Jirapat Phetheet

Geologist (Professional Level)

Department of Groundwater Resources
26/83 Ngamwongwan Rd., Lad Yao,
Chatuchak, Bangkok, Thailand 10900

Contact
Phone: (+66) 9 7995 8883
Email: jirapat.p@dgr.mail.go.th

Professional Profile: Dedicated and detail-oriented professional geologist with expertise in groundwater exploration and numerical modeling. Proficient in groundwater flow modeling, data analysis, and GIS applications for water resource management. Holds an M.S. in Geology from the University of Kansas and a B.Sc. from Chulalongkorn University, with a strong academic record and multiple research publications. Actively engaged in international collaborations, professional training, and conference presentations to advance hydrogeological research and sustainable groundwater management.

Education

M.S. Geology — **The University of Kansas** — 2018 – 2020
Lawrence, Kansas, USA

Thesis: Simulating and Analyzing Use of Water and Renewable Energy in Agricultural Areas Using FEWCalc and DSSAT
https://hdl.handle.net/1808/34766
Thesis supervisor: Professor Mary C. Hill
Committee member: Mary C. Hill, Randy Stotler, Edward Peltier, & Jonathan Aguilar
Cumulative GPA: 3.73

B.Sc. Geology — **Chulalongkorn University** — 2013 – 2017
Bangkok, Thailand

Senior project: Structural Geology of Carbonate Rocks in Siam City Cement Public Company Limited, Amphoe Kaeng Khoi, Changwat Saraburi
https://doi.org/10.58837/CHULA.SP.2016.52
Cumulative GPA: 3.53 (Second-class honors)

Professional Experience

11/2024 to Present — **Geologist (Professional Level)**
Bureau of Groundwater Exploration and Potential Assessment
Department of Groundwater Resources
Ministry of Natural Resources and Environment

- Conducted geological and hydrogeological investigations, both desk work and fieldwork (e.g., groundwater sampling, geophysical survey).
- Analyzed and interpreted groundwater and other hydrogeology-related data.
- Developed groundwater flow models for groundwater potential assessment.
- Organized and coordinates international conferences, facilitating collaboration and knowledge exchange among global experts.
- Pursued professional development, including conference presentations, to improve professional visibility.

01/2021 to 11/2024 — **Geologist (Practitioner Level)**
Bureau of Groundwater Exploration and Potential Assessment
Department of Groundwater Resources
Ministry of Natural Resources and Environment

- Conducted geological and hydrogeological investigations, both desk work and fieldwork (e.g., groundwater sampling, geophysical survey).
- Analyzed and interpreted groundwater and other hydrogeology-related data.
- Developed groundwater flow models for groundwater potential assessment.
- Experienced with deep groundwater exploration and drilling operations.

10/2020 to 12/2020 **Geologist (Practitioner Level)**
Bureau of Groundwater Conservation and Restoration
Department of Groundwater Resources
Ministry of Natural Resources and Environment

- Developed groundwater flow models to investigate sources of contamination from a waste recycling company located in western Thailand.

01/2020 to 06/2020 **Graduate research assistant**
US National Science Foundation's Innovations at the Food, Energy, Water Nexus program and the Established Program

- Supported the water supply and economic teams.
- Developed the decision-making program.

Honors and Awards

2019 Joseph M. Patterson Geology Scholarship — United States

2018 Royal Thai Government Scholarship — Bangkok, Thailand
Allocated upon the requirement of the Department of Groundwater Resources

2017 Outstanding Senior Project Presentation Award (Runner-up) — Bangkok, Thailand

2016 First Place, Geoquiz Competition — Kuala Lumpur, Malaysia
Geoscience Industrial Week 2016, The University of Malaya, Malaysia

Skills

Agent-based modeling (NetLogo), R, Python, MATLAB, Crop modeling (Decision Support System for Agrotechnology Transfer: DSSAT), Groundwater models (Visual MODFLOW, GMS, Groundwater Vistas, FREEWAT, GroundWaterTutor), PHREEQC, ArcGIS, QGIS, Surfer.

Training Courses

2024 Regular training courses on ***Climate Change and Landslides***, International School for Geoscience Resources (IS-Geo), Korea Institute of Geoscience and Mineral Resources (KIGAM), Daejeon, Republic of Korea.

