NATURAL RESOURCES

Index to Geologic and Geophysical Mapping of Washington, Part I—Published and Open-Filed Reports, 1899 to 2001

compiled by
Connie J. Manson

WASHINGTON
DIVISION OF GEOLOGY
AND EARTH RESOURCES

Revised February 8, 2002

Supersedes Information Circular 77
and Open File Report 92-8

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

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Note: This index will be periodically revised as new maps become available. Thesis mapping has been released separately as Part II of this index.

INTRODUCTION

This work is a cumulated update to our previous indexes of geologic and geophysical mapping 1899 to 1983 (Manson, 1984) and 1984 to 1998 (Manson, 1999) and includes maps received in the Washington Division of Geology and Earth Resources (DGER) library through February 8, 2002. The index shows only pertinent and original mapping at scales from 1:480 through 1:580,000 as issued in published and open-filed reports. Superseded maps, sketch maps, mine maps, in-house unpublished maps, maps copied from other sources, and non-geologic or non-geophysical mapping have been excluded. Thesis mapping is not included here but is indexed in *Theses on Washington Geology* (Manson, 1986) and in DGER Open File Report 99-1 (Manson, 1999).

How to Use This Index

The electronic version of this index is a simple copy of the printed index; it is not an interactive, searchable database. (While we greatly appreciate the advantages of that format, it is not possible for us at this time.) Users might find it easier to print out the maps and text for easy reference. The text and color maps print to standard 8½- by 11-inch paper. The text portion was originally designed for double-sided printing; therefore, a few intentionally blank pages appear within the text. The color maps were designed for single-sided printing.

The geologic mapping has been outlined on 14 sheets, separated by scale. The geophysical mapping has been outlined on 5 sheets, separated by scale and type. All map outlines are keyed by number to the Bibliography which gives the full citation for each map, numbered and listed alphabetically by author. If a report includes geologic and (or) geophysical mapping at different scales, the maps are outlined on the separate sheets as appropriate.

How to Obtain the Maps

All the maps listed here are held at the DGER library in Olympia, Washington. Materials are not loaned from the library collection, but are available for examination during our office hours.

Many of the maps are held at major geoscience libraries in Washington, especially the University of Washington in Seattle. Other major geoscience libraries which may hold many of these maps are listed in the Geoscience Information Society's *Directory of Geoscience Libraries, North America* (*see* http://www.geoinfo.org/ *for information on obtaining this directory*).

Many of these maps are still in print and available for sale from the publishers (for example, the U.S. Geological Survey or the Washington Division of Geology and Earth Resources).

History

The first index to geologic mapping of Washington State was produced by the U.S. Geological Survey's Leona Boardman in 1949 (as just one of the forty-seven state geologic map indexes she compiled). William H. Reichert produced an index to published, open-filed, and thesis geologic mapping in 1969, and to published geologic mapping in 1979. Connie J. Manson has continued Reichert's indexes since 1978 with published and open-filed reports on geologic, geophysical, and thesis mapping (for example, Manson 1984, 1999; the full list of those indexes is given in our publications list.)

Other Indexes to Geologic Mapping

The U.S. Geological Survey has a searchable database of geologic, geophysical, and thematic mapping of the United States at http://ngmdb.usgs.gov/.

Many state geological surveys produce map indexes for their areas.

ACKNOWLEDGMENTS

We are gratified that this map index project continues to be highly valued by the geoscience community. They deserve no less than our best efforts.

Because this has been a long-term project, there are many to thank: cartographers Keith Ikerd, Don Hiller, and Nancy Eberle, and editors Laura Bray, Kitty Reed, and Jari Roloff. We offer special thanks to editor Karen D. Meyers for the web version of the index. As ever, we are grateful to the administrators of the Division of Geology and Earth Resources for their continued support for this large, long-term project.

While great effort has been made to make this index as complete and accurate as possible, it is inevitable that some mistakes have been made. Any information about omissions or errors will be greatly appreciated.

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    11b *(gravity)* Plate 4, Bouguer gravity of parts of the Okanogan, Sandpoint, Ritzville, and Spokane 1 degree x 2 degree quadrangles, scale 1:250,000.

    11c *(magnetic)* Plate 5, Aeromagnetic survey of parts of the Okanogan, Sandpoint, Ritzville, and Spokane 1 degree x 2 degree quadrangles, scale 1:250,000.

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33d Plate 8, Reconnaissance airborne radiometric survey of west half of the Kettle Falls 15-minute quandrangle, scale 1:62,500.

33e Plate 9, Reconnaissance airborne radiometric survey of the Sherman Peak 15-minute quandrangle, scale 1:62,500.

33f Plate 10, Reconnaissance airborne radiometric survey of part of the Togo Mountain 15-minute quandrangle, scale 1:62,500.

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57c Plate 3, Geologic map of the Connors iron deposit, Stevens County, Washington, showing magnetic data, scale 1:2,000.

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72a Plate 2, Geologic map of the Deep Lake area, Northport district, Stevens County, Washington, scale 1:12,000.

72b Plate 3, Geologic map of the Red Top area, Northport district, Stevens County, Washington, scale 1:12,000.

72c Plate 4, Geologic map of the Gladstone Mountain area, Northport district, Stevens County, Washington, scale 1:12,000.

72d Plate 5, Geologic map of the Deep Creek area, Northport district, Stevens County, Washington, scale 1:12,000.

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84b Plate 6, Geologic map of the northeastern portion of the study area—Liberty and Thorp 15′ quadrangles, scale 1:48,000.

84c Plate 7, Geologic map of the northeastern portion of the study area—Cle Elum and Easton 15′ quadrangles, scale 1:48,000.

84d Plate 8, Geologic map of the northeastern portion of the study area—Old Scab Mtn., Cliffdell, Manastash Lake, Timberwolf Mtn., Meeks Table, Nile, Rimrock Lake, Tieton Basin, Weddle Canyon, Darland Mtn., and Foundation Ridge 7.5′ quadrangles, scale 1:48,000.

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92c Volume IIC, Part A, Flight line base map [Midnite–Sherwood mines, Washington], 15 sheets, scale 1:62,500.

92d Volume IID, Flight line base map [Lost Creek, Washington], 3 sheets, scale 1:62,500.

92e Volume IIE, Flight line base map [Gleason Mountain, Washington–Idaho], 1 sheet , scale 1:62,500.

92f Volume IIF, Flight line base map [Chelan, Washington], 2 sheets, scale 1:62,500.

92g Volume IIH, Flight line base map [Spirit pluton,Washington], 3 sheets, scale 1:62,500.

Geophysical maps (magnetic):

92h Volume IIA, Magnetic contour map, [west fork of the Sanpoil River, Washington], 6 sheets, scale 1:62,500.

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92j Volume IIC, Part A, Magnetic contour map, [Midnite–Sherwood mines, Washington], 15 sheets, scale 1:62,500.

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127b Plate 3, Geologic map and cross sections, Sand Creek-Deep Creek area, scale 1:12,000.

127c Plate 3, Geologic map and cross sections, Boyds–Nancy Creek area, scale 1:24,000.

127d Plate 3, Geologic map and cross section of the Mount Leona area, scale 1:2,400.

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127e Plate 2, Spectral radiometric survey of Kettle dome, scale 1:62,500.

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128b Plate XII, Coal Bank Rapids area, scale 1:63,360.
128c Plate XIII, Vader area, scale 1:63,360.
128d Plate XV, Centralia–Chehalis area, scale 1:63,360.
128e Plate XVI, Tenino–Mendota area, scale 1:63,360.
128f Plate XIX, Cinnabar area, scale 1:63,360.
128g Plate XX, Mineral Lake area, scale 1:63,360.
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229b Plate 1-B, Webber Canyon geologic map, scale 1:24,000.

229c Plate 1-C, Whitstran NE geologic map, scale 1:24,000.

229d Plate 1-D, Whitstran geologic map, scale 1:24,000.

229e Plate 1-E, Richland geologic map, scale 1:24,000.

229f Plate 1-F, Benton City geologic map, scale 1:24,000.

229g Plate 1-G, Corral Canyon geologic map, scale 1:24,000.

229h Plate 1-H, Snipes Creek geologic map, scale 1:24,000.

229i Plate 1-I, Grandview SE geologic map, scale 1:24,000.

229j Plate 1-J, Grandview SW geologic map, scale 1:24,000.

229k Plate 1-K, Richland NE geologic map, scale 1:24,000.

229l Plate 1-L, Horn Rapids Dam geologic map, scale 1:24,000.

229m Plate 1-M, Iowa Flats geologic map, scale 1:24,000.

229n Plate 1-N, Snively Basin geologic map, scale 1:24,000.

229o Plate 1-O, Maiden Spring geologic map, scale 1:24,000.

229p Plate 1-P, Sulphur Spring geologic map, scale 1:24,000.

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243c Figure 21, Geologic map of Davis property, Whatcom County, scale 1:960.

243d Figure 22, Geologic map of the southeastern part of the Mount Buckindy massif, Skagit County, scale 1:48,000.

243e Figure 24, General geologic map of the Sultan Basin, Vesper Peak, Silver Creek area, Snohomish County, scale 1:78,000.

243f Figure 27, Geology of the Quartz Creek property, King County, Washington, scale 1:4,000.

243g Figure 28, Areal distribution of the principal sulfide zones at the Middle Fork of the Snoqualmie River property, King County, Washington, scale 1:52,000.

243h Figure 30, Generalized geologic map of wetern Kittitas County in the Gold Creek and Mineral Creek areas, scale 1:125,000.

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244c Plate IIIB, Generalized geologic map and mineral prospect locations—Orient–Flagstaff block, scale 1:31,680.

244d Plate IVB, Generalized geologic map and mineral prospect locations—Little Pend Oreille block, scale 1:62,500.

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245c Plate IIIB and VB, Generalized geologic map and mineral prospect locations—Methow–South Okanogan Range block, scale 1:62,500.

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Geologic maps:

305a Volume IIA, Appendix B, Geology map [Pendleton quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

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305c Volume IIC, Appendix B, Geology map [Vancouver quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

305d Volume IID, Appendix B, Geology map [Walla Walla quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

305e Volume IIE, Appendix B, Geology map [Yakima quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

305f Volume IIF, Appendix B, Geology map [Hoquiam quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

Geophysical maps (magnetic):

305g Volume IIA, Appendix E, Pseudo-contour maps—Magnetic [Pendleton quadrangle], scale 1:500,000.

305h Volume IIB, Appendix E, Pseudo-contour maps—Magnetic [The Dalles quadrangle], scale 1:500,000.

305i Volume IIC, Appendix E, Pseudo-contour maps—Magnetic [Vancouver quadrangle], scale 1:500,000.

305j Volume IID, Appendix E, Pseudo-contour maps—Magnetic [Walla Walla quadrangle], scale 1:500,000.

305k Volume IIE, Appendix E, Pseudo-contour maps—Magnetic [Yakima quadrangle], scale 1:500,000.

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306b Volume IIB, Appendix B, Geology map [Seattle quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

306c Volume IIC, Appendix B, Geology map [Victoria quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

306d Volume IID, Appendix B, Geology map [Cape Flattery quadrangle], scale 1:500,000; Appendix D, Flight line/geology, scale 1:500,000.

Geophysical maps (magnetic):

306e Volume IIA, Appendix E, Pseudo-contour maps—Magnetic [Copalis Beach quadrangle], scale 1:500,000.

306f Volume IIB, Appendix E, Pseudo-contour maps—Magnetic [Seattle quadrangle], scale 1:500,000.

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342c Figure A-4, Geologic map, Umtanum Ridge near Hog Ranch Buttes, scale 1:24,000.

342d Figure A-5, Geologic map, Yakima Ridge in the Nelson Springs–Black Rock Springs area, scale 1:24,000.

342e Figure A-7, Geologic map, Rattlesnake Hills in the Horsethief Point area, scale 1:63,360.

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357e Plate 5, Coyote Rapids quadrangle, scale 1:62,500.
357f Plate 6, Hanford quadrangle, scale 1:62,500.
357g Plate 7, Grandview quadrangle, scale 1:62,500.
357h Plate 8, Corral Canyon quadrangle, scale 1:62,500.
357i Plate 9, Richland quadrangle, scale 1:62,500.
357j Plate 10, Prosser quadrangle, scale 1:62,500.
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397a Figure 2, Geologic sketch map showing known occurrences of granitic rock similar to granodiorite of Hall Mountain, scale 1:100,000.

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399b Figure 5, Geologic map of the Cultus–Frailey–Devils Mountain area, scale 1:400,000.

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Sheet 1, Geologic map of the Twisp River–Chelan Divide region, Washington, scale 1:100,000.

Note: Sheets 2 through 11 are at scale 1:24,000, are all within the area of Sheet 1, and are not individually outlined.

Sheet 2, Geologic map of part of the McGregor Mtn. quadrangle, Washington.

Sheet 3, Geologic map of part of the McAlestor Mtn. quadrangle, Washington.

Sheet 4, Geologic map of part of the Gilbert quadrangle, Washington.

Sheet 5, Geologic map of part of the Midnight Mtn. quadrangle, Washington.

Sheet 6, Geologic map of part of the Stehekin quadrangle, Washington.

Sheet 7, Geologic map of part of the Sun Mtn. quadrangle, Washington.

Sheet 8, Geologic map of part of the Oval Peak quadrangle, Washington.

Sheet 9, Geologic map of part of the Hoodoo Peak quadrangle, Washington.

Sheet 10, Geologic map of part of the Prince Creek quadrangle, Washington.

Sheet 11, Geologic map of part of the Martin Peak quadrangle, Washington.

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404b Plate 5, Geologic map of Heidegger Hill district, scale 1:27,000.

404c Plate 6, Geologic map of Colville district, scale 1:80,000.

404d Plate 7, Geologic map of Wannacut Lake area, scale 1:28,000.

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445d Plate II-13, Surficial geologic map of the Ritzville quadrangle, Washington, by L. G. Hanson, E. P. Kiver, and others, scale 1:250,000. (*Note:* Also available as Washington Division of Geology and Earth Resources Open File Report 79-10.)

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445f Plate II-15, Surficial geologic map of the Yakima quadrangle, Washington, by N. P. Campbell, scale 1:250,000. (*Note:* Also available as Washington Division of Geology and Earth Resources Open File Report 79-15.)

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445h Plate II-17, Surficial geologic map of the Pendleton quadrangle, Washington, by N. P. Campbell, scale 1:250,000. (*Note:* Also available as Washington Division of Geology and Earth Resources Open File Report 79-8.)

445i Plate II-18, Surficial geologic map of The Dalles quadrangle, Washington, by N. P. Campbell, scale 1:250,000. (*Note:* Also available as Washington Division of Geology and Earth Resources Open File Report 79-12.)

445j Plate II-19, Surficial geologic map of the Pullman quadrangle, Washington, by G. D. Webster, scale 1:250,000. (*Note:* Also available as Washington Division of Geology and Earth Resources Open File Report 79-9.)

445k Plate III-1, Compilation geologic map of the Pasco Basin, south-central Washington, scale 1:62,500 [on 12 sheets]; Plate III-4a, Top of basalt contour map, scale 1:62,500 [on 2 sheets]; Plate III-4b, Top of Wanapum basalt structure contour map, scale 1:62,500 [on 2 sheets].

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Map B, Radiometric map of apparent surface concentrations of eU in parts per million, in the Salmo–Priest study area, Washington–Idaho, scale 1:48,000.

Map C, Radiometric map of Priest study area, Washington–Idaho, scale 1:48,000.

Map D, Radiometric map of apparent surface concentrations of K in percent, Salmo–Priest study area, Washington–Idaho, scale 1:48,000.

Map E, Radiometric map of the ratio of apparent surface concentrations eU/eTh, in the Salmo–Priest study area, Washington–Idaho, scale 1:48,000.

Map F, Radiometric map of the ratio of apparent surface concentrations eU/K, in the Salmo–Priest study area, Washington–Idaho, scale 1:48,000.

Map G, Radiometric map of ratio of apparent surface concentrations eTh/K, in the Salmo–Priest study area, Washington–Idaho, scale 1:48,000.

