

# Dr. John Griffith

Department Head

Microbiology Department

Southern California Coastal Water Research Project

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## Education

Ph.D., Marine Environmental Biology, University of Southern California, 2006

B.S., Biology, University of Southern California, 1995

B.S., Environmental Studies, University of Southern California, 1995

## Areas of Expertise

Dr. Griffith is a marine microbiologist and Coordinator of Molecular Technology at SCCWRP. He earned his Ph.D. in marine biology and biological oceanography at the University of Southern California, where his dissertation research focused on indicators of fecal contamination in near-shore marine waters. Dr. Griffith joined SCCWRP in 2001. His present research efforts focus on development and evaluation of methods for detection and enumeration of fecal indicators and pathogens in fresh and marine waters, and relationships between water quality indicators and swimming-related illness. He has written over 60 articles on use of Foraminifera as bio-indicators, prokaryotic and viral diversity in marine plankton, beach water quality, microbial source tracking and relationships between water quality indicators and swimming-related illness.

## Professional Experience

Department Head, Southern California Coastal Water Research Project, Costa Mesa, CA. 2010 - Present

Microbiologist, Southern California Coastal Water Research Project. Westminster, CA. 2001-2010

Research Assistant, Marine Biology Research Section, University of Southern California. Los Angeles, CA. 2000-2001

Doctoral Fellow, NSF Integrative Graduate Education and Training, Environmental Studies, Policy and Engineering - Sustainable Cities Program, University of Southern California. Los Angeles, CA. 1999-2000

Teaching Assistant, University of Southern California. Los Angeles, CA. 1995-1999

Trainee, USC Sea Grant Program. Los Angeles, CA. 1995-2001

Laboratory Assistant, University of Southern California. Los Angeles CA. 1993-1995

## Honors and Awards

US EPA Scientific and Technological Achievement Award 2014

National Science Foundation IGERT Doctoral Fellowship (1998-2000)

LAS Dean's Advisory Board, University of Southern California (1994-1997)

LAS Dean's List, University of Southern California (1994, 1995)

Phi Sigma National Biological Honor Society, Chapter President (1993-1994)

Dean's List, University of California, Irvine (1993)

President's Honor Roll, Fullerton College (1992)

Golden Key National Honor Society

## Professional Societies and Certifications

American Society for Microbiology

Association for the Sciences of Limnology and Oceanography

The Oceanographic Society International Water Association

## Journal Articles

Gomez-Alvarez, V., N.J. Ashbolt, J.F. Griffith, J.S. Domingo, J. Lu. 2019. Whole-Genome Sequencing of Four Campylobacter Strains Isolated from Gull Excreta Collected from Hobie Beach (Oxnard, CA, USA). *Microbiology Resource Announcements* 8:1-3.

Steele, J.A., A.D. Blackwood, J.F. Griffith, R.T. Noble, K.C. Schiff. 2018. Quantification of pathogens and markers of fecal contamination during storm events along popular surfing beaches in San Diego, California. *Water Research* 136:137-149.

Arnold, B.F., K.C. Schiff, A. Ercumen, J. Benjamin-Chung, J.A. Steele, J.F. Griffith, S.J. Steinberg,

P.D. Smith, C.D. McGee, R. Wilson, C. Nelsen, S.B. Weisberg, J.M. Colford Jr. 2017. Acute Illness Among Surfers After Exposure to Seawater in Dry- and Wet-Weather Conditions. American Journal of Epidemiology 186:866-875.

Cao, Y., M.R. Raith, P.D. Smith, J.F. Griffith, S.B. Weisberg, A. Schriewer, A. Sheldon, C. Crompton, G.G. Amenu, J. Gregory, J. Guzman, K.D. Goodwin, L. Othman, M. Manasjan, S. Choi, S. Rapoport, S. Steele, T. Nguyen, X. Yu. 2017. Regional Assessment of Human Fecal Contamination in Southern California Coastal Drainages. International Journal of Environmental Research and Public Health 14:874.

Zimmer-Faust, A.G., V. Thulsiraj, C. Marambio-Jones, Y. Cao, J.F. Griffith, P.A. Holden, J.A. Jay. 2017. Effect of freshwater sediment characteristics on the persistence of fecal indicator bacteria and genetic markers within a Southern California watershed. Water Research 119:1-11.

