San Jose State University
College of Social Science
Environmental Studies Department

ENVS 129- 01

Water Policy in the Western US

FALL 2021

Instructor: Patrick T. Ferraro  sjsu.edu/envs/ferraro
Office Hours: Tuesday, Thursday 12:00 pm to 12:30 pm via Zoom
Cell Phone: 408-293-1852
Preferred E-mail: PTFerraro5@gmail.com
Class Hours: Tuesday, Thursday, 12:30 – 1:45 PM
Classroom: SJSU.Zoom.us

Prerequisites: ENVS 001 or Instructor Consent.

Catalog Course Description:

Water resource development; federal reclamation policy; water law and water rights; interbasin transfers; Colorado River, Central Valley Project and State Water Project; groundwater overdrafting; agricultural water and water pricing

Course Format:

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.
Students are required to use a computer or device connected to the Internet and use the Microsoft Office Suite, including current versions of Word, Excel and Microsoft.

Assignments will be posted on Canvas Learning Management System course login website at http://sjsu.instructure.com and be submitted by the due date and times listed. Assignments will also be emailed by due date and time to instructor at preferred email: ptferraro5@gmail.com Students are responsible for regularly checking with the messaging system through MySJSU on Spartan App Portal http://one.sjsu.edu/

**Course Text:**

With the multitude of topics and levels used to approach these subjects, one suitable textbook covering the entire course outline cannot be specified. 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.

The following printed materials are recommended and available for purchase through Amazon.com and for use in the MLK library in the reserve section:

1. **Water Justice (Kindle Edition) $49.60**
   
   by Perreault, Tom, Boelens, Rutgerd
   

2. **Deadbeat Dams: Why We Should Abolish the U.S. Bureau of Reclamation and Tear Down Glen Canyon Dam** Paperback – March 1, 2015
   
   by Daniel P. Beard (Author)
   
Water Policy in the Western US

ENVS 129 Fall 2020 Syllabus

Patrick T. Ferraro, Instructor

What you will learn:

- How water rights are determined in California and other states.
- The processes available for conflict resolution when engineering decisions are in opposition to environmental regulation
- The roles and responsibilities of key state and federal environmental, land use and natural resource management agencies in water resources protection and flood management
- Financing options, common subsidies, and methods used for externalizing costs for water projects and setting water rates.
- Public participation requirements and strategies for successful water project campaigns
- To participate in the ongoing process of water policy development.

Grading

- 20% Classroom participation: includes written responses to 12 reading assignments and classroom discussion of assigned internet articles on topics of the week.
- 30% Quizzes- 6 quizzes will be given about two weeks apart. Each quiz will be 5%
- 25% Paper - Each student will write up to 5000-word paper summarizing student’s participation in current local water issue. Suggested topics will be offered, but students may select a topic of their own interest. Topics are due on Sep. 2, 2020; Final Report Due Dec 7, 2020. Report must follow requirements. (See rubric posted on Canvas for all due dates)
- 25% Final Exam. Take-home, essay style exam will be given two weeks prior to final class meeting and due on day of final scheduled meeting on Dec. 9, 2020 12:00 PM.

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**Writing for EnvS 129 and use of other sources**

SJISU policy prohibits representing the work of another as your own. You must give appropriate credit through quotation and citation whenever you use the work of another. For footnotes, they can be at the end of the page, or the end of the paper. Any significant source, even if not quoted, should be listed in the paper. It is not appropriate to turn in a paper that is a collection of quotes; instead the vast majority of the paper should be your own writing.

The **Writing Center** in Clark Hall 126 offers tutoring services to San Jose State students in all courses. Writing Specialists assist in all areas of the writing process, including grammar, organization, paragraph development, coherence, syntax, and documentation styles. For more information, visit the Writing Center website at [http://www.sjsu.edu/writingcenter](http://www.sjsu.edu/writingcenter) or 924-2308.

