

## 3. Environment



**RESEARCH TEAM:** River and watershed-based environmental planning

**Grand Challenge:** Green Infrastructure for Sustainable Development

**Key Terms:**

Water quality, water scarcity, water shed, low impact development, green space

**Student Leader:** Adam Krohn

**Student Members/Student Research Project Titles:**

- Adam Krohn Watershed Restoration Plans: A Case Study on the Adoption of the Chollas Creek Enhancement Program
- Josh Menvielle Water Transfers and the Salton Sea
- Kevin Lau Low Impact Development: Cross-Collaboration and the Cost-Effectiveness of Sustainable Development Projects
- Preston Lam Valuing Green Infrastructure: Connecting Open-Space through the San Diego River Park

**Mentor(s) Leader:**

- John Robertus

**Research Team Narrative**

The concept of using rivers and watersheds as objects of focus for a region's planning efforts may seem foreign to many. However, once one understands the extent of interconnectedness that rivers and watersheds have upon all the inhabitants of a region they will be able understand the imperative of using rivers and watersheds to base planning efforts. A watershed is best understood as a giant bowl that can span across an entire city, an entire county, or even across multiple states. Whenever it rains or

whenever waste-water is dumped into a storm drain the water travels down the sides of this "bowl" through a series of small creeks and channels. The creeks and channels empty into larger and larger rivers until they finally empty into a region's water bodies also know as lakes, bays, and oceans.

The imperative of using river and watershed based planning efforts becomes clear when one understands that any chemical or waste product that is on our roadways or parking lots will wash directly into the water bodies during a rainstorm. For example, the monitoring of runoff pollution in the Chollas Creek in Southeast San Diego revealed high levels of diazinon, coliform, cadmium, copper, zinc, and lead all due to non-point pollution (Sarabia 2007). Some may shrug and respond that they never visit Southeast San Diego; however, the polluted waters of the Chollas Creek are subsequently carried through Southeast San Diego and then pour directly into the San Diego Bay. Within the context of a watershed the pollution created by upstream cities A, B, and C rapidly becomes the problem of downstream users X, Y, and Z.

Within this section, student researchers in the UCSD Urban Studies and Planning Program's Senior Research Class, studied instances within the San Diego Region where river and watershed based planning efforts are being used to combat the problems of water quality, water scarcity, and urbanization of the natural environment. The students' research examines a sundry of topics including the effects of water transfer agreements, the valuing of green infrastructure, the feasibility of low impact development (LID), and the implementation processes of Watershed Management Plans.

Through interviews, archival research, and GIS analysis student researchers uncovered many of the difficulties that arise when planning efforts are based on rivers and watersheds. Often the public is not informed of the importance of implementing unified regional efforts to preserve and improve watersheds and water quality. Student researchers came to understand that because many cities can be spread across one watershed, the coordination of efforts to collectively address an issue can draw intense opposition because more value is often place on unbridled growth than on the environment (Pezzoli 2002, 349). This distorted value in combination with the issue of fragmented jurisdictions makes river and watershed based planning very difficult.

Each of the student researchers' work does an exceptional job at identifying important river and watershed based planning efforts within the San Diego region. Their research identifies problems with current planning methods and presents possible solutions to correct these issues.

### **Student Research:**

In the research paper, "Water Wars in the West: The Salton Sea in light of the 2003 Quantification Settlement Agreement (QSA) Water Transfer," Josh Menvielle tells a story about California's largest lake, located in Southern California. He explores a theory of policy short-sightedness and the conflict between the environment and our scarce natural resources. Menvielle meticulously analyzes the Salton Sea and clearly presents his findings that the QSA will soon become the major contributor to the quagmire of environmental problems at the Salton Sea. Under the QSA, farmers in the Imperial Valley will conserve irrigation water in order to transfer it to San Diego County. The

Salton Sea's main source of inflow is irrigation runoff, this means if less water is used to irrigate farmland, less water will drain to the Salton Sea. Through extensive interviews and archival research, Menvielle finds that this will negatively impact the Salton Sea through a number of issues including shoreline recessions, air quality, and wildlife endangerment because of the increasing salinity levels of the Sea.

In the research paper by Adam Krohn titled, "Watershed Restoration Plans: A Case Study of the Adoption of the Chollas Creek Enhancement Program," the political and social processes for adoption of a watershed restoration plan were examined. The question was asked, "What significant factors led to the adoption and implementation of the Chollas Creek Enhancement Program." The answers to this question have the potential to be applied in multiple regions across the country, as problems with urbanization and non-point water pollution have become a universal issue. Krohn performed his analysis through interviews with key actors who took part in the document's adoption processes and through archival analysis of past and present planning documents. Through his findings, Krohn concluded that the adoption of the Chollas Creek Enhancement Program was primarily assisted by two factors. First, the potential decision making gap was effectively closed by the continual education of political officials. Second, the use of regulatory sciences allowed for an accurate monitoring process of the Chollas Creek's pollution levels hence giving the problems with pollution political saliency and allowing the project to receive available funding.

