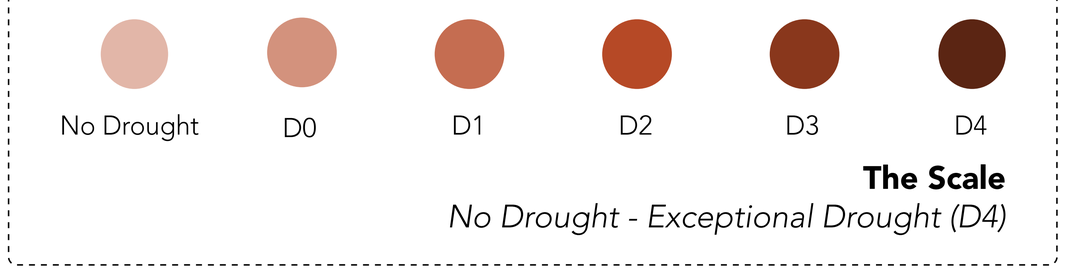
California's Drought

Billy Ceskavich ~ Fall 2014



Introduction

Since 2011, California has been experiencing one of the worst droughts in the state's history. Already, the drought has devastated the local environment and affected the economy nationwide. With significant water shortages looming, Californians are racing to adapt. Researchers, the media, and residents all continue to ask similar questions: how long will this crisis last? How does the current drought compare to past dry spells? Here, we can both vividly see the drought as it exists today and examine drought patterns over time for insight into the years to come.

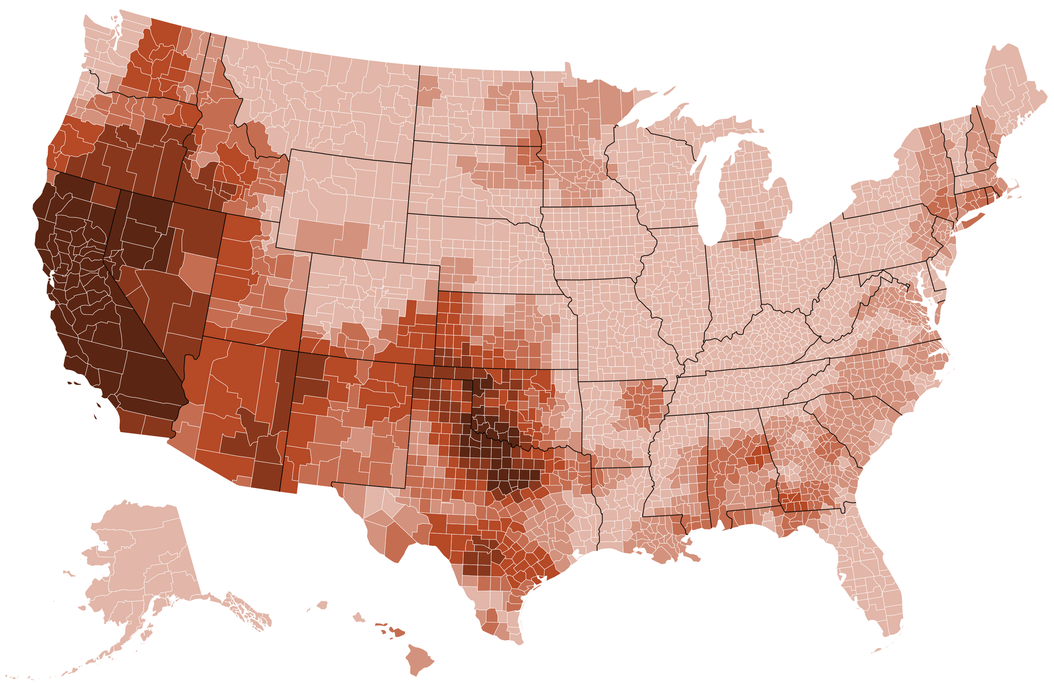
Audience

The intended audience for this visualization is Californians, specifically:

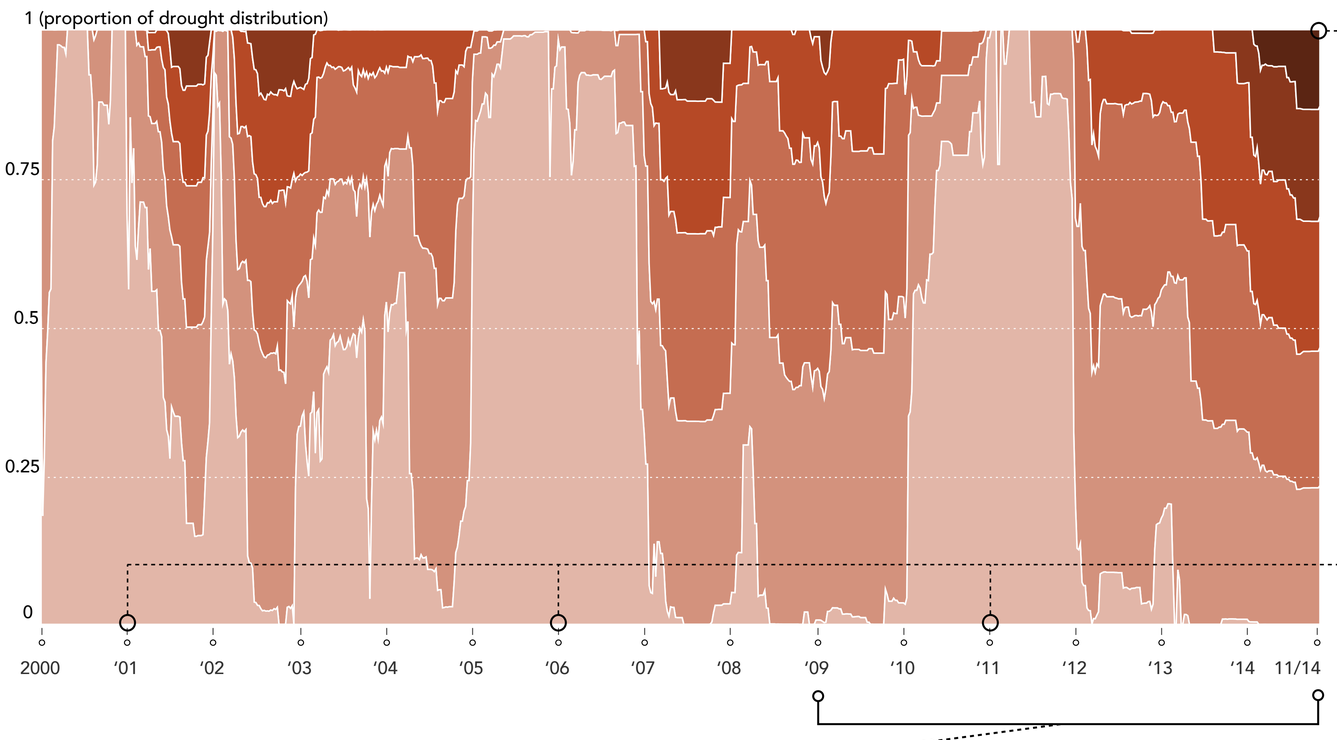
- **Researchers** - Those examining the drought today and in the past for answers about its effects and future trends. They may ask: how is the drought distributed, and how do today's patterns compare to past events?
- **Public Figures** - Policy makers who need to address the issue soon. They could ask: what areas of the state are most affected and need attention most?
- **Residents** - Citizens looking to adapt and survive as conditions change. They currently ask: how does this drought affect me today? Will this be similar to past droughts?

Their expertise and length of residency will inform the way they perceive these graphics.

