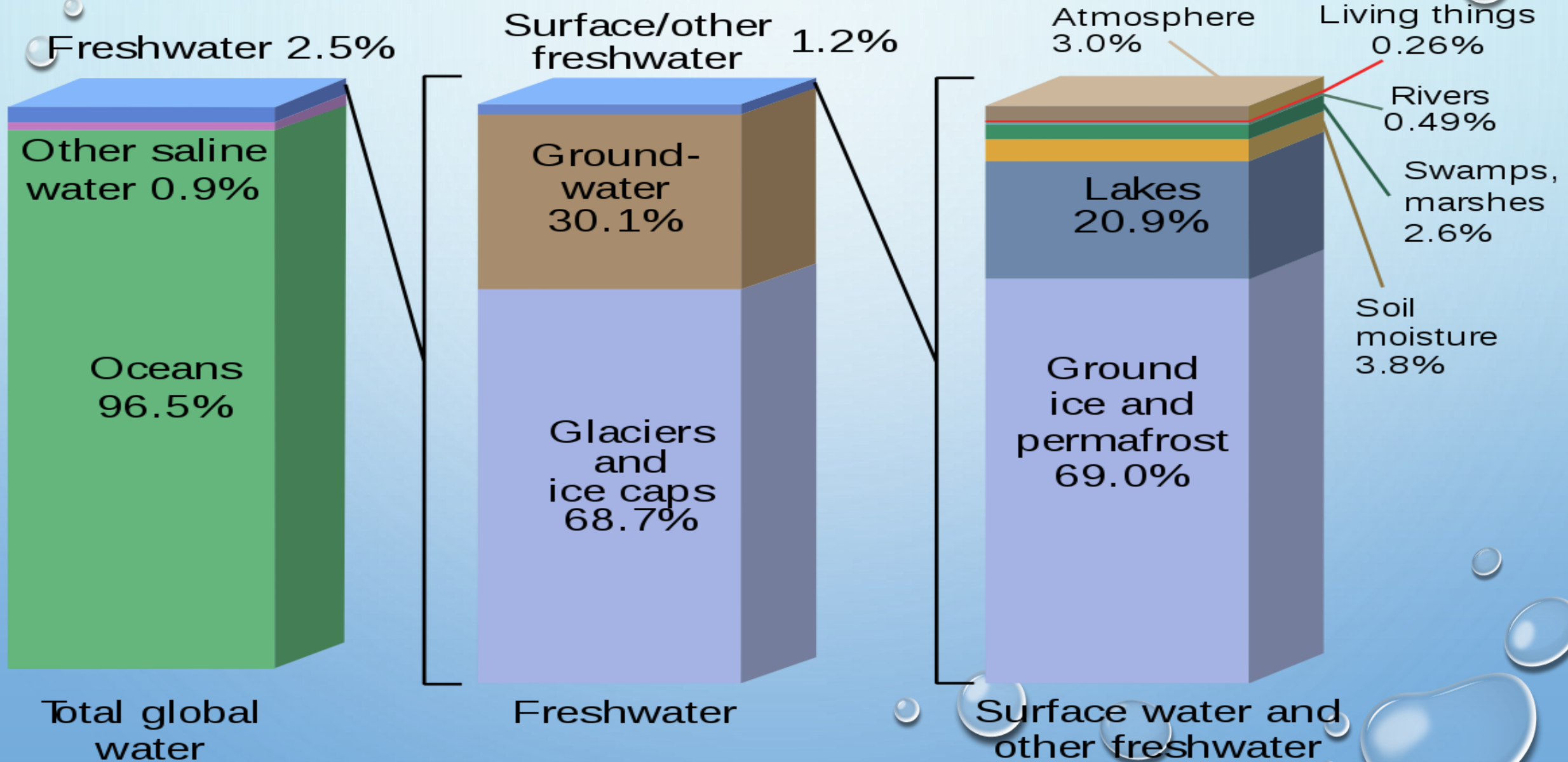


The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text is centered in the middle of the image.

