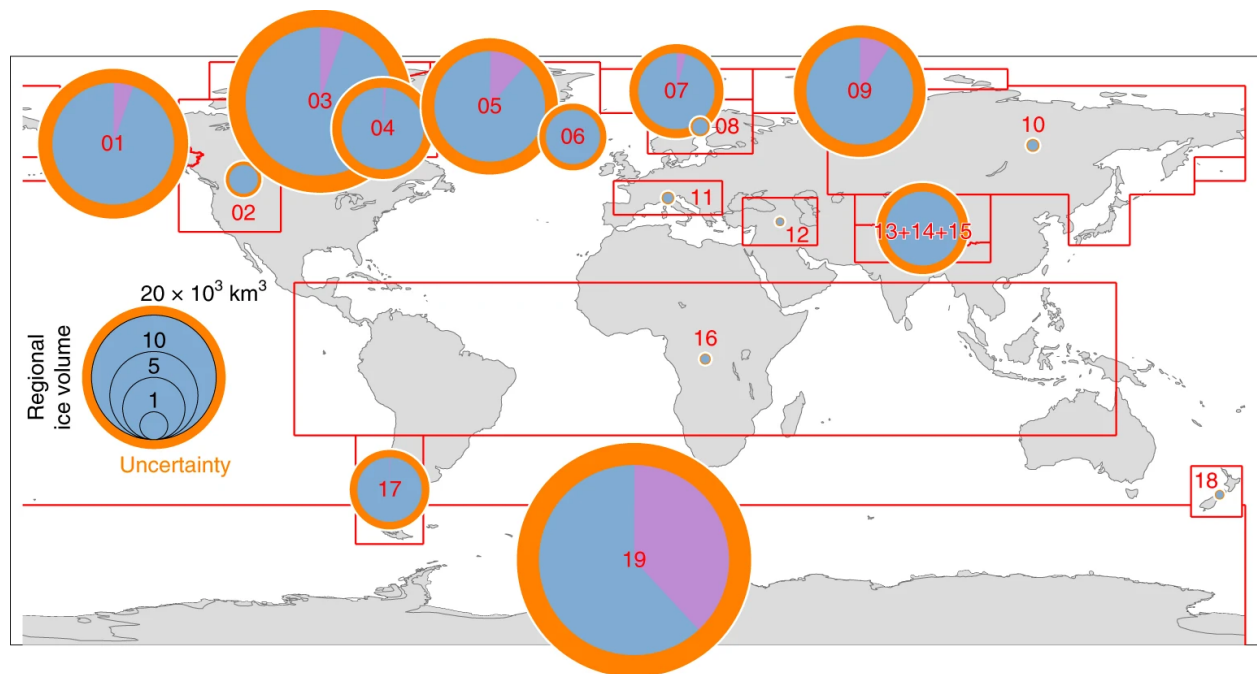
Fig 2. Farinotti, D., Huss, M., Fürst, J.J. *et al.* A consensus estimate for the ice thickness distribution of all glaciers on Earth. *Nat. Geosci.* 12, 168–173 (2019).