Benjamin-Chung, J., B.F. Arnold, T.J. Wade, K.C. Schiff, J.F. Griffith, A.P. Dufour, S.B. Weisberg, J.M. Colford Jr. 2017. Coliphages and gastrointestinal illness in recreational waters: pooled analysis of six coastal beach cohorts. Epidemiology 28:644-652.

Soller, J.A., M. Schoen, J.A. Steele, J.F. Griffith, K.C. Schiff. 2017. Incidence of gastrointestinal illness following wet weather recreational exposures: Harmonization of quantitative microbial risk assessment with an epidemiologic investigation of surfers. Water Research 121:280-289.

Cao, Y., M. Sivaganesan, C.A. Kelty, D. Wang, A. Boehm, J.F. Griffith, S.B. Weisberg, O.C. Shanks. 2017. A human fecal contamination score for ranking recreational sites using the HF183/BacR287 quantitative real-time PCR method. Water Research 128:148-156.

Haugland, R.A., S. Siefring, M. Varma, K.H. Oshima, M. Sivaganesan, Y. Cao, M.R. Raith, J.F. Griffith, S.B. Weisberg, R.T. Noble, A.D. Blackwood, J. Kinzelman, T. Anan'eva, R.N. Bushon, E.A. Stelzer, V.J. Harwood, K.V. Gordon, C. Sinigalliano. 2016. Multi-laboratory survey of qPCR enterococci analysis method performance in U.S. coastal and inland surface waters. Journal of Microbiological Methods 123:114-125.

Maraccini, P.A., M.C.M. Mattioli, L.M. Sassoubre, Y. Cao, J.F. Griffith, J.S. Ervin, L.C. Van De Werfhorst, A.B. Boehm. 2016. Solar Inactivation of Enterococci and Escherichia coli in Natural Waters: Effects of Water Absorbance and Depth. Environmental Science and Technology 50:5068-5076.

Cao, Y., M.R. Raith, J.F. Griffith. 2016. A Duplex Digital PCR Assay for Simultaneous Quantification of the Enterococcus spp. and the Human Fecal-associated HF183 Marker in Waters. Journal of Visualized Experiments 109:e53611.

Arnold, B.F., T.J. Wade, J. Benjamin-Chung, K.C. Schiff, J.F. Griffith, A.P. Dufour, S.B. Weisberg,

J.M. Colford Jr. 2016. Acute Gastroenteritis and Recreational Water: Highest Burden Among Young US Children. *American Journal of Public Health* 9:1690-1697.

Griffith, J.F., S.B. Weisberg, B.F. Arnold, Y. Cao, K.C. Schiff, J.M. Colford Jr. 2016. Epidemiologic evaluation of multiple alternate microbial water quality monitoring indicators at three California beaches. *Water Research* 94:371-381.

Wu, J., Y. Cao, B. Young, Y. Yuen, S. Jiang, D. Melendez, J.F. Griffith, J.R. Stewart. 2016. Decay of Coliphages in Sewage-Contaminated Freshwater: Uncertainty and Seasonal Effects. *Environmental Science and Technology* 50:11593-11601.

Griffith, J.F. 2015. Looking Ahead: New Development in Beach Water Quality Monitoring and Bacterial Source Identification. *Urban Coast* 5:180-184.

Cao, Y., M.R. Raith, J.F. Griffith. 2015. Droplet digital PCR for simultaneous quantification of general and human-associated fecal indicators for water quality assessment. *Water Research* 70:337-349.

Yau, V.M., K.C. Schiff, B.F. Arnold, J.F. Griffith, J.S. Gruber, C.C. Wright, T.J. Wade, S. Burns, J.M. Hayes, C. McGee, M. Gold, Y. Cao, A.B. Boehm, S.B. Weisberg, J.M. Colford Jr. 2014. Effect of submarine groundwater discharge on bacterial indicators and swimmer health at Avalon Beach, CA, USA. *Water Research* 59:23-36.

Riedel, T.E., A.G. Zimmer-Faust, V. Thulsiraj, T. Madi, K.T. Hanley, D.L. Ebentier, M. Byappanahalli, B. Layton, M.R. Raith, A.B. Boehm, J.F. Griffith, P.A. Holden, O.C. Shanks, S.B. Weisberg, J.A. Jay. 2014. Detection limits and cost comparisons of human-and gull-associated conventional and quantitative PCR assays in artificial and environmental waters. *Journal of Environmental Management* 136:112-120.

Sinigalliano, C.D., J. Ervin, L.C. Van De Werfhorst, B.D. Badgley, E. Balleste, J. Bartkowiak, A.B. Boehm, M. Byappanahalli, K.D. Goodwin, M. Gourmelon, J.F. Griffith, P.A. Holden, J.A. Jay, B.A. Layton, C. Lee, J. Lee, W.G. Meijer, R. Noble, M.R. Raith, H. Ryu, M.J. Sadowsky, A. Schriewer, D. Wang, D. Wanless, R.L. Whitman, S. Wuertz, J.W. Santo Domingo. 2013. Multi-laboratory evaluations of the performance of *Catelicoccus marimammalium* PCR assays developed to target gull fecal sources. *Water Research* 47:6883-6896.

Bourlat, S.J., A. Borja, J. Gilbert, M.I. Taylor, N. Davies, S.B. Weisberg, J.F. Griffith, T. Lettieri, D. Field, J. Benzie, F.O. Glockner, N. Rodriguez-Ezpeleta, D.P. Faith, T.P. Bean, M. Obst. 2013. Genomics in marine monitoring: New opportunities for assessing marine health status. *Marine Pollution Bulletin* 74:19-31.

Cao, Y., L.C. Van De Werfhorst, E.A. Scott, M.R. Raith, P.A. Holden, J.F. Griffith. 2013.

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Ferguson, D.M., J.F. Griffith, C.D. McGee, S.B. Weisberg, C. Hagedorn. 2013. Comparison of Enterococcus species diversity in marine water and wastewater using enterolert and EPA method 1600. *Journal of Environmental and Public Health* 2013:11-16.

Raith, M.R., C.A. Kelty, J.F. Griffith, A. Schriewer, S. Wuertz, S. Mieszkin, M. Gourmelon, G.H. Reischer, A.H. Farnleitner, J.S. Ervin, P.A. Holden, D.L. Ebentier, J.A. Jay, D. Wang, A.B. Boehm, T. Gim Aw, J.B. Rose, E. Balleste, W.G. Meijer, M. Sivaganesan, O.C. Shanks. 2013. Comparison of PCR and quantitative real-time PCR methods for the characterization of ruminant and cattle fecal pollution sources. *Water Research* 47:6921-6928.

Cao, Y., L.C. Van De Werfhorst, E.A. Dubinsky, B.D. Badgley, M.J. Sadowsky, G.L. Andersen, J.F. Griffith, P.A. Holden. 2013. Evaluation of molecular community analysis methods for discerning fecal sources and human waste. *Water Research* 47:6862-6872.

Harwood, V.J., A.B. Boehm, L.M. Sassoubre, K. Vijayavel, J.R. Stewart, T.-T. Fong, M.P. Caprais, R.R. Converse, D. Diston, J. Ebdon, J.A. Fuhrman, M. Gourmelon, J. Gentry-Shields, J.F. Griffith, D.R. Kashian, R.T. Noble, H. Taylor, M. Wicki. 2013. Performance of viruses and bacteriophages for fecal source determination in a multi-laboratory, comparative study. *Water Research* 47:6929-6943.

Ebentier, D.L., K.T. Hanley, Y. Cao, B.D. Badgley, A.B. Boehm, J.S. Ervin, K.D. Goodwin, M. Gourmelon, J.F. Griffith, P.A. Holden, C.A. Kelty, S. Lozach, C.M.c.G.e.e. , L.A. Peed, M.R. Raith, H. Ryu, M.J. Sadowsky, E.A. Scott, J.S. Domingo, A. Schriewer, C.D. Sinigalliano, O.C. Shanks, L.C. Van De Werfhorst, D. Wang, S. Wuertz, J.A. Jay. 2013. Evaluation of the repeatability and reproducibility of a suite of qPCR-based microbial source tracking methods. *Water Research* 47:6839-6848.

