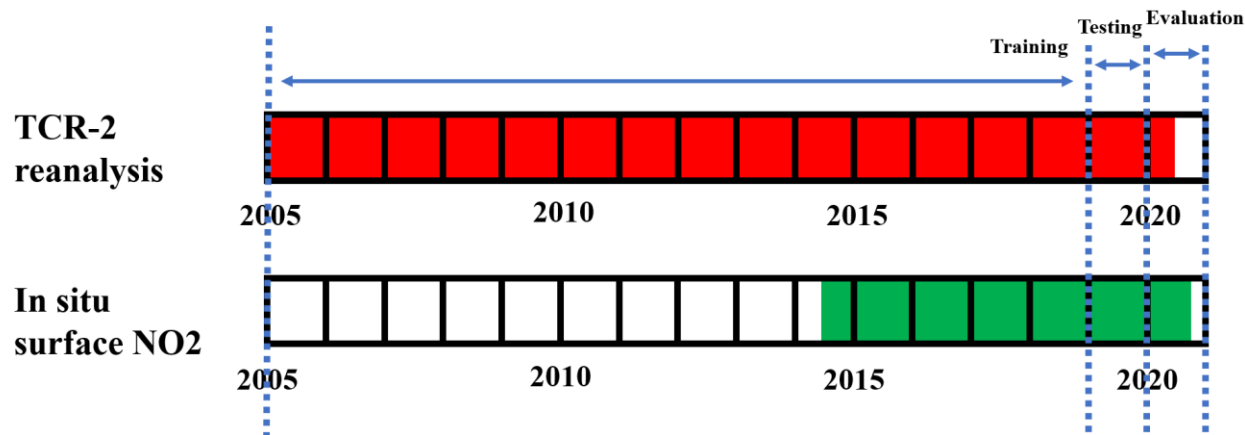
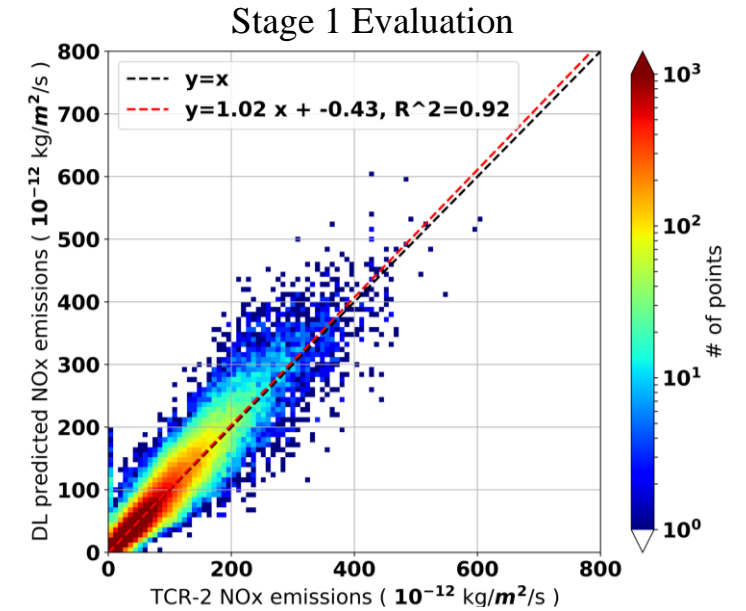
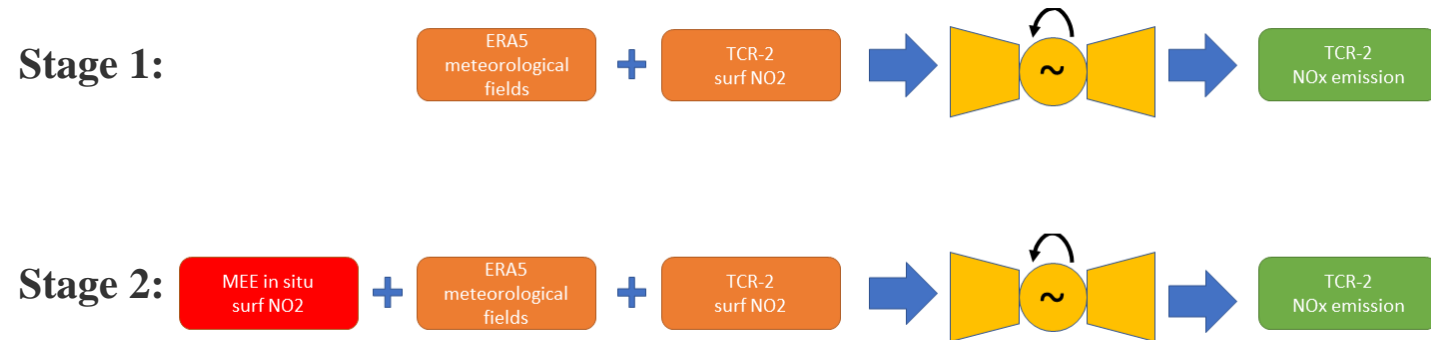


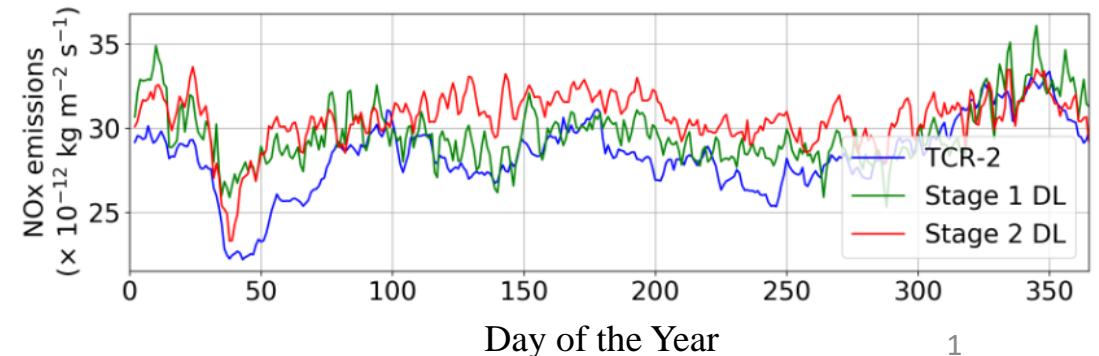
Deep learning for Chinese NO_x emission inversion and the integration of in situ observations: a case study on the COVID-19 pandemic

Tai-Long He, Dylan B. A. Jones, Kazuyuki Miyazaki, Kevin W. Bowman, Zhe Jiang, Rui Li, Xiaokang Chen, Yuxiang Zhang

