



Otto Jaag Prize for Wenzel Gruber and Urs Schönenberger

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Topics: Drinking Water | Wastewater | Pollutants | Climate Change & Energy | Organisation & Staff

Eawag researchers Wenzel Gruber and Urs Schönenberger have won this year's Otto Jaag Water Protection Prize for their dissertations. Reducing emissions of the climate-damaging nitrous oxide from wastewater treatment plants and reducing the leaching of pesticides from drainage systems are the topics.

Nitrous oxide (N_2O) is released in the biological treatment stage of wastewater treatment plants (WWTPs), specifically during nitrogen elimination. Depending on the season, type of operation and quality of management, the amount of climate-damaging gas escaping can vary greatly. Moreover, elevated nitrous oxide levels often indicate indirectly that the treated wastewater contains too much nitrite, a fish toxin.



Award of the Otto Jaag Water Protection Prize 2022 to Urs Schönenberger by ETH Rector Günther Dissertori
(Photo: ETH, Nicola Pitaro)

N₂O: Monitoring and process understanding important

Good monitoring of nitrous oxide - which is not technically trivial - and reliable knowledge of the processes involved are thus very important for optimal operation of WWTPs. At Eawag, environmental engineer Wenzel Gruber has been working intensively on these issues in several long-term measurement campaigns, for which he has now been awarded the Otto Jaag Water Protection Prize. The dissertation was supervised, among others, by Prof. Eberhard Morgenroth, Head of the Engineering Department at Eawag. Gruber's work is of great importance for both research and practice, says Morgenroth. This extends, he says, to new methods for taking more precise account of nitrous oxide emissions in greenhouse gas balances in Switzerland or other countries. In addition, says Morgenroth, the work forms a basis for efficiently achieving the legally required increase in nitrogen elimination at wastewater treatment plants.

Prize winner Gruber is pleased about the recognition of his work, even if the prize money of 750 Swiss francs is very modest. In future, initially in parallel with his research work at Eawag, he intends to set up a new company to advise WWTPs and cantons on nitrous oxide issues and to carry out measurement campaigns.



Eawag researcher Wenzel Gruber during maintenance work on the measuring installation at the Moossee Urtenenbach WWTP.

(Photo: Andrin Moosmann, Eawag)

Overlooked pathway for pesticides

The second award-winning doctoral thesis can also claim to be of great practical significance. In it, its author, environmental engineer Urs Schönenberger, shows how "short-circuits", for example inlet manholes, in agricultural drainage systems lead to the unintentional release of pesticides into waterbodies. It's a pathway that has received little attention in previous discussions of pesticides. "The issue is highly relevant both politically and scientifically, since pesticides are among the most important eco- and human-toxicological problem substances," says Prof. Max Maurer (ETH and Eawag), who co-supervised Schönenberger's dissertation. In his work, Schönenberger combined field, modeling and laboratory work with partly original approaches and finally presented quantitative results that are of importance for the whole of Switzerland, says Maurer. And the work not only shows "grievances": Schönenberger has systematically compiled possible countermeasures - these are valuable foundations for practice and for policy measures.

We congratulate both winners on the award, which was presented on Saturday, November 19, 2022 on the occasion of ETH Day.



Inlets of this type allow water from fields and field paths to flow directly into the nearest watercourse - a hydraulic short-circuit.

(Photo: Eawag, Urs Schönenberger)

Cover picture: Award of the Otto Jaag Water Protection Prize 2022 to Wenzel Gruber by ETH Rector Günther Dissertori. (Photo: ETH, Nicola Pitaro)

Original publications

Gruber, W. J. (2021) Long-term N₂O emission monitoring in biological wastewater treatment: methods, applications and relevance, 305 p, [doi:10.3929/ethz-b-000537321](https://doi.org/10.3929/ethz-b-000537321), [Institutional Repository](#)

Schönenberger, U. T. (2022) The overlooked pathway: hydraulic shortcuts and their influence on pesticide transport in agricultural areas, 207 p, [doi:10.3929/ethz-b-000539927](https://doi.org/10.3929/ethz-b-000539927), [Institutional Repository](#)

Related Links

Otto Jaag Water Protection Prize

Project page N₂Oara – Greenhouse gas emissions from wastewater treatment

Project page «Shortcut»

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