

# Sustainability In Times of Scarcity: How **Catalonian** Water Policy Could Inform California's Groundwater Management

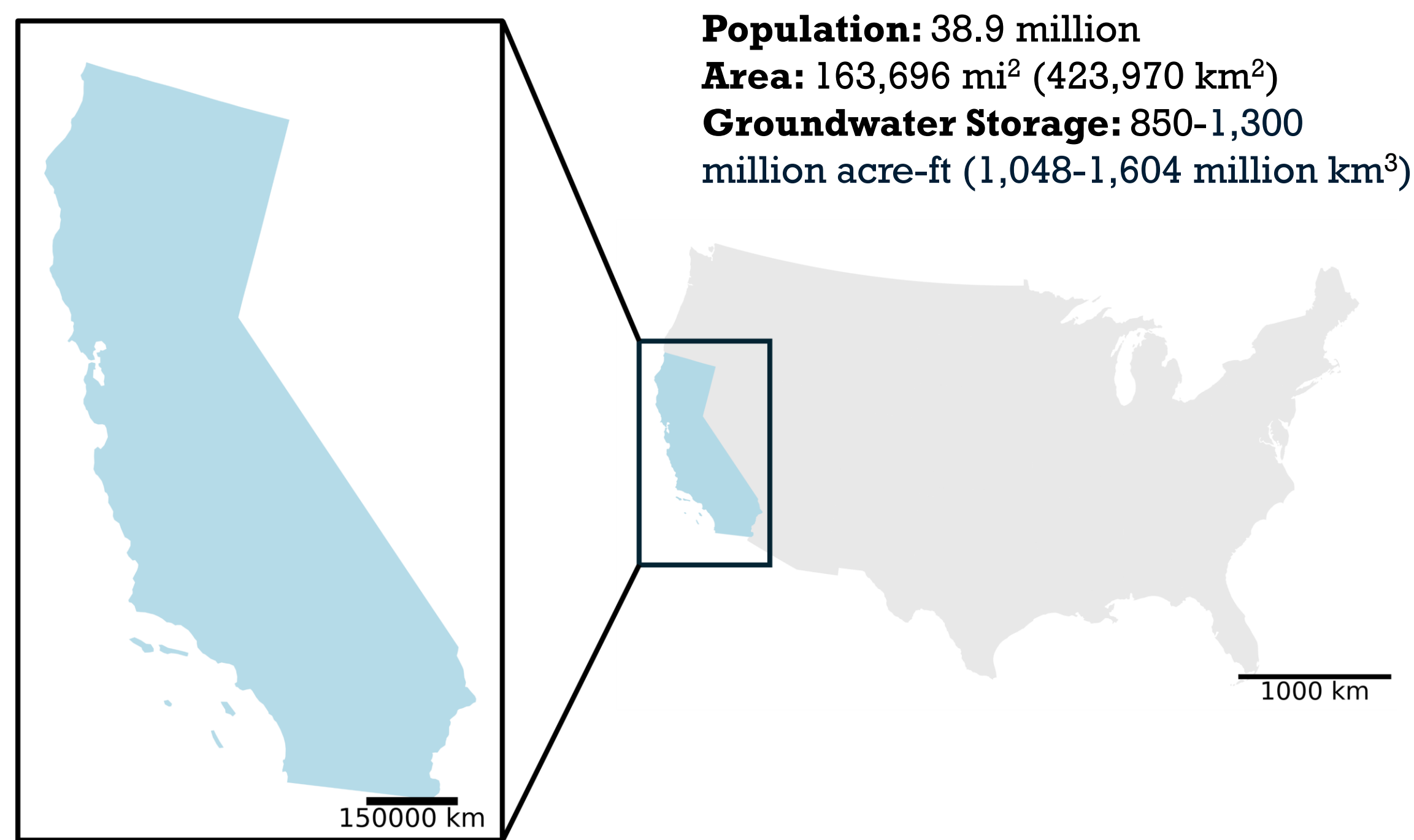


