

Segment 4 — Storm Forecasting for Air Traffic

(a) Merging Automation and Human-over-the-loop Forecast Efforts

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Today's Situation

INFORMATION

Observations

NWP Models

AWIPS

Advanced Weather Interactive Processing System

- AWIPS provides single point to access & review information
- Human data quality assessment

FORECASTING

Graphical Forecast Editor (GFE)

formerly Interactive Forecast Preparation System (IFPS)

Regional Forecast
digital, text & graphics

- Human central to forecast generation (i.e., "IN THE LOOP")
- Human provides "intelligence" (i.e., local weather expertise)
- Limited automation & forecast update frequency

DISSEMINATION

National Forecast
digital, text & graphics

NDFD

National Digital Forecast Database

- Collaborative effort to generate national mosaic (i.e., human quality control)
- Forecast dissemination using internet, radio & tv, etc.
- Human provides consulting (e.g., forecast interpretation) to user

NextGen Era

INFORMATION

Observations

NWP Models

4D Data Cube

- 4D Data Cube serves as information warehouse for both data & derived products
- Network-enabled data access

FORECASTING

Largely Automated Forecast Process

National & Regional Forecasts
digital, text & graphics

- Human oversight to forecast generation (“OVER THE LOOP”)
- Human adds value to forecast (i.e., local weather expertise)
- Significant automation enabling high forecast update frequency

DISSEMINATION

4D Data Cube

- Network-enabled forecast dissemination, internet, radio & tv, cell phones & pagers, etc.
- Forecasts integrated with user’s decision making process
- Human provides consulting to user (e.g., interpretation of forecast uncertainty)

Transition Efforts

Observations

NWP Models

CCFP
Collaborative Convective Forecast Product

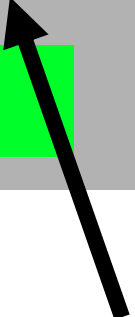
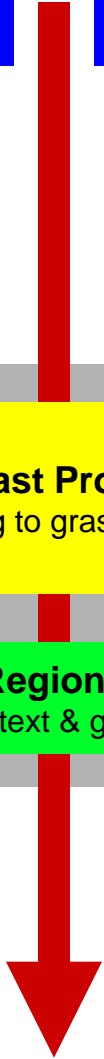
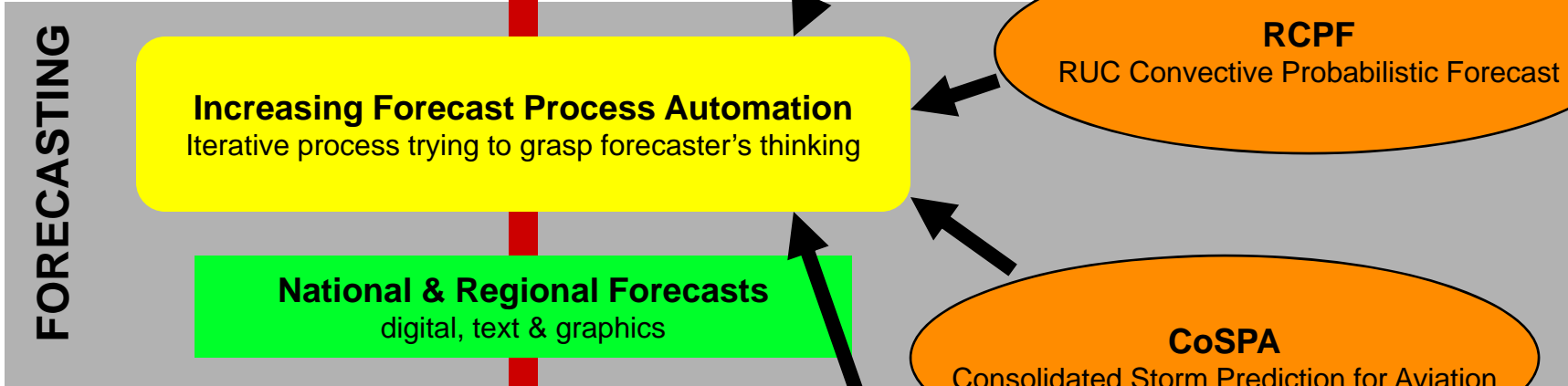
RCPF
RUC Convective Probabilistic Forecast

CoSPA
Consolidated Storm Prediction for Aviation

AutoNowcaster
Human-over-the-loop evaluation

Increasing Forecast Process Automation
Iterative process trying to grasp forecaster's thinking

National & Regional Forecasts
digital, text & graphics



Potential Issues & Concerns

- **Information overload requires increasing automation**
 - need automated tools to aid forecasters digesting information
- **Challenge of grasping human thought process in algorithms**
 - human assessment of the “unmeasurable”
 - human assessment of data quality
- **Local expertise of forecaster will always add value**
 - augmentation & enhancement of automated forecast products
 - particularly relevant for site-specific forecasts (e.g., terminal area)
- **Need for human weather consulting will remain**
 - interpretation of complex weather situations to users
- **Consistency from forecaster to forecaster**
 - variable degree of experience
- **Human factors & social sciences aspects**
 - user acceptance of & trust in forecasting process
 - political acceptance