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Director, Naval Earth Sciences and Engineering Program
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Education

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

Professional Interests

Research interests are in the earth sciences and engineering. Past research activities include developing reactive transport numerical tools for metals and radionuclides in variably saturated environments, and the development of in situ deep borehole instrumentation for real-time measurement of radionuclide activity. Past collaborative research has included the subsurface fate and transport of depleted uranium in dry desert environments, mass transfer mechanisms of aerosol pollutants onto surfaces, and developing electrostatic charge forecasting algorithms that include soil chemistry and physics as it relates to saltation. Current applied 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. Current academic research interests are in developing a new means of ordnance disposal using microbially mediated reaction pathways, developing a new anemometer based on UAS technology, and improving the speed of computation and predictive capability of aerosol transport models. 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 2011, NESEP has completed over \$14M in high-impact sponsored projects for the US Navy.

Professional Experience

2016-Present	Director, High Performance Computational Services (HPCS), Desert Research Institute (DRI)
2015-Present	Research Professor, Division of Hydrologic Sciences, DRI
2014-Present	Deputy Director, Division of Hydrologic Sciences, Desert Research Institute
2011-Present	Founder and Director, Naval Earth Sciences and Engineering Program (NESEP), 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.

Publications in Preparation and Submitted

- Bacon, S.N., Bullard, T.F., Keen-Zebert, A.K., Jayko, A.S., and Decker, D.L. A 40,000-year record of spatiotemporal changes of transtensional slip partitioning and faulting from deformed shorelines in southern Owens Valley, eastern California *Submitted*
- Decker, D.L., Sada, D., Thomas, J. Thermal equilibration rate dependence on mineral precipitation behavior in Travertine depositing hot springs. *In preparation*.

Journal Publications

- 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 Online* 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 $[\text{Co}\{\text{OC}(\text{C}_6\text{H}_{11})_2\}_2]_2 \cdot \text{CH}_3\text{OH} \cdot \frac{1}{2}\text{C}_6\text{H}_{12} \cdot \text{THF}$, $[\text{Co}\{\text{OCPh}_3\}_2]_2 \cdot n\text{-C}_6\text{H}_{14}$, $[\text{Co}\{\text{OSiPh}_3\}_2(\text{THF})_2]_2$, 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 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., 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. 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.
- 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. 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, Pennsylvania, 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

- 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., Schmetz, 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. Biopassivation of Ordnance. Patent Application, 2017

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 – tubing bundle clamping 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 in several projects related to mechanical and geotechnical engineering, variably saturated flow and transport modeling, atmospheric sciences, and instrument development

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

Served as Faculty Senate Chairperson 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.

Reviewer: Applied Geochemistry, Water Resources Research, Journal of Environmental Quality, Soil Science, National Science Foundation

Current DOE-Q and DOD-TS security clearances

Awards

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

2017 Recognized as a key member of the ‘Launch Test Capability’ 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

2009 DRI Faculty Senate medal for Outstanding Service to the Institute

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

Affiliations

American Geophysical Union, Geological Society of America, Geochemical Society, American Society of Civil Engineers, American Society of Mechanical Engineers, U.S. Naval Institute

Leadership Training

Center for Creative Leadership – ‘Leadership for Organizational Impact’ 2018.

External Collaborators

John Speredelozzi, Jacobs Weapon Systems Group; Karl Manger, Jacobs Global Buildings; David Cadieux, Navy Crane Center; Greg Greseth and Pat Madden, JHUAPL; Mark Logsdon, Geochimica; Joe Magallanes, Karagozian and Case; Spence Pickett, NAVFAC-EXWC; Lee Steinberg and Charles Thompson, MCI; Phil Sirles, Olson Engineering; Guy Smith, Northrop Grumman Corporation Electronic Systems; Tim Devane, Northrop Grumman Marine Systems; Zack Beeler, Matt Boggs, Elissa Carey, Dr. Eric Erickson, Eric Frisbee, Tamara Jones, Mark Keenan, Dean Huebert, David Hill, Tom Schilling, Dr. Eric Standard, Naval Air Warfare Center, Weapons Division, China Lake, CA; Dr. Robin Nissan, SERDP.

Graduate Advisors

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