

Earth Science Week 2015: Visualizing Earth Systems

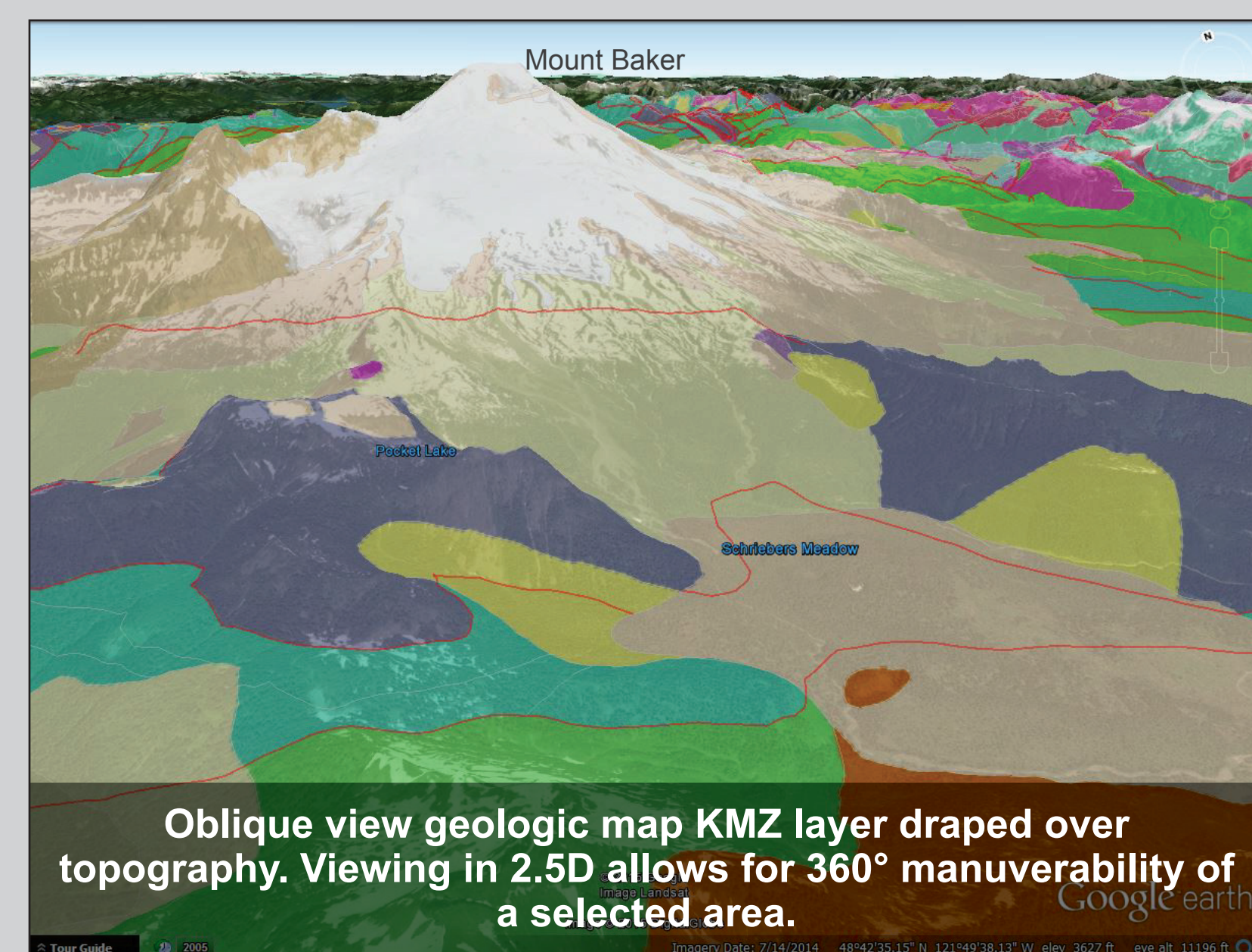
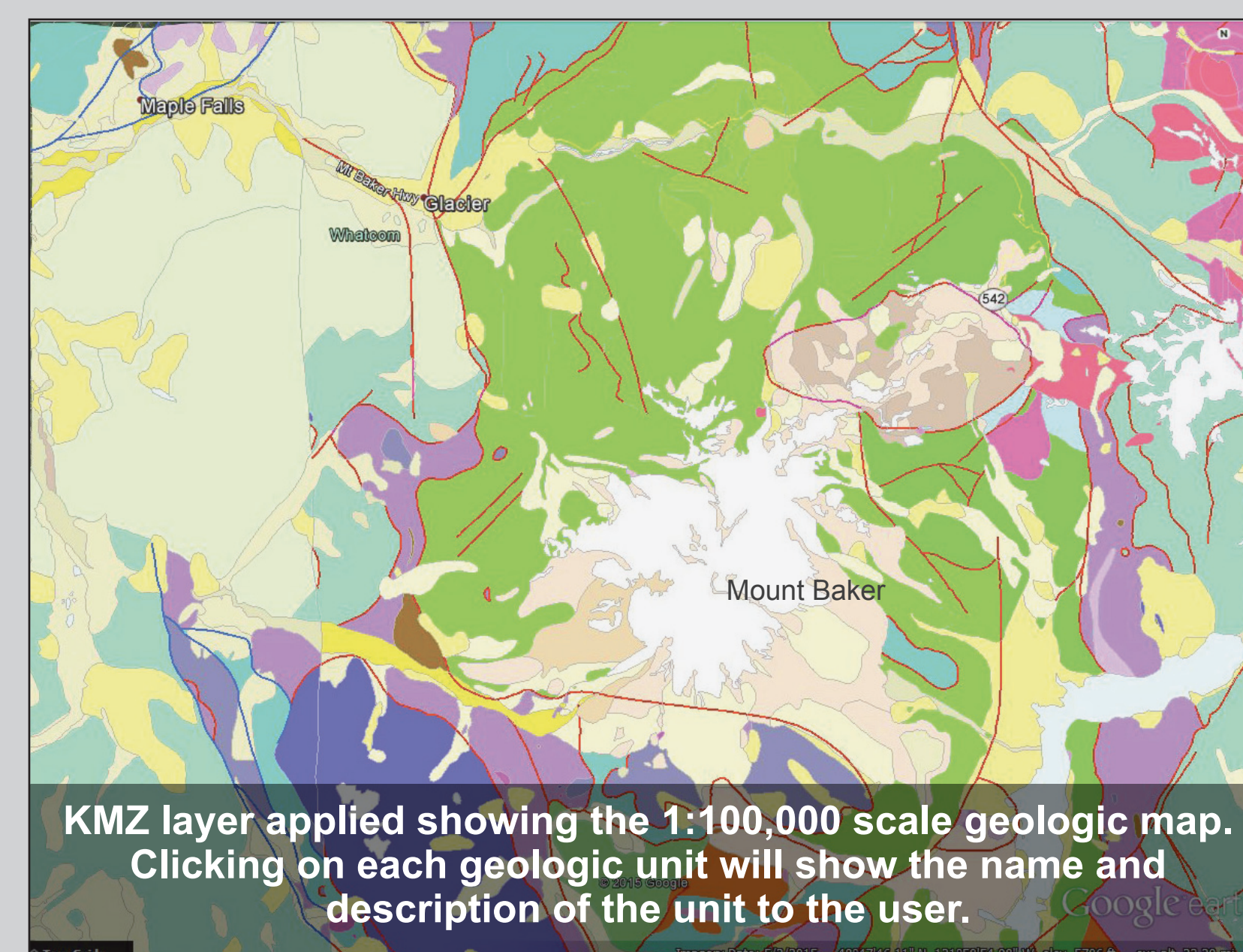
