Environmental Studies 128
Water Resources Management
Fall 2015

Class Hours: Tuesday & Thursdays 1:30 –2:45 PM
Dudley Moorhead Hall 164

Instructor: Patrick T. Ferraro

Office Hours: Tuesdays 3:00 -4:00 PM
Room WSQ 115A

Home Phone: 408-293-1852
E-mail: PTFerraro5@gmail.com

Catalog Course Description:

**ENVS 128 Water Resource Management**

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. Prerequisite: EnvS 129 and STAT 95.

Grading
Normal Grade Rules

Units
3

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.

Course Text:
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.

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


*Hardcover: 576 pages (August 24, 2009)*

• ISBN-10: 0470136316


[Amazon.com link:](http://www.amazon.com/Principles-Water-Resources-Development-Management/dp/0470136316/ref=sr_1_fkmr1_1?ie=UTF8&qid=1295210387&sr=8-1-fkmr1)

*Water 4.0: The Past, Present, and Future of the World’s Most Vital Resource*

*Hardcover* – January 28, 2014 (paperback available until April 1, 2015)

by [David Sedlak](http://www.amazon.com/Water-4-0-Present-World’s-Most-Vital-Resource/dp/030017649X/ref=pd_rhf_ee_s_qp_4_DWH2?ie=UTF8&refRID=1BC5M6VSJJK9YTDPC6J2) (Author)

[Amazon.com link:](http://www.amazon.com/Water-4-0-Present-World’s-Most-Vital-Resource/dp/030017649X/ref=pd_rhf_ee_s_qp_4_DWH2?ie=UTF8&refRID=1BC5M6VSJJK9YTDPC6J2)
Water Resources Management EnvS 128
Patrick T. Ferraro, Instructor
Syllabus

Course Web Page: https://sites.google.com/site/envs128sp2015watermanagement/
Water resources management is a multi-disciplinary field encompassing:

• water supply reliability
• urban vs. agricultural water supply
• 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.
Over the semester, you will:

- gain a working familiarity of major aspects of water resources management (e.g., hydrology, water pollution, irrigation);
- hear from professionals working in the field about “on the ground” issues;
- have an opportunity to explore a water resources management topic of personal interest; and
- practice communicating (both orally and in writing) your findings to others.

Generally, we will meet twice weekly for lectures, in-class exercises, case studies, and discussion. Outside of class homework assignments will include completing course readings and being prepared to discuss course materials, conducting web-based research, writing short essays, leading class discussions, completing problem sets, and working in small groups.

**Grading**

- 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% Paper - Each students will write term paper on a current local water issue. Suggested topics will be provided, but students may select a topic not listed. Please download rubric at: [https://sites.google.com/site/envs128sp2015watermanagement/home/research-assignment-rubric](https://sites.google.com/site/envs128sp2015watermanagement/home/research-assignment-rubric)
  Research topics are due on Sep 8. **DRAFT TERM PAPER DUE Oct. 29, 2015, 11:59PM** Written submittals must follow paper requirements. (See below)
- 25% Final Exam. Take-home exam will be given two weeks prior to final class meeting and due on day of final scheduled meeting.

At SJSU, students are expected to spend at least two hours outside of class for every one hour of in-person class time. Because this is a three-unit course, you can expect to spend a minimum of **6 hours per week** completing class-related assignments in addition to the in-person class meetings. Assignments include weekly readings, problem sets, research and writing term report. These assignments may require work beyond the minimum 6-hours of work outside the classroom. Careful time management will help you keep up with readings and assignments and enable you to succeed in all your classes.

