San José State University
College of Social Science
Environmental Studies Department
ENVS 128, Water Resources Management
Section 80, Spring 2023
Course Number: 27787

Course and Contact Information

Instructor:	**Patrick T. Ferraro**
Department Location:	**Washington Square, Rm 118**
Telephone:	**(408) 293-1852**
Email:	**ptferraro5@gmail.com (Preferred email, SJSU.edu checked once per day)**
Office Hours:	**M 10:00 – 10:30 PM and by appointment on Zoom**
Class Days/Time:	**M, W 10:30 – 11:45 PM on Zoom**
Classroom:	**SJSU.Zoom**

Prerequisites:	**ENVS 129 and STAT 095 or appropriate math course; or instructor consent.**

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas learning management system course website at http://sjsu.instructure.com

You are responsible for regularly checking with the messaging system through MySJSU at http://mysjsu.edu or other communication systems as indicated by the instructor to learn any updates.

Course Description

Water uses and supplies; water resource measurement methods; hydrology; erosional processes; sediment production and transport particularly on Northern California coastal watershed; flood hazards and methods of control; groundwater and groundwater aquifers; water quality.

Learning Outcomes

Water resources management is a multi-disciplinary field encompassing:

- **urban vs. agricultural water supply**
- **water supply reliability**
- **urban and regional planning**

- **water quality for public health and the environment**
- **watershed management**
- **environmental restoration**
- **flood protection**
- **wastewater treatment and advanced treatment for reuse**
- **energy (and thus carbon emission) impacts of human engineered water systems**
- **anticipating and responding to climate change**

This course will give you exposure to both quantitative and qualitative aspects of the topic using a variety of teaching techniques including lectures, group discussion, problem sets, guest lectures, and a field trip. We will look at case studies within California, the US and internationally. We will also evaluate how climate change has already impacted water resources in some regions of the world and how it is expected to change California water management.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. **Calculate measurements of water quantity and quality through practice problems assigned throughout the semester**
2. **After becoming familiar with terminology used by engineers and water managers through reading assignments and class lectures and discussions, understand connection between water policy and measurements used to manage water resources.**

Recommended Texts/Readings

Textbooks:

Cech, Thomas V. 2005. ***Principles of Water Resources: History, Development, Management and Policy****, 3rd.* John Wiley and Sons Inc., Hoboken, NJ.

Hardcover: 576 pages (August 24, 2009)

- *** ISBN-10: 0470136316, ISBN-13: 978-0470136317**

Water 4.0: The Past, Present, and Future of the World's Most Vital Resource by David Sedlak Publisher: Yale University Press (January 28, 2014)

- ISBN-10: 030017649X, ISBN-13: 978-0300176490

Other Readings

This reading list will be supplemented throughout the semester with documents posted on Canvas and in the course syllabus below

Please check Canvas prior to each class and read and comment on attached documents. Lecture notes containing video and additional web links will be posted after each class meeting. Zoom recording links and passcodes will be emailed, usually within an hour after class meeting.

ENVS 128 Water Resources Management

Spring 2022 Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/25/23	Introductions & course overview
1	1/30/23	Managing Water by Watersheds Problem Set #1 assigned; Chapters 1 (Historical Perspectives of Water Use and Development) AND 2 (The Hydrologic Cycle, Climate, and Weather)
2	2/1/23	Semester Case Study: Coyote Creek Chapter 3 (Surface Water Hydrology) Problem set #2 assigned
2	2/6/23	Historical Ecology/Stream and Wetlands \Baseline Water Requirement Chapter 12 (Water, Fish and Wildlife);
3	2/8/23	Watershed /Groundwater Connection Chapter 4 (Groundwater Hydrology) Problem set #1 due.
3	2/13/23	Surface Water Impoundments Assignment #2 due. Problem set #3 assigned.
4	2/15/23	Artificial Recharge with Reservoir Supplies Ch 7 (Dams) Research Topic Due – See Rubric on Canvas under Assignments

Week	Date	Topics, Readings, Assignments, Deadlines
4	2/20/23	Groundwater Extraction/Overdrafts/Subsidence
5	2/22//23	Economics & Agricultural Water Demand Chapter 13 (Economics of Water) ; Problem set #4 assigned
5	2/27/23	Urban Water Demand Projections Ch 6 (Muni Water Development and Irrigation) Problem set #3 due
6	3/1/23	Inter-basin Transfers/Importing Water Problem set #5 assigned
6	3/6/23	Drinking Water Quality Problem set #4 due
7	3/8/23	Water Treatment/Desalination Problem set #5 due Chapter 11 (Drinking Water and Wastewater Treatment)
7	3/13/23	Urban Water Demands & Distribution Problem set #6 assigned
8	3/15/23	Improving Water Use Efficiency
8	3/20/23	Sewage: Generation & Transmission Problem set #6 due Problem set #7 assigned
9	3/22/23	Urban Stormwater & Pollution Prevention

