
Average annual and seasonal wind speed and direction at Swift Current for 1953-2005

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Introduction

- ! The Brown soil zone is one of the windiest regions on the Canadian Prairies (Longley 1972).
- ! Under dry windy conditions (typical for the semiarid prairie), wind is a significant contributor to evapotranspiration (ET) and, therefore, to crop growth (Grace and Quick 1988).
- ! For semiarid climates, the transfer of sensible heat to an evaporating surface (advection) can account for up to one third of the energy used in ET (Hagen and Skidmore 1974).
- ! Wind is an important weather parameter to agriculture in the semiarid prairie but is often overlooked in environment-yield studies.

Objective

- ! To analyze wind data from long-term meteorological records (53 years from 1953 to 2005) collected at the Swift Current Airport to determine annual and seasonal wind speed and directionality for the Swift Current area

Methods

- ! From 1953 to present, wind speed at a height of 10 m has been recorded at a standard meteorological site located at the Swift Current Airport.
- ! We analyzed annual and seasonal - Winter (D,J,F); Spring (M,A,M); Summer (J,J,A); Fall (S,O,N) - wind run (km/yr) and wind direction.

Observations

- ! Annually
 - ! winds predominantly from west (W), southwest (SW) (Fig. 1)
 - ! highest sustained speeds with W, northwest (NW) winds (Table 1)
 - ! winds from north (N), northeast (NE) occur least often (Fig. 1) and have the lowest sustained wind speed (Table 1)
- ! Seasonally
 - ! overall average wind speed highest for winter and lowest for summer (Table 1)
 - ! directional patterns similar for winter and fall, and for spring and summer (Fig. 2)
 - ! winter and fall
 - ! winds predominantly from W, SW - followed by southerly (S) winds (Fig. 2)

- ! winds occur least often from N, NE (especially during winter) - and then least often from the east (E) (Fig. 2)
- ! highest sustained speeds with W, NW winds followed closely by S winds; lowest sustained speeds with N, NE winds (Table 1)
- ! spring and summer
 - ! wind occurrence spread more >evenly= around the directional compass (Fig. 2)
 - ! winds occur most often from W, SW - and from the southeast (SE); followed closely in occurrence by winds from the S, NW, E directions
 - ! winds occur least often from the N, NE directions - although, relatively, substantially more wind occurs from these directions than during winter and fall
 - ! highest sustained speeds with W, NW winds followed closely by S winds (Table 1)
 - ! lowest sustained speeds with N, NE winds - although speeds spread more evenly around the compass than during winter and fall

References

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Table 1. Annual and seasonal mean hourly directional wind speeds (km/h) for 1953-2005 at Swift Current.

Direction	Annual	Winter	Spring	Summer	Fall
N	17.0	16.4	19.3	15.4	16.1
NE	17.4	16.7	19.3	16.5	16.4
E	19.2	21.0	20.4	18.0	18.6
SE	20.6	21.2	21.9	19.1	20.3
S	22.4	25.0	22.0	19.0	22.7
SW	21.4	23.2	21.3	19.3	20.9
W	23.8	25.4	23.8	21.6	23.5
NW	23.6	25.9	24.6	20.3	23.9
Average	21.2	23.2	21.6	19.0	21.2

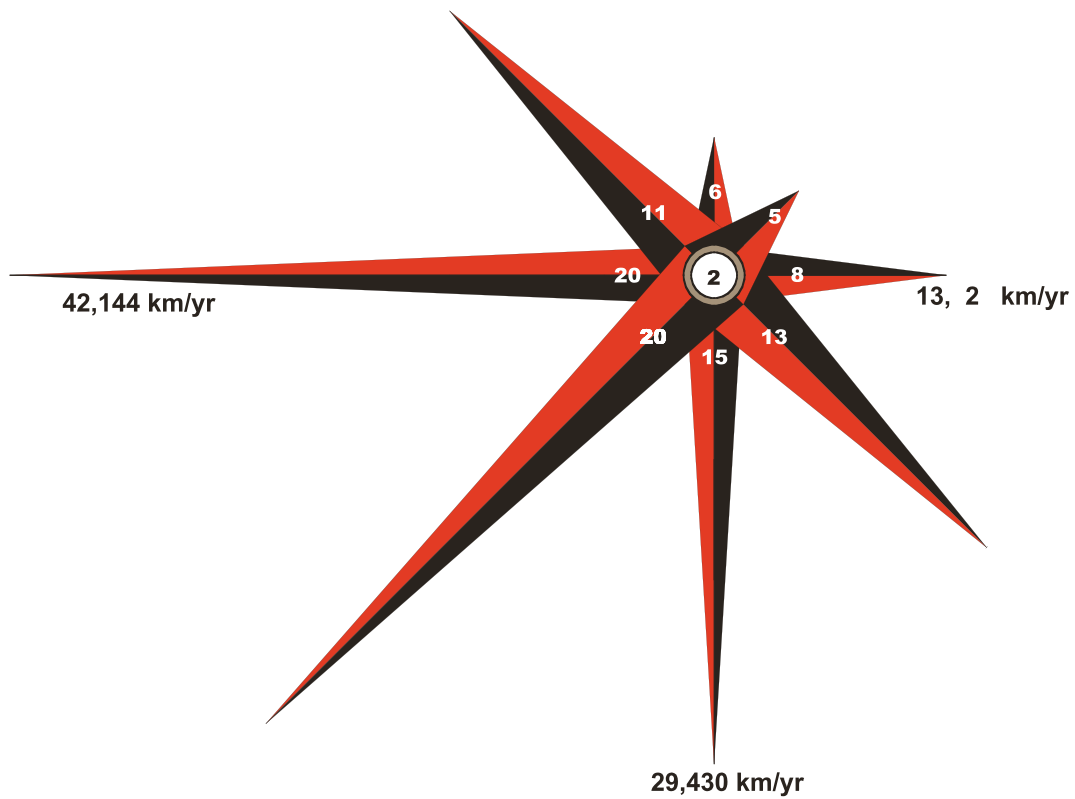


Figure 1. Windrose depicting average annual wind run measured 10 m above soil surface for 1953-2005 at the Swift Current Airport. Length of arrow is proportional to wind run and the number on the arrow is the % of time wind was blowing from that direction, % of time with calm winds shown in center of rose.