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TITLE: Distributed natural gas venting offshore along the Cascadia margin

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ABSTRACT:

Widespread gas venting along the Cascadia margin is investigated from acoustic water column data and reveals a nonuniform regional distribution of over 1100 mapped acoustic flares. The highest number of flares occurs on the shelf, and the highest flare density is seen around the nutrition-rich outflow of the Juan de Fuca Strait. We determine ?430 flow-rates at ?340 individual flare locations along the margin with instantaneous in situ values ranging from ?6 mL min-1 to ?18 L min-1. Applying a tidal-modulation model, a depth-dependent methane density, and extrapolating these results across the margin using two normalization techniques yields a combined average in situ flow-rate of ?88 × 106 kg y-1. The average methane flux-rate for the Cascadia margin is thus estimated to ?0.9 g y-1m-2. Combined uncertainties result in a range of these values between 4.5 and 1800% of the estimated mean values.

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