Week	Date	Topics, Readings, Assignments, Deadlines
		Chapter 5 (Water Quality)
9	4/3/23	Grey Water Generation and Reuse, Rainwater Harvesting **Problem set #7 due**
10	4/5/23	Sewage Treatment & Disposal **Problem set #8 assigned**
10	4/10/23	Water Recycling and Reuse
11	4/12/23	Sediment Transport, Deposition and Tidelands FIELD TRIP: Coyote Creek Outdoor Classroom, located at 791 E. William St, in San Jose, between 16th & Bridge, across from the Williams Street Park. **DRAFT TERM PAPER DUE See Rubric on Canvas under Assignments**
11	4/17/23	Flood Protection: Land Use Controls, Riparian Setbacks, FEMA Flood Insurance Program, Levees and Bypass Channels **Problem set # 8 due Problem set #9 assigned**
12	4/19/23	Flood Frequency Hydrology
12 13	4/24/23 4/26/23	Climate Change/Sea Level Rise Sacramento-San Joaquin Delta & New Convenience
13	5/1/23	Hydroelectric Power Generation **Problem set #9 due**

Week	Date	Topics, Readings, Assignments, Deadlines
14	5/3/23	Final Exam Review
14	5/8/23	Integrated Water Resources Planning Sustainability/Carbon Footprints
15	5/10/23	Course Review Final Draft of Research Report Due May 10, 2023 See Rubric on Canvas under Assignments Course Review Quiz DUE: MAY 10, 2023
Final Exam	5/19/23	Take Home Final Exam DUE Friday May 19, 2023 @12:00 PM

Class Schedule

Date/Topic/Supplemental Online reading assignments

1.January 25, 2023 Introductions/ Overview of Class

The Water Cycle (By NOAA)

The Water Cycle (2::41)

Where is the Earth's Water?

https://www.usgs.gov/media/images/distribution-water-and-above-earth

The water crisis: How California overcomes the drought | David Sedlak | TEDxMarin

https://www.youtube.com/watch?v=MpI-FKqk0Ew&t=18s (14:11)

Two Visions of the Fourth Revolution in Urban Water - David Sedlak

https://www.youtube.com/watch?v=KmR2EWohrCg - t=23 (45:00)

Panel 1A: David Sedlak, UC Berkeley "Water, Cities, and Infrastructure: Innovations in Technology and Affordability."

https://www.youtube.com/watch?v=eGTfojoBYa4 (23:12)

Los Angeles, City of Water By JACQUES LESLIE DEC. 6, 2014

http://www.nytimes.com/2014/12/07/opinion/sunday/los-angeles-city-of-water.html?_r=2

SCVWD Silicon Valley Advanced Water Purification Center

https://www.youtube.com/watch?v=aYOGVpTsvRA (4:09)

2.January 30, 2023 **Managing Water by Watersheds**

Thinking Globally: Water Distribution

OVERPOPULATION crisis part 1 of 2

OVERPOPULATION crisis part 1 of 2

video labeled The Most IMPORTANT Video You'll Ever See

“Arithmetic, Population and Energy” by Prof. Bartlett, Univ. of Colorado

(part 1 of 8)

The Most IMPORTANT Video You'll Ever See (part 1 of 8)

Click on Playlist in side bar for parts 2-8

The Most IMPORTANT Video You'll Ever See (part 2 of 8)

Water cycle

http://en.wikipedia.org/wiki/Water_cycle

3. February 1, 2023 **Semester Case Study: Coyote Creek**

South Bay Restoration/The Mouth of the Coyote:

California Colloquium on Water

Steve Ritchie, Executive Project Manager, South Bay Salt Pond Restoration Project

"The South Bay Salt Pond Restoration Project: The Wild Heart of Silicon Valley" In 2003, the State of California and the U.S. government, with substantial support from private foundations, purchased 15,100 acres of salt production ponds adjoining South San Francisco Bay from Cargill Corporation. These ponds represent an incredible opportunity for shoreline habitat restoration

and public access in the San Francisco Bay Area. This is the largest habitat restoration project in the Western U.S. (http://www.southbayrestoration.org/) and it must be accomplished without increasing flood risk...

