

ADF&G Satellite Tagging

Tagged Crab Behavior, Tag Condition, and Related Projects

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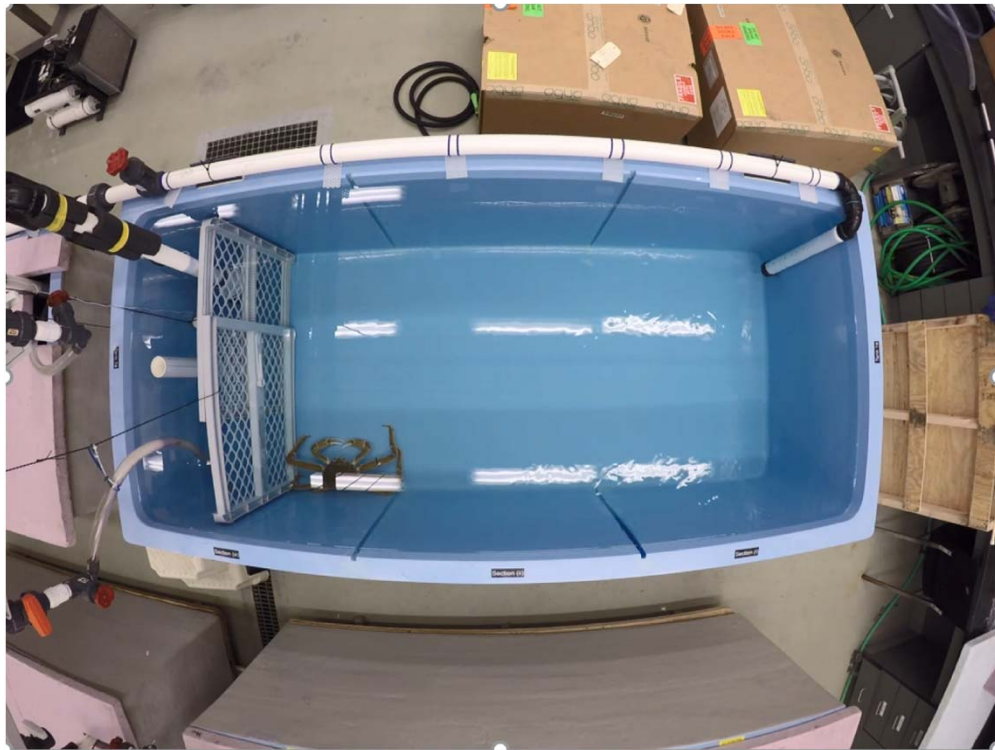
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Overview

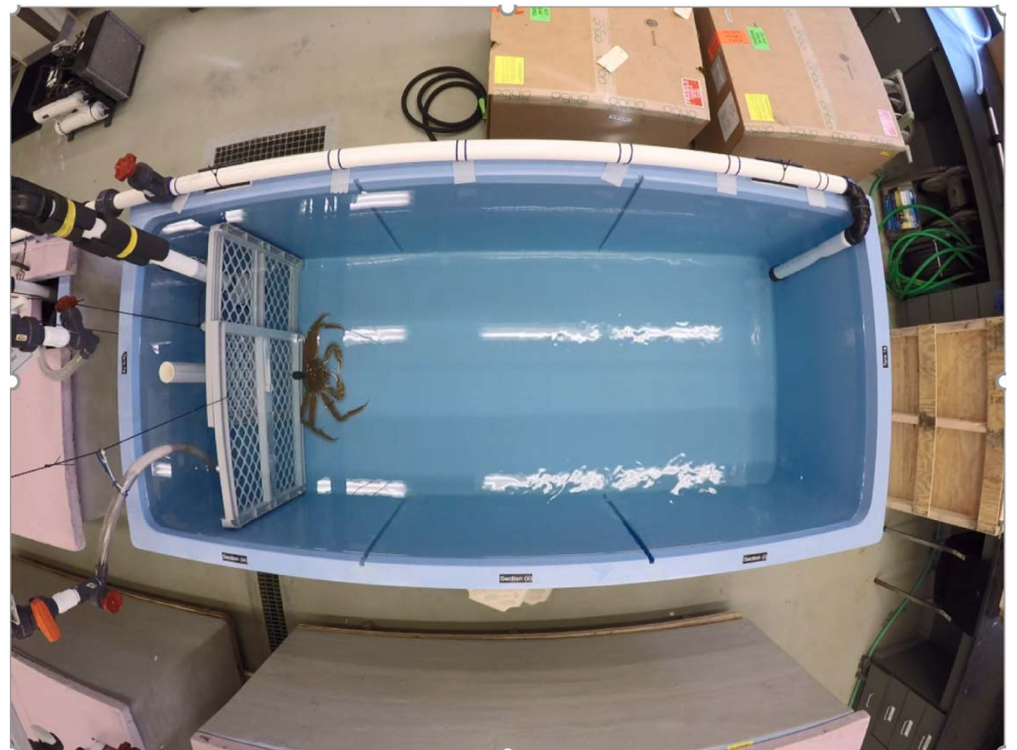
- Tagged crab behavior in lab
- Future behavior research
- Satellite tag condition
- RKC attachment methods

