Verification of the CCFP
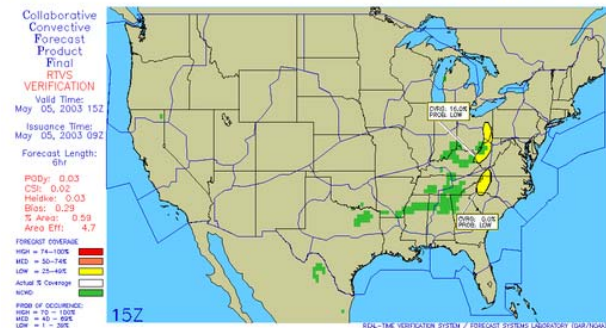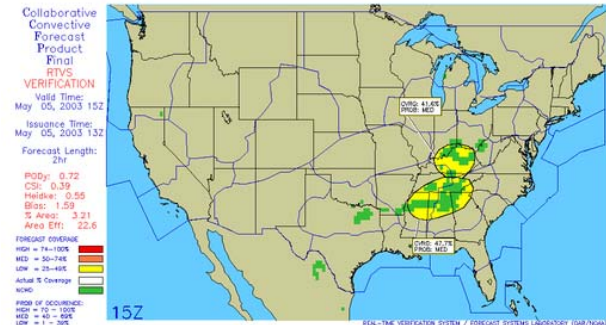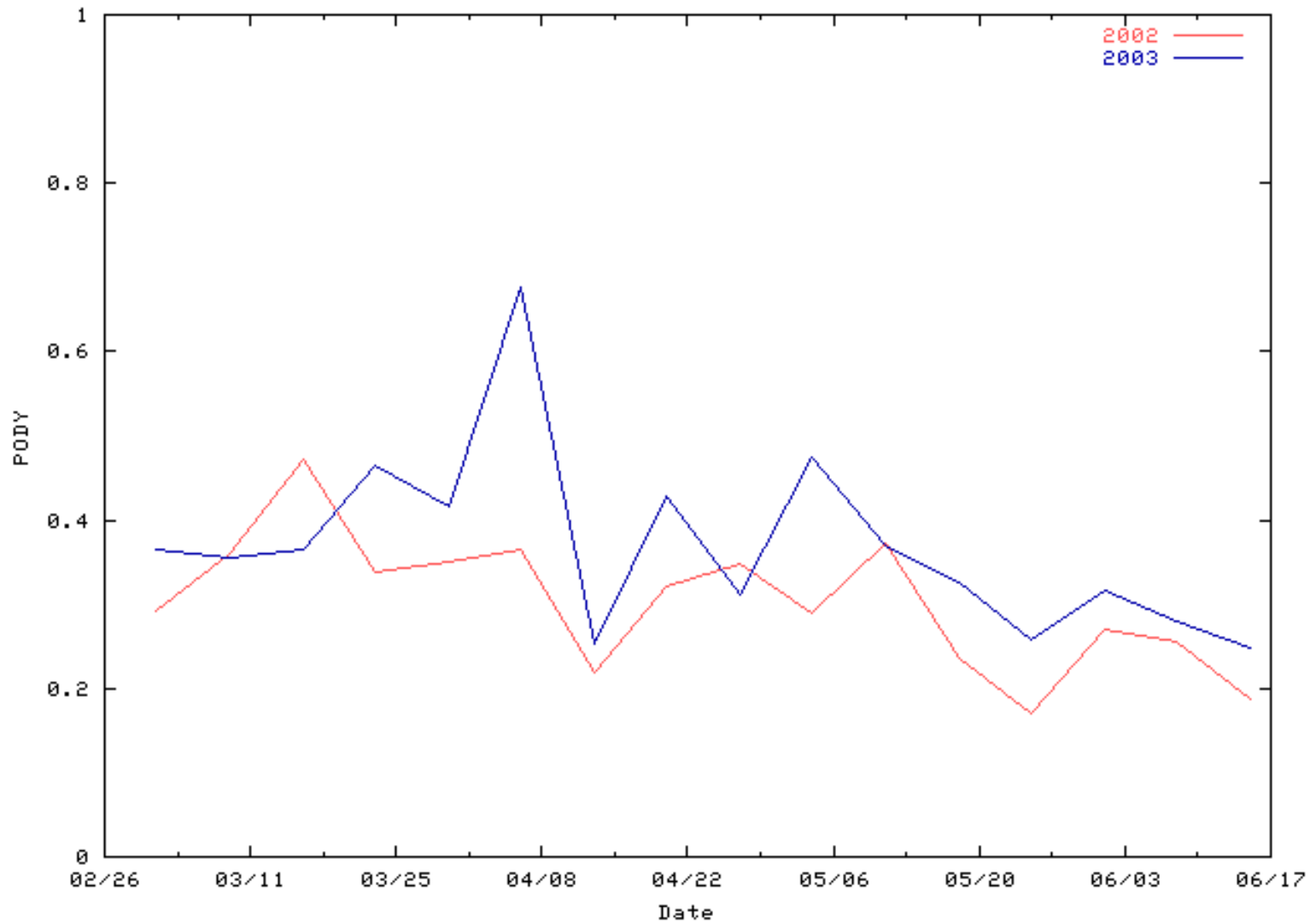
Outline

- FY03 /FY02 Quality of CCFP

- New verification approach

- Consistency index
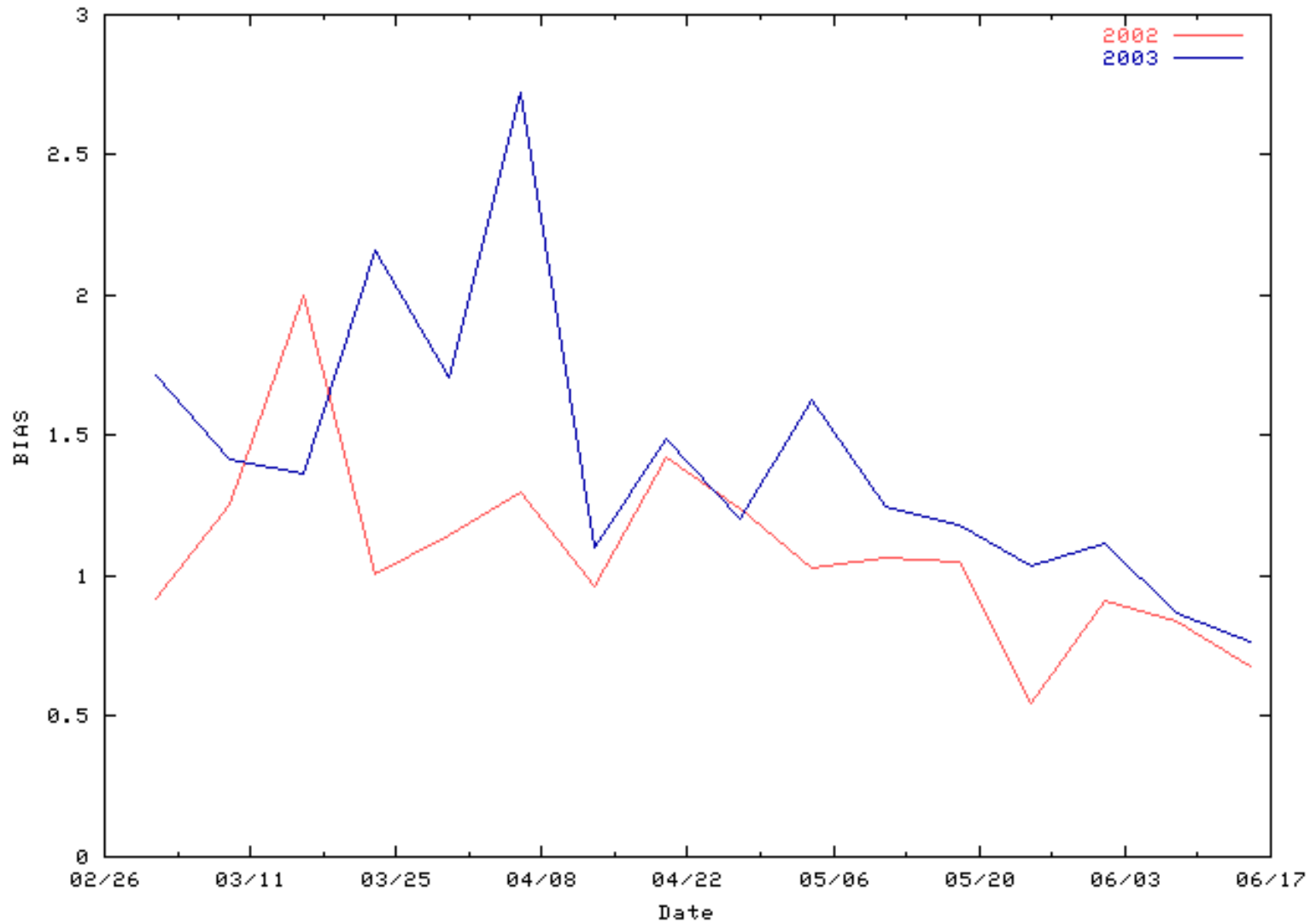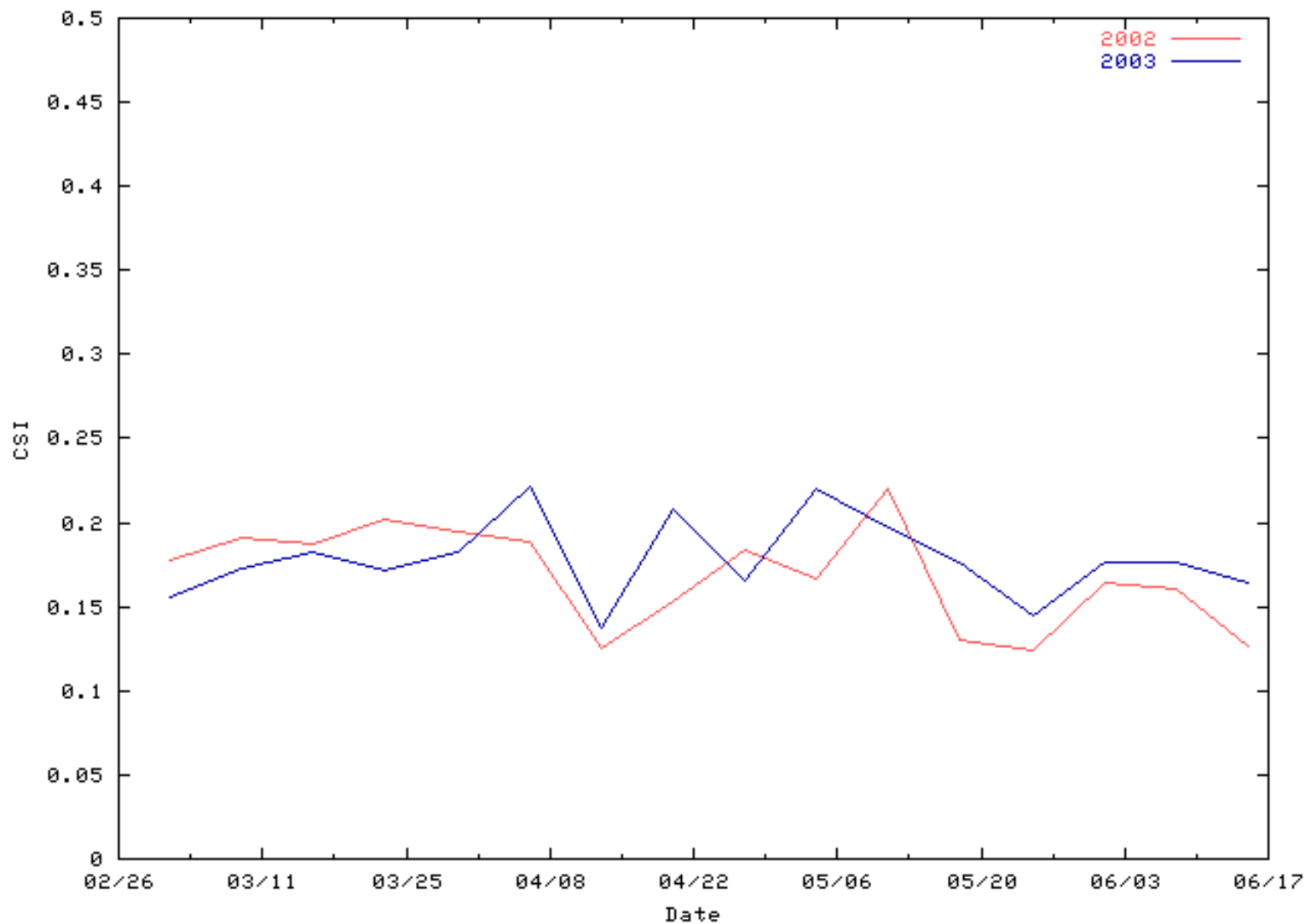
2 March – 15 June

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

2 March – 15 June

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

2 March – 15 June

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

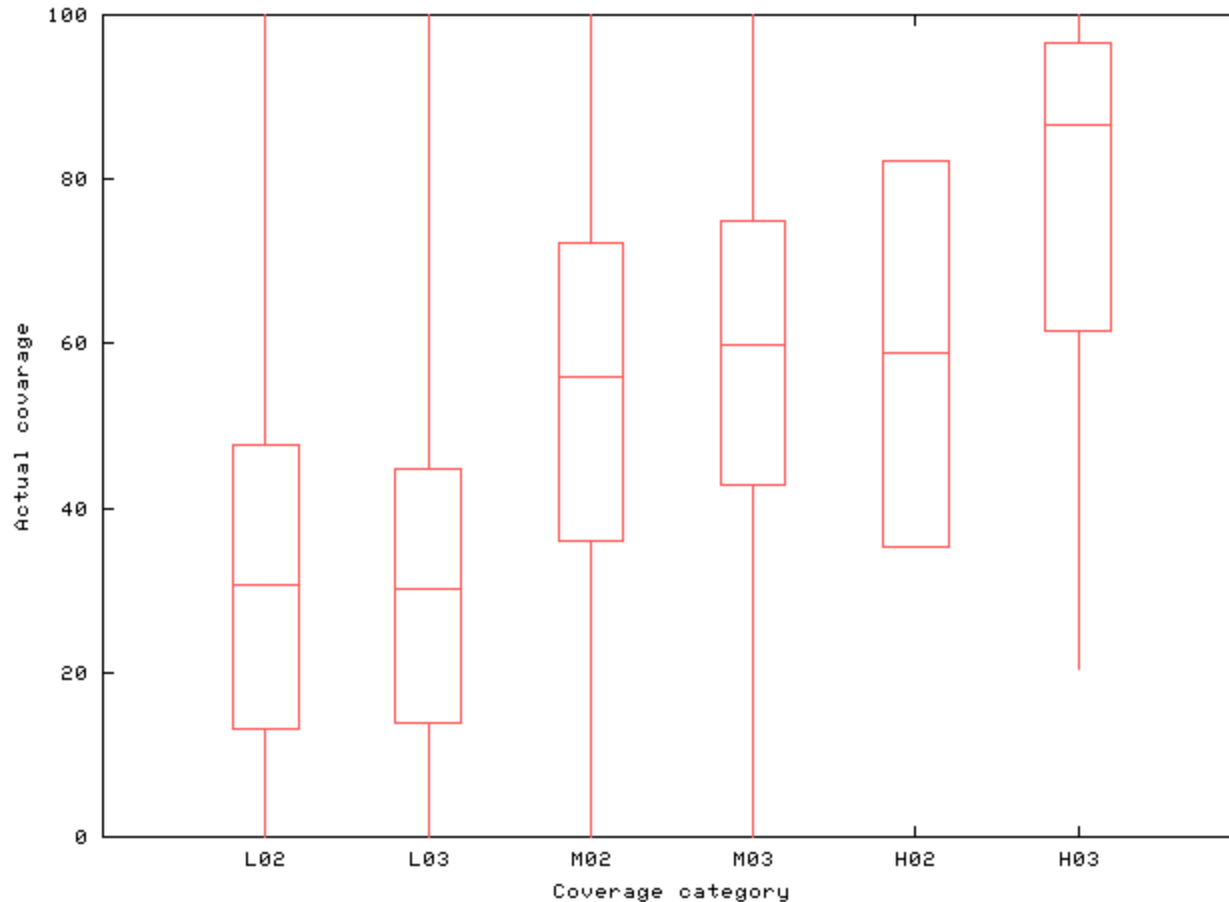# Forecast Coverage vs Actual Coverage
2-h Forecast

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

• Spread is less in
'03
• Accuracy of
coverage improved
in '03, particularly for
the high coverage
forecasts

