

# WATER FOOTPRINT + ALMONDS

## What is a Water Footprint?

Water footprint is one of many ways to quantify environmental impact – as is a carbon footprint or a life cycle assessment. Calculated through a standard global methodology<sup>1</sup>, a water footprint estimates the amount of water used to produce a product or crop.



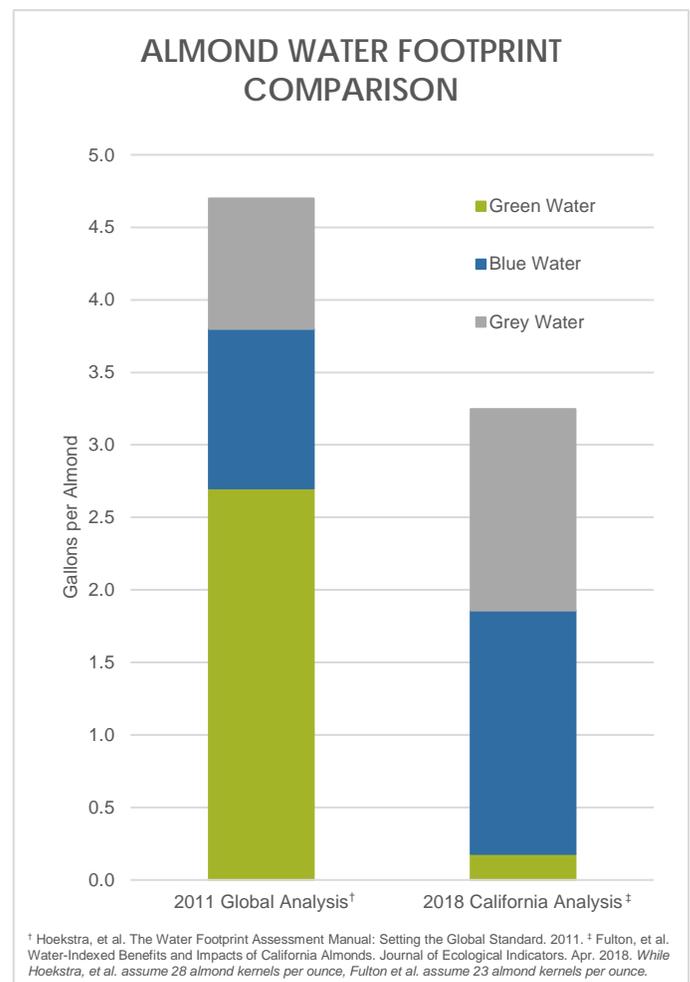
Each water footprint is made up of three components:

- Green water: water from precipitation
- Blue water: water from managed sources (ex. irrigation)
- Grey water: water needed to dilute any pollution impacts to surface and groundwater from the production of a product

## Almond Water Footprint

New research has found that the water footprint of California almonds is smaller<sup>2</sup> than a global average originally reported.<sup>3</sup>

- California's recent drought brought with it broad discussion of the water footprint of food grown in the state, including almonds. Widely reported<sup>4</sup> at the time was the blue component of almonds' water footprint, 1.1 gallon per almond, based on a global average.<sup>5</sup>
- While the earlier reported almond water footprint relied on global averages, the new research analyzed California-specific conditions and crop yields. This fine-tuned analysis found almonds' total water footprint is less than previously estimated, though the components of that footprint have shifted, with a higher percentage of blue water than the global average (1.7 gallon per almond).<sup>6</sup>
- The new research also included analysis of the dietary and economic benefits of California's top 40 crops related to their water footprints. Almonds were among the most valuable foods for both dietary and economic benefits, though its water footprint was on the higher end of the spectrum. Other nuts grown in California, walnuts and pistachios, ranked similar to almonds.



<sup>1</sup> Hoekstra, et al. The Water Footprint Assessment Manual: Setting the Global Standard. 2011.

