[Click here for the 3D file of Figure 3](#). You will need Adobe Acrobat or Adobe Reader DC or later to view and rotate this file. If reading the full-text version of this paper, please download article PDF to view 3D file in these programs.

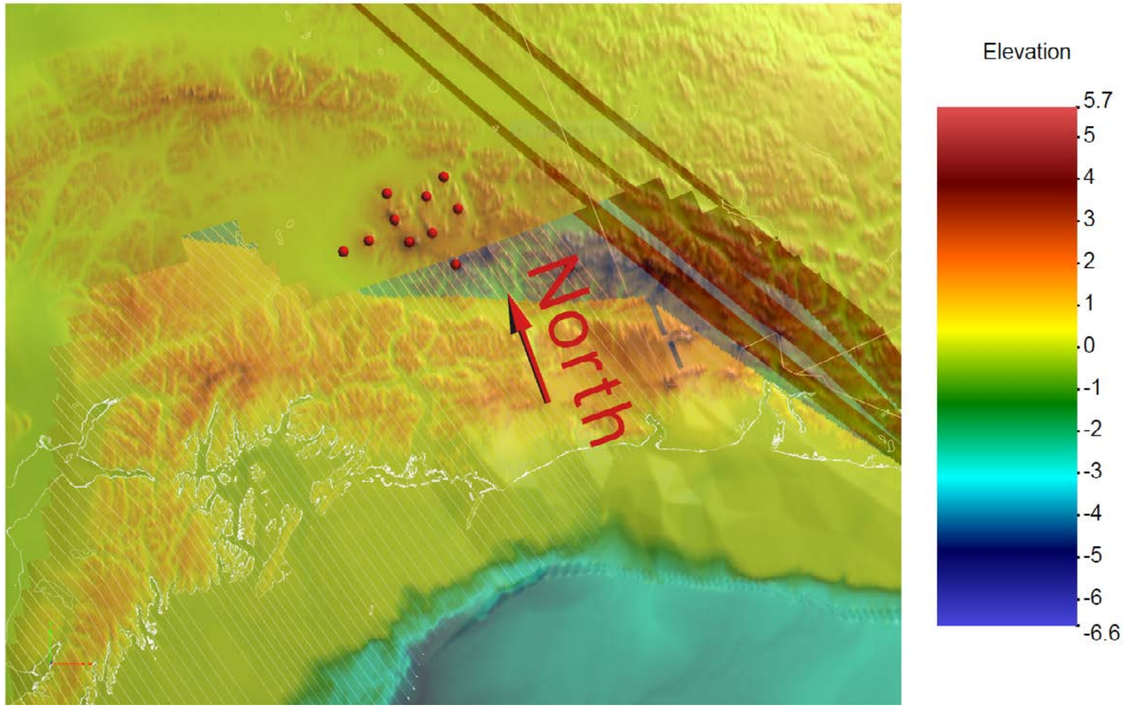

Figure 3. Summary 3D PDF figure of lithospheric scale model for Alaska region. For this and other 3D PDF figures in this paper, it is important to utilize object tags defined by a model tree. The software we used creates a hierarchy of levels. To get to the individual elements, follow model->PDF3d Scene->Root model. Under that are a series of tag names. The objects they reference are as follows. "Political Boundaries" and "Coastline" are 3D lines showing what the names imply. The data used are extracted from the same data set used for the Generic Mapping Toolbox (GMT) package (Wessel et al., 2013). "North Arrow" and "North Arrow Label" provide the 3D equivalent of a north arrow on a more conventional map projection. We emphasize, however, that the arrow is only a local point, and local north is different at every point in the 3D space. "Topography" is digital topography from etopo5 (https://www.ngdc.noaa.gov/mgg/global/etopo5.HTML downloaded 2005) data rendered translucent in true spherical geometry. Those three components provide a 3D base map for the figure. Performance on computers with low-end graphics can be improved for this and other 3D PDFs in this paper by turning the topography layer off. Large numbers of translucent polygons are demanding to display interactively, but we include this layer because it provides an important reference. "Top of Slab model–flow lines," "Yakutat-Pacific Plate Moho Surface," "Interior Alaska Moho Surface," and "LAB surface" are the surfaces that define our 3D model. See Supplemental Materials (text footnote 1) for description of how these surfaces were constructed and additional 3D PDFs that focus on individual surfaces. Similarly, "Edge Track A," "Edge Track B," and "Edge Track C" are three models for the eastern edge of the Yakutat lithosphere. This figure adds two other features. The locations of active volcanoes in the Wrangell Mountains are illustrated as red spheres at the surface. Below each, we draw a 75-km-long line to illustrate how the lithosphere model top of slab is comparable to 75 km at that location. [Click here for the 3D file of Figure 3](#). You will need Adobe Acrobat or Adobe Reader DC or later to view and rotate this file. If reading the full-text version of this paper, please download article PDF to view 3D file in these programs.

cation estimates from the Alaska Earthquake Center (AEC) catalog. We used only data from 1990 through 1 November 2015, because coverage prior to 1990 was sparse, creating potentially large event mislocations and a detection bias. That catalog has 447,288 earthquakes with 64,971 events larger than magnitude 2.5.

Animation 1 is a three-dimensional visualization of seismicity we use to show how our lithospheric model is related to seismicity. It uses two visualization techniques. First, the hypocenters of earthquakes larger than 2.5 are displayed as small spheres at their true position in space. We use a slicing plane in the animation to produce what is best thought of as a continuous series of cross sections that change with every frame of the animation. A fundamental problem with viewing only hypocenter locations, however, is that the eye tends to see only areas with the largest number of events and ignore areas with lower but nonzero rates. For this reason, we also present the seismicity with an alternative display method. We plot the seismicity rate as a three-dimensional field. The rate displayed is the total number of earthquakes in the 1990 to late 2015 period normalized by the averaging volume. The averaging volume used is a sphere with a radius of 20 km. We computed the normalized earthquakes per unit volume metric in a 200 × 140 × 60 grid with a nominal grid size of 10 × 10 × 5 km. The nodes were defined with the georeferenced grid methods introduced by Fan et al. (2006).

Animation 1 demonstrates two things:

1. In most of this area, our top of slab surface is systematically deeper than the AEC catalog event locations. Our model is the same as the U.S. Geological Survey (USGS) slab model (https://earthquake.usgs.gov/data/slab accessed 2015) in the area where mantle seismicity is present. Their model is a compilation of diverse data fit to a surface as described by Hayes et al. (2012). The misfit to AEC seismicity is to be expected because the USGS slab model is based on a different earthquake catalog. A different earth model and a different mix of data were used for the USGS catalog, so differences are expected. On the other hand, the systematic difference illustrates the degree of uncertainty in the inferred position of the top of slab surface.

Return to Figure 3