*Writing for EnvS 128 and use of other sources*

SJSU 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.
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

All SJSU Policies currently posted in the university catalogue are applicable:
http://info.sjsu.edu/static/catalog/policies.html

Water Resources Management
EnvS 128
Patrick T. Ferraro, Instructor

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Lecture Content</th>
<th>Assignments &amp; Recommended Text Chapters (due BEFORE class)</th>
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<tbody>
<tr>
<td></td>
<td>12/10/15</td>
<td>Final Exam, Dudley Moorhead Hall Rm.164</td>
<td>12:15 – 2:30 PM</td>
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<tr>
<td>1</td>
<td>8/20/15</td>
<td>Introductions &amp; course overview</td>
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<tr>
<td>2</td>
<td>8/25/15</td>
<td>Managing Water by Watersheds</td>
<td>Problem Set #1 assigned; Chapters 1 (Historical Perspectives of Water Use and Development) AND 2 (The Hydrologic Cycle, Climate, and Weather)</td>
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<td>3</td>
<td>8/27/15</td>
<td>Semester Case Study: Coyote Creek</td>
<td>Chapter 3 (Surface Water Hydrology)</td>
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<td>Problem set #2 assigned</td>
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<td>4</td>
<td>9/1/15</td>
<td>Historical Ecology/Stream and Wetlands \Baseline Water Requirement</td>
<td>Chapter 12 (Water, Fish and Wildlife); Assignment #1 due.</td>
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<td>5</td>
<td>9/3/15</td>
<td>Watershed /Groundwater Connection</td>
<td>Chapter 4 (Groundwater Hydrology)</td>
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<td></td>
<td>Problem set #2 due.</td>
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<tr>
<td>6</td>
<td>9/8/15</td>
<td>Surface Water Impoundments</td>
<td>Problem set #3 assigned.</td>
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<tr>
<td>Lecture</td>
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<tr>
<td>7</td>
<td>9/10/15</td>
<td>Artificial Recharge with Reservoir Supplies</td>
<td>Ch 7 (Dams)</td>
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<td>8</td>
<td>9/15/15</td>
<td>Groundwater Extraction/Overdrafts/Subsidence</td>
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<td>9</td>
<td>9/17/15</td>
<td>Economics &amp; Agricultural Water Demand</td>
<td>Chapter 13 (Economics of Water) ; Problem set #4 assigned</td>
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<td>10</td>
<td>9/22/15</td>
<td>Urban Water Demand Projections</td>
<td>Ch 6 (Muni Water Development and Irrigation)</td>
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<td><strong>Problem set #3 due</strong></td>
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<td>11</td>
<td>9/24/15</td>
<td>Inter-basin Transfers/Importing Water</td>
<td>Problem set #5 assigned</td>
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<td>12</td>
<td>9/29/15</td>
<td>Drinking Water Quality</td>
<td>Problem set #4 due</td>
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<td>13</td>
<td>10/1/15</td>
<td>Water Treatment</td>
<td>Problem set #5 due Chapter 11 (Drinking Water and Wastewater Treatment)</td>
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<td>14</td>
<td>10/6/15</td>
<td>Urban Water Distribution</td>
<td>Problem set #6 assigned</td>
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<td>15</td>
<td>10/8/15</td>
<td>Improving Water Use Efficiency</td>
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<tr>
<td>16</td>
<td>10/13/15</td>
<td>Sewage: Generation &amp; Transmission</td>
<td>Problem set #6 due Problem set #7 assigned</td>
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<tr>
<td>17</td>
<td>10/15/15</td>
<td>Urban Stormwater &amp; Pollution Prevention</td>
<td>Chapter 5 (Water Quality)</td>
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<td>18</td>
<td>10/20/15</td>
<td>Grey Water Generation and Reuse, Rainwater Harvesting</td>
<td>Problem set #7 due</td>
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<td>19</td>
<td>10/22/15</td>
<td>Sewage Treatment &amp; Disposal</td>
<td>Problem set #8 assigned</td>
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<td>Lecture</td>
<td>Date</td>
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<tr>
<td>20</td>
<td>10/27</td>
<td>Water Recycling and Reuse</td>
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<td>21</td>
<td>10/29</td>
<td>Flood Frequency, Flow and Volume</td>
<td>DRAFT TERM PAPER DUE</td>
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<td>22</td>
<td>11/3</td>
<td>Flood Protection: Land Use Controls, Riparian Setbacks, FEMA Flood Insurance Program, Levees and Bypass Channels</td>
<td>Problem set # 8 due Problem set #9 assigned</td>
</tr>
<tr>
<td>23</td>
<td>11/5</td>
<td>Sediment Transport, Deposition and Tidelands FIELD TRIP: Coyote Creek Outdoor Classroom, located at 791 E. William St, in San Jose, between 16th &amp; Bridge, across from the Williams Street Park.</td>
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</tr>
<tr>
<td>24</td>
<td>11/10</td>
<td>Climate Change/Sea Level Rise</td>
<td>Chapters 14 (Water Use Conflicts); Problem set #9 due</td>
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<td>25</td>
<td>11/12</td>
<td>Sacramento-San Joaquin Delta &amp; New Convenience</td>
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<td>26</td>
<td>11/17</td>
<td>Hydroelectric Power Generation</td>
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<tr>
<td>27</td>
<td>11/19</td>
<td>Integrated Water Resources Planning</td>
<td>Chapter 15 (Emerging Water Issues)</td>
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<td>28</td>
<td>11/24</td>
<td>Sustainability and Carbon Footprints</td>
<td>Final Draft of Term Report Due</td>
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<tr>
<td>29</td>
<td>12/1, 12/3 &amp; 12/6</td>
<td>Student Presentations</td>
<td>Last day for late submission of term papers(-10% penalty)</td>
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Greensheet and class lectures notes will be posted on the following web site: [https://sites.google.com/site/envs128sjsufall2015/]
This reading list will be supplemented throughout the semester with documents posted on the class web site: https://sites.google.com/site/envs128sjsufall2015/

