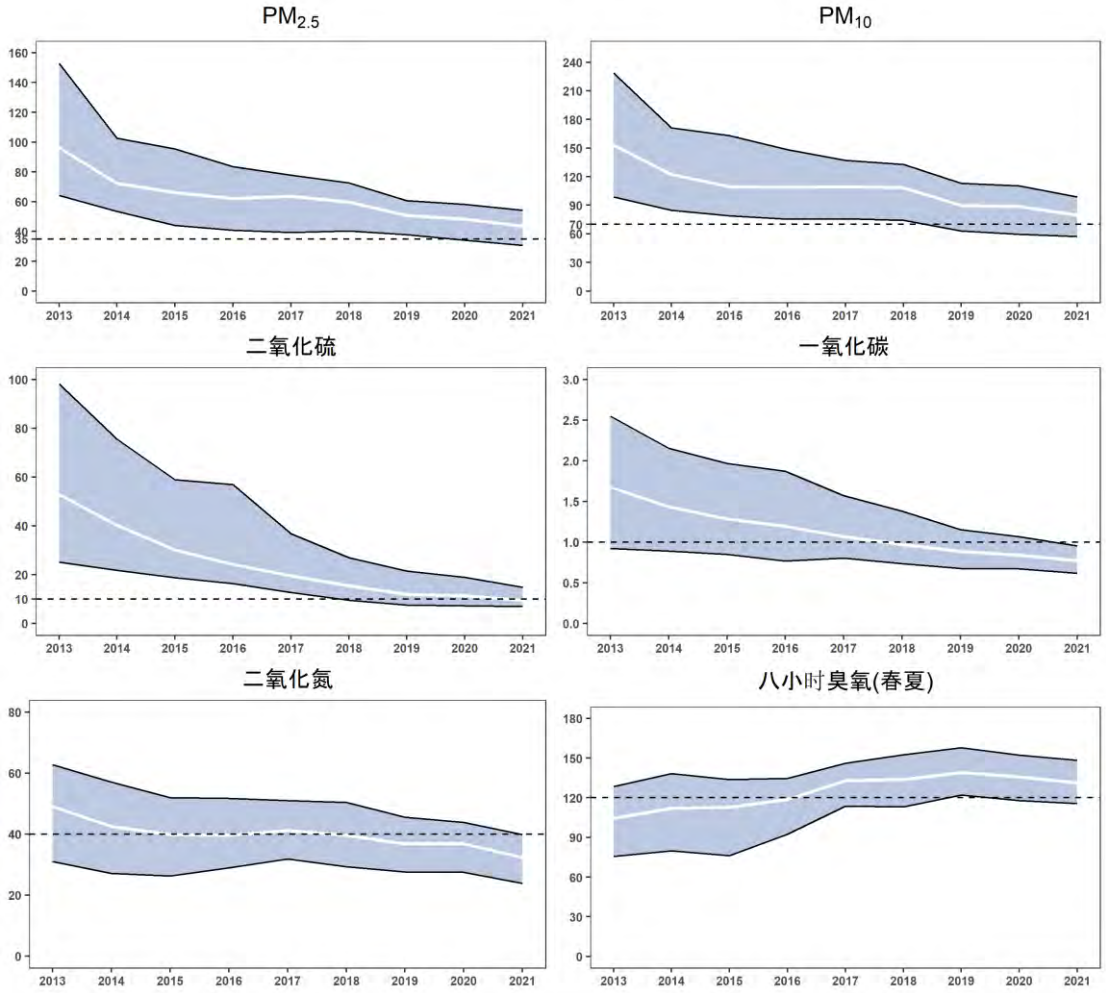
空气质量评估报告（九）

“3+99”城市 2013-2021 年区域污染状况评估

为了蓝天
让我们用数据解读污染

“3+99”城市六污染物年均浓度及 10%-90%分位数区间



北京大学统计科学中心，北京大学光华管理学院
大数据分析与应用技术国家工程实验室

二零二二年四月

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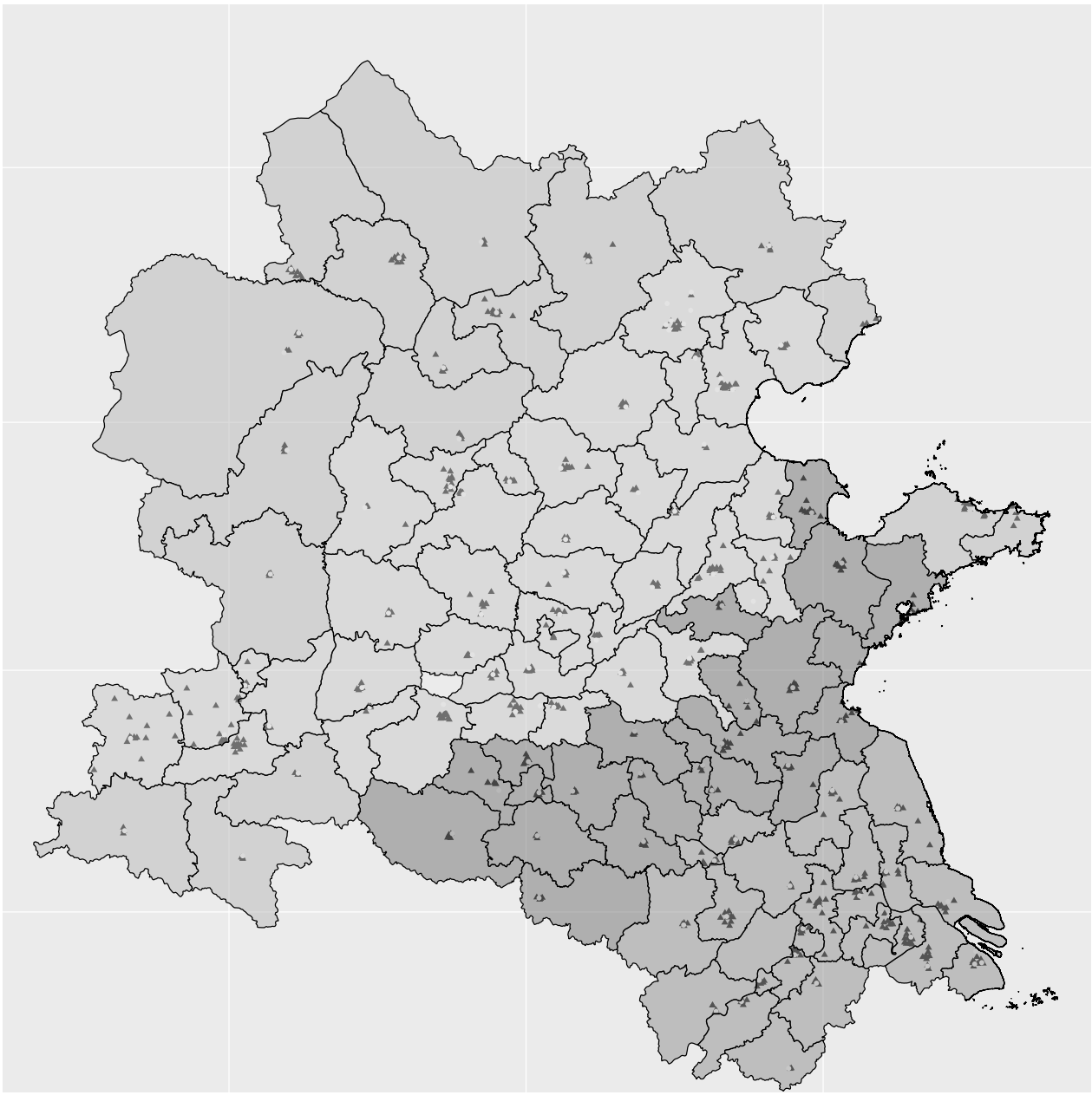

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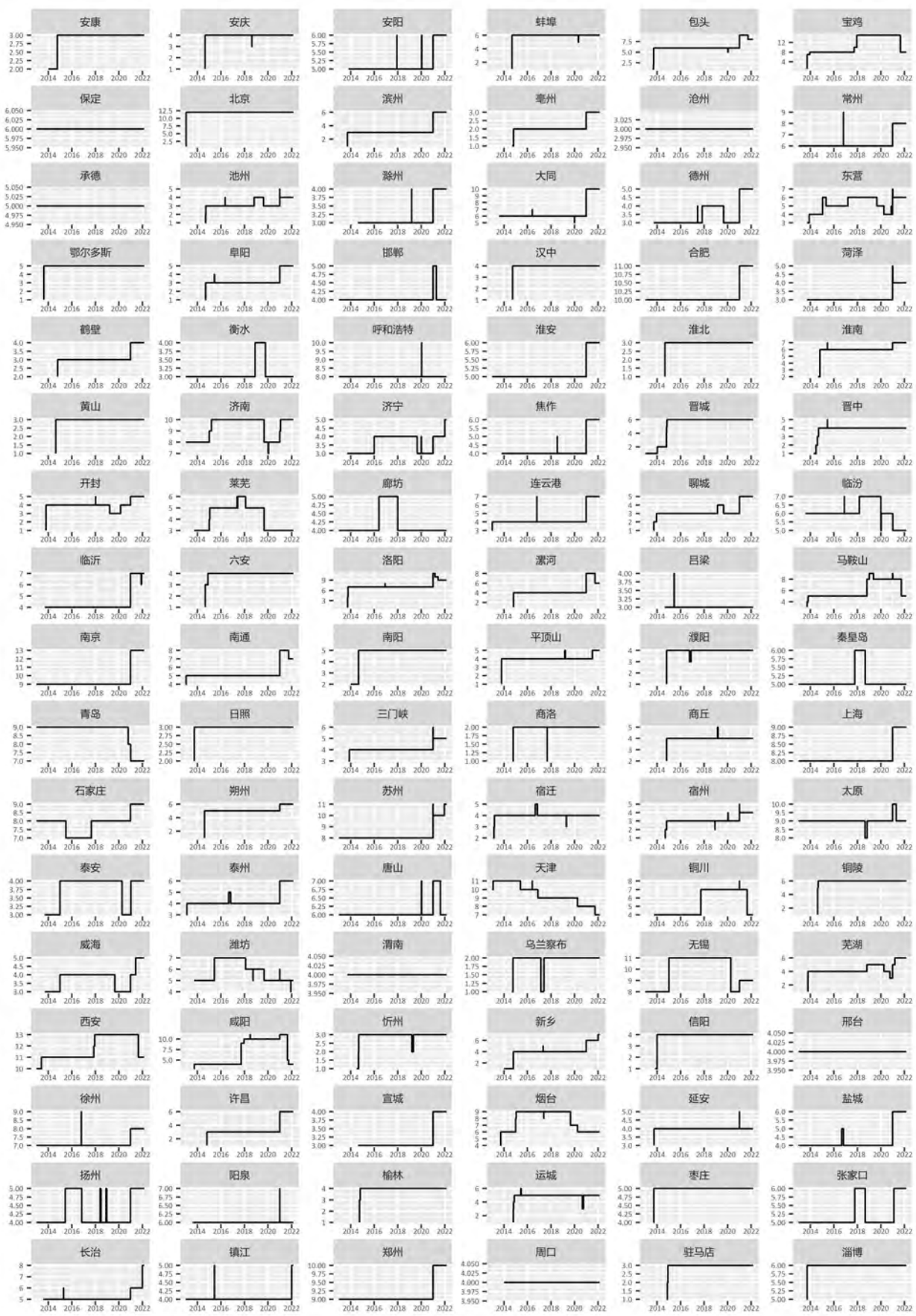
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阜阳
邯郸
汉中
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鹤壁
衡水
呼和浩特
淮安
淮北
淮南
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çažÜaõ£aË2ašûaÛg ƒtìgV7S!ëS©_Ä[Ÿ_Ä”›†ÀµMÄ ½Ba Øa Üa4: ®aqÏa†gažCaÉ½aÉ aÛöaËìaB½a2Øa2 a°va Za ¬Üa^3a• a¸ÄaÆìaÁ a) a¢Üa ”Ëa*pƒtìg !ëS©_Ä-ªº C •9_Ä¥f ƒ iÀµ C_ÄT ¥f ƒbV[ª¹ ƒtìg¥ê™þS©©¥ › ¹×çb 6BZë ýÜaê•a62a6aa7•a"waŒ a”»öaÓÜa?ÃaºXaîµa9 aõ ûa Üa ìƒtìg¥S©_Ä ›VñÏû C À BQ¥Mî ƒV?•Y” ¥BÁŸ ¿ìgS©©¥ ›Ÿªid Bñz¥C`b

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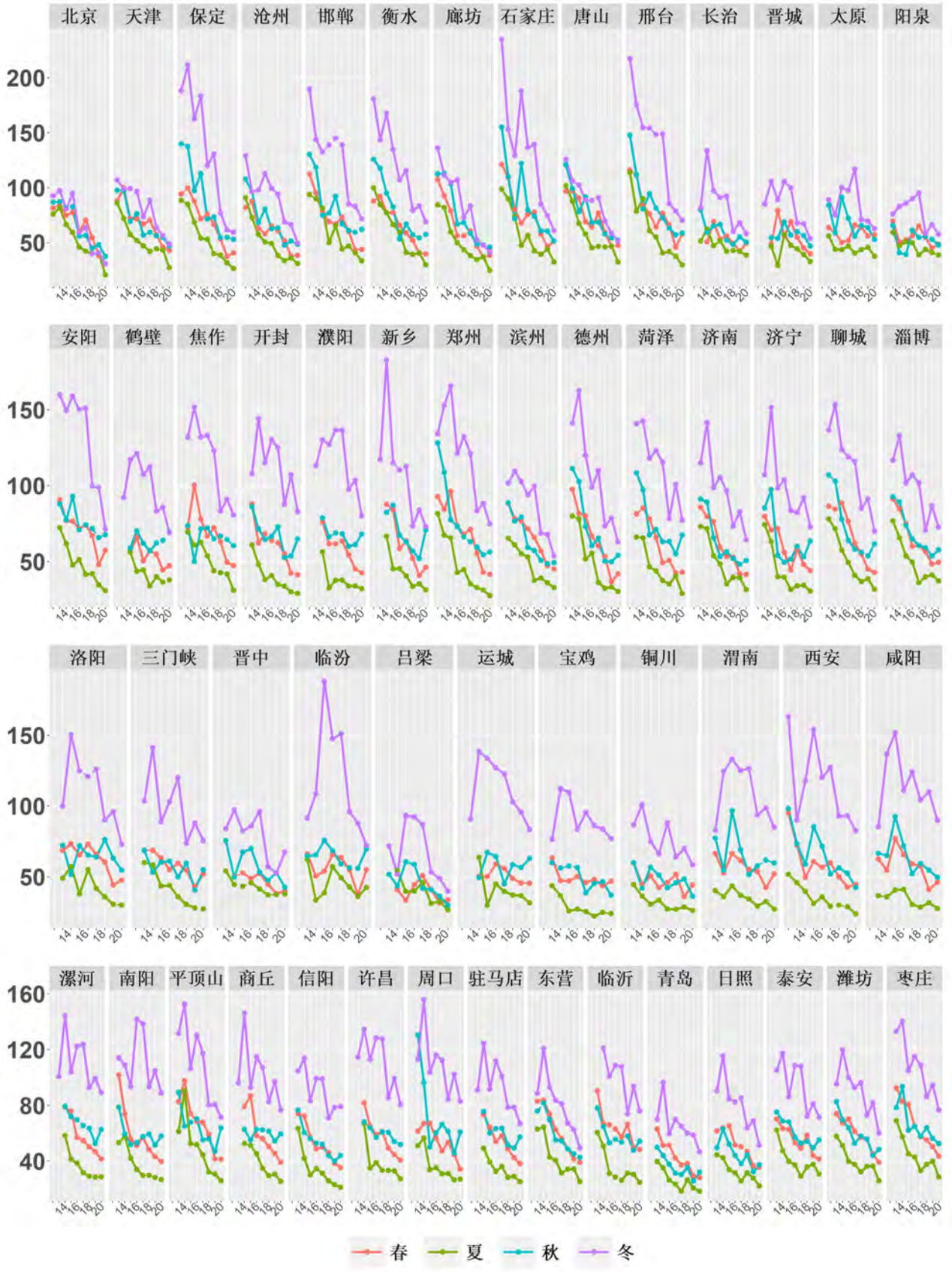

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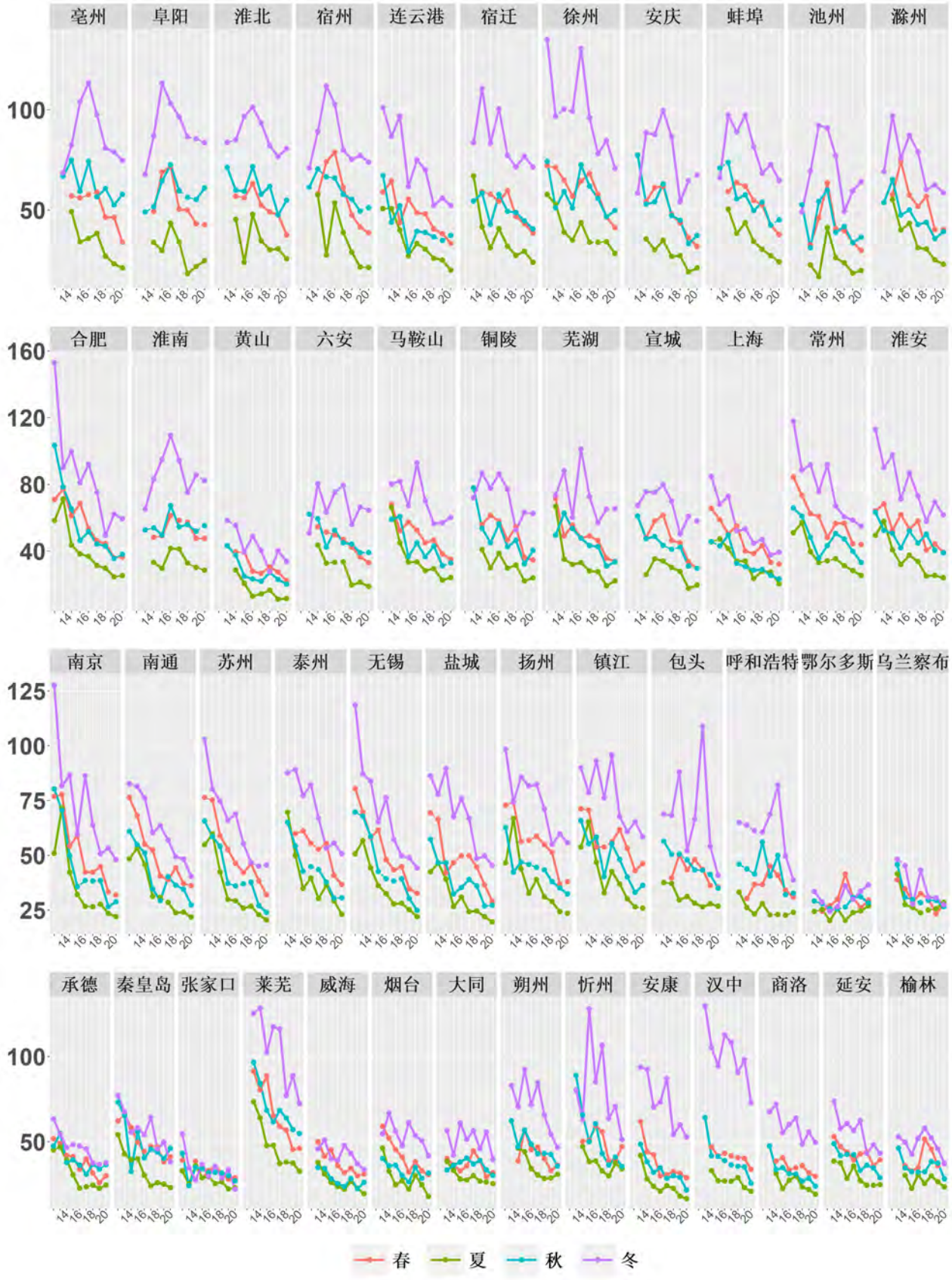

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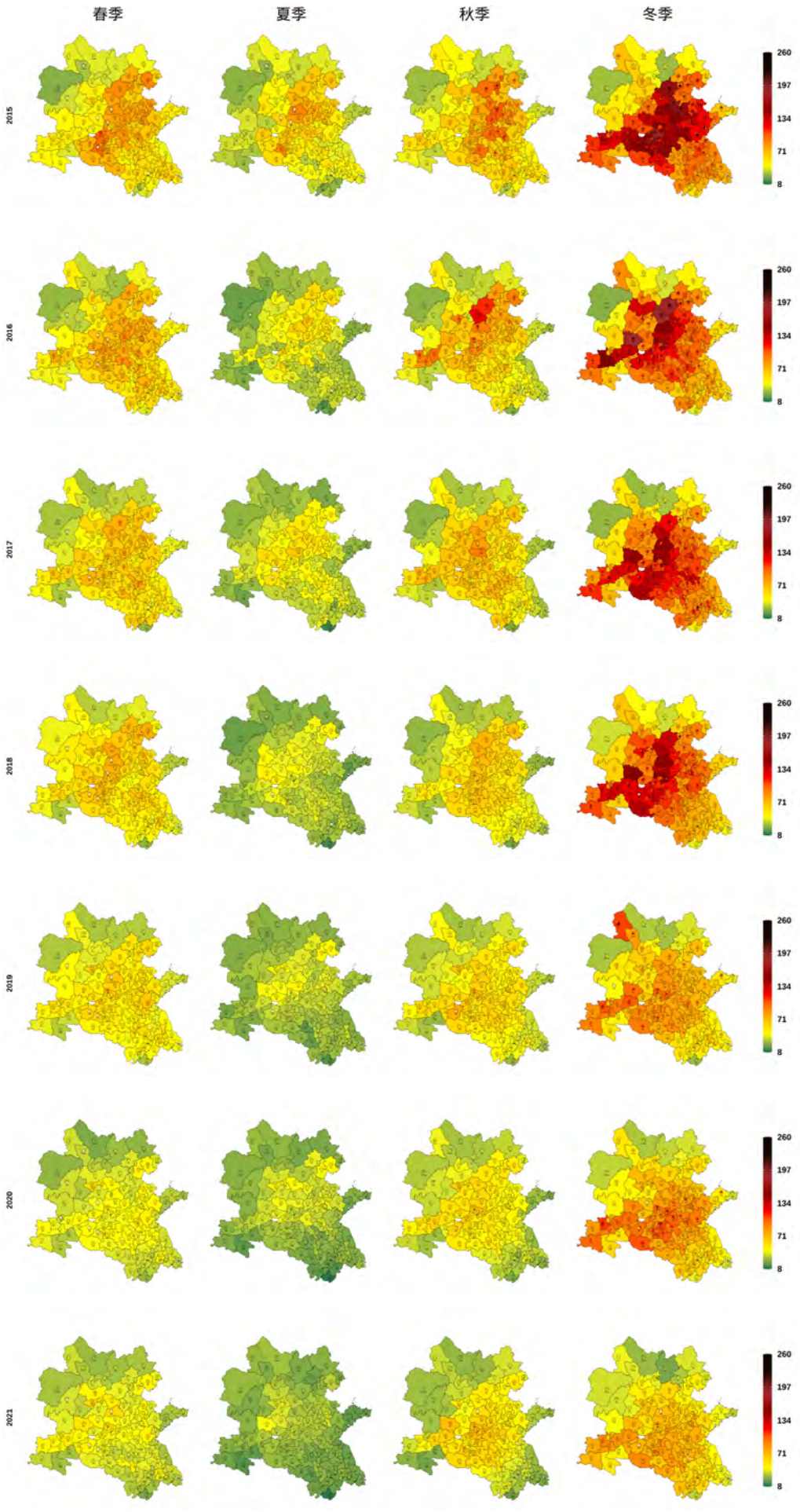

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¡ä„£ä‘LsY}VojYNN pìg¥BM„BMÜ(†–

