



**Exponent®**

Engineering & Scientific Consulting

## Tom Deardorff, Ph.D.

Senior Managing Scientist | Ecological and Biological Sciences

Irvine

+1-949-242-6007 | [tdeardorff@exponent.com](mailto:tdeardorff@exponent.com)

## Professional Profile

Dr. Deardorff possesses a broad scope of experience commensurate with previous employment in academia, the U.S. Food and Drug Administration (FDA), and private industry. His areas of expertise include investigations and evaluations of: the fate, and effects of chemicals in the environment (e.g., dioxins, furans, PCBs, PAHs, and chlorinated phenols); water quality and industrial wastewater treatment; and oil spills.

Dr. Deardorff has extensive experience with; constructed wetlands and wetland restoration. Dr. Deardorff has worked on numerous wildland fires in southern California assessing environmental status of forests, calculating loss of value and subsequent reestablishment costs for forest and agricultural lands damaged by wildland fires, environmental contamination associated with large fires, and environmental impacts to aquatic ecosystems. Much of Dr. Deardorff's work involves providing litigation support for case support and as an expert witness.

## Academic Credentials & Professional Honors

Ph.D., Biology, University of Southern Mississippi, 1980

M.A., Zoology, University of Northern Colorado, 1975

B.A., Science, University of Denver, 1969

## Prior Experience

### International Paper Company

- Manufacturing Solutions Leadership Team, 2004-2005
- Fiberline & Environmental Manufacturing Solutions, 2003-2004
- Environmental Health and Safety Lead Team, 2001-2003
- Environmental Business Services, 2001-2003
- Research & Development Fellow, 1997–2005
- Manager, Environmental Technology, 1996–1997
- Manager, Pulp Manufacturing Technology, 1994–1996
- Principle Scientist, Pulp Manufacturing Technology, 1994
- Senior Research Scientist, Pulp Manufacturing Technology (1993–1994)
- Research Scientist, Pulp Manufacturing Technology, 1990–1993

## Other Professional Positions

- Faculty (Adjunct), Dept of Biology, University of Mississippi, 1997-1999
- Assistant Professor of Structural and Cellular Biology (Adjunct), College of Medicine, University of South Alabama, 1987-1991
- United States Food and Drug Administration, Division of Contaminants Chemistry, 1985-1990
- Faculty, Department of Tropical Medicine and Medical Microbiology, School of Medicine, Leahi Hospital, University of Hawaii, 1980-1985
- Research Scientist, Pacific Gamefish Foundation, 1982-1985
- Research Faculty, Hawaii Institute of Marine Biology, 1982-1984
- Postdoctoral Awardee, Gulf Coast Research Laboratory, 1979-1980

## Publications

Menzie C, Deardorff TL, Ma J, Edwards M. Risk factors that contribute to the occurrence of catastrophic wildfires in California. World Environmental and Water Resources Congress 2015; 2617-2626.

Shaller PJ, Shrestha PL, Deardorff TL, Wren J. Adverse impacts of post-wildfires in the watershed. Proceedings, World Environmental & Water Resources Congress, Austin, TX, May 17-21, 2015.

Semenova S, Deardorff TL. Catastrophic California wildfires: scaling environmental damages. Proceedings, World Environmental & Water Resources Congress, Austin, TX, May 17-21, 2015.

Deardorff TL, Semenova S. Environmental damages associated with wildland fires. Exponent Environmental Perspectives Newsletter 2014; pp. 1-7.

Semenova S, Menzie C, Deardorff TL. A retrospective approach to valuation of natural resources in wildland fire litigation. Environmental Claims Journal 2013; 25(4):291-310.

Menzie CA, Deardorff TL, Booth P, Wickwire T. Refocusing on nature in environmental evaluations: the case for holistic assessments of ecosystem services. Integrated Environmental Assessment and Management 2012; 8(3):401-411.

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Deardorff TL. Wildland fires: Changing ecological and legal landscapes. @Law 2011; 60(3):34-39.

