| Reference | Lake/Location | Lake Area ($km^2$) | Lake max. depth (m) | Lake mean depth (m) | Time frame |
|---|---|---|---|---|---|
| our study (Scholz et al. 2021) | Lake Lunz, Austria | 0.68 | 34 | 20 | 1 year (2017) |
| Anderson et al., 1999 | Williams Lake, MN, USA | 0.37 | 9 | 5.2 | 5x1 week (spring/summer/fall) |
| Armani et al., 2020 | Itaipu Lake, Brazil | 1350 | | | Jan - Nov 2013 (non-continuous) |
| Czikowsky et al., 2018 | Lake Pleasant, NY, USA | 6 | 24 | 8.0 | 16. Sept - 11. Oct 2010 |
| Du et al., 2018 | Erhai Lake, China | 256.5 | 20.7 | 10.0 | 2012 - 2015 |
| Erkkilä et al., 2018 | Lake Kuivajärvi, Finnland | 0.62 | 13.2 | 6.3 | fall 2014 (16 days) |
| Eugster et al., 2003 | Toolik Lake, Alaska | 1.5 | 25 | | short term (2-4 days in July) |
| Eugster et al., 2003 | Soppensee, Switzerland | 0.25 | 27 | | short term (3 days in September) |
| Eugster et al., 2020 | Toolik Lake, Alaska | 1.5 | 26 | | ice free periods 2010-2015 |
| Franz et al., 2016 | Polder Zarnekow, Germany | 0.075 | 1.2 | | May 2013 - May 2014 |
| Han et al., 2020 | Ngoring Lake, Tibet | 610.7 | 32 | 17.0 | ice free periods 2011-2013 |
| Huotari et al., 2011, see also Vesala et al., 2006 | Lake Valkea-Kotinen, Finland | 0.041 | 6.5 | 2.5 | ice free periods 2003-2007 |
| Jammet et al., 2017 | Villasjön, Sweden | 0.17 | 1.3 | 0.7 | Jun 2012 - Dec 2014 |
| Jonsson et al., 2008 | Lake Merasjärvi, Sweden | 3.8 | 17 | 5.1 | Jun - Okt 2005 |

| Reference | Lake/Location | Lake Area ($km^2$) | Lake max. depth (m) | Lake mean depth (m) | Time frame |
|---|---|---|---|---|---|
| Kim et al., 2016 | Eastmain-1 reservoir, Canada | 603 | 57 | 11.0 | ice free 2006-2009 |
| Liu et al., 2015 | Erhai Lake, China | 256.5 | 20.7 | 10.0 | 1 yr (2012) |
| Liu et al., 2016 | Ross Barnett Reservoir, MS, USA | 134 | 8 | 4-8 | 1 yr (2008) |
| Lohila et al., 2015 | Pallasjärv, Finland | 17.3 | 36 | 9.0 | Jul-Oct 2013 |
| Mammarella et al., 2015, see also Heiskanen et al., 2014 | Lake Kuivajärvi, Finland | 0.63 | 13.2 | 6.4 | Jun - Oct 2010 & 2011 |
| Morin et al., 2017 | Douglas Lake, MI, USA | 13.74 | 24 | | Jun - Sept/Oct 2013 & 2014 |
| Podgrajsek et al., 2015 | Lake Tämnaren, Sweden | 38 | 2 | 1.3 | Sept 2010 - Sept 2012 |
| Polsenaere et al., 2013 | Floodplain lake, Barzil | 450 | | | 19.-22.Nov 2011 |
| Potes et al., 2017 | Alqueva reservoir, Portugal | 250 | 92 | 16.6 | 2. Jun-2. Oct 2014 |
| Reed et al., 2018 | Lake Mendota, WI, USA | 39.61 | 25.3 | 12.8 | 2012-2017 |
| Shao et al., 2015, see also Ouyang et al., 2017 | Lake Erie, USA | 25700 | 64 | 5.1 | Oct 2011 - Sept 2013 |
| Sollberger et al., 2017 | Lake Klöntal, Switzerland | 3.3 | 45 | | Mar - Jun 2012 |