Please check this web site prior to each class and read attached documents. Lecture notes containing video and additional web links will be posted after each class meeting.

<table>
<thead>
<tr>
<th>Class Schedule</th>
<th>Topic/Online reading assignments</th>
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<tr>
<td>1. August 20</td>
<td>Introductions/ Overview of Class</td>
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</table>

_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 LESLIEDEC. 6, 2014_  
http://www.nytimes.com/2014/12/07/opinion/sunday/los-angeles-city-of-water.html?_r=2

2. August 25  
Managing Water by Watersheds  
Thinking Globally: Water Distribution  
OVERPOPULATION crisis part 1 of 2  
http://www.youtube.com/watch?v=HhuQfxHBTzg&feature=related

_video labeled The Most IMPORTANT Video You'll Ever See_  
“Arithmetic, Population and Energy” by Prof. Bartlett, Univ. of Colorado (part 1 of 8)  
http://www.youtube.com/watch?v=F-QA2rkpBSY&feature=channel  
Click on Playlist in side bar for parts 2-8  
http://www.youtube.com/watch?v=Pb3JI8F9LQQ&feature=list_related&playnext=1&list=PL6A1FD147A45EF50D  
Water cycle  
http://en.wikipedia.org/wiki/Water_cycle
3. August 27

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...
http://www.youtube.com/watch?v=pw6UCK80ykw&feature=channel

Guide to San Francisco Bay Area Creeks
Coyote Creek Watershed
http://museumca.org/creeks/1390-OBCoyote.html

4. September 1

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 Program http://www.nrcs.usda.gov/Programs/watershed/


5. September 3

Watershed /Groundwater Connection


Download Circular 1886: Sustainability of Groundwater Resources


Video: How a Water Well is Drilled [https://www.youtube.com/watch?v=8K6V450StO4](10:00)

6. September 8

Surface Water Impoundments

Water Supply Forecasts:

US Water Use by category:

Dams in the Coyote Creek Watershed:
[http://valleywater.org/Services/CoyoteDamAndReservoir.aspx](http://valleywater.org/Services/CoyoteDamAndReservoir.aspx)
[http://valleywater.org/Services/AndersonDamAndReservoir.aspx](http://valleywater.org/Services/AndersonDamAndReservoir.aspx)

SCVWD real time data:
[http://www.valleywater.org/Services/Alert.aspx](http://www.valleywater.org/Services/Alert.aspx)

7. September 10

Artificial Recharge with Reservoir Supplies

Artificial Recharge (Resource page)

What is Aquifer Storage & Recovery?

