WALTER DEN

Department of Natural Sciences | Texas A&M University-San Antonio

Education

Doctor of Philosophy in Environmental Engineering (2000)

Department of Civil & Environmental Engineering, University of Southern California
Los Angeles, California

Master of Science in Civil Engineering (1995)

Department of Civil & Environmental Engineering, University of Southern California
Los Angeles, California

Bachelor of Science in Mechanical Engineering (1993)

Department of Mechanical Engineering, University of California at Santa Barbara
San Barbara, California

Academic Employment History

Texas A&M University-San Antonio, San Antonio, Texas

- ***Director, Institute for Water Resources Science and Technology*** | *February 2022 – present*

  Funding acquisition, research and development, capacity building, and network with local and regional stakeholders in water resources management.

- ***Professor and Founding Program Coordinator, Water Resources Science and Technology program*** | *August 2018-present*

  Design, implement curriculum and launched three degree-conferring programs (M.S. and B.S. in 2019; B.A.A.S. in 2020). Coordinating all aspects of the program, including student and faculty recruitment, program and faculty assessment, cultivation of teaching and research laboratories, advising students, formulating faculty promotion & tenure guideline.

Tunghai University, Taichung, Taiwan

- ***Dean, International College*** | *February 2016 – July 2018*

  Appointed as the inaugural full-time deanship for the newly launched college whose mission is to develop curricula for internationalized education and foster campus diversity. Responsible for launching the Global Leadership program and a second academic program in Sustainability Science and Management.

- ***Visiting Professor, Department of Environmental & Occupational Health****, Texas A&M University, College Station, TX | January 2017 – July 2017*

- ***Dean, Office of Research and Development*** | *February 2015 – January 2016*

  An executive position overseeing funding allocation to the university's academic units, sponsored research programs, research centers, institutional research capacity, faculty awards, and program assessment.

- ***Director, Center of Industry Collaboration and Incubation*** | *February 2014 – January 2016*
- ***Department Chair, Department of Environmental Science and Engineering*** | *August 2011 – July 2014*
- ***Director, Center for Precision Instruments*** | *August 2008 – July 2012*
- *Professor (August 2010), Associate Professor (January 2006), Assistant Professor (August 2002), Department of Environmental Science and Engineering | August 2002 – July 2018*

National Nano Device Laboratories, Hsinchu, Taiwan

- ***Associate Researcher, Back-End-of-Line Module*** | *February 2021 – July 2002*

Honors & Awards

Texas A&M University-San Antonio, San Antonio, Texas

- 2025 Texas A&M University System Regents Professor
- 2024 College of Arts and Sciences Tenured faculty Excellence in Scholarship recognition
- 2023 Outstanding Faculty Award: Excellence in Service, College of Arts and Sciences
- 2023 Scholarly Excellence in securing grants and external funding in excess of one million dollars supporting research, community outreach and academic programming, the Provost Office.
- 2023 & 2024 Research Excellence Recognition, the Provost Office.
- 2023 Fellow of Texas Academic Leadership Academy (Cohort 5).
  TALA is the flagship program initiated by the Texas Council of Chief Academic Officers dedicated to advancing higher education in Texas. TALA accepts fellows through institutional nomination.
- 2020 Faculty Excellence in Scholarly/Creative Arts Award, College of Arts and Sciences.

Grants & Contracts Received (Since 2020)

- Research Council Grant, Texas A&M University-San Antonio "Have Texas rivers already been contaminated with fracking wastewater?" (May 2025-April 2026) $9,800. (PI)
- Baptist Health Foundation of San Antonio "Cross sectional survey on emerging environmental pollutant exposure and prevalence of obesity in communities for better health outcomes" (January 2025-December 2026) $585,000 (A&M-SA share, $240,165) (co-PI)
- Research Council Grant, Texas A&M University-San Antonio "Water Quality Monitoring and Characterization of Chemical and Biological Contamination in the Edwards Aquifer Recharge Zone" (May 2024-December 2025) $10,000. (co-PI)
- National Science Foundation - HSI Pilot Project: WaTR3: Retention, Relevance, and Readiness Through Bridging Water Security Issues in San Antonio (March 2023-February 2025). (Grant# 2247898). $199,999. (co-PI)

