

Eddie Duncan conducts noise assessments for a wide range of public and private organizations and develops solutions to mitigate noise impacts. He is involved in all aspects of environmental noise and architectural acoustics projects including measurement, analysis, modeling, design, testimony, policy development, stakeholder discussions, and project management. Eddie has over a decade of experience in computer modeling and monitoring of environmental noise and has conducted noise analyses for projects from many different industries, some of which include transportation, mining, renewable energy, power transmission, parks and tourism, commercial developments, and residential developments.

**EXPERIENCE**

15 years

**EDUCATION**

MS, Environmental Studies,  
Green Mountain College  
(2013)

BS, Engineering Science,  
Rensselaer Polytechnic  
Institute (2003)

**PROJECT EXPERIENCE**

**Velco, Vermont.** Consulted on a number of Velco substation projects throughout the state, some of which include the Y-25 Interconnect Project, the Southern Loop Project, the East Avenue Loop Project, and the Northwest Reliability Project, among others.

Most projects include pre-construction monitoring according to IEEE protocols, modeling of projected sound emissions, proposing mitigation as necessary and post-construction monitoring. (2004 – Current)

**Green Mountain Power, Vermont.** Provided sound monitoring and modeling services on a number of Green Mountain Power projects throughout the state including substation projects and power production projects. (2008 – Current)

**Addison Rutland Natural Gas Project, Vermont Gas, Vermont.** Managed a pre-construction sound monitoring program for ARNGP Phase 1 gate stations. Conducted long-term background sound level monitoring at three gate station sites, analyzed the data, and provided a report documenting the existing conditions at the site. The data will be used for comparison with post-construction sound levels. (2015)

**Kingdom Community Wind, Lowell, Vermont.** Measured pre-construction background sound levels at several locations around the proposed site. Conducted sound propagation modeling for several different turbine layout and model options. Provided mitigation and siting recommendations as necessary. Provided a report summarizing the applicable noise standard, recommended mitigation, and projected sound levels from the proposed project. Managed and conducted an extensive post-construction monitoring program and provided testimony before Vermont's Public Service Board. (2010 - 2015)

**Massachusetts Research Study on Wind Turbine Acoustics, Massachusetts.** Managed the data collection for a comprehensive study on the generation and propagation of sound from wind turbines. Overall, the study evaluated sound at five sites, with an average of five monitoring locations per site. Long-term measurements were made over a two-week period and short-term attended monitoring was conducted at each site. The study will help the State of Massachusetts Clean Energy Center and Department of Environmental Protection improve the regulation of wind turbines in the State and includes factors such as infrasound, amplitude modulation, sound levels, and sound propagation modeling. (2013 - 2014)

**Arnold Brothers Solar Project, Rehoboth, Massachusetts.** Conducted sound propagation modeling of noise emissions from transformers and inverters to project sound levels throughout a community from a 3.3 MW solar power project. (2014)

**Combined Heat & Power Hospital Project, Vermont.** Modeled sound levels from a proposed gas turbine and reciprocating engine for a combined heat and power (CHP) project at a hospital. Assessed potential noise impacts of the project by comparing model results with historical background sound level data in a nearby community and client noise threshold goals. Provided maps showing sound level propagation throughout the community. Proposed noise mitigation for both CHP options to meet client goals. (2011)

**Black Fork Wind Farm, Richland & Crawford County, Ohio.** Conducted pre-construction monitoring of background sound levels throughout a proposed wind power project site with an area of approximately 100 square miles. Correlated background sound levels with wind speed. Modeled projected sound levels from the proposed 200 MW project. Provided mitigation and siting recommendations as necessary. Provided a report summarizing the applicable noise limit precedents, recommended mitigation, and projected sound levels from the proposed project. (2011)

**Canton Wind, Canton, Maine.** Modeled the projected sound levels from a proposed wind power project. Provided the client with a projected sound level contour map. Participated in a public meeting to provide information to the local community and answer questions about the project. (2011)

**Fair Haven & Pownal Biomass Power & Wood Pellet Plants, Fair Haven & Pownal, Vermont.** Conducted pre-construction monitoring of background sound levels around a proposed site for a biomass power and wood pellet plant in Fair Haven and Pownal, Vermont. Modeled sound emissions from over 50 project sound sources and projected sound levels at nearby residences and property lines. Developed mitigation strategies and recommended noise reducing elements to be incorporated into the site plan and equipment specifications. Prepared a report summarizing the applicable noise standards, recommended mitigation, and projected sound levels. Provided pre-filed testimony to Vermont's Public Service Board. (2010)

**Wind Ordinance Review, Huron County, Michigan.** Reviewed and critiqued a proposed wind farm ordinance in northern Michigan. Provided testimony to the local planning commission regarding the content of the proposed ordinance. (2009)

**Georgia Mountain Community Wind, Georgia & Milton, Vermont.** Conducted pre-construction monitoring at multiple locations around the site of a proposed five turbine wind farm in northern

Vermont. Modeled future sound levels of the proposed wind farm. Prepared a report comparing the modeled impacts to the applicable noise standard. The report also included a discussion of construction impacts and recommendations to meet the standard. (2008)

## **PUBLICATIONS**

Duncan, E., Kaliski, K., Old, I., and Lozupone, D., Methods for Assessing Background Sound Levels during Post-Construction Compliance Monitoring within a Community, Proceedings of the 6<sup>th</sup> International Meeting on Wind Turbine Noise 2015.

