

# CWSF 2014 - Windsor, Ontario



## Robert MacDonald

### Severe Tornado Outbreaks: Finding Mechanical and Thermodynamic Relationships

**Challenge:** Discovery

**Category:** Senior

**Region:** Halifax

**City:** Halifax, NS

**School:** J.L. Ilsley High School

**Abstract:** My project is an atmospheric analysis which aims at comparing, quantifying and modeling specific mechanical and thermodynamic relationships between multiple meteorological parameters and indices that are associated with severe tornado outbreaks in the United States. This in-depth data analysis connects the effects of thermodynamic instability, wind shear, dew point depression and various other meteorological parameters and indices to better predict severe tornado outbreaks.

#### Biography

I am in grade 11 at J.L. Ilsley High School in Halifax Nova Scotia. I have always been interested in all fields of math and science especially meteorology. One summer while in Darnley P.E.I. for a family reunion I saw what I later learned were waterspouts (essentially weak tornadoes over water). This really sparked my interest in tornadoes and severe weather. Since then, I have been researching severe weather for many years and have even taken online meteorology courses to further my knowledge. Outside of meteorology, I am also interested in all forms of flight, from commercial aviation to space exploration. After I graduate high school I plan on going to university, and my studies will most definitely be related to my favorite subjects of math and science.

#### Awards

#### Value

Excellence Award - Senior - Gold Medal Sponsor: Youth Science Canada	\$700
Dalhousie University Faculty of Science Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: Dalhousie University, Faculty of Science	\$5 000
UBC Science (Vancouver) Entrance Award Senior Gold Medallist - \$4000 Entrance Scholarship Sponsor: The University of British Columbia (Vancouver)	\$4 000
University of Manitoba Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of Manitoba	\$5 000
University of Ottawa Entrance Scholarship Senior Gold Medallist - \$4,000 Entrance Scholarship Sponsor: University of Ottawa	\$4 000
Western University Scholarship Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University	\$4 000
<b>Total</b>	<b>\$22 700</b>