- U.S. Department of Agriculture - National Institute of Food and Agriculture: Water for Texas through Education and Research - A transdisciplinary undergraduate sustainability program (WaTER) (January 2023-December 2025). (Grant# 20237000338958). $149,996 (PI)
- U.S. Department of Agriculture - Agricultural Research Service: Adaptation, Transfer and Adoption of New Technologies to Increase the Resilience and Protect Vulnerable Water Supplies in agricultural areas of the Karst Edwards Aquifer Region of South Central Texas. (August 2021-December 2023) $109,021 (PI)
- Virginia Tech (Subaward of NSF S-STEM Research Hub): Accelerating Job Readiness by Participation in Community-Focused Innovation - Mitigating an Eutrophic Lake and Building Climate Change Resiliency for the Underserved Southside of San Antonio, Texas. (January 2023-December, 2024). $15,000 (PI)
- National Science Foundation - HSI Pilot Project: Broadening Research Experience for Diversity, Equity, and Inclusion (BREDEI) (September 2021- March 2024). (Grant#2122655). $199,999 (PI)
- National Science Foundation S-STEM: Water Security for Texas: Creating Educational Pathways and Cultivating Leadership for the Water Work Force (March 2021-February 2026). (Grant#2031497). $649,996 (PI)
- TetraTech - Column Treatability Study for PFAS removal in storm runoff from Phillips 66 Refinery, NJ (August 2022). $4,950 (PI)
- City of San Antonio (Proposition 1 project): Edwards Aquifer Water Quality Protection from Catastrophic and Low to Mid-Level Effects of Discharge of Hazardous and Polluting Materials from Contaminated Water Run-off During Emergency Response. (September 2019 - March 2024). $218,937 (PI)
- Humanitarian Grand Challenge "Reinventing Pit Latrines using Breathable Laminate Liners to Mitigate Groundwater Contamination" (September 2020-December 2022). (Grant #R-HGC-POC-2007-35575). CAD$249,980 (PI)
- Research Council Research Grants, Texas A&M University-San Antonio "Scoping the Potential Groundwater Contamination of Per- and Poly-Fluoroalkyl Substrates from Fire Training Sites in San Antonio." (January 2020-December 2020) $10,000 (PI)
- Research Council Research Grants, Texas A&M University-San Antonio "Can natural microbial attenuation of contaminated groundwater in South Bexar County be a solution for safer drinking water?" (January 2020-December 2020) $10,000 (co-PI)

Notable recognitions at Tunghai University, Taichung, Taiwan

- 2010-2016 Recipient of Ministry of Science and Technology- subsidized Research Scholars Excellence Program.
- 2012-2014 Recipient of Excellent University Teaching Projects, Ministry of Education
- 2009-2011, 2013, 2015 Faculty Excellence in Industrial Collaboration Award.
- 2010 Engineering Faculty Outstanding Teaching Award.
- 22 research projects (as PI or co-PI) awarded by the Ministry of Science and Technology between 2002-2018.

- 20 funded projects (as PI) from government offices and industries totaling over >US$500,000 between 2003-2018.
- Served as the academic advisor or co-advisor for five doctoral students (Yuhao Kang, 2006; Changchi Chen, 2008; Jules Chuang, 2018; Chi-Hao Chen, 2018; Mian Ahson Muhammad Islam, 2022) and 39 graduate students, all graduated with M.S. thesis.
- Supervised three post-doctoral research fellows:
    - Dr. Sarttrawut Tulaphol, 2018 (now a faculty at the Department of Chemistry, King Mongkut's University of Technology Thonburi, Thailand)
    - Dr. Mengshan Lee, 2012-2016 (now a faculty at the Department of Safety, Health and Environmental Engineering, National Kaohsiung University of Science and Technology, Taiwan)
    - Dr. Pei-Yu Kuo, 2009-2011

University Service (past five years)

- The Faculty Senate | August 2024 – December 2025
- Leadership Search Committees: Presidential search (2023), Dean of College of Arts and Science search (2020).
- Sponsoring and mentoring international visiting scholars (Hung-Hsiang Chen, National Chi Nan University, Taiwan, August 2024- July 2025; Michelle Urrea Vivas, Polytechnic University of Catalonia, Spain, TBD) and postdocs (Dr. Shray Saxena, 2019-2022; Dr. Sayantan Das, summer 2019; Dr. Mohsen Aghashahi, June-December 2021).
- Thesis Advisor for 11 thesis-tracked graduate students (M.S.) in the Water Resources program since 2020 (6 graduated, 5 active).
- Member of the Council of Principal Investigators | 2023 - present
- Organizing Committee, Student Research Symposium | 2022 - present
- The Graduate Council | 2020 – present
- Faculty Promotion & Tenure Review Committees (annually)
- Faculty Evaluation Committee (2021-2024)
- Faculty Search Committee (Annually)
- Curriculum Review Committee | 2019-2021

Professional Society Service (past five years)

- University Council of Water Resources (UCOWR)
  Member of the Organizing Committee for the 2026 Annual Water Resources Conference.
- American Chemical Society (ACS)
  Member of Executive Committee for the Environmental Chemistry (ENVR) Division since 2019 in the capacity of chairing the Speaker Expense Committee and as an Assistant Treasurer since 2023.
- American Water Works Association (AWWA), South Texas Chapter
  Active member participating in surveys and regional networks.

- UltraPure Micro (UPM)
  Served as a moderator for UltraPure Micro 2020 & 2021 conference.
- International Roadmap for Devices and Systems (IRDS)
  Member of the AMC (Airborne Molecular Contamination) Work group, 2018-2020.

Other National or International Professional Services

- Regular invited talks at local chapters of professional associations.
- Ad hoc and standing Review Panelist for the National Science Foundation (NSF) and the U.S. Department of Agriculture (USDA).
- External reviewer for faculty hiring and promotion evaluation at the national and international level.
- Editorial Board member for *Texas Water Journal* (ISSN 2160-5319, appointed beginning in January 2026), *Water-Energy Nexus* (ISSN: 2588-9125, since 2017) and *Discovery Catalysis* (ISSN 3004-9520, since 2024).
- Co-Guest Editor for special issue "Agricultural Engineering Technologies and Applications," *Sustainability* (journal, with Drs. M. Sultan, Y. Zhao, and U. Sajjad) in 2022.
- Co-Guest Editor for "Innovative Materials for Removal of Environmental Pollutants and Recovery of Nutrients from Wastewater," *Frontiers in Environmental Science* (With Drs. M. Usman, M. Usman, A. Tolkou) in 2023.
- Ad-hoc reviewer for 30+ peer-reviewed journals, accept ~20 manuscripts to review yearly.

