

Human Forecasters – Some Thoughts

- **Local expertise of forecaster will always add value**
 - augmentation & enhancement of automated forecast products, especially for recognizing high-impact situations
 - particularly relevant for site-specific forecasts (e.g., terminal area)
- **Need for human weather consulting will remain**
 - maintenance of situational awareness
 - interpretation of complex weather situations to users
- **Information overload requires increasing automation**
 - need automated tools to aid forecasters digesting wealth of information
 - automate routine tasks to enable forecasters focusing on what matters
- **Challenge of grasping human thought process in algorithms**
 - human assessment of the “unmeasurable”
 - human assessment of data quality

- **Changing workplace**

- increasing utilization of computer-based tools
- increasing demands on timeliness & specificity of forecasts
- where is “optimum” human – machine mix?
- need to foster a culture of embracing change

- **Research to operations**

- how effectively get new scientific understanding & research tools into operations?

- **Consistency from forecaster to forecaster**

- variable degree of experience

- **Verification**

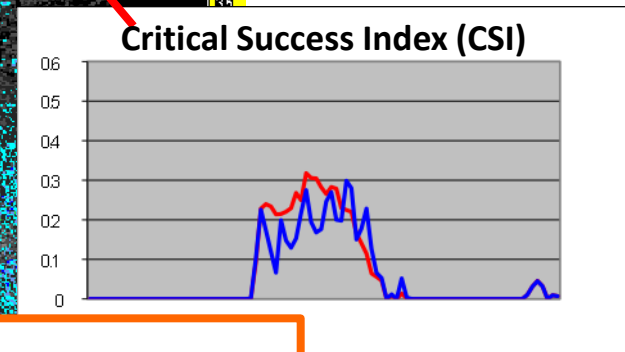
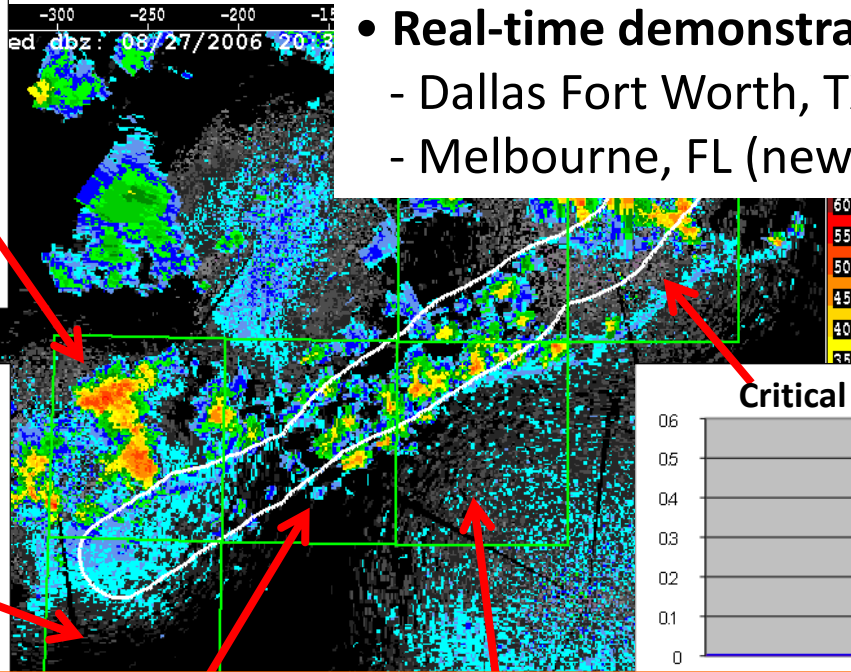
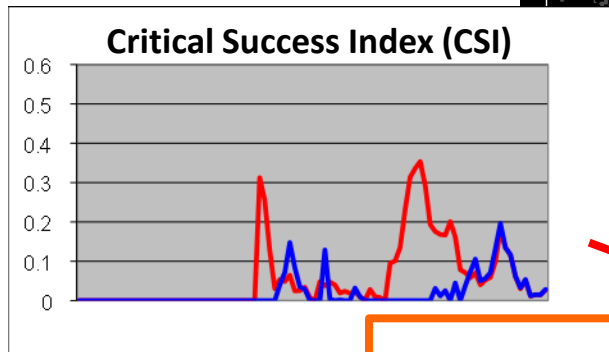
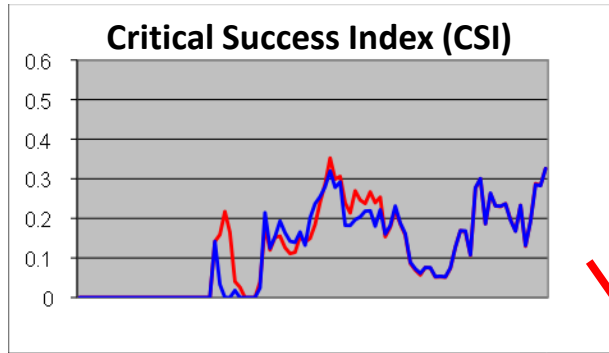
- demonstration of improvement & benefits

