

Incorporating Customer Feedback in NWS Local Climate Outlook Products

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Outline

- Motivation
- New philosophy in developing NWS local forecast product
- Multi-tiered approach in responding customers' needs
- Lessons learned

Motivation – Lessons learned

➤ CPASW past meetings:

- Numerous customers from different sectors are using seasonal climate forecast products
- Need for local (site specific) climate forecast product

➤ CFI (2004) survey:

- Clarity of NWS Three Month Outlooks presentation does not quite satisfy customers' expectations

➤ RISAs. Barriers (Hartmann et al, 2002) in climate forecast use that NWS should break:

- Misinterpretation of the forecast content and its potential usability;
- Confusing and inconsistent language in the forecast product presentation; and,
- Lack of long-term forecast evaluation information

New Philosophy in Developing NWS Local Forecast Products

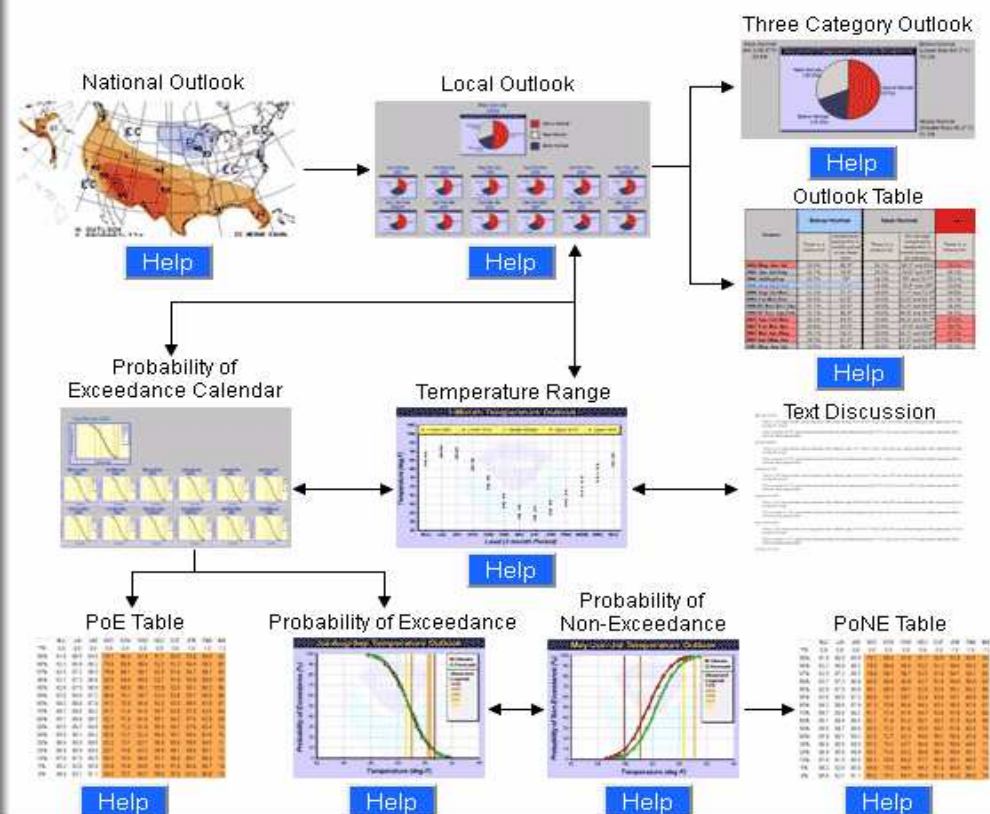
- **Product requirements:**
 - Scientifically Sound: reliable data source, forecast procedure, independency of multiple forecast tests
 - Operationally Efficient: minimal staff production, trained staff, and outreach materials in place
 - Customer Friendly: multiple product formats, intuitive navigation and consistency in text interpretation
- **Customer feedback collection and analysis**
 - Tier 1: Prototype stage
 - Tier 2: Experimental stage
 - Tier 3: Operational stage

Local 3 Month Temperature Outlook

Three-Month Temperature Outlook (Issued: March 2007)

National Outlook Local Outlook Background Information Questions and Feedback

The Local Three-Month Temperature Outlook is presented in a variety of formats. Each site-specific outlook is provided in graphical, tabular, and text formats for thirteen forecast leads, from 0.5 months to 12.5 months. Access to current outlooks is provided using small icons below. Additionally, a Help button is available for each product component and a Product Description Document is available through the NWS National Catalogue of New or Enhanced Products. A detailed Users Guide is also available which describes the web pages and features of the outlook along with a Climate Glossary of terms used.



