

## **THE REFLECTION CHARACTER OF THE CASCADIA SUBDUCTION THRUST: THE SEISMOGENIC ZONE AND THE DOWNDIP ZONE OF SLOW SLIP EVENTS**

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Multichannel seismic reflection data in SW Canada acquired as part of the SHIPS project have been combined with previous Lithoprobe onshore Vibroseis and offshore multichannel data to map the Juan de Fuca plate subduction thrust. Especially sought were variations in reflection character between where the fault is locked and may generate great earthquakes and at greater depths where there is stable sliding. The downdip limit of the seismogenic zone has been defined by modelling geodetic data and by temperature estimates. Offshore reflection data show a generally sharp interplate interface, whereas onshore data show the 5 km-thick landward dipping E reflection band. The new SHIPS data allow mapping the E reflections over a large area, and both the SHIPS seismic tomography and relocated Wadati-Benioff seismicity position the reflector band just above the subducting plate. We find generally thin thrust reflections for the locked seismogenic zone and the broad E shear zone reflections at greater depth. A similar correspondence is suggested by data from Chile and SW Japan. Thus, deep reflection data may be an important tool for mapping the locked sections of the megathrust. GPS and seismic data have shown that downdip of the seismic zone, slip is not steady but occurs in slow slip events at intervals of just over a year. The E band generally terminates close to where the thrust reaches the forearc mantle at about 35 km. This depth approximately corresponds to the landward limit of the slow slip thrust events, so these events may be restricted to the E reflection band.

### **Submittal Information**

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3. Session: Either:
  - Active continental margin
  - Seismotectonics
4. No special equipment required
5. Prefer Poster Session