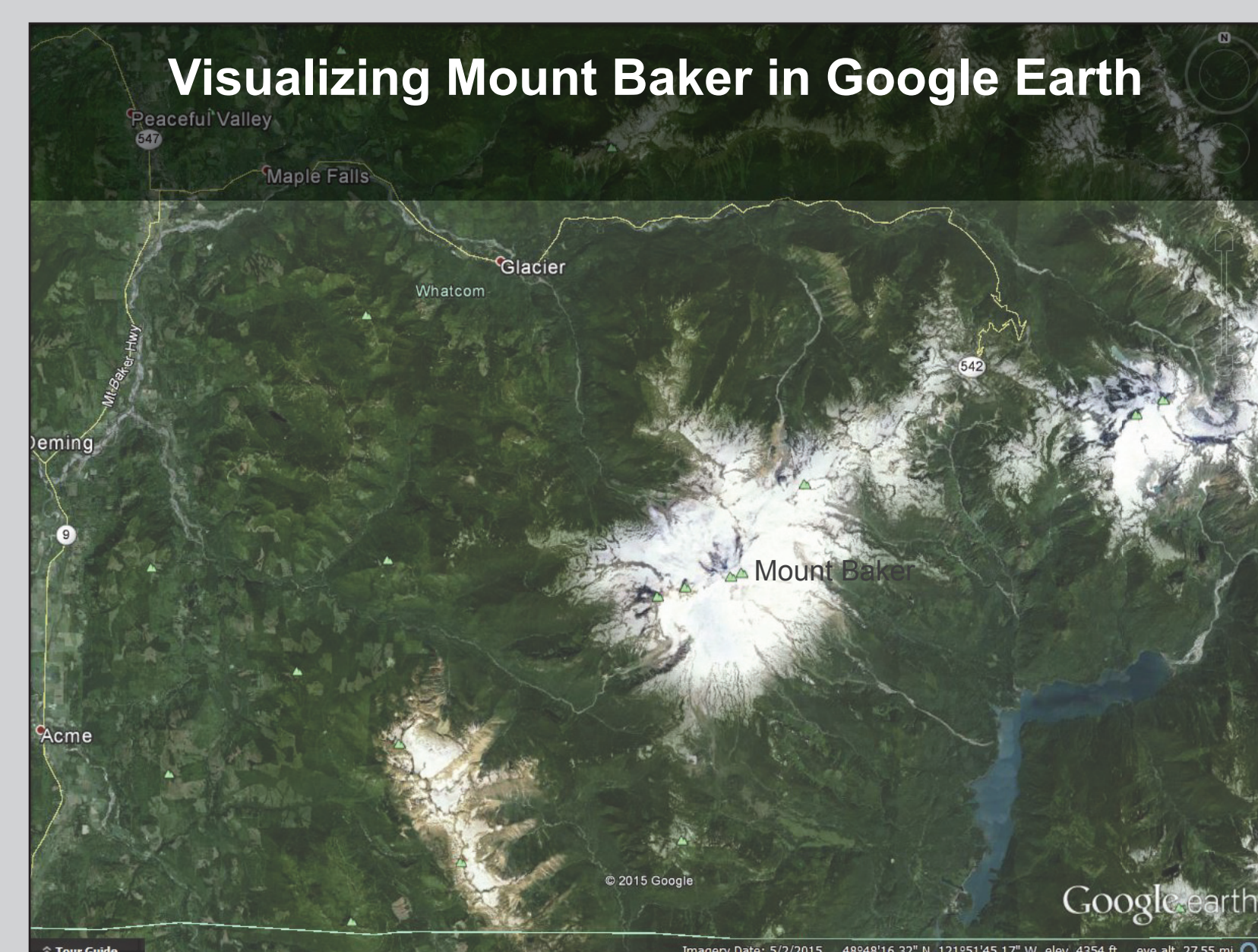
Development of Technologies to View Geology in Three Dimensions