Map H, Map of the residual aeromagnetic field, in gammas, in the Salmo–Priest study area, Washington–Idaho, region field (GRD) was subtracted, scale 1:48,000.

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Map 2.3C, Geology of the Quinault watershed, scale 1:100,000.

Map 2.3D, Geomorphology of the Quinault watershed, scale 1:100,000.

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495b Plate 2, Preliminary geologic map of the Saddle Mountains between Sentinel Gap and longitude 119 degrees 30 minutes [Beverly SE quadrangle], scale 1:24,000.

495c Plate 3, Preliminary geologic map of the Saddle Mountains between Sentinel Gap and longitude 119 degrees 30 minutes [south half of the Smyrna quadrangle], scale 1:24,000.

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Figure 2, Complete Bouguer gravity and generalized geologic map of part of the Yakima basin, Washington, scale 1:250,000.

Figure 3, Aeromagnetic and geologic map of part of the Yakima basin, Washington, scale 1:250,000.

Geophysical maps (gravity):

Figure 4, Upward continuation gravity map computed for the 3-mile level (Yakima basin, Washington), scale 1:250,000.

Figure 5, Residual gravity map after removal of 3-mile continued field (Yakima basin, Washington), scale 1:250,000.

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Sheet 3, [Wenatchee 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 4, [Ritzville 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 5, [Spokane 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 6, [Yakima 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 7, [Walla Walla 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 8, [Pullman 1 degree by 2 degree quadrangle], scale 1:250,000.

Sheet 10, [Vancouver 1 degree by 2 degree quadrangle], scale 1:250,000.

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593b Fig. 5, Geologic map of Helena Ridge area just south of Darrington, scale 1:104,870.

593c Fig. 6, Geologic map of Manastash Ridge area, scale 1:126,720.

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603b Map 2, scale 1:230,000.
603c Map 3, scale 1:230,000.
603d Map 4, scale 1:230,000.
603e Map 5, scale 1:230,000.
603f Map 6, scale 1:230,000.
603g Map 7, scale 1:230,000.

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Drawing 222-100-298, Bacon Siphon no. 2, Geology, plan and profile F–F', scale 1:600.

Drawing 222-100-305, Main Canal Bacon tunnel no. 2, Geologic plan and profile G–G', scale 1:4,800.

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Plate 4, Roslyn basin structural geology, scale 1:250,000.

Plate 7, Kittitas basin surficial geology, scale 1:250,000.

Plate 8, Kittitas basin structural geology and isopachs, scale 1:250,000.

Plate 11, Upper Naches basin surficial geology, scale 1:250,000.

Plate 13, Upper Naches basin structural geology, scale 1:250,000.

Plate 14, Upper Yakima basin surficial geology, scale 1:250,000.

Plate 15, Upper Yakima basin structural geology and isopachs, scale 1:250,000.

Plate 18, Lower Yakima basin surficial geology, scale 1:250,000.

Plate 19, Lower Yakima basin structural geology and isopachs, scale 1:250,000.

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Geophysical maps (magnetic):

626 Plate, Aeromagnetic map of parts of the Okanogan, Sandpoint, Ritzville, and Spokane 1 degree by 2 degree quadrangles, northeastern Washington, scale 1:250,000.

626a Sheet 1, Bald Knob quadrangle, scale 1:62,500.

626b Sheet 2, Seventeen Mile Mountain quadrangle, scale 1:62,500.

626c Sheet 3, Twin Lakes quadrangle, scale 1:62,500.

626d Sheet 4, Nespelem quadrangle, scale 1:62,500.

626e Sheet 5, Keller quadrangle, scale 1:62,500.

626f Sheet 6, Wilmont Creek quadrangle, scale 1:62,500.

626g Sheet 7, Hunters quadrangle, scale 1:62,500.

626h Sheet 8, [unnamed 15-minute quadrangle, SE corner 48 degrees 00’ 00" by 117 degrees, 45’00"], scale 1:62,500.

626i Sheet 9, [unnamed 15-minute quadrangle, SE corner 48 degrees 00’ 00" by 117 degrees, 30’00"], scale 1:62,500.

626j Sheet 10, [unnamed 15-minute quadrangle, SE corner 48 degrees 00’ 00" by 117 degrees, 15’00"], scale 1:62,500.

626k Sheet 11, [unnamed 15-minute quadrangle, SE corner 48 degrees 00’ 00" by 117 degrees, 00’00"], scale 1:62,500.

626l Sheet 12, Grand Coulee Dam quadrangle, scale 1:62,500.

626m Sheet 13, Wilbur quadrangle, scale 1:62,500.

626n Sheet 14, Lincoln quadrangle, scale 1:62,500.

626o Sheet 15, Turtle Lake quadrangle, scale 1:62,500.

626p Sheet 16, Wellpinit quadrangle, scale 1:62,500.

626q Sheet 17, Clayton quadrangle, scale 1:62,500.

626r Sheet 18, Deer Park quadrangle, scale 1:62,500.

626s Sheet 19, Mount Spokane quadrangle, scale 1:62,500.

626t Sheet 20, Reardan quadrangle, scale 1:62,500.

626u Sheet 21, Medical Lake quadrangle, scale 1:62,500.

626v Sheet 22, Spokane quadrangle, scale 1:62,500.

626w Sheet 23, Greenacres quadrangle, scale 1:62,500.

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Geophysical map (magnetic): scale 1:62,500.

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Geophysical maps:

667b *(magnetic)* Plate 6, Map showing magnetic features in the Strait of Juan de Fuca area, Washington, U.S.A. and British Columbia, Canada, scale 1:250,000.

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Geologic map: scale 1:31,680.

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Geologic map:

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Geophysical map (gravity):

678b Plate 3, Complete Bouguer anomaly map of central King County, Washington, scale 1:100,000.

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Geologic maps:

Plate 3, Reconnaissance geologic map (western half) and section of Whitman County, Washington, scale 1:84,480.

Plate 4, Reconnaissance geologic map (eastern half) of Whitman County, Washington, scale 1:84,480.

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Geologic map: Plate 1, Areal geology of central Pierce County, Washington (in two halves), scale 1:50,000.

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Geologic maps: scale 1:24,000.

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Geologic maps: scale 1:24,000.

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Geologic maps: scale 1:24,000.

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Geologic maps: scale 1:24,000.

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702c Fig. 2.5-13, scale 1:62,500.
702d Fig. 2.5-14, scale 1:62,500.
702e Fig. 2.5-15, scale 1:62,500.
702f Fig. 2.5-16, scale 1:62,500.
702g Fig. 2.5-17, scale 1:62,500.
702h Fig. 2.5-18, scale 1:62,500.
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Geologic map: Plate 1, scale 1:125,000.

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Plate 3, Map of western part of area investigated in Lewis County, showing generalized geology and locations of wells and springs, scale 1:63,360.

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Geologic map: scale 1:62,500.

716. Weissenborn, A. E.; Weis, P. L., 1976, Geologic map of the Mount Spokane quadrangle, Spokane County, Washington, and Kootenai and Bonner Counties, Idaho: U.S. Geological Survey Geologic Quadrangle Map GQ-1336, 1 sheet, scale 1:62,500.

Geologic map: scale 1:62,500.

717. Wells, R. E., 1981, Geologic map of the eastern Willapa Hills, Cowlitz, Lewis, Pacific, and Wahkiakum Counties, Washington: U.S. Geological Survey Open-File Report 81-674, 1 sheet, scale 1:62,500.

Geologic map: scale 1:62,500.

718. Wells, R. E., 1989, Geologic map of the Cape Disappointment–Naselle River area, Pacific and Wahkiakum Counties, Washington: U.S. Geological Survey Miscellaneous Investigations Series Map I-1832, 1 sheet.

Geologic map: scale 1:62,500.

719. Weston Geophysical Research, 1978, Qualitative aeromagnetic evaluation of structures in the Columbia Plateau and adjacent Cascade mountain area: Weston Geophysical Research [under contract to] Washington Public Power Supply System, 32 p., 2 plates.

Geophysical map (magnetic): Plate 1, Composite aeromagnetic map, scale 1:250,000.

720. Whetten, J. T., 1980, Preliminary bedrock geologic map of the Chiwaukum 4 SE quadrangle, Chiwaukum graben, Washington: U.S. Geological Survey Open-File Report 80-723, 5 p., 1 plate.

Geologic map: Plate, scale 1:24,000.

721. Whetten, J. T., 1980, Preliminary bedrock geologic map of the Chiwaukum 4 NW quadrangle, Chiwaukum graben, Washington: U.S. Geological Survey Open-File Report 80-456, 7 p., 1 plate.

Geologic map: Plate, scale 1:24,000.

722. Whetten, J. T., 1980, Preliminary bedrock geologic map of the east half of the Chiwaukum 4 SW quadrangle, Chiwaukum graben, Washington: U.S. Geological Survey Open-File Report 80-616, 6 p., 1 plate.

Geologic map: Plate, scale 1:24,000.

723. Whetten, J. T.; Carroll, P. I.; Gower, H. D.; Brown, E. H.; Pessl, Fred, Jr., 1988, Bedrock geologic map of the Port Townsend 30- by 60-minute quadrangle, Puget Sound region, Washington: U.S. Geological Survey Miscellaneous Investigations Series map I-1198-G, 1 sheets.

Geologic map: scale 1:100,000.

724. Whetten, J. T.; Dethier, D. P.; Carroll, P. R., 1979, Preliminary geologic map of the Clear Lake NE quadrangle, Skagit County, Washington: U.S. Geological Survey Open-File Report 79-1468, 10 p., 2 plates.

Geologic map: scale 1:24,000.

725. Whetten, J. T.; Dethier, D. P.; Carroll, P. R., 1980, Preliminary geologic map of the Clear Lake NW quadrangle, Skagit County, Washington: U.S. Geological Survey Open-File Report 80-247, 13 p., 2 plates.

*Geologic map:*scale 1:24,000.

726. Whetten, J. T.; Laravie, J. A., 1976, Preliminary geologic map of the Chiwaukum 4 NE quadrangle, Chiwaukum graben, Washington: U.S. Geological Survey Miscellaneous Field Studies Map MF-794, 1 sheet, scale 1:24,000.

Geologic map: scale 1:24,000.

727. Whetten, J. T.; Waitt, R. B., Jr., 1978, Preliminary geologic map of the Cashmere quadrangle, Chiwaukum lowland, Washington: U.S. Geological Survey Miscellaneous Field Studies Map MF-908, 1 sheet, scale 1:24,000.

Geologic map: scale 1:24,000.

728. Whitwell, G. E.; Patty, E. N., 1921, The magnesite deposits of Washington, their occurrence and technology: Washington Geological Survey Bulletin 25, 194 p.

Geologic map: Plate II, Geologic map of the Stevens County magnesite area, scale 1:125,000.

729. Wildrick, L. L., 1982, repr. 1991, Decreasing streamflow and possible ground water depletion in the Sinking Creek watershed, Lincoln County, Washington: Washington Department of Ecology Open-File Technical Report 82-6, 41 p., 5 plates.

Geologic map: Plate 1, scale 1:62,500.

730. Wilkinson, W. D.; Lowry, W. D.; Baldwin, E. M., 1946, Geology of the St. Helens quadrangle, Oregon: Oregon Department of Geology and Mineral Industries Bulletin 31, 39 p., 1 plate.

Geologic map: Plate, Geologic map of the St. Helens quadrangle, Oregon-Washington, scale 1:62,500.

731. Williams, D. L.; Abrams, G. A.; Finn, Carol; Dzurisin, Daniel; Johnson, D. J.; Denlinger, R. P., 1987, Evidence from gravity data for an intrusive complex beneath Mount St. Helens: Journal of Geophysical Research, v. 92, no. B10, p. 10,207-10,222.

Geophysical map (gravity): Fig. 2, Bouguer anomaly map of Mount St. Helens area at 2-mGal contour interval, scale 1:225,000.

732. Williams, D. L.; Finn, Carol, 1987, Evidence for a shallow pluton beneath the Goat Rocks Wilderness, Washington, from gravity and magnetic data: Journal of Geophysical Research, v. 92, no. B6, p. 4867-4880.

Geophysical maps:

732a *(gravity)* Plate 1, Residual Bouguer gravity anomaly map of the Goat Rocks area at a 2-mGal contour interval, scale 1:330,000.

732b *(magnetic)* Plate 2, Aeromagnetic map of the Goat Rocks Wilderness area, scale 1:330,000.

733. Williams, D. L.; Finn, Carol; Couch, R. W.; Danes, Z. F.; Pitts, G. S.; Phillips, W. M.; Riddihough, R. P., 1988, Residual Bouguer gravity anomaly map of the Cascade Range, California, Oregon, Washington, and British Columbia: U.S. Geological Survey Geophysical Investigations Map GP-973, 2 sheets.

Geophysical map (gravity): Sheet 2, scale 1:500,000.

734. Williams, D. L.; Finn, Carol; Spydell, D. R.; Danes, Z. F., 1984, Gravity and aeromagnetic maps of the Goat Rocks Wilderness and adjacent roadless areas, Lewis and Yakima Counties, Washington: U.S. Geological Survey Miscellaneous Field Studies map MF-1653-C, 2 sheets.

Geophysical maps:

734a *(gravity)* Map A, Bouguer gravity map, scale 1:48,000.

734b *(magnetic)* Map B, Aeromagnetic map, scale 1:48,000.

735. Williams, I. A., 1930, Report on geologic conditions at Ariel dam site, north fork of Lewis River, Washington: Northwestern Electric Company [Portland], 3 v., 2 plates.

Geologic maps:

Plate 1, Surface geologic map, scale 1:1,200.
Plate 2, Bedrock geologic map, scale 1:1,200.

736. Willis, Bailey; Smith, G. O., 1899, Geologic atlas of the United States—Tacoma folio, Washington: U.S. Geological Survey Geologic Folio 54, 10 p.

Geologic map: Plate, Historical geology sheet, scale 1:125,000.

737. Wilson, J. R., 1980, Preliminary geologic map of the Boyds quadrangle, Ferry and Stevens Counties, Washington: U.S. Geological Survey Open-File Report 80-983, 2 sheets, scale 1:24,000.

Geologic map: scale 1:24,000.

738. Wilson, J. R., 1981, Geologic map of the Bangs Mountain quadrangle, Ferry and Stevens Counties, Washington: U.S. Geological Survey Open-File Report 81-581, 2 sheets, scale 1:24,000.

Geologic map: scale 1:24,000.

739. Wilson, J. R., 1983, Relationships between late Quaternary faults and earthquakes in the Puget Sound, Washington area. *In* Yount, J. C.; Crosson, R. S., editors, Proceedings of workshop XIV, Earthquake hazards of the Puget Sound region, Washington: U.S. Geological Survey Open-File Report 83-19, p. 165-177.

Geologic map: Figure 1, Geologic map of area of late Quaternary faulting, scale 1:93,000.

740. Wise, W. S., 1970, Cenozoic volcanism in the Cascade mountains of southern Washington: Washington Division of Mines and Geology Bulletin 60, 45 p., 1 plate.

Geologic map: Plate 1, Geologic map and sections of the Wind River area, Skamania County, Washington, scale 1:125,000.

741. Wolf, S. C.; Hamer, M. R.; McCrory, P. A., 1997, Quaternary geologic investigations of the continental shelf offshore southern Washington and northern Oregon: U.S. Geological Survey Open-File Report 97-677, 4 sheets, scale 1:500,000.

Geologic maps:

Sheet 2, Quaternary erosional surface, scale 1:500,000.

Sheet 3, Isopach map of unconsolidated sediments, scale 1:500,000.

Sheet 4, Geologic structures, scale 1:500,000.

742. Wolfe, E. W.; McKee, E. H., 1968, Geology of the Grays River quadrangle, Wahkiakum and Pacific Counties, Washington: Washington Division of Mines and Geology Geologic Map GM-4, 1 sheet, scale 1:62,500, with 6 p. text.

Geologic map: scale 1:62,500.

743. Wolfe, E. W.; McKee, E. H., 1972, Sedimentary and igneous rocks of the Grays River quadrangle, Washington: U.S. Geological Survey Bulletin 1335, 70 p.

