

DEVELOPING SOCIO-ECOLOGICAL INDICATORS TO EVALUATE MANAGEMENT STRATEGIES TO MITIGATE WHALE ENTANGLEMENT RISK WITHIN THE DUNGENESS CRAB FISHERY

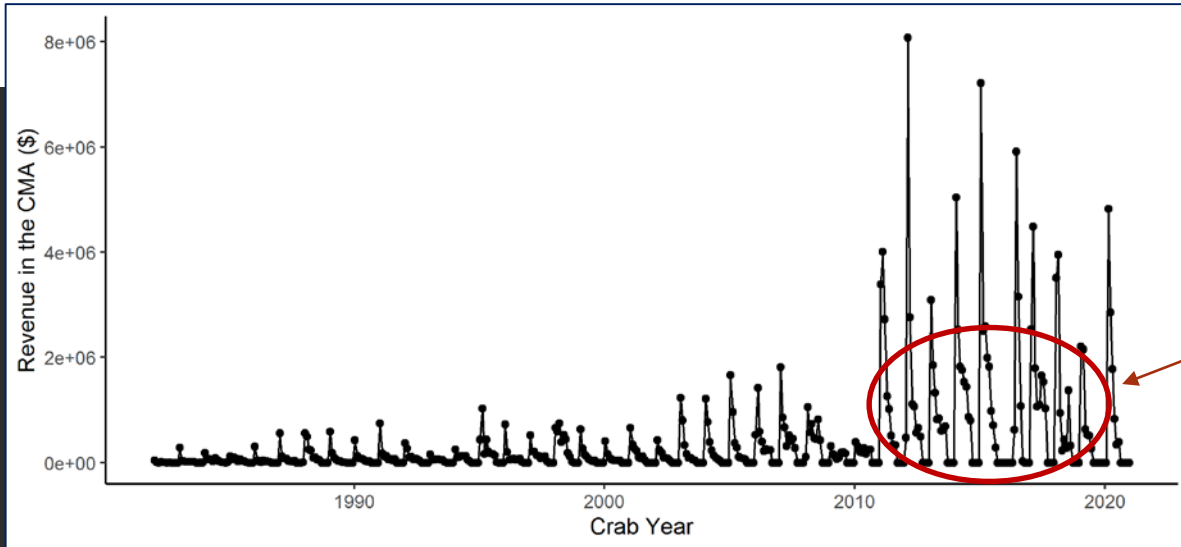
Research question: What is the economic impact of fishery closures due to whale entanglement risk on the Dungeness Crab Fishery?

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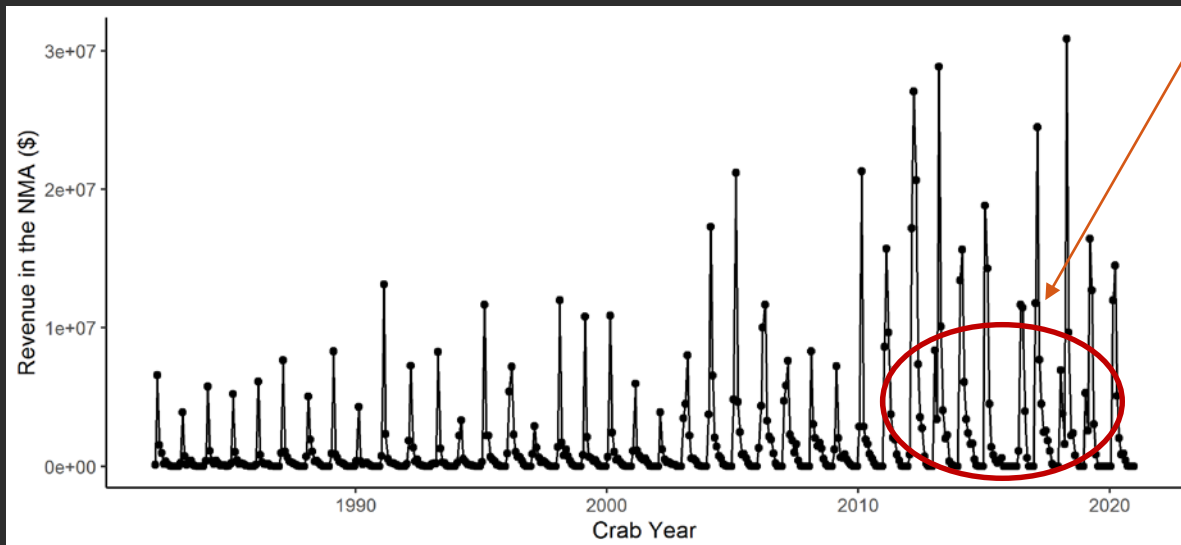
PRELIMINARY ESTIMATE OF DIRECT LOSS (AS IN *YIN ET AL ., 2008*):

