

*CURRICULUM VITAE*

**David Bryan Senn**

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**EDUCATION**

<b>M.I.T.</b>	Civil and Environmental Engineering	Ph.D.	2001
<b>Rutgers University</b>	Civil and Environmental Engineering	B.S.	1992

**RESEARCH INTERESTS**

- Biogeochemistry, fate and transport of nutrients and trace metals/metalloids in lakes, rivers, wetlands, and estuarine/marine systems
- Integrated water resources management

**RESEARCH EXPERIENCE**

**San Francisco Estuary Institute** 2011-present  
Richmond, CA  
*Senior Scientist, Co-Director of Clean Water Program*  
*Lead Scientist, Nutrient Management Strategy for San Francisco Bay*

**Swiss Federal Institute of Technology (ETH-Zürich) and  
Swiss Federal Institute of Aquatic Science and Technology (Eawag)**  
Zurich, Switzerland 2007-2011  
*Senior Researcher*  
- interdisciplinary study of dam impacts in the Zambezi River Basin  
- methylmercury bioaccumulation in marine and freshwater (Swiss lakes and rivers) systems

**Harvard School of Public Health**  
Department of Environmental Health 2001-2002  
*Research Fellow*  
*Research Associate* 2002-2007  
heavy metal transport, speciation, bioavailability, and human exposure in coastal ecosystems and mining-impacted areas.  
*Center Scientist* 2004-2006  
Harvard Center for Children's Environmental Health - Assessing heavy metal mobility and human exposure around an abandoned lead and zinc mine.

**Massachusetts Institute of Technology**  
Department of Civil and Environmental Engineering, Parsons Laboratory 1995-2001  
*Research Assistant*  
arsenic fate and transport, limnology, biogeochemistry

**University of New Orleans**  
Department of Civil and Environmental Engineering 1994-1995  
*Research Associate*  
designing rehabilitation measures for the sanitary sewerage system of Guayaquil, Ecuador

## **TEACHING/EDUCATION EXPERIENCE**

### **ETH-Zürich**

Department of Environmental Sciences

*Instructor-* The Science and Politics of International Water Management 2008, 2010, 2011

### **Harvard School of Public Health, Boston MA**

Department of Environmental Health

*Instructor -* Water Pollution 2003-2006

### **Massachusetts Institute of Technology, Cambridge MA**

Department of Civil and Environmental Engineering, Parsons Laboratory

*Teaching Assistant –*Fate and Transport of Contaminants 1999

### **Tufts University, Medford MA**

Department of Civil and Environmental Engineering

*External masters thesis committee member* 1998,2001,2003,2006

### **Orleans Parish Public Schools, New Orleans LA**

*Teacher:* sixth, seventh, and eighth grade mathematics 1992-1994

## **MAJOR PROJECTS and FUNDING**

NOAA Oceans and Human Health Initiative, *Coastal Eutrophication and Hypoxia: Implications for Mercury Methylation, Mercury Biomagnification, and Human Health*

PI: DB Senn; \$830,000 (project period: 2004-2008)

US National Science Foundation (NSF) Chemical Oceanography Program – *Assessing the Impact of Hurricanes on Mercury Biogeochemistry and Methylation in the Gulf of Mexico*

PI: DB Senn, jointly with RP Mason, University of Connecticut; \$180,000 (project period: 2005-2007)

Swiss Federal Office for the Environment (BAFU/OFEV) *Hg biomonitoring in Swiss rivers and lakes*

PI: DB Senn; \$50,000 (project period: August 2009-July 2010)

Swiss National Science Foundation (SNF), R'Equip Program, *High resolution in situ nutrient mapping of large river and reservoir systems*

PI: DB Senn, jointly with B Wehrli (ETH, Eawag); \$250,000 (awarded 2009)

Competence Center Environment and Sustainability (CCES), *African Dams Project (ADAPT):*

*Adapt planning and operation of large dams to social needs and environmental constraints - an integrated water resource management study in the Zambezi Basin*

co-PI:DB Senn; \$1.4mill (awarded June 2008; Senn=2 PhD projects, floodplain & reservoir biogeochem.)

Eawag Seed Funding proposal, *Measuring N isotopes in specific amino acids to accurately quantify trophic position: Method development and applications in aquatic ecology, evolutionary biology, and contaminant trophic transfer studies.*

PI: DB Senn; \$60,000 (2010-2011)

Foundation for the Study of Lake Geneva, *Real-time mapping and measurement of methane ebullition and fate in the River Rhone Delta, Lake Geneva*

PI: DB Senn; \$190,000 (2011-2012)

*Nutrient Management Strategy for San Francisco Bay*, PI: DB Senn ~\$2.5mill 2012-2015, ~\$1.4 mill/yr anticipated 2016-2019

## **ADVISING**

### *Postdoctoral researchers*

Melissa Peacock, PhD (2013-present) – UC Santa Cruz and SFEI (jointly with R Kudela, UCSC), phytoplankton community composition and toxins in San Francisco Bay.

Anthony Malkasian, PhD (2013-2014) – SFEI and UC Santa Cruz, San Francisco Bay response to nutrients.

Tonya Del Sontro, PhD (2011-2012) – ETH-Zurich, Methane emissions from the Rhone Delta

Bian Liu, PhD (2007-2008) – Harvard School of Public Health, Hg sediment biogeochemistry in the Gulf of Mexico.

Michael Bank, PhD (2004-2006)– Harvard School of Public Health, Hg sediment biogeochemistry in the Gulf of Mexico, methylmercury bioaccumulation and trophic transfer in fish.

### *PhD students*

Manuel Kunz (2011) – ETH-Zürich and Eawag, Nutrient/carbon cycling and sediment retention in large reservoirs of the Zambezi River Basin.

Roland Zurbrügg (2012) - ETH-Zürich and Eawag, Nutrient/carbon cycling in river-wetland systems in the Zambezi River Basin.

### *Masters thesis students*

Nanina Blank (2009) – ETH-Zürich, Nitrogen cycling in two floodplains of the Zambezi River Basin (Zambia)

Jan Landert (2009) - ETH-Zürich, Modeling biogeochemistry in the Zambezi River Basin using the Soil and Water Assessment Tool (SWAT)

Adrian Vollenweider (2009) – ETH-Zürich, Sediment records of Lake Kariba and Lake Itzhi-Tezhi (Zambia)

Jason Wamulume (2011) – University of Zambia, Annual hydrological and nutrient balance of the Kafue Flats (Zambia)

Tim Kempter (2010) - ETH-Zürich, Methane production and emissions in shallow bays of Kariba Reservoir (Zambia)

Stephan Suter (2011) – ETH-Zürich, Dissolved organic matter composition in a tropical river-floodplain ecosystem during flood recession (Kafue Flats, Zambia)

### *Bachelor thesis students*

Aline Meier (2009) – ETH-Zürich, Development of a model for predicting evaporative losses in a tropical floodplain using  $\delta^{18}\text{O}\text{-H}_2\text{O}$ .

Stefan Bucher (2009) – ETH- Zürich, Modeling dissolved oxygen and carbon dioxide levels in the Kafue River, Zambia

## **COMMUNITY/OUTREACH EXPERIENCE**

### **Mystic River Watershed Association, Arlington MA**

*Board of Directors*

2001-2005

*Water Quality Committee*

1998-2005

### **Edward W. Brooke Charter School, Boston MA**

*Chair, Board of Trustees*

2002- 2005

*Board of Trustees*

2002- 2005

### **Aberjona Study Coalition, Woburn MA**

2003- 2004

Served on committee to select and direct consultants, hired through an EPA TAG, to review risk assessments and remedial investigation/design for a Superfund site and downstream areas to which contaminants have migrated.

### **Consultant to Friends of Spy Pond and Town of Arlington**

1998-2000

Assessed sediment/water quality of arsenic-contaminated Spy Pond for community group and town government.