Geologic map: Figure 4, Generalized geologic map of the Grays River quadrangle showing location of samples collected for fossils, for chemical analysis, or for heavy minerals, scale 1:200,000.

744. Wong, Ivan; Sparks, Andrew; Metcalfe, Bob; Wright, Douglas; Stokoe, Ken; Young, James, 1999, Probabilistic seismic hazard analysis and ground shaking microzonation maps for the Seattle, Washington, metropolitan area—Characterization of the near-surface geology (year 1); Final technical report, program element II evaluate urban hazard and risk: URS Greiner Woodward-Clyde Federal Services, 129 p., 2 plates.

Geologic maps:

Plate 1, Surficial geology of the Seattle metropolitan area including locations of geotechnical borehole, water well, geologic cross section, and shear-wave velocity data, scale 1:83,000.

Plate 2, Surficial geology and depth to bedrock in the Seattle metropolitan area, scale1:82,000.

745. Woodward-Clyde Consultants, 1979, Geologic mapping for category I excavations, Washington Public Power Supply System nuclear projects no. 3 and 5; Volume 1, Summary report: Woodward-Clyde Consultants [under contract to] Ebasco Services, 67 p.

Geologic map: Figure 2, Geologic map of the site area, scale 1:19,000.

746. Woodward, D. G.; Packard, F. A.; Dion, N. P.; Sumioka, S. S., 1995, Occurrence and quality of ground water in southwestern King County, Washington: U.S. Geological Survey Water-Resources Investigations Report 92-4098, 69 p., in folder with 4 plates.

Geologic map: Plate 1, scale 1:100,000

747. Wunder, J. M., 1976, Preliminary geologic map of the Utsalady quadrangle, Skagit and Snohomish Counties, Washington: Washington Division of Geology and Earth Resources Open File Report 76-10, 1 sheet, scale 1:24,000.

Geologic map: scale 1:24,000.

748. Yates, R. G., 1964, Geologic map and sections of the Deep Creek area, Stevens and Pend Oreille Counties, Washington: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-412, 1 sheet, scale 1:31,680.

Geologic map: scale 1:31,680.

749. Yates, R. G., 1971, Geologic map of the Northport quadrangle, Washington: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-603, 1 sheet, scale 1:31,680.

Geologic map: scale 1:31,680.

750. Yeats, R. S., 1964, Crystalline klippen in the Index district, Cascade Range, Washington: Geological Society of America Bulletin, v. 75, no. 6, p. 549-561, 1 plate.

Geologic map: Plate 1, Geologic map of the Mount Baring-Gunn Peak area, Cascade Range, Washington, scale 1:81,000.

751. Yost, C. R.; Steele, W. K., 1978, Gravity survey of the Cheney quadrangle, Washington: Northwest Science, v. 52, no. 3, part 2, p. 250-260.

Geophysical map (gravity): Bouguer gravity map of the Cheney quadrangle, scale 1:169,000.

752. Yount, J. C.; Gower, H. D., 1991, Bedrock geologic map of the Seattle 30′ by 60′ quadrangle, Washington: U.S. Geological Survey Open-File Report 91-147, 37 p., 4 plates.

Geologic map:

752a Plate 1, Geologic, locality, and index maps, scale 1:100,000.

Geophysical maps:

752b *(gravity)* Plate 3, Bouguer gravity map, scale 1:100,000.

752c *(magnetic)* Plate 4, Aeromagnetic map, scale 1:100,000.

753. Yount, J. C.; Minard, J. P.; Dembroff, G. R., 1993, Geologic map of surficial deposits in the Seattle 30′ x 60′ quadrangle, Washington: U.S. Geological Survey Open-File Report 93-233, 2 sheets.

Geologic map: Sheet 1, scale 1:100,000.

754. Ziegler, C. B., 1985, The geology, structure and surficial features of the Barometer–Slate Mountain area, North Cascades, Washington: U.S. Forest Service, 21 p., 2 plates.

Geologic map: Plate 1, Geology of the Barometer–Slate Mountain area, scale 1:15,840.

755. Dragovich, J. D.; Troost, M. L.; Norman, D. K.; Anderson, Garth; Cass, Jason; Gilbertson, L. A.; McKay, D. T., Jr., 2000, Geologic map of the Anacortes South and La Conner 7.5-minute quadrangles, Skagit and Island Counties, Washington: Washington Division of Geology and Earth Resources Open File Report 2000-6, 4 sheets, scale 1:24,000.

Geologic map: Plate 1, scale 1:24,000.

756. Lapen, T. J., 2000, Geologic map of the Bellingham 1:100,000 quadrangle, Washington: Washington Division of Geology and Earth Resources Open File Report 2000-5, 36 p., 2 plates.

Geologic map: Plate 1, scale 1:100,000.

757. Miller, F. K., 2001, Geologic map of the Chewelah 30′ x 60′ quadrangle, Washington and Oregon: U.S. Geological Survey Miscellaneous Field Studies Map MF-2354, 56 p., 1 plate.

Geologic map: scale 1:100,000.

758. Schasse, H. W.; Wegmann, K. W., 2000, Geologic map of the Carlsborg 7.5-minute quadrangle, Clallam County, Washington: Washington Division of Geology and Earth Resources Open File Report 2000-7, 27 p., 2 plates.

Geologic map: Plate 1, scale 1:24,000.

759. Tabor, R. W.; Frizzell, V. A., Jr.; Booth, D. B.; Waitt, R. B., 2000, Geologic map of the Snoqualmie Pass 30 x 60 minute quadrangle, Washington: U.S. Geological Survey Geologic Investigations Series I-2538, 1 sheet, scale 1:100,000, with 57 p. text.

Geologic map: scale 1:100,000.

760. Evarts, R. C., 2001, Geologic map of the Silver Lake quadrangle, Cowlitz County, Washington: U.S. Geological Survey Miscellaneous Field Studies Map MF-2371, 1 sheet, scale 1:24,000, with 37 p. text.

Geologic map: Plate, scale 1:24,000.

761. Shannon & Wilson, Inc., 2001, Geology, soil, climate, and hydrology technical report. In U.S. Bonneville Power Administration, Kangley–Echo Lake tranmission line project; Draft environmental impact statement—Appendices: U.S. Bonneville Power Administration, Appendix 7.

Geologic map: Figure 3, scale 1:24,000.

762. Pacific Groundwater Group, 1999, 1999 hydrogeologic characterization, City of Auburn: Pacific Groundwater Group [under contract to] City of Auburn, 1 v., 1 plate.

Geologic map: Figure 4-1, scale 1:46,000.

763. Bush, J. H.; Provant, A. P., 1998, Bedrock geologic map of the Viola quadrangle, Latah County, Idaho and Whitman County, Washington: Idaho Geological Survey Geologic Map 25, 1 sheet, scale 1:24,000.

Geologic map: scale 1:24,000.

764. Bush, J. H.; Provant, A. P.; Gill, S. W., 1998, Bedrock geologic map of the Moscow West quadrangle, Latah County, Idaho and Whitman County, Washington: Idaho Geological Survey Geologic Map 23, 1 sheet, scale 1:24,000.

Geologic map: scale 1:24,000. ■

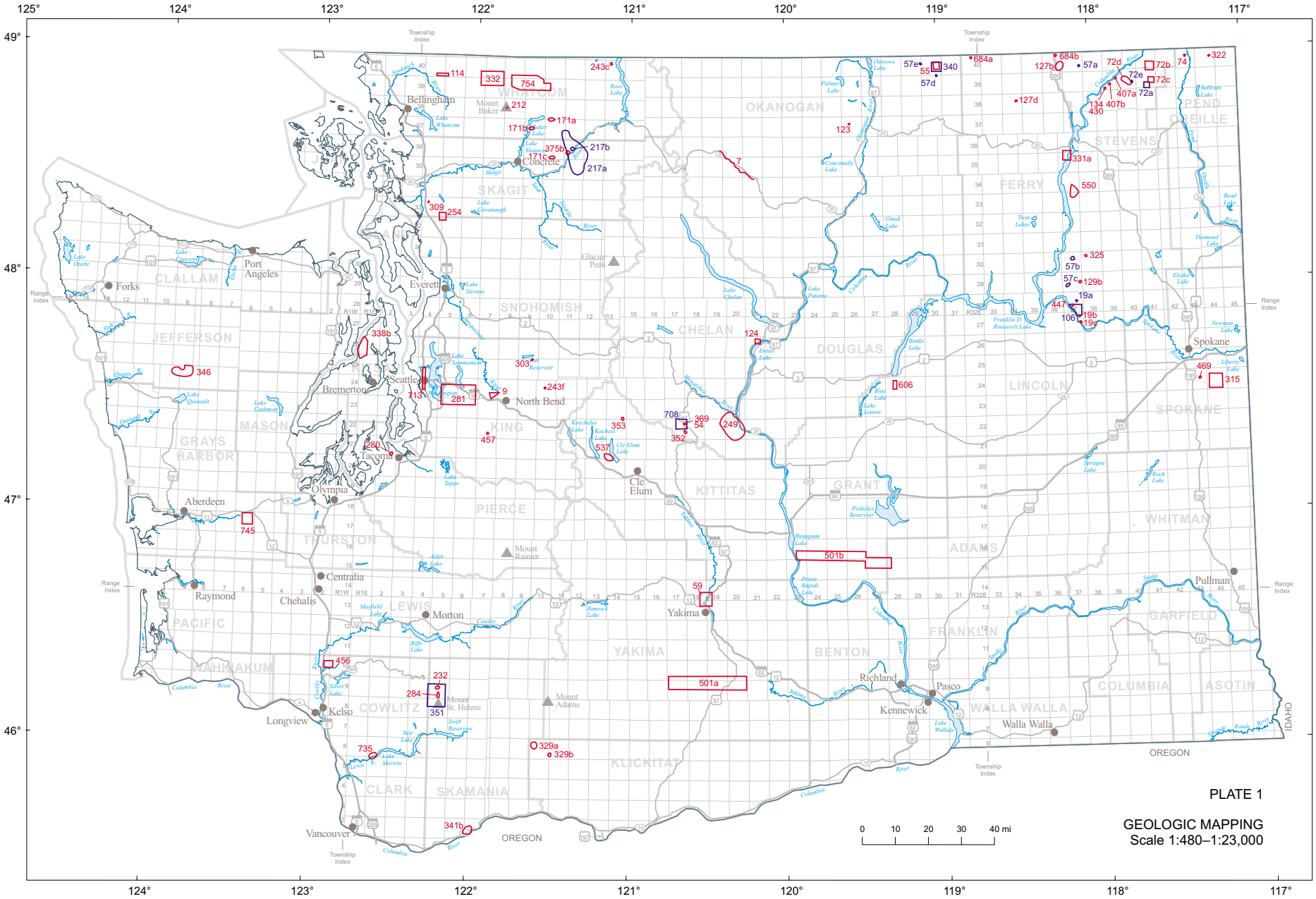
PLATE 1
GEOLOGIC MAPPING
Scale 1:480–1:23,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Mount Baker
Concrete
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Forks
Port Angeles
North Bend
Cle Elum
Yakima
Centralia
Chehalis
Raymond
Morton
Longview
Kelso
Vancouver
Mount St. Helens
Mount Adams
Mount Rainier
Glacier Peak
Spokane
Pullman
Richland
Pasco
Kennewick
Walla Walla
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
CHELAN
DOUGLAS
STEVENS
FERRY
PEND OREILLE
LINCOLN
SPOKANE
CLALLAM
JEFFERSON
KING
KITTITAS
GRANT
ADAMS
WHITMAN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
BENTON
FRANKLIN
YAKIMA
KLICKITAT
SKAMANIA
CLARK
COWLITZ
WAHKIAKUM
PACIFIC
LEWIS
THURSTON
PIERCE
MASON
GRAYS HARBOR
OREGON
IDAHO

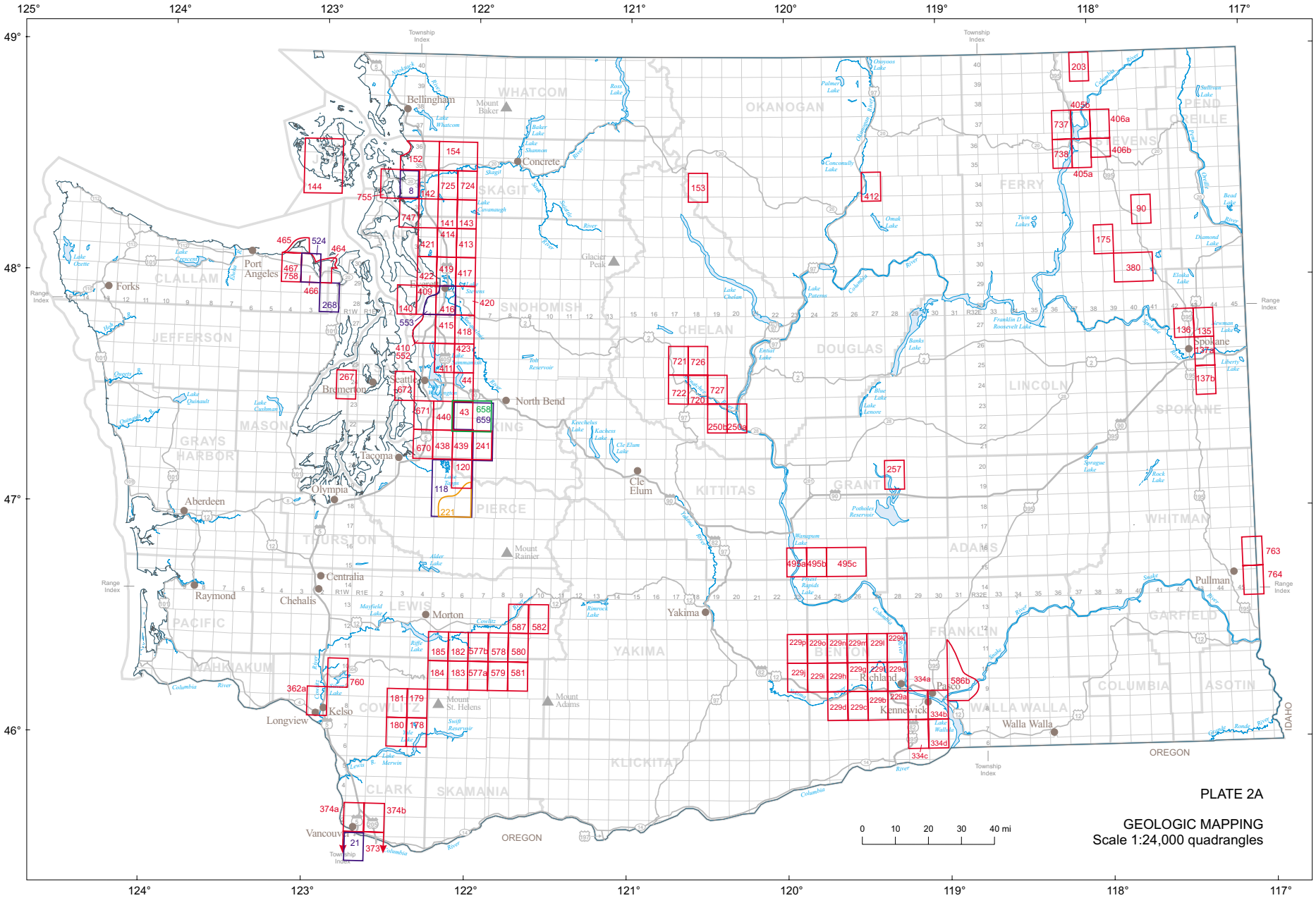
PLATE 2A
GEOLOGIC MAPPING
Scale 1:24,000 quadrangles
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Township Index
Range Index
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
CLALLAM
JEFFERSON
GRAYS HARBOR
MASON
KING
PIERCE
THURSTON
LEWIS
PACIFIC
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KITTITAS
YAKIMA
KLICKITAT
GRANT
ADAMS
FRANKLIN
BENTON
WHITMAN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
OREGON
IDAHO
Bellingham
Concrete
Port Angeles
Forks
Bremerton
Seattle
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Yakima
Centralia
Chehalis
Raymond
Morton
Kelso
Longview
Vancouver
Pullman
Richland
Kennewick
Pasco
Walla Walla
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
144
152
154
8
142
755
747
725
724
141
143
414
413
421
419
417
422
409
420
140
416
553
415
418
423
410
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411
44
672
671
440
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658
659
670
438
439
241
120
118
221
465
524
464
467
758
466
268
267
153
412
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726
722
720
727
250b
250a
257
495a
495b
495c
203
405b
406a
737
406b
738
405a
90
175
380
136
135
137a
137b
763
764
229p
229o
229n
229m
229l
229k
229j
229i
229h
229g
229f
229e
229d
229c
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229a
334a
334b
334c
334d
586b
587
582
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182
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760
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374a
374b
21
373