Groundwater Supply in Santa Clara County
**Video: Groundwater Management - Santa Clara Valley Water District**
[https://www.youtube.com/watch?v=NgWx2IrqIvK](https://www.youtube.com/watch?v=NgWx2IrqIvK) (8:50)

**Video: Groundwater: Our most reliable water source**
SCVWD Valley Water [https://www.youtube.com/watch?v=n3d7nkwwsCc](https://www.youtube.com/watch?v=n3d7nkwwsCc) (5:07)

Kern Water Bank/Monterey Agreement

8. September 15  
Groundwater Extraction/Overdrafts/Subsidence

USGS Groundwater Information Pages

Subsidence
[http://www.valleywater.org/Services/LandSubsidence.aspx](http://www.valleywater.org/Services/LandSubsidence.aspx)

Depth-to-Water Index Well Hydrographs
[http://www.valleywater.org/Services/DepthToWaterIndexWellHydrographs.aspx](http://www.valleywater.org/Services/DepthToWaterIndexWellHydrographs.aspx)

9. September 17  
Economics & Agricultural Water Demand

Economics Primer:

Price elasticity of demand

Video Links:

Price Elasticity of Demand - part 1
[http://www.youtube.com/watch?v=MNiEHvw6TTg](http://www.youtube.com/watch?v=MNiEHvw6TTg)

Price Elasticity of Demand - part 2
[http://www.youtube.com/watch?v=DB6rmbAeqvE&NR=1](http://www.youtube.com/watch?v=DB6rmbAeqvE&NR=1)

Subsidizing Local Food Production, Not Just Farmers

*State of Thirst: CALIFORNIA drought = food decline, Mar 1, 2014*
[https://www.youtube.com/watch?v=s_bqPVU0LWM](https://www.youtube.com/watch?v=s_bqPVU0LWM) (14:57)

*State of Thirst: California’s Water Future - KQED QUEST (Full Version)*
[https://www.youtube.com/watch?v=panaJZaffYk](https://www.youtube.com/watch?v=panaJZaffYk) (26:54) **Jul 11, 2008**

10. September 22  
Urban Water Demand and Projections
Population History:
Population Explosion - ECU #156
http://www.youtube.com/watch?v=WmEosykOesE&feature

OVERPOPULATION crisis part 2 of 2 Steven Hawking (10:02)
http://www.youtube.com/watch?v=-GRzatTQEgQ&feature=related

Video: Water Sensitive Urban Design
https://www.youtube.com/watch?v=b_DTnOzYTR4 (4:15)


https://www.youtube.com/watch?v=bNF041j9QwI (1:05:37)

11. September 24
Interbasin Transfers/Importing Water
Hetch Hetchy Water Project

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

State Water Project Slideshow:
http://www.watereducation.org/topic-state-water-project

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. September 29
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@brwnca1d.com&YM_MID=1282249

13. October 1 Water Treatment/ Desalination

Desalination/Pacific Institute Analysis: (1:14:05)
http://www.youtube.com/watch?v=HFvyxzADd0&feature=channel

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.
https://www.youtube.com/watch?v=x-yt-cl=85027636&x-yt-ts=1422503916&v=_5UkDWGoPJ4

14. October 6 Urban Water Demand & Distribution

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

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

Gold and Water in Them Thar Hills

15. October 8 Improving Water Use Efficiency

CA Urban Water Conservation Council:
BMP 1: Utility Operations Tools
http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-1-Utility-Operations-Programs
BMP 2: EDUCATION PROGRAMS
http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-2-Education-Programs

BMP 3: RESIDENTIAL
http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-3-Residential

BMP 4. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL

BMP 5. LANDSCAPE
http://www.cuwcc.org/Resources/Memorandum-of-Understanding/Exhibit-1-BMP-Definitions-Schedules-and-Requirements/BMP-5-Landscape


16. October 13  Sewage: Generation & Transmission
Typical Sanitary Sewer Design Manual

*Environmental group to sue San Jose for sewage spills and trash pollution*
By Paul Rogers 11/25/2014

17. October 15  Urban Stormwater & Pollution Prevention

*Stormwater management: the basics*
https://www.youtube.com/watch?v=0x-TDvnbheM (7:17)

Stormwater Runoff 101
http://www.youtube.com/watch?v=eoZMJCYHCM
Manufacturers, states, EPA sign agreement to reduce copper in brake pads

*Washington brakes law serves as national model*


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

http://www.youtube.com/watch?v=Dx2FtTuJ0Y8 (0:32)

City of San Jose Storm Sewer System


City of San Jose **Environmental Services - Stormwater Annual Reports**


Floodplain Management

http://www.fpm.water.ca.gov/

“Integrated Pest Management” (IPM) strategies.

