CLIMAS-CPC
Collaborative Development of an Interactive Web Tool for 3-Month Outlooks

Holly Hartmann, Ed O'Lenic, Damian Hammond, Sarah Marquardt, Michael Charles, David Unger, Sundarajan Srinivasan

- Climate Prediction Center -

- University of Arizona -

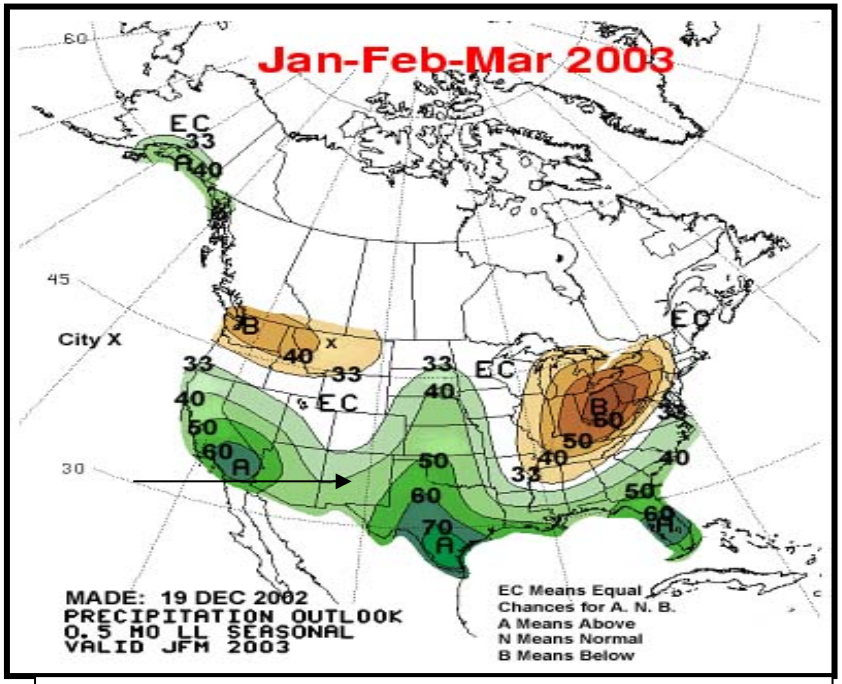
CLIMAS Climate Assessment for the Southwest | ARIZONA

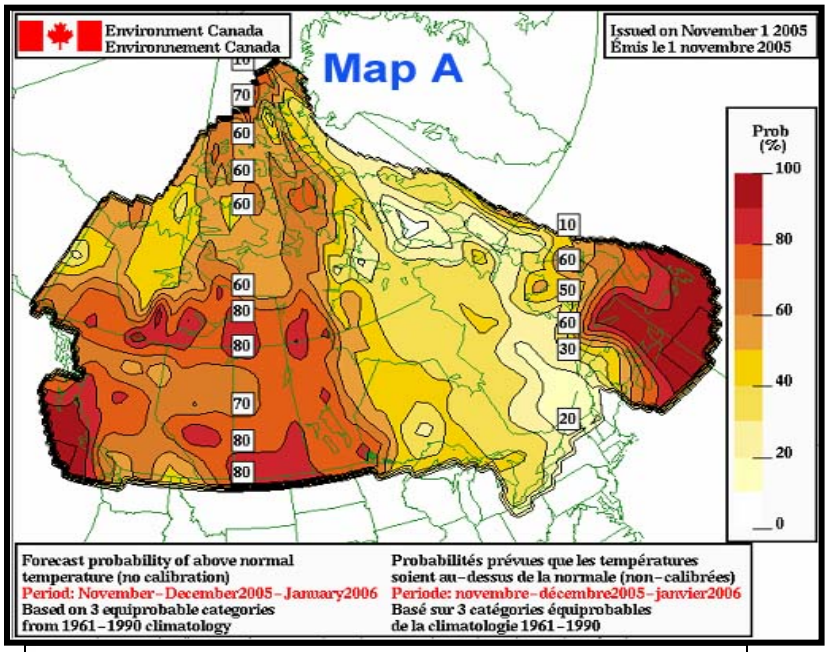
CTB

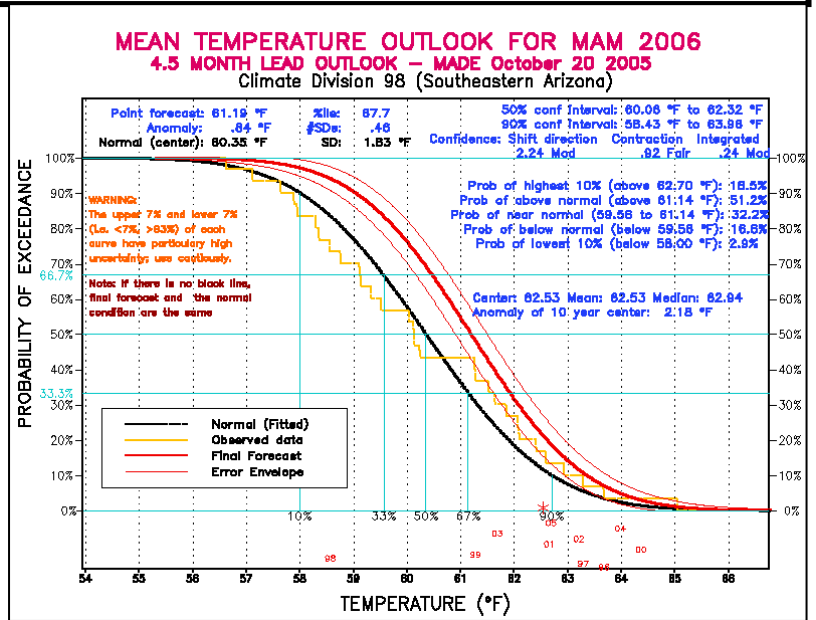
NATIONAL WEATHER SERVICE | NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

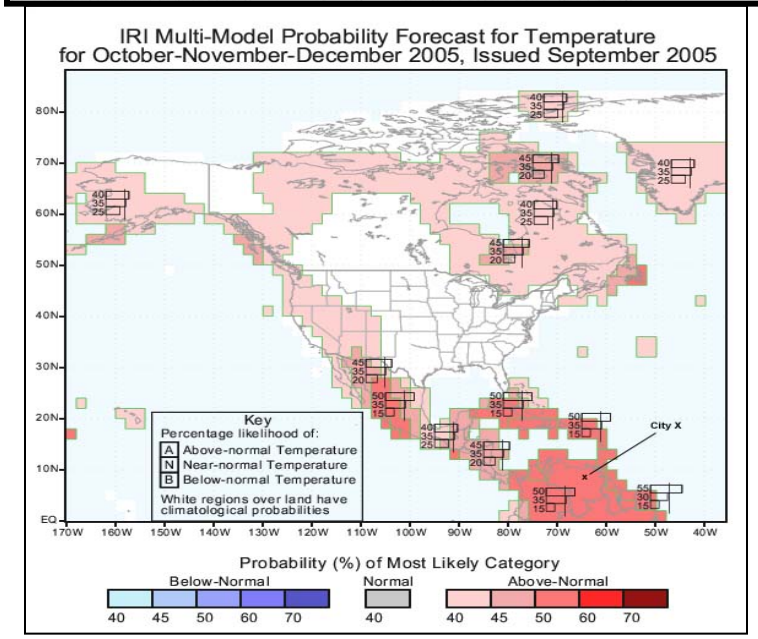
36th Annual Climate Diagnostics Workshop, Ft. Worth, Texas, 3-5 October 2011