REVENUE CHANGE = ACTUAL REVENUE – BASELINE REVENUE



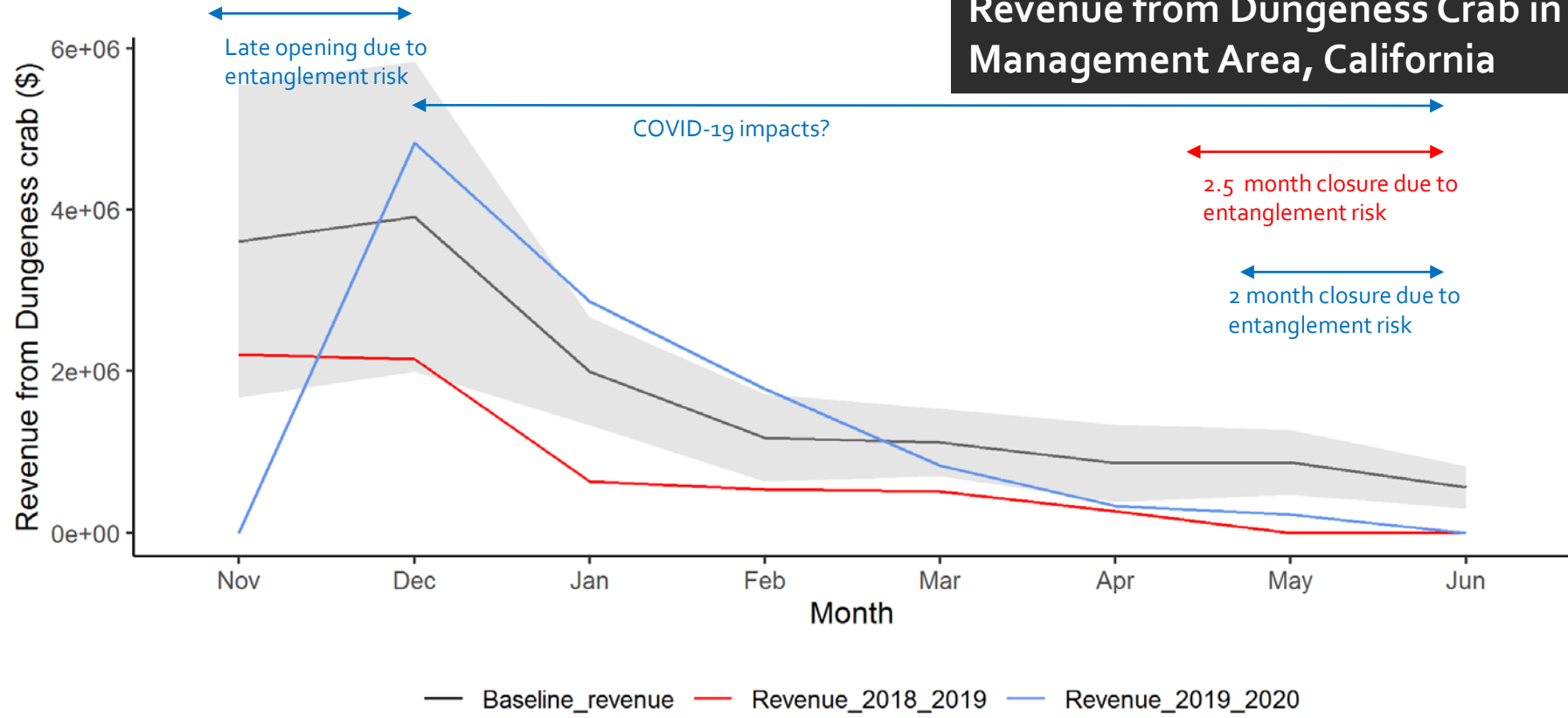
Baseline revenue: An average of monthly revenues from 2011-2017 (not including 2016)

Actual revenue: Monthly total revenue for the 2018/19 and 2019/20 fishing seasons (PacFIN fish ticket data)

