

# CV - Min-Ying Jacob Chu

## Education

- 2004 Ph.D., Environmental Science and Engineering Program, Stanford University
- 1999 M.S., Environmental Engineering, Oregon State University
- 1992 B.A., Civil Engineering, National Taiwan University

## Experience

Dr. Chu is a Senior Associate in the engineering and geosciences group at ENVIRON International Corporation. He has technical expertise in mathematical simulation, chemical fate and transport modeling in the environments, environmental microbiology, and groundwater and soil bioremediation. He has published his work and served as a reviewer for internationally renowned water resource journals, including *Journal of Contaminant Hydrology*, *Advances in Water Resources*, and *Water Resources Research*. His work at ENVIRON includes the following:

- Provided expert opinion report to California State Water Resources Control Board for a site in southern California.
- Provided expert opinions regarding the effects of PCE DNAPL on biofilms for a litigation case.
- Used the AIR2D model to evaluate the explosion potential in surficial air resulting from the leakage of an underground natural gas pipeline.
- Reviewed a groundwater flow model developed for a Superfund site in New Jersey, situated above a karstic aquifer.
- Developed a methodology to determine site-wide & location-specific soil cleanup goals for groundwater protection by coupling a vadose zone transport model, 3DADE (USGS), and the MODFLOW model at a southern California site, extensively contaminated with perchlorate in a 350 ft thick vadose zone.
- Developed a 3-D MODFLOW model of groundwater flow to evaluate pump-and-treat and other remedial alternatives for a site with complex hydrogeology settings in southern California.
- Evaluated the costs and effectiveness of subsurface remedial alternatives, including permeable reactive barriers, in-situ bioremediation, and dual-phase extraction, at a southern California site.
- Analyzed 10-year groundwater and soil data and developed a groundwater model to prepare a supplemental feasibility study report to be submitted to Cal-EPA for a Superfund site in southern California
- Evaluated perchlorate transport through thick vadose zones at two sites in a semi-arid region of California.
- Developed Tier 2 risk-based target groundwater and soil concentrations to evaluate the risk of vapor intrusion to indoor air.
- Conducted the sensitivity analysis for groundwater pumping schemes at a site in New Jersey.

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- Conducted risk assessments at several sites evaluating contaminant vapor intrusion into indoor and outdoor air.

Prior to joining THE NOETIC ADVANCED STUDIES INSTITUTE:

- Post-Doctoral Researcher and Graduate Research Assistant, Stanford University, Stanford, CA

Analyzed the effects of reaction kinetics on DNAPL mass transfer coefficient at various domain scales. This work advances the understanding of how to correctly simulate the bio-enhanced dissolution in the environments.

Analyzed the large-time behavior of a representative bio-reactive transport model, in which the substrate mixing is limited in the directions transverse to groundwater flow. This work has an important implication to the practice of monitoring natural attenuation.

Evaluated the potential of in-situ PCE DNAPL bioremediation with experimental microcosm studies and mathematical modeling. Molecular biology tools, such as T-RFLP and 16SrDNA cloning, were applied to characterize a possible new PCE dechlorinating bacterium. This work enhanced the understanding regarding likely key factors contributing to successful in-situ DNAPL bio-treatments.

- Graduate Research Assistant, Oregon State University, Corvallis, OR

Designed and performed experiments to quantify the degradation of tetraalkoxysilanes (hydraulic fluid), which is catalyzed by aquifer solids under the influences of humidity, different types of exchangeable cations, and the vapors from other contaminants.

- Undergraduate Research Assistant, National Taiwan University, Taipei, Taiwan

Investigated experimentally the extent of bonding strength affected by the addition of fly ash as a concrete ingredient under multi-lateral confined stresses.

