

William E. Schnabel, Ph.D., P.E.

UAF Institute of Northern Engineering
525 Duckering Building, PO Box 755910
Fairbanks, AK 99775-5910
(907) 474-7789 weschnabel@alaska.edu

Education

Ph.D., Environmental Systems Engineering, May 2000

The University of Alaska Fairbanks

M.S., Environmental Engineering, May 1996

The University of Iowa; Iowa City, IA

B.S., Chemistry, May 1991

Purdue University; West Lafayette, IN

**Dissertation Title: Phytoremediation
Strategies for Recalcitrant Chlorinated
Organics**

Post-Ph.D. Employment

7/16 – Present	University of Alaska Fairbanks <i>Director, Institute of Northern Engineering</i> <i>Director, Water and Environmental Research Center</i> <i>Associate Dean, College of Engineering and Mines</i> <i>Professor, Dept. of Civil and Environmental Engineering</i>	Fairbanks, AK
1/15 – 6/16	University of Alaska Fairbanks <i>Interim Director, Institute of Northern Engineering</i>	Fairbanks, AK
8/13 – 6/16	University of Alaska Fairbanks <i>Associate Professor,</i> <i>Dept. of Civil and Environmental Engineering</i>	Fairbanks, AK
7/12 – 1/15	University of Alaska Fairbanks <i>Associate Director, Institute of Northern Engineering</i>	Fairbanks, AK
7/09 – 1/15	University of Alaska Fairbanks <i>Director, Water & Environmental Research Center</i> <i>Research Associate Professor</i>	Fairbanks, AK
9/07 – 6/09	University of Alaska Fairbanks <i>Research Assistant Professor</i>	Fairbanks, AK
8/06 – 9/07	Golder Associates Inc. <i>Senior Project Engineer</i>	Duluth, MN
1/02 – 7/06	University of Alaska Anchorage <i>Assistant Professor</i>	Anchorage, AK
6/00 – 11/01	Ecolotree Incorporated <i>Project Engineer / Project Manager</i>	North Liberty, IA

Current Associations

- Registered Professional Engineer (Environmental), Alaska License # EV 14254
- American Society of Civil Engineers (Associate Member)

- American Water Resources Association
- American Geophysical Union

Detailed Academic Experience

Funded Research (PI or co-PI)

- PI** ***GCI Fiber Optic Project*** (2016). Led an interdisciplinary team to evaluate options for connecting remote Arctic communities via fiber optic cable. Investigation focused on the impacts of placement methods (trenching, direct lay, poles) across permafrost-impacted, polygonal ground. **Funding Agency: General Communications Incorporated. Grant Total: \$67,000**
- PI** ***UAF Participation in Denali Commission's Initiative for Environmentally Threatened Communities*** (2016). Organized and led an interdisciplinary team to evaluate threats of erosion, flooding, and permafrost degradation in Alaska's rural communities. **Funding Agency: The Denali Commission. Grant Total: \$50,000**
- PI** ***Herder Burner: A Field Test of Chemical Herders for In Situ Burning of Crude Oil*** (2014-2015). Constructed a test basin and performed meso-scale field trials of aerial applied chemical herders for in situ burning. **Funding Agency: SL Ross; the International Association of Oil and Gas Producers. Grant Total: \$692,452**
- PI** ***Ice Thickness Measurements on the Yukon River Using Ground Penetrating Radar.*** (2013). Conducted GPR surveys of Yukon River ice to evaluate potential ice road routes to Tanana, Alaska. **Funding Agency: Alaska Department of Transportation & Public Facilities. Grant Total: \$18,823**
- PI** ***Geophysical Methods for Arctic and Subarctic Transportation Planning.*** (2010-2014). Evaluated the use of electrical resistivity tomography (ERT) for visualizing frozen ground characteristics in continuous and discontinuous permafrost zones. **Funding Agency: US Department of Transportation/Alaska Department of Transportation & Public Facilities. Grant Total: \$195,262**
- PI** ***North Slope DSS: A GIS-Based Support System for Informing Water Resource Decisions.*** (2008-2012). Developed new and modified existing water resource models for inclusion into a modular decision support framework. The decision support system was designed for use by industry, regulatory agencies, scientists, municipal planners, and other stakeholders associated with Alaskan North Slope water resources. **Funding Agency: US Department of Energy. Grant Total: \$1,048,032**
- PI** ***Using Modeling to Assess CO2 Sequestration, Engineering, Environmental, and Economic Issues Related to a Proposed Coal-to-Liquids Plant in Interior Alaska.*** Conducted measurements, evaluation, and modeling to investigate feasibility of offsetting CO2 production of a proposed industrial facility through the cultivation of biomass fuels. **Funding Agency: US Air Force. Grant Total: \$261,278**