Multi-stage training to integrate in situ NO₂ data with chemical reanalysis data



Estimated Chinese NO_x Emissions

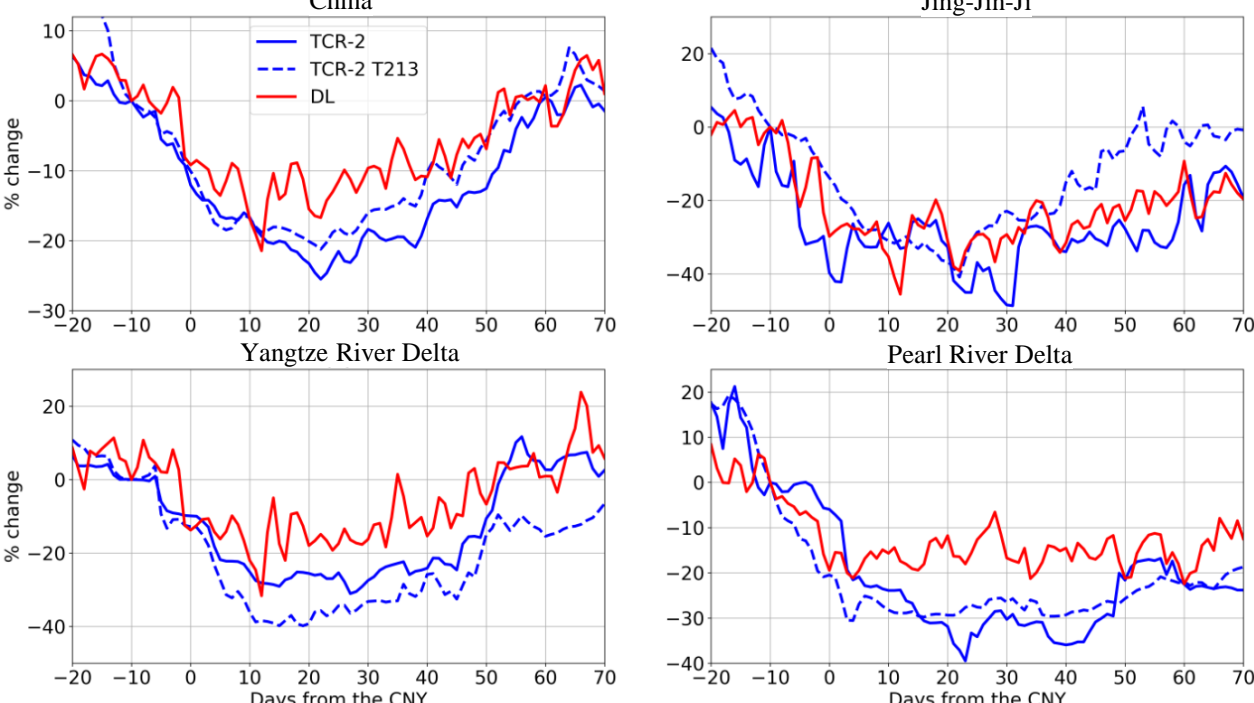
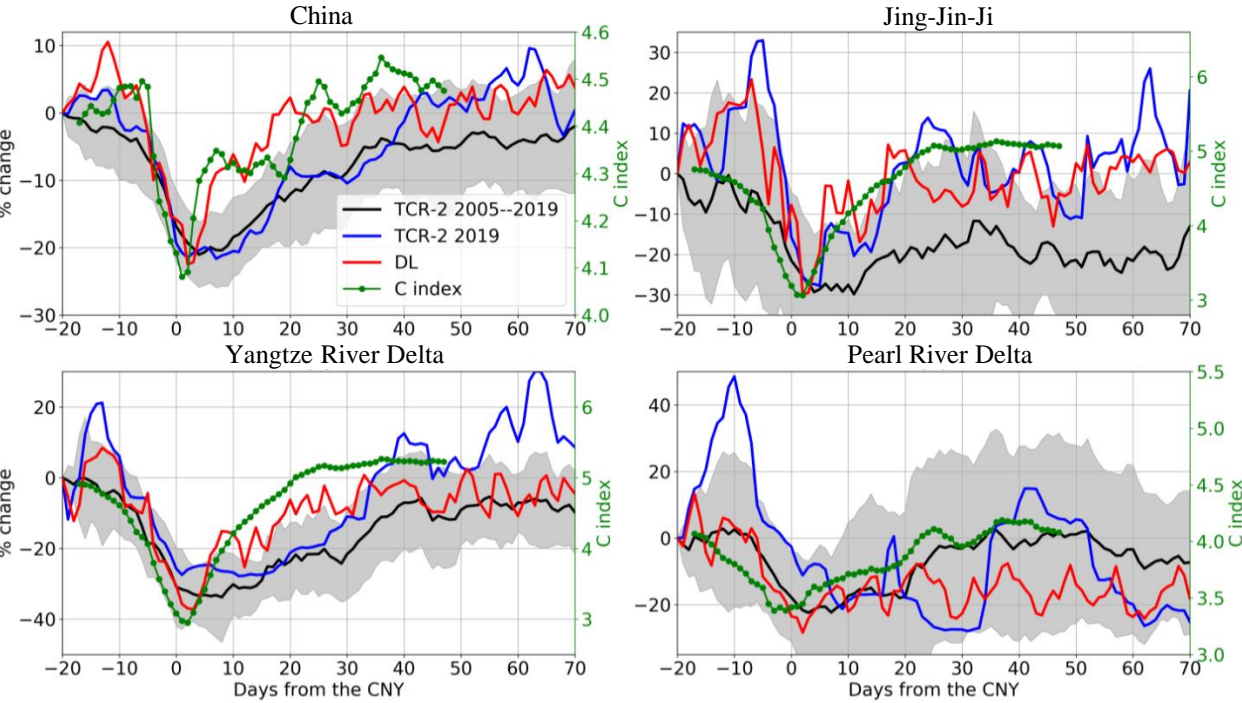


Comparison of changes in NOx emissions with Baidu migration indices

The Baidu “Qianxi” migration indices provide a measure of human mobility

2019 time series of NOx emissions

2020 time series of NOx emissions



- The migration data suggests a faster recovery in NOx emissions after 2019 CNY than TCR-2, which the DL model captures.
- The DL minimum does not go as deep as the TCR-2 suggests during 2020 CNY. But the COVID-contributed reduction is consistent between DL and TCR-2.