Layton, B.A., Y. Cao, D.L. Ebentier, K. Hanley, E. Balleste, J. Brandao, M. Byappanahalli, R. Converse, A. Farnleitner, J. Gentry-Shields, M.L. Gidley, M. Gourmelon, C. Soo Lee, J. Lee, S. Lozach, T. Madi, W.G. Meijer, R. Noble, L. Peed, G.H. Reischer, R. Rodrigues, J.B. Rose, A. Schriewer, C. Sinigalliano, S. Srinivasan, J. Stewart, L.C. Van De Werfhorst, D. Wang, R. Whitman, S. Wuertz, J. Jay, P.A. Holden, A.B. Boehm, O. Shanks, J.F. Griffith. 2013. Performance of human fecal anaerobe-associated PCR-based assays in a multi-laboratory method evaluation study. *Water Research* 47:6897-6908.

Schriewer, A., K.D. Goodwin, C.D. Sinigalliano, A.M. Cox, D. Wanless, J. Bartkowiak, D.L. Ebentier, K.T. Hanley, J. Ervin, L.A. Deering, O.C. Shanks, L.A. Peed, W.G. Meijer, J.F. Griffith, J. SantoDomingo, J.A. Jay, P.A. Holden, S. Wuertz. 2013. Performance evaluation of canine-

associated Bacteroidales assays in a multi-laboratory comparison study. *Water Research* 47:6909-6920.

Boehm, A.B., L.C. Van De Werfhorst, J.F. Griffith, P.A. Holden, J.A. Jay, O.C. Shanks, D. Wanga, S.B. Weisberg. 2013. Performance of forty-one microbial source tracking methods: A twenty-seven lab evaluation study. *Water Research* 47:6812-6828.

Stewart, J.R., A.B. Boehm, E.A. Dubinsky, T.-T. Fong, K.D. Goodwin, J.F. Griffith, R.T. Noble, O.C. Shanks, K. Vijayavel, S.B. Weisberg. 2013. Recommendations following a multi-laboratory comparison of microbial source tracking methods. *Water Research* 47:6829-6838.

Raith, M.R., D.L. Ebentier, Y. Cao, J.F. Griffith, S.B. Weisberg. 2013. Factors affecting the relationship between quantitative polymerase chain reaction (qPCR) and culture-based enumeration of Enterococcus in environmental waters. *Journal of Applied Microbiology* 116:737-746.

Cao, Y., C. Hagedorn, O.C. Shanks, D. Wang, J. Ervin, J.F. Griffith, B.A. Layton, C.D. McGee, T.E. Riedel, S.B. Weisberg. 2013. Towards establishing a human fecal contamination index in microbial source tracking. *International Journal of Chemical and Environmental Engineering Systems* 4:46-58.

Cao, Y., M. Sivaganesan, J. Kinzelman, A.D. Blackwood, R.T. Noble, R.A. Haugland, J.F. Griffith, S.B. Weisberg. 2013. Effect of platform, reference material, and quantification model on enumeration of Enterococcus by quantitative PCR methods. *Water Research* 47:233-241.

Arnold, B.F., K.C. Schiff, J.F. Griffith, J.S. Gruber, V. Yau, C.C. Wright, T.J. Wade, S. Burns, J.M. Hayes, C. McGee, M. Gold, Y. Cao, S.B. Weisberg, J.M. Colford Jr. 2013. Swimmer illness associated with marine water exposure and water quality indicators: Impact of widely used assumptions. *Epidemiology* 24:845-853.

Shanks, O.C., M. Sivaganesan, L. Peed, C.A. Kelty, A.D. Blackwood, M.R. Greene, R.T. Noble, R.N. Bushon, E.A. Stelzer, J. Kinzelman, T. Anan'eva, C. Sinigalliano, D. Wanless, J.F. Griffith, Y. Cao, S.B. Weisberg, V.J. Harwood, C. Staley, K.H. Oshima, M. Varma, R.A. Haugland. 2012. Interlaboratory comparison of real-time PCR protocols for quantification of general fecal indicator bacteria. *Environmental Science and Technology* 46:945-953.

