

Noah Planavsky
Assistant Professor
Department of Geology and Geophysics, Yale University

Education: Lawrence University 2002 –2006 (Bachelor of Arts, *Summa cum laude*).
University of California Riverside, 2007-2012, PhD, Advisor, Tim Lyons
Postdoctoral Fellow, California Institute of Technology, 2012-2013 Advisor, Woodward Fischer

Research Positions: Visiting researcher; Institut de Physique du Globe de Paris, Summer-Winter 2009, Advisor—Vincent Busigny; Guest investigator, Woods Hole Oceanographic Institute, Summer, Winter 2006, Advisor—Olivier Rouxel; Research Associate Rosenstiel School of Marine and Atmospheric Sciences, Fall 2006, Spring-Summer 2007, Advisor—Robert Ginsburg.

Selected Honors, Awards, and Fellowships: Packard Fellowship, 2016, Sloan Research Fellow, 2016, Institut de Physique du Globe de Paris ‘Campagne des Invités’ Fellowship, 2014; NSF Postdoctoral Fellowship, 2012; Marie Curie Postdoctoral Fellowship, 2012, University of California Dissertation Year Fellowship, 2011; Geological Society of America Research Award, 2011; Society for Sedimentary Geology Research Award, 2010 and 2011; NASA Astrobiology Research Scholarship, 2009; Geological Society of America Research Grant, 2009; American Philosophical Society Lewis and Clark Exploration Award, 2008; National Science Foundation Graduate Research Fellowship, 2007; University of California Chancellor’s Fellowship, 2007; Institute on Lake Superior Geology Student Research Grant, 2007; Woods Hole Oceanographic Institute Summer Student Fellowship, 2006; Best student paper award, Institute on Lake Superior Geology, 2006; Lawrence University Excellence in Science award, 2006; Ocean Research and Education Summer Fellowship, 2005.

Major External Grant Support: NSF Earth Life Transition Program grant (Co-I, 2014); Connecticut Space Grant (PI, 2014); NASA “Alternative Earth’s” Astrobiology Institute (Institutional PI, 2015). NIH (Co-I, 2015); NASA Exobiology Program grant (PI, 2016).

Professional Affiliations: American Geophysical Union, Geochemical Society, Geological Society of America, *Phi Beta Kappa*

Professional Activities and Outreach:

Associate Editor at *Geobiology* (2013-) and *American Journal of Science* (2016-). Reviewer for: *American Journal of Science*; *Chemical Geology*; *Earth and Planetary Science Letters*; *Earth and Space Science*; *Earth Science Reviews*; *Geobiology*; *Geochimica et Cosmochimica Acta*; *Geology*; *Gondwana Research*; *Geological Journal*; *Geological Society of London Special Publications*; *Nature*; *Nature Communications*; *Nature Geoscience*; *Nature Communications*; *Palaios*; *Precambrian Research*; *Science*, *Science Advances*, *Scientific Repots*, *Sedimentology*, *Sedimentary Research*. Session organizer for: AbiSciCon2011, 2015; EGU, 2014; GSA 2014, AGU 2014, GAC-MAC 2015, Goldschmidt 2013-2016. Mentor for the 2012-2013 GEOP high school science research opportunities program (student’s project received honorable at the California State Science fair). Science Advisory Board for Bahamas Marine EcoCentre (2016-). Contributor to the BBC series “The Human Universe” (2014). Contributor to the PBS series NOVA (2016).

Courses Taught (Yale): G&G 232: Paleoenvironments; G&G 232: Earth Surface Processes; G&G 402 / G&G 602: Paleoclimates; G&G 614: Biogeochemical Cycles Through Time; G&G 625: Topics in Geobiology; G&G 630: Geoscience Writing; G&G 680: Alternate Earths; G&G 775: Lithospheric & Surface Process; G&G 840: Tutorial in Sedimentology

Scientific Publications:

89. Zhang, S, **Planavsky, NJ**, in review, The Silicate Weathering Feedback from 52 to 42 Ma. *American Journal of Science*.

