Statistical methods for Chinook salmon phenology in the Salish Sea

immediate

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Chinook abundance in the Salish Sea

Washington DFW Recreational fish data include data on fish caught on a daily basis, as well as effort (number of anglers, number of boats). These data are useful because they are spacially explicit (reported by fishing area) and occur at a fine temporal scale (daily) over decades (1978?-present). However, the data are number of fish caught, not number of fish present (which is what we are interested in). Broadly speaking, we expect fish abundance (y)in the Salish Sea (the) to be related to fish caught ('catch'), as well as the number of people fishing ('effort'):

$$y_i = \alpha_{site[year[[i]]} + \beta_{1site[i]} eT_i + \beta_{2site[i]} eP_i + \beta_{3site[i]} eT_i eP_i + \epsilon_i \tag{1}$$

However, especially in recent years, there are fishing regulations that limit catch rates during some times of the year, and altering this correlative relationship. We therefore use logistic regression to model the probability of occurrence: