

Country / City United States / Cambridge, Massachusetts
University / School Harvard University/ Graduate School of Design
Academic year 2019-2020
Title of the project That Sinking Feeling: Subsidence Parables of the San Joaquin Valley
Authors Chelsea Kilburn (advised by Danielle Choi)

image credit: Based on a USGS image: Poland, Joseph F. "Approximate Location of Maximum Subsidence in the United States Identified by Research Efforts of Dr. Joseph F. Poland (Pictured). Signs on Pole Show Approximate Altitude of Land Surface in 1925, 1955, and 1977. The Site Is in the San Joaquin Valley Southwest of Mendota, California." Location of Maximum Land Subsidence in U.S. Levels at 1925 and 1977, USGS, 8 Mar. 2018, <https://www.usgs.gov/media/images/location-maximum-land-subsidence-us-levels-1925-and-1977>.

TECHNICAL DOSSIER

Title of the project	That Sinking Feeling: Subsidence Parables of the San Joaquin Valley
Authors	Chelsea Kilburn
Title of the course	Masters in Landscape Architecture Design Thesis
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Teaching Staff	Advised by Danielle Choi
Department/Section/Program of belonging	Masters of Landscape Architecture I AP program (MLA I AP second year)
University/School	Harvard University Graduate School of Design



This thesis explores the dissonance between the naturally blurry edge of groundwater and the structures of management that define the surface landscape of California’s San Joaquin Valley. In this region, extreme groundwater extraction causes land subsidence, thus physically and directly altering topography. The project frames a reality where imminent coastal migration leads to a soaring urban population in the Valley, further intensifying the need for extraction that not only provides drinking water but sustains some of the nation’s most productive agricultural ground. Sites of intervention consider local groundwater management typologies and imagine near-future scenarios in which design of the landscape can be used to rethink subsidence not as the effect of groundwater extraction but as a generative infrastructural force able to meaningfully shape the ground for the retention, remediation, and distribution of water that can then be utilized in the recharge of a critically overdrafted aquifer as well as in a speculative subversion of California’s constructed natural history.



CLIMATE CHANGE AGAIN

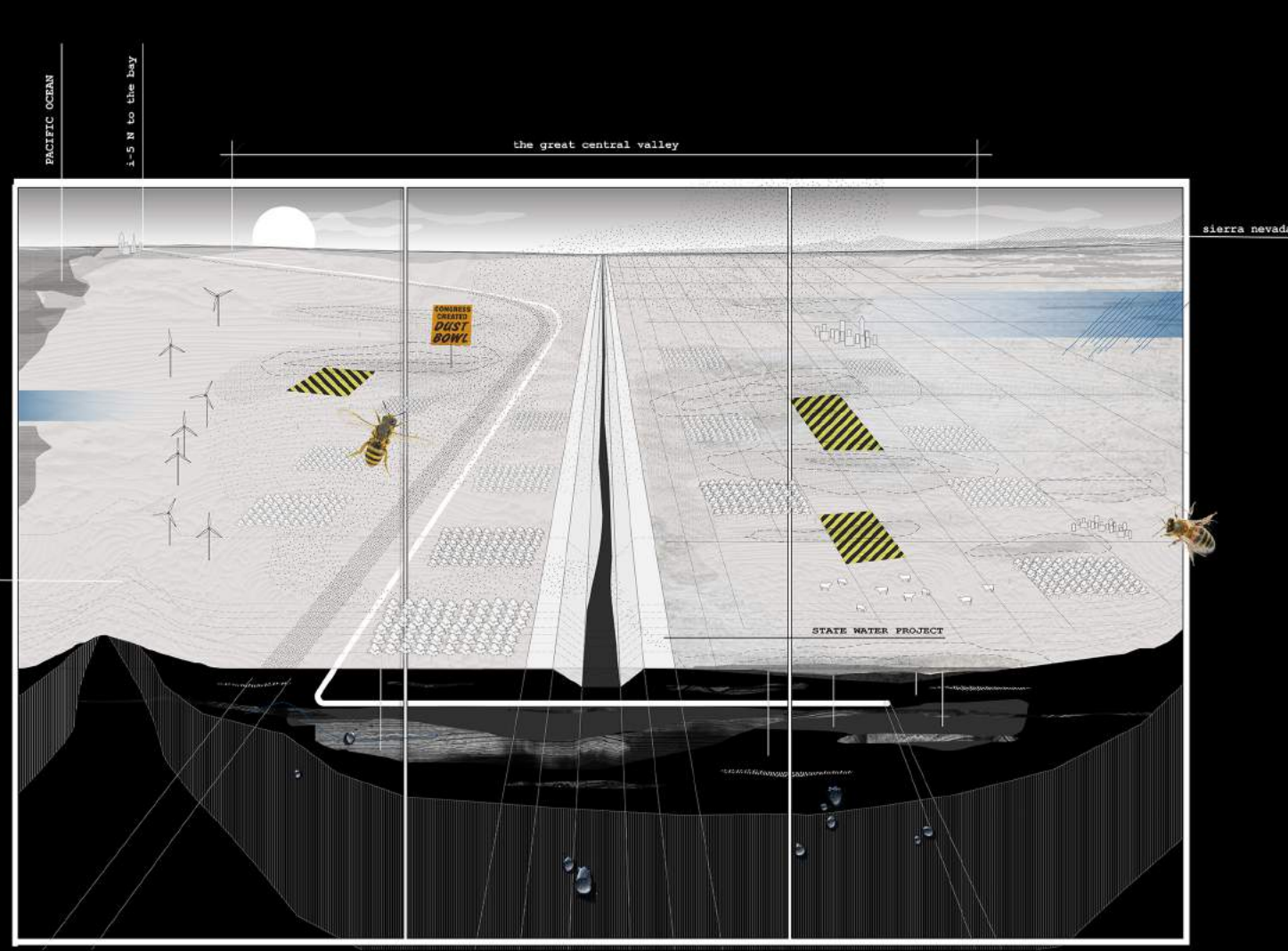
11th International Biennial Landscape Barcelona

