

## **LIFETIME PUBLICATIONS:**

### **(i) Peer-Reviewed:**

### **(c) *Published Journal Articles:***

(Note HQP are underlined and italicized)

67. *Eschelmann, E.*, Daly M.G., **Slater, G.F.**, Cloutis, E. Time-resolved detection of aromatic compounds on planetary surfaces by ultraviolet laser induced fluorescence and Raman spectroscopy (2015) *Planetary and Space Sciences* 119 pp 200-207  
[doi:10.1016/j.pss.2015.09.021](https://doi.org/10.1016/j.pss.2015.09.021)
66. Warren, L.A., Kendra, K., *Brady A.L.*, **Slater G.F.** Oil Sands Composite Tailings a Sulphur and Organic Carbon rich, Microbially Extreme Environment **December 2015** *Frontiers in Microbiology* doi: 10.3389/fmicb.2015.01533
65. Harwood Theisen, C., Sumner D.Y., Mackey, T.J., Lim, D.S.S., *Brady A.L.*, **Slater G.F.** Carbonate fabrics in the modern microbialites of Pavilion Lake: two suites of microfibrils that reflect variation in microbial community morphology, growth habit and lithification (2015) *Geobiology* March 2015 DOI 10.1111/gbi.12134
64. Petryshyn, V.A., Lim, D., Laval, B.L., *Brady, A.L.*, **Slater, G.F.**, Tripathi, A.K. Reconstruction of limnology and microbialite formation conditions from carbonate clumped isotope paleothermometry *Geobiology* 2015 13(1) DOI 10.1111/gbi.12121
63. *Bowman, D.T.*, **Slater, G.F.**, Warren, L., McCarry, B.E., Identification of Individual Thiophene-, Indane-, Tetralin-, Cyclohexane-, and Adamantane-type Carboxylic Acids in Composite Tailings Pore Water from Alberta Oil Sands. *Rapid Communications in Mass Spectrometry* (2014) vol 28 iss 19 pp 2075-2083
62. Joseph A. Russell, Zena Cardman, *Allyson Brady*, **Gregory F. Slater**, Darlene Lim, Jennifer F. Biddle Prokaryote populations of extant microbialites along a depth gradient in Pavilion Lake, British Columbia, Canada *Geobiology* (2014) vol 12 P 250-264 doi 10.1111/gbi. 12082
61. Hilts, R., Herd C.D.K., *Simkus, D.*, **Slater, G.F.**, Soluble Organic Compounds in the Tagish Lake Meteorite *Meteoritics and Planetary Sciences* (2014) pp 1-24 doi 10.1111/maps.12272
60. M. Skulinova, C. Lefebvre, P. Sobron, *E. Eschelmann*, M. Daly, J.-F. Gravel, J.F. Cormier, F. Châteauneuf, **G. Slater**, W. Zheng, A. Koujelev, R. Léveillé Time-resolved stand-off UV-Raman spectroscopy for planetary exploration *Planetary and Space Science* (2014) pp 88-100 doi 10.1016/j.pss.2014.01.010
59. *E. Eschelmann*, M.G.Daly, **G. Slater**, P. Dietrich, J-F Gravel, Ultraviolet Raman Wavelength for the In-Situ Analysis of Organic Compounds Relevant to Astrobiology *Planetary and Space Sciences* 93-94 (2014) 65-70 doi 0.1016/j.pss.2014.01.021
58. *Penny Morrill, Natalie Szponar, Matthew Johnston*, Chris Marvin, **Gregory F Slater**, Deciphering Microbial Carbon Substrates in PAH Contaminated Sediments using Phospholipid Fatty Acids, and Compound Specific  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  (2014) *Organic Geochemistry* 69 pp 76-87 doi 10.1016/j.orggeochem.2014.01.017

57. Brady A.L., Laval, B., Lim D.S.S., **Slater G.F.** Identifying seasonal and spatial variation in autotrophic and heterotrophic communities and associated biosignatures in modern, freshwater microbialites (2014) *Organic Geochemistry* **67** pg 8 – 18 [dx.doi.org/10.1016/j.orggeochem.2013.11.013](http://dx.doi.org/10.1016/j.orggeochem.2013.11.013)
56. L.A. Ziolkowski, N. Mykytczuk, C.R. Omelon, H. Johnson, L.G. Whyte, **G. Slater** Arctic Gypsum Endoliths: A biogeochemical characterization of a viable and active microbial community *Biogeosciences* (2013) 10 7661-7675 doi 10.5194/bg-10-7661-2013