Tagged Crab Behavior in Lab

- Developed simple behavior trials (tagged v. non-tagged Tanners)
 - Movement in isolation tank
 - 45 min time-lapse videos (n=6 tagged, n=7 non-tagged)
 - Manually tracked crab rostrum
 - Distance traveled, positions in tank, V and A
 - Righting response times (proxy for crab condition)
 - 4 righting tests:
 - Tag on, just removed, removed 4 days, re-tagged for 4 days
 - Food consumption
 - 2 groups, 2 tanks (low and high current)
 - Equal number of weeks/tank
 - Blotted wet weights of unused food

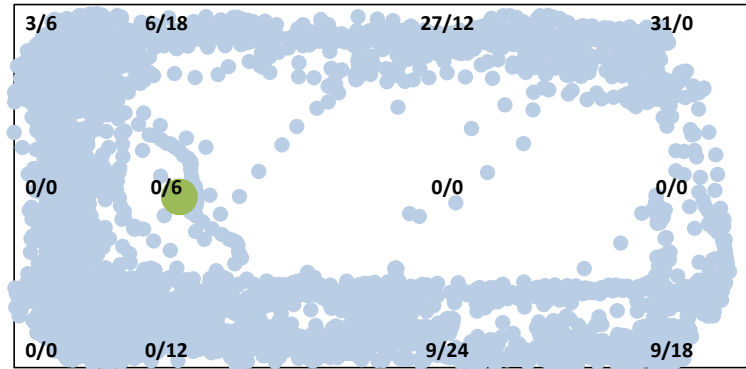


No Tag



Tag

All_Tag



All_No tag

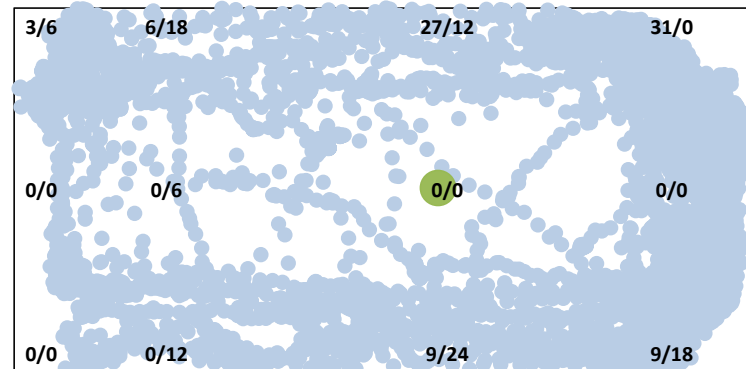


Figure 8. Pooled tank utilization by tagged crab (top) and non-tagged crab (bottom; blue dots are crab locations and green dots are spatial mean centers). Numbers overlaid on tank footprint are current speeds (cm/s) measured at either tag height/crab height for a given location in the test tank.

