

**Super-Scale Slumping of the Southern Oregon
Cascadia Margin: Tsunamis, Tectonic Erosion,
and Extension of the Forearc**

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Using SeaBeam bathymetry and multichannel seismic reflection records on the southern Oregon continental margin, we have identified several large submarine landslides that encompass much of the accretionary wedge of the southern Oregon Cascadia margin. The area affected by these slides is approximately 8000 km², and involve an estimated 12,000 km³ of the accretionary wedge. Debris from these slides is buried or partially buried beneath the abyssal plain, covering a subsurface area of at least 7500 km². Three arcuate slump scars are nearly coincident with the shelf edge on their eastern margin, thus spanning the full width of the active wedge in southern Oregon. In shaded relief SeaBeam bathymetry the accretionary wedge within the slump area is chaotic, with poorly defined thrust ridges and basins. In reflection profiles on the slope, reflectors are commonly chaotic, with poor penetration of seismic energy and numerous diffractions. The bathymetric scarps correlate with listric detachment faults on reflection profiles that cut deeply into the continental slope with as much as 800 m vertical separation at the surface. The ages of the three major slides decrease from south to north. This series of slumps traveled at least 30 km out onto the abyssal plain in at least 3 catastrophic slides, which may have been triggered by subduction earthquakes. The morphology of the slides indicates catastrophic rather than incremental slip. The slides would have generated large tsunami in the Pacific basin, probably larger than that generated by an earthquake alone. Mass wasting features and buried slump debris appear to terminate at the subducting Blanco Fracture Zone. These slides and subduction of the slide debris imply that subduction erosion and narrowing of the southern Oregon margin has occurred over approximately the last 1 Ma, and may be related to tectonic transport and extension of the southern Oregon forearc.

Submittal Information

1. 1995 Fall Meeting
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4. T
5. (b) 3040 - plate tectonics;
4219 - continental shelf
processes; 8010 - fractures
and faults
- 6.
7. none
8. \$60 P.O. - P0002025
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9. C

10.

11. No