California Colloquium on Water - Steve Ritchie

Guide to San Francisco Bay Area Creeks

Coyote Creek Watershed

http://museumca.org/creeks/1390-OBCoyote.html

4.February 6, 2023

Historical Ecology/Stream and Wetlands Baseline Water Requirement

Coyote Creek Watershed Historical Ecology Study

http://www.sfei.org/coyotecreek

Use links on page to Download Executive Summary: and/or Full Report:

Federal Law:

United States Department of Agriculture, Natural Resources Conservation Service/Watershed Programs – PL-566

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcseprd397225

Watershed Protection and Flood Prevention Act of 1954

http://en.wikipedia.org/wiki/Watershed_Protection_and_Flood_Prevention_Act_of_1954

5. February 8, 2023 **Watershed /Groundwater Connection**

How Ground Water Occurs

https://pubs.usgs.gov/gip/gw/how_a.html

Download Circular 1886: Sustainability of Groundwater Resources

http://pubs.usgs.gov/circ/circ1186/pdf/circ1186.pdf

Examples of Innovative Approaches that Contribute to Ground-Water Sustainability

http://water.usgs.gov/pubs/circ/circ1186/html/boxg.html

Ground Water Depletion Across the Nation

http://water.usgs.gov/pubs/fs/fs-103-03/JBartolinoFS(2.13.04).pdf

Video: How a Water Well is Drilled

How a Water Well is Drilled (10:00)

6. February 13, 2023 **Surface Water Impoundments**

Water Supply Forecasts:

http://www.wcc.nrcs.usda.gov/wsf/ http://www.wcc.nrcs.usda.gov/factpub/wsf_primer.html

US Water Use by category:

http://water.usgs.gov/pubs/circ/2004/circ1268/htdocs/text-total.html http://pubs.usgs.gov/circ/2004/circ1268/htdocs/table07.html

Dams in the Coyote Creek Watershed:

https://www.valleywater.org/sites/default/files/SHELL_Anderson%20Dam_30918%20JB.pdf

https://www.valleywater.org/node/163

https://www.valleywater.org/sites/default/files/Coyote%20Dam%20Inundation%20Map%202016.pdf

SCVWD real time data:

http://alert.valleywater.org/

7. February 20, 2023 **Artificial Recharge with Reservoir Supplies**

Artificial Recharge (Resource page)

http://water.usgs.gov/ogw/artificial_recharge.html

What is Aquifer Storage & Recovery?

https://water.usgs.gov/ogw/pubs/ofr0289/epw_historical.html

Groundwater Management in Santa Clara County

https://www.valleywater.org/your-water/where-your-water-comes-from/groundwater/groundwater-management

Groundwater Management Plan -2016

https://s3.us-west 2.amazonaws.com/assets.valleywater.org/2016%20Groundwater%20Management%20Plan.pdf

Video: Groundwater Management-Santa Clara Valley Water District

Groundwater Management-Santa Clara Valley Water District (8:50)

Video: Groundwater: Our most reliable water source

SCVWD Valley Water Groundwater: Our most reliable water source (5:07)

Semitropic Groundwater Banking Program

https://www.valleywater.org/your-water/where-your-water-comes-from/semitropic

Kern Water Bank/Monterey Agreement

http://www.indybay.org/newsitems/2010/01/02/18634125.php

8. February 22, 2023

Groundwater Extraction/Overdrafts/Subsidence

USGS Groundwater Information Pages

http://water.usgs.gov/ogw/ (Resource page)

Subsidence

https://www.usgs.gov/media/images/location-maximum-land-subsidence-us-levels-1925-and-1977

https://www.valleywater.org/your-water/where-your-water-comes-from/groundwater/subsidence

Groundwater Monitoring Report – December 2019

https://www.valleywater.org/sites/default/files/2019-12/Final_Dec_2019_Report.pdf

9. February 27, 2023

Economics & Agricultural Water Demand

Economics Primer:

Price elasticity of demand

http://en.wikipedia.org/wiki/Price_elasticity_of_demand

Video Links:

Price Elasticity of Demand - part 1

Price Elasticity of Demand - part 1

Price Elasticity of Demand - part 2

Price Elasticity of Demand - part 2

Subsidizing Local Food Production, Not Just Farmers

http://neverthirstpatferraro.blogspot.com/2008/06/subsidizing-local-food-production-not.html

California Drought Documentary - A State of Emergency

https://www.youtube.com/watch?v=ruQJZLAZXkg (19:24)