2024 International Workshop on ***Groundwater Database Management***, led by the Geological Survey of Denmark and Greenland (GEUS), NIRAS, and GSI Environmental Inc., hosted by the Department of Groundwater Resources, Bangkok, Thailand.

2024 Training on ***Sustainable Integrated Water Resources Management*** under the Singapore Cooperation Programme (SCP), Nanyang Technological University, Singapore.

2023 IAEA fellowship program on ***Isotope Hydrology Techniques*** under the THA5057 project, the Technische Universität Bergakademie Freiberg (TUBAF), Freiberg, Saxony, Germany. (Host supervisor: Professor Dr. Traugott Scheytt).

2021 Visual Training on ***Groundwater Data Management***, the United States Geological Survey (USGS), hosted by the Department of Groundwater Resources, Bangkok, Thailand.

2020 Virtual Workshop on ***Coupling Agent-Based Models and Grid-Based Numerical Models (Landlab)***, Community Surface Dynamics Modeling System (CSDMS), the University of Colorado, Boulder, Colorado, USA.

2020 International Winter School: ***Agent-Based Modeling Social-Ecological Systems***, Center for Behavior, Institutions and the Environment (CBIE), Arizona State University, Tempe, Arizona, USA.

Publications

Peer-reviewed Publications

1. Banks, A. T., **Phetheet, J.**, & Hill, M. C. (2020). An Interactive Computer Module for Understanding Groundwater Flow and Transport. *Groundwater*. https://doi.org/10.1111/gwat.13040
2. Jitmahantakul, S., **Phetheet, J.**, Kanjanapayont, P. (2020). 2D Sequential Restoration and Basin Evolution of the Wichianburi Sub-basin, Phetchabun Basin, Central Thailand. *Frontiers in Earth Science*. https://doi.org/10.3389/feart.2020.578218
3. **Phetheet, J.**, Hill, M. C., Barron, R. W., Rossi, M. W., Amanor-Boadu, V., Wu, H., & Kisekka, I. (2021). Consequences of climate change on food-energy-water systems in arid regions without agricultural adaptation, analyzed using FEWCalc and DSSAT. *Resources, Conservation & Recycling*. https://doi.org/10.1016/j.resconrec.2020.105309
4. **Phetheet, J.**, Hill, M. C., Barron, R. W., Gray, B. J., Wu, H., Amanor-Boadu, V., Heger, W., Kisekka, I., Golden, B., & Rossi, M. W. (2021). Relating Agriculture, Energy, and Water Decisions to Farm Incomes Using 50-Year Projections from FEWCalc and DSSAT. *Agricultural Systems*. https://doi.org/10.1016/j.agsy.2021.103222
5. **Phetheet, J.,** Occarach, O., & Pirarai, K. (2024). Flood hazard mitigation using managed aquifer recharge: Numerical assessment of a pilot trial in the Nam Kam River Basin, NE Thailand. *Thai Geoscience Journal*, 5(7), 41–50. https://doi.org/10.14456/tgj.2024.3

Book

1. Charusiri, P., Chutakositkanon, V., Surakotra, N., Tangwattananukul, L., Nualkhao, P., Chokchai, S., & **Phetheet, J.** (2022). *Physical Geology* (2nd ed.) [in Thai: ธรณีวิทยากายภาพ]. Bangkok. [ISBN 978-616-588-736-6].

