

Relationship between salt use in fish farms and drift of macroinvertebrates in a freshwater stream

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In Chile, salt (NaCl) use per salmon fish farm ranges between 20-30 t yr⁻¹ and is used to prevent and control fungal infections. An increase in salinity in freshwater can have adverse effects on freshwater biodiversity and ecosystem functions and services. We studied the effects of fish-farm effluents on benthic macroinvertebrate communities in a northern Patagonian stream (Chile). Benthic samples were collected at 3 sites near a land-based salmon aquaculture facility (one located 100 m upstream from the fish-farm outlet for effluent, 2 sites located 200 and 400 m downstream from the effluent source). We found changes in benthic macroinvertebrate communities downstream from the effluent, with higher abundances of tolerant taxa and lower abundances of sensitive taxa, which was related to nutrient and salt concentration in the water. We also studied the effects of salinity on macroinvertebrate drift in a mesocosm experiment conducted in recirculating channels, measuring the drift of 2 salt-sensitive macroinvertebrates (*Andesiops peruvianus* and *Smicridea annulicornis*), collected from an unpolluted northern Patagonian stream, after exposure to a range of salinity concentration pulses similar to those from fish farms. Our results demonstrate that (1) fish-farm effluent can alter stream macroinvertebrate community composition and dynamics, and (2) such effects are at least partly driven by high salt concentrations in effluent waters. © The

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Andesiops

Drift

Fish farm

Macroinvertebrate communities

Smicridea

Sodium chloride