WATER RESOURCES

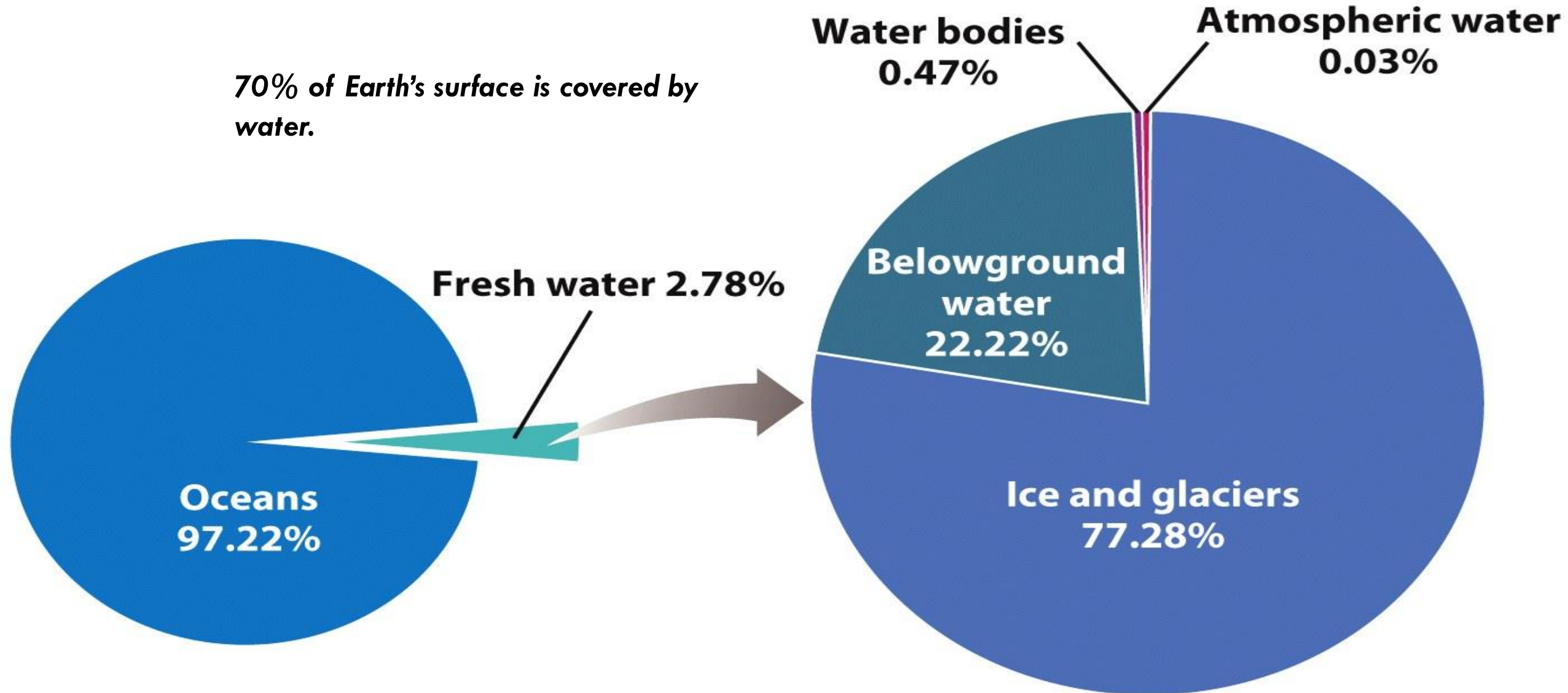
CH. 9 CLASS LECTURE

Where is Earth's Water?



Usable Water is Rare

70% of Earth's surface is covered by water.



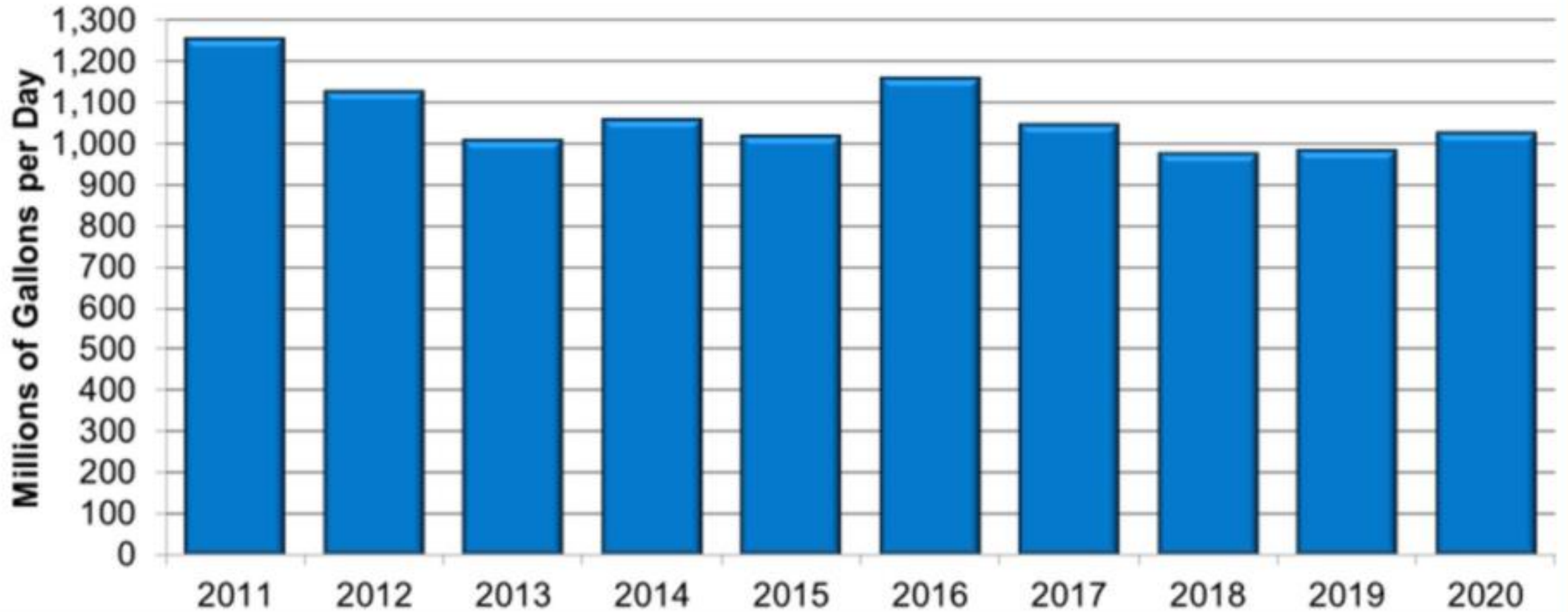
Out of the fresh water (2.8%), 1/4 is underground. Remaining 3/4's is mostly in ice and glacier form.

Less than 1% of all water is accessible for use by humans....20% of fresh water is located in our GREAT LAKES



