Using a SWB Model to Analyze the Anthropogenic Effects on Groundwater Recharge in The Ballona Creek Watershed, Los Angeles County, CA

**Study Area**
- Ballona Creek Watershed of Los Angeles, California (130 square miles)
- Highly developed

**Process**
- Compile sets of tabular and gridded inputs (Fig. 1)
- Create a pre-development land cover shapefile (Fig. 2)
- Model pre/post-development land cover using a soil-water balance (SWB) model

**Goals**
- Determine how highly altered land cover changes groundwater recharge rates
- Evaluate the effects of native vs. non-native vegetation
- Determine the variations on recharge and evapotranspiration (ET) rates between pre and post-development.

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**Legend**
- Open Water
- Alkali Flat
- Alkali Meadow
- Beach
- Cultivated Crops
- Deciduous Forest
- Dune
- Emergent/Herbaceous Wetlands
- Grasslands
- Lake
- Open Water
- Pond
- Salt Flat/Tidal Flat
- Salt Marsh/Tidal Marsh
- Shrub/Scrub
- Valley Freshwater Marsh
- Vernal Pool
- Wet Meadow
- Willow Thicket

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**Fig. 1:** Gridded inputs

**Fig. 2:** Pre-development land cover shapefile
Outcomes

- Post-development outcomes show low recharge and ET rates in highly developed areas (Fig. 3A & 3B)

Future Work

- Calibration, validation, and sensitivity analysis on the post-development model
- Running the pre-development model
- Comparative analysis of the two models

Fig. 3A

Fig. 3B

Fig. 4: Mean monthly recharge rates by land cover type