

# BRIAN DOUGLAS MARTIN

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## Professional Experience

### SCIENTIST IV, 2019-PRESENT

Aeris LLC, Louisville, CO

- Responsible for research and development activities related to Atmospheric Transport and Dispersion, Biodefense, Renewables, and Aviation Weather Sciences

### MANAGER MONITORING AND DIAGNOSTICS CENTER, 2014–2019

Power Systems Manufacturing (PSM), Ansaldo Energia Inc., Jupiter, FL

- Led a highly diverse group of Operators, Engineers, and Data Scientists responsible for the 24/7 monitoring of the Ansaldo Energia 40,000 MW Global Gas Turbine Fleet
  - Managed a \$3M Monitoring and Diagnostics (M&D) Center budget
  - Ensured a continuous and direct line of site for a worldwide 300-unit fleet
  - Responsible for leading the transition of PSM's M&D center from Alstom, through the GE purchase, and subsequent 2016 divestment to Ansaldo Energia, an action accomplished in less than 2 years
  - Developed a strategy for predictive monitoring through machine learning processes mimicked in the production environment by the larger Ansaldo organization
  - Grew team from 4 employees monitoring 26 units to a local team of +13 responsible for those 300 units
  - Responsible for reporting out contractual invoicing tied to revenue for the PSM
  - Developed staffing practices and M&D strategy, leading to a proactive cultural change that allowed M&D to become a profit center in 2018

### SENIOR TECHNICAL CONSULTANT, 2009–2014

WindLogics at NextEra Energy Resources, Juno Beach, FL

- Team Lead for the Operate Vertical's Operational Assessment franchise
  - Coordinate and perform operational assessments for NextEra's 10GW wind fleet, developing code, processes, managing team deliverables
  - Developer of WindLogic's Generation Entitlement efforts (patent PCT/US2014/041044), a novel approach for measuring wind fleet performance from portfolio to turbine level, underlying detection algorithms responsible for exposing ~\$20M in recoverable annual lost revenue
  - Responsible for oversight, execution, coding, and reporting of deliverables for the Wind Energy Index, a report highly visible to NextEra senior management and used as a performance indicator across business units
  - Perform special, nonstandard analyses for senior management, business management, power generation, power marketing, treasury, taxation, and development to assist in budgetary and business decision making
  - Nonstandard analyses assisted in the acquisition of Mt. Miller Wind, in the closing of PENTA Wind and Capricorn Ridge TX tax equity partnerships, Heartland Financing, the Wyoming Wind property tax settlement, and the unsolicited sale of Montfort Wind, all significant value adds
  - Responsible for developing WindLogic's Operational Assessments and performance reporting processes and bringing them to the external market
  - Perform assessments of potential wind sites presented by Development to the Board of Operations
  - Execute site suitability studies to assess stress characteristics of potential wind sites for a range of turbine technologies
  - Validate and approve third party power performance testing of newly commissioned turbine arrays

### WINDFARM OPTIMIZATION ANALYST, 2008–2009

FPL Energy, Juno Beach, FL

- Developed optimized, preliminary, and draft arrays for potential wind farms in the United States and Canada
- Optimized meteorological tower placement for potential wind sites presented by development

