

Statewide Water Footprint Estimation

Methodology and preliminary calculations



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Presentation Overview

- Virtual water and water footprint terminology
- Data for calculating water footprint
- California's Water Footprint
 - Per Capita
 - By Geographic Location
 - By Product

Virtual Water



Lettuce: 28 gallons/pound



Apples: 98 gallons/pound



Wine: 78 gallons/bottle

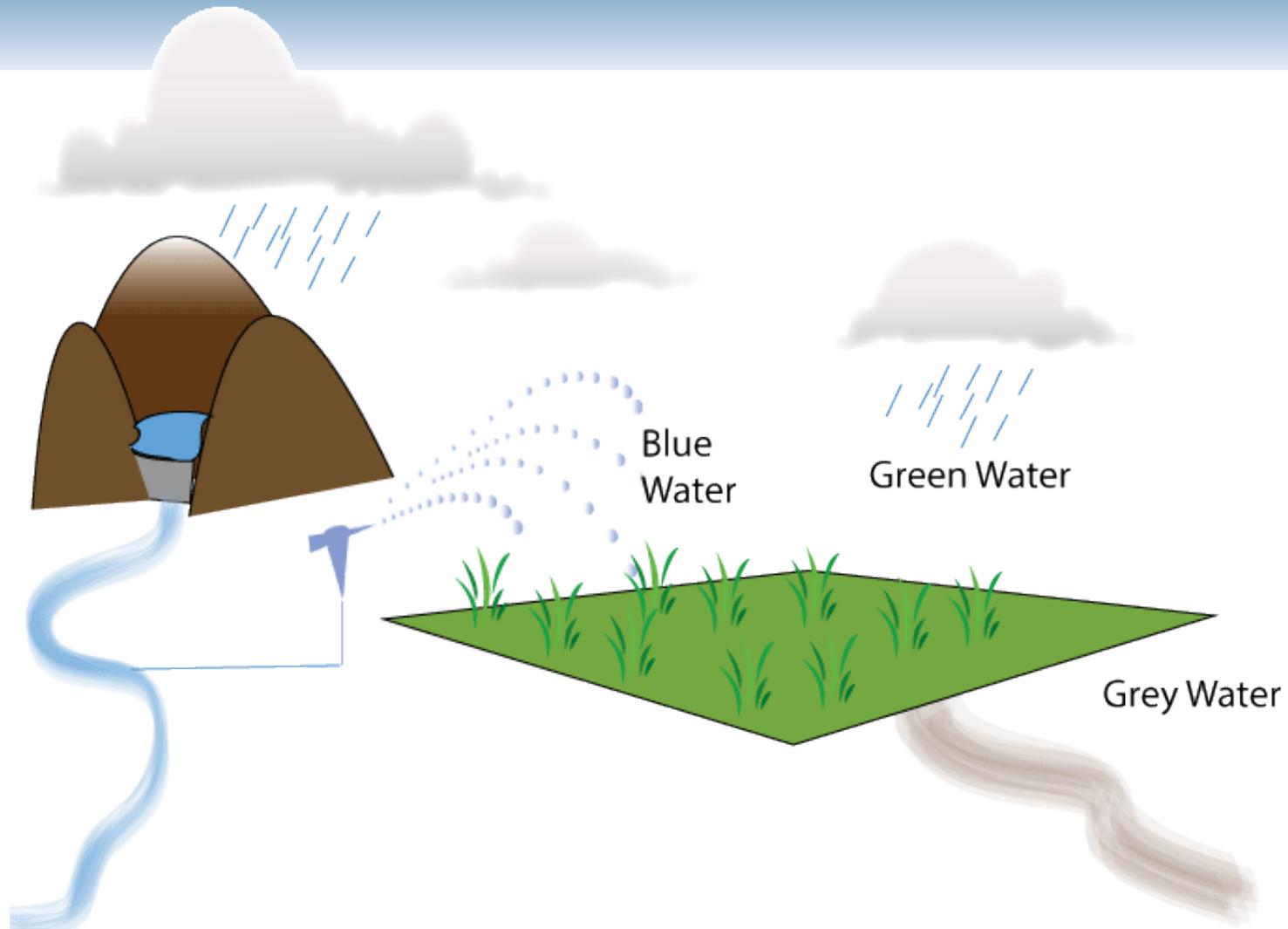


Beef: 1,800 gallons/pound



Chocolate: 2,100 gallons/pound

Blue, Green, and Grey Water



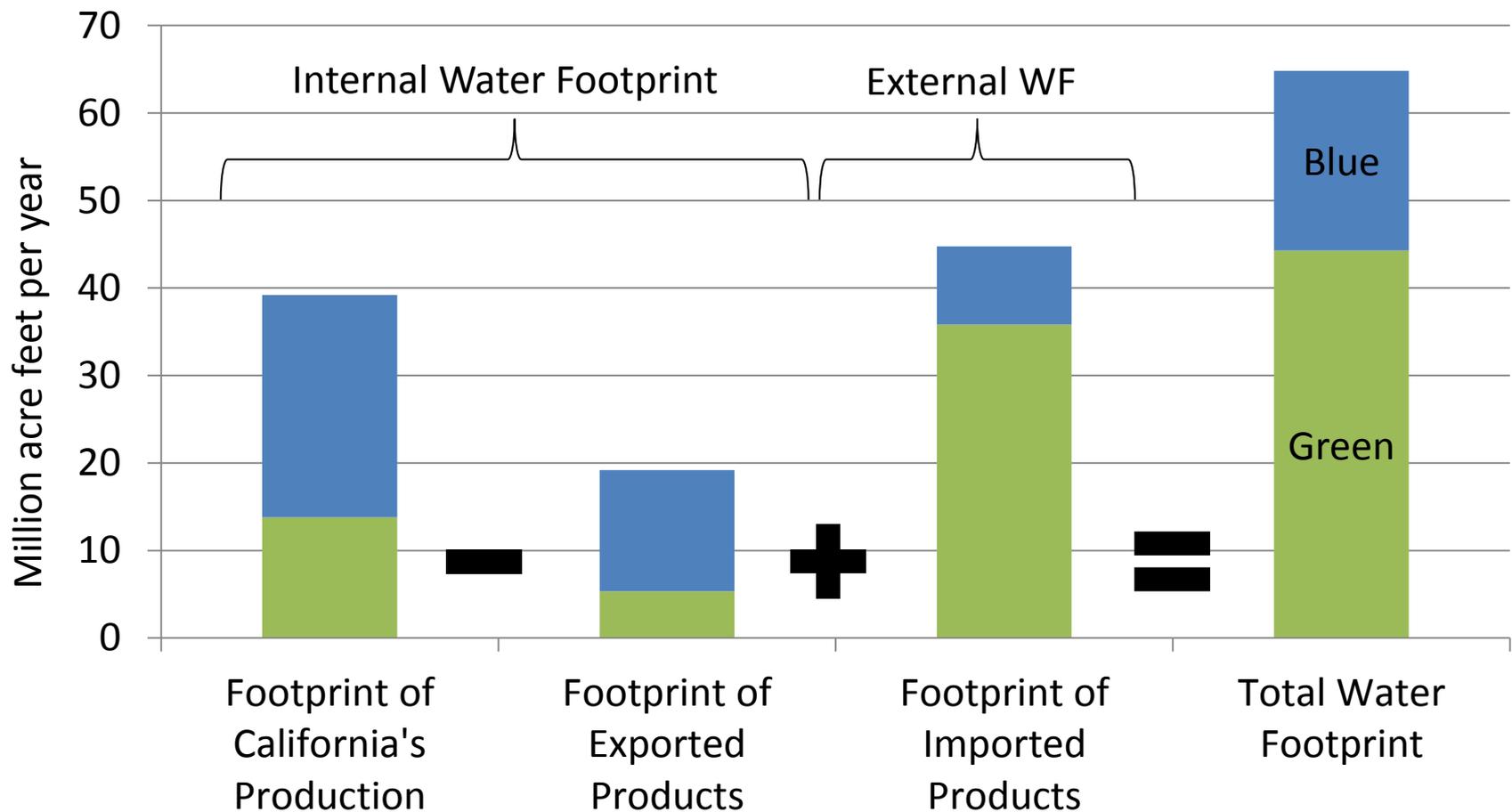
California's Water Footprint

Term	Definition
Water footprint	The total volume of water consumed and needed to assimilate pollutants in the production of goods and services used by Californians.
Internal water footprint (of consumption)	The total volume of water consumed and needed to assimilate pollutants in the production of goods and services used by Californians that originates from within California.
External water footprint (of consumption)	The total volume of water consumed and needed to assimilate pollutants in the production of goods and services used by Californians that originates from outside California.