55. Mahmoudi, N., Porter, T., Zimmerman, A., Fulthorpe, R., Kasozi, G., Silliman, B., **Slater, G.F.**, Rapid degradation of Deepwater Horizon spilled oil by indigenous microbial communities in Louisiana salt marsh sediments (**2013**) *Environmental Science and Technology* **47**, 13303–13312 [dx.doi.org/10.1021/es4036072](http://dx.doi.org/10.1021/es4036072) |
54. Mills, C., **Slater, G.F.**, Dias, R., Carr, S., Reddy, C.M., Schmidt, R., Mandernack, K. Microbial community structure and carbon cycling in soil overlying a coal-deb methane seep. *FEMS microbiology ecology* (2013) **84**, 474-494
53. Lori A Ziolkowski,<sup>1</sup> Jacek Wiezercos<sup>2</sup>, Alfonso Davila<sup>3</sup> and **Gregory F. Slater**, Natural abundance radiocarbon evidence of active endolithic microbial communities in the Atacama Desert *Astrobiology* (2013) Volume 13, Number 7, pages 607-616
52. Christopher Omelon Allyson Brady, **Greg Slater**; Bernard Laval; Darlene Lim; Gordon Southam .Microstructure variability in freshwater microbialites, Pavilion Lake, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology* **392** (2013) 62–70
51. Brady, A.L., Druschel, G., Lim D.S.S., **Slater, G.F.**, Carbon cycling in carbonate rich, cyanobacteria dominated microbial mats of the Cariboo plateau, B.C. *Geobiology* (2013), **11**, 437–456 DOI: 10.1111/gbi.12050
50. **Slater G.F.**, Benson, A.A. Marvin, C., Muir, D., Siskiwit Revisited: Recent trends in PAH sources to Isle Royal resolved using <sup>14</sup>C analysis *Environmental Science and Technology* **2013**, **47** 5066-5073 DOI <http://dx.doi.org/10.1021/es400272z>
49. G. Holland, B. Sherwood Lollar, L. Li, G. Lacrampe-Couloume, **G.F. Slater**, C.J. Ballentine Free fluid habitats can be isolated in deep crustal fractures since the Precambrian *Nature* **497** p 357-360 May 16, 2013 doi: 10.1038/nature12127
48. Mahmoudi, N., **Slater G.F.**, Juhasz, A.L., Assessing limitations for PAH biodegradation in long-term contaminated soils using bioaccessibility assays *Water, Air Soil Pollution* (**2013**), **224**(2): 1411.
47. Nagissa Mahmoudi, Roberta R. Fulthorpe, Leanne Burns, Silvia Mancini, and **Greg F. Slater** Assessing microbial carbon sources and potential PAH degradation using natural abundance radiocarbon analysis *Environmental Pollution* **2013** vol 175 p 125-130
46. Melissa M. Battler<sup>a,\*</sup>, Gordon R. Osinski<sup>a,b</sup>, Darlene S. S. Lim<sup>c,d</sup>, Alfonso F. Davila<sup>c,d</sup>, Frederick A. Michel<sup>e</sup>, Michael A. Craig<sup>a</sup>, Matthew R. M. Izawa<sup>a</sup>, Lisa Leoní, **Gregory F. Slater**<sup>f</sup>, Alberto G. Fairén<sup>c,d</sup>, Neil R. Banerjee<sup>a</sup>, and Louisa J. Preston<sup>a</sup>, Characterization of the acidic cold seep emplaced jarositic Golden Deposit, NWT, Canada, as an analogue for jarosite deposition on Mars Icarus, <http://dx.doi.org/10.1016/j.icarus.2012.05.015>: Available online 22 May 2012, ISSN 0019-1035

45. Mailloux, B. J., Dochenet, A., Bishop, M. E., Dong, H., Ziolkowski, L.A., Wommack, K. E., Sakowski, E. G., Onstott, T. C., and **Slater, G. F.**, A Carbon Free Filter for Collection of Large Volume Samples of Cellular Biomass from Oligotrophic Waters. (2012) *Journal of Microbiological Methods* Vol 90, Issue 3 pp 141-151
