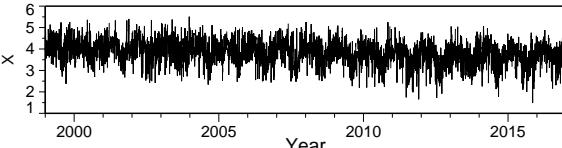


## Original time series ( $X$ ) (Log-transformed)

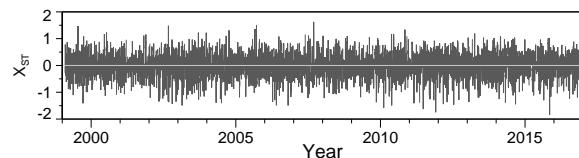


### Low-pass filter ( $KZ_{(15,5)}$ filter)

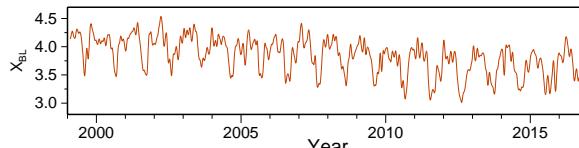
$$X_{BL} = KZ_{(15,5)}X$$

$$X_{ST} = X - X_{BL}$$

## Short-term component ( $X_{ST}$ )



## Baseline ( $X_{BL}$ )



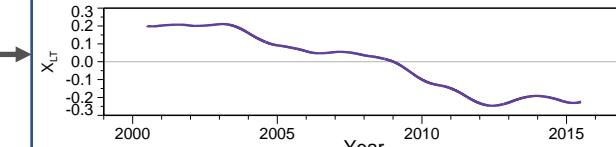
### Climatological seasonal cycle of $X_{BL}$ ( $X_{BL}^{clm}$ ) and Low-pass filter ( $KZ_{(365,3)}$ filter)

$$X_{BL} = X_{BL}^{clm} + \varepsilon$$

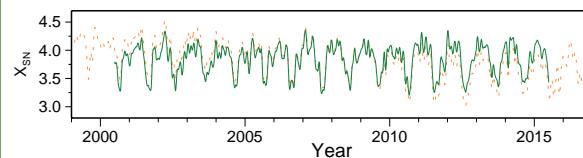
$$X_{LT} = KZ_{(365,3)}\varepsilon$$

$$X_{SN} = X_{BL} - X_{LT}$$

## Long-term component ( $X_{LT}$ )



## Seasonal component ( $X_{SN}$ )



### Multiple linear regression model and Low-pass filter ( $KZ_{(365,3)}$ filter)

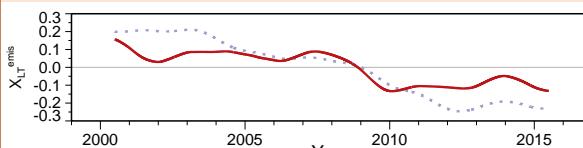
$$\text{MET}_{BL} = [T_{BL}, P_{BL}, RH_{BL}, WS_{BL}, SI_{BL}]$$

$$X_{BL} = a_0 + \sum_i a_i \text{MET}_{BL,i} + \varepsilon'$$

$$X_{LT}^{\text{emis}} = KZ_{(365,3)}\varepsilon'$$

$$X_{LT}^{\text{met}} = X_{LT} - X_{LT}^{\text{emis}}$$

## Emission-related $X_{LT}$ ( $X_{LT}^{\text{emis}}$ )



## Meteorology-related $X_{LT}$ ( $X_{LT}^{\text{met}}$ )

