BULLETIN 97

BIBLIOGRAPHY OF THE GEOLOGY AND MINERAL RESOURCES OF OREGON

(SIXTH SUPPLEMENT)

January 1, 1971 to December 31, 1975

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1978

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 State Office Building
Portland, Oregon 97201

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Compiled by GeoRef, American Geological Institute
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Introduction

Bulletin 97 is the sixth supplement to the original "Bibliography of the Geology and Mineral Resources of Oregon," compiled by Ray C. Treasher and Edwin T. Hodge and published in 1936. This supplement lists publications which appeared during the years 1971-1975. This publication, like the others, includes theses, open-file reports, and other materials which may be available only in certain libraries.

Previous supplements to the "Bibliography of the Geology and Mineral Resources of Oregon" are:

Bulletin 33 [Supplement 1], 1936-1945, by John Allen
Bulletin 44 [Supplement 2], 1946-1950, Margaret L. Steere
Bulletin 53 [Supplement 3], 1951-1955, Margaret L. Steere and Lillian F. Owen
Bulletin 67 [Supplement 4], 1956-1960, Miriam Roberts
Bulletin 78 [Supplement 5], 1961-1970, Miriam S. Roberts, Margaret L. Steere, and Caroline S. Brookhyser

The subject index is structured in hierarchical sets. The major concept or geographic name is listed at the FIRST LEVEL (boldface). Boldface entries not containing geographic names refer to Oregon.

Major subdiscipline terms such as petrology, structural geology, or paleontology shown in boldface refer to Oregon and are cross-referenced with more specific terms such as metamorphic rocks, faults, or plate tectonics.

Thus a user may have access to this bibliography by a general approach or a specific approach. More than 1,000 entries are in this book. All are grouped under the general headings: Areal geology, Economic geology, Engineering geology, Environmental geology, Geochemistry, Geochronology, Geophysical surveys, General, Hydrology, Mineralogy, Oceanography, Paleobotany, Paleontology, Petrology, Sedimentary petrology, Seismology, Soils, Stratigraphy, Structural geology, Tectonophysics, or Volcanology.

To have access to more specific subjects, use the LOWER LEVELS (indented listings), which in most cases will give the specific terms used as cross-references.

Many librarians and personnel in other State agencies have given generous assistance in locating source materials, and we are very grateful.

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Acta Crystallogr., Sect. B, Struct. Crystallogr. Cryst. Chem.	Acta Crystallographica, Section B, Structural Crystallography and Crystal Chemistry (International Union of Crystallography). Copenhagen.
Acta Univ. Carol., Geol.	Acta Universitatis Carolinae, Geologica. Prague.
Akad. Nauk SSSR., Dal'nevost. Nauchn. Tsentr, Nauchn. Soobshch., Inst. Biol. Morya	Akademiya Nauk SSSR, Dal'nevostochnyy Nauchnyy Tsentr, Nauchnyye Soobshcheniya Instituta Biologii Morya, Vladivostok.
Am. Assoc. Pet. Geol., Bull.	American Association of Petroleum Geologists, Bulletin. Tulsa, Oklahoma.
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Am. Assoc. Pet. Geol., Soc. Econ. Paleontol. Mineral., Annu. Meet. Abstr.	American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, Annual Meeting Abstracts. Tulsa, Oklahoma.
Am. Geophys. Union, Geophys. Monogr.	American Geophysical Union, Geophysical Monograph (National Academy of Sciences–National Research Council, Publication). Washington, D.C.
Am. J. Sci.	American Journal of Science. New Haven, Connecticut.
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Annu. Conf. Expo., Mar. Tech. Soc., Prepr.	Annual Conference and Exposition, Marine Technology Society, Preprints. Washington, D.C.
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Settlement, detection, instruments, highways, slope stability, landslides, traffic, Fountain Landslide (Johnsen, E. L. 1975)
Slope stability, Astoria Peninsula (Carter, J. W. 1975)

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Foundations, design, earth walls, fabric-retained (Bell, J. R. 1975)
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Landslides, site exploration, lithology, geophysical surveys, laboratory tests, analysis, stability, causes, Six Soldier Slide (Avolio, G. W. 1975)
Materials, pumice (Lund, J. W. 1971)

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Instruments, inclinometers, piezometers, liquefaction, analysis, slope stability, flow slide, sand fill, observations, dredging, Willamette River (Cornforth, D. H. 1974)

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Site exploration, review, Pebble Springs (Newton, V. C., Jr. 1975)
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Sedimentation, turbidity, causes, montmorillonite, Willamette Basin Dam (Higgs, Nelson B. 1973)
Surface, lakes, artificial, water, stratified, density, flows, effects, stream, factors, causes, turbidity, experimental studies, Hills Creek Reservoir (Slotta, L. S. 1973)
Surface, water storage, sedimentation, surveys, sources, landslides, erosion, applications, regional planning, watersheds, granitic, Ashland (Wilson, S. A. 1975)

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Changes, beaches, dunes, cliffs, geologic hazards, floods, landslides, environmental geology, effects, man, coastal (Stembridge, J. E. 1975)
Changes, construction, jetties (Lizarraga-Arciniega, J. R. 1975)
Changes, inventory (U. S. Army Corps of Engineers. 1971)
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Spits, erosion, siltation, sediment budget, sand mining, stabilization, vegetation, riprap, Lincoln County, Siletz Spit (Rea, C. C. 1975)
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Geologic hazards, ground water, maps, Union County, La Grande (Schlicker, H. G. 1971)

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Effects, slopes, natural, cut, soils, theoretical studies, experimental studies, Umpqua National Forest (Keener, Quentin R. 1973)
Landslides, causes, mechanism, ground water, confined, pressure, uplifts, weathering, soils, pore pressure, soil mechanics, geologic hazards, southwest, Siskiyou National Forest, Six Soldier Landslide (Vandre, B. C. 1975)
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Landslides, history, Portland, OMSI-Zoo Landslide (Squier, L. R. 1971)
Landslides, instruments, field studies, design, Fountain Slide (Munoz, Andy, Jr. 1974)
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Landslides, relation, highways, design, failures, causes, engineering properties, soils, rocks, weathering, Siskiyou National Forest, Josephine County (Vandre, B. C. 1974)
Landslides, soils, erosion, field studies, highways, construction, deforestation, effects, evaluation, data, Cascade Range (Swanson, F. J. 1975)
Mass movements, causes, rates, Deschutes-Umatilla Plateau, Maupin (Pyrch, J. B. 1973)
Soils, hydrologic properties, Coast Ranges (Yee, C. S. 1975)