**Disabilities Policy**

It is the policy of San Jose State University to provide appropriate accommodations to students who have documented disabilities meeting the eligibility requirements of the Americans With Disabilities Act of 1990. This website provides information on how students need to document disabilities: [http://www.drc.sjsu.edu/student_services/document_disability.htm](http://www.drc.sjsu.edu/student_services/document_disability.htm)

The following University Policies also apply to this course:

- 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.
- Course calendar, which includes assignment due dates, quiz dates, date of final exam, is subject to change with fair notice.
- Policy S12-7 (Consent for Recording of Class and Public Sharing of Instructor Material)

“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.”

- Permission can be obtained in writing or orally, for the whole semester or on a class by class basis.
- 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.

4) S12-7 “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.”

**ENVS 129  Water Policy in The Western US**

**Patrick T. Ferraro, Instructor**

(subject to change with fair notice)

<table>
<thead>
<tr>
<th>Class Schedule</th>
<th>Topic</th>
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<tr>
<td>1. Aug 19</td>
<td>Introduction/ Overview of Course</td>
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<td>2. Aug 24</td>
<td>Participation in the Development of Water Policy</td>
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<tr>
<td>3. Aug 26</td>
<td>Water Rights, Ecosystem Rights, Public Trust &amp; Endangered Species Act</td>
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<td>4. Aug 31</td>
<td>Watershed Protection</td>
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<td>5. Sep 2</td>
<td>Groundwater Management</td>
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**Policy Participation Topic Due**

| 6. Sep 7       | Surface Water Impoundments                 |
| 7. Sep 9       | Water Quality & Treatment - How Clean is Clean? |
| 8. Sep 14      | Urban Water Distribution, Public vs. Private Systems |
| 9. Sep 16      | Coastal & Marine Protection                | **Quiz #1 Due** |

| 10. Sep 21     | Urban Stormwater Management                |
11. Sep 23  Water for Agriculture, Ag Runoff
12. Sep 28  Water Pricing, Externalizing Costs  Quiz #2 Due
13. Oct 5   Water Use Efficiency, Paying More For Less Water

14. Oct 7   Sewage Treatment & Water Factories
15. Oct 12  Water Recycling and Reuse
16. Oct 14  Quiz #3 Due  Desalination and Privatization
17. Oct 19  Water Project Financing, Public Outreach & Participation
18. Oct 21  The Sacramento-San Joaquin Delta
19. Oct 26  Colorado and Columbia River Projects

20. Oct 28  Quiz #4 Due  Owens Valley Water Project
21. Nov 2   Hetch Hetchy Water Project
22. Nov 4   Central Valley Project and San Felipe Division
23. Nov 9   Central Valley Project Improvement Act  Draft
Policy Participation Report Due


25. Nov 16  Quiz #5 Due  Water & Power

27. Nov 23  International Water Issues & Projects

Send Take-Home Final Exam
28. Nov 30  Flood Protection, FEMA and Watershed Stewardship
29. Dec 2   Class Presentations  Quiz #6 Due

30. Dec 7   Class Presentations Policy Participation Report Due

30. Dec 9   Final Exam Due by 12:00 PM
Quizzes will be posted on Canvas and emailed to students and returned, when completed, by email to ptferraro5@gmail.com and posted on Canvas.

Supplemental Reading Assignments

ES 129 Water Policy in the West

Patrick T. Ferraro, Instructor

Class Schedule  

<table>
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<tr>
<th>Topic</th>
<th>Online supplemental reading assignments</th>
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<tr>
<td>Introduction/ Overview of Class</td>
<td>How Much Water Is There On Earth? Magellan Would Be Shocked</td>
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GOOD: Water (2:30): Water by the Numbers | GOOD


Partial Text of The Great Thirst: Chapters on Aboriginal California & Spanish Settlement

http://books.google.com/books?id=7CDVZL_AOBUC&dq=1.)+The+Great+Thirst:+Californian+and+Water,+1770-1990+Hundley&printsec=frontcover&source=bl&ots=Qm0taOovnz&sig=d1VoMAq84Yc5ShGL2BHE-lpdsYs&hl=en&ei=e0iMSua5GlfSsgOJo6y7CQ&sa=X&oi=book_result&ct=

Good Water Research Sites:

Brown & Caldwell Consulting Engineers’ Daily Water News posted:
• Sign up for FREE subscription at http://register.bcwaternews.com

