# Supplemental materials

Table DR1. Sediment gauging stations used in this study

| Station Name | Basin name | Station Number | Drainage Area [km$^2$] | Period of record |
|---|---|---|---|---|
| A. Chu-Kou | Pachang | 1580H001 | 83.2 | 1966-2011 |
| B. Chun-Huei Bridge | Pachang | 1580H007 | 122.3 | 1970-2011 |
| C. Chang-Pan Bridge | Pachang | 1580H008 | 101.1 | 1970-2011 |
| D. Shin-Ying | Chishui | 1590H012 | 226.7 | 1958-2011 |
| E. San-Ti-Men | Kaoping | 1730H036 | 408.5 | 1965-2011 |
| F. Chao-Chou | Tungkang | 1740H002 | 175.3 | 1966-1981, 1983-2011 |
| G. Hsin-Pei | Linpien | 1760H004 | 309.9 | 1961-2011 |
| H. Chih-Pen | Chinpen | 2170H001 | 166.0 | 1961-1975, 1979-2011 |
| I. Yen-Ping | Peinan | 2200H007 | 476.2 | 1955-2011 |
| J. Tai-Tung Bridge | Peinan | 2200H011 | 1584.3 | 1948-2011 |
| K. Li-Lin Bridge | Kaoping | 1730H043 | 2894.8 | 1991-2004,2007-2011 |
| L. Li-Chia | Lichia | 2180H002 | 148.6 | 1999-2011 |
| M. Hsin-Wu-Lu | Peinan | 2200H020 | 638.8 | 1979-2011 |
| N. Wan-Nei Bridge | Potzu | 1550H012 | 282.9 | 1994-2003,2005-2011 |
| O. Yu-Tien | Tsengwen | 1630H005 | 160.5 | 1959-2011 |
| P. Tso-Chen | Tsengwen | 1630H013 | 121.3 | 1971-2011 |
| Q. Hsin-Shih | Yenshui | 1650H006 | 146.5 | 1973-2011 |
| R. A-Lien-2 | Erren | 1660H009 | 175.1 | 1971-1981,1990-2010 |
| S. Chung-Te Bridge | Erren | 1660H010 | 139.6 | 1982-2011 |