Data Sources

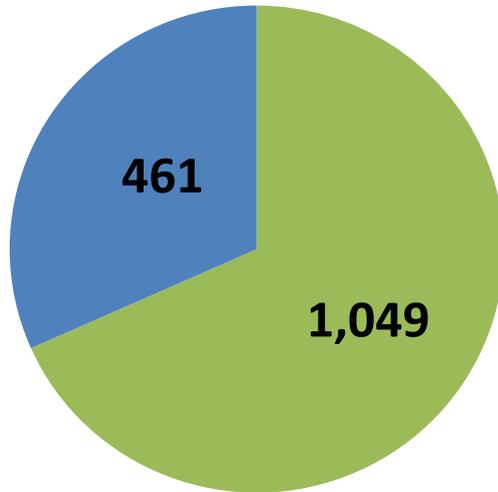
Term	Data Source
Footprint of California's production	DWR Land and Water Use Surveys, 1998-2005 DWR Commercial, Industrial, Institutional water use survey , 1995 DWR Water Plan Update 2009 USDA County Agricultural Commissioners' Production Data, 2007 US Census Bureau, Economic Census, 2007 USGS Estimated Water Use in the US, 2005 Water Footprint Network, avg. industrial grey water factors, 1996-2005
Footprint of products produced in California and exported	As above, combined with: US Census Bureau, Commodity Flow Survey, 2007 US Census Bureau, Foreign Trade Statistical Program, 2007
Footprint of products imported and consumed in California	US Census Bureau, Commodity Flow Survey, 2007 US Census Bureau, Foreign Trade Statistical Program, 2008 Water Footprint Network, WaterStat Database, 1996-2005

Blue and green water footprint



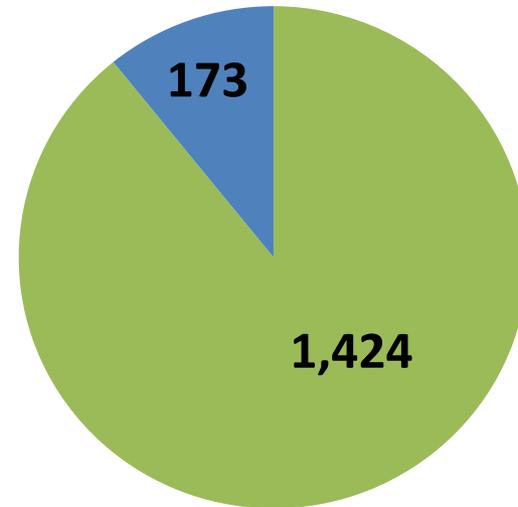
Blue and green water footprint

Water footprint for average Californian (Total = 1,510 gpcd)



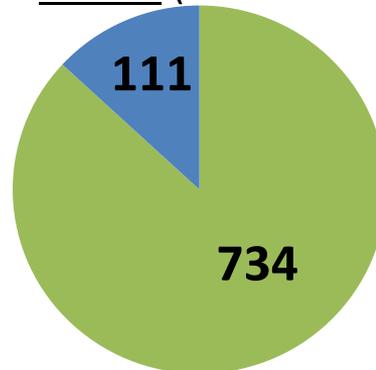
Source: Pacific Institute analysis

Water footprint for average American (Total = 1,597)



Source: Water Footprint Network

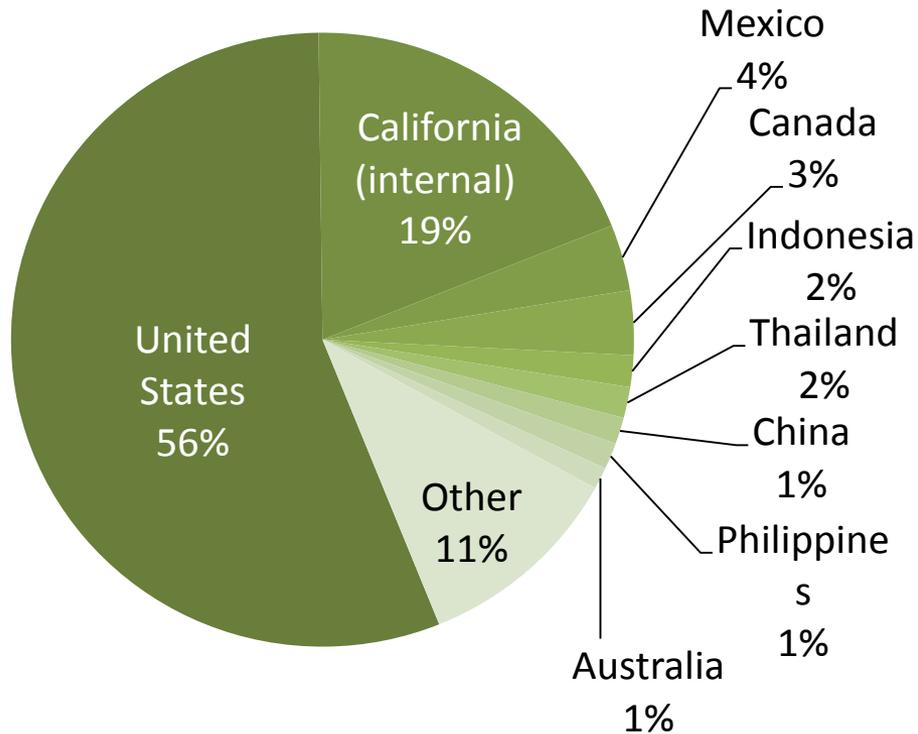
Water footprint for average human (Total = 845)