88. Terry-Tang, YS, Love, GD, Zumberge, A, Reinhard, CT, Dupont, CL, Asael, D, Rooney, AD, Gill, BC, Rainbird, RH, McCrow, JP, Lyons, TW, **Planavsky, NJ**, in review, Tracking the Rise of Eukaryotes to Ecological Dominance with Zinc Isotopes. *Science Advances*.

87. Konhauser, KO, **Planavsky, NJ**, Hardisty, D, Robbins, L, Warchola, T, Haugaard, R, Lalonde, S, Partin, C, Paul Oonk, P, Tsikos, H, Lyons, TW, Bekker, A, Johnson, C. in review, Iron Formations: A Record of Neoproterozoic to Paleoproterozoic Environmental History. *Earth Science Reviews*.
86. Bellefroid, EJ, **Planavsky, NJ**, Hood, AvS. Halverson, GP, Spokas, K, in review, Shallow water redox conditions of the Mid-Proterozoic Muskwa Assemblage, British Columbia, Canada. *Precambrian Research*.
85. Cole, DB, Wang, X, Qin, L, Reinhard, CT, Planavsky, NJ, in review, Chromium Isotopes. in *Encyclopedia of Geochemistry*, ed. White, W.
84. Wang, X, **Planavsky, NJ**, Hofmann, A, De Corte, BP, Saupe, EE, Philippot, P, LaLonde, SV, Jemison, N, Zou, H, Ossa Ossa, F, Rybacki, K, Larson, MJ, Tsikos, H, Fralick, PW, Reinhard, CT, Johnson, TM, Knudsen, AC, Konhauser, KO, in review, Uranium Isotope Evidence for Oxygenic Photosynthesis Three Billion Years Ago. *Nature Geoscience*.
83. Liu, K, Feng, Q, Shen, J, **Planavsky, NJ**, Khan, MZ, in review. Oceanic environmental evolution of early Cambrian in Hubei area (China) and its influence on metazoan diversification. *Palaeogeography, Palaeoclimatology, Palaeoecology*.
82. Stueken, E.E, Bellefroid, EJ, Prave, A., Aseal, D., **Planavsky, NJ**, Lyons, T.W. Not so non-marine? Revisiting the Torridonian Supergroup. *Geochemical Perspectives Letters*.
81. Cole, D.B., Zhang, S., **Planavsky, NJ**, accepted, A new estimate of detrital redox-sensitive metal concentrations and variability in marine sediments. *Geochimica et Cosmochimica Acta*.
80. Tarhan, LG, **Planavsky, NJ**, Wang, X, Bellefroid, EJ, Droser, ML, Gehling, JG, in review, Late-stage 'ferruginization' of the Ediacara Member (Rawnsley Quartzite, South Australia): Insights from uranium isotopes: *Geobiology*.
79. Bauer, KW, Cole, DB, Francois, R, Poulton, SW, **Planavsky, NJ**, Crowe, SA, in review, Oxidative diagenesis fractionates chromium isotopes in hydrothermal sediments. *Geochimica et Cosmochimica Acta*.
78. Wallace, MW, Hood, AV, Shuster, A, Greig, AJ, Planavsky, NJ, 2017, Oxygenation history of the Neoproterozoic to early Phanerozoic and the rise of land plants, *Earth and Planetary Science Letters* 466, 12-19.
77. Stüeken, EE, Buick, R, **Planavsky, NJ**, Lyons, TW, in review, Environmental niches and biodiversity in Neoproterozoic lakes. *Geobiology*.
76. Busigny, V, Jézéquel, D, Cosmidis, J, Viollier, E, Benzerara, K, **Planavsky, NJ**, Albéric, P, Lebeau, O, Sarazin, G, Michard, G, 2016, The Iron Wheel in Lac Pavin: Interaction with Phosphorus Cycle, in *Lake Pavin*. eds. Sime-Ngando, T., et al., Springer, pp. 205-220.
75. Li, C, Jin, C, Algeo, TJ, **Planavsky, NJ**, Cheng, M, Yang, X, Zhao, Y, Xie, S. in press, Coupled oceanic oxygenation and metazoan diversification during the early-middle Cambrian? *Geology*.
74. **Planavsky, NJ**, Busigny, V. in press, Iron isotopes, in *Encyclopedia of Geochemistry*, ed. White, W.
73. Hanberg, JS, Rao, V, ter Maaten, JM, Laur, O, Brisco, MA, Wilson, FP, Grodin, JL, Assefa, M, Broughton, JS, **Planavsky, NJ**, Ahmad, T, Bellumkonda, L, Tang, WHW, Parikh, CR, Testani, JM. 2016, Hypochloremia and Diuretic Resistance in Heart Failure. *Circulation: Heart Failure*. 9, 003180.
72. McCoy, T., **Planavsky, NJ**, Asael, D. in press, Iron isotopes in a high-oxygen, low-sulfate environment: implications for interpreting Archean sedimentary iron isotope excursions. *Geobiology*.