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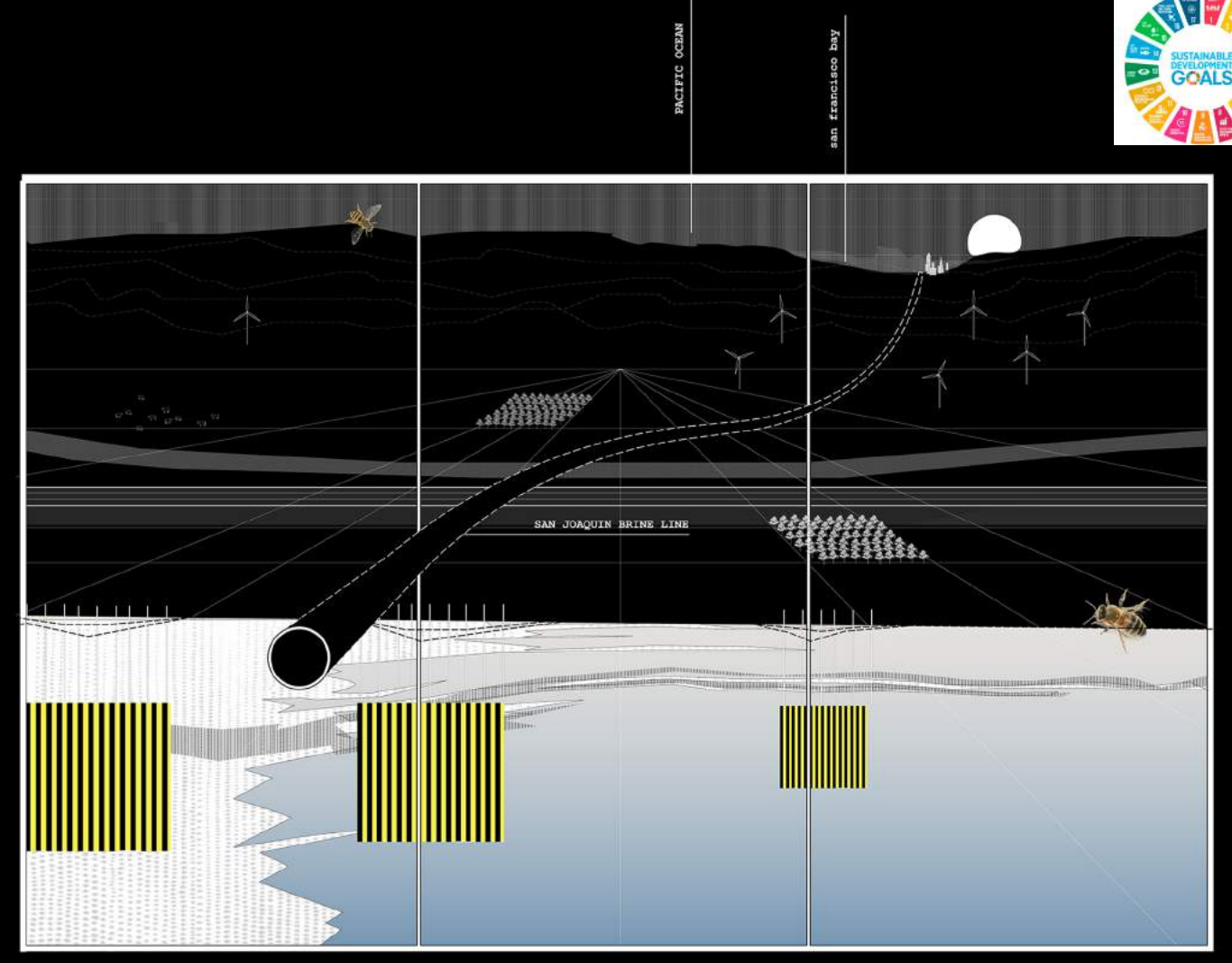
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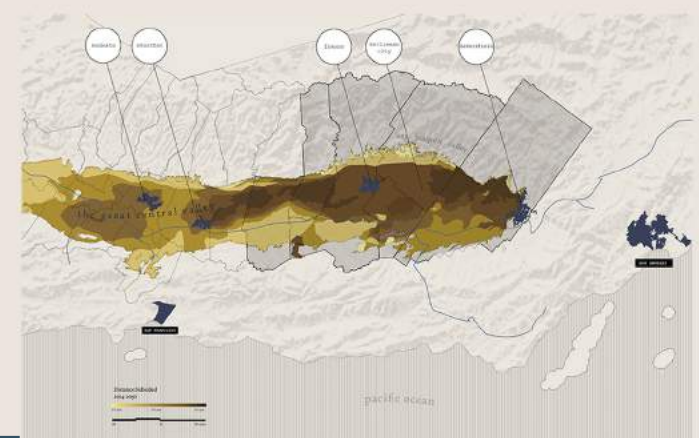
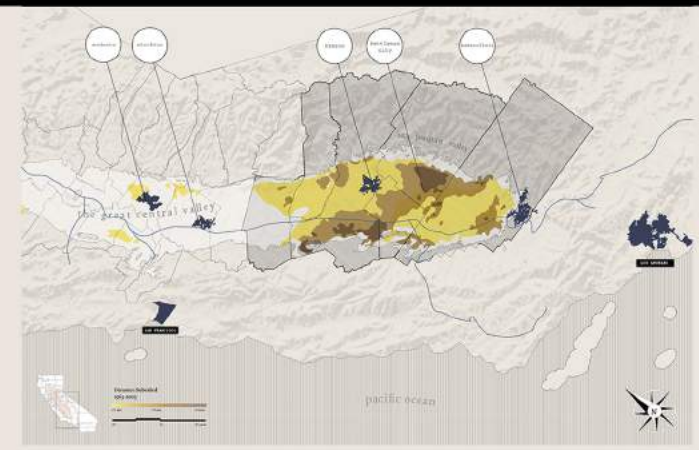
Barcelona September 2020
SCHOOL PRIZE