Field-testing Forecast Formats: POE Most Problematic

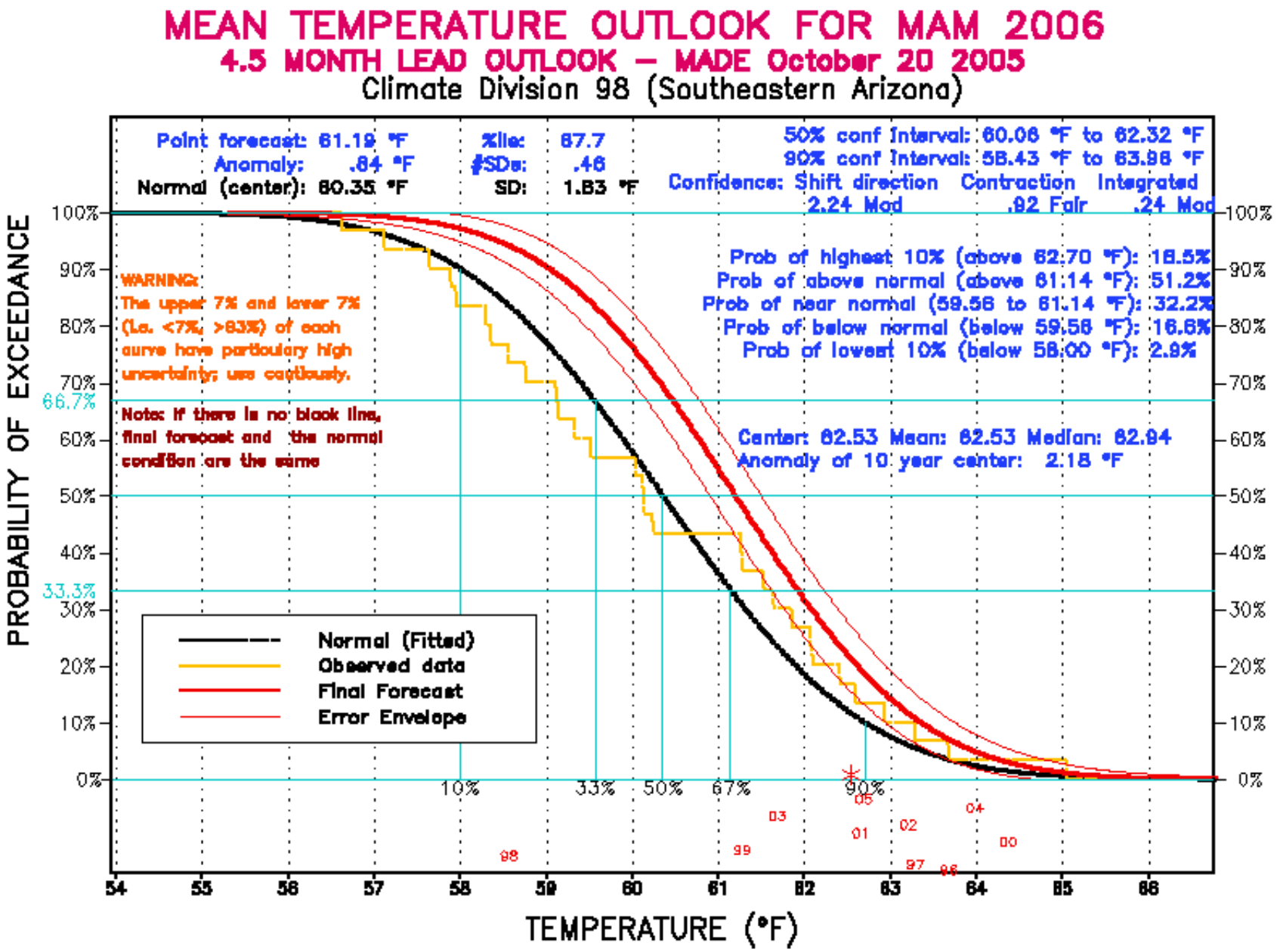




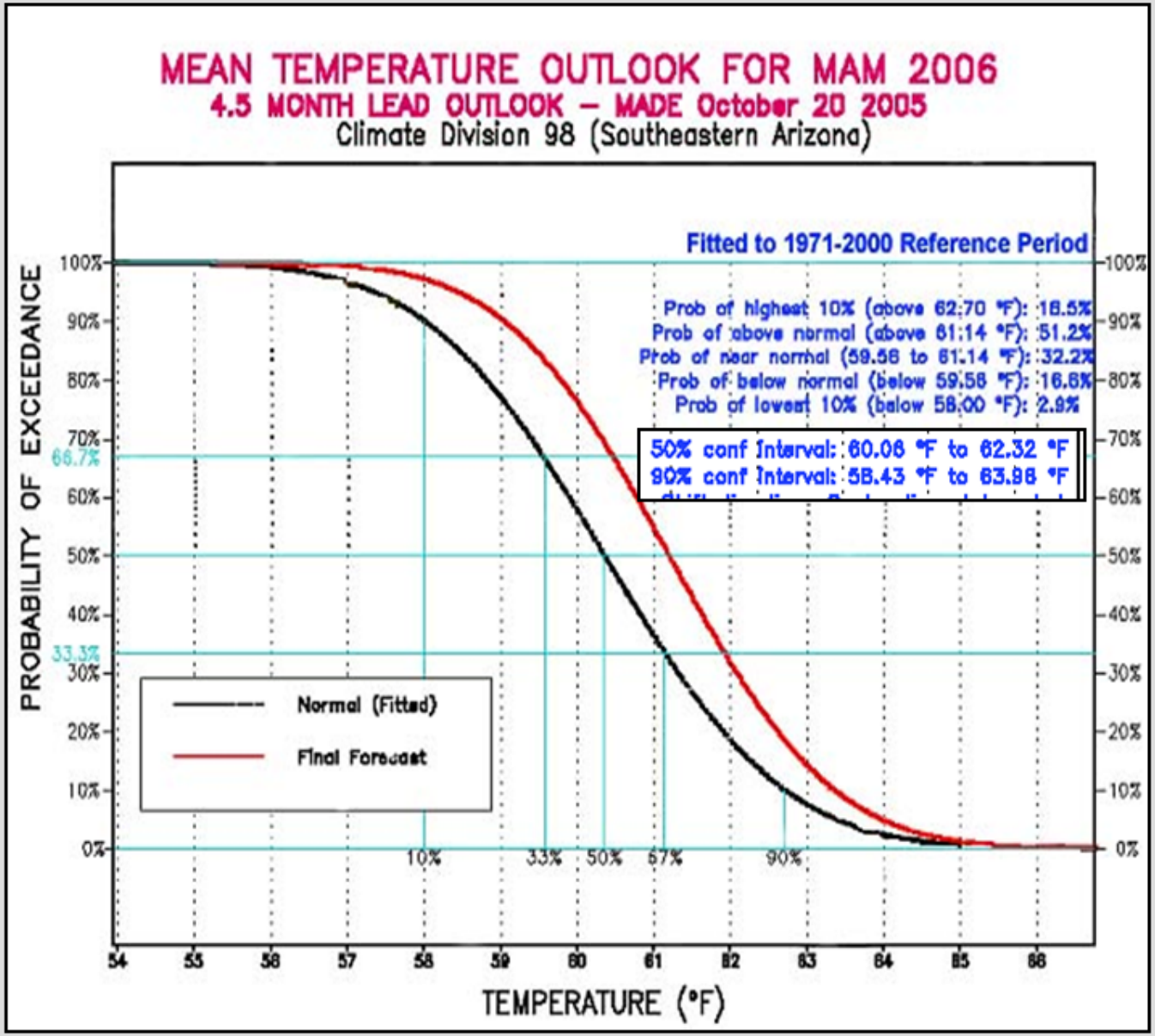




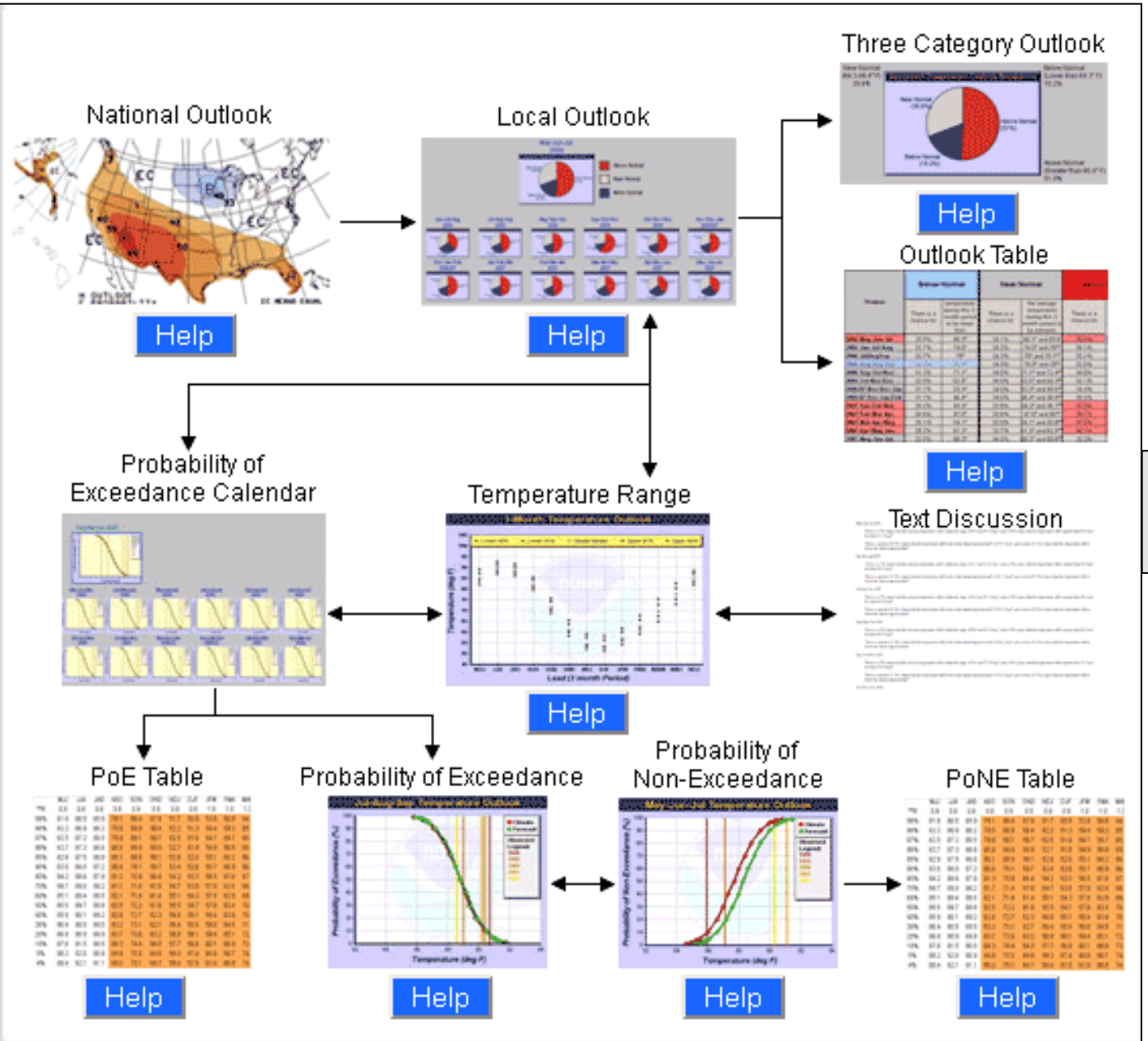
POE: Comprehensive, Complex, “Not meant for me”