Professional Opinions & Media Presence

- "How Texas Could Lead the Nation in Addressing a Growing Water Workforce Problem," invited webinar for the Texas Water Journal. https://twj-ojs-tdl.tdl.org/twj/index.php/twj/how-texas-could-lead. October 16, 2025.
- "Best management practices for emergency response in the vulnerable Edwards Aquifer Recharge Zone in San Antonio," Invited talk at the Education Series webinar of the South Central International Erosion Control Association (SCIECA) https://scieca.org/education-series/. August 16, 2025.
- "Is San Antonio among the fastest-sinking cities in the United States?" Interviewed by reporter Yahaira Hernandez with NBCUniversal's KVDA San Antonio, Texas (Telemundo 60). July 2, 2025.
- "Fracking Flowback and Produced Water Management and Treatment," Invited talk at the Air & Waste Management Association, Alamo Chapter (Lunch & Learn). May 16, 2025.
- University Researchers Probe Environmental Factors Driving Local Health Risks. A&M-SA Today (April 2025). https://news.tamusa.edu/2025/04/University-Researchers-Probe-Environmental-Factors-Driving-Local-Health-Risks.html
- Protecting San Antonio's Primary Water Source. A&M-SA Today (Feb 2025). https://news.tamusa.edu/2025/02/Protecting-San-Antonios-primary-water-source.html

- Recent samples include interview by New Scientist regarding conflicting energy consumption and GHGs reduction goals in growing intensity of semiconductor fab operations, interview by the Department of Commerce CHIPS Program Office managing implementation of the CHIPS for America program (Nov 2022). https://www.newscientist.com/article/2345448-emissions-from-worlds-chip-manufacturing-hub-are-growing-each-year/
- Student club helps preserve environment at VIDA trail near campus. The Mesquite (Nov. 10, 2022) Texas A&M University-San Antoni. https://mesquite-news.com/student-club-helps-preserve-environment-at-vida-trail-near-campus/
- Can sewage help predict coronavirus strains, outbreaks? Texas A&M-San Antonio researchers think so, Interviewed by San Antonio Express News (March 2022). https://www.expressnews.com/news/local/article/Sewage-COVID-strains-17007748.php
- Austin regarding the 3-day boil water mandate issued by the City of Austin due to a water treatment operator's error, interviewed by KXAN News/NBC (Feb. 2022). https://www.kxan.com/news/local/austin/austin-water-answers-questions-about-what-caused-recent-boil-water-notice/
- Community faces boil water notice, offers resources. The Mesquite, Texas A&M University-San Antonio (Feb 2021). https://mesquite-news.com/community-faces-boil-water-notice-offers-resources/
- Water, But No Workers, TxH2O, Summer 2019 issue, Texas Water Resources Institute. https://twri.tamu.edu/publications/txh2o/2019/summer-2019/water-but-no-workers/

Peer-Reviewed Publications

Over 75 peer-reviewed journal and book chapter publications. See here for a full list.

Peer-reviewed journals

1. Mendietta, A., J. Sierra, A. Teufel, W. Den* "Potential Effects of Produced Water Discharge on Surface Water Quality: Two Case Studies on Nueces River Watershed." Texas (in review, *Texas Water Journal*).
2. Saxena, S.*, W. Den, P. T. Imhoff. (2025). "A CFD-Based Regressional Model for Estimating Moisture Transfer Across Laminate-Lined Sanitation Systems." *J Water Sanit Hyg Dev. (in press)*. *https://doi.org/10.2166/washdev.2025.112*
3. Den, W.* and D.S. Smyth (2025). "How Texas Could Lead the Nation in Addressing a Growing Water Workforce Problem." *Texas Water Journal 16, 80-92*. https://doi.org/10.21423/twj.v16i1.7194
4. Walla, T.J., W. Den* (2025). "Assessment of Forced Evaporation as a Solution for Onsite Produced Water Management," *Water-Energy Nexus* 8, 93-100. https://doi.org/10.1016/j.wen.2025.03.004
5. Rosen*, R.A., G.M. Schindel, R. Green, W. Den (2024). "Best Management Practices to Mitigate Inadvertent Transport of Contaminants to Karstic Aquifers in Runoff During Emergency Fire Control," *Texas Water Journal* 15, 140-157. https://doi.org/10.21423/twj.v15i1.7172
6. McBrady, A.J., W. Den*(2024). "Targeting Macrophytes: Optimizing Vegetation Density to Enhance Water Quality within Constructed Wetlands," *Water* 16, 2278. https://doi.org/10.3390/w16162278
7. Thimons, S.X., S. Saxena, W. Den* (2022b). "Ferrate-Pretreated Directional Solvent Extraction for Hydraulic Fracturing Produced Water: Technical and Economic Feasibility Studies," *Journal of Water Process Engineering* 49, 103053. https://doi.org/10.1016/j.jwpe.2022.103053
8. Abongwa,* P.T., W. Den, A. Teague (2022). "Dual Isotopic (O & N) Approach in the Assessment of NO_3^- Pollution in an Urban River," *Water, Air, Soil Pollution* 233, 280. https://doi.org/10.1007/s11270-

