Appendix. WinBUGS code for spatial model. Based on the lip cancer example in the GeoBUGS manual. Lines beginning with ‘#’ are not executed by the program.

model {

  # Likelihood
  for (i in 1 : N) {
    casos[i] <- casos03[i] + casos04[i] + casos05[i] + casos06[i] + casos07[i]
    casos[i] ~ dpois(mu[i])
    mu[i] <- rate[i] * pop[i] * 5

    PopDen[i] <- pop[i] / AreaKm2[i]
    PopDenNorm[i] <- PopDen[i] - mean(PopDen[])

    # those variables not in the model have regression coefficients equal to zero
    log(rate[i]) <- alpha0 + (0 * MalePropNorm[i]) + (bTemp * TempNorm[i]) +
           (bTemp2 * TempNorm[i] * TempNorm[i]) + b[i] + (0 * PptNorm[i]) +
           (0 * TemqNorm[i]) + (0 * PptWetNorm[i]) + (0 * PptDryNorm[i]) +
           (0 * TemWetNorm[i]) + (0 * TemDryNorm[i]) + (0 * AltNorm[i]) +
           (0 * CultNorm07[i]) + (0 * GrassNorm07[i]) + (bForShr * ForShrNorm07[i]) +
           (bPopDen * PopDenNorm[i])
  }
}
# trivial inclusion of remaining layers, to avoid an error when loading the data
nullvars[i]<-(0*BIO02Norm[i]) + (0*BIO03Norm[i]) + (0*BIO04Norm[i]) +
(0*BIO05Norm[i]) + (0*BIO06Norm[i]) + (0*BIO07Norm[i]) +
(0*BIO11Norm[i]) + (0*BIO13Norm[i]) + (0*BIO14Norm[i]) +
(0*BIO15Norm[i]) + (0*BIO18Norm[i]) + (0*BIO19Norm[i])

rawRate03[i]<-casos03[i]/pop[i]
rawRate04[i]<-casos04[i]/pop[i]
rawRate05[i]<-casos05[i]/pop[i]
rawRate06[i]<-casos06[i]/pop[i]
rawRate07[i]<-casos07[i]/pop[i]

# to plot the above in Map Tool, choose 3 cut points at 0.0000001, 0.2 and 0.4
rawRate[i]<-casos[i]/(pop[i]*5)

# CAR prior distribution for random effects:
b[1:N] ~ car.normal(adj[], weights[], num[], tau)

for(k in 1:sumNumNeigh) {
    weights[k] <- 1
}

# temperature for peak incidence. Need to add back the mean to undo normalization
TempPeak<-(bTemp/(2*bTemp2))+223.6287
# Other priors:

alpha0 ~ dflat()

# alpha0 ~ dnorm(0.0, 1.0E-5)

# following is original prior on precision
tau ~ dgamma(0.5, 0.0005)

# following is alternative

# tau ~ dgamma(0.01, 0.01)

sigma <- sqrt(1 / tau)  # standard deviation

# bMale ~ dnorm(0.0, 1.0E-5)

# bTemp~0

# bTemp2~0

bTemp ~ dnorm(0.0, 1.0E-5)
bTemp2 ~ dnorm(0.0, 1.0E-5)

# bAlt ~ dnorm(0.0, 1.0E-5)

# bAlt2 ~ dnorm(0.0, 1.0E-5)

# bCult ~ dnorm(0.0, 1.0E-5)

bForShr ~ dnorm(0.0, 1.0E-5)

# bGrass ~ dnorm(0.0, 1.0E-5)

# bShrub ~ dnorm(0.0, 1.0E-5)

# bTemq ~ dnorm(0.0, 1.0E-5)

# bTemq2 ~ dnorm(0.0, 1.0E-5)

# bPpt ~ dnorm(0.0, 1.0E-5)

# bPptTemp ~ dnorm(0.0, 1.0E-5)
bPopDen ~ dnorm(0.0, 1.0E-5)

# bPopWood ~ dnorm(0.0, 1.0E-5)