

**San José State University**  
**College of Social Science**  
**ENVS 128, Water Resources Management**  
**Section 01, Spring 2020**  
**Course Number 21319**

**Course and Contact Information**

<b>Instructor:</b>	Patrick T. Ferraro
<b>Office Location:</b>	Washington Square, Rm 115A
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<b>Office Hours:</b>	M 12:00 – 1:00 PM and by appointment in WSQ 115A
<b>Class Days/Time:</b>	M, W 1:30 – 2:45 PM
<b>Classroom:</b>	Hugh Gillis Hall, Room 122
<b>Prerequisites:</b>	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 control**
- **wastewater treatment**
- **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.**

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# ENVS 128 Water Resources Management

## Spring 2020 Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/27/20	Introductions & course overview
1	1/29/20	Managing Water by Watersheds <b>Problem Set #1 assigned;</b> Chapters 1 (Historical Perspectives of Water Use and Development) AND 2 (The Hydrologic Cycle, Climate, and Weather)
2	2/3/20	Semester Case Study: Coyote Creek Chapter 3 (Surface Water Hydrology) <b>Problem set #2 assigned</b>
2	2/5/20	Historical Ecology/Stream and Wetlands \Baseline Water Requirement Chapter 12 (Water, Fish and Wildlife); <b>Assignment #1 due.</b>
3	2/10/20	Watershed /Groundwater Connection Chapter 4 (Groundwater Hydrology) <b>Problem set #2 due.</b>
3	2/12/20	Surface Water Impoundments <b>Problem set #3 assigned.</b>
4	2/17/20	Artificial Recharge with Reservoir Supplies Ch 7 (Dams) <b>Research Topic Due</b>
4	2/19/20	Groundwater Extraction/Overdrafts/Subsidence

5	2/24/20	Economics & Agricultural Water Demand Chapter 13 (Economics of Water) ; <b>Problem set #4 assigned</b>
5	2/26/20	Urban Water Demand Projections Ch 6 (Muni Water Development and Irrigation) <b>Problem set #3 due</b>
6	3//2/20	Inter-basin Transfers/Importing Water <b>Problem set #5 assigned</b>
6	3/4/20	Drinking Water Quality <b>Problem set #4 due</b>
7	3/9/20	Water Treatment/Desalination <b>Problem set #5 due</b> Chapter 11 (Drinking Water and Wastewater Treatment)
7	3/11/20	Urban Water Demands & Distribution <b>Problem set #6 assigned</b>
8	3/16/20	Improving Water Use Efficiency
8	3/18/20	Sewage: Generation & Transmission <b>Problem set #6 due</b> <b>Problem set #7 assigned</b>
9	3/23/20	Urban Stormwater & Pollution Prevention Chapter 5 (Water Quality)
9	3/25/19	Grey Water Generation and Reuse, Rainwater Harvesting <b>Problem set #7 due</b>
10	4/6/20	Sewage Treatment & Disposal

		<b>Problem set #8 assigned</b>
10	4/8/20	Water Recycling and Reuse
11	4/13/20	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. <b>DRAFT TERM PAPER DUE</b>
11	4/15/20	Flood Protection: Land Use Controls, Riparian Setbacks, FEMA Flood Insurance Program, Levees and Bypass Channels <b>Problem set # 8 due Problem set #9 assigned</b>
12	4/20/20	Flood Frequency Hydrology
12	4/22/20	Climate Change/Sea Level Rise
13	4/27/20	<u>Sacramento-San Joaquin Delta &amp; New Convenience</u>
13	4/29/20	Chapters 14 (Water Use Conflicts); <b>Problem set #9 due</b>
14	5/4/20	Hydroelectric Power Generation
14	5/6/20	Integrated Water Resources Planning Sustainability/Carbon Footprints Chapter 15 (Emerging Water Issues)
15	5/11/20	Student Presentations <b><u>Final Draft of Research Report Due May 11, 2020</u></b>

<b>Final Exam</b>	<b>5/18/19</b>	<b>Take Home Final Exam</b>
		<b>DUE Monday, May 18 , 2020 @2:30 PM</b>

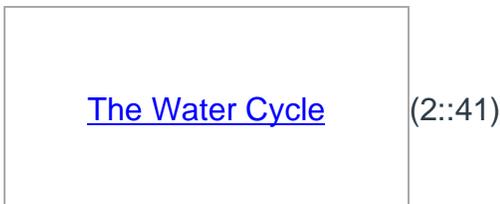
## Class Schedule

Date/Topic/[Supplemental Online reading assignments](#)

