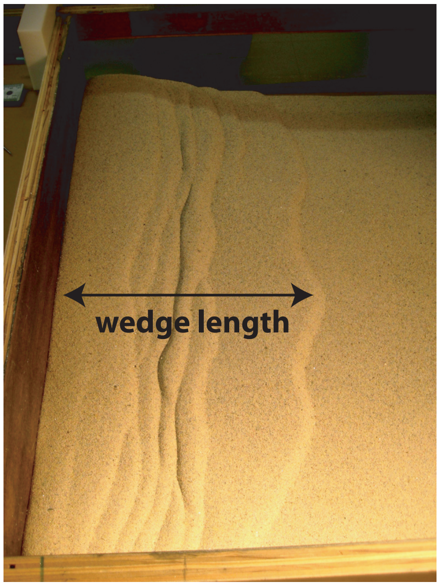
Erosion experiment without a plate beneath the sand

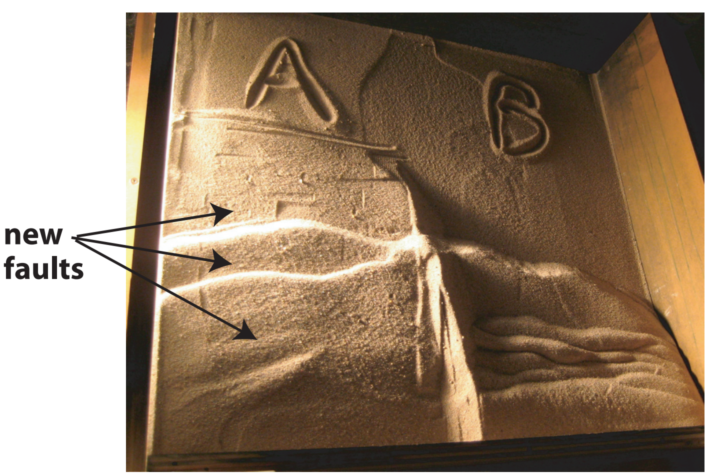
An acrylic sheet was put beneath the sand pack. Uniform basal friction. The near wall in the first row of figures below is wood, which has higher friction than the window side. This causes the faults to curve near the wood wall.

In this experiment, a wedge will be built and then one half will be eroded . Futher compression will test the hypothesis that unloading the wedge (less weight) promotes thickening of the wedge (by inboard faulting) rather than lengthening of the wedge by faulting in front of the toe.

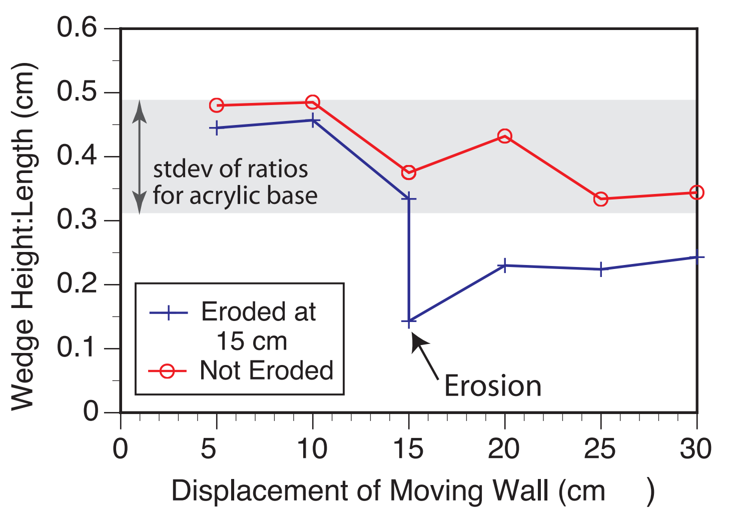


The wedge prior to erosion. The wedge was built with 60 turns of the crank (15 cm) in compression. Wedge height is measured at the highest point -- length is measured to the toe.

The wedge after erosion. The far half of the wedge, labelled ‘A’, was reduced in height and increased in length.



The wedge was compressed further by 20 cranks (5cm). On side B faults formed at the toe of the wedge while at side A faults formed inboard from the wedge toe. This is how the wedge strives to regain equilibrium. The faults act to increase the edge height and decrease the wedge length so the wedge goes back to the equlibrium ratio of wedge height:length.



At 15 cm displacement of the moving wall, erosion of one half of the sandbox greatly reduces the ratio of wedge height to width. The wedge is now out of equilibirum. Equilibirum wedge ratios for acrylic base are 0.40+/-0.08. Upon subsequent compression. the wedge thickness more quickly than it lengthens (by faulting) in order to regain equilibirum.