**PEER-REVIEWED PUBLICATIONS** (\*=Senn as Principal Investigator; <sup>^</sup> = student or post-doc advisee)

31. AL Zuidgeest, R Zurbrügg, N Blank, R Fulcri, DB Senn, B Wehrli (2015) Seasonal dynamics of carbon and nutrients from two contrasting tropical floodplain systems in the Zambezi River basin *Biogeosciences* 12 (24), 7535-7547
30. \*Liu B<sup>^</sup>, LA Schaidler, RP Mason, NN Rabalais, JP Shine, DB Senn (2015) Controls on methylmercury accumulation in northern Gulf of Mexico sediments, *Estuarine, Coastal, and Shelf Science*. 159: 50-59, doi:10.1016/j.ecss.2015.03.030
29. Schaidler LA, DB Senn, ER. Estes, DJ. Brabander, JP Shine (2014) Sources and fates of heavy metals in a mining-impacted stream: Temporal variability and the role of iron oxides. *Science of The Total Environment*, 490: 456-466, <http://dx.doi.org/10.1016/j.scitotenv.2014.04.126>.
28. Sollberger S, JP Corella, S Girardclos, ME Randlett, CJ Schubert, DB Senn, B Wehrli, T DelSontro (2014) Spatial heterogeneity of benthic methane dynamics in the subaquatic canyons of the Rhone River Delta (Lake Geneva) *Aquatic Sciences* 76(1):89-101
27. Kunz MJ, DB Senn, B Wehrli, EM Mwelwa, A Wüest (2013) Optimizing turbine withdrawal from a tropical reservoir for improved water quality in downstream wetlands. *Water Resources Research*, 49(9): 5570-5584. doi: 10.1002/wrcr.20358
26. \*<sup>^</sup>Blank N, AG Hudson, P Vonlanthen, O Seehausen, CR Hammerschmidt, DB Senn (2013) Speciation leads to divergent methylmercury accumulation in sympatric whitefish. *Aquatic Sciences*, doi:10.1007/s00027-012-0271-6
25. \*<sup>^</sup>Zurbrügg R, S Suter<sup>^</sup>, MF Lehmann, N Blank<sup>^</sup>, B Wehrli, DB Senn. (2013) Organic C and N export from a tropical dam-impacted floodplain system (Kafue Flats, Zambia) *Biogeosciences* 10(1):23-38. doi:10.5194/bg-10-23-2013.
23. \*<sup>^</sup>Zurbrügg R, J Wamulume<sup>^</sup>, Romas Kamanga<sup>^</sup>, B Wehrli, DB Senn (2012) River-floodplain exchange and its effect on the fluvial oxygen regime in a large tropical river system (Kafue Flats, Zambia). *JGR-Biogeosciences*, 117:1-12, doi:10.1029/2011JG001853.
22. Dong Z, DB Senn, RE Moran, JP Shine (2012) Prioritizing environmental risk of prescription pharmaceuticals. *Regulatory Toxicology and Pharmacology* 65(1):60-7, doi: 10.1016/j.yrtph.2012.07.003
21. \*<sup>^</sup>Kunz M, A Wueest, B Wehrli, J Landert, DB Senn (2011) Impact of a large tropical reservoir on riverine transport of sediment, carbon, and nutrients to downstream wetlands. *Water Resources Research* 47(12), doi:10.1029/2011WR010996
20. \*<sup>^</sup>DelSontro T, MJ Kunz <sup>^</sup>, T Kempter, A Wueest, B Wehrli, DB Senn (2011) Spatial heterogeneity of methane ebullition in a large tropical reservoir. *Environmental Science & Technology*. 45 (23), 9866-9873. doi:10.1021/es2005545
19. \*<sup>^</sup>Kunz M, A Vollenweider<sup>^</sup>, FS Anselmetti, B Wehrli, A Wüest, DB Senn (2011) Sediment accumulation and carbon, nitrogen, and phosphorous deposition in the large tropical reservoir Lake Kariba (Zambia/Zimbabwe). *JGR-Biogeosciences*. G03003, doi:10.1029/2010JG001538.
18. \*<sup>^</sup>Wamulume J, J Landert<sup>^</sup>, R Zurbruegg<sup>^</sup>, I Nyambe, B Wehrli, DB Senn (2011) Exploring the hydrology and biogeochemistry of the dam-impacted Kafue River and Kafue Flats. *Physics and Chemistry of the Earth*. 36: 775-788.
17. Tilmant A, W Kinzelbach, D Juizo, L Beevers, DB Senn, C Casarotto (2011) Economic Valuation of Benefits and Costs Associated with the Coordinated Development and Management of the Zambezi Basin. *Water Policy* doi:10.2166/wp.2011.189.
16. \*<sup>^</sup>Lincoln R, JP Shine, EJChesney, DJ Vorhees, P Grandjean, DB Senn (2011) Methyl-mercury exposure among recreational anglers in coastal Louisiana *Environmental Health Perspectives*, 119:245–251 doi: 10.1289/ehp.1002609

15. \*Senn DB, EJ Chesney, JD Blum, MS Bank<sup>Δ</sup>, A Maage, JP Shine (2010) Stable isotope (N, C, Hg) study of methylmercury sources and trophic transfer in the northern Gulf of Mexico. *Environmental Science & Technology*. doi: 10.1021/es902361j
14. Osterman LE, RZ Poore, PW Swarzenski, DB Senn, S DiMarco, RE Turner (2009) 20<sup>th</sup> Century development and expansion of Louisiana shelf hypoxia, Gulf of Mexico *Geo-marine Letters* 29(6): 405-414
13. \*<sup>Δ</sup>B Liu, LA Schaider, RP Mason, MS Bank<sup>Δ</sup>, NN Rabalais, PW Swarzenski, JP Shine, T Hollweg, DB Senn (2009) Disturbance impacts on mercury dynamics in northern Gulf of Mexico sediments. *Journal of Geophysical Research-Biogeosciences*, 114, G00C07, doi:10.1029/2008JG000752
12. \*Rice GE, DB Senn, JP Shine (2009) Relative importance of atmospheric and riverine mercury sources to the northern Gulf of Mexico. *Environmental Science & Technology* 43(2):415-422.
11. \*<sup>Δ</sup>MS Bank, EJ Chesney, JP Shine, A Maage, DB Senn (2007) Mercury bioaccumulation and trophic transfer in sympatric snapper species from the Gulf of Mexico. *Ecological Applications* 17(7): 2100-2110.
10. Senn, DB, JE Gawel, JA Jay, HF Hemond, JL Durant (2007) Long-term fate of a pulse arsenic input to a eutrophic lake. *Environmental Science & Technology* 41(9): 3062 -3068.
9. Schaider L, DB Senn, DJ Brabander, JP Shine (2007) Characterization of zinc, lead and cadmium in mine waste: Implications for transport, exposure and bioavailability. *Environmental Science & Technology* 41(11): 4164-4171.
8. Lattanzi PR, DB Senn, JA Jay, V Monastra, KM Regan, JL Durant (2007) Persistence and remobilization of arsenic in Massachusetts (USA) lakes treated with arsenical herbicides *Lake and Reservoir Management* 23:59-68.
7. Isaacs A.M., DB Senn, JP Shine, BA Yankner (2006) Calcium regulates Abeta protofibril to fibril transition *Journal of Biological Chemistry* 281: 27916-27923.
6. Jay JA, NK Blute, K Lin, DB Senn, HF Hemond, JL Durant (2005) Controls on arsenic speciation and solid-phase partitioning in the sediments of a two-basin lake. *Environmental Science & Technology* 39 (23):9174 - 9181.
5. Senn DB, HF Hemond (2004) Particulate arsenic and iron in the anoxic hypolimnion of a eutrophic, urban lake. *Environmental Toxicology and Chemistry* 23(7):1610-1616.
4. Durant, JL, T Ivushkina, K MacLaughlin, H Lukacs, J Gawel, DB Senn, HF Hemond (2004) Elevated levels of arsenic in the sediments of an urban pond: distribution, sources and water quality impacts. *Water Research* 38:2989-3000.
3. McCarty K, DB Senn, M Kile, Q Quamruzzaman, M Rahman, , G Mahiuddin, D Christiani (2004) Antimony: an unlikely confounder in the relationship between well water arsenic and health outcomes in Bangladesh. *Environmental Health Perspectives* 112(8):809-811.
2. Senn DB, S Griscom, C Lewis, J Galvin, M Chang, JP Shine (2004) Equilibrium sampler for determining copper free metal ion concentration. *Environmental Science & Technology* 38(12):3381-3386.
1. Senn DB, HF Hemond (2002) Nitrate controls on iron and arsenic in an urban lake. *Science* 296: 2373-2376.