- **Human factors & social sciences aspects**

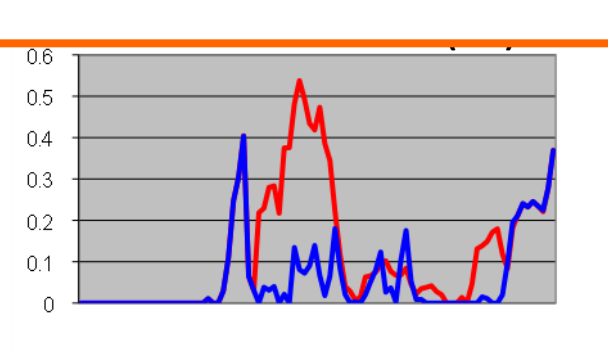
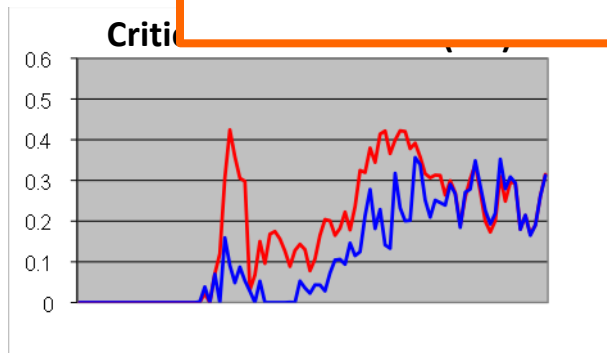
- user training, acceptance of & trust in forecasting process
- political acceptance

Update on AutoNowcaster

- **Research & development**
 - verification of initiation forecasts
 - assessment of human-over-the-loop
- **Real-time demonstrations**
 - Dallas Fort Worth, TX (ongoing)
 - Melbourne, FL (new)



