

Slow earthquakes illuminating interplate coupling heterogeneities in subduction zones

Satoru Baba¹, Shunsuke Takemura¹, Kazushige Obara¹, and Akemi Noda²

1. Earthquake Research Institute, The University of Tokyo

2. National Research Institute for Earth Science and Disaster Resilience

Contents of this file

Figures S1 to S6

Additional Supporting Information (Files uploaded separately)

Data Set S1

Introduction

This supporting information file includes six supplemental figures. Figure S1 presents the virtual epicentral grids analysed in this study. Figure S2 presents the frequency distribution of VLFs. Figure S3 presents the distribution of the number of detected events in each virtual epicentral grid. Figure S4 presents the cumulative numbers of events detected from January 2003 to June 2019. Figure S5 presents the temporal variation of the moment density release rate. Figure S6 presents the relationship between the moment density release rate after huge earthquakes and interplate coupling rate.

Additional Supporting Information includes the detected VLFE catalog (Data Set S1).

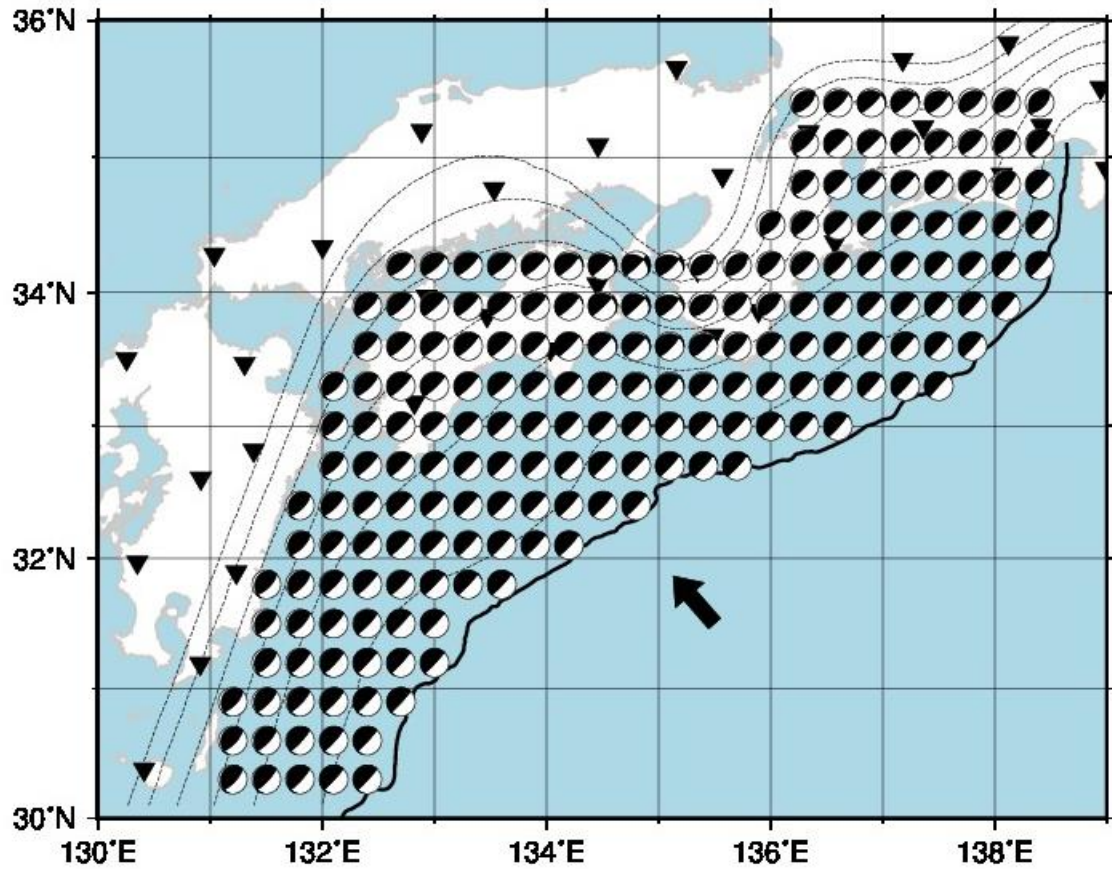


Figure S1. Virtual epicentral grids analysed in this study. Beach balls indicate the places and focal mechanisms of virtual sources. Inverted triangles represent the F-net station locations used in this study. The black line, black arrows, and dashed contours are the same as those in Figure 1.

