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Supplemental Material

Current and Projected Distributions of *Aedes aegypti* and *Ae. albopictus* in Canada and the U.S.

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Table S1. A list of climatic and land cover data included in the boosted regression tree models. We also extracted identical variables for the following projected regional climatic models: CanRCM4-CanESM2, CRCM5-CanESM2, CRCM5-MPI-ESM-LR, and HIRHAM5-EC-EARTH. The vegetation index variable was not included in the list of projected climatic variables as it dropped out during the model simplification process.

Table S2. A brief outline of the Regional Climate Models (RCMs) in reference to the Coupled Global Climate Models (CGCMs). The simulations include three Regional Climate Models (RCMs) driven by three CGCMs under two representative concentration pathways (RCP4.5 and RCP8.5), and one RCM used two different boundary conditions from two CGCMs.

Figure S1. Reported distribution of *Ae. aegypti and Ae. albopictus* mosquitoes in Canada and the United States, 2001-2016. The orange dots represent the geographic location of mosquito occurrences referred in Excel table S1 and S2.

Figure S2. The relationship between the primary risk factors and the ecological niche of *Aedes aegypti* resulted from the model utilizing currently observed (2001-2016) climatic conditions. Results from the three primary contributing factors mean minimum daily temperature, mean maximum daily temperature and mean daily temperature in January are presented here. These results are from 120 bootstraps. The grey lines represent the predicted line for each bootstrap, the dashed black line represents the upper and lower boundary of the 95% confidence intervals, and the red continuous line represented the average of the bootstraps.

Figure S3. The relationship between the primary risk factors and the ecological niche of *Aedes albopictus* resulted from the model utilizing currently observed (2001-2016) climatic conditions. Results from the two primary contributing factors mean minimum daily temperature, number of days above 10°C are presented here. These results are from 120 bootstraps. The grey lines represent the predicted line for each bootstrap, the dashed black line represents the upper and lower boundary of the 95% confidence intervals, and the red continuous line represented the average of the bootstraps.

Table S3. Determining the presence/absence threshold cut-offs for the current (2001-2016 observed climatic data) and simulated climatic models (2006-2016). We considered the multiple recursive partitioning pathways (RCPs) leading to moderate (RCP 4.5) and high (RCP 8.5) greenhouse gas emission scenarios. The table shows the presence/absence threshold cut-offs determined by True Skill Statistics (*TSS*), threshold where maximum Kappa and the maximum percentages of the observations correctly classified (*MaxPCC*).

Table S4. Accuracy measures for the boosted regression tree models developed using simulated climatic data for the time period 2006-2016. The area under the receiver operating characteristic curve (AUC) are presented as accuracy measures.

Figure S4. The most influential variables identified in the *Aedes aegypti and Ae. albopictus* ecological niche models developed using simulated climatic data for the time period 2006-2016 and a single boosted regression trees model run. The figure represents the relationship between the most influential factors and *Aedes* ecological niche for each model and the black line represents a single iteration. The most influential covariates varied from one Regional Climatic Model (RCM) to another. This includes mean minimum temperature ("tmin", mean January temperature ("*tjan*"), mean daily temperature ("*avgtmp*") and average number of days ≥10° C ("ncdays10").

R codes and additional information's on boosted regression trees model

ADDITIONAL REFERENCE

Additional File- Excel Document