Human adds value to initiation forecasts



- automated
- human enhanced

1 h forecasts

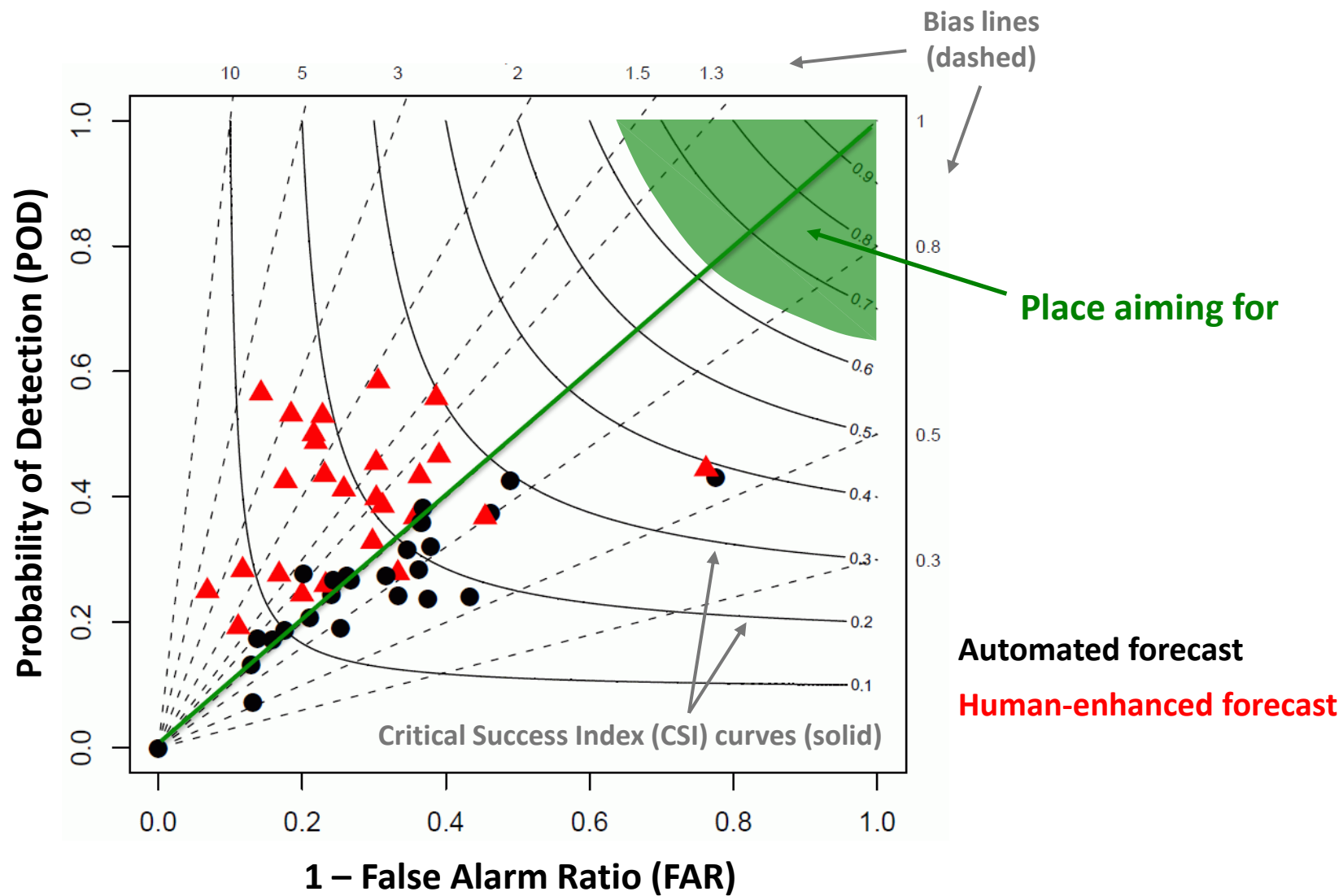


Diagram after Paul Roebber (WAF 2009)