Colford Jr, J.M., K.C. Schiff, J.F. Griffith, V. Yau, B.F. Arnold, C.C. Wright, J.S. Gruber, T.J. Wade, S. Burns, J. Hayes, C. McGee, M. Gold, Y. Cao, R.T. Noble, R. Haugland, S.B. Weisberg. 2012. Using rapid indicators for Enterococcus to assess the risk of illness after exposure to urban runoff contaminated marine water. *Water Research* 46:2176-2186.

Ryu, H., J.F. Griffith, I.U.H. Khan, S. Hill, T.A. Edge, C. Toledo-Hernandez, J. Gonzalez-Nieves, J.

Santo Domingo. 2012. Comparison of gull feces-specific assays targeting the 16S rRNA genes of *Catellibacterium marimammalium* and *Streptococcus* spp. *Applied and Environmental Microbiology* 78:1909-1916.

Goodwin, K.D., M. McNay, Y. Cao, D. Ebentier, M. Madison, J.F. Griffith. 2012. A multi-beach study of *Staphylococcus aureus*, MRSA, and enterococci in seawater and beach sand. *Water Research* 46:4195-4207.

McQuaig, S., J.F. Griffith, V.J. Harwood. 2012. Association of fecal indicator bacteria with human viruses and microbial source tracking markers at coastal beaches impacted by nonpoint source pollution. *Applied and Environmental Microbiology* 78:6423-6432.

Converse, R.R., J.F. Griffith, R.T. Noble, R.A. Haugland, K.C. Schiff, S.B. Weisberg. 2012. Correlation between quantitative polymerase chain reaction and culture-based methods for measuring *Enterococcus* over various temporal scales and three California marine beaches. *Applied and Environmental Microbiology* 78:1237-1242.

Cao, Y., J.F. Griffith, S. Dorevitch, S.B. Weisberg. 2012. Effectiveness of qPCR permutations, internal controls and dilution as means for minimizing the impact of inhibition while measuring *Enterococcus* in environmental waters. *Journal of Applied Microbiology* 113:66-75.

Lu, J., H. Ryu, J.W. Santo Domingo, J.F. Griffith, N. Ashbolt. 2011. Molecular detection of *Campylobacter* spp. in California gull (*Larus californicus*) excreta. *Applied and Environmental Microbiology* 77:5034-5039.

Gregory, J.B., L.F. Webster, J.F. Griffith, J.R. Stewart. 2011. Improved detection and quantitation of norovirus from water. *Journal of Virological Methods* 172:38-45.

Griffith, J.F., S.B. Weisberg. 2011. Challenges in implementing new technology for beach water quality monitoring: Lessons from a California demonstration project. *Marine Technology Society Journal* 45:65-73.

Cao, Y., C.D. McGee, J.F. Griffith, S.B. Weisberg. 2011. Method repeatability for measuring *Enterococcus* in southern California beach sands. *Letters in Applied Microbiology* 53:656-659.

Griffith, J.F., K.C. Schiff, G.S. Lyon, J.A. Fuhrman. 2010. Microbiological water quality at non-human influenced reference beaches in southern California during wet weather. *Marine Pollution Bulletin* 60:500-508.

Halliday, E., J.F. Griffith, R.J. Gast. 2010. Use of an exogenous plasmid standard and quantitative PCR to monitor spatial and temporal distribution of *Enterococcus* spp. in beach sands. *Limnology and Oceanography: Methods* 8:146-154.

Lee, C.M., J.F. Griffith, W. Kaiser, J.A. Jay. 2010. Covalently-linked immunomagnetic separation/adenosine triphosphate technique (Cov-IMS/ATP) enables rapid, in-field detection and quantification of Escherichia coli and Enterococcus spp. in freshwater and marine environments. *Journal of Applied Microbiology* 109:324-333.

Hamilton, M.J., A.Z. Hadi, J.F. Griffith, S. Ishii, M.J. Sadowsky. 2010. Large scale analysis of virulence genes in Escherichia coli strains isolated from Avalon Bay, CA. *Water Research* 44:5463-5473.

Johnston, C., J.A. Ufnar, J.F. Griffith, J.A. Gooch, J.R. Stewart. 2010. A real-time qPCR assay for the detection of the nifH gene of Methanobrevibacter smithii, a potential indicator of sewage pollution. *Journal of Applied Microbiology* 109:1946-1956.

