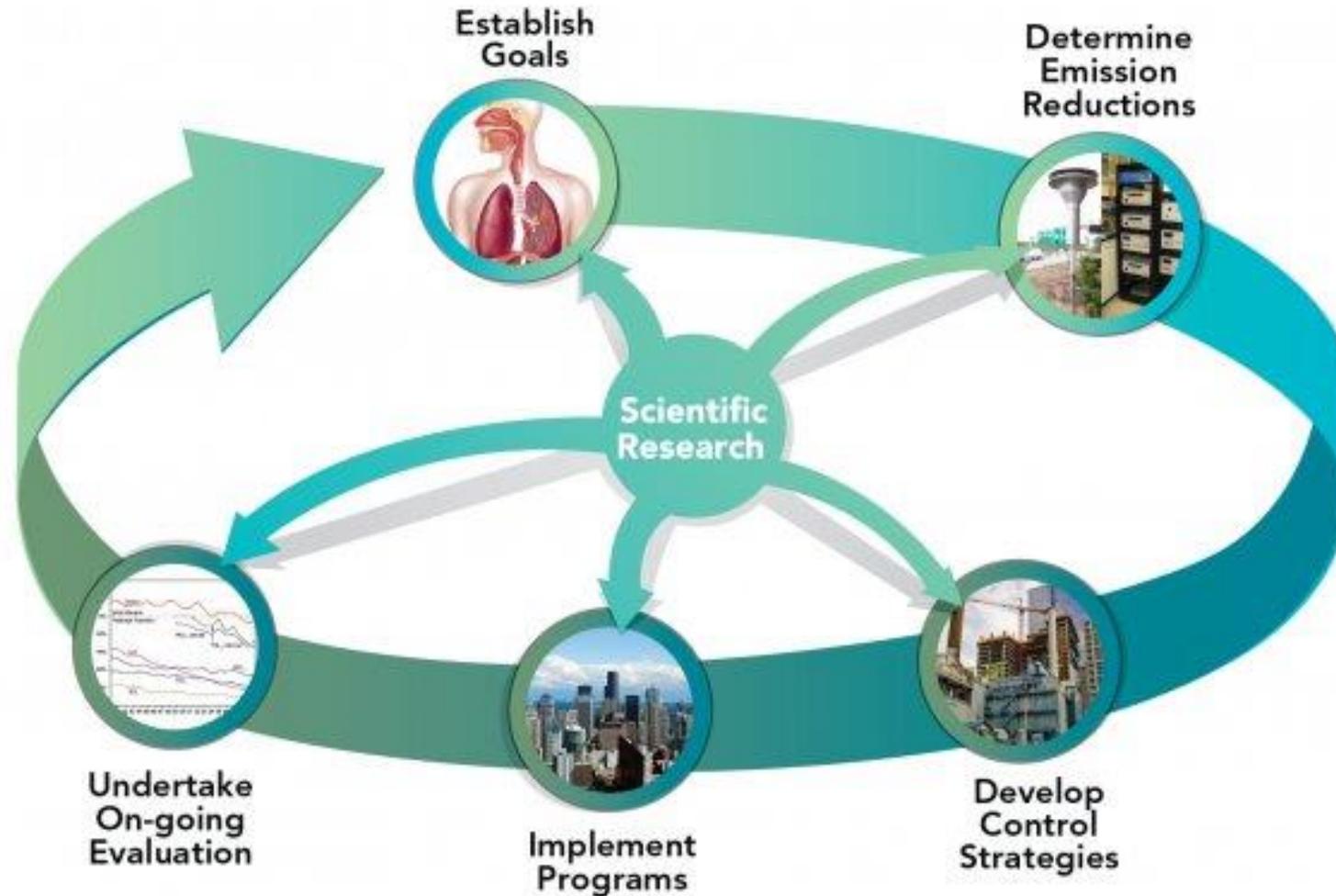


Air Quality Policy Evaluation Tool (AQ-PET)

Yuqing Dai, Bowen Liu, Zongbo Shi et al.