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Urban planning, hydrogeology, ground water, areal geology, mapping (Cushing, E. M. 1974)

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Instruments, circular cell, bulkhead, sheet piling, determination, deformation, stress, foundations, Multnomah County, Portland, Portland Harbor (Schroeder, W. L. 1974)

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Liquid waste, thermal discharge, utilization, agriculture, Eugene (Christianson, A. G. 1973)
Radioactive waste, Columbia River (Glenn, J. L. 1971)
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Radioactive waste, distribution, estuaries, Columbia River estuary (Hubbell, D. W. 1971)
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Ecology (Faegri, Knut. 1972)

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Land use, streams, soils, erosion, causes, controls (Nicolescu, George V. 1972)
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Mining, surface mining (Mason, Ralph S. 1972)
Natural resources, estuaries, planning, general, regional planning, methods, objectives, resource management, recommendations, programs, classification, environmental analysis, habitat, impact statements, evaluation, coastal zone (Klingeman, P. C. 1973)
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Streams, runoff, changes, observations, logging, effects (Harris, D. D. 1973)

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College level, guidebook, field studies, land use, conservation, northwest, Portland, Wilson River Highway (Dart, John O. 1973)

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Erosion, Bayocean Peninsula, Salishan Spit (Webber, B. 1973)
Eruptions, volcanism, tephra, Cascade Range (Crandell, Dwight R. 1975)
Faults, identification, Portland (Beeson, M. H. 1975)
Floods, controls, drainage basins, systems, reservoirs, regional planning, objectives, Columbia River (Rockwood, David M. 1974)
Land use, regional planning, legislation (Baker, E. J. 1975)
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Landslides, regional planning, Portland, Clackamas River (Ludowise, H. 1974)
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Landslides, 1975, Ecola State Park, Crescent Beach (Carson, R. J. 1975)
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Erosion, geomorphology, southwest, coastal (Janda, R. J. 1972)

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Coal, mining, resources, management, strip mining, federal, regulations, legislation (U. S. Department of the Interior. 1975)

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Atlas, maps (Highsmith, Richard M., Jr. 1973)
Automatic data processing (Calligan, Christopher C. 1974)
Beaches, dunes, marshes, tidal flats, development, Lincoln County, coastal (Mathiot, R. K. 1973)
Controls, bedrock, Elk River, Sixes River (Swanson, F. J. 1975)
Effects, reservoirs, surface, lakes, artificial, water, quality, limnology, pollution, controls, methods, experimental studies, farm ponds (Malueg, K. W. 1973)
Floodplains, patterns, legislation (Muckleston, Keith W. 1974)
Inventory, monitoring, pollution, genesis, waste disposal, geophysical methods, remote sensing (Howard, G. E., Jr. 1975)
Legislation, coastal zone (Schell, Steven R. 1974)
Maps, Willamette River basin, land use, water resources (Vickers, S. D. 1975)
Mineral resources, construction materials, quarries, water resources, ground water, Bull Run Watershed (Beaulieu, J. D. 1974)
Parks, water resources, legislation, Willamette River (Churchill, George W. 1974)
Planning, gravel (Montagne and Associates. 1975)
Planning, Portland, Marquam Hill (Redfern, R. 1973)
Possibilities, legislation, consumer protection (Hargreaves, Hal H. 1974)
Preservation, fossil localities (Orr, W. N. 1975)
Regional planning, classification, mapping, programs, remote sensing (Anderson, J. R. 1975)
Regional planning, maps, soils, geologic hazards, Linn County (Beaulieu, J. D. 1974)
Regional planning, urban planning, water resources, management (McPherson, M. B. 1975)
Remote sensing, natural resources, regional planning, ERTS-1 (Simonson, G. H. 1974)
Sediment yield, effects, deforestation, surface water, 1968-1974 (Harris, D. D. 1974)
Urban planning, slope stability, hydrology, seismicity, vegetation, Portland, Marquam Hill (Palmer, L. 1973)

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Radioactivity, measurement, effects, estuaries, Columbia River estuary, Alder Slough (Renfro, William C. 1972)
Radioactivity, radionuclides, distribution, concentration, coastal, estuaries, Pacific Ocean, Columbia River (Forster, William O. 1972)
Rivers, tidal, experimental studies, slack-water buildup, theoretical studies, automatic data processing, mathematical models, Yaquina River (Grenney, William J. 1972)
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Water, waste disposal, effects, ground water, Eugene-Springfield region (Frank, F. J. 1973)
Water resources, salinity, contamination, trace elements, water quality, east (Van Volk, V. 1974)
Water, surface water, water quality, oxygen, depletion, standards, models, nitrification, planning, implications, Willamette River (Rickert, D. A. 1975)

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Coastal, Tillamook County, Clatsop County (Schlicker, H. G. 1972)
Concepts, conservation, estuaries, shorelines, coastal, legislation (Day, L. B. 1972)
Concepts, land use, coastal (Ternyik, Wilbur B. 1972)
Estuaries, concepts, utilization, Clatsop County (Roberts, Kenneth J. 1972)
Floods, insurance (Taylor, Paul A., Jr. 1972)
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Areal geology, mineral resources, petroleum, gas, natural, nepheline syenite, construction materials, jettystones, water resources, ground water, land use, Lincoln County (Schlicker, H. G. 1973)
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Igneous rocks, volcanic, sandstone, alluvium, terraces, geologic hazards, mineral resources, construction materials, sand, gravel, ground water, water resources, Tillamook County, Clatsop County (Beaulieu, J. D. 1973)
Land use, urban planning, conservation, human ecology, impact statements, estuaries, marshes, beaches, coastal, lakes, recreation, geologic hazards, agriculture, fire protection, forests, floods, controls, regional planning (Anonymous. 1973)
Projects, Project PEG, Portland (Hammond, P. E. 1974)
Radionuclides, distribution, sediments, estuaries, maps, Columbia River (Hubbell, D. W. 1973)
Rivers, floods, irrigation, waste disposal, human ecology, Tualatin River, Portland (Carter, L. M. 1975)
Urban planning, guidebook, Portland (Palmer, L. 1973)

