Cascadia Segmentation: Sediment Supply, Structural Influences, and a (possible) Pinchout of the Locked Interface

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TWO SEGMENTATION MECHANISMS

Core Locations

Onshore and offshore paleoseismic evidence from 41 Cascadia earthquakes strongly suggest that segmentation plays a significant role in the Mazama Ash datum (13) and the Holocene.

Three indicators of downdip masked by thicker sediment supply, supporting a primary control by sediment thickness on the subducting plate. In Cascadia, massive submarine et al., 2007 GPS Goldfinger structural indicators (in Priest et al., 2008, levelling and tide)

One segment boundary in Cascadia appears not to be related to sediment supply, but may linked to a narrowing of the locked interface in map view. The Cascadia forearc is composed of an Eocene-Pliocene accretionary complex, outboard of which lies a Pleistocene-Holocene wedge of

Burgette et al., 2008, levelling and tide structural evidence of a transition from arc normal to arc parallel contraction. An average boundary consistent with these disparate data suggest Direct correlation, shown below, links the northern and landward position of the updip limit may create a "pinchout" in central Oregon, where we observe a paleoseismic segment boundary.

Finally, the HR site has no river paleoseismology. Four panels showing rupture modes inferred from turbidite compression and margin normal extension or neutral deformation was observed in the inner wedge. Right panel shows these data without the tracklines. Red crosses between these two sites. Though they pass fewer tests of seismic

C. Southern rupture from central Oregon southward represented by 9-10 events. Small events. Southern Oregon sites including Sanger Lake, CA, belong to either segment B or C. D. Southern Oregon/northern California events, events indicated by query, limited by temporal coverage and probable non-seismic events in (Goldfinger et al., 1997).

Hydrate Ridge and Rogue Apron. These two sites are completely isolated from each other and are based on turbidite evidence, shown at left, and reduced occurrence of ETS events. C. Southern rupture from central Oregon southward represented by 9-10 events. Small events. Southern Oregon sites including Sanger Lake, CA, belong to either segment B or C. D. Southern Oregon/northern California events, events indicated by query, limited by temporal coverage and probable non-seismic events in (Goldfinger et al., 1997).

Paleoseismic segmentation shown is also roughly compatible with latitudinal boundaries of ETS (Episodic Tremor and Slip) events proposed for the downdip subduction interface (Brudzinski et al., 2007). These boundaries are shown by white dashed lines. Further landward, they clearly deform the inner wedge (Goldfinger et al., 1997). The ETS horizons in Rogue core coinced

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though they tend to be heavily bioturbated. black wiggle traces are the extracted CT density values represented on an arbitrary grey scale. Many of these small events have sharp bases and a fining

errors. Smaller southern Cascadia events as published, with some sites revised as minimum ages as published (land only). Two sided arrows shown where maximum and

biologic "bloom" of benthic infauna that bioturbate the small

have lesser degrees of bioturbation.