Conference Abstracts and Proceedings

1. **Phetheet, J.**, Lhosupasirirat, K., Panyapradit, T., Jirarachwaro, S., & Jitmahantakul, S. (2016). A New Technique for Making Digital Outcrop Model for Structural Analysis: An Example from the Permian Khao Luak Formation Outcrop in Phetchabun, Thailand. International Conference on the Tectonics of the Northwestern Indochina, Chiang Mai, Thailand. (Poster Presentation).
2. Heger, W., **Phetheet, J.**, Hill, M. C., Gray, B. J., & Barron, R. W. (2018). Farm Income Analysis Using the Food-Energy-Water Decision Support Calculator, with Application to Western Kansas. Governor's Conference on the Future of Water in Kansas, Manhattan, Kansas. (Poster Presentation).
3. **Phetheet, J.**, Heger, W., & Hill, M. C. (2019). A Coupled Simulation of the Food-Energy-Water Nexus for Farm Income Analysis: An Agent-based Approach Applied to Western Kansas. The CSDMS 2019 Annual Meeting, Boulder, Colorado. (Poster Presentation).
4. **Phetheet, J.**, Heger, W., & Hill, M. C. (2019). Evaluating Use of Water and Renewable Energy in Agricultural Areas: A Coupled Simulation of DSSAT and Agent-Based Modeling. AGU Fall Meeting 2019, San Francisco, California. (Poster Presentation).
5. Hill, M. C., **Phetheet, J.**, Rossi, M., Amanor-Boadu, V., & Barron, R. W. (2020). Climate Change and Food-Energy-Water Systems in Arid Regions: Dynamics and Economics Simulated Using FEWCalc and DSSAT. AGU Fall Meeting 2020. (Presenting Author).
6. Nettasana, T., Hengsuwan, M., Busarakum, C., Kullaboot, P., & **Phetheet, J.** (2020). Characterization of Contaminated Groundwater and Remediation Plans in Namphu and Rangbua Subdistricts, Ratchaburi, Thailand. The 56th CCOP Annual Session: Geoscience towards New Normal and Future Earth, Bangkok, Thailand.

7. **Phetheet, J.**, Lerdlum, K., Occarach, O., Hunyek, V., & Yotmaw, J. (2021). Groundwater Potential Assessment Using Groundwater Flow Model: A Case Study of Tham Luang-Khun Nam Nang Non Forest Park, Chiang Rai Province, Thailand. Geothai Webinar 2021, Bangkok, Thailand. (Poster Presentation).
8. Hill, M. C., Stover, S., Amanor-Boadu, V., Pfromm, P., Edmonds, L., Barron, R., Wu, H., & **Phetheet J.** (2021). FEWtures: Building Rural Economies, Reducing Carbon, and Supplying Food for the Future. AGU Fall Meeting 2021, New Orleans, Louisiana.
9. Nettasana, T., Hengsuwan, M., Busarakum, C., Kullaboot, P., & **Phetheet, J.** (2022). Characterization of Contaminated Groundwater and Remediation Plans in Namphu and Rangbua Subdistricts, Ratchaburi, Thailand. In Koontanakulvong, S., & Visessri, S. (Eds.), *Proceedings of the THA 2022 International Conference on Moving Towards Sustainable Water and Climate Management After COVID-19* (pp. 245).
10. Ounping, N., Yotmaw, J., **Phetheet, J.**, Occarach, O., & Pirarai, K. (2022). Managed Aquifer Recharge: The Exploration of Potential Areas, Nam Kam River Basin, Sakon Nakhon and Nakhon Phanom Provinces, Thailand. In Koontanakulvong, S., & Visessri, S. (Eds.), *Proceedings of the THA 2022 International Conference on Moving Towards Sustainable Water and Climate Management After COVID-19* (pp. 236-237).
11. Yanawongsa, J., Hunyek, V., **Phetheet, J.**, Occarach, O., & Pirarai, K. (2022). GIS Analysis for Groundwater Exploration in Hard Rock Terrains: Huai Krachao, Kanchanaburi, Thailand. In Koontanakulvong, S., & Visessri, S. (Eds.), *Proceedings of the THA 2022 International Conference on Moving Towards Sustainable Water and Climate Management After COVID-19* (pp. 232-233).
12. **Phetheet, J.**, & Hill, M. C. (2022). An Agent-based Approach for Managing the Food-energy-water Systems Under Future Climate Scenarios Using FEWCalc and DSSAT. In Koontanakulvong, S., & Visessri, S. (Eds.), *Proceedings of the THA 2022 International Conference on Moving Towards Sustainable Water and Climate Management After COVID-19* (pp. 226-227).
13. Busarakum, C., Nettasana, T., Hengsuwan, M., Kullaboot, P., & **Phetheet, J.** (2022). Conceptual Model and Numerical Simulation of Aquifer Contaminated by Volatile Organic Compounds in Tambon Namphu and Tambon Rangbua, Ratchaburi Province. The 1st Thailand Groundwater Symposium: Key to Water Security and Sustainability, Bangkok, Thailand.
14. Duangsong, S., **Phetheet, J.**, Occarach, O., & Pirarai, K. (2022). Discovered Five Groundwater Aquifers in the Lower Chao Praya Basin. The 1st Thailand Groundwater Symposium: Key to Water Security and Sustainability, Bangkok, Thailand.
15. Yotmaw, J., Yanawongsa, J., **Phetheet, J.**, Occarach, O., & Pirarai K. (2022). Hydrogeological Behavior of Deep Groundwater Resources in the Northeast Area (Nakhon Ratchasima-Ubon Ratchathani Basin). The 1st Thailand Groundwater Symposium: Key to Water Security and Sustainability, Bangkok, Thailand.
16. **Phetheet, J.**, Rittisit, R., Ounping, N., & Occarach, O. (2022). Numerical Simulation and Particle-Tracking Analysis of the Managed Aquifer Recharge System in Sakon Nakhon Province, Northeast Thailand. The 1st Thailand Groundwater Symposium: Key to Water Security and Sustainability, Bangkok, Thailand. (Oral Presentation).
17. **Phetheet, J.**, Occarach, O., & Pirarai, K. (2022). Flood hazard mitigation using managed aquifer recharge: Numerical assessment of a pilot trial in the Nam Kam River Basin, NE Thailand. The 58th CCOP Annual Session: Geoscience for energy transition in East and Southeast Asia, Bandung, West Java, Indonesia. (Oral Presentation).
18. Hunyek, V., **Phetheet, J.**, Yanawongsa, J., & Occarach, O. (2023). Integrated assessment of groundwater potential zones for deep groundwater exploration in hard rock aquifers using GIS and geophysical techniques: A case study of Huai Krachao, Kanchanaburi, western Thailand. The 50th IAH Congress 2023, Cape Town, South Africa.