(14:57)

State of Thirst: California's Water Future - KQED QUEST (Full Version)

State of Thirst: California's Water Future - KQED

QUEST (26:54) Jul 11, 2008

10. MARCH 1, 2023

Urban Water Demand and Projections

Population History:

Population Explosion - ECU #156 Population Explosion - ECU #156

Overpopulation or Overconsumption?
https://www.youtube.com/watch?v=HrEimAzxYzo (48:31)

OVERPOPULATION crisis part 2 of 2 Steven Hawking (10:02)

OVERPOPULATION crisis part 2 of 2

Video: Water Sensitive Urban Design

Water Sensitive Urban Design (4:15)

Video: Highlights: Water Policy and Water Myths in California: Drought Edition Highlights: Water Policy and Water Myths in California: Drought Edition (3:50)

Full Version: Water Policy and Water Myths in California: Drought Edition, Lecture By Jeffrey Mount, PhD

Water Policy and Water Myths in California: Drought

Edition (1:05:37)

11. March 6, 2023

Interbasin Transfers/Importing Water

Shortage on the Colorado River (2014)

https://www.youtube.com/watch?v=XTggRoxK7Qs (6:46)

Hetch Hetchy Water Project

Temples of Water

http://neverthirstpatferraro.blogspot.com/2008/08/temple-of-water.html

State Water Project Slideshow:

https://www.youtube.com/watch?time_continue=7&v=Zd_NqfdZslA&feature=emb_logo (8:21)

South Bay Aqueduct

http://en.wikipedia.org/wiki/South_Bay_Aqueduct

Central Valley Project/San Felipe Division

http://neverthirstpatferraro.blogspot.com/2008/06/effluent-for-affluentinside-poop-on-san.html

12. March 8, 2023 Water Quality

How Clean IS Clean?

http://neverthirstpatferraro.blogspot.com/2008/06/how-clean-is-clean.html

Chlorine by products:

http://www.southerndatastream.com/thm/index.html - Introduction

California pesticide use swings up after four-year decline, DPR Jan. 3, 2012 http://westernfarmpress.com/government/california-pesticide-use-swings-after-four-year-decline?NL=WFP-01&Issue=WFP-01_20120103_WFP-01_659&YM_RID=rhellmann@brwncald.com&YM_MID=1282249

13. March 13, 2023 Water Treatment/ Desalination

Desalination/Pacific Institute Analysis: (1:14:05) California

Colloquium on Water - Heather Cooley

A Look Inside the Largest Desalination Plant in the Western Hemisphere

by Laura Bliss@mslaurabliss Dec 16, 2015

http://www.citylab.com/tech/2015/12/a-look-inside-the-largest-desalination-plant-in-the-western-hemisphere/420501/

Turning seawater into drinking water – Australia
https://www.youtube.com/watch?v=38GdjlXRmCM (8:50)

Innovations in Clean Water Technology: Desalination (59:27)

Massachusetts Institute of Technology Professor Lienhard explains the different types of desalination and the recent developments that make this technology so promising.

Innovations in Clean Water Technology: Desalination

14. March 15, 2023

Urban Water Demand & Distribution

Milpitas council approves controversial water rate hike

By Ian Bauer, Milpitas Post

Posted: 12/17/2015

http://www.mercurynews.com/milpitas/ci_29263326/milpitas-council-approves-controversial-water-rate-hike

The answer to our readers' biggest water question: What does it cost?

By Lance Williams / December 21, 2015

https://www.revealnews.org/article/the-answer-to-our-readers-biggest-water-question-what-does-it-cost/?utm_source=Reveal%20Newsletters&utm_campaign=f132ecea8e-The_Weekly_Reveal_12_24_15&utm_medium=email&utm_term=0_c38de7c444-f132ecea8e-229943185

Every Flush You Take Silicon Valley is watching your water habits. That's probably a good thing

https://medium.com/backchannel/conserving-water-with-software-and-shame-3a846c01b811

Water Distribution Lecture Slides, Virginia.edu

http://galileo.phys.virginia.edu/classes/605.ral5q.spring04/lectures/water_distribution.pdf

Gold and Water in Them Thar Hills

http://neverthirstpatferraro.blogspot.com/2008/09/flow-movie.html

15. March 22, 2023 **Improving Water Use Efficiency**

CA Urban Water Conservation Council:

