



# Forecasting fire activity in Indonesia

## Towards an Fire Early Warning System for Indonesia (ToFEWSI)

<https://tofewsi.github.io>

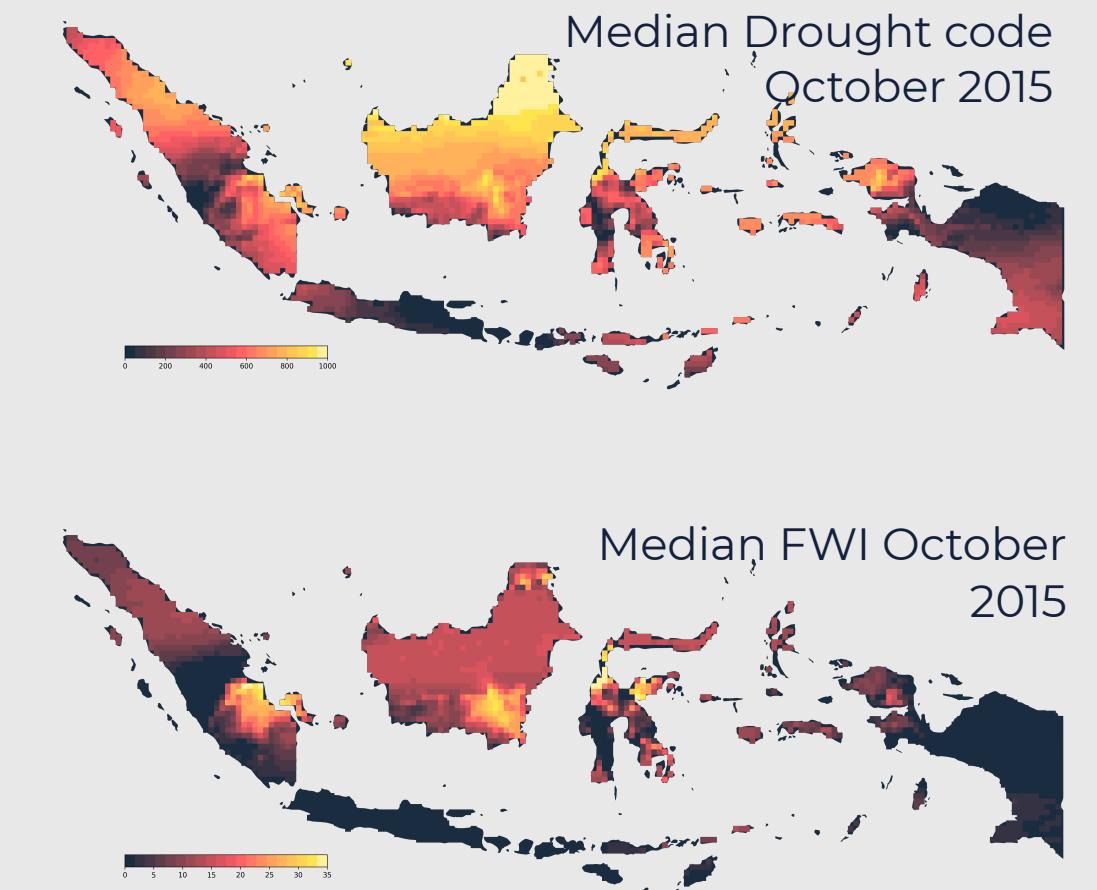
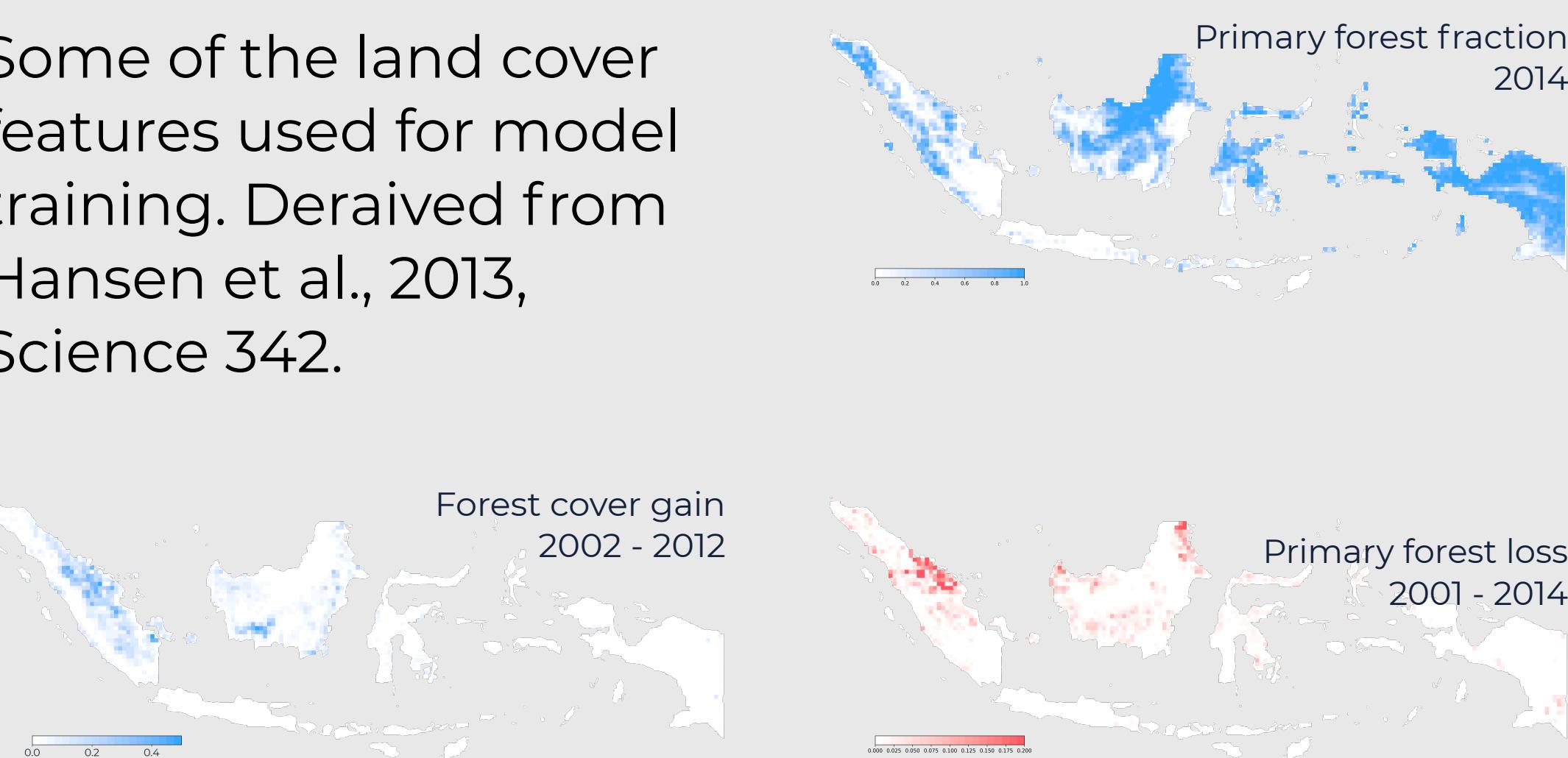
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(1) Swansea University, College of Science, Geography Department, Swansea, United Kingdom (tadas.nik@gmail.com),

