

WILLIAM C. BURGESS, Ph.D.
Founder & CEO
Senior Principal Design & Research Engineer
Acoustimetrics

Work:

6060 Graham Hill Road, Floor 2, Stop F
Felton, CA 95018
Tel: (831) 335-9600

RESEARCH INTERESTS

Acoustic investigation of marine wildlife, geophysics, and human activity using underwater loggers, tags, and remote arrays; physiological and behavioral acoustics; autonomous low-power data-logging devices.

EDUCATION

Ph.D. *Electrical Engineering, Stanford University.* Experimental radio science and signal processing. 1993
M.S. *Electrical Engineering, Stanford University.* Computer systems and networks. 1987
B.S. *Electrical Engineering, Stanford University.* 1985

DISSERTATION

“Lightning-Induced Coupling of the Radiation Belts to Geomagnetically Conjugate Ionospheric Regions.” Documented the discovery that lightning flashes can induce the simultaneous precipitation of radiation belt electrons into localized, geomagnetically conjugate regions of the ionosphere. Showed for the first time that lightning could thus be responsible for the control of radiation belt electron populations. Published in *Geophysical Research Letters* and the *Journal of Geophysical Research*. Advisors: Dr. Umran S. Inan and Dr. Robert A. Helliwell.

EMPLOYMENT HISTORY

Founder, CEO, and Senior Principal Design & Research Engineer *Acoustimetrics* 2023 – present
Transitioned a company division to fully independent operation as a separate corporation under new management. Responsible for all management, business, technical, legal, and accounting decisions and processes.

Chairman, Vice President and Senior Principal Engineer *Greeneridge Sciences, Inc.* 2018 – 2023
Led legal aspects of purchasing a small research contracting company from its previous owner. Interacted frequently with corporate counsel to tune purchase agreement, culminating in successful closing January 31, 2018. Since February 1, 2018, co-owner of the corporation and responsible for assuring proper processes and documentation at the director level. Technical work included integration of satellite-telemetry capability and support for user programmability into the Acousonde™ operating system. Hardware integration of satellite telemetry with the Acousonde is in progress. Between 2009 and 2020, cumulatively produced and sold 110 Acousonde units to 34 different investigators at 27 institutions in 8 countries and, within the US, in 10 states.

Senior Research Engineer, Greeneridge Sciences, Inc. 1998 – 2018
Obtained Office of Naval Research (ONR) development support for, designed, constructed, and programmed two generations of miniature self-contained underwater acoustic recorders – the Bioacoustic Probe™ and the Acousonde™ – using 68EZ328 and ARM9 microprocessors, individual integrated circuits, and an original operating system (see details at <http://www.acousonde.com>). Supervised fabrication of small numbers of the devices for commercial sale. Joined collaborative partnerships with field biologists to apply the device with blue, fin, and humpback whales off the California coast, with sperm whales in the Gulf of Mexico, and with northern fur seals in the Bering Sea. Recorded vessel, airgun, pile-driving, and ambient sounds using boat-based recording gear in Washington-State rivers, San Francisco Bay, the Beaufort Sea, the Gulf of Maine, the Santa Barbara Channel, and Cook Inlet, Alaska. Deployed and recovered seafloor acoustic recording equipment from research and cable ships in the Beaufort Sea. Processed terrestrial and underwater acoustic data to determine exposure of protected species to sounds from jet aircraft, rockets, missiles, vessels, airguns, and pile driving. Authored reports to the National Marine Fisheries Service documenting client compliance with federal regulations. Installed and maintained router equipment and a Fedora Linux server for company-wide network services, including Samba file sharing, Subversion svn+ssh networked versioning repositories, outgoing e-mail, group calendaring, domain name service, XMPP messaging, automated fax handling, and redundant/distributed backups.

Research Engineer, SRI International 1996 – 1998
 Supervised development and field testing of a prototype optical system for sensing of vibration. Designed and tested photodiode amplifier electronics. Developed image reconstruction software for hyperspectral data. Authored or co-authored four proposals to ONR, the National Oceanographic Partnership Program, and others.

Postdoctoral Fellow, Monterey Bay Aquarium Research Institute 1994 – 1996
 Designed, constructed and programmed a battery-powered acoustic/velocity/pressure/temperature logger based on an Onset Corp. “TattleTale 7” data acquisition platform, and worked with field biologists to deploy it successfully on northern elephant seals. Analyzed and documented acoustic signatures of physiological and behavioral indicators, such as respiration, heartbeat, stroke rate, and possible vocalizations.

Postdoctoral Scholar, Woods Hole Oceanographic Institution 1993 – 1994
 Analyzed backscattering behavior of deep ocean sediments at shallow grazing angles using monostatic data from an acoustic source and vertical hydrophone array towed at 4000-m depth. Spent a month at sea obtaining the data over the Mid-Atlantic Ridge with the ONR Acoustic Reverberation Special Research Project (ARSRP).

Research Assistant, Space, Telecommunications & Radioscience Laboratory, Stanford University 1985 – 1993
 Six months’ cumulative field experience installing, operating and maintaining VLF radio receivers and data acquisition equipment in Antarctica and northern Québec. Developed a digital Fourier algorithm to determine arrival azimuth of VLF signals as a function of time and frequency, leading to a new project to study the location and movement of thunderstorms using VLF radio. Programmed Apple Macintosh to browse through time series data (software still in use in 2020). Designed, constructed, and programmed digital broadband VLF data acquisition hardware using a 68000-based prototyping board. Wrote software to produce spectrograms of the digital data.

C System Programmer and UNIX Manager, SUMEX-AIM, Stanford University 9/81 – 6/85
 Wrote and maintained C language system software for a variety of platforms. From 5/84 to 6/85, responsible to a community of 100 people for software and hardware maintenance, user assistance and accounting on a Digital Equipment VAX 11/780 running Berkeley UNIX.

HONORS, AWARDS, AND PROFESSIONAL ACTIVITIES

Invited Presenter, Developing the Next Generation of Marine Animal Telemetry, workshop hosted at the World Marine Mammal Conference, Barcelona 2019

Bronze Award (team member), United States Department of Commerce, awarded to the National Oceanic and Atmospheric Administration (NOAA) and its partners for “pioneering use of a Saildrone for next-generation ecosystem surveys in the Bering Sea.” 2018

Invited Presenter, Workshop on Recommendations Related to Passive Ocean Acoustic Data Standards, hosted by the Consortium for Ocean Leadership (COL), Washington, DC 2018

Invited Participant, Cetacean Tag Development and Tagging Best Practices Workshop, sponsored by ONR, NOAA, and the International Whaling Commission (IWC), Silver Spring, MD 2017

Invited Presenter, Workshop on Fine-Scale Movement, hosted at the Biologging IV conference, Hobart 2011

Invited Presenter, Seismic Survey Sound Propagation in the Beaufort Sea, workshop sponsored by the Canadian Environmental Studies Research Fund (ESRF), Calgary, AB 2009

Session Chair, Tools for Animal Bioacoustics, 149th meeting of the Acoustical Society of America (ASA), Vancouver, BC 2005

Invited Participant, Schooling and Aggregation of Pelagic Fish, workshop sponsored by the Pelagic Fisheries Research Program, Kaneohe, HI 2002

Invited Participant, Cetacean Audiometrics, workshop sponsored by the Edwin W. Pauley Summer Program in Marine Biology, Kaneohe, HI 2001

Session Chair, Instrumentation for Animal Bioacoustics, 140th meeting of the ASA, Newport Beach, CA 2000

Invited Instructor, Marine Mammal Bioacoustics Short Course, sponsored by the ASA at the Thirteenth Biennial Conference of the Society for Marine Mammalogy, Wailea, HI 1999

Invited Panelist, National Public Radio, “Talk of the Nation/Science Friday” October 20, 1995 1995