<http://www.weather.gov/climate/l3mto.php>

- Drill down maps and plots
- Search engine
- Navigating options
- Selection of desired space and time information
- Multi-featured product presentation:
 - Numerous components of different complexity outlook product (for different user categories),
 - Background information including tutorials on product interpretation and development,
 - Long term forecast performance evaluation,
 - Feedback collection option

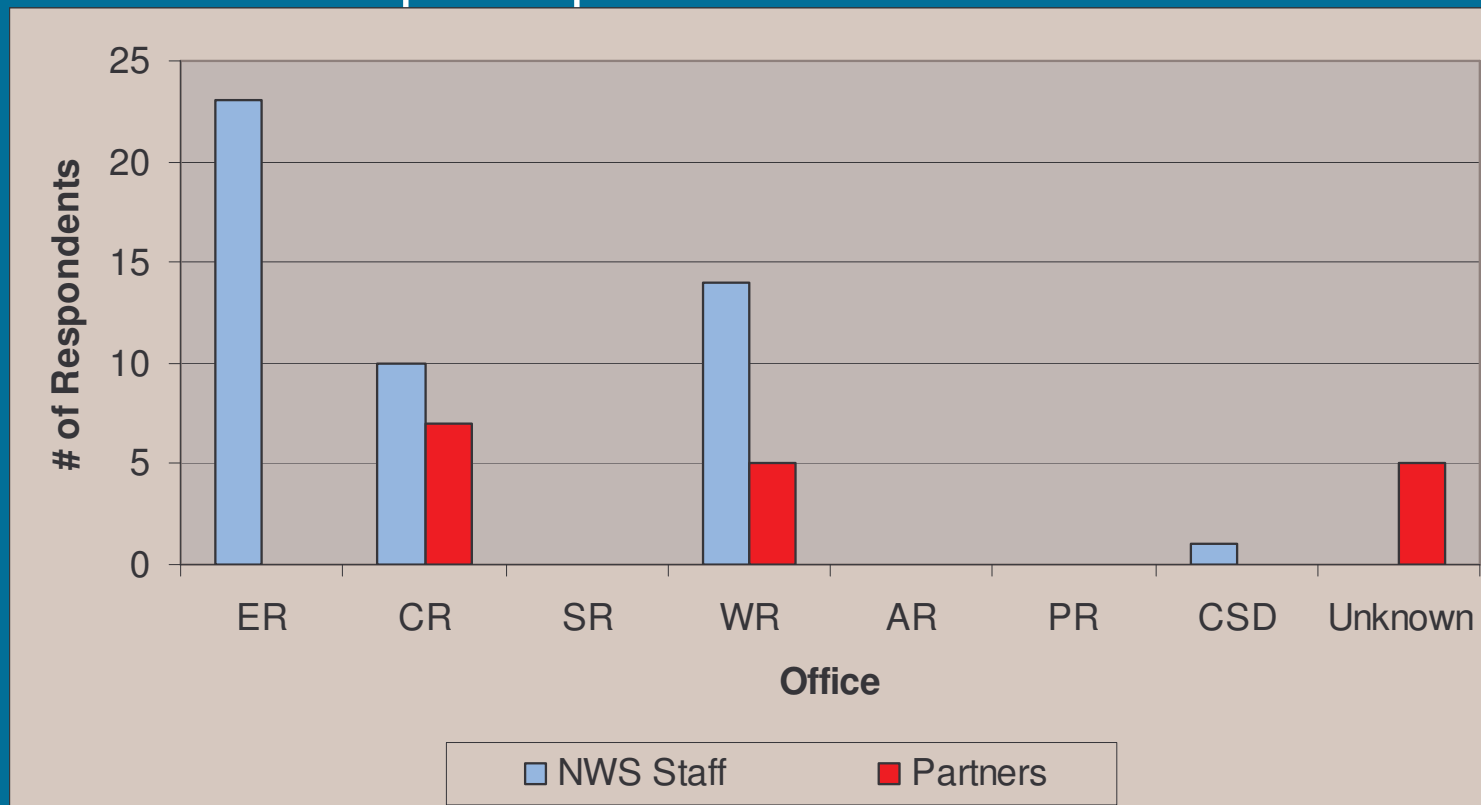
Tier 1 Customer Feedback

The Questionnaire targeted four main areas:

- Product potential applicability:
 - Who are the users?
 - Users' potential level of scientific comprehension
- Product definitions clarity:
 - Is probabilistic information understood?
 - Opinion on usage of selected terms: names of categories (EC, BNA)
- Product informational appeal:
 - Completeness of information
 - Clarity
 - Easiness in navigating
- Product aesthetic appeal:
 - Clearness of graphs
 - Usage of appropriate graph types
 - Usage of appropriate design tools: color, layout, etc.