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

18. October 20 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)

https://www.youtube.com/watch?v=ppyZN3sQ24M (13:54)

(links to parts 2-4 are in Youtube side-bar)

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. October 22  Sewage Treatment & Disposal

Wastewater Treatment:  http://ga.water.usgs.gov/edu/wwvisit.html


GHG Emissions from Treatment Plants: Video: Dr. Perry McCarty @UCBerkeley Water Colloquium:  http://www.youtube.com/watch?v=15S4teA2l-M&feature=channel  (1:11:54)

20. October 27  Water Recycling and Reuse


Virginia:  http://www.hrsg.state.va.us/waterreuse.htm

South Bay Water Recycling Project

21. October 29  
**Flood Frequency, Flow and Volume**

Hydrologic Engineering Center (HEC)  

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22. November 3  
**Flood Protection:**  
Land Use Controls: Riparian Setbacks,  
FEMA Flood Insurance Program  
Levees and Bypass Channels

Natural Flood Protection  
[http://www.valleywater.org/services/NaturalFloodProtection.aspx](http://www.valleywater.org/services/NaturalFloodProtection.aspx)

Fear of FEMA, Revisited  

Federal Emergency Management Agency  

- Federal law authorizing NFIP
- Experts: Flood terms mislead public

Report: Criticism of FEMA's Katrina response deserved  

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23. November 5  
**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.  
[http://www.valleywater.org/Programs/CoyoteCreekOutdoorClassroom.aspx](http://www.valleywater.org/Programs/CoyoteCreekOutdoorClassroom.aspx)

Reading Assignments prior to Field Trip:  

SEDIMENT SOURCES, TRANSPORT, DEPOSITION, AND RETENTION TIMES  
Sediment Transport and Deposition

Protect Our Groundwater Resources at the Polls, October 14, 2014
http://www.sanjoseinside.com/2014/10/14/protect-our-groundwater-resources-at-the-polls/

24. November 10 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/

Water and Climate Change Adaptation
http://www.climatechange.ca.gov/adaptation/water.html

CA Climate Change Planning Program /San Francisco Bay Impacts:
http://www.bcdc.ca.gov/planning/climate_change/climate_change.shtml

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

KQED Quest Audio File: (5:43)
http://science.kqed.org/quest/audio/rough-waters-for-sea-level-rise-planning/

25. November 12 The Sacramento-San Joaquin Delta & The Peripheral Canal

Fixing The Sacramento/San Joaquin Delta
http://neverthirstpatferraro.blogspot.com/2008/06/fixing-sacramentosan-joaquin-delta.html

Another challenge for Henry Waxman: Salt of the Earth
26. November 17  Hydroelectric Power Generation

Geothermal Geyser Plants:
http://www.youtube.com/watch?v=Hj6ojHEmW8c&feature=channel

Hydroelectric power: How it works
http://ga.water.usgs.gov/edu/hyhowworks.html

Advantages of Hydroelectric Power Production and Usage
http://water.usgs.gov/edu/hydroadvantages.html

SCVWD Failure to Develop Hydro Power: Water and Power

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

27. November 19  Integrated Water Resources Planning

28. November 24  Sustainability and Carbon Footprints

Water and energy quiz

New Low Impact Development Approach Offers Climate, Energy and Water Saving Solutions (download report from link on web page)

29. November 26  Thanksgiving – No Class Meeting

30. December 1, 3 & 6  Student Presentations

Friday, December 10  Final Exam
12:15 – 2:30 PM  Dudley Moorhead Hall Rm 164
Submit by email ONLY to: PTFerraro5@gmail.com by 2:30 PM