BMP 1: Utility Operations Tools

BMP 2: EDUCATION PROGRAMS

BMP 3: RESIDENTIAL

BMP 4. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL

BMP COSTS & SAVINGS STUDY

http://www.doe2.com/download/Water-Energy/CUWCC_BMPCostsSavingsStudy.pdf

Price of Water: A Comparison of Water Rates, Usage in 30 U.S. Cities, 4/26 10

http://www.circleofblue.org/waternews/2010/world/the-price-of-water-a-comparison-of-water-rates-usage-in-30-u-s-cities/

16. April 3, 2023

Sewage: Generation & Transmission

City of Sunnyvale Sanitary Sewer Systems

https://sunnyvale.ca.gov/civicax/filebank/blobdload.aspx?BlobID=22836

Environmental group to sue San Jose for sewage spills and trash pollution

By Paul Rogers 11/25/2014

http://www.contracostatimes.com/breaking-news/ci_27005457/environmental-group-sue-san-jose-sewage-spills-and

17. APRIL 5, 2023

Urban Stormwater & Pollution Prevention

Stormwater management: the basics

Stormwater management: the basics (7:17)

Stormwater Runoff 101

Stormwater Runoff 101

Manufacturers, states, EPA sign agreement to reduce copper in brake pads Washington brakes law serves as national model

http://www.ecy.wa.gov/news/2015/008.html January 21, 2015

“In Washington, brake pads release about 250,000 pounds of copper to the environment each year. When Washington's Better Brakes Law is fully implemented in 2025, this source of copper will be virtually eliminated.”

Santa Clara Valley Urban Runoff Pollution Prevention Program PSA

Prevent Litter to Protect Our Creeks and the Bay -	
Watershed Watch	(0:32)

City of San Jose Environmental Services – Stormwater Annual Reports

https://www.sanjoseca.gov/Home/ShowDocument?id=39180

CA Floodplain Management Task Force Recommendations - 2002

https://cdn.ymaws.com/floodplain.org/resource/resmgr/old_website_files/California_Floodplain_Manage.pdf

“Integrated Pest Management” (IPM) strategies.

http://www.sccgov.org/portal/site/ipm/

18. APRIL 10, 2023

Water Resources Management ENVS 128 Spring Semester 2023

Grey Water Generation and Reuse, Rainwater Harvesting

Grey Water Reuse and Rooftop Rainfall Capture and Storage Systems

GROWin' and Savin' Water Too - Part 1/4 (edited)

GROWin' and Savin' Water Too - Part 1/4 (Edited) (13:54)

https://www.youtube.com/watch?v=zjuc9oC5OEU (part 2/4)

https://www.youtube.com/watch?v=aiHSE6hPsgk (part 3 of 4)

https://www.youtube.com/watch?v=rYsOceqbhGY (part 4/4)

About greywater reuse

http://greywateraction.org/greywater-recycling

Grey Water Information Central

http://www.oasisdesign.net/greywater/

About rainwater harvesting

http://greywateraction.org/rainwater-harvesting

19. April 12, 2023 **Sewage Treatment & Disposal**

The sewage treatment process

https://www.youtube.com/watch?v=8isr9nSDCK4 (7:47)

Behind the Flush: San José-Santa Clara Regional Wastewater Facility
https://www.youtube.com/watch?v=BHY87Y0marQ (8:14)

GHG Emissions from Treatment Plants: Video: Dr. Perry McCarty @UCBerkeley Water Colloquium:

California Colloquium on Water - Perry L. McCarty (1:11:54)

20. April 17, 2023 **Water Recycling and Reuse**

Video: Water In an Endless Loop, Water Reuse Association

http://www.vimeo.com/9333749 (23:21)

Water Recycling and Reuse: The Environmental Benefits

http://www.epa.gov/region9/water/recycling/

US EPA Brochure: Water Recycling & Reuse: Environmental Benefits

http://www.epa.gov/region9/water/recycling/brochure.pdf

South Bay Water Recycling Project

South Bay Water Recycling:

https://www.sanjoseca.gov/your-government/environment/water-utilities/recycled-water

SBWR Trunk Line Map

https://www.sanjoseca.gov/home/showdocument?id=522

VALLEY WATER AND COMMUNITY PARTNERS DEVELOP A WATER REUSE MASTER PLAN FOR WATER SUPPLY SUSTAINABILITY

HTTPS://VALLEYWATERNEWS.ORG/2019/11/20/VALLEY-WATER-AND-COMMUNITY-PARTNERS-DEVELOP-A-WATER-REUSE-MASTER-PLAN-FOR-WATER-SUPPLY-SUSTAINABILITY/