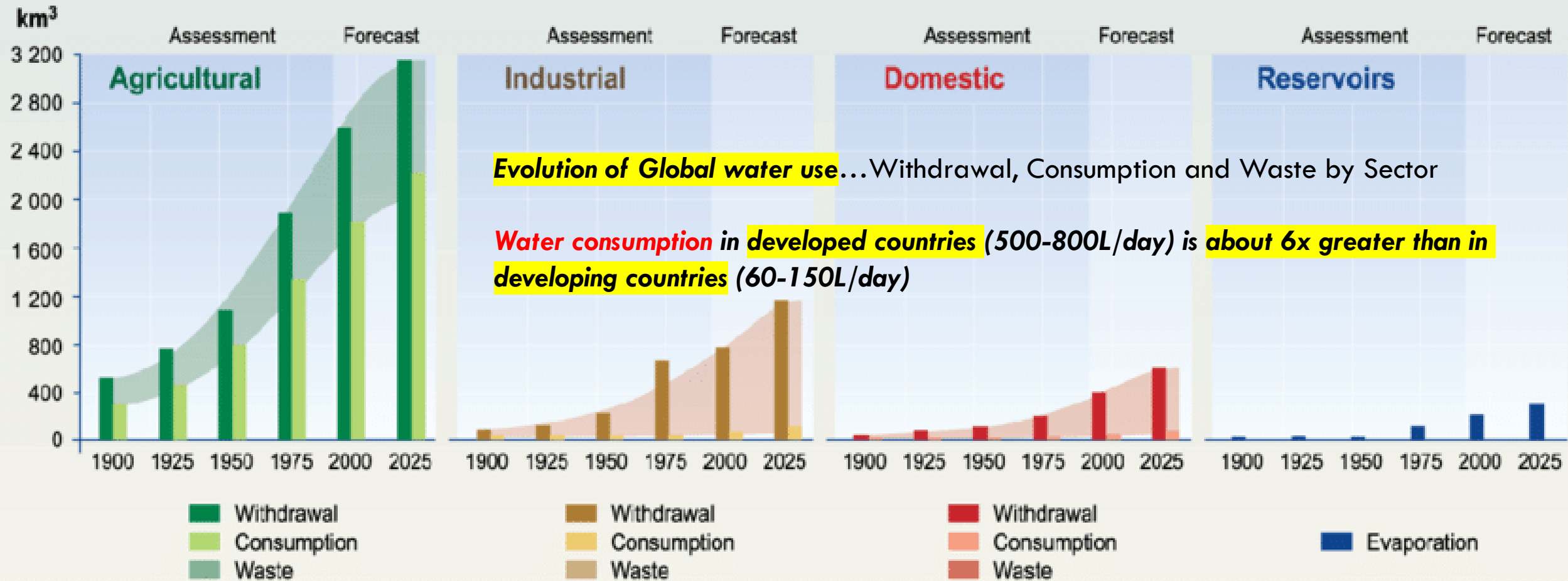
The available freshwater is located in the great lakes (20%); however, we can also find it in other lakes, streams, or river...

Historical Freshwater Use



Early in 2020, more than 2,141,668,773 tons of freshwater had already been used worldwide.





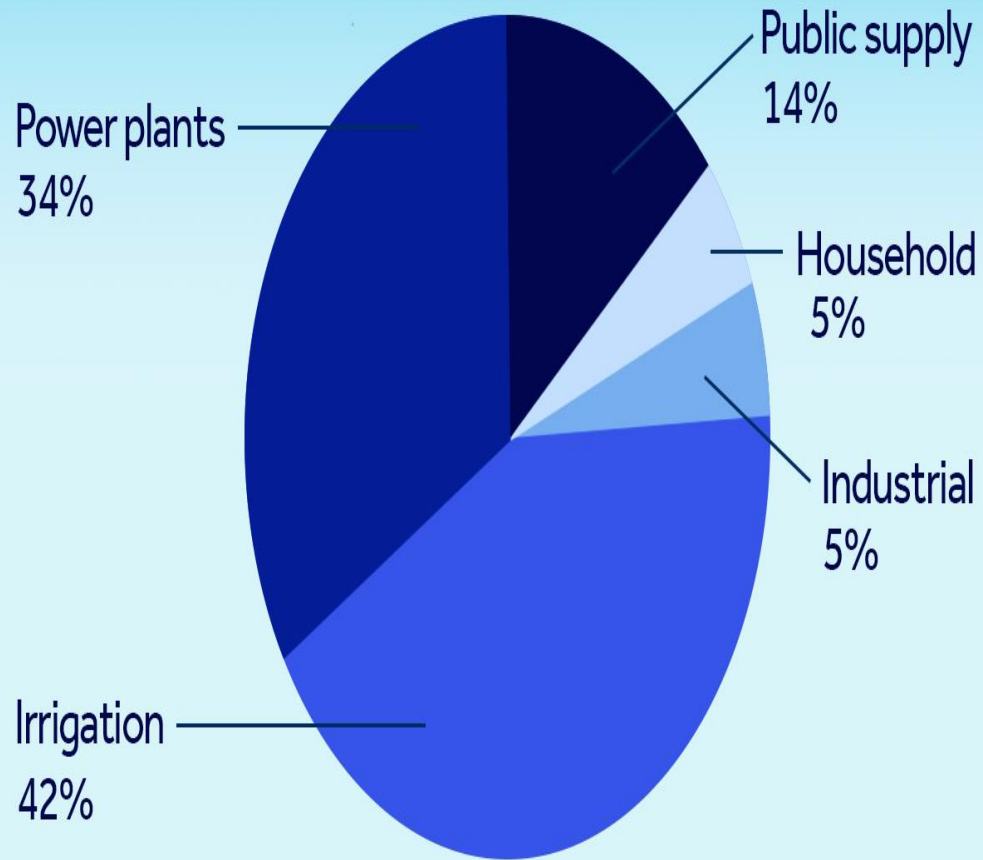
Water may be extracted, used, recycled (or returned to rivers or aquifers) and reused several times over.

Consumption is final use of water, after which it can no longer be reused.

Extractions have increased at a much faster rate is an indication of how much more intensively we can now exploit water.

Only a fraction of water extracted is lost through **evaporation**.

