West Nile virus forecast model submission form
Email completed form to vbd-predict@cdc.gov

Team name
DyMSiM_NN

Team leader

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Other team members

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Model description
Provide a brief summary of the model methods with sufficient detail for another modeler to understand the approach being applied. If multiple models are used, describe each model and how they were combined.

The input data for the model was obtained from MACA Datasets (see citation below). We use the MACAv2-METDATA dataset and the GFDL_ESM2M (USA) model. Precipitation, maximum temperature, and minimum temperature data was obtained for each county in the competition, and the annual mean and standard deviation of the three variables was calculated for each county for years 2000-2020. The input variables were: mean precipitation, mean maximum temperature, mean minimum temperature, standard deviation of precipitation, standard deviation of maximum temperature, and standard deviation of minimum temperature.

The input data was fed into a neural network architecture with three dense layers of size 128, 64, and 32, a batch normalization layer, and an output layer. Each layer had a relu activation function, and the model was compiled using a mean squared error loss function and an Adams optimizer. Batches of size 128 were run over 30 epochs during the training process.

Variables

List each variable used and its temporal relationship to the forecast. If multiple models are used, specify which enter into each model.

1. Annual mean precipitation per county
2. Annual mean maximum temperature per county
3. Annual mean minimum temperature per county
4. Annual standard deviation precipitation per county
5. Annual standard deviation maximum temperature per county
6. Annual standard deviation minimum temperature per county
7.
8.
9.
10.

Computational resources

Describe the programming languages and software tools that were used to write and execute the forecasts.

The neural network was developed in Python using Tensorflow with a Keras backend.

Publications

Note whether the model was derived from previously published work and, if so, provide references.

MACA Dataset (input data):

Abatzoglou J.T. and Brown T.J. (2012). "A comparison of statistical downscaling methods suited for wildfire applications". International Journal of Climatology, doi: 10.1002/joc.2312.

Participation agreement

By submitting these forecasts, the team agrees to abide by the project rules and data use agreements.

Team lead name	Date
Adrienne Kinney	4/30/2020