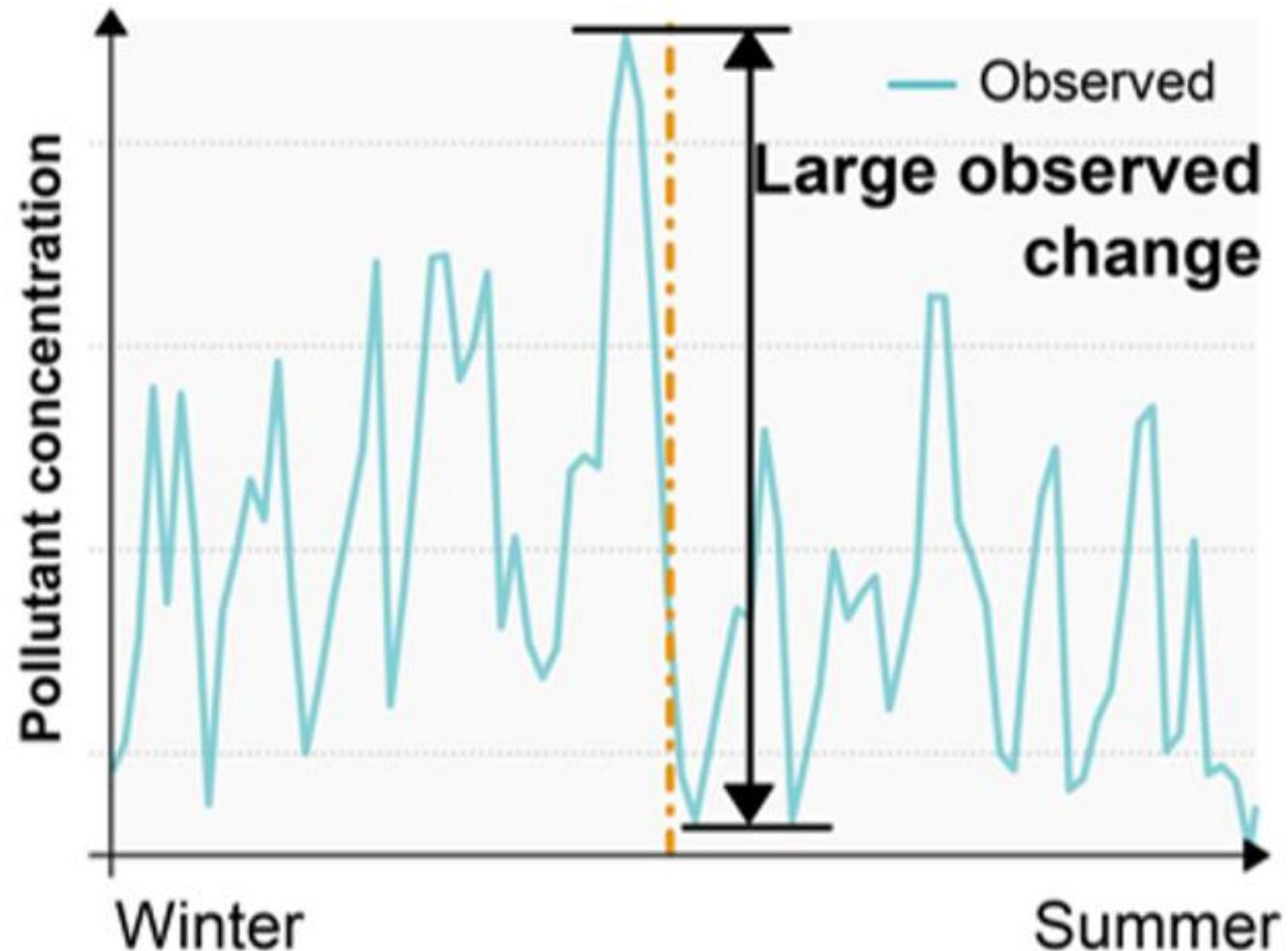
Why evaluating AQ “interventions”?