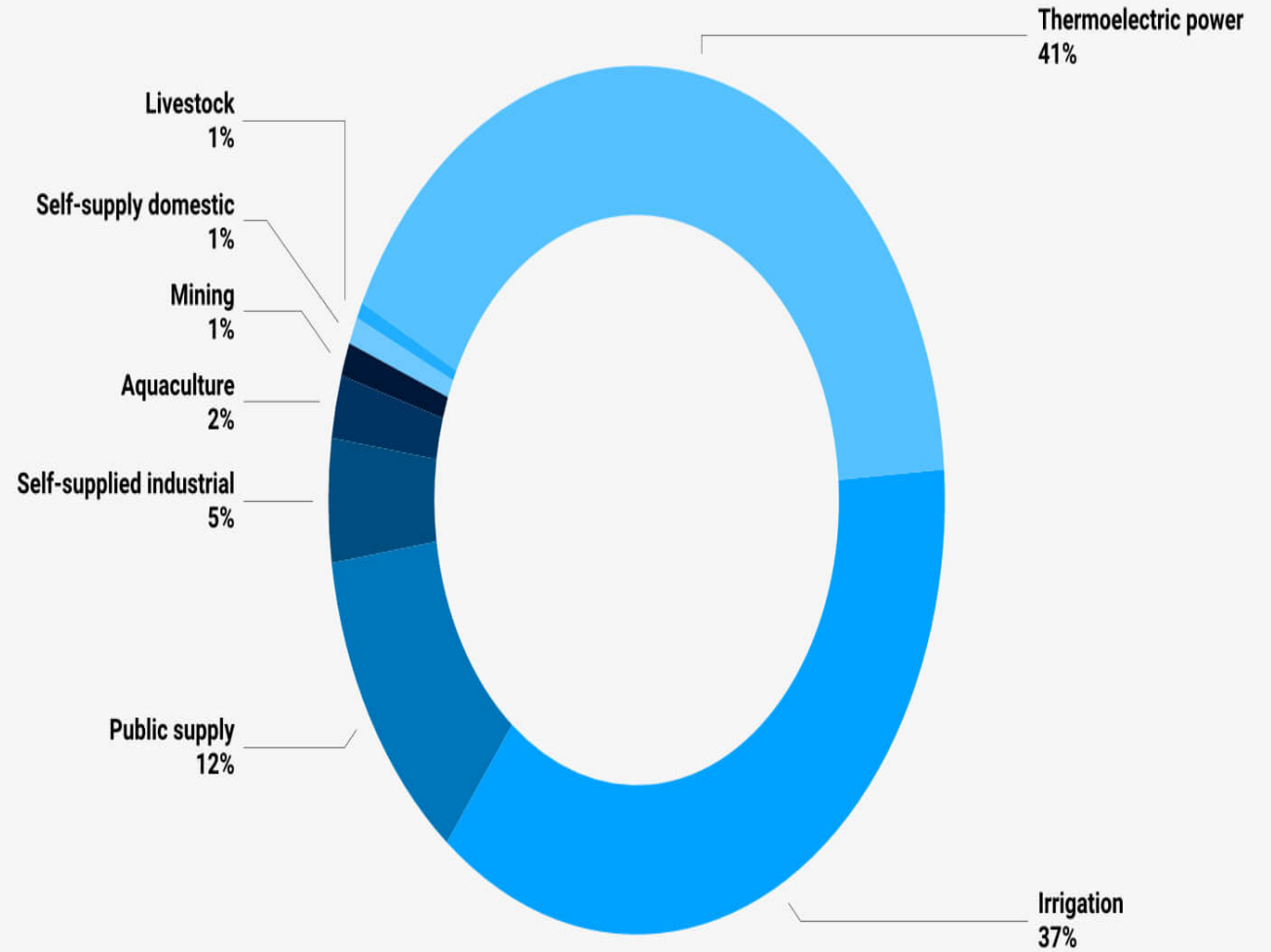
TOP U.S. FRESHWATER USE



Source: 2015 USGS National Water Census. Produced 3/20/2019.

