Decision Aids for Antarctic Weather Forecasting

Yes

No

Objective

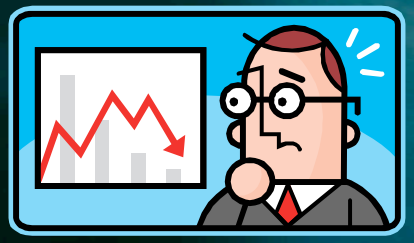
- **Identify patterns and develop quantitative warning signs to assist in forecasting decision making**
  - **Example "Wind Alert" program based on Holmes *et al.* wind study**

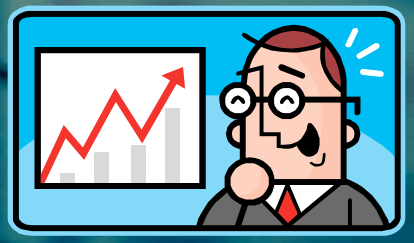
Increases in the temperature difference between the Pegasus North AWS and the Minna Bluff AWS and increasing pressure differences between other AWS sites were also common features present before the wind speed began to increase at the Pegasus North site. Many times, changes in one or more of these parameters occurred hours before the wind began to increase at the Pegasus North site. Monitoring of these parameters can lead to an improved 3–6-h forecast of these high wind speed events at Pegasus Runway, Antarctica

- Holmes, R. E., C. R. Stearns, G. A. Weidner, L. M. Keller, 2000: Utilization of Automatic Weather Station Data for Forecasting High Wind Speeds at Pegasus Runway, Antarctica. Wea. Forecasting, 15, 137–151.

Required Steps

- **Grouping**
  - **Identification of periods of inclement weather**
    - **New database query**
      - ***Note: Spreadsheets will be replaced with comparable reports***
    - **Align with forecasts for the period**
    - **Identify both good and bad forecasts**





Required Steps

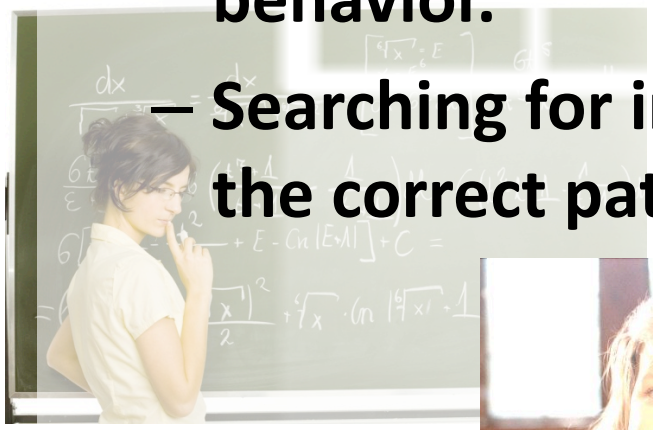
- **Data Gathering**
  - **Each event will be reviewed one at a time**
  - **Reconstruction of each forecast process**
    - **1st time looking at what went right events**

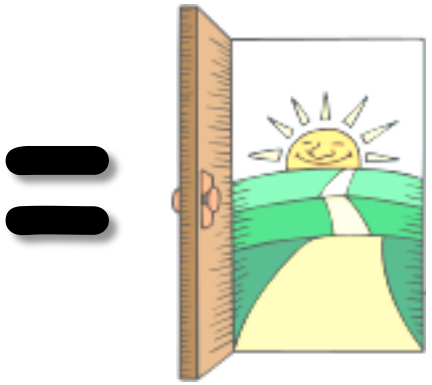
Required Steps

- Correlations
  - Matching each type with similar situations
    - Time of year
    - Synoptic Situation
    - Type of event
      - Wind
        - » Direction
      - Snow
      - Low Cloud Cover
      - Fog

Required Steps

- Consistencies in the forecasting process
  - Searching for patterns that show a consistency in our process for both the correct and incorrect decision will help change or fortify our learned behavior.
  - Searching for inconsistencies will help identify the correct path to take in a given situation.





Required Steps

- **Empirical Rules**
  - **When outcomes are correct but data speculative or vague it will be catalogued with empirical rules**
  - **These situations will be grouped to alert the forecasters when similar situations occur again to either**
    - **Validate data**

    or
    - **A greater collection of supportive data for the given situation**

Required Steps

- Absolutes
  - The goal of this process is to find absolute measurable rules in various conditions.
  - Current absolute rules with measure are few.
  - Many known outcomes in given situations lack the measure which through this process we hope to capture over time to substantiate and equated to measurable impacts.