### ASSOCIATE TECHNICAL STAFF, 2001–2008

## Massachusetts Institute of Technology (MIT) Lincoln Laboratory, Group 43 – Weather Sensing, Lexington, MA

- Principal analyst for Aviation Weather-Traffic Flow Management Integration research
  - Modeler and algorithm developer for the Federal Aviation Administration's Airspace Flow Program
  - Developed statistical and objective models relating convective weather to capacity reduction in both en route and terminal area airspace
  - Secured continued funding for research efforts for capacity models of the national airspace system
  - Routinely presented research efforts to potential project sponsors as well as collaborative research institutions and senior level leadership
  - Developed boundary detection algorithms for Group 43's Convective Weather Forecast
  - Assimilated multiple NEXRAD / TDWR Doppler radar information, 1-min surface observations, aircraft observations, and model forecasted winds into a single-high resolution now cast of boundary layer winds
  - Assisted in the development and analysis of Lagrangian Scalar Integration techniques for synoptic and mesoscale feature detection that use high resolution wind analyses
- Meteorological support and analysis for the Integrated Terminal Weather System (ITWS) - Terminal Winds
  - Analyzed and revised algorithm parameters that made the Twinds analysis more representative of wind conditions over the near terminal environment
  - Parameterizations became a part of the production ITWS deployed at major terminals across the United States
  - Developed and licensed technology for the ITWS Path-based Shear Detection© (PSD) algorithm and display
- Meteorological support, analysis, and algorithm development for Wake Vortex research
  - Participated in wake vortex data collection effort using Lincoln Laboratory's Coherent Continuous Wave LIDAR at Denver International Airport, 2003
  - Helped develop Wake Vortex advection now casting

## Related Skills and Qualifications

### Computing Languages:

- Proficient user of MATLAB for analysis, algorithm development, statistics, and visualization
- Developed algorithms using languages that include R, Splus, C++, FORTRAN, JAVA
- Scripting languages include Perl, Python, C-shell, PowerShell

### Programming Libraries:

- GRIB utilities for atmospheric model data extraction
- SQL for querying and data analysis of SCADA, MV90, high resolution aircraft data
- NetCDF utilities, Numerical Recipes, NCAR Graphics, R open source libraries, Lincoln Laboratory utilities

### Software Applications:

- WindFarmer, WAsP, ArcGIS, XMap
- GrADS, GEMPAK, IDL, McIDAS, XMGR, XV
- ArcGIS Advanced

### Other:

- Leadership Development Program, PSM
- Six Sigma Black Belt trained; Six Sigma Green Belt certified
- Fluent Applications in Computational Fluid Dynamics
- Present Operational Assessment Reports for the Monitoring and Diagnostics Center to a large customer base as well as present center capabilities at annual Asset Manager Meetings, meetings with potential customers, and during unit issue reviews
- Presented at the AIAA 7<sup>th</sup> Aviation Technology, Integration, and Operations Conference representing MIT Lincoln Laboratory's aviation weather program, 2007
- Presented at American Meteorological Society Conferences, 2005–2007
- Practical Pattern Classification: Neural Nets, Statistics, Machine Learning