Deardorff TL, Flowers T, Hamilton D. Stemming the tide: Lessons learned from the loss and restoration efforts of the Iraqi wetlands with comparisons with San Francisco Bay. Proceedings, World Environmental & Water Resources Congress: Bearing Knowledge for Sustainability 2011; 414:4849-4855.

Deardorff TL, Menzie C, Pryke D. Uruguay's Orion Mill wins landmark environmental case before the World Court. Paper 360° 2011; 40-42.

Deardorff TL, Flowers T, Hamilton D, Cattarossi A, Lecollinet J. The value of a constructed wetland in southern Iraq to sustainably enhance water quality. World Environmental & Water Resources Congress: Bearing Knowledge for Sustainability 2011; 414:4532-4537.

Deardorff TL, Flowers T, Hamilton D, Cattarossi A, Lecollinet J. The value of a constructed wetland in southern Iraq to sustainably enhance water quality. Proceedings, World Environmental & Water Resources Congress. Vol. 414, 2011.

Deardorff TL, Karch NJ, Holm SE. Dioxin levels in ash and soil generated in Southern California fires. *Organohalogen Compd* 2010; 70:2284-2288.

Golden R, Holm SE, Deardorff TL, Kelly CR, Jones W. The consequences of sample preparation methods on the derivation of environmentally relevant ecotoxicology data for two complex mixtures. *Bullet Environ Contam Toxicol* 2008, in press.

Hall TJ, Fisher RP, Rodgers Jr JH, Minshall GW, Landis WG, Kovacs T, Firth BK, Dube MG, Deardorff TL. A long-term multi-trophic level study to assess pulp and paper mill effluent discharges on aquatic communities in 4 U.S. receiving waters: Background and status. *Integr Environ Assess Manage* 2009; 5(2):189-198.

Hall TJ, Fisher RP, Rodgers Jr JH, Minshall GW, Landis WG, Kovacs T, Firth BK, Dube MG, Flinders CA, Deardorff TL, Borton DL. A long-term multi-trophic level study to assess pulp and paper mill effluent discharges on aquatic communities in 4 U.S. receiving waters: Lessons learned. *Integr Environ Assess Manage* 2009; 5(2):283-290.

Mesard PM, Deardorff TL. Stormwater management during construction—A technical perspective. Proceedings, American Bar Association's Toxic Tort Environmental Law Section, Scottsdale, AZ, 2008.

Kelly CR, Golden R, Holm SE, Deardorff TL, Festa JL. Toxicity investigations associated with *Daphnia magna* and *Pimephales promelas* exposed to spent pulping liquor from an elemental-chlorine-free kraft mill. pp. 304-309. In: *Pulp & Paper Mill Effluent Environmental Fate & Effects*. Borton DL, Hall TJ, Fisher RP, Thomas JF (eds), DEStech Publications, Inc., 2004.

Deardorff TL, Rodgers, Jr., JH, Felder DP, D'Surney SJ. A multifaceted investigation of the aquatic ecosystems near a bleached and unbleached kraft mill. In: *Environmental Impacts of Pulp and Paper Waste Streams*. Proceedings, 3rd International Conference on Environmental Fate and Effects of Pulp and Paper Mill Effluents. Stuthridge TR, Van den Heuvel MR, Marvin NA, Slade AH, Gifford J (eds), 2003.

Mastin BJ, Rodgers, Jr., JH, Deardorff TL. Risk evaluation of Cyanobacteria-dominated algal "blooms" in a North Louisiana reservoir. *J Aquat Ecosystem Stress Recovery* 2002; 9:103-114.

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Felder DP, D'Surney SJ, Rodgers, Jr., JH, Deardorff TL. A comprehensive environmental assessment of a receiving aquatic system near an unbleached kraft mill. *Ecotoxicology* 1998; 7:313-324.

Deardorff TL, Renard JJ, Phillips RB. An environmental assessment before and after conversion of a bleached draft mill to elemental-chlorine-free bleaching. pp. 143-150. In: *Chlorine and Chlorine Compounds in the Paper Industry*. Turosky V (ed), Ann Arbor Press, Inc., Chelsea, MI, 1997.

