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#Full Model 2 yos
#Data in from long dataset: HS,
#Data in from short dataset: ROS, Wp, B23c, ndvi, mWp, mB23c, NBndvi, mROS
#user input: NsiteYears, num_indiv, n.ROS

model {

  #Likelihood
  for (i in 1:Nsiteyears) {

    ROS[i] ~ dbin(ROS.hat[i],n.ROS)
    logit(ROS.hat[i]) <- alpha.ROS + B1.1*Wp[i] + B1.2*B23c[i]

    mROS[i] ~ dbin(mROS.hat[i],n.ROS)
    logit(mROS.hat[i]) <- alpha.mROS + B2.1*mWp[i] + B2.2*mB23c[i]

    ndvi[i] ~ dnorm(ndvi.hat[i], tau.ndvi)
    ndvi.hat[i] <- alpha.ndvi + B3.1*B23c[i]

    for (j in (sum(num_indiv[1:i])):(sum(num_indiv[1:(i+1)]))-1) {
      HS[j] ~ dnorm(HS.hat[j], tau.HS)
      HS.hat[j] <- alpha.HS + B1*ROS[i] + B2*ndvi[i] + B3*B23c[i] + B4*Wp[i] + B5*NBndvi[i]
      + B6*mROS[i]
    }

  }

  #Priors
  B1 ~ dnorm(0, 0.000001)
  B2 ~ dnorm(0, 0.000001)
  B3 ~ dnorm(0, 0.000001)
  B4 ~ dnorm(0, 0.000001)
  B5 ~ dnorm(0, 0.000001)
  B6 ~ dnorm(0, 0.000001)

  B1.1 ~ dnorm(0, 0.000001)
  B1.2 ~ dnorm(0, 0.000001)
  B2.1 ~ dnorm(0, 0.000001)
  B2.2 ~ dnorm(0, 0.000001)
  B3.1 ~ dnorm(0, 0.000001)

  tau.HS <- 1/(sig.HS * sig.HS)

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sig.HS ~ dunif(0,100)

tau.ndvi <- 1/(sig.ndvi * sig.ndvi)
sig.ndvi ~ dunif(0,100)

alpha.ROS ~ dnorm(0, 0.00001)
alpha.mROS ~ dnorm(0, 0.00001)
alpha.HS ~ dnorm(0, 0.00001)
alpha.ndvi ~ dnorm(0, 0.00001)

}

##We also modeled mROS as an overdispersed poisson distribution; code below. Did not alter
model selection results.

#ROS[i] ~ dpois(ROS.hat[i])
#log(ROS.hat[i]) <- log.ROShat[i]
#log.ROShat[i] <- alpha.ROS + B1.1*Wp[i] + B1.2*B23c[i] + eps_ROS[i]
#eps_ROS[i] ~ dnorm(0, tau.eps_ROS)

#mROS[i] ~ dpois(mROS.hat[i])
#log(mROS.hat[i]) <- log.mROShat[i]
#log.mROShat[i] <- alpha.mROS + B2.1*mWp[i] + B2.2*mB23c[i] + eps_mROS[i]
#eps_mROS[i] ~ dnorm(0, tau.eps_mROS)

#If using above overdispersed poisson code for mROS, priors must include the terms below:
#tau.eps_ROS <- 1/(sig.eps_ROS * sig.eps_ROS)
#sig.eps_ROS ~ dunif(0,10)

#tau.eps_mROS <- 1/(sig.eps_mROS * sig.eps_mROS)
#sig.eps_mROS ~ dunif(0,10)

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