71. Wu W., Wang, X. Reinhard, C.T., **Planavsky, NJ**, in press, Chromium isotope systematics in temperate weathering environments: A case study of the Connecticut River System. *Chemical Geology*.
70. Louyakis, AS, Mobberley, JM, Vitek, B, Hagan, PD, Reid, RP, **Planavsky, NJ**, Kozdon, R, Orland, I, Valley, JW, Visscher, PT, Casaburi, G, Foster, JS, in press, Spatial heterogeneity of thrombolites using molecular, biochemical, and stable isotope analyses. *Astrobiology*.
69. Zhang, S, Henehan, M, Hood, A, Hardisty, D, Reid, RP, Hull, P, **Planavsky, NJ**, 2017, Investigating controls on boron isotope ratios in shallow marine carbonates. *Earth and Planetary Science Letters*. 458, 380–393.
68. Fralick, P, **Planavsky, NJ**, Burton, J, Addison, B, Barrett, T, Brumpton, G, Jarvis, I, 2017, Geochemistry of Paleoproterozoic Gunflint Formation carbonate: implications for hydrosphere-atmosphere evolution. *Precambrian Research*. 290, 126–146.
67. Korenaga, J, **Planavsky, NJ**, Evan, DAD, in press, Global water cycle and the coevolution of Earth's interior and surface environment. *Philosophical Transactions A*.
66. Reinhard, CT*, **Planavsky, NJ***, Gill, BC, Ozaki, K, Robbins, LJ, Lyons, TW, Fischer, WW, Wang, C, Cole, DB, Konhauser, KO, 2017, Evolution of the global phosphorous cycle. *Nature*. 541, 386–389.
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65. Wang X, **Planavsky, NJ**, Hull, PM, Tripathi, AE, Zou, H, Elder, L, Henehan, M, 2017, Chromium isotopic composition of core-top planktonic foraminifera. *Geobiology*. 15, 51-64
64. Wang, X, Reinhard, CT, **Planavsky, NJ**, Owens, JD, Lyons, TW, Johnson, TM, 2016, Sedimentary chromium isotopic compositions across the Cretaceous OAE2 at Demerara Rise Site 1258, *Chemical Geology* 429, 85-92.
63. **Planavsky, NJ**, Cole, DB, Reinhard, CT, Zhang, S, Diamond, C, Love, GL, Konhauser, K, Lyons, TW, 2016, No evidence for high atmospheric oxygen levels 1400 million years ago. *Proceedings of the National Academy of Sciences*. 113, E2550–E2551.
62. Hood, AvS, **Planavsky, NJ**, Wallace, MW, Wang, X, Bellefroid, E, Gueguen, B, Cole, DB, 2016, Integrated geochemical-petrographic insights from component-selective $\delta^{238}\text{U}$ of Cryogenian marine carbonates. *Geology*. 44, 951-954.
61. Sahoo, SK, **Planavsky, NJ**, Jiang, GQ, Kendall, B, Owens, JG, Wang, XQ, Shi, XY, Anbar, AD, and Lyons, TW, 2016, Oceanic oxygenation events (OOEs) in the anoxic Ediacaran ocean. *Geobiology*. 14, 457–468.
60. Hardisty, DS, Riedinger, N, **Planavsky, NJ**, Asael, D, Andrén, T, Jørgensen, BB, Lyons, TW, 2016, A Holocene history of dynamic water column redox conditions in the Landsort Deep, Baltic Sea. *American Journal of Science*. 316, 713-745.
59. Suosaari, EP, Reid, RP, Playford, PE, Foster, JS, Stolz, JF, Casaburi, G, Hagan, PD, Chirayath, V, Macintyre, IG, **Planavsky, NJ**, Eberli, GP, 2016, New multi-scale perspectives on the stromatolites of Shark Bay, Western Australia. *Scientific Reports*. 6.
58. Anderson, R, Tarhan. LG, Cummings, K, **Planavsky, NJ**, Bjørnerud, M, 2016, Macroscopic structures in the 1.1 Ga continental Copper Harbor Formation: Concretions or fossils? *Palaios*. 31, 327-338.
57. Reinhard, CT, **Planavsky, NJ**, Olson, SL, Lyons, TW, Erwin, DH, 2016, Causal relationships between earth's oxygen cycle and the evolution of metazoan life. *Proceedings of the National Academy of Sciences*. 113, 8933–8938.

56. Cole, DB, Reinhard, CT, Wang, X, Gueguen, B, Halverson, GP, Lyons, TW, **Planavsky, NJ**, 2016, A shale-hosted Cr isotope record of low atmospheric oxygen during the Proterozoic. *Geology*. 44, 555-558.
55. Wang, X, Reinhard, CT, **Planavsky, NJ**, Owens, JD, Lyons, TW, Johnson, TM, 2016, The chromium isotope system tracks bottom-water redox across the Cretaceous OAE2 at Demerara rise site 1258. *Chemical Geology*. 429, 85–92.
54. Gueguen, B, Reinhard, CT, Algeo, TJ, Peterson, LC, Nielsen, SG, Wang, X, **Planavsky, NJ**. 2016. The chromium isotope composition of reducing and oxic marine sediments. *Geochimica et Cosmochimica Acta*. 184, 1-19.
53. Jin, C, Li, C, Algeo, TJ, **Planavsky, NJ**, Cui, H, Yang, X, Zhao, Y, Zhang, X, Xie, S, 2016, A highly redox-heterogeneous ocean in South China during the early Cambrian (~529-514 Ma): Implications for biota-environment co-evolution. *Earth and Planetary Science Letters*. 441, 38-51.
52. McKenzie, NR, Horton, BK, Loomis, SE, Stockli, DF, **Planavsky, NJ**, Lee, CTA, 2016, Continental arc volcanism as the principal driver of icehouse–greenhouse variability. *Science*. 352, 444-447.
51. Shen, J, Feng, Q, Algeo, TJ, Li, C, Planavsky, NJ, Zhou, L, Zhang, M, 2016, Two pulses of oceanic environmental disturbance during the Permian–Triassic boundary crisis. *Earth and Planetary Science Letters* 443, 139-152.
50. Wang X., **Planavsky NJ**, Reinhard CT, Hein JR, Johnson TM, 2016, Cenozoic seawater U isotopic composition recorded in ferromanganese crusts. *American Journal of Science*. 316, 64-83
49. Wang X., Planavsky NJ, Reinhard CT, Zou H., Ague J, Wu Y, Peucker-Ehrenbrink B. 2016, Chromium isotope effects associated with high temperature metamorphism, black shale weathering and hydrothermal alteration. *Chemical Geology*. 423, 19–33.
48. Li, C, **Planavsky, NJ**, Shi, W., Zhang, Z., Zhou, C, Cheng, Luo, G, and Xie, S, 2015, Ediacaran Marine Redox Heterogeneity and Early Animal Ecosystems. *Scientific Reports*. 5, 17097.
47. **Planavsky, NJ**, Tarhan, LG, Bellefroid, EJ, Evans, DA, Reinhard, CT, Love, GD, Lyons, TW, 2015, Late Proterozoic transitions in climate, oxygen, and tectonics, and the rise of complex life. In: *Earth-Life Transitions: Paleobiology in the Context of Earth System Evolution. The Paleontological Society Papers, Volume 21*, P. David Polly, Jason J. Head, and David L. Fox (eds.). Yale University Press, New Haven.
46. Konhauser, KO, **Planavsky, NJ**, Hardisty, D, Lyons, TW, Bekker, A, 2016, Iron formations as recorders of Neoproterozoic to Paleoproterozoic environmental history. In: D. Johnston and S. Poulton (eds.), *Revolutions in the Early Proterozoic: Tracking Geochemical and Geobiological Change*.
45. Partin, CA, Bekker, A., **Planavsky, NJ**, Lyons, TW, 2015, Euxinic conditions recorded in the ca. 1.93 Ga Bravo Lake Formation, Nunavut (Canada): Implications for oceanic redox evolution. *Chemical Geology*. 417, 148–162.
44. Tarhan, LG, Droser, M, **Planavsky, NJ**, Johnston, D, 2015, Protracted development of the sediment mixed layer, *Nature Geoscience*. 8, 865–869.
43. Thompson, D, Rainbird, RH, **Planavsky, NJ**, Lyons, TW, Bekker, A, 2015, Chemostratigraphy of the Shaler Supergroup, Victoria Island, NW Canada: record of ocean composition prior to the break-up of Rodinia. *Precambrian Research*, 263, 232-245.

