

## **Operational Cold Advisory for Newborn Livestock System Product Description Document**

The Cold Advisory for Newborn Livestock (CANL) system produces graphic products that can be used as decision support by ranchers. In the winter of 2008-2009, NWS Glasgow was the first office to run this system. Due to significant livestock losses in other areas of the high plains during the winter of 2008-2009, additional NWS Weather Forecast Offices (WFO) joined the experimental test period for the winters of 2009-2010, 2010-2011, and 2011-2012.

The following Weather Forecast Offices will be providing the CANL products operationally:

WFO Aberdeen, SD  
WFO Billings, MT  
WFO Bismarck, ND  
WFO Glasgow, MT  
WFO Great Falls, MT  
WFO Pocatello, ID  
WFO Pendleton, OR  
WFO Cheyenne, WY

### **Part I – Mission Connection**

- a. Product Description – This system uses the current NDFD forecast grids for temperature and wind (wind chill), humidity, sky conditions and Quantitative Precipitation Forecasts (QPF) to create a graphic that shows the potential for weather related impact to newborn livestock.
- b. Product Type – Operational.
- c. Purpose – To provide users with a decision support tool that could help reduce newborn livestock losses due to hazardous weather.
- d. Audience – The general public, including those with livestock interests.
- e. Presentation Format – Graphics derived from the NDFD gridded database that are available via the participating WFO website. The information may also be broadcast over the NOAA Weather Radio.
- f. Each office will have a link to its own graphics.  
Example URL = <http://www.wrh.noaa.gov/ggw/canl/canl.html>

## **Part II – Technical Description**

**Format and Science Basis** – This system was completed through the COMET Partnership Program under grant #S08-68874. CANL was developed via a partnership between NWS Glasgow and the University of Miami, including Dr. Larry Kalkstein and Dr. Katrina Frank. Nationally, approximately 95,000 calves die each year due to cold stress (Azzam et al. 1993) resulting in an estimated \$38 million loss to producers (Dietz et al. 2003). Discussions with ranchers and the NWS Glasgow office showed there was considerable interest from local ranchers in the possibility of a National Weather Service (NWS) product specific to the effect of cold weather on newborn livestock. One rancher stated “calves are our saleable product, so no calves, no sales, no income.” During the critical weeks of calving, generally mid-January to mid-April in the high plains, ranchers depend heavily upon advanced warning of extreme cold in order to move livestock to more sheltered areas. This minimizes mortality rates of newborn calves, specifically those less than 24-hours old, because these calves are least able to regulate their body temperature (Sanko et al. 1991). Improvement in the advanced warning of potentially hazardous conditions will enable producers to more effectively implement life-saving measures to minimize losses.

Given that the primary mission of the National Weather Service is to:

*... provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy,*

development of a system that helps livestock producers mitigate loss of livestock due to cold stress furthers the fulfillment of the mission of the NWS. This proposal for the development and implementation of a Cold Advisory for Newborn Livestock system follows a feasibility study, UCAR Award Number: S07-62730, which found that such a system can be developed based on currently available forecast information.

As the study evolved, it was shown CANL would work for all newborn livestock, and was expanded from calves to include all newborn livestock. It also works for all areas of the country because newborn livestock are not acclimated prior to being born.

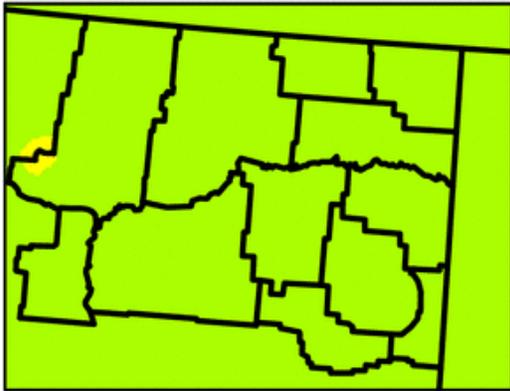
**Availability** – The graphics will be automatically updated four times a day (4 am, 10 am, 4 pm and 10 pm) during the period from January 31 through May 31 each season. The graphics will be available in 6 hour increments out to 36 hours.

