

Research paper

Water; an untraditional investment

Written by

Maelian Kouache
Ramsey Daunch
Yash Kaushal
Mathilde Jourde
Maximilian Neville
Evgenii Kostromin

Table:

- 1- A new introduction to water
- 2- Products available to invest in water
- 3- Theory in application
- 4- Trends and future projections
- 5- Geographical Distribution
- 6- Continuity; roles and future developments of the industry

1. History/Context

In the emerging assets industry, attention has steadily been directed towards water as a profitable investment. Demand for water has been growing in the last few decades due to an expanding global population. However, with the rise of climate change and the urbanisation of natural soils, water supply has been continuously declining. As a result, water is gradually becoming a scarce resource and therefore more valuable. Consequently, water is often presented as the oil of the 21st century and a high growth investment opportunity (Buckingham, 2008).

In order to understand how water is progressively becoming an emerging asset, it is essential to grasp the nuances of different water sources. Indeed, financialization of water only applies to a very small portion of the global water supply, which is fresh water. The vast majority of the water on earth, 97,5%, comes from saltwater oceans. This means that only 2.5% of global water supply is fresh. But most of this fresh water is not accessible as it lies underground or is frozen in ice caps and glaciers (Allianz Global Investors White Paper Series, 2013). This leaves a very modest portion, around 0.5%, available for human consumption. However, once this fresh water goes through the process of filtration and sanitation, only 0.007% is left (World Health Organization). This means that 0.007% of global water supply in the world is potable water (i.e. safe for consumption).

All these factors combined are particularly problematic considering the context of climate change and global warming, which speed up the process of water scarcity. Pollution, for instance, participates in turning fresh water sources toxic. In Global South nations 90 to 95% of sewage is discharged directly into rivers, lakes or coastal waters without being treated (UNDP, 2006). As a result, this contaminates water supplies which in turn become unusable. This is showcased through the Allianz Global Investors White Paper Series which highlights how 80% of rivers in China are too toxic for fish to inhabit (UNDP, 2006). Regarding climate change, stakes are particularly high for Global South nations considering temperatures there are rising the most. This engenders water scarcities which are already turning into humanitarian disasters in some regions, such as Madagascar. There, more than 58% of the countries' people are currently lacking access to safe drinking water and nearly half of all households live without sanitation facilities (Harding, 2021). As a result, Madagascar is on the brink of experiencing the world's first "climate-change famine" and the UN characterized the level of suffering of this population as "catastrophic" due to the levels of hunger and food insecurity after years of droughts and no rain. Thus, water scarcity will be augmented as the availability of fresh water will decline and the demand rise with the population growth of the upcoming decades. Indeed, by 2030, water global demand is expected to rise and exceed available supplies by 40% (Allianz Global Investors White Paper Series, 2013).

Water scarcity is particularly worrisome as it will lead to tremendous losses in terms of human, economic and financial capital. Indeed, water-related losses in agriculture, health, property and income will lead to a decline of 6% in GDP with some countries seeing losses up to 7%. With the current state of water sanitation, we are witnessing 675,000 premature deaths annually, a number which will continue to rise. Moreover, over 2.1 billion people today do not have access to safe drinking water, while 4.5 billion people lack access to sanitation compatible with SDG6. According to the United Nations, by 2025, two thirds of the global population will face water shortage and 1.8 billion people will be living in "absolute water scarcity". These are yet another situation which have worsened with the sanitary crisis. As a result, water availability is a global issue that needs to be tackled now to anticipate and prevent the famines, diseases and wars that could arise from its unavailability.

One solution that has been identified as a means to solve this issue is leveraging financial instruments. Firstly, the nature of water and its specificities contribute to its worth. One important characteristic is that water has no substitutes and cannot be replaced, giving it a monopoly with no potential entrants. Financially, this is

