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Spatial and Temporal Wind Patterns in Ontario, 1980-2010

Wind plays an important role in a host of environmental factors ranging from the Earth's energy and water budgets to the redistribution of snow, soil, atmospheric pollutants and disease. Extreme winds are implicated in damaging events to production and infrastructure in agriculture, forestry, transportation, and the marine environment occasionally accompanied by loss of life. Wind also represents an emerging source of alternate energy production. Using NARR reanalysis model 3-hourly output at 32 km grid resolution, we examine trends and variability in 10 m surface winds over the past 31 years for the Province of Ontario and adjacent Great Lakes, bordering provinces, states and Hudson Bay. Regions which demonstrate statistically significant monthly and seasonal trends between 1980 and 2010 can be identified which may be linked to hemispheric periodic climate variability or to climate change. The dynamical factors responsible for shifting wind patterns are discussed.