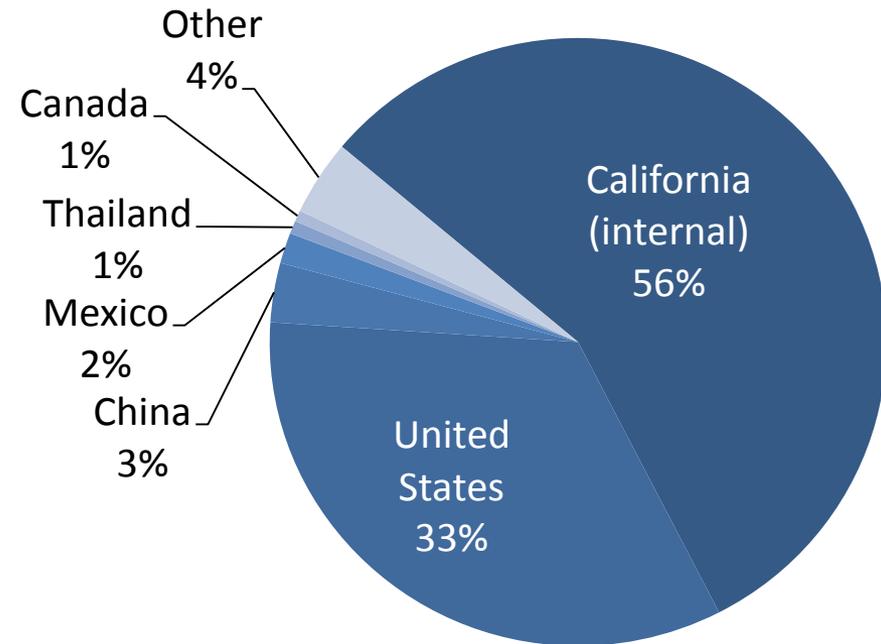
Source: Water Footprint Network

Water footprint, by location

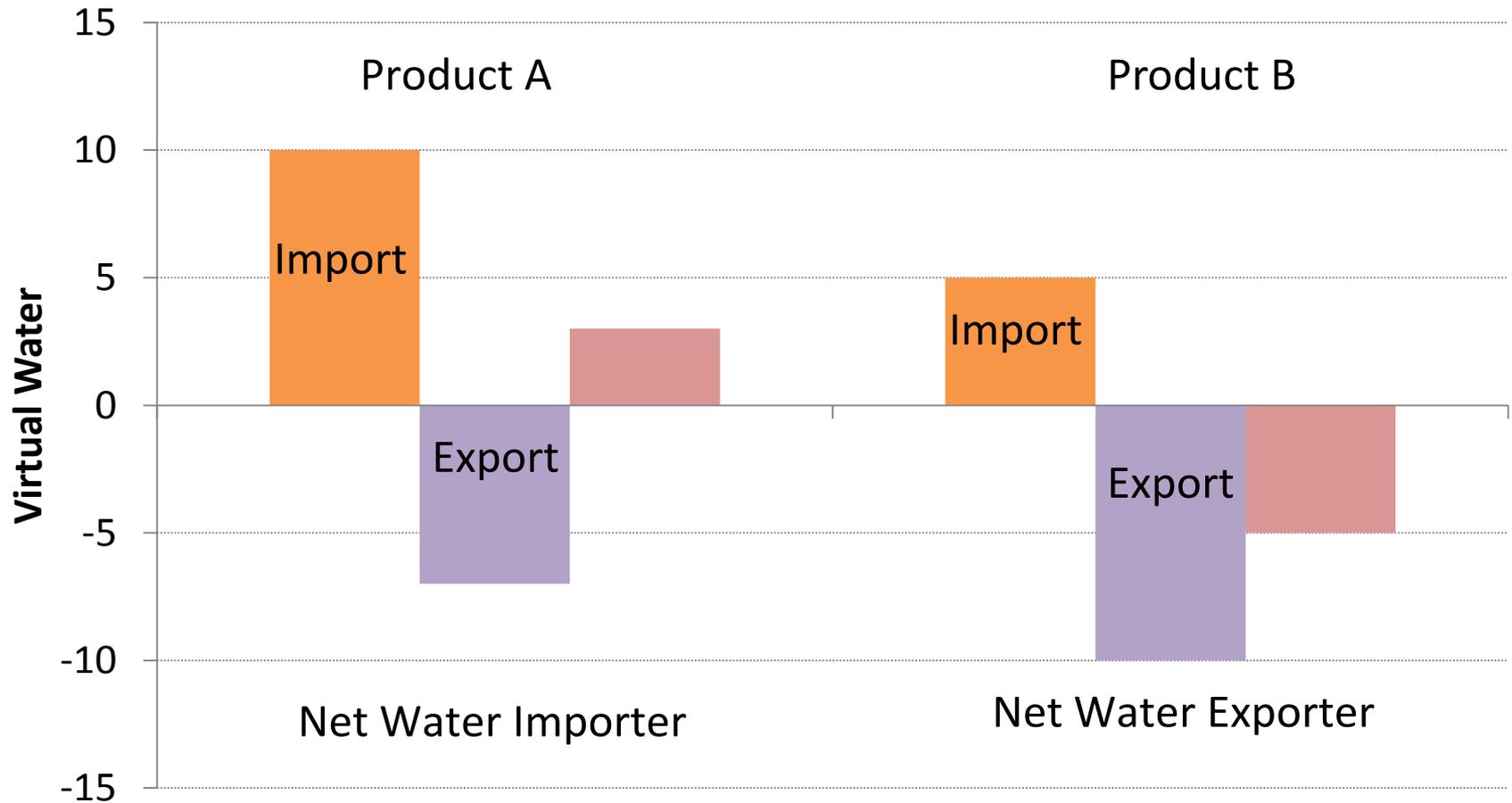
