We use a delta-generalized linear geo-statistical mixed-effect model to describe squid catches from 1998 to 2017. The observation model consists of the joint probability of encountering squid, where the CPUE at station *i* in year *t*,

and the probability of the positive catches as a function of the expected expected catch rate at station *I* in year *t* and the coefficient of variation in the positive catches ,

The expected catches are a linear combination of fixed random effects,

where, is a vector of fixed-effects relating CPUE at location i in year *t* to a vector of environmental covariates at location *i* in year *t*, is a random effect for the station *i*, is a random effect for year *t*, is a random effect for location of the *ith* observation, and is the random effect for location of the *ith* observation during year *t.*