AIR QUALITY MANAGEMENT CYCLE

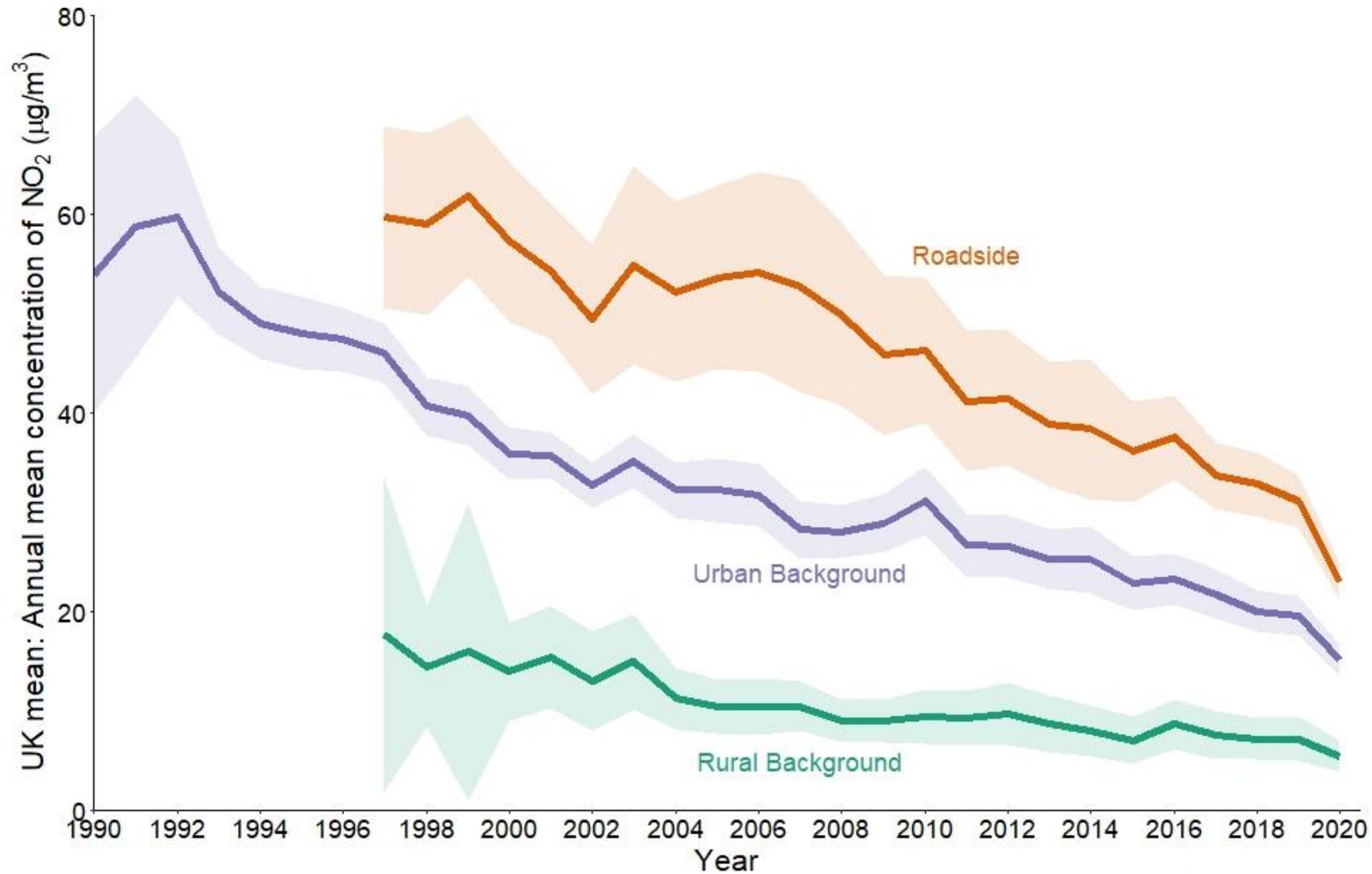


Confounder: Weather

Short-term change in air quality dominated by met. variations



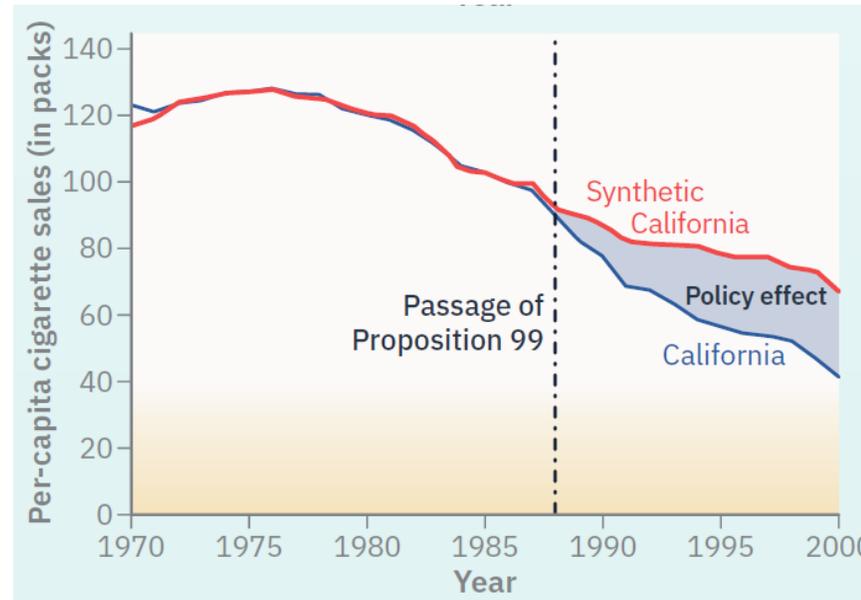
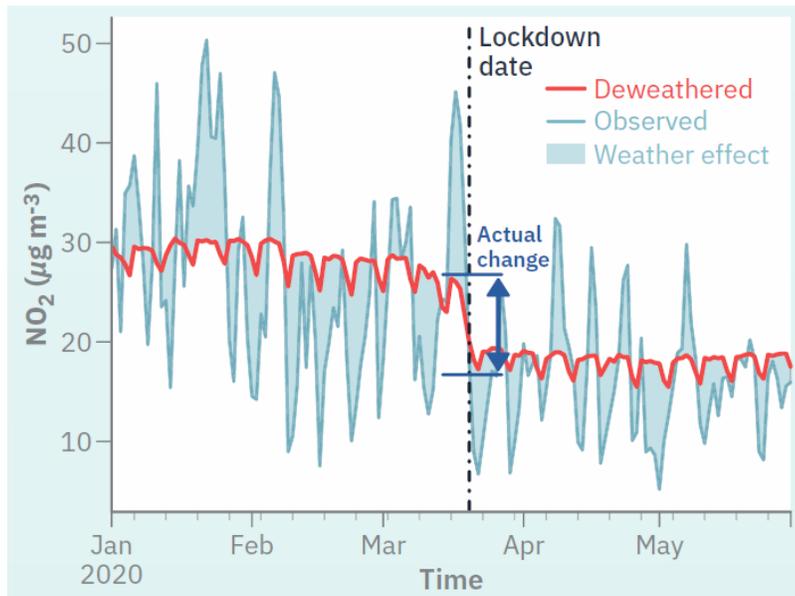
Confounder: underlying trend



Source: Ricardo Energy & Environment

What is AQ-PET

- A simple tool to quantify the causal impact of air pollution control policies
- No prior knowledge of machine learning or causal inference model needed
- No prior coding experience needed
- Illustrations generated can be directly used for reporting