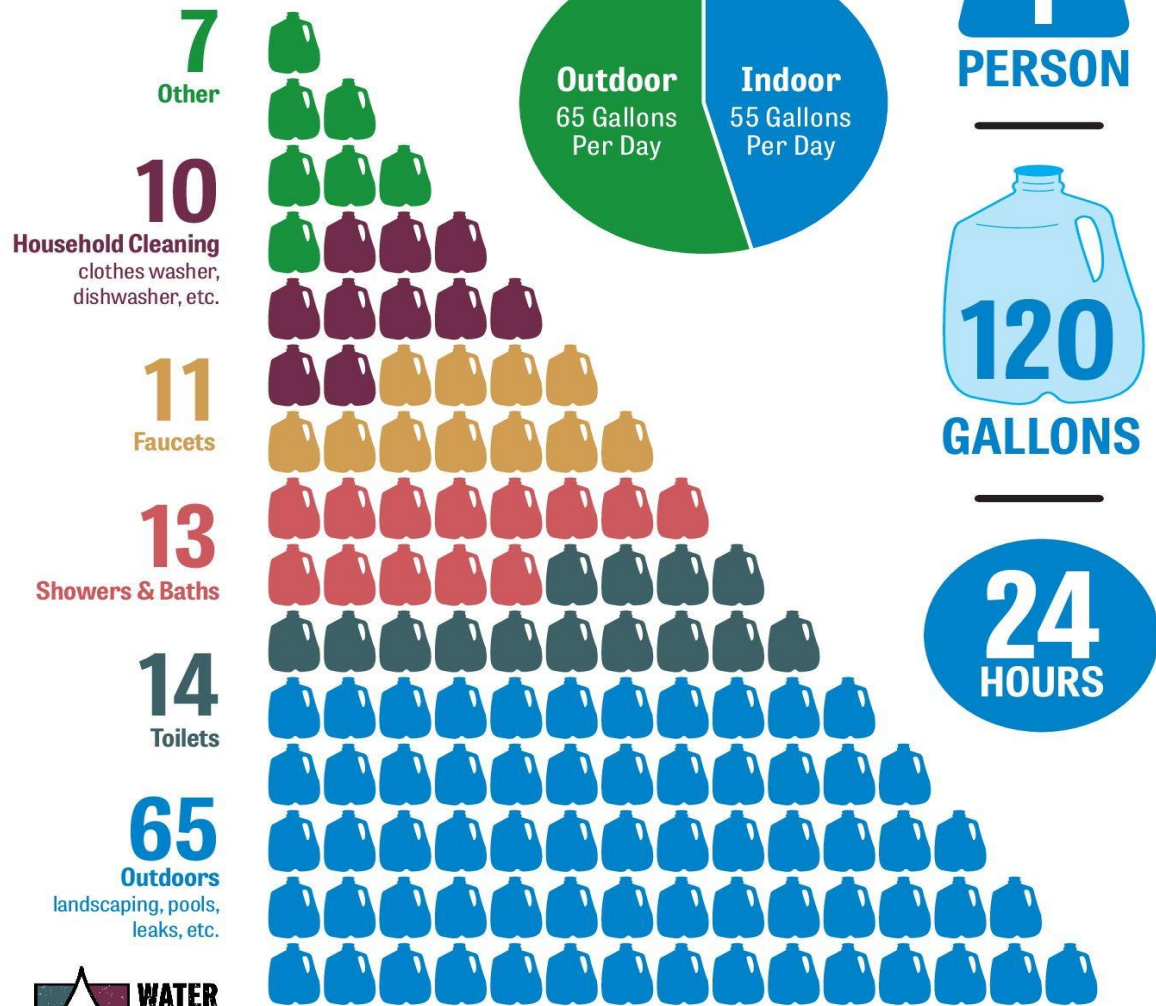


Water Usage by Category in the U.S. 2024

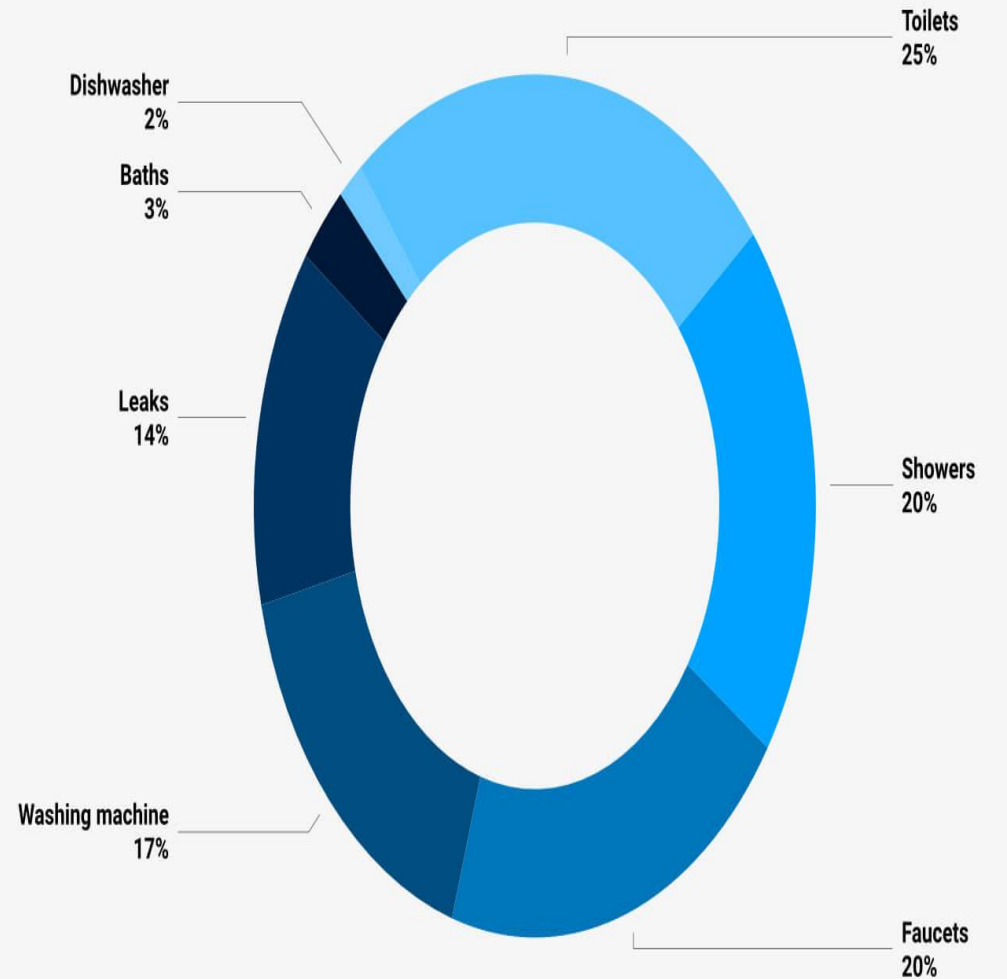


WAR OF WATER: FUTURE OF WATER

Average Daily Water Usage



Household Water Usage in the U.S.



