

## Curriculum Vitae

### SUMMARY

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Ms. Wells is an Air Quality Scientist with a background in meteorology and air quality including monitoring, data analysis, and modelling. She is knowledgeable in the environmental assessment and permitting procedures within various Canadian Provinces and Territories. She has experience in air quality and meteorological modeling for a both research and oil and gas and mining industries. As a Senior Air Quality Analysis for ECCC, Ms. Wells provides air quality reviews of Environmental Assessments and Environmental Impact Statements nationally. She has testified on behalf of Environment and Climate Change Canada (ECCC) at several panel and board hearings providing information on the topic of air quality.

Ms. Wells recently became a Senior Program Scientist in the Energy and Transportation Directorate (ETD), within Environment and Climate Change Canada (ECCC). In this role she is focused on the impacts to air quality and greenhouse gases from marine shipping in the Salish Sea of British Columbia.

### EXPERIENCE

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- Sept 2019 – Present     **Senior Program Scientist, ETD, ECCC, Vancouver BC**
- Engage with Indigenous rights holders who were intervenors in the Trans Mountain Pipeline Project Reconsideration to discuss vessel emissions in the Salish Sea.
  - Host training sessions for Indigenous rights holders and other stakeholders on public access version of MEIT
  - Oversee contracts and conduct analysis to assess emissions from vessels in the Salish Sea and develop recommendations for emission reduction opportunities
  - Research environmental assessments and cumulative effects on air quality / emissions of marine shipping in the Salish Sea. Participate in monitoring and follow-up programs for approved projects and participate in future environmental assessments.
  - Lead interdepartmental technical work group to evaluate proposals. Oversee development and execution of grants and contributions on emission reductions from vessels in the Salish Sea.
- Dec 2017 – Sept 2019     **Senior Air Quality Analyst, EPOD, ECCC, Vancouver BC**
- EA and EIS review:*
- Conducts air quality reviews of EA's and EIS's for the Prairie Northern and Pacific Yukon Regions.
  - Provides scientific/technical air quality advice to EPOD programs
  - Collaborates with experts within EPOD and other directorates on air quality content
- Environmental Hearings:*
- Participates in environmental hearings in Northern Canada

- Testifies as air quality witness on behalf of ECCC for Join-Review panel hearings (most recent: Teck Frontier Oil Sands Mine October 2018 and Roberts Bank Terminal 2 May 2019)

May 2016 – Dec 2017 **Air Quality Research Scientist, Meteorological Service of Canada (MSC), ECCC, Vancouver BC**

*Air Quality Science Research:*

- Involves the transportation, dispersion and the chemical transformation of trace gas and particle species in the atmosphere.
- Reading literature, contacting experts in the field, web searching and many other means of attaining the latest information, techniques and methodologies.
- Statistical analysis of large data sets such as regression analysis, PMF, PCA, cluster analysis and other statistical techniques.
- Aid in troubleshooting specific issues with NO<sub>x</sub> measurements in the Lower Fraser Valley, collaborating with Metro Vancouver.

*Air Quality Field Research:*

- Conduct field measurement activities to support research.
- Includes travel to field locations, planning field campaigns, logistical preparations for field campaigns, instrument maintenance and calibrations, documentation of calibrations and maintenance, installation of instrumentation, writing instrument protocols, collecting data, data archiving, data validation (QA/QC), writing or amending validation software, budgeting.
- Responsible for 2<sup>nd</sup> and 3<sup>rd</sup> level validation for the Marine Boundary Layer site as well as weekly checks on site performance
- Responsible for checking instrument operations, calibrations, and data analysis at the Near Road study site mobile trailer

*Science Communication:*

- Assist with and provide analysis for papers, reports, and presentations that communicate air quality research to a variety of audiences

*Attend meetings relating to research:*

- Attend meetings with Stakeholders on a regular basis including but not exclusive to , 1) the NAPS Roadside Committee meetings, 2) the MBL Oversight Committee meetings and other meetings as required
- Collaborate with other agencies, departments and branches to encourage the sharing of information and resources to accomplish common goals. This includes collaborations with universities (UBC, UofT, York, VIU, SFU, UC Davis, WSU, UWA), branches (S&T), other departments (Health Canada, DFO, AAFC), and other agencies (BC Environment, BC Ministry of Agriculture, Metro Vancouver, FVRD, EPA, NPS, USDA).