Simplified POE: More Approachable, Mostly Correctly



Simplified POE: Included in Local 3-Month Outlooks



NWS Climate Services Division

Weather.gov/climate/l3mto.php

User-selected product formats

Simplified POE: Pseudo-Interactive, Limited by Policy

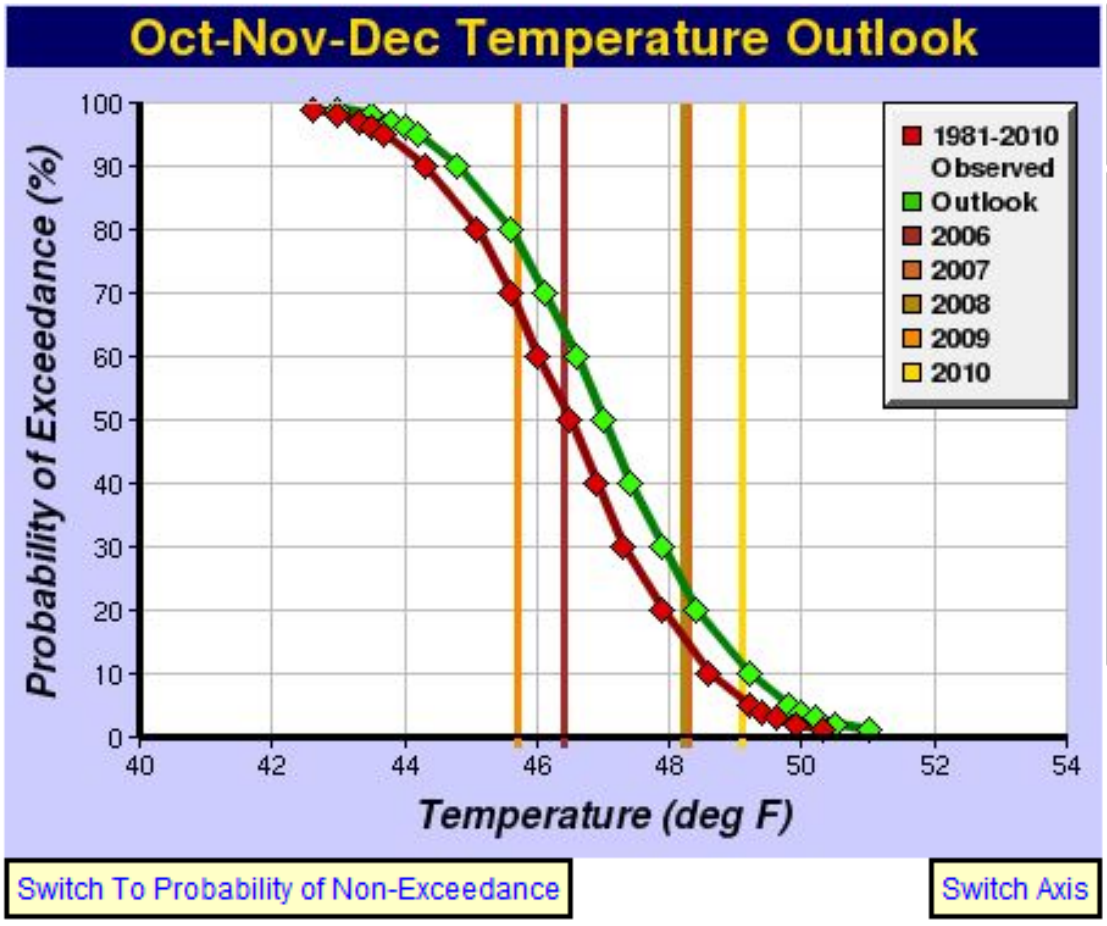
National Outlook | Local Outlook | Background Information | Questions and Feedback

ALBUQUERQUE INTL AP, NM
BERNALILLO County, Coop ID: 290234
Elevation: 5310 ft.
Latitude: 35° 2' N Longitude: 106° 36' W

NOAA Online Weather Data

Help

Probability of Exceedance Curve



Switch To Probability of Non-Exceedance

Switch Axis

Customized Confidence Interval Worksheet

If you want to be 99 % Go! Confident

You may then expect the average temperature during this 3-month period to be between **42.6** and **51.4** °F

Note: If only one POE curve is shown, the forecast is equal to 1981-2010 observed.

CLIMAS-CPC Climate Test Bed: Interactive Products

Develop & Transfer vs. Collaborative Development

- Dynamic process initiation by users
- Application software
- Data and database issues
- Security access for non-NWS collaborators
- Collaborative process and software

CLIMAS-CPC Climate Test Bed: Interactive Products

Develop & Transfer vs. Collaborative Development

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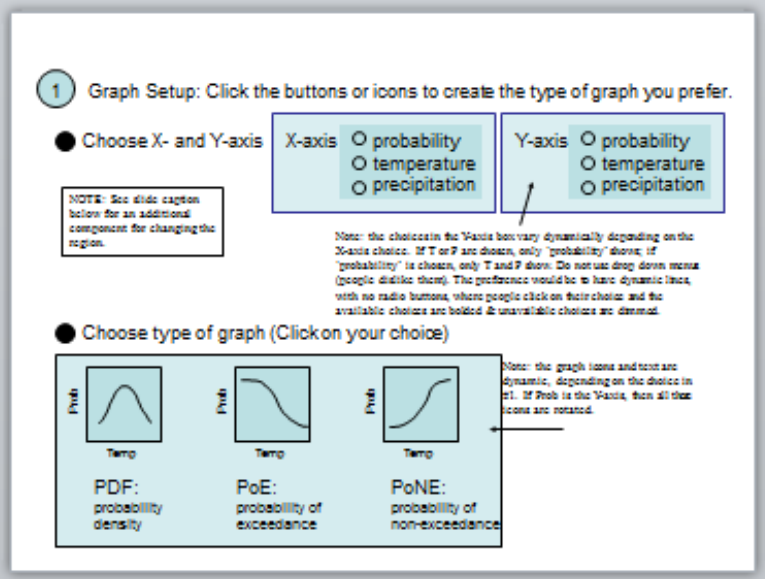
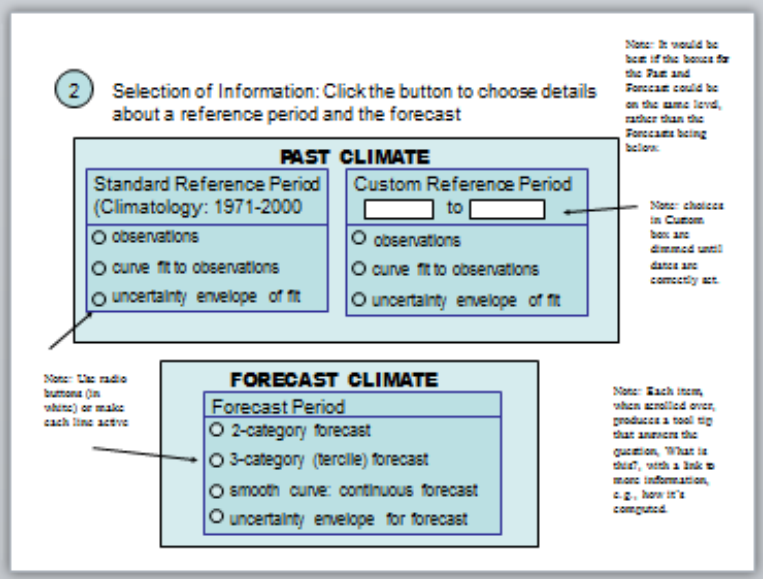
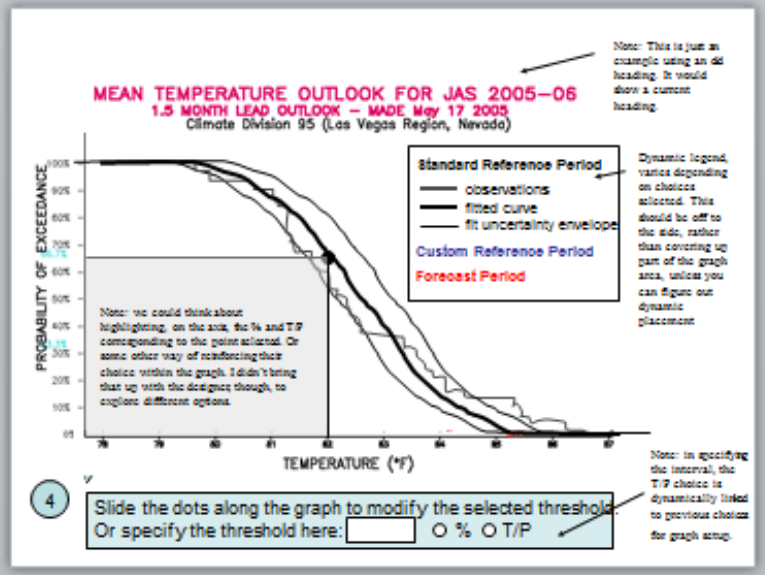
Collaborative Process

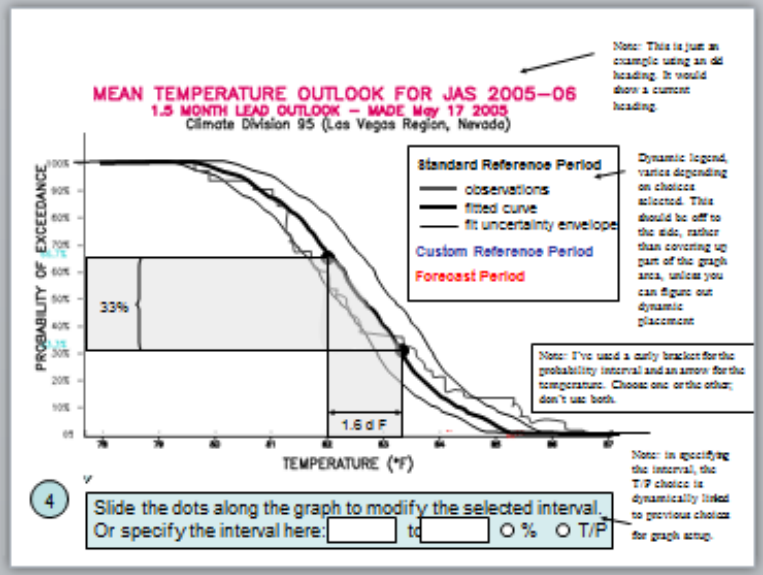
- Project planning
- Timeline and scope
- Project Wiki
- Issue and task tracking
- Version control for code
- High level design
- Code reviews