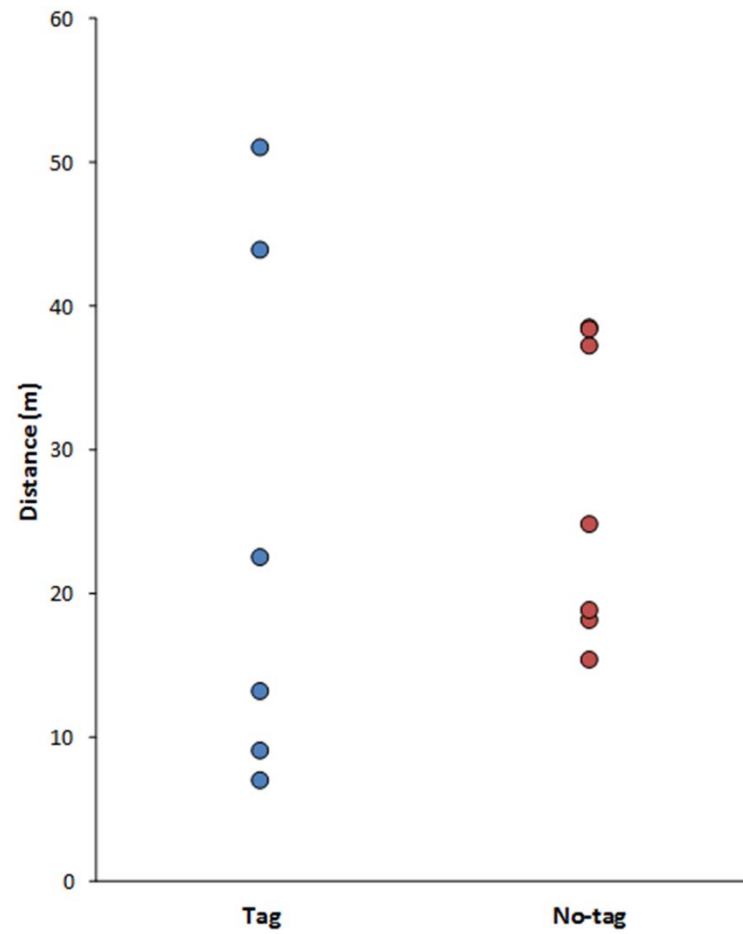


Figure 1. Distance traveled over 45-minute video period by n=6 tagged and n=7 non-tagged crab.

Conclusions (video)

- Mean distances not different (t-test)
- Variance in distance was greater and unusually large for tagged group
 - Difference of observed variances has $P < 0.02$ in randomization test distribution using these 13 crab over 10K samples
- Considerations:
 - Small n and not replicated
 - No incentive to move other than stress/acclimation to new tank
 - Improve by implementing reward-based challenge?