1. January 27, 2020

**Introductions/ Overview of Class**

The Water Cycle (By NOAA)



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=Mpl-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](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 29, 2020 **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](http://en.wikipedia.org/wiki/Water_cycle)

3. February 3, 2020      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-OB\\_Coyote.html](http://museumca.org/creeks/1390-OB_Coyote.html)

4. February 5, 2020

**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>

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**Watershed Protection and Flood Prevention Act of 1954**

[http://en.wikipedia.org/wiki/Watershed\\_Protection\\_and\\_Flood\\_Prevention\\_Act\\_of\\_1954](http://en.wikipedia.org/wiki/Watershed_Protection_and_Flood_Prevention_Act_of_1954)

5. February 10, 2020      **Watershed /Groundwater Connection**

**How Ground Water Occurs**

[https://pubs.usgs.gov/gip/gw/how\\_a.html](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](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 12, 2020 **Surface Water Impoundments**

### Water Supply Forecasts:

<http://www.wcc.nrcs.usda.gov/wsf/> [http://www.wcc.nrcs.usda.gov/factpub/wsf\\_primer.html](http://www.wcc.nrcs.usda.gov/factpub/wsf_primer.html)

### US Water Use by category:

<http://water.usgs.gov/pubs/circ/2004/circ1268/hdocs/text-total.html> <http://pubs.usgs.gov/circ/2004/circ1268/hdocs/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/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 17, 2020 **Artificial Recharge with Reservoir Supplies**

Artificial Recharge (Resource page)

[http://water.usgs.gov/ogw/artificial\\_recharge.html](http://water.usgs.gov/ogw/artificial_recharge.html)

What is Aquifer Storage & Recovery?

[https://water.usgs.gov/ogw/pubs/ofr0289/epw\\_historical.html](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)

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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 19, 2020

## **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](https://www.valleywater.org/sites/default/files/2019-12/Final_Dec_2019_Report.pdf)

9. February 24, 2020

## **Economics & Agricultural Water Demand**

Economics Primer:

Price elasticity of demand

[http://en.wikipedia.org/wiki/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. February 26, 2020

# **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 2, 2020

## **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](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](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 4, 2020 **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](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 9, 2020

## 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@msslaurabliss](mailto:Laura.Bliss@msslaurabliss)

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=38GdjIXRmCM> (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 11, 2020

## 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](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=f132ec ea8e-](https://www.revealnews.org/article/the-answer-to-our-readers-biggest-water-question-what-does-it-cost/?utm_source=Reveal%20Newsletters&utm_campaign=f132ec ea8e-)

[The Weekly Reveal 12 24 15&utm\\_medium=email&utm\\_term=0\\_c38de7c444-f132ecea8e-229943185](https://www.revealnews.org/article/the-answer-to-our-readers-biggest-water-question-what-does-it-cost/?utm_source=Reveal%20Newsletters&utm_campaign=f132ec ea8e-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](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>

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15. March 16, 2020 **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 5. LANDSCAPE

## **BMP COSTS & SAVINGS STUDY**

[http://www.doe2.com/download/Water-Energy/CUWCC\\_BMPCostsSavingsStudy.pdf](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. March 18, 2020

## **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](http://www.contracostatimes.com/breaking-news/ci_27005457/environmental-group-sue-san-jose-sewage-spills-and)

17. March 23, 2020

## **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](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. March 25, 2020

**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 6, 2020

## **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 8, 2020 **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](https://www.youtube.com/watch?v=Fh4roylMODU&feature=emb_logo)  
(1:46)

21. April 13, 2020

## **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 15, 2020

## **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/Federal_Emergency_Management_Agency)

[http://en.wikipedia.org/wiki/National\\_Flood\\_Insurance\\_Program](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 20, 2020

## **Flood Frequency, Flow and Volume**

Hydrologic Engineering Center (HEC)

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

24. April 22, 2020 **EARTH DAY 2020**

## 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](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. April 27, 2020

## **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. April 29, 2020

## 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](http://en.wikipedia.org/wiki/Tidal_power)

27. May 4, 2020

## Integrated Water Resources Planning

## Integrated Water Resources Management

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

28. May 6, 2020

## 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>

29. May 11, 2020 Student Presentations

**30. May 18, 2019 Take Home Final Exam Due 2:30 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](http://www.sjsu.edu/senate/docs/S12-3.pdf) 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](http://www.sjsu.edu/senate/docs/F69-24.pdf) 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 local water issue. Suggested topics will be provided, but students may select a topic not listed.
- **RESEARCH TOPIC ABSTRACTS** due February 17, 2020, 1:30 PM
- **First DRAFT RESEARCH REPORT** due April 15, 2020 11:59 PM
- **FINAL DRAFT RESEARCH REPORT** due May 11, 2019 1:30 PM