Pick a leaflet
about the
concept

Data needed

Datetime

Air pollutant

Met data

datetime	NO2	PM2.5	ws	wd	temp	pressure	RH	ssr	tp
01/01/2017 00:00	70.127	31.5	3.76667	208.22	6.23333	1024.1	96.758	0	1.75E-0
01/01/2017 01:00	96.572	33.6	3.43333	216.962	6.06667	1022.7	97.5854	0	1.31E-0
01/01/2017 02:00	99.928	25.6	3.6	210	6	1021.9	97.5818	0	3.06E-0
01/01/2017 03:00	86.837	23.1	3.1	200.54	5.9	1020.7	98.0053	0	8.74E-0
01/01/2017 04:00	80.749	23.1	3.26667	195.193	5.2	1019.6	97.5746	0	6.47E-0
01/01/2017 05:00	74.912	24.7	2.6	196.531	5.83333	1018.5	98.0023	0	3.85E-0
01/01/2017 06:00	61.144	24	3.43333	206.508	5.96667	1017.8	98.0082	0	1.92E-0
01/01/2017 07:00	59.2	21	3.1	186.705	6.46667	1017.1	98.0156	0	2.45E-0
01/01/2017 08:00	75.252	23	3.26667	190	6.9	1016.3	98.4509	0	9.88E-0
01/01/2017 09:00	90.475	18.1	3.6	201.511	7.76667	1015.9	98.6742	14863.4	1.37E-0
01/01/2017 10:00	87.207	14	2.93333	210	8.33333	1015.8	98.039	94718	4.10E-0
01/01/2017 11:00	85.217	15.8	3.26667	213.67	9.23333	1015.6	95.4882	144388	0.0001
01/01/2017 12:00	87.228	13.4	4.1	223.33	9.9	1015.1	89.5281	138059	0.0003
01/01/2017 13:00	99.217	14.3	3.76667	239.447	9.6	1014.6	88.7392	93469	0.0008
01/01/2017 14:00	35.431	6.6	4.46667	356.907	7.03333	1014.6	94.4063	41717.6	0.0017
01/01/2017 15:00	28.218	1.9	4.76667	23.5631	5.06667	1015.8	95.1328	31433.9	0.0015
01/01/2017 16:00	27.905	0.8	4.8	20	4.53333	1017	94.9081	8743.2	0.0011
01/01/2017 17:00	23.974	2.7	3.76667	23.1818	4.16667	1018.2	97.1273	0	0.0008
01/01/2017 18:00	30.876	3.7	3.76667	33.1818	4.43333	1018.9	95.3296	0	0.000
01/01/2017 19:00	29.805	2.9	3.93333	34.3203	4.83333	1019.6	92.6845	0	0.0005
01/01/2017 20:00	28.796	4	3.76667	27.2612	4.86667	1020.6	95.1209	0	0.0005
01/01/2017 21:00	33.718	5.7	3.43333	16.9946	4.53333	1021.4	97.7719	0	0.0004
01/01/2017 22:00	38.603	5	3.26667	20	4.16667	1022.2	97.5546	0	0.0003

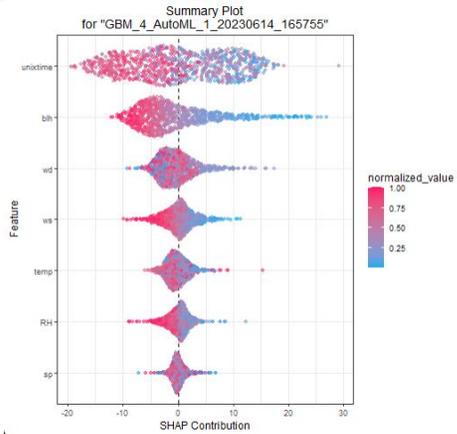
User interface

The screenshot displays the AQ-PET user interface. On the left is a dark sidebar with navigation options: Data Input (gear icon), Data (download icon), Model (document icon), WeNorm Output (list icon), Synthetic Control Methods (gears icon), and Model Evaluation (table icon). The main content area is titled 'Global Parameters Panel' and contains the following fields:

