

THE FUTURE OF WATER



THE FUTURE OF WATER

Subjects for discussion:

- **We have too much**
- **We have too little**
- **What is the real issue**
- **Where/How do we use water?**
- **What are the solutions?**
- **How can we protect water?**

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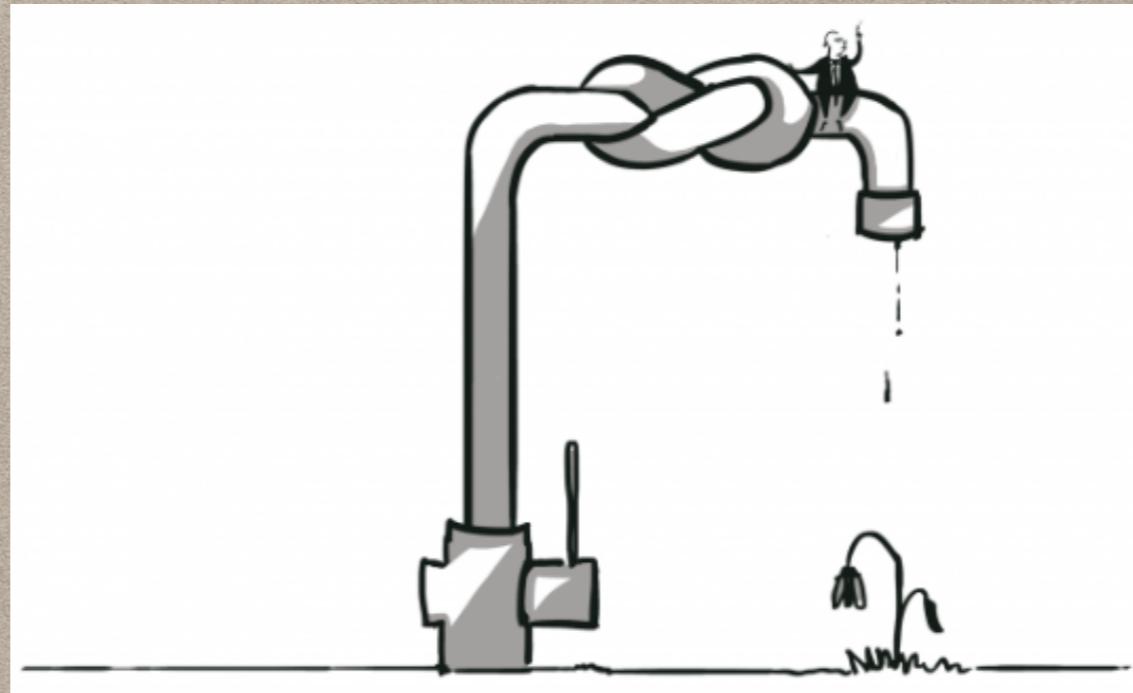


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Marcus Plaza - Venice

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- We have too much
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April 2019: Cape Town limited people to a mere 13 gallons per person per day.

(Perspective: Average in U.S.: 100 gallons/day)

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A woman down in Africa
is looking hopeful to the sky.
She pulls her bucket from the well,
too bad, it's running dry...

While people in the wealthy lands,
so many thousand miles away
are mindless of the water wasted
every single day.

Chorus:

We must come up with answer to
the problems that we face,
answers that we all can embrace.
And if we have a common goal
and vision, there's a way
to build a new tomorrow, *today!*

A woman down in Amazon
is cutting trees to build a fire,
and offers - just to eat a bite -
her little girls for hire...

While people thousand miles away
are edging closer to the brink
of getting sick and dying from
what they eat and drink.

Chorus . . .

I tell you, there has never been so many
with so little of so much -
so little of so much!
That's why I'm telling you, that...
. . . the world is small and we must learn
to swallow our pride
and share what Mother Earth can provide.
And once again: With common goals
and visions, there's a way
to build a new tomorrow, *today!*