Tier 1 Customer Feedback

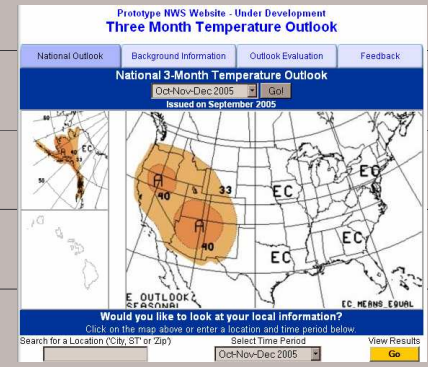
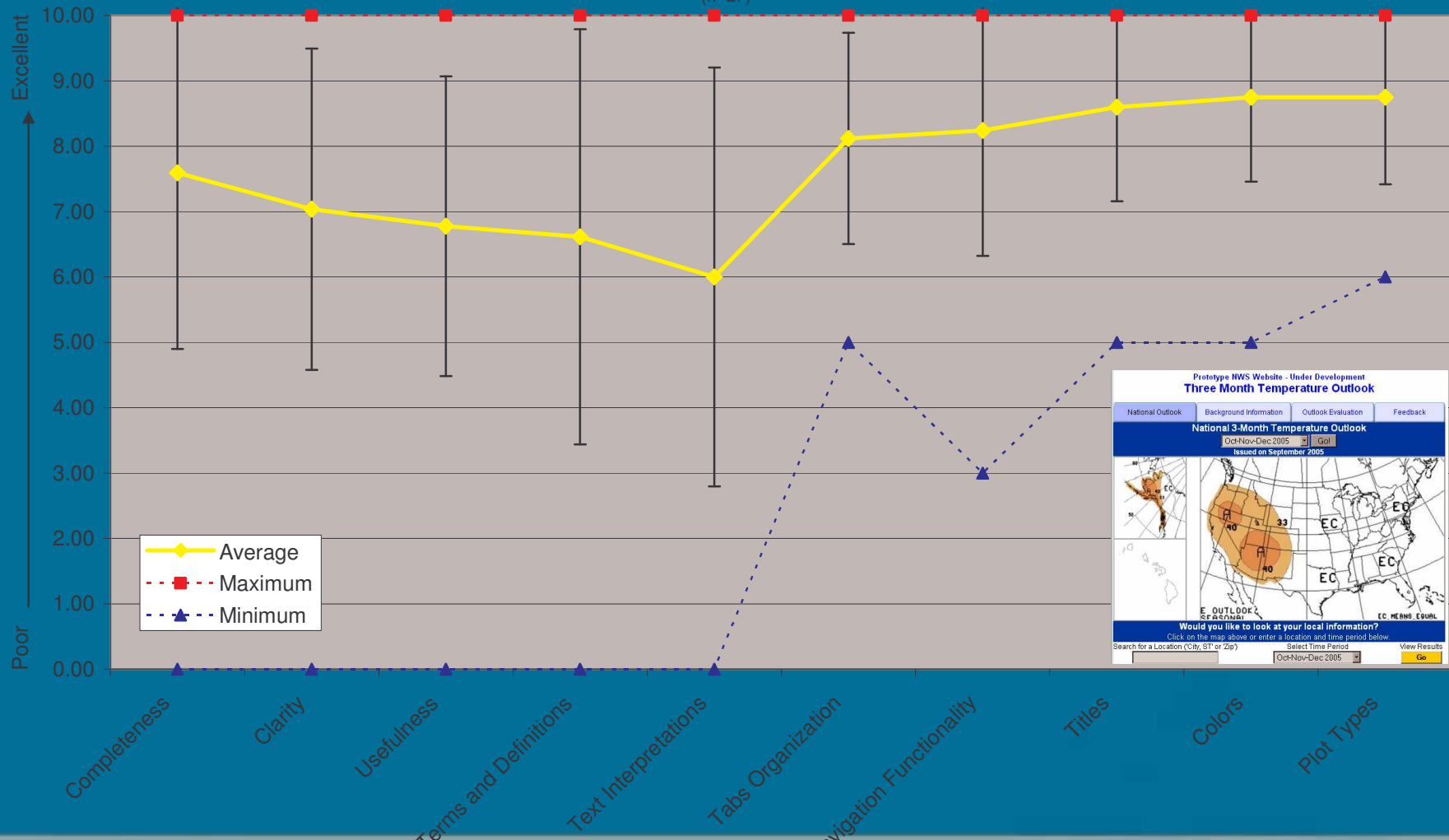
- Internal questionnaire: NWS staff and invited users
- There were total of 65 responses
- Feedback participation statistics



