**Table S4** Sources of the daily meteorological data of individual paddy rice field sites for each period with ammonia observation (PAO) and for those beyond the PAO, and simulation configurations.

|  |  |
| --- | --- |
| Changshu |  |
| PAO | The maximum daily air temperature (*T*max, ℃), the minimum daily air temperature (*T*min, ℃), the average daily wind speed (*W*, m s−1) and the average daily relative humidity (RH, %) in 2002/2003 and daily precipitation (*P*, mm d−1) in 2003: Measured in Nantong (station no.: 58259; downloaded from the online database of China Meteorological Administration (CMA, http://www.data.cma.cn).  Daily precipitation (*P*, mm d−1) in 2002: Adapted from the observations in Nantong (station no.: 58259; downloaded from CMA) by referring to the periodically maximum value (45.2 mm) from 06/22 to 06/30, the periodically few amount (< 5 mm, arbitrarily) from 07/20 to 07/29, and the total value (29.1 mm) from 08/20 to 08/31 measured onsite by Song et al. (2004).  The maximum daily solar radiation (*R*max, W m−2) and the moment of *R*max appearing (*M*, hour) in 2002/2003: Measured in Shanghai (station no.: 58362; downloaded from CMA). |
| Beyond PAO | *T*max, *T*min, *P*, *W* and RH in 2002/2003: Measured in Nantong (station no.: 58259; downloaded from CMA).  *R*max and *M* in 2002/2003: Measured in Shanghai (station no.: 58362; downloaded from CMA). |
| Configuration | Ten years for spin-up, which was driven by the inputs of 2002; the last 2 years (2002−2003) for simulation. |
| Danyang |  |
| PAO | *T*max and *T*min in 1984: Measured in Changzhou (station no.: 58343; downloaded from CMA).  *P* in 1984: No precipitation, measured onsite by Cai et al. (1986).  *W* in 1984: Adapted from the observations in Changzhou (station no.: 58343; downloaded from CMA) by referring to the periodically low values (1 m s−1, arbitrarily) from 06/20 to 06/27 measured onsite by Cai et al. (1986).  RH in 1984: Measured in Gaoyou (station no.: 58241; downloaded from CMA).  The average daily solar radiation (*R*ave, W m−2) in 1984: Measured in Nanjing (station no.: 58238; downloaded from CMA). |
| Beyond PAO | *T*max, *T*min, *P* and *W* in 1984: Measured in Changzhou (station no.: 58343; downloaded from CMA).  RH in 1984: Measured in Gaoyou (station no.: 58241; downloaded from CMA).  *R*ave in 1984: Measured in Nanjing (station no.: 58238; downloaded from CMA). |
| Configuration | Ten years for spin-up, which was driven by the inputs of 1984; the last year (1984) for simulation. |
| Fengqiu |  |
| PAO | *T*max, *T*min, *P*, *W* and RH in 1986: Measured in Kaifeng (station no.: 57091; downloaded from CMA).  *R*ave in 1986: Measured in Zhengzhou (station no.: 57083; downloaded from CMA). |
| Beyond PAO | *T*max, *T*min, *P*, *W* and RH in 1986: Measured in Kaifeng (station no.: 57091; downloaded from CMA).  *R*ave in 1986: Measured in Zhengzhou (station no.: 57083; downloaded from CMA). |
| Configuration | Ten years for spin-up, which was driven by the inputs of 1986; the last year (1986) for simulation. |
| Shenzhen |  |
| PAO | *T*max and *T*min in 2010: Measured in Shenzhen (station no.: 59493; downloaded from CMA).  *P* in 2010: No data because the wind tunnel could not receive rainfall (Gong et al., 2013).  *W* in 2010: Adapted from the observations in Shenzhen (station no.: 59493; downloaded from CMA) by referring to periodically average value 1.4 m s−1 (for P11 and P12 cases) from 05/16 to 06/04, 1.3 m s−1 (for P13 case) from 06/22 to 07/11, 0.89 m s−1 (for P14 case) from 06/22 to 07/11, 1.4 m s−1 (for P15 case) from 07/31 to 08/19, 1.2 m s−1 (for P16 case) from 07/31 to 08/19, 1.1 m s−1 (for P17 case) from 08/26 to 09/14, 0.96 m s−1 (for P18 case) from 08/26 to 09/14 inside the wind tunnel measured onsite by Gong et al. (2013).  RH: Adapted from the observations in Shenzhen (station no.: 59493;downloaded from CMA) by referring to the periodically average value (77.7 %, 76.5 %, 77.3 %, 75.8 %, 77.1 %, 76.2 %, 80.5 % and 79.5 %) from 05/16 to 06/04 (for P11 case),  from 05/16 to 06/04 (for P12 case), from 06/22 to 07/11 (for P13 case), from 06/22 to 07/11 (for P14 case), from 07/31 to 08/19 (for P15 case), from 07/31 to 08/19 (for P16 case), from 08/26 to 09/14 (for P17 case) and from 08/26 to 09/14 (for P18 case) measured onsite by Gong et al. (2013).  *R*max and *M* in 2010: Measured in Guangzhou (station no.: 59287; downloaded from CMA). |
| Beyond PAO | *T*max, *T*min, *P*, *W* and RH in 2010: Measured in Shenzhen (station no.: 59493; downloaded from CMA).  *R*max and *M* in 2010: Measured in Guangzhou (station no.: 59287; downloaded from CMA). |
| Configuration | Ten years for spin-up, which was driven by the inputs of 2010; the last year (2010) for simulation. |
| Yingtan |  |
| PAO | *T*max, *T*min, *P*, *W* and RH in 1992: Measured in Guixi (station no.: 58626; downloaded from CMA).  *R*ave in 1992: Measured in Jianou (station no.: 58737; downloaded from CMA). |
| Beyond PAO | *T*max, *T*min, *P*, *W* and RH in 1992: Measured in Guixi (station no.: 58626; downloaded from CMA).  *R*ave in 1992: Measured in Jianou (station no.: 58737; downloaded from CMA). |
| Configuration | Ten years for spin-up, which was driven by the inputs of 1992; the last year (1992) for simulation. |

The definitions of the case codes are referred to Table 2.

**Reference:**

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