North Shore Community Climate Readiness Project

North Shore Exposure

University of Minnesota | North Carolina State University | Carleton College

What are projected changes in climate for the North Shore?

Ice Thickness, Snow Pack and Wind Chill will Decrease

- Dec –Feb average Ice thickness in inland lakes will decrease by up to 20% and days to complete ice cover may increase by up to 10 days.
- Max snow depth will decrease by >7 inches and 1 ft snow depth (Jan) may take a month longer (Feb) to occur.
- Average (Dec-Feb) wind chill (2.4°F) will increase by 8 degrees (10.4°F) and days below –10°F wind chill will become almost non-existent.

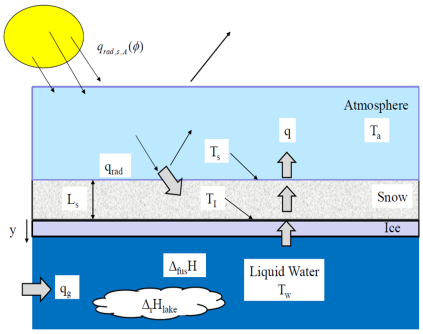
CO_2 Emissions (2035-2065)	*Ice Thickness (in)*	*# of Days to Ice Cover from Nov 1*	*Max Snow Depth in*	*Days < -10°F Wind Chill*
Recent Historical (1.85 W/m^2)	18.7	30.0	19.3	22.8
Low (40% increase)	16.9	35.3	14	1.2
Medium (140% increase)	15.8	37.4	12.4	-
High (360% increase)	15.1	40.9	11.6	0.13

Heat Index, Fire Danger will Increase, Precipitation will not Change

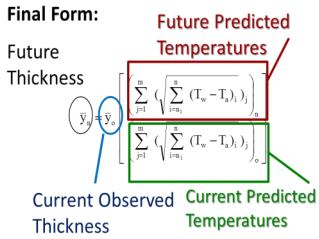
- May-Sept average heat index will increase by 4°F and the days above 80°F HI are projected to more than double.
- The number of days at extreme fire risk is projected to increase by almost 40%.
- The average daily precipitation remains virtually unchanged with the average number of monthly precipitation events (9.5) rising slightly (9.8).

CO_2 Emissions (2035-2065)	*Days >80°F HI*	*Average Heat Index °F*	*Days of Extreme Fire Risk*	*Avg Daily Precipitation (in)*
Recent Historical (1.85 W/m^2)	7.9	62.3	15.2	0.10
Medium (140% increase)	17.3	65.8	19.5	0.10
High (360% increase)	20.5	66.9	21.1	0.11

Transforming Climate Model Variables



We were limited to only climate variables that were generated from coupled atmosphere-ocean general circulation models. To obtain climate variables more relevant to visitor use (wind chill, snow depth, ice thickness and heat index) we used established formulas and the First Law of Thermodynamics. Frequency counts were generated with probability density functions and a Markov chain model. Model bias was corrected for by applying the percent change of future (2035-2064)/current (1980-2010) shown in the models to current historical climate data from NOAA.



Primary Contact:
Mae A. Davenport, PhD
Associate Professor
University of Minnesota
115 Green Hall
1530 Cleveland Avenue
Saint Paul, MN 55118
Phone: 612-624-2721
Email: mdaven@umn.edu

Additional Contacts:
Bruce Wilson, PhD
Professor
University of Minnesota
Dept of Bioproducts and Biosystems Engineering
Email: wilson@umn.edu

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For more information, you can visualize projected changes in climate and the water balance for any state, county and USGS Hydrologic Units (HUC) with the National Climate Change Viewer. http://www.usgs.gov/climate_landuse/clu_rd/nccv/

Acknowledgements

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