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Supporting Information for

A 15-year catalog of more than 1 million low-frequency earthquakes: tracking tremor and slip along the deep San Andreas Fault

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Additional Supporting Information (Files uploaded separately)

Introduction

Supplemental material for this manuscript includes supplemental Text S1, which provides additional methods details, and supplemental Dataset S1, which provides the LFE catalog in full (.txt file).

Text S1. Supporting Method Notes

Family IDs:
Each family has an associated identification code, which is a number followed by 1-4 ‘s’. The family IDs are almost meaningless and are simply used as unique identifiers. Originally the numeric code was taken from the second of the day at which the initial template for this family occurred. The number of ‘s’ indicates the number of iterations of stacking and cross-correlation that were applied to derive the template waveforms (see Methods). The lower amplitude and more distant sources typically benefitted from multiple iterations of stacking and cross correlation, before the final template stabilized in its detection set.

Data channels Used (station.channels):

GHIB.13, EADB.123, JCSB.1, FROB.123, JCNB.123, VCAB.123, MMNB.123, CCRB.123, LCCB.123, SMNB.123, RMNB.123, SCYB.123

JCNB failed in 2008 and was replaced by a shallow sensor. New sensor not used.

RMNB failed in 2011 and was not replaced.

GHIB.2 was never operational

JCSB.23 have poor signal to noise and are not used.

VARB was replaced with a new sensor at a new depth in 2003, and was not used in original template formation.

As of 2016, a maximum of 27 channels of data are available.

Channel swap on FROB, VCAB (after BP->SP channel swap, before 2011-7-14):

2011/4/21-2011/7/14: Swap VCAB.2 and VCAB.3

2010/11/10-2011/7/14: Swap FROB.2 and FROB.3

Disregard mean correlation, enforce network correlation sum only (because of poor but present data): 2012/2/13-2014/4/23

Polarity corrections during initial processing:

CCRB.123, correct for reversed polarity from 2001-6-1 to 2001-12-13.

FROB.123, correct for reverse polarity from 2010/12/10-2011/4/7

MMNB.123, correct for reverse polarity from 2010/12/10-2011/4/7

FROB.23, correct for reverse polarity from 2010/4/8 to 2011-7-14

Polarity corrections applied in post-processing (these are minor and done after initial detection stage):

2011-4-7 to 2011-5-27: zero FROB.2 channel (wiring mistake, FROB.2 duplicates FROB.3)

2005/4/11-2005/5/13: reverse GHIB.13

2005/12/15-present: reverse GHIB.3

2002/11/22-2003/1/16: reverse EADB.2

2002/11/21-2003/1/17: reverse VCAB.3

Data Set S1. Low-frequency earthquake catalog, April 2001 to 19 September, 2016, 1,045,627 events.

Format:

```
YYYY MM DD s_of_day HH mm ss.ss ccsum  meancc med_cc seqday
   ID     latitude longitude  depth  n_chan
```

Explantions:

YYYY MM DD (year month day) - Event time (template start time in UTC - ~1s prior to first S-wave arrival time at an HRSN station)

s_of_day - Event time (template start time in UTC - ~1s prior to first S-wave arrival time at an HRSN station), second of the day (i.e. 0-86400),

HH mm ss.ss (hour, minute, second) - Event time (template start time in UTC- ~1s prior to S-wave arrival time at first HRSN station)

ccsum - correlation sum across all stations (must exceed 4.0)

meancc - mean correlation among stations with data

med_cc - median correlation

seqday - sequential day since March 1, 2001

ID - reference ID of family

latitude longitude depth - estimated location for that family (Shelly and Hardebeck, 2010)

n_chan - number of data channels existing for event (some channels may exist, but not have good data)