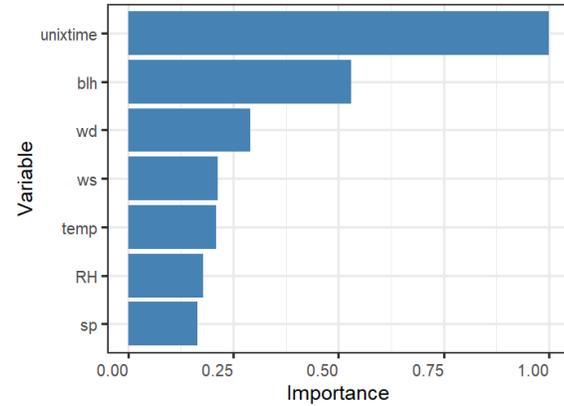
- Data Directory:**
- File Pattern:**
- Datetime Format:**
- Dependent Variable:**
- Treatment ID:**
- Reading Time Period:** to
- Intervention Start Time:**
- Intervention Elimination Time:**
- WeNorm Method:**
- SCM Option:**

At the bottom of the panel are two green buttons: 'Read Data' (with an upload icon) and 'Show Missing Data' (with an eye icon). Below the main panel are three expandable control panels: 'Wenorm Control Panel', 'WCP2', 'A-SCM Control Panel', and 'ML-SCM Control Panel'.

