We used GAMMs to explain the effect of climatic and DD effects with pink salmon on returning Sockeye populations to the Nass and Rivers Inlet watersheds.

Our questions are:

1. Do climatic and biotic conditions in the ocean influence the size of returning sockeye salmon in the Nass River & Rivers Inlet?
2. Do climate indices elicit the same response in Nass River & Rivers Inlet sockeye salmon?
3. Do trends in size co-vary between the sockeye populations over the 4-decade period?

We used GAMMs because:

* The values of the response variables are not independent (temporally auto-correlated)
* Our climatic predictor variables varied in a non-parametric manor

Our predictor variables are:

* PDO at return year
* Narrow geographic average for SST at return year
* Broad geographic average for SST at return year
* Aleutian Low Pressure Index at return year
* Pink salmon abundance

Our response variables are:

* Fulton’s K Condition factor (K = 105 x WEIGHT(g)/LENGTH(mm)3) at return
* Weight at return
* Length at return

We created the following 3 subsets of GAMMs to be compared with AIC

* Y ~ Each predictor variable on its own for all fish in the system
* Y ~ Each climate variable as a fixed effect and age as an interaction effect
* Y ~ Each climate variable as a fixed effect, pink abundance as a fixed effect and age as a random effect