Mockup Design Based on Prior Feedback

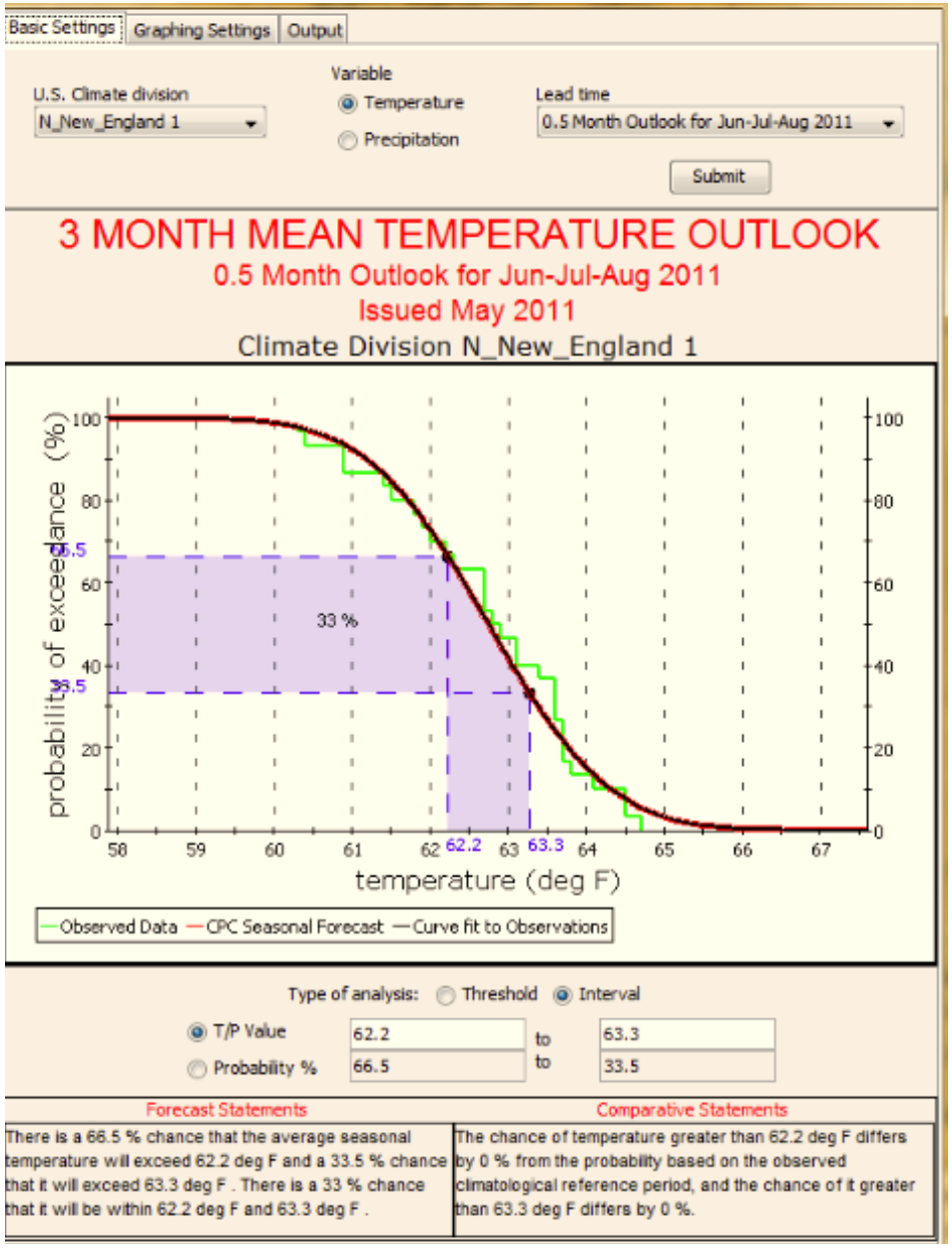


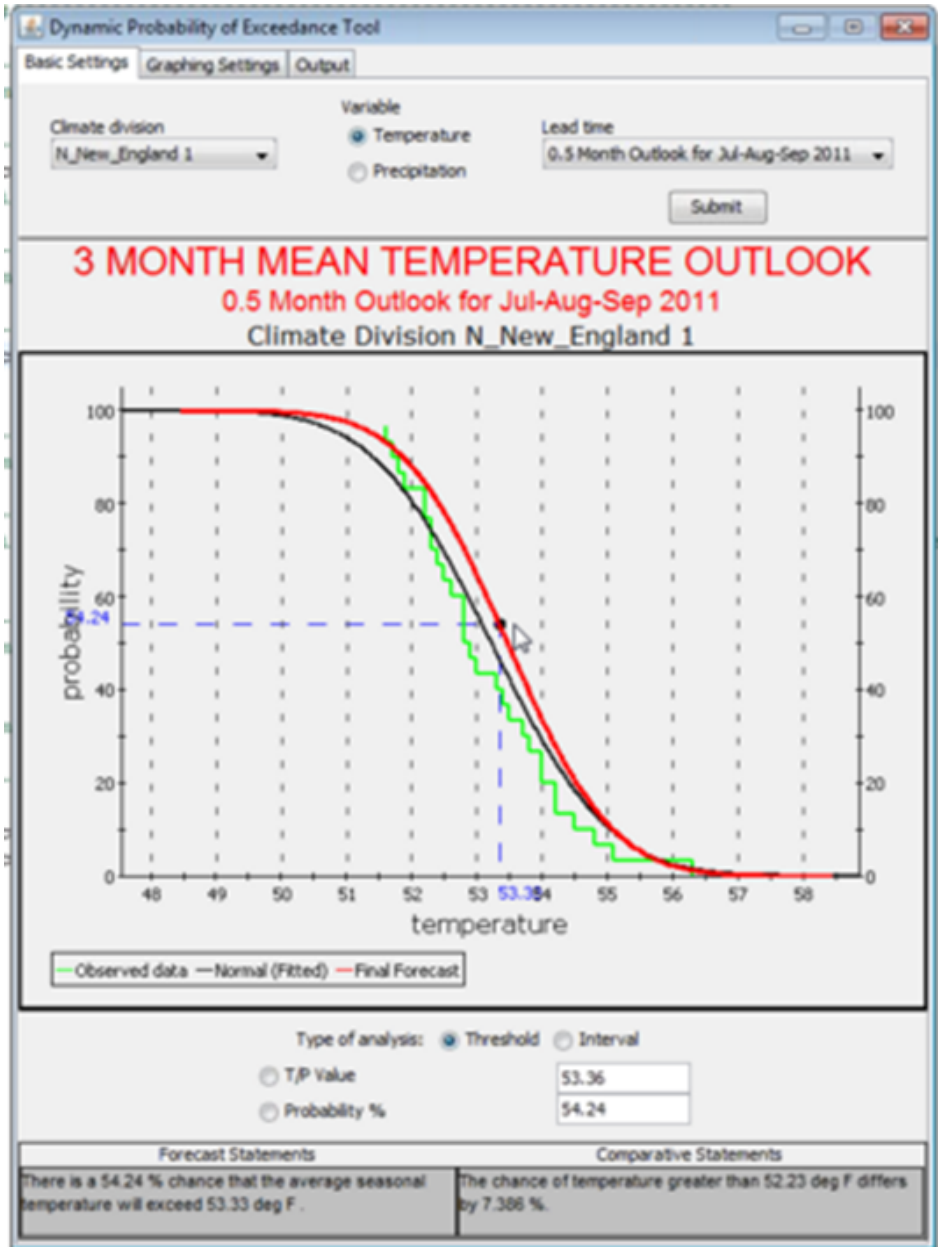






Initial Implementation





Usability Assessment

Usability Assessment Process

- NOT focus groups, NOT satisfaction surveys
- Qualitative testing of 5-7 people
- 1-on-1 meetings, ~ 1 hour
- Script: Accomplish typical tasks.
- Response: Track activity. Follow mouse!
- “Speak Aloud Protocol”

Design Insights

- Individual design preferences not reliable
- Design Principles: Quick-scan text, avoid long scrolls

Design Adjustment

Save Your Results

1 Choose your U.S. climate division

S_New_Mexico 102 View Map

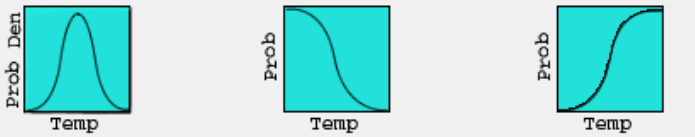
2 Choose your variable

- Temperature
- Precipitation

3 Choose your lead time

1.5 Month Outlook for Feb-Mar-Apr 2011

4 Choose the type of graph



- PDF: *probability density*
- PoE: *probability of exceedance*
- PoNE: *probability of non-exceedance*

5 Choose climate info

Past Climate	Forecast Climate
Standard Reference Period (Climatology): 1981-2010	
Historically Observed Data	CPC Seasonal Forecast
Curve fit to Observed Data	

