

# Discovering heterogeneous water demand responses under non-stationary hydroclimatic, social, and economic stressors. A 20-year analysis in Costa Mesa (California)

Figure source: <https://www.nytimes.com/2015/04/05/us/california-drought-tests-history-of-endless-growth.html>

Marie-Philine Becker<sup>1,2</sup>, Newsha Ajami<sup>3</sup>, Andrea Cominola<sup>1,2</sup>

<sup>1</sup>Technische Universität Berlin | <sup>2</sup>Einstein Center Digital Future | <sup>3</sup>Lawrence Berkeley National Lab

# OSPP AWARDS





TECHNOLOGY NEWS JANUARY 26, 2009 / 9:34 AM / UPDATED 13 YEARS AGO

## Recession hits Silicon Valley as layoffs pile up

By Anupreeta Das

4 MIN READ



NEW YORK (Reuters) - The recession turned up late on Silicon Valley's doorstep but is likely to stay awhile, as technology companies slash thousands of jobs and raise in costs to make up for shrinking earnings and tight-fisted customers.

## COVID-19: An Overview of Governor Newsom's Statewide Shelter-In-Place Order

MARCH 23, 2020

CLIENT ALERTS

# MOTIVATION

The New York Times

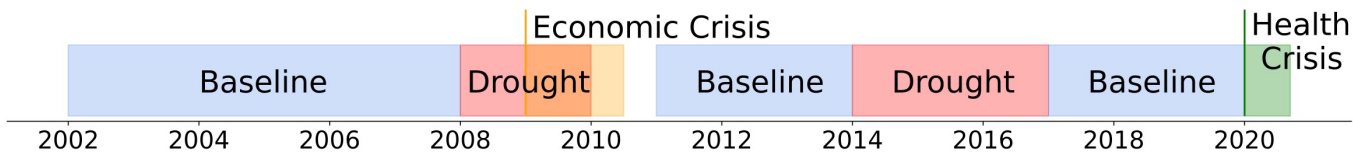
## California Imposes First Mandatory Water Restrictions to Deal With Drought



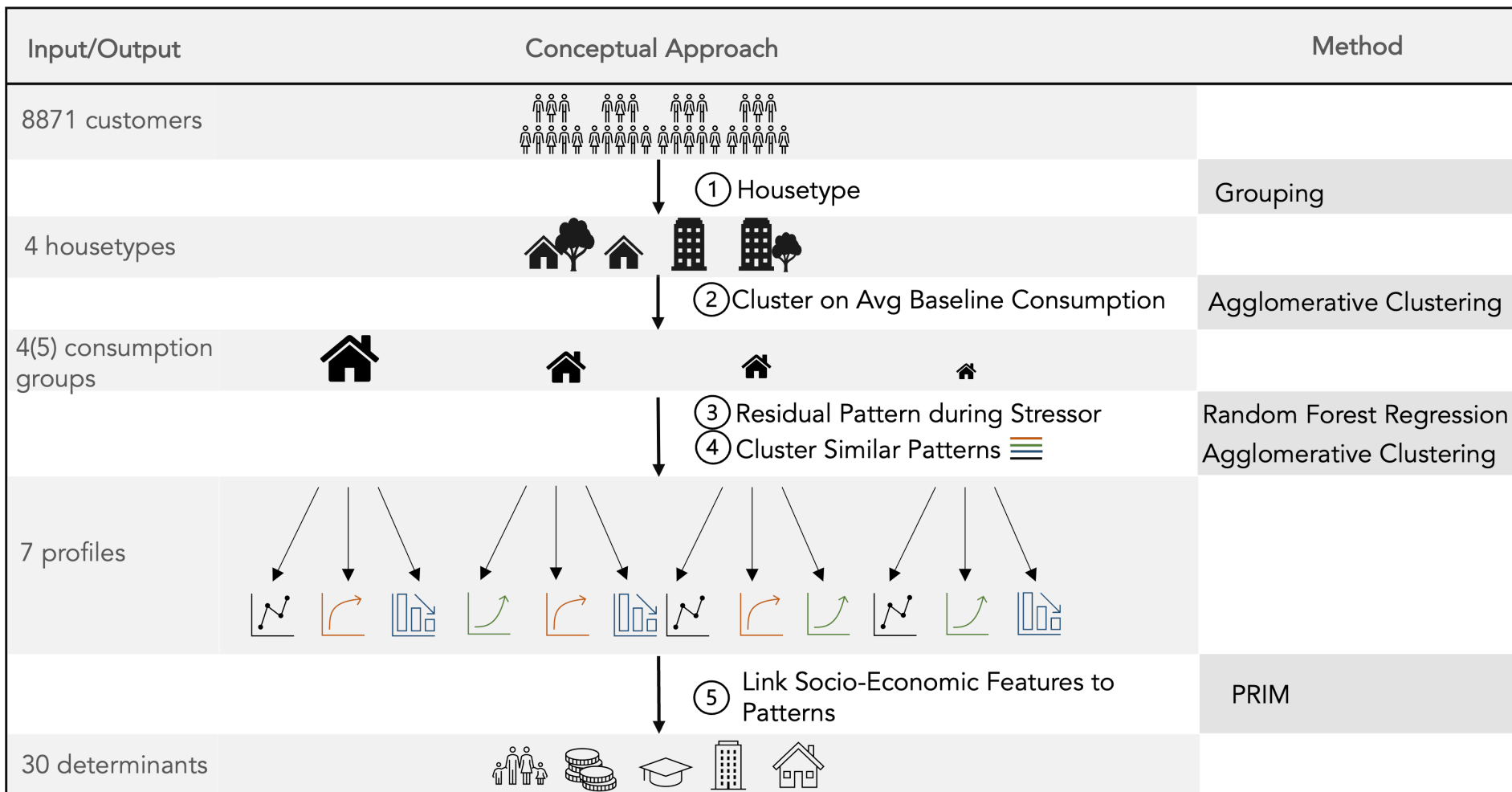
Figure sources(top): <https://www.reuters.com/article/us-siliconvalley-jobs-idUSTRE50M6YO20090126>  
(left): <https://www.wilmerhale.com/en/insights/client-alerts/20200323-covid-19-an-overview-of-governor-newsoms-statewide-shelter-in-place-order> ; (right): <https://www.nytimes.com/2015/04/02/us/california-imposes-first-ever-water-restrictions-to-deal-with-drought.html>