城市	2013年	排名	2014年	排名	2015年	排名	2016年	排名	2017年	排名	2018年	排名	2019年	排名	2020年	排名	2021年	排名
临汾	NA		71.1	(36)	64.4	(54)	89.1	(7)	84.7	(5)	80.8	(5)	62.5	(6)	54.3	(28)	59.9	(1)
安阳	NA		102.7	(8)	91.5	(16)	94.0	(4)	86.1	(4)	85.2	(1)	70.1	(1)	61.8	(1)	56.7	(2)
渭南	NA		66.8	(46)	67.0	(50)	84.9	(10)	73.1	(18)	66.9	(25)	58.6	(16)	58.8	(7)	55.9	(3)
鹤壁	NA		NA		72.3	(41)	75.3	(24)	66.0	(42)	65.1	(33)	60.0	(13)	57.6	(13)	55.9	(4)
运城	NA		NA		75.5	(36)	70.3	(34)	73.8	(17)	65.8	(29)	61.9	(8)	58.6	(9)	55.8	(5)
濮阳	NA		NA		85.3	(24)	71.9	(30)	76.2	(13)	76.5	(7)	61.4	(9)	60.9	(3)	55.8	(6)
漯河	NA		NA		90.3	(18)	73.4	(28)	71.9	(23)	68.9	(21)	59.0	(15)	56.9	(19)	55.6	(7)
新乡	NA		NA		104.8	(2)	82.8	(13)	70.3	(33)	69.9	(18)	54.0	(43)	53.0	(34)	55.4	(8)
焦作	NA		86.9	(23)	90.7	(17)	86.0	(9)	81.4	(6)	76.0	(8)	63.9	(4)	61.7	(2)	54.8	(9)
开封	NA		85.6	(26)	81.5	(28)	71.5	(32)	75.4	(15)	73.7	(10)	57.3	(24)	58.4	(11)	54.5	(10)
淄博	NA		94.4	(14)	93.1	(14)	76.1	(21)	70.4	(29)	64.8	(35)	56.5	(31)	57.4	(14)	54.2	(11)
邢台	148.7	(2)	119.3	(2)	102.4	(6)	96.4	(3)	87.2	(2)	84.7	(2)	64.3	(3)	54.8	(25)	54.1	(12)
菏泽	NA		99.2	(11)	97.7	(9)	77.5	(18)	76.0	(14)	66.3	(27)	56.9	(29)	59.8	(5)	54.1	(13)
南阳	NA		87.0	(22)	75.0	(37)	60.9	(54)	70.1	(34)	70.7	(15)	57.7	(21)	57.0	(17)	53.4	(14)
淮南	NA		NA		54.6	(81)	55.9	(65)	69.9	(35)	62.1	(42)	55.3	(38)	53.8	(30)	53.4	(15)