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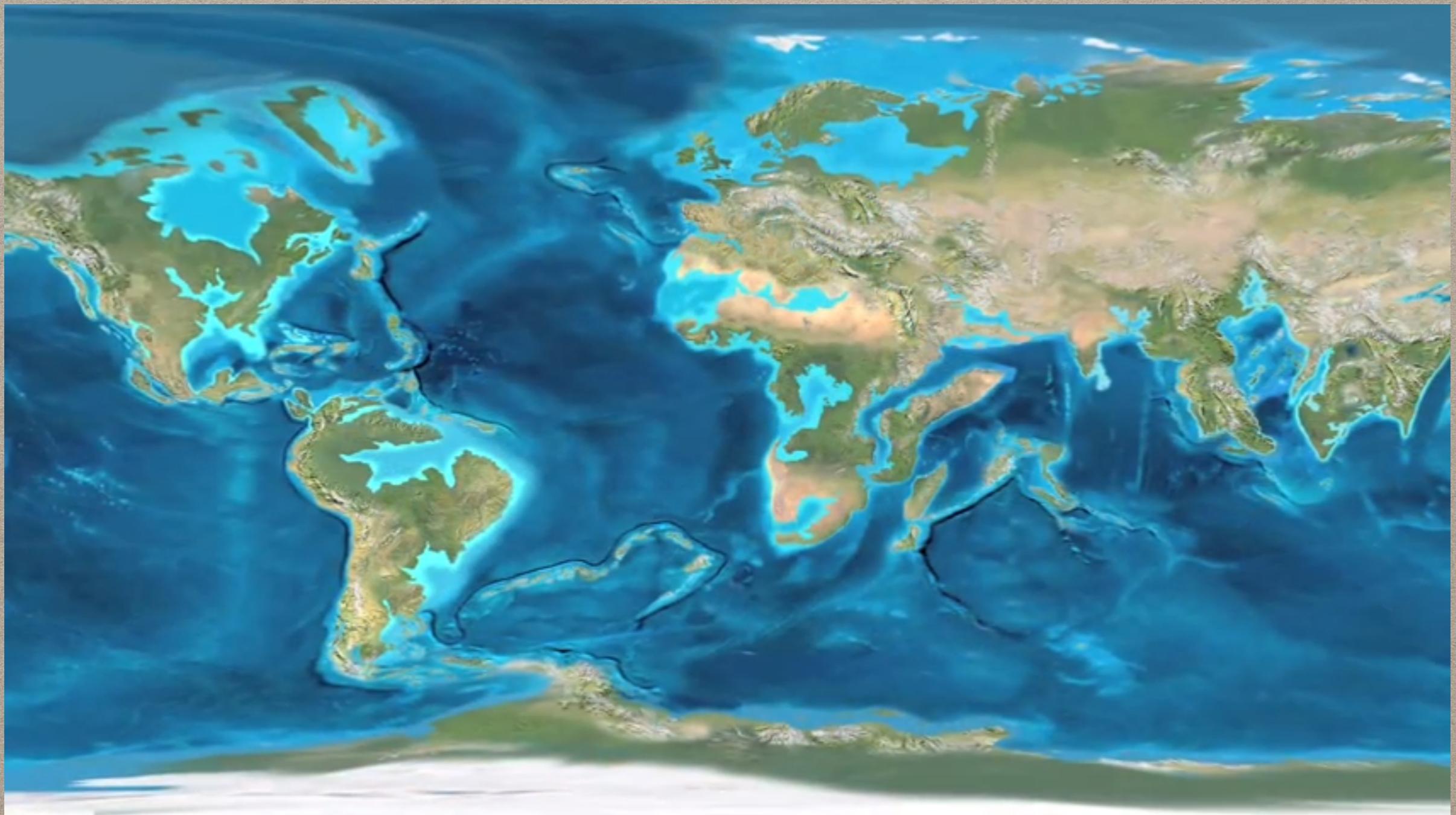
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Earth - The Blue Planet . . . 71% is covered by water

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Point of reflection:

The water you drink today was around in one form or another for hundreds of millions of years ago. It has remained relatively constant over that time.

So, what's the problem?

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Problem #1:

**Blue Planet or not . . . only 2% of the world's water supply is fresh water
Half (1%) is easily accessible, but mostly locked up in ice.**

In fact: Only 0.007% of all water in the world is potable

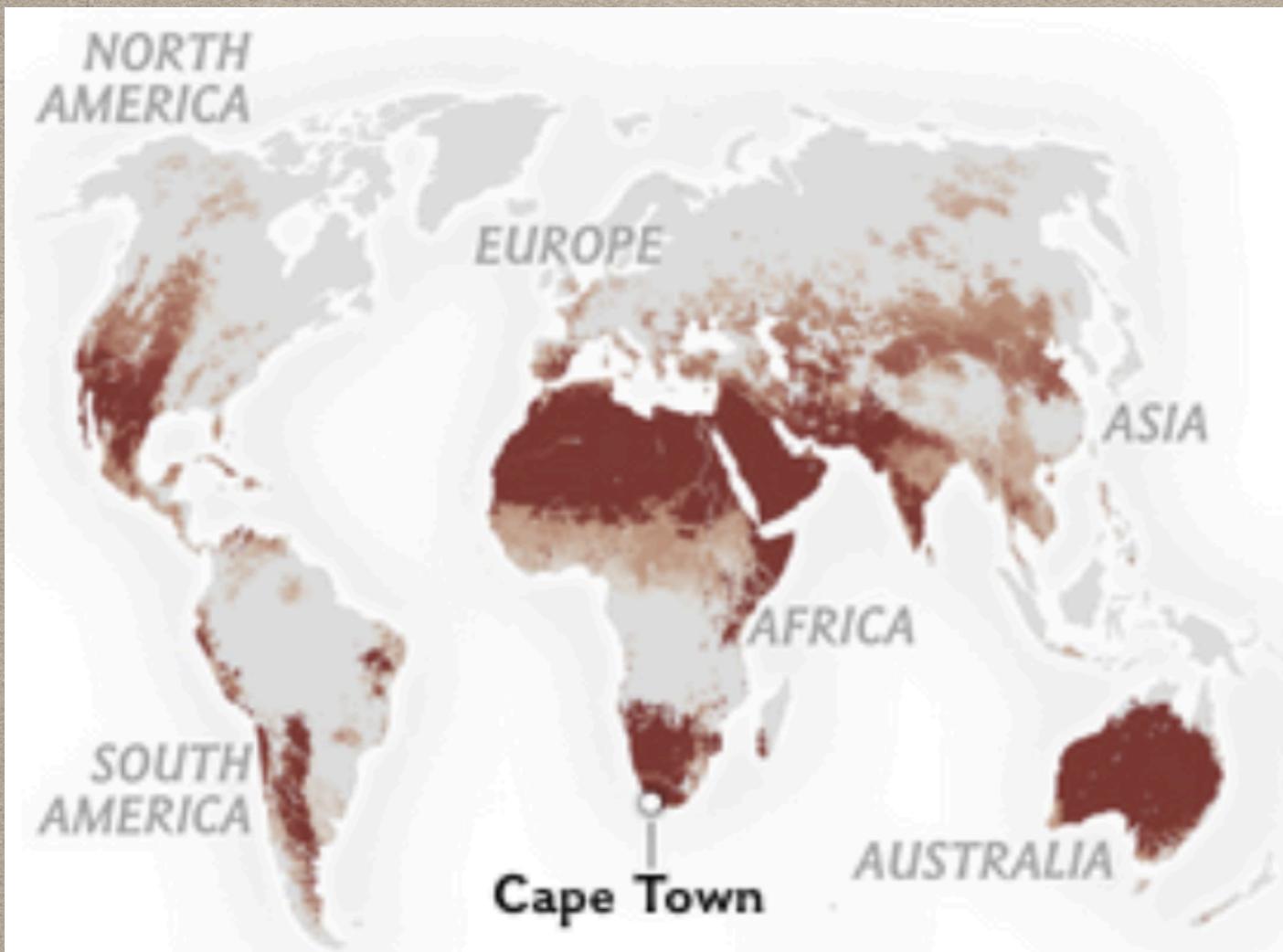
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Of the world's 6.7 Bn people