Water Education Foundation: https://www.watereducation.org

• Trending, Aquafornia, Aquapedia, Water Academy

California Institute for Water Resources

http://ciwr.ucanr.edu

UC Water Colloquium Video Library:

https://www.youtube.com/playlist?list=PLCF0A91966F74204D

DIRECTORY of Association of California Water Agencies:

https://www.acwa.com/about/directory/

Regulated Water Utilities in California

(private or Investor Owned water utilities)


2. Aug 24 Participation in Developing Water Policy

Environmental Justice Coalition for Water  https://ejcw.org

The Citizen’s Guide to Working with the California Water Boards (14.9 MB)

https://www.waterboards.ca.gov/publications_forms/publications/general/docs/citizenguide.pdf

Making Presentations Before the State Water Resources Control Board

http://www.swrcb.ca.gov/board_info/meetings/board_presentations.shtml


Successes and Failures in California Water Regulation

Gary Wolff, Vice Chair, California State Water Resources Control Board (1:19:00)

California Colloquium on Water - Gary Wolff (1:19:00)
https://www.youtube.com/watch?v=tLWPylrrfJ0


https://www.edf.org/media/edf-recommends-policy-reforms-california-water-market

1. Aug 26 Water Rights, Ecosystem Rights, Public Trust, Endangered Species Act

Water Rights-California:

http://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.shtml

Public Trust: philosophical and legal implications for California's future; given by Joseph L. Sax, Professor, Boalt School of Law, UC Berkeley.(1:20:16)

California Colloquium on Water: Sax

Public Trust Doctrine: https://www.watereducation.org/aquapedia/public-trust-doctrine

Protecting Natural Capital & Ecosystem Services Using Public Trust Doctrine http://ssrn.com/abstract=934393

Text of TITLE 34 - CENTRAL VALLEY PROJECT IMPROVEMENT ACT

https://www.usbr.gov/mp/cypia/title_34/

Text of Endangered Species Act

https://www.fws.gov/ENDANGERED/laws-policies/esa.html

Endangered Species Act, United States, Encyclopedia of Earth

https://editors.eol.org/eoearth/wiki/Endangered_Species_Act,_United_States

Video: Ron Robie@ UCBerkeley Water Colloquium: (1:09:52)

California Colloquium on Water: Robie

1. Aug 31 Watershed Protection
What is a Watershed?

http://www.kcet.org/socal/departures/lariver/confluence/river-notes/what-is-a-watershed-anyway.html

Watershed Academy Webcast Archives

https://www.epa.gov/watershedacademy/watershed-academy-webcast-archives

Earth Focus Episode 39 – American Rivers: Challenges of the Colorado and Potomac (27:27/VIDEO)

Earth Focus Episode 39 - American Rivers: Challenges of the Colorado and Potomac

US Dept. of Agriculture, Natural Resources Conservation Service: Landscape Planning and Watershed Programs: http://www.nrcs.usda.gov/Programs/watershed/

Watershed Protection and Flood Prevention Act of 1954


5. Sep 2 Groundwater Management

What is Ground Water?


Selected Groundwater Issues

* Artificial Recharge

* Freshwater-Saltwater Interactions along the Atlantic Coast

* Groundwater and Surface-water Interactions

* Karst

* Land Subsidence

* Unsaturated Zone

* Groundwater Networks

* Regional Groundwater Studies
Groundwater, Aquifers, Wells, and Springs


Sustainability of Groundwater Resources


Water in Storage and Approaches to Ground- Water Management, High Plains Aquifer, 2003


Groundwater Depletion Across Nation


Groundwater Loss and Aquifer System Compaction in San Joaquin Valley During 2012–2015 Drought

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6559157/

Water follies: the environmental consequences of groundwater pumping given by Robert Glennon, Morris K. Udall Professor of Law and Public Policy, University of Arizona.(1:11:39)

California Colloquium on Water: Glennon

Managing groundwater resources given by David Todd, President, Todd Engineers and Professor Emeritus, UC Berkeley(1:02:58)

California Colloquium on Water: Todd

1. Sep 7 Surface Water Impoundments

Water Supply Forecasts:

http://www.wcc.nrcs.usda.gov/wsf/

US Water Use by category (2000) :