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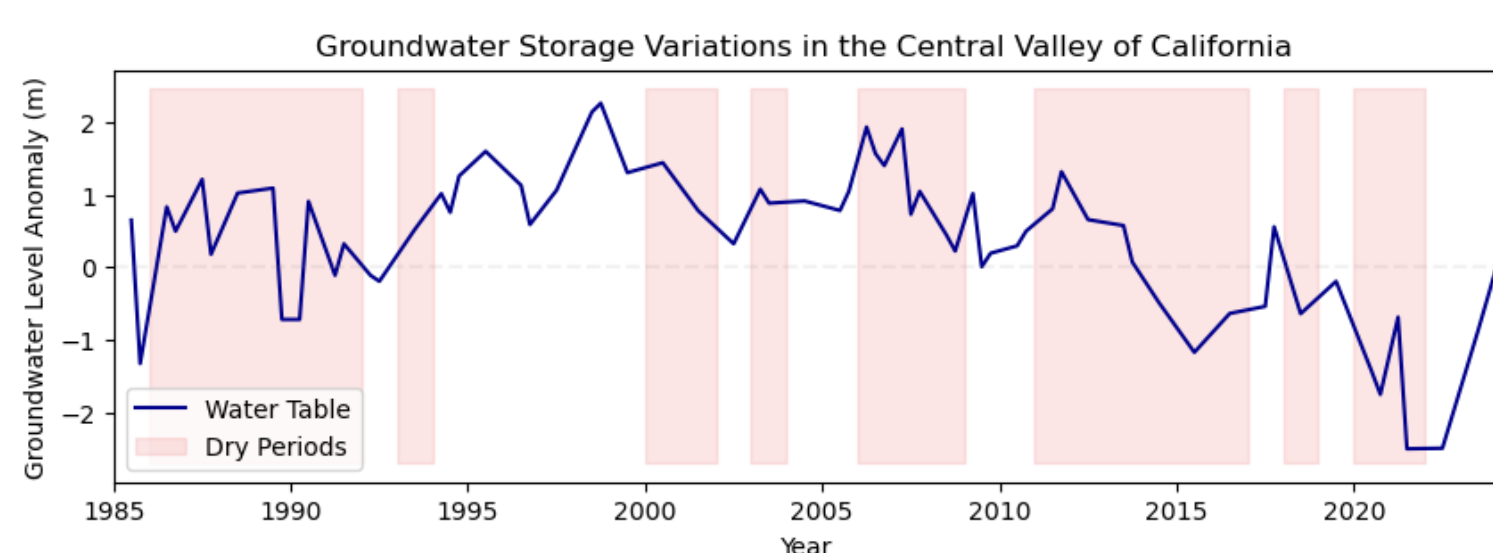
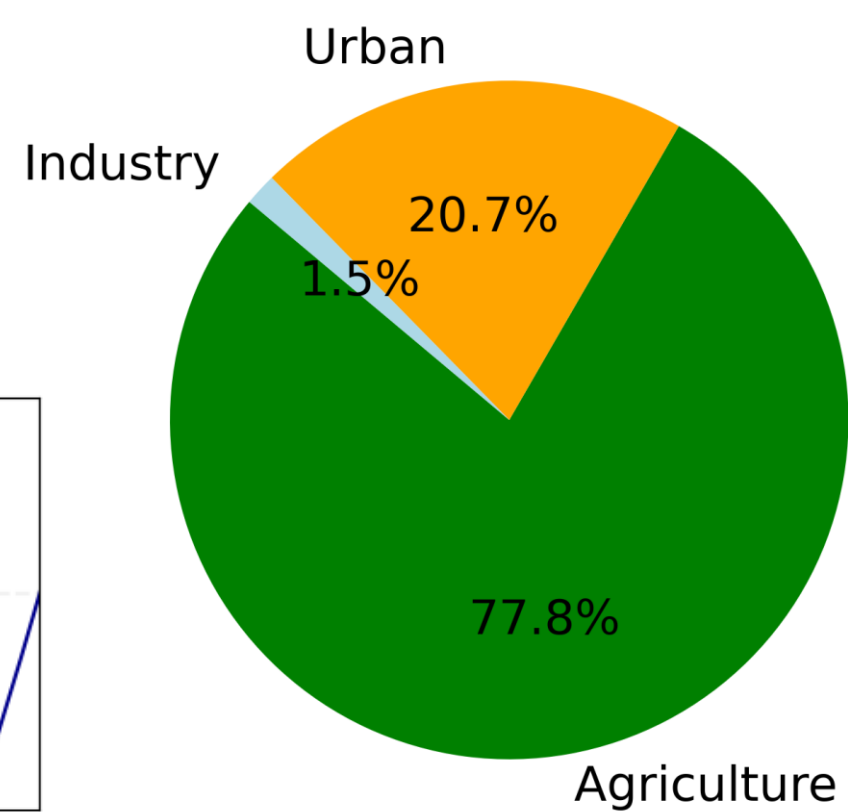
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CALIFORNIA