very appealing seeing as no competitors would be entering the market and you would ensure all possible revenues. Water is also a finite resource which is limited in time, making it an increasingly scarce asset. Scarce resources are by nature highly valued seeing as demand exceeds supply leading to higher price equilibriums and consequently higher revenues. Additionally, with the rising global population, demand for and consumption of water will continue increasing. For example, water used for human activities grew by 600% over the course of the 20th century. Therefore, water is an attractive investment as it would be a reliable stream of revenue overtime. Moreover, decreasing water supply is also strengthened by the lack of investments in adequate infrastructure. Especially in Global countries where many crises will arise as a result of too modest investments. But such events can be prevented as the benefit-cost ratios for investments in water sanitation services have been reported to be as high as 7 to 1 in Global South countries. Investments are a solution thus a solution, but they need to outstrip the current flows. Hutton and Varughese estimated in 2016 that the present value of the additional investments needed until 2030 to achieve SDG6, which corresponds to universal and equitable access to save water for all, is equivalent to 1.7 trillions USD. This corresponds to about three times the current investment levels. As a result, treating water as an asset could encourage companies and different parties to address the growing water crisis by offering long-term investment opportunities. In fact, for investors, water combines competitive investments, serving the common good as well as delivering measurable positive impact. Finally, investments related to water will enable investors to realize capital appreciation and sustainable long term dividends with a rather low amount of risk and availability.

2. Product

Investors looking to gain exposure to water and water related industries are certainly not stuck for choice. The most abundant product available on the market are 'water' Exchange Traded Funds (ETFs) which track the performance of a basket of companies operating within the water industry. Two of the largest of such funds include:

Invesco Water Resources ETF (\$PHO)

Underlying Index	Nasdaq OMX US Water Index
YTD Daily Total Return	24.91%
Expense Ratio	0.60%
Annual Dividend Yield	0.28%
3-Month Average Daily Volume	152,761
Assets Under Management	\$1.67 billion
Inception Date	Dec. 6, 2005
Summary	Focused on companies within water purification and conservation.

Source: (Invesco Water Resources ETF, 2021)

First Trust Water ETF (\$FIW)

Underlying Index	ISE Clean Edge Water Index
YTD Daily Total Return	23.8%

Expense Ratio	0.54%
Annual Dividend Yield	0.45%
3-Month Average Daily Volume	69,226
Assets Under Management	\$1.04 billion
Inception Date	May 8, 2007
Summary	Focused on small, mid and large-cap companies in potable water and wastewater industries

Source: (First Trust Water ETF, 2021)

Recently, a particularly interesting product was launched on the CME. The Nasdaq Veles California Water Index (NQH20) futures, is a product that simply tracks the spot rate price of water in California, the largest water market in the country and an area whose water supply has experienced remarkable turbulence over the last few years (Nasdaq). This is the first product of its kind, and we expect to see more like it as climate shocks continue to increase in frequency, market participants require an innovative solution to align supply and demand and hedge water price exposure.

The Nasdaq Veles California Water Index Futures (NQH20)

Underlying Index	The Nasdaq Veles California Water Index
Contract Unit	10 acre feet x NQH20 Index
Pricing	\$1.00 per acre foot = \$10.00 per Contract
Summary	Tracks the volume-weighted average transaction prices in five Californian water markets

Source: (Nasdaq Veles Water Indexes: A Clear Solution for Water Price Discovery, 2021)

3. Theory in application

Case Study: Water as an Agricultural Asset

In 2012, Harvard Management Co. made sweeping land purchases in prime agricultural areas of central California, and began developing vineyards for the sale of grapes to outside wineries¹. Through a shell company, they were able to slowly accumulate some of the most water-rich parcels in the area by paying consistently above-market prices. Behind the shell company was Harvard's in-house natural resources investment group, which has since been spun off into an outside entity (now named Solum Partners).

By 2015, the endowment had spent around \$60M in acquiring more than 10,000 acres of prime agricultural vineyard land - and more importantly the rights to drill upwards of 15 wells into some of the richest groundwater reserves in the area². This was of particular monetary and environmental concern to surrounding residents and farmers, who depend on an equitable usage of groundwater but are located on adjacent parcels with drought-weakened reserves. As time has passed, the Harvard-owned vineyards have continued to seek regulatory approval for the extraction of

ever-increasing amounts of reservoir water to support their grape output. This prospect has prompted continued bursts of legal conflict with surrounding landowners due to the critically-low area water supply.

We can gain some recent insight into Harvard's natural resources investments from their annual financial reports dating up until 2019³. Although water is not specifically broken out as an individual investment class, Harvard considers natural resources to be an illiquid asset group (alongside private equity and real estate). As compared to traditional farmland and timberland, one would theoretically consider water to be the *most* illiquid of any natural resource investment. However, this case is a great example of a strategic agricultural model of water investment - one which has allowed Harvard to achieve both price appreciation and cash flows alongside a (presumed) greater degree of liquidity than expected.

