

# Gantzer Water Resources Engineering, LLC

Paul A. Gantzer, Ph.D., P.E.

## Summary

Paul Gantzer is a civil/environmental engineer with 11 years of experience in lake and reservoir management specifically in oxygenation and aeration review, design, and operation. He is also specialized in water quality monitoring and data analysis.

## Education

Ph.D., Civil Engineering, Virginia Tech, Blacksburg, VA, 2008  
M.S., Environmental Engineering, Virginia Tech, Blacksburg, VA, 2002  
B.S., Civil Engineering, Virginia Tech, Blacksburg, VA, 2000

## Professional Registration

Licensed Professional Engineering, Environmental Engineering (License #042670) - Virginia

## Professional Associations

National Association on Lake Management Society (NALMS)  
American Water Works Association (AWWA)  
International Water Association (IWA) Management Committee Member  
National Honor Society  
International Honor Society  
Chi Epsilon  
Tau Beta Pi

## *Summary of Experience and Qualifications:*

### Gantzer Water Resources Engineering, LLC, 2008 to Present

Founded Gantzer Water Resources Engineering, LLC in 2008 to provide water quality monitoring in addition to feasibility studies and design specialty for lake and reservoir management, specifically in the field of aeration and oxygenation. Clients and summary work:

- Western Virginia Water Authority
  - Carvins Cove Reservoir, Spring Hollow Reservoir: Oxygenation operational support, data analysis, and automated remote data acquisition. Develop an operations and maintenance manual for the oxygenation systems.
  - Falling Creek Reservoir: Design a hybrid lake management program to mitigate anoxia through side-stream super saturation (SSS) coupled with intermittent destratification to mitigate algae.
- Consolidated Colville Tribes (Twin Lakes): Remote monitoring, oxygenation operational support, high resolution water column profiles, and submerged (under ice) data collection/DO monitoring. Design and system performance evaluation for North and South Twin oxygenation systems.
- Malcolm Pirnie (Occoquan Reservoir): Reservoir aeration review and oxygenation design.
- Oklahoma Department of Wildlife Conservation (Broken Bow Reservoir): High resolution profiling and upwelling aeration analysis and support.

- Mobley Engineering: Oxygenation design review, sidestream super saturation (SSS), and data analysis.
  - Wallenpaupack Hydropower Reservoir
  - Shepaug Hydropower Reservoir
  - San Antonio Reservoir
  - Pine Mountain Lake
- Army Corp of Engineers: (J Strom Thurman, SC): Performance testing of oxygenation system to provide Striper Bass fish habitat.
- Progress Power: (Tillery, NC): Provide oxygen mapping and distribution in the forebay to meet downstream discharge requirements.
- BlueInGreen: (Grand Bay, MS): Map oxygen distribution from a side-stream supersaturation oxygen injection system into tidal influenced estuary.
- CH2MHILL
  - Lake Vadnais, Lake Pleasant: Water quality improvement feasibility study involving aeration review and oxygenation design in Minnesota.
  - Lake Ann: Palletized SSS design couple with onsite oxygen generation to mitigate hypoxia in bottom waters.
  - Lake Whatcom: Water quality review to address algae and hypolimnetic anoxia. Develop in-lake strategies to combine hybrid techniques to oxygenate the bottom waters using SSS while promoting intermittent destratification using an upwelling line diffuser.
- University of Akron / City of Barberton (Barberton Reservoir): Water quality improvement feasibility study to mitigate summer anoxia, soluble metals release to the water column, eutrophication, and oxygenation design.