Green Water Footprint



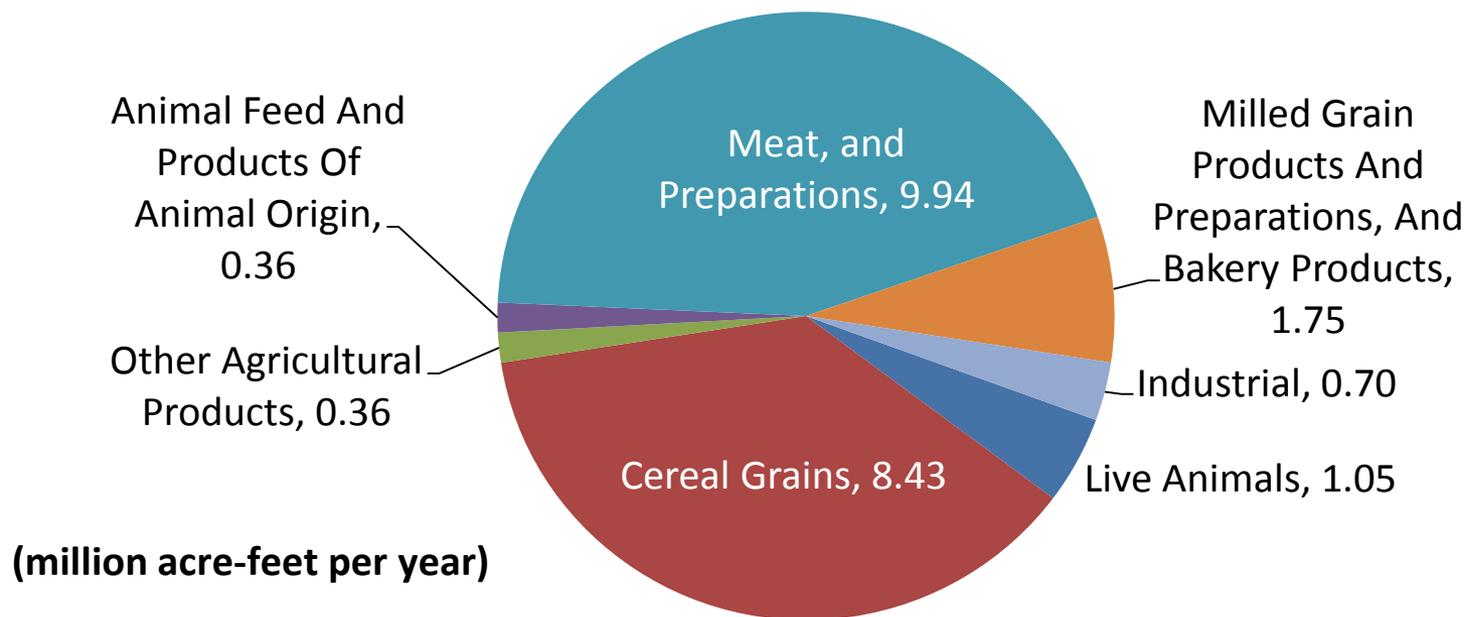
Blue Water Footprint