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Sewage, pollution, water, ground water, water quality, Multnomah County, Portland (Quan, E. L. 1974)
Site exploration, industrial waste, Alkali Lake (Newton, V. C., Jr. 1971)
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Agness, Arthropoda, middle Eocene, Lookinglass Formation (Kooser, M. A. 1973)
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Coast Ranges, igneous rocks, volcanic, basalt, thickness, petrology, nomenclature, upper Eocene, Yachats Basalt (Snavely, Parke D., Jr. 1974)
Coast Ranges, stratigraphy, biostratigraphy, Mollusca, foraminifera, correlation, upper Eocene, Tyee Formation, Yamhill Formation (McWilliams, Robert G. 1974)
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Coastal, foraminifera, biogeography, paleoecology, paleoclimatology, Penutian, Ulatisian (Knappe, R., Jr. 1974)
Coastal, Mollusca (Moore, Ellen James. [1971])
Coos County, biostratigraphy, zoning, foraminifera, boreholes, upper Eocene, Narizian (Rau, W. W. 1973)
Crook County, angiosperms, Clarno Formation (Gregory, Irene. 1973)
Curry County, Arthropoda, Malacostraca, Umpqua Formation (Orr, W. N. 1971)
Douglas County, foraminifera, biostratigraphy, zoning, boreholes, Ulatisian, Penutian, Umpqua Formation, Tyee Formation (Rau, W. W. 1973)
Douglas County, sedimentation, Fluornoy Formation, Tyee Formation, Lookinglass Formation, Roseburg Formation (Perttu, R. K. 1975)
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Nehalem River basin, stratigraphy, Cowlitz Formation (Van Atta, Robert O. 1971)
Northwestern Oregon, biostratigraphy, foraminifera, algae, middle Eocene, Narizian (Robertson, Richard. 1973)
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Regional, Pisces (Welton, Bruce J. 1974)
Sixes River, faults, plate tectonics (Baldwin, E. M. 1972)
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Southwestern Oregon, lithostratigraphy, revision, sedimentary rocks, igneous rocks, tectonics, sedimentation, lower Eocene, Roseburg Formation, middle Eocene, Lookinglass Formation, Fluornoy Formation, Tyee Formation, Elkton Formation, upper Eocene, Bateman Formation, Coaledo Formation, Bastendorff Formation (Baldwin, E. M. 1975)
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Upper Nehalem River basin, stratigraphy, Cowlitz Formation, Keasey Formation, Columbia River Basalt, Goble Volcanics Member (Nafziger, R. H. 1972)
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Western Oregon, correlation, faults, lithostratigraphy, Narizian, Ulatisian (McWilliams, Robert G. 1972)
Wheeler County, igneous rocks, absolute age, Clarno Formation (Enlows, Harold E. 1972)

Faults, *Displacements*
Normal, Grande Ronde River, Columbia Plateau (Ross, M. E. 1975)
Normal, fault zone, Brothers fault zone (Tucker, E. R. 1975)
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Overthrust, Colebrooke thrust plate, Eocene, Sixes River (Baldwin, E. M. 1972)
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Interpretation, biostratigraphy, Mesozoic, southwestern Oregon, Paskenta Fault, Elder Creek Fault, Cold Fork Fault (Jones, David L. 1973)
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Wheeler County, Mitchell Quadrangle, Mitchell Fault (Oles, K. 1972)