| Reference | Instrumentation:<br>Open path (OP)/Close path (CP) gas analysator and measurement height (m) | Instrument set-up ** | EC processing software |
|---|---|---|---|
| our study<br>(Scholz et al. 2021) | CP 3.9 m | shore | EddyPro / matlab OgO Toolbox |
| Anderson et al., 1999 | CP & OP 1.2 m | fix | |
| Armani et al., 2020 | OP | fix | |
| Czikowsky et al., 2018 | CP 2 m | float | |
| Du et al., 2018 | OP 2.5 m | fix | EddyPro |
| Erkkilä et al., 2018 | CP 1.8 m | float | EddyUH |
| Eugster et al., 2003 | CP 1.5 m | float | |
| Eugster et al., 2003 | OP 2.8 m | float | |
| Eugster et al., 2020 | CP 1.3 - 1.6 m | float | eth-flux software |
| Franz et al., 2016 | CP 2.6 m | shore | EddyPro |
| Han et al., 2020 | OP 3 m | fix | EddyPro |
| Huotari et al., 2011, see also Vesala et al., 2006 | CP 1.5 m | float | |
| Jammet et al., 2017 | OP 2.5 m | shore | EddyPro |
| Jonsson et al., 2008 | OP 1.6 -2.6 m | fix | EcoFlux 1.4 |

| Reference | Instrumentation: Open path (OP)/Close path (CP) gas analysator and measurement height (m) | Instrument set-up ** | EC processing software |
|---|---|---|---|
| Kim et al., 2016 | OP 13 m | fix | |
| Liu et al., 2015 | OP 3.5 m | fix | EddyPro |
| Liu et al., 2016 | OP 4 m | fix | |
| Lohila et al., 2015 | CP 2.5 m | shore | |
| Mammarella et al., 2015, see also Heiskanen et al., 2014 | CP 1.7 m | float | EddyUH |
| Morin et al., 2017 | OP ~2 m | fix | |
| Podgrajsek et al., 2015 | OP 4.7 m | fix | |
| Polsenaere et al., 2013 | OP 4.6 m | shore | EdiRe |
| Potes et al., 2017 | OP 2 m | float | |
| Reed et al., 2018 | OP 11.6 m | shore | TK3 |
| Shao et al., 2015, see also Ouyang et al., 2017 | OP 15 m | fix | EdiRe |
| Sollberger et al., 2017 | OP 1.5 m | float | eth-flux software |
| | | ** fix: solid base but not on shore (e.g. fixed in sediment; island)<br>float: floating platform<br>shore: on shore of lake | various methods for time lag estimation and spectral corrections were applied |

| Reference | averaging interval (min) / detrending *** | coordinate rotation | Quality checks and criteria for rejection (SST: steady state test; ITT: integral turbulence test) |
|---|---|---|---|
| our study (Scholz et al. 2021) | variable (OgO) | coordinate rotation | OgO; positive momentum flux |
| Anderson et al., 1999 | 30 / digital recursive filter | coordinate rotation | spectral inspection |
| Armani et al., 2020 | 10 / LD | coordinate rotation | |
| Czikowsky et al., 2018 | 15 | raft motion corrected; coordinate rotation | SST > 30 %; fluxes with high low-frequency contribution (ogive); calm & unstable periods (z/L<-0.55) |
| Du et al., 2018 | 30 / BA | coordinate rotation | SST & ITT (flag 0-1-2); flag = 2 is discarded |
| Erkkilä et al., 2018 | 30 / LD | coordinate rotation | SST > 100 %; skewness, kurtosis; standard deviation of CO2 > 3 ppm |
| Eugster et al., 2003 | 30 / LD | coordinate rotation | positive momentum flux; spectral inspection |
| Eugster et al., 2003 | 5 / LD | coordinate rotation | positive momentum flux; spectral inspection |
| Eugster et al., 2020 | 30 | coordinate rotation | 9-level flag system according to Foken (in Aubinet 2012); only flag = 9 was rejected |
| Franz et al., 2016 | 30 / BA | planar fit | flag 0-1-2; flag = 2 is discarded; u* < 0.12 or > 0.76 m s-1; flux <0.2 or >99.8 percentile |
| Han et al., 2020 | 30 / LD | coordinate rotation | |
| Huotari et al., 2011, see also Vesala et al., 2006 | 30 / LD | coordinate rotation | SST > 30 %; positive momentum flux; intermittency, skewness, kurtosis (Vickers & Mahrt 1997); vertical rotation > 15° |
| Jammet et al., 2017 | 30 / BA | coordinate rotation | SST > 30 %; skewness, kurtosis (Vickers & Mahrt 1997); when no time-lag found |
| Jonsson et al., 2008 | 30 / BA | coordinate rotation | SST > 30 %; positive momentum flux; CO2 fluxes outside 3 std |