### Professional Activities

Member, American Geophysical Union

Reviewer, Water Resources Research

Reviewer, Advances in Water Resources

Reviewer, Environmental Science & Technology

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### Publications, Presentations, and Reports

- [1] Chu, M., McCarty, P.L., and Kitanidis, P.K., Inhibition of High cis-1,2-Dichloroethene Concentrations to Tetrachloroethene Reductive Dechlorination. (in preparation)
- [2] Yuxing Sun, E.A. Rauscher, S. Giandinoto, M-Y J. Chu, & R.L. Amoroso, Empirical Mediation of the Primary Mechanism Initiating Protein Conformation in Prion Propagation in D. Dubois (ed.) Proceedings of CASYS07, August, 2007, Liege, Belgium, 2008.
- [3] Min-Ying Jacob Chu, Estimation of the Extent of Perchlorate Movement in the Vadose Zone at the 160-Acre Parcel, Rialto, California, Report to California State Water Resources Control Board. April 16, 2007.
- [4] Chu, M., Kitanidis, P.K., and McCarty, P.L., Mass Transfer Coefficients Depend on Scale and Biological Reactions, *Advances in Water Resources*, v(30), pp.1618-1629, 2007.
- [5] Chu, M., Kitanidis, P.K., and McCarty, P.L., Potential of Bio-Enhanced DNAPL Dissolution, AGU, Fall Meet. Suppl., 2006. (Invited Talk)
- [6] Chu, M., Kitanidis, P.K., and McCarty, P.L., Inhibition Related Limitation to Biologically Enhanced Dissolution of Chlorinated Solvents. (A talk and a proceedings paper in the Fifth Battelle International Conference of Remediation of Chlorinated and Recalcitrant Compounds in May, 2006)
- [7] McCarty, P.L., Chu, M., and Kitanidis, P.K., Biological Degradation and Enhanced Dissolution of Chlorinated Solvent DNAPL, 3rd European Bioremediation Conference, 2005.
- [8] Chu, M., Kitanidis, P.K., and McCarty, P.L., Modeling Microbial Reactions at Plume Fringe Subject to Transverse Mixing in Porous Media: When Can the Rates of Microbial Reaction Be Assumed to Be Instantaneous?, *Water Resources Research*, v(41), W06002, 2005.
- [9] Min-Ying Chu, Factors controlling the Efficiency of Bio-enhanced PCE NAPL Dissolution Ph.D. dissertation, Stanford University, 2004
- [10] Chu, M., Kitanidis, P.K., and McCarty, P.L., Possible Factors Controlling the Effectiveness of Bio-enhanced Dissolution of Non-Aqueous Phase Tetrachloroethene, *Advances in Water Resources*, v(27), pp.601-615, 2004.
- [11] Chu, M., Kitanidis, P.K., and McCarty, P.L., Effect of Biomass Accumulation on Biologically Enhanced PCE DNAPL Dissolution: A Numerical Simulation, *Journal of Contaminant Hydrology*, v(65), pp.73-100, 2003.
- [12] Chu, M., Kitanidis, P.K., and McCarty, P.L., Large-Time Behavior of GW Pollutant Plumes Subject to Biodegradation at the Fringe, AGU, Fall Meet. Suppl., 2003. (Poster)
- [13] Chu, M., Kitanidis, P.K., and McCarty, P.L., Effect of Biomass Accumulation on Biologically Enhanced PCE DNAPL Dissolution: A Numerical Simulation, *EOS Trans. AGU*, **82**(47), Fall Meet. Suppl., Abstract U41A-00005, 2001. (Talk)

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- [14] Chu, M., McCarty, P.L., and Kitanidis, P.K., Observation of NAPL Dissolution in a Silicon Pore Imaging Element, EOS Trans. AGU, 82(20), Spring Meet. Suppl., OS31A-04, 2001. (Poster)
- [15] Min-Ying Chu, Hydrolytic Transformation of TKEBS by Subsurface Solids From a Contaminated Site, Master thesis, Oregon State University, 1999
- [16] Chu, M. and Semprini, L., Hydrolytic Transformation of TKEBS by Subsurface Solids from a Contaminated Site, presented at the Annual Meeting of the Western Region Hazardous Substance Research Center, Corvallis, Oregon, August 1999. (Poster)
- [17] Chu, M. and Semprini, L., Hydrolytic Transformation of TKEBS by Subsurface Solids from a Contaminated Site, 54<sup>th</sup> Northwest ACS Regional Meeting, Portland, OR, June 1999. (Talk)
- [18] Chu, M. and Wu, J., Effects of Fly-Ash Addition on Bonding Strength Between High Strength Concrete and Steel Bars under Multi-lateral Confined Stresses, Undergraduate Thesis, National Taiwan University, 1992. (in Chinese)