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Lineaments, geophysical methods, geological methods, Lower Clackamas River (Schmela, Ronald J. 1971)
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Rift zones, lava, western Oregon (McWilliams, Robert G. 1972)
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Relation, intrusions, Mesozoic, Wallowa Mountains (Neal, K. G. 1974)
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Overturned, Jurassic, Cretaceous, Riddle (Jones, David L. 1973)
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Diapirs, deformation, phases, mechanism, occurrence, mantle, upper mantle, field studies, experimental studies (Ave Lallemant, H. G. 1975)
Domes, absolute age, effects, resources, geothermal energy, southeastern Oregon (MacLeod, Norman S. 1975)
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Eocene, Coast Ranges, *Amphimorphina californica, Nodosaria latejugata* (McWilliams, Robert G. 1974)
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Planktonic, benthonic, Eocene, Narizian, northwestern Oregon (Robertson, Richard. 1973)
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Pleistocene, Holocene, continental slope (Barnard, William D. 1973)
Tertiary, Coast Ranges (McKeel, Daniel R. 1971)
Zoning, age, occurrence, Tertiary, Pleistocene, Hallian, regional (Phillips, F. Jay. 1974)
Zoning, correlation, Mesozoic (Berry, K. D. 1974)
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Zoning, paleoecology, morphology, Eocene, southwestern Oregon, *Cassidulina, Operculina, Martinottiella, Nonion, Cibicides, Robulus* (Thoms, Richard E. 1975)
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Permian, regional, taxonomy, new taxa (Skinner, John W. 1971)
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Permian, McCloud Limestone, regional, *Pseudofusulinella* (Wilde, Garner L. 1971)
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Columnar joints, Columbia River Basalt, Columbia River gorge (Stachelrodt, C. 1971)
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Western Oregon, continental shelf, reserves, production (Braislin, Dana B. 1971)
Gems
Glass Buttes, obsidian, collecting, popular geology (Broughton, P. L. 1974)
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Current research, field studies, 1972 (Beaulieu, J. D. 1973)
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Granite, ultramafic family, Paleozoic, Triassic, Klamath Mountains (Kays, M. A. 1973)
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Igneous rocks, *Pyroclastics and glasses*
Ignimbrite, composition, textures, genesis, Pliocene, central Oregon (Enlows, Harold E. 1973)
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Obsidian, aqueous dissolution, effects, sculpture, experimental studies, Glass Buttes (Keller, W. D. 1971)
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Ophiolite, spilite, petrology, Ordovician, Jurassic, Cascade Range, Klamath Mountains (Hopson, C. A. 1973)
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Sedimentary rocks, siltstone, south (Broughton, P. L. 1974)
Sedimentary rocks, Tertiary (Baldwin, E. M. 1975)
Sedimentary rocks, Tertiary, Nehalem River basin (Van Atta, Robert O. 1971)
Sedimentary rocks, Tertiary, west (Boggs, Sam, Jr. 1972)
Sedimentary structures, concretions, mudstone, Tertiary (Boggs, Sam, Jr. 1972)
Sedimentary structures, soft sediment deformation, Miocene, northwest (Niem, Alan R. 1974)
Sedimentary structures, Tertiary, Youngs River (Boggs, Sam, Jr. 1975)
Sedimentation, Coast Ranges (Milhous, Robert T. 1972)
Sedimentation, coastal (Clifton, H. E. 1974)
Sedimentation, Columbia River estuary (Hubbell, D. W. 1971)
Sedimentation, continental shelf, Astoria Fan (Nelson, C. Hans. 1974)
Sedimentation, Cretaceous, Klamath Mountains (Elliott, Monty. 1974)
Sedimentation, estuaries, Columbia River, Astoria (Stevens, H. H., Jr. 1973)
Sedimentation, gravel, southwest, Elk River (Swanson, F. J. 1972)
Sedimentation, Holocene (Kulm, L. D. 1973)
Sedimentation, Pliocene, Coos Conglomerate, Coos Bay (Armentrout, John M. 1973)
Sedimentation, Rogue River, Coquille River, Pistol River, southwest (Clifton, H. E. 1973)
Sedimentation, sediments, Sixes River estuary (Jones, Charles A. 1972)
Sedimentation, shorelines (Clifton, H. E. 1972)
Sedimentation, Sixes River (Jones, Charles A. 1972)
Sedimentation, south (Clifton, H. E. 1971)
Sedimentation, southwest (Janda, R. J. 1972)
Sedimentation, turbidite, Cenozoic, continental margin (Kulm, L. D. 1974)
Sediments (Clifton, H. E. 1972)
Sediments, Cape Arago (Rottmann, C. J. F. 1973)
Sediments, Cape Arago, Whisky Run Terrace (Rottmann, C. J. F. 1972)
Sediments, coastal, south, Rogue River (Judkins, T. W. 1975)
Sediments, Columbia River (Glenn, J. L. 1971)
Sediments, Columbia River estuary (Hubbell, D. W. 1971)
Sediments, Curry County, Gold Beach (Lissner, Frederick G. 1971)
Sediments, heavy minerals, Quaternary, Columbia River, Wildcat Canyon (Kittleman, L. R. 1972)
Sediments, Holocene, west, coastal, Columbia River estuary (Harmon, Robert A. 1972)
Sediments, loess, sedimentation, Quaternary, north-central, Deschutes-Umatilla Plateau, Columbia River, Blue Mountains (Wimer, R. D. 1975)
Sediments, properties, estuaries (Folger, David W. 1972)
Sediments, sand, black sand (U. S. Geological Survey. 1971)
Sediments, sand, coastal, Dune Lake, Alder Lake, Buck Lake (Larson, G. L. 1975)
Sediments, sand, heavy minerals (U. S. Geological Survey. 1972)
Sediments, Sunset Bay (Rottmann, C. J. F. 1970)
Sediments, west-central, coastal, Coast Ranges, Rock Creek (Dietrich, W. E. 1975)

Sedimentary rocks, *Carbonate rocks*
Limestone, chemical composition, algae, foraminifera, Tertiary, western Oregon (Boggs, Sam, Jr. 1972)
Petrography, chemical composition, environmental analysis, Eocene, northwestern Oregon (Boggs, Sam, Jr. 1973)

Sedimentary rocks, *Chemically precipitated rocks*
Chert, diagenesis, genesis, Pliocene, Rome (Sheppard, Richard A. 1973)
Chert, occurrence, beds, nodules, data, chemical composition, genesis, diagenesis, precursors, minerals, magadiite, lacustrine, Pliocene, Rome Beds, Malheur County, Rome (Sheppard, Richard A. 1974)

Sedimentary rocks, *Clastic rocks, nonterrigenous*
Diatomaceous rock, Miocene, continental shelf (Fowler, G. A. 1971)
Diatomite, genesis, correlation, sea-floor spreading, Tertiary, continental shelf (Orr, W. N. 1972)

Sedimentary rocks, *Clastic rocks, terrigenous*
Arkose, siltstone, mudstone, mineral composition, provenance, Eocene, Cowlitz Formation, northwestern Oregon (Van Atta, Robert O. 1972)
Breccia, genesis, slumping, petrography, Cretaceous, Cape Sebastian (Phillips, R. L. 1974)
Breccia, intraformational, genesis, factors, intrusions, Miocene, Astoria Formation, northwestern Oregon (Niem, Alan R. 1974)
Composition, zeolites, lakes, Pliocene, Durkee Basin (Sheppard, Richard A. 1975)
Conglomerate, environmental analysis, Pliocene, Coos Bay (Armentrout, John M. 1973)
Conglomerate, gravel, genesis, bedding, lenticularity, pebbles, segregation, Cenozoic, southwestern Oregon (Clifton, H. E. 1973)
Conglomerate, Triassic, Jurassic, eastern Oregon (Henricksen, Thomas A. 1973)