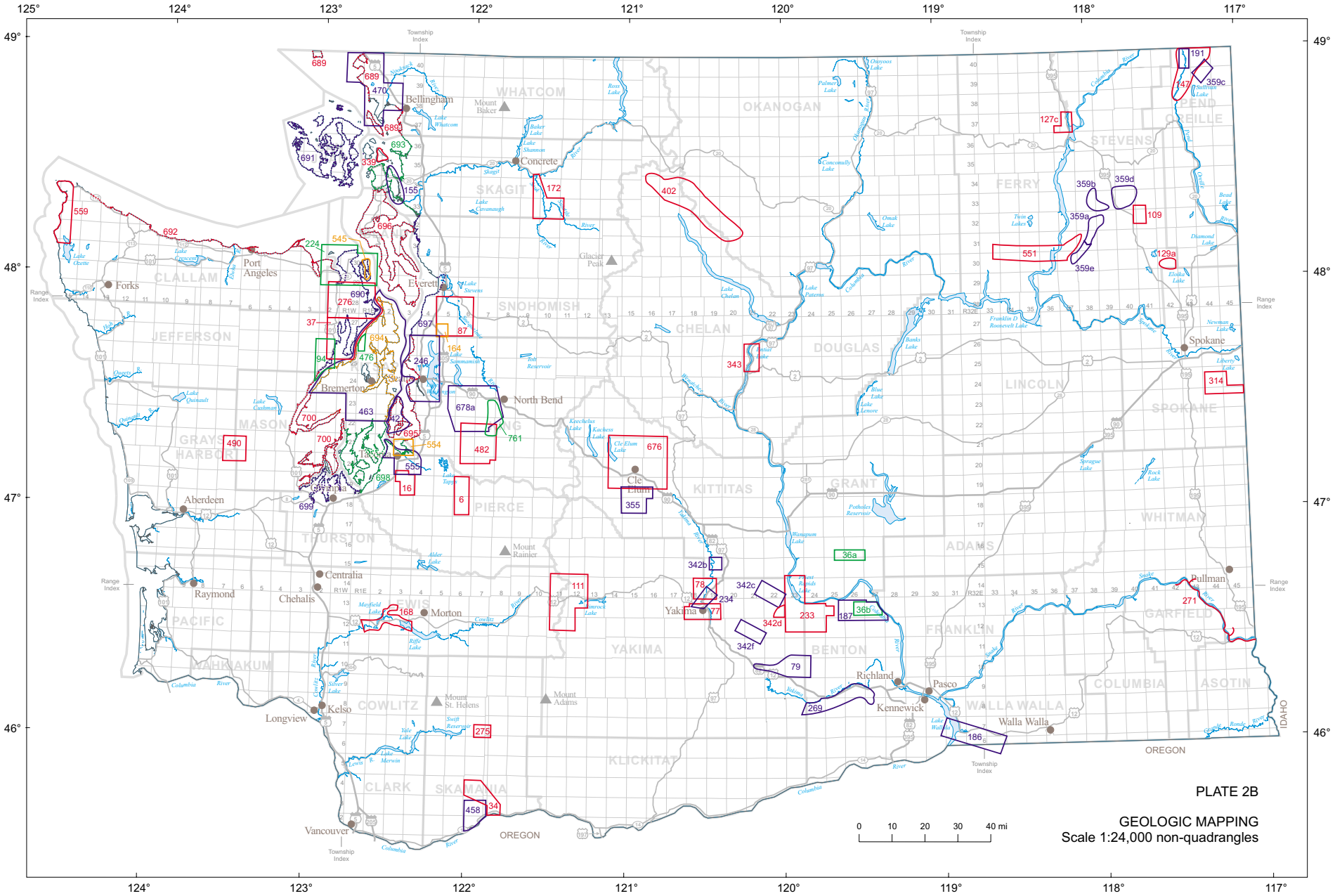
PLATE 2B
GEOLOGIC MAPPING
Scale 1:24,000 non-quadrangles
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125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
WHATCOM
SKAGIT
SNOHOMISH
CLALLAM
JEFFERSON
KING
KITSAP
MASON
GRAYS HARBOR
PIERCE
THURSTON
LEWIS
PACIFIC
MAHKAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
YAKIMA
KITTITAS
CHELAN
OKANOGAN
DOUGLAS
GRANT
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
ADAMS
WHITMAN
FRANKLIN
BENTON
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
Bellingham
Concrete
Everett
Seattle
Bremerton
North Bend
Port Angeles
Forks
Aberdeen
Raymond
Chehalis
Centralia
Morton
Kelso
Longview
Vancouver
Yakima
Cle Elum
Spokane
Pullman
Richland
Pasco
Kennewick
Walla Walla
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
OREGON
IDAHO
Range Index
Township Index

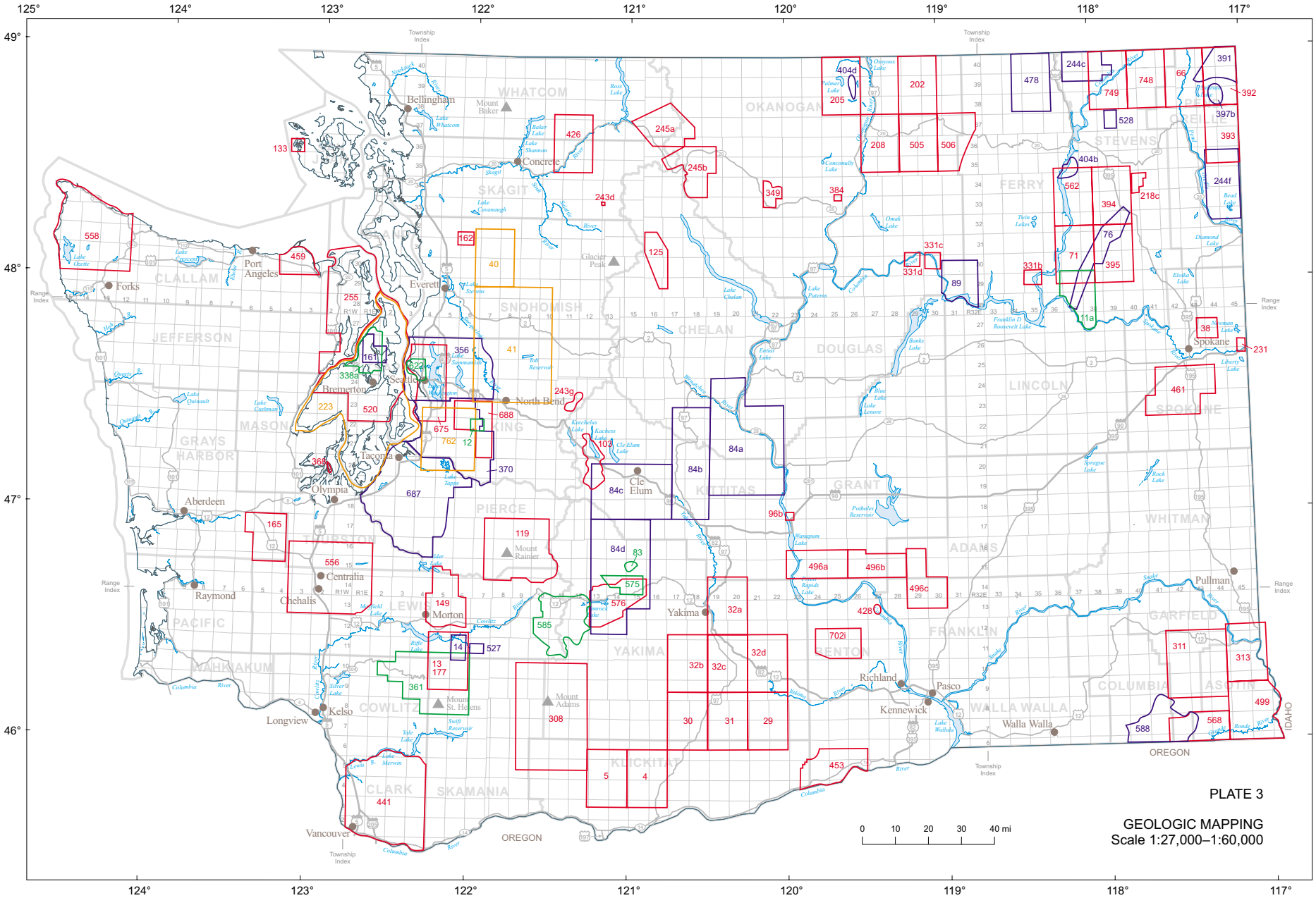
PLATE 3
GEOLOGIC MAPPING
Scale 1:27,000–1:60,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
WHATCOM
SKAGIT
SNOHOMISH
CLALLAM
JEFFERSON
KING
KITSAP
MASON
GRAYS HARBOR
THURSTON
PIERCE
LEWIS
PACIFIC
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
YAKIMA
OKANOGAN
CHELAN
DOUGLAS
KITTITAS
GRANT
FERRY
STEVENS
LINCOLN
SPOKANE
ADAMS
FRANKLIN
BENTON
WHITMAN
GARFIELD
COLUMBIA
WALLA WALLA
ASOTIN
Bellingham
Mount Baker
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Raymond
Centralia
Chehalis
Morton
Longview
Kelso
Vancouver
Mount Rainier
Mount St. Helens
Mount Adams
Glacier Peak
North Bend
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
OREGON
IDAHO
Township Index
Range Index

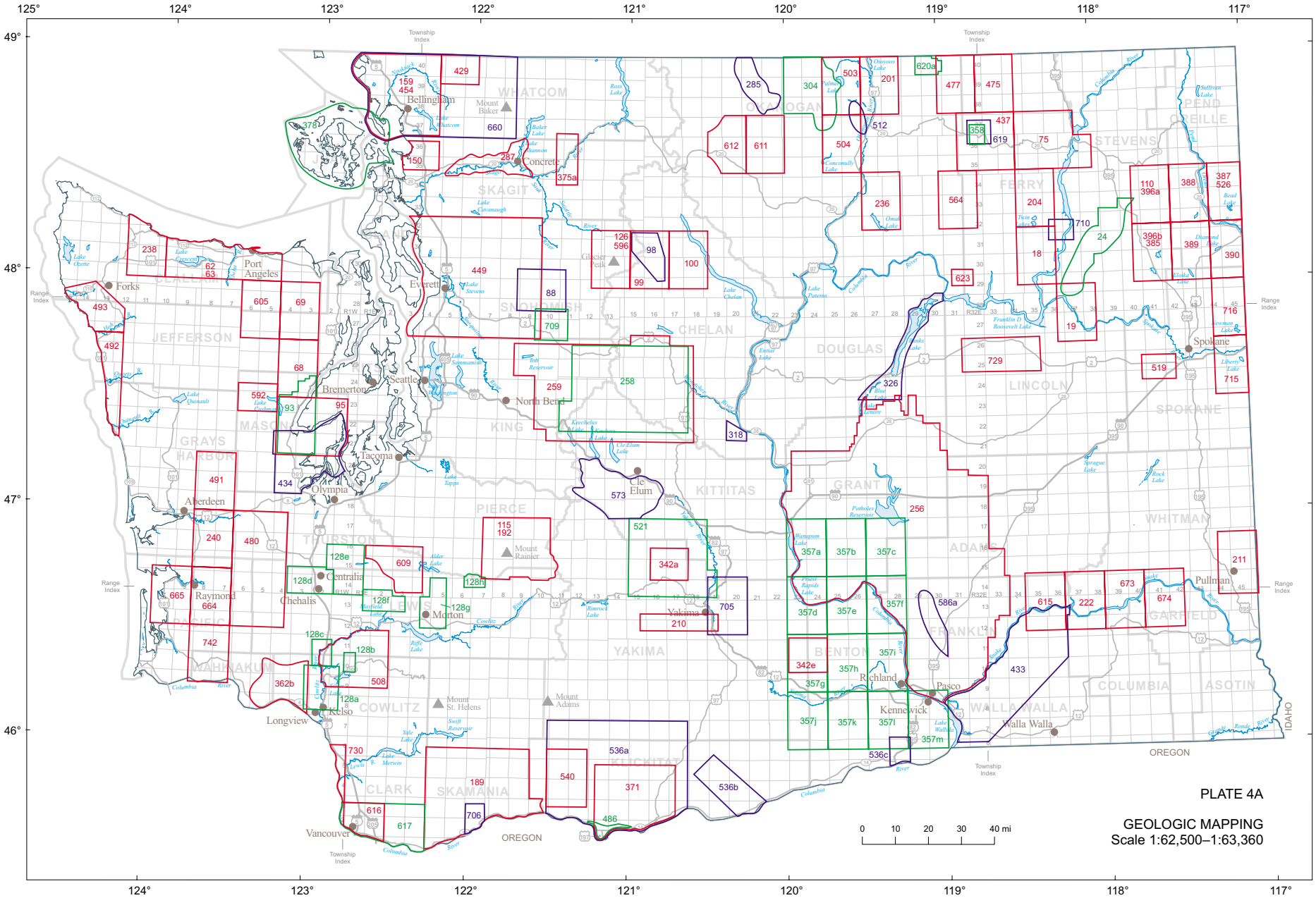
PLATE 4A
GEOLOGIC MAPPING
Scale 1:62,500–1:63,360
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125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Mount Baker
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Raymond
Chehalis
Centralia
Morton
Kelso
Longview
Vancouver
Mount Rainier
Mount St. Helens
Mount Adams
Glacier Peak
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
DOUGLAS
OKANOGAN
STEVENS
FERRY
PEND OREILLE
LINCOLN
SPOKANE
WHITMAN
GARFIELD
ADAMS
GRANT
FRANKLIN
BENTON
COLUMBIA
ASOTIN
WALLA WALLA
KITTITAS
YAKIMA
KLICKITAT
SKAMANIA
CLARK
COWLITZ
WAHKIAKUM
PACIFIC
LEWIS
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GRAYS HARBOR
JEFFERSON
CLALLAM
OREGON
IDAHO
Range Index
Township Index

