Weather Support to Deicing Decision Making (WSDDM) Winter Nowcasting System

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National Center for Atmospheric Research
March 1 2011
Sochi Planning Meeting
Weather Support to Deicing Decision Making (WSDDDM)

WSDDDM System

1. Storm motion and intensity
2. Past 30 minutes snow data and 30 minute forecast of snow intensity.
3. Temperature, wind and humidity

- Automated Surface Observing System
- Terminal Doppler Weather Radar
- NEXRAD Radar Data
- Real-Time Snowfall Rate Display
- Ground Deicing Operations
- Airport Runway Plowing
- Airport Traffic Management

* FAA Sponsored
WSDDM System designed to help users make real-time weather decisions at an airport, including liquid equivalent snowfall rate from hotplate and temperature

WSDDM provides:

- Updated radar every 10 minutes, precipitation type and rate every one minute
- Timeline of temperature, dewpoint, wind speed and direction, updated every minute
- Short-term precipitation forecast (two-hours)
- Current METARs for surrounding stations
- Storm tracking
- Lightning data (not in the Olympic version)
WSDDM: Accurate storm tracking using Radar data

- Accurate storm motion vectors
- Radar information every ten minutes
- Allows the determination of the onset and offset of storms at an airport
WSDDM: Decoded METARS and one minute local weather sensor data

- Weather information every minute

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- Snowfall rate based on liquid equivalent rate rather than visibility
WSDDM: Trend graph and one hour nowcast of snowfall rate

- Trend graphs
- One hour nowcast of snowfall rate (80% accurate)
• Real-time calibration of radar echo with surface gauge

• Forecast based on extrapolation of calibrated radar echo one hour into the future.
Precipitation rate (mm/hr)
Denver International Airport
WSDDDM system
Minneapolis/St. Paul WSDDM system
WSDDM in action at Denver
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Last Updated: 18:46 02/10/10 UTC
YVR1 WSDM Liquid Precip Rate: Nil
YVR1 120 Minute Forecast Rate: VERY LIGHT

02/10/2010 18:06:53

NOW

--- RADAR dBZ

ZR C: 200
ZR E: 1.80
Men’s 10 km Biathlon Sprint on February 14th, 2010
Lowell Bailey (U.S.): That was one challenging race today! Both shooting and skiing were pretty hard and I started right in the middle of the big snowstorm. But that’s just what it is. You can’t control Mother Nature and especially you can’t let yourself be distracted by the weather. We actually worked a lot with our sports psychologist to keep the focus even if thinks like that come up.

Tim Burke (U.S.): It was the most unfair competition I’ve ever raced in. To start there with all that snow was really frustrating. I was in a good shape so of course I am not happy how things went. When I came to the second shooting I had snow stuck in my sight. Basically there was snow everywhere. I tried to focus on the same things like in every normal race but it was so hard to keep that up under those conditions. Besides that it of course felt great to represent the States here at the Olympics and I hope to do better the next races.

Jay Hakkinen (U.S.): Those conditions out there were just horrible and unpredictable. It is a good thing that I shot clean and I also felt in great shape but with that snow coming down I basically could not ski as fast as I wanted. It is really frustrating but today it was all about luck.
Men’s Biathlon Spring Gold Medal Winner Vincent Jay of France crossing the finish line
In rain and snow, France's Jay wins biathlon gold

By MATTIAS KAREN, AP Sports Writer
• Sunday, February 14, 2010 at 2:15 p.m.

WHISTLER, British Columbia — France's Vincent Jay certainly doesn't mind the fickle weather conditions plaguing these Vancouver Games.

All that snow and rain isn't bad when it mainly falls on your rivals.

The 24-year-old capitalized on an early start number and superb shooting Sunday to win a gold medal on his Olympic debut in the men's biathlon 10-kilometer sprint.

Jay was able to ski two of his three laps around the course before a thick sheet of wet snowflakes started coming down over Whistler Olympic Park to slow down his main rivals. After being the sixth skier to finish the interval-start race, Jay stood by and watched the pre-race favorites falter one by one.
In rain and snow, France's Jay wins biathlon gold

- "I was very lucky as far the weather conditions," said Jay, who had bib No. 6 among 88 racers. "But the shooting was all my doing, and had nothing to do with the climate."
- Jay shot cleanly and quickly to finish in 24 minutes, 7.8 seconds, beating Norwegian silver medalist Emil Hegle Svendsen by 12.2 seconds. Jakov Fak of Croatia got the bronze, finishing another 1.8 seconds behind.
- All three medalists were among the first 10 starters, who were able to ski their first two laps around the course before the snowfall began.
- Tim Burke wasn't as lucky.
- Burke is hoping to become the first American to win an Olympic medal in biathlon, but ended up skiing in some of the worst conditions of the day. He missed three shots and finished 47th - meaning he'll struggle to get a medal in Tuesday's 12.5-kilometer pursuit as well. The times from the sprint carry over to that race, meaning Burke will start 2:47 behind Jay.
- "It was the most unfair competition I've ever raced in," Burke said. "To start there with all that snow was really frustrating."
Norwegian silver medalist Emil Hegle Svendsen
Norway's Ole Einar Bjoerndalen reacts at the shooting ranch during the men's 10 km sprint event at the Vancouver 2010 Olympics in Whistler, British Columbia, Sunday, Feb. 14, 2010. (AP Photo/Jin-man Lee)
Vancouver Olympics
WSDDM system
Summary

• The WSDDM winter nowcasting system provided valuable information to Olympic forecasters regarding storm motion, nowcasts of precipitation rate, type, and visibility.

• A similar system could be implemented over the web based on the experience during the Vancouver 2010 Olympics
Other Potential Areas NCAR Could Participate in Sochi 2014

• WRF high resolution modeling (Greg Thompson)
• Verification (Barb Brown)
• Societal Impacts Research (Jeff Lazo, SIP)
Thank you!