Groundwater Use Distribution - California, USA



## California's Legal Framework

### Sustainable Groundwater Management Act (SGMA)

- Passed in 2014 to address California's critical groundwater depletion issues.
- Overseen by the California Department of Water Resources (DWR), which provides guidance and ensures compliance.

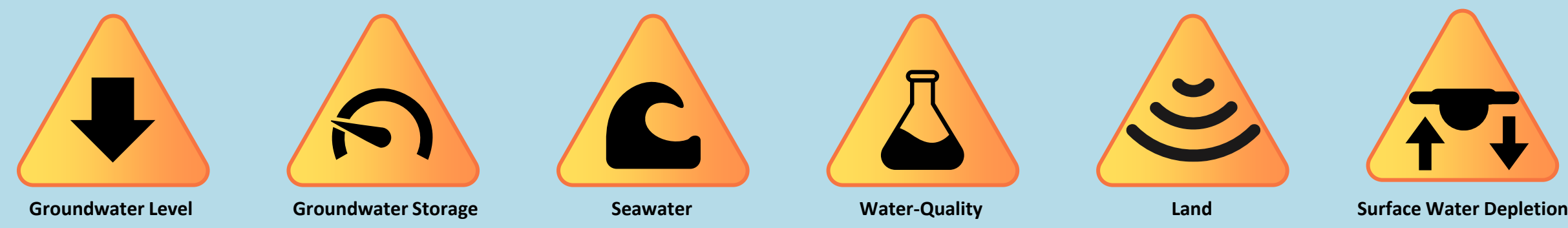
## Regional Implementation

### Groundwater Sustainability Agencies (GSAs)

- Local agencies created under SGMA to manage groundwater resources for specific subbasins.
- Responsible for developing and implementing Groundwater Sustainability Plans (GSPs).

### Groundwater Sustainability Plans

GSAs develop and implement groundwater sustainability plans (GSPs) to avoid undesirable results (symbols below) and mitigate overdraft within 20 years.



## INTRODUCTION

In 2014, California passed the Sustainable Groundwater Management Act (SGMA) aiming to reduce groundwater overexploitation by setting measurable targets that signal unsustainable groundwater use in basins. However, increasingly severe droughts, funding shortfalls, and enforcement difficulties pose ongoing challenges to SGMA.

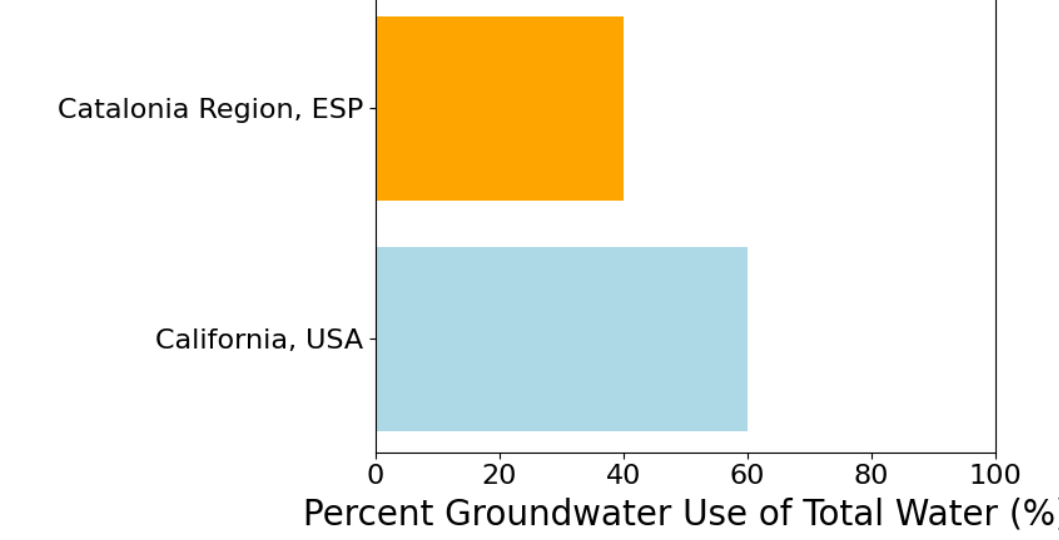
Catalonia differs significantly in its approach: under the European Union Water Framework Directive (WFD), Catalonia has established rules to balance social, economic, and environmental water demands. Despite similar challenges to California, Catalonia has reformed its water rights framework and empowered regional regulators to enforce sustainable water allocation.