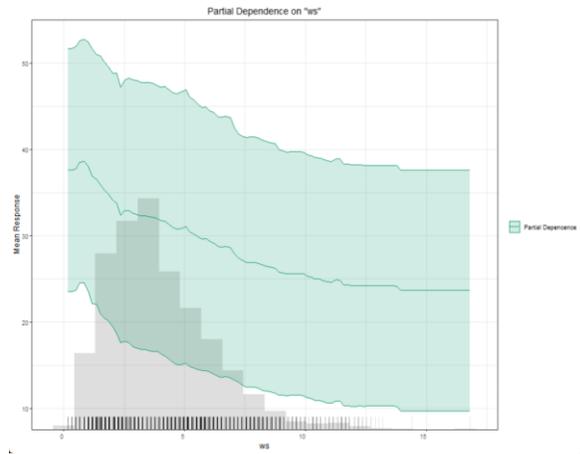
Example outcome



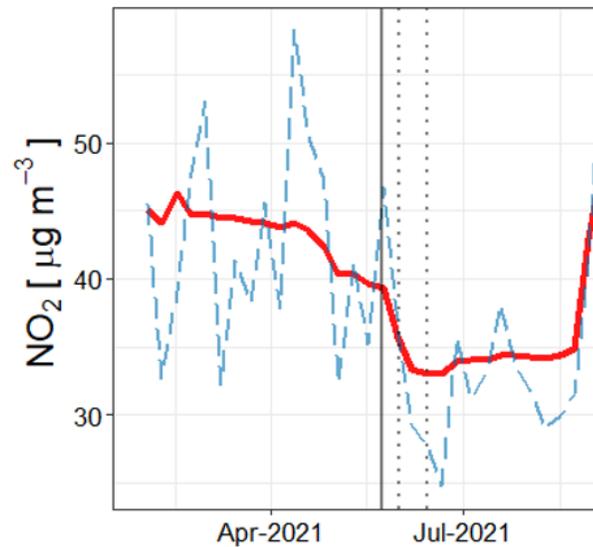
SHAP value



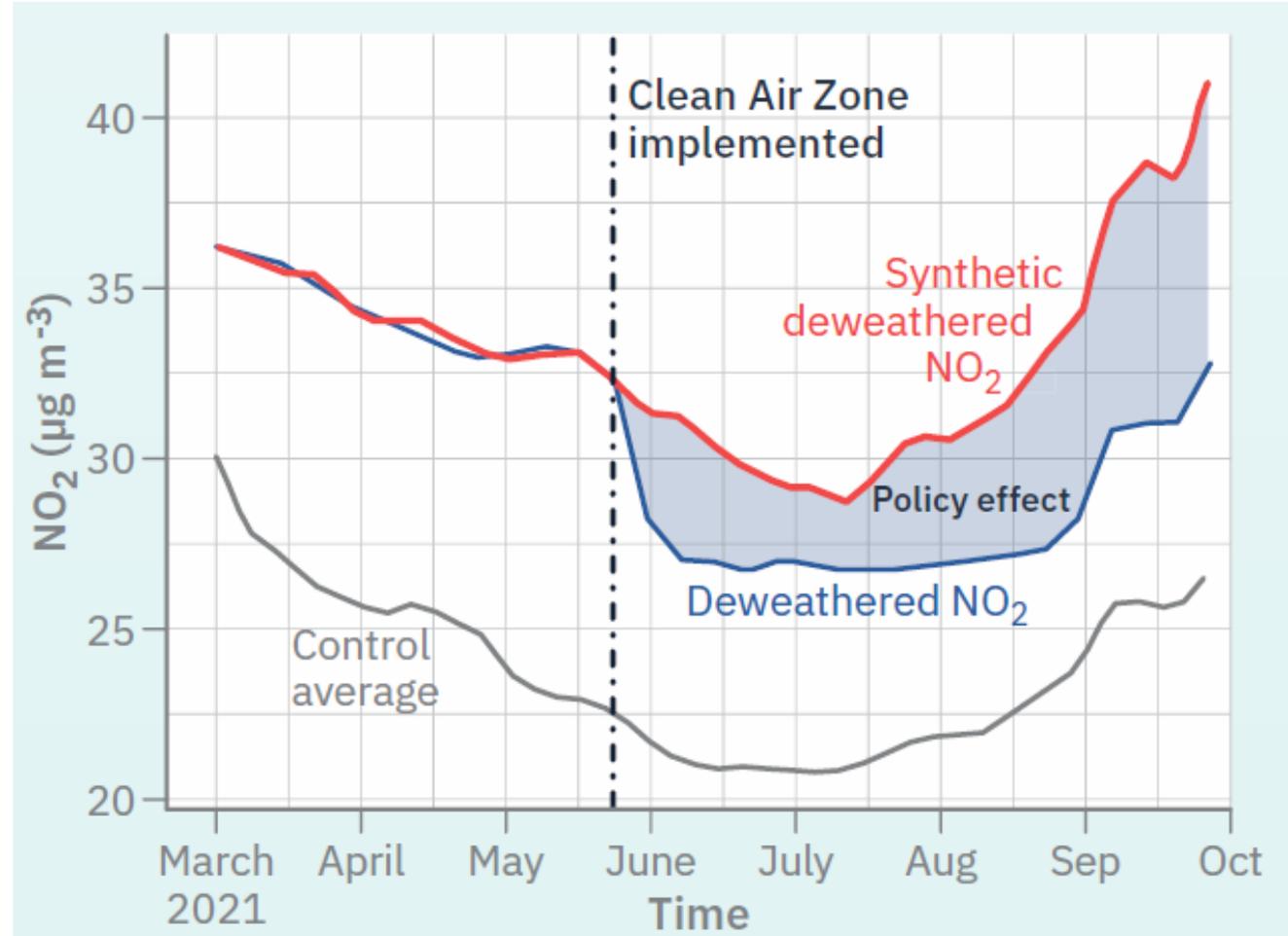
Variable importance



Partial dependence



Observed vs. de-weathered



Causal impact of CAZ