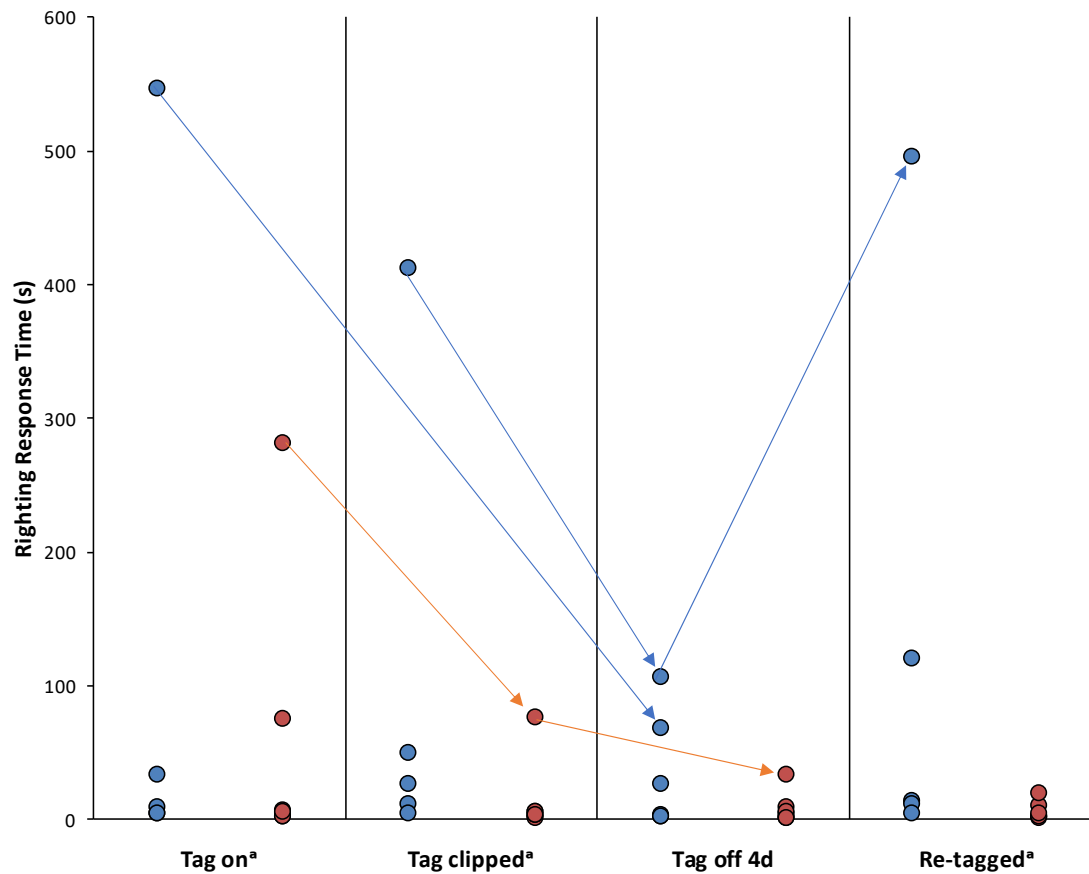


Figure 10. Righting response times observed for tagged (blue dots) and non-tagged (red dots) crab over 4 separate trials; (1) tags on (2) just after removing tags; (3) tags off for 4 days; and (4) re-tagged 4 days prior to testing. Non-tagged crab served as controls during each trial. Data is from n=5 tagged crab and n=7 non-tagged crab in all trials except “Tag off 4d” where n=6 tagged crab and n=7 non-tagged crab.

^a 1 tagged crab failed to right itself in 15 minutes.

Tag	No-tag

Conclusions (righting response)

- Righting response data suggests:
 - No difference between median response times (Wilcoxon rank-sum test)
 - Between groups within tests or within groups across tests
 - Some sign of improvement with tag removed 4d
 - Particularly for poor performing tagged crab
 - More noise in tagged group
 - Real response to treatment or consequence of small n?

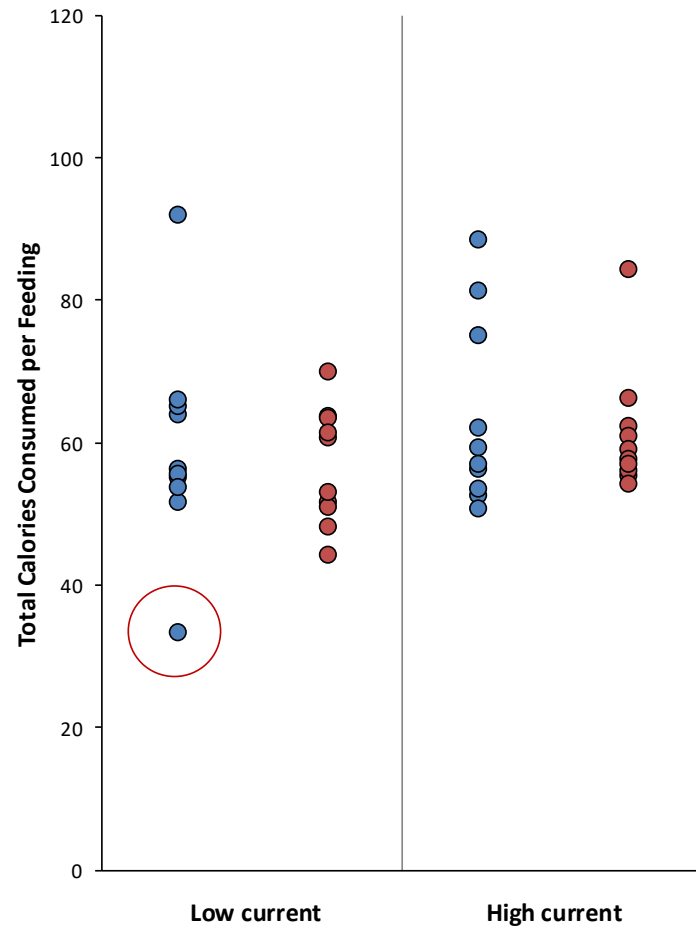


Figure 11. Total calories consumed per feeding by n=6 tagged (blue dots) and n=6 non-tagged (red dots) crab under low or high current conditions.

Tag	No-tag

Conclusions (food consumption)

- Food consumption over 20 feedings not different between tagged and non-tagged crab within high or low current tanks.
- Differences within groups between high and low current also not different.

Future Behavior Research

- Double tagging experiment
 - Deploy array of acoustic receivers
 - Study area with natural barriers to leaving array
 - Tag Tanner crab with:
 - Acoustic and Sat tags
 - Acoustic tags only
- Compare movement of groups

