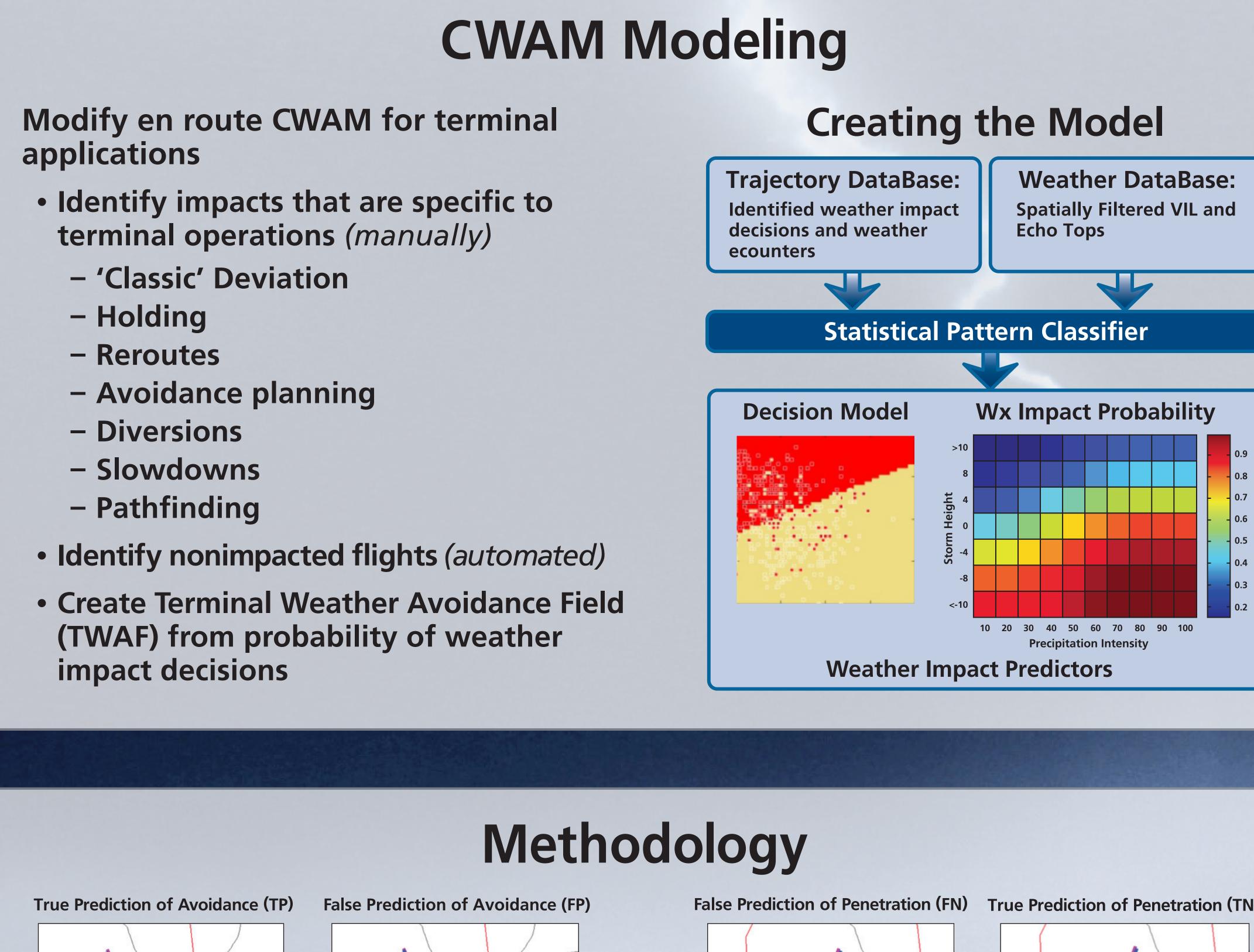
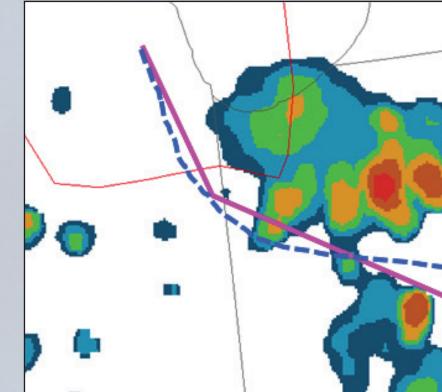
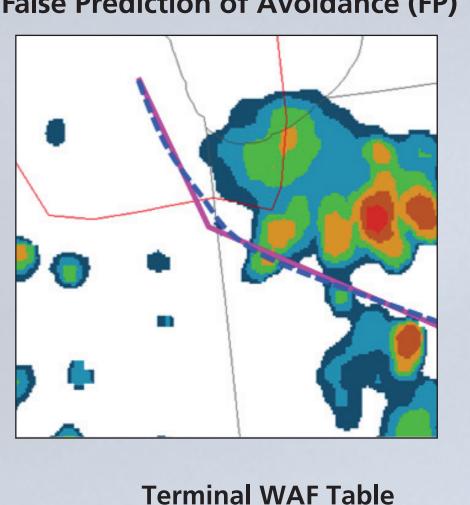
Evaluation of Convective Weather Avoidance Models for the Terminal Area