The Division of Geology and Earth Resources produces maps, animations, and 3D visualizations to better understand the geology and hazards of our state. 3D geologic models show complex data interactively and help non-geologists understand how geology interacts with the Earth's surface. These models and products are an important component of educating our stakeholders and the public. We have developed several ways to bring geology into the third dimension.

2.5D visualization Google Earth + KMZ layers

We publish KMZ files that 'drape' a geologic map over the topography in Google Earth. A user can manipulate or "fly" around and see the geology forming mountains and valleys. We currently have these files for each county of the state at 1:100,000-scale.



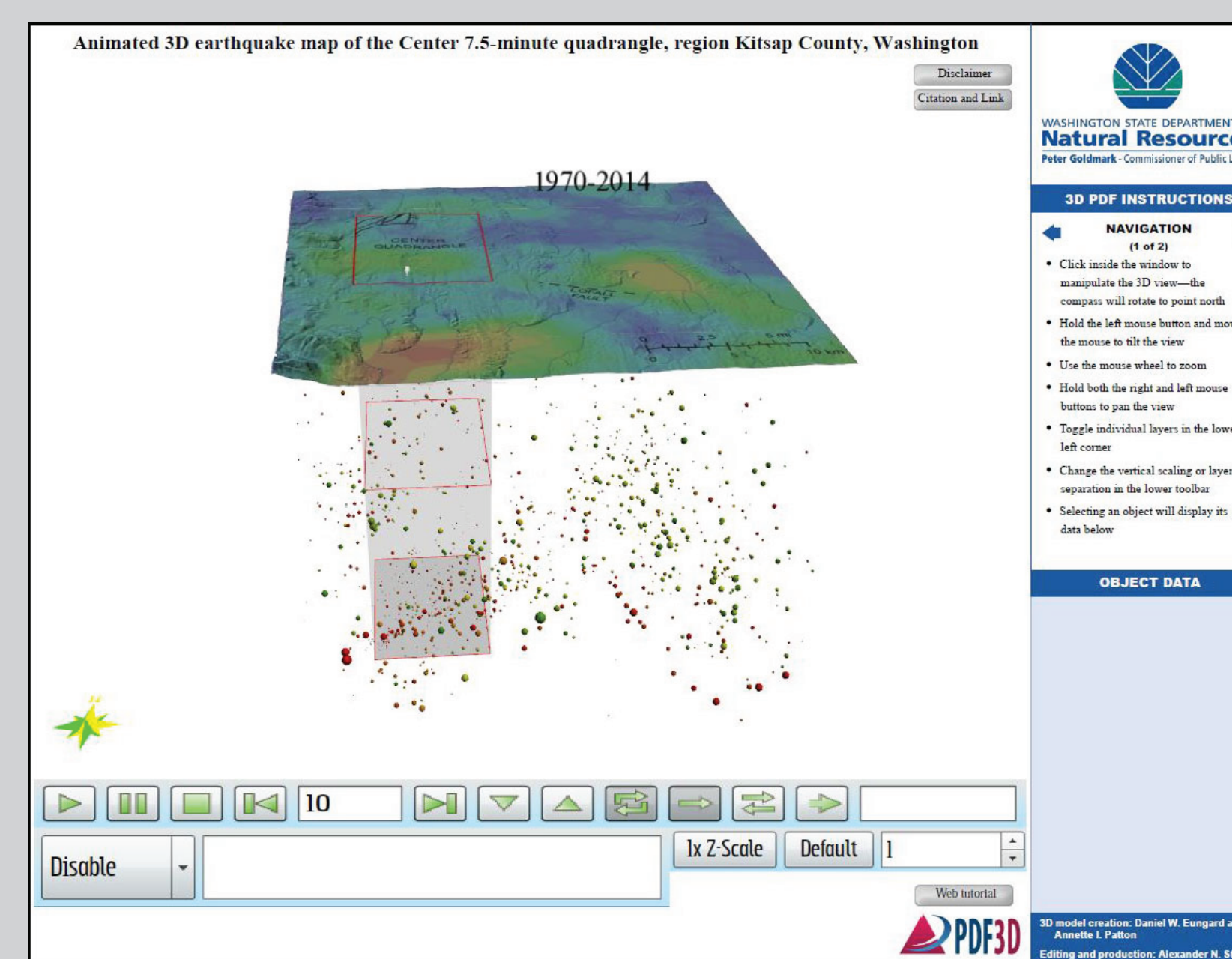
3D visualization 3D PDF viewer

We have also developed 3D PDF files that make an interactive 3D model from existing geologic maps. These 3D PDFs can also show subsurface cross sections (interpretations of what's underground), and other subsurface

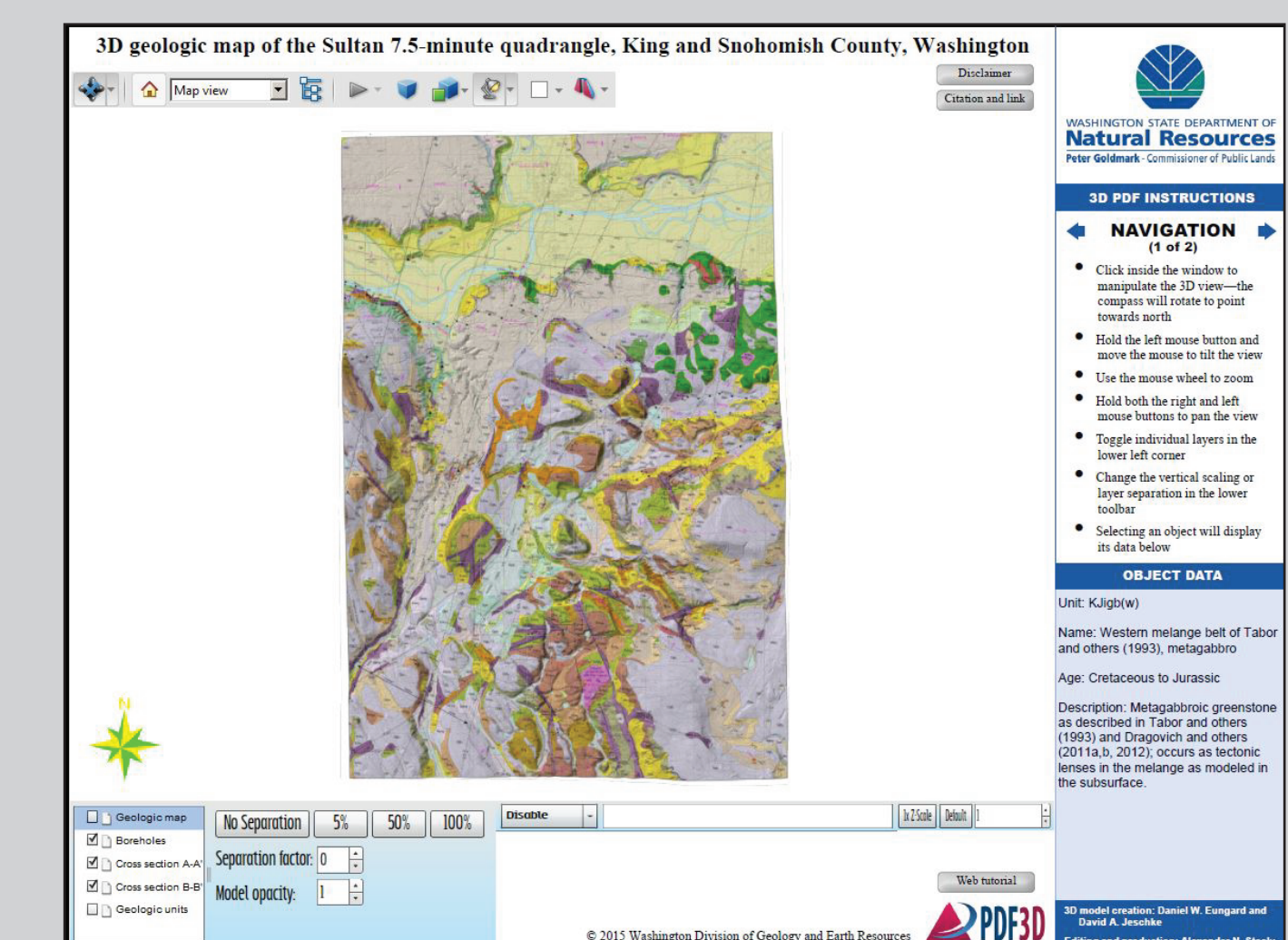
information such as wells, boreholes, or earthquakes. The user can move and view the model from any angle, even from underground. We currently have about 60 1:24,000-scale maps in this format.

