



Figure 7. Application of the model to the CB-1 experimental catchment. (a) The first eigenvector x^* , which corresponds to the smallest eigenvalue of the linear system defined by equation (12). (b) The outlines of the search algorithm predictions with the minimum FS (red), the maximum FS below unity (gray); those from an exhaustive rectangular search (dark brown), and from an exhaustive elliptical search (light brown); the observed CB-1 landslide (black). The landslides are overlaid on a map showing 1 m elevation contours (thin black lines) and the fraction of the 475 predicted landslide shapes that include each grid cell. (c) The outlines of the search algorithm prediction with the minimum FS (red) and of the observed CB-1 landslide (black). The landslides are overlaid on a map showing 1 m elevation contours, 0.2 m/m saturation ratio (h/z) contours, and the soil depth grid. Data from *Montgomery et al. [2009]*.

the predicted landslide is slightly rounder; the topographic index is 6% lower, indicating that the predicted landslide is slightly shifted up the hollow axis; and the FS is 1% lower, indicating that the predicted landslide is slightly more unstable (Table 2). We apply the same measures to the predictions resulting from the FS_{max} methods, as well as those resulting from the application of the exhaustive rectangular and elliptical search methods (Figure 7b). The FS_{min} method vastly outperforms the other methods in this application, based on the relative change between the observations and the predictions (Table 2).

As errors in field measurements used to determine the input parameters in this application may impact the results, we test the sensitivity of our procedure to modest changes in the input parameters by varying soil depth, pore water pressure, root strength, and soil friction angle by $\pm 5\%$. While uncertainty in these parameters is difficult to assess from published data, the values reported suggest that at this site uncertainty may in fact be relatively small. Friction angle measurements for CB-1 range from 39.5° to 41°