



# BLUE RIDGE RESEARCH AND CONSULTING, LLC

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[www.BlueRidgeResearch.com](http://www.BlueRidgeResearch.com)

Blue Ridge Research and Consulting delivers cutting edge solutions for a wide range of acoustic and vibration projects. Our extensive research capabilities give BRRC the unique ability to provide practical solutions to real world problems. BRRC projects range from military and civilian environmental noise studies to the design of outdoor warning systems. Specialized modeling and visualization tools allow BRRC to deliver concise, accurate results at public meetings. We provide expertise in the following specialty areas.

## Environmental Studies

- General and Specific Impact Analyses
  - Environmental Impact Analyses
  - Air Installation Compatible Use Zones (AICUZ) Studies
  - Part 150 Noise Studies
- Community Noise
  - Transportation
  - Industrial
  - Residential
- Military Issues
  - Aircraft Noise
  - Weapon System Noise
  - Sonic Boom
  - Training Ranges, Airspaces, and Routes
  - DoD Unique
- Natural Soundscapes
  - Characterization
  - Visitor Experience
  - Wildlife
- Animal Response to Noise

## Acoustic Modeling

- Atmospheric Acoustic Propagation
- Unique Sources
- Software Development
- Noise Control Studies
- Community Noise
- Audibility/Detection
- Intrusions to Natural Soundscapes
- Expertise with all DoD environmental noise & sonic boom models: NoiseMap, RNM, MR\_NMAP, NoiseRunner, PCBoom4, CORBoom, MOABoom, BoomMap, BNoise2, and SARNAM.
- Expertise with civilian transportation models: INM & TNM
- NMSim Development & Application

## Visualization Tools

- Auralization of Modeled Noise
- Three Dimensional Visualization
- Public Demonstration Animations

## Sound Source Characterization

- DoD Measurement Protocols
  - Aircraft
  - Helicopters
  - Weapon Systems
- Industrial
  - Compressors
  - Turbines
  - Generators
  - HVAC
- Transportation
- Natural
  - Wildlife
  - Geological

## Noise Impact Criteria

- Supplemental Metrics Development & Modeling
- Criteria Testing & Development
- Analysis and Assessment of Unique Situations

## Siren Systems

- Design Requirements
- Modeling
- Compliance with FEMA Standard

## Machinery Vibration

- Noise Reduction: Design Phase
- Noise Control: In-situ
- Fault Detection / Prognostics
- Active Noise Control

## Principals:

**Micah Downing, Ph.D.** is a founding member of Blue Ridge Research and Consulting and serves as Chief Scientist and President. He has over 18 years experience in environmental and transportation noise research. His primary research has focused on aircraft noise and sonic boom modeling, measurement, and assessment as well as characterizing natural soundscapes. He received his PhD degrees in mechanical engineering from Georgia Tech. Before completion of his PHD, Dr. Downing began working the Air Force Research Laboratory in the Noise Effects Branch as a Research Physicist. In this position, he became responsible for sonic boom modeling and measurements as well as the lead for aircraft noise data collection for environmental noise applications. Dr. Downing then moved to Wyle Laboratories, where he was responsible for both research projects and environmental noise analysis of military noise issues. Dr. Downing has served as the Principal Investigator for over 35 field measurement projects for USAF, USN, USA, NATO, and NPS. In addition to his applied research experience, He has been the acoustical expert for over 10 major environmental impact studies for DoD. Dr. Downing serves as co-Chair of the Transportation Noise Committee for INCE and serves as the chair of the aircraft noise subcommittee of the Transportation Research Board's Committee on Transportation-Related Noise and Vibration. He serves on the Acoustical Technical Committee of the American Helicopter Society International, and he is a member of Acoustical Society of America.

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**Bruce Ikelheimer, Ph.D.** is a founding member of Blue Ridge Research and Consulting and serves as a Principal Engineer and the Vice President of Research. He has over 15 years of experience in aeroacoustics, aircraft noise, noise modeling, environmental noise, and active noise control. He is the lead in commercial business development for BRRC and specializes in advance modeling techniques. Dr. Ikelheimer's recent focus has been on the development of a new model to asses the noise impact from air-borne weapons. In addition he has been heavily involved with the assessment of outdoor warning systems for nuclear energy facilities. He received his Masters degree in Aeronautics and his Ph.D. in Mechanical engineering from North Carolina State University. After completing his Ph.D. (with a focus on Active Noise Control) he began working with SRS Technologies, providing contract support to the DARPA. There he was responsible for tracking and helping to manage over \$20 million dollars in research programs. Projects included advanced small scale propulsion systems for next generation UAVs, as well as the Quiet Super sonic Program (QSP). After three years there he began working for Wyle Laboratories. There he worked in the development of next generation noise models. He was responsible for the development of a user friendly ray-tracing model called NMSIM, as well managing many environmental noise programs and field measurements. He is a senior member of American Institute of aeronautics and Astronautics and a member of the Acoustical Society of America.

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**Michael James, M.S.** is a founding member of Blue Ridge Research and Consulting were he serves as Vice President. He has over nine years of experience in applied research, measurement, and analysis of atmospheric acoustics and technical management of consulting studies focused on community and military noise. He has performed over twenty large scale measurements for military and civilian aviation, weaponry, and blast noise to develop reference noise data and advanced propagation algorithms. Mr. James



has extensive experience in sound and vibration measurements, data acquisition, signal processing, data analysis, and software development. He completed his BS and MS Degrees in mechanical engineering from Virginia Tech. His research at Virginia Tech's Vibration and Acoustic Laboratory included designing and testing passive and active turbofan engine noise reduction and control technologies. Upon graduation he served at Wyle Laboratories as a Senior Engineer where he performed aviation research for the DoD and technical management of airport Master Plan and FAR Part 150 studies.

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**Sally Anne McInerny, Ph.D.** has over 25 years of engineering and research experience. She is currently a Professor and Director of Undergraduate Programs for the Department of Mechanical Engineering at the University of Alabama at Birmingham. Dr. McInerny's research interests include rocket noise generation/propagation, high intensity jet noise, and diagnostics/prognostics of rotating machinery and motors. Prior to completing her Ph.D., she designed HVAC systems and worked in acoustical consulting as a specialist in HVAC and plumbing system noise control. After completing her Ph.D. (UCLA), she became a member of the technical staff at The Aerospace Corporation, where she worked on launch vehicle vibroacoustics issues and rocket noise measurement, analysis, and prediction.

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**Partners:** BRRC has outside partners who complement our team by providing a comprehensive skill set that can address a diverse range of issues in acoustics. Our partners include specialists in Bioacoustics, Machinery Acoustics, Physical Acoustics, Physiological and Psychological Acoustics, and Structural Acoustics.