

Curriculum Vitae: **BERNARD PAUL BOUDREAU**

DoB: 15 February 1953
Citizenship: Canadian

PoB: Moncton, NB, Canada
Status: Married

Education:

B.Sc. (1st Honors)	1975, University of New Brunswick (Geology)
M.S.	1981, Texas A&M University (Oceanography)
M.S.	1980, Yale University (Geology & Geophysics)
M.Phil.	1981, Yale University (Geology & Geophysics)
Ph.D.	1985, Yale University (Geology & Geophysics)

Professional Experience:

Geologist, Imperial Oil Ltd (ESSO), Calgary, Alberta, 4 months in 1975
Postdoctoral Fellow, Geol. Survey Canada, Bedford Inst. Oceanography, 1984-1986
NSERC University Research Fellow, Dept. Oceanography, University of British Columbia, 1986-1988
Assist. Professor, Dept. Oceanography, Dalhousie University, 1988-1992
Assoc. Professor, Dept. Oceanography, Dalhousie University, 1992-2001
University Chair in Geological Oceanography, School of Ocean and Earth Sciences, University of Southampton, UK, 2000-2001
Professor, Dept. Oceanography, Dalhousie University, July 2002-present
Chair, Dept. Oceanography, Dalhousie University, July 2002-July 2008
Faculty of Science Killam Professor, Dalhousie University, 2009-2014
Dean, Faculty of Graduate Studies, Dalhousie University, 2011-2014
Professor Emeritus, Dalhousie University 2019.

Memberships:

American Geophysical Union, American Society for Limnology and Oceanography, International Association for Mathematical Geology.

Editorships:

Associate Editor, *Geochimica et Cosmochimica Acta* (1993-2002)
Associate Editor, *Limnology & Oceanography* (1993-1999)
Co-Editor Pro-Tem, *American Journal of Science* for the "Berner" Volume 1999-2000
Editorial Advisory Board, Member, *Computers & Geoscience* (1999-2010)
Associate Editor, *Limnology & Oceanography: Fluids & Environments* (2009-2015)

National and International Scientific Committees:

SCOR JGOFS Task Team on Benthic Processes (1990-1992), Member
SCOR WG 95 "Sediment Suspension and Sea Bed Properties" (1991-1995), Member
SCOR WG 114 "Reaction and Transport Processes in Permeable Marine Sediments" (1998-2003), Chair
JGOFS Canada, Member of the Scientific Steering Committee (1992-1993)
JGOFS Canada, National Chair (1993)
Canadian Marine Sciences Workshop, Steering Committee, Member, (1996-98)
US NSF Funding Panel: JGOFS Modelling and Synthesis (2000)
US NSF Integrated Carbon Cycle Science, Inaugural Panel (June 2002)

Geochemical Society, Clark Medal Committee, Member (2003-2007)
A.G. Huntsman Foundation, Member, Board of Directors (2002-2008)
ASLO 2008 Summer Meeting Organizing Committee, Member
RSC College of New Scholars, Nomination Committee, Member (2014-2017)
Selection Committee, EOAS Division, Academy III, RSC, Member (2017-present)
RSC Atlantic Steering Committee, Member (2016-2018)
Co-chair, RSC Atlantic (2018-present)

Awards, Appointments and Honors:

Province of New Brunswick Postgraduate Scholarship, 1975-1976
NRC/NSERC Postgraduate Scholarship, 1976-1977, 1978-1981
DuPont Tuition Fellowship, Texas A&M University, 1976-1978
Yale University Fellowship, 1978-1982
The *Orville Prize* for Outstanding Dissertation Research in the Earth Sciences,
Yale University, 1985
NSERC/DEMRC Visiting Fellowship, 1984-1986
NSERC University Research Fellowship, 1986-1995
Alexander von Humboldt Fellowship, 1994-95
Best Paper in Computers & Geosciences, 1996, IAMG
Frey-Deevey Invited Review, 1999, Journal of Paleolimnology
F. Mosey Visiting Scholar, University of Western Australia, June 2002
Appointed to the *Graduate Faculty*, University of Maine, 2005-2014
Distinguished Visiting Scientist, Centre for Marine Ecology, Royal Dutch Academy of
Sciences, The Netherlands, 2002-2008
CNC-SCOR/CMOS Travelling Lecturer 2009
Editors' Highlights, Geophysical Research Letters (GRL) paper
10.1029/2009GL041847, 2010
Fellow of the Royal Society of Canada (The National Academies) 2011
Visiting Fellow, Netherlands Earth System Science Center, 2017