THE SAN JOAQUIN VALLEY, LOOKING NORTH



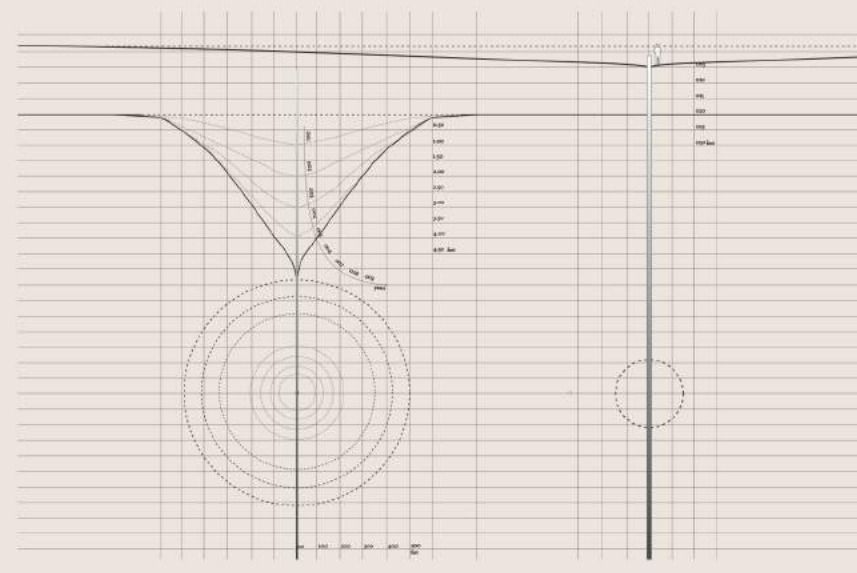
THE SAN JOAQUIN VALLEY, LOOKING WEST



Like much of central California, this area has historically been subjected to both flattening and desiccation for the reclamation of land through the use of technological innovations. Landscape tools such as the Fresno scraper have allowed this region to be transformed from what was previously deemed 'unsettleable' by missionaries into one of the nation's most productive technical grounds, now capable of supporting agricultural industry worth billions and responsible for a large portion of America's food and economic security.

The water used to support that economy, however, is, like almost all water in the west, secured through an incredibly complex series of exchanges, and difficulties arise in trying to break from a system that has come to anticipate regular delivery, especially in the face of a shifting climate and aging infrastructure.

The most recent drought in California led not only to a more extreme reliance on extracted groundwater, but also amplified the mismanagement of this resource. Drawing water from the ground has in some areas exacerbated subsidence, which has led to the cracking and shifting of infrastructure, including some of the water delivery canals.



This project speculates on a near future where design of the landscape can be used to rethink subsidence not as the effect of groundwater extraction, but instead as a productive force to design with. I speculate here on the reconstruction of the ground where the technical landscape is embraced, a cyborg nature unsettling the Valley at an accelerated pace.

Two sites were selected as proving grounds for this project, one at Kettleman City at the edge of a now dry lakebed, and the other one at the Fresno fairgrounds.

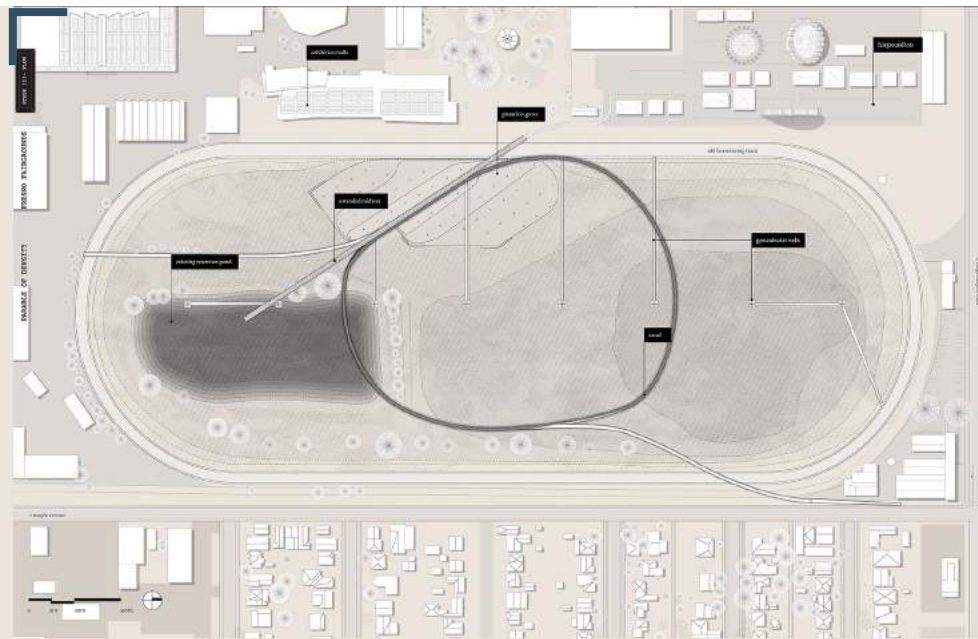
Since California's relationship to water and infrastructure has been portrayed through time as almost biblical, I have adopted the parable as a framing device and offer the challenge to see extraction as a generative force able to shape the ground for the retention, remediation, and redistribution of water.