Recycled and Purified Water

https://www.valleywater.org/your-water/recycled-and-purified-water

Silicon Valley Advanced Water Purification Center celebrates five years of operations

https://www.youtube.com/watch?v=Fh4roylMODU&feature=emb_logo (1:46)

21. April 19, 2023 CELEBRATE **EARTH DAY 2023**

Sediment Transport, Deposition and Tidelands

FIELD TRIP: Meet at regular class time at Coyote Creek Outdoor Classroom,

located at 791 E. William St, in San Jose, between S. 16th and the William St. bridge, across from the Williams Street Park. https://www.valleywater.org/coyote-creek-outdoor-classroom

Reading Assignments prior to Field Trip:

Sediment transport - Video Learning - WizScience.com

https://www.youtube.com/watch?v=z9t2UWKX2tA (1:57)

Sediment in the Chesapeake Bay Program

https://www.chesapeakebay.net/issues/sediment (1:50)

SEDIMENT SOURCES, TRANSPORT, DEPOSITION, AND RETENTION TIMES

http://water.usgs.gov/osw/techniques/workshop/hupp.html

2 - Sediment transport
https://www.youtube.com/watch?v=kKXd0dv6ae4 (10:38)

Protect Our Groundwater Resources at the Polls, October 14, 2014

http://www.sanjoseinside.com/2014/10/14/protect-our-groundwater-resources-at-the-polls/

22. April 24, 2023

Flood Protection: Land Use Controls: Riparian Setbacks,

FEMA Flood Insurance Program

Benefits of Natural Floodplains

https://www.fema.gov/benefits-natural-floodplains

Fear of FEMA, Revisited

http://neverthirstpatferraro.blogspot.com/2009/01/fear-of-fema-revisited.html

Federal Emergency Management Agency

http://en.wikipedia.org/wiki/Federal_Emergency_Management_Agency

http://en.wikipedia.org/wiki/National_Flood_Insurance_Program

- http://www.FloodSmart.gov
- Federal law authorizing NFIP

Report: Criticism of FEMA's Katrina response deserved

http://www.cnn.com/2006/POLITICS/04/14/fema.ig/index.html

23. April 26, 2023

Flood Frequency, Flow and Volume

Hydrologic Engineering Center (HEC)

http://www.hec.usace.army.mil/software/

24. MAY 1, 2023

Climate Change/Sea Level Rise

Addressing Climate Change in Long-Term Water Resources Planning and Management: User Needs for Improving Tools and Information

http://www.usbr.gov/climate/userneeds/

http://www.usbr.gov/climate/userneeds/docs/Summary-standalone-final.pdf

Climate Change and Water

https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Change-and-Water

INDICATORS OF CLIMATE CHANGE IN CALIFORNIA May 2018

https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf

Will Travis, San Francisco and Global Warming
https://www.youtube.com/watch?v=60qtuzhrC6w (13:52)

Building Climate Resilient Cities: Will Travis, Executive Director, BCDC- Part 1

https://www.youtube.com/watch?v=NSZLSeEX7Fg&feature=emb_logo (8:51)

https://www.youtube.com/watch?v=gTeng5rL0pY (Part 2, 9:48)

Climate Change at the Doorstep PBS
Video: http://video.pbs.org/video/1818412519/ (11:35)

25. MAY 3, 2023

The Sacramento-San Joaquin Delta & The Twin Tunnels

SACRAMENTO-SAN JOAQUIN DELTA

https://www.watereducation.org/aquapedia/sacramento-san-joaquin-delta

The Delta

https://water.ca.gov/Water-Basics/The-Delta

CHALLENGES FACING THE SACRAMENTO-SAN JOAQUIN DELTA ***Complex, chaotic or simply cantankerous?***

http://resources.ca.gov/docs/DeltaChallenges-v13.pdf

Fixing the Sacramento/San Joaquin Delta

http://neverthirstpatferraro.blogspot.com/2008/06/fixing-sacramentosan-joaquin-delta.html

26. MAY 8, 2023 **Hydroelectric Power Generation**

Geothermal Geyser Plants:

California Colloquium on Water: Box

How a hydro generator works

https://www.youtube.com/watch?v=Lx6UfiEU3Q0 (4:18)

Advantages of Hydroelectric Power Production and Usage

http://water.usgs.gov/edu/hydroadvantages.html

SCVWD Failure to Develop Hydro Power: Water and Power http://neverthirstpatferraro.blogspot.com/2008/07/water-and-power.html