Eastern Oregon, Eocene, Clarno's Ferry (Hanson, C. Bruce. 1973)
Environmental analysis, Oligocene, upper Oligocene, Yaquina Formation, Lincoln County (Goodwin, C. J. 1973)
Flysch, genesis, Mesozoic, Klamath Mountains, Coast Ranges (Medaris, L. G. 1973)
Lithology, Oligocene, Lincoln County, Seal Rock State Park (Norton, Hiram A., Jr. 1971)
Lithostratigraphy, Ordovician, Cascade Range, Klamath Mountains (Hopson, C. A. 1973)
Mudstone, concretions, Tertiary, regional (Boggs, Sam, Jr. 1972)
Mudstone, siltstone, tuffaceous, sandstone, turbidite, conglomerate, heavy minerals, lithostratigraphy, sedimentation, Tertiary, Clatsop County, Onion Peak region (Smith, T. N. 1975)
Petrology, environmental analysis, Tertiary, Nehalem River basin (Van Atta, Robert O. 1971)
Pyroclastics, lithostratigraphy, Triassic, Jurassic, Blue Mountains (Brooks, H. C. 1973)
Sandstone, conglomerate, mudstone, composition, clay minerals, sedimentary structures, environmental analysis, Cretaceous, Hudspeth Formation, Mitchell (Jarman, Clara Birchak. 1973)
Sandstone, Eocene, Cape Arago (Rottmann, C. J. F. 1970)
Sandstone, mudstone, petrology, textures, stratigraphy, bedding, Cenozoic, Astoria Formation, Hug Point State Park (Niem, Alan R. 1975)
Sandstone, siltstone, tuffaceous, environmental analysis, sublittoral, Oligocene, Alsea Formation, Coast Ranges (Snavely, Parke D., Jr. 1975)
Siltstone, mudstone, graywacke, sandstone, lithic, arkosic, volcanic, distribution, patterns, rates, age, deposition, Cenozoic, continental margin (Kulm, L. D. 1974)
Siltstone, properties, occurrence, collecting, guidebook, southern Oregon (Broughton, P. L. 1974)
Tuff, mineral composition, zeolites, textures, environmental analysis, diagenesis, Pliocene, Durkee Basin (Sheppard, Richard A. 1975)
Turbidite, composition, pyroclastics, textures, sorting, lithostratigraphy, sedimentary structures, graded bedding, Snake River (White, D. L. 1975)
Volcanic ash, zeolites, lakes, Pliocene, Deschutes County (Wolf, K. H. 1971)
Wildflysch, Eocene, Roseburg Formation (Baldwin, E. M. 1975)

Sedimentary rocks, *Composition*
Chemical composition, data, compilation, regional (Hill, Thelma P. (compiler). 1972)

Sedimentary rocks, *Lithofacies*
Cretaceous, Hornbrook Formation, Eocene, Payne Cliffs Formation, Medford-Ashland region (McKnight, Brian Keith. 1971)

Sedimentary rocks, *Lithostratigraphy*
Continental margin, western Oregon (Braislin, Dana B. 1971)
Permian, Triassic, Jurassic, Blue Mountains (Thayer, T. P. 1973)
Petrology, petrography, middle Pliocene, Grassy Mountain Formation, Malheur County (Storm, A. B. 1975)
Unconformities, Pittsburg Landing (White, D. L. 1972)

Sedimentary rocks, *Petrology*
Lithostratigraphy, Cretaceous, Jackson County (Elliott, Monty. 1971)

Sedimentary structures, *Bedding plane irregularities*
Ripple marks, eddy gravels, lag gravel, genesis, floods, Pleistocene, Lake Missoula, Spokane Valley (Weis, P. L. 1973)
Ripple marks, patterns, ocean waves, continental shelf (Komar, P. D. 1972)

Sedimentary structures, *Environmental analysis*
Primary structures, bedding plane irregularities, megaripples, sand waves, bars, planar bedding structures, cross-bedding, orientation, Pleistocene, Holocene, Otter Point, coastal, southwestern Oregon (Clifton, H. E. 1973)

Sedimentary structures, *Interpretation*
Cretaceous, Hornbrook Formation, Eocene, Payne Cliffs Formation, Medford-Ashland region (McKnight, Brian Keith. 1971)
Marine, high energy, current markings (Clifton, H. E. 1971)
Mudcracks, molds, imprints, Pleistocene, southern Oregon (Broughton, P. L. 1974)
Ripple marks, eastern Oregon, Lake Missoula (Baker, Victor R. 1971)
Ripple marks, maars, mud flows, current ripples, current ridges, Big Hole Butte, Hole-in-the-Ground, North Twin Lake (Lorenz, V. 1974)

Sedimentary structures, *Secondary structures*
Concretions, calcite, genesis, spectroscopy, electron probe, mudstone, mold-fillings, Tertiary, regional (Boggs, Sam, Jr. 1972)
Concretions, glendonites, properties, mineral composition, occurrence, orientation, genesis, Youngs River (Boggs, Sam, Jr. 1975)

Sedimentary structures, *Soft sediment deformation*
Folds, penecontemporaneous, relation, intrusions, Miocene, northwestern Oregon (Niem, Alan R. 1974)

Sedimentary structures, *Turbidity current structures*
Graded bedding, Astoria Fan (Nelson, C. Hans. 1974)

Sedimentation, *Deposition*
Geosynclines, flysch, turbidite, fluxoturbidite, grains, flow, lithofacies, deep sea, fans, continental margin, Astoria Fan (Nelson, C. Hans. 1974)
Models, shorelines (Clifton, H. E. 1972)
Processes, Tertiary, Coast Ranges (Baldwin, E. M. 1972)
Tectonics, Eocene, Sutherlin (Perttu, R. K. 1975)

