



# Waterloo-Wellington Science & Engineering Fair 2014 Annual Report



*WWSEF Finalists at the Canada-Wide Science Fair in Windsor...see inside*

## Outstanding! Again!

Every finalist your regional science fair took to the Canada-Wide Science Fair (CWSF) in Windsor received an award for the research and project presentation. This was the third time in recent years for this rare success.

There are more than 100 regional science fairs in Canada, and about 450 young researchers bring their projects to the week-long CWSF.

## Re-Wilding

Our afternoon environmental education program is intended to invite the talents of some of our young researchers to environmental topics. Our theme this year involved the notion of 're-wilding' and our relationship with wilderness. Re-wilding is a concept in conservation and restoration circles. The program was supported by TD Friends of the Environment Foundation and BlackBerry.

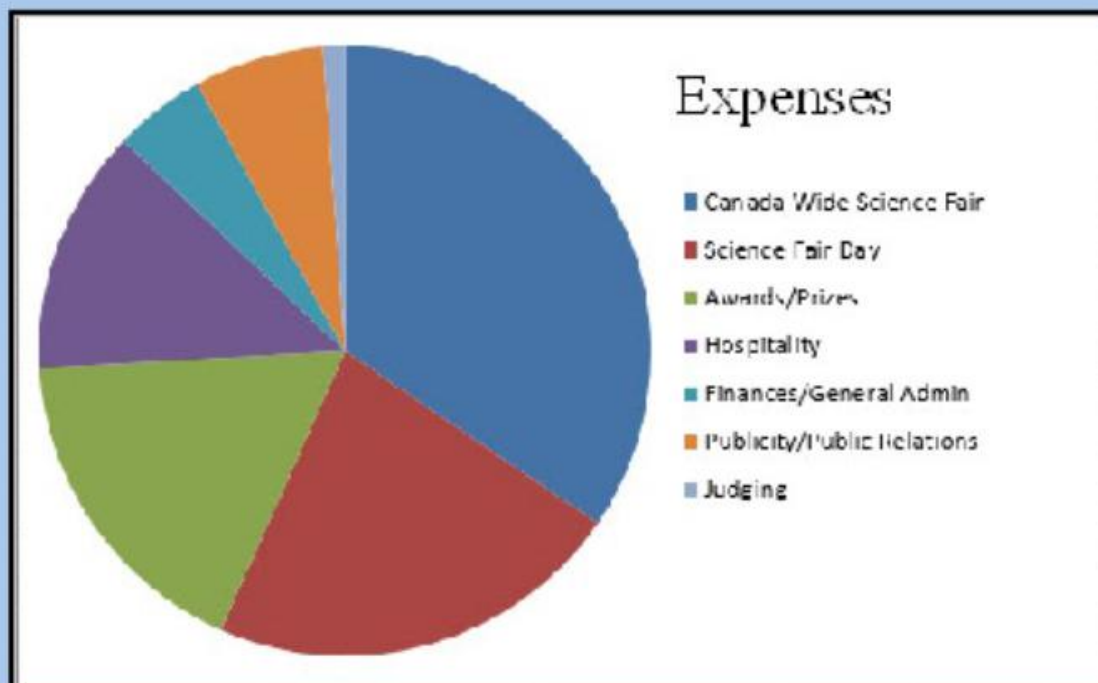
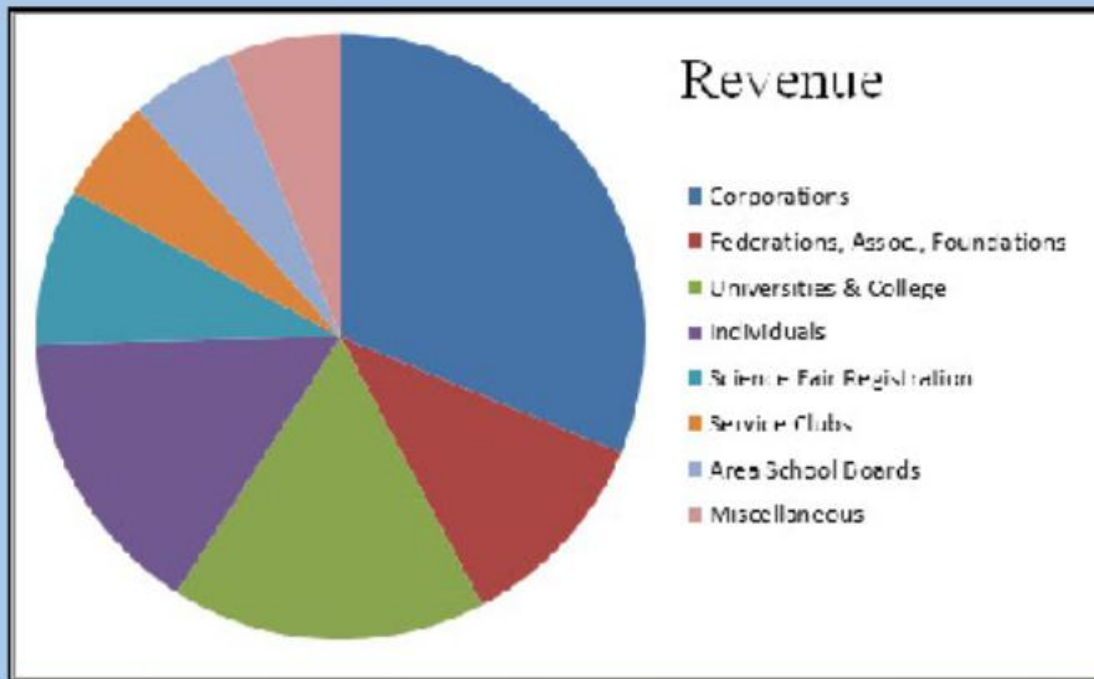
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# 2014 Financials...