022-05758-8
9. Abongwa,* P.T., W. Den, A. Teague (2022). "Chemical and Carbon Isotopic Characterization of a Karst-Dominated Watershed: Case of the Upper San Antonio River," *Archive in Environmental Contamination and Toxicologyl* 82, 439–454. https://doi.org/10.1007/s00244-022-00921-y
10. Bilal, M., M. Sultan*, T. Morosuk, W. Den, U. Sajjad, M.M.A. Aslam (2022). Adsorption Based Atmospheric Water Harvesting: Materials and Systems. *International Communication of Heat and Mass Transfer* 133, 105961. https://doi.org/10.1016/j.icheatmasstransfer.2022.105961
11. Saxena, S., W. Den* (2022). "In-situ Treatment Technologies for Pit Latrines for Mitigation of Groundwater Contamination by Fecal Pathogens – A Review of Recent Technical Advances," *Journal of Water, Sanitation and Hygiene for Development* 12, 102–115. https://doi.org/10.2166/washdev.2021.184
12. Aslam, M.M.A., W. Den*, H.W. Kuo (2022a). "Elucidating the Mass Transfer Mechanism of Cr^{6+} Adsorption by Encapsulated Chitosan-Carbon Nanotubes-Iron Beads in Packed-Bed Columns," *Journal of Water Processing Engineering* 46, 102586. https://doi.org/10.1016/j.jwpe.2022.102586
13. Aslam, M.M.A., H.W. Kuo, W. Den*, M. Usman, M. Sultan*, H. Ashraf (2021). "Functionalized Carbon Nanotubes (CNTs) for Water and Wastewater Treatment: Preparation to Application," *Sustainability* 13, 5717. https://doi.org/10.3390/su13105717
14. Aslam, M.M.A., W. Den*, H.-W. Kuo (2021b). "Removal of Hexavalent Chromium by Encapsulated Chitosan-Modified Carbon Nanotubes: Fixed-Bed Column Study and Modelling," *Journal of Water Process Engineering* 42, 102143. https://doi.org/10.1016/j.jwpe.2021.102143
15. Abongwa, P.T. and W. Den (2021). "Evolution of a Deep Fluid in a Surficial Environment Using Stable Isotopes of Carbon and Sulfur: Case of the Transitional Section of the Edwards Aquifer," *Water, Air, Soil Pollution* 232, 213. https://doi.org/10.1007/s11270-021-05159-3
16. Aslam, A.M., W. Den*, H.-W. Kuo (2021a). "Encapsulated Chitosan-Modified Magnetic Carbon Nanotubes for Aqueous-Phase Cr(VI) Uptake," *Journal of Water Process Engineering* 40, 101793. https://doi.org/10.1016/j.jwpe.2020.101793
17. Den, W.*, S.-C. Hu, C. Garza, O.A. Zargar (2020). "Airborne Molecular Contamination: Recent Developments in the Understanding and Minimization for Advanced Semiconductor Device Manufacturing," *ECS J Solid State Sci Technol* 9, 064003. http://doi.org/10.1149/2162-8777/aba080
18. Lee, M., Y.L. Lin, P.-T. Chiueh, W. Den (2020). "Environmental and Energy Assessment of Biomass Residues to Biochar as Fuel: A Brief Review with Recommendations for Future Bioenergy Systems," *J Clean Prod* 251, 119714. https://doi.org/10.1016/j.jclepro.2019.119714
19. Chen, B.-Y., H.-W. Kuo, V.K. Sharma, W. Den* (2019). "Chitosan Encapsulation of $Ferrate^{VI}$ for Controlled Release to Water: Mechanistic Insights and Degradation of Organic Contaminant," *Scientific Report* 9, 18268. https://doi.org/10.1038/s41598-019-54798-4
20. Chuang, J., H.-L. Lien, A. Kokubo Roche, P.-H. Liao, W. Den* (2019). "Consolidated Climate Markets Mechanism Analysis – Case Studies of China, Japan, and Taiwan," *Sustainability* 11, 6478. https://doi.org/10.3390/su11226478
21. Yang, C.T., S.T. Chen, C.H. Chang, W. Den, C.-C. Wu (2019). "Implementation of an Environmental Quality and Harmful Gases Monitoring System in Cloud," *Journal of Medical Biological Engineering* 39, 456-469. https://doi.org/10.1007/s40846-018-0383-0
22. Yang, C.T., S.T. Chen, C.H. Chang, W. Den, E. Kristiani (2019). "Implementation of an Intelligent Indoor Environmental Monitoring and Management System in Cloud," *Future Gener Computational System* 96, 731-749. https://doi.org/10.1016/j.future.2018.02.041
23. Kanchanatip, E., S. Tulaphol, W. Den*, N. Grisdanurak, H.-Y. Miao (2019). "Sensing and Adsorption Study of Gaseous Phase Chlorophenols on Functionalized Carbon Nanotube Membrane," *Environmental Progress and Sustainable Energy* 38, S315-S322. https://doi.org/10.1002/ep.13038
24. Den, W.*, C.-H. Chen, Y.-C. Luo (2018). "Revisiting the Water-Use Efficiency Performance for Microelectronics Manufacturing Facilities: Using Taiwan's Science Parks as a Case Study," *Water Energy Nexus* 1, 116-133. https://doi.org/10.1016/j.wen.2018.12.002
25. Lu, B.-H., M. Lee, S.-T. Chen, C.-H. Chen, J. Luo, W. Den* (2018). "Strategic Optimization of Water Reuse in Wafer Fabs via Multi-Constraint Linear Programming Technique," *Water Energy Nexus* 1, 86-96. https://doi.org/10.1016/j.wen.2018.07.004
26. Chuang, J., H.-L. Lien, W. Den*, L. Iskandar, P.-H. Liao (2018). "The Relationship between Electricity Emission Factor and Renewable Energy Certificate: The Free Rider and Outsider Effects,"