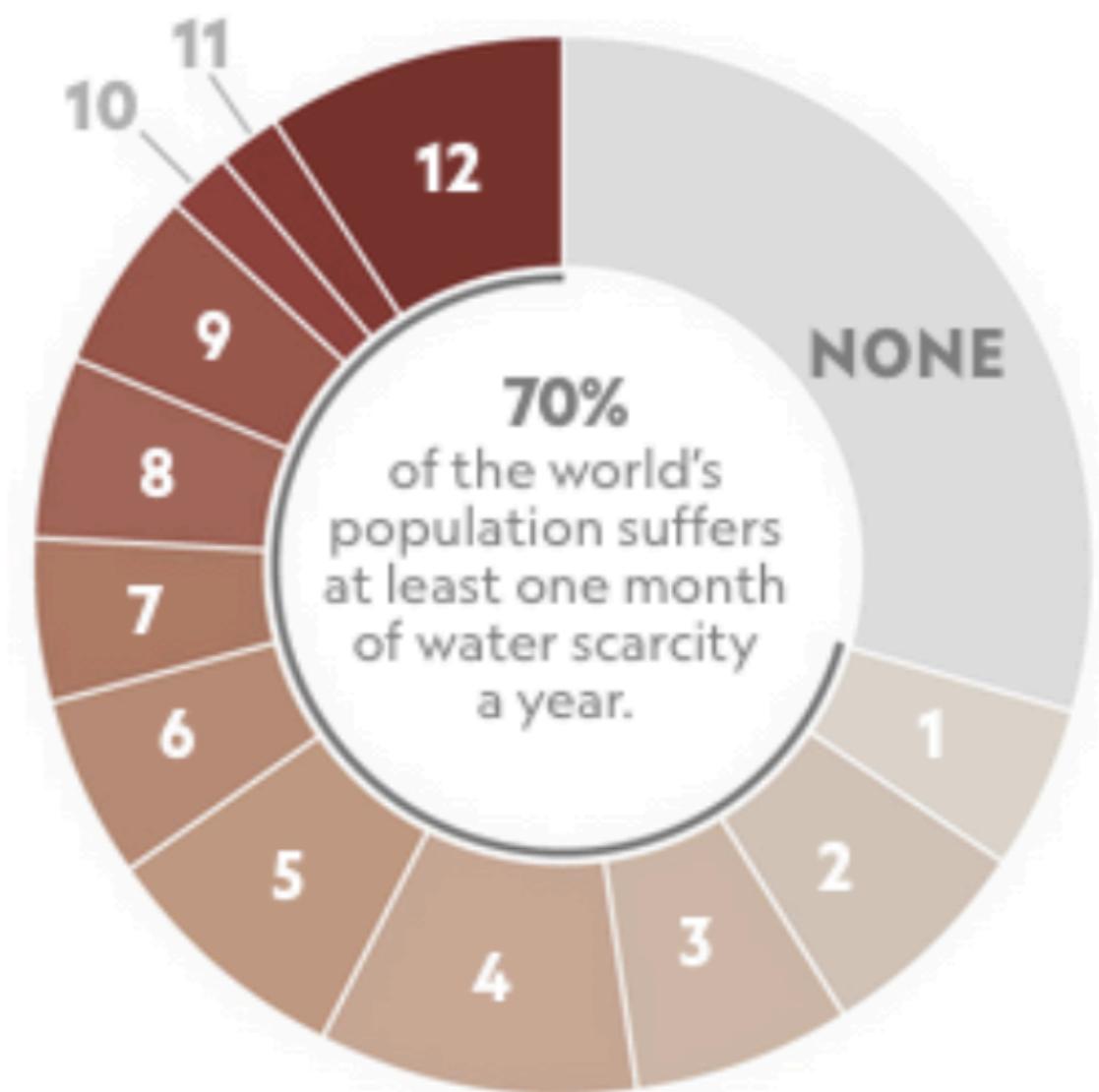
- 66% are affected by water shortages
- 33% lack plumbing enough to have access to a toilet . . . >2 billion people drink water from sources contaminated by feces (cholera and typhoid)

[According to the World Health Organization](#)

