

7th Annual Richard 'Dick' Thomas Memorial Student Presentation Competition & Award at the 2013 Washington GIS Conference

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*Richard 'Dick' Thomas
1947 – 2006*

Four students presented their projects at the seventh annual Richard 'Dick' Thomas Memorial Student Presentation Competition & Award on Wednesday, May 8, 2013 at this year's Washington GIS Conference (May 6 - 8) at the Lynnwood Convention Center in Lynnwood. The Washington State Chapter of the Urban and Regional Information Systems Association (WAURISA) established this award to honor Washington State GIS pioneer and mentor, Richard 'Dick' Thomas by continuing his work of encouraging students to excel in their studies and transition successfully into GIS careers.

WAURISA's goal with this award is to inspire students to present their original work related to GIS, geography, or geographic research in Washington State at the annual Washington GIS Conference. The competition comprised of two parts: the first was the selection of four (4) abstracts by the Competition Committee. The second part was the judging of the 4 selected presentations during the Student Presentation Session at the 2013 Washington GIS Conference. The students used a maximum of 300 words in their abstracts to describe the proposed presentations and the presentations were limited to 20 minutes each for presentations and audience questions.

Current students who are enrolled at least 6 hours in a relevant curriculum at a secondary school, community college, technical school or university program were eligible to enter. Entries were the original work by the students, which they conducted as school projects or under the supervision of a professor while enrolled in a GIS, geography, technology or related academic program. Subjects for papers were related to geography, GIS or an allied technology, as applied to natural resource, hazard mitigation, health, law enforcement, energy, social, business, government or other issues.

Abstracts and presentations were judged on whether the students demonstrated expertise and understanding of geographic concepts; demonstrated expertise and understanding of GIS, related technology, and its application; explained how the work related to the topic and contributed to greater understanding or knowledge of the topic and GIS; demonstrated an innovative approach and/or critical thinking; as well as the quality of their written abstracts and public presentations.

This year's four entries presented an array of topics. **Christopher Wright** discussed his work in modeling water infiltration for the City of Bothell. **Solmaz Amiri** presented her work on utilizing georeferenced data and technologies for crime prediction in a block group in Spokane. **Melissa Kelly** spoke about her work on sourcing and identifying offensive odors in King County's Cedar Grove Road area. **Abdullah Akpınar** discussed his project on assessing the associations among green space type, structure, general mental health, and general health using GIS and FRAGSTATS.

First Place: Christopher Wright



Christopher is a student at University of Washington – Bothell in Environmental Science. His project was done under the guidance of Dr. Santiago Lopez. Christopher’s presentation was “**City of Bothell Water Infiltration Modeling**”.

Here is his abstract:

Water infiltration is an important component to understanding, runoff, erosion, and groundwater recharge. Many factors influence how and where this process takes place. In urbanized areas, growth and development are increasing the amount of impervious surfaces and in turn, decreasing the amount of available area for water infiltration.

The City of Bothell is interested in modeling water infiltration within their city planning area to understand the relationship with storm water and runoff. This project incorporates the city of Bothell’s geodatabase and data provided by the USGS in a Multi

Criteria Evaluation (MCE) within a GIS framework to determine sites within the city’s planning area that could be suitable for water infiltration. Soil water infiltration is determined by the rate and duration of the rain or water event along with the physical properties of the soil, slope, and vegetation. Reclassification of soil data characteristics, slope, land use and land cover allowed me to assign infiltration percentages based on primary literature.

Five MCE models were run and the results were reclassified and analyzed to determine area sizes. Results showed that suitable water infiltration areas range from 6-24% of the total planning area depending on how the criteria are weighted. The identification of water infiltration areas will allow city officials to implement community-based programs to increase water infiltration in areas with high priority and determine where on-site water infiltration should be employed for new development projects decreasing the demand on existing storm water infrastructure.



Christopher (left) receiving his rewards from Amanda Taub, GISP (center) and Sarah Myers, GISP (right).