Noble, R.T., A.D. Blackwood, J.F. Griffith, C.D. McGee, S.B. Weisberg. 2010. Comparison of rapid quantitative PCR-based and conventional culture-based methods for enumeration of Enterococcus spp. and Escherichia coli in recreational waters. *Applied and Environmental Microbiology* 76:7437-7443.

Boehm, A.B., J.F. Griffith, C.D. McGee, T.A. Edge, H.M. Solo-Gabriele, R. Whitman, Y. Cao, M. Getrich, J.A. Jay, D. Ferguson, K.D. Goodwin, C.M. Lee, M. Madison, S.B. Weisberg. 2009. Fecal indicator bacteria enumeration in beach sand: A comparison study of FIB extraction methods in medium to coarse sands. *Journal of Applied Microbiology* 107:1740-1750.

Converse, R.R., A.D. Blackwood, M. Kirs, J.F. Griffith, R.T. Noble. 2009. Rapid qPCR-based assay for fecal Bacteroides spp. as a tool for assessing fecal contamination in recreational waters. *Water Research* 43:4828-4837.

Mika, K.B., G. Imamura, C. Chang, V. Conway, G. Fernandez, J.F. Griffith, R.A. Kampalath, C.M. Lee, C.-C. Lin, R. Moreno, S. Thompson, R.L. Whitman, J.A. Jay. 2009. Pilot- and bench-scale testing of faecal indicator bacteria survival in marine beach sand near point sources. *Journal of Applied Microbiology* 107:72-84.

Griffith, J.F., Y. Cao, C.D. McGee, S.B. Weisberg. 2009. Evaluation of rapid methods and novel indicators for assessing microbiological beach water quality. *Water Research* 43:4900-4907.

Cao, Y., J.F. Griffith, S.B. Weisberg. 2009. Evaluation of optical brightener photodecay characteristics for detection of human fecal contamination. *Water Research* 43:2273-2279.

Colford Jr, J.M., T.J. Wade, K.C. Schiff, C.C. Wright, J.F. Griffith, S.K. Sandhu, S. Burns, M. Sobsey, G. Lovelace, S.B. Weisberg. 2007. Water quality indicators and the risk of illness at beaches with nonpoint sources of fecal contamination. *Epidemiology* 18:27-35.

Noble, R.T., J.F. Griffith, A.D. Blackwood, J.A. Fuhrman, J.B. Gregory, X. Hernandez, X. Liang, A.A.



Bera, K.C. Schiff. 2006. Multitiered approach using quantitative PCR to track sources of fecal pollution affecting Santa Monica Bay, California. *Applied and Environmental Microbiology* 72:1604-1612.

Griffith, J.F., L.A. Aumand, I.M. Lee, C.D. McGEE, L.L. Othman, K.J. Ritter, K.O. Walker, S.B. Weisberg. 2006. Comparison and verification of bacterial water quality indicator measurement methods using ambient coastal water samples. *Environmental Monitoring and Assessment* 116:335-344.

Griffith, J.F., S.B. Weisberg, C.D. McGee. 2003. Evaluation of microbial source tracking methods using mixed fecal sources in aqueous test samples. *Journal of Water and Health* 1.4:141-151.

Field, K.G., E.C. Chern, L.K. Dick, J. Fuhrman, J.F. Griffith, P.A. Holden, M.G. LaMontagne, M.G. LaMontagne, J. Le, B. Olson, M.T. Simonich. 2003. A comparative study of culture-independent library-independent genotypic methods of fecal source tracking. *Journal of Water and Health* 1.4:181-194.

## Book Chapters

Cao, Y., M.R. Raith, J.F. Griffith. 2018. Testing of General and Human-Associated Fecal Contamination in Waters. in: G. Karlin-Neumann, F. Bizouarn (eds.), *Digital PCR: Methods and Protocols* pp. 127-140. Humana Press. New York, NY.

Cao, Y., J.F. Griffith, S.B. Weisberg. 2016. The Next-Generation PCR-Based Quantification Method for Ambient Waters: Digital PCR. in: S.J. Bourlat (ed.), *Marine Genomics: Methods and Protocols* pp. 113-130. Springer. New York, NY.

