**STARVOX (Project leader: Åsa Frostegård)**

**Revealing effects of starvation and oxidative stress on denitrifying bacteria: a basis for novel N2O mitigation and industrial applications**

**Popular abstract:**

The last reports from IPCC (the Intergovernmental Panel on Climate Change) describe steadily increasing emission of N2O, a potent greenhouse gas and in addition the main destructor of the stratospheric ozone. Denitrifying bacteria are responsible for the main part of the global N2O emissions from soils, primarily driven by excessive use of fertilizers. Denitrification is a microbial process where the organisms respire nitrate and other nitrogen oxides when oxygen becomes scarce. Many denitrifying bacteria are able to both produce and consume N2O, and the amounts that are emitted depend on their regulatory biology. Although much is known about this regulation, the current knowledge is mostly based on laboratory studies of organisms growing under optimal conditions. Surprisingly little is known about the regulation of denitrification in bacteria living under natural conditions, where they starve most of the time and are exposed to fluctuating oxygen concentrations that may harm the enzymes. This is the focus of STARVOX. The results will add new, basic knowledge to our understanding of the biogeochemical nitrogen cycle and will strengthen our ongoing development of novel methods for N2O mitigation where N2O reducing bacteria will be spread on farmland via biofertilization.