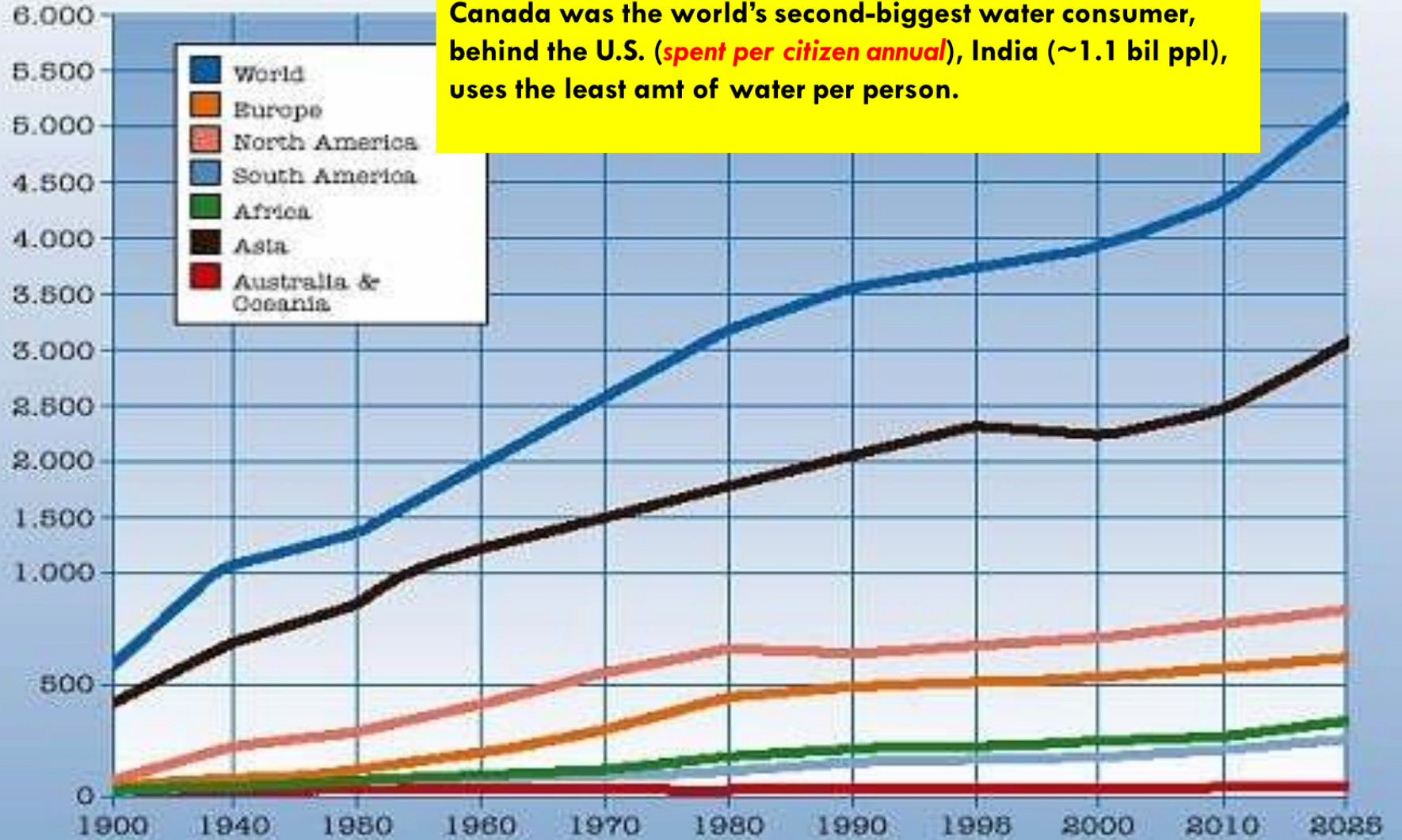
Freshwater water problems

10 Countries That Use the Most Water annually:

- China – 362 trillion gallons
- United States – 216 trillion
- Brazil – 95 trillion gallons
- Russia – 71 trillion gallons
- Mexico – 53 trillion gallons
- India – 30 trillion gallons
- England – 20 trillion gallons
- France – 20 trillion gallons
- Canada – 19 trillion gallons
- Australia – 12 trillion gallons

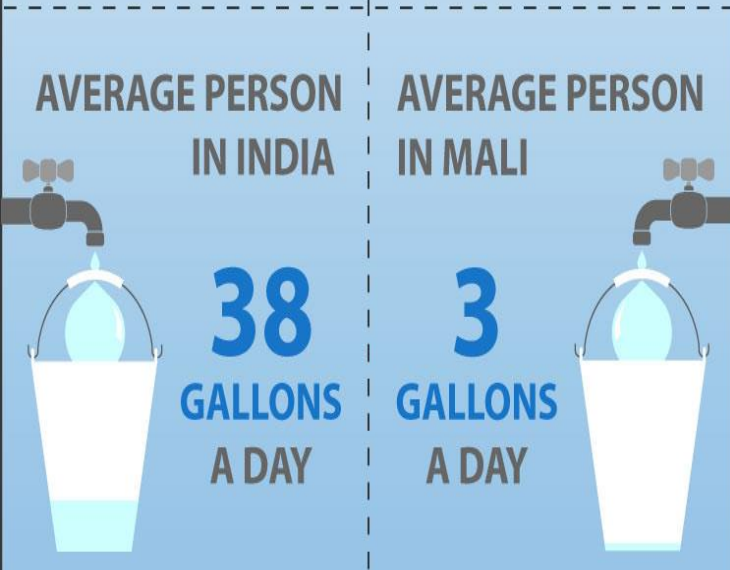
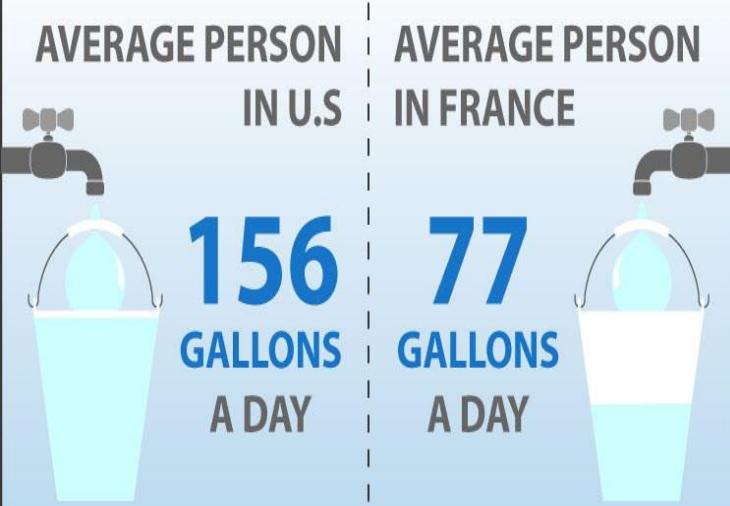
Global Water Consumption 1900 - 2025

(by region, in billion m³ per year)

