Students:

The “AleutianModel.kmz” and “AleutianData.kmz” files serve as solutions to this exercise.

Answer the following questions:

(i) Compare the crustal thickness in different parts of the block. The crust is thinnest at the south end of the block - about 5 km. It thickens to about 28 km under the volcanic center and then thins slightly at the north end of the block, reflecting extension in the back-arc basin (Berring Sea).

(ii) What is the approximate angle of subduction in this region? The initial angle of subduction at the surface is about 12 degree, increasing to about 27 degrees with depth.

(iii) About how far is it from the trench to the volcanic arc? About 120 km, which is typical for island arcs worldwide.

(iv) Why is the Aleutian Arc arcuate? [hint: what would happen if the block were make twenty times as wide as it is?]. If the block were extended laterally, its sides would be floating in space. Island arcs are arcuate because subduction is happening on a sphere.