Earthquakes

This screenshot of a 3D animation shows a new way that DGER geologists use to help visualize earthquake activity beneath a field study area. The animation shows the depth and magnitude of earthquakes through time and culminates in this final image of all earthquakes recorded from 1970–2014. The study area outlined in red is the Center quadrangle, south of Port Townsend.



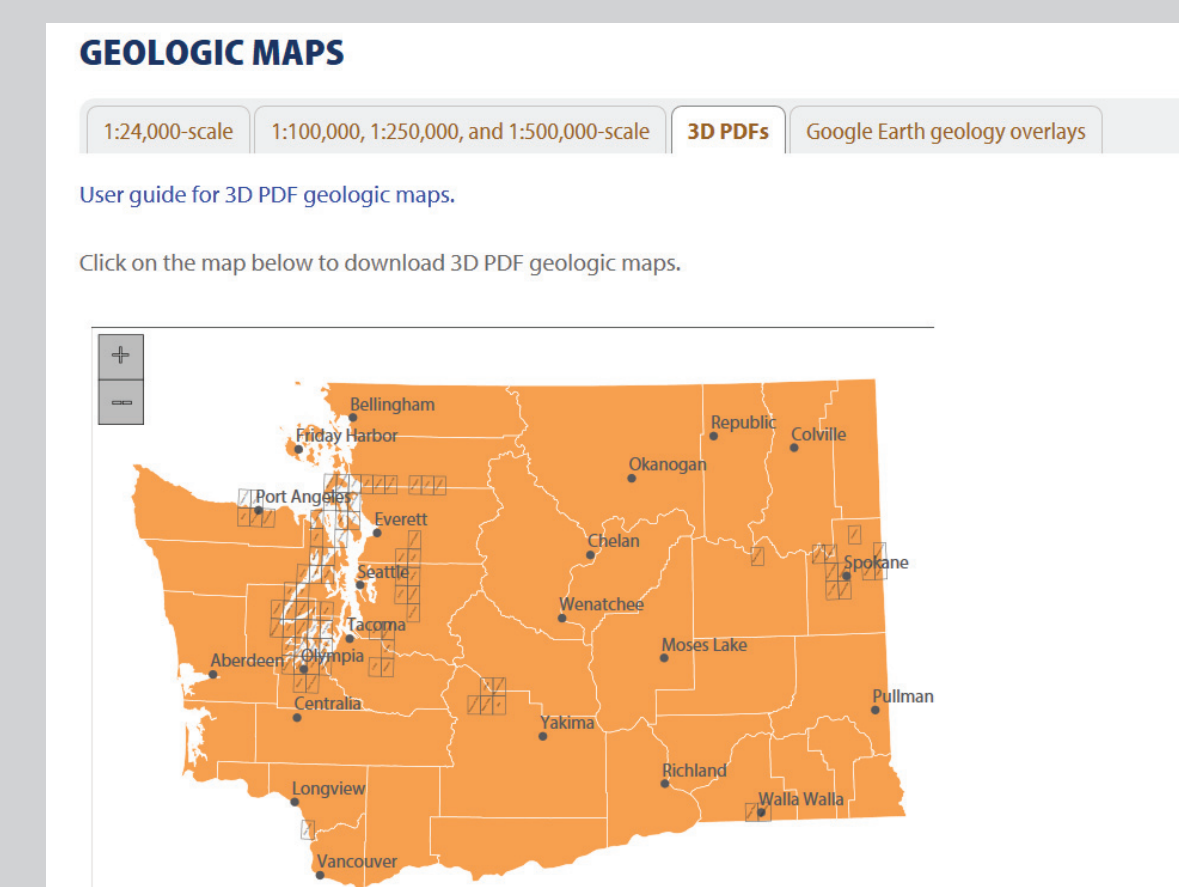
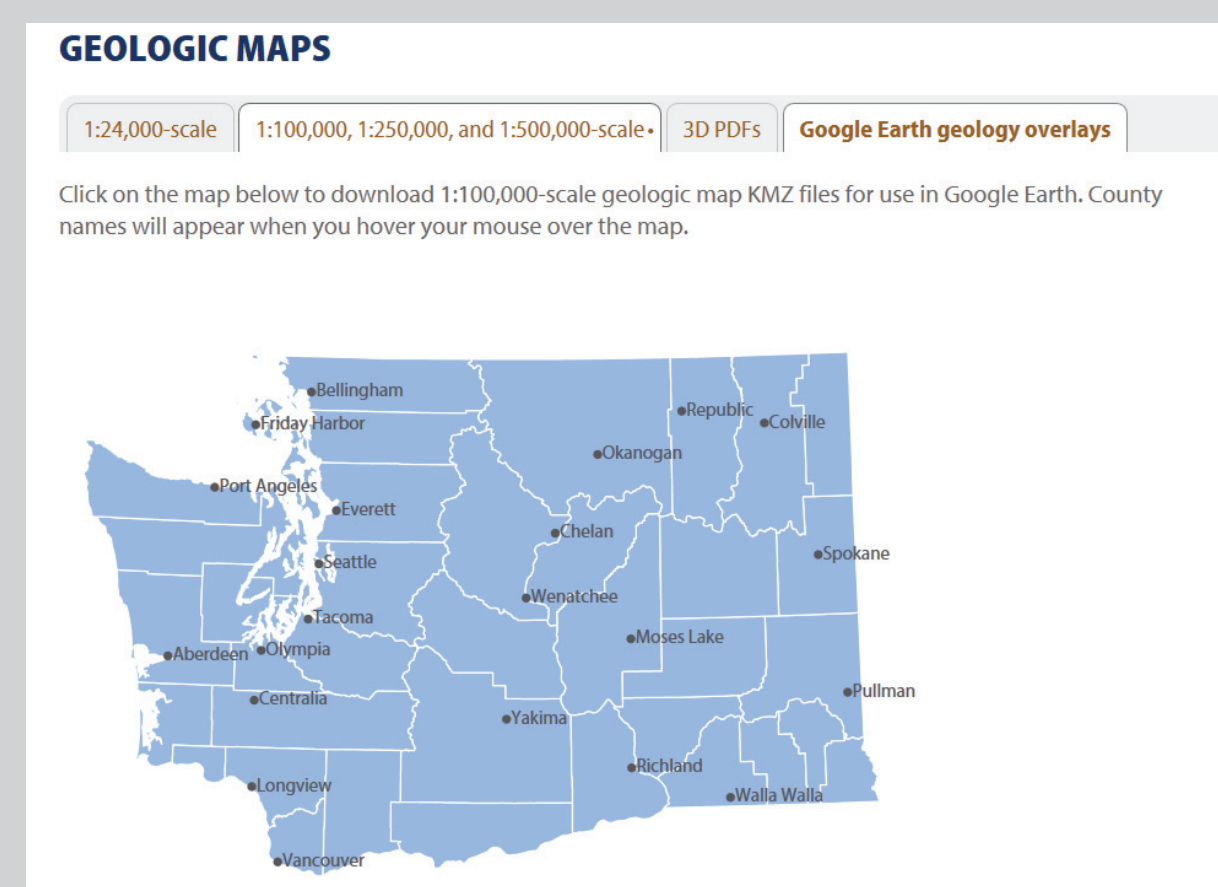
Geologic Maps



