

## Supplementary material

Table S1. Hydroclimate variable and their sources used in this study.

Variable	Data source
Pacific Decadal Oscillation	Japan Meteorological Agency, <i>Tokyo climate center WMO regional climate center in RA II (Asia)</i> . <a href="https://ds.data.jma.go.jp/tcc/tcc/products/el_nino/decadal/pdo_month.html">https://ds.data.jma.go.jp/tcc/tcc/products/el_nino/decadal/pdo_month.html</a> (accessed 2020-10-17).
El Niño-Southern Oscillation	Trenberth, K.E.; National Center for Atmospheric Research Staff (Eds). Last modified 21 Jan 2020. “The Climate Data Guide: Nino SST Indices (Nino 1+2, 3, 3.4, 4; ONI and TNI)”. <a href="https://climatedataguide.ucar.edu/climate-data/nino-sst-indices-nino-12-3-34-4-oni-and-tni">https://climatedataguide.ucar.edu/climate-data/nino-sst-indices-nino-12-3-34-4-oni-and-tni</a> (accessed 2020-10-17).
East Asia Winter Monsoon	Jhun, J. G.; Lee, E. J. A new East Asian winter monsoon index and associated characteristics of the winter monsoon. <i>Journal of Climate</i> 2004, 17(4), 711-726.
Sea Surface Temperature and precipitation rate	Kalnay, E.; Collins, W.; Deaven, D.; Gandin, L.; Iredell, M.; Jenne, R.; Joseph, D. The NCEP_NCAR 40-year reanalysis project. 1996. <i>Bull. Am. Meteorol. Soc.</i> 1996, 77, 437–472. <i>NCEP Reanalysis data provided by the NOAA/OAR/ESRL PSL, Boulder, Colorado, USA.</i> <a href="https://psl.noaa.gov/cgi-bin/data/testdap/timeseries.pl">https://psl.noaa.gov/cgi-bin/data/testdap/timeseries.pl</a> (accessed 2020-10-17).
Chlorophyll	Ministry of Oceans and Fisheries, <i>Ocean Environment Information Portal</i> . <a href="https://www.meis.go.kr/mei/observe/port.do">https://www.meis.go.kr/mei/observe/port.do</a> (accessed 2020-10-19).