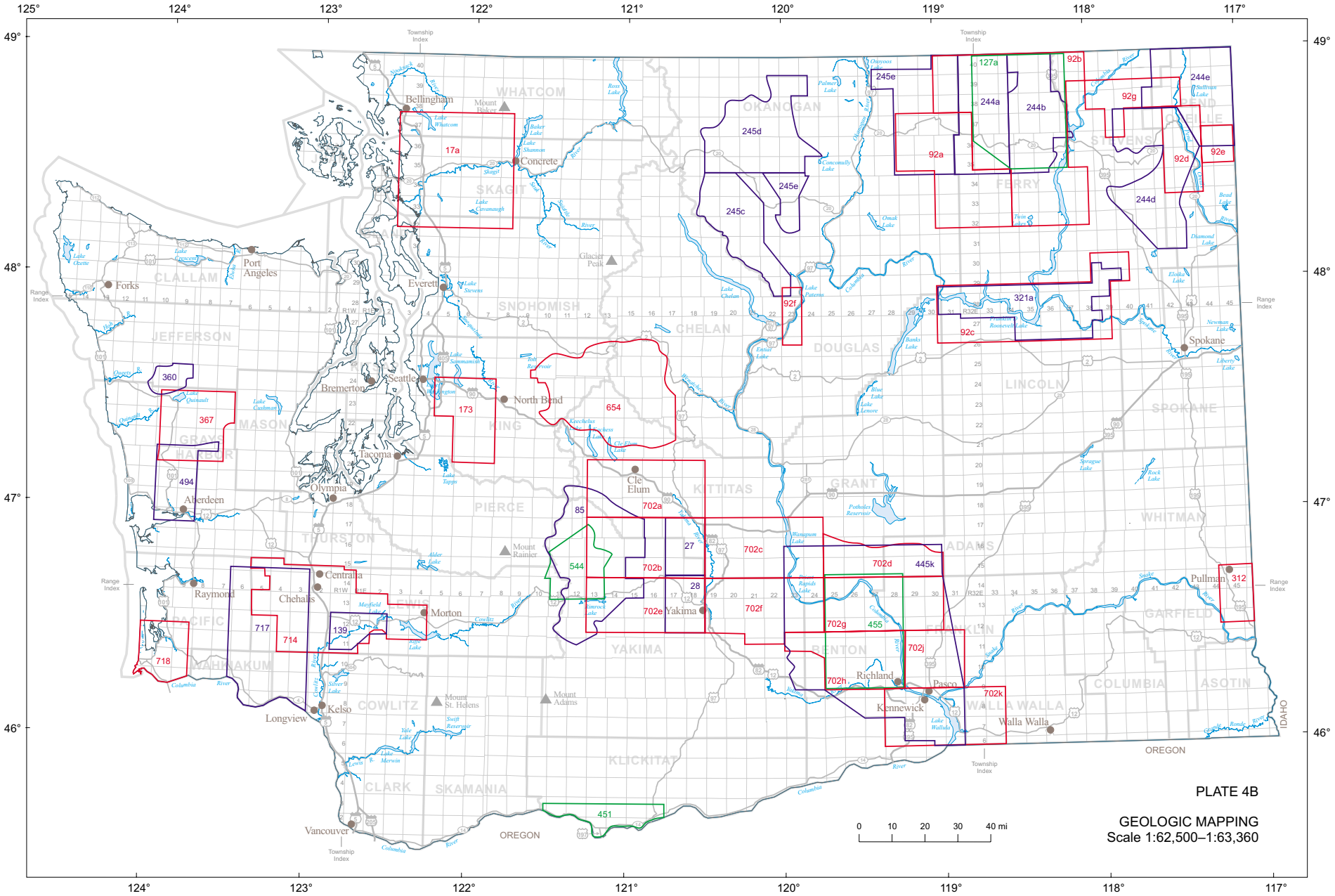
PLATE 4B
GEOLOGIC MAPPING
Scale 1:62,500–1:63,360
0 10 20 30 40 mi
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
WHITMAN
GARFIELD
ASOTIN
COLUMBIA
WALLA WALLA
FRANKLIN
BENTON
ADAMS
GRANT
KITTITAS
YAKIMA
KLICKITAT
SKAMANIA
CLARK
COWLITZ
WAHKIAKUM
PACIFIC
LEWIS
THURSTON
PIERCE
KING
MASON
GRAYS HARBOR
JEFFERSON
CLALLAM
Bellingham
Concrete
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Port Angeles
Forks
North Bend
Cle Elum
Yakima
Centralia
Chehalis
Morton
Raymond
Kelso
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Vancouver
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Kennewick
Walla Walla
Spokane
Pullman
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
OREGON
IDAHO
17a
173
654
360
367
494
85
544
702a
702b
702c
702d
702e
702f
702g
702h
702j
702k
445k
455
27
28
717
714
139
718
451
92a
92b
92c
92d
92e
92f
92g
127a
244a
244b
244d
244e
245c
245d
245e
321a
312

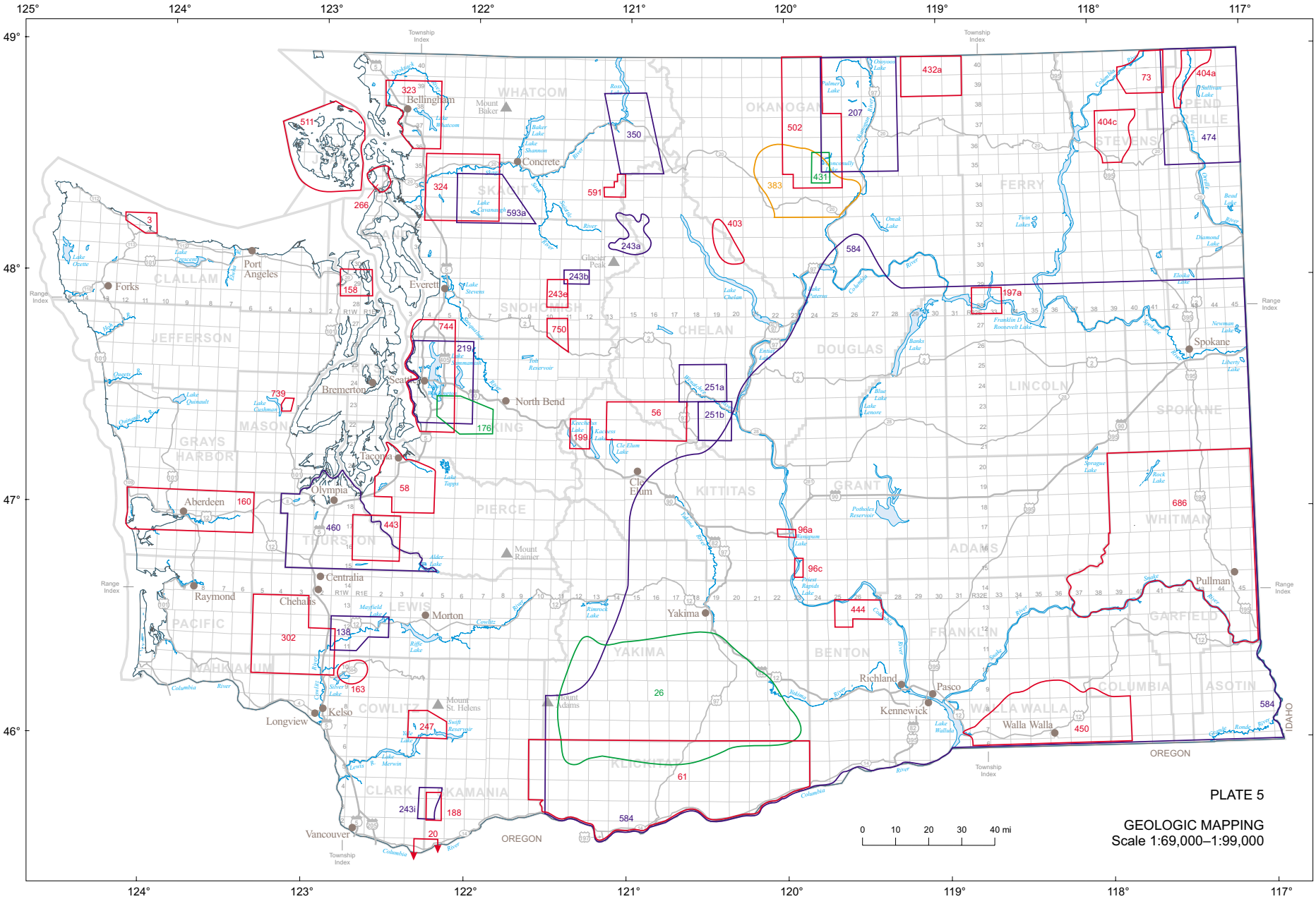
PLATE 5
GEOLOGIC MAPPING
Scale 1:69,000–1:99,000
0 10 20 30 40 mi
OREGON
IDAHO
Township Index
Range Index
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
GARFIELD
FRANKLIN
BENTON
YAKIMA
KITTITAS
PIERCE
KING
MASON
GRAYS HARBOR
JEFFERSON
CLALLAM
PACIFIC
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
LEWIS
THURSTON
COLUMBIA
ASOTIN
WALLA WALLA
Bellingham
Mount Baker
Concrete
Glacier Peak
Everett
Port Angeles
Forks
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Mount Rainier
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Kelso
Longview
Mount St. Helens
Mount Adams
Vancouver
3
511
323
266
324
593a
350
591
243a
243b
243e
750
744
219
176
739
160
58
460
443
302
138
163
247
243i
188
20
26
61
584
403
502
207
431
383
432a
73
404a
404c
474
197a
251a
251b
56
199
96a
96c
444
686
450

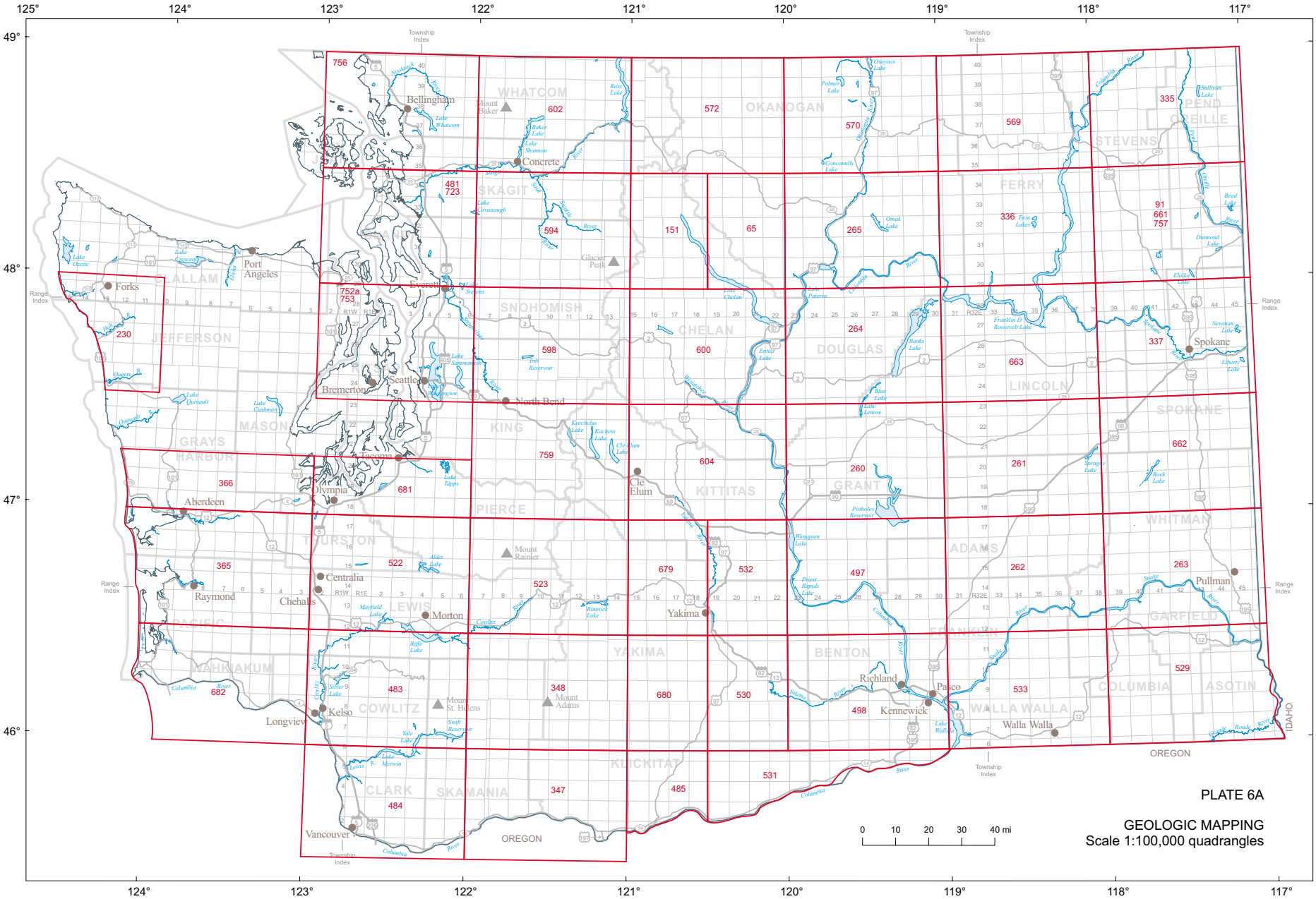
PLATE 6A
GEOLOGIC MAPPING
Scale 1:100,000 quadrangles
0 10 20 30 40 mi
WHATCOM
OKANOGAN
STEVENS
PEND OREILLE
SKAGIT
FERRY
CLALLAM
JEFFERSON
SNOHOMISH
CHELAN
DOUGLAS
LINCOLN
SPOKANE
MASON
GRAYS HARBOR
KING
KITTITAS
GRANT
WHITMAN
TOURSTON
PIERCE
ADAMS
LEWIS
PACIFIC
YAKIMA
BENTON
FRANKLIN
GARFIELD
WAHKIAKUM
COWLITZ
WALLA WALLA
COLUMBIA
ASOTIN
CLARK
SKAMANIA
KLICKITAT
OREGON
IDAHO
Bellingham
Concrete
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Kelso
Longview
Vancouver
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Port Angeles
Forks
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
Township Index
Range Index

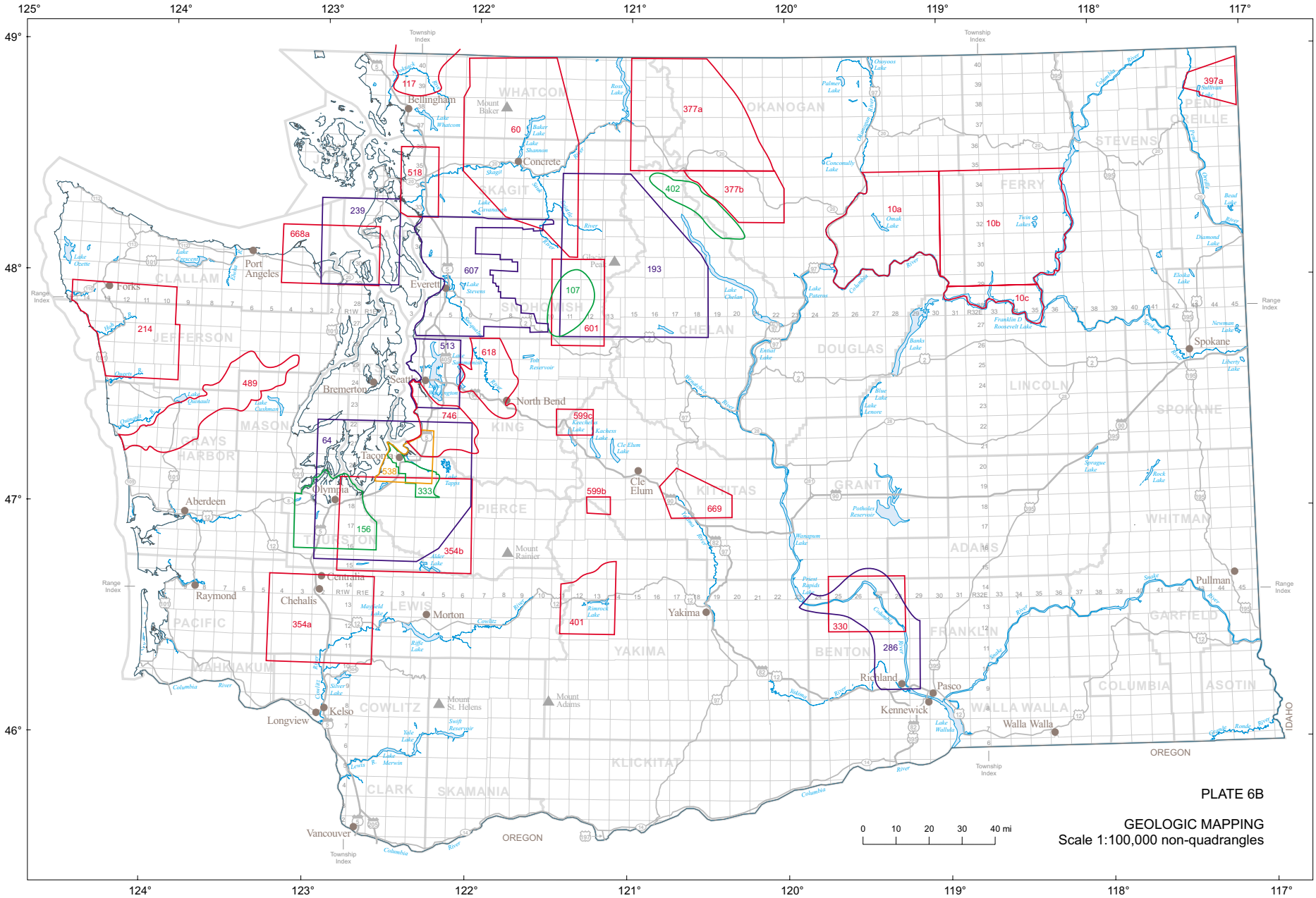
PLATE 6B
GEOLOGIC MAPPING
Scale 1:100,000 non-quadrangles
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Raymond
Chehalis
Centralia
Morton
Kelso
Longview
Vancouver
North Bend
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
WHATCON
SKAGIT
OKANOGAN
STEVENS
PEND OREILLE
FERRY
CLALLAM
JEFFERSON
SNOHOMISH
CHELAN
DOUGLAS
LINCOLN
SPOKANE
KING
MASON
GRAYS HARBOR
PIERCE
KITTITAS
GRANT
WHITMAN
ADAMS
THURSTON
LEWIS
PACIFIC
YAKIMA
BENTON
FRANKLIN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
MAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
OREGON
IDAHO
Range Index
Township Index
117
60
518
239
668a
607
214
489
513
618
746
64
538
333
156
354b
354a
601
107
193
402
377a
377b
10a
10b
10c
397a
599c
599b
669
401
330
286