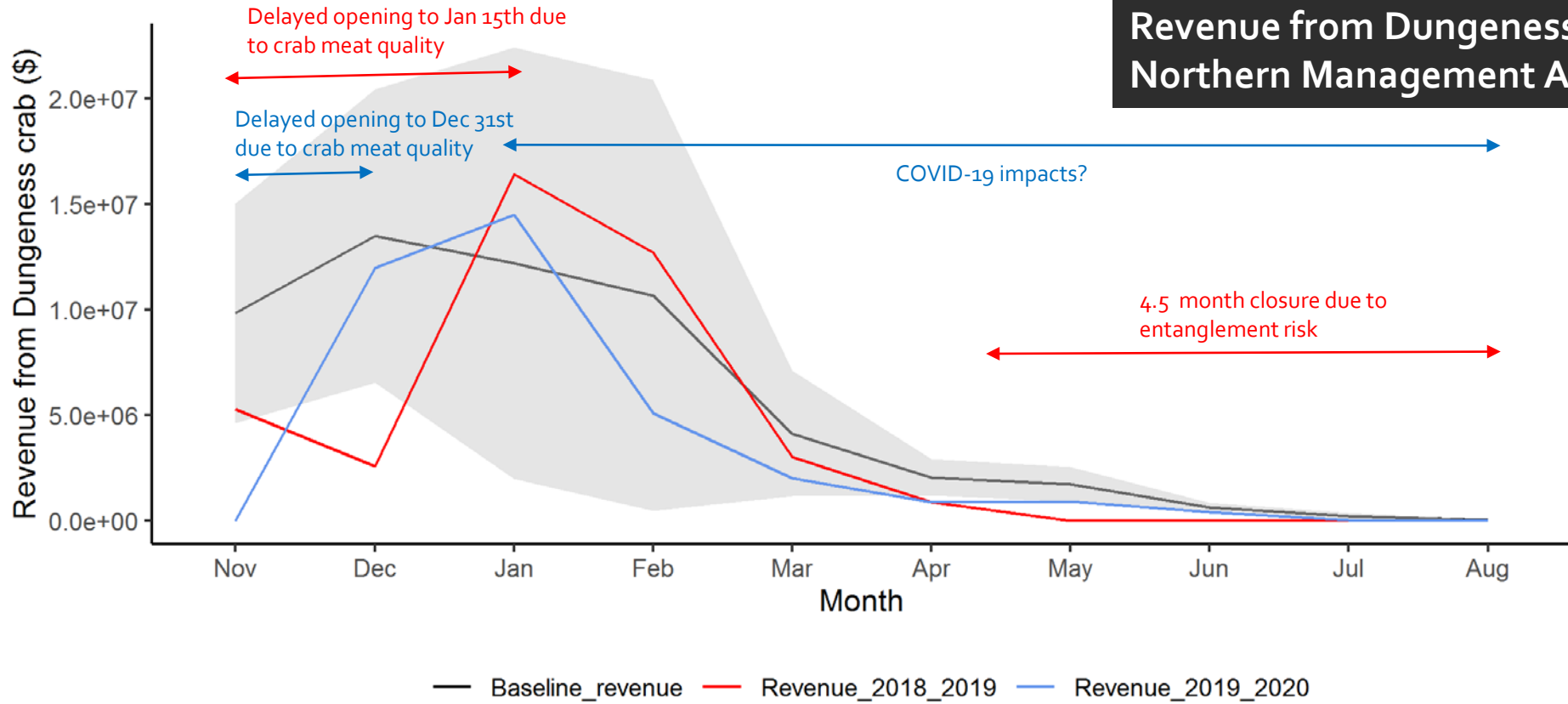


Figures: Time series of revenues from Dungeness crab in California, Central Management Area (top) and Northern Management Area (bottom)

Revenue from Dungeness Crab in the Central Management Area, California



Revenue from Dungeness crab in the Northern Management Area, California



ONGOING RESEARCH



Using method from *Holland and Leonard (in review)*, we'll model expected revenue at the vessel level for the 2018/19 and 2019/20 crab seasons if there had been no closures using:

- Estimates of crab abundance using *Richerson et al (2020)* depletion estimator model
- Vessel level annual revenues using fish ticket data from PacFIN
- Latitude of landings, vessel length, vessel participation in previous years (probability of fishing)

This will allow us to estimate income and employment impacts of closures to vessels from Dungeness crab and other west coast fisheries.

- Also, we want to hear about your experience! **Look out for survey requests from us.**

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