Sustainable Environment Research 28, 422-429. https://doi.org/10.1016/j.serj.2018.05.004
27. Den, W.*, V.K. Sharma, M. Lee, G. Nadadur, R. Varma (2018). "Lignocellulosic Biomass Transformations via Greener Oxidative Pretreatment Processes: Access to Energy and Value-Added Chemicals," *Frontier in Chemistry* 6, 141. https://doi.org/10.3389/fchem.2018.00141
28. Lee, M, A.A. Keller, P.-C. Chiang, W. Den, H. Wang, C.-H. Hou, J. Wu, X. Wang, J. Yan (2017). "Water-Energy Nexus for Urban Water Systems: A Comparative Review on Energy Intensity and Environmental Impacts in Relation to Global Water Risks," *Applied Energy* 205: 589-601. https://doi.org/10.1016/j.apenergy.2017.08.002
29. Chen, C.-H., W. Den (2017). "The Value of Green Belts in Urban Sprawl: a Case Study of Taichung City, Taiwan," *International Journal of GEOMATE*, 12(33): 147-152. https://geomatejournal.com/geomate/article/view/1252
30. Tu, T.-T., M. Lee, S.-T. Kuo, and W. Den (2016). "Citric Acid-Impregnated Activated Carbon Chemical Filtration for the Control of N-Methyl-2-Pyrrolidone in Air," *Indoor and Build Environment* 25: 772-785. https://doi.org/10.1177/1420326X15591638
31. Tulaphol, S., S. Bunsan, E. Kanchanatip, N. Grisdanurak, H.-Y. Miao, W. Den (2016). "Influence of Chlorine Substituted on the Gaseous Adsorption of Chlorinated Phenolic Chemicals Using SiO_2 Particles Embedded Multiwall Carbon Nanotubes," *International Journal of Environmental Science and Technology* 13(6): 1465-1474. https://doi.org/10.1002/ep.13038
32. Kanchanatip, E., B.-R. Su, S. Tulaphol, W. Den, N. Grisdanurak, C.-C. Kuo (2016). "Fouling Characterization and Control for Harvesting Microalgae Arthrospira (Spirulina) maxima Using a Submerged, Disc-Type Ultrafiltration Membrane," *Bioresource Technology* 209:23-30.
33. Lee, M. and W. Den (2016). "Life Cycle Value Analysis for Sustainability Evaluation of Bioenergy Products," Journal of Cleaner Production 113:541-547. https://doi.org/10.1016/j.biortech.2016.02.081
34. Ma, C.-Y., S.-C. Huang, P.-H. Chou, W. Den and C.-H. Hou (2016). "Application of Multiwalled Carbon Nanotube-Chitosan Composite as Electrode to Electrosorption Process for Water Purification," *Chemosphere* 146:113-120. https://doi.org/10.1016/j.chemosphere.2015.12.012
35. Lee, M., B.-Y. Chen, W. Den (2015). "Chitosan as a Natural Polymer for Heterogeneous Catalysts Support: A Short Review on Its Applications," *Applied Sciences* 5:1272-1283. https://doi.org/10.3390/app5041272
36. Lee, H.-C., M. Lee, W. Den (2015). "Phenol Tolerance and Biodegradation by Spirulina maxima," Water, Air & Soil Pollution 226, 395:1-11. https://doi.org/10.1007/s11270-015-2664-3
37. Hou, C.-H., S.-C. Huang, P.-H. Chou, W. Den (2015). "Removal of Bisphenol A from Aqueous Solutions by Electrochemical Polymerization on a Carbon Aerogel Electrode," *Journal of Taiwan Institute of Chemical Engineers* 51:103–108. https://doi.org/10.1016/j.jtice.2015.01.009
38. Lin, W.-S., M.S. Lee, Y.-C. Huang, W. Den (2015) "Identifying Water Recycling Strategy Using Multivariate Statistical Analysis for High-Tech Industries in Taiwan," *Resources, Conservation & Recycling* 94:35-42. https://doi.org/10.1016/j.resconrec.2014.11.007
39. Su, Y.-N., W.-H. Lin, C.-H. Hou, and W. Den (2014) "Performance of Integrated Membrane Filtration and Electrodialysis Processes for Copper Recovery from Wafer Polishing Wastewater," *Journal of Water Process Engineering* 4:149-158. https://doi.org/10.1016/j.jwpe.2014.09.012
40. Chang, P., R. Yang, W. Den, C.F. Wu (2014) "Characterizing and Locating Air Pollution Sources in a Complex Industrial District Using Optical Remote Sensing Technology and Multivariate Statistical Modeling," *Environmental Science and Pollution Research* 21:10852–10866. https://doi.org/10.1007/s11356-014-2962-0
41. Hou, C.-H., N.-L. Liu, H.-L. Hsu, and W. Den (2014). "Development of Multiwalled Carbon Nanotubes/Poly(vinyl Alcohol) Composite as Electrode for Capacitive Deionization," *Separation and Purification Technology* 130: 7-14. https://doi.org/10.1016/j.seppur.2014.04.004
42. Yang, C. T., J.T. Liu, W. Den, C.-R. Liao, Y. C. Chou, J. J. Tsai (2014) "Application of an Intelligent Indoor Air Quality Monitoring System in a Medical Center," *Journal of Medical Systems* 38(2), art. 15. https://doi.org/10.1007/s10916-014-0015-3
43. Lin, L.-K. Lin, W. Den, Y.-C. Chou, H.-Y. Yen, C.-H., Lu (2014). "A study on Developing the Indicators of Energy Conservation and Carbon Reduction for the Business," *Proceedings of the 2014 IEEE IEEM*, 1491-1495. http://dio.org/10.1109/IEEM.2014.7058887
44. Cheng, W.-L., L.-W. Lai, W. Den, M.-T. Wu, C.-A. Hsueh, and P.-L. Lin (2014). "The Relationship between Typhoons' Peripheral Circulation and Ground-Level Ozone Concentrations in Central