Tier 1 Customer Feedback

National Outlook Score

(Error bars indicate ± 1 Standard Deviation Range around the average value at each point)
(n=27)

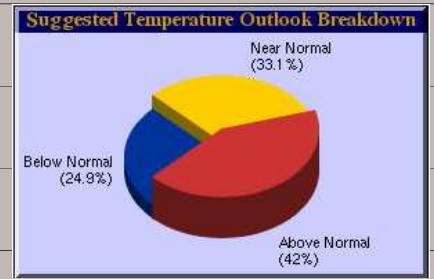
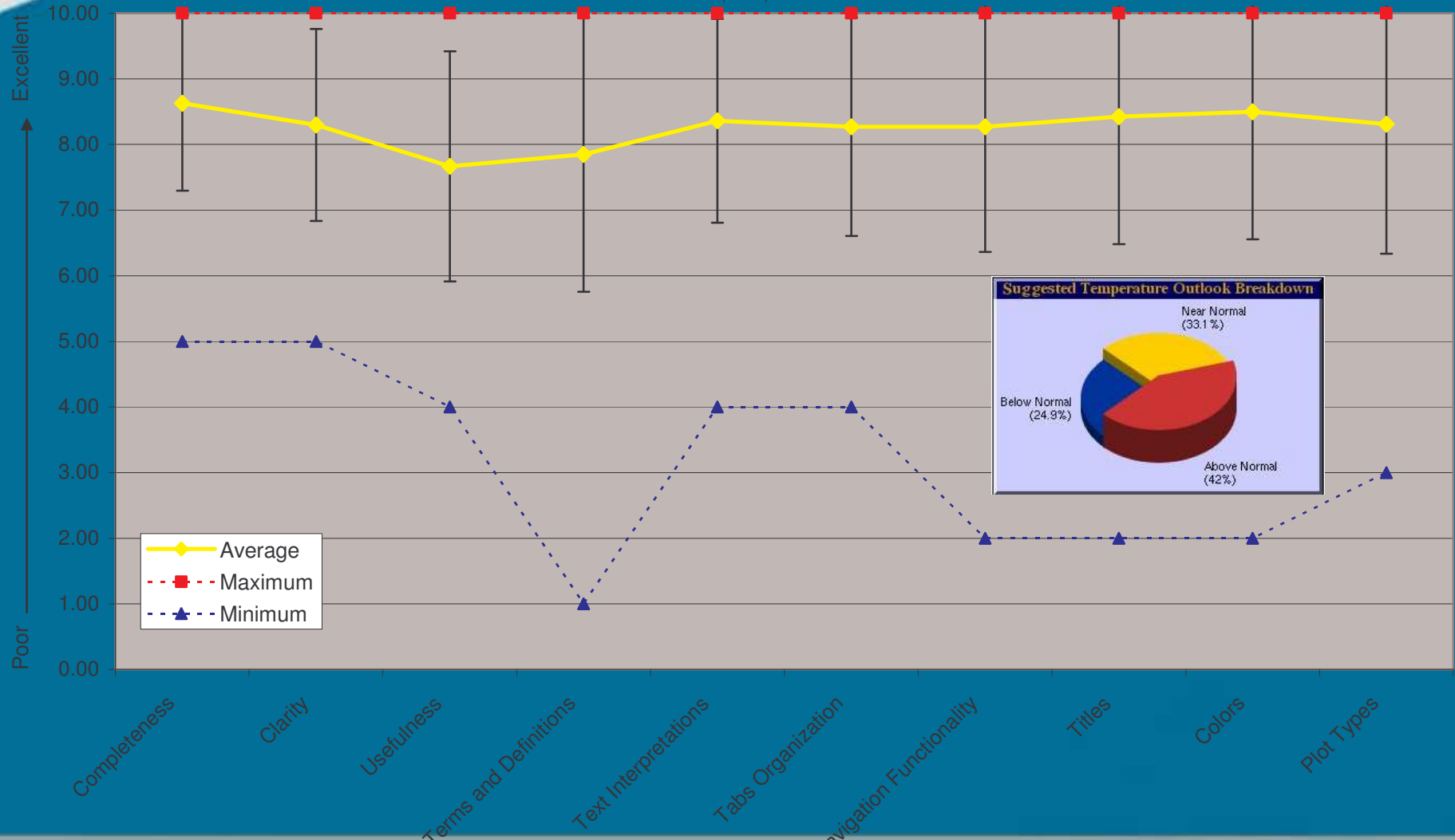