In Kevin Lau's research paper "Low Impact Development: Cross-Collaboration and the Cost-Effectiveness of Sustainable Development Practices in San Diego and along the Chollas Creek Watershed," he discusses how low impact development (LID) has become increasingly utilized for stormwater protection and for creating more efficient water systems. Lau's paper answers the question, "To what extent cross-collaboration has become a benefit to sustainable planning practices and initiatives with regards to LID and its cost-effectiveness along the Pueblo Watershed in San Diego?" Through participant observation, archival research, and interviews with key individuals related to the planning field, Lau's conclusions have shown that LID is cost-effective but its impact is limited by the efforts and collaboration of the parties involved. Also, that there is a double standard with regards to cross-collaborative efforts potentially allowing for more buy-in and support while at the same time leading to a break down in coordination (potential for better quality work but harder to achieve coordination).

In the research paper by Preston Lam titled, "Valuing Green Infrastructure: Addressing Urbanization through the San Diego River Park," he explores the development of the San Diego River Park as an opportunity to restore the health of the San Diego River Watershed. Through examination of the San Diego River Park, Preston found that the development of the River Park effectively counters the effects of urbanization in a variety of ways. First, the San Diego River Park connects open-space through an extensive trail system, uniting isolated trails along the San Diego River. Second, the San Diego River Park promotes the use of alternative transportation such as the trolley, bus routes, and paths for bicycles and pedestrians; particularly in the Mission Valley portion of the River Park. Third, the San Diego River Park promotes environmental stewardship through access points along the River Park that informs users of the history of the San Diego River in the region. As a site of green infrastructure development, the San Diego River

Park has the capacity to catalyze a regional green infrastructure approach to sustainable development in the region.

### **Conclusion:**

Each of these students has effectively demonstrated the importance, feasibility, and potential of watershed and river based planning efforts. As politicians and environmental scientists face the growing threats of water scarcity, climate change, and non-point pollution an even greater understanding of how to effectively plan for these challenges will be needed. Students looking to further the understanding of watershed and river based planning could focus on any of the overarching areas, such as: understanding the problems or benefits caused by water related decisions, documenting the current efforts and solutions being used to address problems within the rivers and watersheds, and analyzing successful planning efforts that can be applied to other suffering watersheds. The issue of watershed and river based planning will only grow more imperative and continue to need the thoughtful consideration of all current and future planners.

### **References:**

Walker, Dan. Thirst for Independence: The San Diego Water Story. Sunbelt Publications, 2004.

Water Scarcity: Impacts on Western Agriculture (1984)

Ernest Engelbert and Ann Scheuring; Berkely, University of California Press. BMP Analysis System for Watershed-Based Stormwater Management (2006)

Jenny Zhen and Leslie Shoemaker; Journal of Environmental Science and Health, Part A Toxic/Hazardous Substances and Environmental Engineering. Rapid Assessment of the Cost-Effectiveness of Low Impact Development for CSO Control (2007)

Franco Montalto and Christopher Behr; Journal of Landscape and Urban Planning.

Pezzoli, Keith. 2000. Environmental Management Systems (EMSs) and regulatory Innovation. California Western Law Review 36 (2): 335-365.

### **Links:**

<http://www.sandiego.gov/planning/community/profiles/encanto/plan.shtml>

<http://www.cwp.org/>

<http://www.epa.gov/watertrain/cwa/>

<http://www.sandiego.gov/thinkblue/chollas/index.shtml>

<http://www.chesapeakebay.net/>

<http://www.saltonseaca.gov/>

<http://www.institute.redlands.edu/salton/>

<http://www.saltonseawater.ca.gov/>

<http://www.usbr.gov/lc/region/programs/saltonseahtml>

<http://books.google.com/books?hl=en&lr=&id=GkAHsixhMZwC&oi=fnd&pg=PP9&dq=low+impact+urban+design&ots=P5XPgcrNow&sig=nBsLYq42iqPclxWy9a3oQnaM4Vk#PPR6,M1>

<http://www.lowimpactdevelopment.org/>

<http://www.lid-stormwater.net/intro/background.htm>

<http://www.nrdc.org/water/pollution/storm/chap12.asp>

[http://www.projectcleanwater.org/html/ws\\_san\\_diego\\_river.html](http://www.projectcleanwater.org/html/ws_san_diego_river.html)

<http://www.sandiegoriver.org/>

**Multimedia Archive:**

Available presentations for this group can be found on the Senior Sequence website at:

[http://seniorsequence.net/?page\\_id=440](http://seniorsequence.net/?page_id=440)