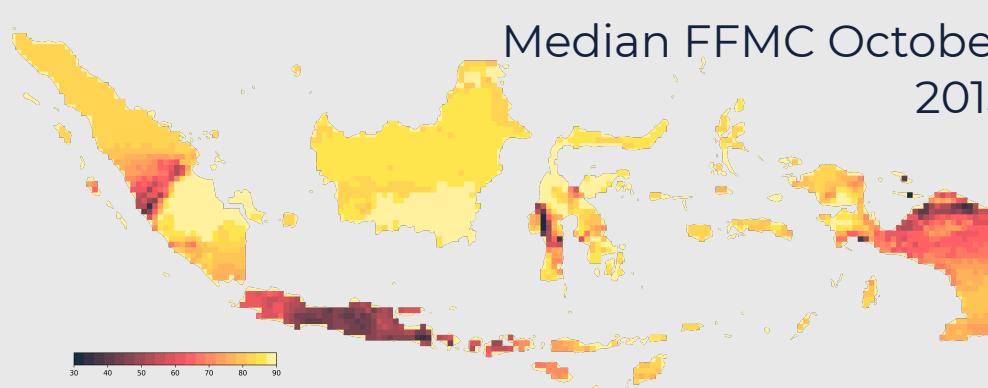
(2) Department of Renewable Resources, University of Alberta, Canada

This study explores if extreme peatland and forest burning events can be predicted by supervised learning methods using fire weather indices and available land use datasets.

Some of the land cover features used for model training. Derived from Hansen et al., 2013, Science 342.