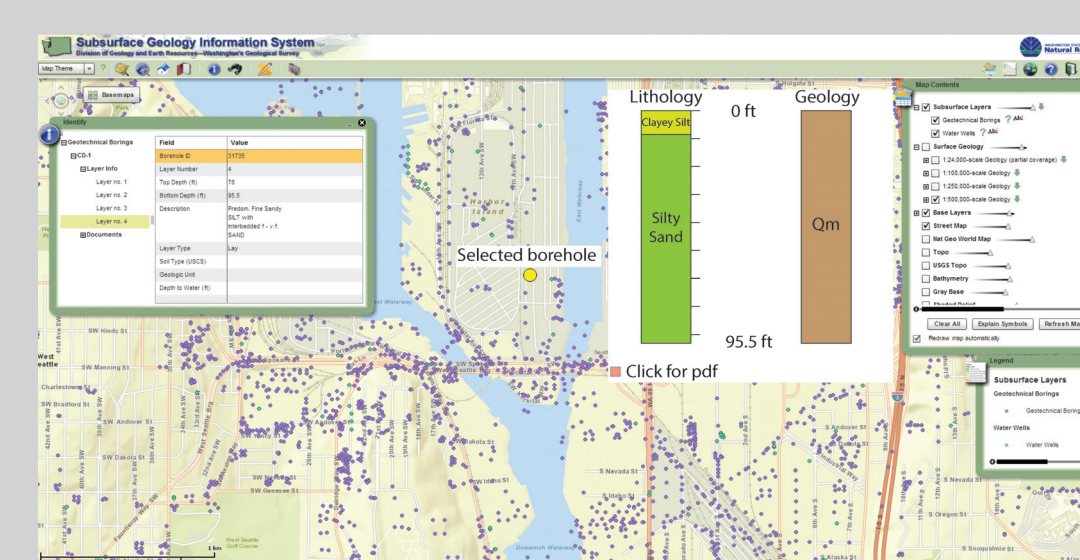
3D view showing the Sultan 7.5-minute geologic map. Adobe Acrobat Reader allows the user to interactively explore a geologic map. It also shows subsurface borehole information, cross sections, and the user can query each geologic unit.

How to get these products...

