

Fig. 1

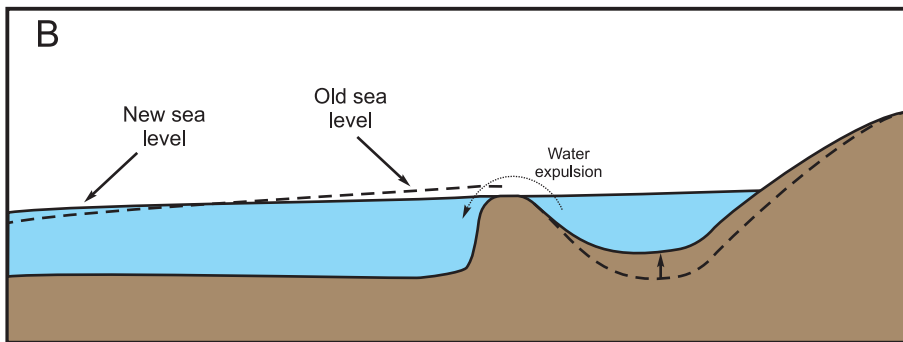
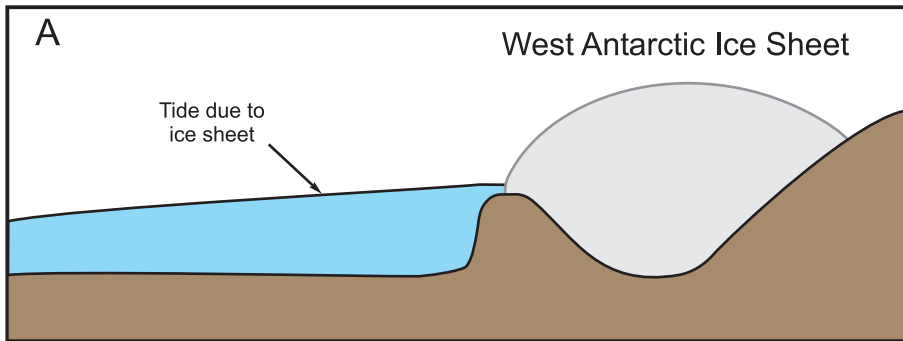


Fig. 2

Source: Jerry Mitrovica & Natalya Gomez,
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gravitational attraction of the ocean toward the West Antarctic, and water would therefore migrate away from the West Antarctic (compare the old and new sea levels). The net effect (even after you take into account all the water that entered the ocean when the ice sheet melted) is that sea level would actually fall in a zone close to the West Antarctic and it would rise progressively more as you move further away from this region. Sites in the northern hemisphere (e.g., North America) would experience the largest sea-level rise from this effect. The second process, which might be called "water expulsion", is due to the rebound of the crust in the region originally covered by the WAIS. This rebound will push water out of the West Antarctic "hole" and into the open ocean, thus contributing a further sea-level rise. A final effect, not shown, is the movement of water due to the shift in the rotation pole of the Earth caused by the melting of the WAIS. This process would shift water toward two regions - North America and the southern Indian Ocean.

The net effect is that the sea-level rise predicted for North America and in the southern Indian Ocean is significantly higher than what you would predict if you assumed that the meltwater distributed evenly across the oceans.

Two figures illustrating processes that contribute to the geometry of sea-level change following the potential collapse of the West Antarctic Ice Sheet (WAIS). As shown in Fig. 1, the WAIS is largely a marine-based ice sheet - that is, its base commonly sits below local sea level. The sea level is tilted toward the WAIS, reflecting the gravitational attraction that the ice sheet exerts on the ocean. Fig. 2 shows the change in sea-level geometry that would follow the disappearance of the WAIS. For the sake of comparison, the dashed lines to the left and right show the original location of the sea surface and crustal surface, respectively (i.e., the locations these surfaces had on the top frame, before WAIS collapse).

After the collapse of the WAIS ice sheet, a vast amount of meltwater would enter the global ocean and global sea level would, on average, rise. But the melting of the WAIS would also remove the