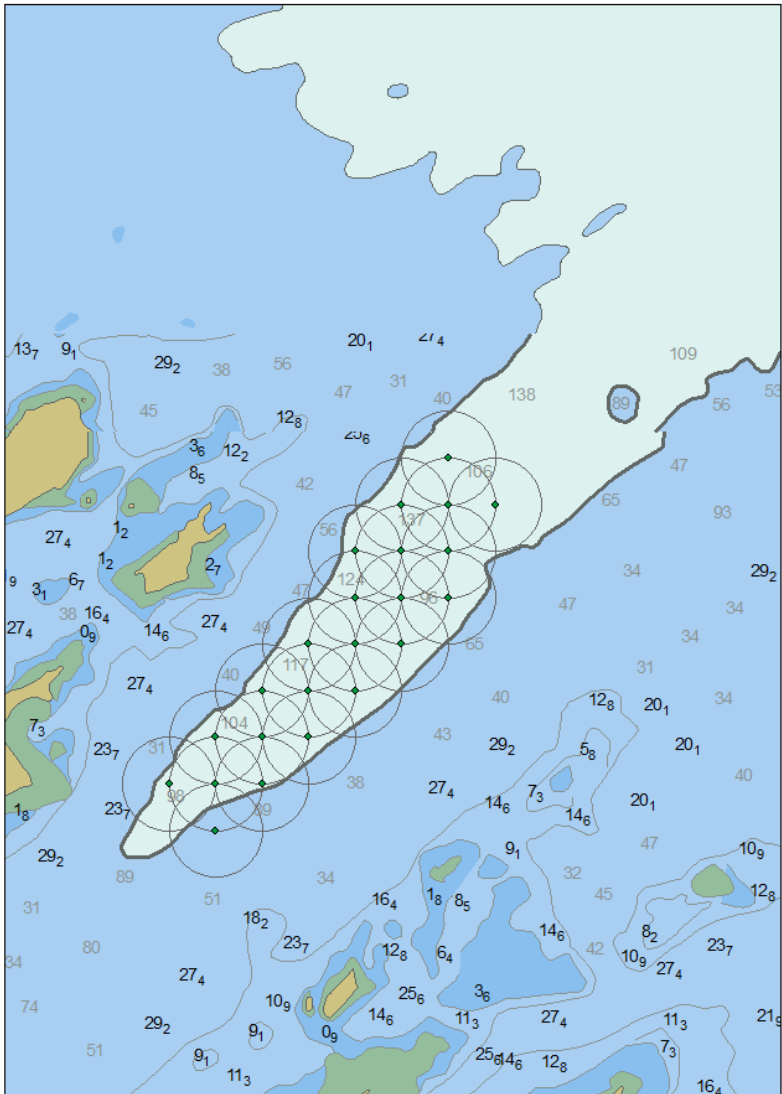


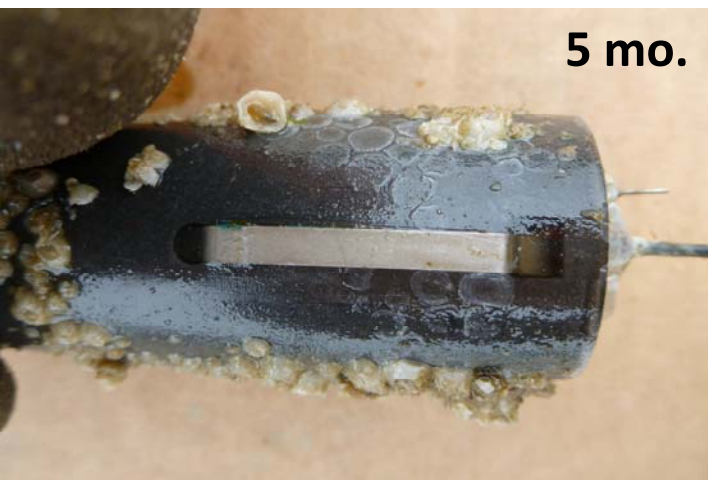
Figure 1.—Proposed array of 23 acoustic receivers to monitor Tanner crab movement in Kalsin gully.



Figure 2.—Size comparison of acoustic tag and satellite tag. Vemco V9 pictured on top with and without end cap (note that tag with end cap is a V9-2, which is 0.5 cm longer than the proposed V9-1). Wildlife Computers MiniPAT pictured on bottom.

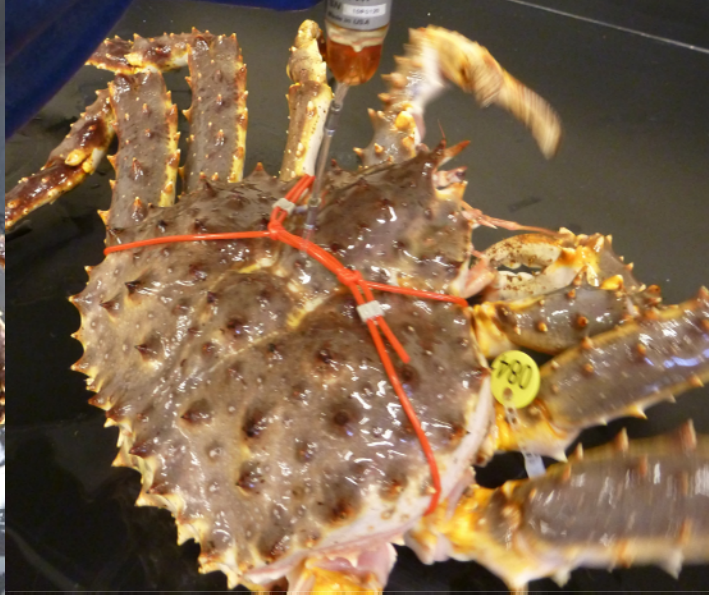
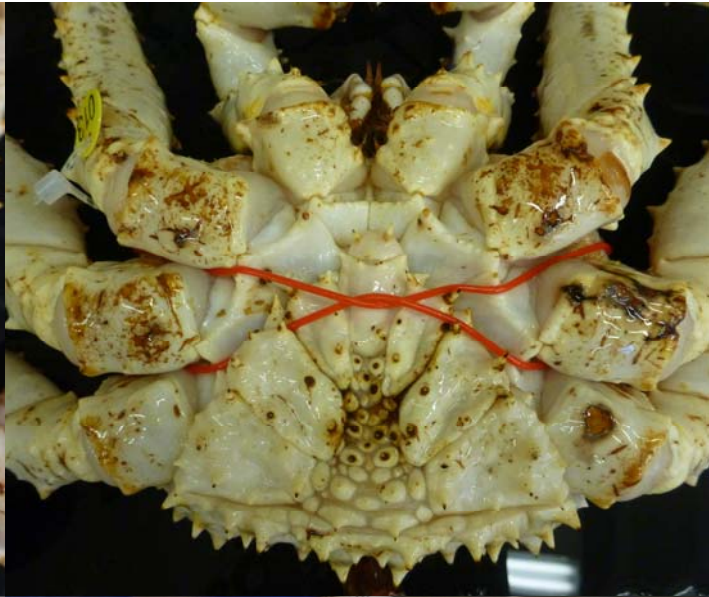
Satellite Tag Condition