July 2012 – May 2016 **Air Quality Scientist, Stantec Consulting, Burnaby BC**

*Ambient Monitoring and Data Analysis:*

- Worked with the air quality team to create baseline air quality and meteorology for the region surrounding proposed projects.
- Included leading and participating in field programs to collect dustfall samples, meteorological data, and air quality data.
- Projects also include snow course surveys, QA/QC and analysis of the collected data, and creation of visual aids such as web pages, graphs, and spreadsheets.
- Co-author of numerous baseline reports relating to air quality, meteorology, and snow surveys.

*Air Quality and Meteorological data analysis:*

- Downloaded, analyzed, and QA/QC air quality and metrological data using various programming tools (MATLAB, R, VBA).
- Author of Airshed study reports using graphs, tables, and discussion suitable for regulators and the public

*Environmental Assessments and Permitting:*

- Compiled facility design information and create emissions inventories using various emission factors relevant for the specific project
- Authored modelling plans according to the BC Modelling Guidelines that were then approved by regulators
- Conducted meteorological modelling over large domains and complex terrain using MM5, WRF, CALWRF, CALMET, and AERMET and air dispersion modelling using CALPUFF, AERMOD, and SCREEN3.
- Processed and analyzed the output data from the models using various post processing tools via scripting languages, VBA, and excel.
- Air Quality Discipline Lead role: ensuring all air quality components of an Environmental Assessment were completed correctly, on time, and on budget. Participated in regular meetings with project managers, clients, regulators, and stakeholders
- Author and lead author of the numerous Technical Data Reports and Environmental Assessment chapters relating to air quality.
- Types of projects modelled and involved on: Liquefied Natural Gas facilities, gas plants, pipelines, copper/gold mines, coal mines, compressor stations, terminals.

Jan 2009 – July 2012    **Atmospheric Science Research Assistant, University of British Columbia (UBC), UBC Weather Forecast Research Team (WFRT), Vancouver BC**

*Statistical evaluation of medium range ensemble weather forecasts and of short-range high-resolution ensemble weather forecasts*

- Created an ensemble verification system (using C, MATLAB, Perl, Python, php, html) that contained a tailored set of nine verification metrics that is currently being run annually but the WFRT
- Verification metrics utilized observations, requiring data base queries
- Results displayed on a real-time web page to aid forecasters

*Compilation, configuring and operation of the WRF-NMM weather forecast model for the WFRT*

- Troubleshoot issues related to configuration and operation of model including those relating to complex terrain
- Asses specific physics schemes appropriate for the region
- Work with the team to determine domain size and optimal resolution
- Used bash scripting to automate and to ultimately run models operationally for the WFRT on HPCC

*Participate in weekly weather briefings and science seminars*

- Prepared and disseminate individual weather forecasts
- Presented weather forecasts to public using green screen technology
- Presented progress of research projects

## EDUCATION

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Bachelor of Science, Major in Atmospheric Science with Distinction  
University of British Columbia, Vancouver BC, 2012

## **AWARDS, TRAINING, & CERTIFICATIONS**

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Management of Fugitive Dust, Occupational Level 1 First aid, collision avoidance driving, 4x4 off-road driving, Mental Health in the Workplace, Wilderness first aid, H2S Training, Transportation Endorsement, WMIS, Bear Aware, Green Defensive Driving, Visual Basic Application training, Campbell Scientific Data Logger training

Chih-Chuang and Yien-Ying Wang Hsieh Memorial Scholarship, Canadian Meteorological and Oceanographic Society (CMOS) Undergraduate Scholarship, CMOS/The Weather Network Scholarship, Natural Sciences and Engineering Research Council of Canada (NSERC) – Undergraduate Student Research Award (two awards held), University of British Columbia President's Entrance Scholarship, Selkirk College Board of Governors Entrance Award