- PI** *Impacts of Cold Region Open Dumps on Microbial Water Quality (2009 – 2010).* Surveyed microbial water quality in rural Alaskan villages associated with solid waste sites. Evaluated possible feedback mechanisms between microbial water quality and human health. **Funding Agency: USGS/National Institute for Water Resources. Grant Total: \$20,000**
- PI** *Kuparuk Foothills Hydrology Study (2006 – 2011).* Evaluated quality and quantity of lake water resources for industrial use on Alaska’s North Slope. Contributed to an interdisciplinary multi-project initiative to characterize surface water flow processes on the North Slope. **Funding Agency: Alaska Department of Transportation & Public Facilities. Grant Total: \$2,188,046**
- PI** *Partitioning Behavior of Pathogen Indicator Organisms in Snowmelt (2008 – 2009).* Investigated the survivability and partitioning dynamics of fecal indicator organisms associated with agricultural activities. Constructed snow lysimeters to capture snow and assess snowmelt water quality. **Funding Agency: USDA-CSREES. Grant Total: \$99,951**
- PI (UAA)** *Sources and Dynamics of Fecal Coliform Bacteria in University Lake (2005-2006).* Employed bi-weekly sampling and source tracking to investigate origin and fate of fecal indicator bacteria in an impacted lake. **Funding Agency: Alaska Department of Environmental Conservation**
- PI (UAA)** *Characterizing Sources and Growth Potential of Indicator Bacteria in Cold Region Streams (2005-2006).* Modified the Antibiotic Resistance Analysis source tracking method for use in cold region water bodies. **Funding Agency: USGS/UAF Water and Environmental Research Center**
- PI (UAA)** *An Evapotranspiration Landfill Cap at Elmendorf Air Force Base (2004-2010).* Modeled, designed, constructed, and monitored two pilot-scale basin lysimeters for the assessment of evapotranspiration covers employed at cold region landfills. Developed a method utilizing Electrical Resistivity Tomography to visualize and quantify vadose zone soil moisture. Project led to the installation of a full-scale evapotranspiration cover. **Funding Agency: USAF/Weston Solutions**
- PI (UAA)** *Developing Sustainable Waste Management Technologies in Sichuan, China (2005).* Project was performed as a supplement to an Engineers Without Borders student group trip. Undergraduate research involved literature review, presentation, and design of sustainable water/wastewater/waste management solutions for use in a remote Chinese village. **Funding Agency: University of Alaska Anchorage**
- PI (UAA)** *Spatial, Temporal, and Phase Distribution of Fecal Coliform Bacteria in Chester Creek (2004-2005).* Employed weekly sampling and spatial analysis to develop a conceptual model and propose best management practices for an urban stream. **Funding Agency: Alaska Department of Environmental Conservation**
- PI (UAA)** *Metals Uptake from Surface Waters Through a Sand Filter Willow Wetlands (2003).* Constructed a greenhouse wetlands to investigate the use of willow plantations as a best management practice for surface water quality. **Funding Agency: Alaska EPSCoR**