<sup>2</sup> Fulton, et al. Water-Indexed Benefits and Impacts of California Almonds. Journal of Ecological Indicators. Apr. 2018.

<sup>3</sup> Mekonnen, M., & Hoekstra, A. The Green, Blue and Grey Water Footprint of Crops and Derived Crop Products. UNESCO – IHE Institute for Water Education. 2010.

<sup>4</sup> Park, A., Lurie, J. It Takes How Much Water to Grow an Almond?! Mother Jones. Feb 2014.

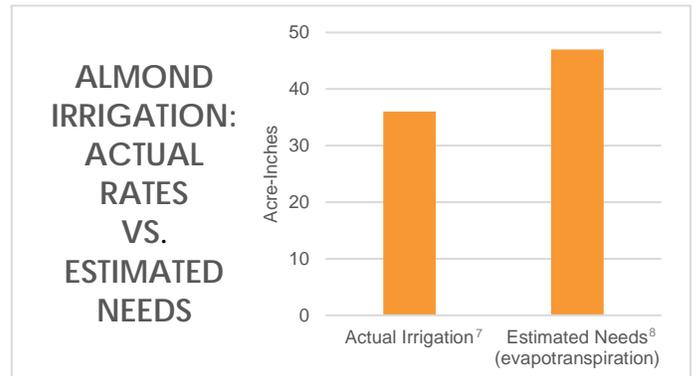
<sup>5</sup> Mekonnen, M., & Hoekstra, A. The Green, Blue and Grey Water Footprint of Crops and Derived Crop Products. UNESCO – IHE Institute for Water Education. 2010.

<sup>6</sup> Fulton, et al. Water-Indexed Benefits and Impacts of California Almonds. Journal of Ecological Indicators. Apr. 2018.

## Other Considerations

While water footprints and other ecological impact calculations are useful for comparisons between products, they are theoretical. We can look to farmer-reported data, the responsible practices they implement, and the almond community's commitment to continuous improvement for additional context.

- In practice, almond farmers are using less water to irrigate their crops than estimated in almonds' water footprint. Through the California Almond Sustainability Program, California's almond farmers report irrigating their orchards with 36 inches of water, per acre, per year, on average statewide.<sup>7</sup> By comparison, almonds' blue water footprint number is based on the maximum amount of water applied to grow healthy, productive almond trees in California's almond growing regions, an average of 47 inches of water per acre, per year.<sup>8</sup>



- Research-based farming improvements and water-saving technologies have helped California almond farmers reduce the amount of water it takes to grow one pound of almonds by 33 percent over the past 20 years.<sup>9</sup> California's almond farmers continue to do more by adopting increasingly precise practices and installing efficient microirrigation systems far above the state average.<sup>10</sup> In fact, nearly 80 percent of almond orchards utilize this water-saving technology.<sup>11</sup>

- While other crops can leave behind pits, peels and rinds, almonds are relatively unique in that everything the orchard grows is put to use. The water used to grow an almond actually grows four products: the kernel you eat, which is protected by a hull and a shell, as well as the tree. The trees store carbon and are transformed into electricity at the end of their lives, the shells become livestock bedding and the hulls are nutritious dairy feed, reducing the water needed to grow other feed crops. Using and recycling these coproducts can offset some of almonds' water footprint.



To learn more about almonds and water, visit [Almonds.com/Water](https://Almonds.com/Water).

<sup>7</sup> California Almond Sustainability Program. Jan. 2018.

<sup>8</sup> Fulton, et al. Water-Indexed Benefits and Impacts of California Almonds. Journal of Ecological Indicators. Apr. 2018.

<sup>9</sup> University of California, 2010. Food and Agriculture Organization of the United Nations, 2012. Almond Board of California, 1990-94, 2000-14.

<sup>10</sup> California Department of Water Resources. California Water Plan Update 2013: Volume 3, Chapter 2.

<sup>11</sup> California Almond Sustainability Program. Aug. 2017.