A Federal Partnership: Assessing Extreme Cold Warnings in North Dakota through a Community Assessment for Public Health Emergency Response (CASPER)

John Paul Martin

Warning Coordination Meteorologist
NOAA’s National Weather Service
Bismarck, North Dakota

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Wind Chill and the Extreme Cold Experiment

- Wind Chill in use by NWS since 1973
- Calculation change in 2001
- Life threatening low temperatures under arctic high pressure with little to no wind
- Wind Chill Temperature ≈ Ambient Air Temperature (low)
- Motivation for this experiment: use of wind chill warning when there is little to no wind but ambient temperature is life threatening
The Extreme Cold Experiment

- **2010 – 2011**
  - Wind Chill Warning: -40°F and lower with 5+ mph wind
  - Extreme Cold Warning: Ambient Temperature of -30°F and lower with wind under 5 mph
  - Confusion at the borders (participating offices vs non-participating)

- **2011 – 2012**
  - Extreme Cold Warning used exclusively
  - Mild winter
  - Few issuances
  - More confusion at the borders

- **2012 – 2013**
  - Much collaboration…but no common solutions
  - Discontinue the extreme cold experiment
NOAA / CDC MOU
MOA-2011-069/8371

• Strengthen science and services of both agencies

• Understand, communicate, and reduce environmental and public health and safety impacts

• Promote the exchange of scientific expertise and personnel to conduct research in the areas of climate, weather, water, environment, ocean, etc.
Timeline

- **October 2011**: NOAA / CDC MOU signed
- **February 2012**: CDC’s National Center for Environmental Health contacts NWS Bismarck
- **March 2012**: NWS and ND Department of Health develop “extreme cold” CASPER questions
- **April 9-13, 2012**: CDC team deploys to ND and conducts CASPER to evaluate effectiveness of NWS’s extreme cold experiment in Burleigh County
- **2013**: Published results in AMS journals – BAMS and WCAS
- **2014 and beyond**: Successful use of the MOU on future collaboration

**NOAA – NWS strength**: ability to reach customers with weather hazard impact information

**CDC strength**: ability to scientifically assess the effectiveness of public health communications
Training

• April 9-13, 2012 – thorough review of survey questions and methodology
Hot Wash

- April 13, 2012 – CDC presents preliminary survey results to NOAA
A Few Key Findings from this CASPER

- Majority heard NWS warnings and took action, regardless of the warning name (wind chill / extreme cold)
- TV was the main source for severe winter weather and emergency information

![Satisfaction with NWS warnings and forecasts]
- 90% Satisfied and Very Satisfied
- 0% "Others"
A Few Recommendations from this CASPER

- Use extreme cold warning to capture all dangerous cold weather events for all wind conditions.

- Utilize TV as the key medium to inform the community regarding severe weather and emergencies (local NWS / broadcasters have strong partnership).
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Thank You!

Publications

Early Online Release of Manuscript in BAMS:
Chiu, C. Noe, R. et al. 2013
http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-12-00123.1

Weather, Climate, and Society (WCAS) Journal Article:
Chiu, C. Vagi, S. et al. 2014
http://dx.doi.org/10.1175/WCAS-D-13-00023.1

John Paul Martin
NOAA’s NWS Bismarck, ND

john.paul.martin@noaa.gov
701-250-4495
701-527-3469