- Co-PI** *Hydro-Sedimentological Monitoring and Analysis Program for Material Sites on the Sagavanirktok River: Phase I* (2015 – present). Collect river discharge and sediment measurements associated with resurfacing efforts on the Dalton Highway. **Funding Agency: Alaska Department of Transportation & Public Facilities. Grant Total: \$1,455,716**
- Co-PI** *Phytoremediation in Kaltag, Alaska. Phase III: Phytoremediation of Soil Contaminated with DRO and 1-chloro-octadecane - Initial Field Implementation* (2014-2015). Installed a field test plot to mitigate contaminated soil in Kaltag, AK. **Funding Agency: Alaska Department of Environmental Conservation. Grant Total: \$25,000**
- Co-PI** *Meteorological and Hydrological Monitoring and Analysis Program for the Ambler Corridor: Phase 1-3* (2012-present). Monitoring, modeling, and evaluating watershed processes in four remote rivers to support planning efforts for a transportation corridor to the Ambler mining district. **Funding Agency: Alaska Industrial Development and Export Authority. Grant Total: \$1,373,519**
- Co-PI** *Water, Energy, and Food Security in the North: Synergies, tradeoffs, and building community capacity for sustainable futures* (2013-present).
The Sustainable Futures North (SFN) project 1 is concerned primarily with developing a more sophisticated understanding of the interactions among environmental security² and natural resource development in the North American Arctic and Subarctic regions. **Funding Agency: National Science Foundation. Grant Total: \$1,227,455**
- Co-PI** *Regional Assessments of Vulnerability and Environmental Security—Water Security in a Changing Coastal Environment (2011-2013)*. Performed an integrative assessment of water assets and vulnerability in the Bristol Bay region of Alaska, and use this activity as a 'sandbox' for defining features and requirements, towards the development of a GIS-based decision support system. **Funding Agency: National Oceanic and Atmospheric Administration. Grant Total: \$134,560**
- Co-PI** *Surface Water Flow Monitoring and Analysis for the North Slope Umiat Corridor* (2009-2014). Worked with an interdisciplinary team to conduct hydrologic/meteorologic monitoring and analysis to support resource development activities on Alaska's North Slope. Focused on collecting snowmelt discharge measurements of remote arctic rivers. **Funding Agency: Alaska Department of Transportation & Public Facilities. Grant Total: \$2,734,784**
- Co-PI** *Data Rescue, Inventory, and Network Analysis of Hydroclimate Data in Arctic Alaska* (2010-2011). Created and populated a searchable database of hydrologic and meteorological data collected by state and federal agencies in Arctic Alaska. **Funding Agency: U.S. Fish and Wildlife Service. Grant Total: \$196,638**
- Co-PI** *Attenuation of Herbicides in Sub Arctic Environments* (2008-2010). Performed field and lysimeter fate and transport studies on a suite of herbicides proposed for use along Alaskan transportation corridors. **Funding Agency: Alaska University Transportation Center. Grant Total: \$209,830**
- Co-PI** *Sagavanirktok River/Bullen Point Hydrology Project* (2008 – 2010). Worked with an interdisciplinary team to conduct hydrologic/meteorologic monitoring and analysis to support resource development activities on Alaska's North Slope. **Funding Agency: Alaska Department of Natural Resources. Grant Total: \$999,352**

- Co-PI (UAA)** *Independent Third Party Review of the Proposed Kincaid Estates Subdivision, Anchorage, Alaska* (2005). Surface water infiltration and groundwater contaminant fate/transport characteristics were assessed to predict the impacts of a proposed subdivision upon a local aquifer. **Funding Agency: Alaska Legislature**
- Co-PI (UAA)** *Evaluation of Stormwater Treatment by Constructed Wetlands in Alaska* (2002 -2003). The performance of three wetlands constructed for stormwater treatment was evaluated with respect to contaminant mitigation and design performance over a period of two field seasons. **Funding Agency: Alaska Department of Transportation and Public Facilities**
- Co-PI (UAA)** *Fundamental and Applied Research on Water Generated during the Production of Gas Hydrates* (2003). Treatment options for water and wastewater produced during methane hydrate extraction were evaluated for use at North Slope drilling installations. **Funding Agency: Anadarko Petroleum Corporation**
- Co-PI (UAA)** *Community Based Service Learning Minigrant: Collection, Analysis, and Dissemination of Water Quality Data for the Chester Creek Watershed* (2003). Collaborated with faculty members from Geology and Biology departments to institute a student-run water quality sampling and assessment program. **Funding Agency: UAA**