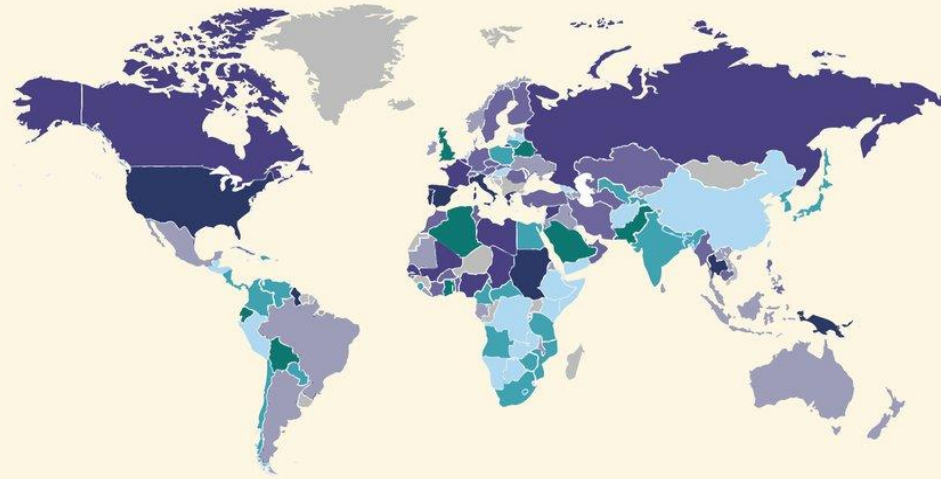


WATER USE AROUND THE WORLD

The U.S. uses a large amount of water each day compared to other countries.



World Water Use

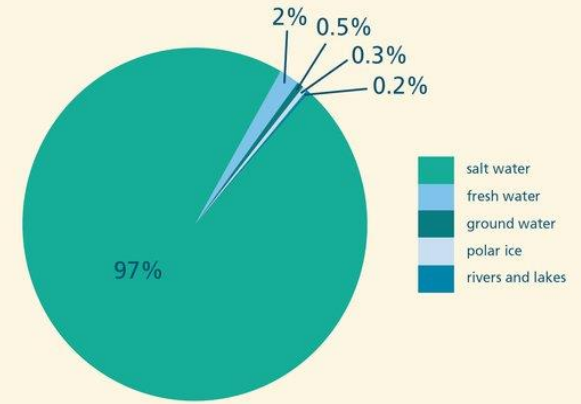


Water footprint per capita (m³)

- 600 – 1000
- 1000 – 1200
- 1200 – 1300
- 1300 – 1500
- 1500 – 1800
- 1800 – 2100
- 2100 – 2500

global average water footprint is around **1,240** m³ per person

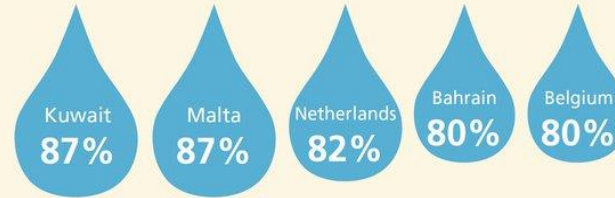
Breakdown of the world's water types



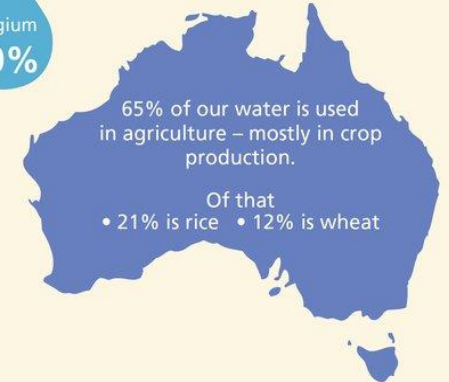
Highest water footprint per capita



Countries most dependent on water imports



Water footprint of different foods



Water Conservation For A Growing World

Where is the water?

2% Trapped in Icebergs

1% Fresh Water

97% Saltwater

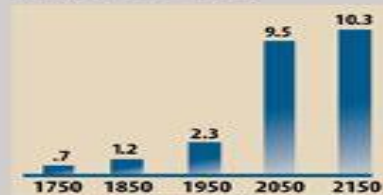
Where the water goes...

PROBLEM:

5.3 billion people will suffer from water shortages by 2025

48 UN estimate of the number of nations that will face freshwater "stress" or "scarcity" by 2025

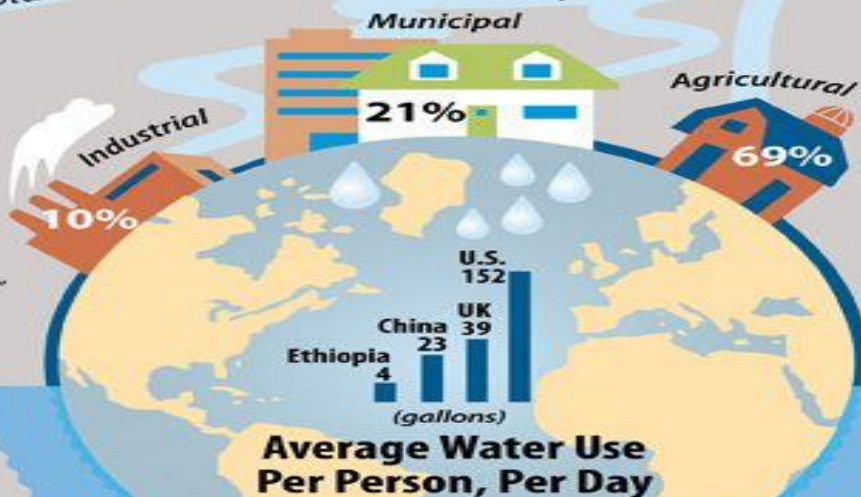
PROBLEM:



World Population Growth in billions

Not Potable

Available for use



1 Water Transfers



Colorado River
35 Million The number of people in 7 states served by the sharing of the water in the Colorado River Basin, up 10 million people from 1990-2008. Per capita water usage is DOWN 1% in the same time period.