Update on CoSPA

- **Research & development**

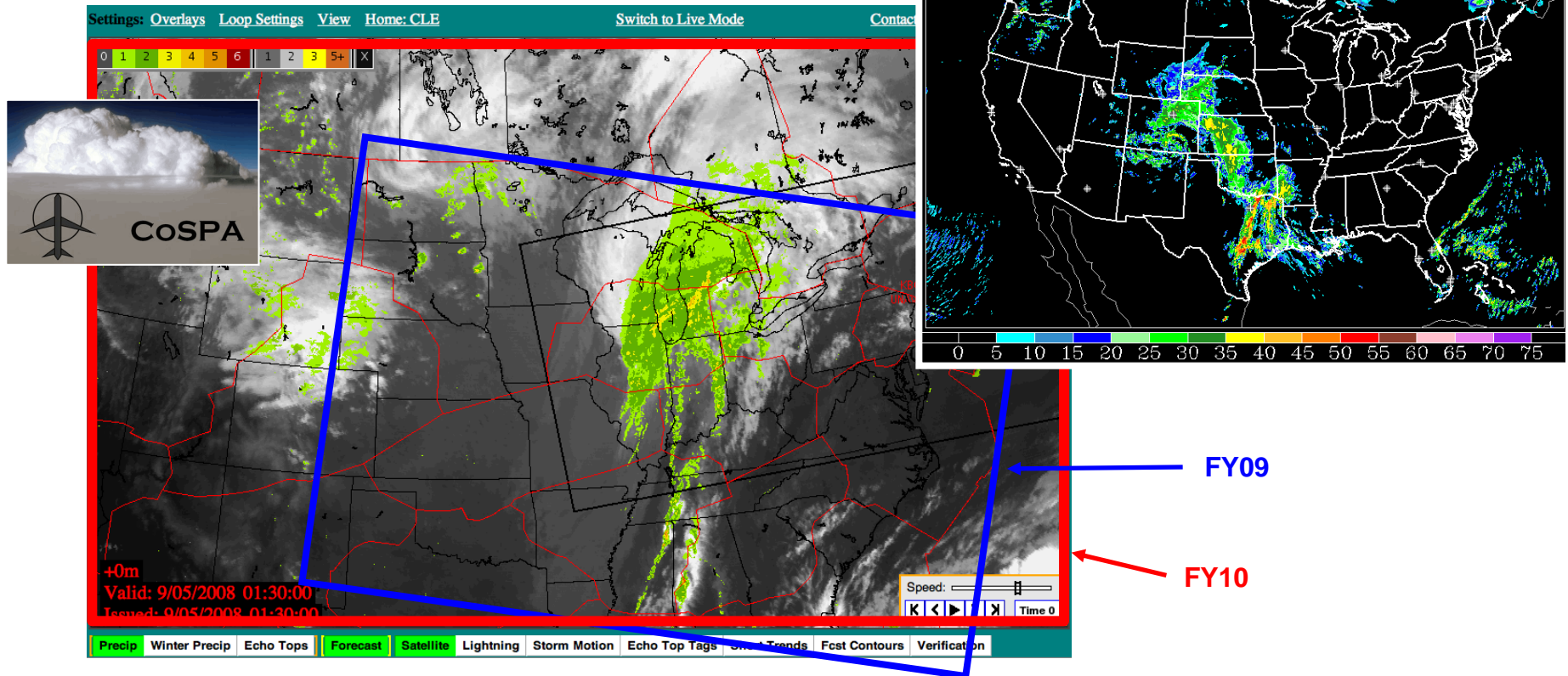
- improvements in storm initiation & evolution
- uncertainty characterization & probabilistic forecasting

- **Real-time demonstrations**

- working toward a CONUS 0-8 hour demonstration in 2010
- vertically integrated liquid (VIL) & echo top (ET)
- possibly include weather avoidance field (WAF) & precipitation phase (snow, rain, mixed)