# RESEARCH QUESTIONS

1. How do individuals **change** their water demand in response to **evolving external conditions**?
2. Do **housing type** and other **socio-economic factors** play a role in driving response to external stressors?



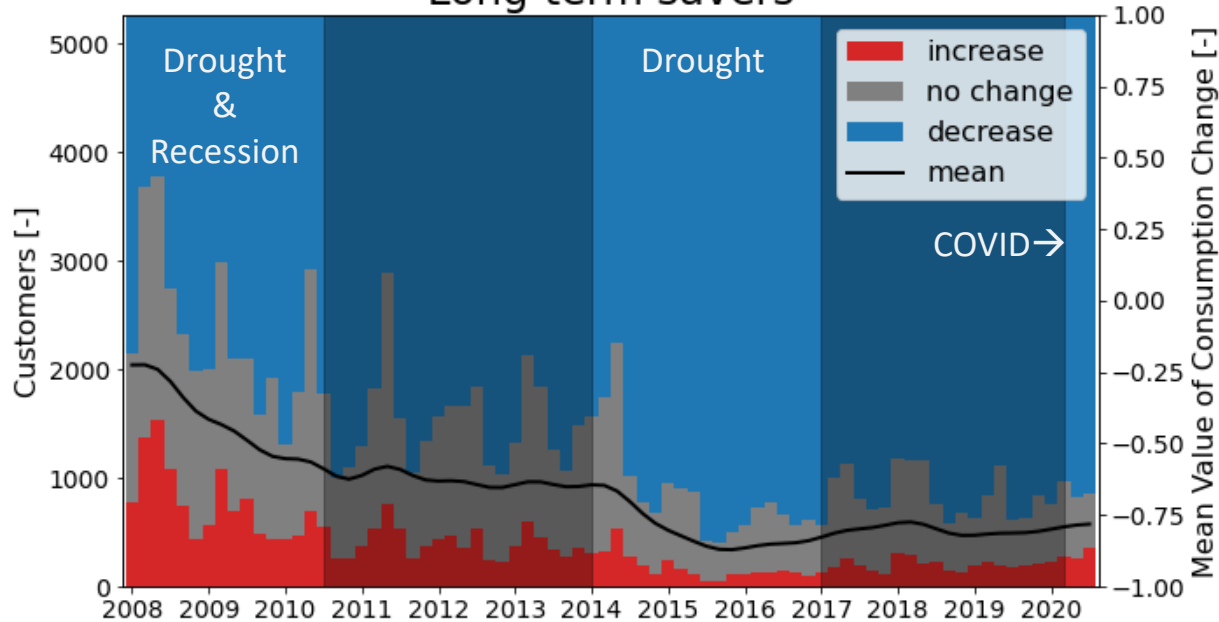
# DATA & METHODS



# WATER DEMAND RESPONSES

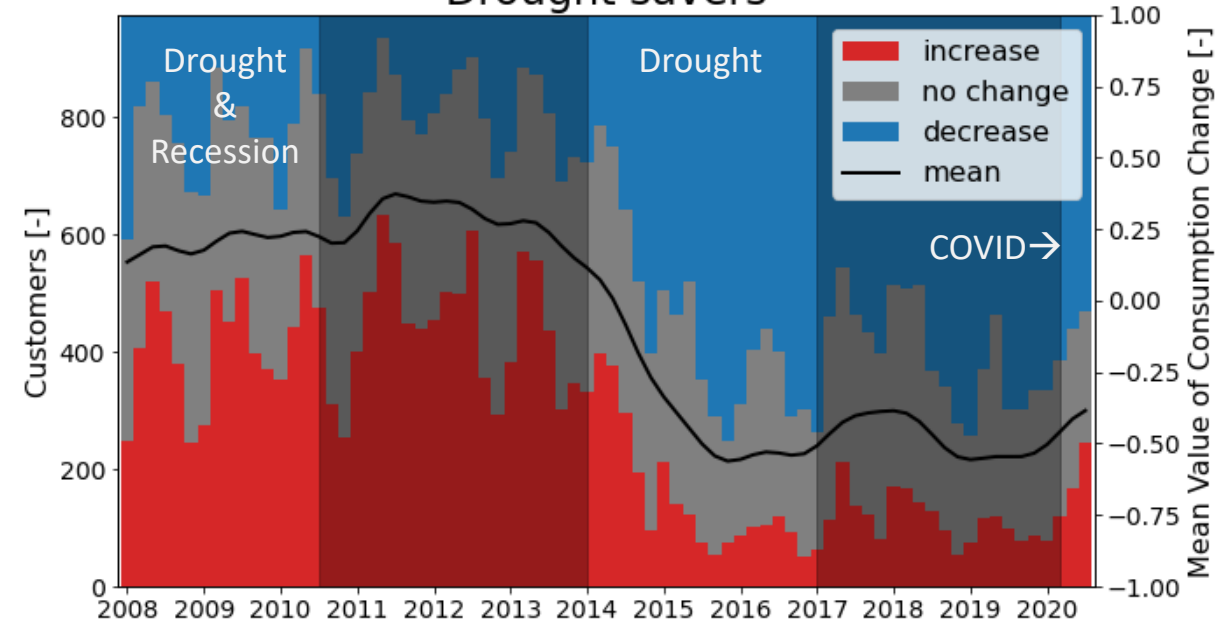
## 7 long-term water consumption patterns

Long-term savers



60 % of customers show an overall decrease

Drought savers



15 % of customers show a long-lasting decrease during the drought

# SOCIO-ECONOMIC DRIVERS

## DROUGHT VS RECESSION SAVERS

- low income
- young
- lower education level
- new or large families

## COVID INCREASE VS DECREASE

- higher education level
- live in densely populated areas
- families

# TAKE-HOME MESSAGES

- **historical analysis** reveals changing water consumption behaviors
- **mapping of socio-economic features** characterizes heterogeneous water demand patterns
- what for: can be used for **designing future demand side management strategies**





Please enter  
your feedback  
for the OSPP

# Thank you

Marie-Philine Becker

marie-philine.becker@tu-berlin.de  
www.swn.tu-berlin.de

Newsha Ajami

newsha@lbl.gov  
@NewshaAjami  
<http://eesa.lbl.gov>

Andrea Cominola

andrea.cominola@tu-berlin.de  
@AndreaCominola  
www.swn.tu-berlin.de