Taiwan," *Environmental Monitoring and Assessment*, 186(2):791-804. https://doi.org/10.1007/s10661-013-3417-7

45. Huang, P.-Y., Z.-Y. Shi, C.-H. Chen, W. Den, H.-M. Huang, J.-J. Tsai (2013). "Airborne and Surface-Bound Microbial Contamination in Two Intensive Care Units of a Medical Center in Central Taiwan," *Aerosol and Air Quality Research*, 13(3):1060-1069. https://doi.org/10.4209/aaqr.2012.08.0217
46. Chang, W.-T., M. Lee, and W. Den (2013). "Simultaneous Carbon Capture, Biomass Production, and Diary Wastewater Purification by Spirulina maxima Photobioreaction," *Industrial and Engineering Chemistry*, 52(5):2046-2055. https://doi.org/10.1021/ie301932v
47. Cheng, W.-L., L.-W. Lai, W. Den, S.-Y. Wang, P.-L. Lin, and C.-H. Pai (2012) "An Analytical Investigation of a Sequence of Unusual Springtime Ozone Episodes over Metropolitan Taichung in 2007," Meteorology and Atmospheric Physics, 117(3-4):153-166. https://doi.org/10.1007/s00703-012-0194-8
48. Den, W. and C. C. Wang (2012). "Enhancement of Adsorptive Chemical Filters via Titania Photocatalysts to Remove Vapor-Phase Toluene and Isopropanol," *Separation and Purification Technology*, 85(1): 101-111. https://doi.org/10.1016/j.seppur.2011.09.054
49. Shiue, A., W. Den, S.-C. Hu, C.-H. Lin, V. Hu, and S. I. Lin (2011). "Validation and Application of Adsorption Breakthrough Models for the Chemical Filters Used in Air Purification Systems," *Building and Environment*, 46(2):468-477. https://doi.org/10.1016/j.seppur.2011.09.054
50. Den, W., C.-C. Wang and S. Yang (2010). "Preliminary Investigation of an Integrated Photobioreactor System for Microalgal CO_2 Fixation," *Chemical Engineering Transactions*, 21, 193-198 (doi: 10.3303/CET1021033). https://doi.org/10.3303/CET1021033
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Books/Book Chapters

74. Chen, H.-H., P. Vicaria, W. Den* (2026, in press). "Temperature-Responsive Solvent Extraction for Desalinating Hydraulic Fracturing Hypersaline Produced Water", to be published in: (Ed.) M.A. Benvenuto, Green Chemical Processes (vol 12). De Gruyter, Boston.
75. Aslam, M.M.A., H.-W. Kuo, W. Den*, M. Sultan*, K. Rasoold, M. Bilal (2022). "Recent Trends of Carbon Nanotubes and Chitosan Composites for Hexavalent Chromium Removal from Aqueous Samples", In: (Ed) Sut Ahuja, Separations of Water Pollutants with Nanotechnology - Separation Science and Technology series. Chapter 10, pp. 179-210. Elsevier: the Netherlands. https://doi.org/10.1016/B978-

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78. Den, W. (2011) Biofiltration Modeling and Applications: Evaluating Gas-Phase Biofilter Performance in Treating VOCs from Industrial Emissions. VDM Verlag, Germany. (ISBN 10: 3639312880; ISBN 13: 9783639312881)

Editorials

1. Co-Editor (with Muhammad Sultan, Yuguang Zhao, and Uzair Sajjad), Special Issue in Agricultural Engineering Technologies and Applications (2021-22) in Sustainability (IF 3.251). https://www.mdpi.com/books/book/6461-sustainable-agricultural-engineering-technologies-and-applications
2. Co-Editor (with Muhammad Usman; Muhammad Usman; Athanasia Tolkou), special issue in Water and Wastewater Management (2022-23), Frontiers In Environmental Science (IF: 5.411), Research Topic: Innovative Materials for Removal of Environmental Pollutants and Recovery of Nutrients from Wastewater.

