General Intro:

Pacific salmon fisheries, particularly the Fraser River sockeye salmon, make up some of the most important fisheries in Canada, but have been in decline in recent decades. While many factors are likely contributing to this decline, one of the chief factors is the parasitism of juvenile salmon by two species of sea lice, *Caligus clemensi,* a generalist parasite, and *Lepeophtheirus salmonis,* a salmon specialist. Currently, there is little known about the patterns of infection across the different species of fish and lice, and information regarding what factors affect parasite load for juvenile salmon is still very sparse. Using data from an intensive field sampling program, we fit a series of generalized linear mixed-effect models to estimate the parasite loads of both lice specieson juvenile chum, pink, and sockeye salmon, as well as to determine what other important factors drive this multi-host, multi-parasite system. We discovered that infection loads differ significantly between the three salmon species as well as across migratory regions. This indicates that species-level differences as well as spatial differences in infection patterns are important drivers in the dynamics of this host-parasite system and that these factors need to be taken into account when considering conservation and management options.