**Additional Information** – Below is an example of the experimental graphic:

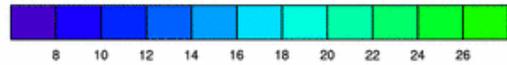
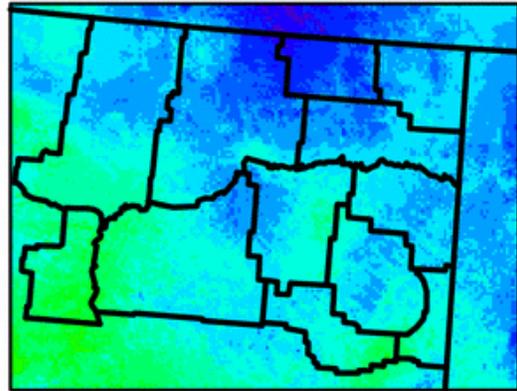
# Cold Advisory for Newborn Livestock

Fri-Mar-19-2010- Noon-6pm  
Plot Generated Thu Mar 18 2010 10:00 AM MDT

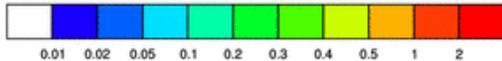
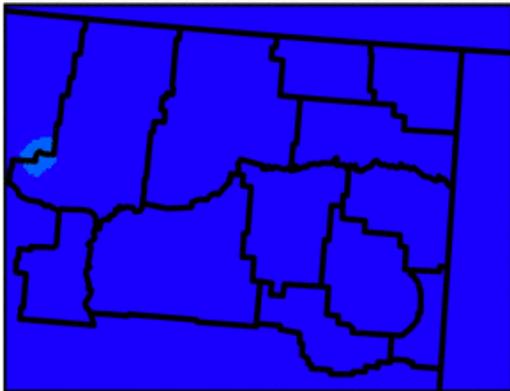
Experimental CANL Index for NE MT Counties



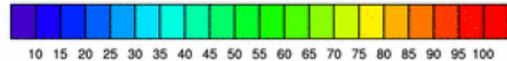
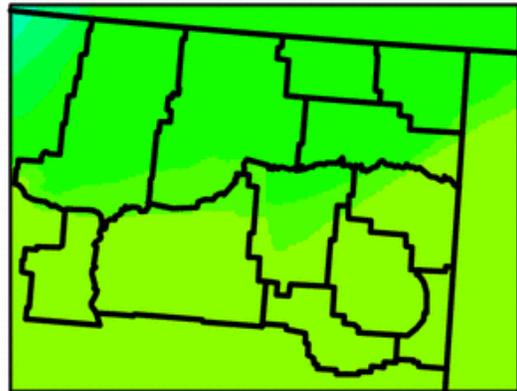
Wind Chill Values, Degrees F



Forecast Liquid Equiv. Precip., inches



Forecast Ave. Sky Cover, %



- (GREEN) NO ADVISORY:** Wind Chill above 41 degrees
- (PALE YELLOW) SLIGHT:** Wind Chill less than 41 degrees for 2 or more hours
- (YELLOW) MILD:** Wind Chill less than 32 degrees for 2 or more hours
- (ORANGE) MODERATE:** Wind Chill less than 0 degrees for 2 or more hours or Wind Chill less than 32 degrees and 0.02" precipitation.
- (RED) SEVERE:** Wind Chill of -9 degrees or colder for two or more hours, or wind chill of less than 32 degrees and 0.05" of precipitation
- (DEEP RED) EXTREME:** Wind Chill of -18 or colder for two or more hours, or wind chill less than 32 degrees and 0.1" of precipitation

Sky Cover < 40% - reduce Wind Chill thresholds by 10 degrees  
 Min RH > 95% - increase Wind Chill thresholds by 10 degrees  
 Max Temp. < 26 degrees - double the Precipitation thresholds for Moderate-Extreme