California Colloquium on Water: Brechin (59:34)

https://www.youtube.com/watch?v=HPETYHEtJwk

When myth trumps history: the Reclamation Bureau and the family farm, 1902-1935 given by Donald Pisani, Merrick Professor of History, University of Oklahoma

California Colloquium on Water: Pisani. (1:31:10)

Big Dams of the New Deal Era:

http://books.google.com/books?id=XP5LkSQMM5QC&dq=Big+Dams+of+the+New+Deal+Era:+A+Confluence+of+Engineering+And+Politics&printsec=frontcover&source=bl&ots=DN05ukAk-p&sig=YukG6MBQ4pTC9w1hHyC0kVnZkZQ&hl=en&ei=w0h-SpnGDoWlswPT0LHvCg&sa=X&oi=book_result

Save The Yampa River From Being Dam'd

Save The Yampa River From Being Dam'd (9:56)

Video of Grand Teton Dam Failure:  Teton Dam Collapse

1. **Sep 9** Water Quality & Treatment

Disinfection By-Products:

https://www.cdc.gov/safewater/chlorination-byproducts.html

1. **Sep 14** Urban Water Distribution: Public vs. Private Systems

Water Distribution Power Point

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

Gold and Water in Them Thar Hills

Sep 16  ________________________ Coastal Protection

California Colloquium on Water: Douglas

**Saving the coast: A job that's never done;** given by Peter Douglas, Executive Director, California Coastal Commission; Examines desalting plant impacts (1:22:21)

[California Colloquium on Water: Douglas](#)

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Coastal Communities and the Blue Planet

Meg Caldwell, Woods Institute for the Environment, Stanford University (1:22:28)

[Coastal Communities and the Blue Planet](#)

1. **Sep 21  ________________________ Urban Stormwater Management**

Strategy to Optimize Resource Management of Stormwater

[https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/strategy_initiative/draft_revised_strategy.pdf](https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/strategy_initiative/draft_revised_strategy.pdf)

Low Impact Development – Sustainable Storm Water Management


Santa Clara Valley Urban Runoff Pollution Prevention Program (N Santa Clara Co.)

[https://scvurppp.org](https://scvurppp.org)

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1. **Sep 23  ________________________ Water for Agriculture, Ag Runoff**

The King of California: J.G. Boswell and the Making of A Secret American Empire


Mobile Lab To Improve Farm Irrigation Efficiency in Santa Clara County
Pollution from agriculture

http://butane.chem.uiuc.edu/pshapley/Environmental/L33/2.html

Tropical Storm May Have Kept Gulf 'Dead Zone' in Check,

By PAUL QUINLAN of Greenwire, August 1, 2011


Nonpoint Source (NPS) Pollution: Forestry

https://www.epa.gov/nps/nonpoint-source-forestry

1. **Sep 28** Water Pricing, Externalizing Costs


Pricing and Affordability of Water Services

Affordability Assessment Tool for Federal Water Mandates

https://www.awwa.org/Portals/0/AWWA/ETS/Resources/AffordabilityAssessmentTool.pdf

Water Subsidies and Shortages in the American West

https://mises.org/library/water-subsidies-and-shortages-american-west

Federal Dollars Are Financing the Water Crisis in the West
May 28, 2015


1. **Sep 30** Water Use Efficiency:
   
   **Paying More For Less Water and More Growth**

**6 Simple Ways to Bring the Water Revolution Home**


**US EPA Water Sense** https://www.epa.gov/watersense/how-we-use-water

**Valley Water District Conservation Programs**

https://www.valleywater.org/water-conservation-programs

1. **Oct 5** Sewage Treatment & Water Factories

**How Do Wastewater Treatment Plants Work?** (10:02)

https://www.youtube.com/watch?v=FvPakzqM3h8

**BLUEPRINT for Onsite Water System (in San Francisco, CA)**


**Onsite Wastewater Treatment Systems Policy Implementation Program**

https://www.waterboards.ca.gov/centralvalley/water_issues/owts/
San José-Santa Clara Regional Wastewater Facility

*Behind the Flush: San José-Santa Clara Regional Wastewater Facility*

*Behind the Flush: San José-Santa Clara Regional Wastewater Facility* (8:14)