44. Lim, D. S. S., Abercromby, A.F., Andersen, D., Andersen, M., Arnold, R.R., Bird, J.S., Bohm, H.R., Brady, A.L., Cady, S.L., Cardman, Z., Chan, A.M., Chan, O., Chénard, C., Cowie, B.R., Davila, A., Deans, M.C., Dearing, W., Downs, M., Fong, T., Forrest, A., Gernhardt, M.L., Hawes, I., Hansen, J., Imam, Y., Laval, B.L., Lees, D., Leoni, L., Looper, C., Marinova, M.M., McCombs, D., McKay, C.P., Mullins, G. Nuytten, P., Pendery R., Pike, W., Pointing, S.B., Pollack, J., Raineault, N., Reay, M., Reid, D., Sallstedt, T., Schulze-Makuch, D., Seibert, M., Shepard, R., **Slater, G.F.**, Sumner, D.Y., Suttle, C.A., Trembanis, A., Turse, C., Wilhelm, M., Wilkinson, N., Williams, D., Winget, D.M., Winter, C. A historical overview of The Pavilion Lake Research Project – Analog science and exploration in an underwater environment. 2011 *Geological Survey of America Special Paper 483: Analogs for Planetary Exploration* p 85- 116
43. Mahmoudi, N., Slater, G.F., Fulthorpe, R. Comparison of commercial DNA extraction kits for isolation and purification of bacterial and eukaryotic DNA from PAH-contaminated soils *Canadian Journal of Microbiology* 2011 v 57 p 623-628
42. Ahad J. M. E., Ganeshram R. S., Bryant C. L., Cisneros-Dozal L. M., Ascough P. L., Fallick A. E., and Slater G. F. Sources of *n*-alkanes in urbanized estuary: Insights from molecular distributions and compound-specific stable and radiocarbon isotopes *Marine Chemistry* 2011 vol 126 pp 239-249
41. Herd, C. D. K. Blinova, A, Simkus, D.N., Huang, Y., Tarozo, R., Alexander, C. M. O'D., Gyngard, F., Nittler, L.R., Cody, G.D, Fogel, M.L., Kebukawa, Y., Kilcoyne, A. L. D., Hiltz R.W., **Slater G.F.**, Glavin D.P., Dworkin J.P, Callahan, M.P., Elsila J.E., DeGregorio, B.T., Stroud, R.M. Origin and Evolution of Prebiotic Organic Matter as Inferred from the Tagish Lake Meteorite, *Science* 332, 1304 (2011) DOI: 10.1126/science.1203290
40. Gregg, M., **Slater, G.F.** A new method for extraction, isolation and transesterification of free fatty acids from archeological pottery 2010 *Archeometry* 52 pp 833-854
39. Ahad, J.M.E., Burn, L., Mancini, S., **Slater, G.F.** Assessing microbial uptake of petroleum hydrocarbons in groundwater systems using natural abundance radiocarbon 2010 *Environmental Science and Technology* 44, pp 5092-5097
38. Brady A., **G. F. Slater**, C. Omelon, G. Southam, G. Druschel, D. Andersen, I. Hawes, B. Laval and D.S.S. Lim Photosynthetic isotope biosignatures in laminated micro-stromatolitic and non-laminated nodules associated with modern, freshwater microbialites in Pavilion Lake, B.C. 2010 *Chemical Geology* 274 (2010) 56–67
37. Christopher T. Mills, Yuki Amano, **Gregory F. Slater**, Robert F. Dias, Teruki Iwatsuki, Kevin W. Mandernack Microbial carbon cycling in oligotrophic regional aquifers near the Tono Uranium Mine, Japan as inferred from  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  values of in situ phospholipid fatty acids and carbon sources 2010 *Geochimica Cosmochimica Acta* 74 p 3785-3805
36. Lim, D. S. S., Warman, GL, Gernhardt, ML, McKay, CP, Fong, T, Marinova, MM, Davila, A, Andersen, D, Brady, AL, Cardman, Z, Cowie, B, Delaney, MD, Fairen, A, Forrest, AL, Heaton, J, Laval, BL, Nuytten, P, Osinski, G, Reay, M, Reid, D, Schulze-Makuch, D, Shepard, R, **Slater, GF**, Williams, D. The Scientific Training of Moon and Mars Bound Astronauts. 2010 *Planetary and Space Science* 58 pp 920-930

35. Cowie, B.R., Greenberg, B., **Slater G.F.** Determination of microbial carbon sources and cycling during remediation of petroleum hydrocarbon impacted soil using natural abundance  $^{14}\text{C}$  analysis of PLFA *Environmental Science and Technology* **2010** vol 44 pp 2322-2327
34. A.L. Forrest, B.E. Laval, D.S.S. Lim, D. Williams, A. Trembanis, M.M. Marinova, R. Shepard, A.L. Brady, **Slater, G.F.**, Gernhardt, M.L. and C.P. McKay Underwater vehicles as analogues for space exploration **2010** *Planetary and Space Science* 58 706-716.