咸阳	NA		62.8	(50)	73.1	(40)	90.5	(5)	72.4	(21)	66.4	(26)	62.4	(7)	59.3	(6)	53.3	(16)
阜阳	NA		NA		55.5	(79)	69.2	(40)	72.8	(20)	60.1	(48)	52.8	(47)	51.5	(39)	53	(17)
济宁	NA		86.6	(24)	95.7	(10)	66.0	(43)	62.3	(55)	52.8	(62)	58.5	(17)	56.9	(20)	52.7	(18)
邯郸	131.6	(3)	111.8	(4)	91.7	(15)	83.6	(11)	92.4	(1)	80.8	(4)	63.2	(5)	56.6	(21)	52.6	(19)
太原	NA		73.2	(34)	59.2	(67)	71.3	(33)	67.1	(39)	69.8	(19)	60.9	(10)	58.8	(8)	52.5	(20)
三门峡	NA		75.1	(33)	80.4	(31)	64.0	(45)	65.7	(43)	66.3	(28)	54.5	(41)	50.0	(44)	52.4	(21)
莱芜	NA		96.8	(13)	89.4	(19)	76.9	(19)	73.1	(19)	70.3	(17)	59.0	(14)	57.3	(15)	51.5	(22)
聊城	NA		102.0	(9)	103.2	(5)	86.9	(8)	77.2	(12)	69.2	(20)	58.2	(18)	57.1	(16)	51.5	(23)
洛阳	NA		72.4	(35)	83.1	(27)	75.0	(25)	78.5	(9)	74.4	(9)	65.7	(2)	58.5	(10)	51.3	(24)
周口	NA		89.1	(19)	94.0	(12)	63.7	(47)	67.1	(38)	64.3	(38)	57.6	(22)	54.8	(24)	51.3	(25)
临沂	NA		NA		76.0	(34)	62.8	(49)	64.0	(50)	61.3	(43)	57.5	(23)	55.4	(23)	50.9	(26)
平顶山	NA		91.2	(18)	101.5	(7)	75.3	(23)	80.4	(7)	71.3	(12)	56.9	(28)	49.9	(45)	50.7	(27)
枣庄	NA		93.3	(15)	93.6	(13)	73.2	(29)	72.0	(22)	64.4	(37)	60.8	(11)	60.4	(4)	50.4	(28)
商丘	NA		NA		85.2	(25)	71.6	(31)	70.4	(30)	65.2	(30)	56.0	(33)	57.0	(18)	50.2	(29)
许昌	NA		NA		88.0	(21)	69.3	(39)	70.9	(28)	70.8	(13)	57.2	(26)	57.8	(12)	50.1	(30)