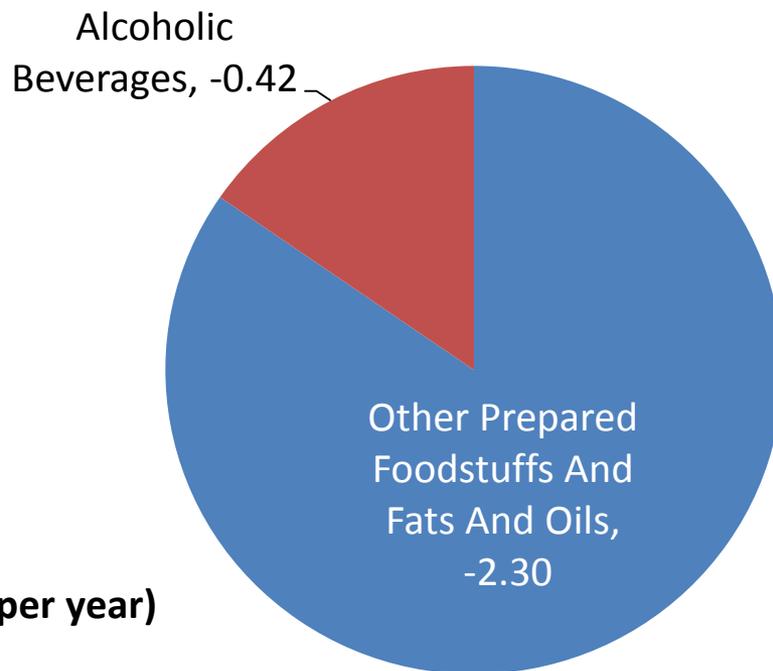
Net water imports and exports



Domestic net water imports, by product

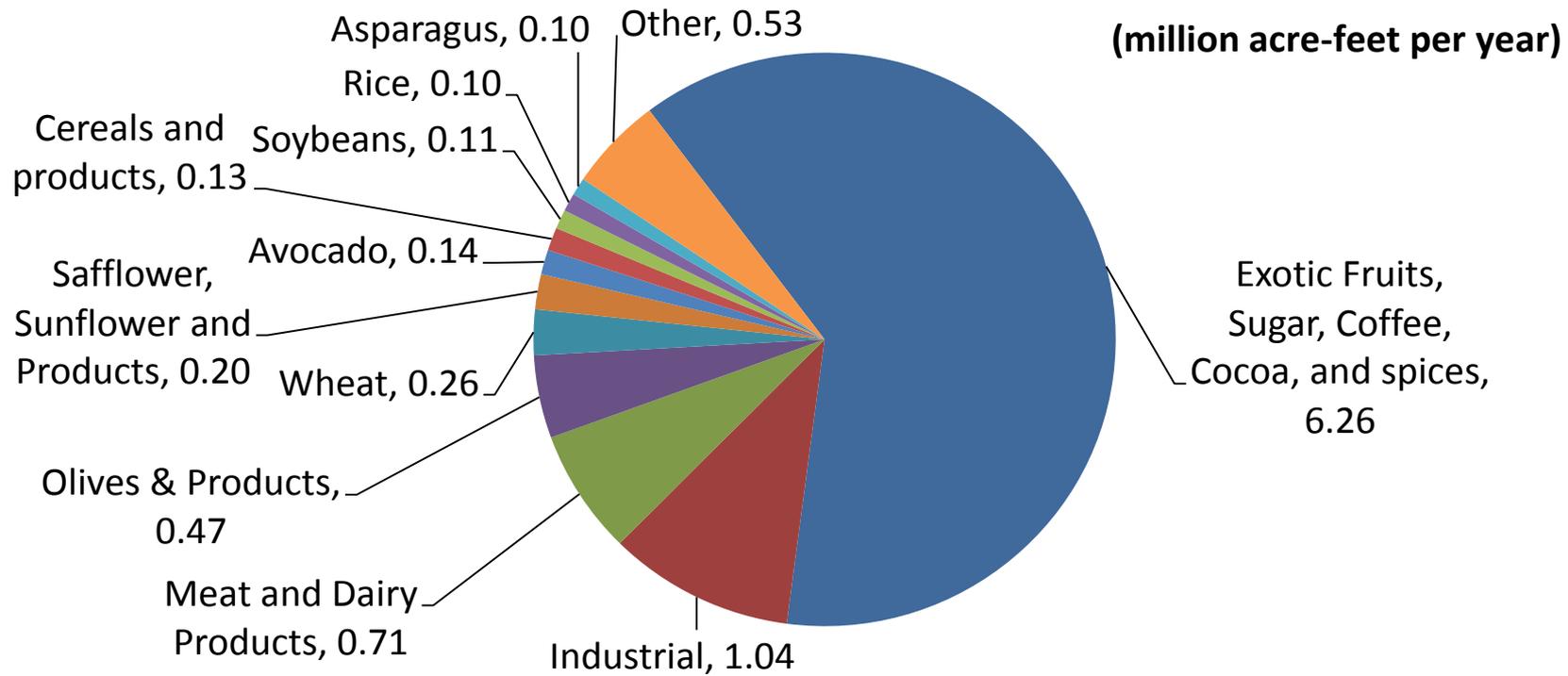