33. Brady A., **Slater, G.F.**, Lim, D., Laval, B. Carbon sources and cycling associated with the formation of microbialites in Pavilion Lake B.C. **2009** *Geobiology* vol 7, pp 544–555
32. **Slater, G.F.** Invited Paper Biosignatures: Interpreting Evidence of the Origins and Diversity of Life **2009** *GeoScience Canada Vol 36, no 4*
- 31 Cowie, B., **Slater, G.F.**, Bernier, L., Warren, L. Carbon Isotope Fractionation in Lipid Biomarkers of Bacteria Native to an Acid Mine Drainage Lake *Organic Geochemistry* **2009** vol 40 pp 956-962
30. Darlene S. S. Lim, B. E. Laval, **G. Slater**, D. Antoniadis, A. Forrest, W. Pike, R. Pieters, M. Saffari, D. Reid, D. Andersen and C.P. McKay Limnology of Pavilion Lake B.C. - Characterization of a microbialite forming environment *Fundamental and Applied Limnology* **2009** vol 173/4 pp329-351
29. Sherwood Lollar, B., Lacrampe-Coulome, G., Voglesoner, K., Onstott, T.C., Pratt, L. **Slater, G.F.** Isotopic Signatures of CH<sub>4</sub> and Higher Hydrocarbon Gases from Precambrian Shield Sites: A Model for Abiogenic Polymerization of Hydrocarbons *Geochemica Cosmochemica Acta* **2008** (72) 4778-4795
28. Gregg, M.W., E.B. Banning , K. Gibbs , **G.F. Slater**, Subsistence practices and pottery use in Neolithic Jordan: molecular and isotopic evidence **2008** *Journal of Archeological Sciences* 36 pages 937-946
27. Ahad, J.M.E., **Slater, G.F.**, Differentiating biotic from abiotic (Fenton's reaction) degradation of toluene: A test of compound-specific stable carbon isotopes *Science of the Total Environment* **2008** 401 pp 194-198 doi 10.1016/j.scitotenv.2008.02.048
26. **Slater, G.F.**, Cowie, B., Harper, N., Droppo, I.G. Variation in PAH inputs and microbial community in surface sediments of Hamilton Harbour: Implications to Remediation and Monitoring *Environmental Pollution* **2008** 153 pp 60-70: online doi10.1016/j.envpol.2007.08.009
25. Onstott, T.C., Lin, L-H, Davidson, M., Mislowack, B., Borcisk, M., Hall, J., **Slater, G.F.**, Ward, J., Sherwood Lollar, B. Lippmann-Pipke, J., Boice, E., Pratt, L.M., Pfiffner, S., Moser, D., Gihring, T., Kieft, T.L., Phelps, T.J., Vanheerden, E., Litthaur, D., Deflaun, M., Rothmel, R., Wanger, G., Southam, G., *The origin and age of biogeochemical trends in deep fracture water of the Witwatersrand Basin, South Africa*, **2006** *Geomicrobiology Journal* 23 pp 369-414
24. **Slater, G.F.**, J. Lippman, C. M. Reddy, G. Lacrampe-Couloume, T.C. Onstott, B. Sherwood Lollar  $^{14}\text{C}$  in Methane and DIC in the Deep Terrestrial Subsurface: Implications for the Timing of Microbial Methanogenesis: **2006** *Geomicrobiology Journal* 23 pp 453-462
23. Morrill, P. L.; Sleep, B.; **Slater, G. F.**; Edwards, E. A.; Sherwood Lollar, B. Evaluation of Isotopic Enrichment Factors for the Biodegradation of Chlorinated Ethenes Using a Parameter Estimation Model: Towards an Improved Quantification of Biodegradation. **2006** *Environmental Science & Technology* **40** pp 3886-3892