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- Overstreet RM, Hawkins WE, Deardorff TL. The western mosquitofish as an environmental sentinel: parasites and histological lesions. pp. 495-509. In: Environmental fate and effects of pulp mill effluents. Servos MR, Munkittrick KR, Carey JH, Van Der Kraak G (eds), St. Lucie Press, Delray Beach, FL, 1996.
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- Deardorff TL, Renard JJ, Phillips RB. Elemental-chlorine-free bleaching: An environmental assessment in the mill and adjacent aquatic ecosystem. pp. 50-53. Proceedings, Pacific Paper '95 conference. Vancouver, BC, October 15-18, 1995.
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- Deardorff TL. Epidemiology of marine fish-borne parasitic zoonoses. Southeast J Parasitol 1991; pp. 146-149.
- Deardorff TL, Overstreet RM. Seafood-transmitted zoonoses in the United States: the fishes, the dishes, and the worms. pp. 211-265. In: Microbiology of Marine Food Products. Ward DR and Hackney CR (eds), Van Nostrand Reinhold Co., Inc., New York, NY, 1991.
- Jones RE, Deardorff TL, Kayes SG. *Anisakis simplex*: Histopathological changes in experimentally infected CBA/J mice. Exper Parasitol 1990; 70:305-313.
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- Brooks DR, Deardorff TL. *Rhinebothrium devaneyi* n. sp. (Eucestoda: Tetraphyllidea) and

*Echinocephalus overstreeti* Deardorff and Ko, 1983 (Nematoda: Gnathostomatidae) in a thorny back ray, *Urogymnus asperrimus*, from Enewetak Atoll, with phylogenetic analysis of both species groups. J Parasitol 1988; 74:459-465.

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McKerrow JH, Sakanari JA, Deardorff TL. Revenge of the sushi parasite. New Engl J Med 1988; 319:1228-1229.

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Deardorff TL, Altman J, Nolan CM. Human anisakiasis: Two case reports from the State of Washington. J Helminth Soc WA 1987; 54:274-275.

Deardorff TL. Marine mammals: A barometer for human disease? Proceedings, International Association for Aquatic Animal Medicine 1987; 18:136-141.

Bier JW, Deardorff TL, Jackson GJ, Raybourne RB. Human anisakiasis. pp. 723-733. In: Bailliere's Clinical Tropical Medicine and Communicable Diseases, Vol. 2, Intestinal Helminthic Infections. Pawlowski ZS (ed), W.B. Saunders Company, United Kingdom, 1987.

Deardorff TL, Fukumura T, Raybourne RB. Invasive anisakiasis: A case report from Hawaii. Gastroenterology 1986; 90:1047-1050.

Deardorff TL, Overstreet RM, Okihiro M, Tam R. Piscine adult nematode invading an open lesion in a human hand. Am J Tropical Med Hyg 1986; 35:827-830.

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Deardorff TL. Helminths and human health: An update on larval ascaridoid nematodes in seafood products. Proceedings, Annual Tropical and Subtropical Fisheries Conference of the Americas 1986; 11:285-291.

Deardorff TL, Raybourne RB, Desowitz RS. Behavior and viability of third-stage larvae of *Terranova* sp. (type HA) and *Anisakis simplex* (type I) under coolant conditions. J Food Protect 1984; 47:49-52.

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Deardorff TL, Kliks MM, Desowitz RS. Histopathology induced by larval *Terranova* (type HA) (Nematoda: Anisakinae) in experimentally infected rats. J Parasitol 1983; 69:191-195.

Deardorff TL, Ko RC. *Echinocephalus overstreeti* sp. n. (Nematoda: Gnathostomatidae) in the stingray, *Taeniura melanophilos* Bleeker, from the Marquesas Islands, with comments on *E. sinensis* Ko, 1975. J Helminth Soc WA 1983; 50:285-293.

Deardorff TL, Stanton RG. Nematode-induced abdominal distention in the Hawaiian puffer fish, *Canthigaster jactator* (Jenkins). Pac Sci 1983; 37:45-47.

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Rychlinski RA, Deardorff TL. *Spirocamallanus*: A potential fish health problem. Freshwater Marine Aquarium 1982; 5:22-23, 79, 84.