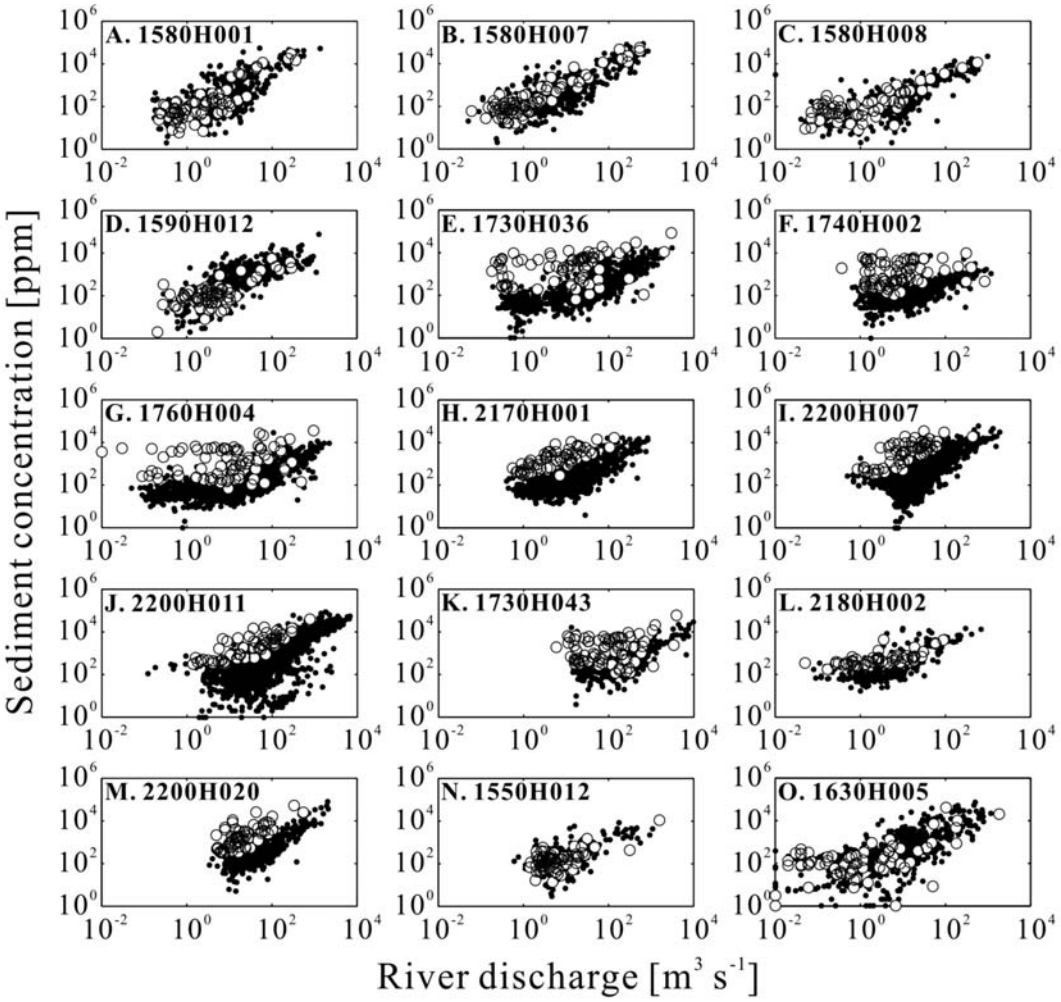


Fig. DR1. Sediment concentration versus discharge data for 15 suspended sediment gauging stations for which *K* increased after Morakot typhoon. We separated all data into two groups, before Morakot typhoon (black dots), and after Morakot event (open circles). The after Morakot data period extended to the end of year 2011.

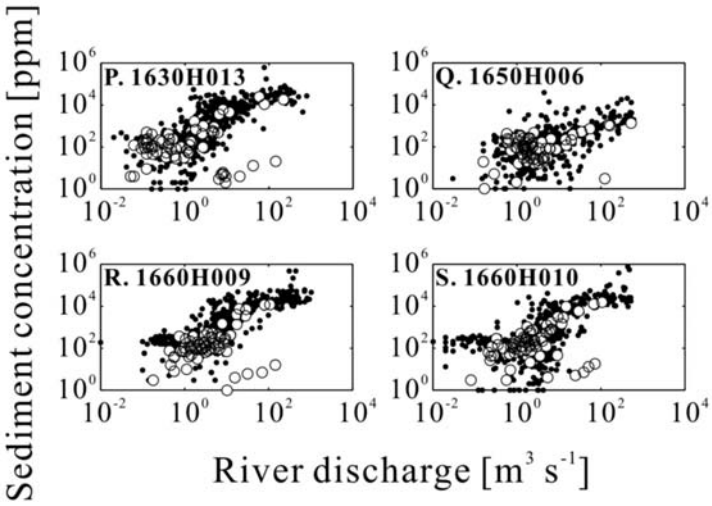


Fig. DR2. Sediment concentration versus discharge data for the four stations for which *K* decreased after Morakot typhoon. These four stations are all located on coastal plains far from upland regions and lacked extensive landslide during Morakot (see Fig. 1A black symbols in manuscript)

Table DR2. Power law regression parameters for C-Q rating curves for data from periods before and after typhoon Morakot for all 19 stations in this study, and the Nash-Sutcliffe model efficiency coefficient (*E*) was used to evaluated the rating curve efficient.

(a) Long-term stations

| Station | Before Morakot typhoon | | | After Morakot typhoon | | |
|---|---|---|---|---|---|---|
| | $b_{range}$ | $K_{range}$ | $E$ | $b_{range}$ | $K_{range}$ | $E$ |
| 1580H001 | 0.82±0.08 | 54±9 | 0.47 | 0.91±0.13 | 61±21 | 0.68 |
| 1580H007 | 0.81±0.06 | 96±12 | 0.64 | 0.85±0.08 | 148±31 | 0.83 |
| 1580H008 | 0.55±0.06 | 81±10 | 0.47 | 0.53±0.11 | 108±30 | 0.55 |
| 1590H012 | 0.90±0.06 | 35±4 | 0.63 | 0.65±0.14 | 47±17 | 0.51 |
| 1630H005 | 0.57±0.06 | 114±13 | 0.41 | 0.39±0.17 | 126±43 | 0.29 |
| 1630H013 | 0.88±0.06 | 306±45 | 0.56 | 0.22±0.21 | 121±70 | 0.05 |
| 1650H006 | 0.54±0.07 | 61±11 | 0.28 | 0.37±0.16 | 55±27 | 0.16 |
| 1730H036 | 0.59±0.06 | 35±3 | 0.54 | 0.21±0.19 | 1180±390 | 0.10 |
| 1740H002 | 0.52±0.05 | 25±2 | 0.48 | 0.14±0.19 | 845±358 | 0.03 |
| 1760H004 | 0.46±0.04 | 41±3 | 0.49 | 0.10±0.29 | 962±339 | 0.02 |
| 2170H001 | 0.71±0.06 | 35±4 | 0.52 | 0.60±0.12 | 603±174 | 0.60 |
| 2200H007 | 1.04±0.08 | 15±2 | 0.51 | 0.75±0.20 | 533±210 | 0.57 |
| 2200H011 | 0.93±0.09 | 7±1 | 0.47 | 0.67±0.19 | 218±61 | 0.66 |