Under a U.S. National Science Foundation (NSF) grant, 10 U.S. graduate and law students and four UC Davis professors traveled through California and Spain discussing

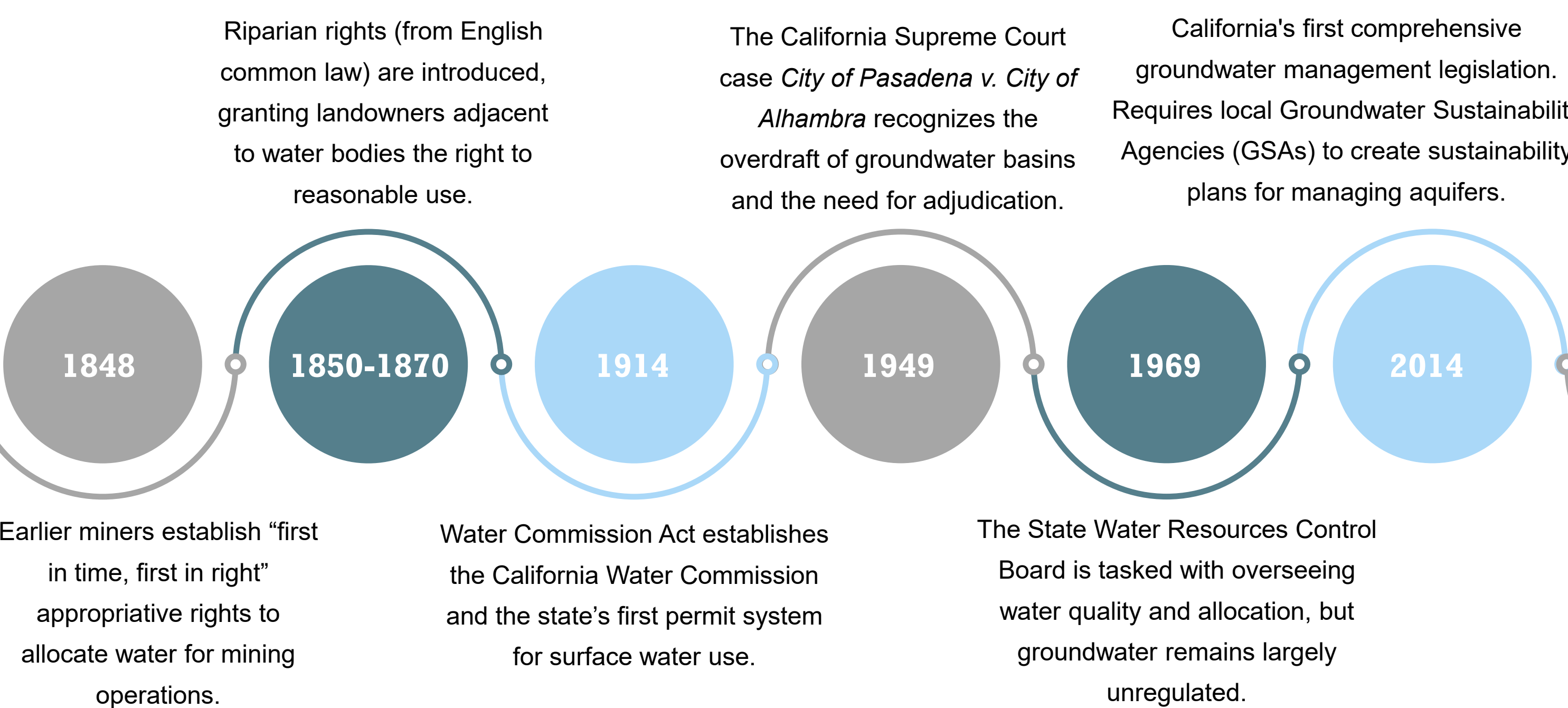
water management, climate change, drought, recharge projects, agricultural water use, and water governance with farmers, water managers, water suppliers, and professors.