Current Research Interests:

- methane bubble formation and movement in soft sediments
- mixing of sediments and bioturbation
- sedimentary geotechnical properties (porosity, tortuosity, elasticity and fracture)
- modelling of diagenesis and process sedimentology
- calcium carbonate compensation and ocean acidification: past and future

Academic Courses Taught:

An Introduction to Physical and Chemical Oceanography (undergraduate 1990-1997)
The Salty Sea: An Introduction to Chemical Oceanography (undergraduate 2003-2011)
Geochemistry of Aqueous Environments (undergraduate 1998-2000)
Chemical Sedimentology and Diagenesis (graduate – 1992, 1995, 1999)
Physical Chemistry of Seawater (graduate - 1991)
Geological Oceanography (graduate/undergraduate 2015-17)

Thesis and Dissertation Titles:

The Influence of a Diffusive Sublayer on Diagenesis at the Sea Floor, M.S. Thesis,
Texas A&M University; supervisor: Dr. Martha R. Scott.

Diagenetic Models of Biological Processes in Marine Sediments, Ph.D.
Dissertation, Yale University; supervisor: Dr. Robert A. Berner.

Refereed Published Papers:

1. Boudreau, B.P. and Scott, M.R. (1978) A model for the diffusion-controlled growth of deep-sea manganese nodules, *American Journal of Science* 278, 903-929.
2. Boudreau, B.P. and Guinasso, N.L., Jr. (1982) The influence of a diffusive sublayer on accretion, dissolution and diagenesis at the sea floor, in *The Dynamic Environment of the Ocean Floor* (K.A. Fanning and F.T. Manheim, eds.), Lexington Books, pp. 115-145.
3. Boudreau, B.P. (1984) On the equivalence of nonlocal and radial-diffusion models for porewater irrigation, *Journal of Marine Research* 42, 731-735.
4. Boudreau, B.P. and Westrich, J.T. (1984) The dependence of bacterial sulfate reduction on sulfate concentration in marine sediments, *Geochimica et Cosmochimica Acta* 48, 2503-2516.
5. Boudreau, B.P. (1986) Mathematics of tracer mixing in sediments: I. Spatially-dependent, diffusive mixing, *American Journal of Science* 286, 161-198.
6. Boudreau, B.P. (1986) Mathematics of tracer mixing in sediments: II. Nonlocal mixing and biological conveyor-belt phenomena, *American Journal of Science* 286, 199-238.
7. Smith, J.N., Boudreau, B.P. and Noshkin, V. (1986) Plutonium and ^{210}Pb distributions in northeast Atlantic sediments: Subsurface anomalies caused by nonlocal transport, *Earth and Planetary Science Letters* 81, 15-28.
8. Boudreau, B.P. (1987) A steady-state diagenetic model for dissolved carbonate species and pH in the porewaters of oxic and suboxic sediments, *Geochimica et Cosmochimica Acta* 51, 1985-1996.
9. Boudreau, B.P. and Imboden, D.M. (1987) Mathematics of tracer mixing in sediments: III. The theory of nonlocal mixing within sediments, *American Journal of Science* 287, 693-719.

