**Supplemental material**

**Article title: A critical review on variation in pH and chemical characteristics of rainwater during 1982 - 2018 in 24 cities in China**

Rui Qua, Guilin Hana\*

a Institute of Earth Sciences, China University of Geosciences (Beijing)，Beijing 100083，China；

\* Corresponding author: Tel.: +86-10-82323536; fax: +86-10-82321115. *E-mail address*: hanguilin@cugb.edu.cn (Han G.)

**List of Contents:**

**Table S1. Rainwater data of different cities in China (pH in unit and volume-weighted mean concentration of ion in µeq/L ).**

**Table S1.** **Rainwater data of different cities in China (pH in unit and volume-weighted mean concentration of ion in µeq/L ).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Province** | **City** | **n** | **pH** | **K+** | **Na+** | **Ca2+** | **Mg2+** | **NH4+** | **Cl-** | **NO3-** | **SO42-** | **Year** | **References** |
| **Henan** | **Zhengzhou city** | - a | 6.1  | - | - | 760.0  | 383.2  | 185.0  | 34.3  | 46.3  | 508.4  | 1991 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 6.2  | - | - | 480.0  | 366.8  | 134.4  | 57.1  | 15.3  | 354.0  | 1992 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 6.5  | - | - | 1620.0  | 482.0  | 251.1  | 40.0  | 60.6  | 454.0  | 1993 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 6.7  | - | - | 980.8  | 359.2  | 160.2  | 32.7  | 31.1  | 766.4  | 1994 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 6.4  | - | - | 1480.0  | 788.4  | 210.0  | 68.9  | 33.5  | 940.4  | 1995 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 6.1  | - | - | 1305.6  | 1620.4  | 485.6  | 238.7  | 45.1  | 1165.6  | 1996 | Sun, 1998 |
| **Henan** | **Zhengzhou city** | - | 5.8  | 30.0  | 66.5  | 314.6  | 300.4  | 219.1  | 224.6  | 43.4  | 312.2  | 2002 | Guo et al., 2008 |
| **Henan** | **Zhengzhou city** | - | 5.4  | 27.2  | 55.7  | 346.8  | 37.4  | 177.7  | 259.2  | 91.3  | 351.0  | 2003 | Guo et al., 2008 |
| **Henan** | **Zhengzhou city** | - | 5.4  | 30.4  | 75.3  | 306.4  | 37.6  | 183.5  | 427.3  | 116.3  | 346.2  | 2004 | Guo et al., 2008 |
| **Henan** | **Zhengzhou city** | - | 5.5  | 69.7  | 155.4  | 501.6  | 56.4  | 208.5  | 733.4  | 86.3  | 374.4  | 2005 | Guo et al., 2008 |
| **Henan** | **Anyang city** | - | 6.7  | 28.3  | 32.6  | 668.2  | 129.3  | 144.6  | 90.0  | 143.8  | 856.1  | 2006 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.1  | 31.6  | 47.8  | 847.7  | 95.3  | 244.1  | 54.5  | 103.5  | 514.9  | 2007 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.1  | 10.4  | 29.3  | 350.1  | 53.4  | 237.0  | 66.4  | 93.5  | 396.0  | 2008 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.1  | 6.4  | 20.1  | 351.9  | 41.0  | 187.0  | 76.3  | 57.0  | 318.7  | 2009 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.1  | 16.7  | 19.5  | 761.8  | 45.9  | 162.6  | 107.6  | 38.0  | 302.5  | 2010 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.0  | 12.8  | 47.5  | 541.7  | 32.7  | 163.8  | 89.0  | 98.8  | 417.8  | 2011 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.0  | 7.9  | 54.8  | 536.2  | 20.5  | 123.4  | 39.5  | 84.1  | 277.5  | 2012 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 6.9  | 22.6  | 86.6  | 696.3  | 63.9  | 162.0  | 74.7  | 89.0  | 272.1  | 2013 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.1  | 15.3  | 39.4  | 863.8  | 54.0  | 166.9  | 83.8  | 138.1  | 259.9  | 2014 | Zhao et al., 2017 |
| **Henan** | **Anyang city** | - | 7.4  | 13.2  | 30.2  | 719.3  | 74.8  | 170.5  | 70.9  | 125.7  | 263.2  | 2015 | Zhao et al., 2017 |