42. Youm, YH, Nguyen, KY, Grant, R, Goldberg, E, Bodogai, E, Kim, D, D'Agostino, D, **Planavsky, NJ**, Lupfer, C, Kanneganti, TD, Horvath, T, Fahmy, T, Crawford, P, Biragyn, A, Alnemri, E, Dixit, VD, 2015, Ketone body β -hydroxybutyrate blocks NLRP3 inflammasome-mediated inflammatory disease. *Nature Medicine*. 21, 263–269.
41. Li, C, **Planavsky, NJ**, Love, G, Reinhard, CT, Hardisty, D, Feng, L, Bates, L, Huang, J, Zhang, Q, Chu, X, Lyons, TW, 2015, Ferruginous marine conditions and low oxidant concentrations in Middle Proterozoic oceans: Insights from a geochemical investigation of the Chuanlinggou Formation, Yanshan Basin, North China, *Geochimica et Cosmochimica Acta*, 150, 90-105.
40. **Planavsky, NJ**, 2014. The elements of marine life. *Nature Geoscience*, 7, 855–856.
39. **Planavsky, NJ***, Reinhard, CT*, Wang, X, McGoldrick, P, Thompson, D, Rainbird, RH, Fischer, W, Johnson, TM, Lyons, TW, 2014, Low Mid-Proterozoic Atmospheric Oxygen Levels and the Delayed Rise of Animals. *Science*. 346, 635-638.
*Equal contribution authors
38. Castro-Contreras, SI, Gingras, MR, Pecoits, E, Aubet, NR, Petrash, D, Castro-Contreras, SM, **Planavsky, NJ**, Konhauser, KO, 2014, Textural and geochemical features of freshwater microbialites from Laguna Bacalar, Quintana Roo, Mexico. *Palaios*. 29, 192-209
37. Reinhard, CT, **Planavsky, NJ**, Wang, X, Johnson, T, Fischer, WW, Lyons, TW, 2014, The isotopic composition of authigenic chromium in anoxic marine sediments: A case study from the Cariaco Basin. *Earth and Planetary Science Letters*. 407, 9-18.
36. Busigny, V*, **Planavsky, NJ*** Jézéquel, D, Crowe, S, Louvat, P, Moureau, J, Viollier, E, Lyons, TW, 2014, Iron isotopes in an Archean ocean analogue, *Geochimica et Cosmochimica*, 133, 443-462.
*Equal contribution authors
35. McKenzie, NR, Hughes, NC, Myrow, PM, Banerjee, DM, Deb, M, **Planavsky, NJ**, 2014. Reply to comment on "New age constraints for the Proterozoic Aravalli-Delhi successions of India and their implications" by Melezhik et al. *Precambrian Research*, 246, 371-372.
34. Hardisty, DS, Lu, Z, **Planavsky, NJ**, Bekker, A, Zhou, X., Lyons TW, 2014, A Novel Iodine Record of Paleoproterozoic Surface Ocean Oxygenation. *Geology*, 42, 619-622.
33. Lyons, TW, Reinhard, CR, **Planavsky, NJ**, 2014, Evolution: A Fixed-Nitrogen Fix in the Early Ocean? *Current Biology*, 24, R277.
32. **Planavsky, NJ**, Asael, D, Hofmann, A, Reinhard, CT, Lalonde, SV, Wang, X, Knudsen, A, Ossa Ossa, F, Bekker, A, Johnson, TM, Lyons, TW, Rouxel, OJ, 2014, Evidence for Oxygenic Photosynthesis Half a Billion Years Before the Great Oxidation Event, *Nature Geoscience*. 7, 283–286.
31. Swanner, ED, **Planavsky, NJ**, Lalonde, SV, Robbins, LJ, Bekker, A, Rouxel, OJ, Kappler, A, Mojzsis, SJ, and Konhauser, KO, 2014, Cobalt and marine redox evolution. *Earth and Planetary Science Letters*. 390, 253–263.

