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Objective:

My objectives as an S&T professional are: (i) to develop a quantitative predictive capability for the fate and transport of aquatic sediments and sediment-bound compounds (including carbon and contaminants) in watersheds, rivers, estuaries and continental shelves; (ii) to develop a quantitative predictive capability for the environmental/geological consequences of the interactions between sediments, sediment-bound compounds and benthic organisms; and (iii) to develop a computational model framework for the littoral and shelf sediment/contaminant dynamics that consider hydrodynamics, particle surface chemistry and sediment material mechanics along with the traditional chemical mass transfer processes.

Specialization:

- Sediment/Soil Biogeochemistry (sediment-benthos interactions and sedimentary organic matter fate/transport)
- Sediment Dynamics (numerical modeling and sedimentological field sample analysis and model validation)
- Littoral Environmental Biogeochemistry (sediment-contaminant interactions and contaminant fate/transport modeling and field validation)
- Physical-chemistry of Natural Colloids
- Material Surface Chemistry
- Computational numerical modeling

Education:

- Ph.D., Geosciences, Pennsylvania State University, August 1994.
- B.Eng., Mineral Resources Engineering, Waseda University, Tokyo, Japan, March 1989
- High School Diploma, Tokyo Gakugei Univ.-Attached High School, Japan, March 1985

Membership in Technical Societies and Organizations:

- American Chemical Society Division of Geochemistry
- American Geophysical Union
- American Society for Limnology and Oceanography
- Geochemical Society
- Geochemical Society of Japan
- Coastal Education and Research Foundation

Selected Services and Activities:

- Co-Editor-in-Chief, *Geochemical Transactions* (2012 – present)
- Technical Committee Member, **SERDP-ER** (2009 – present)
- Technical Committee Member, **ESTCP-ER** (2009 – present)
- Alternate Councilor, American Chemical Society (2011 – present) **ELECTED**
- Chair, American Chemical Society Division of Geochemistry (2006) **ELECTED**
- Program Chair, American Chemical Society Division of Geochemistry (2005) **ELECTED**
- Treasurer, American Chemical Society Division of Geochemistry (2008 - 2010) **ELECTED**
- Secretary, Goldschmidt Conference International Program Committee (2003)
- Thematic Chair (Biogeochemistry), Goldschmidt Conference Program Committee (2005)
- Membership Chair, American Chemical Society Division of Geochemistry (2003-2004)

Recent Field Experiments:

- Northern Gulf of Mexico in the vicinity of the Atchafalaya Bay, April 2 – 7, 2013 (**Chief Scientist**, on board *R/V Pelican*)
- Northern Gulf of Mexico in the vicinity of the Atchafalaya Bay, June 9 – 15, 2012 (**Chief Scientist**, on board *R/V Pelican*)
- Mississippi Sound, five (5) day cruises between August 2011 and February 2012 (participating geochemist, on board *R/V EO Wilson*)

Recent Funding Acquisitions:

- Biogeochemical Forcings on Sediment Strength and Dynamics (**PI**, 2009 – 2014, \$5,710K)
- Benthic Microbial Fuel Cell Design Considerations (**co-PI**, 2012 – 2016, \$583K)
- Environmental Considerations for Benthic Microbial Fuel Cell (**co-PI**, 2009 – 2012, \$676K)

Selected Publications:

1. Furukawa, Y. and J. R. Dale (2013). "The surface properties of *Shewanella putrefaciens* 200 and *S. oneidensis* MR-1: the effect of pH and terminal electron acceptors." *Geochemical Transactions* **14**(1): 3.
2. Zhang, G., H. Yin, et al. (2013). "Effects of exopolymers on particle size distributions of suspended cohesive sediments." *Journal of Geophysical Research: Oceans*.
3. Furukawa, Y. and J. L. Watkins (2012). "Effect of organic matter on the flocculation of colloidal montmorillonite: a modeling approach." *Journal of Coastal Research* **28**(3): 726-737.
4. Keen, T. R., R. L. Slingerland, et al. (2012). Sediment transport on continental shelves: storm bed formation and preservation in heterogeneous sediments. *Sediments, Morphology and sedimentary processes on continental shelves*, Wiley-Blackwell. **44**: 295-310.