Tier 1 Customer Feedback

General Outlook Score

(Error bars indicate ± 1 Standard Deviation Range around the average value at each point)

(n=27)



Tier 1 Definitions Questions

National Weather Service - NWS Flagstaff - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

https://dev.enable-us.com/dscale/feedback.php?wfo=fgz&lead=

3. 3 Month Outlooks are 3 classes of probabilistic outlooks. The classes are defined by 1971-2000 climatological terciles limits using following names:

Below Normal
Near Normal
Above Normal

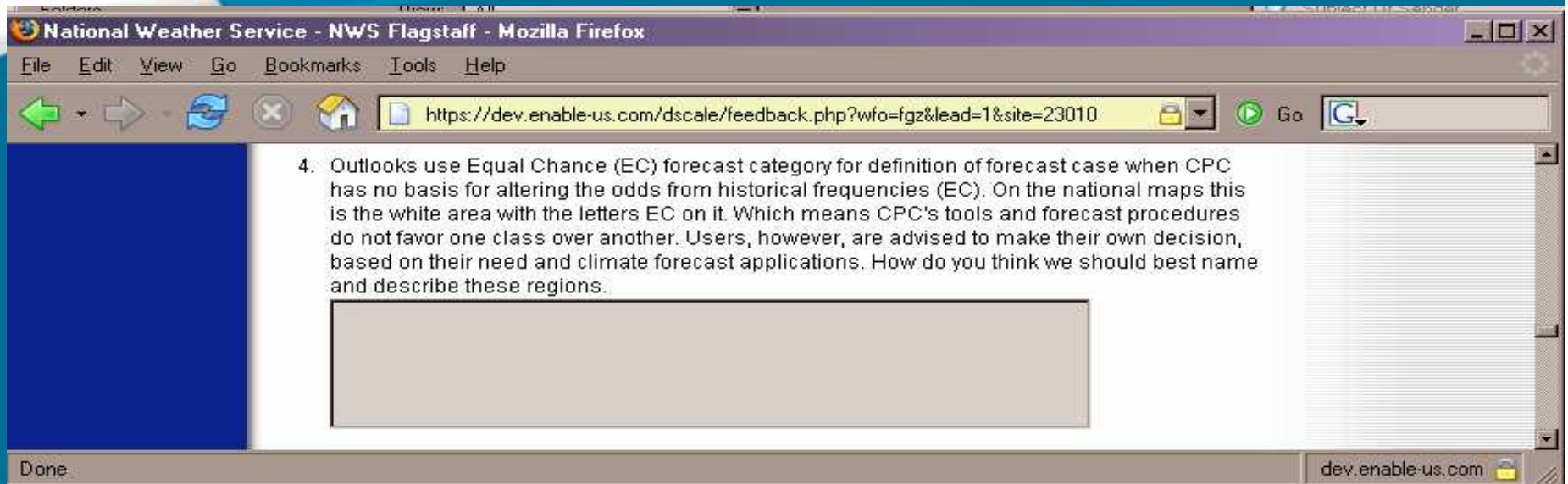
Use of the word "Normal" in this context is technically incorrect. Normal implies normal distribution features and properties of the data. This leads to the misinterpretation that Near Normal is more frequently occurring class. If you could choose a better way to describe these 3 classes which of the following would you select?

Choice	Approach/ Reference to	Temperature classes Example	Precipitation classes Example
a.	Feeling associations	<input checked="" type="radio"/> Cool <input type="radio"/> Neutral <input type="radio"/> Warm	<input checked="" type="radio"/> Dry <input type="radio"/> Neutral <input type="radio"/> Wet
b.	Computations	<input checked="" type="radio"/> Lower tercile <input type="radio"/> Middle tercile <input type="radio"/> Upper tercile	<input checked="" type="radio"/> Lower tercile <input type="radio"/> Middle tercile <input type="radio"/> Upper tercile
c.	Statistic in the middle tercile	<input checked="" type="radio"/> Below Median* <input type="radio"/> Near Median <input type="radio"/> Above Median	<input checked="" type="radio"/> Below Median <input type="radio"/> Near Median <input type="radio"/> Above Median
d.	Climate Variable measurement scale	<input checked="" type="radio"/> Less than 50°F <input type="radio"/> Between 50°F and 65°F <input type="radio"/> Greater than 65°F	<input checked="" type="radio"/> Less than 5.0" <input type="radio"/> Between 5.0" and 10.0" <input type="radio"/> Greater than 10.0"
e.	Other Idea?		

