

WHAT & WHO? Investigating the relationship between heavy metals in oysters, and the resuspension of contaminated sediments (PhD graduate at the University of Sydney Jung-Ho (John) Lee)

BACKGROUND: The sediments in Sydney Harbour are significantly impacted by a range of contaminants such as heavy metals (particularly Copper, Lead and Zinc). Highly enriched concentrations have also been detected in the tissues of Sydney rock oyster in the harbour. It was hypothesised that when these contaminated sediments were resuspended in to the water column by winds, waves, burrowing organisms, boats etc., they would then be ingested by the oysters and as a result may help explain the high levels of metals in oyster tissues.

WHAT WAS FOUND? John was only able to link the levels of contaminants in sediment with farmed oysters that were deployed in Sydney Harbour but not with the local wild oysters. This mismatch between wild vs farmed oysters was perplexing and indicated that wild oysters were unsuitable to be used as a bio-monitoring species while farmed oysters possessed good potential. John also tried to mimic field conditions in laboratory experiments but still failing to determine such correlation. Further experimental work was conducted at ANSTO using the gamma-emitting ⁶⁵Zn radioisotope to follow the dissolved and dietary metal uptake pathways. This led to the attainment of new and highly useful rates of metal uptake and loss for the first time in Sydney rock oysters. Overall, the data indicated two likely scenarios to explain the poor link between metals in sediments to oysters. Firstly, sediment particles filtered by oysters may be considered unpalatable and so they are rejected as pseudofaeces at the mouth rather than being fully ingested. Secondly, if sediment particles are being ingested (as seen in the experiments at ANSTO), only a small fraction of the metals are absorbed, with most of the metals remaining stuck in the sediments and excreted in the faeces. Further research is required to understand if plankton is an important pathway for heavy metals into the oysters as plankton can also concentrate high amount of metals and they are a primary food source for oysters more than sediments.

HOW WILL THIS HELP THE OYSTER INDUSTRY? This research highlighted that farmed oysters seem to have different physiological responses to metal exposure to wild oysters, with wild oysters displaying impaired metal uptake regulation likely due to chronic metal exposure spanning several generations. This could explain why the two types of oysters tend to perform differently within the same estuary.

FURTHER INFORMATION: Jung-Ho (John) Lee on [email](#)