

MICHAEL E. DONALDSON, PH.D.  
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## EDUCATION

University of California, Davis, CA, Ph.D., Environmental Studies, December, 1995.  
Western State College, Gunnison, CO, Bachelor of Arts, Major in Biology, Minor in Chemistry, May, 1989.

## SUMMARY

Dr. Donaldson has 25 years cumulative forensics and environmental science experience. He specializes in accident reconstruction experimentation and crash simulation. He has extensive knowledge and experience in creating custom laboratory test devices and equipment; designing, testing and deploying custom data acquisition systems; and performing mathematical modeling and statistical analyses. Dr. Donaldson has developed custom software and solutions using Unix and Windows workstations, networks, and development languages including C, C++, Fortran, Visual Basic, JavaScript, MS Access, SQL, PHP and R statistical programming language, and has extensive experience in carrying out site-specific experiments in the field.

## EXPERIENCE

### Selected Projects:

#### Accident reconstruction experimentation:

- Created a custom system to directly measure tipping force in a human lift device accident reconstruction analysis (2018).
- Designed drag sled for site-specific friction analysis (2018)
- Performed scale model vehicle-vehicle, vehicle-pedestrian impact simulations (2017-18)
- Designed a custom crush test device to measure impact force imparted to an exemplar automobile structure (2017)

#### Demographic and economic modeling:

- Designed custom parsing algorithms for matching paired demographic samples from monthly Current Population Survey demographic data (2008-2009).
- Created custom algorithms for estimating standard errors associated with worklife expectancy estimates by the bootstrap method of parameter estimation (2008-2009).
- Developed a years-to-final-separation worklife model for estimating worklife parameters using data from the current population survey (2008-2009).

#### Acoustical modeling and statistics:

- Performed spatially explicit statistical analyses of observed vs. predicted noise contours during summer flight-seeing season; created custom software for subsampling continuous recordings of acoustical study sites in Grand Canyon National park (2007-2009).
- Developed standards-based model of sound attenuation for calculating noise contours associated with airboat traffic in the Tanana Flats, Alaska (2007).

Custom data acquisition, analysis and modeling:

- Carried out snow modeling experiments to study snow accumulation and ablation patterns near Lake Iliamna, Alaska (2007-2008).
- Created custom software for batch processing Level IB Moderate-resolution Imaging Spectroradiometer (MODIS) satellite data to study large-scale snow ablation and green-up in northern Alaska (2006-2008).
- Developed, deployed and maintained custom data acquisition systems, in the Tanana Flats as part of a project to study impacts of airboat activity on the vegetation, wildlife and hydrology; conducted spatial statistical analyses (2003-2006).

Acoustical data collection and statistical analysis:

- Developed custom computer software and hardware systems for monitoring audibility of natural and non-natural sounds (1998-2007).
- Created and supported computer systems for remotely monitoring ambient sound levels, capturing loud events (e.g. sonic booms), and recording real-time digital video of animal responses to acoustic events (1996-1999).

Ecological modeling:

- Performed computer simulation analysis to estimate fishing limits - by season, and pond salinity - for brine shrimp harvested from within Refuge boundaries (1994-1995).
- Developed a quantitative ecosystem computer simulation model, with parameters estimated independently of field data, to determine allowable take by season (1992-1994).

**SELECTED PUBLICATIONS**

- Richards, H., and M. Donaldson, 2009. Life and Worklife Expectancies. Lawyers and Judges Pub. Co., Tucson, AZ.
- Ambrose, R., C. Florian, and M. Donaldson. 2009. Assessment of Accuracy of Integrated Noise Model 6.2a at Grand Canyon National Park, August 10, 2007. Final Report prepared for National Park Service, Grand Canyon National Park, AZ.
- Jorgenson, M.T., S. M. Murphy, J. E. Roth, T. C. Cater, W. A. Davis, T. A. Obritschkewitsch, C. Heaton, G. V. Frost, M. E. Donaldson, A. L. Payne. 2006. Investigations of impacts to fen ecosystems and wildlife from airboat traffic on the Tanana Flats, Fort Wainwright, Alaska, 2003. Report prepared for U.S. Army Alaska, Fort Richardson, Anchorage, AK by ABR Inc. and Far North Aquatics, Fairbanks, AK.
- Ambrose, S., C. Florian, and M. Donaldson. 2005. Sound levels in and near the YUKON Military Operations Areas, Alaska, 1999-2003. Unpublished report to 11th Air Force, Elmendorf Air Force Base, AK. 211 pp.
- Jorgenson, M. T., S. M. Murphy, J. E. Roth, T. C. Cater, M. Eniers, S. F. Schlentner, J. S. Mitchell, M. E. Donaldson. 2003. Disturbance and recovery of fens from airboat impacts on the Tanana Flats, Fort Wainwright, AK, 2002. Report prepared for U.S. Army Alaska, Fort Richardson, Anchorage, AK, by ABR. Inc. and Far North Aquatics, Fairbanks, AK
- Donaldson, M. E. 1995. Analysis of alternative harvesting strategies of the brine shrimp *Artemia franciscana* in the salt ponds of the San Francisco Bay National Wildlife Refuge. Unpublished report prepared for the Don Edwards San Francisco Bay National Wildlife Refuge, Newark, CA.