

Maternal effect key to fish combating climate change

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(Phys.org) —According to research by Western scientists, thermal tolerance in a wild fish population is a key factor in understanding how animal species adapt to climate change.

Western Sciences professors Nico Munoz and Bryan Neff, along with collaborators at the University of British Columbia and Yellow Island Aquaculture Limited, conducted the first-ever genetic assessment of oxygen-limited, thermal (heat) tolerance and cardiac (heart) performance within a coastal population of [chinook salmon](#).

The investigators found compelling results, which help explain the adaptive mechanisms available to fish populations faced with rising temperatures in the world's oceans. The findings were published this week in *Proceedings of the Royal Society B*.

Maternal effects, or the ways mothers influence the physical features and performance of their offspring, can be critical to successful acclimatization of offspring, said Neff, who also serves as associate dean (research) in the Faculty of Science.

"We found that these maternal effects were associated with egg size. Mothers that produced larger, high quality eggs also produced offspring that could tolerate warmer water temperatures," he said. "Because egg size can be highly heritable in chinook salmon, our finding indicates that the salmon can respond to warming temperatures in at least two ways, selection on their own thermal tolerance, as well as selection on the size

of eggs that mothers produce."

According to Neff, this indirect genetic effect mediated by egg size could accelerate evolutionary success in combating rising temperatures and could contribute to the population-specific [thermal tolerance](#) that has recently been uncovered among Pacific salmon populations.

Provided by University of Western Ontario

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