

Gas supersaturation at Norwegian hydroplants – risk modelling and monitoring

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ABSTRACT: Gas supersaturation from hydropower installations can harm aquatic life in rivers. The Research Council of Norway project SUPERSAT has assessed the risk of gas supersaturation in 1695 Norwegian hydroplants, based on turbine type, secondary intakes, and head. 444 hydroplants were identified as high-risk candidates. Subsequently, 10 hydroplants with the high risk were monitored with satumeter loggers. The results showed that total dissolved gasses (TDG) values of 110% were exceeded at all plants, with seven experiencing periods of TDG values reaching from 130% to 230%. Such high saturation can cause acute mortality and sub lethal effects in fish and benthic invertebrates. The findings suggest that severe gas supersaturation is more widespread in Norwegian hydroplants than previously thought. However, the ecological effects of gas supersaturation depend not only on the dose but also on duration, frequency, dilution, aeration, and water depth and require further investigations at each site.