### Western Virginia Water Authority 2000 to 2008

- Carvins Cove Reservoir – (2004-2008)
  - Feasibility Study: Study investigated the feasibility of using a pure oxygen line diffuser system to increase hypolimnion DO while suppressing soluble Mn during summer stratification.
  - Oxygenation design, install, and operational/performance evaluation:
- Spring Hollow Reservoir – (2000-2008)
  - Aeration performance and line-diffuser evaluation
  - Aeration system upgrade to LOx: Responsible for diffuser oxygen supply sizing design and served as project manager.
  - Oxygenation performance and operation evaluation

### Publications:

1. Bryant, L., Hsu-Kim, H., Gantzer, P.A., and Little, J.C. (2011) Solving the problem at the source: Controlling Mn release at the sediment-water interface via hypolimnetic oxygenation, *Water Research*, doi:10.1016/j.watres.2011.09.030
2. Bryant, L., Gantzer, P.A., and Little, J.C. (2011) Increased sediment oxygen uptake caused by oxygenation-induced hypolimnetic mixing, *Water Research*, doi:10.1016/j.watres.2011.04.018
3. Gantzer, P.A., Bryant, L., and Little, J.C. (2009). Effect of hypolimnetic oxygenation on oxygen depletion rates in two water-supply reservoirs, *Water Research*, 43, doi:10.1016/j.watres.2008.12.053.

4. Gantzer, P.A., Bryant, L., and Little, J.C. (2009). Controlling soluble iron and manganese in a water-supply reservoir using hypolimnetic oxygenation, *Water Research*, 43, doi:10.1016/j.watres.2008.12.019.
5. Gantzer, P.A., Singleton, V.L., and Little, J.C. (2008). Lake and Reservoir Management, *Water Environment Research*, 80, (10), doi:10.2175/106143008X328798.
6. Singleton, V.L., Gantzer, P., Little, J.C. (2007), Linear Bubble Plume Model for Hypolimnetic Oxygenation: Full-scale Validation and Sensitivity Analysis, *Water Resource Research*, 43, W02405, doi:10.1029/2005WR004836.

### Presentations:

1. "Hypolimnetic Oxygenation at Spring Hollow Reservoir", AWWA 2001
2. "Oxygenation at Spring Hollow Reservoir, adding oxygen to the hypolimnion to sustain water quality", Virginia Water JAM 2002, Virginia Beach, VA
3. "Comparing Hypolimnetic Aeration and Oxygenation", NALMS 2004, Vancouver, BC
4. "Hypolimnetic Oxygenation: Improving Raw Water Quality", Virginia Rural Water Association 2006, Richmond, VA
5. "Hypolimnetic Oxygenation: Improving Raw Water Quality", AWWA ACE 2006 San Antonio TX
6. "Hypolimnetic Oxygenation: Improving Raw Water Quality", IWA Conference 2006 Granada, Spain
7. "Hypolimnetic Oxygenation: Improving raw water quality in a water supply reservoir", NALMS 2006, Indianapolis, IN.
8. "Hypolimnetic Oxygenation: Improving raw water quality in a water supply reservoir", PACNW NALMS 2006, Portland OR
9. "Hypolimnetic Oxygenation Design", Virginia Rural Water Continuing Education 2006, Salem, VA
10. "Improved Raw Water Quality from Direct Hypolimnetic Oxygenation of Two Water Supply Reservoirs", Virginia Water JAM 2007, Hampton Roads, VA
11. "Hypolimnetic Oxygenation for In-Situ Control of Iron and Manganese in Water Supply Reservoirs", AWWA Inorganic Contaminants Workshop 2008, Albuquerque, NM
12. "Controlling Iron and Manganese with Hypolimnetic Oxygenation", 1<sup>st</sup> IWA symposium of Lake and Reservoir Management 2009 Tainan, Taiwan
13. "Controlling Raw Water Quality in Water-Supply Reservoirs using Hypolimnetic Oxygenation", Virginia Water JAM 2009, Richmond, VA.
14. "Using Direct Oxygenation to Control Iron and Manganese in Water Supply Reservoirs", IWA International Convention 2010, Montreal, Canada
15. "Water Quality Response to Hypolimnetic Oxygenation", IWA specialist group 2011, Granada, Spain