* indicates the corresponding author(s)

Other Publications or Patents

1. Yang, Y. H., Yu, M. C., Den, W. Carbon Capture and Storage System, New design patented in the Republic of China (M386111, effective from 08/2010 to 08/2030).
2. Hsiao, J., Yang, Y. H., Den, W. Horizontal Bioreactor, New design patented in the Republic of China (M378931, effective from 08/2010 to 08/2030) and People's Republic of China (CN201565255U, effective from 08/2010 to 08/2030).
3. Yang, Y. H., Yu, M. C., Jeng, J. M., Den, W., Lin, J. Automated Algae Culture Apparatus, New design patented in Republic of China (M373108B, effective from 02/2010~01/2029) and People's Republic of China (CN201541550U, effective from 08/2010~08/2030).
4. Huang, C. P. and Den, W. Equipment for Treating Wastewater. New invention patented in the Republic of China (I286998, Effective from 09/2007 to 08/2026).
5. Den, W., Pirbazari, M., Sze, M. An Apparatus and Method for UV Oxidation and Microbiological Decomposition of Organic Waste Air. New invention patented in the Republic of China (446572, effective from 07/2001 to 09/2019) and the United State of America (6,632,659 B1, effective from 10/2003 to 10/2018).
6. Den, W., Huang, C. P., Dai, B. T. An Apparatus and Method for Biological Adsorbing Filter to Treat Organic Waste Air. New invention patented in the Republic of China (409067, effective from 10/2000 to 08/2019).

Teaching & Advising

Course Developed & Taught

Undergraduate Level

- WATR 4310 Desalination and emerging technologies (3 credit hours, stacked with graduate-level course 5335, since Fall 2019): Principles and applications of membrane

desalination technology (reverse and forward osmosis), thermal desalination processes, electro-dialysis and electro-capacitive deionization technology; the concept of zero-liquid-discharge process.

- WATR 4315 Advanced wastewater treatment and recycling systems (3 credit hours, stacked with graduate-level course 5315, since Fall 2019): Principles and design criteria of primary (physical screen and sedimentation), secondary (suspended and attached-film biological processes), and tertiary (disinfection) wastewater treatment processes; regulation and policy for water reclamation and reuse; additional processes needed for water reclamation.
- Engineering mathematics (3 + 3 credit hours, 2002-2018): Ordinary differential equations, partial differential equations, Laplace transform, Fourier series and transform, Euler's method, Runge-Kutta method, finite difference methods for both ordinary and partial differential equations.
- Fluid mechanics (3 credit hours, Fall 2002-2009): Fluid statics, hydraulics, Navier-Stokes equation, internal flow, headloss, pump performance, external flow, flow about an immersed body, flow measurement.
- Trends in global ecology and environmental change (2 credit hours, 2016, 2017): Practicing techniques and ability to research and communicate on critical environmental issues on both global and local scales; understanding international and national policies on energy, water, and resources through devising "board games" based on the policy and market frameworks; critically review of an existing CSR report, and make a tangible recommendation based on scenario data.
- Scientific computation (2 credit hours, Spring 2004-2009): Problem-based learning for students from diverse fields. The computational process included setting up differential equations with pertinent initial and boundary conditions, followed by building a numerical method to solve the problem. Solution methods and results were discussed throughout the course.

Graduate Level

- WATR 5335 & WATR 5315 (please see Undergraduate-Level WATR 4310 & WATR 4315)
- WATR 5360 Water Resource Sustainable Use and Conservation Policy and Practices: Examination of the existing practices of water conservation goals and techniques for several key water-consuming sectors, including industrial, agriculture, and commercial sectors. The course will also practice how to make water conservation strategies at the corporate level and integrate water conservation as part of a circular economy. The course consists of five modules based on separate but interlinking topics, namely: 1 water management plan for the state of Texas. 2. corporate social responsibilities and water conservation goals. 3. water consumption in common industrial cooling and heating facilities and water conservation opportunities. 4. characteristics of selected industries and their water consumption pattern and water conservation goals and methods. 5. irrigation practices and the existing and potential water-saving techniques.

- WATR 5111 Graduate Seminars: Weekly seminar during each Fall Semester since 2019. Invited speakers include professionals from various municipal and state agencies, water and energy utility companies, federal agency, consulting firms, non-profit organizations, and academia.
- Advanced air pollution control design (3 credit units, Fall 2003-2018 odd years): Unit design of particulate-removing devices (cyclone, electrostatic precipitator, baghouse) and vapor-removing devices (adsorption, scrubbing, thermal and catalytic oxidation), emission inventory and risk assessment of air pollution emission, engineering costs.
- Environmental system simulation (3 credit hours, Spring 2003-2018 even years): Application of numerical solver (FlexPDE) and commercial computational fluid dynamics software (COMSOL) to design projects for environmental applications.
- Sustainable resource management (3 credit hours, Spring 2015): Corporate social responsibility, guidelines of sustainability reporting, waste-to-resource valuation, life cycle assessment (carbon footprint, water footprint), introduction to energy, water, and waste policies, software application and project presentation.
- Environmental Physicochemical Treatment Processes (2 credit hours, co-instructors, Fall 2011-2018): Introduction to membrane filtration and desalination technologies, reactor types and kinetics.