Teaching Experience

- *Fluid Mechanics* (ES 341); Fall 13, Spring 15, Fall 15; undergraduate level (UAF)
- *Special Topics* (ENVE 650); Spring 15, Spring 16; graduate level (UAF)
- *Effective Research Writing* (ENVE 693); Spring 14, 16; graduate level (UAF)
- *Water Resources Engineering* (CE 344); Fall 11; undergraduate level (UAF)
- *Remediation* (EQE 613); Spring 02, 03, 05; graduate level (UAA)
- *Water Quality Management* (EQE 602); Fall 02, 03, 05; graduate level (UAA)
- *Goundwater Dynamics* (CE 663); Spring 04, 06; graduate level (UAA)
- *Engineering Graphics* (ES 103); (Team taught) Fall 04; undergraduate level (UAA)
- *Introduction to Environmental Engineering* (CE 441); Fall 05; undergraduate level (UAA)

Service Activities

- Co-Chair – UAF Public Information, Market and Communications Special Program Review Committee (2014 - 2015)
- Member – UAF Center for Global Change Steering Committee (2011-present)
- Member – UAF Master Planning Committee (2012-2016)
- Member – ASCE Technical Council on Cold Regions Engineering Environment and Public Health Committee (2003 – present)

- Manuscript Reviewer – International Journal of Phytoremediation, Environmental Science & Technology, ASCE Journal of Cold Regions Engineering(2002 – present)
- Faculty Liaison and Project PI – UAF Alaska Native Science and Engineering Program Graduate Fellowships (2008 – 2013)
- Faculty Mentor – Engineers Without Borders (2005-2006)
- Faculty Mentor – ASCE (2004)
- UAA Faculty Senator (2003 – 2006)
- Member - Engineers Week Student Competition Organizing Committee (2002 – 2006) (Chair, 2006)
- Member - Municipality of Anchorage Onsite Systems Technical Advisory Board (2003 – 2006)
- Member – Conference Organizational Committees (2002 – 2006) (e.g., Alaska Water and Wastewater Management Association Annual Conference, ASCE World Water and Environmental Resources Congress, UAA Science to Engineering Conference, UAA Educating for a Sustainable Future Conference)
- Member – UAA Sustainability Task Force (2004 – 2005)

Peer-Reviewed Journal Publications

- Penn, H., P. Loring, and W. **Schnabel** (2016). “Diagnosing Water Security in the Rural North with an Environmental Security Framework.” *Journal of Environmental Management*. *In review, submitted September 2016*.
- Bullock, R.J., S. Aggarwal, R.A. Perkins, and W. **Schnabel** (2016). “Scale-up Considerations for Herder Assisted In-situ Burn Crude Oil Spill Response Experiments in the Arctic: Laboratory to Field-Scale Investigations.” *Journal of Environmental Management*. *In review, submitted August 2016*.
- Aggarwal, S., W. **Schnabel**, I. Buist, J. Garron, R. Bullock, R. Perkins, S. Potter, and D. Cooper (2016). “Aerial Application of Herding Agents to Advance In-Situ Burning for Oil Spill Response in the Arctic.” *Cold Regions Science and Technology*. *In review, submitted August 2016*.
- Trochim, E.D., W. **Schnabel**, M. Kanevskiy, J. Munk, and Y. Shur, (2016). “Geophysical and Cryostratigraphic Investigations for Road Design in Northern Alaska.” *Cold Region Science and Technology*, 131, DOI: 10.1016/j.coldregions.2016.08.004.
- Mutter, E., W. **Schnabel** and K. Duddleston, (2016). “Partitioning and Transport Behavior of Pathogen Indicator Organisms at Four Cold Region Solid Waste Sites.” *ASCE Journal of Cold Regions Engineering*, DOI: 10.1061/(ASCE)CR.1943-5495.0000111.
- Ruairuen, W., G.J. Fochesatto, E.B. Sparrow, W.E. **Schnabel**, M. Zhang, and Y. Kim, (2015). “Evapotranspiration Cycles in a High Latitude Agroecosystem. Potential Warming Role.” *PLOS ONE*, DOI: 10.1371/journal.pone.0137209
- **Schnabel**, W., Munk, J. and Byrd, A. (2014). “Field Note: Comparative Efficacy of a Woody Evapotranspiration Landfill Cover Following the Removal of Aboveground Biomass.” *International Journal of Phytoremediation* DOI: 10.1080/15226514.2013.862210

- **Schnabel, W., J. Munk, D. Barnes, and W. Lee (2012).** “Four-year performance evaluation of a pilot-scale evapotranspiration landfill cover in Southcentral Alaska.” *Cold Region Science and Technology*, DOI: 10.1016/j.coldregions.2012.03.009
- **Schnabel, W., J. Munk, T. Abichou, D. Barnes, W. Lee, and B. Pape (2012).** “Assessing the Performance of a Cold Region Evapotranspiration Landfill Cover Using Lysimetry and Electrical Resistivity Tomography.” *International Journal of Phytoremediation Volume 14, Issue sup1 pp. 61-75* | DOI: 10.1080/15226514.2011.607870.
- **Alessa, L., M. Altaweel, A. Kliskey, W. Schnabel, and K. Stevenson (2011).** “Alaska’s Freshwater Resources: Issues Affecting Local and International Interests.” *Journal of the American Water Resources Association*, 47(1), pp 143-157. DOI: 10.1111/j.1752-1688.2010.00498.x
- **Munk, J., W. Schnabel, D. Barnes, and W. Lee (2011).** “Atmospheric Loading Effects on Free-draining Lysimeters.” *Water Resources Research*, 47, W05541, DOI: 10.1029/2010WR009784.
- **Schnabel, W., K. Duddleston, T. Wilson, R. Edwards, G. Stahnke, M. Maselko, and D. Maddux, (2010).** “Variability, Seasonality, and Persistence of Fecal Coliform Bacteria in a Cold Region, Urban Stream.” *ASCE Journal of Cold Regions Engineering* 24(2), pp. 54-75.
- **Toniolo, H., Derry, J. Irving, K. and W. Schnabel, (2010).** “Hydraulic and Sedimentologic Characterization of a Reach on the Anaktuvuk River, Alaska.” *ASCE Journal of Hydraulic Engineering*, 136(11), pp. 935-939. DOI: 10.1061/(ASCE)HY.1943-7900.0000265
- **Licht, L., E. Aitchison, W. Schnabel, M. English, and M. Kaempf (2001).** “Landfill Capping with a Woodland Ecosystem.” *ASCE Journal: The Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management*, 5, pp 175-184.
- **Schnabel, W. and D. White (2001).** “The Effect of Mycorrhizal Fungi on the Fate of Aldrin: Phytoremediation Potential.” *International Journal of Phytoremediation*, 3, pp 221-241.
- **Schnabel, W. and D. White (2001).** “The Effect of Mycorrhizal Fungi on the Fate of PCB’s in Two Vegetated Systems.” *International Journal of Phytoremediation*, 3, 203-220.
- **Schnabel, W. and D. White (2000).** “Surfactant Addition Enhances the Hyphal Uptake of PCB’s and Aldrin by Mycorrhizal Fungi in Liquid Culture.” *International Journal of Phytoremediation*, 2, pp233-242.
- **White, D. and W. Schnabel (1998).** “Treatment of Cyanide Waste in a Sequencing Batch Biofilm Reactor.” *Water Research*, 32, pp254-257.
- **Schnabel, W., A. Dietz, J. Burken, J. Schnoor and P. Alvarez (1997).** “Uptake and Transformation of TCE by Edible Garden Plants.” *Water Research*, 31, pp816-824.
- **S. Delisle, O. Blondel, F.J. Longo, W. Schnabel, G.I. Bell and M.J. Welsh (1996).** “Expression of Inositol 1,4,5-Triphosphate Receptors Changes the Calcium Signal of *Xenopus* Oocytes.” *American Journal of Physiology*. 270 (Cell Physiol. 39), C1255-C1261.
- **Lahiri, D. and W. Schnabel (1993).** “DNA Isolation by a Rapid Method from Human Blood Samples: Effects of MgCl₂, EDTA, Storage Time, and Temperature on DNA Yield and Quality.” *Biochemical Genetics*, 31, pp321-328.

Other Publications

- **Kane, D.L., E.K. Youcha, S.L. Stuefer, H.A. Toniolo, J.W. Homan, W.E. Schnabel, R.E. Gieck, E. Lamb, T. Tschetter, and G. Myerchin-Tape (2015).** *Environmental Studies of Ambler Transportation Corridor. Final Report to the Alaska Industrial Development and Transport Authority, Report INE/WERC 15.14, Fairbanks, AK, December 2015. 214 pp + appendices.*

- Kane, D.L., E.K. Youcha, S.L. Stuefer, G. Myerchin-Tape, E. Lamb, J.W. Homan, R.E. Gieck, W.E. **Schnabel**, and H. Toniolo (2014). Hydrology and Meteorology of the Central Alaskan Arctic: Data Collection and Analysis. Final Report to the Alaska Department of Transportation & Public Facilities, Report INE/WERC 14.05, Fairbanks, AK, May 2014. 169 pp + appendices.
- **Schnabel**, W., R. Fortier, M. Kanevskiy, J. Munk, Y. Shur, and E. Trochim (2014). Geophysical Applications for Arctic/Subarctic Transportation Planning. Final Report to the Alaska University Transportation Center and ADOT&PF. Fairbanks, AK, 134 pp.
- Loring, P.A., H.J. Penn, S.C. Gerlach, W. **Schnabel**, and S.T. Norlin (2014). Challenges to Community Water Security in Bristol Bay, Alaska: A Report on Climate Change, Vulnerability, and Community Capacity. WERC-HD Report No. 2. Human Dimensions Laboratory at Water and Environmental Research Center. Fairbanks, AK, 57 pp.
- Kane, D.L., E.K. Youcha, S.L. Stuefer, H. Toniolo, W.E. **Schnabel**, R.E. Gieck, G. Myerchin-Tape, J. Homan, E. Lamb, and K. Tape (2012). Meteorological and Hydrological Data and Analysis Report for the Foothills/Umiat Corridor and Bullen Projects: 2006-2011. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 12.01, Fairbanks, Alaska, 260 pp. plus appendices.
- Hilton, K., G. Myerchin, C. Van Breukelen, W. **Schnabel**, and M. Lilly (2010). Survey Data for Selected North Slope Lakes and Reservoirs from the Kuparuk River to Bullen Point: 2009. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 09.05, Fairbanks, Alaska, 21 pp.
- Holland, K.M., M.R. Lilly, W.E. **Schnabel**, H. Toniolo, and P. Prokein (2010). An Overview of Available Research Results Related to Lakes Located within the Arctic Coastal Plain and North Slope Foothills Region. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 09.04, Fairbanks, Alaska, 27 pp.
- Kane, D., D. White, M. Lilly, H. Toniolo, S. Berezovskya, W. **Schnabel**, E. Youcha, J. Derry, R. Gieck, R. Paetzold, E. Trochim, M. Remillard, R. Busey, and K. Holland (2009). Meteorological and Hydrological Data and Analysis Report for Bullen Point and Foothills Projects: 2006–2008. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 08.18, Fairbanks, Alaska, 180 pp.
- **Schnabel**, W., W. Lee, and J. Munk. (2011). Evapotranspiration Lysimeter Study: Project Final Report. Water and Environmental Research Center report to USAF Joint Base Elmendorf-Richardson and Weston Solutions, Inc. Fairbanks, AK, 37 pp plus appendices.
- Van Stempvoort, D., K. Biggar, D.M. Filler, R. A. Johnson, J. Armstrong, I. Snape, K. Mumford, S. Bainbridge, D.L. Barnes and W. **Schnabel** (2008). Emerging Technologies. In Filler, D.M., D. L. Barnes, I. Snape (Eds) Bioremediation of Petroleum Hydrocarbons in Cold Regions – A Handbook, Cambridge University Press.
- Myerchin, G., D. White, W. **Schnabel**, M. Lilly, K. Holland, and P. Prokein. (2008). Lake survey data for the Kuparuk Foothills region: Spring 2008. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 08.04, Fairbanks, Alaska, 9 pp.
- Myerchin, G., D. White, W. **Schnabel**, M. Lilly, K. Holland, and P. Prokein. (2008). Lake survey data for the coastal plain from the Sagavanirktok River to Bullen Point: Spring 2008. University of Alaska Fairbanks, Water and Environmental Research Center, Report INE/WERC 08.04, Fairbanks, Alaska, 9 pp.
- **Schnabel**, W., K. Duddleston, and R. Edwards (2006). Sources and Dynamics of Fecal Coliform Bacteria in University Lake; Final Report to the Alaska Department of Environmental Conservation

- **Schnabel, W., T. Wilson, K. Duddleston, C. MacCauley, D. Nyman, and D. Maddux (2005).** Spatial, Temporal, and Phase Dynamics of Fecal Coliform Bacteria in Chester Creek; Final Report to the Alaska Department of Environmental Conservation.
- **Schnabel, W. and W. Lee (2005).** A Numerical Simulation of Evapotranspiration Landfill Cover Performance at Three Cold-Region Locations. *Proceedings of the World Water and Environmental Resources Congress*, Anchorage, Alaska, May 2005.
- Lee, W., W. **Schnabel**, and D. Barnes (2005). Implementation of a Pilot Scale Evapotranspiration Landfill Cover for Use in Cold Regions. *Proceedings of the World Water and Environmental Resources Congress*, Anchorage, Alaska, May 2005.
- Stahnke, G., W. **Schnabel**, K. Duddleston, and T. Wilson (2005). Antibiotic Resistance Analysis of *Enterococci* in Chester Creek. *Proceedings of the World Water and Environmental Resources Congress*, Anchorage, Alaska, May 2005.
- Wilson, T., G. Stahnke, W. **Schnabel** and K. Duddleston (2005). Seasonal Variations in Fecal Coliform Bacteria in a Cold Region Stream. *Proceedings of the World Water and Environmental Resources Congress*, Anchorage, Alaska, May 2005.
- Munk, L., M. Methany, and W. **Schnabel** (2004). Review of Geologic and Hydrogeologic Studies Related to the Proposed Kincaid Estates Subdivision, Anchorage, AK. Final report to the Office of Norman Rokeberg, AK State Legislature. Oct 6th, 2004.
- **Schnabel, W.E. (2004).** Cold Weather Evapotranspiration Covers: A Viable Alternative? In Proceedings for *PNWIS 2004 Annual Conference* (Pacific Northwest International Section, Air & Waste Management Association), Portland, OR, Nov 3-5, 2004.
- Maddux, D., D. Nyman, C. McCauley, and W. **Schnabel** (2004). Evaluation of Stormwater Treatment by Constructed Wetlands in Alaska. Final report to the Alaska Department of Transportation and Public Facilities, Project # 75079.
- Woolard, C., W. **Schnabel**, L. Munk, M. Hines (2003). Fundamental and Applied Research on Water Generated During the Production of Gas Hydrates. Final report to Anadarko Petroleum Corporation, February 17th, 2003.
- **Schnabel, W. and E. Mutter (2003).** Preliminary Protocols for the Study of Ectomycorrhizal Gene Expression in Northern Systems. In Proceedings for *International Conference on Mycorrhizae 4*, Montreal, Quebec, August 10-14, 2003.
- **Schnabel, W., D. Maddux, C. McCauley, D. Nyman, C. Adler, and C. Woolard (2003).** Determination of Polycyclic Aromatic Hydrocarbon and Heavy Metal Concentrations in Two High-Latitude Constructed Wetland Systems. In Proceedings for *Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates*, Edmonton, Alberta, May 4-6, 2003.
- **Schnabel, W. (2003).** Heavy Metal Deposition in a Sand Filter Willow Wetland Model. In Proceedings for *Alaska Water and Wastewater Management Association Research & Development Conference*, Fairbanks, AK, April 13, 2003.