Submit

6 Customize your graph

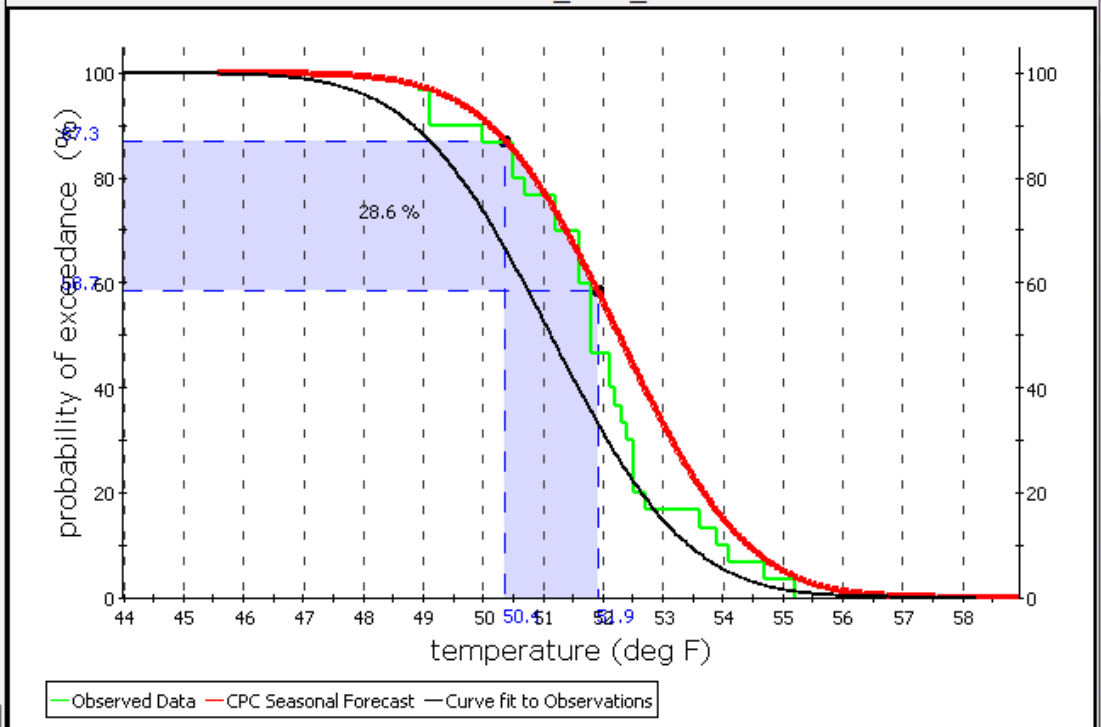
- *Interval analysis* lets you focus on information between two values
  - Select the probability (%) interval:
  - Select the variable (Temp, Precip) interval:
  - 3-category (tercile) forecast. Similar to the linked products (link1) (link2)
- *Threshold analysis* lets you focus on information above or below a single value

3 MONTH MEAN TEMPERATURE OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

Issued Dec 2010

Climate Division S_New_Mexico 102



Forecast Statements

There is a 87.3 % chance that the average seasonal temperature will exceed 50.4 deg F (the bottom third of observations from the climatological reference period, i.e. the below average category) and a 58.7 % chance that it will exceed 51.9 deg F (the middle third of observations from the climatological reference period, i.e the near average category). There is a 28.6 % chance that it will be within 50.4 deg F and 51.9 deg F .

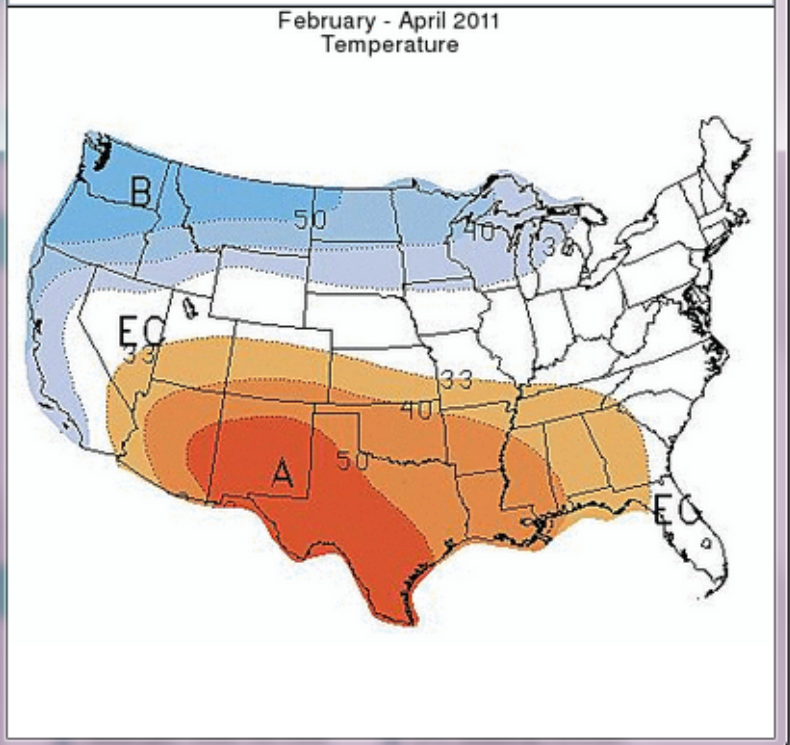
Comparative Statements

The chance of temperature greater than 50.4 deg F (the bottom third of the observations from the climatological reference period, i.e. the below average category) differs by 20.6 % from the probability based on the observed climatological reference period, and the chance of it greater than 51.9 deg F (the middle third of the observations from the climatological reference period, i.e. the near average category) differs by 25.4 %.

1 **Choose your U.S. climate division**

dec_2010_2_temp_FMA_2011_large.gif (450×375) ...

fettest.hwr.arizona.edu/fet/forecasts/temp/seasonal/2011/large/dec_2



Curve fit to Observed Data

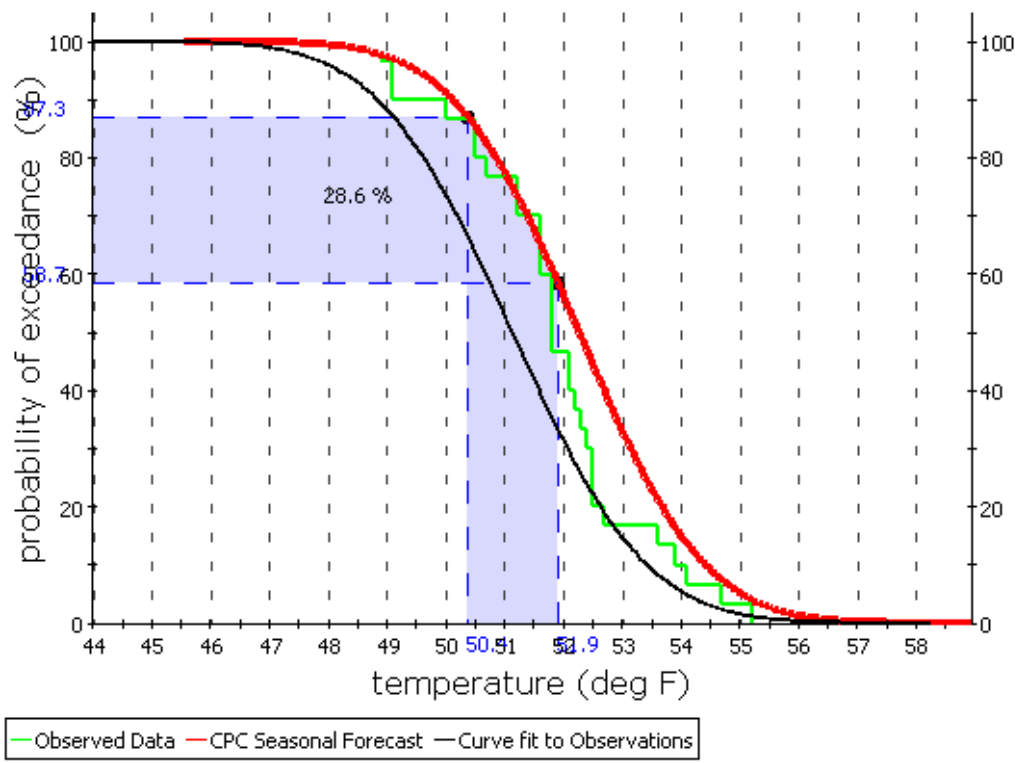
Submit

3 MONTH MEAN TEMPERATURE OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

Issued Dec 2010

Climate Division S_New_Mexico 102



6 **Customize your graph**

- *Interval analysis* lets you focus on information between two values
  - Select the probability (%) interval:
  - Select the variable (Temp, Precip) interval:
  - 3-category (tercile) forecast. Similar to the linked products (link1) (link2)
- *Threshold analysis* lets you focus on information above or below a single value

Forecast Statements

There is a 87.3 % chance that the average seasonal temperature will exceed 50.4 deg F (the bottom third of observations from the climatological reference period, i.e. the below average category) and a 58.7 % chance that it will exceed 51.9 deg F (the middle third of observations from the climatological reference period, i.e the near average category). There is a 28.6 % chance that it will be within 50.4 deg F and 51.9 deg F .

Comparative Statements

The chance of temperature greater than 50.4 deg F (the bottom third of the observations from the climatological reference period, i.e. the below average category) differs by 20.6 % from the probability based on the observed climatological reference period, and the chance of it greater than 51.9 deg F (the middle third of the observations from the climatological reference period, i.e. the near average category) differs by 25.4 %.