| **Shaanxi** | **Xi'an city** | - | 6.1  | 42.9  | 149.7  | 1137.3  | 104.8  | 281.1  | 69.5  | 143.0  | 792.7  | 2001 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.0  | 47.9  | 212.4  | 975.0  | 131.5  | 251.6  | 306.6  | 125.8  | 1516.0  | 2002 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.1  | 20.6  | 74.8  | 541.0  | 69.8  | 171.9  | 89.0  | 67.7  | 419.8  | 2003 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.2  | 39.7  | 63.8  | 745.9  | 90.8  | 178.6  | 91.6  | 135.5  | 641.4  | 2004 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 5.6  | 12.7  | 26.4  | 288.1  | 37.3  | 72.7  | 42.3  | 15.5  | 355.7  | 2005 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 5.8  | 28.5  | 49.0  | 952.4  | 84.6  | 268.9  | 61.2  | 126.0  | 971.4  | 2006 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 5.6  | 23.4  | 50.9  | 349.6  | 36.5  | 144.3  | 122.6  | 75.0  | 446.2  | 2007 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.4  | 17.7  | 30.2  | 650.5  | 99.8  | 179.2  | 57.6  | 24.7  | 403.5  | 2008 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.6  | 11.8  | 20.0  | 479.6  | 37.5  | 226.4  | 32.9  | 78.3  | 328.6  | 2009 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.7  | 10.9  | 14.7  | 426.4  | 32.1  | 178.5  | 27.5  | 62.4  | 272.7  | 2010 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 5.6  | 15.3  | 16.3  | 211.6  | 30.1  | 91.2  | 12.6  | 26.4  | 336.1  | 2011 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | - | 6.3  | 3.9  | 4.2  | 110.3  | 8.0  | 75.9  | 13.9  | 17.1  | 249.2  | 2012 | Song et al., 2013 |
| **Shaanxi** | **Xi'an city** | 37 | 6.5  | 18.7  | 10.4  | 207.1  | 30.2  | 175.7  | 20.8  | 54.7  | 163.5  | 2015 | Wang et al., 2018 |
| **Liaoning** | **Dalian city** | 114 | 7.9  | - | 630.4  | 505.0  | 56.7  | - | 760.6  | 51.6  | 377.1  | 1984-1985 | Lu et al., 1987 |
| **Liaoning** | **Dalian city** | 453 | 7.6  | 52.6  | 162.7  | 968.1  | 123.8  | 164.5  | 92.9  | 63.5  | 517.8  | 1991-1995 | Xie et al., 1998 |
| **Liaoning** | **Dalian city** | 23 | 4.8  | 8.2  | 45.7  | 68.5  | 16.3  | 120.6  | 76.1  | 60.8  | 209.4  | 2007-2008 | Liu and Wang, 2011 |
| **Liaoning** | **Dalian city** | - | 4.9  | 6.8  | 34.6  | 68.2  | 24.5  | 385.3  | 51.9  | 127.7  | 320.3  | 2009 | Chen, 2013 |
| **Liaoning** | **Dalian city** | 68 | 4.9  | 10.0  | 33.3  | 139.5  | 22.1  | 92.8  | 42.7  | 72.6  | 206.2  | 2011 | Ji,2012 |
| **Liaoning** | **Anshan city** | - | 7.0  | 30.3  | 91.3  | 571.5  | 164.2  | 175.6  | 82.0  | 207.9  | 490.2  | 2011 | Zhao, 2015 |
| **Liaoning** | **Anshan city** | - | 7.3  | 6.2  | 22.2  | 41.5  | 39.2  | 70.6  | 21.4  | 11.5  | 136.0  | 2012 | Zhao, 2015 |
| **Liaoning** | **Anshan city** | - | 6.4  | 9.2  | 17.0  | 133.5  | 47.5  | 160.6  | 38.0  | 33.4  | 281.7  | 2013 | Zhao, 2015 |
| **Liaoning** | **Anshan city** | - | 6.3  | 20.5  | 40.0  | 127.0  | 100.8  | 143.3  | 38.0  | 148.6  | 249.2  | 2014 | Zhao, 2015 |
| **Shandong** | **Qingdao city** | 60 | 4.7  | 5.4  | 71.7  | 217.0  | 33.3  | 64.4  | 47.0  | 39.0  | 144.6  | 1997 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 107 | 4.7  | 7.2  | 28.7  | 164.0  | 15.8  | 68.3  | 57.8  | 28.2  | 142.5  | 1998 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 66 | 5.1  | 11.3  | 40.9  | 177.5  | 20.0  | 65.6  | 45.9  | 26.0  | 125.0  | 1999 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 94 | 5.7  | 10.3  | 174.4  | 116.0  | 62.5  | 54.4  | 82.0  | 33.1  | 167.9  | 2000 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 80 | 5.9  | 14.1  | 55.2  | 107.5  | 26.7  | 63.3  | 79.4  | 40.8  | 159.0  | 2001 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 72 | 5.1  | 12.8  | 66.5  | 146.0  | 44.2  | 98.9  | 76.3  | 48.1  | 179.4  | 2002 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 123 | 5.7  | 10.5  | 69.6  | 271.5  | 49.2  | 63.3  | 86.5  | 37.7  | 204.0  | 2003 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 92 | 5.6  | 18.0  | 51.7  | 259.0  | 51.7  | 87.8  | 89.6  | 51.8  | 335.4  | 2004 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 72 | 5.7  | 10.0  | 120.0  | 148.5  | 51.7  | 61.7  | 85.9  | 32.1  | 227.9  | 2005 | Wei, 2008 |
| **Shandong** | **Qingdao city** | 73 | 5.6  | 18.2  | 60.4  | 123.0  | 29.2  | 147.2  | 85.9  | 59.7  | 353.8  | 2006 | Wei, 2008 |
| - | **Chongqing city** | - | 4.1  | 7.4  | 51.4  | 110.0  | 48.3  | 106.0  | 15.0  | 31.6  | 307.0  | 1982-1984 | Zhao et al., 1988 |
| - | **Chongqing city** | 126 | 4.1  | 17.0  | 17.0  | 125.0  | 31.0  | 123.0  | 30.0  | 23.0  | 299.0  | 1998-1999 | Wei et al., 2005 |
| - | **Chongqing city** | 171 | 5.5  | 12.7  | 27.0  | 114.4  | 29.1  | 126.6  | 25.3  | 43.7  | 258.3  | 2000-2009 | Zhao et al., 2013 |
| - | **Chongqing city** | - | 5.7  | 71.3  | 72.6  | 23.5  | 80.0  | 70.6  | 63.9  | 48.4  | 165.0  | 2011 | Song et al., 2017 |
| - | **Chongqing city** | - | 5.9  | 111.3  | 32.6  | 82.5  | 26.7  | 34.4  | 35.2  | 41.1  | 207.7  | 2012 | Song et al., 2017 |
| - | **Chongqing city** | - | 6.6  | 16.2  | 35.2  | 179.5  | 22.5  | 45.0  | 35.2  | 12.4  | 179.2  | 2013 | Song et al., 2017 |
| - | **Chongqing city** | - | 6.1  | 6.7  | 14.8  | 59.5  | 17.5  | 47.2  | 11.6  | 10.2  | 116.9  | 2014 | Song et al., 2017 |
| - | **Chongqing city** | - | 6.4  | 6.4  | 8.3  | 74.0  | 14.2  | 48.3  | 7.6  | 9.4  | 109.2  | 2015 | Song et al., 2017 |
| **Sichuan** | **Chengdu city** | 56 | 4.4  | 20.8  | 22.6  | 192.0  | 33.2  | 250.7  | 42.3  | 30.4  | 431.5  | 1989 | Lei et al., 1997 |
| **Sichuan** | **Chengdu city** | - | 4.9  | 15.0  | 8.0  | 152.4  | 15.6  | 119.6  | 59.5  | 22.4  | 203.2  | 1995 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 4.9  | 17.7  | 27.0  | 182.8  | 18.0  | 166.2  | 35.8  | 30.1  | 296.6  | 1996 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 4.5  | 16.3  | 9.0  | 133.4  | 32.4  | 142.8  | 28.5  | 24.3  | 214.8  | 1997 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 4.9  | 24.1  | 16.6  | 124.0  | 12.8  | 199.4  | 26.5  | 29.9  | 217.6  | 1998 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 5.8  | 27.5  | 10.2  | 213.2  | 34.8  | 284.2  | 19.3  | 59.5  | 385.8  | 1999 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 5.6  | 90.8  | 35.4  | 307.2  | 36.0  | 160.7  | 38.6  | 63.6  | 376.0  | 2000 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 5.3  | 19.0  | 25.0  | 490.1  | 23.5  | 190.4  | 35.2  | 86.1  | 269.3  | 2001 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 4.4  | 48.8  | 36.0  | 288.9  | 49.9  | 147.9  | 64.2  | 67.9  | 329.7  | 2002 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | - | 4.9  | 21.3  | 9.7  | 278.3  | 27.8  | 150.5  | 42.4  | 87.0  | 327.3  | 2003 | Mei et al., 2005 |
| **Sichuan** | **Chengdu city** | 44 | 5.1  | 6.6  | 1.4  | 196.6  | 16.2  | 150.5  | 8.9  | 156.2  | 212.8  | 2008 | Wang and Han, 2011 |
| **Sichuan** | **Leshan city** | - | 5.4  | 19.4  | 77.6  | 134.3  | 19.0  | 177.0  | 25.8  | 46.2  | 163.2  | 2006 | Zheng, 2012 |
| **Sichuan** | **Leshan city** | - | 5.3  | 36.1  | 30.7  | 228.0  | 31.2  | 277.6  | 38.9  | 134.2  | 251.6  | 2007 | Zheng, 2012 |
