

Appendix 1

Tool	Description	Item format	Access	Extent of Spatial Coverage	Scale/Level of detail	Website Link
<b>Digital Elevation Models</b>						
Lidar Digital Elevation Model (DEM)	Digital elevation model derived from laser and analysis of reflected light. Often processed to remove vegetation (aka bare earth) to derive modelled formats of hillshades, slopes, contours and other applications	GIS based product	In the public domain and accessible through Puget Sound Lidar Consortium; processed through various GIS products	Roughly 6,400 sq. mi. of 1-meter lidar and 18,700 sq. mi. for 2-meter lidar.	Provides for a 1 to 2 meter Digital Elevation model that can help resource managers clearly identify GDLS. Some parts of the lidar data contains poor data collection through vegetation and can lead to coarseness in data (aka pyrite forests or crystalline forests)	<a href="http://pugetsoundlidar.ess.washington.edu/">http://pugetsoundlidar.ess.washington.edu/</a>
10-meter Digital Elevation Model (DEM)	Digital elevation model produced by the US Geological Survey through various formats, in which coarseness averages or estimates value of elevation over a 10 meter grid	GIS based product	In the public domain and accessible through various sources	Statewide	Moderate resolution, difficult to determine small features	<a href="http://gis.ess.washington.edu/data/raster/index.html">http://gis.ess.washington.edu/data/raster/index.html</a>
<b>DNR Map Layer (GIS data, landslide hazard zonation, landslide inventory, mass wasting prescriptions...</b>						
Landslide Hazard Zonation	The Landslide Hazard Zonation (LHZ) Project is to create a vastly improved screening tool by better describing and mapping all potentially unstable slope areas in priority watersheds. The purpose is to eliminate any errors of omission in the identification of unstable landforms during both harvest layout and permitting process. In addition to identifying areas of hazard for mass wasting, landforms and hazard classifications are linked to the degree of hazard and sensitivities to land management practices. The LHZ project also provides information useful for appropriate mitigation.	Reports, landslide and landform are in GIS format	Department of Natural Resources Website (Accessible by anyone)	Fifty-nine high priority watersheds	Contains mapped deep-seated landslide and can provide information on deep-seated landslide processes or potential sensitivities to landslide movement.	<a href="http://www.dnr.wa.gov/BusinessPermits/Topics/LandslideHazardZonation/Pages/fp_lhz_completed.aspx">http://www.dnr.wa.gov/BusinessPermits/Topics/LandslideHazardZonation/Pages/fp_lhz_completed.aspx</a>
Watershed Analysis; Mass Wasting Prescriptions	Watershed analysis is a biological and physical assessment of a watershed designed to address the cumulative effects of forest practices on specific public resources (fish, water, and capital improvements of the state) and on cultural resources. The Mass Wasting Prescriptions are specific to a landslide inventory and analysis of slope stability in relation to forest practices or general stability.	Reports; some landslide and landforms are in GIS format	Department of Natural Resources Website (Accessible by anyone)	Fifty-three watersheds	Contains mapped deep-seated landslide and can provide information on deep-seated landslide processes or potential sensitivities to landslide movement.	<a href="http://www.dnr.wa.gov/ResearchScience/Topics/WatershedAnalysis/Pages/fp_watershed_analysis.aspx">http://www.dnr.wa.gov/ResearchScience/Topics/WatershedAnalysis/Pages/fp_watershed_analysis.aspx</a>
Washington State Landslide Database	GIS polygon dataset with attributions (slope morphology, gradient, landslide type, land use association, and others) of a conglomeration of data from various sources (LHZ, Watershed Analysis, Geologic Maps, DNR Reconnaissance of landslide producing storm events, various other datasets)	Online interactive map and GIS	Washington State Geologic Information Portal (Accessible by anyone)	Generally statewide, data is limited by data input sources and does not capture all landslides in Washington State.	Contains mapped deep-seated landslide in spatial polygon format with attributed data attached that could provide additional information on deep-seated landslide mechanisms	<a href="http://www.dnr.wa.gov/researchscience/topics/geosciencesdata/pages/geology_portal.aspx">http://www.dnr.wa.gov/researchscience/topics/geosciencesdata/pages/geology_portal.aspx</a>
Geologic Maps	Geologic maps show the types and ages of rocks that occur at or near the Earth's surface. They show the locations of faults and folds, landslides, glacial deposits, and other regional or local features, depending on the scale of the map. Geologic maps are the most fundamental and important tool of earth scientists.	Online interactive map, pdf reports and GIS	Washington State Geologic Information Portal (Accessible by anyone); Department of Natural Resources Website (pdf reports)	At a scale of 1:100,000, the entire state; Partial coverage at scale of 1:24,000; various other scales throughout the state	Contains areas of mapped deep-seated landslides and can provide stratigraphic data to help determine potential deep-seated landslide mechanisms	<a href="http://www.dnr.wa.gov/researchscience/topics/geosciencesdata/pages/geology_portal.aspx">http://www.dnr.wa.gov/researchscience/topics/geosciencesdata/pages/geology_portal.aspx</a>
<b>Forest Practices Application Geologic Reviews/Reports</b>	Geologic reports completed by qualified experts that accompany FPA's (usually Class IV specials or Class III) that analyze slope stability with accompanying forest management activities.	Online; pdf	In public domain through FPARS website.	Site specific for the area covered in the FPA	Analysis of deep-seated landslide (if existent) and will contain scientifically sourced information or professional opinion.	<a href="http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_fpars.aspx">http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_fpars.aspx</a>
<b>Field Visit</b>	Field visits are conducted by a qualified expert with accompany of a forester, forestry engineer or related occupation to determine potential slope stability issues and delineation of features.	Field review	Accessible through permission of the land owner	Statewide	Field review of area helps to determine indicators of slope stability, potential level of activity and delineation of features.	
<b>Stereo Photos</b>	Aerial photos that can be overlapped and viewed through a stereoscope to create a topographic view of the aerial photos	Paper/photo	Limited public access (often through Universities); usually must be purchased.	Statewide in various years	Allows remote review analysis of an area; smaller features are more easily discernable when vegetation has been removed from the site	
<b>Orthophoto (NAIP)</b>	Data collected by the USDA Farm Service Agency, National Agriculture Imagery Program, consisting of aerial imagery that has been converted to digital files and spatially rectified for access mostly in GIS programs	GIS based product	In public domain through various websites	Statewide in various years	Allows remote review analysis of an area; smaller features are more easily discernable when vegetation has been removed from the site	<a href="http://wagda.lib.washington.edu/data/type/photography/">http://wagda.lib.washington.edu/data/type/photography/</a>