Done dev.enable-us.com

- Best pick: “Feeling association”
- Decision:
 - At this time (small sample of respondents) keep BNA in combination with “Climate variable measurement scale”
 - Coordinate with RISA activities on

Tier 1 Definitions Questions



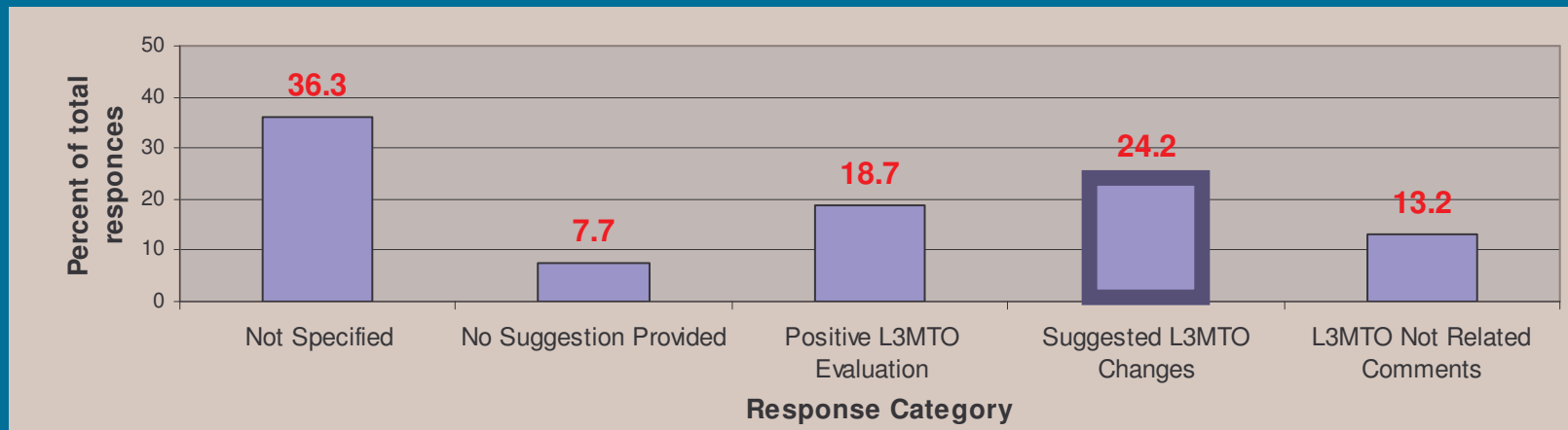
- EC is OK to many respondents, but a fair number indicated that it is not good adding no value and that a better verbiage ought to be established to convey this
- Other suggestions: Uncertain; Neutral; Unknown Chances; No Skill; No Clear Signal; No Clear Trend; No Forecast; No Forecast Signal; Even Chance or Likelihood; No Indication; No Discernable Forecast; Indeterminate Forecast; Neither (neither above or below normal)

Tier 2 Customer Feedback

- Survey Start Date: July 21, 2006
- Survey Stop Date: August 20, 2006
- Duration of Feedback Collection: 31 Days
- Number of Responses Summarized: 91
- Pre-approved Questions:
 1. What products/services did you obtain? 9**** 17%
 2. How did you find out about our products? 8**** 10%
 3. What will be the primary use of the service? (67% identified Personal Use) 5**** 21%
 4. Do you have suggestions as to how NWS can improve its products and services? 6**** 9%
 5. Will you use our products and services again? (82% Yes) 7**** 6%
 6. What new products/services would you like to see offered? 4**** 5%
 7. What is your affiliation? (51% Individual, 10% Business) 1**** 6%
 8. What is your zip code? 0**** 8%