While the two regions are very different, they have enough in common for comparisons between the two to provide interesting insights into what California may be able to learn from Catalonia.

Percent Groundwater Use of Total Water Use



## CALIFORNIA TIMELINE



## TAKEAWAYS

### Water Sourcing

Catalonia uses water from many sources: groundwater, surface water, desalination, wastewater re-use. This offers greater flexibility during times of scarcity.

- For large coastal cities, desalination is a great way to reduce the need to import water from afar or pump it from the ground
- Surface and treated wastewater can be used in recharge efforts to help keep saltwater intrusion at bay

### Management Approach

Catalonia manages surface water and groundwater conjunctively with the same set of laws. Conjunctive use recognizes the connectedness between surface water and groundwater and can streamline management effectiveness.

In California, surface water and groundwater are still generally seen as "two" separate water resources and are handled by different water rights frameworks and at different regulatory levels (i.e., the State Water Resources Board for surface water and GSAs for groundwater).

### Water Rights

California is still using its 20<sup>th</sup> century water rights system, which makes it very difficult to manage water during multi-year droughts Catalonia used to have its own water rights system, but the Spanish Water Act of 1985 made water a public resource, effectively putting water rights in the state's control.

### Lessons Learned

#### Diversifying Supply

California could explore the advantages / disadvantages of large-scale desalination which could act as a "safety net" during times of scarcity in traditional water supply (surface water and groundwater) and reduce the total share of groundwater in the water supply.