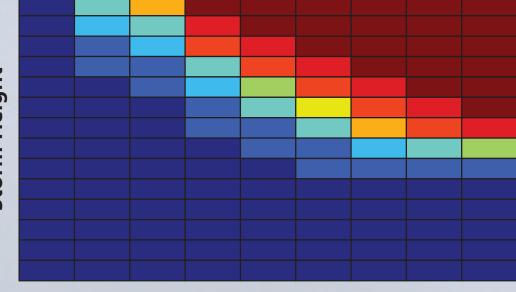
Objective

Verify the performance of the Terminal Convective Weather Avoidance Model (CWAM) and investigate its sensitivity to TRACON complexity, spatial filter size, and forecast time horizon.









80 70 60 50 40 30 20 10

Planned Trajectory

Probability of Deviation

---- Actual Trajectory

70 WAF Threshold

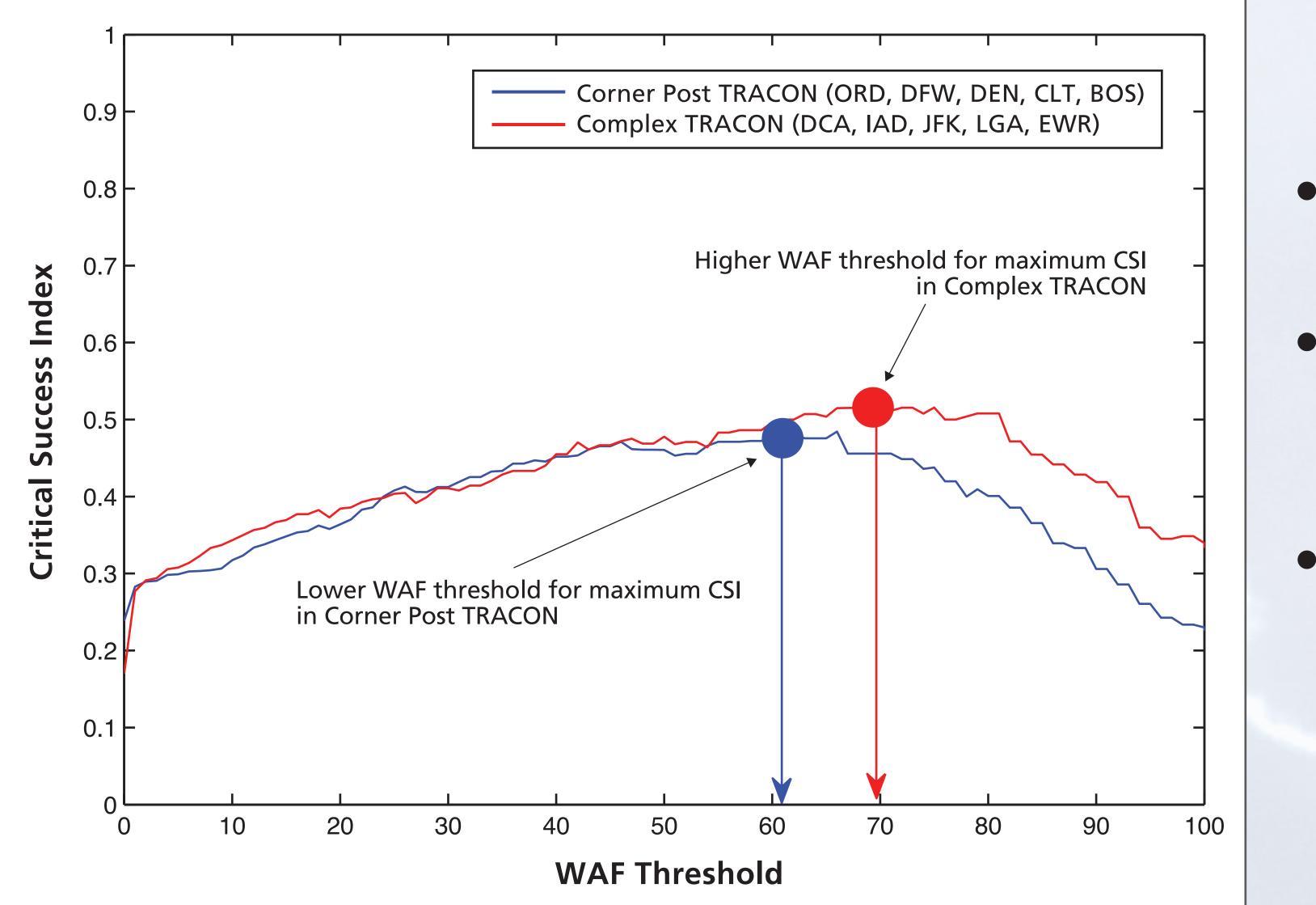
Precipitation Intensity

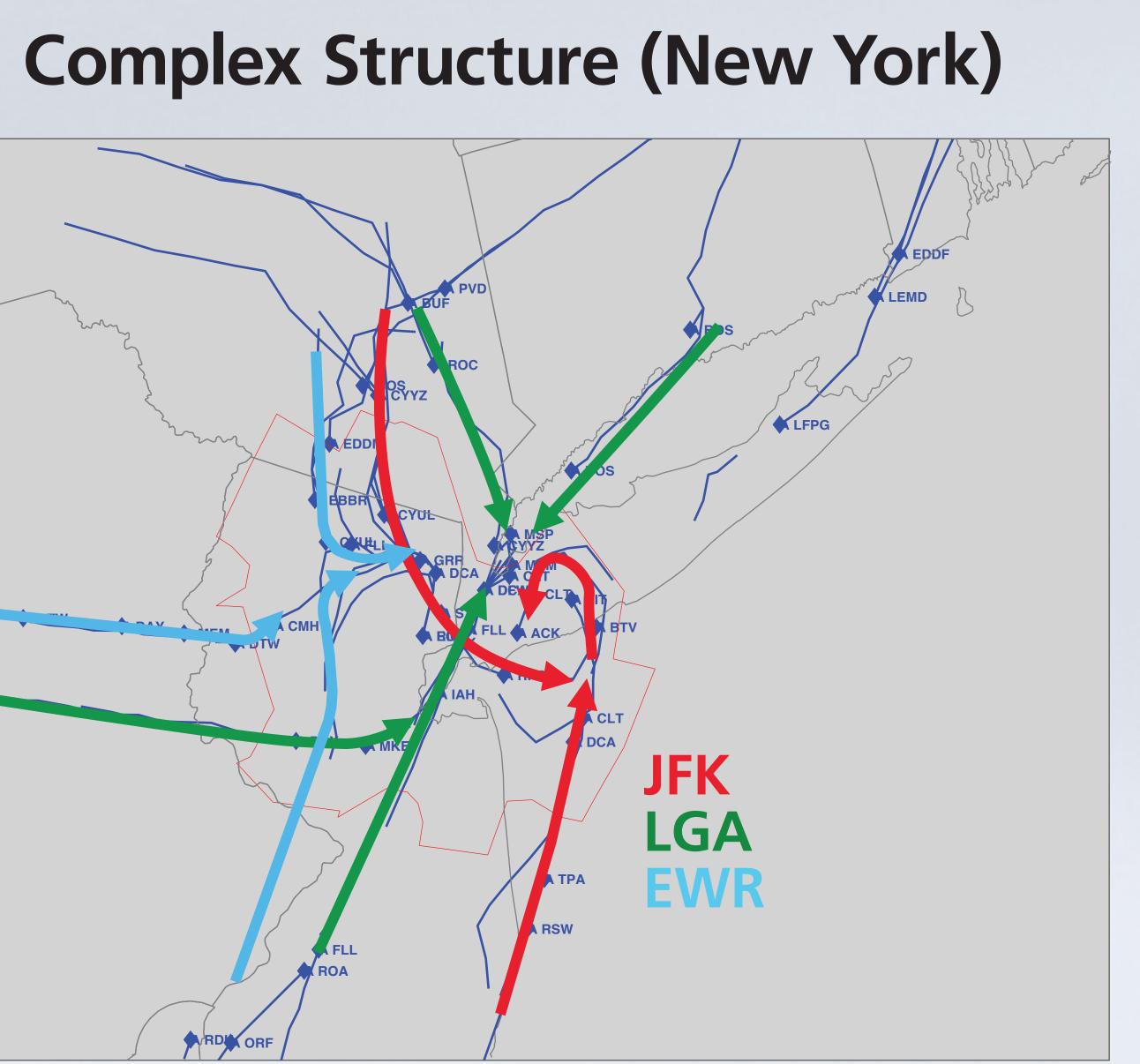
Michael Matthews, Scot Campbell, and Richard DeLaura, MIT Lincoln Laboratory, Lexington, Massachusetts