Tier 2 Customer Feedback

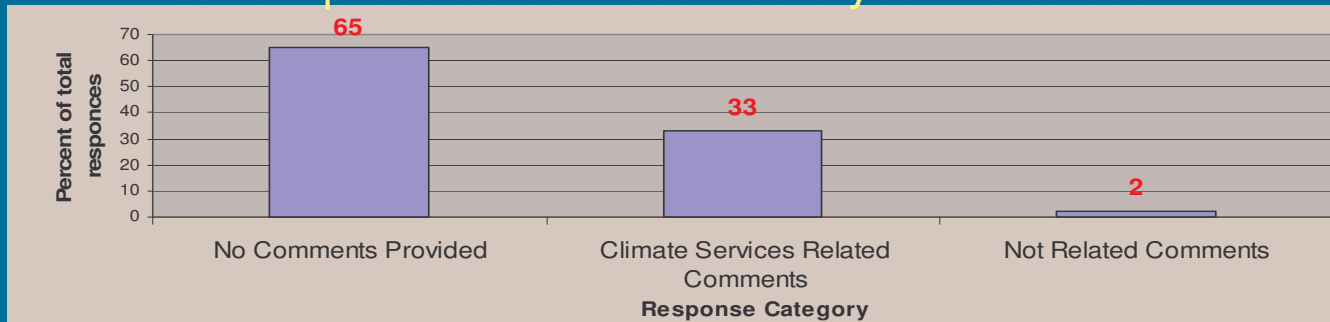
Do you have suggestions as to how NWS can improve its products and services?



- Local one-month outlook is needed
- Would like to see the trend information
- Local precipitation outlook is needed
- Provide detailed explanation of each page
- Make sure that the station data (including the metadata) is correct.
- The product should be easy to understand
- Add more stations
- The server is too slow
- Text, numbers and graphics are too small to see

Tier 2 Customer Feedback

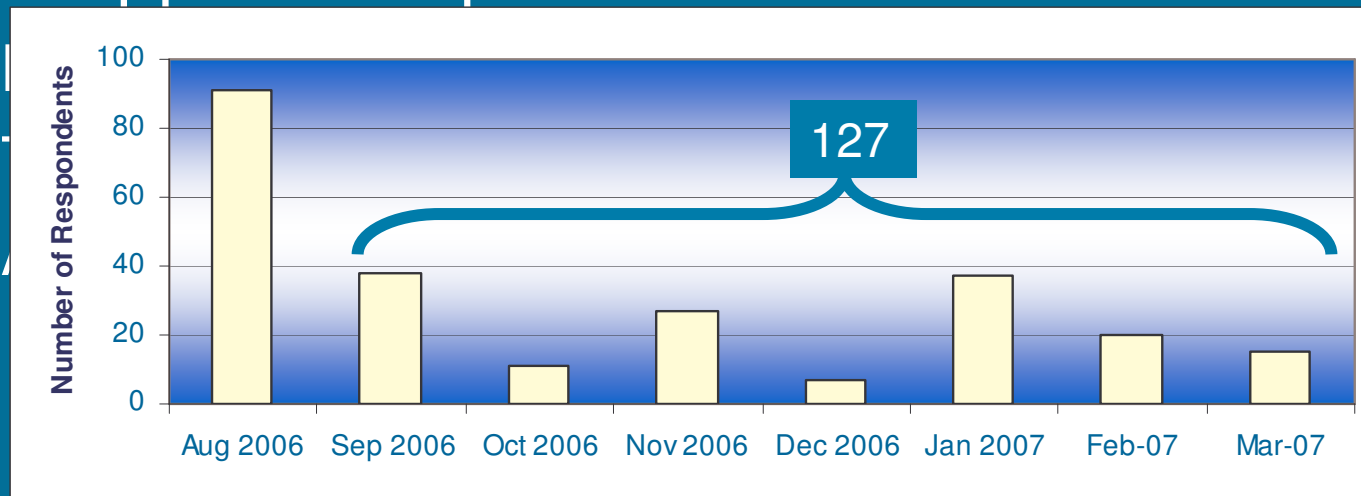
What new products/services would you like to see?



- 3-Month Precipitation Outlook (there were multiple entries of this request)
- Monthly Outlook
- Additional info for the forecast model
- Year-to-year variations as well as the forecast
- Easier access to the local climate information
- Easier access to the local observations
- Higher temporal resolution climate forecasts (hourly, daily, etc.)
- Probability of Exceedance products for 7-14 day forecast (probably they meant 8-14 day forecast)
- Additional coverage for the non urban areas
- F6 should be include the entire period

Tier 3 Customer Feedback

- Continuous Process: Jan 2007 addressed 91 responses, collected from Jul 20 – Aug 20, 2006
- 127 additional responses collected
- Once a year we can address the users' feedback
- Question: how much can we really learn from “pre-approved” questionnaire?