10. Boudreau, B.P. and Canfield, D.E. (1988) A provisional diagenetic model for pH in anoxic porewaters: Application to the FOAM site, *Journal of Marine Research* 46, 429-455.
11. Syvitski, J., Smith, J.N., Calabrese, E. and Boudreau, B.P. (1988) Basin sedimentation and the growth of pro-grading deltas, *Journal of Geophysical Research* 93, 6895-6908.
12. Boudreau, B.P. (1988) Mass transport constraints on the growth of discoidal ferromanganese nodules, *American Journal of Science* 288, 777-797.
13. Boudreau, B.P. and Taylor, R.J. (1989) A theoretical study of the diagenetic concentration fields near solid objects at the sediment-water interface, *Journal of Geophysical Research* 94, 2124-2136.
14. Boudreau, B.P. and Leblond, P.H. (1989) A simple evolutionary model for water and salt in the Black Sea, *Paleoceanography* 4, 157-166.
15. Boudreau, B.P. (1989) The diffusion and telegraph equations in diagenetic modelling, *Geochimica et Cosmochimica Acta* 53, 1857-1866.
16. Boudreau, B.P. (1990) Asymptotic forms and solutions of the model for silica-opal diagenesis in bioturbated sediments, *Journal of Geophysical Research* 95, 7367-7379.
17. Boudreau, B.P. (1990) Modelling early diagenesis of silica in non-mixed sediments, *Deep-Sea Research* 37, 1543-1567.
18. Boudreau, B.P. (1991) Modelling the sulfide-oxygen reaction and associated pH gradients in porewaters, *Geochimica et Cosmochimica Acta* 55, 145-159.
19. Boudreau, B.P. and Ruddick, B.R. (1991) On a reactive continuum representation of organic matter diagenesis, *American Journal of Science* 291, 507-538.
20. Boudreau, B.P., Canfield, D.E. and Mucci, A. (1992) Early diagenesis in a marine sapropel, Mangrove Lake, Bermuda. *Limnology and Oceanography* 37, 1738-1753.
21. Boudreau, B.P. (1992) A kinetic model for microbial organic-matter decomposition in marine sediments. *FEMS Microbiology Ecology* 102, 1-14.
22. Boudreau, B.P. and Canfield, D.E. (1993) A comparison of closed and open-system models for porewater pH and calcite saturation, *Geochimica et Cosmochimica Acta* 22, 317-334.
23. Boudreau, B.P. and Marinelli, R. (1993) Effects of discontinuous vs. continuous irrigation on dissolved silica fluxes from marine sediments. *Chemical Geology* 107, 439-441.
24. Boudreau, B.P. (1994) Is burial velocity a master parameter for bioturbation? *Geochimica et Cosmochimica Acta* 58, 1243-1249.
25. Boudreau, B.P. and Marinelli, R. (1994) A modelling study of discontinuous biological irrigation. *Journal Marine Research* 52, 947-968.
26. Boudreau, B.P. (1996) A method-of-lines code for Carbon and nutrient diagenesis. *Computers and Geosciences* 22, 479-496.