- Tag corrosion
 - Dummy tags corroded in lab
 - Suspended tags from NMFS dock at Gibson Cove
 - Mix of real and dummy tags of two tag models
 - After 9 months, one model in much better shape
 - Useful to estimate maximum safe deployment duration
 - ≤ 5 months for simple locator
 - > 9 months for archival tag

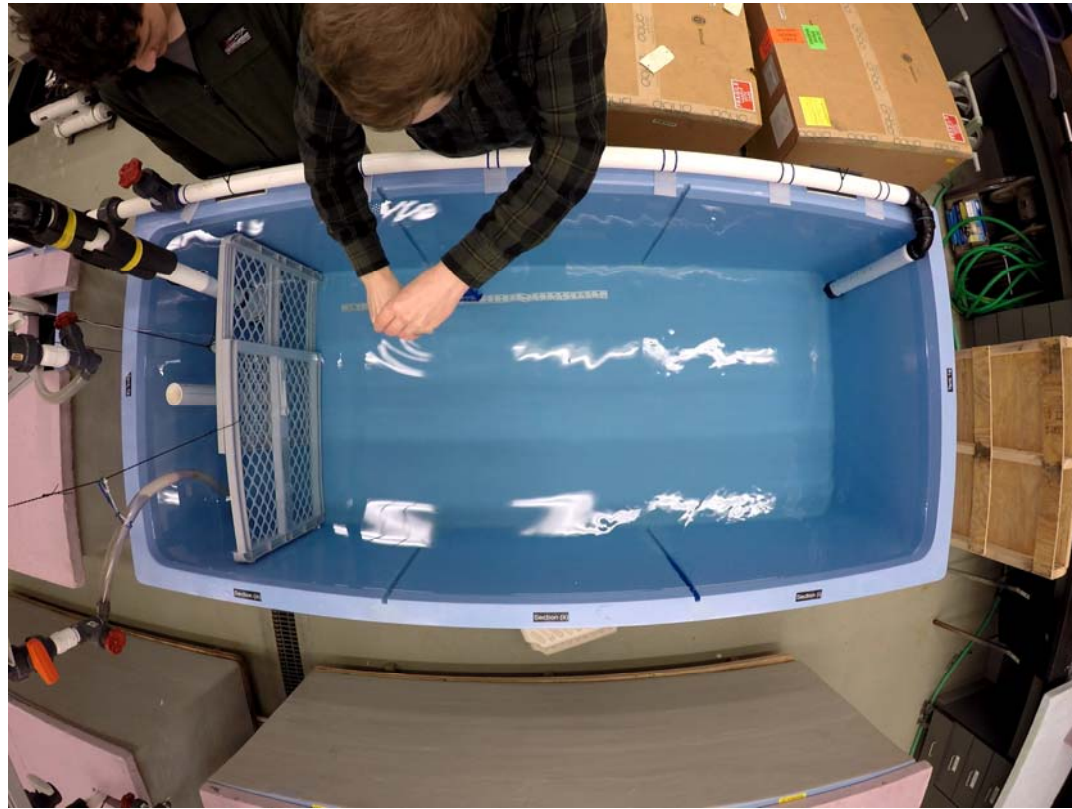


RKC Attachment Methods

- Test methods to attach satellite tags to RKC
 - Consider security, molting, mating, etc.
 - Inhibition of chelipeds or walking leg movement
 - Interaction of harness with soft tissue, abdominal flap



Questions?



Thanks to: Aidan Coyle, Bill Gaeuman, Vicki Vanek, Ben Daly