Sedimentation, *Environment*
Coastal, Cenozoic, Neahkahnie Mountain, Angora Peak (Cressy, F. B., Jr. 1974)
Coastal, southwestern Oregon (Janda, R. J. 1972)
Coastal, 1974 (Clifton, H. E. 1974)
Continental shelf, dispersal, patterns, sand (Scheidegger, K. F. 1971)
Deltas, Oligocene, Lincoln County (Goodwin, C. J. 1973)
Estuaries, Quaternary, southwestern Oregon (Janda, R. J. 1972)
Estuaries, shelf, continental shelf, deposition, variations, seasonal, transport, fluvial transport, currents, ocean waves (Kulm, L. D. 1973)
Lakes, diagenesis, Pliocene, Durkee Basin (Sheppard, Richard A. 1975)
Lakes, Pliocene, Durkee Basin (Sheppard, Richard A. 1975)
Lakes, pyroclastics, Pliocene, Deschutes County (Wolf, K. H. 1971)
Littoral, sublittoral, tidal channel, Pliocene, Coos Bay (Armentrout, John M. 1973)
Marine, continental shelf, Columbia River, Umpqua River, Rogue River (Kulm, L. D. 1975)
Marine, continental shelf, southern Oregon (Bowman, Kenneth C., Jr. 1972)
Marine, high energy, nearshore, deposition (Clifton, H. E. 1971)
Marine, shallow water, shelf, sublittoral, sandstone, siltstone, tuffaceous, Oligocene, Alsea Formation, Coast Ranges (Snavely, Parke D., Jr. 1975)
Marine, sublittoral, terrestrial, streams, Cretaceous, Klamath Mountains (Elliott, Monty. 1974)
Saline, alkalic, chert, nodules, thin beds, lacustrine, mudstone, magadi-type, zeolites, authigenic, K-feldspar, fluorite, molds, gaylussite, pirrosonite, Pliocene, Rome (Sheppard, Richard A. 1973)
Terrestrial, alluvial, marine, gravel, southwestern Oregon (Clifton, H. E. 1973)

Sedimentation, *Flow regime*
Stream transport, floods, deposition, environment, rates, Quaternary, regional (Baker, Victor R. 1973)
Turbidity currents, velocity, thickness, correlation, channels, slope, models, computer, Pacific Ocean, Surveyor Channel (Komar, P. D. 1973)

Sedimentation, *Processes*
Deposition, streams, mouths, coastal, sediments, load, transport, floods, velocity, salinity, variations, seasonal, wind, ocean waves, shoaling, tides, longshore drift, cores, X-ray radiographs, engineering geology, southwestern Oregon (Clifton, H. E. 1973)

Sedimentation, *Provenance*
Indicators, strontium, isotopes, variations, Columbia River (Peterman, Z. E. 1972)

Sedimentation, *Transport*
Marine transport, bottom currents, turbidity currents, suspended sediments, northern Oregon, continental shelf (Harlett, John C. 1973)
Marine transport, continental shelf (Harlett, John C. 1972)
Marine transport, continental shelf, currents, effects, coastal (Smith, J. D. 1972)
Marine transport, currents, continental shelf (Smith, J. D. 1971)
Marine transport, deposition, high-energy coast, southern Oregon (Clifton, H. E. 1971)
Marine transport, ripple marks, continental shelf (Komar, P. D. 1972)
Marine transport, surf action, effects, shape, grains, quartz, Cape Arago (Rottmann, C. J. F. 1973)
Marine transport, suspended sediments, measurement, data, submarine canyons, Astoria Canyon (Plank, William S. 1974)
Marine transport, turbidity currents, observations, theoretical studies, continental shelf (Komar, P. D. 1974)
Stream transport, Alsea River basin (Harris, D. D. 1971)
Stream transport, changes, logging, effects (Harris, D. D. 1973)
Stream transport, channels, gravel-bottom streams, Coast Ranges (Milhous, Robert T. 1972)
Stream transport, discharge, tracers, fluorescent, Sixes River estuary (Jones, Charles A. 1972)
Stream transport, flow regime, estuaries, cycles, changes, acoustical surveys, Columbia River estuary (Hubbell, D. W. 1971)
Stream transport, gravel beds, bed load, gravel-bottom streams, suspended material, models, Coast Ranges (Milhous, Robert T. 1973)
Stream transport, gravel, shape, sorting, Elk River (Swanson, F. J. 1972)
Stream transport, models, turbidity, suspended material, Columbia River (Stevens, H. H., Jr. 1973)

Stream transport, provenance, Tertiary, Clatsop County, Onion Peak region (Smith, T. N. 1975)
Stream transport, rates, Coast Ranges (Milhous, Robert T. 1973)
Stream transport, rates, sediments, coastal, Rock Creek (Dietrich, W. E. 1975)
Stream transport, suspended load, bed load, gravel-bottom streams, Coast Ranges (Milhous, Robert T. 1972)
Stream transport, tracer experiments, fluorescence, Sixes River (Jones, Charles A. 1972)
Wind transport, provenance, Quaternary, Deschutes-Umatilla Plateau (Wimer, R. D. 1975)

Sediments, *Clastic sediments, terrigenous*
Black sand (Clifton, H. E. 1972)
Distribution, size, sand, silt, clay, factors, rivers, wave transport, current transport, circulation, estuaries, Columbia River, Umpqua River, Rogue River, continental shelf (Kulm, L. D. 1975)
Drift, lithostratigraphy, Pleistocene, Cascade Range, Mountain Lakes Wilderness (Carver, Gary Alen. 1972)
Drift, till, Cascade Range (Easterbrook, D. J. 1975)
Gravel, sand, clay, silt, geochemistry, isotopes, chromium, scandium, zinc, cobalt, manganese, antimony, radionuclides, abundance, distribution, sources, nuclear facilities, Columbia River (Haushild, W. L. 1975)
Gravel, shape, variations, Elk River (Swanson, F. J. 1972)
Lithology, Lincoln County, Seal Rock State Park (Norton, Hiram A., Jr. 1971)
Mud, silt, sand, gravel, heavy minerals, distribution, reworked, southwestern Oregon (Clifton, H. E. 1973)
Physical properties, chemical composition, mineral composition, correlation, radionuclides, Columbia River (Glenn, J. L. 1971)
Provenance, distribution, heavy minerals, Pacific Ocean (Scheidegger, K. F. 1971)
Sand, black sand, heavy minerals (U. S. Geological Survey. 1971)
Sand, distribution, vertical, chemical composition, phosphorus, environmental analysis, dunes, lakes, coastal, Dune Lake, Alder Lake, Buck Lake (Larson, G. L. 1975)
Sand, heavy minerals, chromite, magnetite, ilmenite, spinel, continental shelf (U. S. Geological Survey. 1972)
Sand, provenance, Gold Beach (Lissner, Frederick G. 1971)
Sand, shape, roundness, sphericity, quartz, variations, effects, surf, Cape Arago (Rottmann, C. J. F. 1973)
Sand, silt, loess, environmental analysis, provenance, textures, thickness, Quaternary, Deschutes-Umatilla Plateau (Wimer, R. D. 1975)
Sand, silt, mineral assemblages, heavy minerals, pyroclastics, chronology, alluvium, age, Columbia River, Wildcat Canyon (Kittleman, L. R. 1972)
Sand, size analysis, shape analysis, composition, terraces, beaches, Cape Arago (Rottmann, C. J. F. 1970)
Size, shape, heavy minerals, terraces, Cape Arago, Whisky Run Terrace (Rottmann, C. J. F. 1972)
Turbidite, distribution, bathymetry, Gorda Rise (Atwater, Tanya. 1973)
Twin Lake tuff, vesiculated, genesis, interpretation, ripple marks, maars, mud flows, current ripples, current ridges, examples, Hole-in-the-Ground, Big Hole Butte, North Twinlake (Lorenz, V. 1974)