Conclusions

- Multi-tier process of customer feedback incorporation worked
- To change definitions we need larger sample of users responses
- US gov. (NWS) policies limit the ability to adequately collect customers input



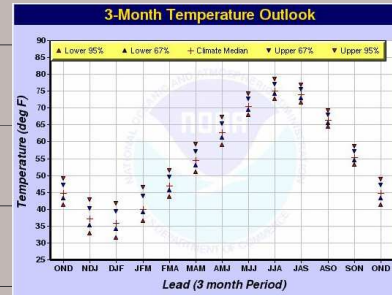
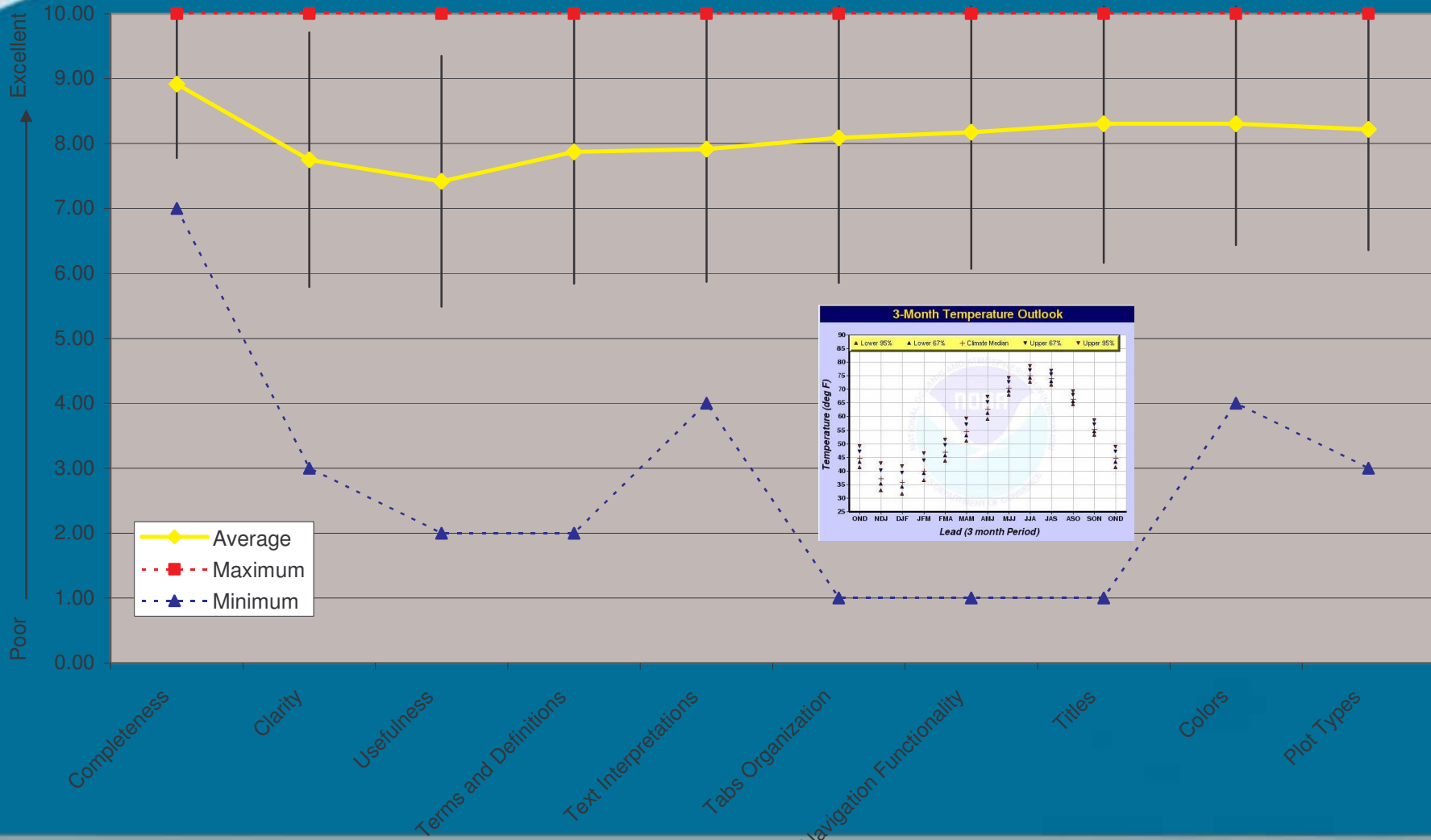
The end



Tier 1 Customer Feedback

Temperature Range Score

(Error bars indicate ± 1 Standard Deviation Range around the average value at each point)
(n=26)



Tier 1 Customer Feedback

Detailed Outlook Score

(Error bars indicate ± 1 Standard Deviation Range around the average value at each point)
(n=27)