| **Sichuan** | **Leshan city** | - | 5.1  | 31.4  | 61.7  | 216.7  | 32.3  | 196.5  | 50.5  | 174.1  | 347.3  | 2008 | Zheng, 2012 |
| **Sichuan** | **Meishan city** | - | 6.9  | 11.2  | 18.6  | 47.3  | 16.9  | 72.3  | 18.5  | 47.7  | 301.7  | 2009 | Li, 2015 |
| **Sichuan** | **Meishan city** | - | 6.3  | 41.3  | 24.8  | 211.0  | 27.7  | 94.9  | 18.3  | 54.7  | 269.9  | 2010 | Li, 2015 |
| **Sichuan** | **Meishan city** | - | 6.4  | 15.4  | 62.9  | 168.9  | 24.2  | 168.8  | 25.8  | 108.3  | 418.2  | 2011 | Li, 2015 |
| **Sichuan** | **Meishan city** | - | 6.4  | 10.5  | 21.5  | 351.1  | 48.3  | 124.9  | 29.2  | 102.3  | 444.1  | 2012 | Li, 2015 |
| **Sichuan** | **Meishan city** | - | 6.3  | 14.2  | 23.9  | 307.7  | 39.6  | 62.4  | 15.5  | 81.2  | 412.7  | 2013 | Li, 2015 |
| **Sichuan** | **Meishan city** | 165 | 6.7  | 16.3  | 25.7  | 363.5  | 54.3  | 136.1  | 29.7  | 76.3  | 188.4  | 2015 | Zhang, 2017 |
| **Jiangsu** | **Nanjing city** | - | 5.2  | 12.3  | 41.3  | 390.5  | 36.7  | 166.1  | 175.8  | 35.5  | 379.8  | 1992 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 4.9  | 10.3  | 11.3  | 245.0  | 20.8  | 155.0  | 77.2  | 31.0  | 226.7  | 1993 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.3  | 12.1  | 21.7  | 416.0  | 30.0  | 198.9  | 120.3  | 33.2  | 271.7  | 1994 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.4  | 18.2  | 23.9  | 450.0  | 34.2  | 255.0  | 295.8  | 37.3  | 354.8  | 1995 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.1  | 11.8  | 30.9  | 315.0  | 38.3  | 162.2  | 151.8  | 30.2  | 228.5  | 1996 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.1  | 13.3  | 18.7  | 258.0  | 30.8  | 218.9  | 207.3  | 49.0  | 253.3  | 1997 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.1  | 10.5  | 13.0  | 287.0  | 30.0  | 289.4  | 154.4  | 34.5  | 212.3  | 1998 | Tu, 1999 |
| **Jiangsu** | **Nanjing city** | - | 5.4  | 41.8  | 85.2  | 264.5  | 106.9  | 246.0  | 112.3  | 139.4  | 720.6  | 2005 | Zheng et al., 2007 |
| **Jiangsu** | **Nanjing city** | - | 6.0  | 62.5  | 99.6  | 468.2  | 112.4  | 219.0  | 83.8  | 114.7  | 503.6  | 2006 | Zheng et al., 2007 |
| **Jiangsu** | **Changzhou city** | 63 | 4.8  | - | - | 78.0  | - | 77.1  | - | 23.7  | 101.3  | 2007 | Yang et al., 2009 |
| **Jiangsu** | **Changzhou city** | - | 5.2  | 16.3  | 36.8  | 96.8  | 20.4  | 191.1  | 40.2  | 58.2  | 175.1  | 2009 | Wang et al., 2014 |
| **Jiangsu** | **Taizhou city** | - | 6.2  | 12.3  | 34.8  | 255.5  | 48.3  | 41.1  | 52.7  | 86.5  | 127.7  | 2011 | Xu, 2017 |
| **Jiangsu** | **Taizhou city** | - | 5.8  | 16.2  | 40.4  | 251.5  | 51.7  | 65.0  | 38.3  | 67.9  | 139.8  | 2012 | Xu, 2017 |
| **Jiangsu** | **Taizhou city** | - | 6.2  | 10.5  | 26.5  | 221.0  | 50.8  | 68.9  | 36.1  | 61.6  | 138.8  | 2013 | Xu, 2017 |
| **Jiangsu** | **Taizhou city** | - | 6.2  | 10.5  | 31.3  | 257.0  | 52.5  | 58.9  | 35.2  | 46.9  | 123.8  | 2014 | Xu, 2017 |
| **Jiangsu** | **Taizhou city** | - | 6.8  | 9.2  | 24.4  | 166.0  | 41.7  | 61.1  | 33.8  | 46.6  | 99.8  | 2015 | Xu, 2017 |