Christopher's rewards included:

- Dick Thomas Award Plaque
- \$1000
- One year membership in WAURISA
- Free registration to the 2014 Washington GIS Conference
- Publication of paper in *The Summit* (Washington GIS Newsletter)

In addition, his professor, Dr. Santiago Lopez, was awarded a cash prize of \$250.

Second Place: Solmaz Amiri



Solmaz is a student at Washington State University. Her advisor was Kerry R. Brooks and her presentation was on “**Utilizing Georeferenced Data and Technologies for Crime Prediction in a Block Group in Spokane, WA**”.

Here is her abstract:

One of the main desires of human beings is to live in crime-free environments. The design of the built environment can influence fulfilling this desire. One of the main qualities of physical configuration postulated to promote freedom from crime is natural surveillance (NS). NS is facilitated by physical design that offers residents/guardians opportunities to survey non-private spaces of their residential settings. Previous research have acknowledged a relationship between NS and the distribution of crime incidents, hypothesizing that crime is more reduced in eye-policed streets. However, studies have measured the degree of NS in two ways: either objectively in two dimensions without taking into consideration the height and surveillance characteristics of surrounding structures, or

subjectively based upon retrieved researchers'/residents' judgments of whether or not a dwelling can be seen from other dwellings.

This study utilizes georeferenced data and technologies to expand the objective approach into the 3rd dimension. To this end, in a residential neighborhood, data on the position and size of openings (i.e. doors, windows, etc.), vegetation and visual barriers are gathered from geo-referenced oblique aerial imagery and complemented by site surveys. Openings are enumerated and mapped. Then, ArcGIS 3D Analyst tools has been utilized to create a three dimensional model of this site. Sight-lines are generated from each opening to openings in all other residential structures on the same street segments. Sight-lines that are too distant or that are obstructed by vegetation and barriers are removed and intensity of NS for each opening are calculated. Next, the entry point of burglars for the actual burglarized dwellings from the Spokane Police Department reports are compared to the NS intensity for each opening. A multi-level analysis will reveal which openings might be more targeted by burglars, and whether significant mean differences exist for NS between burglarized and non-burglarized housing units.



Solmaz (left) receiving her rewards from Amanda (center) and Sarah (right).



Sarah (left) with Solmaz (center) and Amanda (right).

Her rewards included:

- Dick Thomas Second Place Award Certificate
- \$300
- One year membership in WAURISA
- Publication of paper in *The Summit* (Washington GIS Newsletter)

Third Place: Melissa Kelly



Melissa, with the GIS Department at Green River Community College, presented “**King County Cedar Grove Road Area: Odor Identification and Sourcing**”. Her advisor was Sabah Jabbouri.

Here is her abstract:

For well over a decade, residents in the Cedar Grove Road area in King County have been plagued by nuisance odors in their neighborhoods. A number of lawsuits and penalties have yet to resolve the situation.

At the center of the situation are two Cedar Grove Composting (CGC) sites. Local residents are convinced that the CGC sites are the source of the odors. However, a reclamation facility and the King County Regional Sanitary Landfill lie next to CGC, thereby complicating the identification of odors.

The regulatory agency responsible for the situation is the Puget Sound Clean Air Agency (PSCAA). Unfortunately, they have been somewhat ineffective because they are required to be accurate in any indictments they may make. In addition, CGC claims that

they are not the source of the odor complaints but instead point to the county landfill and the materials site next door.

CGC requires and deserves accurate and timely odor source identification. In collaboration with Atlas,

a non-profit organization for the Four Creeks Unincorporated Area Council (FCUAC), and local residents, the objective of this project is to develop a system to effectively identify the source of nuisance odors.

Once originated, odor particles are at the effect of meteorological forces and physical blockage including vegetation, topography, and man-made objects. Wind, humidity, and temperature are among the forces that influence the direction and disbursement of odors. The outcome will be to perform multiple analyses including mapping odor complaints and the facilities in question, topography analysis, and Spatial Analyst modeling using weather station data for various weather parameters. Geostatistical Analyst will be used to produce predictions of weather phenomena for the unsampled locations. Hot Spot analysis will be generated using all complaint addresses. Several GIS maps will be created for comparison of days with and without odor complaints.