(b) Short-term stations

| Station | Before Morakot typhoon | | | After Morakot typhoon | | |
|---|---|---|---|---|---|---|
| | $b_{range}$ | $K_{range}$ | $E$ | $b_{range}$ | $K_{range}$ | $E$ |
| 1550H012 | 0.72±0.11 | 33±7 | 0.43 | 0.53±0.15 | 57±21 | 0.37 |
| 1660H009 | 0.88± 0.07 | 166±23 | 0.60 | 0.52±0.25 | 71±52 | 0.15 |
| 1660H010 | 0.78±0.08 | 180±34 | 0.40 | 0.49±0.20 | 113±75 | 0.16 |
| 1730H043 | 0.69±0.18 | 10±2 | 0.49 | 0.18±0.43 | 643±321 | 0.04 |
| 2180H002 | 0.63±0.08 | 90±16 | 0.51 | 0.29±0.07 | 395±77 | 0.47 |
| 2200H020 | 1.03±0.11 | 6±1 | 0.65 | 0.86±0.30 | 133±68 | 0.50 |

Table DR3. Constant-slope fixed *b* powerlaw regression parameters for C-Q rating curves for discharge > 10 $m^3 s^{-1}$. The slope (*b*) value was determined by fitting all data, and *E* is Nash-Sutcliffe model efficiency coefficient.

(a) Long-term stations

| Station | *b* | Before Morakot | | After Morakot | |
|---|---|---|---|---|---|
| | | $K_{range}$ | *E* | $K_{range}$ | *E* |
| 1580H001 | 1.29 | 22±4 | 0.32 | 43±18 | 0.55 |
| 1580H007 | 1.13 | 57±8 | 0.54 | 129±33 | 0.74 |
| 1580H008 | 1.01 | 39±6 | 0.14 | 99±41 | 0.08 |
| 1590H012 | 0.69 | 58±7 | 0.59 | 44±16 | 0.51 |
| 1630H005 | 0.95 | 63±8 | 0.23 | 124±59 | -0.29 |
| 1630H013 | 0.52 | 425±68 | 0.47 | 120±73 | -0.04 |
| 1650H006 | 0.90 | 35±7 | 0.16 | 32±18 | -0.17 |
| 1730H036 | 0.77 | 20±2 | 0.49 | 344±155 | -0.62 |
| 1740H002 | 0.71 | 16±1 | 0.41 | 277±146 | -0.47 |
| 1760H004 | 0.87 | 16±1 | 0.11 | 199±110 | -1.26 |
| 2170H001 | 0.99 | 17±2 | 0.44 | 313±117 | 0.35 |
| 2200H007 | 1.20 | 9±1 | 0.49 | 171±83 | 0.36 |
| 2200H011 | 1.04 | 4±1 | 0.47 | 62±22 | 0.45 |

(b) Short-term stations

| Station | *b* | Before Morakot | | After Morakot | |
|---|---|---|---|---|---|
| | | $K_{range}$ | *E* | $K_{range}$ | *E* |
| 1550H012 | 0.81 | 27±6 | 0.42 | 34±14 | 0.26 |
| 1660H009 | 0.80 | 193±27 | 0.59 | 48±37 | 0.11 |
| 1660H010 | 0.89 | 155±30 | 0.39 | 80±57 | 0.05 |
| 1730H043 | 0.53 | 22±4 | 0.47 | 127±68 | -0.11 |
| 2180H002 | 0.96 | 57±12 | 0.37 | 198±94 | -2.03 |
| 2200H020 | 0.99 | 7±1 | 0.65 | 88±46 | 0.49 |