

An Israeli 'white-ball solution' to water stress

Evaporation is a silent culprit that causes major losses of water. Israel's NeoTop may have found a way to end this deficit.

BY DAVID SHAMAH | August 31, 2015, 7:57 pm |

A new study by the World Resources Institute says that Israel — along with the entire Middle East — will be extremely “water stressed” in the coming decades.

But there is plenty of water stress going on in the world right now — such as in California, where earlier this month desperate officials dumped 20,000 black plastic balls into a Los Angeles reservoir to prevent further water losses due to evaporation in the devastating five-year-long drought.

The balls are a good idea — in principle. But according to Israeli water tech start-up [NeoTop Water Systems](#), its water-ball solution is better on all counts than the one implemented in California.

“Not only is our solution cheaper, but it also saves more water. Using our method, we are able to decrease evaporation by 90%,” said Zeev Birger, the company's founder. “If we manage to cover all of Israel's reservoirs, we might be able to double our water supply in Israel.”

What Israel is likely to be experiencing in a few years' time — a desperate need for water that reservoirs and aquifers no longer have the capacity to supply — California is, to a large extent, experiencing today. Legislation essentially allocates water to residents, with stiff fines for those who violate rules on watering lawns or washing cars. And high costs for industrial and agricultural use are driving up the price of the fruits and vegetables that California sells to the world.

Of course, California's water is unlikely to have the geopolitical implications that Israel's water has. According to the study, most of the Middle East will be in a critical water situation by 2040 — or even much sooner — a situation that is likely to lead to conflict, unrest, and political upheaval.

Those factors will affect Israel even if the country brings on-line more water desalination and water recycling plants — a country considered a world leader in both areas, where over 60% of the water used in industry and agriculture already comes from recycled or desalinated sources.

But even that may not be enough to stave off a water disaster in Israel. Leaky pipes, old water mains — and, surprisingly, evaporation — need to factor in to the country's “water budget.” Evaporation alone is responsible for 10-50 percent of the loss of fresh water worldwide annually — depending on the location, how hot the summer has been, how often it rains, etc.

California is still suffering a major drought, even though substantial rains fell in July for the first time in five years. Preventing further evaporation is one strategy authorities are using to prevent further losses. To do that, the city of Los Angeles in August dumped \$34.5 million worth of tiny, black, plastic balls into the city's 175-acre (708,200 sq. m) Van Norman Complex reservoir.

With the balls covering the water, the sun won't be able to hit the water's surface. According to estimates, this will save some 300 million gallons (1,135 million liters) of water — worth \$250 million — from evaporation per year.

But there are questions on the effectiveness — and even the safety — of California's evaporation solution. Biologist Nathan Krekula, a professor of health science at Bryant & Stratton College in Milwaukee, told Fox News that the black balls could cause more problems than they solve.

"Bacteria require a few things to grow in a dark, warm and moist environment," explained Krekula. "The balls will give them the perfect environment to live in. Keeping the balls clean when covered in bacteria and mold slime will be a monumental task." According to the report, all experts "agreed that the worst color for the job is the one LA chose."

Birger, too, agrees with that assessment — and believes that NeoTop's solution is a better one.

"Our advanced white-ball solution prevents evaporation, algae bloom, bacteria growth, and a reduction of water quality," he said. "It also prevents birds from congregating, thus reducing pollution, and cools the water in an efficient manner."

NeoTop's TopUp Ball System provides a cover that "recycles" water in white spheres that keep it in the reservoir instead of evaporating to the heavens. The balls, open on one side, float on the surface of a reservoir, half-filled with water, with the other half floating above the water's surface. Since the balls are white — which absorbs light — water that enters the spheres evaporates inside the balls, but condenses immediately and drops back down into the reservoir. Holes on the side cause a cooling effect, keeping the lower part of the sphere, where the water is, cooler than the top part.

Multiplied by thousands, the evaporation-condensation-cooling cycle has an effect on all the water in the reservoir, the company says. This keeps the temperature from heating up, and prevents algae or bacteria from forming. In essence, continued Birger, "each ball acts as a small cooling tower."

In tests at reservoirs in northern Israel, NeoTop's system has saved up to 90% of the water that had previously been lost to evaporation — with NeoTop-protected reservoirs remaining as cool as unprotected reservoirs, with lower bacteria counts.

NeoTop received an award from the Prime Minister's Office in 2014 for Entrepreneurship and Innovation, and the system has been approved by Israel's national water company, Mekorot, as an effective solution to evaporation problems. It has also been given the thumbs-up by the Israeli Air Force as a bird deterrent for planes that fly over water.

"This is a very effective system," claimed Birger. "If we can cover all of Israel's reservoirs in the

coming years, we will be able to double the supply of water available for farming.”

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