Melissa (left) receiving her rewards from Amanda (center) and Sarah (right).



Melissa (left) with Amanda (center) and Sarah (right).

Her rewards included:

- Dick Thomas Third Place Award Certificate
- \$200
- One year membership in WAURISA
- Publication of paper in *The Summit* (Washington GIS Newsletter)

Honorable Mention: Abdullah Akpinar

Abdullah is a student at Washington State University and his advisor was Kerry R. Brooks. His presentation was on “**Assessing the associations among green space type, structure, general mental health, and general health using GIS and FRAGSTATS**”. This year we tried something new when **Abdullah** was unable to attend the conference in person, so **Abdullah** gave his presentation via Skype.

Here is his abstract:



Today many people suffer from mental health problems such as depression and anxiety. The prevalence of depression and anxiety are 16.1% and 12.3%, respectively. The WHO reports that mental health disorders are expected to be one of the major contributors to illnesses by 2020. Another important phenomenon that affects/decreases mental health is stress, which is estimated to affect 75-90% people. In this study, "General Mental Health" was adopted to describe stress-depression-anxiety. Previous research reveals that green space (GS) has positive effects on general mental health (GMH) and general health (GH) and GS may mitigate GMH problems and improve GH. However, research has not demonstrated which types of GS are better to mitigate GMH and improve GH. Therefore, my project is about identifying appropriate green environments using existing nationally collected survey and geospatial information.

Objectives of my project were to fill the gap in existing knowledge in the literature and create recommendations for policy makers/planners/designers regarding where/how to design, create, preserve or restore GS that people can reduce GMH problems and improve GH. This research was conducted at zip-code levels in Washington State employing NLCD and BRFSS data. The purpose was to explore relationships between types and structures of GS, and people's GMH and GH, specifically addressing questions of whether general specifications of GS are affirmatively associated to GMH and GH. This was done by adopting a three-tiered, hierarchical approach using GIS and FRAGSTATS: first examining relationships between unitary GS (all GS types) and people's GMH and GH; secondly, assessing relationships between specific types of GS, GMH, and GH; and thirdly, assessing relationships between structures of significant GS and GMH and GH. Results showed that urban green space and forest positively; rangeland and agricultural land negatively affect GMH and GH; less fragmented, less isolated and well-connected GS positively affect GMH and GH.

Abdullah received an Honorable Mention certificate for his work.



Thank you!

Every year the students dazzle us with their projects and dedication. This year was no exception. All of the students did a great job of presenting their work. The future is bright for them and our profession.



We would like to send our heartfelt gratitude to everyone that made possible this year's Dick Thomas Student Presentations. We would like to thank this year's entrants, **Christopher Wright, Melissa Kelly, Solmaz Amiri** and **Abdullah Akpinar**, for the great work they demonstrated in their abstracts and quality presentations. We would like to thank the judges, Emelie Healy with Aspect Consulting, Deron Smith with Peninsula Light, Winston McKenna with ActioNet, Walker Willingham with Wilson Engineering, Lane DeLarme, and Rick Lortz with the Lakehaven Utility District for their work judging the abstracts and presentations. Finally, we would like to thank all of the professors who encouraged their students to enter the competition. These

presentations would not have happened without your support.

I, Amanda, would like to thank Sarah for joining me as the co-coordinator for this year's competition. This was my last year as coordinator. I have really enjoyed my time coordinating this competition. I know that Dick would be so proud of all the students that have presented through the years. Please be certain to welcome Sarah as next year's coordinator. I know she will do a wonderful job managing the competition.

We hope you will come to the eighth annual Richard 'Dick' Thomas Memorial Student Presentation Competition and Award at next year's Washington GIS Conference (May 12 - 14, 2014) at the Greater Tacoma Convention & Trade Center. Student presentations will be Wednesday, May 14, 2014.

1st Place Winner: Christopher Wright



2nd Place Winner: Solmaz Amiri



3rd Place Winner: Melissa Kelly



Honorable Mention: Abdullah Akpınar