Deardorff TL, Overstreet RM. *Hysterothylacium pelagicum* sp. n. and *H. cornutum* from marine fishes. J Helminth Soc WA 1982; 49:246-251.

Deardorff TL. Abnormal morphology in *Contracaecum* sp. n. (Anisakidae: Anisakinae). J Helminth Soc WA 1982; 49:325-326.

Deardorff TL, Kliks MM, Rosenfeld ME, Rychlinski RA, Desowitz RS. Larval ascaridoid nematodes from fishes near the Hawaiian Islands with comments on pathogenicity experiments. Pac Sci 1982; 36:187-201.

Deardorff TL. 1982. What's bugging the billfishes? Pacific Gamefish Research 1982; Winter issue, p 4.

Deardorff TL, Brooks DR, Thorson TB. Two species of *Echinocephalus* (Nematoda: Gnathostomidae) from neotropical stingrays with comments on *E. diazi*. J Parasitol 1981; 67:433-439.

Deardorff TL, Overstreet RM. *Raphidascaris camura* sp. n., *Hysterothylacium eurycheilum* (Olsen) comb. n., and comments on *Heterotyphlum* Spaul (Nematoda: Ascaridoidea) in marine fishes. J Parasitol 1981; 67:426-432.

Deardorff TL, Overstreet RM. *Terranova ceticola* sp. n. (Nematoda: Anisakidae) from the dwarf sperm whale, *Kogia simus*, from Mississippi. System Parasitol 1981; 3:25-29.

Deardorff TL, Overstreet RM. Larval *Hysterothylacium* (= *Thynnascaris*) (Nematoda: Anisakidae) from fishes and invertebrates in the Gulf of Mexico. J Helminth Soc WA 1981; 48:113-126.

Deardorff TL. Adult ascaridoid nematodes from fishes of the northern Gulf of Mexico with notes on some larval forms. Dissertation. University of Southern Mississippi, Hattiesburg, MS, 1980.

Brooks DR, Deardorff TL. Three proteocephalid cestodes from Colombian siluriform fishes, including *Nominoscolex alovarius* sp. n. (Monticelliidae: Zygobothriinae). J Helminth Soc WA 1980; 47:15-21.

Deardorff TL, Overstreet RM. Taxonomy and biology of North American species of *Goezia* (Nematoda: Anisakidae) from fishes, including three new species. J Helminth Soc WA 1980; 47:192-217.

Deardorff TL, Overstreet RM. Review of *Hysterothylacium* and *Iheringascaris* (both previously = *Thynnascaris*) (Nematoda: Anisakidae) from the northern Gulf of Mexico. Proc. Biological Society of

Washington 1980; 93:1035-1079.

Deardorff TL, Overstreet RM. *Contracaecum multipapillatum* (synonym = *C. robustum*) from fishes and birds in the northern Gulf of Mexico. J Parasitol 1980; 66:853-856.

Deardorff TL, Overstreet RM. *Goezia lacerticola* sp. n. (Nematoda: Anisakidae) in *Alligator mississippiensis* from Florida. J Helminthol 1979; 53:317-320.

Deardorff TL, Schmidt GD, Kuntz RE. *Allohymenolepis palawanensis* sp. n. (Cyclophyllidae: Hymenolepididae) from the Philippine bird, *Nectarinia jugularis* (Tweeddale 1878). J Helminthol 1978; 52:211-213.

Deardorff TL, Brooks DR. *Passerilepis schmidtii* sp.n. (Cestoidea: Hymenolepididae) from the blue jay, *Cyanocitta cristata* L. in Nebraska. J Helminth Soc WA 1978; 45:190-192.

Deardorff TL, Overstreet RM. *Thynnascaris rhacodes* sp. n. (Nematoda: Ascaridoidea) in fishes from the Israeli Mediterranean coast. Annales de Parasitologie (Paris) 1978; 53:519-525.

Deardorff TL, Schmidt GD, Kuntz RE. Tapeworms from Philippine birds, with three new species of *Raillietina* (*Raillietina*). J Helminthol 1976; 50:133-142.