# Canada-Wide Science Fair

## Windsor, Ontario...



**Kevin Strauss & Kevin Dong, Waterloo Collegiate Institute**

### The Calculated Crisis

Every year, hurricanes along the East Coast create storm surges which devastate cities. To help these cities, a method was devised using physics and ArcGIS, a mapping and data manipulation program, to estimate the extent and damage caused by hypothetical storm surges. With Jacksonville, FL, as the city of study, the method was used to calculate the surge extent to an accuracy of 81%.

**Awards:** Excellence Award - Senior Gold Medal (YSC) (\$700), Challenge Award - Environment - Senior (\$1000), The Actuarial Foundation of Canada Award - Senior (\$1000), Entrance Scholarships: Dalhousie U(\$5000), UBC Science (Vancouver) (\$4000), U of Manitoba (\$5000), U of Ottawa (\$4000), Western University (\$4000), U of Windsor(\$2000)

**Devanshi Shukla , Centennial Collegiate & Vocational Institute**

### Quorum sensing: A novel approach for identifying anti-microbial herbal plants

Measuring reduction of luminescence in *V. fischeri* due to the addition of 6 medicinal plants (Holy Basil, Cumin, Coriander, Nutmeg, Turmeric & Artemisia) is a new approach for quantifying the efficiency of their anti-bacterial compounds. This research explored the effect of extracts in direct contact with bacteria as well as the volatile effect of fresh leaves and compounds without contact.

**Awards:** Excellence Award - Intermediate - Gold Medal- YSC(\$700), Challenge Award - Innovation - Intermediate (BlackBerry) (\$750), Western University Entrance Scholarship (\$4000)



**Arjun Pandey, Waterloo Collegiate Institute**

### The Effects of Body Mass Index and Weight Loss on Pulmonary Blood Pressure

Pulmonary hypertension can have many negative effects on individuals' health, including premature mortality. My study demonstrates a strong correlation between obesity (measured through Body Mass Index) and elevated pulmonary pressures, and also demonstrates a strong correlation between weight loss and a reduction in pulmonary pressures, suggesting that obesity is an important potential contributor to pulmonary hypertension.

**Awards:** Excellence Award - Intermediate - Silver Medal: YSC (\$300), Western University Entrance Scholarship (\$2000)

**Zoë Kovacs, St.John's-Kilmarnock**

### The Digestion Question

Zoë also qualified to attend the Canada-Wide Science Fair but stayed home for school commitments.



**Avinash Pandey, Waterloo Collegiate Institute**

**Addressing Forgetfulness as a Contributor to Inactivity: A Text Message Solution**

Inactivity post-heart attack is common and can have serious repercussions. The purpose of this study was to assess the role of forgetfulness in inactivity and the effectiveness of an automated text message reminder system to improve exercise adherence. In 50 individuals, text message reminders resulted in a 40% improvement in exercise adherence over 1 year. Forgetfulness appears to be a significant contributor to inactivity.

**Awards:** Excellence Award - Senior - Silver Medal: YSC (\$300), Entrance Scholarships: Dalhousie University (\$2500), UBC Science (Vancouver) (\$2000), University of Ottawa (\$2000), Western University (\$2000).

**Andrew Ilyas, Waterloo Collegiate Institute**

**MicroFilters: Harnessing Twitter for Disaster Management**

MicroFilters is a novel system harnessing the power of Twitter for disaster response using automatic image extraction and machine learning. Previously, tweets were manually filtered for images or automatically classified using text. MicroFilters automates the filtering process using a novel image-based approach accelerating disaster response and producing richer data than text alone. MicroFilters was used by the UN during Typhoon Haiyan and the Oklahoma Tornado.

**Awards:** Excellence Award - Intermediate- Silver Medal: YSC (\$300), Western University Entrance Scholarship Silver Medallist (\$2000)



**George Utsin, Waterloo Collegiate Institute**

**AlgEYE: Automation of Algal Hydrogen Production**

AlgEYE is a system that automatically monitors algal growth and controls hydrogen production. Green algae is known to produce hydrogen gas under anaerobic states influenced by sulfur depletion, however this can have negative long term repercussions on the algae. By creating a system that automatically regulates the sulfur levels, hydrogen production is not sacrificed to algal nutrient starvation.

**Awards:** Excellence Award - Senior - Silver Medal: YSC (\$300), Entrance Scholarships: Dalhousie University (\$2500), UBC Science (Vancouver) (\$2000), University of Ottawa (\$2000), Western University (\$2000)

**Parker Hoyes, St.John's-Kilmarnock**

**Trendsetter**

Trendsetter is a project in the areas of Theoretical Physics and Computer Science. This project uses a Java physics engine created by Parker to model physics scenarios with which this project aims to discover a proof of the Butterfly Effect in Chaos Theory.

**Awards:** Excellence Award - Junior - Bronze Medal: YSC (\$100), Western University Entrance Scholarship (\$1000)