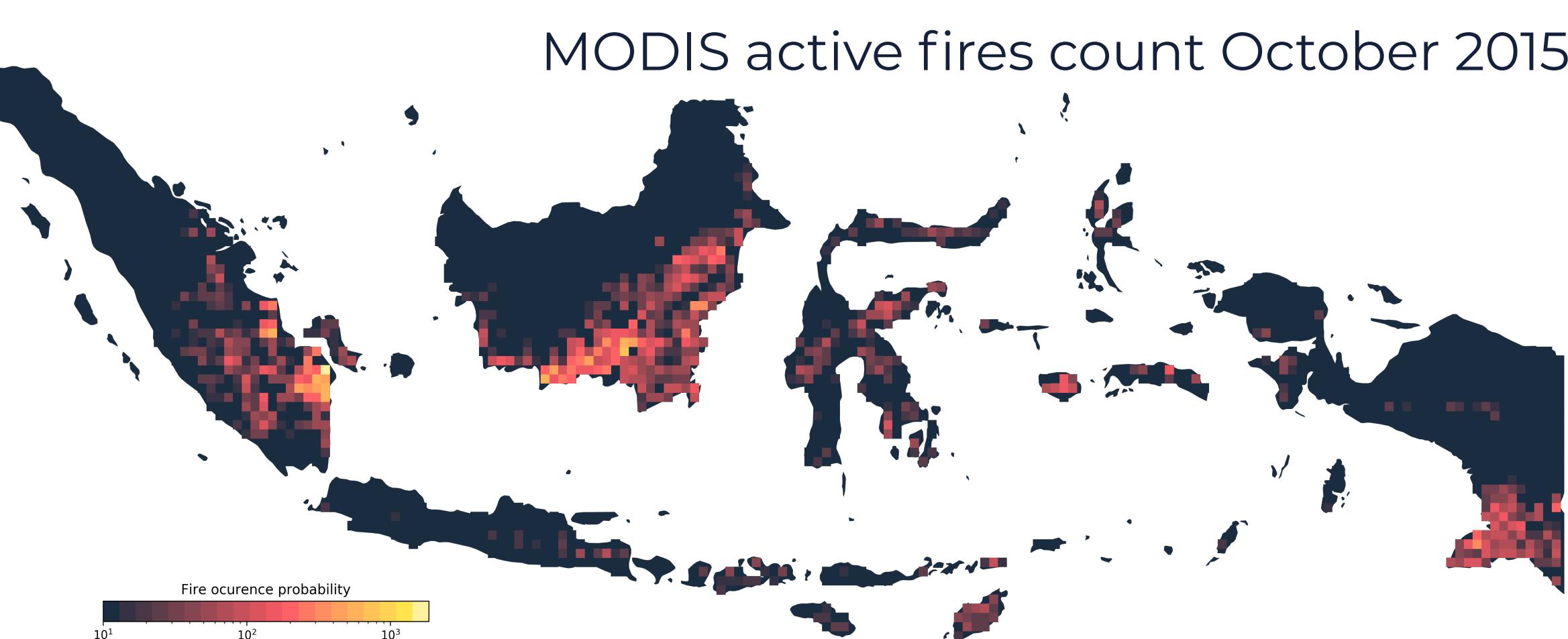
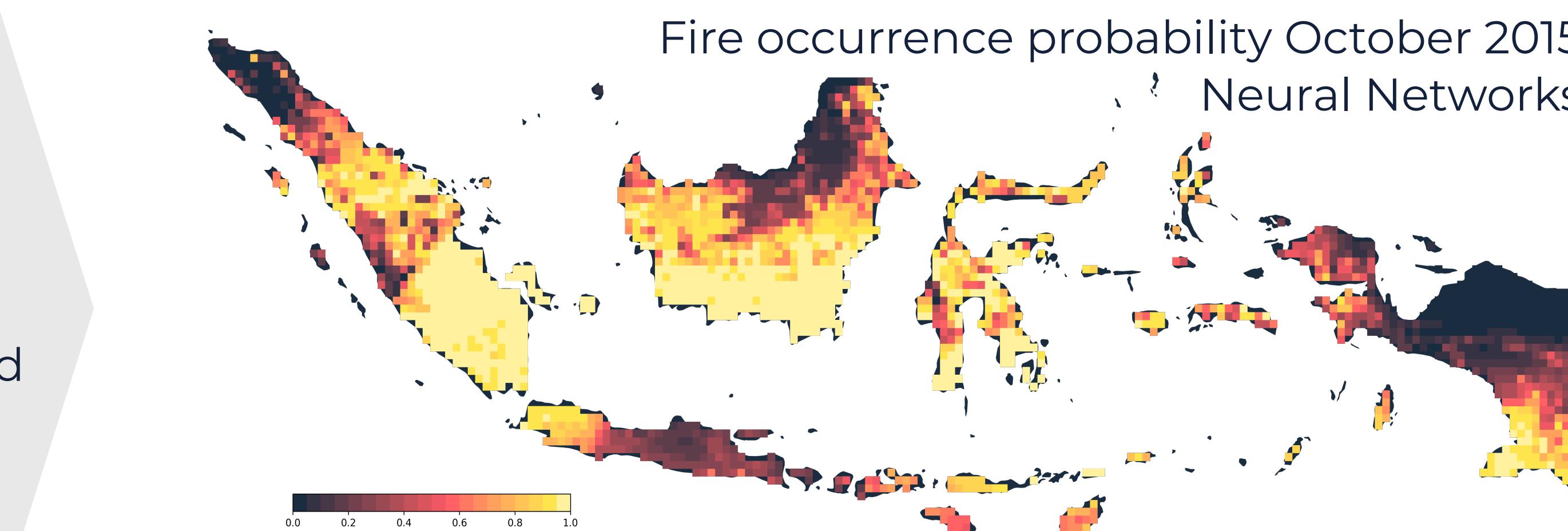
Canadian Fire Weather indices were calculated from the ECMWF ERA5 reanalyses dataset.