Kaliski, K., Duncan, E., et al, The Massachusetts Research Study on Wind Turbine Acoustics – Methods and Goals, Proceedings of the 2014 Institute of Noise Control Engineers NOISE-CON 2014.

Duncan, E., Using Public Input to Develop Scientifically Sound Noise Pollution Policy for Vermont's Rural Land Uses and Communities, MSES Thesis, Green Mountain College, October 2013.

Duncan, E., Using Public Input to Develop Scientifically Sound Noise Pollution Policy for Vermont's Rural Land Uses and Communities: Methodology and Initial Results, Proceedings of the 2013 Institute of Noise Control Engineers NOISE-CON 2013.

Duncan, E., Sustainable Noise Pollution Policy, Proceedings of the 2012 Institute of Noise Control Engineers INTER-NOISE 2012.

Duncan, E., Protecting Wildlife from Noise Impacts: A Review of Legislation and Legal Precedents in New England and by the Federal Government, Proceedings of the 2012 Institute of Noise Control Engineers INTER-NOISE 2012.

Kaliski, K., Duncan, E., Wilson, K., and Vecherin, S., Improving Predictions of Wind Turbine Noise using PE Modeling, Proceedings of the 2011 Institute of Noise Control Engineers NOISE-CON 2011.

Duncan, E., and Kaliski, K., A Case Study in Cooperation: A Gravel Pit and Its Community, Proceedings of the 2010 Institute of Noise Control Engineers NOISE-CON 2010.

Kaliski, K., and Duncan, E., Calculating Annualized Sound Levels for a Wind Farm, Proceedings of Meetings on Acoustics (POMA), Vol. 9-159th Meeting of the Acoustical Society of America/NOISE-CON 2010.

Kaliski, K., and Duncan, E., "Propagation Modeling Parameters for Wind Power Projects," Sound & Vibration Magazine, Vol. 42 No. 12, December 2008.

Kaliski, K., and Duncan, E., Propagation Modeling Parameters for Wind Turbines, Proceedings of the 2007 Institute of Noise Control Engineers NOISECON 2007.

Kaliski, K., Duncan, E., and Cowan, J., "Community and Regional Noise Mapping in the United States," Sound & Vibration Magazine, Vol. 41 No. 9, September 2007.

Duncan, E., Kaliski, K., Collier, R., and Maher, M., Design of a Small Reverberation Room for Use in ANR and Other Testing, Proceedings of the 2006 Institute of Noise Control Engineers INTER-NOISE 2006.

## PRESENTATIONS

Duncan, E., Understanding Noise Complaints from Relatively Low-Noise Utility Projects, Energy, Utility & Environment Conference 2016 (EUEC 2016), February 2016.

Duncan, E., Noise from Wind Power Projects: Assessment, Regulation, & Management, Renewable Energy 2014 (RE 2014), October 2014.

Duncan, E., Using Public Input to Develop Scientifically Sound Noise Pollution Policy for Vermont's Rural Land Uses and Communities: Methodology and Initial Results, Public Outreach Workshop on Noise in Communities & Natural Areas, Denver, Colorado, August 2013.

Kaliski, K., et al., Modeling Hikers' Exposure to Transportation Noise in National Parks and Wilderness, 161st Meeting of the Acoustical Society of America, May 2011

Old, I., Eros, E., and Duncan, E., Wind Turbine Noise Ordinances: A Review of Selected State and Local Regulations, 161st Meeting of the Acoustical Society of America, May 2011

Duncan, E., and Kaliski, K., Improving Sound Propagation Modeling for Wind Power Projects, Joint Meeting of the Acoustical Society of America (ASA) and the European Acoustics Association (EAA) Acoustics'08.

Duncan, E., and Kaliski, K., Design and Construction of a Small Sound Testing Room in an Office Building, 4th Joint Meeting of the Acoustical Society of American and the Acoustical Society of Japan, November 2006.

## LICENSES, CERTIFICATIONS, MEMBERSHIPS, AND AFFILIATIONS

- Institute of Noise Control Engineering
  - Board Certified, 2009-Current
- Acoustical Society of America
  - Member of the Technical Committee on Architectural Acoustics, 2007-Current
  - Co-Chair of Technical Session: Wind Turbine Noise, 161st Meeting of the Acoustical Society of America, May 2010
  - Co-Chair of Structured Session: NS05 – Noise from Wind Power Projects, Acoustics '08
  - Chair of Technical Session: Acoustics of Modular Construction, 154th Meeting of the Acoustical Society of America, November 2007