Tidal Power: http://en.wikipedia.org/wiki/Tidal_power

27. May 10, 2023

Integrated Water Resources Planning

Integrated Water Resources Management

http://www.waterencyclopedia.com/Hy-La/Integrated-Water-Resources-Management.html

28. May 15, 20215

Sustainability and Carbon Footprints

How Greening California Cities Can Address Water Resources and Climate Challenges in the 21st Century

http://www.nrdc.org/water/lid/files/lid.pdf

30. May 19, 2023 Take Home Final Exam Due 12:00 PM

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Students are expected to have completed reading assignments prior to class. Lecture will be supplemented with audio-visual media. A portion of each class will be spent as interactive discussion between instructor and students. Experts may be invited to some of the classes to augment the instructor's expertise. Field trips will be scheduled as time permits.

With the multitude of topics and levels used to approach these subjects, one suitable textbook trying to cover the entire course is limited to prior application of public policy to water management and visa versa. Many reading assignments will be internet based and your only cost will be your time and access portal. The campus has computers for use by all students with and without personal/portable IT technology

Readings from pertinent Internet web sites will be assigned for each class topic. Students will be encouraged to search and review related links to supplement the information provided on the assigned sites and use the information to help generate discussions in the classroom.

Final Exam

The Academic Vice President requires that there shall be an appropriate final examination or evaluation at the officially scheduled time in every course, unless specifically exempted by the college dean who has curricular responsibility for the course.

University policy F69-24 at http://www.sjsu.edu/senate/docs/F69-24.pdf states, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Grading Policy

- 10% Classroom participation/ discussion of internet articles on topics of the week.
- 40% Nine (9) take-home problem sets will be given about a week apart. Each set will be 5%, but your lowest score will be tossed.
- 25% Research Report - Each student will write term report on a current water issue. Suggested topics will be provided, but students may select a topic not listed.

- **RESEARCH TOPIC ABSTRACTS** due February 23, 2022, 10:30 AM
- **First DRAFT RESEARCH REPORT** due April 13, 2022 10:30 AM
- **FINAL DRAFT RESEARCH REPORT** due May16, 2022 10:30 AM

Written submittals must follow report requirements. (See below)

- 25% Final Exam. Take-home exam will be given two weeks prior to final class meeting and due on day of SJSU scheduled final exam

Normal Grade Rules

97-100 = A+	**82-86 = B**	**70-71 = C-**

92-96 = A	80-81 = B-	67-69 = D+
90-91 = A-	77-79 = C+	66-63 = D
87-89 = B+	72-76 = C	62-58 = D-

Note that "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See University Policy F13-1 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Classroom Protocol

Students are expected to have completed reading assignments prior to class. Lecture will be supplemented with audio-visual media. A portion of each class will be spent as interactive discussion between instructor and students. Experts may be invited to some of the classes to augment the instructor's expertise. Field trips will be scheduled as time permits.

Use of electronic devices are to be used during class time only for taking notes, viewing online material under discussion

University Policies

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the

institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. To learn important campus information, view University Policy S90–5 at http://www.sjsu.edu/senate/docs/S90-5.pdf and SJSU current semester's Policies and Procedures, at http://info.sjsu.edu/static/catalog/policies.html

In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not address the issue, it is recommended that the student contact the Department Chair as the next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- **"Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material."**
  - **In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.**
- **"Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."**

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. University Policy on Academic Integrity: https://www.sjsu.edu/studentconduct/docs/SJSU-Academic-Integrity-Policy-F15-7.pdf

This policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf

requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec

to establish a record of their disability.

Accommodation to Students' Religious Holidays (Optional)

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See University Policy S14-7 at http://www.sjsu.edu/senate/docs/S14-7.pdf

Student Technology Resources

Computer labs for student use are available in the Academic Success Center at http://www.sjsu.edu/at/asc/ located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther

King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

SJSU Peer Connections

Peer Connections' free tutoring and mentoring is designed to assist students in the development of their full academic potential and to inspire them to become independent learners. Peer Connections tutors are trained to provide content-based tutoring in many lower division courses (some upper division) as well as writing and study skills assistance. Small group and individual tutoring are available. Peer Connections mentors are trained to provide support and resources in navigating the college experience. This support includes assistance in learning strategies and techniques on how to be a successful student. Peer Connections has a learning commons, desktop computers, and success workshops on a wide variety of topics. For more information on services, hours, locations, or a list of current workshops, please visit Peer Connections website at http://peerconnections.sjsu.edu for more information.