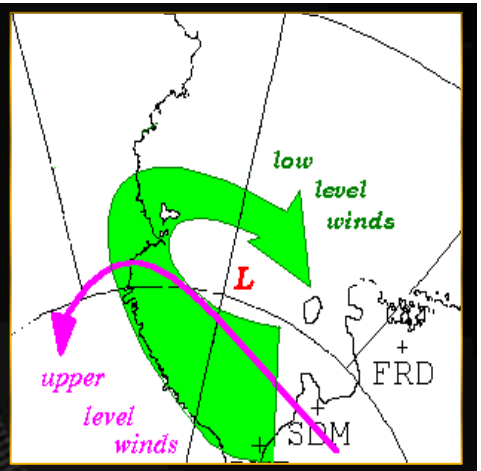
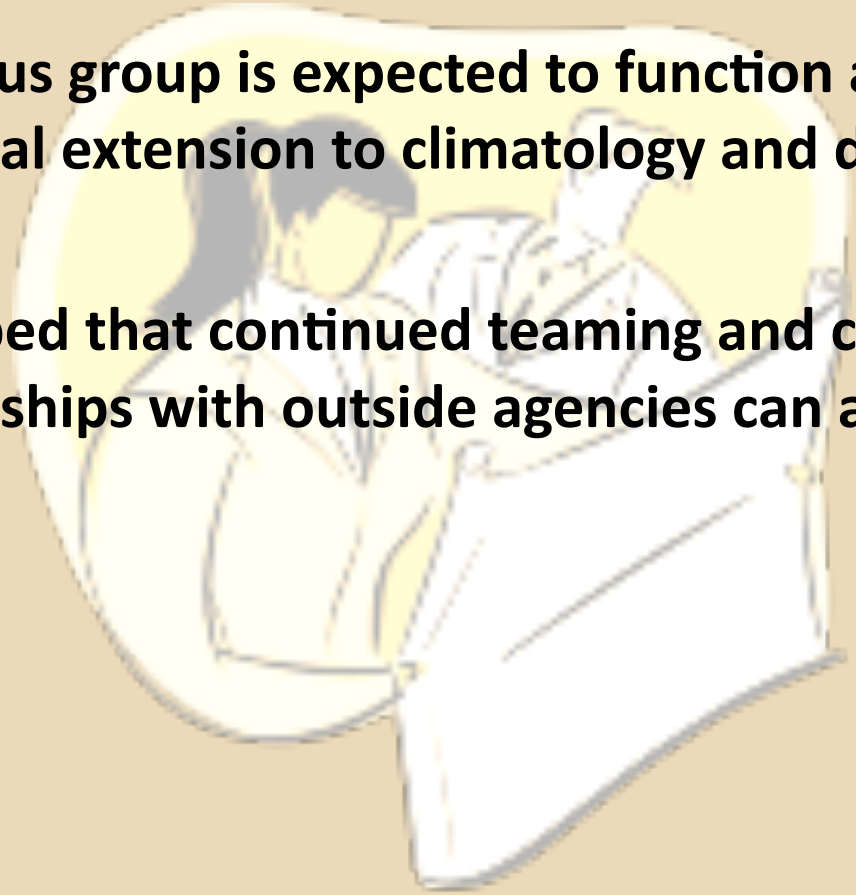


Table 4. Guidelines for forecasting blowing snow used from August through November.

Sustained wind speed (kt) = Predominant visibility (m)
<15 KT = 4800-9999 m
15-20 KT = 2400-4800 m
20-25 KT = 1600-2400 m
25-30 KT = 0800-1600 m
30-35 KT = 0000-0800 m

a strong katabatic regime of the Ross Ice Shelf: Onset of winds initially marked by 1 to 4 hours of gusty NE winds and temporary periods of blowing snow that can reduce visibility to less than ½ mile at the Ice Runway or Williams Field, then rapidly abating. Onset of winds typically 6 to 8 hours after onset at Byrd Glacier

Summary



This focus group is expected to function as a long term analytical extension to climatology and data collection.

It is hoped that continued teaming and close fostered relationships with outside agencies can assist in this effort .