



## **Effect of shipping emissions on European ground-level ozone**

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Shipping emissions contribution to the global nitrogen oxides emissions is about 15%, affecting ozone formation and the chemical composition of the atmosphere. The objective of this study is to assess the impact of shipping emissions on ozone levels over Europe suggesting regions where air quality degradation due to shipping emissions dominates against the rest of the anthropogenic source emissions. Ranking the importance of the Standard Nomenclature for Air Pollution (SNAP) categories on ozone mixing ratio, road transport has the major impact followed by other mobile sources, power generation, and industrial combustion sectors. All other sectors have a minor impact, therefore, our analysis is focused on these four emission categories. Results suggest that shipping emissions seem to play an important role on ozone levels compared to road transport sector near the coastal zone, while they could partly offset the benefits from the emissions reduction of other mobile sources, power generation and industrial combustion sources, over a great part of the European land.