

**EXPLANATION OF MAP UNITS**

**Mass Movement Hazards**

- PHc Prehistoric complex landslide
- PHb Prehistoric slide block or slump
- PHf Prehistoric rock or soil flow
- PAc Potentially active complex landslide
- PAb Potentially active slide block or slump
- Alc Active complex landslide
- Ab Active slide block or slump

**Shoreline Geology**

- Fill Artificial fill
- Qal Alluvium
- S Vegetated dune sand
- S + Qal Dune-covered alluvium
- Qr Colluvium
- Qmt Marine terrace deposits
- Tmcd Cape Folleweather Basalt
- Tmcc Sandstone of Whale Cove
- Tmcb Depoe Bay Basalt
- Tma Astoria Formation
- Tmn Nye Mudstone
- Toym Yaquina Formation (mudstone)
- Toys Yaquina Formation (sandstone)
- Tech Basalt of Cascade Head
- Ten Neslucia Formation
- Tb Intrusive basalt

**MAP SYMBOLS**

— Contact — Approximately located contact between formations or areas of differing type or age of mass movement

----- Contact between areas of mass movement and other areas — Approximately located. Outlines a general area of mass movement of one or several ages and types

~~~~~ Zone of particularly active landslides and slide blocks — Area vulnerable to episodic loss of large amounts (>40 feet) of headwall in back of landslides or slide blocks

25 Fault zones — Arrow showing dip; bar and ball on downthrown side; dashed where approximate; dotted where concealed; diamond-headed arrow showing strike-slip; vertical offset of marine terrace in feet in parentheses

Boundary of slide block within larger slide block — Approximately located; bar and square on downthrown side

Rock fall hazard — Areas of major rock fall hazard at high-use beaches

(Qmt) Rock unit label within a prehistoric slide block or slump — Parentheses differentiate formation labels within a prehistoric slide block from the mass movement label PHc

[Toys] Rock unit label for unit making up less than 3 ft of the sea cliff — Brackets are utilized to indicate that the rock unit has little control on sea cliff erosion

? Uncertainty — Question mark used to indicate uncertainty about a mass movement label because the area was examined only by aerial photo analysis or had ambiguous field information

Erosion rate transects — Points where shoreline erosion rates were examined for entry into the database of Open-File Report O-94-11; spacing on straight shorelines is about 150 feet; every tenth is labeled for reference to the database

0.0 to -0.6 ft/yr (-0.3) Generalized erosion rates — Feet per year of erosion (negative sign = erosion); mean is in parentheses; range separated by a small arrow; applicable to the shoreline segment marked by the arrows perpendicular to the shoreline

Shoreline protection structures — Sea walls or riprap

25 Strike and dip of bedding

\* Oregon Department of Geology and Mineral Industries Open-File Report O-94-11 should be utilized with this map to provide detailed information on the hazard mapping techniques and appropriate use of the information. Data fields summarizing erosion rates, geologic data, and mass movement hazards at each transect are listed in a digital database included with Open-File Report O-94-11.

Erosion rates estimated from data in Open-File Report O-94-11

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Field work conducted 1991 through 1993

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Scale 1:4800

Horizontal datum: 1983 North American Datum

Base map is a 1993 orthophotograph; photography was produced from a positionally controlled flight in the late summer of 1993; the flight was conducted by Spencer B. Cross, Inc. in cooperation with Bergman Photographic Services, both of Portland, Oregon.

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**DISCLAIMER:** The Oregon Department of Geology and Mineral Industries is publishing this paper because the subject matter is consistent with the mission of the Department. To facilitate timely distribution of information, this report has not been edited to our usual standards.