| **Hunan** | **Changsha city** | - | 3.8  | 22.4  | 49.5  | 297.0  | 18.1  | 72.1  | 10.7  | 20.7  | 333.5  | 1992 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.0  | 5.9  | 4.4  | 112.0  | 13.2  | 78.2  | 13.8  | 29.2  | 207.1  | 1993 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 2.8  | 7.3  | 6.7  | 103.0  | 18.1  | 99.2  | 11.6  | 26.6  | 233.3  | 1994 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 3.5  | 6.2  | 5.7  | 102.0  | 18.1  | 86.5  | 11.6  | 26.5  | 184.2  | 1995 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 3.4  | 3.6  | 2.2  | 106.0  | 9.9  | 63.2  | 37.2  | 26.9  | 145.0  | 1996 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 3.7  | 4.1  | 2.6  | 178.0  | 9.0  | 58.8  | 12.4  | 21.0  | 186.9  | 1997 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.7  | 3.6  | 3.0  | 211.0  | 8.2  | 65.4  | 6.8  | 20.5  | 132.9  | 1998 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.6  | 3.8  | 3.9  | 68.5  | 8.2  | 68.2  | 8.2  | 22.7  | 159.4  | 1999 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.7  | 5.4  | 7.0  | 95.4  | 9.9  | 63.2  | 12.4  | 22.7  | 143.1  | 2000 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.3  | 3.8  | 3.9  | 62.0  | 5.6  | 70.4  | 9.6  | 21.8  | 142.9  | 2001 | Jiang et al., 2003 |
| **Hunan** | **Changsha city** | - | 4.0  | 8.2  | 6.1  | 54.9  | 8.2  | 91.9  | 18.9  | 42.1  | 167.4  | 2004 | Liu and Chang, 2009 |
| **Hunan** | **Changsha city** | - | 4.0  | 9.7  | 10.9  | 38.4  | 4.9  | 88.1  | 15.8  | 26.9  | 103.1  | 2005 | Liu and Chang, 2009 |
| **Hunan** | **Changsha city** | - | 4.1  | 4.6  | 6.1  | 29.4  | 3.3  | 75.4  | 13.5  | 26.3  | 103.1  | 2006 | Liu and Chang, 2009 |
| **Hunan** | **Changsha city** | - | 4.0  | 7.2  | 4.8  | 34.9  | 4.9  | 112.5  | 20.6  | 43.1  | 151.4  | 2007 | Liu and Chang, 2009 |
| **Hunan** | **Changsha city** | - | 4.3  | 3.3  | 3.9  | 19.0  | 4.1  | 47.1  | 20.6  | 16.3  | 80.6  | 2008 | Liu and Chang, 2009 |
| **Hunan** | **Changsha city** | 24 | 4.8  | - | - | - | - | - | 17.3  | 69.7  | 76.4  | 2012-2013 | Yi et al., 2014 |
| - | **Beijing** | - | 6.7  | 38.2  | 77.4  | 760.0  | - | 224.4  | 59.1  | 81.0  | 337.5  | 1982 | Zhao et al., 1988 |
| - | **Beijing** | - | 6.1  | 24.0  | 29.0  | 148.0  | 21.0  | 134.0  | 26.0  | 54.0  | 180.0  | 1992 | Fujita et al., 2000 |
| - | **Beijing** | - | 5.8  | 24.0  | 55.0  | 459.0  | 71.0  | 159.0  | 72.0  | 123.0  | 417.0  | 1993 | Fujita et al., 2000 |
| - | **Beijing** | 8 | 4.9  | 17.9  | 31.4  | 27.5  | 8.6  | 49.9  | 12.9  | 23.3  | 85.7  | 1994 | Wang and Zhang,1997 |
| - | **Beijing** | - | 6.8  | 51.9  | 64.0  | 346.2  | 84.7  | 125.4  | 91.7  | 65.5  | 346.6  | 1995-1998 | Feng et al., 2001 |
| - | **Beijing** | 137 | 6.0  | 13.8  | 22.5  | 209.0  | 48.4  | 236.0  | 34.9  | 106.0  | 314.0  | 2001-2005 | Yang et al., 2012 |
| - | **Beijing** | 23 | 5.1  | 17.7  | 25.0  | 607.2  | 40.4  | 185.6  | 104.0  | 109.0  | 315.8  | 2006 | Xu and Han, 2009 |
| - | **Beijing** | 93 | 5.1  | - | - | - | - | - | - | - | - | 2007 | Yang et al., 2011 |
| - | **Beijing** | 43 | 5.3  | 6.7  | 8.5  | 291.0  | 38.5  | 179.0  | 67.8  | 139.0  | 270.0  | 2008 | Xu et al., 2012 |
| - | **Beijing** | 93 | 5.6  | - | - | - | - | - | - | - | - | 2009 | Yang et al., 2011 |
| - | **Beijing** | 128 | 5.0  | 13.2  | 26.3  | 182.2  | 34.3  | - | 121.9  | 147.6  | 279.0  | 2010-2013 | Zhu et al., 2016 |
| - | **Beijing** | - | 6.7  | 74.0  | 69.2  | 130.3  | 23.7  | 89.9  | 123.4  | 70.2  | 77.2  | 2017 | Xu et al., 2020 |
| - | **Beijing** | - | 6.8  | 38.0  | 49.3  | 152.4  | 42.3  | 62.7  | 76.8  | 49.1  | 55.4  | 2018 | Xu et al., 2020 |
| **Guangdong** | **Guangzhou** | - | 5.9  | - | - | 52.9  | - | 64.9  | 13.5  | 11.3  | 50.4  | 1983 | Xu, 1991 |
| **Guangdong** | **Guangzhou** | - | 5.5  | - | - | 43.6  | - | 92.0  | - | 7.1  | 147.6  | 1984 | Xu, 1991 |
| **Guangdong** | **Guangzhou** | - | 5.2  | 3.8  | 18.3  | 14.5  | 6.6  | 76.5  | 18.9  | 6.8  | 81.4  | 1985 | Xu, 1991 |