SJSU Writing Center

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the Writing Center website at http://www.sjsu.edu/writingcenter. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this code.)

SJSU Counseling and Psychological Services

The SJSU Counseling and Psychological Services is located on the corner of 7th Street and San Carlos in the new Student Wellness Center, Room 300B. Professional psychologists, social workers, and counselors are available to provide confidential consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit Counseling and Psychological Services website at http://www.sjsu.edu/counseling.

ENVS 128 Water Resources Management

Spring 2023 Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/30/23	Managing Water by Watersheds Problem Set #1 assigned; Chapters 1 (Historical Perspectives of Water Use and Development) AND 2 (The Hydrologic Cycle, Climate, and Weather)
2	2/1/23	Semester Case Study: Coyote Creek Chapter 3 (Surface Water Hydrology) Problem set #2 assigned
2	2/6/23	Historical Ecology/Stream and Wetlands \Baseline Water Requirement Chapter 12 (Water, Fish and Wildlife);
3	2/8/23	Watershed /Groundwater Connection

Week	Date	Topics, Readings, Assignments, Deadlines
		Chapter 4 (Groundwater Hydrology) **Problem set #1 due**
3	2/13/23	Surface Water Impoundments **Assignment #2 due** **Problem set #3 assigned.**
4	2/15/23	Artificial Recharge with Reservoir Supplies Ch 7 (Dams) **Research Topic Due**
4	2/20/23	Groundwater Extraction/Overdrafts/Subsidence
5	2/22/23	Economics & Agricultural Water Demand Chapter 13 (Economics of Water) ; **Problem set #4 assigned**
5	2/27/23	Urban Water Demand Projections Ch 6 (Muni Water Development and Irrigation) **Problem set #3 due**
6	3/1/23	Inter-basin Transfers/Importing Water **Problem set #5 assigned**
6	3/6/23	Drinking Water Quality **Problem set #4 due**
7	3/8/23	Water Treatment/Desalination

Week	Date	Topics, Readings, Assignments, Deadlines
		Problem set #5 due Chapter 11 (Drinking Water and Wastewater Treatment)
7	3/13/23	Urban Water Demands & Distribution **Problem set #6 assigned**
8	3/15/23	Improving Water Use Efficiency
8	3/20/23	Sewage: Generation & Transmission **Problem set #6 due** **Problem set #7 assigned**
9	3/22/23	Urban Stormwater & Pollution Prevention Chapter 5 (Water Quality)
9	4/3/23	Grey Water Generation and Reuse, Rainwater Harvesting **Problem set #7 due**
10	4/5/23	Sewage Treatment & Disposal **Problem set #8 assigned**
10	4/10/32	Water Recycling and Reuse
11	4/12/23	Sediment Transport, Deposition and Tidelands FIELD TRIP: Coyote Creek Outdoor Classroom, located at 791 E. William St, in San Jose, between 16th & Bridge, across from the Williams Street Park. **DRAFT TERM PAPER DUE**
11	4/17/23	Flood Protection: Land Use Controls, Riparian Setbacks,

Week	Date	Topics, Readings, Assignments, Deadlines
		FEMA Flood Insurance Program, Levees and Bypass Channels **Problem set # 8 due** **Problem set #9 assigned**
12	4/19/23	Flood Frequency Hydrology
12 13 13	4/24/23 4/26/23 5/1/23	Climate Change/Sea Level Rise Sacramento-San Joaquin Delta & New Convenience Hydroelectric Power Generation **Problem set #9 due**
14	5/3/23	Final Exam Review
14	5/8/23	Integrated Water Resources Planning Sustainability/Carbon Footprints
15	5/10/23	Course Review **Final Draft of Research Report Due May 16, 2023** **Course Review Quiz DUE: MAY 16, 2023**
Final Exam	**5/19/23**	**Take Home Final Exam** **DUE Friday May 19, 2023 @12:00 PM**

Course Format

Technology Intensive, Hybrid, and Partially Online Course

This course adopts an online, hybrid, classroom delivery format. All students must have access to Internet connectivity and technology requirements, such as computer, special hardware devices or software apps that students must have to participate in the classroom activities and/or submit assignments. See University Policy F13-2 at http://www.sjsu.edu/senate/docs/F13-2.pdf for more details

Students should also download Microsoft Office Suite into their computers. You will be expected to use Word, Excel and PowerPoint during the semester.

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on my faculty web page at **http://www.sjsu.edu/people/Pat.Ferraro** and/or on Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

University Policies

University Policy on Academic Integrity:

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo