

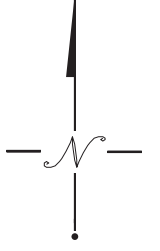
LIQUEFACTION SUSCEPTIBILITY

of the

Greater Eastside Area, King County, Washington

by

**Stephen P. Palmer,
Brian D. Evans, and Henry W. Schasse**



WHAT IS LIQUEFACTION?

LIQUEFACTION is a phenomenon in which strong earthquake shaking causes a soil to rapidly lose its strength and behave like quicksand. Liquefaction typically occurs in artificial fills and areas of loose sandy soils that are saturated with water, such as low-lying coastal areas, lake shores, and river valleys. When soil strength is lost during liquefaction, the consequences can be catastrophic. Movement of liquefied soils can rupture pipelines, move bridge abutments and road and railway alignments, and pull apart the foundations and walls of buildings.

Ground movement resulting from liquefaction caused massive damage to highways and railways throughout southern Alaska during the 1964 Good Friday earthquake. Liquefaction was a contributing factor to the severe building damage that occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake. Control of the ensuing fires in the Marina District was severely hampered because water lines in the area were broken by liquefaction-induced ground movement. Damage caused by liquefaction to the port area of Kobe, Japan, during the 1995 earthquake resulted in billions of dollars in reconstruction costs and lost business.

WHAT IS A LIQUEFACTION SUSCEPTIBILITY MAP?

A LIQUEFACTION SUSCEPTIBILITY MAP provides an estimate of the likelihood that the soil will liquefy as a result of earthquake shaking. This type of map depicts the relative hazard in terms of high, moderate, or low liquefaction susceptibility. The hazard zones shown on this map were determined using geological mapping and quantitative analysis of data from more than 650 geotechnical borings drilled in the study area.

HOW CAN THIS MAP BE USED?

LIQUEFACTION HAZARD MAPS such as this can be used for many different purposes by a variety of users. For example:

Emergency managers can determine which critical facilities and lifelines are located in hazardous areas.

Building officials and engineers can select areas where detailed geotechnical studies should be performed before new construction or retrofitting older structures.

Facilities managers can assess the vulnerability of corporate and public facilities, including schools, and recommend actions required to minimize earthquake damage and loss.

Insurance providers can determine relative seismic risk to aid in the calculation of insurance ratings and premiums.

Land use planners can recommend appropriate zoning and land use in higher hazard areas to promote long-term mitigation of earthquake losses by reducing vulnerability.

Private property owners can guide their decisions on retrofitting, purchasing, and upgrading their properties.