| **Guangdong** | **Guangzhou** | - | 4.9  | 1.7  | 4.4  | 8.3  | 0.9  | 61.0  | 5.9  | 7.4  | 43.1  | 1986 | Xu, 1991 |
| **Guangdong** | **Guangzhou** | - | 5.0  | 2.6  | 12.2  | 15.0  | 3.3  | 86.7  | 16.9  | 11.0  | 55.8  | 1987 | Xu, 1991 |
| **Guangdong** | **Guangzhou** | - | 4.9  | 24.1  | 28.1  | 175.1  | 25.0  | 141.1  | 38.1  | 33.3  | 254.9  | 1988 | Qi and Wang, 1995 |
| **Guangdong** | **Guangzhou** | 61 | 4.4  | 24.6  | 34.5  | 22.0  | 3.4  | 128.6  | 42.1  | 48.9  | 40.6  | 1990 | Wu et al., 1994 |
| **Guangdong** | **Guangzhou** | - | 4.6  | 8.6  | 14.7  | 83.1  | 7.6  | 71.3  | 27.8  | 48.8  | 158.3  | 2001 | Liu and Xia, 2007 |
| **Guangdong** | **Guangzhou** | - | 4.4  | 15.1  | 75.3  | 82.8  | 11.1  | 75.3  | 38.8  | 45.4  | 146.6  | 2002 | Liu and Xia, 2007 |
| **Guangdong** | **Guangzhou** | - | 4.6  | 20.0  | 69.3  | 127.2  | 12.0  | 69.3  | 46.6  | 67.9  | 228.0  | 2003 | Liu and Xia, 2007 |
| **Guangdong** | **Guangzhou** | - | 4.5  | 7.7  | 61.1  | 100.2  | 8.3  | 61.1  | 46.9  | 72.2  | 185.1  | 2004 | Liu and Xia, 2007 |
| **Guangdong** | **Guangzhou** | - | 4.8  | 8.0  | 27.1  | 57.3  | 5.5  | 27.2  | 22.0  | 28.3  | 118.0  | 2005 | Xu and Wu, 2010 |
| **Guangdong** | **Guangzhou** | - | 4.9  | 4.5  | 11.0  | 47.0  | 4.4  | 19.7  | 16.0  | 21.2  | 52.4  | 2006 | Xu and Wu, 2010 |
| **Guangdong** | **Guangzhou** | - | 4.8  | 5.9  | 11.9  | 50.7  | 4.4  | 26.0  | 15.9  | 21.7  | 59.1  | 2007 | Xu and Wu, 2010 |
| **Guangdong** | **Guangzhou** | - | 4.9  | 18.5  | 5.2  | 50.0  | 3.4  | 20.7  | 28.0  | 17.4  | 52.3  | 2008 | Xu and Wu, 2010 |
| - | **Shanghai** | 66 | 4.7  | 6.7  | 12.6  | 71.2  | 9.0  | 92.5  | 21.8  | 9.7  | 113.7  | 1986 | Lei et al., 1997 |
| - | **Shanghai** | - | 5.4  | 30.0  | 48.7  | 356.0  | 65.0  | 144.4  | 70.7  | 34.8  | 376.7  | 1990 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.0  | 5.1  | 17.8  | 182.5  | 13.1  | 94.6  | 29.0  | 21.6  | 220.8  | 1991 | Sha et al., 2007 |
| - | **Shanghai** | - | 4.8  | 16.5  | 41.4  | 315.3  | 29.8  | 142.7  | 41.6  | 39.2  | 287.0  | 1992 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.1  | 10.1  | 42.1  | 298.8  | 24.1  | 120.1  | 49.9  | 26.9  | 274.6  | 1993 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.4  | 13.6  | 38.9  | 291.5  | 31.5  | 122.8  | 66.1  | 30.2  | 302.3  | 1994 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.3  | 37.3  | 35.3  | 214.1  | 25.9  | 115.3  | 43.5  | 30.8  | 251.4  | 1995 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.4  | 22.0  | 41.2  | 229.3  | 23.4  | 128.2  | 74.0  | 40.4  | 301.7  | 1996 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.7  | 15.4  | 31.6  | 194.2  | 26.2  | 145.4  | 62.1  | 50.5  | 374.4  | 1997 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.6  | 15.2  | 38.4  | 161.2  | 22.8  | 122.7  | 52.7  | 37.3  | 264.5  | 1998 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.6  | 22.2  | 35.0  | 124.9  | 20.8  | 136.3  | 57.8  | 39.8  | 256.4  | 1999 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.4  | 16.2  | 41.3  | 140.2  | 24.3  | 113.8  | 51.3  | 36.2  | 191.3  | 2000 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.4  | 20.5  | 89.8  | 193.2  | 33.7  | 103.7  | 72.1  | 40.5  | 253.1  | 2001 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.4  | 16.7  | 53.5  | 202.5  | 36.8  | 101.1  | 56.6  | 41.8  | 197.9  | 2002 | Sha et al., 2007 |
| - | **Shanghai** | - | 5.2  | 27.7  | 59.6  | 233.0  | 34.5  | 140.6  | 62.3  | 55.2  | 256.3  | 2003 | Sha et al., 2007 |
