

|                             | Variable  | Site  | Start (year) | Reference   |
|-----------------------------|---|---|--------------|---|
| Meteorological observations | $T$ , $p$ , WS, WD, RH  | 5   | 1881         | Laapas and Venäläinen (2017)                      |
|                             | Precipitation, cloudiness   | 5   | 1881         |   |
|                             | Global, diffuse and UV radiation  | 3   | 1998         | Riihelä et al. (2015)                             |
|                             | Visibility  | 5   | 2002         |   |
|                             | Cloud cover and height  | 5   | 2006         |   |
|                             | 3-D wind profile (Doppler lidar)  | 5   | 2012         | Hirsikko et al. (2014),<br>Tuononen et al. (2017) |
|                             | Weather camera  | 4   | 2014         |   |
| Aerosol and trace           | Aerosol mass (PM <sub>10</sub> )  | 5   | 1980         | Ruoho-Airola et al. (2003)                        |
|                             | SO <sub>2</sub>   | 5   | 1980         | Ruoho-Airola and Salmi (2001)                     |
|                             | Aerosol chemical composition (PM <sub>10</sub> )                                    | 5   | 1980         | Ruoho-Airola et al. (2003)                        |
|                             | NO <sub>x</sub> , O <sub>3</sub>  | 5   | 1986         | Engler et al. (2007)                              |
|                             | Aerosol mass (PM <sub>2.5</sub> )   | 5   | 2003         |   |
|                             | Aerosol size distribution   | 5   | 2004         | Engler et al. (2007),<br>Hyvärinen et al. (2008)  |
|                             | Aerosol absorption  | 5   | 2007         |   |
|                             | Aerosol scattering  | 5   | 2010         | Hyvärinen et al. (2011)                           |
|                             | Aerosol chemical composition (PM <sub>2.5</sub> )                                   | 5   | 2011         |   |
|                             | Phosphorus deposition   | 5   | 2014         | Makkonen et al. (2015)                            |
|                             | Radon   | 5   | 2015         | Vesterbacka (2017)                                |
|                             | Atmospheric greenhouse measurements   | CO <sub>2</sub> , CH <sub>2</sub> and CO gas concentrations | 3            | 2012  |
| CO <sub>2</sub> flux        |   | 2   | 2012         | Honkanen et al. (2018)                            |
| Marine observations         | Sea ice observations  | 1   | 1897         | Seinä and Palosuo (1996)                          |
|                             | Temperature and salinity profiles (0 to −90 m)                                      | 1   | 1900         | Ahlnäs (1961)                                     |
|                             | Nutrient and chlorophyll profiles (0 to −70 m)                                      | 1   | 2001         | Suomela (2003)                                    |
|                             | Sea ice radar   | 4   | 2013         |   |
|                             | Temperature, salinity, O <sub>2</sub> , turbidity, chlorophyll (−5 m)               | 2   | 2014         |   |
|                             | Currents (0 to −23 m) and surface waves   | 2   | 2014         | Haavisto (2015)                                   |
|                             | Automatic Identification System (AIS)   | 2   | 2015         |   |
|                             | Bottle sampler  | 2   | 2015         |   |
|                             | Spectrometric observations of phytoplankton   | 2   | 2016         |   |
|                             | $p\text{CO}_2$  | 2   | 2016         | Honkanen et al. (2018)                            |
|                             | pH, DIC   | 2   | 2016         |   |
|                             | Cabled bottom profiler (−5 to −70 m)  | 6   | 2018         |   |
|                             | Temperature, salinity, O <sub>2</sub> , turbidity, fluorescence (three wavelengths) |   |              |   |
|                             | Currents (0 to −75 m) and surface waves   | 6   | 2018         |   |