

## DAVID (DAVE) L. DECKER

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Research Professor  
Director, Naval Earth Sciences and Engineering Program  
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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

Current research engineering interests are associated with development of new missile launcher technologies in support of the US Navy's Columbia and Prompt Global Strike Programs. I am a member of a very small interdisciplinary and multiorganizational team that has developed critical expertise in ship board launcher systems design and testing through continuous Navy research, development, test and evaluation funding since 2008. Current applied science research interests include developing tools that support live-fire range operations, capabilities, and long-term sustainability. Examples include development of improved open-burn, open-detonation ordnance disposal aerosol characterization, development of an integrated and adaptive real-time environmental monitoring and alert system (REMAS), numerous investigations related to climate change impacts and the design of adaptive responses for continued operational sustainability on DoD installations. Additional examples include development of a new patented method of ordnance and energetic materials disposal using microbially mediated reaction pathways; development of a new anemometer based on UAS technology, and development of a novel wind forecast engine specifically for high-risk industrial and construction projects, such as heavy-lift crane operations. A significant effort has been invested in developing and leading an interdisciplinary applied science and engineering program for the US Navy (NESEP). This effort involves faculty from across DRI and 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. Since inception in 2008, NESEP has completed over \$19M in high-impact sponsored projects for the US Navy and has current contracts worth \$8M that extend through 2024.

## PROFESSIONAL EXPERIENCE

- 2015-Present Research Professor, Division of Hydrologic Sciences, DRI
- 2011-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-Present 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.

## 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](#), *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-fluoride 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  $\text{YBa}_2\text{Cu}_3\text{O}_7$ ,  $\text{EuBa}_2\text{Cu}_3\text{O}_7$  and  $\text{LaBa}_2\text{Cu}_3\text{O}_7$ . *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  $[\text{Co}\{\text{OC}(\text{C}_6\text{H}_{11})_3\}_2]_2 \cdot \text{CH}_3\text{OH} \cdot \frac{1}{2}\text{C}_6\text{H}_{12} \cdot \text{THF}$ ,  $[\text{Co}(\text{OCPh}_3)_2]_2 \cdot n\text{-C}_6\text{H}_{14}$ ,  $[\text{Co}(\text{OSiPh}_3)_2(\text{THF})_2]_2$ , and  $\text{Co}(\text{OCPh}_3)_2(\text{THF})_2$ . *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 oxalyhydroxamic 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., Sirls, 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. 91<sup>st</sup> 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

- LeFebvre, 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. 11<sup>th</sup> 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 <sup>14</sup>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 233<sup>rd</sup> 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 233<sup>rd</sup> 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, 18<sup>th</sup> 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, 104<sup>th</sup> 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 6<sup>th</sup> 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., Pohl, G., and Papelis, C. 2009. Laboratory experiments of <sup>14</sup>C 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.

## **PATENTS**

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

## **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 Sperdelozzi, Jacobs Weapon Systems Group; Karl Manger, Jacobs Global Buildings; Brian Sexton, Glen Ward, Dave Edgar, Jacobs Technology Group; Pat Madden, Johns Hopkins University Applied Physics Laboratory; Joe Magallanes, Karagozian and Case; Lee Steinberg and Charles Thompson, Mr. Crane Inc; Tim Devane, Northrop Grumman Marine Systems; Zack Beeler, Matt Boggs, Dean Huebert, David Hill, Naval Air Warfare Center, Weapons Division, China Lake, CA; Shane Frink, Naval Surface Warfare Center, Crane Indiana.

## **GRADUATE ADVISORS**

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