3 MONTH MEAN PRECIPITATION OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

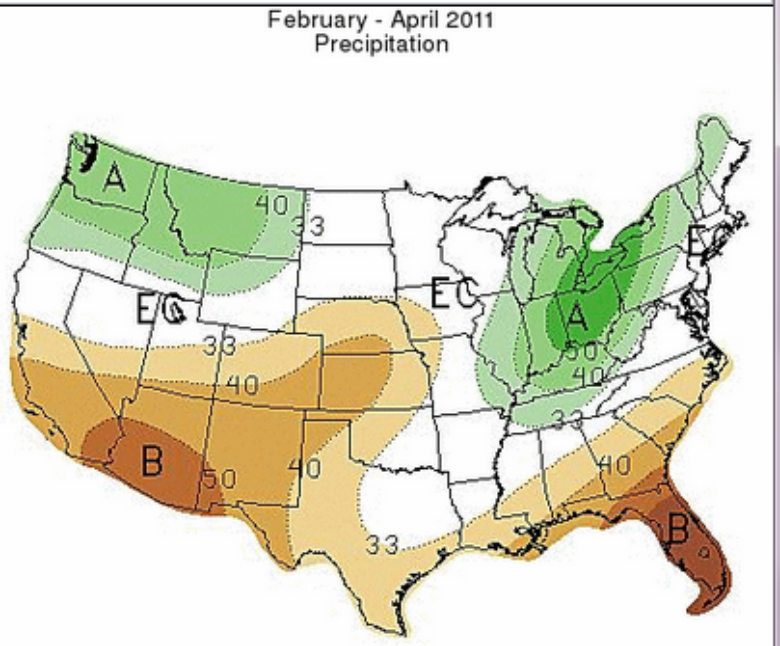
Issued Dec 2010

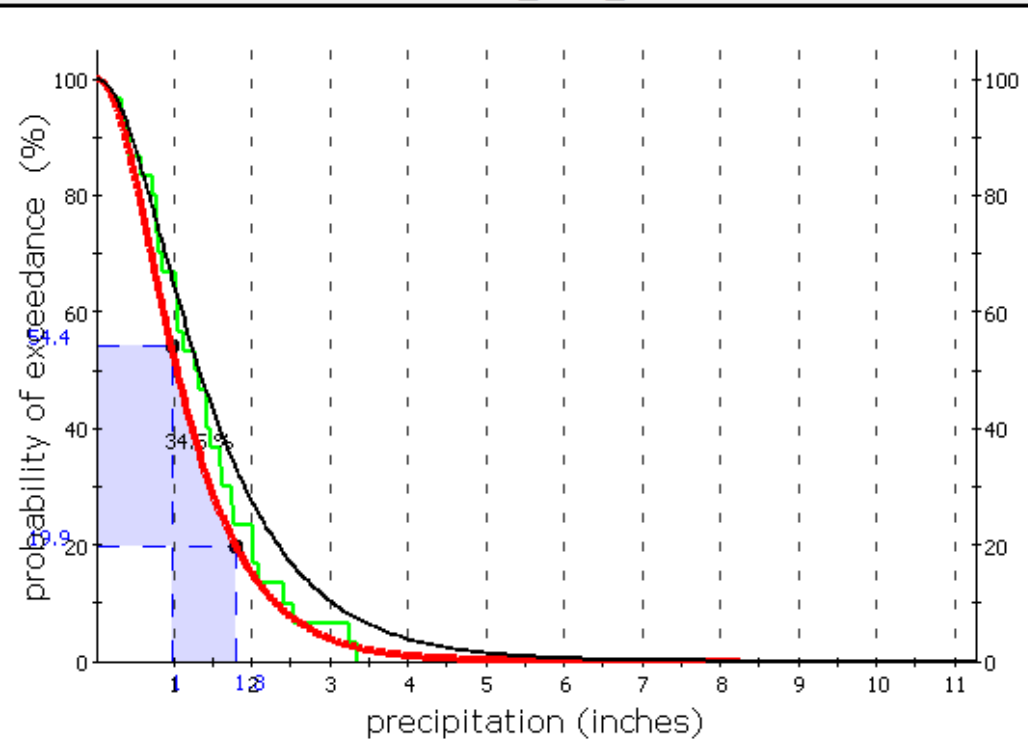
Climate Division S_New_Mexico 102

1 **Choose your U.S. climate division**

dec_2010_2_precip_FMA_2011_large.gif (450×375) ...

fettest.hwr.arizona.edu/fet/forecasts/precip/seasonal/2011/large/dec_2





Curve fit to Observed Data

Submit

6 **Customize your graph**

- *Interval analysis* lets you focus on information between two values
  - Select the probability (%) interval:
  - Select the variable (Temp, Precip) interval:
  - 3-category (tercile) forecast. Similar to the linked products (link1) (link2)
- *Threshold analysis* lets you focus on information above or below a single value

Forecast Statements

There is a 54.4 % chance that the total seasonal precipitation will exceed 1 inches (the bottom third of observations from the climatological reference period, i.e. the below median category) and a 19.9 % chance that it will exceed 1.8 inches (the middle third of observations from the climatological reference period, i.e the near median category). There is a 34.5 % chance that it will be within 1 inches and 1.8 inches .

Comparative Statements

The chance of precipitation greater than 1 inches (the bottom third of the observations from the climatological reference period, i.e. the below median category) differs by -12.3 % from the probability based on the observed climatological reference period, and the chance of it greater than 1.8 inches (the middle third of the observations from the climatological reference period, i.e. the near median category) differs by -13.5 %.

1 **Choose your U.S. climate division**

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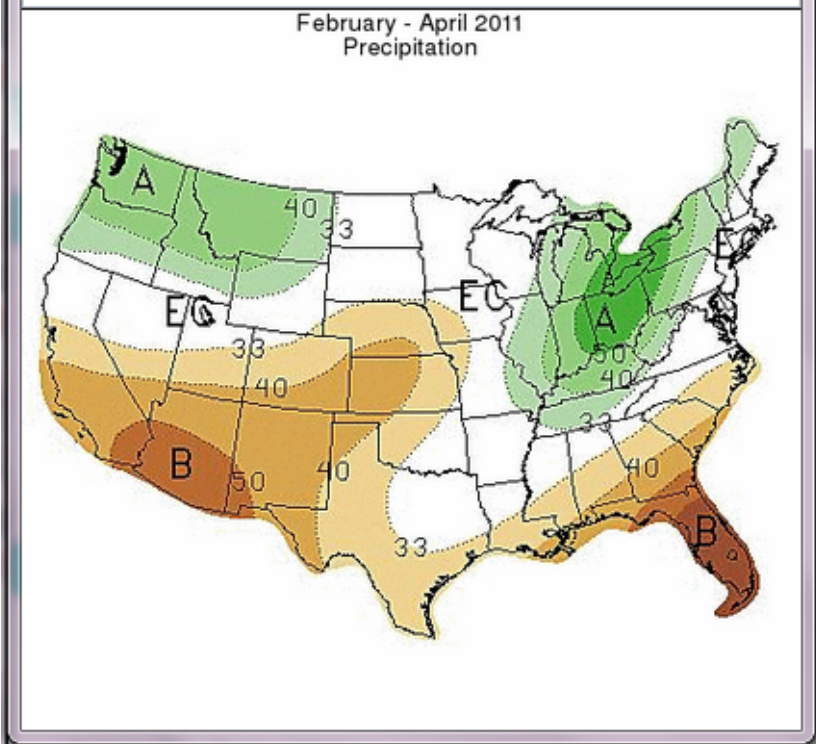
fettest.hwr.arizona.edu/fet/forecasts/precip/seasonal/2011/large/dec_2



Curve fit to Observed Data

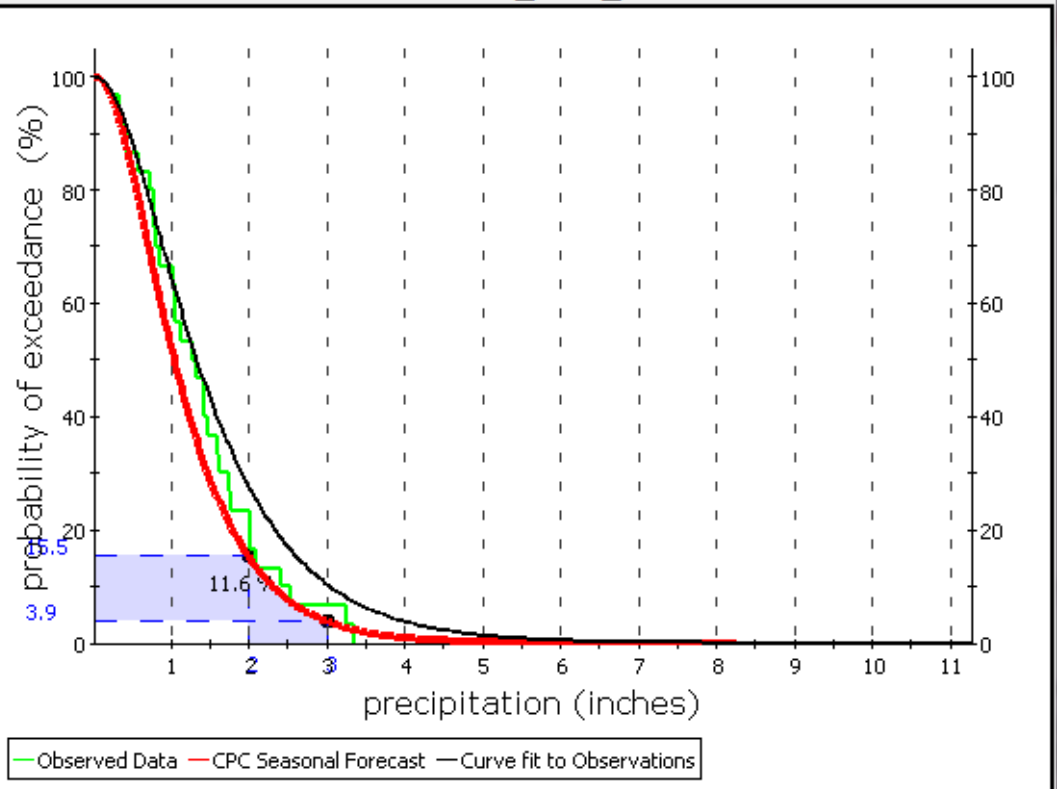
Submit

3 MONTH MEAN PRECIPITATION OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

Issued Dec 2010

Climate Division S_New_Mexico 102



6 **Customize your graph**

Interval analysis lets you focus on information between two values

Select the probability (%) interval:

Select the variable (Temp, Precip) interval:

2 to 3

3-category (tercile) forecast. Similar to the linked products (*link1*) (*link2*)

Threshold analysis lets you focus on information above or below a single value

Forecast Statements

There is a 15.5 % chance that the total seasonal precipitation will exceed 2 inches and a 3.9 % chance that it will exceed 3 inches . There is a 11.6 % chance that it will be within 2 inches and 3 inches .

Comparative Statements

The chance of precipitation greater than 2 inches differs by -12.5 % from the probability based on the observed climatological reference period, and the chance of it greater than 3 inches differs by -6.6 %.