## Education

### THE FLORIDA STATE UNIVERSITY

- Masters of Science, Meteorology, 2001

- Bachelors of Science, Meteorology, 1999

## Publications and Conference Papers

- Martin, B.**, 2007: Model Estimates of Traffic Reduction in Storm Impacted En Route Airspace, *7<sup>th</sup> AIAA ATIO Conference, Belfast, Ireland, Sep. 18-20, 2007*
- Martin, B.**, and J. Evans, 2006: Results of an Exploratory Study to Develop a Model for Route Availability in En Route Airspace as a Function of Actual Weather Coverage and Type, *Lexington, MA, MIT, Lincoln Laboratory, Project Report NASA/A-7*
- Martin, B.**, J. Evans, and R. DeLaura, 2006: Exploration of a Model Relating Route Availability in En Route Airspace to Actual Weather Coverage Parameters, *12<sup>th</sup> Conference on Aviation, Range and Aerospace Meteorology, American Meteorological Society, Atlanta, GA*
- Martin, B.D.**, H.E. Fuelberg, N.J. Blake, J.H. Crawford, J.A. Logan, D.R. Blake, and G.W. Sachse, 2002: Long-range transport of Asian outflow to the equatorial Pacific, *J. Geophys. Res.*, *108(D2)*, 8322, doi:10.1029/2001JD001418
- Robinson, M., DeLaura, R., **Martin, B. D.**, Evans, J. E., Weber, M. E., Initial Studies of an Objective Model to Forecast Achievable Airspace Flow Program Throughput from Current and Forecast Weather Information, *89<sup>th</sup> ARAM Special Symposium on Weather - Air Traffic, Phoenix, AZ, Amer. Meteor. Soc., 2009*
- Welch, J.D., J. Andrews, **B.D. Martin**, E.M. Shank, 2008: Applications of a Macroscopic Model for En Route Sector Capacity, *AIAA GNC, Honolulu, Hawaii, Aug. 18-21, 2008*
- Cho, J.Y.N., and **B.D. Martin**, 2007: Technical Assessment of the Impact of Decommissioning the TDWR on Terminal Weather Services. *MIT Lincoln Laboratory, Lexington, MA, Project Report ATC-331*
- Welch, J.D., J. Andrews, **B. Martin**, B. Sridhar, 2007: Macroscopic Workload Model for Estimating En Route Sector Capacity, *7<sup>th</sup> Eurocontrol/FAA ATM R&D Seminar ATM-2007, Barcelona, Spain*
- Bieringer P.E., **B. Martin**, J. Morgan, S. Winkler, J. Hurst, J. McGinley, Y. Xie, and S. Albers, 2006: An Assessment of Automated Boundary and Front Detection to Support Convective Initiation Forecasts, *12<sup>th</sup> Conference on Aviation, Range and Aerospace Meteorology, American Meteorological Society, Atlanta, GA*
- Weber M.E., J. Evans, M. Wolfson, R. DeLaura, B. Moser, **B. Martin**, J. Welch, J. Andrews, and D. Bertsimas, 2006: Improving Air Traffic Management During Thunderstorms, *12<sup>th</sup> Conference on Aviation, Range and Aerospace Meteorology, AMS, Atlanta, GA*
- Dupree, W., M. Wolfson, R. Johnson Jr., R. Boldi, E. Mann, K. Theriault Calden, C. Wilson, P. Bieringer, **B. Martin**, H. Iskenderian, 2005: FAA Tactical Weather Forecasting in the United States National Airspace, *Toulouse Nowcasting Conference, Toulouse, France*
- Weber, M., J. Evans, M. Wolfson, R. DeLaura, W. Moser, **B. Martin**, D. Bertsimas, J. Welch and J. Andrews, 2005: Improving Air Traffic Management during Thunderstorms, *Digital Avionics System Conference (DASC), Washington, DC*
- Allan, S., R. DeLaura, **B. Martin**, D. Clark and C. Gross, 2004: Advanced Terminal Weather Products Demonstration in New York, *Proceedings of the 11<sup>th</sup> Conference on Aviation, Range and Aerospace Meteorology, Hyannis, MA*
- Bieringer P.E., **B. Martin**, B. Collins, and J. Shaw, 2004: Commercial Aviation Encounters with Severe Low Altitude Turbulence, *Proceedings of the 11<sup>th</sup> Conference on Aviation, Range and Aerospace Meteorology, Hyannis, MA*
- Dinunno, B., D. Davis, G. Chen, G. Gregory, B. Anderson, G. Sachse, S. Vay, M. Avery, B. Ridley, M. Carroll, J. Walega, D. Montzka, F. Grahek, J. Bradshaw, S. Sandholm, Y. Knodo, G. Kok, D. Blake, N. Blake, J. Barrick, H. Fuelberg, **B. Martin**, and A. Balok, 2003: Central/Eastern North Pacific Photochemical Precursor Distributions for Fall/Spring Seasons as Defined by Airborne Field Studies, *J. Geophys. Res.*, *108*, 8240
- Fuelberg, H.E., R.E. Newell, D.J. Westberg, J.C. Maloney, J.R. Hannan, **B.D. Martin**, and Y. Zhu, 2001: A Meteorological Overview of the Second Pacific Exploratory Mission in the Tropics, *J. Geophys. Res.*, *106*, 32427-32443