Communiqué de presse

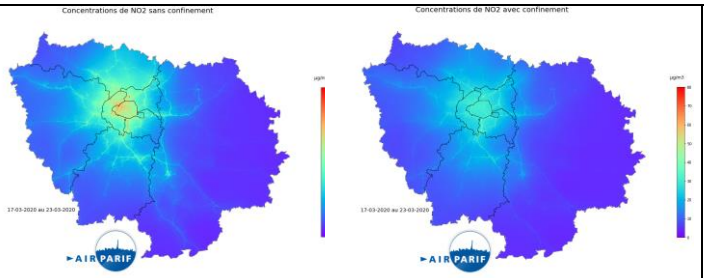
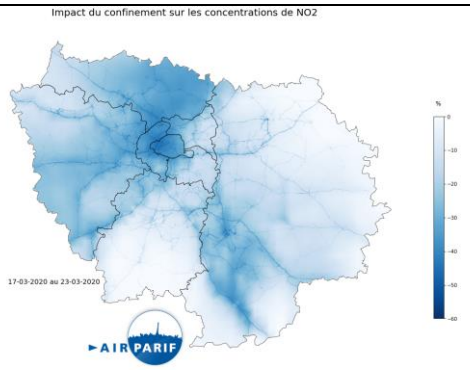
Impact on air quality in the Île-de-France region of the first three weeks of lockdown as part of the fight against COVID-19

Updated assessment for the period March 17th – April 6th

In order to limit the spread of COVID-19, authorities implemented confinement measures starting on Tuesday, 17th March at noon. Over the past month, Airparif's assessments of the impact on air pollution have confirmed the findings of the first few days (see press release of 25/04/20):
- A significant improvement in air quality for nitrogen dioxide (a local pollutant mainly emitted by traffic) from -20% to -35% depending on the week and up to -50% along traffic routes. This is confirmed by the national assessment published today by Atmo France (the French federation of independent associations in charge of monitoring and providing information on air quality, including Airparif), based on measurements from monitoring stations representative of the population's exposure to traffic-related pollution in major French conurbations. For nitrogen oxides, this reduction is even more significant: from -30 to -75% in some French cities (https://atmo-france.org/covid-19/).
- A co-benefit of -30% on CO_2 emissions, a greenhouse gas;
- But a lesser impact for particulate matter (PM_{10} and $PM_{2.5}$), whose sources are more diverse and not only local.

Nitrogen dioxyde

Comparison of pollution levels between a normal situation and the first three weeks of lockdown, with similar weather conditions, shows an average decrease in nitrogen dioxide levels of -20 to -35%. Along traffic routes, this decrease can be as much as -50%, with levels that are similar to those usually observed in parks. In the 40 years of Airparif monitoring, this situation at traffic stations had never occurred to such an extent and at so many stations.

Typical concentrations (µg/m³) without lockdown	Observed concentrations (µg/m³) with lockdown	Difference map
Week 1 (March 17-23 2020) : -20 to -30% reduction		
		