郑州	109.3	(8)	103.4	(7)	101.2	(8)	77.6	(17)	77.9	(10)	72.7	(11)	57.8	(20)	54.3	(29)	50	(31)
泰安	NA		78.2	(29)	74.2	(39)	64.2	(44)	64.1	(49)	59.8	(50)	55.2	(39)	53.1	(31)	49.7	(32)
淮北	NA		NA		61.8	(59)	59.1	(59)	71.0	(26)	59.6	(52)	55.8	(35)	50.7	(41)	49.7	(33)
长治	NA		NA		76.6	(33)	69.7	(38)	65.5	(45)	60.6	(46)	50.0	(54)	51.9	(37)	49.1	(34)
石家庄	152.4	(1)	115.5	(3)	88.7	(20)	106.3	(1)	87.1	(3)	83.4	(3)	60.7	(12)	56.3	(22)	49	(35)
衡水	123.6	(5)	109.4	(5)	104.3	(3)	90.3	(6)	71.5	(25)	70.5	(16)	57.0	(27)	54.6	(26)	48.9	(36)
西安	102.0	(10)	70.5	(37)	66.5	(51)	82.9	(12)	71.0	(27)	67.0	(24)	57.3	(25)	54.3	(27)	48.4	(37)
阳泉	NA		67.6	(43)	55.3	(80)	57	(62)	64.3	(48)	63.4	(40)	53.1	(46)	51.2	(40)	48.2	(38)
徐州	84.8	(13)	68.0	(42)	65.9	(52)	60.6	(55)	77.8	(11)	65.0	(34)	56.4	(32)	53.0	(32)	47.5	(39)
德州	NA		107.6	(6)	106.2	(1)	81.2	(14)	70.3	(31)	68.0	(23)	52.4	(48)	49.6	(49)	47.2	(40)
晋中	NA		NA		60.5	(62)	61.4	(53)	62.6	(53)	60.8	(45)	46.7	(64)	45.3	(59)	47	(41)
驻马店	NA		NA		80.6	(30)	63.9	(46)	65.6	(44)	64.8	(36)	51.8	(49)	49.9	(46)	46.9	(42)
济南	NA		91.2	(17)	95.5	(11)	73.6	(27)	66.6	(40)	60.4	(47)	54.4	(42)	53.0	(33)	46.9	(43)
亳州	NA		NA		65.9	(53)	63.4	(48)	70.3	(32)	62.9	(41)	53.7	(45)	50.3	(42)	46.9	(44)
