

Trace Metals in Sea-Surface Microlayer

The sea-surface microlayer (SML) consists of the upper fraction of a millimetre of the water column. It is a place where floatables (fats, oils, bubbles, haddock eggs, cod eggs, lobster larvae) accumulate as well as other substances such as metals and pesticides. Concentrations of metals and pesticides can be many times enriched in comparison with concentrations of these same substances just below the SML in the water column.

Sea-surface microlayer samples, collected 13 and 18 months after the fish farm had been fallowed, indicate that copper occurred in the SML more than a year after initial fallowing of the Spectacle Island salmon farm, and comprised a pathway of influence and footprint extending at least 500 m from the farm site at times. These SML samples reflect an enrichment factor for copper as high as 6 times the concentration found in the water column. (Copper is an ingredient in fish feed, and in anti-foulants on nets.)

These concentrations - as high as 34 µg/L, exceeded the British Columbia Ministry of Environment copper guideline for marine and estuarine aquatic life - 3 µg/L. And they exceed the 0.5 µg/L guideline for the protection of European lobster larvae recommended in a study (Marino-Balsa et al, 2000) where lobster larvae were found to be more sensitive than those of crab or prawn.



Aerial photograph of a slick moving outward from the Spectacle Island fish farm, July, 2009, before fish were removed and the farm fallowed. (Photo: Linda Ross)

Marino-Balsa, J.C. , E. Poza, E. Vazques and R. Beiras. 2000. Comparative toxicity of dissolved metals to early larval stages of *Palaemon serratus* , *Maja squinado* , and *Homarus gammarus* / (Crustacea:Decapoda). ARCHIVES OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY,_Volume 39, Number 3, 345-351, DOI: 10.1007/s00244001011