Texas A&M University-San Antonio

WATR 5214 Nexus Water Energy and Food

(3 credit hours)

Spring 2026, R 5:30 – 6:45 pm.

Zoom link to classes: https://tamusa.zoom.us/j/85276967541

Instructors: Madjid Delkash

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Office Hours: You may email to schedule an appointment.

Let's watch this video.

Weekly Class Schedule with Dates and Specific Case Studies (Spring 2026)

Course structure reminder: This is a presentation-based course. Every class meeting consists of student presentations (10 to 15 minutes each), followed by questions and open discussion. Attendance, asking questions, and respectful discussion are encouraged every week. There is no midterm and final exams.

Note on academic calendar: Spring Break is March 9 to March 14. The last day of scheduled weekday classes is May 4, and final examinations are May 6 to May 12. Therefore, this section schedules its final regular meeting on Thursday, April 30.

Week 1 (Thursday, January 22, 2026): Course overview and expectations

- Course goals, weekly workflow, presentation expectations, grading rubric, and discussion norms
- How to find credible sources (agency reports, peer reviewed work, reputable news, technical reports)
- How to cite sources on slides
- How weekly topics will be assigned to students

Week 2 (Thursday, January 29, 2026): Rio Grande Compact dispute, Mesilla Valley groundwater pumping

Case focus: Texas v. New Mexico (Rio Grande Compact) and the Mesilla Valley irrigation and groundwater pumping issues affecting deliveries to Texas.

Week 3 (Thursday, February 5, 2026): Red River Compact and the Tarrant v. Herrmann ruling

Case focus: The Red River dispute (Texas and Oklahoma) and the U.S. Supreme Court decision in Tarrant Regional Water District v. Herrmann (2013) regarding cross border access and state control.

Week 4 (Thursday, February 12, 2026): Colorado River allocation crisis, Lake Mead and Lake Powell shortage operations

Case focus: Lower Basin and Upper Basin tensions, shortage declarations, and the policy transition toward post 2026 operating rules.

Week 5 (Thursday, February 19, 2026): ACF basin conflict and Apalachicola Bay impacts

Case focus: Florida v. Georgia litigation context, Atlanta metro withdrawals, and downstream ecosystem and fisheries impact in the Apalachicola Bay system.

Week 6 (Thursday, February 26, 2026): Missouri River management conflict, reservoir releases versus navigation

Case focus: U.S. Army Corps of Engineers management, upstream reservoir storage priorities, downstream navigation expectations, and drought and flood risk tradeoffs.

Week 7 (Thursday, March 5, 2026): Permian Basin water use: hydraulic fracturing versus agriculture and rural groundwater

Case focus: West Texas water sourcing for fracking (fresh, brackish, and reused water), aquifer stress, drought vulnerability, and competition with irrigated agriculture.

Week 8 (Thursday, March 12, 2026): No class, Spring Break (March 9 to March 14)

Week 9 (Thursday, March 19, 2026): Renewable Fuel Standard and corn ethanol: food price and land and water tradeoffs

Case focus: Midwest corn ethanol expansion under federal policy, land use shifts, corn price sensitivity during drought years, and irrigation implications in high production regions.

Week 10 (Thursday, March 26, 2026): Columbia and Snake River hydropower, irrigation reliability, and salmon recovery

Case focus: Hydropower operations and competing priorities for irrigation, river temperature, spill, and endangered species recovery, with emphasis on the Columbia Basin and Snake River system.

Week 11 (Thursday, April 2, 2026): California drought: Central Valley agriculture versus hydropower and environmental flow requirements

Case focus: State Water Project and Central Valley Project allocation reductions during drought, hydropower output variability, and the competing requirements of agriculture, urban supply, and ecosystem flows.

Week 12 (Thursday, April 9, 2026): Imperial Valley land and water nexus: solar development, agriculture, and Salton Sea implications

Case focus: Renewable energy buildout pressures in the Imperial Valley, farmland leasing and conversion dynamics, irrigation district governance, and linkages to Salton Sea management and dust and air quality concerns.

Week 13 (Thursday, April 16, 2026): Ogallala Aquifer depletion and the Kansas LEMA approach

Case focus: High Plains groundwater decline, energy intensity of deeper pumping, and the Kansas Local Enhanced Management Area (LEMA) approach as a structured conservation policy model.

Week 14 (Thursday, April 23, 2026): Desalination in practice: Carlsbad desalination plant and the energy penalty tradeoff

Case focus: The Carlsbad seawater desalination facility in San Diego County as an applied case of supply reliability versus energy use, cost, and environmental considerations.

Week 15 (Thursday, April 30, 2026): Data centers in water scarce regions: The Dalles, Oregon and municipal water demand

Case focus: The Dalles, Oregon and the Google data center expansion, including the municipal water demand for cooling, public transparency disputes about water use, and community concerns about groundwater and long-term supply planning.