宿州	NA		NA		68.8	(47)	70.1	(35)	75.3	(16)	59.5	(53)	51.8	(50)	47.5	(53)	46.2	(45)
宝鸡	NA		60.8	(55)	63.1	(57)	60.1	(56)	54.4	(74)	51.3	(66)	50.4	(53)	49.7	(48)	46.2	(46)
唐山	111.3	(6)	97.5	(12)	84.5	(26)	76.8	(20)	66.5	(41)	70.8	(14)	58.2	(19)	51.5	(38)	45.9	(47)
滨州	NA		86.0	(25)	81.3	(29)	78.5	(16)	69.5	(36)	65.1	(32)	53.9	(44)	49.9	(47)	45.2	(48)
信阳	NA		79.7	(27)	72.1	(42)	56.7	(64)	59.0	(63)	58.1	(55)	46.7	(63)	45.1	(60)	45	(49)
保定	127.8	(4)	133.4	(1)	104.0	(4)	105.4	(2)	80.1	(8)	77.6	(6)	55.8	(34)	46.3	(55)	44.8	(50)
宿迁	NA		NA		67.4	(48)	53.8	(70)	63.4	(52)	54.5	(59)	48.6	(59)	48.5	(51)	43.6	(51)
潍坊	NA		77.4	(31)	77.0	(32)	68.5	(41)	61.2	(56)	60.9	(44)	55.1	(40)	51.9	(35)	43.4	(52)
晋城	NA		NA		63.9	(55)	62.7	(50)	71.9	(24)	68.3	(22)	56.7	(30)	51.9	(36)	43.3	(53)
蚌埠	NA		NA		70.2	(45)	61.7	(52)	65.1	(46)	55.1	(58)	51.3	(51)	46.2	(56)	43	(54)
忻州	NA		NA		56.5	(77)	66.8	(42)	61.0	(58)	59.6	(51)	42.3	(76)	47.1	(54)	42	(55)
沧州	102.5	(9)	88.2	(20)	71.7	(43)	75.4	(22)	69.0	(37)	64.1	(39)	50.5	(52)	47.9	(52)	41.8	(56)
镇江	70.2	(20)	67.5	(44)	63.0	(58)	50.8	(79)	62.5	(54)	53.6	(60)	46.1	(66)	42.0	(64)	41.8	(57)
铜川	NA		62.7	(51)	56.1	(78)	53.2	(72)	48.4	(82)	50.9	(70)	47.1	(61)	45.8	(58)	41.3	(58)
天津	94.7	(12)	92.1	(16)	74.4	(38)	74.1	(26)	61.0	(57)	65.1	(31)	55.4	(37)	50.1	(43)	41.2	(59)
淮安	72.4	(19)	67.2	(45)	60.3	(63)	51.7	(74)	57.4	(67)	52.4	(63)	43.4	(72)	44.8	(61)	40.9	(60)
铜陵	NA		NA		59.3	(66)	53.5	(71)	59.8	(61)	49.0	(74)	46.3	(65)	38.4	(75)	40.3	(61)
滁州	NA		NA		68.8	(46)	59.4	(57)	59.5	(62)	51.2	(68)	47.9	(60)	40.9	(67)	40.3	(62)
合肥	96.4	(11)	79.2	(28)	67.4	(49)	58.5	(60)	58.5	(65)	49.3	(73)	41.6	(77)	39.5	(71)	39.8	(63)
安庆	NA		NA		57.9	(72)	58.3	(61)	64.9	(47)	52.1	(65)	42.5	(75)	38.3	(77)	39.4	(64)
常州	79.8	(17)	70.0	(39)	60.5	(61)	51.3	(76)	54.3	(75)	52.3	(64)	48.9	(57)	42.7	(62)	39.3	(65)
东营	NA		77.7	(30)	87.6	(22)	69.9	(37)	60.5	(59)	55.9	(57)	49.7	(55)	45.9	(57)	39.2	(66)
六安	NA		NA		59.5	(65)	47.4	(82)	52.6	(76)	51.2	(69)	40.5	(83)	40.8	(68)	38.9	(67)
芜湖	NA		65.3	(47)	58.7	(68)	50.3	(80)	57.4	(66)	48.2	(76)	43.4	(73)	37.7	(78)	38.7	(68)
汉中	NA		NA		56.8	(75)	51.2	(77)	55.5	(71)	53.3	(61)	48.9	(58)	49.3	(50)	38.4	(69)
马鞍山	NA		68.3	(41)	59.9	(64)	48.7	(81)	55.9	(69)	45.0	(83)	43.8	(71)	37.2	(80)	38	(70)
廊坊	110	(7)	99.7	(10)	86.8	(23)	70	(36)	60.3	(60)	60.1	(49)	45.5	(68)	42.4	(63)	37.6	(71)
池州	NA		NA		38.9	(98)	52.3	(73)	63.9	(51)	45.7	(80)	38.6	(89)	36.4	(82)	37.6	(72)
扬州	70.2	(21)	64.4	(49)	58.2	(70)	54.3	(68)	56.2	(68)	50.1	(71)	43.3	(74)	39.0	(72)	37.5	(73)
朔州	NA		NA		50.8	(85)	62.6	(51)	50.0	(78)	51.3	(67)	44.3	(70)	39.7	(70)	37.4	(74)
秦皇岛	66.7	(24)	60.5	(56)	46.6	(90)	51.0	(78)	42.4	(88)	45.4	(81)	40.7	(81)	38.4	(76)	37.1	(75)
日照	NA		61.6	(53)	71.2	(44)	59.1	(58)	52.5	(77)	49.9	(72)	46.8	(62)	41.4	(66)	36.7	(76)
连云港	69.5	(22)	61.5	(54)	58.2	(71)	43.4	(89)	49.1	(79)	46.9	(77)	38.8	(88)	38.5	(74)	35.7	(77)
泰州	NA		NA		63.3	(56)	54.1	(69)	55.5	(70)	48.4	(75)	45.7	(67)	39.0	(73)	35.3	(78)
包头	NA		NA		48.9	(87)	54.6	(66)	43.7	(86)	46.5	(79)	55.5	(36)	39.9	(69)	34.5	(79)
宣城	NA		NA		49.3	(86)	54.3	(67)	54.6	(73)	46.9	(78)	41.2	(80)	35.6	(86)	34.2	(80)
延安	NA		53.6	(60)	46.1	(91)	43.9	(86)	43.6	(87)	41.4	(90)	37.0	(93)	35.9	(85)	34.1	(81)
南京	83.9	(15)	75.5	(32)	58.3	(69)	46.7	(83)	48.5	(81)	42.8	(85)	40.5	(84)	34.2	(92)	32.7	(82)
吕梁	NA		NA		47.6	(88)	56.8	(63)	58.8	(64)	56.3	(56)	41.5	(79)	37.3	(79)	32.5	(83)
承德	52.0	(27)	51.4	(61)	41.5	(94)	39.9	(95)	35.1	(97)	35.1	(96)	32.7	(98)	29.9	(97)	32.3	(84)
大同	NA		42.2	(64)	37.1	(100)	40.1	(94)	38.9	(93)	42.1	(87)	37.7	(92)	36.3	(83)	31.8	(85)
呼和浩特	NA		NA		41.0	(95)	40.7	(92)	45.3	(84)	44.3	(84)	49.0	(56)	34.7	(88)	31.6	(86)
北京	84.1	(14)	87.7	(21)	75.8	(35)	78.6	(15)	55.2	(72)	58.2	(54)	44.8	(69)	41.8	(65)	31.6	(87)
榆林	NA		NA		37.7	(99)	32.6	(99)	37.5	(95)	41.9	(88)	41.6	(78)	36.4	(81)	31.5	(88)