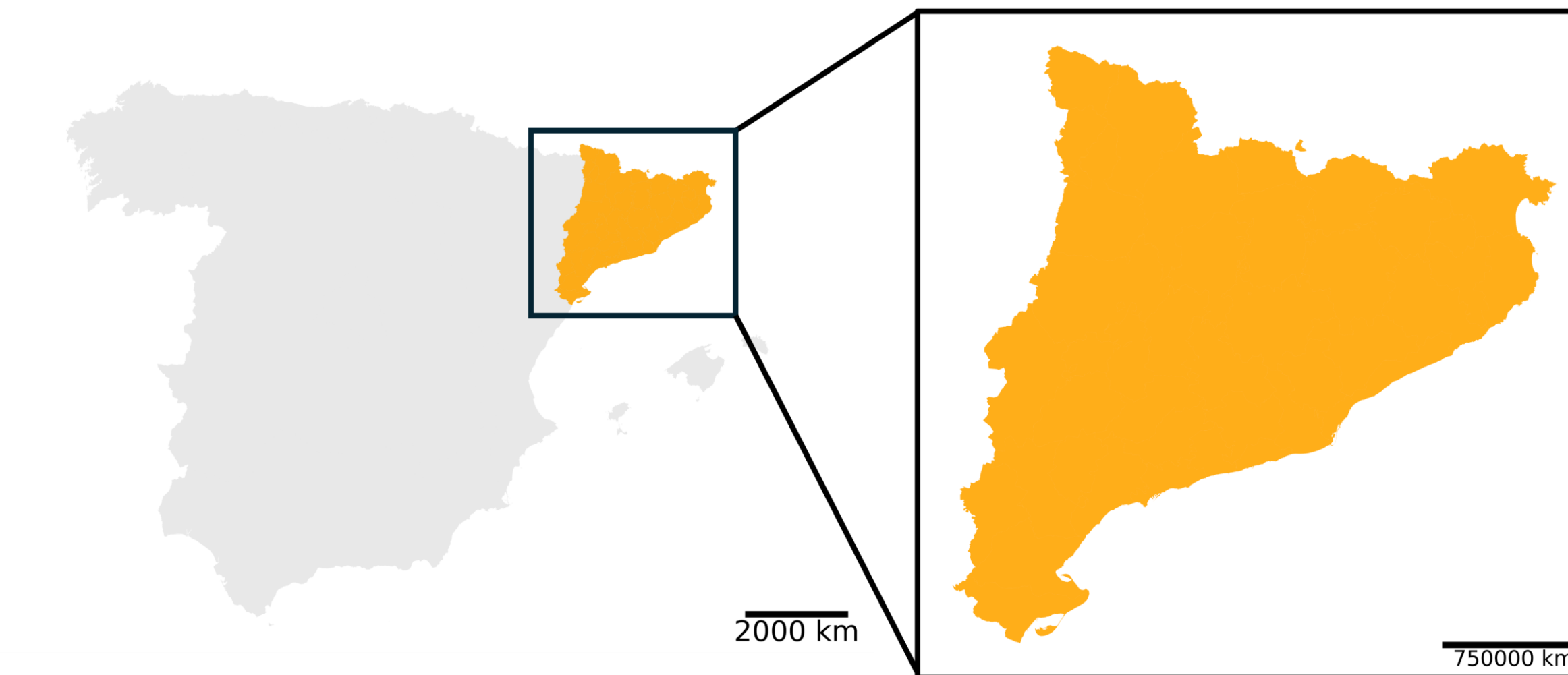
#### Conjunctive Use

California groundwater and surface water continue to be governed by different water rights frameworks. Placing all water under one single management system would have great advantages in efficiency and efficacy.

