

The logo for SustainValencia 2022 is a circular emblem on the left side of the blue banner. It features a central blue triangle pointing upwards, surrounded by a ring of smaller blue squares. The background of the banner is a gradient of blue with a pattern of small white dots.

# SustainValencia 2022

October 6 to 8, 2022

Valencia

## **Book of abstracts**

J. Jaime Gómez-Hernández  
James J. Butler Jr.  
Editors

Editors:

J. Jaime Gómez-Hernández

James J. Butler Jr.

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SustainValencia2022 builds on the success of the 2019 Chapman conference “Quest for Sustainability of Heavily Stressed Aquifers at Regional to Global Scales” held in Valencia and the well-attended 2021 AGU annual meeting hybrid session “Prospects for Sustainability of Heavily Stressed Aquifers: Impediments and Opportunities.” The conference has attracted close to 100 participants from all over the world with an important presence of USA, Germany, Spain and Italy. It has been organized around eleven topical sessions, touching groundwater sustainability from many different angles.

J. Jaime Gómez-Hernández  
James J. Butler Jr.  
Editors



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All of them from the Group of Hydrogeology of the Institute for Water and Environmental Engineering at the Universitat Politècnica de València



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# A Multiplayer Simulation Game of Groundwater Appropriation Problems in Irrigation

Elif Bal<sup>1</sup>, Ali Kerem Saysel<sup>1</sup>

<sup>1</sup>*Boğaziçi University*

**Abstract.** Groundwater is one of the most valuable natural resources, as it is the largest source of freshwater in the world. In the areas where surface water resources and/or precipitation are limited or demand is high, people mostly rely on groundwater. In Turkey as well, groundwater is a major resource for agricultural needs and drinking purposes particularly in rural areas in Central Anatolia. However, groundwater management poses challenges, particularly because of its common pool resource (CPR) characteristics and its hidden nature. Sustainable management of CPRs need cooperation and coordination of its beneficiaries, beyond command-and-control of the central authority and privatization and market design. In real life, learning by experience is often difficult due to factors such as systemic delays and non-linearities and information scarcity. In such dynamically complex environments, simulation models and games can help people learn not only about the consequences of their decisions, but develop deeper learning in and about the dynamic complexity of the systems. This research focuses on this crucial learning element with computer simulation models and games. The purpose of this research is to help irrigators learn about the challenges that they may face in a single irrigation season. For this purpose, a dynamic simulation model and a network based interactive game is developed. In line with the field observations in Konya closed basin in Central Anatolia Region of Turkey, assignment problems that occur around a well in a single irrigation season is studied and the game is parameterized accordingly. The initial observations obtained from the pilot gaming sessions indicate that the game allows participants to explore consequences of alternative irrigation schedules and learn the need for cooperation and coordination with neighboring farmers to reduce their water consumption while increasing their profits.



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**Directions and Unresolved Challenges**  
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