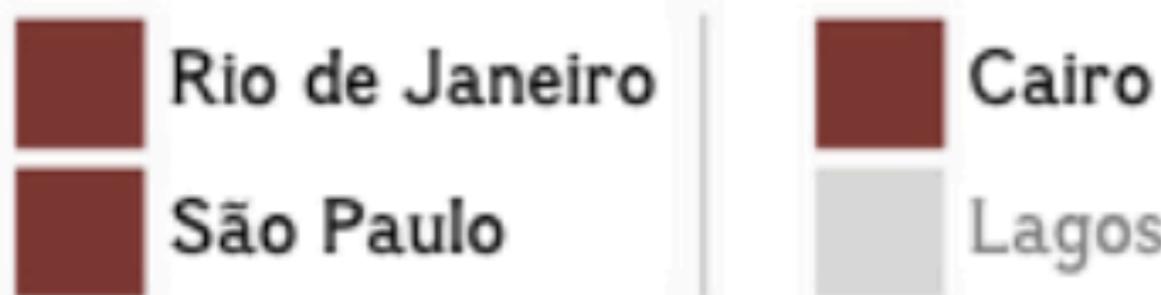
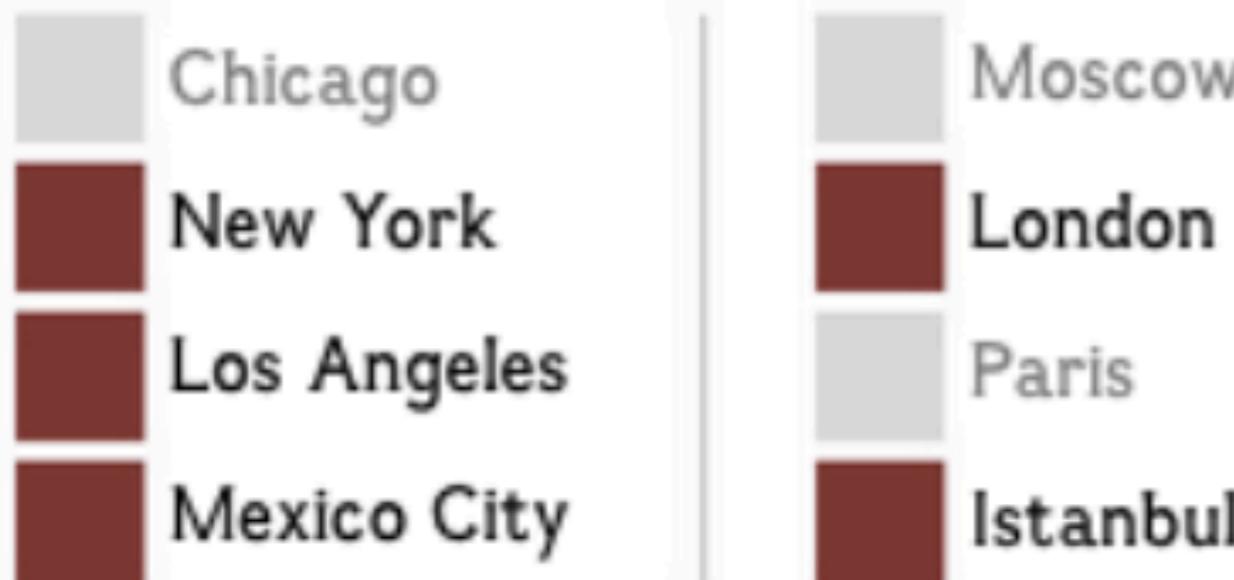
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Number of months a year region experiences water scarcity



14 OUT OF 20 GLOBAL CITIES[†] ARE EXPERIENCING WATER SCARCITY



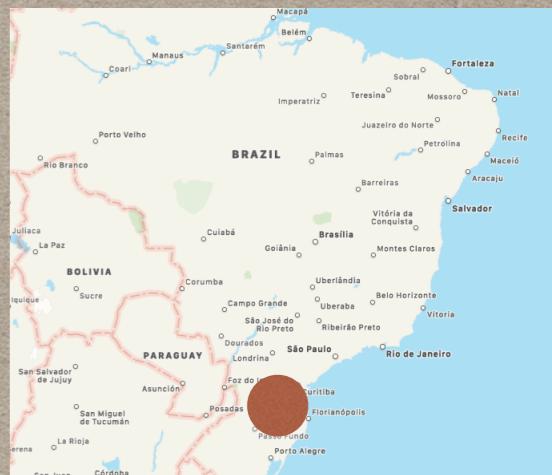
4 Bn people live in regions that experience severe water stress for at least one month of the year (nearly half of them live in the fastest growing cities).

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2008: Barcelona, Spain, had to import tankers with freshwater from France



2015: Brazil's São Paulo (20 m people) turned off its water supply for 12 hours a day to avoid a Day Zero



2019: Cape Town was 4 days away from running completely dry (Day Zero)



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Remember: Only 0.007% of all water in the world is potable ...

Problem #2:

Water usage has grown 2 times faster than the increase in global population *in the last century.*

[United Nations](#)

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**Any observations
at this time?**

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Problem #3:

Humans are *inefficient* water users

- in our food and drinks
- in water-intensive crops (grown in arid regions)

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***Water Footprint
of National Production:***

**the total amount of freshwater
consumed and/or polluted
in a country* . . .**

A.Y. HOEKSTRA
UNESCO-IHE INSTITUTE OF WATER EDUCATION,
Project: "NATIONAL WATER FOOTPRINT ACCOUNTS"

* or a region or a product

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QUESTION:

***How much water is required
to make 1/2 l of a soda:***

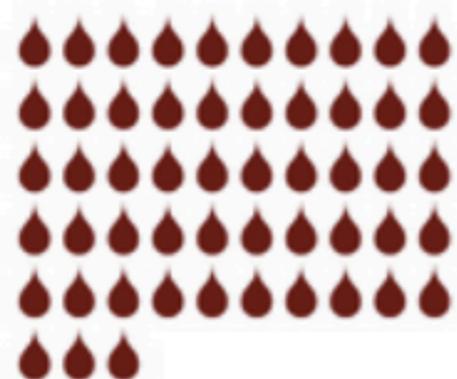
Any wild guesses?