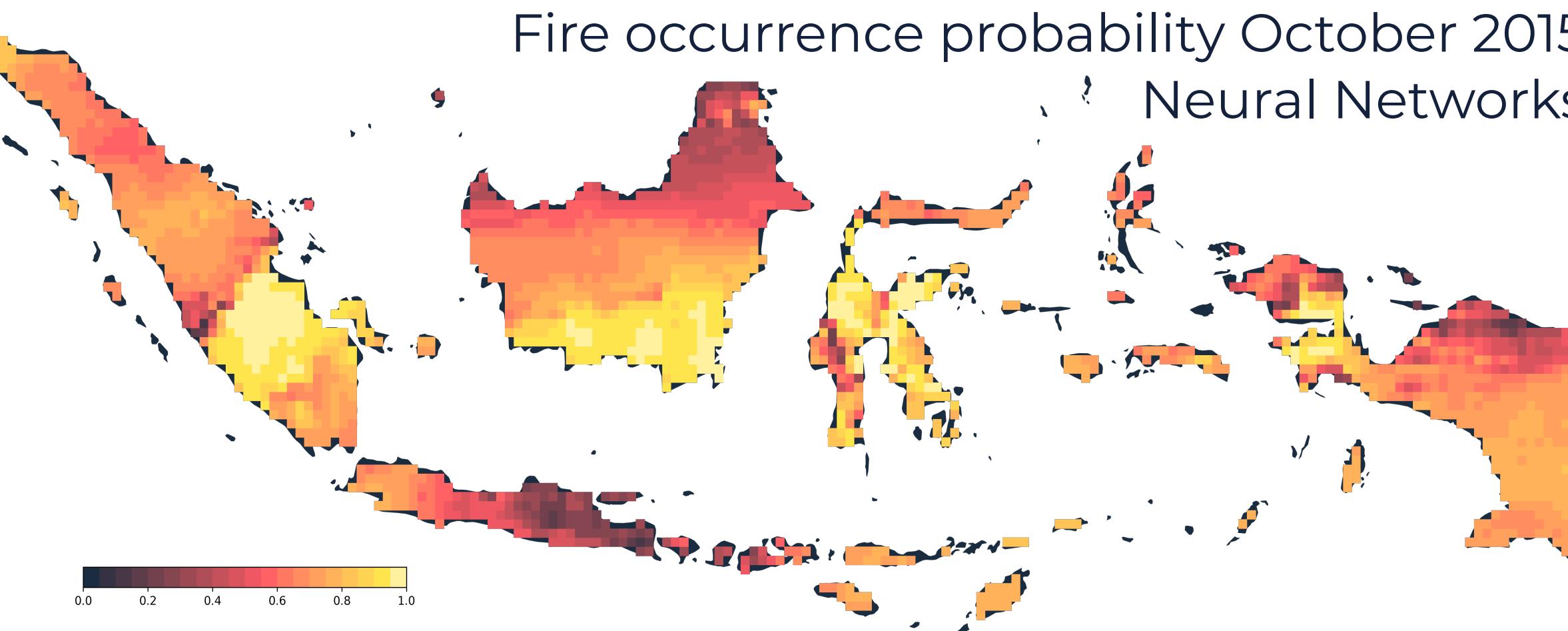
Features were calculated on 25km grid and monthly temporal resolution for 2002 - 2018 period. A range of supervised learning models was tested in this study.

