



# Ella Castillo

## Associate Consultant: Air Quality Support : Atmospheric Modeller

Ella Castillo is an atmospheric scientist with almost 20 years' experience in air quality, mesoscale and local-scale meteorological modelling, dispersion modelling, emissions estimation, climate analysis and reporting. She has a Bachelor of Science degree in Physics and Computer Engineering from the Ateneo de Manila University in the Philippines.

Ella specialises in the application of numerical models to conduct air quality impact assessments for a range of industries including energy, mining and extractive industries, transport, and agricultural businesses within Australia, the Middle East and other international locations. These include regulatory models such as TAPM, CALMET/CALPUFF, AUSPLUME, and AERMOD, ISC3, and CAL3QHCR.

Ella also specialises in the generation of three-dimensional meteorological datasets to use for dispersion modelling, regional and meso-scale climate and weather analysis, and other applications. This includes the detailed configuration of the Weather Research and Forecasting (WRF) model, comprising the optimisation of Physics options, generation of custom input geographic datasets, data assimilation, as well as processing results.

Ella is also a specialist in Geographic Information Systems (GIS). She created an algorithm which utilised advances in data generation capabilities of other environmental fields, inherently strengthening the connection between air quality and other areas of study. These methods significantly improved input information for models in a robust and efficient manner, and enabled translation of technical model data into information that can be utilised in other disciplines including environmental impact assessments.

Ella's knowledge of databases extends beyond the spatial component of GIS. She also has significant experience in the development, management and maintenance of technical and administrative databases using MySQL, MS SQL, MariaDB, and Microsoft Access. She has worked with databases for numerical weather forecasts, comprehensive project management systems and detailed emissions inventories for government and industry clients.

She specialises in mathematical interpolation, data processing and analysis using scientific and object-oriented programming and scripting languages to improve data linkages across different formats and disciplines. Ella is well-versed in using an array of standard and specialist analytical fields in the air quality field.

Ella's contributions to the field of air quality and GIS led to her being awarded residence in Australia on a Distinguished Talent Visa in 2009.

Her knowledge, skills, and experience have led to successful project outcomes for a number of air quality, greenhouse gas and climate assessments.

### Technical Experience/Skills Set

- Air Quality Assessments
- Greenhouse Gas Assessments (NGER, IPCC)
- Emissions inventories for modelling (AP-42 or NPI Emissions Estimation Techniques, stack monitoring, mass balance equations)
- Air Dispersion Modelling (CALPUFF, AERMOD, AUSPLUME, TAPM, ISC3, and CAL3QHCR)
- Source Apportionment (Positive Matrix Factorisation, Principal Components Analysis)
- Numerical weather prediction modelling (WRF, MM5, TAPM)
- GIS - Geographic Information Systems (ArcGIS, Grass, QGIS, Microstation, Bentley)
- Computer coding (Fortran, Visual Basic, Python, PHP, GrADS, NCL)
- Database design and management (MS Access, SQL, MySQL, MariaDB)