MIXER & POSTER SESSION

4:50 PM - 6:55 PM

TOPIC 3

PREDICTING, PLANNING FOR, AND ADAPTING TO A CHANGING CLIMATE

Posters that highlight research to better understand California's changing climate in the context of watershed health and water resources and efforts to plan and adapt to a changing normal.

TOPIC 3: PREDICTING, PLANNING FOR, & ADAPTING TO CLIMATE CHANGE

Managing Streamflow to Support Aquatic Species in Consideration of Climate Change and New Water Management Practices

Jennifer B. Taylor (SCCWRP and UCLA), and Eric, Eric D. Stein (SCCWRP)

Streamflow patterns largely govern the distribution of riverine and riparian biota. Climate change induced shifts in rainfall-runoff patterns combined with changing urban water use practices present new management challenges in aquatic resource management. Research over the past decade has shown that managing for minimum flows is not sufficient to ensure integrity and resiliency of aquatic communities. Instead, flow management programs must account for the pattern of flow necessary to support key life history needs of aquatic organisms, which include the magnitude, timing, duration, and frequency of flow events. Management is further complicated because different parts of watersheds are affected by different pressures on streamflow. Upper watershed areas are typically affected by climate change induced changes in flow, while lower watershed areas are affected by changes in water use practices, such as wastewater discharge, recycling and conservation, and storm water capture. Our research investigates the implications of these two processes on species habitat and other beneficial uses with a goal of providing recommendations for water resource management under competing needs in the watersheds of Los Angeles and Ventura counties.

To provide an efficient way to account for needs of dozens of aquatic species that reside in the six major watersheds of the study area, we investigated the relationship of flow patterns on the distribution of six species that represent a range of life history needs related to stream flow patterns. The six species include the Santa Ana sucker, arroyo chub, *O. mykiss*, Least Bell's vireo, Southwestern pond turtle, and arroyo toad – all native species which are either threatened or endangered.

We developed species distribution models that relate flow patterns to probability of occurrence using both current and predicted precipitation under different climate change and water use scenarios. Presence and absence data for the six species within the study region were assembled from various wildlife surveys from the 1980s through the present. Daily flow time series were calculated for every river reach within these watersheds using flow gages, hydrologic modeling, and machine learning prediction. Ecohydrological metrics, such as stream flashiness or month of largest flow magnitude, were calculated from these timeseries and used to build statistical relationships between species occurrence and flow patterns. We use random forest models to extrapolate our species distribution knowledge of appropriate habitat in areas that have not been surveyed and investigate how these distributions change under future scenarios.

The knowledge of flow pattern requirements can aid in prioritizing areas of restoration and in setting flow discharge regulations which are increasingly important as agencies seek to curb the use of imported water.

TOPIC 3: PREDICTING, PLANNING FOR, & ADAPTING TO CLIMATE CHANGE

Watershed Planning for Climate Resilience

Melanie Winter, Johnathan Perisho*, and Zoe Axelrod - The River Project

Los Angeles faces critical challenges to ensure water security and climate resilience. Our urban landscape has been made to drain water into the ocean as quickly as possible. Impermeable surfaces prevent soil and natural systems from cleaning air and water, and increase urban heat while concentrating floodwaters, peak flows, and pollution that moves over them. One project at a time has covered the basin with little consideration for the cumulative impacts on the wider regional and global systems.

Watershed planning considers the big picture, recognizing myriad inter-related factors in decision-making. Climate, rainfall, geology, land use, species distribution, community needs, culture, and wider goals are all factors in evaluating both feasibility and suitability of different projects and programs. Considering these comprehensive factors, Nature-Based Solutions stand out for making the best and most cost-effective long-term investments with our limited resources.

Nature-Based Solutions Nature-based solutions rely predominantly on soils and vegetation to restore the natural ecosystem processes required to slow, detain, and absorb water, infiltrate water to aquifers, filter pollutants out of water and air, sequester greenhouse gasses, support biodiversity, provide shade, and aesthetically enrich environments. Examples include: strategically undeveloped and protected mountains and floodplains; wetlands; rain grading/rain gardens; mulch; soil conservation and enhancement; tree and vegetation planting; and parkway basins.

Wetlands, Rivers, Creeks, and Streams Wetlands including river systems clean and infiltrate more water, cleanse more air, sequester more carbon, and support more species than any other land cover. These functions are increasingly essential in a region facing significant climate threats, flooding, prolonged drought, park poverty, and failure to meet the Clean Air and Clean Water Act standards for safe places to live and work.

Proactive investment in the face of climate change is key. Proactive action saves lives, and also saves several times the funding and resources otherwise necessary to recover from disaster. If we develop and retrofit land to capture water we can reduce peak flow intensity of flood waters, and ultimately peel back enough concrete to enable all the essential functions soil and rivers can provide.

Water LA Water LA was developed to empower LA residents to make positive impacts with Nature-Based Solutions, one property at a time. Throughout the original Pilot program, The River Project worked directly with homeowners, hosting hands-on educational workshops and implementing home retrofit projects in climate- vulnerable communities, while also working directly with agencies to streamline permit processes, amend building codes, develop a set of design standards, and model the project benefits. The results were included in all three regional water planning documents, and have contributed to advances in statewide requirements.

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