27. Boudreau, B.P. (1996) The diffusive tortuosity and porosity of fine-grained sediments. *Geochimica et Cosmochimica Acta* 60, 3139-3142.
28. Marinelli, R. and Boudreau, B.P. (1996) An experimental and modelling study of pH and related solutes in an irrigated anoxic coastal sediment. *Journal of Marine Research* 54, 939-966.
29. Boudreau, B.P. (1997) A mathematical model for sediment-suspended particle exchange. *Journal of Marine Systems* 11, 279-303.
30. Rutgers van der Loeff, M.M. and Boudreau, B.P. (1997) The effects of resuspension on contaminants, radioactive tracers and soluble particles. *Journal of Marine Systems* 11, 305-342.
31. Mulsow, S., Boudreau, B.P. and Smith, J.N. (1998) Bioturbation and porosity gradients. *Limnology and Oceanography* 43, 1-9.
32. Boudreau, B.P. (1998) Mean mixed depth of sediments: the wherefore and the why. *Limnology and Oceanography* 43, 524-526.
33. Canfield, D.E., Boudreau, B.P., Mucci, A., and Gundersen, J.K. (1998) The early diagenetic formation of organic sulfur in the sediments of Mangrove Lake, Bermuda. *Geochimica et Cosmochimica Acta* 62, 767-781.
34. Boudreau, B.P., Mucci, A., Sundby, B., Luther, G.W. and Silverberg, N. (1998) Comparative diagenesis at three sites on the Canadian continental margin. *Journal of Marine Research* 56, 1259-1284.
35. Boudreau, B.P. (1999) A theoretical investigation of the organic carbon-microbial biomass relation in sediments. *Aquatic Microbial Ecology* 17, 181-189.
36. Boudreau, B.P. and Bennett, R.H. (1999) New rheological and porosity equations for steady-state compaction. *American Journal of Science* 299, 517-528.
37. Boudreau, B.P. (1999) Metals and models: Diagenetic modelling in freshwater lacustrine sediments. (Frey-Deevey Invited Review) *Journal of Paleolimnology* 22, 227-251.
38. Gehlen, M., Mucci, A. and Boudreau, B.P. (1999) Modelling the distribution of stable carbon isotopes in porewaters of marine sediments. *Geochimica et Cosmochimica Acta* 66, 2763-2773.
39. Thyne, G., Boudreau, B.P., Ramm, M. and Midtbø, R.E. (2001) Simulation of K-Spar dissolution and illitization in the Stratfjord formation, North Sea. *American Association of Petroleum Geologists Bulletin* 85, 621-635.
40. Boudreau, B.P. (2000) The Mathematics of Early Diagenesis: From Worms to Waves. *Reviews in Geophysics* 38, 389-416.
41. Dade, B.D., Hogg, A. and Boudreau, B.P. (2000) Chapter 2, Physics of benthic boundary layers. In *The Benthic Boundary Layer: Transport Processes and Biogeochemistry* (Boudreau, B.P. and Jørgensen, B.B., eds), pp. 4-43. Oxford University Press.

42. Boudreau, B.P. (2000) Chapter 5, Solute transport in benthic boundary layers. In *The Benthic Boundary Layer: Transport Processes and Biogeochemistry* (Boudreau, B.P. and Jørgensen, B.B., eds), pp. 104-126. Oxford University Press.
43. Boudreau, B.P. and Jørgensen, B.B. (2000) Chapter 9, Diagenesis in the benthic boundary layer. In *The Benthic Boundary Layer: Transport Processes and Biogeochemistry* (Boudreau, B.P. and Jørgensen, B.B., eds), pp. 211-244. Oxford University Press.
44. Boudreau, B.P., Gardiner, B., and Johnson, B. (2001a) Rate of growth of isolated bubbles in sediments with a distributed diagenetic source of methane. *Limnology and Oceanography* 46, 616-622. (see also the Erratum in the same issue)
45. Boudreau, B.P., Choi, J. and François-Carcaillet, F. (2001b) Diffusion in a lattice-automaton model of bioturbation by small deposit feeders. *Journal of Marine Research* 59, 749-768.
46. Boudreau, B.P. et al. (14 co-authors) (2001c) Permeable marine sediments: overturning an old paradigm. *EOS* 82, 133-136.
47. Choi, J., François-Carcaillet, F. and Boudreau, B.P. (2002) Lattice-automaton bioturbation simulator (LABS): Implementation for small deposit feeders. *Computers and Geosciences* 28, 213-222.
48. Johnson, B., Boudreau, B.P., Gardiner, B. and Maass, R. (2002) Mechanical response of sediments to bubble growth. *Marine Geology* 187, 347-363.
49. Gardiner, B.S., Boudreau, B.P. and Johnson, B.D. (2003) Growth of disk-shaped bubbles in sediments by fracture. *Geochimica et Cosmochimica Acta* 67, 1485-1494.
50. Mucci, A., Boudreau, B.P., and Guignard, C. (2003) Diagenetic mobility of trace elements in sediments covered by a flash flood deposit: Mn, Fe and As. *Applied Geochemistry* 18, 1011-1026.
51. Gardiner, B.S., Boudreau, B.P. and Johnson, B.D. (2003) Diffusion-limited growth of a disk-shaped bubble. *Applied Mathematical Modelling* 27, 817-829.
52. Boudreau, B.P. (2003) Chemical Diffusion, in *Encyclopedia of Sedimentology* (G. Middleton, ed.), pp. 225-226. Elsevier.
53. Boudreau, B.P. (2003) Mixing Models, in *Encyclopedia of Sedimentology* (G. Middleton, ed.), pp. 450-451. Elsevier.
54. Meysman, F., Boudreau, B.P. and Middelburg, J.J. (2003) Relations between local, non-local, discrete and continuous models of bioturbation. *Journal of Marine Research* v. 61, 391-410.
55. Boudreau, B.P., Meysman, F. and Middelburg, J.J. (2004) Multi-component ionic diffusion in porewaters – Revisited. *Earth Planetary Science Letters* 222, 653-666.
56. Boudreau, B.P. (2004) What controls the mixed-layer depth in deep-sea sediments? The importance of POC flux - Comment. *Limnology and Oceanography* 49, 620-622.