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THE AVERAGE WATER CONSUMPTION
TO PRODUCE ONE SERVING OF SODA



Growing natural sweetener:
30 liters



Growing coffee beans for caffeine:
53 liters

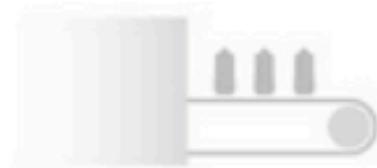
QUESTION:

***How much water is required
to make 1/2 l of a soda:***

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Processing flavoring:
80 liters



Molding of plastic bottle:
5.3 liters



Water added in recipe:
0.5 liters



Manufacturing and packaging:
7 liters

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QUESTION:

***How much water is required
to make 1/2 l of a soda?***

It takes . . .

Ratio: 350:1



SOREN WALLJASPER, NGM STAFF

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Even worse . . .

- The average **hamburger** takes 2,400 liters (630 gallons)
- A 750 ml bottle of **wine** takes nearly 750 liters (200 gallons)
- One **orange** takes 80 liter (21 gallons)

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The larger perspective:

The typical **home use** of water—for washing, flushing, and cooking—represents only about **3%** of humanity's total water consumption . . .

. . . in other words

Hoekstra

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Our water consumption:

3% for household consumptions

- washing, flushing, cooking

80% for agriculture

- Agriculture uses ~80% of CA's water, but produces less than 2.5% of CA's income.
- 10-15% for food and drinking

10-20% for energy production and industry

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Overall question:

What can (must) we do to solve the fresh water crisis, given the three problems*

*** 3 Problems**

- Only 0.007% of all water in the world is potable
- Water usage grows 2 times faster than population
- Humans are inefficient water users

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We need new strategies:

- desalinate seawater
- extract water from fog/humidity
- use reclaimed water/treated waste water - in agriculture, golf courses, etc.

Fx: Cape Town reuses just 5% of its wastewater, compared to Israel's 85%.

- use less water-intensive crops (cotton, alfalfa) - or modify them to tolerate salt water

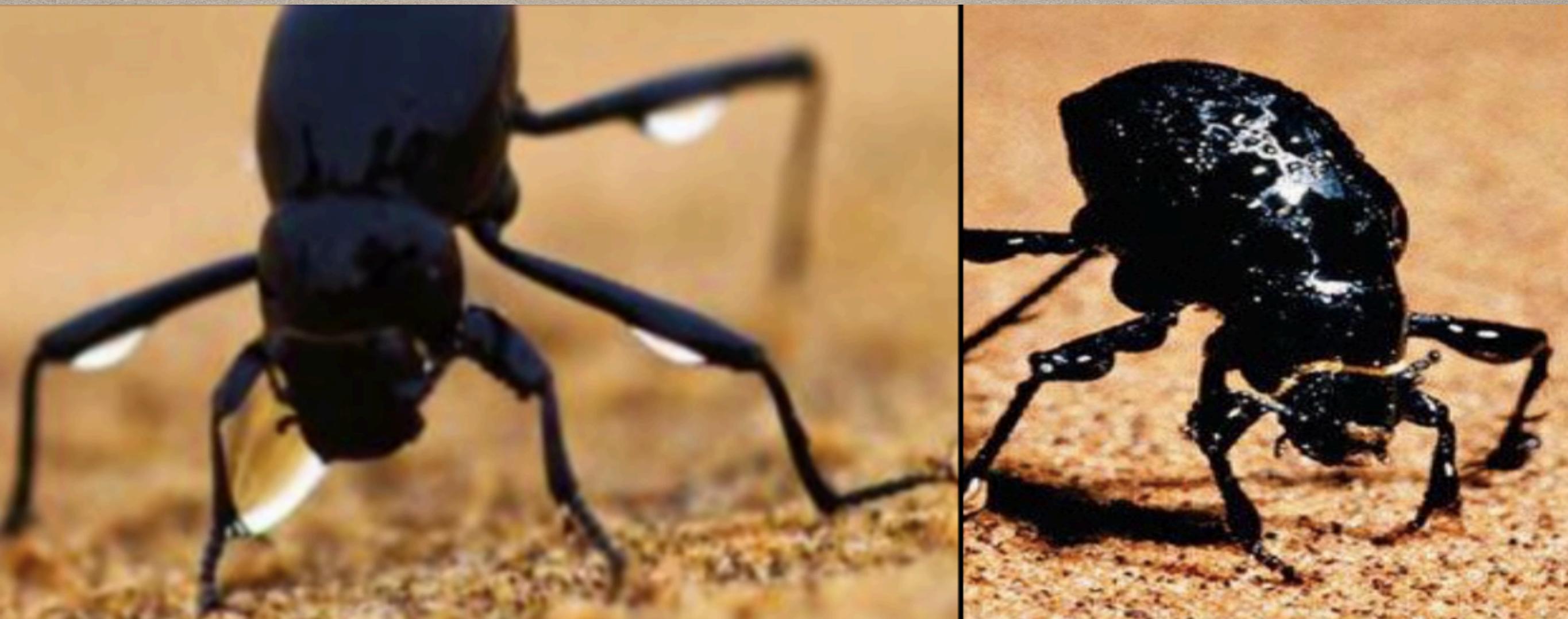
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https://www.ted.com/talks/david_sedlak_4_ways_we_can_avoid_a_catastrophic_drought?referrer=playlist-talks_on_water