| - | **Shanghai** | - | 4.9  | 12.2  | 43.4  | 120.0  | 22.1  | 120.6  | 43.4  | 39.0  | 145.4  | 2004 | Sha et al., 2007 |
| - | **Shanghai** | 76 | 4.5  | 14.9  | 50.1  | 204.0  | 29.6  | 80.7  | 58.3  | 49.8  | 199.6  | 2005 | Huang et al., 2008 |
| - | **Shanghai** | - | 4.8  | 2.3  | 22.5  | 47.4  | 6.7  | 108.4  | 19.7  | 31.4  | 101.6  | 2006 | Wang, 2012 |
| - | **Shanghai** | - | 4.5  | 4.0  | 44.8  | 47.1  | 15.0  | 106.7  | 53.5  | 43.1  | 122.2  | 2007 | Wang, 2012 |
| - | **Shanghai** | - | 4.5  | 4.3  | 11.8  | 43.7  | 7.3  | 116.5  | 19.3  | 48.8  | 117.5  | 2008 | Wang, 2012 |
| - | **Shanghai** | - | 4.5  | 2.5  | 11.1  | 32.5  | 5.8  | 87.6  | 14.1  | 46.7  | 89.5  | 2009 | Wang, 2012 |
| - | **Shanghai** | - | 4.6  | 2.0  | 9.5  | 36.7  | 5.9  | 93.5  | 13.8  | 45.0  | 88.2  | 2010 | Wang, 2012 |
| - | **Shanghai** | - | 4.8  | 5.0  | 22.0  | 59.9  | 11.5  | 104.4  | 26.4  | 64.2  | 116.6  | 2011 | Meng et al., 2019 |
| - | **Shanghai** | - | 4.7  | 3.7  | 13.7  | 28.2  | 7.6  | 53.1  | 17.7  | 30.1  | 61.1  | 2012 | Meng et al., 2019 |
| - | **Shanghai** | - | 4.8  | 2.7  | 18.8  | 39.5  | 11.8  | 62.0  | 22.7  | 41.4  | 70.9  | 2013 | Meng et al., 2019 |
| - | **Shanghai** | - | 4.9  | 4.6  | 17.7  | 34.3  | 9.8  | 58.0  | 27.1  | 31.6  | 70.4  | 2014 | Meng et al., 2019 |
| - | **Shanghai** | - | 5.2  | 3.1  | 13.7  | 34.1  | 7.3  | 54.7  | 17.3  | 30.9  | 55.4  | 2015 | Meng et al., 2019 |
| - | **Shanghai** | - | 5.3  | 3.2  | 15.6  | 32.4  | 7.1  | 68.2  | 19.2  | 41.1  | 59.9  | 2016 | Meng et al., 2019 |
| **Fujian** | **Nanping city** | 132 | 4.7  | 6.3  | 59.8  | 16.1  | 20.5  | 18.5  | 118.0  | 28.0  | 91.6  | 2011 | Zheng, 2016 |
| **Fujian** | **Nanping city** | 210 | 4.8  | 11.4  | 42.2  | 7.4  | 12.1  | 17.6  | 84.6  | 37.7  | 68.2  | 2012 | Zheng, 2016 |
| **Fujian** | **Nanping city** | 135 | 4.9  | 9.7  | 42.8  | 11.5  | 13.7  | 17.8  | 100.4  | 37.3  | 83.1  | 2013 | Zheng, 2016 |
| **Fujian** | **Nanping city** | 159 | 4.9  | 7.7  | 25.9  | 13.0  | 17.2  | 17.0  | 90.6  | 49.2  | 66.5  | 2014 | Zheng, 2016 |
| **Fujian** | **Nanping city** | 300 | 4.8  | 25.7  | 18.4  | 16.1  | 42.2  | 25.1  | 109.7  | 23.5  | 47.0  | 2015 | Zheng, 2016 |
| **Guangdong** | **Foshan city** | - | 4.5  | - | - | - | - | - | 26.1  | 17.0  | 107.2  | 2001 | Liu and Xia, 2007 |
| **Guangdong** | **Foshan city** | - | 4.5  | 65.6  | 34.2  | 77.4  | 12.1  | 75.3  | 75.6  | 30.3  | 144.2  | 2002 | Liu and Xia, 2007 |
| **Guangdong** | **Foshan city** | - | 4.5  | 10.0  | 26.4  | 101.9  | 11.6  | 93.9  | 22.4  | 33.6  | 166.0  | 2003 | Liu and Xia, 2007 |
| **Guangdong** | **Foshan city** | - | 4.6  | 23.3  | 50.0  | 189.5  | 22.5  | 66.7  | 55.1  | 49.5  | 209.0  | 2004 | Liu and Xia, 2007 |
| **Guangdong** | **Foshan city** | 429 | 4.5  | 15.1  | 111.7  | 125.5  | 19.2  | 47.8  | 44.2  | 33.6  | 179.8  | 2006 | Yao and Liang, 2012 |
| **Guangdong** | **Foshan city** | 354 | 4.6  | 16.4  | 36.1  | 85.5  | 23.3  | 70.6  | 42.0  | 42.3  | 178.1  | 2007 | Yao and Liang, 2012 |
| **Guangdong** | **Foshan city** | 442 | 4.5  | 13.6  | 21.3  | 72.0  | 16.7  | 49.4  | 34.7  | 40.2  | 137.3  | 2008 | Yao and Liang, 2012 |
| **Guangdong** | **Foshan city** | 360 | 4.4  | 18.0  | 20.0  | 68.0  | 18.3  | 76.1  | 37.8  | 42.7  | 125.4  | 2009 | Yao and Liang, 2012 |
| **Guangdong** | **Foshan city** | 404 | 4.3  | 8.7  | 18.7  | 73.5  | 19.2  | 62.8  | 27.3  | 64.4  | 115.4  | 2010 | Yao and Liang, 2012 |
| **Guangdong** | **Foshan city** | 65 | 5.1  | 3.6  | 11.3  | 21.5  | 5.8  | 47.8  | 12.4  | 32.4  | 41.5  | 2016 | Huang and Liang, 2017 |