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](http://www.sjsu.edu/senate/docs/F13-1.pdf) 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](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf> and SJSU current semester’s [Policies and Procedures](http://info.sjsu.edu/static/catalog/policies.html), 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](http://www.sjsu.edu/provost/services/academic_calendars/) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/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](http://www.sjsu.edu/advising/) 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), <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. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> 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](http://www.sjsu.edu/studentconduct/) 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](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](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 \(AEC\)](http://www.sjsu.edu/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](http://www.sjsu.edu/senate/docs/S14-7.pdf) 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](http://www.sjsu.edu/at/asc/) 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](http://peerconnections.sjsu.edu) 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](http://www.sjsu.edu/writingcenter) 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](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.

# ENVS 128 Water Resources Management Spring 2020 Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/27/20	Introductions & course overview
1	1/29/20	Managing Water by Watersheds <b>Problem Set #1 assigned;</b> Chapters 1 (Historical Perspectives of Water Use and Development) AND 2 (The Hydrologic Cycle, Climate, and Weather)

2	2/3/20	Semester Case Study: Coyote Creek Chapter 3 (Surface Water Hydrology) <b>Problem set #2 assigned</b>
2	2/5/20	Historical Ecology/Stream and Wetlands \Baseline Water Requirement Chapter 12 (Water, Fish and Wildlife); <b>Assignment #1 due.</b>
3	2/10/20	Watershed /Groundwater Connection Chapter 4 (Groundwater Hydrology) <b>Problem set #2 due.</b>
3	2/12/20	Surface Water Impoundments <b>Problem set #3 assigned.</b>
4	2/17/20	Artificial Recharge with Reservoir Supplies Ch 7 (Dams) <b>Research Topic Due</b>
4	2/19/20	Groundwater Extraction/Overdrafts/Subsidence
5	2/24/20	Economics & Agricultural Water Demand Chapter 13 (Economics of Water) ; <b>Problem set #4 assigned</b>
5	2/26/20	Urban Water Demand Projections Ch 6 (Muni Water Development and Irrigation) <b>Problem set #3 due</b>
6	3/2/20	Inter-basin Transfers/Importing Water <b>Problem set #5 assigned</b>

6	3/4/20	Drinking Water Quality <b>Problem set #4 due</b>
7	3/9/20	Water Treatment/Desalination <b>Problem set #5 due</b> Chapter 11 (Drinking Water and Wastewater Treatment)
7	3/11/20	Urban Water Demands & Distribution <b>Problem set #6 assigned</b>
8	3/16/20	Improving Water Use Efficiency
8	3/18/20	Sewage: Generation & Transmission <b>Problem set #6 due</b> <b>Problem set #7 assigned</b>
9	3/23/20	Urban Stormwater & Pollution Prevention Chapter 5 (Water Quality)
9	3/25/19	Grey Water Generation and Reuse, Rainwater Harvesting <b>Problem set #7 due</b>
10	4/6/20	Sewage Treatment & Disposal <b>Problem set #8 assigned</b>
10	4/8/20	Water Recycling and Reuse
11	4/13/20	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. <b>DRAFT TERM PAPER DUE</b>
11	4/15/20	Flood Protection: Land Use Controls, Riparian Setbacks,

		FEMA Flood Insurance Program, Levees and Bypass Channels <b>Problem set # 8 due Problem set #9 assigned</b>
12	4/20/20	Flood Frequency Hydrology
12	4/22/20	Climate Change/Sea Level Rise
13	4/27/20	<u>Sacramento-San Joaquin Delta &amp; New Convenience</u>
13	4/29/20	Chapters 14 (Water Use Conflicts); <b>Problem set #9 due</b>
14	5/4/20	Hydroelectric Power Generation
14	5/6/20	Integrated Water Resources Planning Sustainability/Carbon Footprints Chapter 15 (Emerging Water Issues)
15	5/11/20	Student Presentations <b><u>Final Draft of Research Report Due May 11, 2020</u></b>
<b>Final Exam</b>	<u>5/18/19</u>	<b>Take Home Final Exam</b> <b>DUE Monday, May 18 , 2020 @2:30 PM</b>

## 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**

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](http://www.sjsu.edu/gup/syllabusinfo) at <http://www.sjsu.edu/gup/syllabusinfo>