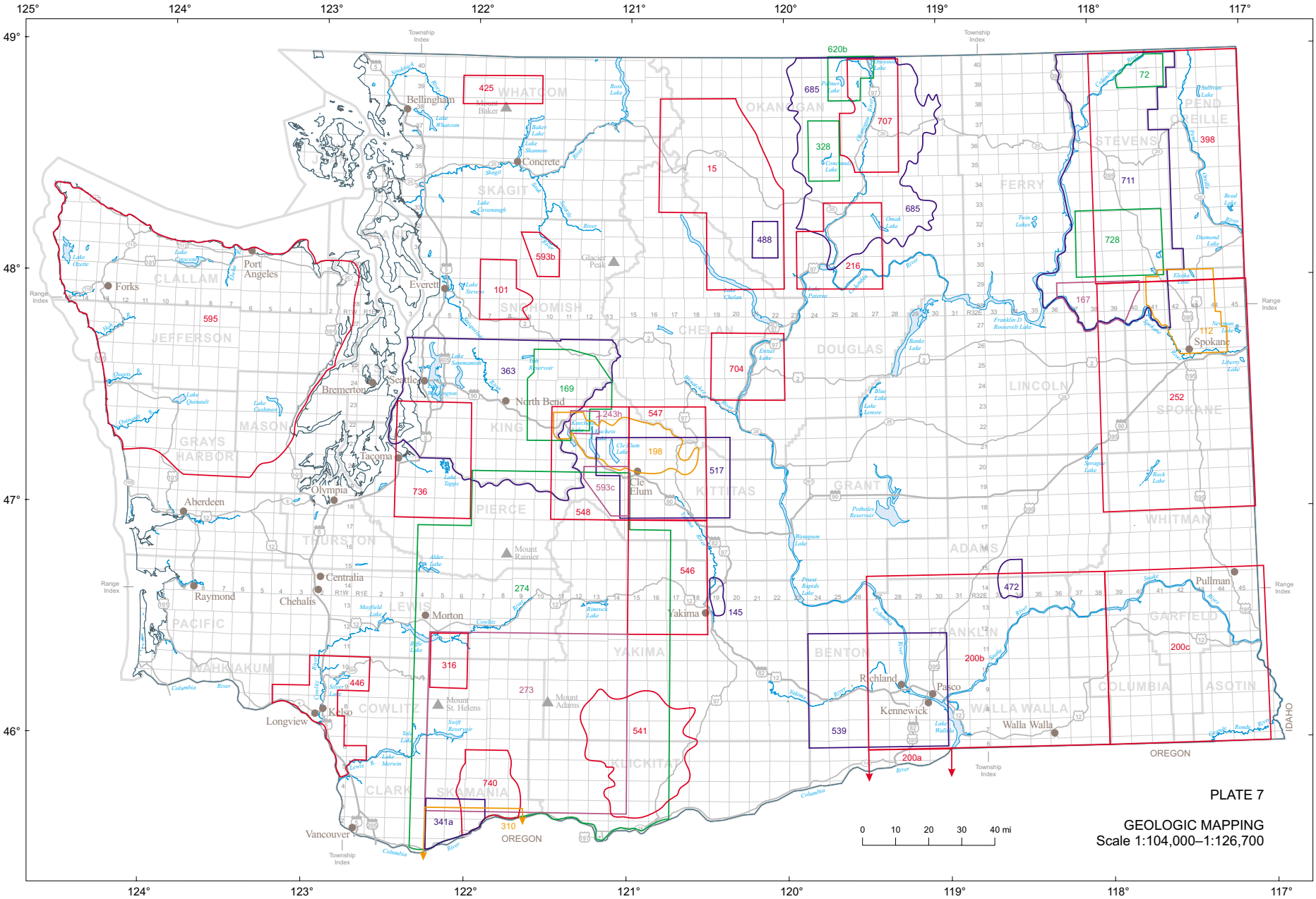
PLATE 7
GEOLOGIC MAPPING
Scale 1:104,000–1:126,700
0 10 20 30 40 mi
OREGON
IDAHO
Township Index
Range Index
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
CHELAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
CLALLAM
JEFFERSON
GRAYS HARBOR
MASON
KING
PIERCE
THURSTON
LEWIS
PACIFIC
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
YAKIMA
KITTITAS
GRANT
LINCOLN
SPOKANE
WHITMAN
ADAMS
FRANKLIN
BENTON
WALLA WALLA
COLUMBIA
GARFIELD
ASOTIN
Bellingham
Concrete
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Kelso
Longview
Vancouver
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Port Angeles
Forks
Glacier Peak
Mount Baker
Mount Rainier
Mount St. Helens
Mount Adams
425
593b
101
595
363
169
243h
547
198
517
593c
548
736
546
274
316
446
273
541
740
341a
310
15
488
685
620b
707
328
216
704
72
398
711
728
167
112
252
472
200b
200c
539
200a
145

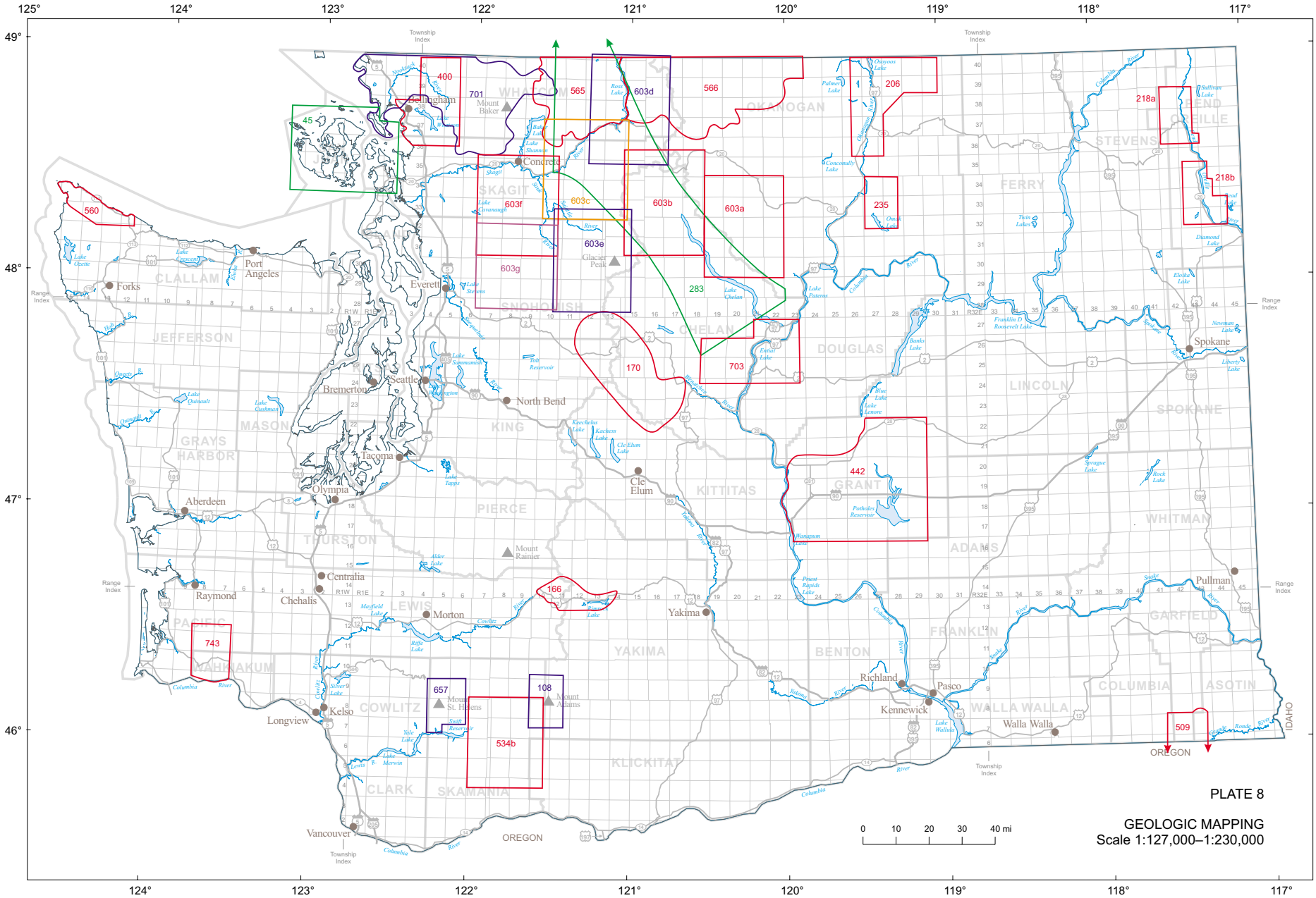
PLATE 8
GEOLOGIC MAPPING
Scale 1:127,000–1:230,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Concrete
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Forks
Port Angeles
Raymond
Chehalis
Centralia
Longview
Kelso
Vancouver
Morton
North Bend
Cle Elum
Yakima
Spokane
Pullman
Richland
Pasco
Kennewick
Walla Walla
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
DOUGLAS
OKANOGAN
STEVENS
FERRY
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
FRANKLIN
BENTON
YAKIMA
KITTITAS
KING
PIERCE
THURSTON
LEWIS
COWLITZ
CLARK
SKAMANIA
KLICKITAT
MASON
GRAYS HARBOR
PACIFIC
WAHKIAKUM
JEFFERSON
CLALLAM
OREGON
IDAHO
Township Index
Range Index
400
701
565
603d
566
206
218a
218b
45
560
603f
603c
603b
603a
235
603e
603g
283
170
703
442
166
743
657
108
534b
509

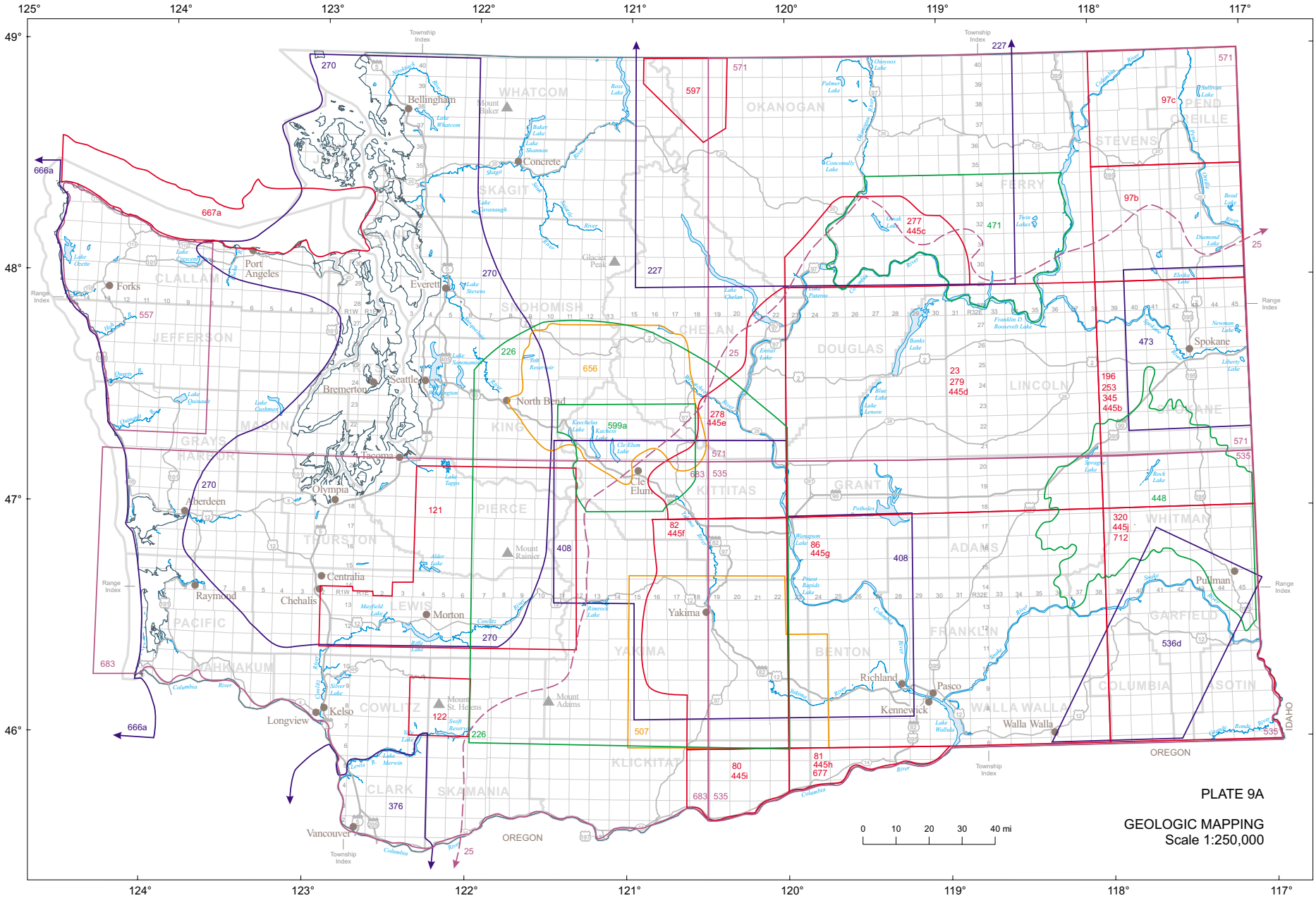
PLATE 9A
GEOLOGIC MAPPING
Scale 1:250,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
FERRY
STEVENS
PEND OREILLE
CHELAN
DOUGLAS
LINCOLN
SPOKANE
JEFFERSON
CLALLAM
KING
KITTITAS
GRANT
ADAMS
WHITMAN
GRAYS HARBOR
MASON
PIERCE
THURSTON
LEWIS
PACIFIC
WAHKIAKUM
YAKIMA
BENTON
FRANKLIN
GARFIELD
COWLITZ
CLARK
SKAMANIA
KLICKITAT
COLUMBIA
ASOTIN
WALLA WALLA
OREGON
IDAHO
Bellingham
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Centralia
Chehalis
Raymond
Morton
Yakima
Richland
Pasco
Kennewick
Walla Walla
Pullman
Spokane
Kelso
Longview
Vancouver
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
Township Index
Range Index