Above, left: looking north/south along existing channelized infrastructure

Above, right: looking east/west across existing systems to embrace new forms of near-future infrastructure

Far left: mapping of subsidence patterns

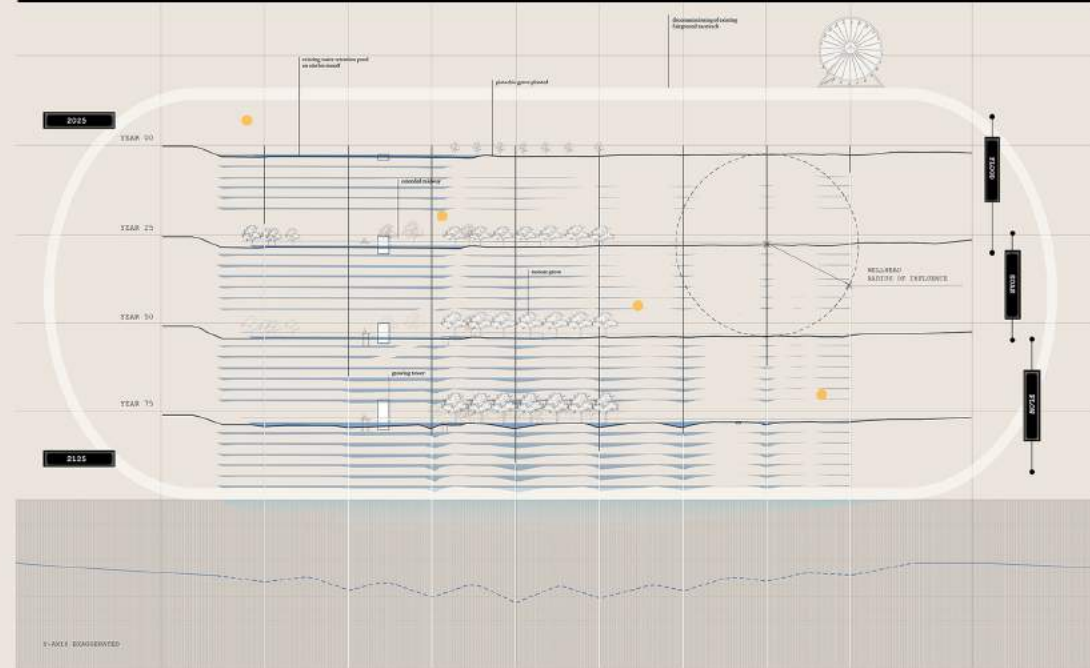
Left: diagrammatic range of groundwater well influence



Left: stages of the site through time, with the same phasing: flood, soak, and flow to again reference the amount of water on site.

Above: Imaging of the site in its final phase, flow. This image depicts the miniaturized canal that, in stage one, transports water across the site now separated from the ground and acting as a dry walking path.

Below: Diagrammatic sections of the site through time with built elements mitigating a wetter ground.



The second step on our tour across the valley is in Fresno, the metropolitan seat of the region. In this near future, the site is at the recently decommissioned horse racing track adjacent the fairgrounds. Here induced subsidence is paired with grading management to blur the line between natural and manufactured systems. The city of Fresno requires a new field of drinking wells to provide for these soaring population, as more and more coastal migrants move away from what is becoming an increasingly inhospitable coastline. Concentrated extraction occurs on this site, but here it is incorporated into the fair's attractions. This technology is displayed for public interaction and consumption, similar to the large-scale expositions of the past. Subsidence occurs, again, very slowly and unevenly, over time return visitors can see before them what they knew was happening but could not recognize, a hidden metabolism made apparent.