Explanation

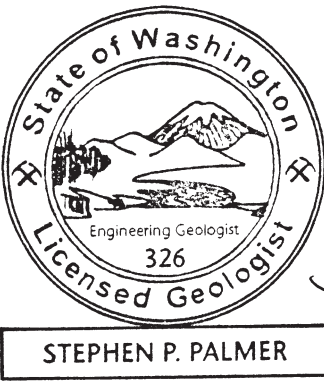
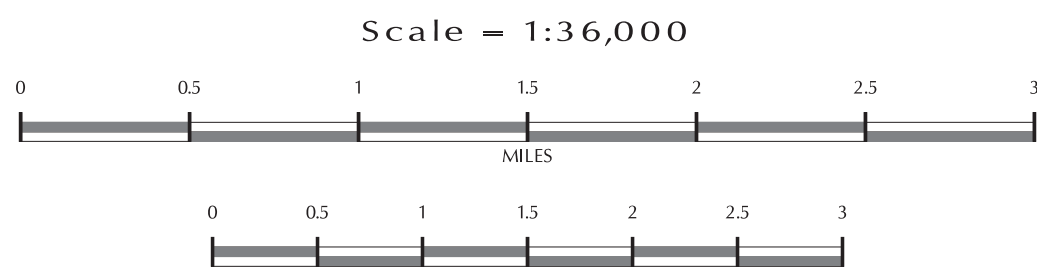
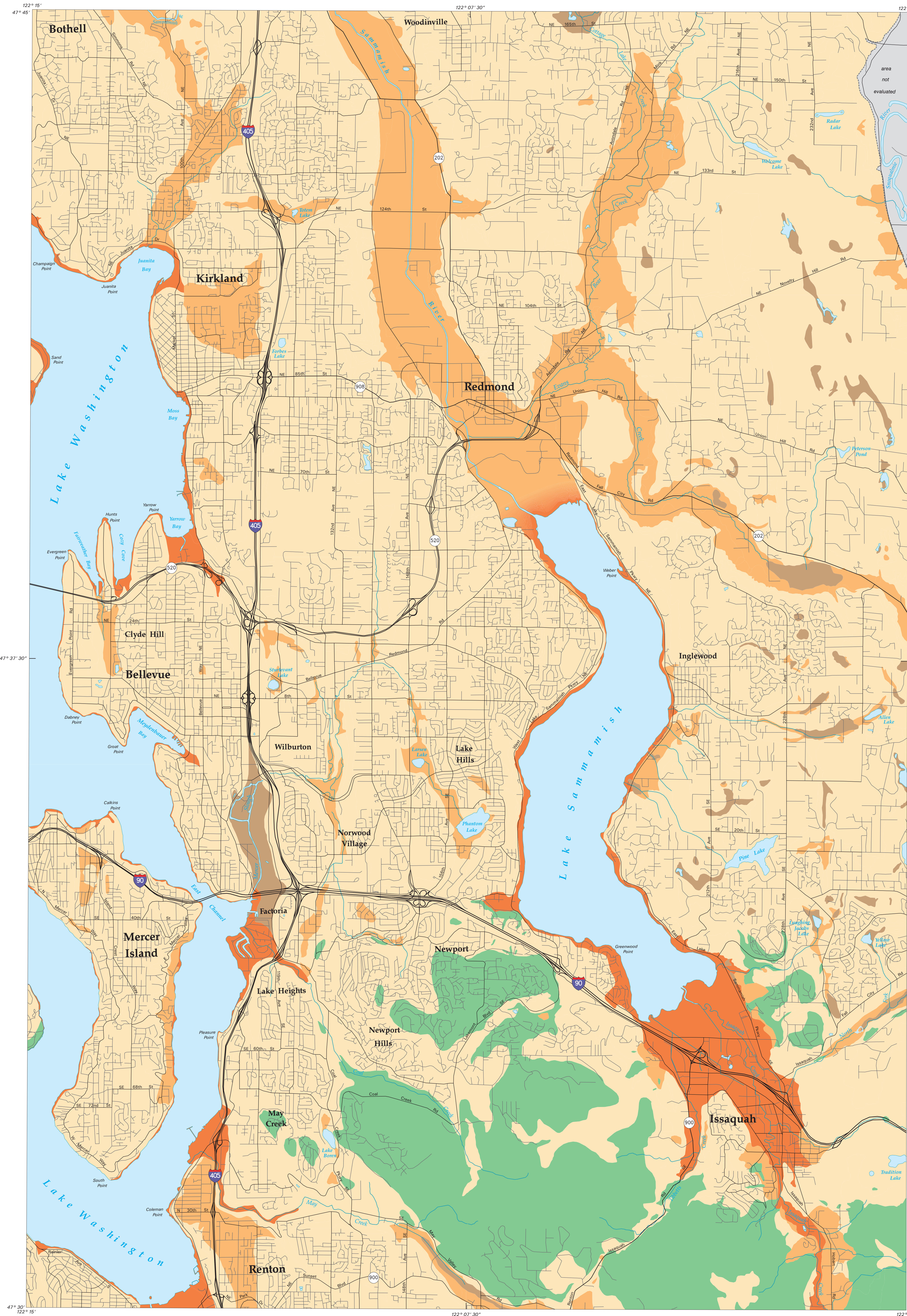
- Liquefaction susceptibility: Moderate to High
- Liquefaction susceptibility: Low to Moderate
- Liquefaction susceptibility: Very Low
- Bedrock
- Peat deposits

Liquefaction Susceptibility

- MODERATE TO HIGH** Areas underlain by artificial fill and recent (mid- to late Holocene) lake and stream deposits in the vicinity of the Lake Washington and Lake Sammamish shorelines.
- LOW TO MODERATE** Areas underlain by recent (Holocene) river and stream deposits in the Sammamish River valley and Bear and Evans Creek tributaries, landslide debris and thick soil deposits often found at the base of steep slopes, and sandy outwash from the recession of the latest (late Pleistocene) continental glaciation in the Puget Sound region.
- VERY LOW** Areas underlain by all other Pleistocene glacial and non-glacial deposits.
- BEDROCK** Areas underlain by Tertiary bedrock. Rock is not susceptible to liquefaction, but unmapped areas of thick soils or fill overlying bedrock may be liquefiable.
- PEAT DEPOSITS** Areas underlain by recent (Holocene) peat deposits, such as those underlying Mercer Slough. Peat is not susceptible to liquefaction but may undergo settlement as a result of earthquake shaking. Also, sand beds within the peat deposits may be liquefiable.



Map location comprises the Kirkland, Redmond, Mercer Island, and Issaquah 7.5-minute USGS topographic quadrangles.



Stephen P. Palmer
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This map is meant only as a general guide to delineate areas prone to liquefaction. It is not a substitute for site-specific investigation to assess the potential for liquefaction for any development project. Because the data used in the liquefaction susceptibility assessment have been subdivided on the basis of regional geologic mapping, this map cannot be used to determine the presence or absence of liquefiable soils beneath any specific locality. This determination requires a site-specific geotechnical investigation performed by a qualified practitioner. For additional information, refer to the enclosed map report.

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