

Biology Seminar

By: Dr. Emily Carrington

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Losing their lifeline? Mussel attachment in dynamic coastal environments



Monday, September 30, 2019 | 12:00pm
HCK 132 Refreshments at 11:45am

Mussels are well-known ecosystem engineers, often dominating temperate wave-swept shores worldwide. They are also important aquaculture species and a “biofouling” nuisance to many maritime industries. Disturbance to mussel populations, such as dislodgment due to increased flow forces and/or weakened attachment, therefore has important ecological and economic ramifications. Mussels attach securely to hard substrates such as rock, aquaculture rope and ship hulls by molding golden collagen-like tethers called byssal threads. In laboratory experiments, we found byssal threads weaken under low pH, high temperature and low dissolved oxygen. Observations of farmed mussels in local seawater conditions largely confirm these findings. Ocean acidification, warming and hypoxia are all predicted to worsen in the Salish Sea; our ecomechanical

framework provides a valuable tool for predicting the responses of mussels, and their dependent coastal communities, to current and future climate scenarios. Our research also informs the bio-inspired design of wet adhesives for biomedical and industrial applications.



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By: Dr. Peter Ward

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How much water is too much open water to maintain a species in direct development, non-pelagic mollusks? How the present distribution of extant *Nautilus* shows how the oldest known *Nautilus* and *Allonautilus* from the Cretaceous of Vancouver Island is the best new evidence of the Baja British Columba Hypothesis



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Species of both genera newly collected from the Upper Cretaceous of Vancouver Island, like the two species here, hatched at more than 25mm shell diameter and spend(t) no time in the plankton or more than a meter above the bottom; constantly and slowly seeking carrion on the bottom of 100-700m fore reef slope bottoms. Because they implode at 800m depth, nautilus are shown in this talk to be among the best of all paleobiogeographic “index” species: more than 100km water distance is sufficient to stop gene flow. Here the discovery of more than 15 species of nautilids on the 85-66 million year old Vancouver Island, compared to only three (different) species on the North American mainland provides the first ever tool for “paleolongitude”, and is consistent with the Insular Belt being far off the NA coast till docking.

Extant Nautilus and Allonautilus in 2015, Manus Island.