Forecast Coverage vs Actual Coverage

Generated on 19 Jun 2003 by NOAA/FSL-RTVS
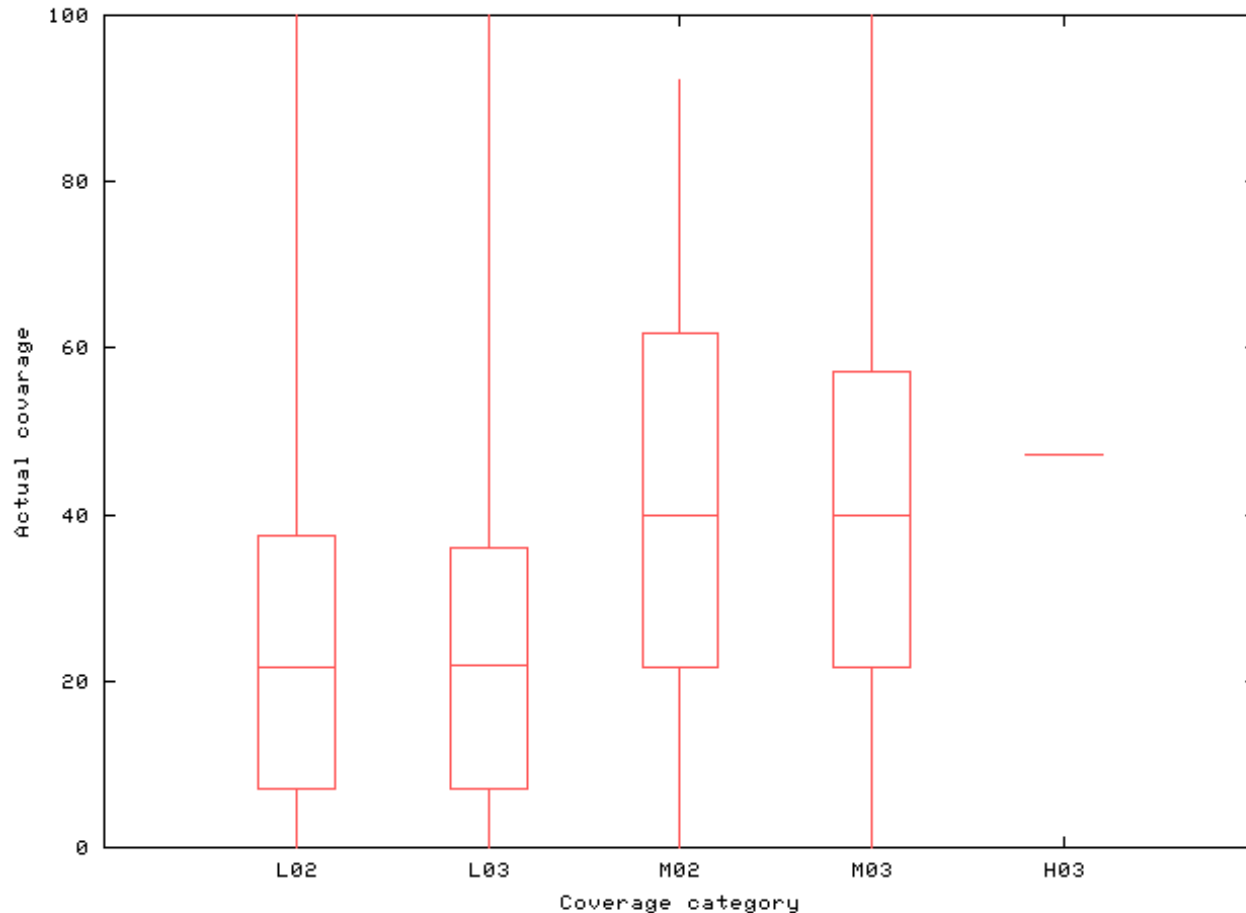
• Spread is less in '03
• Little change in accuracy of forecast coverage at 4-h lead
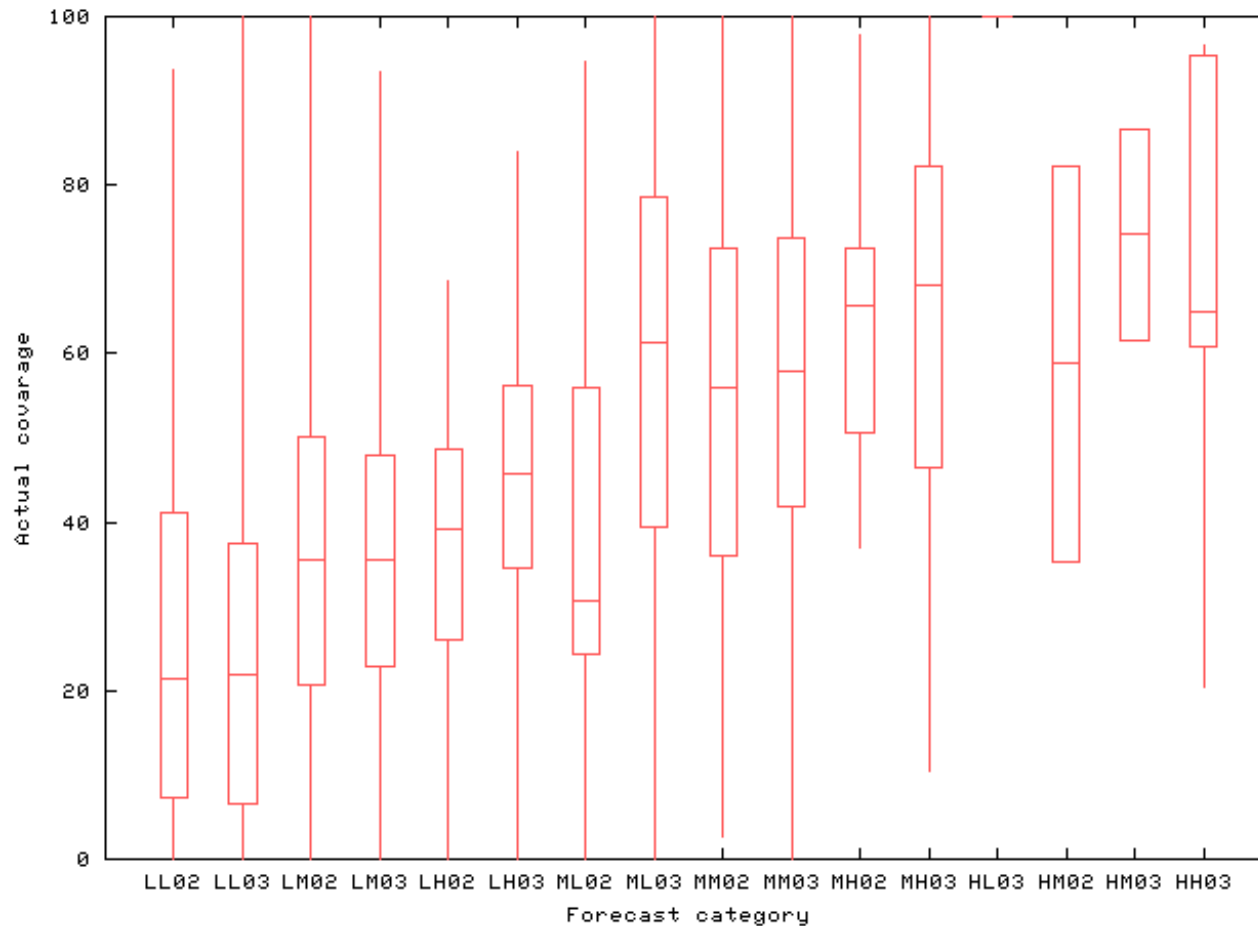
Forecast Coverage vs Actual Coverage

Generated on 19 Jun 2003 by NOAA/FSL-RTVS
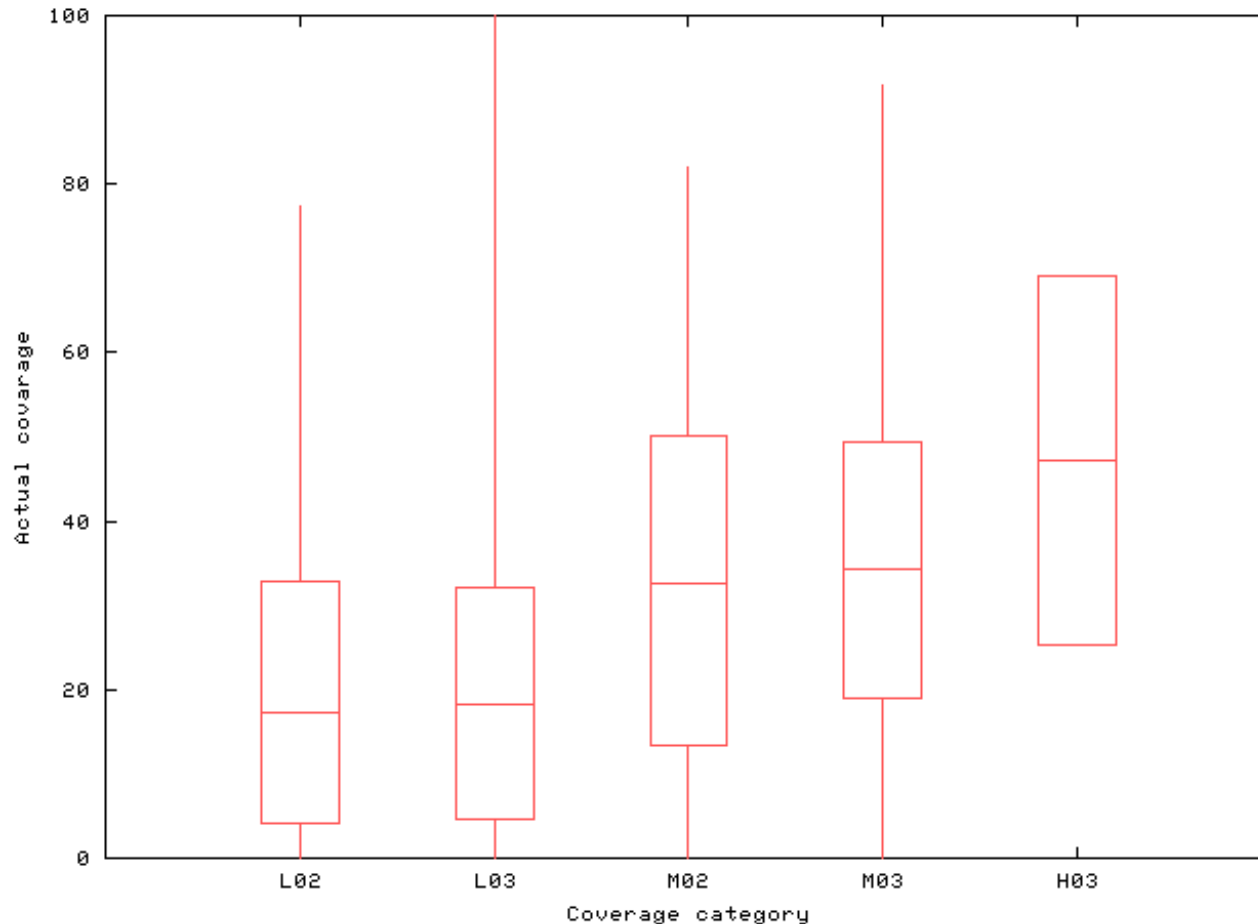
- Spread is less in '03
- Forecast accuracy improves, particularly for high coverage forecasts.

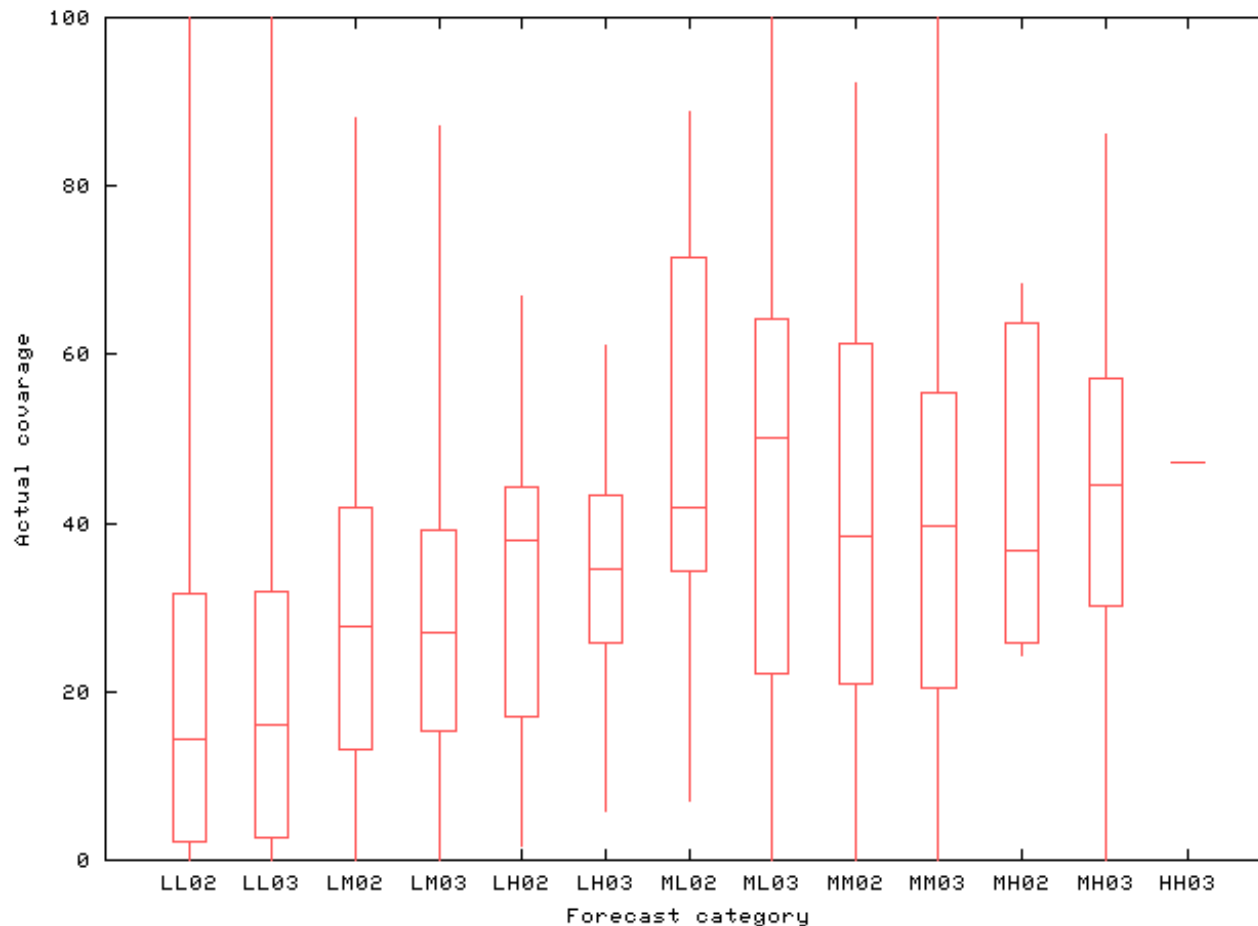# Forecast Coverage/Probability vs Actual Coverage
2-h Forecast

- Spread is less in '03
- Medium and high coverage forecasts better at capturing actual coverage in '03
- Increase in low and medium coverage with increase in probability

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

Forecast Coverage/Probability vs Actual Coverage
4-h Forecast

Generated on 19 Jun 2003 by NOAA/FSL-RTVS

• Little change in low coverage /low probability forecasts between '02 and '03
• Increase in low coverage with increase in probability
• Medium coverage low probability cases improved from '02 to '03

# Forecast Coverage/Probability vs Actual Coverage
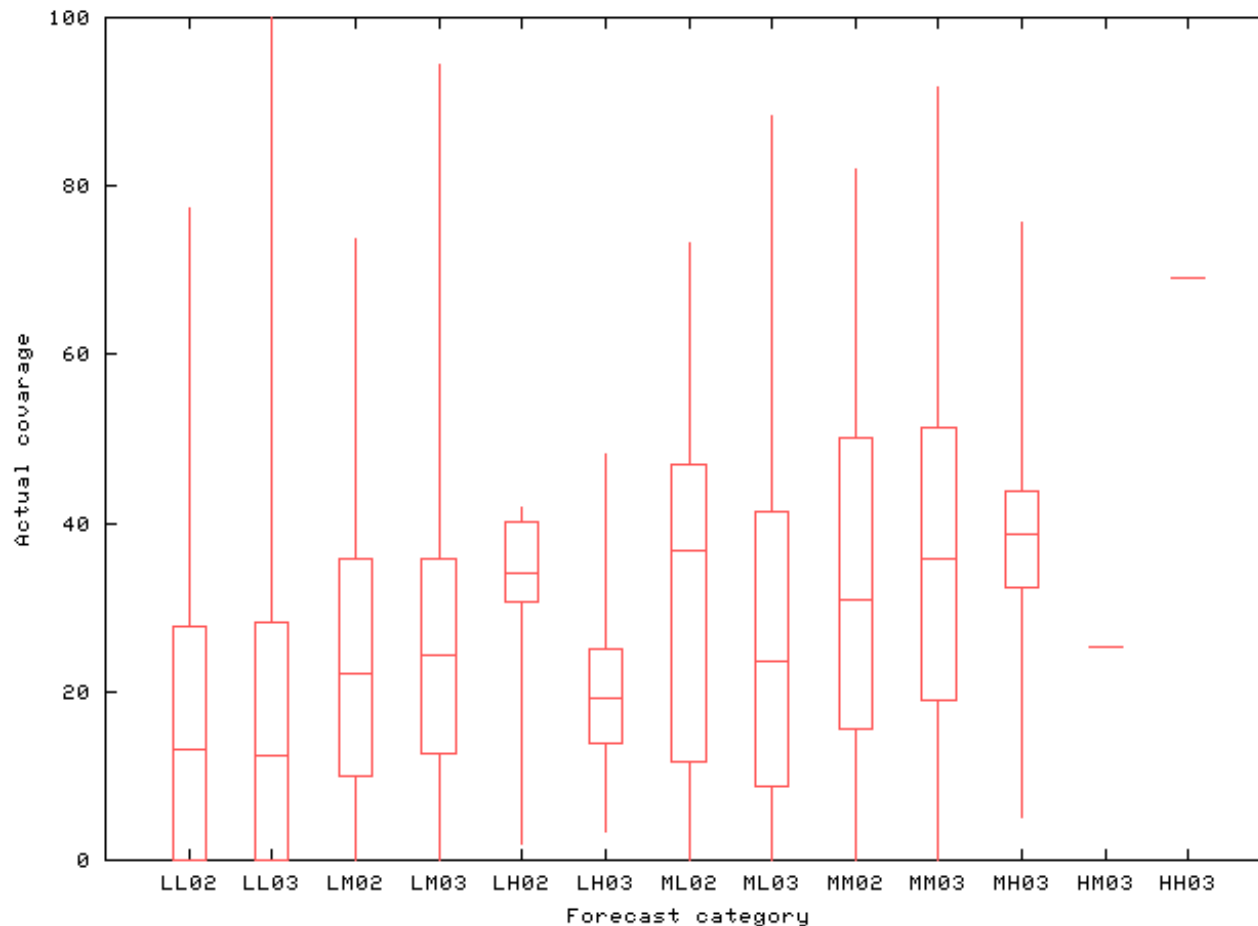
Generated on 19 Jun 2003 by NOAA/FSL-RTVS

• Slight change in low coverage medium probability forecasts in '03
• Decrease in low coverage high probability forecasts in '03
• Slight improvement in medium coverage medium probability forecasts in '03
• Forecast coverage lower than actual coverage

New Verification Approach

- Maintain attributes of forecast
- Assess quality of forecast through reliability and accuracy
- Reduce scale issue
- Evaluate forecast attributes independently
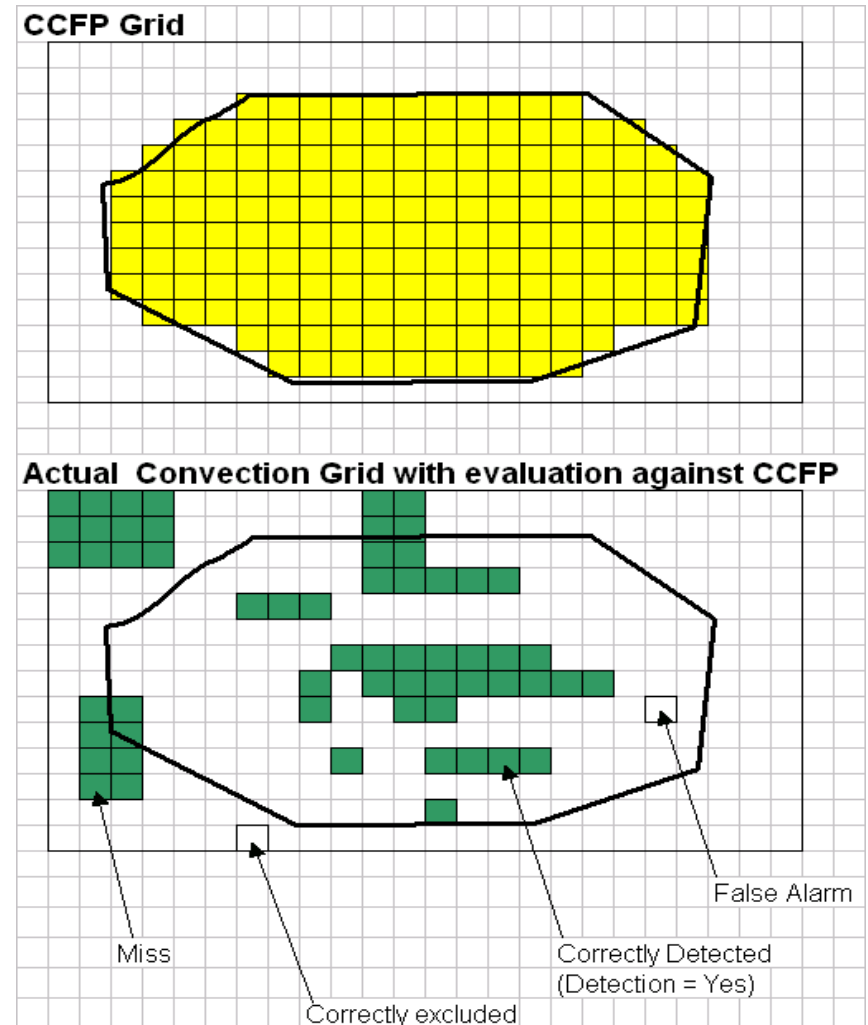
Coverage as a verification measure
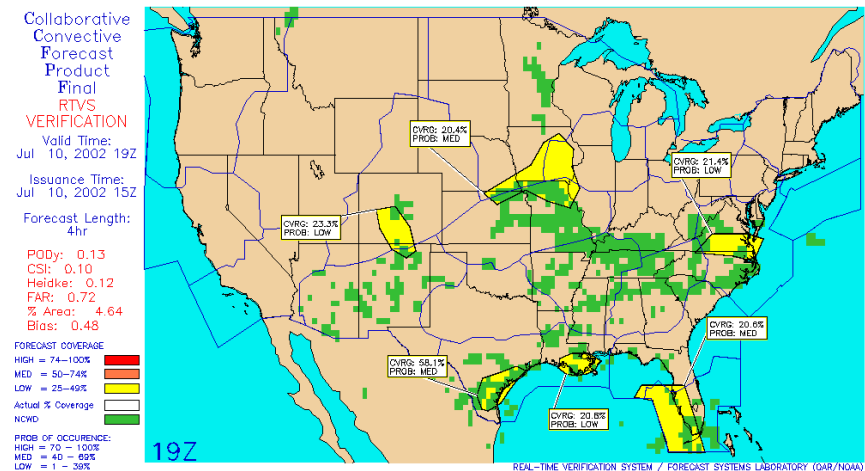
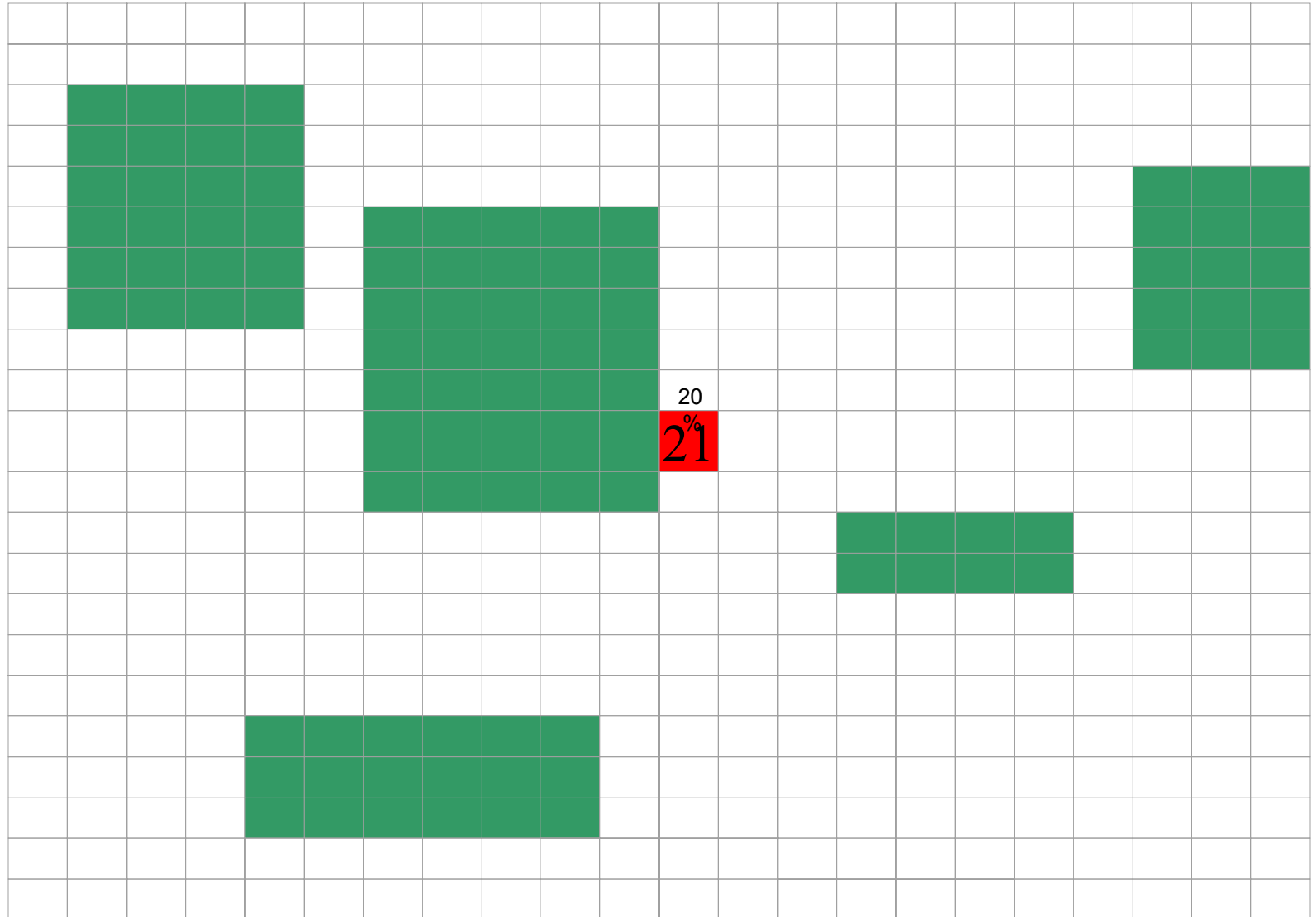Coverage alone doesn't tell you everything…

Current Verification Approach
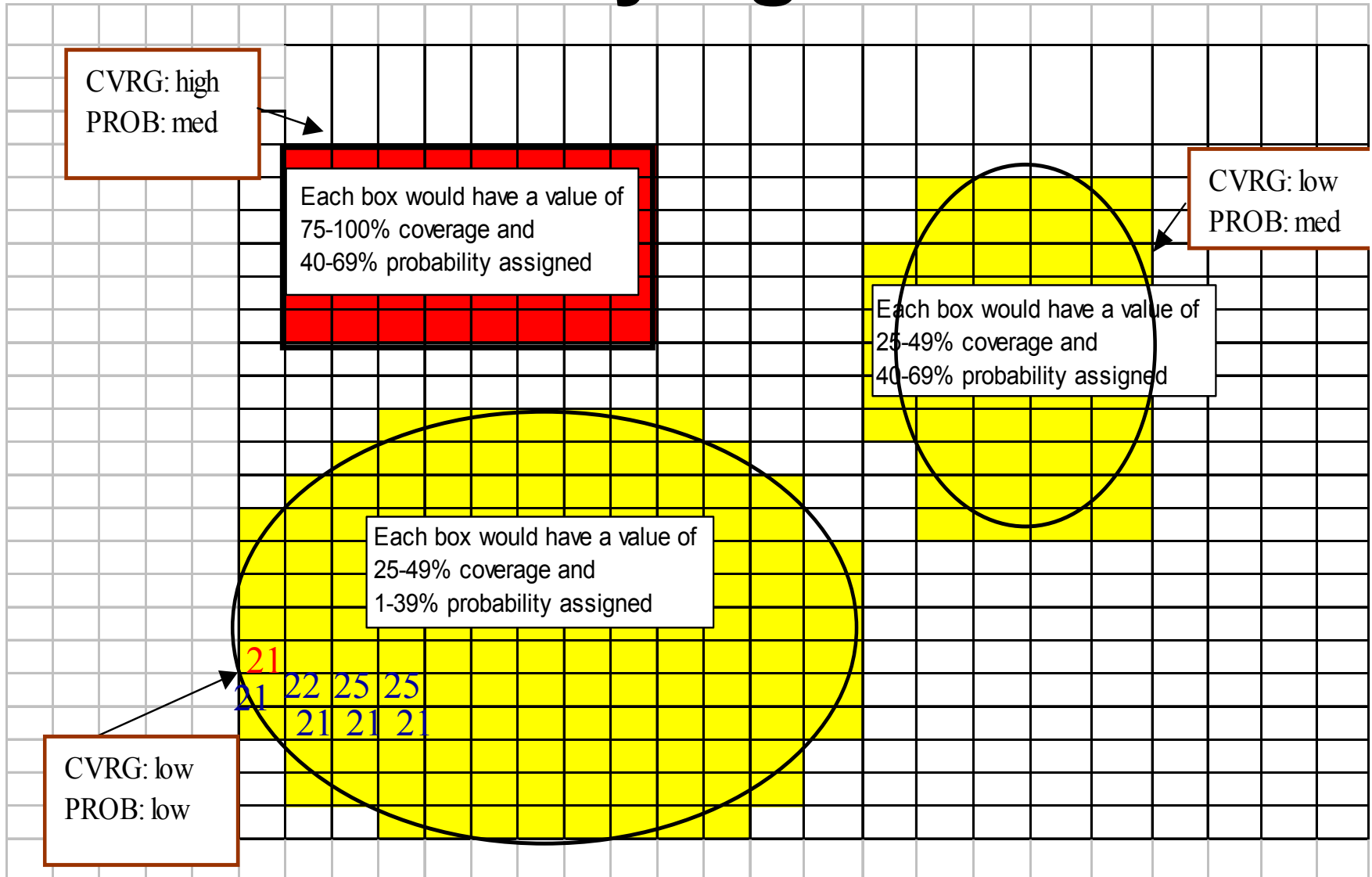
Grid-based approach

- Binary comparison

- Compare forecasts with observations
  - *Overlay forecasts and observations*
  - *Test inclusion in forecast*

- Methods consider the entire domain and sub-domains
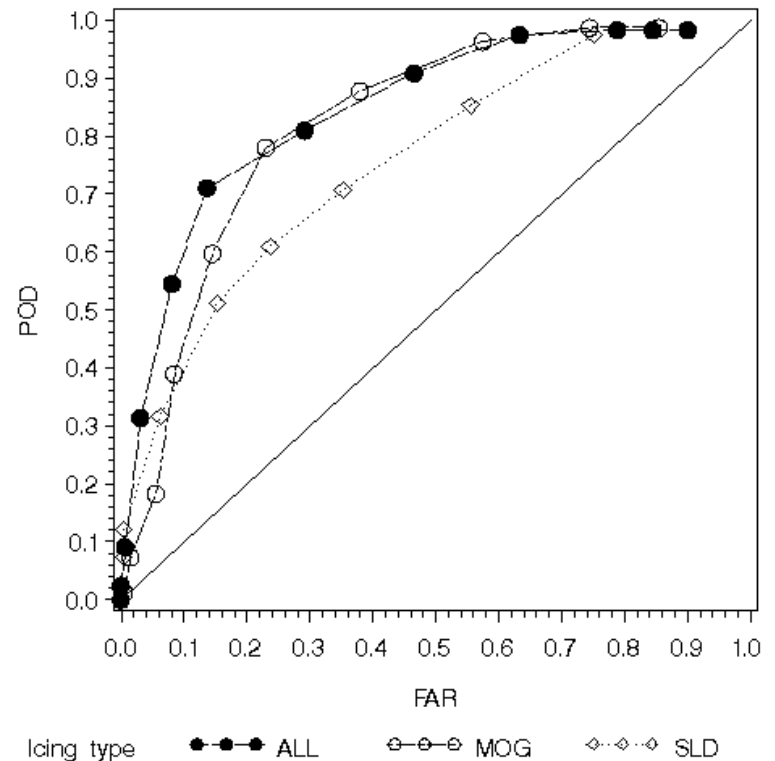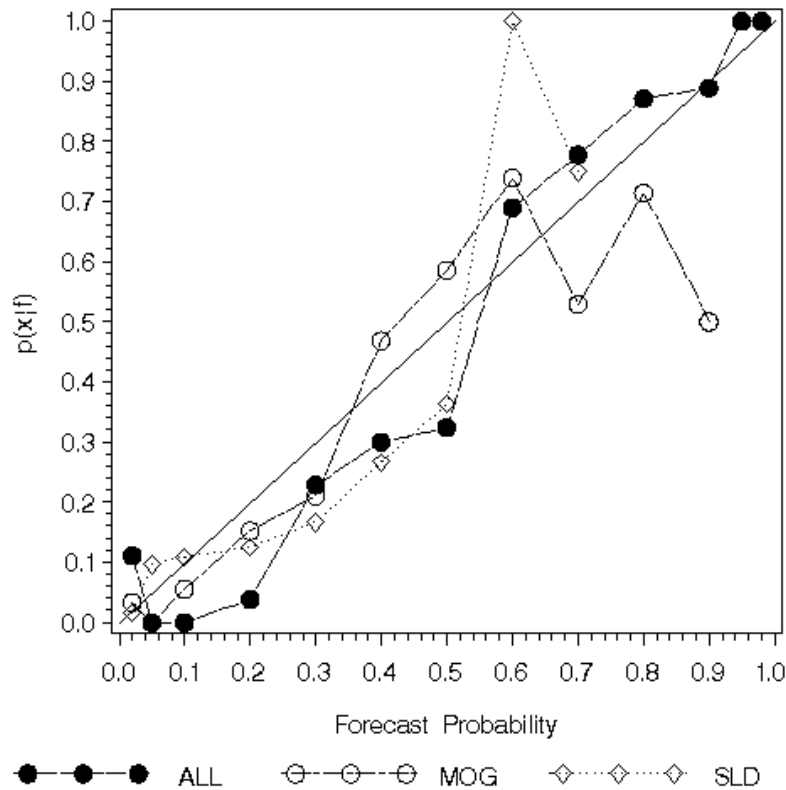
- Compute coverage separately

CCFP Grid

Actual Convection Grid with evaluation against CCFP

False Alarm

Miss

Correctly Detected
(Detection = Yes)

Correctly excluded

Observation Grid

20
%
21

Verifying Grid

CVRG: high
PROB: med

Each box would have a value of
75-100% coverage and
40-69% probability assigned

CVRG: low
PROB: med

Each box would have a value of
25-49% coverage and
40-69% probability assigned

Each box would have a value of
25-49% coverage and
1-39% probability assigned

21
21 22 25 25
21 21 21

CVRG: low
PROB: low

| Observed Coverage	Forecast Coverage											
	25-49				50-74				74-100			
	YY	YN	NY	NN	YY	YN	NY	NN	YY	YN	NY	NN
0												
10												
20	2	6										
30												
40												
50												
Etc.												

Measures of Quality

Measures of Quality

- Continue to compute standard skill scores that maintain the attributes of the forecast

- Investigate particulars of forecast attributes (e.g. number of areas issues, relationship between coverage and probability)

- Doesn't answer the "were we close" question. Need object-oriented verification approaches.

Consistency Index

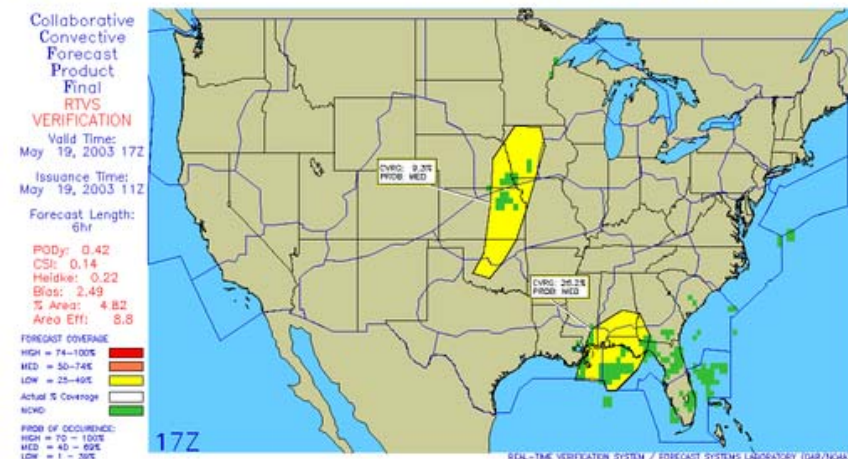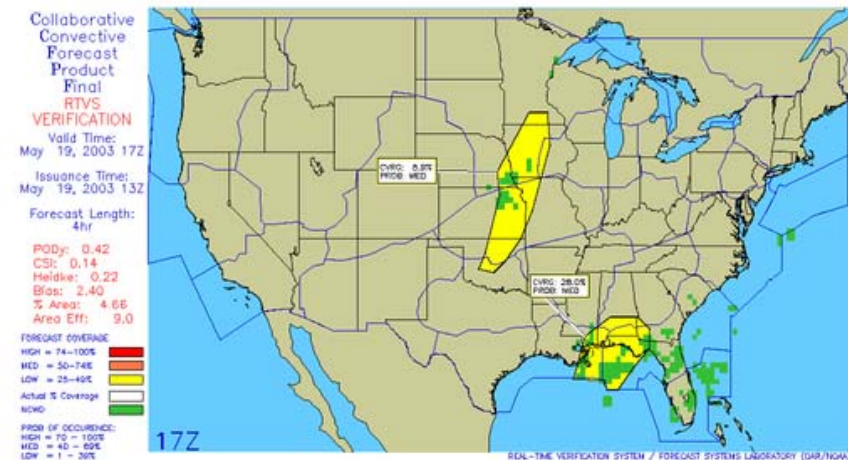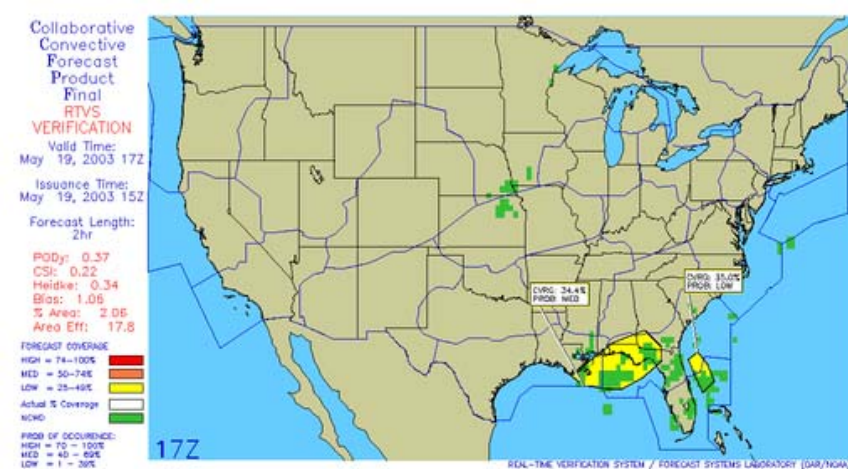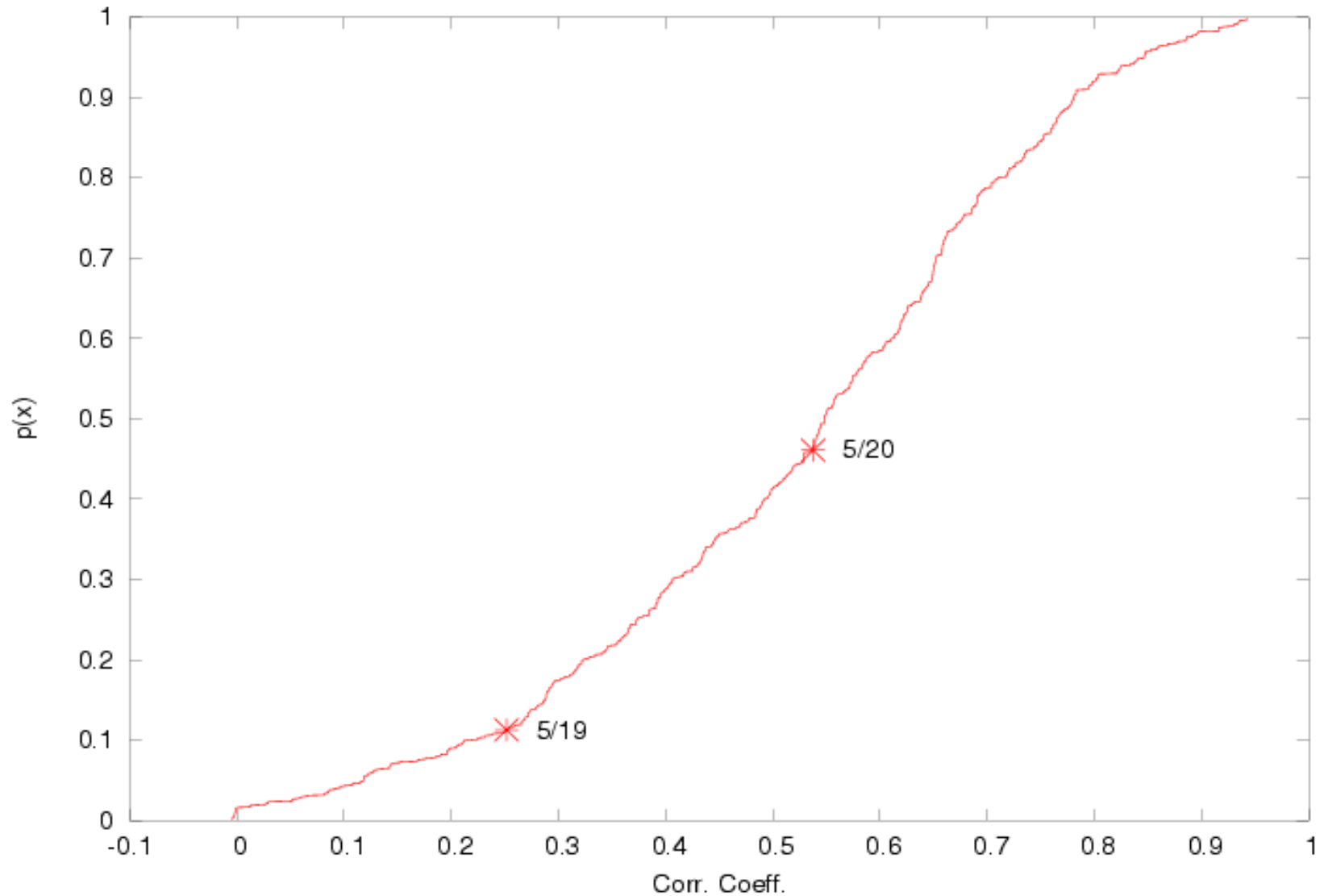Determine consistency between forecasts valid at the same time.
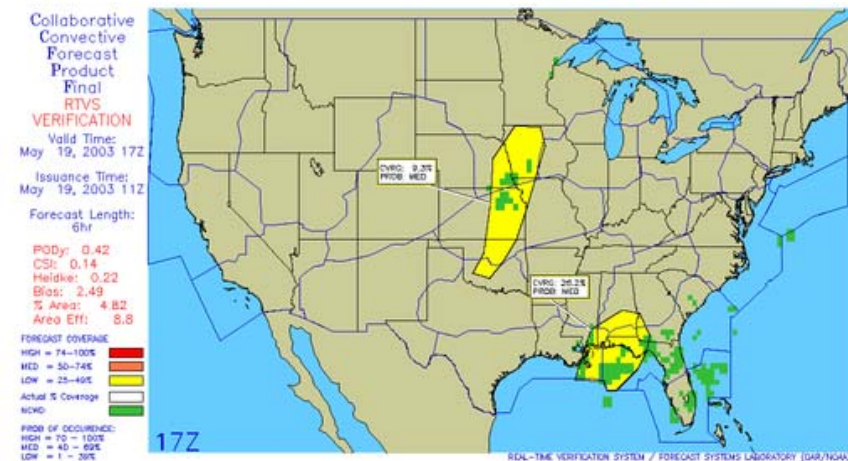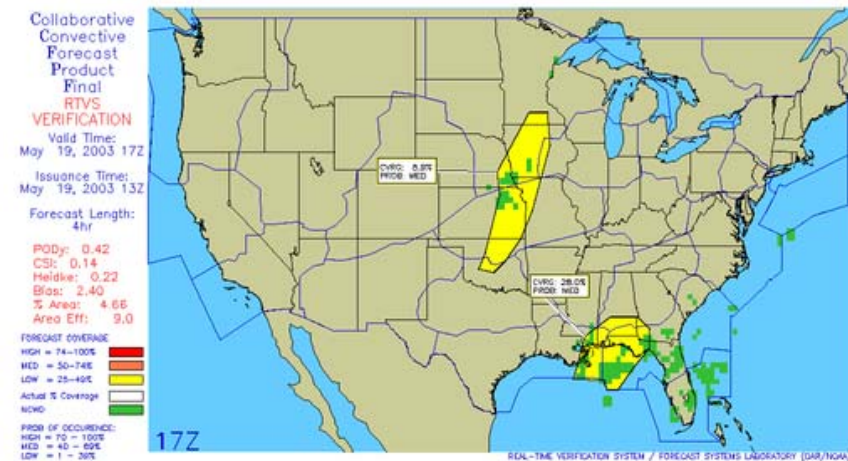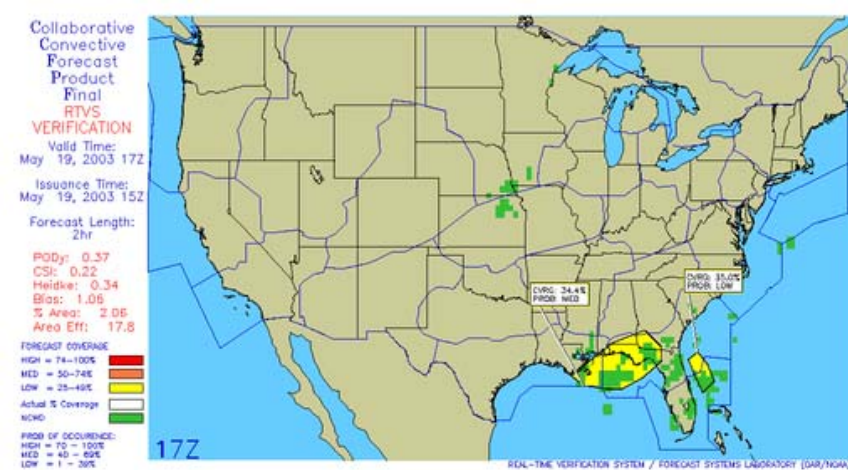
25 June 2003