## Recent Abstracts

Shaller PJ, Shrestha PL, Deardorff TL, Wren J. Adverse impacts of post-wildfires in the watershed. World Environmental & Water Resources Congress, Austin, TX, May 17-21, 2015.

Deardorff TL, Semenova S, Shaller PJ, Shrestha P. Risk factors and ecological disturbances that contribute to the occurrence of catastrophic wildfires in California. World Environmental & Water Resources Congress, Austin, TX, May 17-21, 2015.

Semenova S and Thomas L. Deardorff. Catastrophic California wildfires: Scaling environmental damages. World Environmental & Water Resources Congress, Austin, TX, May 17-21, 2015.

Deardorff TL. Don't let them bite! - Cutting edge risk, management and litigation strategies for responding to bed bug infestation claims. Retail, Restaurant & Hospitality Conference, Orlando, FL, 2015.

Semenova S, Menzie C, Deardorff TL. Environmental damages associated with wildland fires. Society for Environmental Toxicology and Chemistry North America 34th Annual Meeting, Nashville, TN, 2013.

Menzie CA, Deardorff TL, Ma J, Edwards MR. California's catastrophic wildland fires: Increasing the risks of burning hotter, faster, and higher. Society for Environmental Toxicology and Chemistry North America 33th Annual Meeting, Long Beach, CA, 2012.

Deardorff TL, Menzie CA. Considerations for assessing the status of ecosystem services following the 2007 Grass Valley wildland fire: Thinking historically. Society for Environmental Toxicology and Chemistry North America 32th Annual Meeting, Boston, MA, 2011.

Cantor RA, Menzie CA, Deardorff TL, Hulme-Lowe CK, Wickwire T. Seeing the forest through the trees: NRD and dynamic ecosystems. Society of Risk Analysis Annual Meeting, 2011.

Deardorff TL, Menzie CA, Ma J, Salatas J, Wickwire T, McArdle M, Pryke D. The first international environmental decision by The World Court on paper mill impacts. Society for Environmental Toxicology and Chemistry North America 32th Annual Meeting, Boston, MA, 2011.

Deardorff TL, Menzie CA. Value judgments versus nature: Considerations for ecological recovery following catastrophic wildland fires.

Deardorff TL, Flowers T, Hamilton D, Cattarossi A, Lecollinet J. The value of a constructed wetland in southern Iraq to sustainably enhance water quality. World Environmental & Water Resources Congress, Palm Springs, CA, May 2011.

Deardorff TL, Flowers T, Hamilton D. Stemming the tide: Lessons learned from the loss and restoration efforts of the Iraqi wetlands with comparisons with San Francisco Bay. Proceedings, World Environmental & Water Resources Congress, Vol. 414, Palm Springs, CA, May 2011.

Holm SE, Gross TS, Deardorff TL. Dioxin in fish caught in the lower St. John's River Basin: an evaluation of pulp and paper process modifications from 1995-2009. Society for Environmental Toxicology and Chemistry North America 30th Annual Meeting, New Orleans, LA, 2009.

Deardorff TL, Holm SE. Heavy metals and other elements found in ash and soil samples following the 2007 Southern California fires. Society for Environmental Toxicology and Chemistry North America 29th Annual Meeting, Tampa, FL, 2008.

Holm SE, Deardorff TL, Karch NJ. The contribution of forest fires to the generation of dioxins and furans in ash and soil. Society for Environmental Toxicology and Chemistry North America 29th Annual Meeting, Tampa, FL, 2008.

Mesard PM, Deardorff TL. Stormwater management during construction—A technical perspective. American Bar Association meeting, Phoenix, AZ, 2008.

Deardorff TL, Karch NJ, Holm SE. Dioxin levels in ash and soil following the Southern California fires. 28th International Symposium on Halogenated Persistent Organic Pollutants, Birmingham, England, 2008.

Flowers T, Deardorff TL. The role of wetlands as a viable treatment technology for developing nations. World Environmental & Water Resources Congress, Honolulu, HI, May 12-16, 2008.