22. **Slater, G.F.**, Nelson, R.K., Kile, B., C.M. Reddy Intrinsic bacterial biodegradation of petroleum contamination demonstrated in situ using natural abundance, molecular-level <sup>14</sup>C analysis **2006** *Organic Geochemistry* **37**, pg 981-989
21. Lorraine B. Eglinton, Darlene Lim, **Greg Slater**, Gordon R. Osinski, Jean K. Whelan and Marianne Douglas *Organic Geochemical Characterization of a Miocene Core Sample from Haughton impact structure, Devon Island, Nunavut, Canadian High Arctic 2006* *Organic Geochemistry* **37** pp 688-710
20. B. Sherwood Lollar, G. Lacrampe-Couloume, **G.F. Slater**, J. Ward, D.P. Moser, L.-H. Lin, and T.C. Onstott, Unravelling abiogenic and biogenic sources of methane in the Earth's deep subsurface **2006** *Chemical Geology*, **226**, 328-339
19. **Slater, G.F.**, White H.K., Eglinton T.I., Reddy C.M *Determination of Microbial Carbon sources In Petroleum Contaminated Sediments Using Molecular <sup>14</sup>C analysis* **2005** *Environmental Science and Technology* **39**, 2552-2558
18. P. L. Morrill, G. Lacrampe-Couloume, **G. F. Slater**, B. E. Sleep, E. A. Edwards, M. L. McMaster, D. W. Major, and B. Sherwood Lollar, **2005** *Quantifying chlorinated ethene mass degraded during reductive dechlorination using stable carbon isotopes at Kelly AFB: Comparison to concentration-derived estimates* *Journal of Contaminant Hydrogeology* **76** 279-293
17. Li-Hung Lin, **Greg F. Slater**, Barbara Sherwood Lollar, Georges Lacrampe-Couloume and Tullis C. Onstott **2005** *The yield and isotopic composition of radiolytic H<sub>2</sub>, a potential energy source for the deep subsurface biosphere* *Geochemica Cosmochemica acta* **69** pp 893-903
- 16 Ward J.A., **Slater G.F.**, Lacrampe-Couloume G., Lin L-H, Bonin A., Bellamy R.E.S., Onstott T.C., Sherwood Lollar B. **2004** *Microbial and Hydrocarbon Gases in the Witwatersrand Basin, South Africa: Implications for Deep Biosphere.* *Geochemica Cosmochemica acta* **68** (15) 3239-3250
15. **Slater, G.F.** *Environmental Forensics* **2003**, **4**, 13-23, Invited Article: Stable Isotope Forensics – When Isotopes Work (3<sup>rd</sup> most downloaded article in *Environmental Forensics* for the period 2000-2005)
14. **Slater, G.F.**, Sherwood Lollar, B., Lesage, S., Brown, S. *Ground Water Monitoring and Remediation*, **2003**, **23** (4) P 59-67 *Stable carbon isotopic fractionation during reductive dechlorination of PCE and TCE by Vitamin B-12*
13. D. P, Moser, T. C. Onstott, F. J. Brockman, J. K. Fredrickson, D. Balkwill, G.R. Drake, S.M. Pfiffner, D.C. White, K. Takai, L. M. Pratt, J. Fong, B. Sherwood Lollar, **G.F. Slater**, T. J. Phelps, Nico Spoelstra, M. DeFlaun, G. Southam, A.T. Welty, B. J. Baker, J. Hoek *Geomicrobiology Journal*, **2003**, **20**, 517-548 *Temporal Shifts in the Geochemistry and Microbial Community Structure of an Ultradeep Mine Borehole Following Isolation*
12. Schüth, C.; Bill, M.; Barth, J.A.C.; **Slater, G.F.**; Kalin, R.M.: *Carbon Isotope Fractionation during Reductive Dechlorination of TCE in Batch-Experiments with Iron Samples from Reactive Barriers.* **2003** *J. Contam. Hydrol.*, **66**, (1-2), 25-37.
