

NWS-CR-TA-87-20

AMS TECHNICAL LIBRARY
PL 4414
SCOTT AFB, IL 62225-5458

1 SEP 1987

CRH SSD
AUGUST 1987

1 - -
CENTRAL REGION TECHNICAL ATTACHMENT 87-20

h
PUBLIC INTERPRETATION AND UNDERSTANDING OF FORECAST TERMINOLOGY

Reprinted from Southern Region Technical Attachment
National Weather Service Southern Region
Scientific Services Division
Fort Worth, Texas

(Ed. Note: The following is a slight revision of a Technical Attachment Southern Region ran two years ago. We believe the message is important. Part of the business of forecasting the weather is communicating what we know. To do this effectively, we have to know as much as possible about how users interpret what we say.)

In the July, 1985 issue of the Bulletin of the AMS, Joel Curtis and Allan Murphy reported on results of a newspaper survey in the Seattle/Tacoma area. Over 2500 readers provided responses to twenty-one questions which concerned interpretation of weather forecast terminology. Responses from this study agreed closely with those from earlier studies conducted in the same area and carried out nationally. This summary of the article is intended to highlight a few points of particular importance to forecasters. It is strongly recommended that all forecasters read the original article. It can be provided by SSD if not available on-station.

Importance of Elements

Readers indicated that precipitation and temperature are definitely more important to them than sky cover and wind. Within these two pairs of elements, precipitation is more important than temperature, wind more important than sky cover. The climate of the Pacific Northwest is certainly different from that in other parts of the country, but this result is similar to what was found in other studies, including the national survey.

Precipitation

What do the terms "showers" and "rain" mean to the public? Almost all readers (95%) interpreted "showers" to mean discontinuity in time or space. Most (75%) interpreted "rain" to mean continuity in time or space. That's very good. More specifically, a majority of those surveyed understood discontinuity in time for "showers" rather than discontinuity in space. The same majority understood "rain" to mean continuity in space rather than continuity in time.

PoP

More readers (40%) chose an interpretation "percentage of rain" than "probability at a point" (25%) when asked to interpret what a PoP forecast meant to them. That interpretation is not consistent with the way we define PoPs, but as the frequency of precipitation in an area increases, the two become the same. Since the survey was carried out in the Pacific Northwest, perhaps the misinterpretation is not as bad as it seems.

Another question revealed that a majority of those who found area forecasts most useful interpreted the PoPs as area forecasts; those who preferred point forecasts interpreted the PoPs as such. The authors make the following significant point: since a substantial fraction of the public evidently prefers a "percentage of area" expression (more than prefer a "probability at a point," at least in this survey), they should be informed that it is perfectly correct to interpret NWS PoP forecasts in this manner in many cases. We can do that in the following way. If it rains in an area, the chance that any given point in the area had rain is the same as the area coverage. Thus, if you are sure it will rain somewhere, use an areal qualifying term such as "scattered," and modify the PoP with an expression such as "rain will cover X% of the area today." If you're not that sure it will rain somewhere in the forecast area, then use an uncertainty qualifier such as "chance" — not an areal qualifier — and modify the PoP with something like "X% chance of rain at any point today."

Another question related to PoP forecasts asked readers whether they preferred to have the uncertainty in precipitation forecasts expressed in terms of numerical statements (PoPs) or in terms of verbal statements (e.g., "chance," "likely"). By a ratio of 3-to-1 the readers expressed a preference for PoPs. These results are similar to results of a recent nationwide survey in which the ratio was 2-to-1 in favor of PoPs.

Temperature

Ninety percent of the readers interpreted "mid 50s" as a 3 or 5 degree interval and about 60% chose a symmetric 3-5 degree interval to represent "near" when this term was used in conjunction with a high or low forecast. This is just what we would like to see. Note, however, that 40% — a substantial minority — of the readers selected asymmetric intervals to define "near." The interpretation of most of these is an interval approaching a high (max) temperature below, and a low (min) temperature from above. In other words, "high near 50" would be interpreted as 47-50, say, while "low near 50" would be interpreted as 50-53 (or possibly 53-50).

Preferences regarding alternative expressions for intervals of temperature values indicated that "mid to upper 50s" and "55-60" were each preferred by approximately 45% of the readers. Only slightly more than 10% preferred "near 57."

Cloudiness

Readers were asked to indicate their interpretation of percentage of cloud cover for a number of terms such as "cloudy," "sunny," "partly cloudy," "considerable cloudiness," etc. From this and earlier surveys, it is clear a number of terms can be considered as equivalent:

- (1) "clear" and "sunny"
- (2) "mostly clear" and "mostly sunny"
- (3) "partly cloudy," "variable cloudiness" and "partly sunny"
- (4) "mostly cloudy," "considerable cloudiness" and "cloudy".

Not surprisingly, there was considerable overlap in the respondents' interpretation of cloudiness associated with each term. Most of the responses fell in the following ranges for the above categories: (1) less than 10% cloud cover; (2) 10-30%; (3) 30-60%; and (4) 70-100%. These values essentially match the NWS "definitions" for the terms ... very encouraging. "Fair" was in a class by itself. Most people associated anywhere from 10 to 40% of cloudiness with the term.

Hazardous Event Terminology

About 80% of the readers correctly interpreted "watch" and "warning". This result is encouragingly similar to several other surveys and indicates we've got the message through to most of the public. Several other questions in the survey focused on marine-related terms, since the survey was taken in the Pacific Northwest, and we will not discuss the responses here.

Miscellaneous Terms and Interpretations

Eighty percent of the respondents correctly interpreted their location in reference to the local zone (which is identified as "Seattle, Tacoma, Everett, and vicinity"). About 60% of the readers correctly chose 35 mph as the equivalent of 30 kts, but one-fourth apparently thought 1 kt was less than 1 mph. It's probably safe to assume even fewer people would understand the term "knot" in an area with less of a marine environment than the survey area. We should keep that in mind. Almost 95% of the readers correctly identified a northeasterly wind as a wind which is blowing from the northeast.

Finally, there was generally good understanding on the public's part of terms forecasters frequently use to describe current and/or future weather conditions. For example, terms such as weather disturbance, low pressure system, cyclone, cold front, and trough (!) were selected by a majority of readers as indicative of inclement weather, whereas only a small number of readers chose such terms as anticyclone, ridge, and high pressure system as indicative of such conditions.

While this survey reveals a weather-conscious public in the study area, with good understanding of terms and phrases used by NWS forecasters, there were indications we have not been as successful as we might like in some

areas. In fact, with so little effort on our part (in many areas, at least) to educate the public, it's somewhat surprising the level of understanding is as high as it is. The authors make the following concluding observations:

"What are some of the implications of this and the other recent studies of forecast terminology for current procedures and practices in weather forecasting? First and foremost, a greater effort must be made by the meteorological community in general to inform and educate members of the public regarding the meaning and proper (as well as improper) interpretations of terms and phrases commonly used in weather forecasts. In particular, a definite need exists for a brochure that clearly and unambiguously defines both the events to which weather forecasts refer and the terminology that may be used in describing the likelihood of these events occurring in the future. Moreover, this brochure should be written in language that can be readily understood by the general public. In developing and standardizing a vocabulary for forecast terminology, careful consideration should be given to the general public's interpretations of various terms and phrases, especially in those cases in which marked differences in interpretations exist between the official definition and the public's preferences."