Response letter:

We would like to express our sincere gratitude to the editor and both reviewers for their positive evaluation and for recommending our work for publication in HESS. We have addressed the final suggestions provided by the reviewers. Please find our detailed responses and the corresponding corrections below.

Corrections:

1.

Comment: Line 132 – suggestion: "Given a set of known categories i_1, i_2,…,i_n at neighborhood locations … "

Original: '*Given a set of known categories at neighborhood locations* $x_1, x_2, \ldots, x_n$, *the conditional probability of category* i_0 *at an unsampled location* x_0 *is calculated as*'

Revision:' *Given a set of known categories* $i_1, i_2, \ldots, i_n$ *at neighborhood locations* $x_1, x_2, \ldots, x_n$, *the conditional probability of category* i_0 *at an unsampled location* x_0 *is calculated as:*'

2.

Comment: Equation 1: the number of categories I does not seem to be defined yet.

Original: '*where* i_0 *is the category being predicted, and* i_k *are the observed categories in the neighborhood of* x_0.'

Revision: '*where* i_0 *is the category being predicted,* i_k *are the observed categories in the neighborhood of* x_0, *and I is the total number of possible categories (e.g., lithological units).*'

3.

Comment: Lines 269-270: "located at".

Original: '*The associated electrical conductivity model (right) is generated by assigning values to each lithology using a Gaussian random distribution.*'

Revision:' *The associated electrical conductivity model (right) is generated by assigning values to each lithology located at each grid cell using a Gaussian random distribution.*'