Dependence on Terminal Area Corner Post Structure (Chicago)

Performance of Terminal CWAM

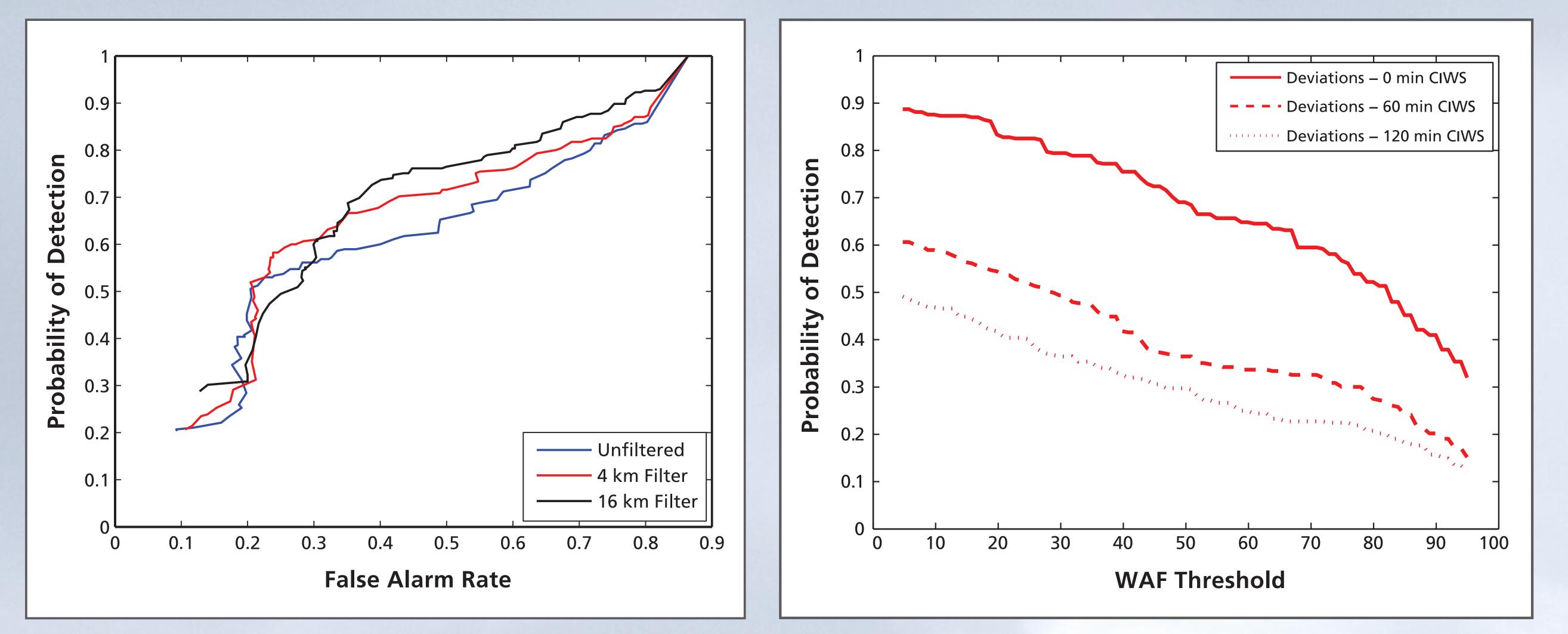
This work is sponsored by the Federal Aviation Administration under Air Force Contract FA8721-05-C-0002. Opinions, and recommendations are those of the authors and are not necessarily endorsed by the United States Government.





- Flight paths are closer to storms in terminal airspace compared to en route airspace
- Pilot behavior is more predictable in **Complex TRACONs compared to Corner** Post TRACONs
- A higher WAF threshold for maximum CSI indicates pilots penetrate stronger storms in Complex TRACONs

Sensitivity to Spatial Filter Size and Forecast Time Horizon



- The Terminal Convective Weather Avoidance Model is validated by an independent dataset
- There is less weather avoidance flexibility in a Complex TRACON
 - Pilots deviate less frequently in a Complex TRACON
 - Model can be calibrated for different TRACON types by adjusting Weather Avoidance Field threshold
- Weather forecast uncertainty reduces model performance



Weather Forecast

• The model shows slight dependence on spatial filter size (4 km filter generates the best tradeoff) Weather forecast uncertainty reduces model performance

Conclusions

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