Postdoctoral Fellowship, Monterey Bay Aquarium Research Institute 1994

Postdoctoral Scholarship, Woods Hole Oceanographic Institution 1993

Elected to Sigma Xi, Stanford University Chapter 1993

Outstanding Student Paper Award, American Geophysical Union 1991

Antarctica Service Medal, National Science Foundation 1988

PUBLICATIONS

- Burgess, W. C., *Ambient underwater sound levels measured at Windy Corner, Turnagain Arm, Alaska*, Greeneridge Rep. 515-2, rep. from Greeneridge Sciences Inc., Santa Barbara, CA, for the State of Alaska, Department of Transportation and Public Facilities, in association with LGL Alaska Research Associates, Inc., 15 pp., 2014.
- Burgess, W. C., *Development of a wideband acoustic recording tag to assess the acoustic behavior of marine wildlife*, Greeneridge Rep. GS0118A-1001, rep. from Greeneridge Sciences Inc., Santa Barbara, CA, for the U. S. Office of Naval Research, Defense Technical Information Center Accession No. ADA513321, 2010.
- Insley, S. J., B. W. Robson, T. Yack, R. R. Ream, and W. C. Burgess, Acoustic determination of activity and flipper stroke rate in foraging northern fur seal females, *Endangered Species Research*, 4, doi:10.3354/esr00050, 147–155, 2007.
- Meyer, C. G., W. C. Burgess, Y. P. Papastamatiou, and K. N. Holland, Use of an implanted sound recording device (Bioacoustic Probe) to document the acoustic environment of a blacktip reef shark (*Carcharhinus melanopterus*), *Aquatic Living Resources*, 20, doi:10.1051/alr2008002, 291–298, 2007.
- Oleson, E. M., J. Calambokidis, W. C. Burgess, M. A. McDonald, C. A. LeDuc, and J. A. Hildebrand, Behavioral context of call production by eastern North Pacific blue whales, *Marine Ecology Progress Series*, 330, 269–284, 2007.
- Thode, A. M., P. Gerstoft, W. C. Burgess, K. Sabra, M. Guerra, M. D. Stokes, M. Noad, and D. C. Cato, A portable matched-field processing system using passive acoustic time synchronization, *Journal of Oceanic Engineering*, 31, 696–710, 2006.
- Burgess, W. C., S. B. Blackwell, and R. Abbott, *Underwater acoustic measurements of vibratory pile driving at the Pipeline 5 crossing in the Snohomish River, Everett, Washington*, Greeneridge Rep. 322-2, rep. from Greeneridge Sciences Inc., Santa Barbara, CA, for URS Corporation, Seattle, WA, and the City of Everett, Everett, WA, 35 pp., 2005.
- Burgess, W. C., and S. B. Blackwell, *Acoustic monitoring of barrier wall installation at the former Rhône-Poulenc site, Tukwila, Washington*, Greeneridge Rep. 290-1, rep. from Greeneridge Sciences Inc., Santa Barbara, CA, for RCI Environmental Inc., Sumner, WA, 31 pp., 2003.
- Au, W. W. L., J. Mobley, W. C. Burgess, M. O. Lammers, and P. E. Nachtigall, Seasonal and diurnal trends of chorusing humpback whales wintering in waters off western Maui, *Mar. Mamm. Sci.*, 16, 530–544, 2000.
- Greene, C. R., Jr., and W. C. Burgess, Physical acoustic measurements, p. 3-1 to 3-45 In: W. J. Richardson (ed.), *Marine mammal and acoustical monitoring of Western Geophysical's open-water seismic program in the Alaskan Beaufort Sea, 1999*, LGL Rep. TA2313-4, rep. from LGL Ltd., King City, Ont., and Greeneridge Sciences Inc., Santa Barbara, CA, for Western Geophysical, Anchorage, AK, and Nat. Mar. Fish. Serv., Anchorage, AK, and Silver Spring, MD, 155 p., 2000.
- Burgess, W. C. and C. R. Greene, Jr., Physical acoustics measurements. p. 3-1 to 3-65 In: W. J. Richardson (ed.), *Marine mammal and acoustical monitoring of Western Geophysical's open-water seismic program in the Alaskan Beaufort Sea, 1998*, LGL Rep. TA2230-3, rep. from LGL Ltd., King City, Ont., and Greeneridge Sciences Inc., Santa Barbara, CA, for Western Geophysical, Houston, TX, and Nat. Mar. Fish. Serv., Anchorage, AK, and Silver Spring, MD, 390 p., 1999.
- Burgess, W. C. and C. R. Greene, Jr., BQM-34S and Vandal missile target launch sound measurements recorded at San Nicolas Island and NAWS Point Mugu, rep. from Greeneridge Sciences, Inc., Santa Barbara, CA, and Ogdan Environmental and Energy Services, Inc., Santa Barbara, CA, for the Naval Air Warfare Center, Weapons Division, Point Mugu, CA, 27 p., 1998.
- Burgess, W. C., P. L. Tyack, B. J. Le Boeuf, and D. P. Costa, A programmable acoustic recording tag and first results from free-ranging northern elephant seals, *Deep-Sea Res. Part II*, 45, 1327–1351, 1998.
- Burgess, W. C., and U. S. Inan, The role of ducted whistlers in the precipitation loss and equilibrium flux of radiation belt electrons, *J. Geophys. Res.*, 98, 15643, 1993.
- Burgess, W. C., and U. S. Inan, Ducted whistlers and the burst loss of radiation belt electrons to geomagnetically conjugate ionospheric regions, *Antarctic J.*, 26, 309, 1991.
- Burgess, W. C., and U. S. Inan, Simultaneous disturbance of conjugate ionospheric regions in association with individual lightning flashes, *Geophys. Res. Lett.*, 17, 259, 1990.
- Burgess, W. C., and U. S. Inan, Simultaneous lightning-associated precipitation of radiation-belt electrons into the Northern and Southern Hemispheres, *Antarctic J.*, 24, 271, 1989.

Inan, U. S., W. C. Burgess, T. G. Wolf, and D. C. Shafer, Lightning-associated precipitation of MeV electrons from the inner radiation belt, *Geophys. Res. Lett.*, 15, 172, 1988.

PAPERS PRESENTED AT SCIENTIFIC CONFERENCES

Burgess, W. C., and T. L. McGuire, A novel approach to measurement of underwater sound levels in a dangerous tidal fjord using a miniature self-contained acoustic recorder (abstract), *J. Acoust. Soc. Am.*, 140, 3182, 2016.

Burgess, W. C., E. M. Oleson, and R. W. Baird, A hydrodynamic acoustic recording tag for small cetaceans and first results from a pantropical spotted dolphin, paper presented at the Nineteenth Biennial Conference of the Society for Marine Mammalogy, Tampa, Florida, November 26–December 2, 2011.

Burgess, W. C., The Acousonde: A miniature autonomous wideband recorder (abstract), *J. Acoust. Soc. Am.*, 125, 2588, 2009.

Mathias, D., A. Thode, J. Straley, K. Folkert, J. Calambokidis, G. Schorr, W. C. Burgess, and C. Lunsford, Depth, orientation, and acoustics of sperm whales (*Physeter macrocephalus*) under natural and depredation foraging conditions in the Gulf of Alaska (abstract), *J. Acoust. Soc. Am.*, 123, 3775, 2008.

Schorr, G. S., J. Calambokidis, E. M. Oleson, W. C. Burgess, M. A. McDonald, J. Francis, J. A. Goldbogen, J. A. Hildebrand, Comparisons of lunge feeding behavior between blue, fin, and humpback whales, paper presented at the Sixteenth Biennial Conference of the Society for Marine Mammalogy, San Diego, California, December 12–16, 2005.

Burgess, W. C., M. T. Williams, and S. B. Blackwell, Miniature self-contained acoustic recorders applied in a survey of beluga-whale populations in Knik Arm, Alaska (abstract), *J. Acoust. Soc. Am.*, 117, 2524, 2005.

Thode, A., and W. Burgess, Modular autonomous array deployments using passive acoustic time synchronization (abstract), *J. Acoust. Soc. Am.*, 117, 2525, 2005.

Insley, S. J., B. W. Robson, and W. C. Burgess, Acoustic monitoring of northern fur seals in the Bering Sea (abstract), *J. Acoust. Soc. Am.*, 116, 2555, 2004.

Calambokidis, J., E. M. Oleson, W. C. Burgess, M. A. McDonald, J. A. Hildebrand, Insights into underwater behavior and vocalizations of blue and fin whales from attachments of acoustic recording tags (abstract), *J. Acoust. Soc. Am.*, 116, 2613, 2004.

Thode, A. M., P. Gerstoft, M. Guerra, D. M. Stokes, W. C. Burgess, M. J. Noad, and D. H. Cato, Range-depth tracking of humpback whales using autonomous acoustic recorders (abstract), *J. Acoust. Soc. Am.*, 116, 2589, 2004.

Thode, A. M., J. M. Straley, T. M. O'Connell, and W. C. Burgess, Acoustic observations of longline depredation by sperm whales (abstract), *J. Acoust. Soc. Am.*, 116, 2614, 2004.

Calambokidis, J., E. Oleson, M. McDonald, B. Burgess, J. Francis, G. Marshall, M. Bakhtiari, and J. Hildebrand, Feeding and vocal behavior of blue whales determined through simultaneous visual-acoustic monitoring and deployment of suction-cup attached tags, paper presented at the Fifteenth Biennial Conference of the Society for Marine Mammalogy, Greensboro, North Carolina, December 14–19, 2003.

Burgess, W. C., A general-purpose acoustic recording tag for marine wildlife (invited abstract), *J. Acoust. Soc. Am.*, 110, 2722–2723, 2001.