Water and Wastewater Treatment Plant and System Operators


**GHG Emissions from Treatment Plants:** Video: Dr. Perry McCarty @UCBerkeley Water Colloquium (1:11:56)

[California Colloquium on Water - Perry L. McCarty](https://www.youtube.com/watch?v=15S4teA2l-M&feature=channel) (1:11:55)

1. **Oct 7** Water Recycling and Reuse

   Video: *Water In an Endless Loop*, Water Reuse Association


   **Water Reuse and Recycling: Community and Environmental Benefits**

   [https://www.epa.gov/waterreuse](https://www.epa.gov/waterreuse)

**NATIONAL WATER REUSE ACTION PLAN**

Update on Collaborative Progress April 2021


**Water From Water - Recycling**
10 Years of Recycled Water Deliveries to Coastal Farmers

Grey Water Central: http://www.oasisdesign.net/greywater/

Laundry to Landscape Greywater System Installation

1. Water Reuse in SoCal (Irvine Ranch, Orange Co, West Basin) and Northern CA & South Bay Water Recycling Projects

Recycled Water: Conveying the Message to Non-Water Experts; given by Roy Herndon, Chief Hydrogeologist, Orange County Water District

California Colloquium on Water: Herndon

Planet LA - Water

Title XVI - Water Reclamation and Reuse

South Bay Water Recycling: https://www.sanjoseca.gov/home/showdocument?id=32151

South Bay Water Recycling Master Plan with Valley Water -2014

Audit: Recycled Water Program Needs More Financial Oversight

By Jennifer Wadsworth @jennwadsworth/ April 25, 2016

1. **Oct 12** Desalination and Privatization

Desalination, With a Grain of Salt: A California Perspective

Heather Cooley: Senior Researcher, Pacific Institute

[California Colloquium on Water - Heather Cooley](https://www.youtube.com/watch?v=HFvyxwzADd0) (1:15:05).

**Desalination issues in the United States**, given by Kevin Price, Manager of the Water Treatment Engineering Research and Development Group, U.S. Bureau of Reclamation.

[California Colloquium on Water: Price](https://www.youtube.com/watch?v=neS_mX9GqJA) (1:22:09)

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San Jose Water Company’s Merger With Connecticut Utility Sparks Bicoastal Bidding War

*By Jennifer Wadsworth @jennwadsworth/ July 10, 2018*


SJW Group and Connecticut Water Service Merger Updates

[https://www.sjwgroup.com/sjw-group-stockholders-merger-information](https://www.sjwgroup.com/sjw-group-stockholders-merger-information)

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1. **Oct 14** Water Project Financing, Public Outreach & Participation

MWD

Video: [Thirst](https://www.youtube.com/watch?v=6Hc6lDaWako&feature=related) (9:50)

Financing Resilient and Sustainable Water Infrastructure

WATER FINANCE:
The Imperative for Water Security and Economic Growth


https://leginfo.legislature.ca.gov/faces/billHistoryClient.xhtml?bill_id=201720180AB2541

1. Oct 19  The Sacramento-San Joaquin Delta & The Peripheral Canal/CA WaterFix/EcoRestore

Debating the Delta 56 min. PBS video Aired: 06/21/11

http://vids.kvie.org/video/2017614881/

Hell and high water in the Delta: The fate of California's water supply hub California Colloquium on Water: Mount

https://www.youtube.com/watch?v=0_VJyCHG-iE&feature=channel (1:12:56)

Confluence, Confusion, or Catastrophe: Prospects for Ending the Delta Stalemate

California Colloquium on Water: John Cain (1:26:08)

Sacramento-San Joaquin Delta: An Ecosystem & Water Delivery System in Crisis

California Colloquium on Water - Richard M. Frank (1:31:29)

Pat Ferraro Blog Posts:

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


1. Oct 21  Colorado and Columbia River Projects

Grand Coulee Dam 70 Years Later: What can we learn Leonard Ortolano & Katherine Kao Cushing; 2002 Water Resources Development, Vol 18, No. 3, pages 373-390; Reprinted with permission in EnvS 129 Course Reader
Download/read reprint from EnvS 129 FA19 Canvas Module #10: Colorado & Columbia River Projects