57. Boudreau, B.P. (2005) Modelling mixing and diagenesis, in Kristensen, E., Kostka, J., and Haese, R.H., eds., *Macro- and Microorganisms in Marine Sediment*, AGU Series "Coastal and Estuarine Studies" 60, 323-340.
58. Meysman, F., Boudreau, B.P. and Middelburg, J.J. (2005) Modelling reactive transport in sediments subject to bioturbation and compaction. *Geochimica et Cosmochimica Acta* 222, 653-666.
59. Grigg, N.J., Boudreau, B.P., Webster, I.T., and Ford, P.W. (2005) The non-local model of porewater irrigation: limits to its equivalence with a cylinder diffusion model. *Journal of Marine Research* 63, 437-455.
60. Dorgan, K.M., Jumars, P.A., Johnson, B.D., Boudreau, B.P., and Landis, E. (2005) Burrowing by crack propagation: efficient locomotion through muddy sediments. *Nature* 433, 475.
61. Boudreau, B.P., Algar, C., Johnson, B.D., Croudace, I., Reed, A., Furukawa, Y., Dorgan, K.M., Jumars, P.A., Grader, A.S., Gardiner, B.S. (2005) Bubble growth and rise in sediments. *Geology* 33, 517-520.
62. Dorgan, K.M., Jumars, P.A., Johnson, B.D., and Boudreau, B.P. (2006). Macrofaunal burrowing: The medium is the message. *Oceanography and Marine Biology: An Annual Review* 44, 85-121. CLC Press.
63. Reed, D. Huang, K. and Boudreau, B.P. (2006) Steady state tracer dynamics in a lattice-automaton model of bioturbation. *Geochimica et Cosmochimica Acta* 70, 5855-5867.
64. Boudreau, B.P. and Meysman, F.J.R. (2006) Predicted tortuosity of muds. *Geology* 34, 693-696.
65. Best, A., Richardson, M., Boudreau, B.P., Judd, A., Leifer, I., Lyons, A., Martens, C.S., Orange, D., and Wheeler, S. (2006) Shallow gassy marine sediments and their impact on society and global climate. *EOS* 87, no. 22, p. 213.
66. Jumars, P.A., Dorgan, K.M., Mayer, L.M., Boudreau, B.P., and Johnson, B.D. (2006) Material constraints on infaunal lifestyles: May the strong and the persistent forces be with you, in W. Miller, III (ed.), *Trace Fossils: Concepts, Problems, and Prospects*, p. 441-456. Elsevier.
67. Meysman, F.R.J., Malyuga, V., Boudreau, B.P., and Middelburg, J.J. (2007) The influence of porosity gradients on mixing coefficients in sediments. *Geochimica et Cosmochimica Acta* 71, 961-973.
68. Haeckel, M., Boudreau, B.P., and Wallmann, K. (2007) Bubble-induced porewater irrigation: A 3-D model for porewater mixing. *Geochimica et Cosmochimica Acta* 71, 5135-5154.
69. Huang, K., Boudreau, B.P., and Reed, D. (2007) Simulated fiddler-crab sediment mixing. *Journal of Marine Research* 65, 491-522.
70. Reed, D., Boudreau, B.P., and Huang, K. (2007) Transient tracer dynamics in a lattice-automaton model of bioturbation. *Journal of Marine Research* 65, 813-833.

