DAVID (DAVE) L. DECKER

Research Professor Emeritus
Founder and Director, Naval Earth Sciences and Engineering Program
Founder and Director, High Performance Computational Services

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PROFESSIONAL PREPARATION

University of California, Davis	Civil Engineering	B.S., 1992
University of Nevada, Reno	Hydrogeology (soil physics emphasis)	M.S., 1996
University of Nevada, Reno	Hydrogeology (reactive transport emphasis)	Ph.D., 2001

PROFESSIONAL INTERESTS

In 2008 I created a new interdisciplinary applied science and engineering research program at DRI serving the US Navy. The Naval Earth Sciences and Engineering Program (NESEP) involves faculty from across DRI across a broad range of disciplines and has opened new opportunities for both DRI faculty and Navy scientists and engineers to further their own research interests through new collaborative ventures. Research topics are developed in collaboration with Navy stakeholders to address emerging needs of the warfighter. Applied science and engineering topics are approached through use of fundamental science and engineering principles along an incremental line of inquiry to develop 'enough of the answer' for the sponsor to move forward with its objectives. Since inception in 2008, NESEP has completed over $20M in high-impact sponsored projects for the US Navy and has current contracts worth $10M that extend through 2026.

Current program development interests are associated with building knowledge and technologies that contribute to climate resiliency for DoD installations and capabilities. This is an outgrowth of my contributions over the past fifteen years in research and development for the US Navy's Columbia and Prompt Global Strike Programs. My contributions to those programs include civil, mechanical and systems engineering research and design for ship and weapon systems, and the development of technologies that enable near-real-time weather situational awareness for high-risk industrial and defense operations. Current applied science research interests for myself and the NESEP team include developing tools that support live-fire range operations, capabilities, and long-term sustainability. Examples include the development of an integrated and adaptive real-time environmental monitoring and alert system (REMAS); development of a new patented method of ordnance and energetic materials disposal using microbially mediated reaction pathways; development of a novel wind forecast engine specifically for high-risk industrial and construction projects, such as heavy-lift crane operations; and development of a novel method to correct for atmospheric optical distortion for airframe targeting and control systems, patent pending. As an Emeritus faculty I am working on commercialization my IP and providing advice and mentoring to DRI faculty, staff and students.

PROFESSIONAL EXPERIENCE

2025-Present	Research Professor Emeritus, DRI
2015-2025	Research Professor, Division of Hydrologic Sciences, DRI
2008-Present	Founder and Director, Naval Earth Sciences and Engineering Program (NESEP), DRI
2016-Present	Founder and Director, High Performance Computational Services (HPCS), DRI
2014-2021	Deputy Director, Division of Hydrologic Sciences, DRI
2019-2020	Interim Executive Co-Director, Division of Hydrologic Sciences, Desert Research Institute (DRI)
2011-2015	Associate Research Professor, DRI
2006-2021	Faculty, Graduate Program of Hydrologic Sciences, University of Nevada, Reno
2005-2011	Assistant Research Professor, Division of Hydrologic Sciences, DRI
2001-2005	Post-Doctoral Research Fellow, Division of Hydrologic Sciences, DRI
1994-2001	Graduate Research Assistant, Water Resources Center, Desert Research Institute, and the University of Nevada, Reno, Nevada
1992-1993	Post–Graduate Research Engineer, Land, Air and Water Resources Department, University of California, Davis

RESTRICTED PUBLICATIONS

Since 2008, author and co-author of dozens of restricted peer reviewed technical reports, papers, briefings, and presentations for the US Navy.

PATENTS

Decker, D.L., Wilcox, E., McGraw, D. Position Location of Distal Objects. Notice of Award October 2025; final Patent assignment pending.

Decker, D.L. and Grzymski, J. Microbial Passivation of Explosive Ordnance – Ordnance Magazines. U.S. Patent 11,040,921. Issued June 22, 2021.

Decker, D.L. and Grzymski, J. Microbial Passivation of Explosive Ordnance – Land and Sea Mines; Warheads. U.S. Patent 10,760,886. Issued September 1, 2020.

Decker, D.L. and Grzymski, J. Microbial Passivation of Explosive Ordnance – Rocket Motors. U.S. Patent 10,351,485. Issued July 16, 2019.

Decker, D.L., Lyles, B.F, Purcell, R.G., Hershey, R.L. Sampling System and Method. U.S. Patent 9,587,448. Issued March 7, 2017. (Geophysical wireline and tubing clamping method)

Decker, D.L., Lyles, B.F, Purcell, R.G., Hershey, R.L. Sampling System and Method. U.S. Patent 8,727,024. Issued May 20, 2014 (Geophysical wireline and tubing installation method)

Decker, D.L., Lyles, B.F, Purcell, R.G., Hershey, R.L. Sampling System and Method. U.S. Patent 8,418,760. Issued April 16, 2013 (Deep groundwater pump)

Decker, D.L. A device to thermoelectrically condense and collect water vapor for sampling chemical or radiological constituents. U.S. Patent 8,006,576. Issued August 30, 2011

JOURNAL PUBLICATIONS

Lancaster, N., Bacon, S., Bullard, T., Neudorf, C., Keen-Zebert, A., Decker, D., & Boggs, M. (2021). Tectonic, hydrogeologic, and climatic controls on Late Holocene dune formation, China Lake basin, Indian Wells Valley, California, USA. *Quaternary Research,* 1-17. doi: 10.1017/qua.2021.62

Bacon, S. N., Bullard, T. F., Keen-Zebert, A. K., Jayko, A. S., Decker, D. L., 2020: Spatiotemporal patterns of distributed slip in southern Owens Valley indicated by deformation of late Pleistocene shorelines, eastern California, *Geological Society of America Bulletin*, 132 (7/8), 1681-1703, doi: 10.1130/B35247.1

Bacon, S. N., Jayko, A. S., Owen, L. A., Lindvall, S. C., Rhodes, E. J., Schumer, R., Decker, D. L., 2020: A 50,000-year record of lake-level variations and overflow from Owens Lake, eastern California, USA, *l Quaternary Science Reviews*, 238, 106312, doi: 10.1016/j.quascirev.2020.106312

Craig, L., Thomas, J.M., Lutz, A., Decker, D.L., 2017. Determining the optimum locations for pumping low-flouride groundwater to distribute to communities in a fluoridic area in Upper East Region, Ghana. *Chemical Geology*, 476, 481-492, doi: 10.1016/j.chemgeo.2017.12.001

Craig, L., Stillings, L, Decker, D., 2017. Assessing changes in the physico-chemical properties and fluoride adsorption capacity of activated alumina under varied conditions. *Applied Geochemistry*, 76, 112-123, doi: 10.1016/j.apgeochem.2016.11.011

Craig, L., Stillings, L, Decker, D., 2015. Comparing activated alumina with indigenous laterite and bauxite as potential sorbents for removing fluoride from drinking water in Ghana. *Applied Geochemistry*, 56, 50-66, doi: 10.1016/j.apgeochem.2015.02.004 Published: May 2015

Cooper, C.A., Crews, J.B., Schumer, R., Breitmeyer R.J., Voepel, H. and Decker D.L. Experimental Investigation of Transient Penetrative Thermal Convection in Porous Media. 2014 Transport in Porous Media. *Published On-line* doi: 10.1007/s11242-014-0337-0

Scott, J., Rosen, M., Saito, L., and Decker, D.L., 2012. The influence of irrigation water on the hydrology and lake water budgets of two small arid-climate lakes in Khorezm, Uzbekistan. *Journal of Hydrology* 410(1-2): 114-125

Cooper, C.A. and Decker, D.L. Nuclear rocket exhaust gas sequestration in deep vadose zones, 2011. *Journal of Nuclear Technology,* 174(3): 452-459

Decker, D.L., Papelis, C., Tyler, S.W., Logsdon, M., and Simunek, J., 2006. Arsenate and arsenite sorption on carbonate hosted precious metals ore. *Vadose Zone Journal*, Vol 5:419-429

Decker, D.L., Simunek, J., Tyler, S.W., Papelis, C., and Logsdon, M., 2006. Variably saturated reactive transport of arsenic in heap leach facilities. *Vadose Zone Journal*, Vol 5: 430-444

Decker, D.L., and Tyler, S.W., 1999. Evaluation of Flow and Solute Transport Parameters for Heap Leach Recovery Materials. *Journal of Environmental Quality* Vol. 28 No. 2

Fogg, G.E., Rolston, D.E., Decker, D.L., Louie, D.T., and Grismer, M.E., 1998. Spatial Variation in Nitrogen Isotope Values Beneath Nitrate Contamination Sources. *Ground Water* 36(3):418-426

Fogg, G.E., Rolston, D.E., Decker, D.L., Louie, D.T., and Grismer, M.E., 1996. Nitrogen Isotope Ratios Identify Nitrate Contamination Sources. *California Agriculture*. 50(2): 32-36

Vanderah, T.A., Decker, D.L., Harris, D.C. and Chamberland, B.L., 1989. Synthesis and characterization of fluoride-substituted $YBa_2Cu_3O_7$, $EuBa_2Cu_3O_7$ and $LaBa_2CuO_7$. *Materials Research Bulletin* 24(1):1648-1649

Sigel, G.A., Bartlett, R.A., Decker, D.L., Olmstead, M.M., and Power, P.P., 1987**.** Synthesis and spectroscopic and x-ray structural characterization and dynamic solution behavior of the neutral Cobalt(II) Alkoxides $[Co\{OC(C_6H_{11})_3\}_2]_2{\cdot}CH_3OH{\cdot}\frac{1}{2}C_6H_{12}{\cdot}THF$, $[Co(OCPh_3)_2]_2{\cdot}n\text{-}C_6H_{14}$, $[Co(OSiPh_3)_2(THF)]_2$, and $Co(OCPh_3)_2(THF)_2$. *Inorganic Chemistry* 26(11):1773-1780

Fischer, J.W., Atkins, R.L., Nissan, R.A., Lowema, C.K., and Decker, D.L., 1986. Synthesis of furazano-substituted 1,5-Diazepines. *Journal of Heterocyclic Chemistry* 23(5):1519-1522

Lowema, C.K. and Decker, D.L., 1986. Structure of the propellant oxalylhydroxamic acid. *Acta Crystallographica Section C – Crystal Structure Communications* 42(11):1648-1649

PRESENTATIONS WITH ABSTRACTS

Bacon, S.N., Adams, K.D., Bullard, T.F., Keen-Zebert, A., Decker, D.L., 2014. Sill failure and catastrophic outburst floods from Owens Lake, CA: implications for latest Pleistocene and Holocene paleohydrology of the Owens River drainage basin. Geol. Soc. of America Annual Meeting, Vancouver British Columbia, 19-22 October 2014, Paper No. 310-7

Thompson, M., Sheehan, J., Sirles, P., Decker, D.L., 2012. Maximizing seismic data acquisition with minimal environmental impact: a southern California case study. Association of Environmental and Engineering Geologists, Salt Lake City, UT

McAlpine, J.D., Koracin, D.R., Decker, D.L., Gertler, A.W. A comparison of dispersion modeling results using idealized meteorology in a coastal region. Air Waste Management Association poster paper for the June 2011 annual meeting

Uher, E., Kaplan M., Joros, A., Decker, D.L. 2011. Air pollution dispersion forecasting: A climatological study of Cape Canaveral tropospheric wind patterns. 91st American Meteorological Society Annual Meeting, Seattle WA 23-27 January 2011

Voepel, H., Schumer, R., Breitmeyer, R.J., Cooper, C.A., Decker, D.L. 2011. Laboratory models of thermal convection in porous media. Fall Meeting American Geophysical Union, San Francisco, CA

LeFebre, K., Hershey, R.L., Decker, D.L. 2011. Evaluation of Radionuclide Mobilization and Redistribution during Playa Lake Formation on the Frenchman Flat Playa, Nevada Nuclear Security Site. Fall Meeting American Geophysical Union, San Francisco, CA

Scott, J., Rosen, M., Nishonov, B., Lamers, J., Saito L., Decker D., Mullabaev, N., Fayzieva, D. 2009. Possible origin of shallow lakes in the arid Uzbekistan Province of Khorezm and their dependence. 11th International Paleolimnology Symposium, Guadalajara, Jalisco, Mexico, December 13-19, 2009

Cooper, C.A. and Decker, D.L., 2009 Injection of nuclear rocket exhaust and water into a deep unsaturated zone. 2009 TOUGH Conference, Lawrence Berkeley Laboratory, October 2009

Scott J, Saito L, Rosen M, Lamers J, Mullabaev N, Decker D, Bekchonova M, Shermetova D, Fayzieva D. 2008. Groundwater-surface water interactions of small arid-landscape lakes in Khorezm, Uzbekistan (poster). 2008 American Geophysical Union Fall Meeting. San Francisco, California. December 2008

Cooper, C.A. and Decker, D.L., 2008. Injection of Nuclear Rocket Engine Exhaust into Deep Unsaturated Zones. American Geophysical Union, Spring Meeting 2008. Abstract H33A-01.

Decker, D.L, Earman, S., Hershey, R.L., Ryu, J.H., Garcia, G., and Reimus, P.W. 2007. Reactive transport of ^{14}C through a carbonate aquifer: implications for contaminant migration. Geol. Soc. of America Annual Meeting, Denver, CO. Paper No. 221-2

R.L. Hershey, D.L. Decker, S. Earman, J. Ryu, P. Reimus, and E.S. Garcia, Jr., 2007. Laboratory experiments of carbon-14 uptake on calcite and dolomite. The 233rd American Chemical Society National Meeting, March 25-29, 2007, Chicago, IL, Abstract # NUCL 135

E.S. Garcia, Jr., P. Reimus, R.L. Hershey, and D.L. Decker, 2007. Laboratory experiments of carbon-14 uptake and release from calcite. The 233rd American Chemical Society National Meeting, March 25-29, 2007, Chicago, IL, Abstract # NUCL 136

Breitmeyer, R.J, Cooper, C.A., and Decker, D.L. 2006. Thermal convection in laboratory-scale porous media. Proceedings, American Geophysical Union, Fall 2006 Meeting

Andraski, B.J., Stonestrom, D.A., Garcia, C.A., Michel, R.L., Johnson, M.J., and Decker, D.L., 2006. Plant-based plume-scale mapping reveals tritium-transport extent and processes in desert soils. Proceedings, 18th World Congress of Soil Science, July 9-15, 2006 – Philadelphia, PA, USA

Decker, D.L., and Hershey, R.L., 2005. Coupling a discrete-state compartment model and a water-rock reaction model with application to a large-scale hydrologic system in southern Nevada. Proceedings, American Geophysical Union, Fall 2005 Meeting

Thomas, J.M., Deverel, S.J., Decker, D.L., Earman, S., Mihevc, T., Acheampong, S.Y., 2005. Groundwater evaporation from a playa in Spring Valley, Nevada. Proceedings, American Geophysical Union, Fall 2005 Meeting

Gee, G., Keller, J.M., Serne, R.J., Albright, W.H., and Decker, D.L. 2005. Chloride Mass Balance Errors in Low-Chloride Environments. Proceedings: Soil Science Society of America, November 2005 Meeting

Decker, D.L., Tyler, S.W., Papelis, C., and Simunek, J., 2000. Experimental pH-dependent arsenic oxyanion adsorption on gold ore: an effort in support of a reactive flow and transport model for oxyanion transport in spent mine waste. A symposia lecture. Proceedings: Geological Society of America, Reno, Nevada

Decker, D.L., Tyler, S.W., Papelis, C., and Simunek, J., 2000. A reactive transport model for Arsenic in unsaturated gold mine heap and waste rock structures. A symposia lecture for the *Humbolt River Workshop* held January 12, 2000, Reno, NV

Decker, D.L., Tyler, S.W., Miller, G., Miller, W., and Papelis, L., 1999. Developing a reactive numerical flow and transport model for arsenic in heap leach and waste rock structures. A poster presentation for the *Closure, Remediation & Management of Precious Metals Heap Leach Facilities Workshop* held January 14-15, 1999, Reno, NV

Tyler, S. and Decker, D., 1999. Hydrodynamics and Solute Transport in Heap Leach Mining. A symposia lecture for the *Closure, Remediation & Management of Precious Metals Heap Leach Facilities Workshop* held January 14-15, 1999, Reno, NV

Decker, D.L., Tyler, S.W., Papelis, C., and Simunek, J., 1999. A reactive transport model for Arsenic in unsaturated gold mine heap and waste rock structures. Proceedings: Geological Society of America, Denver Colorado

Rolston, D. E., G. E. Fogg, D. L. Decker and D. T. Louie. Nitrogen isotope ratios of natural and anthropogenic nitrate in the subsurface. Water Down Under 94, Groundwater/Surface Hydrology Common Interest Papers, Australia, Nov. 21-25, 1994

PEER REVIEWED CONFERENCE PAPERS

McAlpine, J.D., Koracin, D.R., Decker, D.L., Gertler, A.W., 2011 A comparison of dispersion modeling results using idealized meteorology in a coastal region. Proceedings, 104th Air Waste Management Association Annual Conference, Orlando Florida, 21-24 June 2011. Vol. 2, pp 1313-1329

Cooper, C.A. and Decker, D.L., 2009. Injection of nuclear rocket exhaust and water into a deep unsaturated zone. Proceedings of the 2009 TOUGH Conference Lawrence Berkeley Laboratory, October 2009

Hershey, R.L., Papelis, C., Decker, D.L., and Miller, G.C., 2003. Laboratory experiments of As(V) and As(III) sorption onto pit-lake sediments from three different ore types. A poster for the 6th International Conference on Acid-Rock Drainage (ICARD), Cairns, Queensland, Australia, July 2003

Decker, D. and Tyler, S., 1999. Hydrodynamics and Solute Transport in Heap Leach Mining. *Closure, Remediation & Management of Precious Metals Heap Leach Facilities, Kosich and Miller eds.* pp. 1-12

PROJECT REPORTS (UNRESTRICTED)

Etyemezian, V. R., Decker, D. L., Nikolich, G., Kohl, S. D., Khlystov, A. Y., 2018: Exploratory development of energetic and pyrotechnic combustion characterization apparatus, 44 p.

Jasoni, R.L., Thomas, J.M., Cablk, M.E., Decker, D.L., Lyles, B.F., Arnone, J.A., 2009. Evapotranspiration in Smoke Creek Desert, Nevada. Publication No. 41224R Desert Research Institute, Division of Hydrologic Sciences, Reno NV

Reimus, P.W., Hershey, R.L., Decker, D.L., Garcia, E., Earman, S., Ryu, J., Roback, R.C., Pohll, G., and Papelis, C. 2009. Laboratory experiments of 14C uptake and release on calcite and dolomite to support groundwater radionuclide transport modeling for the Nevada Test Site Underground Test Area Program. Los Alamos National Laboratory, LA-UR-07-6962.

Hershey, R.L., Paces, J.B., Singleton, M.J., Kwickless, E.M., Decker, D.L., Fryer, W.M., and Earman, S. 2008. Geochemical and isotopic evaluation of groundwater movement in corrective action unit 99: Rainier Mesa and Shoshone Mountain, Nevada Test Site. Publication No. 45229 Desert Research Institute, Division of Hydrologic Sciences, Reno NV.

Decker, D.L., Cooper, C.A., Jacobson, R., Oberlander, P., and Shafer, D. 2007. Preliminary numerical modeling and sub-scale experimental design of a nuclear rocket test facility with vadose zone exhaust sequestration at the Nevada Test Site. Publication No. 41238 Desert Research Institute, Division of Hydrologic Sciences, Reno, NV.

Pohlmann, K., Ye, M., Reeves, D., Zavarin, M., Decker, D., and Chapman, J. 2007. Modeling of groundwater flow and radionuclide transport at the Climax Mine sub-CAU, Nevada Test Site. Publication No. 45226 Desert Research Institute, Division of Hydrologic Sciences, Reno, NV.

Reimus, P.W., Hershey, R.L., Decker, D.L., Ware, D.S., Papelis, C., Earman, S., Abdel-Fattah, A., Haga, M., Counce, D., Chipera, S., and Sedlacek, C., 2006. Tracer transport properties in the lower carbonate aquifer of Yucca Flat. Los Alamos National Laboratory, LA-UR-06-0486.

Decker, D.L., Carnahan, T.G., Murphy, J.E., and Lyles, B.F., 2006. Subsurface in situ tritium monitoring instrument development: interim report. Publication No. 41227 Desert Research Institute, Division of Hydrologic Sciences, Reno, NV.

Albright, W.H., R.L. Jasoni, M.E. Cablk, J.M. Thomas, D.L. Decker, and J.A. Arnone, 2006: *Evapotranspiration in Smoke Creek Desert, Nevada.* DHS Publication No. 41224. Prepared for Sempra Energy. 70 pp.

Deverel, S., Thomas, J., Decker, D., Earman, S., Mihevc, T., and Acheampong, S. 2005. Groundwater evaporation estimates using stable isotope and chloride data, Yelland Playa, Spring Valley, Nevada. Publication No. 41219 Desert Research Institute, Division of Hydrologic Sciences, Reno, NV.

Decker, D., Papelis, C., Hershey, R.L., Harris, R., Schmett, G. 2003. Temperature dependence of sorption behavior of lead and cesium metal ions on western Pahute Mesa and Rainier Mesa aquifer rocks. Publication No. 45193 Desert Research Institute, Division of Hydrologic Sciences, Reno, NV.

SYNERGISTIC ACTIVITIES

Principal investigator on several projects related to mechanical and systems engineering, ordnance disposal, and atmospheric sciences

Former instructor for graduate level environmental geochemistry Hydrologic Sciences Graduate Program, University of Nevada, Reno.

Served as Faculty Senate Chair for the Desert Research Institute, 2008-2009, and 2011-2012.

Served on graduate committees for students in the Hydrologic Sciences Graduate Program and funded student research in the Atmospheric Sciences Graduate Program.

Current DOE-Q and DOD-TS security clearances

AWARDS

2018 DRI Outstanding Contributions Medal and $5,000 Prize, first awardee

2017 Recognized as an essential core member of the Columbia Program research engineering and science team by Adm. Corey, Naval Air Warfare Center, Weapons Division, China Lake, CA.

2014 DHS 'Mad Hatter Award' for Outstanding Service to the Division of Hydrologic Sciences

2012 DRI Faculty Senate medal for Outstanding Service to the Institute – DRI-wide faculty equity

2009 DRI Faculty Senate medal for Outstanding Service to the Institute – first upward DRI and NSHE Presidential Evaluation

1998 George B. and Jane C. Maxey Award (graduate paper competition)

AFFILIATIONS

American Geophysical Union, American Association for the Advancement of Science, American Society of Civil Engineers, American Society of Mechanical Engineers, Geochemical Society, U.S. Naval Institute, Specialized Crane and Rigging Association

LEADERSHIP TRAINING

Center for Creative Leadership – 'Leadership for Organizational Impact' 2018.

EXTERNAL COLLABORATORS

John Speredelozzi, Jacobs Weapon Systems Group; Lee Steinberg and Charles Thompson, Mr. Crane Inc; Matt Boggs, Eric Frisbee, Naval Air Warfare Center, Weapons Division, China Lake, CA

GRADUATE ADVISORS

Prof. Scott Tyler, University of Nevada, Reno and Prof. Graham Fogg, University of California, Davis