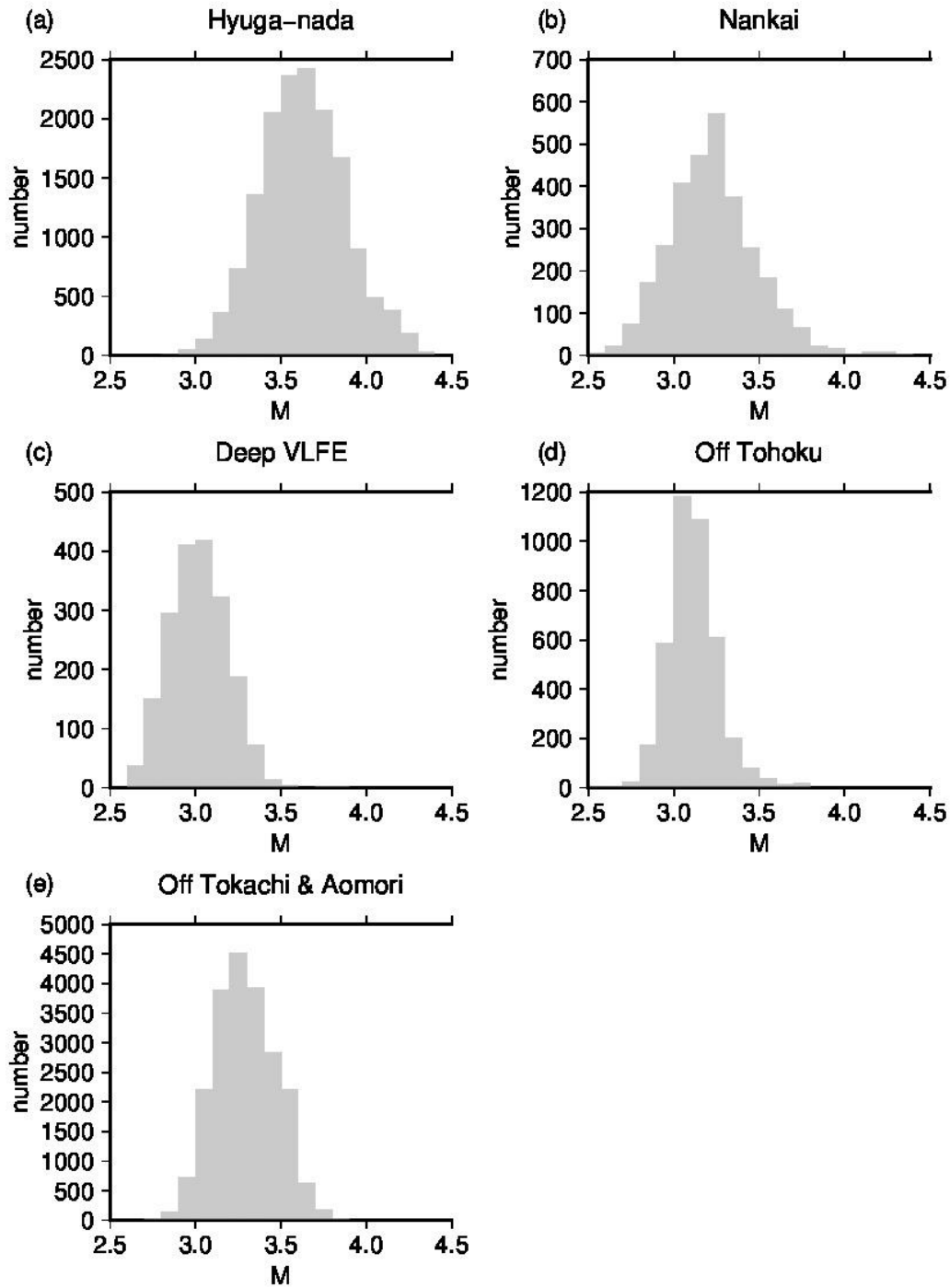


Figure S2. Frequency distribution of VLFs. (a) Shallow VLFs in Hyuga-nada, (b) Shallow VLFs in Nankai, except for Hyuga-nada, (c) Deep VLFs along the Nankai Trough, (d) Off Tohoku region, and (e) Off Tokachi and off Aomori.

