

Supplement of SOIL Discuss., 2, 1419–1448, 2015
<http://www.soil-discuss.net/2/1419/2015/>
doi:10.5194/soild-2-1419-2015-supplement
© Author(s) 2015. CC Attribution 3.0 License.



Supplement of

Sediment concentration rating curves for a monsoonal climate: upper Blue Nile Basin

M. A. Moges et al.

Correspondence to: T. S. Steenhuis (tss1@cornell.edu)

The copyright of individual parts of the supplement might differ from the CC-BY 3.0 licence.

Table A1: Theissen weight derived from the Theissen polygon method for estimating areal rainfall

| Watershed | Rainfall stations and Theissen weight | | |
|-------------|---------------------------------------|------------------|-----------------|
| | Station Id. | Rainfall station | Theissen weight |
| Gilgel Abay | 1 | Adet | 0.01 |
| | 2 | Sekela | 0.47 |
| | 3 | Injibara | 0.20 |
| | 4 | Dangila | 0.31 |
| Gumara | Station Id. | Station Name | Theissen weight |
| | 1 | Agere Genet | 0.04 |
| | 2 | Debre Tabor | 0.54 |
| | 3 | Nifas Mewucha | 0.01 |
| | 4 | Wanzaye | 0.41 |
| Ribb | Station Id. | Station Name | Theissen weight |
| | 1 | Addis Zemen | 0.34 |
| | 2 | Debre Tabor | 0.37 |
| | 3 | Nefas Mewucha | 0.21 |
| | 4 | Woreta | 0.08 |
| Megech | Station Id. | Station Name | Theissen weight |
| | 1 | Amba Giorgis | 0.31 |
| | 2 | Gonder | 0.68 |
| | 3 | Maksegnt | 0.01 |

Table B1: Observed discharge and sediment data measured at the gauging station of Gilgel Abay watershed.

| Date | Discharge(m ³ /s) | Sediment concentration, g/l |
|------------|------------------------------|-----------------------------|
| 6/28/1968 | 70.8 | 1.77 |
| 7/22/1968 | 150.7 | 1.39 |
| 8/12/1968 | 171.7 | 1.04 |
| 8/26/1968 | 195.9 | 1.3 |
| 8/18/1983 | 117.9 | 0.78 |
| 8/30/1985 | 75.9 | 1.91 |
| 2/10/1986 | 3.5 | 0.14 |
| 4/11/1986 | 1.9 | 0.07 |
| 4/25/1987 | 2.18 | 0.03 |
| 10/23/1987 | 48.8 | 0.51 |
| 5/20/1988 | 10.9 | 0.21 |
| 7/20/1988 | 213.45 | 2.06 |
| 9/8/1988 | 123.6 | 0.84 |
| 8/2/1990 | 195.9 | 3.13 |
| 5/7/1993 | 3.6 | 0.17 |
| 8/23/1995 | 173.5 | 1.56 |
| 2/17/1996 | 2.6 | 0.12 |
| 8/19/2004 | 149.5 | 3.22 |
| 8/22/2004 | 119.4 | 2.22 |
| 8/23/2004 | 179.5 | 3.15 |
| 2/17/2005 | 2.8 | 0.13 |
| 6/7/2005 | 3.5 | 2.17 |
| 12/6/2007 | 9.8 | 0.31 |

Table B2: Observed discharge and sediment data measured at the gauging station of Gumara watershed.

| Date | Discharge (m ³ /s) | Sediment concentration, g/l |
|------------|-------------------------------|-----------------------------|
| 7/27/1964 | 195 | 6.5 |
| 8/1/1964 | 189 | 7.21 |
| 7/22/1968 | 3.5 | 2.11 |
| 7/28/1968 | 43.5 | 0.02 |
| 7/23/1968 | 108.9 | 1.65 |
| 8/6/1968 | 138.1 | 1.73 |
| 8/21/1968 | 34.8 | 0.78 |
| 9/3/1968 | 53.1 | 0.61 |
| 8/6/1980 | 141.3 | 1.39 |
| 9/24/1980 | 26.6 | 0.1 |
| 8/17/1983 | 182.7 | 2.58 |
| 9/2/1985 | 55.9 | 2.91 |
| 2/11/1986 | 0.7 | 0.22 |
| 9/5/1986 | 92.4 | 2.6 |
| 3/1/1987 | 0.4 | 0.86 |
| 10/29/1987 | 12.1 | 0.73 |
| 5/25/1988 | 0.4 | 0.39 |
| 7/21/1988 | 132.9 | 4.12 |
| 11/17/1988 | 9.1 | 0.08 |
| 12/22/1988 | 3.1 | 0.06 |
| 2/10/1989 | 1.4 | 0.06 |
| 2/10/1990 | 1.2 | 0.15 |
| 7/1/1992 | 37.6 | 10.07 |
| 6/1/1992 | 0.3 | 0.37 |
| 5/3/1993 | 0.5 | 0.54 |
| 9/3/1994 | 35.8 | 0.03 |
| 8/3/1995 | 181.9 | 0.26 |
| 8/16/1995 | 258.7 | 6.89 |
| 8/24/1996 | 197.5 | 2.54 |
| 7/30/1996 | 218.8 | 5.33 |
| 11/14/1996 | 3.6 | 0.16 |
| 11/14/1996 | 3.6 | 0.12 |
| 11/14/1996 | 3.6 | 0.09 |
| 8/16/2004 | 117.1 | 3.44 |
| 8/17/2004 | 207.8 | 5.86 |
| 9/5/2005 | 95.2 | 5.05 |
| 9/6/2005 | 146.5 | 3.3 |
| 9/7/2005 | 152.7 | 3.9 |
| 7/17/2006 | 50.1 | 2.9 |
| 7/18/2006 | 62.9 | 6.1 |
| 7/28/2006 | 73.7 | 3.83 |
| 8/10/2007 | 129.8 | 3.13 |
| 8/14/2007 | 122.7 | 2.15 |
| 8/22/2007 | 73.4 | 0.78 |

| | | |
|-----------|-------|------|
| 8/23/2007 | 129.3 | 3.09 |
| 8/24/2007 | 152.3 | 2.36 |
| 8/25/2007 | 180.5 | 6.37 |
| 8/11/2007 | 118.1 | 1.66 |
| 12/4/2007 | 3.2 | 0.15 |
| 8/2/2008 | 176.5 | 5.28 |
| 8/3/2008 | 221.3 | 4.98 |
| 8/4/2008 | 171.1 | 2.62 |
| 8/5/2008 | 276.4 | 3.99 |

Table B3: Observed discharge and sediment data measured at the gauging station of Ribb watershed.

| Date | Discharge (m ³ /s) | Sediment concentration, g/l |
|------------|-------------------------------|-----------------------------|
| 7/3/1968 | 32.5 | 7.33 |
| 7/23/1968 | 44.7 | 2.73 |
| 8/7/1968 | 96.7 | 3.37 |
| 8/20/1998 | 123 | 3.53 |
| 9/3/1968 | 320 | 3.34 |
| 8/7/1980 | 34.6 | 2.12 |
| 9/24/1980 | 6.8 | 0.17 |
| 8/15/1983 | 134.9 | 0.08 |
| 9/3/1985 | 27.31 | 3.02 |
| 2/11/1986 | 0.1 | 0 |
| 8/7/1986 | 77.7 | 0.22 |
| 9/5/1986 | 24.6 | 0.55 |
| 4/29/1987 | 0.7 | 0.22 |
| 10/29/1987 | 16 | 0.37 |
| 5/25/1988 | 0.1 | 2.06 |
| 7/22/1988 | 60.3 | 3.35 |
| 9/2/1988 | 56 | 3.87 |
| 11/18/1988 | 2.6 | 0.16 |
| 12/22/1988 | 1.1 | 0.09 |
| 2/11/1989 | 0.6 | 0.1 |
| 2/12/1990 | 0.4 | 0.27 |
| 7/6/1990 | 46.1 | 10 |
| 5/23/1992 | 0.5 | 0.94 |
| 7/20/1992 | 36.3 | 19 |
| 8/25/1992 | 62.2 | 2.97 |
| 5/12/1993 | 0.3 | 0.35 |
| 7/20/1993 | 90.6 | 13.83 |
| 8/26/1994 | 113.9 | 8.34 |
| 8/3/1995 | 138.2 | 3.11 |
| 8/24/1996 | 212.7 | 7.7 |
| 8/12/1996 | 57.6 | 0.73 |
| 10/2/1996 | 2.1 | 0.02 |
| 8/9/2004 | 104.1 | 5.31 |
| 8/16/2004 | 90.6 | 5.44 |
| 9/5/2005 | 57.3 | 2.98 |
| 9/6/2005 | 40.7 | 1.46 |
| 9/7/2005 | 91.4 | 8.38 |
| 7/17/2006 | 50.9 | 13.7 |
| 7/18/2006 | 38.1 | 6.79 |
| 7/28/2006 | 56.5 | 6.57 |
| 8/10/2007 | 96.2 | 6.24 |
| 8/14/2007 | 98.6 | 8.59 |
| 8/22/2007 | 73.9 | 3.79 |
| 8/23/2007 | 75.4 | 3.66 |