Thesis/Dissertation Advising

Doctoral Dissertation

- Ahson Mohammed Aslam, Synthesis of Chitosan-Encapsulated Magnetic Carbon Nanotube Particles for the Removal of Hazardous Heavy Metals Ions from Wastewater. (2022). Tunghai University, Taiwan (co-advised).
- Chih-Hao Chen, Ecological Compensation Assessment for Urban Development and Coastal Management. (2018). Tunghai University, Taiwan.
- Jules Chuang, An Integrated Renewable Energy and Carbon Market Model for Climate Market Mechanism Analysis: Challenges and Opportunities. (2018). Tunghai University.
- Sarttrawut Tulaphol, Carbon Nanotube Embeded Micro-Particles for Uptaking Chlorophenols: Adsorption Characterization and Application as a Solid-Phase Extractant. (2017). Thammasat University, Thailand (co-advised).
- Ekkachai Kanchanatip, Electrochemical Sensing of Chlorophenol Gases Using Carbon Nanotube Membranes. (2016). Chulalongkorn University, Thailand (co-advised).
- Yuhao Kang, Deposition Characteristics of Condensable Organic Airborne Molecular Contaminants on Wafer Surfaces in Cleanrooms. (2006). National Chiao-Tung University, Taiwan (co-advised).

*Master's Thesis & Research Report**

(Texas A&M University-San Antonio)

- Brenda Miller, Impact of Riparian No-Mow Treatment to Water and Soil Quality in an Urban Stream (Expected completion in May 2026).

- Ofojioha Onyekachi, Laboratory Column Studies to Characterize Atrazine Subsurface Transport in the Carrizo Aquifer in South Texas (Expected completion in May 2026).
- Jame Benny Otabil, Hydro-Biogeochemical Investigation of Groundwater-Surface Water Interaction in a Karst System: Case of the Edwards and Trinity Aquifer Systems, South-Central Texas, USA (Co-advise, expected completion in Dec. 2025).
- Joshua Sierra, Identification of oil & gas produced water indicators in a tributary in Eagle Ford Shale Play, Texas (Expected completion in Dec. 2025).*
- Angelica Canizalez, Nutrient uptake from water using two Texas native aquatic plants: Buttonbush and Maximilian Sunflower (Expected completion in Dec. 2025).*
- Eric Soliz, Removal of Diisopropylamine from Water Using Thermal- and UV-Activated Persulfate (2025).
- Kimia AhmadiyehYazdi, Evaluation of *Schoenoplectus Californicus* in an Artificial System for *E. Coli* Removal (2025). Texas A&M University-San Antonio.
- Pablo Vicaria, Synthetic Produced Water Treatment by Directional Solvent Extraction in a Continuous System (2024). Texas A&M University-San Antonio.
- Travis Walla, Is On-Site Evaporation a Feasible Solution for Produced Water for Oil and Gas Development? (2024).
- Alejandro Mendietta, Potential Effect of Produced Water Discharge on Surface Water: Lower Atascosa River Study* (2024).
- David Arambula, Detection of Per- and Polyfluoroalkyl Substances in Public Water Supply: San Antonio Case Study* (2024).
- Elora Afrin, Technoeconomic and Environmental Assessment of Produced Water Treatment Technologies for Beneficial Reuse* (2024).
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- Benjamin Arellano, Laboratory-Scale Parameter Optimization for Electrocoagulation Process for Treating Artificial Produced Water* 2023.
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- Julie A. Scott, Aflatoxin in Dairy Cattle Water Troughs* (2022).
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- Anna Flores, Rivers as International Borders: A Comparison of How Social-Political Factors Have Impacted Natural Resources in the Usumacinta River Basin and Rio Grande River Basin Within the Context of Climate Change (2022).
- Ramiro Nava, PFOA Loaded GAC* (2021).
- Sean X. Thimons, Treatment of Produced Water Using Ferrate (VI) and Directional Solvent Extraction (2021).

(Tunghai University)

- Wei-Chu Wang, Inactivation of Airborne Bacteria in Solution by Potassium Ferrate (2019).
- Song-Hua You, Application of Ferrate(VI) as Oxidant for Valorizing Lignocellulosic Biomass: Depolymerization of Cellulose and Conversion of Hydroxymethylfurfural (2019).
- Hsuen-Wen Kuo, The Effects of Buffer Agents as a Protective Layer of Encapsulated Potassium Ferrate for Oxidation of Methyl Orange (2018).

- Bo-Hsun Lu, Optimization of Water Recycling Strategy for an Integrated-Circuit Packaging Fab: A Scenario-Base Analysis (2018).
- Bo-Yen Chen, Preparation of Encapsulated Ferrate (VI) and Controlled Release Study (2017).
- Hui-Chun Lee, Hydrothermal, Synthesis of CuS as Photocatalyst to Degrade Paraquat via Heterogeneous Photo-Fenton-Like Oxidation under Visible Light (2016).
- Po-Ying Huang, Identification of Water Recycling Strategy for Microelectronics Industry Using Linear Programming Models (2016).
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- Li-Fen Jiang, Development of a Solid-Phase Extraction Media Based on Carbon Nanotubes (2006).
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