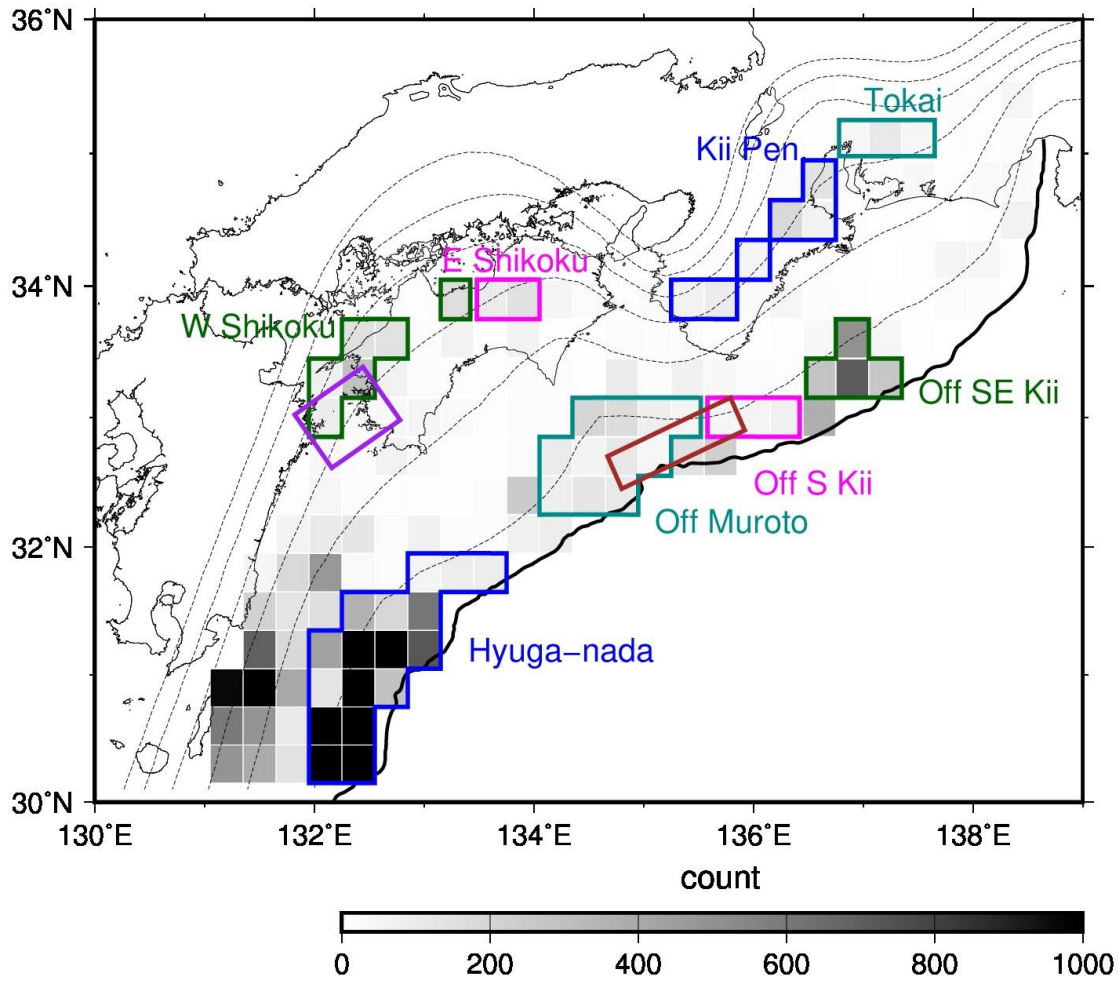
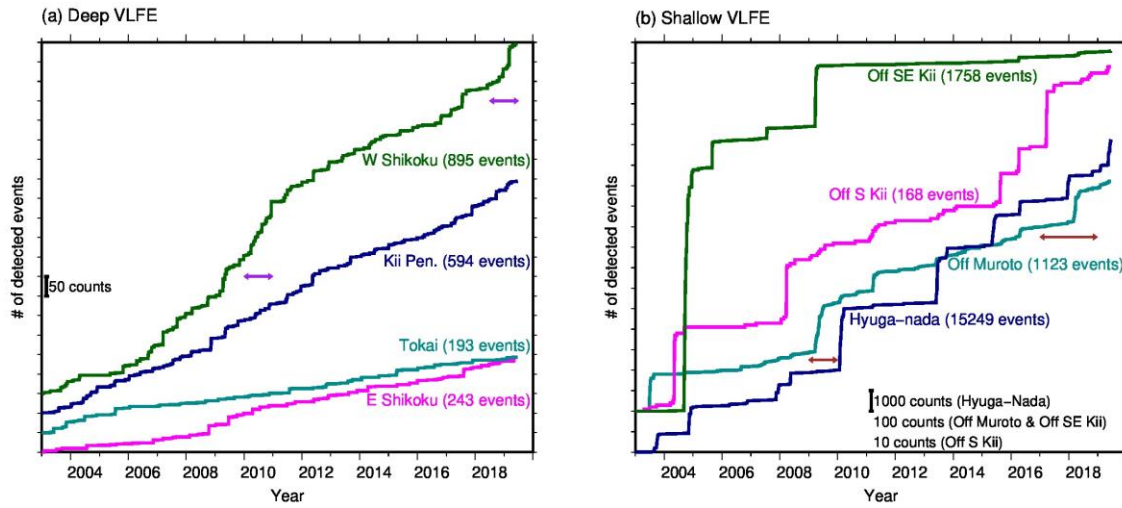


Figure S3. Distribution of the number of detected events in each virtual epicentral grid. The black line, dashed contours, and purple and brown rectangles are the same as those in Figure 1.

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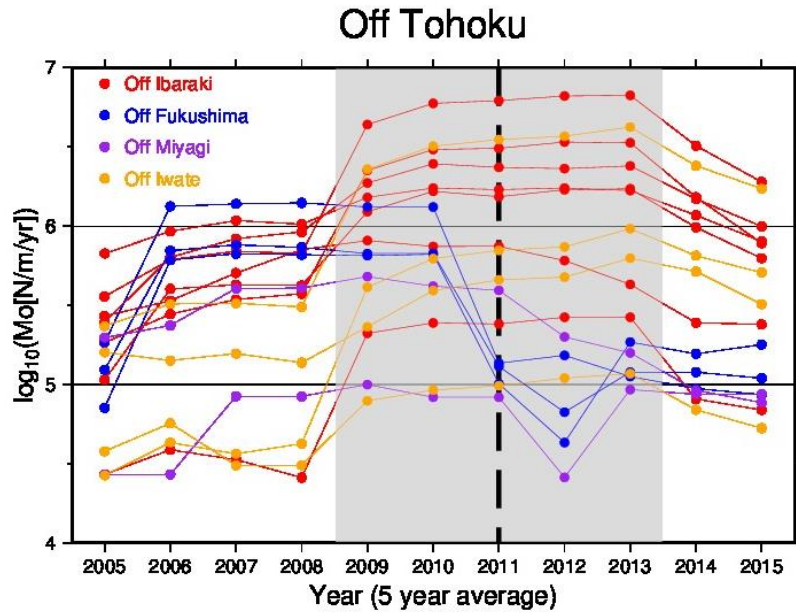


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43 **Figure S4.** Cumulative numbers of events detected from January 2003 to June 2019. (a)
 44 Cumulative numbers of deep VLFs. The cumulative number of each group contains events
 45 from all virtual epicentral grids in that group. The horizontal purple arrows are the same as
 46 those in Figure 2c. (b) Cumulative numbers of shallow VLFs. The cumulative number of each
 47 group contains events from all virtual epicentral grids in that group. The horizontal brown
 48 arrows are the same as those in Figure 2d.

