Measuring and Monitoring the Vegetation of the Scott Creek Marsh

T. Buchloh, S. Farrow, C. Doiron, R. Kenny, G. Hayes, J. Yost, M. Ritter
Biological Sciences, California Polytechnic State University, San Luis Obispo, CA

INTRODUCTION

The Scott Creek Bridge, part of CA Highway 1 adjacent to the Cal Poly Swanton Pacific Ranch, and crossing the Scott Creek estuary and saltmarsh, is due to be replaced in the next several years. Because the Scott Creek estuary was channelized when the current bridge was installed, the bridge replacement project will be accompanied by a restoration project aimed at de-channelizing the creek. This is a rare opportunity to observe the response of coastal wetland vegetation communities to a rapid shift in hydrologic conditions.

Figure 1. The location of Scott Creek (left). The Scott Creek Bridge, which is scheduled to be replaced.

De-channelization will affect not only the rate of flow of Scott Creek but also the timing and frequency of bar closure. This will result in dramatically changed hydrologic conditions in portions of the marsh, and we would predict rapid vegetation change to follow. Baseline data is needed before changes can be assessed.

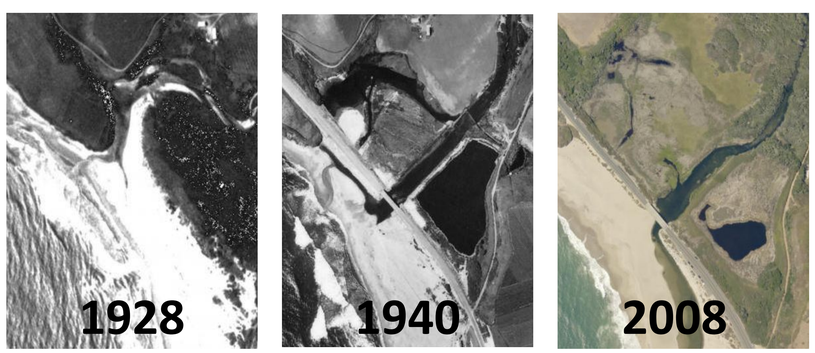

Figure 2. Aerial photos of Scott Creek.

METHODS

Cal Poly has implemented an ambitious species inventory, vegetation mapping and long-term monitoring program in the Scott Creek Marsh. Over the summer of 2018, we began the first systematic effort to catalog the flora and delineate the vegetation types in the marsh. Post-restoration, this work will allow us to quantify the amount of vegetational change in the marsh.

- Using ArcGIS online, we created transects running east to west through the entire area of the marsh, spaced 5m apart.
- Transect start and end points were located using a Garmin GPS and known landmarks.
- Transects were sampled at every meter.
- At each sampling point we recorded species presence/absence in a 0.25x0.25 meter quadrat.
- Records were uploaded into ArcGIS and overlaid onto a high resolution drone image.
- Errors resulting from GPS accuracy were visually corrected using the drone image.

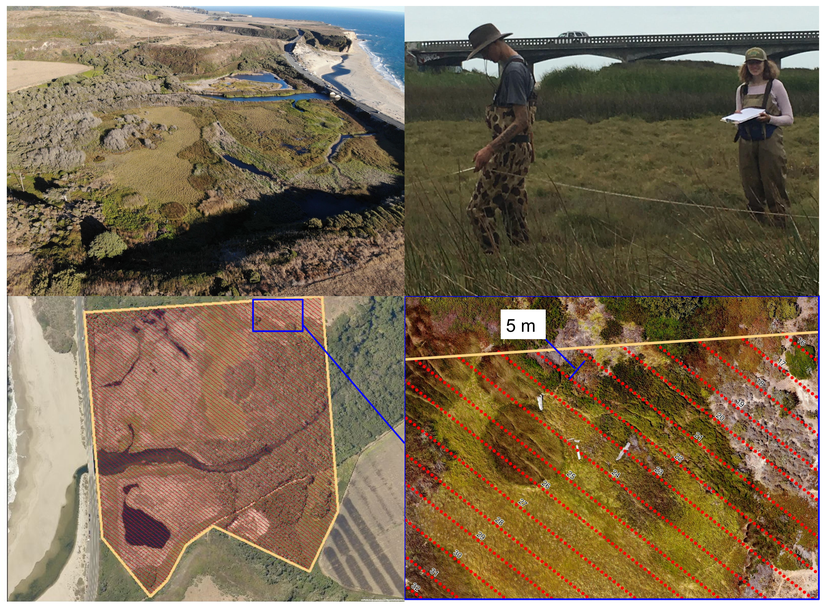

Figure 3. Aerial image of SCM (top left); Data collecting (top right); Boundary of marsh ecosystem (lower left); GIS sampling grid (lower right).

RESULTS

- 12,041 data points sampled
- 111 species identified in sample area
- Data and images overlaid and map created

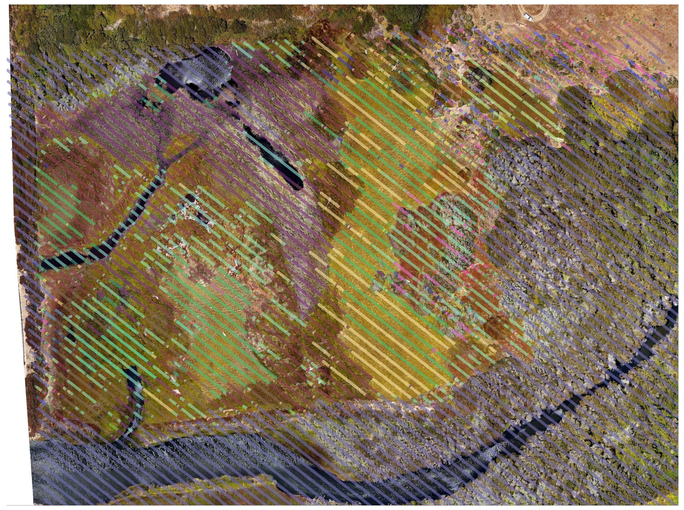

Figure 4. Points are associated with a unique code that corresponds to a species occurrence. Species are associated with unique colors.

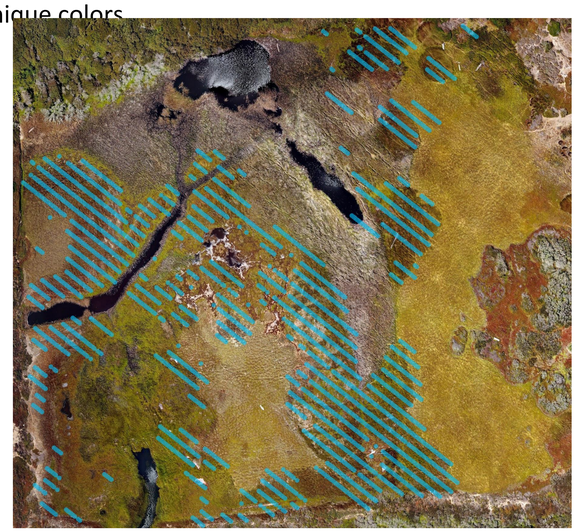

Figure 5. Species distribution represented by map data. Example: *Juncus lescurii* Bol.

Future work

- Resample the marsh post-restoration using field methods and drone imagery

Acknowledgements

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