 Supplement of

**Bedload transport measurements with Swiss impact plate geophones in two Austrian mountain streams (Fischbach and Ruetz): system calibration, grain size estimation, and environmental signal pick-up**

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Figure S1. Basket sampler as designed and used by TIWAG to collect bedload samples downstream of the geophone plate where there is a steel-concrete pillar to guide the position of the sampler during the calibration measurements. (a) top view, (b) side view

Figure S2. Geophone measuring cross-section at the Fischbach in March 2013, view looking upstream. Note that only about half the width of the sill with the steel plate is submerged under water. Base-flow during this period is approximately 1 m$^3$ s$^{-1}$. (Photo Hydrographic Service of Tyrol.)
Figure S3. Fischbach: Arithmetic mean of geophone impulses per 15 min for each of the 8 plates (ordinates), averaged over the period 2008-2013 and including zero values, for discharge Q classes of width of 0.25 m³ s⁻¹, for discharges up to 6 m³ s⁻¹.
Figure S4. Ruetz: Arithmetic mean of geophone impulses per 15 min for each of the 8 plates (ordinates), averaged over the period 2008-2013 and including zero values, for discharge Q classes of width of 0.25 m$^3$ s$^{-1}$, for discharges up to 3 m$^3$ s$^{-1}$.
Figure S5. Fischbach: Mean of recorded impulses (mean IMP) for each of the 8 plates, and mean of discharge (Q), versus time of day, averaged for the period 2008-2013 and including zero values, shown for different discharge classes of width of 1.0 m$^3$ s$^{-1}$, for discharges up to 12 m$^3$ s$^{-1}$. (Same color scheme as in Fig. 12 and Fig. S3.)
Figure S6. Ruetz: Mean of recorded impulses (mean IMP) for each of the 8 plates, and mean of discharge (Q), versus time of day, averaged for the period 2008-2013 and including zero values, shown for different discharge classes of width of 0.5 m$^3$ s$^{-1}$, for discharges up to 6 m$^3$ s$^{-1}$. (Same color scheme as in Fig. 13 and Fig. S4.)
Figure S7. Fischbach: Sum of geophone impulses per 15 minute intervals (IMP) for all 8 plates versus discharge $Q$, for the entire year 2010. Discharges smaller than about 1-2 m$^3$ s$^{-1}$ are unlikely to produce bedload transport with particles $D$ larger than about 10 to 20 mm. Many impulses in the range of about up to 500 IMP and up to 3 m$^3$ s$^{-1}$ are implausible and are likely due to nearby road traffic.

Figure S8. Ruetz: Sum of geophone impulses per 15 minute intervals (IMP) for all 8 plates versus discharge $Q$, for the entire year 2010. Discharges smaller than about 0.5-1.0 m$^3$ s$^{-1}$ are unlikely to produce bedload transport with particles $D$ larger than about 10 to 20 mm. Many impulses in the range of about up to 100 IMP and up to 1.5 m$^3$ s$^{-1}$ are implausible and are likely due to nearby road traffic.