Weisberg, S.B., R.T. Noble, J.F. Griffith. 2007. Microbial Indicators of Marine Recreational Water Quality. in: C.J. Hurst, R.L. Crawford, A.L. Mills, J.L. Garland, L.D. Stetzenbach, D.A. Lipson (eds.), *Manual of Environmental Microbiology* pp. 280-289. ASM Press. Washington, D.C..

## Technical Reports

Steele, J.A., D. Ebentier, A.G. Zimmer-Faust, J.F. Griffith, K.C. Schiff. 2019. Los Coches Creek Microbial Source Tracking Study. Technical Report 1087. Southern California Coastal Water Research Project. Costa Mesa, CA.

Schiff, K.C., J.F. Griffith, J.A. Steele, A.G. Zimmer-Faust, J.A. Soller. 2019. Inner Cabrillo Beach Microbial Source Tracking and Quantitative Microbial Risk Assessment (QMRA). Technical Report 1068. Southern California Coastal Water Research Project. Costa Mesa, CA.

Cao, Y., G.L. Andersen, A.A. Boehm, P. Holden, J.A. Jay, J.F. Griffith. 2017. Determination of DNA-based Fecal Marker Aging Characteristics for Use in Quantitative Microbial Source Tracking. Technical Report 978. Southern California Coastal Water Research Project. Costa Mesa, CA.

Cao, Y., M.R. Raith, P.D. Smith, J.F. Griffith, S.B. Weisberg, A. Schriewer, A. Sheldon, C. Crompton, G.G. Amenu, J. Gregory, J. Guzman, K.D. Goodwin, L. Othman, M. Manasjan, S. Choi, S. Rapaport, S. Steele, T. Nguyen, X. Yu. 2017. Southern California Bight 2013 Regional Monitoring Program: Volume IX. Shoreline Microbiology. Technical Report 1005. Southern California Coastal Water Research Project. Costa Mesa, CA.

Steele, J.A., J.F. Griffith, R. Noble, K.C. Schiff. 2017. Tracking Human Fecal Sources in an Urban Watershed During Wet Weather. Technical Report 1002. Southern California Coastal Water Research Project. Costa Mesa, CA.

Schiff, K.C., J.F. Griffith, J.A. Steele, B. Arnold, A. Ercumen, J. Benjamin-Chung, J.M. Colford Jr, J. Soller, R. Wilson, C. McGee. 2016. The Surfer Health Study: A Three-Year Study Examining Illness Rates Associated with Surfing During Wet Weather. Technical Report 943. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Tiefenthaler, L.L., M. Sutula, J.F. Griffith, M.R. Raith. 2016. Microbiological Water Quality at Reference Beaches and an Adjoining Estuary in Southern California during a Prolonged Drought. Technical Report 936. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Layton, B.A., M.R. Raith, J.F. Griffith. 2015. Use of dye tracers and qPCR to identify human fecal contamination at Doheny State Beach, Dana Point, CA. Technical Report 860. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Tiefenthaler, L.L., M. Sutula, Y. Cao, J.F. Griffith, M.R. Raith, C. Beck, R. Christoph, J. Shrake. 2015. Wet and Dry Weather Natural Background Concentrations of Fecal Indicator Bacteria in San Diego, Orange, and Ventura County, California Streams. Technical Report 862. Southern California Coastal Water Research Project. Costa Mesa, CA.

Tiefenthaler, L.L., M. Sutula, Y. Cao, J.F. Griffith, M.R. Raith, C. Beck, R. Christoph, J. Shrake. 2015. Wet and Dry Weather Natural Background Concentrations of Fecal Indicator Bacteria in San Diego, Orange, and Ventura County, California Streams (Appendix A). Technical Report 862.A. Southern California Coastal Water Research Project. Costa Mesa, CA.

Tiefenthaler, L.L., M. Sutula, Y. Cao, J.F. Griffith, M.R. Raith, C. Beck, R. Christoph, J. Shrake. 2015. Wet and Dry Weather Natural Background Concentrations of Fecal Indicator Bacteria in San Diego, Orange, and Ventura County, California Streams (Appendix B). Technical Report 862.B. Southern California Coastal Water Research Project. Costa Mesa, CA.

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