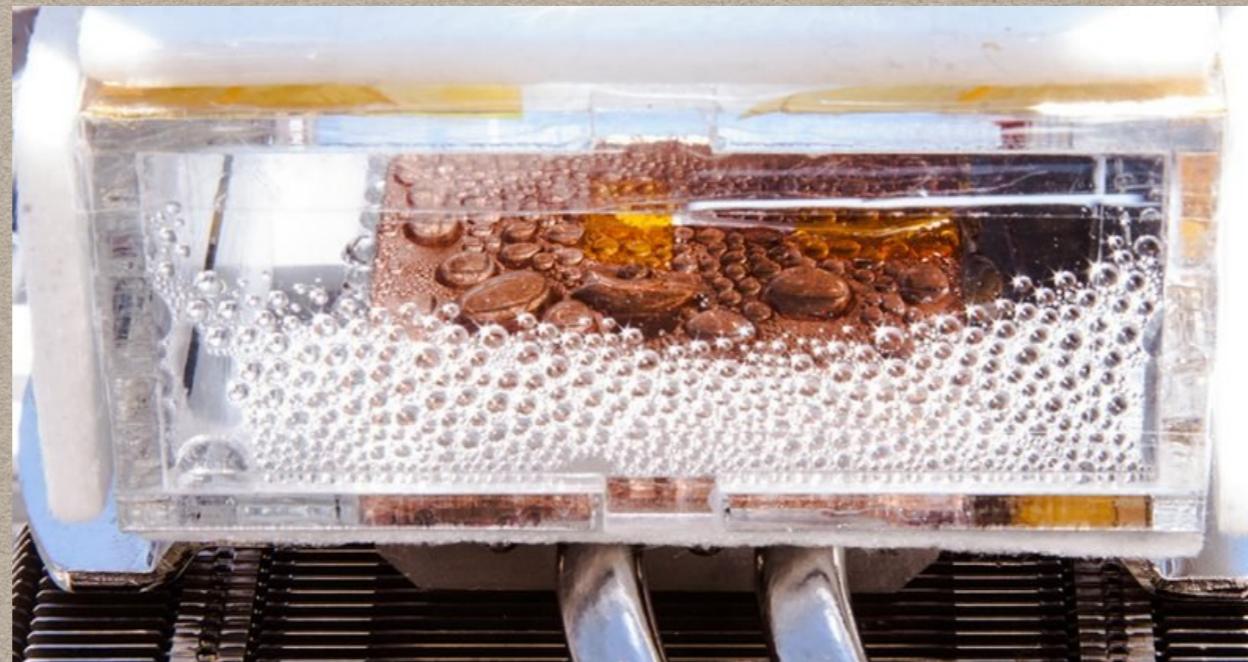
- 1: *Storm water harvesting*
- 2 *Water reuse (reclaimed water > RO > oxygenation)*
3. *Conservation (half of all consumption is outdoors)*
4. *Seawater desalination*

Pamela: Biomimicry Presentation



Namib Beetle

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MIT scientific breakthrough:

Building on [a concept proposed last year](#), MIT's new contraption uses what are called [metal-organic frameworks \(MOFs\)](#) to [extract drinking water from desert air](#) – and it's powered by solar energy.