| Reference | averaging interval (min) / detrending *** | coordinate rotation | Quality checks and criteria for rejection (SST: steady state test; ITT: integral turbulence test) |
|---|---|---|---|
| Kim et al., 2016 | 30 / BA | coordinate rotation | |
| Liu et al., 2015 | 30 / BA | coordinate rotation | Foken et al. 2004 |
| Liu et al., 2016 | 30 | coordinate rotation | Foken et al. 2004; negative CO2 fluxes outside 2-4 std were discarded |
| Lohila et al., 2015 | 30 / BA | coordinate rotation | SST; variance of CO2 concentration > 1 ppm |
| Mammarella et al., 2015, see also Heiskanen et al., 2014 | 30 / BA | coordinate rotation | skewness, kurtosis (Vickers & Mahrt 1997); SST > 100 % |
| Morin et al., 2017 | 30 / BA | coordinate rotation | u* threshold |
| Podgrajsek et al., 2015 | 30 / LD | coordinate rotation | u spd < 1 m s-1; skewness, kurtosis (Vickers & Mahrt 1997) |
| Polsenaere et al., 2013 | 10 / LD | coordinate rotation | SST & ITT |
| Potes et al., 2017 | 30 / LD | coordinate rotation | only diagnostic flags from instruments+wind direction/footprint |
| Reed et al., 2018 | 30 | polynomal planar fit | default TK3 (SST & ITT) |
| Shao et al., 2015, see also Ouyang et al., 2017 | 30 / BA | planar fit | SST & ITT, u* < 0.1; flux > 6std (7day moving window) |
| Sollberger et al., 2017 | 30 | NA | SST (Foken et al. 2012) |
| | *** BA: Block Average LD: Linear Detrending | most of the time, 'coordinate rotation' equals a double rotation. | |

| Reference | data cover (%) | Gap-filling | $CO_2$ flux (mg C $m^{-2}$ $d^{-1}$) |
|---|---|---|---|
| our study (Scholz et al. 2021) | 15% | | 259 |
| Anderson et al., 1999 | | | -186 to 2800 |
| Armani et al., 2020 | | | 301 |
| Czikowsky et al., 2018 | 35% | | 348 |
| Du et al., 2018 | 55% | different methods for gap-filling were tested | 322 to 443 |
| Erkkilä et al., 2018 | 27% | | 363 to 1130 |
| Eugster et al., 2003 | | | 114 |
| Eugster et al., 2003 | | | 289 |
| Eugster et al., 2020 | 51-93% | median diel cycle approach for short gaps up to 1.5 days; longer gaps: daily average of the respective season | 200 |
| Franz et al., 2016 | 45.5% | marginal distribution sampling | 118 |
| Han et al., 2020 | 80% | | -830 to 130 |
| Huotari et al., 2011, see also Vesala et al., 2006 | 10% | | 210 (186 to 266) |
| Jammet et al., 2017 | 26% | Artificial Neural Network | 228 |
| Jonsson et al., 2008 | 16% | | 221 |

| Reference | data cover (%) | Gap-filling | $CO_2$ flux (mg C $m^{-2}$ $d^{-1}$) |
|---|---|---|---|
| Kim et al., 2016 | | | 1140 |
| Liu et al., 2015 | | | 466 to 1284 |
| Liu et al., 2016 | 80% | | 321 |
| Lohila et al., 2015 | | | 210 |
| Mammarella et al., 2015, see also Heiskanen et al., 2014 | 37% | | 726 |
| Morin et al., 2017 | 51-73 % | Neural Network (separately for night-time and daytime data) | 726 |
| Podgrajsek et al., 2015 | 45% | | 187 |
| Polsenaere et al., 2013 | 62% | | 612 |
| Potes et al., 2017 | 63% | | -38 |
| Reed et al., 2018 | 29 % (?) | | -151 to -636 |
| Shao et al., 2015, see also Ouyang et al., 2017 | 35% | marginal distribution sampling (monthly mean / MDV were also tested) | 173 |
| Sollberger et al., 2017 | 83.7 % (26.4 % best QC) | | 15.5 |