Sediments, *Composition*
Bacteria, benthonic, continental shelf, Columbia River estuary (Wiebe, William J. 1972)
Chemical composition, mineral composition, isotopes, radioactivity, Columbia River (Glenn, J. L. 1973)
Chemical composition, radionuclides, distribution, Columbia River estuary (Hubbell, D. W. 1973)
Chemical composition, Sr-90, fallout, Crater Lake (Volchok, H. L. 1971)
Chemical composition, strontium, isotopes, variations, relation, provenance, Columbia River (Peterman, Z. E. 1972)
Mineral composition (Kennedy, V. C. 1965)
Mineral composition, hypersthene, sorting, selective, sand, beaches, southern Oregon (Judkins, T. W. 1975)
Radionuclides, Columbia River estuary (Hubbell, D. W. 1971)

Sediments, *Distribution*
Continental shelf, microbiogenic, foraminifera, algae, diatoms, Radiolaria, Holocene, Columbia River estuary (Harmon, Robert A. 1972)
Lithostratigraphy, grains, size, sorting, paleogeography, composition, deep sea fans, ancient, geosynclines, continental margin (Nelson, C. Hans. 1974)

Sediments, *Environmental analysis*
Estuarine (Folger, David W. 1972)
Tracers, fluorescent, Sixes River estuary (Jones, Charles A. 1972)

Sediments, *Genesis*
Weathering, erosion, sedimentation, sediment budget, composition, coastal, Rock Creek (Dietrich, W. E. 1975)

Sediments, *Provenance*
Granulometry, distribution, grain size, shape, heavy minerals, Tillamook Bay (Avolio, G. W. 1973)

Sediments, *Textures*
Analysis, size, distribution, clay, sand, silt, Columbia River estuary (McManus, D. A. 1972)

Seismic surveys
Lower Sixes River valley, refraction, data, Quaternary (Greene, H. Gary. 1971)

Seismology
Earthquakes (Couch, R. 1974)
Earthquakes, energy release (Couch, R. 1971)
Earthquakes, Tillamook (Woodcock, S. F. 1975)

Seismology, *Crust*
Elastic waves, velocity, velocity structure, anisotropy, interpretation, ophiolite, complexes (Christensen, N. I. 1975)

Seismology, *Earthquakes*
Magnitude, intensity, epicenters, periodicity, amplitude, strong motion, accelerograms (Trifunac, M. D. 1975)
Magnitude, intensity, strong motion, modified Mercalli scale, mathematical methods, instruments, *seismoscopes (Trifunac, M. D. 1975)
Seismicity (Chandra, Umesh. 1974)

Seismology, *Elastic waves*
P-waves, amplitude, anomalies, mantle, structure, Blue Mountains Seismological Observatory (Needham, R. E. 1973)
P-waves, structure, crust, mantle, low-velocity zone (Hill, D. P. 1975)
P-waves, traveltime, variations, propagation, direction, experimental studies, lithosphere, underthrust, detection, seismicity, observations, seismic sources, regional (Solomon, Sean C. 1974)

Seismology, *Microseisms*
Possibilities, correlation, geothermal energy, Klamath County (Crosson, Robert S. 1972)

Seismology, *Seismic sources*
Microearthquakes, epicenters, fracture zones, faults, transform, rates, sonobuoy, Blanco fracture zone (Johnson, Stephen H. 1974)

Seismology, *Volcanology*
Volcanism, earthquakes, focus, local, magnitude, P-waves, S-waves, velocity, Cascade Range (Westhusing, J. K. 1974)
Volcanoes, eruptions, geologic hazards, possibilities, prediction, methods, stratigraphy, geochronology, Cascade Range (Crandell, Dwight R. 1974)

Sierra Nevada, *Petrology*
Igneous rocks, Cenozoic (Silberman, M. L. 1975)

Sodium, *Geochemistry*
Eclogite, southwestern Oregon (Ghent, E. D. 1973)
Melts, silicates, diffusion (Smith, Harry Dean. 1973)

Soils
Genesis, volcanic ash, stratigraphy, east, Blue Mountains (Rai, Dhanpat. 1971)
Volcanic ash, chemical composition, correlation, trace elements, Mt. Mazama (Borchardt, G. A. 1971)
West, mineral composition, chemical properties, andic soils (Franklin, William Talbert. 1971)

Soils, *Chemistry*
Mercury, Douglas County, Bonanza Mine (Trost, P. B. 1971)
Nickel, laterites, applications, exploration, Riddle (Rudmann, Joseph E. 1971)
Sr-90, fallout, Crater Lake (Volchok, H. L. 1971)

Soils, *Composition*
Chemical composition, mineral composition, volcanic ash, Mount Mazama (Dudas, Marvin Joseph. 1973)

Soils, *Conservation*
Erosion control, surveys, streams, land use (Nicolescu, George V. 1972)