Domestic net water exports, by product



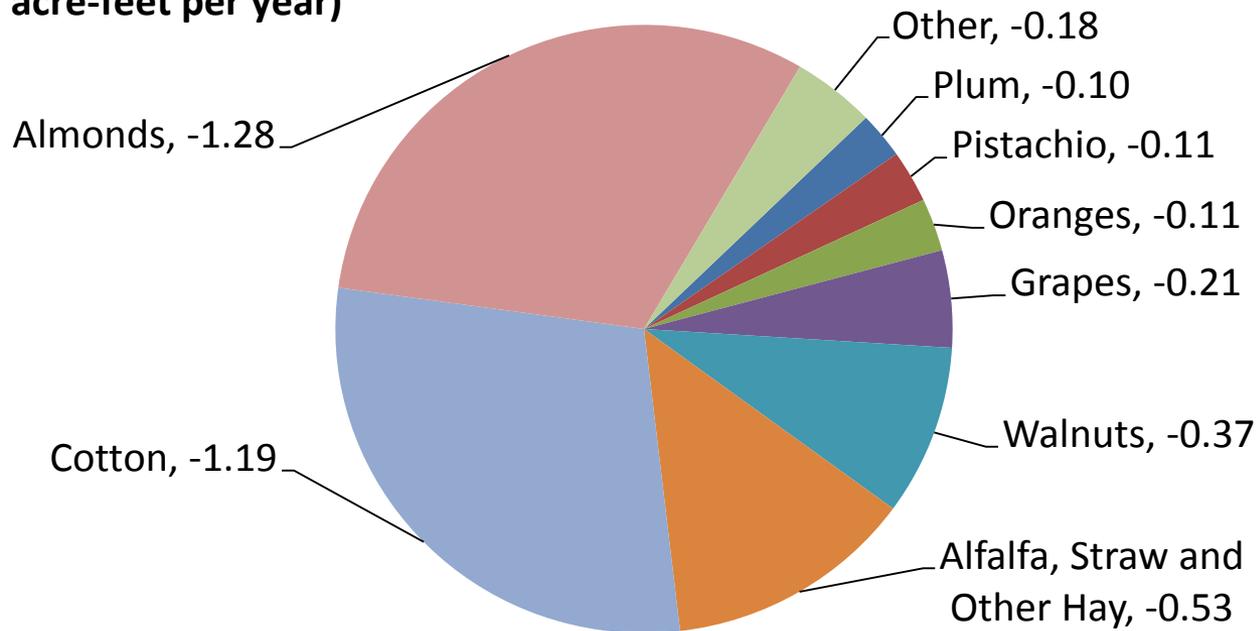
(million acre-feet per year)