71. Boudreau, B.P., Arnosti, C., and Jørgensen, B.B. (2008) Organic matter decay. *Science* 319, Technical Comment 1616b (see: www.sciencemag.org).
72. Meysman, F.J.R., Malyuga, V.S., Boudreau, B.P., and Middelburg, J.J. (2008) Quantifying particle dispersal in aquatic sediments at short time scales: model selection. *Aquatic Biology* 2, 239-254.
73. Boudreau, B.P. (2008) Nodule morphology and growth model. *Proc. US National Academy Science* 105, E21.
74. Meysman, F.J.R., Malyuga, V.S., Boudreau, B.P., and Middelburg, J.J. (2008) A generalized stochastic approach to particle dispersal in soils and sediments. *Geochimica et Cosmochimica Acta* 72, 3460-3478.
75. Algar, C.K. and Boudreau, B.P. (2009) Transient growth of an isolated bubble in sediments. *Geochimica et Cosmochimica Acta* v. 73, 2581-2591.
76. Algar, C.K. and Boudreau B.P. (2010) Stability of bubbles in a linear elastic medium: Implications for bubble growth in marine sediments. *Journal of Geophysical Research – Earth Surface*, v. 115, F03012, 12 pp., 2010^[11]_{SEP}doi:10.1029/2009JF001312.
77. Barry, M.A., Boudreau, B.P. and Johnson, B.D. (2010) First-order description of the mechanical fracture behavior of fine-grained surficial marine sediments during gas bubble growth. *Journal of Geophysical Research – Earth Surface*, v. 115, F04029, doi:10.1029/2010JF001833.
78. Boudreau, B.P., Middelburg, J.J. and Meysman, F.J.R. (2010) Carbonate compensation dynamics. *Geophysical Research Letters* v. 37, L03603, doi:10.1029/2009GL041847.
79. Boudreau, B.P., Middelburg, J.J. and Meysman, F.J.R. (2010) Ongoing transients in carbonate compensation. *Global Biogeochemical Cycles*, v. 24, GB4010, doi:10.1029/2009GB003654.
80. Meysman, F.J.R., Boudreau, B.P., and Middelburg, J.J. (2010) When and why does bioturbation lead to diffusive mixing? *Journal of Marine Research*, v. 68, 881-920.
81. Algar, C.K., Boudreau, B.P. and Barry, M.A. (2011) Initial rise of bubbles in cohesive sediments by a process of viscoelastic fracture. *Journal of Geophysical Research – Solid Earth*, v. 116, B04207, doi:10.1029/2010JB008133.
82. Algar, C.K., Boudreau, B.P. and Barry, M.A. (2011) Release of multiple bubbles from cohesive sediments. *Geophysical Research Letters*, v. 38, L08606, doi:10.1029/2011GL046870.
83. Barry, M.A., Johnson, B.D., and Boudreau, B.P. (2012) A new instrument for high-resolution in situ assessment of Young's modulus in shallow cohesive sediments. *Geomarine Letters*, v. 32, 349-357.
84. Boudreau, B.P., Barry, M., L'Esperance, C., Algar, C.K., and Johnson, B.D. (2013) The mechanics of soft cohesive sediments, p. 81-105, in *Processes, Assessment and Remediation*

of Contaminated Sediment, Reible, D., ed., Springer, 462 p., ISBN: 978-1-4614-6725-0 (Print) 978-1-4614-6726-7 (Online).