Soils, *Engineering properties*
Highways, stability, soils, volcanic, slopes, natural, cutbank slope, design, theoretical studies, experimental studies, Umpqua National Forest (Keener, Quentin R. 1973)

Soils, *Erosion*
Landslides, causes, ground water, confined, pressure, southwestern Oregon, Siskiyou National Forest, Six Soldier Landslide (Vandre, B. C. 1975)
Landslides, field studies, forestry, logging, highways, construction, deforestation, effects, evaluation, Cascade Range (Swanson, F. J. 1975)
Landslides, Tillamook County (Kenney, L. W. 1972)
Water erosion, controls, objectives, Columbia Plateau (Barr, Scott. [1972])
Water erosion, siltation, engineering geology, environmental geology, Ashland (Lund, J. W. 1974)

Soils, *Evolution*
Volcanic ash, mineralogy (Borchardt, G. A. 1971)

Soils, *Field studies*
Effects, ground water, pore pressure, settlement, embankments, silt, clayey (Driscoll, D. D. 1975)

Soils, *Genesis*
Erosion, terraces, Coos County, Curry County (Janda, R. J. 1971)

Soils, *Morphology*
Profiles, color, textures, mottled zone, ground water, Willamette Valley (Simonson, G. H. 1972)
Profiles, horizons, volcanic ash, Mount Mazama (Dudas, Marvin Joseph. 1973)

Soils, *Processes*
Mass movements, Western Cascades (Paeth, R. C. 1971)

Soils, *Soil group*
Aqualfs, xerolls, water regimes, levels, morphology, Willamette Valley (Boersma, L. 1972)
Argixerolls, morphology, physical properties, chemical properties, Willamette Association, Pleistocene, northwestern Oregon, Polk County (Gelderman, F. W. 1972)
Laterites, structure, textures, Columbia County (Jackson, R. L. 1971)

Soils, *Surveys*
Classification, water regimes, Xeric soils, Udic soils, vegetation (Thomas, B. R. 1972)
Coos County, Douglas County, classification (Beaulieu, J. D. 1975)

Soils, *Water regimes*
Characterization, levels, ground water, Aqualfs, xerolls, Willamette Valley (Boersma, L. 1972)
Drainage, movement, properties, hydrologic properties, morphology, micromorphology, erosion, slope stability, Coast Ranges (Yee, C. S. 1975)
Drainage, variations, spatial, environment, dunes, coastal (Tolle, T. V. 1975)

South Africa, *Geomorphology*
Experimental studies, rivers, channels, genesis (Shepherd, R. G. 1974)

South Dakota, *Economic geology*
Gems (Johnson, R. N. 1975)

South Dakota, *Paleontology*
Mammalia, Tertiary (Rensberger, J. M. 1973)

South Dakota, *Petrology*
Igneous rocks, Black Hills (Armstrong, R. L. 1975)

Spectroscopy, *Methods*
Mass spectroscopy, isotopes, Oregon State University (Senechal, R. G. 1974)

Springs
Breitenbush Hot Springs, occurrence, genesis (Hammond, P. E. 1975)
Hunter's Hot Springs, temperature, algae, Ostracoda, ecology (Wickstrom, C. E. 1974)
Klamath Falls KGRA, hot springs, thermal waters, exploration, utilization (Lund, J. W. 1975)
Metolius Springs, genesis (Peterson, N. V. 1972)
Regional, hot springs, guidebook (Kaysing, B. 1974)
Western Oregon, hot springs, mineral waters, thermal waters, development, relict spas (Horowitz, H. 1973)

Stratigraphy
Cenozoic (Niem, Alan R. 1973)
Cenozoic, continental margin (Fowler, G. A. 1972)
Cenozoic, foraminifera, biogeography, Neahkahnie Mountain, Angora Peak (Cressy, F. B., Jr. 1974)
Cenozoic, lithostratigraphy (McBirney, A. R. 1975)
Cenozoic, lithostratigraphy, west (McBirney, A. R. 1973)
Cenozoic, northwest (Niem, Alan R. 1973)
Cretaceous, central Oregon, Ochoco Mountains, Strawberry Mountains (Oles, K. 1973)
Cretaceous, Jackson County (Elliott, Monty. 1971)
Devonian, biostratigraphy, conodonts (Sandberg, C. A. 1975)
Devonian, biostratigraphy, conodonts, Klamath Mountains (Savage, N. M. 1974)
Eocene, biostratigraphy, foraminifera, Polk County (Gaston, L. R. 1974)
Eocene, biostratigraphy, paleoecology, northwest (McDougall, K. 1975)
Eocene, biostratigraphy, paleoecology, southwest, Coos County, Coos Bay (Rooth, Guy Harlan. 1974)
Eocene, biostratigraphy, southwest (Thoms, Richard E. 1975)
Eocene, Clarno Formation, biostratigraphy, Clarno's Ferry (Hanson, C. Bruce. 1973)
Eocene, Cowlitz Formation, Oligocene, Keasey Formation, northwest, Nehalem River basin (Van Atta, Robert O. 1971)
Eocene, foraminifera, west, coastal (Knappe, R., Jr. 1974)
Eocene, lithostratigraphy, southwest (Baldwin, E. M. 1975)
Eocene, Narizian, biostratigraphy, northwestern Oregon (Robertson, Richard. 1973)
Eocene, Narizian, Yamhill Formation, biostratigraphy, west-central (McWilliams, Robert G. 1973)
Eocene, Oligocene, Clarno Group, central Oregon, John Day River, Clarno Ferry, Mitchell (Enlows, Harold E. 1973)
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Eocene, Sutherlin (Perttu, R. K. 1975)
Eocene, Tyee Formation, Yamhill Formation, biostratigraphy, Coast Ranges (Rau, W. W. 1974)
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Eocene, Tyee Formation, Yamhill Formation, west-central Oregon (McWilliams, Robert G. 1973)
Eocene, Upper Nehalem River basin (Nafziger, R. H. 1972)
Holocene, paleomagnetism, Cascade Range, Three Sisters (Heinrichs, Donald F. 1973)
Mesozoic, biostratigraphy, coastal (Berry, K. D. 1974)
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