International net water imports, by product

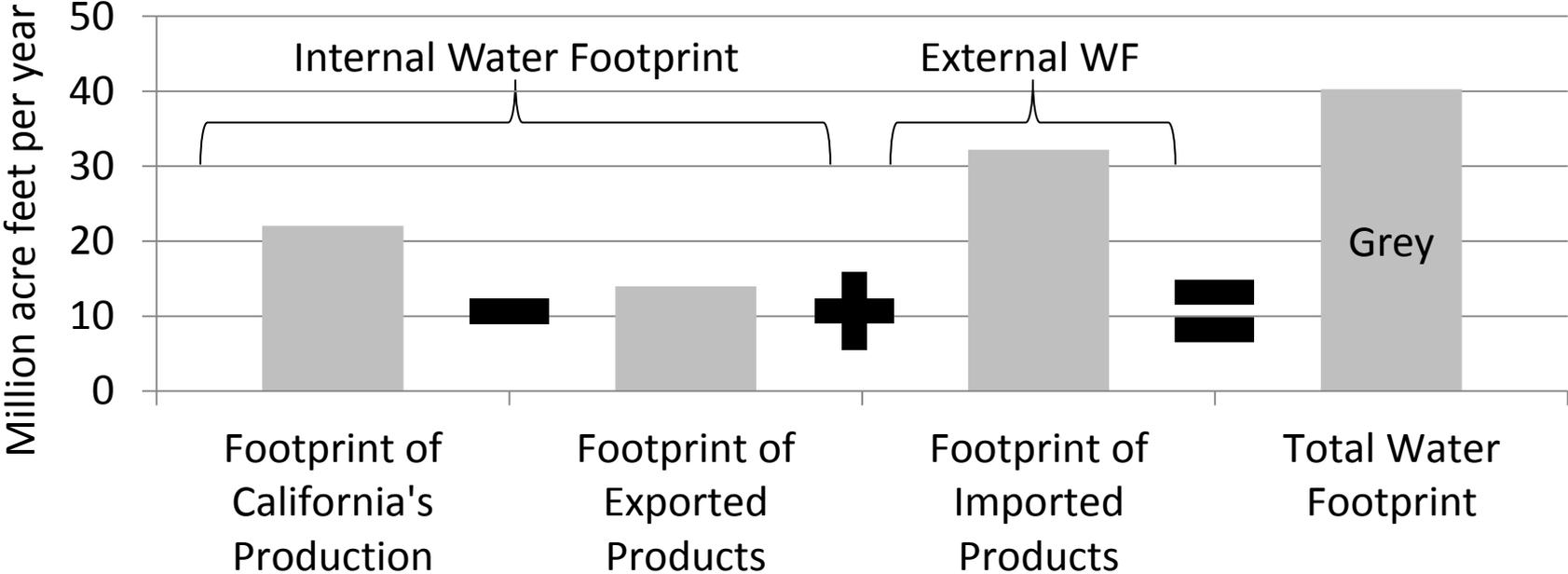


International net water exports, by product

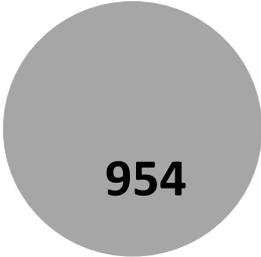
(million acre-feet per year)



Grey water footprint



Source: Pacific Institute analysis



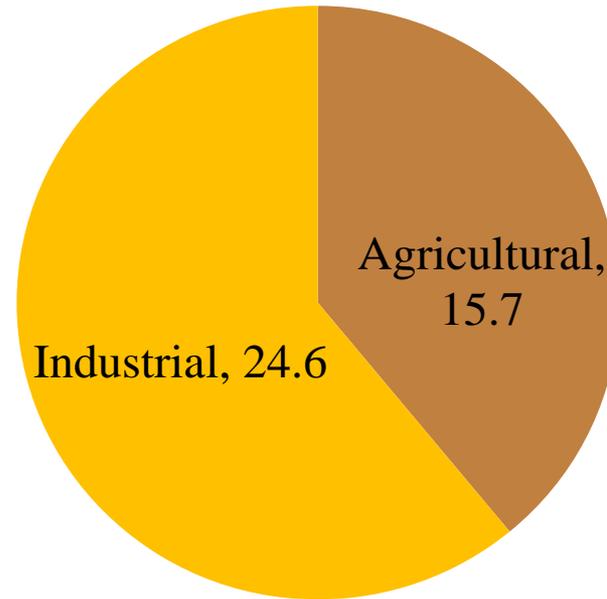
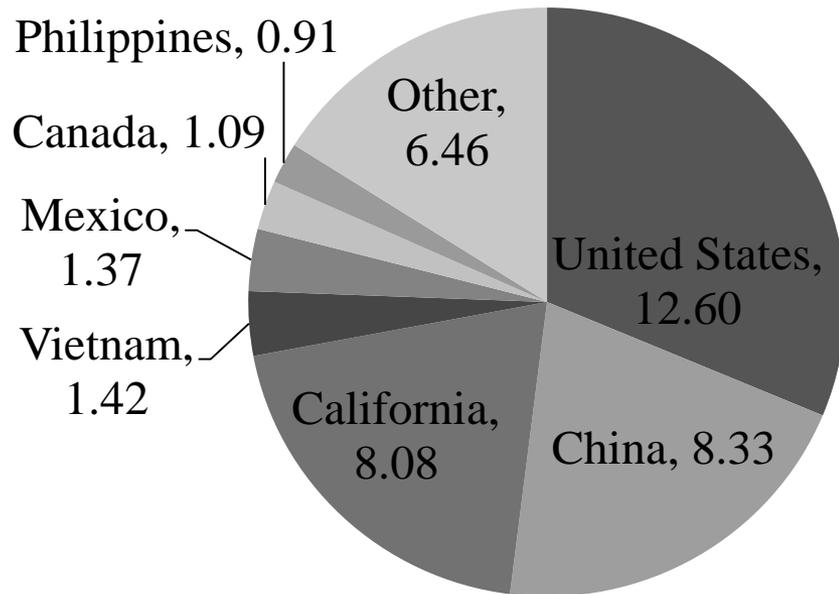
Footprint for average Californian (gpcd)



Footprint for average American (gpcd)

Source: Water Footprint Network

Grey water footprint



Conclusions

- Californians, compared to the average American...
 - ...have about the same total WF
 - ...rely much more heavily on blue water than green water
 - ...have a much larger external footprint (more dependent on imports)
- California, as a whole...
 - ...is a net virtual water importer
 - ...imports more green water than statewide applied agricultural water
 - ...exports more than half of the blue water that goes into production

Next Steps

- Refinement of WF calculations
- WF error propagation analysis
- Regional WF and inter-regional flows
- WF trends analysis
- Illustrate business case for WF



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