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Sedimentology of Seismo-Turbiditas Offshore Western North America Coast

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The sedimentologic characteristics of Holocene turbidites, along the active tectonic continental margins of the Cascadia Subduction Zone (Washington, and Oregon offshore) and the northern San Andreas Fault (California offshore), help to identify their origin by seismic triggering of great earthquakes.
Previous work and this study demonstrate that the number and character of coarse pulses for an individual turbidite commonly remains constant in multiple channel systems along a continental margin. This suggests that the earthquake shaking or aftershock signature is often preserved, especially for the strongest great earthquakes. Consequently, both downstream confluences and the strongest great earthquakes may contribute to multiple pulses that are typical for seismo-turbidites. The detailed analyses of the turbidites recovered in the Cascadia and northern California margins based on visual core descriptions, grain size analysis, x-ray radiographs, mineral analysis and physical properties, reveals common sedimentologic characteristics of turbidites triggered by earthquakes that can be used to distinguish seismo-turbidites in other active tectonic margins around the world. Also, we evidence that earthquake triggering and stacking of multiple coarse grained pulses become an alternative explanation for the amalgamated turbidite beds in active tectonic margins, in addition to other classic explanations for amalgamated turbidites.