

Dunagan, Christopher. “Ten Years of Confronting a Costly Green Crab Invasion in Puget Sound: Encyclopedia of Puget Sound.” *Ten Years of Confronting a Costly Green Crab Invasion in Puget Sound* | *Encyclopedia of Puget Sound*, www.eopugetsound.org/magazine/ten-years-of_confronting-a-costly-green-crab-invasion. Accessed 6 Apr. 2026.

- This article highlights the spread of European green crab throughout Puget Sound, focusing on the ecological disruptions and preferential habitat the species has exhibited. This could be used to inform target regions where management should be applied, where the green crab may have large success as an invader due to the local oceanic conditions.

“Invasive Green Crabs Pose Threat to Washington’s Shellfish Industry and Tribal Culture.” *USGS*, www.usgs.gov/news/science-snippet/invasive-green-crabs-pose-threat-washingtons-shellfish-industry-and-tribal. Accessed 6 Apr. 2026.

- The economic threat presented by invasive European green crab is synthesised. This covers the ecological impact presented by European green crab connecting to larger financial implications. This could be used to inform target regions where management should be applied.

Lam, Emily K., et al. “Interactions between temperature variability and reproductive physiology across traits in an intertidal crab.” *Frontiers in Physiology*, vol. 13, 8 Mar. 2022, <https://doi.org/10.3389/fphys.2022.796125>.

- Using physiological approaches combined with demographic, molecular, and behavioral approaches, this study demonstrated that gravid females have a lower VTmax compared to non-gravid *P. cinctipes* females. This demonstrates a link between temperature shifts and reproduction physiology. Increased oceanic temperatures may limit reproduction in other crab species, such as invasive European green crab or native shore crabs.

McGaw, Iain J., and Nia M. Whiteley. “Effects of acclimation and acute temperature change on specific dynamic action and gastric processing in the green shore crab, *carcinus maenas*.” *Journal of Thermal Biology*, vol. 37, no. 8, Dec. 2012, pp. 570–578, <https://doi.org/10.1016/j.jtherbio.2012.07.003>.

- This examined acclimation and acute changes impacts on physiological conditions in *Carcinus maenas*. Sudden temperature shifts demonstrated a strong impact on physiological mechanisms, including oxygen supply.

Monteiro, João N., et al. “Effect of warming on European Green Crab (*carcinus maenas*) populations from larvae to sexual maturity.” *Journal of Experimental Marine Biology and Ecology*, vol. 594, Jan. 2026, p. 152160, <https://doi.org/10.1016/j.jembe.2025.152160>.

- Across temperature regimes in an experimental setting, larval survival is improved along with development through larval stages when *C. maenas* populations are exposed to warmer temperatures. Juvenile mortality however did increase, despite this there is the potential for population level resilience. This presents the potential for dynamic resilience in invasive *C. maenas* populations where sea temperatures are increasing, that may not be exhibited by native competing populations of shore crabs.

Nancollas, Sarah J., and Iain J. McGaw. "The role of tidal acclimation on the physiological responses of the green shore crab, *Carcinus maenas*, to thermal stress." *Journal of Experimental Marine Biology and Ecology*, vol. 545, Dec. 2021, p. 151630, <https://doi.org/10.1016/j.jembe.2021.151630>.

- By assessing physiological response in an experimental tidal regime or entirely submerged condition, the authors demonstrated *C. maenas* had reduced oxygen consumption, leading to consistent Q10 values, higher haemocyanin and lactate levels. This indicates tidal acclimation may elicit different physiological responses to the associated environmental conditions.

Rivers, Molly L., et al. "Physiological responses of the green shore crab, *Carcinus maenas*, during acute and chronic low temperature exposure." *Animals*, vol. 14, no. 21, 22 Oct. 2024, p. 3049, <https://doi.org/10.3390/ani14213049>.

- Across experimental temperature changes, acute and chronic low temperature exposure presented decline in heart rate, oxygen consumption, and expenditure in *C. maenas*. This demonstrates a strong physiological link with temperature in *C. maenas*, with stress exhibited in low temperature conditions. With dynamically changing oceanic temperatures, especially in Puget Sound, this could provide insight to the spatial distributions of *C. maenas* along with an understanding of future spread dynamics.

Simonik, Elisabeth, and Raymond P. Henry. "Physiological responses to emersion in the intertidal green crab, *Carcinus Maenas* (L.)." *Marine and Freshwater Behaviour and Physiology*, vol. 47, no. 2, 4 Mar. 2014, pp. 101–115, <https://doi.org/10.1080/10236244.2014.905001>.

- *C. maenas*. showed physiological responses to emersion in intertidal conditions simulated in the lab, including a reduced oxygen uptake, increased anaerobic metabolism, and acidosis. Desiccation was largely avoided for *C. maenas*. and physiological maintenance was largely maintained. This presents potential concerns for *C. maenas* ability to adapt to changing temperatures in the Salish sea, while other native shore crabs may not.

Torres, Gabriela, et al. "Physiological basis of interactive responses to temperature and salinity in coastal marine invertebrate: Implications for responses to warming." *Ecology and Evolution*, vol. 11, no. 11, May 2021, pp. 7042–7056, <https://doi.org/10.1002/ece3.7552>.

- By measuring hemolymph osmolality and gene expression, it was found that increased temperatures have a positive effect on the osmoregulatory capacity throughout particular larval stages of *C. maenas*. This increased osmoregulation demonstrates physiological responses enhanced by increased temperature, while also raising concerns about potential range expansion and resilience with climate induced oceanic warming in regions where *C. maenas* is native.

Vianna, Brunna Da, et al. "Effects of temperature increase on the physiology and behavior of fiddler crabs." *Physiology & Behavior*, vol. 215, Mar. 2020, p. 112765, <https://doi.org/10.1016/j.physbeh.2019.112765>.

- In an experimental setting, fiddler crab populations from vegetated areas and those from unvegetated areas were exposed to different temperature regimes. Crabs from the vegetated areas demonstrated a reduced resilience to temperature increase showing heightened physiological stressors— oxygen consumption, Q10, ammonia excretion and hepatosomatic index. Those from unvegetated areas demonstrated a greater tolerance to heat stress. This paper links temperature increase to physiological mechanisms in nearshore crab species, shedding light on potential population level physiological shifts and impacts associated with climate change. It further provides insight on physiological methods to test this in other crab species.