Cattarossi A, Lecollinet J, Hamilton D, Deardorff TL. The Iraqi wetlands: Ecological stress and hydrological potential for restoration. SETAC Europe 17th Annual Meeting, Porto, Portugal, May 20-24, 2007.

Deardorff T. The feasibility of using a microcosm-scaled wetland for treating wastewater from a pulp and paper mill. SETAC Europe 17th Annual Meeting, Porto, Portugal, May 20-24, 2007.

Deardorff TL, Flowers T, Hamilton D, Cattarossi A, Lecollinet J. Development of a constructed wetland in Southern Iraq. SETAC Europe 17th Annual Meeting, Porto, Portugal, May 20-24, 2007.

Deardorff TL. The efficacy of a constructed wetland for the pulp and paper industry: From the laboratory to a full-scale trial. SETAC North America 27th Annual Meeting, Montréal, Québec, November 5-9, 2006.

Kelly CR, Holm SE, Golden R, Deardorff TL. Rosin and tall oil fatty acids (TOFA) do not exhibit acute toxicity to aquatic organisms using OECD recommended methodology. SETAC Europe, 2005.

Kelly CR, Holm SE, Golden R, Deardorff TL. Environmentally relevant ecotoxicology data for two complex mixtures. SETAC North America 25th Annual Meeting, Salt Lake City, UT, November 14-18, 2004.

## Project Experience

Dr. Deardorff was hired by International Paper (IP) in 1990 to assist the company with their emerging human and environmental issues surrounding dioxins and furans. He conducted numerous ecological health studies adjacent to paper mills, managed all of IP's dioxin monitoring programs (i.e., fish and



effluent concentrations, soil and effluent fingerprinting, effluent quality, bleaching with chlorine and chlorine dioxide, and worker health programs), and served as IP's principle expert in all areas of dioxin. He has significant litigation experience in this area. Dr. Deardorff understands the various paper mill processes and the potential impacts process changes have on the quality of wastewater released by the mills. He also served as a customer advocate for environmental issues with the industry such as paper recycling and sustainable forestry practices.

Dr. Deardorff chaired the Health Effects committee of the U.S. Forest & Paper Association (the industry trade association) in Washington, DC for over a decade leading its research and policy efforts in areas such as the U.S. EPA's dioxin reassessment, aquatic health of rivers and estuaries, worker exposures, epidemiology, and endocrine disruption. He helped develop and implement the industry's position to the U.S. EPA dioxin reassessment. Dr. Deardorff has published technical reports and peer-reviewed papers on the formation of dioxins and furans in various paper mill streams, under various bleaching conditions, and their fate in the environment. He has presented to local, state, and federal regulators on topics ranging from endangered species to habitat protection.

At Exponent, he has been involved in environmental issues following wildland fires for several years and has experience assessing environmental status of forests, determining impacts to endangered species habitats, calculating loss of value and subsequent reestablishment costs for forest and agricultural lands damaged by wildland fires, environmental contamination associated with large fires, determining human health impact for soot and ash, and investigating environmental impacts to aquatic ecosystems.

Environmental projects of significance since joining Exponent include assistance on a two-country (Uruguay and Argentina) dispute on the environmental impacts and Best Management Practices for Uruguay paper mill, which was heard at the International Court of Justice (The Hague) and involvement in wetland restoration and mitigation projects in the US, participation on teams advising the Iraq Ministry of the Environment of achieving the best management practices of wetland restoration of the lower reaches of the Tigris and Euphrates Rivers.

Dr. Deardorff's Ph.D. research addressed the risks to humans from infections with parasitic diseases while ingesting raw or inadequately cooked fresh or marine foods, such as sushi and sashimi. He worked with parasitic diseases in humans vectored by insects and fishes at the University of Hawaii's School of Medicine and the University of South Alabama's School of Medicine and has worked on transmission of parasitic infections vectored by insects (e.g., malaria and mosquitos). At the U.S. FDA, his research addressed chemical and parasitic contaminants in fin- and shell-fishes. Dr. Deardorff has been retained on several cases involving food and product contamination, insect infestations and medical entomology, including bedbug infestations. He has inspected homes, apartments, and office buildings for insect infestations. Dr. Deardorff is extensively published.