Drought Levels in the United States, by County
November 4, 2014



See more trends over time at: http://drought.ceskavich.com/



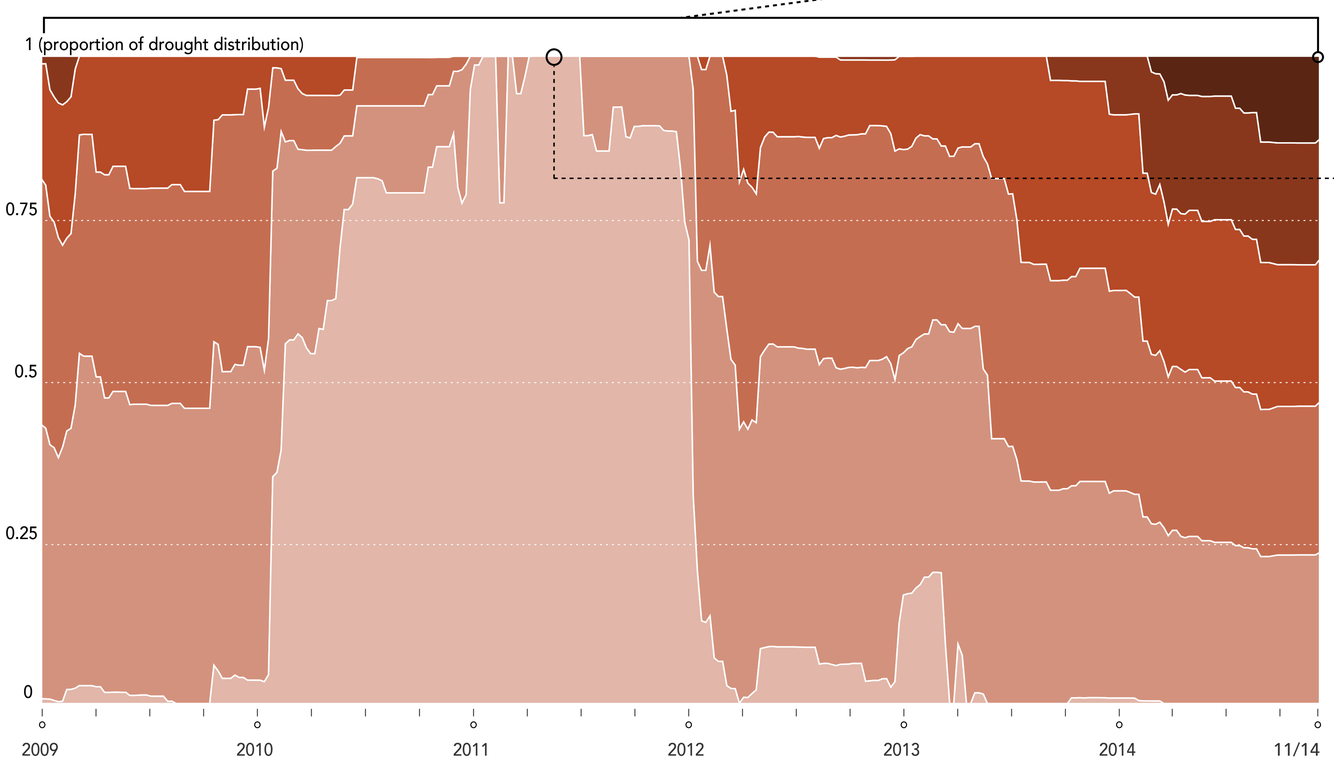
Changes in Drought Proportions in California

2000 - Nov. 2014

These two graphics illustrate the proportion of each level of drought in California over time. We can clearly see a cyclical nature to drought and non-drought periods in the state. We can also see that the current drought is the first time California has experienced any level D4 "exceptional" drought. Building from my user testing, I have made an effort to provide scales and guides, in addition to points of significance in this drought history.

Starting in 2014, California has started to experience its **first ever D4 "exceptional" level drought** in the USDM record. At the same time, the entirety of the state is now experiencing some level of drought.

We can see three distinct periods of non-drought state, each peaking during the winter new year period.



Changes in Drought Proportions in California

2009 - Nov. 2014

The beginning of 2011 saw the peak of California's last non-drought period, soon followed by a sharp drop into the present drought period. This was one of three noticeable non-drought cycles since 2000.

User Feedback

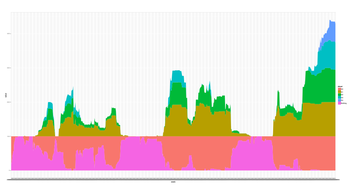
I collected user feedback from three Syracuse-based Californians on the visuals presented here along with the sketches highlighted below. Through their talk aloud descriptions, it became clear that the proportional stacked area chart was the most compelling visualization, highlighting palpable trends over time. Two study participants even pointed out moments in these graphics and referenced past experiences, which led me to create the pointer guides highlighting important moments from the last 15 years. The participants I worked with also indicated a need for better and consistent scales and legends throughout, which I iterated upon over time. In all, the feedback I gathered played a key role in helping me decide on a proper, final design.

Data Source

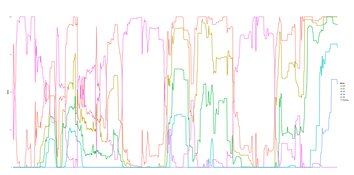
The data visualized here is from the United States Drought Monitor (USDM), maintained by the University of Nebraska, Lincoln on a weekly basis since 2000. Learn more online at: http://droughtmonitor.unl.edu/

Sketches

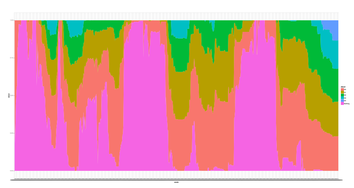
Through sketches and initial wrangling in R, I went from numerous concepts, to a few initial graphs, to the final concepts seen here.



My first rendering, a fully stacked line chart, did not do well to visualize the nuances between California's dry and wet periods.



A line chart trying to show changes in pure drought frequency was not as clear as I had hoped.



The beginnings of my final visualization, with the initial color scheme as rendered by the R data analysis program.