

# D.L. MARRIN

Dr. Marrin (nickname West) is an applied scientist in the fields of biogeochemistry, pollutant dynamics, water resources, and aquatic ecology. He has developed analytical and interpretive techniques to assess the biodegradation and partitioning of contaminants in aquifers, soils and surface freshwaters, as well as to detect wastewater impacts on coastal marine ecosystems. His lectures focus on water quality and footprints, hydromimicry, the water-energy-food nexus and related perceptual challenges. He maintains a multi-faceted water forum/consultancy and has taught at three universities, including an adjunct professorship at San Diego State University. His clients include environmental firms, major corporations, public health agencies and NGOs.

## **EDUCATION**

Ph.D., Water Resources (hydrochemistry); The University of Arizona.

M.S., Environmental Science (fisheries); University of California, Berkeley.

B.S., Biological Sciences (ecology/biochemistry); University of California, Irvine.

Cert./CPE, Wastewater Treatment (CSUS); Nutrition (AFPA/ASN); Neurocognition (NSA).

## **RECENT POSITIONS**

**Consulting Scientist** (California, Hawaii, México); 2008-present.

Working with corporations, public agencies, and environmental firms on projects involving the analysis, behavior and remediation of aqueous pollutants and the chemistry of potable waters. Assisting institutes and NGOs with education and R&D programs related to water-energy-food.

**Associate Founder**, Fundación Somos Agua (México DF, Yucatán Peninsula); 2008-2015.

Designed projects that addressed water issues, emphasizing simple technology, hydromimicry, sustainability and watershed compatibility. Cultural traditions, personal experiences, relevant education, and collaborations among artists, scientists, engineers and architects were highlighted.

**Research Scientist & Writer** (Hawaii); 1999-2008.

Investigated a wide range of water-related disciplines (e.g., physical chemistry, biogeochemistry, hydrology, systems theory, ancient traditions, non-scientific research) and wrote three books. Also served as a technical/legal expert for water quality disputes in Hawaii and the Pacific Rim.

**Adjunct Professor**, SDSU (San Diego State University, California); 1988-1999.

Developed and taught graduate courses (hydrochemistry, biogeochemistry) and served on thesis committees in the SDSU Geosciences Department. Taught the environmental chemistry course and lectured in public health classes at the UCSD (University of California-San Diego) Extension.

## **REPRESENTATIVE PROJECTS**

- Projecting the contribution of greenhouse gases to the atmosphere from the aerobic and anaerobic biodegradation of organic wastes in shallow soils and aquifers.
- Critiquing the application of remedial technologies for polluted surface and ground waters.
- Utilizing natural and anthropogenic tracers to evaluate the locations of saline water intrusion into coastal aquifers and the submarine groundwater discharge from coastal aquifers.
- Evaluating changes in water quality, habitat utilization and the nutritional status of native fishes following the impoundment of streams in the Sierra Nevada Mountains.
- Assessing the potential impact of crude oil spills on the distribution and productivity of marine macrophytes (seaweeds) along the Southern California coast.

- Evaluating the biochemistry and treatment of biofilms affecting water distribution systems.
- Providing litigation support on cases involving water pollution and resource allocation.
- Using footprint analyses to assess the demands of food and energy on water resources.
- Documenting the production rates, chemical variability, microbial status, treatment options and probable recharge zones for mountain spring waters.
- Applying systems and information theories (emergence, connectivity, feedback, complexity) to generally describe and detect changes in watersheds and aquatic ecosystems.
- Estimating the demands of alternative energy sources (e.g., biofuels, hydrogen, solar, wind) on water supplies and their respective impacts on water quality.
- Evaluating pattern-based languages to improve communication among diverse professionals.
- Serving as an advisor and mentor to groups focused on investment in the water sector.
- Exploring the use of pattern recognition, interpretation and projection techniques to more effectively communicate water quality issues to a general audience.
- Collaborating with artists, musicians, and filmmakers to design and build a visual, auditory, and interactive display for attendees at an international water exhibition.

### **SELECTED PUBLICATIONS**

2019. Natural resource constraints on the food system. *In: Environmental Nutrition*, Elsevier Publ.; Amsterdam, Netherlands (Chapter 4).

2019. Emergent properties of water resources and watersheds. *MDPI Proceedings*, 48: 18.

2018. *A Global Compendium on Water Quality Guidelines* (w/H. Bond et al.). International Water Resources Association: Paris, France.

2018. Perspectives on altering our perceptions of water. *Interalia*, September issue, 9 pp.

2017. Pattern-based approaches to evaluating water quality. *MDPI Proceedings*, 2: 176.

2017. The commonality of patterns. *SciArt Magazine* (STEAM issue): feature article, 4 pp.

2016. Using water footprints to identify alternatives for conserving local water resources in California. *Water*, 8(11): 497.

2014. Reducing water and energy footprints via dietary changes among consumers. *International Journal of Nutrition and Food Sciences*, 3(5): 361.

2014. Functional art and water science. *SciArt Magazine* (June issue): 34.

2012. Water, fractals, and watershed processes. *In: Environmental Landscape Sustainability*, Sousse Univ., Sousse, Tunisia (p 161).

2010. Perspectives on the relationship between water and carbon. *Proceedings of the American Institute of Physics*, 1251: 12.

2010. *Hydromimicry: Strategies for a Water Planet*. Water Sciences & Insights; Kauai, HI.

2008. Water requirements and impacts associated with alternative energy sources. *In: Water Scarcity, Global Changes, and Groundwater Management*, Univ. of California, Irvine, CA (Chapter 1).

2006. *Altered Perceptions: Addressing the Real Water Crises*, Unlimited Publ., Bloomington, IN.

2002. *Universal Water: Ancient Wisdom and Scientific Theory of Water*, Inner Ocean Publ.; Maui, HI.

2000. Potential atmospheric contribution of methane from fractured aquifers. *EOS*, 81(26): 290.