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| **Table.** Model setup and selected explanatory variable for energy, CO2 and CH4 fluxes. List of abbreviation: land cover type - IGBP classification (LC\_IGBP), net radiation (RNET), latent hear flux (LE), sensible heat flux (H), gross primary production (GPP), ecosystem respiration (RE), methane flux (FCH4), enhanced vegetation index (EVI), normalized difference vegetation index (NDVI), precipitation (P), incoming shortwave radiation (SW\_IN), incoming longwave radiation (LW\_IN), vapor pressure deficit (VPD), air temperature (TA), potential evapotranspiration (PET), wind speed (WS), daytime land surface temperature (LST.day), nighttime land surface temperature (LST.night), land surface water index (2130nm) (LSWI2), seasonal amplitude of EVI (EVI.amp), seasonal amplitude of NDVI (EVI.amp), EVI in the peak-EVI quarter (EVI.pqtr), NDVI in the peak-NDVI quarter (NDVI.pqtr) | | | | | |
| Variable setup1 | Type of variable | Energy flux  (RNET, LE, H) | CO2 flux  (GPP, RE) | CH4 flux  (FCH4) | Data source [original name] |
| I. CIMIS+MODIS (500m×8day)  II. CIMIS+MODIS (250m×16day)  III. CIMIS+Landsat (120m×32day) | Spatial  (yearly-aggregated ) | LC\_IGBP | LC\_IGBP | LC\_IGBP | MODIS [LC.IGBP.1] |
| EVI.amp | EVI.amp | EVI.amp | MODIS/Landsat |
| NDVI.amp | NDVI.amp | NDVI.amp | MODIS/Landsat |
| EVI.pqtr | EVI.pqtr | EVI.pqtr | MODIS/Landsat |
| NDVI.pqtr | NDVI.pqtr | NDVI.pqtr | MODIS/Landsat |
| Temporal  (daily)2 | P | P | P | CIMIS [Precip] |
| SW\_IN | SW\_IN | SW\_IN | CIMIS [Sol Rad] |
| LW\_IN | LW\_IN | LW\_IN | Tower data [Rlong\_in] |
| VPD | VPD | VPD | CIMIS-derived [VPD] |
| TA | TA | TA | CIMIS [Avg Air Temp] |
| PET | PET | PET | CIMIS [ETo] |
| WS | WS | WS | CIMIS [Avg Wind Speed] |
| LST.day | LSTday | LSTday | MODIS [LST.day] |
| LST.night | LSTnight | LSTnight | MODIS [LST.night] |
| EVI | EVI | EVI | MODIS/Landsat [EVI] |
| NDVI | NDVI | NDVI | MODIS/Landsat [NDVI] |
| LSWI2 | LSWI2 | LSWI2 | MODIS/Landsat [LSWI2] |
| - | - | Rn | ML-derived |
| - | - | GPP | ML-derived |
| - | - | P−PET | CIMIS-derived |
| - | - | P-ET | ML-derived |
| 1 Three variable setups were adopted with the major difference in the sources of remote-sensing products used, such as MODIS 500 m × 8 day, MODIS 250 m × 16 day, and Landsat 120 m × 32 day  2 Daily LST.day, LST.night, EVI, NDVI, LSWI2 are derived by using spline interpolation on the original 8-day and 16-day MODIS or 30-day Lansat data. | | | | | |