

Ontogenetic changes in the olfactory antennules of the shore crab, *Hemigrapsus oregonensis*, maintain sniffing function during growth

Waldrop et al 2015

- Wanted to test if olfactory sense was equal in smaller or juvenile crabs vs full grown
- Created scaled models of the antennules at different sizes
- Recorded fluid motion dynamics through antennules and flicks/downstrokes w/ laser imagery
- Generated Vector aesthetic arrays
- Findings: larger crabs are better at retaining water throughout a flick, juveniles have more variability in fluid exchange, intermediary sized crabs have the highest amount of loss/sensory inability
- Important to note that these antennules don't directly scale w/ body size
- Could have an impact depending on the size of crabs we're studying, could be a factor to look into

The predator and prey behaviors of crabs: from ecology to neural adaptations

Tomsic et al 2017

- A few selected passages, but does a good literature review of predation responses in shore crabs
- Introduces immense precisions in direction and speed when introduced to predator stimulus
- Outlines movement patterns, stopping when predator stops
- Other studies have used tracking-treadmill technology (outside the scope of this project), but still would be interesting to observe movement patterns
- Outlines visual sense, impressive ability of monocular 360° views
- Important to take into account when considering how they'll interact in experiment

The role of changing pH on olfactory success of predator-prey interaction in green shore crabs, *Carcinus maenas*

Richardson et al 2022

- Took one crab, in a tank, put either predator or prey odor cue into sponges on either side
- Determined if there was feeding activity response or predation response (freezing, retreating)
- Used cuttlefish for predator cue, mussel for prey cue
- Isolated crab within a ring as to not be affected by unintentional visual or olfactory stimulus
- Tested across pH levels
- In higher pH (8.2) acclimated crabs, they found prey cue quicker than at lower (7.6)
- Males found prey cue quicker than females in current day conditions, no difference in future conditions
- No olfactory change for predator response, no sex difference

Elevated pCO₂ Affects Feeding Behavior and Acute Physiological Response of the Brown Crab *Cancer pagarus*

Wang et al 2018

- Similar to above paper
- FOR foraging behavior and prey profitability specifically, they starved crabs for 2 days then introduced one mussel, measured searching time, time to break through shell, eating time, and size of prey/prey profitability
- Under low pH conditions, ate smaller prey
- Search time increased as pH increased
- Overall showed very little recovery when put back into standard optimal pH levels
- Interesting to see other direction of pH influence on foraging
- Would be interesting to see if either direction of pH influence is more dominating

Intraguild predation by shore crabs affects mortality, behavior, growth, and densities of California horn snails

- Did studies in the lab, along with in the field
- Analyzed diet and abundances, correlation between amounts of two species
- Size of snails correlates w size of crabs
- Crabs affected directly by nonconsumptive effects and avoidant behavior of snails

- Primarily, found that these shore crabs are both predating and competing w/ the snails, could make for an interesting choice in prey interaction
- Very interesting dynamic, could be really cool to see how it works along w/ predator interaction of euro green crab

Factors influencing the abundance of European green crab *Carcinus maenas*: combined effects of temperature, habitat and predator release

Nielsen et al 2025

- Took 6 study areas
- Various substrate, crab levels, algal levels, etc
- Underwater camera surveys
- Measured temperatures, visibility levels
- \Found that temperature was the best predictor for the Euro Green Crab, REGARDLESS OF ENVIRONMENT huge impact
- Correlated w/ metabolic rate of course, potential explanation
- Followed by environment and visibility playing large roles
- Interesting w/ visibility, does it have anything to do w/ nutrient, mostly correlated w/ ability to see the crabs and identify them
- Implications w/ cod, are crabs hiding or cod predating
- Would be interesting, understanding how temp impacts the euro crab in its environments, do shore crabs show different responses at different temperatures? Potentially too tied to environmental nature of this study

<https://wsg.washington.edu/first-detection-of-highly-invasive-green-crab-in-skagit-bay/>

First detection of highly invasive European green crab in Skagit Bay, Nov 25 2025

- Interesting to see how long the group has been running vs when they got this first detection (a couple of years)
- Makes me wonder about potential hiding and discrete nature of detection
- Also makes me question whether or not our shore crabs will understand this predator or recognize it
- Clearly shows there is a major geographic differences here in the sound, not all sample areas and populations will be treated the same

<https://alaskabeacon.com/2025/10/31/explosion-of-invasive-european-green-crabs-reported-in-southeast-alaska/>

‘Explosion’ of invasive European green crabs reported in Southeast Alaska

Oct 31 2025 – Yereth Rosen

- What really stood out to me in this example was the sheer explosion in size we see here
- 1000 ish – 40,000 euro green crabs in one year
- Huge geographic area affected – how might shore crabs be affected olfactorily over such a wide area
- Really inspiring and fun work w/ the organizations and the stickers they made
- Really marks the extents to which they can devastate, far northern points

Invasive European green crab (*Carcinus maenas*) predation in a Washington State estuary revealed with DNA metabarcoding

Fisher et al 2024

- Collected green crabs at 4 sites, southern coastal Washington
- During Heavy foraging months for full stomachs
- DNA was extracted from stomachs, prepped, and metabarcoded (mitochondrial DNA was analyzed)
- 3 samples per crab
- Samples were compared to known species, filtered out non-important and green crab data
- Categorized taxa and split up data
- Dissected 121 crabs
- Found a decent presence of the hairy shore crab! Highest most common prey item, all 4 sites
- Slight other diet variation in different sites
- Good to have the peer-reviewed sources backing up prey relationship
- Don't care as much about spatial variation for my purposes

- **Relevance:** tells us how important prey they are, especially in areas like Sloughs, could be relevant based on sampling area of crabs and driving that prey-predator knowledge/relationship