南通	67.1	(23)	64.5	(48)	57.0	(74)	44.7	(85)	41.1	(90)	41.1	(91)	38.4	(91)	36.0	(84)	31.5	(89)
青岛	NA		55.7	(58)	56.7	(76)	43.9	(87)	41.8	(89)	37.8	(94)	40.0	(85)	33.7	(94)	31.4	(90)
无锡	79.9	(16)	70.4	(38)	61.3	(60)	51.4	(75)	49.0	(80)	41.7	(89)	40.5	(82)	34.8	(87)	31	(91)
商洛	NA		NA		43.9	(92)	38.4	(96)	38.1	(94)	39.9	(93)	33.8	(96)	34.5	(90)	30.7	(92)
烟台	NA		50.1	(62)	46.9	(89)	40.7	(93)	36.6	(96)	35.6	(95)	39.3	(87)	34.2	(91)	30.6	(93)
苏州	75.0	(18)	68.5	(40)	57.6	(73)	46.5	(84)	45.1	(85)	40.1	(92)	39.3	(86)	33.4	(95)	30.5	(94)
鄂尔多斯	NA		NA		26.6	(102)	24.3	(102)	27.0	(102)	31.1	(101)	28.9	(101)	28.9	(98)	30.3	(95)
盐城	63.9	(25)	59.4	(57)	54.4	(82)	43.3	(90)	48.0	(83)	45.0	(82)	38.5	(90)	33.8	(93)	30.3	(96)
安康	NA		61.6	(52)	50.8	(84)	42.2	(91)	39.8	(91)	42.7	(86)	34.9	(95)	34.6	(89)	30	(97)
上海	60.4	(26)	54.3	(59)	53.6	(83)	43.5	(88)	39.4	(92)	33.8	(97)	36.7	(94)	30.9	(96)	28.8	(98)
威海	NA		42.2	(63)	39.5	(97)	35.0	(97)	31.1	(98)	31.4	(100)	33.2	(97)	28.1	(100)	27.7	(99)
乌兰察布	NA		NA		43.6	(93)	34.6	(98)	28.2	(101)	32.0	(99)	28.9	(100)	27.3	(101)	27.6	(100)
张家口	42.5	(28)	NA		34.3	(101)	32.2	(100)	31.0	(99)	32.2	(98)	29.7	(99)	28.6	(99)	25.4	(101)
黄山	NA		NA		40.2	(96)	31.1	(101)	28.2	(100)	25.7	(102)	25.4	(102)	25.3	(102)	21.9	(102)

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