Save Your Results

1 Choose your U.S. climate division

S_New_Mexico 102 View Map

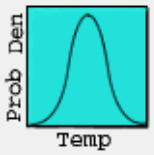
2 Choose your variable

- Temperature
- Precipitation

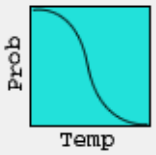
3 Choose your lead time

1.5 Month Outlook for Feb-Mar-Apr 2011

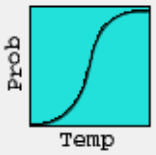
4 Choose the type of graph



PDF: *probability density*



PoE: *probability of exceedance*



PoNE: *probability of non-exceedance*

5 Choose climate info

Past Climate	Forecast Climate
Standard Reference Period (Climatology): 1981-2010	
Historically Observed Data	CPC Seasonal Forecast
Curve fit to Observed Data	

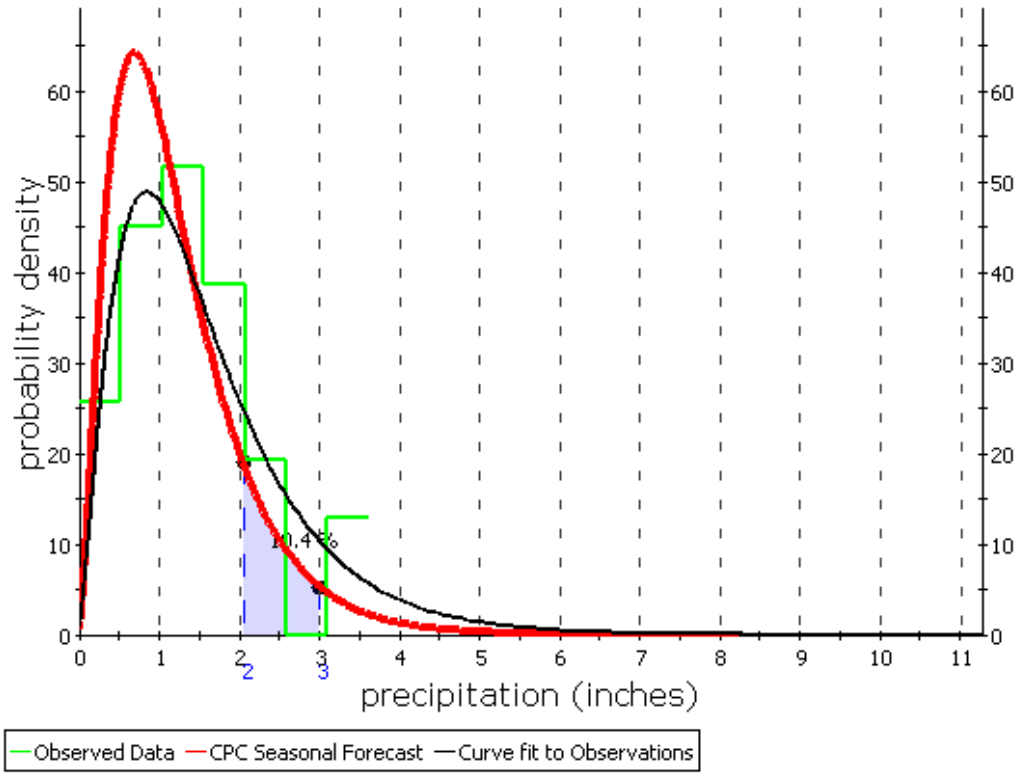
Submit

3 MONTH MEAN PRECIPITATION OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

Issued Dec 2010

Climate Division S_New_Mexico 102



6 Customize your graph

Interval analysis lets you focus on information between two values

- Select the probability (%) interval:
- Select the variable (Temp, Precip) interval: 2 to 3
- 3-category (tercile) forecast. Similar to the linked products (link1) (link2)

Forecast Statements

There is a 85.7 % chance that the total seasonal precipitation will be less than 2 inches , a 10.4 % chance it will be within 2 and 3 inches , and a 3.9 % chance it will be greater than 3 inches .

Comparative Statements

The chance of precipitation less than 2 inches differs by 12.1 % from the probability based on the observed climatological reference period, the chance of it between 2 and 3 inches differs by -5.6 %, and the chance of it greater than 3 inches differs by -6.6 %.

Save Your Results

1 Choose your U.S. climate division

S_New_Mexico 102 View Map

2 Choose your variable

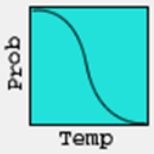
- Temperature
- Precipitation

3 Choose your lead time

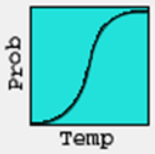
1.5 Month Outlook for Feb-Mar-Apr 2011

4 Choose the type of graph

PDF: *probability density*



PoE: *probability of exceedance*



PoNE: *probability of non-exceedance*

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Past Climate	Forecast Climate
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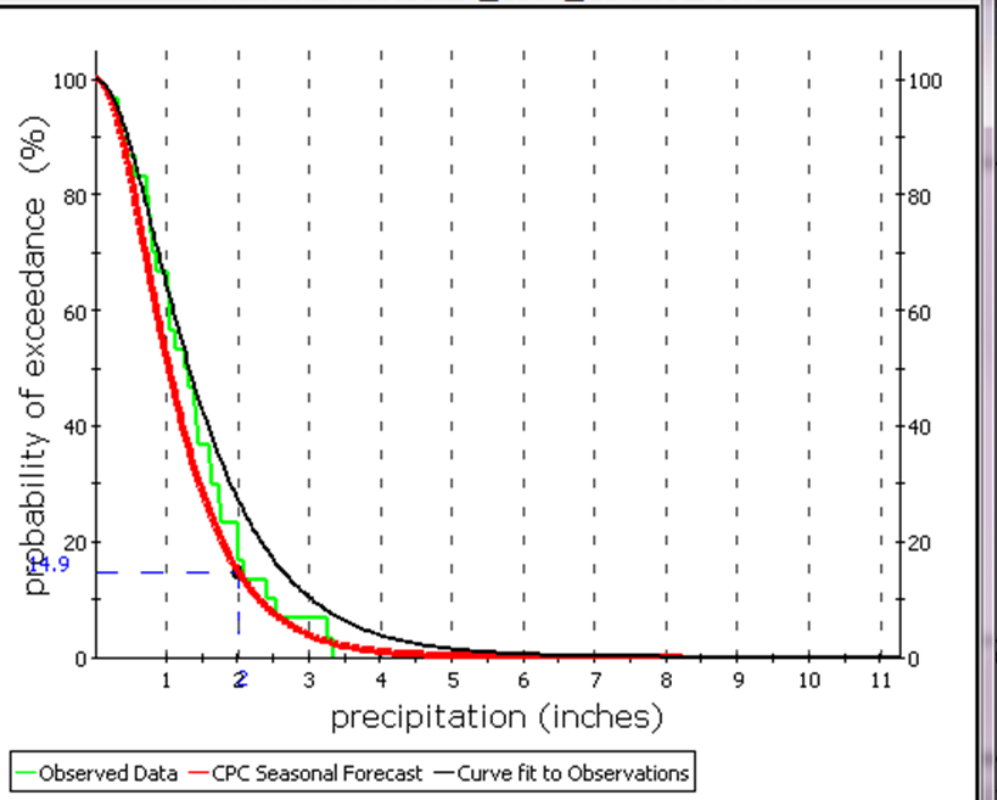


6 Customize your graph

- *Interval analysis* lets you focus on information between two values
- *Threshold analysis* lets you focus on information above or below a single value
  - Select the probability (%) threshold: 14.9
  - Select the variable (Temp, Precip) threshold:
  - 2-category (above and below median) forecast. Similar to the linked product (link)

Forecast Statements

There is a 14.9 % chance that the total seasonal precipitation will exceed 2 inches .

Comparative Statements

The chance of precipitation greater than 2 inches differs by -12.3 % from the probability based on the observed climatological reference period.

Save Your Results

1 Choose your U.S. climate division

S_New_Mexico 102 View Map

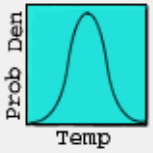
2 Choose your variable

- Temperature
- Precipitation

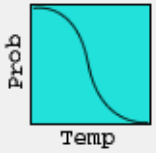
3 Choose your lead time

1.5 Month Outlook for Feb-Mar-Apr 2011

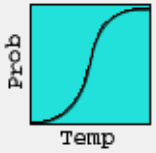
4 Choose the type of graph



PDF: *probability density*



PoE: *probability of exceedance*



PoNE: *probability of non-exceedance*

5 Choose climate info

Past Climate	Forecast Climate
Standard Reference Period (Climatology): 1981-2010	
Historically Observed Data	CPC Seasonal Forecast
Curve fit to Observed Data	

Submit

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- *Interval analysis* lets you focus on information between two values
- *Threshold analysis* lets you focus on information above or below a single value
  - Select the probability (%) threshold: 80.3
  - Select the variable (Temp, Precip) threshold:
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3 MONTH MEAN PRECIPITATION OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

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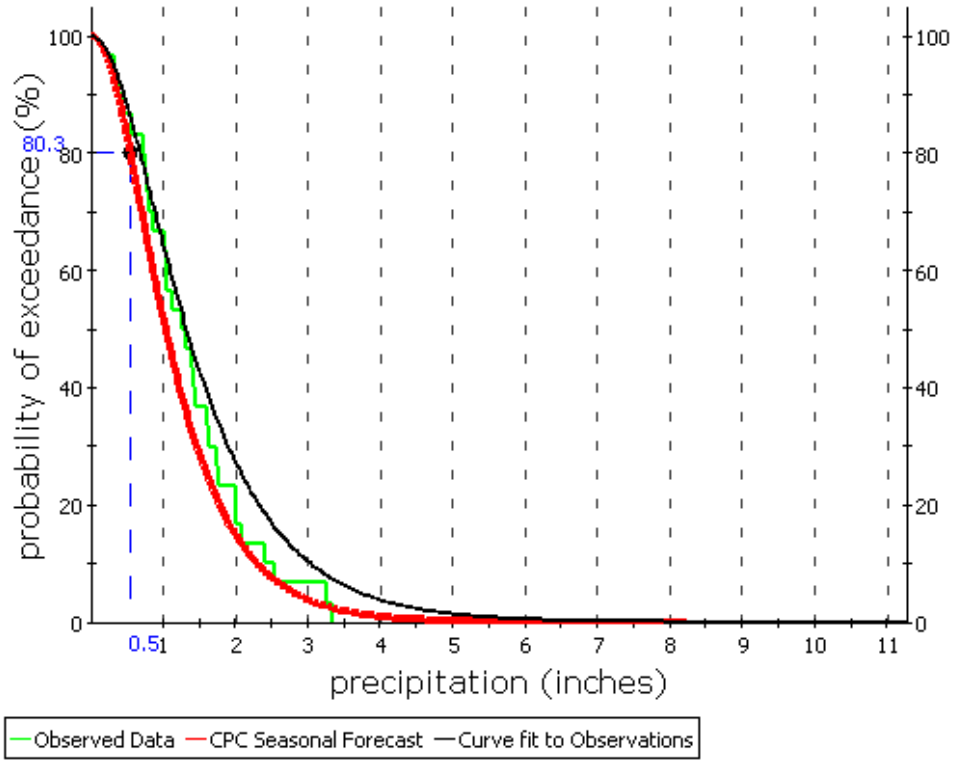


Forecast Statements

There is a 80.3 % chance that the total seasonal precipitation will exceed 0.5 inches .