30. Lyons, TW, Reinhard, CR, **Planavsky, NJ**, 2014, The early rise of oxygen in the ocean and atmosphere. *Nature*. **506**, 307–31.
29. McKenzie, NR, Hughes, NC, Myrow, PM, Dhiraj, M, Banerjee, M, Deb, M, **Planavsky, NJ**, 2014, New detrital zircon age constraints on the Proterozoic Aravalli-Delhi successions of central India and their implications, *Precambrian Research*, 238, 120-128.
28. Scott, CT, Wing, BA, Bekker, A, **Planavsky, NJ**, Medvedev, P, Bates, SM, Yun, SM, Lyons, TW, 2014, Pyrite multiple-sulfur isotope evidence for rapid expansion and contraction of the early Paleoproterozoic seawater sulfate reservoir. *Earth and Planetary Science Letters*, 389, 95-104
27. Partin, CA, Lalonde, SV, **Planavsky, NJ**, Bekker, A, Rouxel, OJ, Lyons, TW, Konhauser, KO, 2014, Uranium in iron formations and the rise of atmospheric oxygen. *Chemical Geology*, 362, 82-90.
26. Bekker, A, **Planavsky, NJ**, Krapež, B, Rasmussen, B, Hofmann, A, Slack, JF, Rouxel, OJ, Konhauser, K.O., 2014, Iron Formations: Their Origins and Implications for Ancient Seawater Chemistry, *Treatise on Geochemistry*. vol., 10.
25. Tarhan, LG, **Planavsky, NJ**, Reid, RP, 2013, Microbial mat control on infaunal abundance and diversity in modern marine microbialites, *Geobiology*. 11, 485-497.
24. Robbins, LJ, Lalonde, SV, Saito, M, **Planavsky, NJ**, Mloszewska, AM, Pecoits, E, Dupont, CL, Kappler, A, Konhauser, KO, 2013, Authigenic iron oxide proxies for marine Zinc over geological time and implications for eukaryotic metallome evolution, *Geobiology*, 11, 295-306.
23. Partin, C, Bekker, A, **Planavsky, NJ**, Gill, BG, Li, C, Podkovyrov, V, Maslov, A, Konhauser, KO, Lyons, TW, 2013, Large-scale fluctuations in Precambrian atmospheric and oceanic oxygen levels, *Earth and Planetary Science Letters*, 369, 284–293.
22. Reinhard, CT, **Planavsky, NJ**, Robbins, LJ, Partin, C, Gill, GC, Lalonde, SV, Bekker, A, Konhauser, KO, Lyons, TW, 2013, Proterozoic ocean redox and evolutionary stasis. *Proceedings of the National Academy of Sciences*. 110, 5357-5363.
21. Reinhard, CR, **Planavsky, NJ**, Lyons, TW, 2013, Long-term sedimentary recycling of rare sulphur isotope anomalies and its significance for reconstructing atmospheric evolution, *Nature*. 497, 100-103.
20. Scott, CT, **Planavsky, NJ**, Dupont, CL, Kendall, B, Gill, B, Robbins. LJ, Bekker, A, Konhauser, KO, Anbar, A, Lyons, TW, 2013, Marine zinc bioavailability through time and eukaryotic metallome evolution, *Nature Geoscience*. 6, 123-125.
19. Huang, J, Chu, X, Lyons, TW, **Planavsky, NJ**, Wen, H, in 2013, A new look at saponite formation and early animal records in the Ediacaran of South China, *Geobiology*, 11, 3-14.
18. **Planavsky, NJ**, Bekker, A, Hofmann, A, Lyons, TW, 2012, Sulfur record of rising and falling marine oxygen and sulfate levels during the Lomagundi event. *Proceedings of the National Academy of Sciences*, 45 18300-18305.
17. Bekker, A, Krapež, B, Slack, JF, **Planavsky, NJ**, Hofmann, A, Konhauser, KO, Rouxel, OJ, 2012, Iron Formation: The sedimentary product of a complex interplay among mantle, tectonic, oceanic, and biospheric processes—a reply. *Economic Geology*, 107, 379-380.
16. Sahoo, SW, **Planavsky, NJ**, Kendall, B, Wang, X, Shi, X, Scott, C, Anbar, AD, Lyons, TW, Jiang, G, 2012, Ocean oxygenation in the wake of the Marinoan glaciation. *Nature*, 489, 546–549.