1. **Oct 26** Owens Valley Water Project

*Parts of Cadillac Desert Video Series:*

Expansion of L. A. - destruction of Owens River & Valley

[Expansion of L. A. - Destruction of Owens River & Valley](https://www.youtube.com/watch?v=CN1VYCczw9U (3:32)

Construction of the Owens Valley Project

[Construction of the Owens Valley Project](https://www.youtube.com/watch?v=QesBtxLwvWY&feature=fvw (4:11)


1. **Oct 28** Hetch Hetchy Water Project

*Temples of Water*

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

**Hetch Hetchy Valley: Water and California's Future**; given by Sarah Null, Doctoral Student, Geography, UC Davis; Spreck Rosekrans, Economic Analyst, Environmental Defense; and Jay Lund, Professor of Civil and Environmental Engineering, UC Davis.

[California Colloquium on Water: Null, Rosenkrans and Lund](https://www.youtube.com/watch?v=8gHjGqzBqdQ&feature=related (1:22:47)

*Restore Hetch Hetchy*

[https://www.hetchhetchy.org

*Discover Hetch Hetchy*
Discover Hetch Hetchy (21:25)

U.S. Supreme Court

UNITED STATES v. CITY AND COUNTY OF SAN FRANCISCO, 310 U.S. 16 (1940)

http://caselaw.lp.findlaw.com/scripts/getcase.pl?navby=case&court=us&vol=310&page=16 Supreme Court decision holding the City of San Francisco is violating the Raker Act by selling electrical power from the Hetch Hetchy dam.

San Francisco Should Pay Yosemite the Dam Rent

The century-old agreement between the city and the national park over the use of Hetch Hetchy Reservoir demands an update. Sara Sutherland October 29, 2020

https://www.perc.org/2020/10/29/san-francisco-should-pay-yosemite-the-dam-rent/

1. Nov 2 Central Valley Project and San Felipe Division

Effluent for the Affluent/Inside Poop of San Felipe Aqueduct

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

1. Nov 9 Central Valley Project Improvement Act

Central Valley Project Improvement Act (CVPIA)

http://www.usbr.gov/mp/cvpi/

Final Audit Report on the Central Valley Project Restoration Fund, Bureau of Reclamation

2017 Draft CVPIA Annual Workplan

Alien invaders, endangered natives, and declining fisheries: a history of fish in the upper San Francisco estuary; given by Peter Moyle, Professor of Fish Biology, UC Davis.

California Colloquium on Water: Moyle

California Colloquium on Water: Moyle (1:08:16)

24. Nov 11 SoCal and So SF Bay Water Recycling

Water Reuse in SoCal (Irvine Ranch, Orange Co, West Basin) and Northern CA & South Bay Water Recycling Projects

25. Nov 16 Water & Power

LADWP In Crisis Video (8:03) LA Department of Water and Power in Crisis

SCVWD Failure to Develop Hydro Power:


1. Nov. 18 Integrated Water Resources Planning, Sustainability and Carbon Footprints


Nov 23 International Water Issues & Projects

Laying the groundwork for transboundary groundwater November 12, 2020


2013 Great Lakes Water Quality Report

https://legacyfiles.ijc.org/publications/16thBE_internet%2020130509.pdf

Nov 30 Flood Protection, FEMA and Watershed Stewardship
Fear of FEMA Revisited


Federal Emergency Management Agency

From Wikipedia


Report: Criticism of FEMA's Katrina response deserved

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

Smart Growth 2 (Flooding)

FEMA - Smart Growth Part 2

https://www.youtube.com/watch?v=uAuGZ615TrM&feature=related (6:40)

Smart Growth 3 (Flooding)

FEMA - Smart Growth Part 3

https://www.youtube.com/watch?v=HaPoQO-aWQA&feature=channel (6:40)

Smart Growth 4 (Flooding)

FEMA - Smart Growth Part 4

FEMA - Smart Growth Part 4 (6:40)

29. Dec. 2 Class Presentations

30. Dec 7 Class Presentations

31. Dec 9 Final ExamDue 12:00 PM

Final Exam should be submitted by email to ptferraro5@gmail.com and posted on Canvas as MS Word file with .doc or .docx suffix