Consistency Index

- Compare grid points between two forecasts

- Determine the correlation coefficient

- Develop Distribution Function

- Compare individual cases with ideal distribution to determine level of consistency.
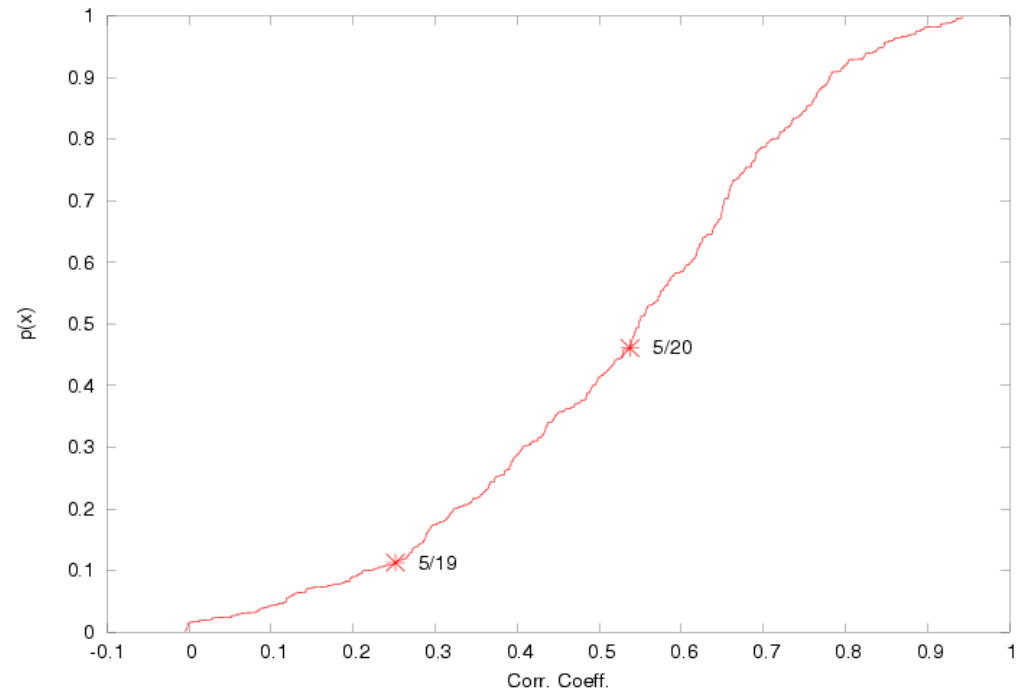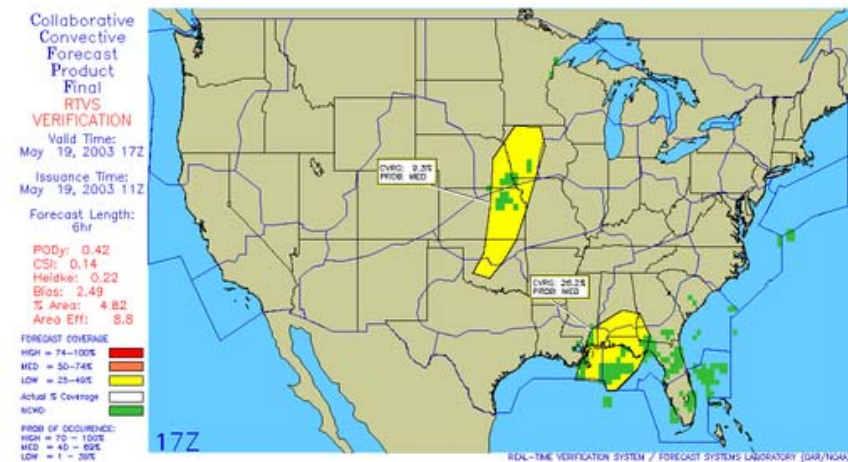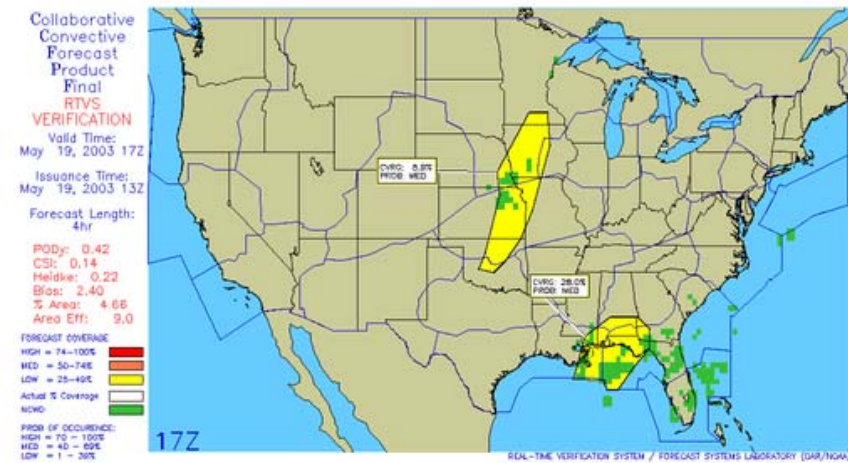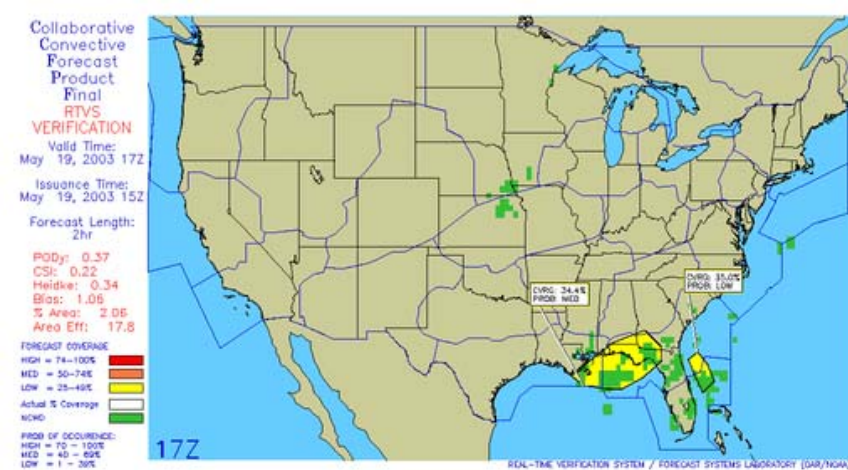
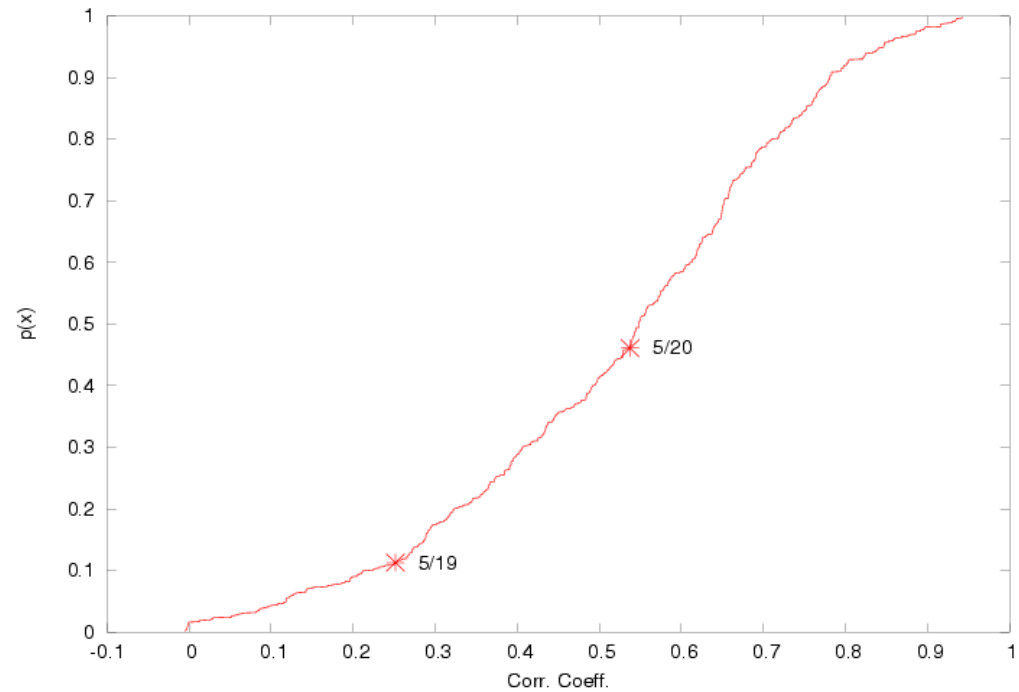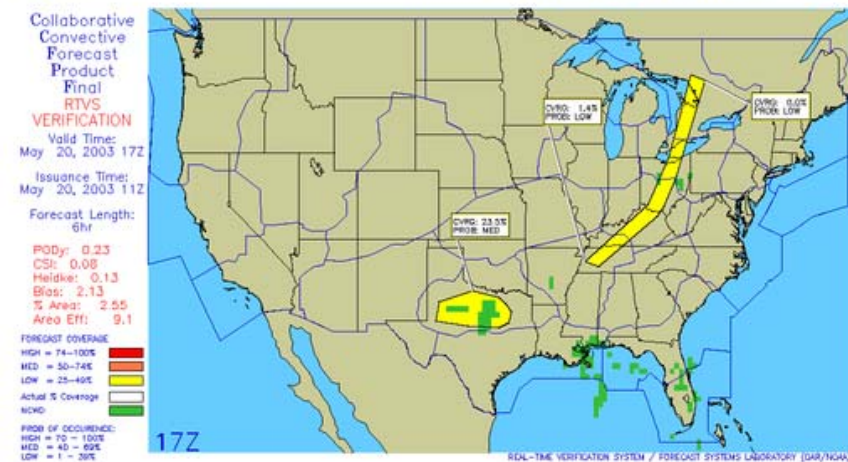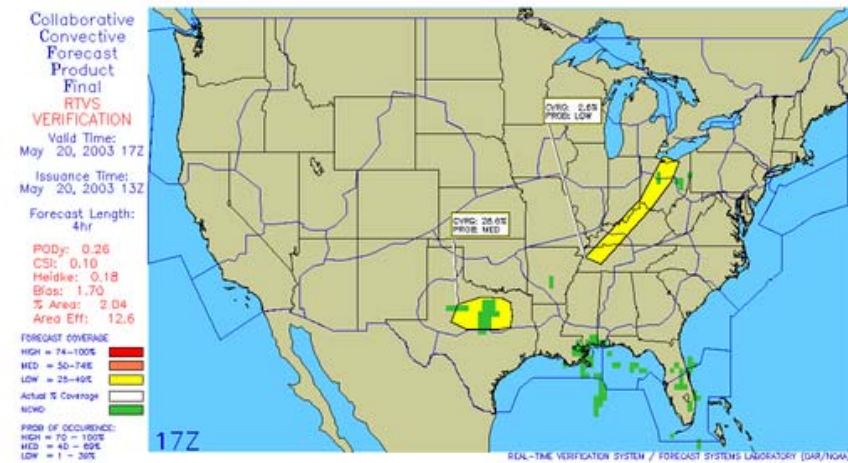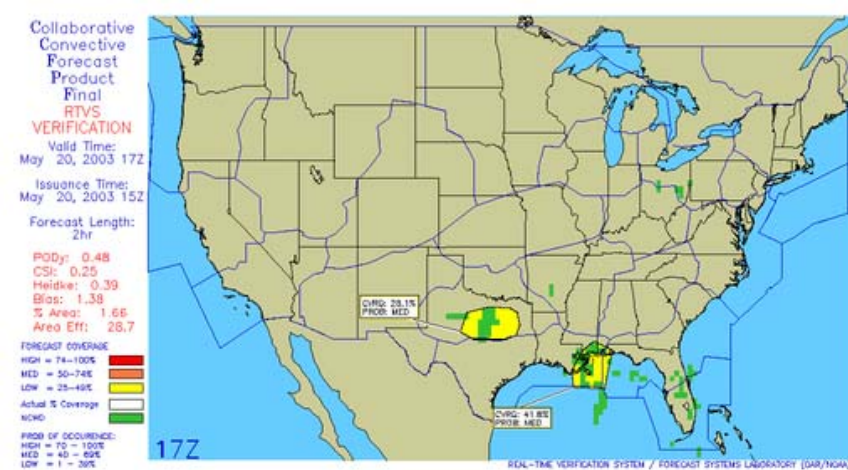25 June 2003

Distribution Function

May 19, 2003

25 June 2003

May 20, 2003

25 June 2003

Summary

- Overall results indicate that:
  - Coverage categories more accurately reflect actual coverage in '03 for short leads.
  - Overall, coverage of 6-h forecasts are less than actual coverage.
  - Probability attribute in '03 is somewhat better at 2-h lead indicating confidence in meeting forecast coverage.

- New verification methods show promise for maintaining forecast attributes and providing a measure of skill that is meaningful to the user.

Summary

- The consistency index shows promise for providing a measure of forecast consistency. This method will be tested over the next few months.

- Monthly report describing quality of forecast will be provided by end of month.