5. Kim, J., Y. Furukawa, et al. (2012). "Role of chitin in montmorillonite fabric: transmission electron microscope observations." Clays and Clay Minerals **60**(1): 89-98.
6. Wang, G., P. Ma, et al. (2012). "Endocrine disrupting chemicals in New Orleans surface waters and Mississippi Sound sediments." Journal of Environmental Monitoring **14**(5): 1353-1364.
7. Robertson, K., Y. Furukawa, et al. (2012). "Deletion of the Hoc and Soc capsid proteins affects the surface and cellular uptake properties of bacteriophage T4 derived nanoparticles." Biochemical and Biophysical Research Communications **418**(3): 537-540.
8. Sou, I. M., J. Calantoni, et al. (2012). "Laboratory investigation of the erosion of cohesive sediments under oscillatory flows using a synchronized imaging technique." Bulletin of the American Physical Society **57**.
9. TAN, X.-l., G.-p. ZHANG, et al. (2012). "Characterization of particle size and settling velocity of cohesive sediments affected by a neutral exopolymer." International Journal of Sediment Research **27**(4): 473-485.
10. Yin, H., X. Tan, et al. (2010). "Influence of Compositional Variations on Floc Size and Strength." AGU Fall Meeting Abstracts **1**: 1421.
11. Furukawa, Y., J. L. Watkins, et al. (2009). "Aggregation of montmorillonite and organic matter in aqueous media containing artificial seawater." Geochemical Transactions **10**: 2.
12. Montgomery, M. T., C. L. Osburn, et al. (2008). "Increased capacity for polycyclic aromatic hydrocarbon mineralization in bioirrigated coastal marine sediments." Bioremediation Journal **12**(2): 98-110.
13. Keen, T. and Y. Furukawa (2007). "A modular entrainment model for cohesive sediment." Proceedings in Marine Science **8**: 189-207.
14. Furukawa, Y. and S. O'Reilly (2007). "Rapid precipitation of amorphous silica in experimental systems with nontronite (NAu-1) and *Shewanella oneidensis* MR-1." Geochimica Et Cosmochimica Acta **71**(2): 363-377.
15. Keen, T. R., Y. Furukawa, et al. (2006). "Geological and oceanographic perspectives on event bed formation during Hurricane Katrina." Geophysical Research Letters **33**: L23614.
16. Brunner, C. A., J. M. Beall, et al. (2006). "Hypoxia hotspots in the Mississippi Bight." The Journal of Foraminiferal Research **36**(2): 95.
17. Furukawa, Y. (2005). "Biogeochemical consequences of infaunal activities." Macro and Microorganisms in Marine Sediments: Coastal and Estuarine Studies **60**: 159-177.
18. O'Reilly, S., Y. Furukawa, et al. (2006). "Dissolution and microbial Fe (III) reduction of nontronite (NAu-1)." Chemical geology **235**(1-2): 1-11.
19. O'Reilly, S. E., J. Watkins, et al. (2005). "Secondary mineral formation associated with respiration of nontronite, NAu-1 by iron reducing bacteria." Geochemical Transactions **6**: 7.
20. Reed, A., C. Algar, et al. (2005). "Bubble growth and rise in soft sediments." Geology(6): 517-520.
21. Boudreau, B. P., C. Algar, et al. (2005). "Bubble growth and rise in soft sediments."

- Geology **33**(6): 517.
22. Kim, J.-w., Y. Furukawa, et al. (2005). "The effect of microbial Fe (III) reduction on smectite flocculation." Clays and clay minerals **53**(6): 572.
 23. Furukawa, Y., A. C. Smith, et al. (2004). "Quantification of macrobenthic effects on diagenesis using a multicomponent inverse model in salt marsh sediments." Limnology and Oceanography: 2058-2072.
 24. Kim, J.-w., Y. Furukawa, et al. (2003). "Characterization of microbially Fe (III)-reduced nontronite: environmental cell-transmission electron microscopy study." Clays and Clay Minerals **51**(4): 382.
 25. Viollier, E., C. Rabouille, et al. (2003). "Benthic biogeochemistry: state of the art technologies and guidelines for the future of in situ survey." Journal of Experimental Marine Biology and Ecology **285**: 5-31.
 26. Furukawa, Y., J.-W. Kim, et al. (2002). "Formation of ferrihydrite and associated iron corrosion products in permeable reactive barriers of zero-valent iron." Environmental Science & Technology **36**(24): 5469-5475.
 27. Furukawa, Y. (2001). "1 O Microwave Processing of Sediment Samples." Microwave techniques and protocols: 123.
 28. Furukawa, Y. (2001). "Biogeochemical consequences of macrofauna burrow ventilation." Geochemical Transactions **2**(1): 83-91.
 29. Furukawa, Y., S. J. Bentley, et al. (2001). "Bioirrigation modeling in experimental benthic mesocosms." Journal of marine research **59**(3): 417-452.
 30. Lavoie, D., J. Watkins, et al. (2001). "Microwave Processing of Sediment Samples." Microwave Techniques and Protocols: 123-137.
 31. Furukawa, Y., S. J. Bentley, et al. (2000). "The role of biologically-enhanced pore water transport in early diagenesis: An example from carbonate sediments in the vicinity of North Key Harbor, Dry Tortugas National Park, Florida." Journal of marine research **58**(3): 493-522.
 32. Bentley, S. J., Y. Furukawa, et al. (2000). "Record of event sedimentation in Mississippi Sound." Transactions-Gulf Coast Association of Geological Societies: 715-724.
 33. Furukawa, Y. (2000). "Energy-filtering transmission electron microscopy (EFTEM) and electron energy-loss spectroscopy (EELS) investigation of clay-organic matter aggregates in aquatic sediments." Organic Geochemistry **31**(7-8): 735-744.
 34. Furukawa, Y., D. Lavoie, et al. (1997). "Effect of biogeochemical diagenesis on sediment fabric in shallow marine carbonate sediments near the Dry Tortugas, Florida." Geo-Marine Letters **17**(4): 283-290.
 35. Bentley, S., K. Briggs, et al. (1997). "Appendix B Names and addresses of attendees." Boundary Layer Key West Workshop **574**: 221.
 36. Furukawa, Y. and H. Barnes (1996). "Reactions forming smythite, Fe₉S₁₁." Geochimica Et Cosmochimica Acta **60**(19): 3581-3591.
 37. Furukawa, Y. and H. Barnes (1995). "Reactions forming pyrite from precipitated amorphous ferrous sulfide." ACS Symposium Series **612**: 194-205.
 38. Furukawa, Y. and H. Barnes (1994). "Replacement Mechanisms Among Iron Sulphide Minerals." Mineralogical Magazine **58**(1): 299-300.