Invited Presentations, Lectures, and Workshops

1. **Workshop on Groundwater Modeling for Groundwater Resources Management**
   Hosted by the Department of Groundwater Resources | December 2023
   Grand Richmond Stylish Convention Hotel, Nonthaburi Province.
2. **Training Course for Engineers or Geologists, 25th Batch**
   Hosted by the Department of Groundwater Resources | June 2024
   Coco View Hotel, Samut Songkhram Province.
3. **Lecture on Groundwater Investigation and Development**
   Part of the Groundwater Development Course (01096153) | September 2024
   Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok.
4. **Training Course for Engineers or Geologists, 26th Batch**
   Hosted by the Department of Groundwater Resources | April 2025
   Navela Hotel & Convention, Ratchaburi Province.
5. **Groundwater Bootcamp under the Youth Groundwater Guardian Project**
   Hosted by the Department of Groundwater Resources for high school students | May 2025
   Cholchan Pattaya Beach Resort, Chonburi Province.
6. **Lecture on Basic Hydrogeology for Local Stakeholders**
   Topic: Area-based groundwater development in Thailand
   Hosted by the Department of Groundwater Resources | June 2025
   Novotel Rayong Star Convention Center, Rayong Province.
7. **Field Training on Resistivity Survey for Armed Forces Development Command**
   Hosted by the Department of Groundwater Resources & Royal Thai Army | September 2025
   The 1st Regional Development Office, Royal Thai Army, Chachoengsao Province.

Research Funding

1 Nettasana, T. (PI), Pimpa, N., Hengsuwan, M., Jumpa, K., Busarakum, C., Banjerdkij, P., Kullaboot, P., & **Phetheet, J.** Spatial distribution of illegal industrial wastewater disposal and integrated remediation schemes: A case study of the 16th Lum Nam Jone reservoir, Chachoengsao Province. National Research Council of Thailand, 3904428, 8,809,000 baht (approx. USD 243,000), 08/2021-08/2023.

2. Varnakovida, P. (PI), Soralump, S., Occarach, O., & **Phetheet, J.** Suitable areas analysis for groundwater bank recharge, monitoring and evaluation of drought solution using groundwater bank in the Northeastern Mekong, Chi and Mun watershed area. Agricultural Research Development Agency (Public Organization), PRP6605031120, 1,589,000 baht (approx. USD 44,000), 04/2023-06/2024.