Comparative Statements

The chance of precipitation greater than 0.5 inches differs by -6.1 % from the probability based on the observed climatological reference period.

Save Your Results

1 Choose your U.S. climate division

S_New_Mexico 102 View Map

2 Choose your variable

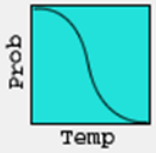
- Temperature
- Precipitation

3 Choose your lead time

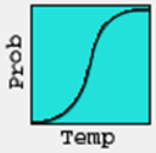
1.5 Month Outlook for Feb-Mar-Apr 2011

4 Choose the type of graph

PDF: *probability density*



PoE: *probability of exceedance*



PoNE: *probability of non-exceedance*

5 Choose climate info

Past Climate	Forecast Climate
Standard Reference Period (Climatology): 1981-2010	
Historically Observed Data	CPC Seasonal Forecast
Curve fit to Observed Data	

Submit

6 Customize your graph

Interval analysis lets you focus on information between two values

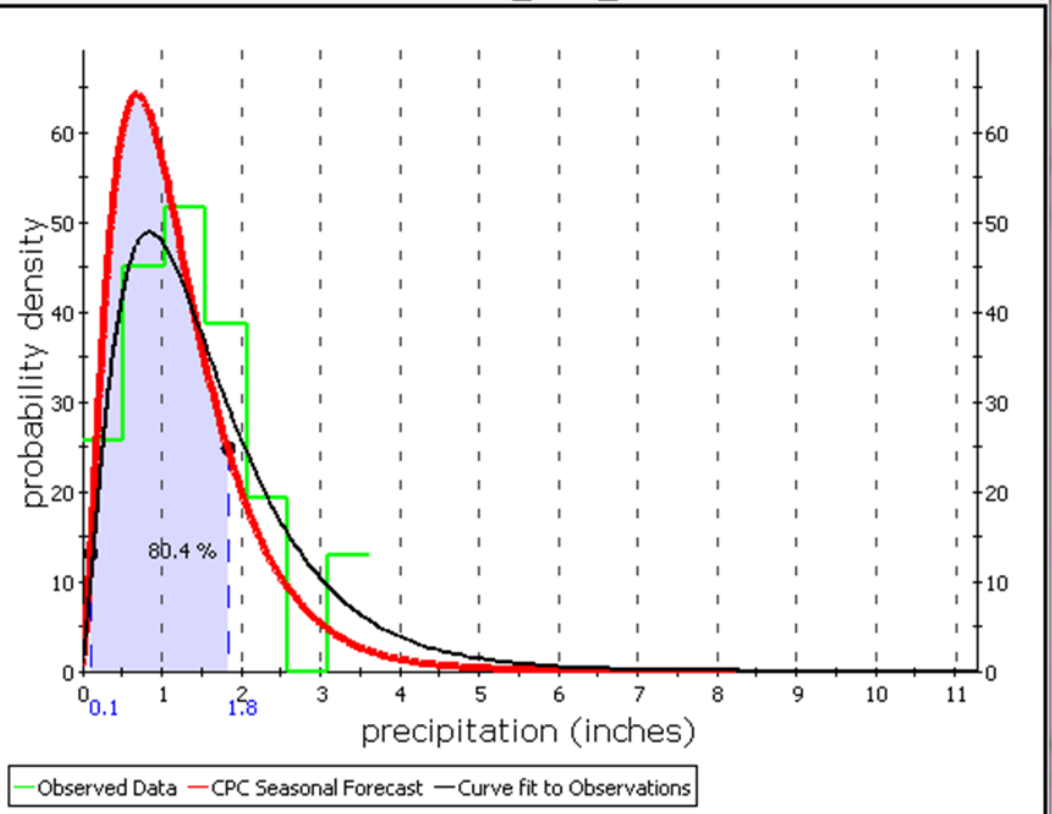
- Select the probability (%) interval:
- Select the variable (Temp, Precip) interval: 0.1 to 1.8
- 3-category (tercile) forecast. Similar to the linked products (*link1*) (*link2*)

3 MONTH MEAN PRECIPITATION OUTLOOK

1.5 Month Outlook for Feb-Mar-Apr 2011

Issued Dec 2010

Climate Division S_New_Mexico 102

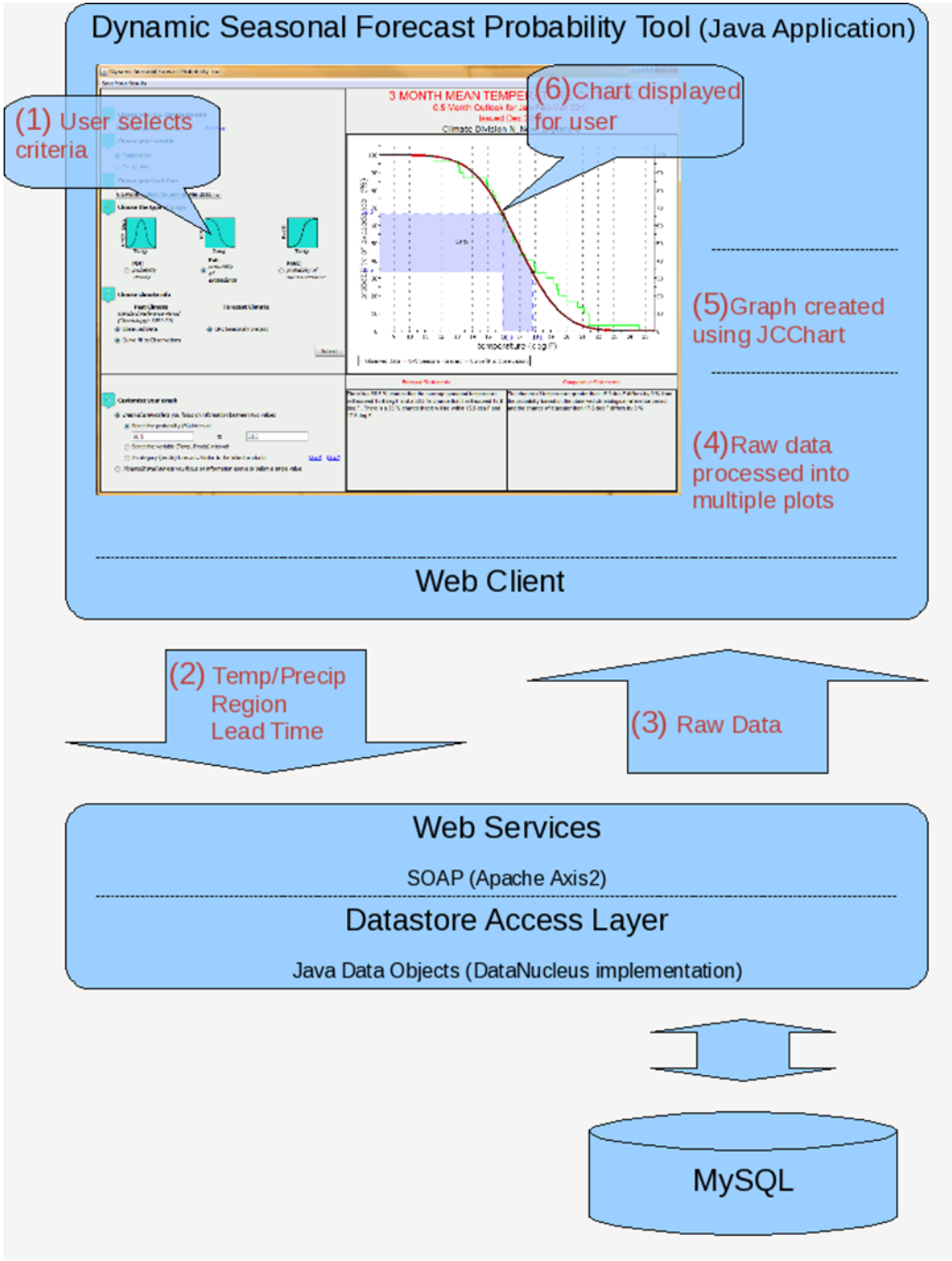


Forecast Statements

There is a 0.6 % chance that the total seasonal precipitation will be less than 0.1 inches , a 80.4 % chance it will be within 0.1 and 1.8 inches , and a 18.9 % chance it will be greater than 1.8 inches .

Comparative Statements

The chance of precipitation less than 0.1 inches differs by 0.1 % from the probability based on the observed climatological reference period, the chance of it between 0.1 and 1.8 inches differs by 13.2 %, and the chance of it greater than 1.8 inches differs by -13.3 %.

Dynamic POE Web Tool: High-Level Design

Version 0.1
www.ua-alic.com
/DynamicPOE