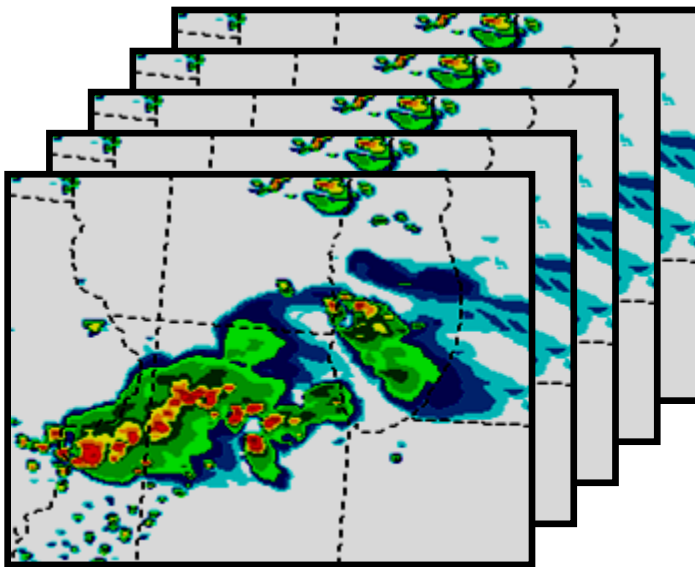
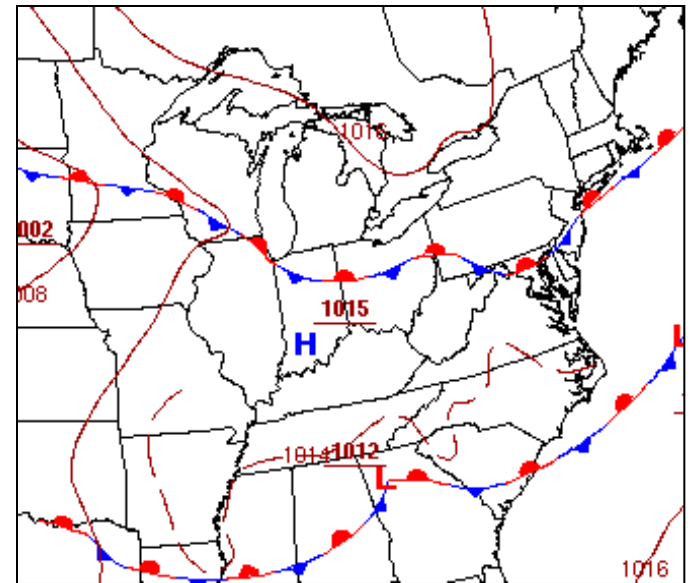
HRRR going CONUS

- hourly updating
- 3 km resolution
- 15 h outlook

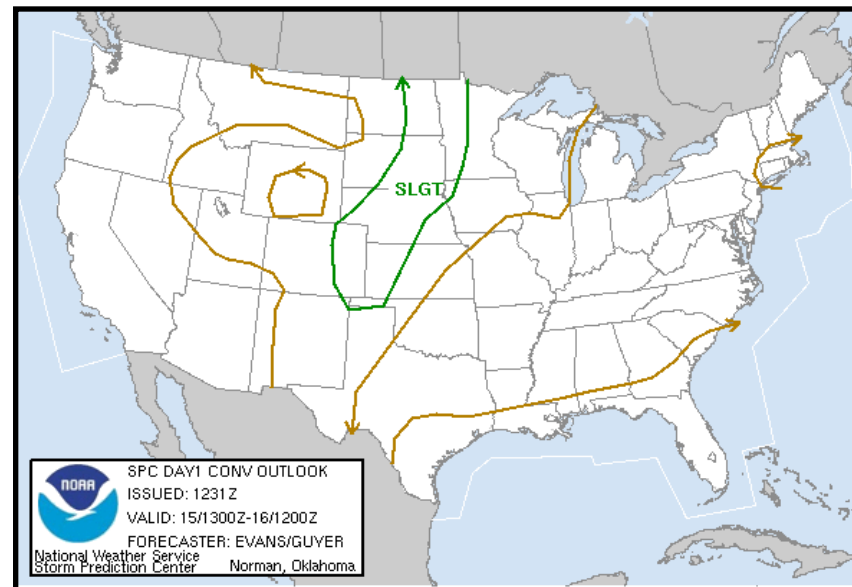


- **Human-related CoSPA enhancements**

- overlay of CCFP
- overlay of 3-hourly HPC synoptic fronts & automated advection
- overlay of SPC convective outlook, thunderstorm watch & warning boxes
- selection of weights for ensemble-based probabilistic forecasts (future R&D)

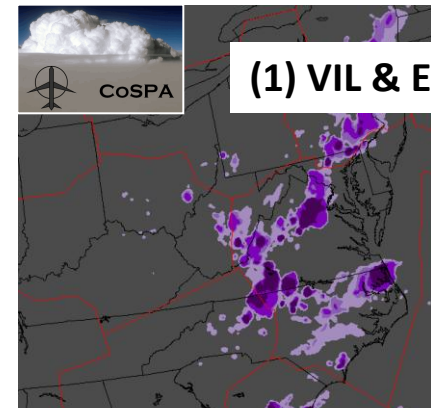
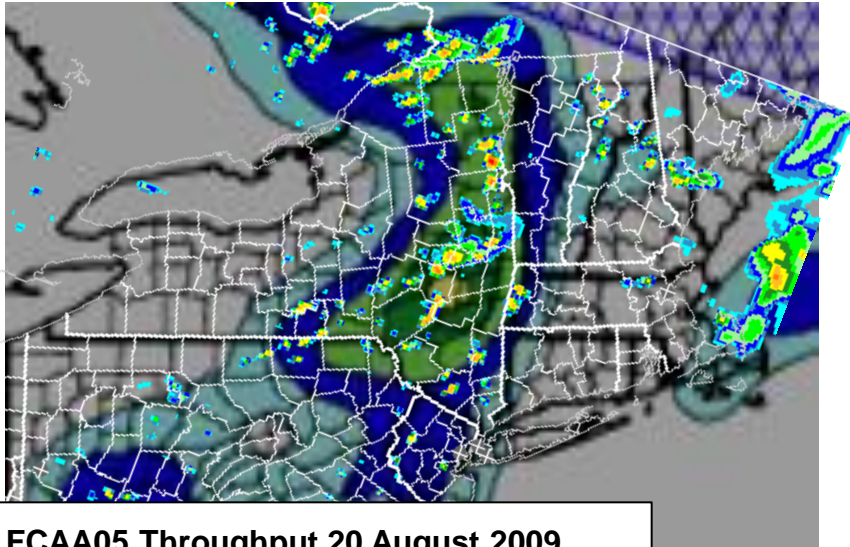


**HRRR ensemble with
adjustable weights**



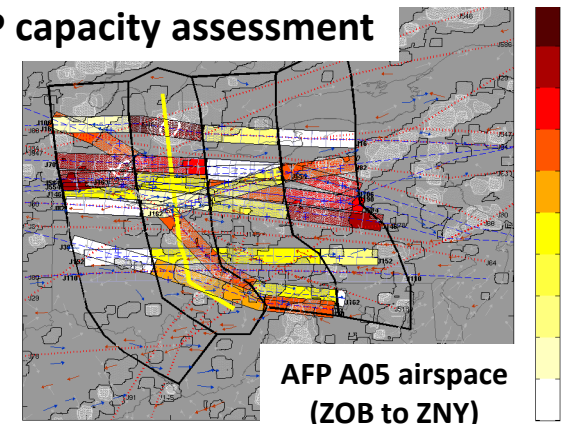
- **Other potential CoSPA enhancements**

- deterministic & probabilistic forecast overlay
- translation of weather into capacity constraints



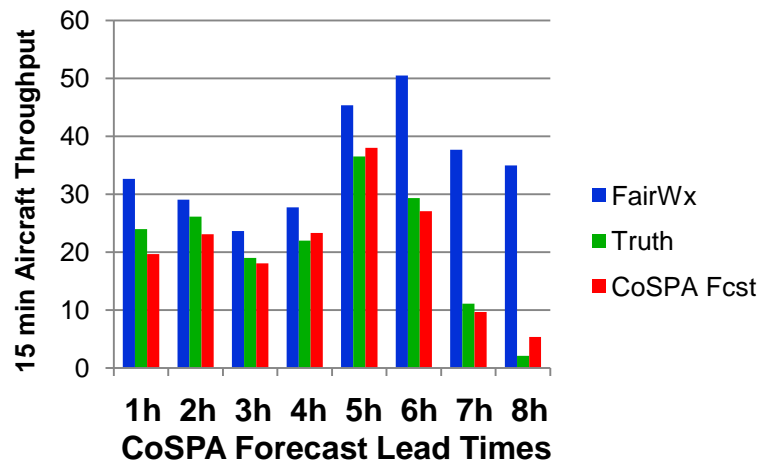
(1) VIL & ET => WAF

(2) AFP capacity assessment



AFP A05 airspace
(ZOB to ZNY)

AFP FCAA05 Throughput 20 August 2009



Fair weather estimate