Burgess, W. C., The Bioacoustic Probe: a miniature acoustic recording tag, poster paper presented at the Fourteenth Biennial Conference of the Society for Marine Mammalogy, Vancouver, BC, November 29–December 3, 2001.

Burgess, W. C., The Bioacoustic Probe: a miniature acoustic recording tag, paper (verbal only) presented at the Oceans 2001 meeting of MTS/IEEE, Honolulu, Hawaii, November 7, 2001.

Burgess, W. C., The Bioacoustic Probe: a general-purpose acoustic recording tag (invited abstract), *J. Acoust. Soc. Am.*, 108, 2583, 2000.

Burgess, W. C., W. W. L. Au, J. Mobley, M. O. Lammers, P. E. Nachtigall, Seasonal and diurnal trends of chorusing humpback whales wintering in waters off west Maui, paper presented at the Thirteenth Biennial Conference of the Society for Marine Mammalogy, Wailea, Maui, November 29–December 3, 1999.

Burgess, W. C., P. L. Tyack, B. J. Le Boeuf, and D. P. Costa, A programmable acoustic recording tag and first results from free-ranging northern elephant seals, paper presented at the World Marine Mammal Science Conference, Monaco, January 20–24, 1998.

- Burgess, W. C., P. L. Tyack, B. J. Le Boeuf, D. P. Costa, and D. E. Crocker, A microprocessor-based tag to record acoustics experienced and generated by migrating northern elephant seals (abstract), *J. Acoust. Soc. Am.*, *102*, 3197, 1997.
- Burgess, W. C., P. L. Tyack, B. J. Le Boeuf, and D. P. Costa, Acoustic measurement of cardiac function on northern elephant seals (abstract), *J. Acoust. Soc. Am.*, *100*, 2709, 1996.
- Le Boeuf, B. J., D. P. Costa, P. L. Tyack, S. Fletcher, and W. Burgess, Onboard acoustic recording from diving elephant seals, paper presented at the Fifth European Conference on Wildlife Telemetry, Strasbourg, France, August 25–30, 1996.
- Le Boeuf, B. J., D. P. Costa, P. L. Tyack, S. R. Fletcher, and W. C. Burgess, Onboard acoustic reporting from diving elephant seals, paper presented at the Twenty-Fourth International Ethological Conference, Honolulu, Hawaii, August 12, 1995.
- Burgess, W. C., P. L. Tyack, B. J. Le Boeuf, and D. P. Costa, Measuring in-situ environmental and physiological acoustics of marine animals: first results from an autonomous broadband recording tag, substitute paper 4aAB10 presented at the 129th meeting of the Acoustical Society of America, Washington, DC, June 2, 1995.
- Burgess, W. C., G. V. Frisk, and C. J. Sellers, The influence of sediment cover on low-frequency reverberation from deep ocean bedrock, paper presented at the Spring Symposium of the ONR Acoustic Reverberation Special Research Project (ARSRP) Cambridge, Massachusetts, June 5, 1994.
- Tang, D., W. C. Burgess, S. D. Rajan, C. J. Sellers, G. V. Frisk, and D. Li, A summary of the direct-path scattering experiments in the ARSRP sediment pond and some preliminary results, paper presented at the Fall Symposium of the ONR Acoustic Reverberation Special Research Project (ARSRP), La Jolla, California, December 1–3, 1993.
- Burgess, W. C., and U. S. Inan, On the role of ducted whistlers in lightning-induced electron precipitation (abstract), *EOS Trans. AGU*, *72*, 399, 1991.
- Burgess, W. C., and U. S. Inan, Simultaneous disturbance of conjugate ionospheric regions by whistler-induced electron precipitation, paper presented at the International Union of Geodesy and Geophysics, Vienna, August 17, 1991.
- Burgess, W. C., and U. S. Inan, Simultaneous perturbation of conjugate ionospheres in association with individual lightning flashes (abstract), *EOS Trans. AGU*, *70*, 1009, 1989.
- Burgess, W. C., and U. S. Inan, Hemispheric distribution and magnetic conjugacy of Trimpi events, paper presented at the Sixth Scientific Assembly of the International Association of Geomagnetism and Aeronomy, Exeter, July 26, 1989.
- Burgess, W. C., and U. S. Inan, Lightning-induced precipitation of MeV electrons from the inner radiation belt (abstract), *EOS Trans. AGU*, *68*, 1222, 1987.