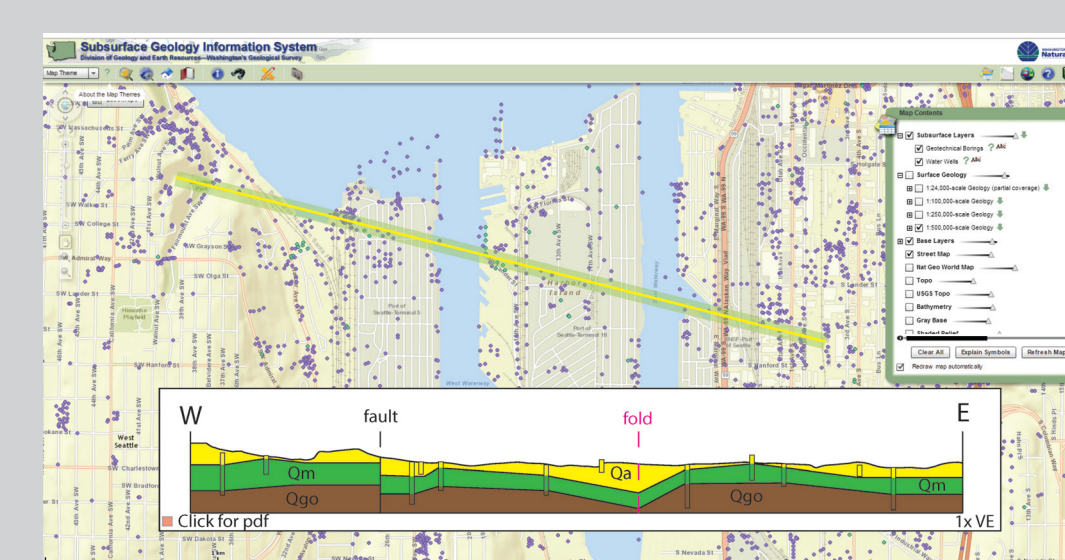
Google Earth KMZ files and 3D PDFs can both be found on the Publications and Maps page of our website:
<http://www.dnr.wa.gov/programs-and-services/geology/publications-and-data/publications-and-maps>



