Use truncated SBP with probit to do model selection for covariates and number of groups

* Do we select the optimal number of groups?
* Are the response curves still meaningful?
* Are spatial and temporal predictions good?

Let the indicator vector be comprised of zeroes, except for a single 1. We assume that:

Furthermore, we adopt a probit regression formulation in which we assume that:

and:

If we integrate out , we get:

#---------------------------------------------------------------

We will sample these parameters in the following way:

Finally, we will jointly sample and :

where

#-------------------------------------------------------

FCDs:

* For :
* For :

Taking the log, this becomes:

Notice that we can propose for all locations simultaneously and accept or reject independently for each locations

* For :

Where and

* For :

This implies that

If , then this simplifies to the following

* For :

I will propose and accept/reject based on an independence sampler.

We could also have be discrete. In this case, it would be straight-forward to sample from a multinomial distribution.