| **Guangxi** | **Guilin city** | - | 4.5  | 4.6  | 14.1  | 149.5  | 8.7  | 57.5  | 14.0  | 17.2  | 104.3  | 1989 | Qi and Wang, 1995 |
| **Guangxi** | **Guilin city** | - | 4.5  | 4.8  | 6.6  | 45.0  | 6.8  | 44.6  | 6.0  | 14.2  | 107.0  | 1994-1995 | Ning and Li, 1997 |
| **Guangxi** | **Guilin city** | 501 | 5.0  | 5.9  | 13.4  | 83.0  | 9.4  | 71.6  | 20.4  | 38.8  | 126.6  | 2008-2011 | Shi et al., 2015 |
| **Guangxi** | **Guilin city** | 44 | 4.7  | - | - | - | - | - | - | - | - | 2011 | Zhong et al., 2018 |
| **Guangxi** | **Guilin city** | - | 4.7  | - | - | - | - | - | - | - | - | 2012 | Zhong et al., 2018 |
| **Guangxi** | **Guilin city** | - | 5.0  | - | - | - | - | - | - | - | - | 2013 | Zhong et al., 2018 |
| **Guangxi** | **Guilin city** | - | 4.9  | - | - | - | - | - | - | - | - | 2014 | Zhong et al., 2018 |
| **Guangxi** | **Guilin city** | - | 5.2  | 17.1  | 29.0  | 125.9  | 14.4  | 45.3  | 33.3  | 40.8  | 125.0  | 2015 | Zhong et al., 2018 |
| **Guangxi** | **Nanning city** | - | 5.0  | 12.3  | 24.7  | 173.1  | 14.8  | 115.2  | 43.3  | 21.1  | 243.4  | 1988 | Qi and Wang, 1995 |
| **Guangxi** | **Nanning city** | - | 4.8  | 9.0  | 21.0  | 150.4  | 14.3  | 130.9  | 34.0  | 17.0  | 243.9  | 1989 | Qi and Wang, 1995 |
| **Guangxi** | **Nanning city** | - | 5.0  | 4.0  | 25.0  | 40.0  | 9.0  | 62.0  | 17.0  | 17.0  | 112.0  | 1992 | Fujita et al., 2000 |
| **Guangxi** | **Nanning city** | - | 5.2  | 12.1  | 23.0  | 295.4  | 31.7  | 193.2  | 142.6  | 39.6  | 241.8  | 1992-2003 | Tu et al.2005 |
| **Guangxi** | **Nanning city** | - | 6.5  | 3.5  | 12.2  | 199.1  | 9.2  | 48.4  | 13.6  | 19.8  | 59.5  | 2015 | Guo et al., 2017 |
| **Jiangxi** | **Yingtan city** | - | 4.9  | 6.0  | 7.1  | 19.9  | 2.7  | 35.8  | 61.4  | 10.2  | 77.3  | 2002 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.9  | 6.1  | 4.3  | 19.6  | 12.1  | 45.9  | 56.4  | 15.3  | 93.9  | 2003 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.5  | 6.2  | 3.8  | 30.0  | 11.4  | 42.5  | 7.8  | 21.9  | 118.3  | 2004 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.4  | 8.2  | 2.9  | 29.9  | 12.3  | 73.4  | 6.1  | 29.5  | 125.3  | 2005 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.4  | 4.7  | 2.9  | 46.2  | 8.2  | 89.6  | 6.1  | 26.4  | 141.2  | 2006 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.1  | 3.8  | 3.0  | 29.0  | 13.0  | 89.1  | 5.3  | 48.7  | 117.2  | 2007 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.1  | 2.3  | 1.3  | 9.9  | 4.1  | 100.3  | 4.0  | 38.0  | 182.0  | 2008 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.6  | 1.5  | 2.6  | 11.8  | 2.8  | 80.3  | 70.6  | 56.8  | 228.9  | 2009 | Wu, 2011 |
| **Jiangxi** | **Yingtan city** | - | 4.4  | 2.3  | 3.9  | 15.7  | 3.2  | 57.9  | 24.4  | 64.7  | 186.0  | 2010 | Wu, 2011 |
| **Jiangxi** | **Ji'an city** | 107 | 4.5  | 10.3  | 8.3  | 71.5  | 10.8  | 57.2  | 45.1  | 39.7  | 95.4  | 2011 | He, 2016 |
| **Jiangxi** | **Ji'an city** | 192 | 4.5  | 10.3  | 2.6  | 60.0  | 8.3  | 43.9  | 37.4  | 35.5  | 91.7  | 2012 | He, 2016 |
| **Jiangxi** | **Ji'an city** | 87 | 4.5  | 11.0  | 0.4  | 84.0  | 7.5  | 46.1  | 24.2  | 39.0  | 102.3  | 2013 | He, 2016 |
| **Jiangxi** | **Ji'an city** | 127 | 5.0  | 23.3  | 10.4  | 106.0  | 12.5  | 57.8  | 12.6  | 44.7  | 104.4  | 2014 | He, 2016 |
| **Jiangxi** | **Nanchang city** | 95 | 5.1  | 1.8  | 10.1  | 47.9  | 6.7  | 37.2  | 15.9  | 30.9  | 67.7  | 2015-2016 | Zheng et al., 2020 |

a No data

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