## Land cover and land use information is critical for modelling fire activity in Indonesia

Full set of features used for learning and prediction

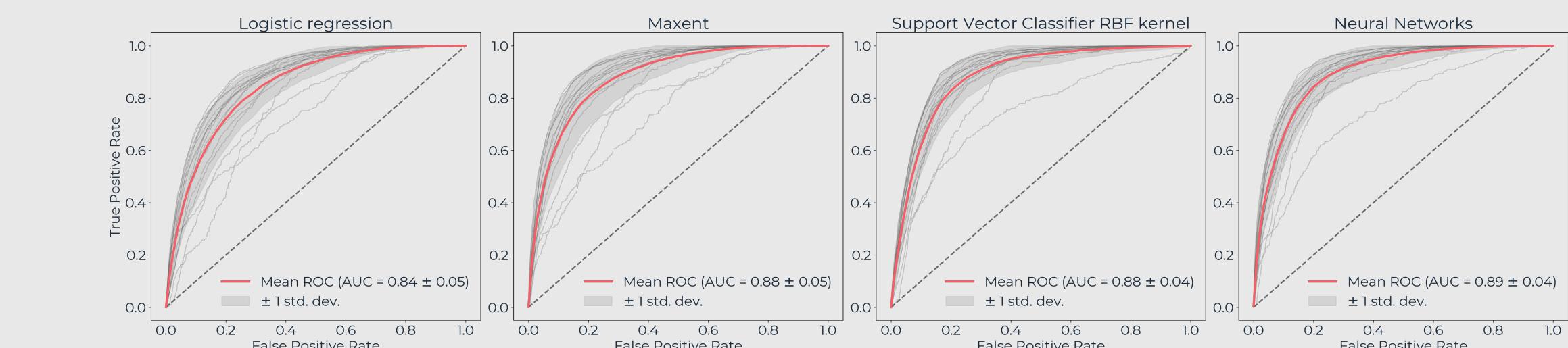


Only fire weather features used for learning and prediction

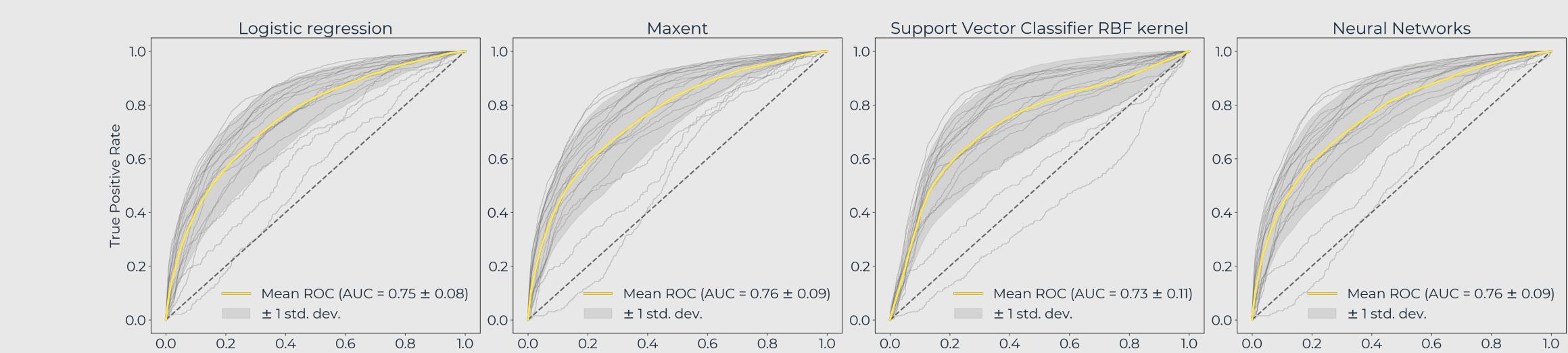


Models have significantly better prediction skill when trained with full feature set.

ROC curves for the models, full feature set.

