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Titolo	Mathematical social sciences
Pubbl/distr/stampa	Amsterdam, : North-Holland
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Lingua di pubblicazione	Inglese
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Titolo	The Impact of Microorganisms on Consumption of Atmospheric Trace Gases
Pubbl/distr/stampa	Frontiers Media SA, 2017
Descrizione fisica	1 online resource (201 p.)
Collana	Frontiers Research Topics
Soggetti	Microbiology (non-medical)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	Gases with a mixing ratio of less than one percent in the lower atmosphere (i.e. the troposphere) are considered as trace gases. Numerous of these trace gases originate from biological processes in marine and terrestrial ecosystems. These gases are of relevance for the climate as they contribute to global warming or to the troposphere's chemical reactive system that builds the ozone layer or they impact on the stability of aerosols, greenhouse, and pollutant gases. These reactive trace gases include methane, a multitude of volatile organic compounds of biogenic origin (bVOCs) and inorganic gases such as nitrogen oxides or ozone. The regulatory function of microorganisms for trace gas cycling has been intensively studied for the greenhouse

gases nitrous oxide and methane, but is less well understood for microorganisms that metabolize molecular hydrogen, carbon monoxide, or bVOCs. The studies compiled in this Research Topic reflect this very well. While a number of articles focus on nitrous oxide and methane or carbon monoxide oxidation, only a few articles address conversion processes of further bVOCs. The Research Topic is complemented by three review articles about the consumption of methane and monoterpenes, as well as the role of the phyllosphere as a particular habitat for trace gas-consuming microorganisms, and point out future research directions in the field. The presented scientific work illustrates that the field of microbial regulation of trace glas fluxes is still in its infancy when one broadens the view on gases beyond methane and nitrous oxide. However, there is a societal need to better predict global dynamics of trace gases that impact on the functionality and warming of the troposphere. Upcoming modelling approaches will need further information on process rates, features and distribution of the driving microorganisms to fulfill this demanding task.