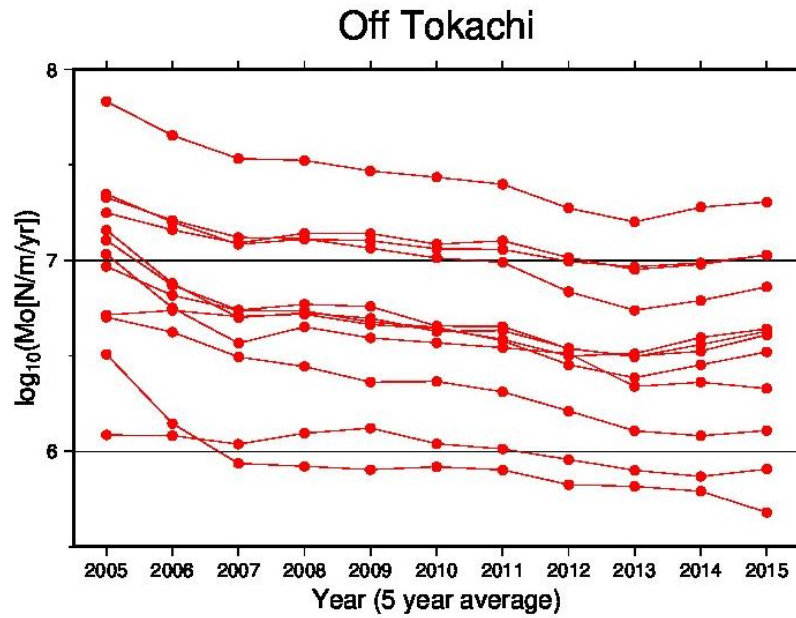
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50 (a)



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52 (b)



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54 **Figure S5.** Temporal variation of the moment density release rate. (a) Temporal variation of
 55 the moment density release rate for each grid based on the 5-year moving average off
 56 Tohoku. The black broken line shows the year of the Tohoku earthquake. The period, which
 57 includes the year of the Tohoku earthquake based on the 5-year moving average, is filled in
 58 grey. (b) Same as (a) but for the region off Tokachi.

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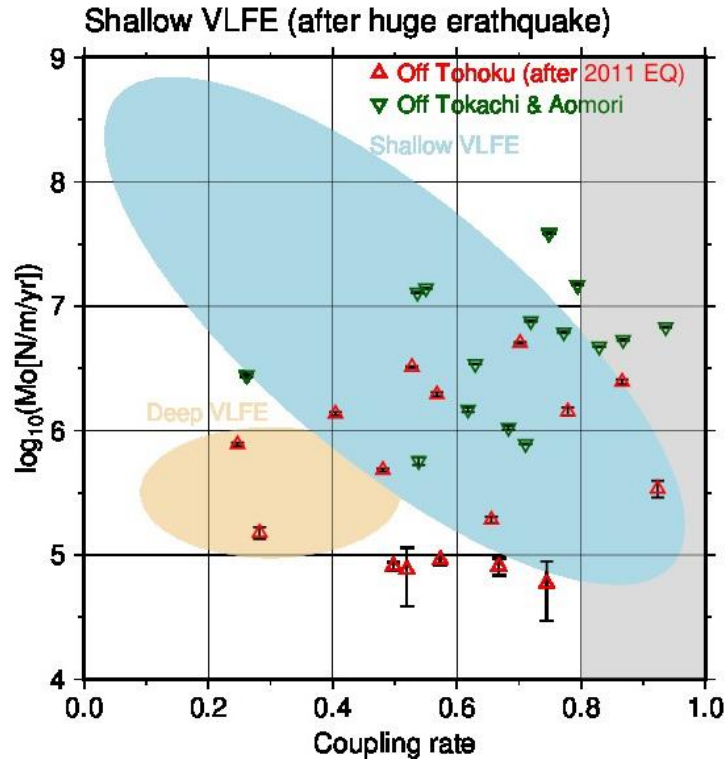


Figure S6. Relationship between the moment density release rate after huge earthquakes and interplate coupling rate. Same as Figure 3 but for shallow VLFs that occurred after huge earthquakes. The colored ellipses are the same as those in Figure 3.

Data Set S1. List of origin times of detected VLFs. First column: year, second column: month, third column: day, forth column: hour, fifth column: minute, sixth column: second, seventh column: longitude, eighth column: latitude, ninth column: depth, and tenth column: region name. Times are described in JST (UT+9).