Supplemental Material

Weather and Forecasting
A Statistical Model to Predict the Extratropical Transition of Tropical Cyclones
https://doi.org/10.1175/WAF-D-19-0045.1

Supplemental Material

Table S1: List of all features used for the initial feature selection in the operational model.

| Feature	Definition
B	CPS parameter B
ΔB	change in B during previous 12 h
H_a	heading angle, measured clockwise from north
ΔH_a	change in H_a during previous 12 h
lat	latitude of the storm center
Δlat	change in lat during previous 12 h
lon	longitude of the storm center
Δlon	change in lon during previous 12 h
P_o	storm central pressure
ΔP_o	change in P_o during previous 12 h
SHR	vertical wind shear (200 hPa - 850 hPa) within a circle of radius 500 km around the storm center
ΔSHR	change in SHR during previous 12 h
SST	mean sea surface temperature within a circle of radius 500 km around the storm center
ΔSST	change in SST during previous 12 h
T_s	storm translational speed
ΔT_s	change in T_s during previous 12 h
$-V_T^L$	CPS parameter $-V_T^L$
$\Delta-V_T^L$	change in $-V_T^L$ during previous 12 h
$-V_T^U$	CPS parameter $-V_T^U$
$\Delta-V_T^U$	change in $-V_T^U$ during previous 12 h
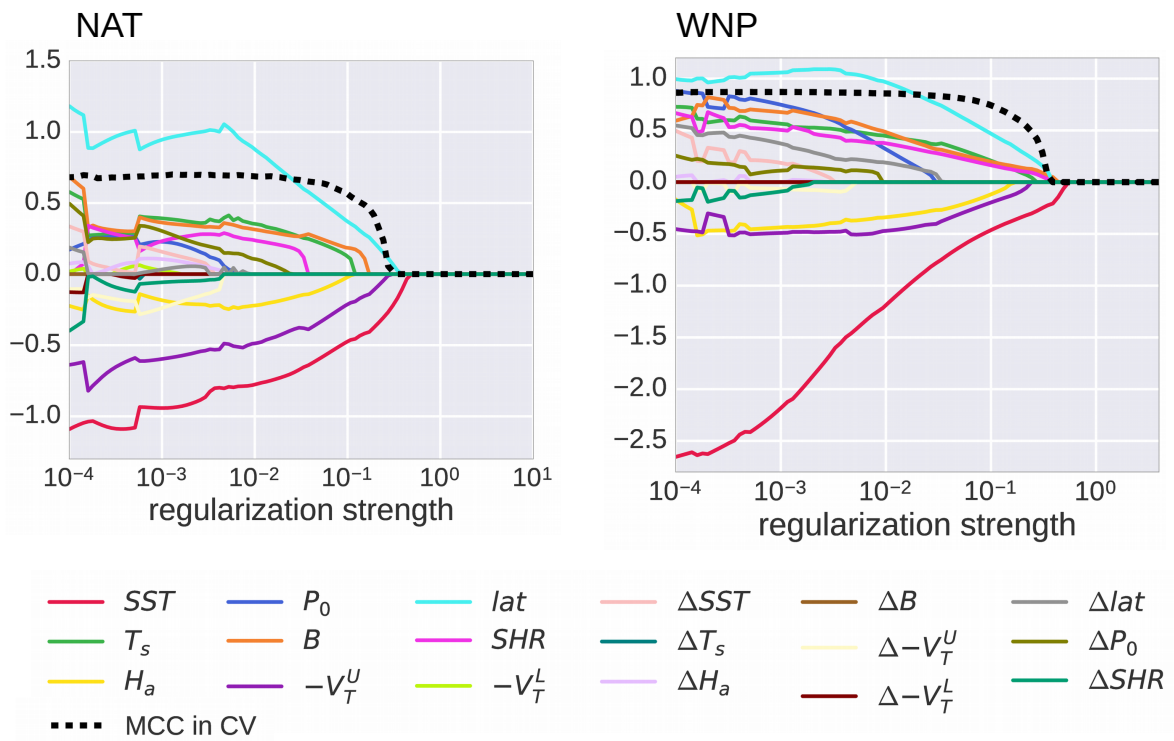
Fig. S1: Regularization path of the logistic regression model for (left) the NAT, and (right) the WNP, showing how the feature coefficients (colored lines) vary with regularization strength, for a lead time of 24 h. The abbreviations of the features are defined in Table S1. The black dotted line is the Matthews correlation coefficient (MCC) obtained in the cross-validation (CV).
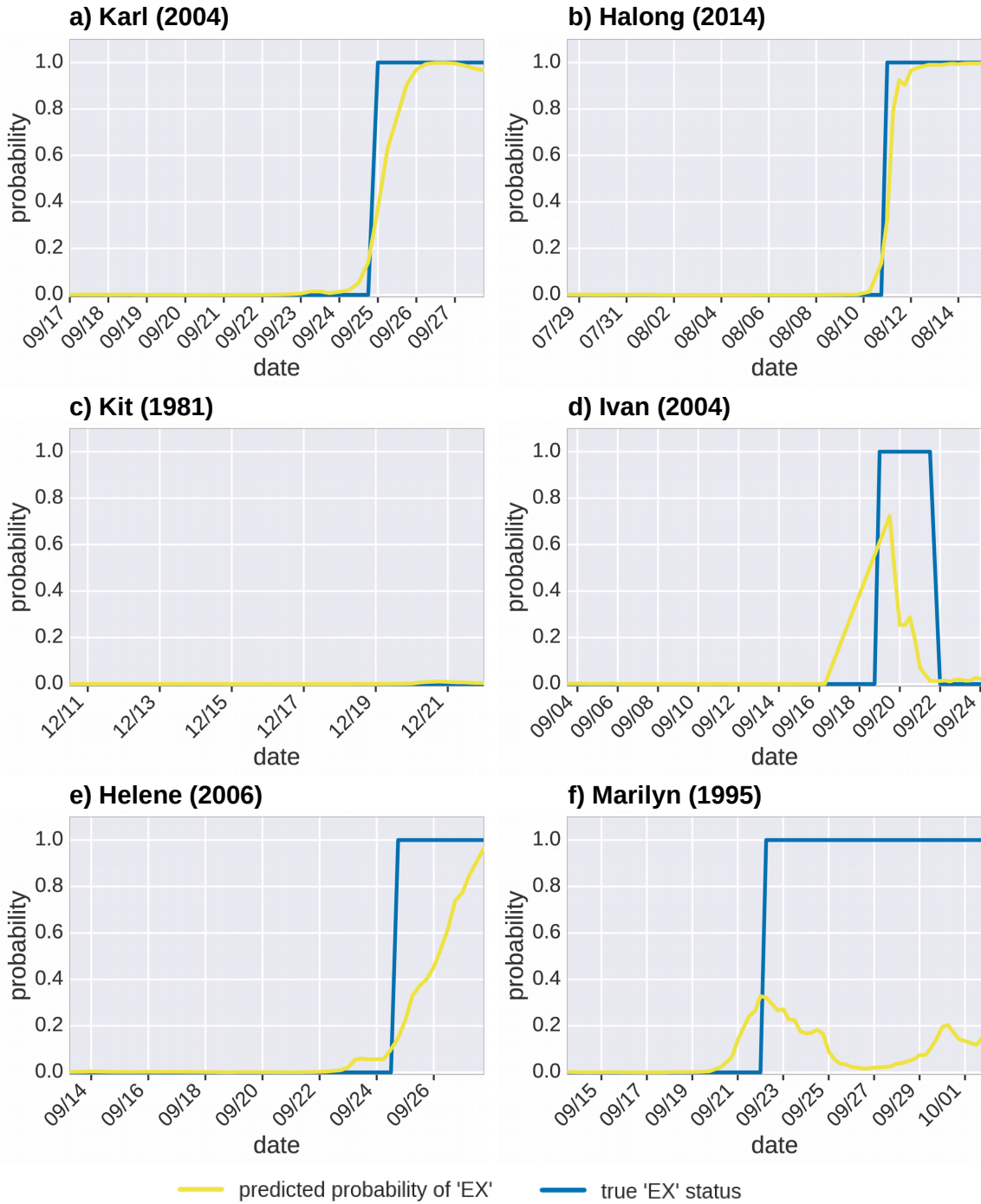
Fig. S2: The hazard model's phase diagnosis for six examples from the test set: a) Karl (2004, NAT), b) Halong (2014, WNP), c) Kit (1981, WNP), d) Ivan (2004, NAT), e) Helene (2006, NAT), and f) Marilyn (1995, NAT). The yellow line shows the predicted probability of the cyclone being extratropical, and the blue line shows the true status (1: extratropical, 0: tropical).