85. Johnson, B.D., Barry, M.A., Boudreau, B.P., Jumars, P.A., and Dorgan, K.M. (2012) In situ tensile fracture toughness of surficial cohesive marine sediments. *Geo-Marine Letters*, v. 32, 39-48, doi 10.1007/s00367-011-0243-1.
86. Barry, M.A., Boudreau, B.P., and Johnson, B.D. (2012) Gas domes in soft cohesive sediments. *Geology*, v. 40; no. 4, 379–382, doi:10.1130/G32686.1.
87. Boudreau, B.P. (2012) The physics of bubbles in surficial, soft, cohesive sediments. *Marine and Petroleum Geology*, v. 38, 1-18, <http://dx.doi.org/10.1016/j.marpetgeo.2012.07.002>.
88. L'Esperance, J.C., Boudreau, B.P., Barry, M.A., and Johnson, B.D. (2013) Small-scale, high-precision and high-accuracy determination of Poisson's ratios in cohesive marine sediments. *Geo-Marine Letters*, v. 33, 75-81, doi 10.1007/s00367-012-0305-z
89. Barry, M.A., Johnson, B.D., Boudreau, B.P., Law, B.A., Hill, P.S., Wheatcroft, R.A. (2013) Sedimentary and geo-mechanical properties of Willapa Bay tidal flats. *Continental Shelf Research*, on line Nov. 2012, <http://dx.doi.org/10.1016/j.csr.2012.05.007>.
90. Boudreau, B.P. (2013) Carbonate dissolution rates at the deep ocean floor. *Geophysical Research Letters*, v. 40, 1-5, doi:10.1029/2012GL054231.
91. Boudreau, B. P., Luo, Y., Meysman, F.J.R., Middelburg, J. J., and Dickens, G. R. (2015) Gas hydrate dissociation prolongs acidification of the Anthropocene oceans. *Geophys. Res. Lett.*, v. 42, 9337-9344, doi:10.1002/2015GL065779.
92. Luo, Y., and Boudreau, B.P. (2016) Future acidification of marginal seas: A comparative study of the Japan/East Sea and the South China Sea, *Geophys. Res. Lett.*, v. 43, doi:10.1002/2016GL068760.
93. Luo, Y., Boudreau, B.P., Dickens, G.R., Sluijs, A., Middelburg, J.J. (2016) An alternative model for CaCO₃ over-shooting during the PETM: Biological carbonate compensation. *Earth Planet. Sci. Lett.*, v. 453, 223-233.
94. Luo, Y., Boudreau, B.P., and Mucci, A. (2016) Disparate acidification and calcium carbonate desaturation of deep and shallow waters of the Arctic Ocean. *Nature Commun.*, v. 7, 12821, doi: 10.1038/ncomms12821.
95. Sulpis, O., Lix, C., Mucci, A., and Boudreau, B.P. (2017) Calcite dissolution kinetics at the sediment-water interface in natural seawater. *Mar. Chem.*, v. 195 (Millero Volume), 70-83, <http://dx.doi.org/10.1016/j.marchem.2017.06.005>.
96. Boudreau, B.P. and Luo, Y. (2017) Retrodiction of secular variations in deep-sea CaCO₃ burial during the Cenozoic. *Earth Planet. Sci. Lett.*, v. 474, 1-12, <https://doi.org/10.1016/j.epsl.2017.06.005>.
97. Sulpis O., Boudreau, B.P., Mucci A., Jenkins C., Trossman D.S., Arbic B.K. and Key R.M. (2018) Current CaCO₃ dissolution at the seafloor caused by anthropogenic CO₂. *Proc. Nat. Acad. Sci.*, v. 115, 11700-11705.

98. Boudreau B.P., Middelburg J.J. and Luo Y. (2018) The role of calcification in carbonate compensation, *Nature Geosci.*, v. 11, 894-900, <https://doi.org/10.1038/s41561-018-0259-5>.
99. Sulpis, O., Mucci, A., Boudreau, B.P., Barry, M. and Johnson, B.D. (accepted December 2018, in press) Precise control of the diffusive boundary layer thickness above the sediment-water interface in a thermostated rotating-disk reactor. *Limnol. Oceanogr. Methods*.