It can extract water from air with less than 10% humidity (instead of >50%)

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Called SOURCE, the panels can be installed atop any building just like a standard photovoltaic, but instead of just harvesting solar energy, it **uses the sun's rays to pull water from the air**. Each panel has the potential to draw up to 10 liters (2.64 gallons) of water per day.

Sunlight + Air = Water . . . the heart of a new solar hydropanel developed by **Arizona-based startup Zero Mass Water.**

Yield . . .

averages out to about \$1.23 per day, or between \$0.12 and \$0.30 per liter of H₂O.

Right now, the two-panel array costs \$4000, plus \$500 installation

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Taraltec in-pump installation for purification



Mumbai, India

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So . . .

if we know there's a problem

if we know what solutions there are

if we have the technology to solve it . . .

WHY DON'T WE DO IT?

It's a mindset!

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How can we *protect* water?

Let's be philosophical for a moment . . .

Who is water?

And who owns water?

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Who is water? And who owns water?

How can I call a glass of water mine when its fate is to run through rivers and living bodies, so many already and so many yet to come?

Water is an ancient, dazzling relic, temporarily quarantined here in a glass of water, waiting to return to its kind, waiting to move a mountain, waiting to carve a canyon.

We are not important to water. It's the other way around. Our task is to work out reasonable ways to survive inside its boundaries . . . hence A New Tomorrow

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On that note:

In 2018, Ecuador became the first nation on Earth to put the **rights of Mother Nature** in its constitution so that rivers and forests are not simply property but maintain their own right to flourish.

In 2019, New Zealand granted Mother Nature “**personhood**” in their constitution

Water is life: <https://tinyurl.com/ssvnk75> - TED Talk: 13 min

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Additional resources

[Anu Sridharan: When will I get my water next?](#)

[Safia Elhillo: "To Make Use of Water"](#)

[Anupam Mishra: The ancient ingenuity of water harvesting](#)

[Deepika Kurup: A young scientist's quest for clean water](#)

[Michael Pritchard: How to make filthy water drinkable](#)

[Fahad Al-Attiya: A country with no water](#)

[Lana Mazahreh: 3 thoughtful ways to conserve water](#)

[Sonaar Luthra: Meet the Water Canary](#)

[Balsher Singh Sidhu: Are we running out of clean water?](#)

[Ludwick Marishane: A bath without water](#)



Want to Learn More about Water? Come to the Smithsonian Water/Ways Exhibit

Made possible by Arizona Humanities, our sponsors, donors, and volunteers.



The Black Canyon Heritage Park and Cañon School District 50 invite you to this exhibit that examines water as an environmental necessity and an important cultural element. Interactive. **Free.** Family Friendly. Educational.

Location: Cañon Elementary School
34630 S. School Loop Rd,
Black Canyon City, AZ 85324.

Open Dates / Hours http://bit.ly/WW_Open_to_Public

- Saturday noon to 4 PM - **January 4, 11, 18, and 25**
- Thursday noon to 4 PM - **January 2 and 23**
- Monday 4 PM to 7 PM - **January 6 and 13**
- Wednesday 4 PM to 7 PM - **January 8, 15, and 22**
- Sunday 4 PM to 7 PM - **January 26 (last day of exhibit)**

Tours at other times available by appointment –
<https://blackcanyonheritagepark.org/water-way.>

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Thank You!

by the way:

World Water Day, March 22

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SUMMARY: Fast facts on the global water crisis

- Close to 1 billion people lack basic drinking water access
- Women and girls spend an estimated 200 million hours hauling water every day.
- The average woman in rural Africa walks 6 kilometers every day to haul 5 gal (40 pounds)
- Every year, 300,000 children under age 5 die from diarrhea attributed to poor water and sanitation.

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7 deadly water sins (the reasons we're facing a global water crisis)

- 1) **Changing climate**
- 2) **More People + More Money = More Water Demand.**
- 3) **Groundwater depletion**
- 4) **Water infrastructure is in disrepair**
- 5) **Natural infrastructure is being ignored (e.g. loss of ecosystems such as tree logging)**
- 6) **Water is wasted**
- 7) **The price is wrong**