11. **Slater, G.F.**, Sherwood Lollar B., R. Allen King, S. O'Hannesin, *Isotopic Fractionation during reductive dechlorination of TCE by zero valent iron: Influence of surface treatment.* *Chemosphere* **2002**, **49**, 587-596
10. Sherwood Lollar, B., Westgate, T., Ward, J., **Slater, G.F.**, and Lacrampe-Couloume, G. *Abiogenic Formation of alkanes in the Earth's Crust as a Minor Source for Global Hydrocarbon Reservoirs.* *Nature*, **2002**, **416**, 522-524,

9. Barth, J.A.C., **Slater, G.F.**, Schuth, C., Markus, B., Downey, A., Kalin, R.M. Carbon Isotope Fractionation during Aerobic Biodegradation of Trichloroethene by *Burkholderia Cepacia* G4: a Tool to Map Degradation Mechanisms. *Applied and Environmental Microbiology*, **2002**, 68, 1728-1734
8. **Slater, G.F.**, Sherwood Lollar, B., Sleep, B.E., Edwards, E.A., Variability in Carbon Isotopic Fractionation During Biodegradation of Chlorinated Ethenes: Implications for Field Applications. *Environmental Science and Technology*, **2001**, **35**, 901-907
7. Sherwood Lollar, B., **Slater, G.F.**, Sleep, B.S., Witt, M., Klecka, G.M., Harkness, M. Spivack, J., Stable Carbon Isotope Evidence for Intrinsic Bioremediation of Tetrachloroethene (PCE) and Trichloroethene (TCE) at Area 6, Dover Air Force Base *Environmental Science and Technology*, **2001**, 35, pp 261-269
6. **Slater, G.F.**, Ahad, J.M.E., Sherwood Lollar, B., Allen-King, R., Sleep B., Carbon Isotopic Effects Resulting from Equilibrium Sorption of Dissolved VOCs *Analytical Chemistry*, **2000**, **72**, pp 5669-5672
5. Ward, J., Ahad, J.M.E., Lacrampe-Coloume, G., **Slater, G.F.**, Edwards, E., Sherwood Lollar, B., Hydrogen Isotopic Fractionation During Methanogenic Degradation of Toluene: Potential for direct verification of Bioremediation. *Environmental Science and Technology*, **2000**; **34**(21); 4577-4581,
4. Lee, R., Jones, S.A., Kuniandy, E.L., Harvey, G.J., Eberts, S.M., **Slater, G.**, and Sherwood Lollar B., Phreatophyte influence on reductive dechlorination in a shallow aquifer containing TCE *International Journal of Phytoremediation*, **2000**, 2, pp193-212
3. Ahad, J.M.E., Sherwood Lollar, B., Edwards, E.A., **Slater, G.F.**, Sleep, B.E., Carbon Isotope Fractionation During Anaerobic Biodegradation of Toluene: Implications for Intrinsic Bioremediation *Environmental Science and Technology*, **2000**, **34**, 892-896
2. Sherwood Lollar, B., **Slater, G.F.**, Ahad, J., Sleep, B., Spivack, J., Brennan, M., MacKenzie, P. Contrasting carbon isotope fractionation during biodegradation of trichloroethylene and toluene: Implications for intrinsic bioremediation *Organic Geochemistry*, **1999**, **30**, 813-820
1. **Slater, G.F.**, Dempster, H.D., Sherwood Lollar, B., Ahad, J. Headspace Analysis: A New Application for Isotopic Characterization of Dissolved Organic Contaminants. **1999**, *Environmental Science and Technology* **33**,190-194,