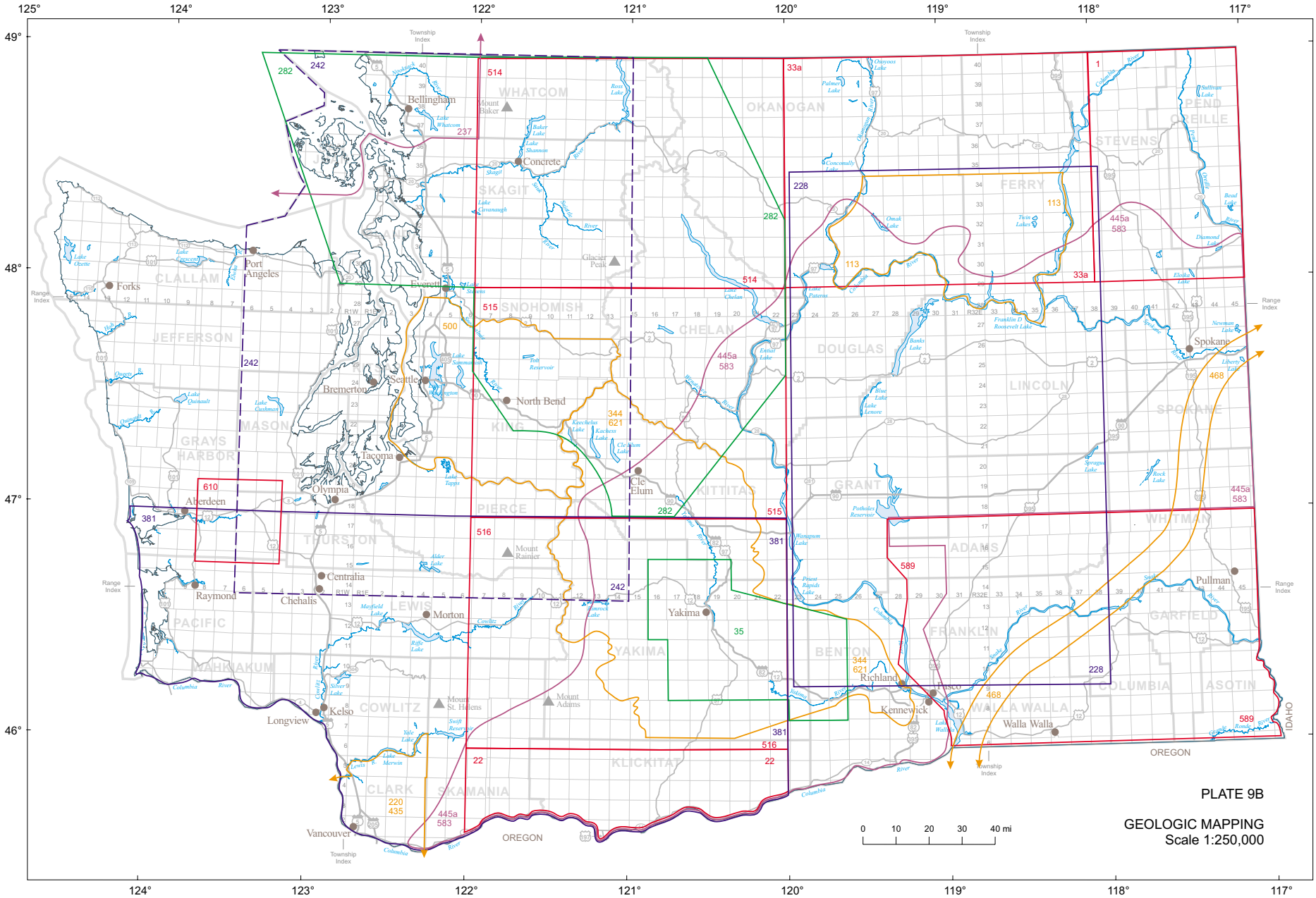
PLATE 9B
GEOLOGIC MAPPING
Scale 1:250,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
FERRY
STEVENS
PEND OREILLE
CLALLAM
JEFFERSON
KING
CHELAN
DOUGLAS
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
GRAYS HARBOR
MASON
PIERCE
KITTITAS
THURSTON
LEWIS
YAKIMA
BENTON
FRANKLIN
GARFIELD
PACIFIC
WAHKIAKUM
COWLITZ
KLICKITAT
COLUMBIA
ASOTIN
WALLA WALLA
CLARK
SKAMANIA
Bellingham
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Centralia
Chehalis
Raymond
Morton
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Kelso
Longview
Vancouver
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
OREGON
IDAHO
Township Index
Range Index

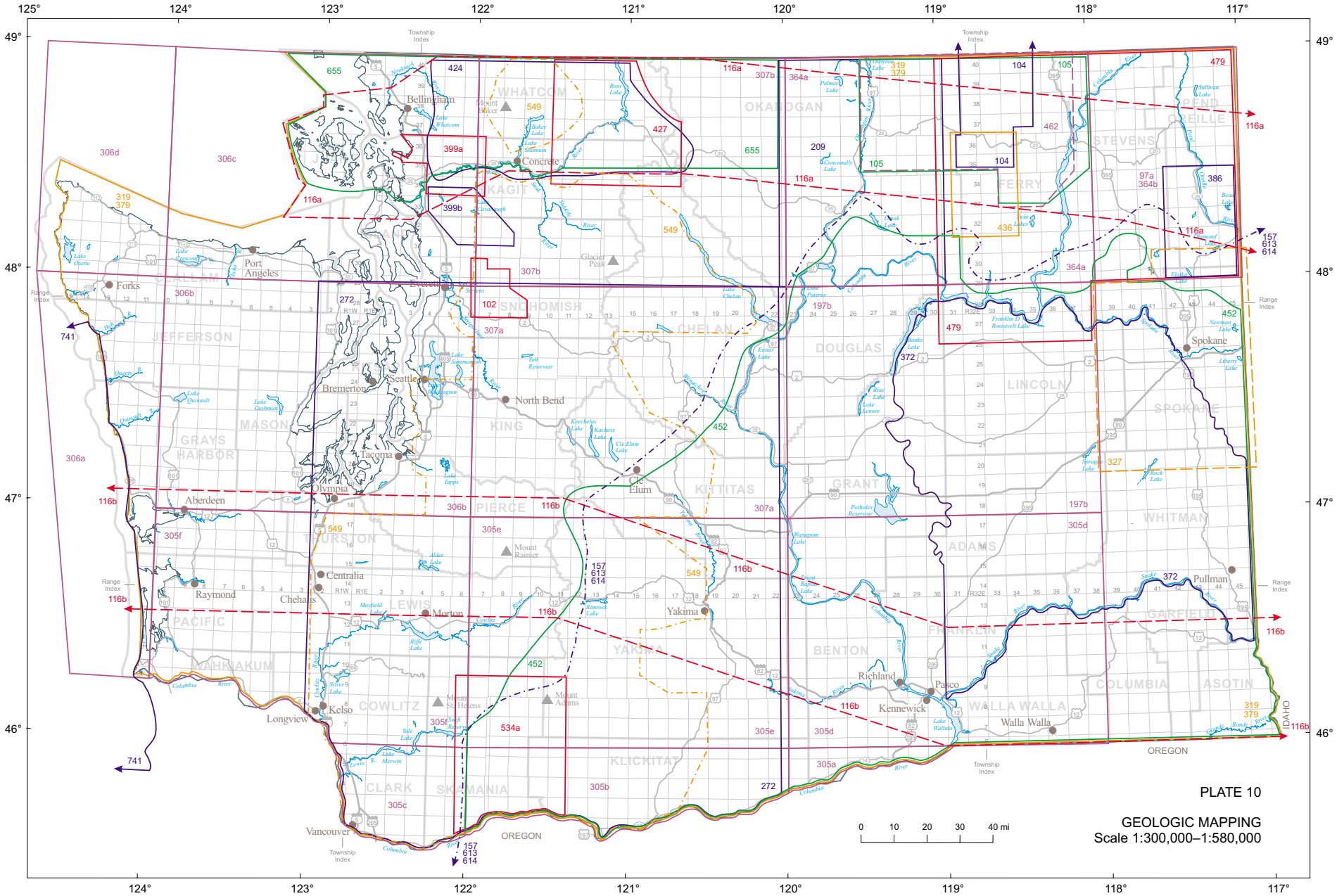
PLATE 10
GEOLOGIC MAPPING
Scale 1:300,000–1:580,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Concrete
Port Angeles
Forks
Bremerton
Seattle
North Bend
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Longview
Kelso
Vancouver
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
CHELAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
BENTON
FRANKLIN
YAKIMA
KITTITAS
KING
PIERCE
THURSTON
MASON
GRAYS HARBOR
JEFFERSON
CLALLAM
PACIFIC
LEWIS
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
OREGON
IDAHO
Range Index
Township Index

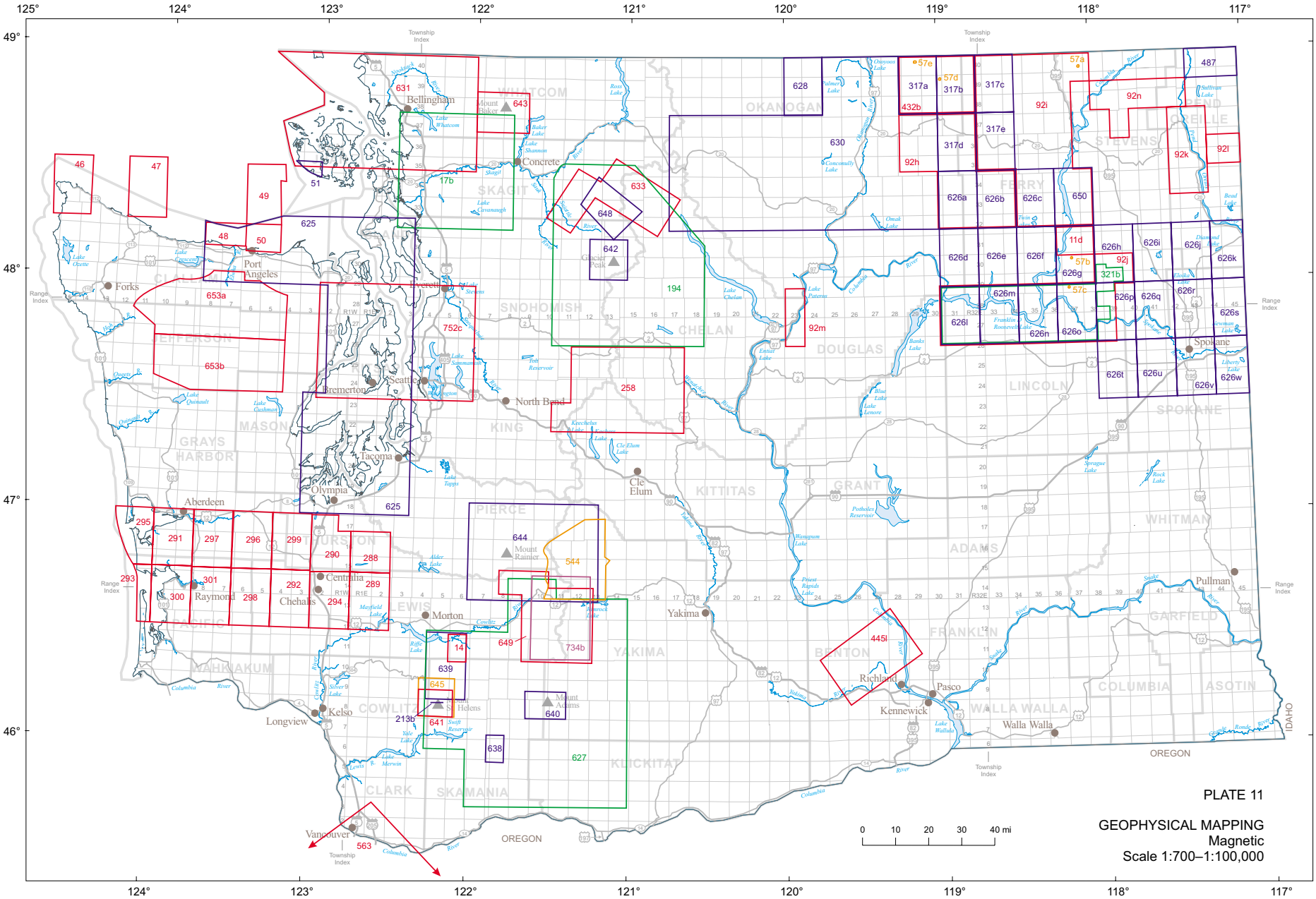
PLATE 11
GEOPHYSICAL MAPPING
Magnetic
Scale 1:700–1:100,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Kelso
Longview
Vancouver
North Bend
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Pullman
Spokane
Mount Baker
Glacier Peak
Mount Rainier
Mount St Helens
Mount Adams
WHATCOM
SKAGIT
SNOHOMISH
KING
PIERCE
THURSTON
MASON
GRAYS HARBOR
JEFFERSON
CLALLAM
PACIFIC
LEWIS
WAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
YAKIMA
KITTITAS
CHELAN
DOUGLAS
OKANOGAN
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
FRANKLIN
BENTON
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
OREGON
IDAHO
Township Index
Range Index

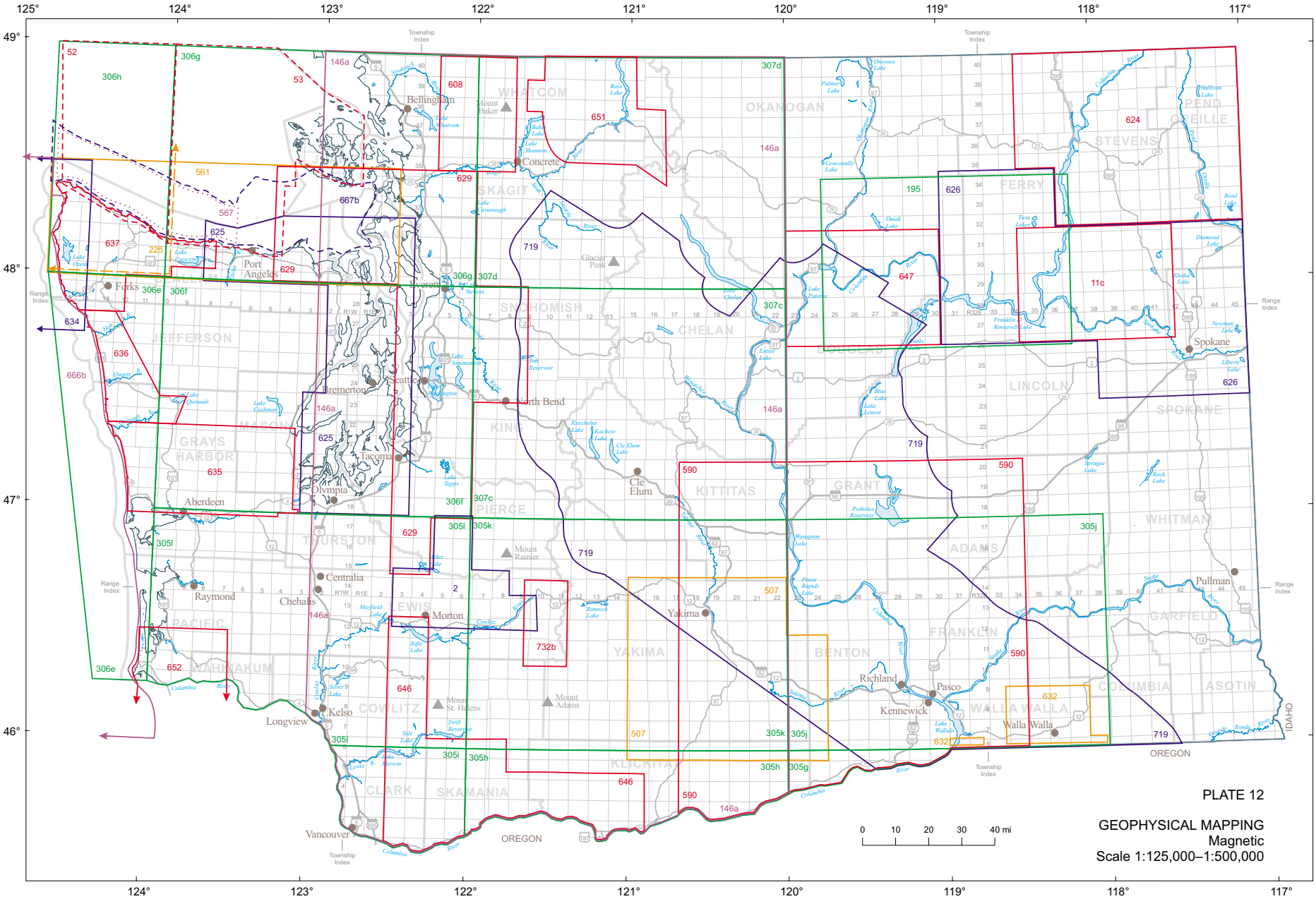
PLATE 12
GEOPHYSICAL MAPPING
Magnetic
Scale 1:125,000–1:500,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Concrete
Port Angeles
Forks
Bremerton
Seattle
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Spokane
Pullman
Centralia
Chehalis
Raymond
Morton
Yakima
Richland
Pasco
Kennewick
Walla Walla
Kelso
Longview
Vancouver
Mount Baker
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
WHATCOM
SKAGIT
SNOHOMISH
OKANOGAN
CHELAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
JEFFERSON
KING
KITTITAS
GRANT
WHITMAN
GRAYS HARBOR
MASON
PIERCE
THURSTON
ADAMS
GARFIELD
PACIFIC
LEWIS
YAKIMA
BENTON
FRANKLIN
COLUMBIA
ASOTIN
WAHKIAKUM
COWLITZ
WALLA WALLA
KLICKITAT
CLARK
SKAMANIA
OREGON
IDAHO
Township Index
Range Index