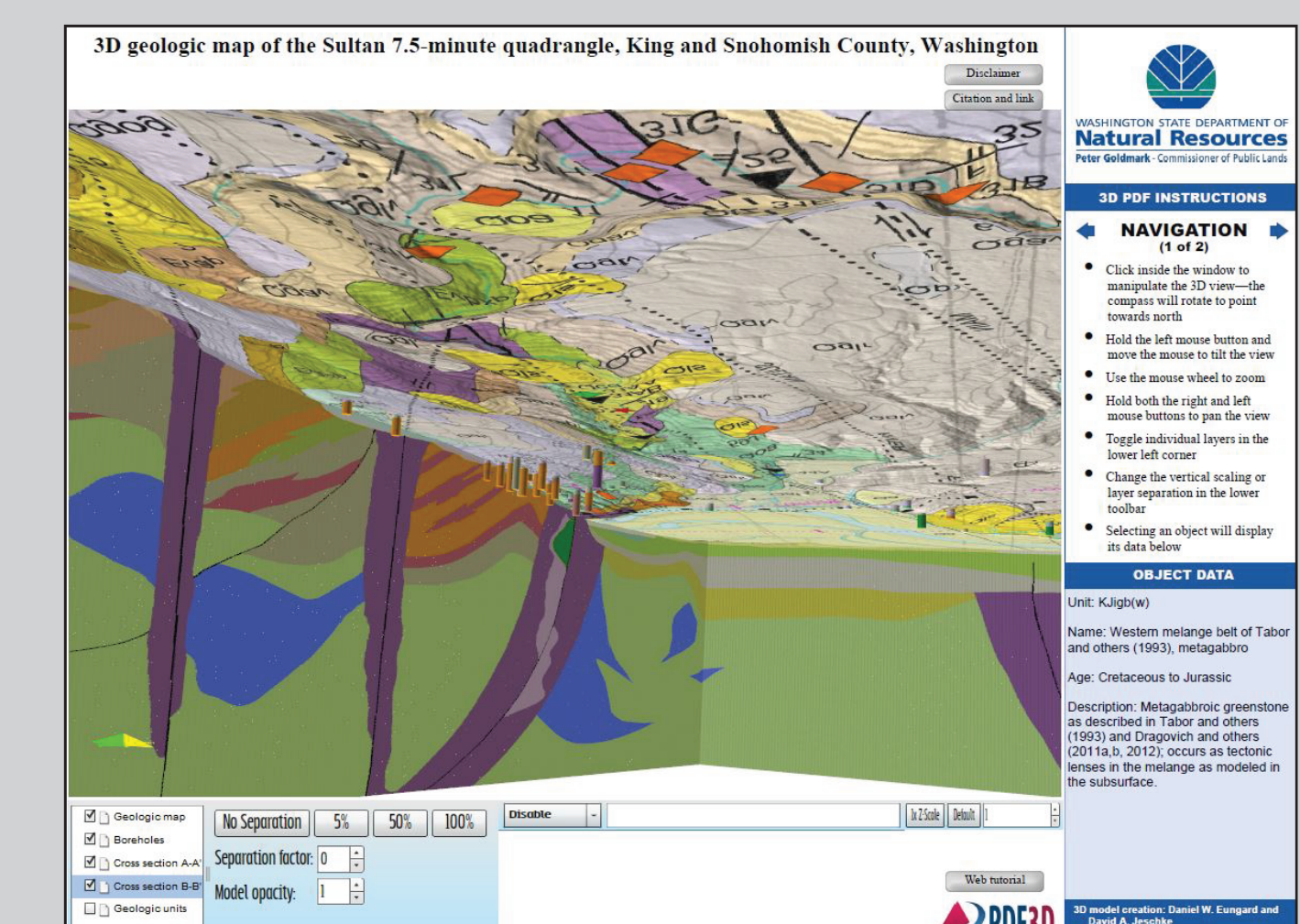
Future development



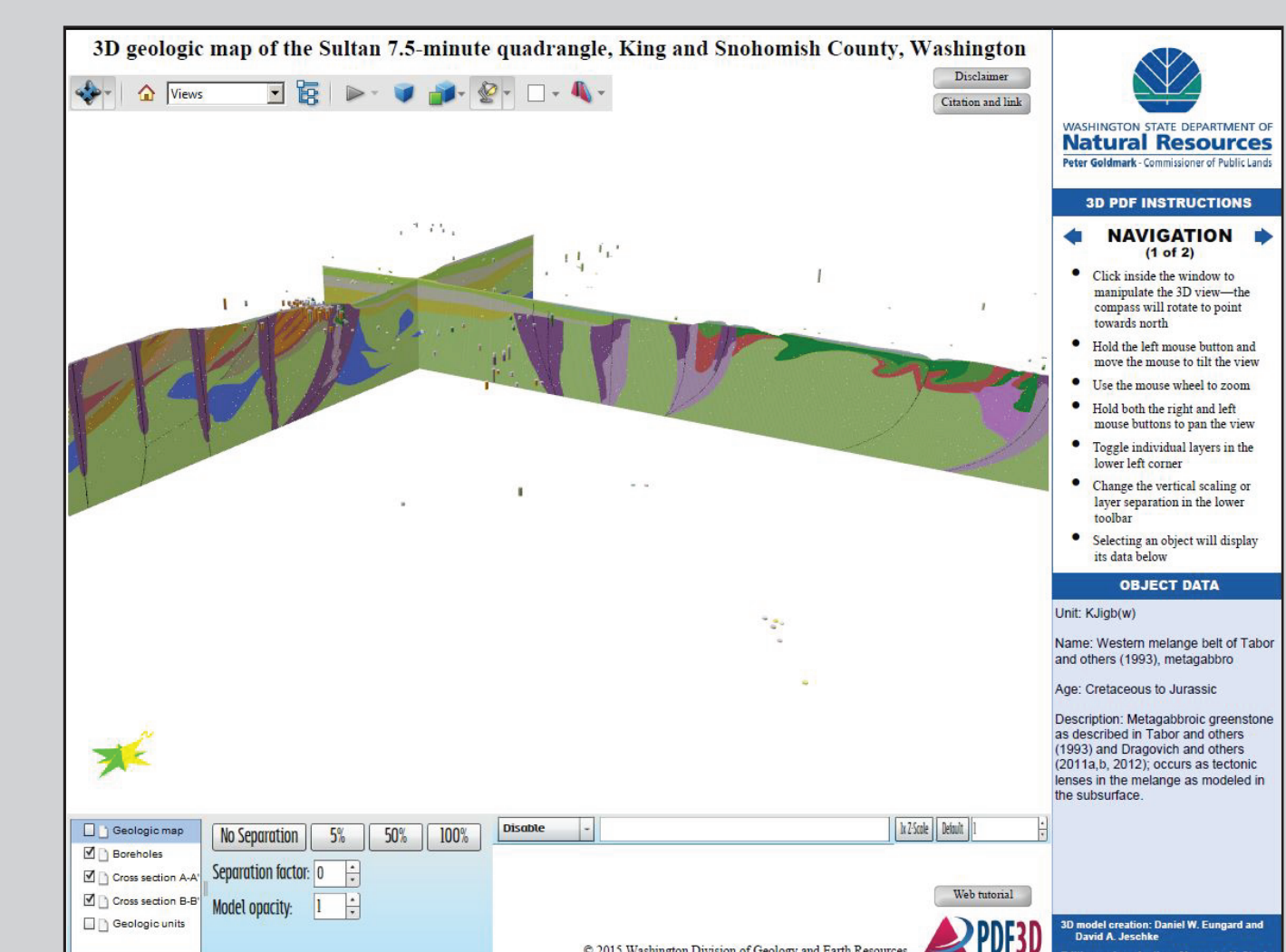
Ongoing improvements to the subsurface theme on our Geologic Information Portal will soon allow users to visualize geology at depth through custom cross sections and borehole tools.



<http://www.dnr.wa.gov/geologyportal>



3D view from underground looking at the bottom of the geologic map. This view shows the cross sections and boreholes as they would look underground. All geologic units are interactive and display descriptive information when clicked.



3D cross sections and boreholes can also be viewed without the geologic map layer.