| | | |
|-----------|-------|------|
| 8/24/2007 | 103.3 | 5.15 |
| 8/25/2007 | 81.1 | 5.86 |
| 8/26/2007 | 85.63 | 3.96 |
| 8/27/2007 | 85.63 | 4.1 |
| 8/28/2007 | 85.63 | 4.19 |
| 8/1/2008 | 95.81 | 4.34 |
| 8/3/2008 | 37.98 | 6.63 |
| 8/4/2008 | 78.28 | 4.78 |

Table B4: Megech observed discharge and sediment data.

| Date | Discharge (m ³ /s) | Sediment concentration, g/l |
|------------|----------------------------------|--------------------------------|
| 2/21/1990 | 0.04 | 0.23 |
| 8/10/1990 | 8.96 | 0.59 |
| 5/27/1992 | 0.05 | 0.37 |
| 5/14/1993 | 0.19 | 0.63 |
| 10/6/1994 | 2.61 | 0.19 |
| 3/11/2005 | 0.11 | 0.29 |
| 9/2/2005 | 9.61 | 0.28 |
| 9/3/2005 | 9.78 | 0.21 |
| 9/4/2005 | 8.67 | 0.22 |
| 8/15/2007 | 17.24 | 0.65 |
| 8/16/2007 | 46 | 2.07 |
| 8/18/2007 | 49.33 | 2.67 |
| 8/19/2007 | 21.41 | 0.5 |
| 8/20/2007 | 23.99 | 0.85 |
| 8/21/2007 | 41.82 | 1.26 |
| 11/22/2007 | 0.7 | 0.26 |

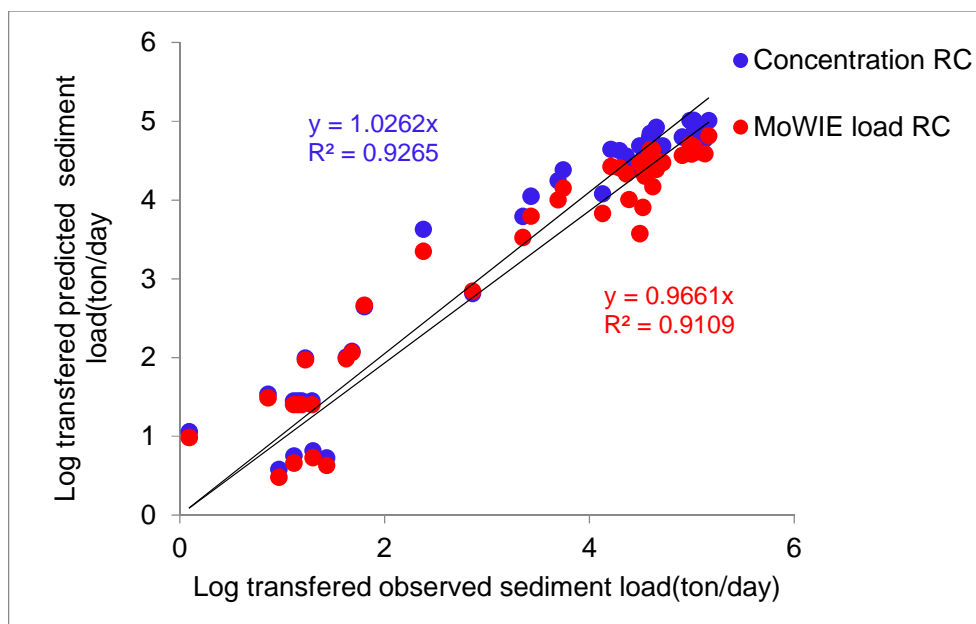


Figure C1: Log log transformed values of sediment load predicted by concentration and MoWIE load rating curves for Gumara watershed