2 Reuse



40 The number of gallons of gray water produced per person per day in the United States; water that could be re-used for other purposes, such as irrigation.

3 Repricing
\$350

The average price charged in the US per year, per household for water. The same amount would cost \$1,700 in Guatemala City.



4 Alternative Plant Selection

60% The amount of water a typical household could save each year by switching their outdoor landscaping to low-water-use grasses, wildflowers and/or plants native to the area.

5 Desalination



6.8 BILLION The number of gallons of freshwater produced DAILY by the world's 13,600 desalination plants. This represents less than 1% of the world's needs.

6 Efficient Irrigation



The number of easy steps to save the most water with an automatic irrigation system.
HOW?
Design: Proper design ensures proper coverage and no overlap or overspray
Installation: Critical to the proper operation of the system
Products: The latest technology, such as smart controllers, can save the most water
Use: Even the best system must be programmed and used properly to save water
Maintenance: Prevents leaks and other water-wasting problems

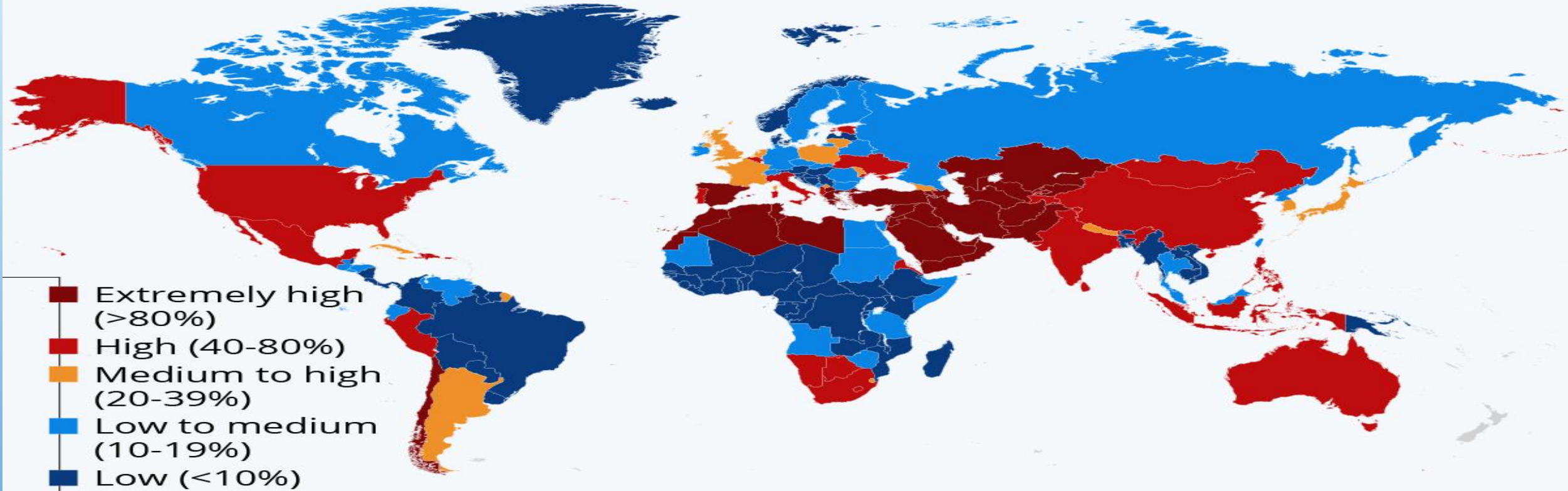
Two billion people do not currently have safe drinking water and 3.6 billion lack access to safely managed sanitation

By 2050, the number of people in cities facing water scarcity is projected to nearly double from 930 million people in 2016 to up to 2.4 billion

World Water Day (Water for Peace), held on March 22 every year, is an annual United Nations Observance focusing on the importance of freshwater, raising awareness

Where Water Stress Will Be Highest by 2040

Projected ratio of water withdrawals to water supply (water stress level) in 2040



Source: World Resources Institute via The Economist Intelligence Unit



FACTS

- **ACCORDING TO USGS, EVERY PERSON (US) SPENDS BETWEEN 80 AND 100 GALLONS OF WATER DAILY GLOBALLY (INDOOR USE ONLY).**
- **AVERAGE HOUSEHOLD (FAMILY OF 4) IN THE US USES ~ 400 GALLONS OF WATER EVERY DAY (30% OF THIS AMOUNT IS USED OUTSIDE THE HOUSE).** U.S. CONSUMES 322 BILLION GALLONS OF WATER PER DAY AND THE MAJORITY IS USED FOR **IRRIGATION, THERMOELECTRIC POWER, AND PUBLIC SUPPLY.**
- **AN AVERAGE AMERICAN HOUSEHOLD CAN WASTE ABOUT 9,400 GALLONS OF WATER YEARLY DUE TO HOUSEHOLD LEAKS (ACCORDING TO THE EPA, AMERICAN FAMILIES WASTE UP TO 180 GAL/WEEK)**
- **PEOPLE BUY AROUND A MILLION PLASTIC BOTTLES EVERY MINUTE, MOST OF WHICH ARE WATER BOTTLES (CONSUMPTION OF WATER BOTTLES, US IS 4TH... MEXICO & THAILAND HAD THE HIGHEST, ITALY WAS SECOND... 600 MILLION HOUSEHOLD CONSUMED BOTTLED WATER IN 2022, 1 MILLION BOTTLES/MINUTE. CONTINUES TO GROW BY 5% ANNUALLY)**
- **IF YOU JUST TURN OFF THE TAP WHILE SHAVING OR BRUSHING YOUR TEETH, YOU COULD CONSERVE ALMOST 5,700 GALLONS OF WATER ANNUALLY.**