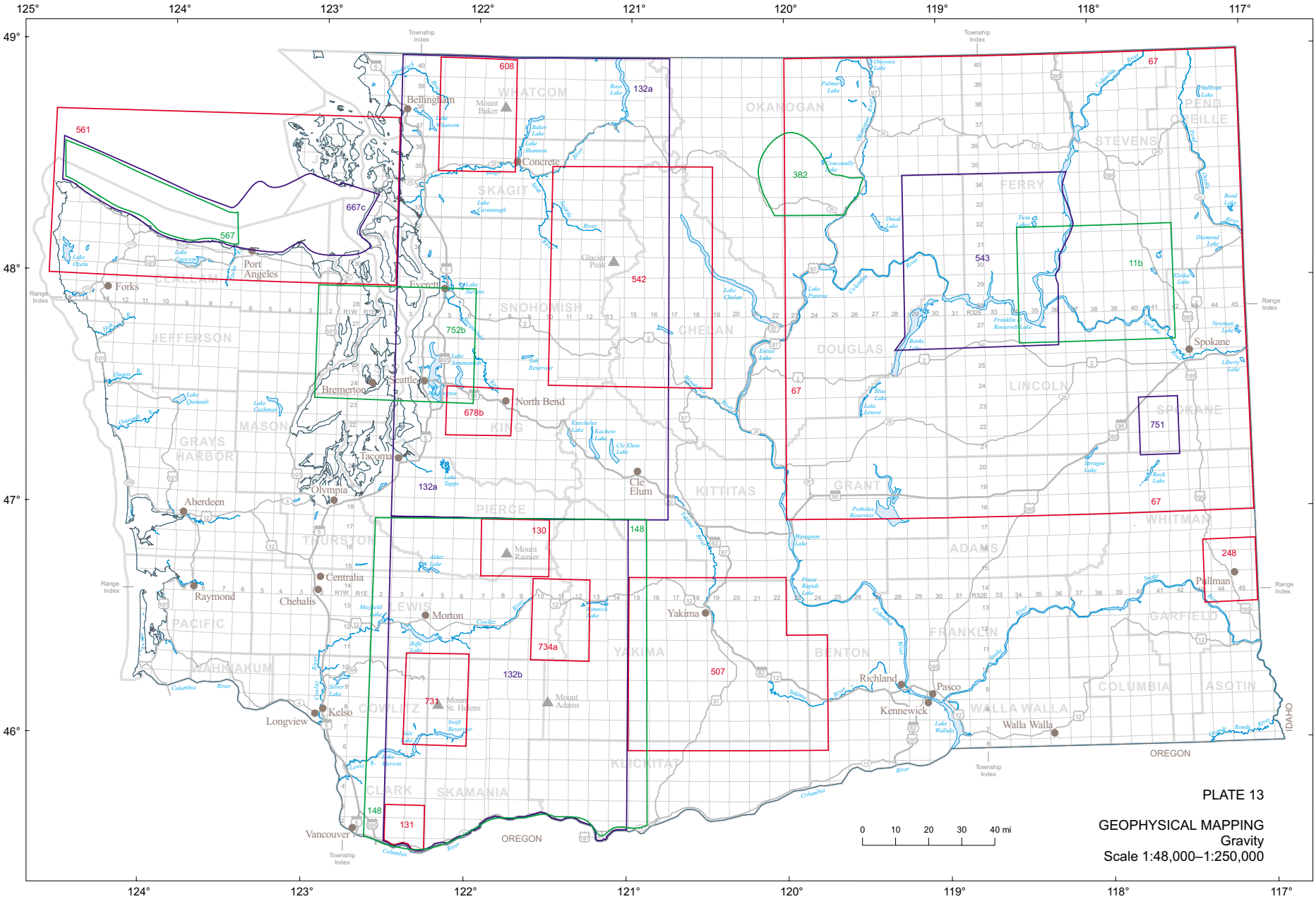
PLATE 13
GEOPHYSICAL MAPPING
Gravity
Scale 1:48,000–1:250,000
0 10 20 30 40 mi
Township Index
Range Index
OREGON
IDAHO
WHATCOM
SKAGIT
SNOHOMISH
KING
PIERCE
LEWIS
YAKIMA
KLICKITAT
SKAMANIA
CLARK
COWLITZ
WAHKIAKUM
PACIFIC
GRAYS HARBOR
MASON
JEFFERSON
CLALLAM
OKANOGAN
CHELAN
DOUGLAS
KITTITAS
GRANT
ADAMS
FRANKLIN
BENTON
WALLA WALLA
COLUMBIA
ASOTIN
GARFIELD
WHITMAN
SPOKANE
LINCOLN
FERRY
STEVENS
PEND OREILLE
Bellingham
Mount Baker
Concrete
Glacier Peak
Everett
Port Angeles
Forks
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Mount Rainier
Centralia
Chehalis
Raymond
Morton
Yakima
Mount St. Helens
Mount Adams
Kelso
Longview
Vancouver
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
561
567
667c
608
132a
542
752b
678b
130
148
734a
132b
731
131
507
382
543
11b
67
751
248

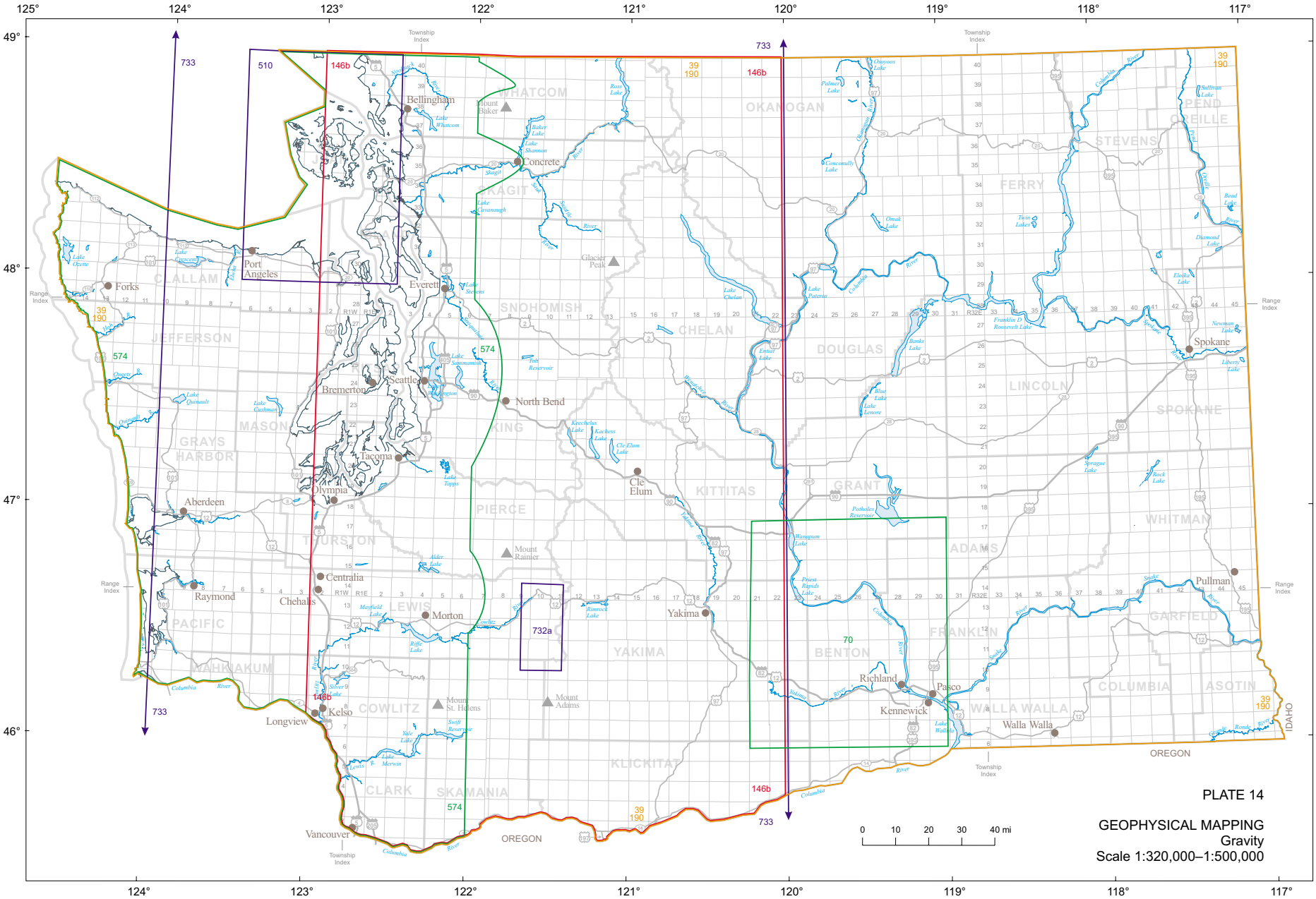
PLATE 14
GEOPHYSICAL MAPPING
Gravity
Scale 1:320,000–1:500,000
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
733
510
146b
39
190
574
70
732a
Bellingham
Mount Baker
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Centralia
Chehalis
Raymond
Morton
Longview
Kelso
Vancouver
Cle Elum
Yakima
Richland
Pasco
Kennewick
Walla Walla
Spokane
Pullman
Glacier Peak
Mount Rainier
Mount St. Helens
Mount Adams
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
GRANT
WHITMAN
ADAMS
FRANKLIN
GARFIELD
COLUMBIA
ASOTIN
WALLA WALLA
BENTON
YAKIMA
KITTITAS
KING
PIERCE
THURSTON
LEWIS
COWLITZ
CLARK
SKAMANIA
KLICKITAT
MASON
GRAYS HARBOR
PACIFIC
WAHKIAKUM
JEFFERSON
CLALLAM
OREGON
IDAHO
Township Index
Range Index

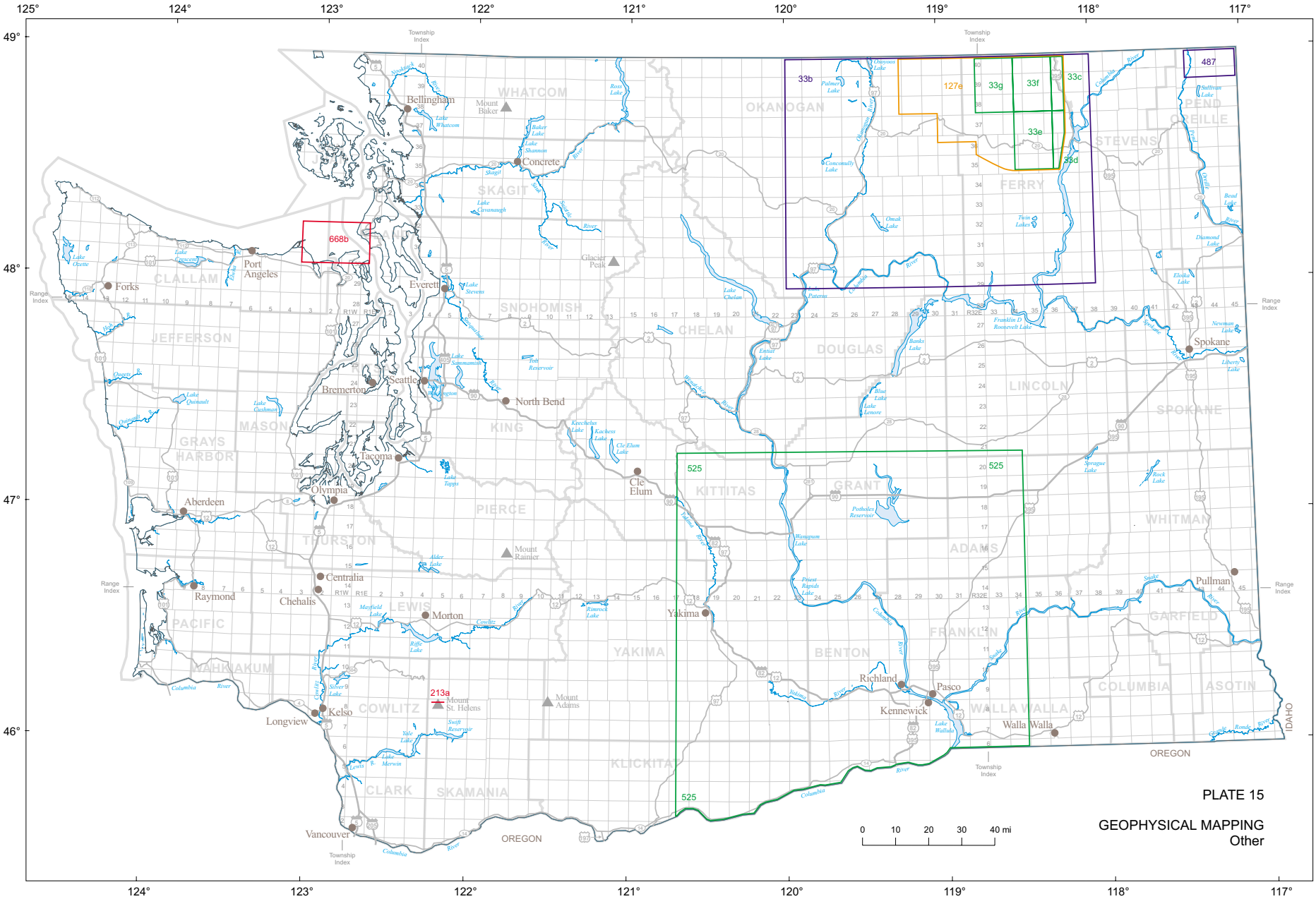
PLATE 15
GEOPHYSICAL MAPPING
Other
0 10 20 30 40 mi
125° 124° 123° 122° 121° 120° 119° 118° 117°
49° 48° 47° 46°
Bellingham
Mount Baker
Concrete
Port Angeles
Forks
Everett
Seattle
Bremerton
North Bend
Tacoma
Olympia
Aberdeen
Cle Elum
Centralia
Chehalis
Raymond
Morton
Yakima
Richland
Pasco
Kennewick
Walla Walla
Kelso
Longview
Vancouver
Mount Rainier
Mount St. Helens
Mount Adams
Glacier Peak
Spokane
Pullman
WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
DOUGLAS
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
CLALLAM
JEFFERSON
KING
KITTITAS
GRANT
ADAMS
WHITMAN
GARFIELD
MASON
GRAYS HARBOR
PIERCE
THURSTON
LEWIS
PACIFIC
YAKIMA
BENTON
FRANKLIN
COLUMBIA
ASOTIN
WALLA WALLA
MAHKIAKUM
COWLITZ
CLARK
SKAMANIA
KLICKITAT
OREGON
IDAHO
Range Index
Township Index
33b
33c
33d
33e
33f
33g
127e
487
668b
525
213a