Submitted Papers (Refereed):

100. Boudreau, B.P., Middelburg, J.J., Sluijs, A. and van der Ploeg, R. (January 2018, in second review) Secular variations in the carbonate chemistry of the oceans over the Cenozoic. *Earth Planet. Sci. Letter*.
101. van der Ploeg, R., Boudreau, B.P., Middelburg, J.J., and Sluijs, A. (Submitted October 2018) Convergent Cenozoic continental weathering and carbonate burial reconstructions. *Geology*.
102. Boudreau, B.P. and Hill, P.H. (submitted January 2019) Rouse Revisited: The Bottom Boundary Condition for Suspended Sediment. *Marine Geology*.
103. Sulpis, O., Dufour, C., Trossman, D., Fassbender, A., Mucci, A., Arbic, B.K., Boudreau, B.P. (submitted January 2019) Globally decreasing seafloor CaCO₃ dissolution in the 21st century under RCP8.5. *Geophys. Res. Lett.*
104. Boudreau, B.P., Sulpis, O. and Mucci, A. (submitted January 2019) Porewater pH profiles with mass-transfer-controlled CaCO₃ dissolution. *Geochim. Cosmochim. Acta*.

Books - Authored:

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- Boudreau, B.P. and Jørgensen, B.B., eds. (Dec. 2000) *The Benthic Boundary Layer: Transport Processes and Biogeochemistry*. Oxford University Press. ISBN 0-19-511881-2

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Recent Research Collaborators (past 5 years):

Bruce Johnson and Mark Barry – Pro-oceanus Inc., Bridgewater, NS, Canada
 Jack Middelburg, Appy Sluijs, and Robin van der Ploeg, University of Utrecht
 Gerry Dickens – Rice University
 Alfonso Mucci and Olivier Sulpis – McGill University
 Yiming Luo, Sun Yat-sen University, Guangzhou, China
 Bob Key, Princeton University
 Brian Arbic, University of Michigan

Post-Doctoral Fellows:

Roberta Marinelli – Dean, College of Earth, Ocean and Atmospheric Sciences, Univ. Oregon
 Sandor Mulsow – Science Head, International Seabed Authority, Office of Resources and Environmental Monitoring (OREM), Jamaica
 Peter Eldridge – Research Scientist, NOAA (deceased)
 Frederique Carcaillet – Maitre de conférences, Université Montpellier II
 Jae Choi – Senior Research Scientist, DFO, Bedford Institute of Oceanography
 Bruce Gardiner – Professor of Physics and Deputy Dean for Engineering and Information Technology, Murdoch University, Perth, Australia
 Filip Meysman – Professor of Biology, University of Antwerp (just appointed)
 Matthias Haeckel (Feodor Lynen Fellow) – Mitarbeiter (Research Scientist) GEOMAR
 Katherine Huang – Privately employed computer consultant (Toronto)
 Yiming Luo – Assistant Professor, Sun Yat-sen University, Guangzhou, China

Graduate Students:

Daniel Reed (PhD) - recipient of a 2005 AGU Best Student Paper Prize, graduated Nov. 2007; contract researcher, Dept. Fisheries and Oceans, Canada
 Mark Barry (PhD) – Research Scientist with Pro-Oceanus Inc. (Nova Scotia)
 Chris Algar (PhD) - Killam and NSERC Pre-Doctoral Fellow - defended 16 Nov. 2009;

Assistant Professor, Dalhousie University
Chris L'Esperence (MSc) - defended 28 August 2009; now a PhD student at Dalhousie
Kelly Dorgan (PhD) - U. Maine - extramural advisor. She is the 2007 recipient of the
Lindeman Prize from ASLO for our joint Nature paper and one of
Popular Sciences "Brilliant Ten" for 2006; Associate Prof. at Univ.
South Alabama.

Published with 2 other students: Olivier Sulpis, McGill University
Robin van der Ploeg, Utrecht University