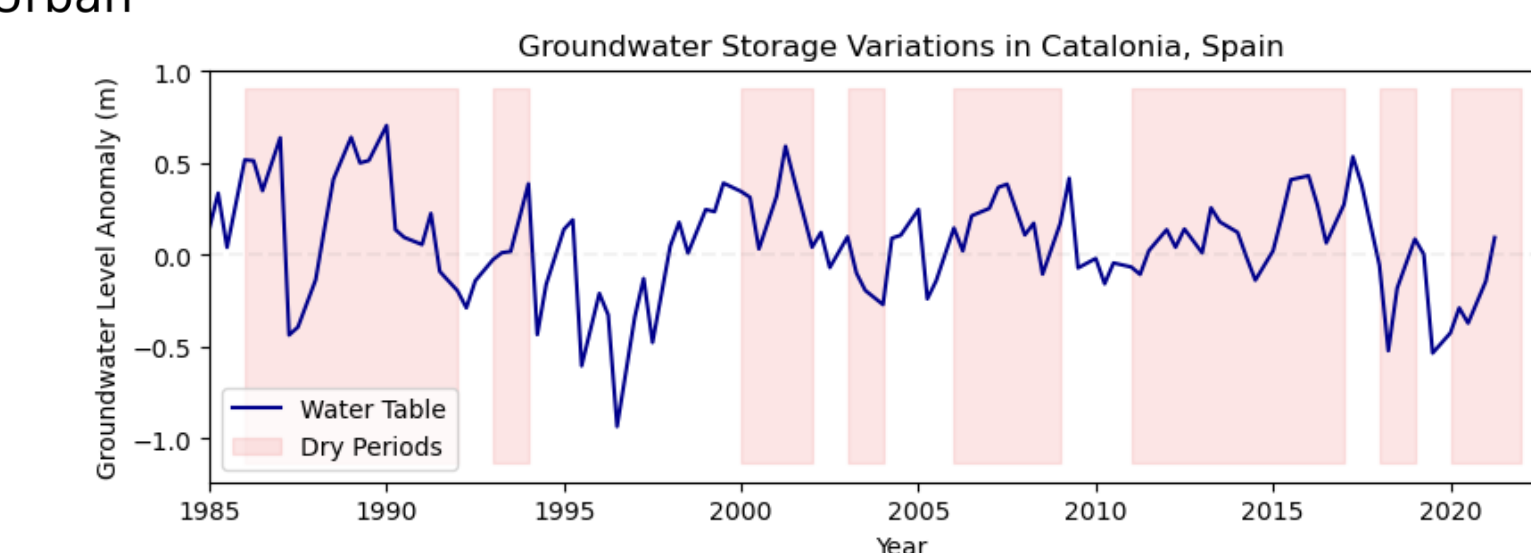
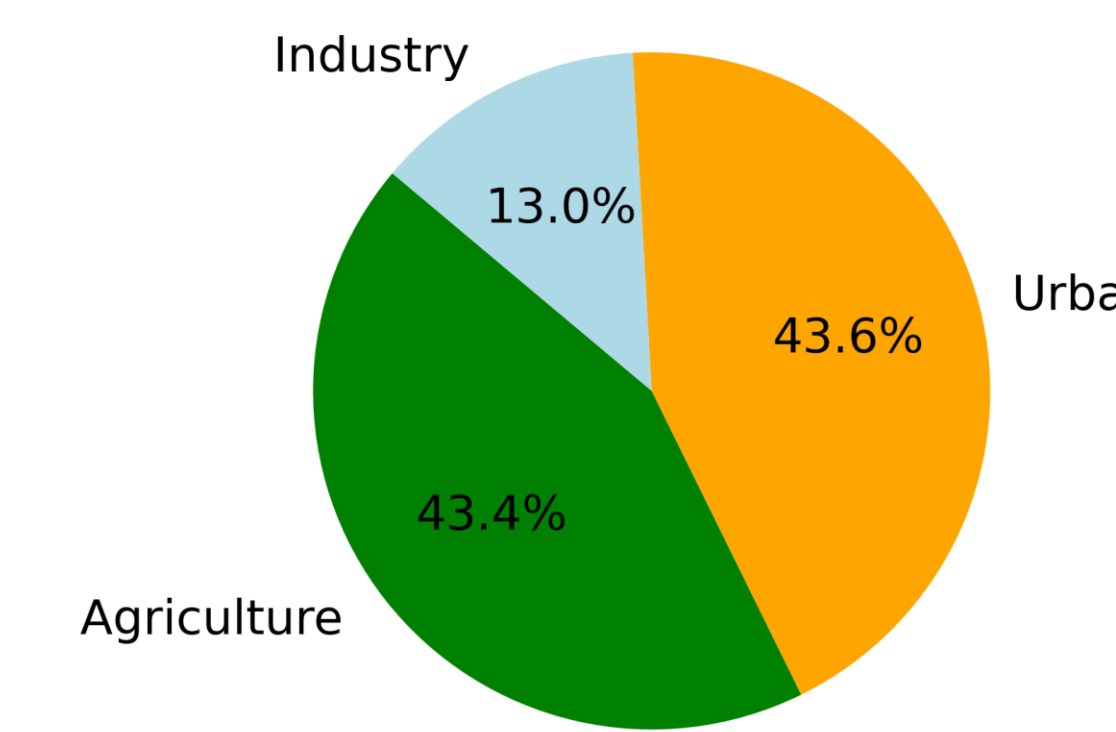
#### Water Rights Restructuring

The California water rights system is deeply in need of reforms to enable it to strike a fairer balance between environmental and agricultural water needs, as well as ensuring better long-term sustainability of the water resources. One idea is to shift away from correlative groundwater rights to appropriate rights. This would enable GSAs to issue permits for pumping and better regulate their basins. Ideally, this would also be combined with monitoring pumping, which is not done in many overdrafted basins.

CATALONIA



Groundwater Use Distribution - Catalonia Region, ESP



## European Union Framework

### EU Water Framework Directive (WFD)

- Established in 2000, the WFD aims to achieve "good status" for all European water bodies.
- Focuses on sustainable water use, environmental protection, and public participation.
- Sets standards for water quality and resource management across member states.

## Regional Implementation

### Catalan Water Agency (ACA)

- Implements the WFD directives through strategic basin management plans.
- Conjunctively manages groundwater and surface water.
- Authorizes the construction and monitors operation of desalination plants

### Catalan River Basin District Management Plan (2022-2027)

- Key objectives:
- Improve water quality.
  - Mitigate climate change effects.
  - Balance water demands across sectors.
  - Reduce greenhouse gas emissions.

## Local Plan

### Municipalities and Water User Associations

- Execute ACA's strategies through local projects.
- Operate wastewater treatment, irrigation systems, and community water supplies
- Address region-specific water needs while aligning with broader sustainability goals