15. **Planavsky, NJ**, Rouxel, OJ, Bekker, A, Little, C, Hoffman, A, Lyons, TW, 2012, The iron isotope composition of some Archean and Paleoproterozoic iron formations. *Geochimica et Cosmochimica Acta*, 80, 158–169.
14. Konhauser, KO, Lalonde, SV, **Planavsky, NJ**, Pecoits, E, Lyons, TW, Mojzsis, SJ, Rouxel, OJ, Barley, ME, Bekker, A, 2011, Aerobic bacterial pyrite oxidation and acid rock drainage during the Great Oxidation Event. *Nature*, 478, 369–373.
13. **Planavsky, NJ**, McGoldrick, P, Scott, C, Li, C, Reinhard, CT, Kelly, A, Bekker, A, Love, G, Lyons, TW, 2011, Widespread Iron-rich Conditions in Mid-Proterozoic Oceans, *Nature*, 477, 448–451.
12. Reinhard, CR, **Planavsky, NJ**, 2011, Mineralogical constraints on Precambrian pCO₂. *Nature*, 474, e3-4.
11. **Planavsky, NJ**, Partin, C, and Bekker, A, 2011, Carbon Isotopes as a Geochemical Tracer, In: *Encyclopedia of Astrobiology*, Springer-Verlag, 1600 p., p. 249-253.
10. **Planavsky, NJ**, Rouxel, OJ, Bekker, A, Lalonde, SV, Konhauser, KO, Reinhard, CR, Lyons, TW, 2010, Evolution of marine phosphate concentrations, *Nature* 467: 1088–1090.
9. **Planavsky, NJ**, Bekker, A, Rouxel, OJ, Kamber, B, Knudsen, AH, Lyons, TW, 2010, The rare earth element and yttrium composition of Archean and Paleoproterozoic iron formations revisited: A new perspective on significance and mechanisms of iron formation deposition: *Geochimica et Cosmochimica Acta*, 74: 6387-6405.
8. Bekker, A, Slack, JF, **Planavsky, NJ**, Krapež, B, Hofmann, A, Konhauser, KO, Rouxel, OJ, 2010, Iron Formation: The Sedimentary Product of a Complex Interplay Among Mantle, Tectonic, Oceanic, and Biospheric Processes. *Economic Geology* 105: 467-508.
7. **Planavsky, NJ**, 2009, Early Neoproterozoic origin of the metazoan clade recorded in carbonate rock texture: *Comment, Geology*, 37: e195.
6. **Planavsky, NJ**, Reid, RP, Myshrall, KL, Lyons, TW, Vischer, PT, 2009, Formation and diagenesis of modern marine calcified cyanobacteria, *Geobiology*, 7: 566 – 576.
5. Grey, K, **Planavsky, NJ**, 2009, *Microbialites of Lake Thetis, Cervantes, Western Australia—A Field Guide*. Geological Survey of Western Australia Publication. Perth, Australia.
4. **Planavsky, NJ**, Rouxel, O, Bekker, A, Shapiro, RS, Fralick, PF, Knudsen, A, 2009, Iron-oxidizing microbial ecosystems thrived in Paleoproterozoic redox-stratified oceans, *Earth and Planetary Science Letters*, 286: 230-242.
3. **Planavsky, NJ**, Ginsburg, RN, 2009, The Taphonomy of Modern Marine Bahamian Microbialites, *Palaios*. 24: 5-18.
2. **Planavsky, NJ**, Grey, K, 2008, Stromatolite branching in the Neoproterozoic of the Centralian Superbasin, Australia: an investigation into sedimentary and microbial control of stromatolite morphology, *Geobiology*. 6: 33-45.
1. Ginsburg, RN, **Planavsky, NJ**, 2008, Diversity of Bahamian stromatolite substrates. *in*, *Links Between Geological Processes, Microbial Activities & Evolution of Life*. pg. 177-195. eds., Dilek Y, Furnes H, Muehlenbachs K. Springer academic press. Amsterdam.

Selected Invited Talks:

- Planavsky, NJ**, 2016, Tracking the rise of eukaryotes and land plants. University of Michigan, Ann Arbor, USA.
- Planavsky, NJ**, 2016, Can we paint a clear picture of Earth's oxygenation (Keynote), Goldschmidt2016, Yokohama, Japan.
- Planavsky, NJ**, 2015, Earth's oxygenation. Rice, Department of Earth and Planetary Sciences, Houston, USA.
- Planavsky, NJ**, 2015, New insights into Earth's oxygenation. MIT, Department of Earth and Planetary Sciences, Cambridge, USA.
- Planavsky, NJ**, 2014, A Cr and U record of Archean Oxygen levels. AGU Fall meeting. San Francisco, USA.
- Planavsky, NJ**, 2014, Utility of Metal Isotopes as Redox Tracers, Université Libre de Bruxelles, Laboratoire G-Time, Belgium.
- Planavsky, NJ**, 2013, Oxygen and Life – Can we paint a clear picture? Harvard University, Department of Earth Sciences, Cambridge, Ma, USA.
- Planavsky, NJ**, 2013, New insights into Earth's oxygenation. University of Oxford, Department of Earth Sciences, Oxford, UK.
- Planavsky, NJ**, 2013, The utility of Cr isotopes. University of Nevada, Las Vegas, Geosciences Department, Las Vegas, NV, USA.
- Planavsky, NJ**, 2012, What we talk about when we talk about Earth's oxygenation. Dartmouth College, Biology Department, Hanover, NH, USA.
- Planavsky, NJ**, 2012, Proterozoic Redox Evolution, GAC-MAC-2012, St. John's, Canada.
- Planavsky, NJ**, 2011, Tracking the oxidation of the Earth's Surface, Frontiers in Earth Surface System Interactions Symposium, Yale University, New Haven, CT, USA.
- Planavsky, NJ**, Bekker A, Lyons, TW, 2010, High rates of primary productivity in the aftermath of the rise in atmospheric oxygen, Goldschmidt-2010, Knoxville, TN, USA.
- Planavsky, NJ**, Bekker A, Lyons, TW, 2010, High rates of primary productivity in the aftermath of the rise in atmospheric oxygen: Insights from the Lomagundi Formation, Zimbabwe, GAC-MAC-2010, Calgary, AB, Canada.
- Planavsky, NJ**, 2009, Insights from iron formations into the coevolution of the Earth's biosphere and redox state. Institut de Physique du Globe de Paris, Laboratoire de Géochimie et Cosmochimie, Paris, France.
- Planavsky, NJ**, 2009, The evolution of the marine phosphorous cycle through time, University of Manitoba, Department of Geological Sciences, Winnipeg, MB, Canada.