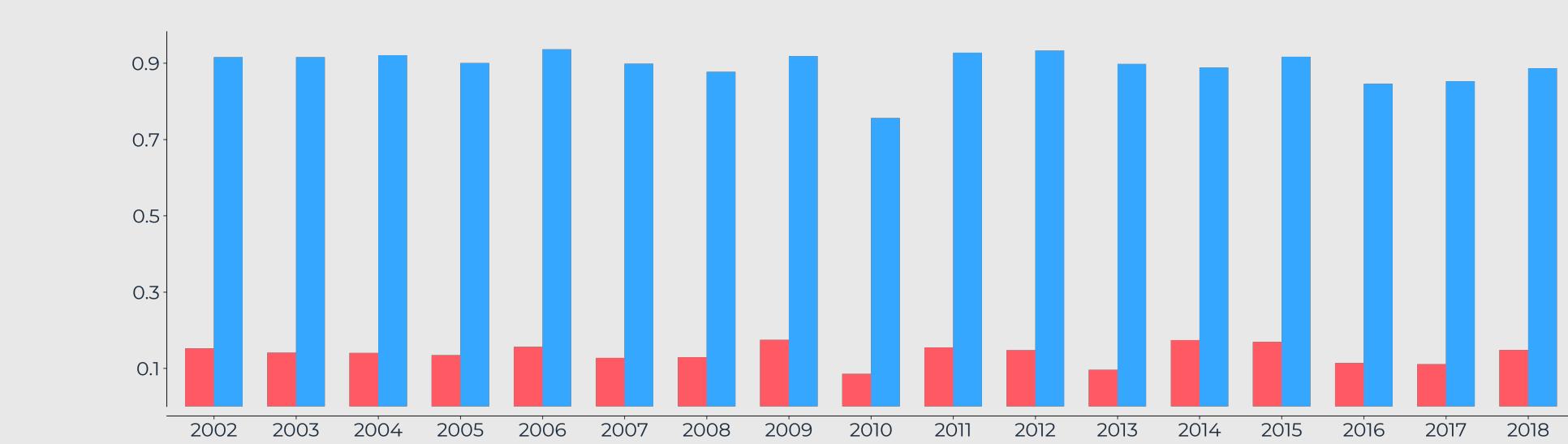


ROC curves for the models, fire weather features only.

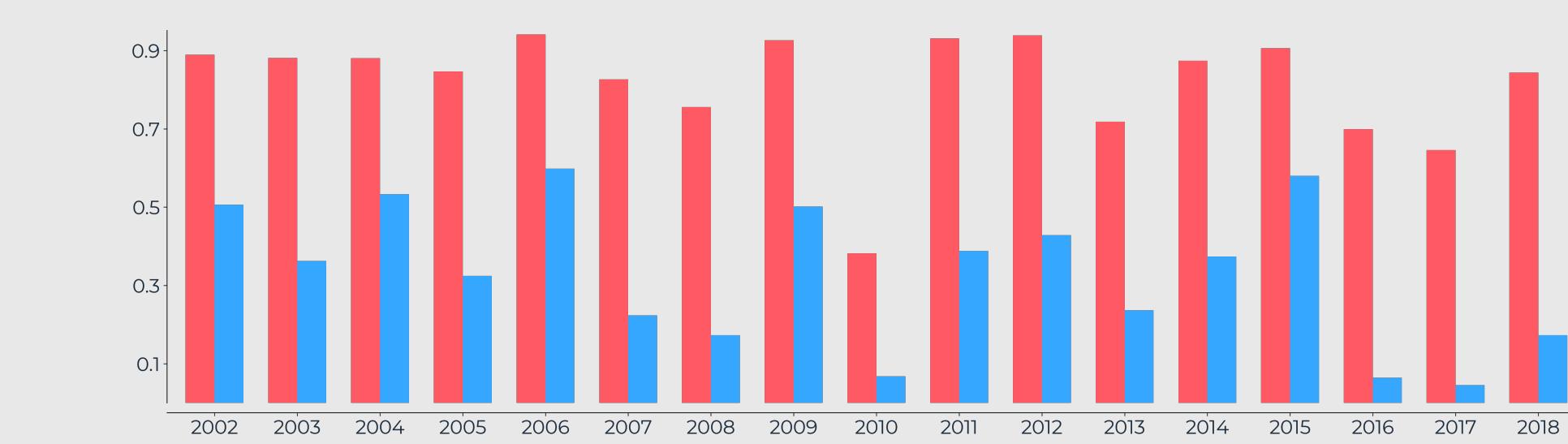


Validation was performed leaving one year out during training and using it as testing data.

Brier score and ROC for each year, Neural Networks



Recall and precision for each year, Neural Networks



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