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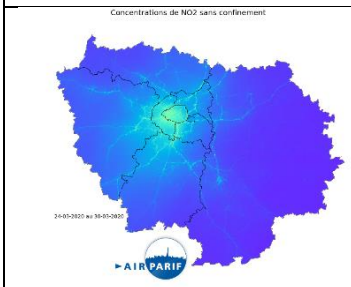
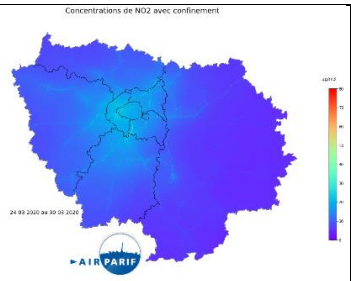
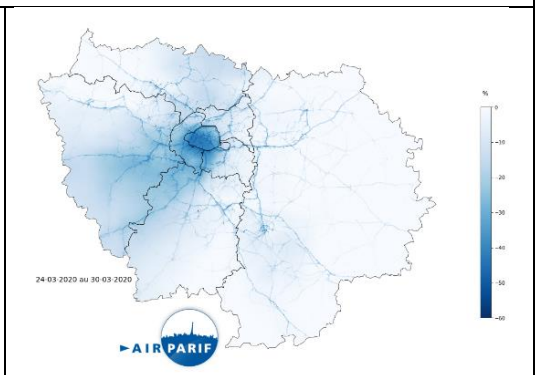
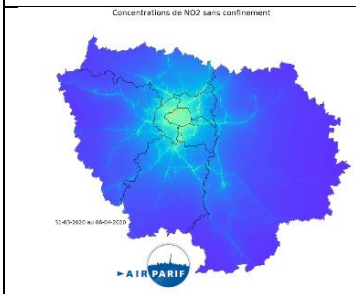
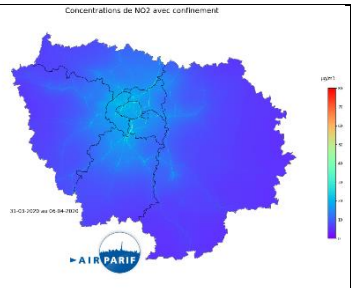
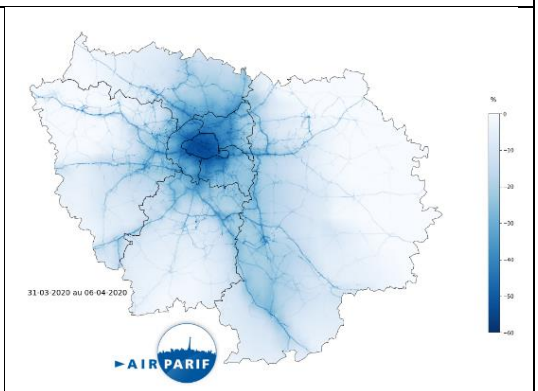
Typical concentrations (µg/m³) without lockdown	Observed concentrations (µg/m³) with lockdown	Difference map
Week 2 (March 24-30 2020) : -15 to -20% reduction		
		
Week 3 (March 31-April 6 2020) : -30 to -35% reduction		
		

Comparison of weekly nitrogen dioxide concentrations in the Île-de-France region, with and without lockdown, for the first three weeks (March 17-April 6)

▸ Particulate matter

The impact of lockdown was less visible for particulate matter (PM_{10} and $PM_{2.5}$) with levels still sustained on some days. Concentrations remained higher than expected given the lockdown, because some sources of particulate matter or precursor gases, such as agriculture and heating, were less (or not at all) impacted. Furthermore, spring weather conditions were conducive to chemical reactions in the atmosphere leading to the creation of particulate matter. These secondary particles can be created in particular from nitrogen oxides (emitted mainly from heating and, to a lesser extent in the current situation, traffic) and ammonia (emitted mainly from agricultural activities. These secondary particles added to primary particles produced by residential heating (including wood burning) in the evening in March; and to particles imported through long-range pollution transfer, since part of France was subject to weather conditions conducive to such importation.

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Under these conditions, the information threshold for particulate matter was exceeded on March the 28th. Analysing the composition of the particles makes it possible to trace them back to their sources. For March the 28th, this analysis shows that road traffic and wood burning contributed little (accounting for around 6% of primary particles each), and that agriculture accounted for 32% of the secondary inorganic particles.
By way of comparison, during the PM episode of February, 16th 2019, the contribution of road traffic was estimated at a minimum of 32% and that of agriculture at 19%.
Under normal traffic conditions, the levels would have been even higher and thus more problematic given the aggravating role played by air pollution in the Covid-19 outbreak.

▸ Greenhouse gases

The link between air pollution and climate change is further confirmed with a 30% decrease in CO_2 emissions during the first three weeks of lockdown.

Airparif and its team continue to monitor air quality and inform the public during this unprecedented period. The analysis of the evolution of pollution levels with regard to the confinement measures will continue over the duration of the lockdown according to the evolution of emissions (decrease in heating, pick-up in traffic with the gradual recovery of business ...) and increasingly summery weather conditions (increase in average levels of pollutants such as ozone).

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