It is difficult to assign a dollar value directly to the water reserves that Harvard owns. Inevitably, long-term legal complications exist for any accumulation of such an in-demand public good. Additionally, difficulty exists in forecasting water reserves in the long-term - especially in drought stricken areas such as central California. In the end, the value of the water might be considered as the added value via cash flows from water-intensive agricultural output as well as land price appreciation due to surrounding water scarcity - a potentially substantial sum in water-challenged areas.

One figure we do have a firm grasp on is the value of Harvard's California vineyards as of 2018, which rest at a hefty \$305M in total. While it's impossible to compute a concrete rate of return due to their opaque acquisition practices, it's clear that making strategic bets on agricultural land containing concentrated water reserves has paid off to some degree. With water scarcity growing into an even more drastic issue, it remains to be seen how the endowment will handle its water investments going forward.

4. Trends and future projections

Water investments are becoming more and more popular among investors due to the increasing demand for water, corresponding to the growth of the world's population. It is expected that by 2050 it will increase by 2 billion, reaching almost 10 billion people (Glazer, 2020). In addition to the booming population the rising demand for water is aggravated by climate change, water pollution and lack of sufficient infrastructure (Glazer, 2020). For example, 13.7% of daily household water usage in the US and almost 25% in the UK is lost through leaks due to the aging infrastructure (Killik & Co, 2015).

According to the United Nations Environment Program, half of the human population will face severe water stress by 2030 (UN Environment, 2016). The World Resource Institute has predicted that by 2025 66% of the world will live in water-stressed areas (Killik & Co, 2015). In order to keep spigots running, annual expenditures need to be increased from the historical average of about \$40 billion to \$200 billion dollars (UN Environment, 2016). People are already facing this water crisis dying from the lack of drinking water, while situation is becoming worse and worse:

- One in 3 people (2.2 billion) lack access to safe, readily available water (World Health Organization, 2019).
- Six out of 10 people lack safely managed sanitation (United Nations Sustainable Development, 2018).
- 2 million people, mostly children, die every single year either from lack of water or from disease they got from tainted drinking water (Water Scarcity | Threats | WWF, 2020).

- 2.7 billion people live without access to fresh water at least 1 month per year (Water Scarcity | Threats | WWF, 2020).

Obviously, since 2000 there has been some improvement in the delivery of the basic water utilities: 2.1 billion people have gotten access to basic sanitation services and 1.8 billion people have gained access to drinking water services (World Health Organization, 2019). However, due to all the factors mentioned above water demand is still rising faster than the supply and the 40% gap between the demand and supply is projected to emerge by 2030 (Killik & Co, 2015).

In order to cut the costs related to the possible rise of water price, many companies are starting to reduce their water consumption. Drinks brand Diageo cut its water usage by almost 1 million cubic metres between 2013-14; whilst Lafarge, a cement-maker, carries out risk assessments of its river basins in the areas it operates. The brewer, SABMiller has reduced its water “footprint” by over 20%; and Levi-Strauss, known for its jeans, is now using 96% less water than just a few years ago (Killik & Co, 2015).

Research by Trucost (S&P Global, 2015) suggests that more than half of the profits of the world’s biggest companies would be at risk if water was priced to reflect its true value. That could be one of the reasons why Microsoft is experimenting with putting its data centres beneath the ocean (to cool naturally) and an increasing number of companies are signing up to CDP (Carbon Disclosure Project), an investor-led data transparency organisation on the environment.

Consequently, water investments are becoming more and more popular among investors who identified this trend. One of the recent trends is the creation of the Water markets where the forwards and options on water could be bought and sold. An example is Australian water market Waterbind (Gray, 2019). Possibly as the size of the water investment market grows, more such marketplaces will emerge in the nearest future. However, for now the main kind of water investments is investing in the shares of the water utilities companies. Here are some of the promising sectors in that industry:

- New treatment technologies (e.g. Evoqua),
- Smart water networks (e.g. Danaher),
- Desalination systems,
- Non-revenue water products,
- Metering solutions,
- Outsourcing systems
- Testing equipment.

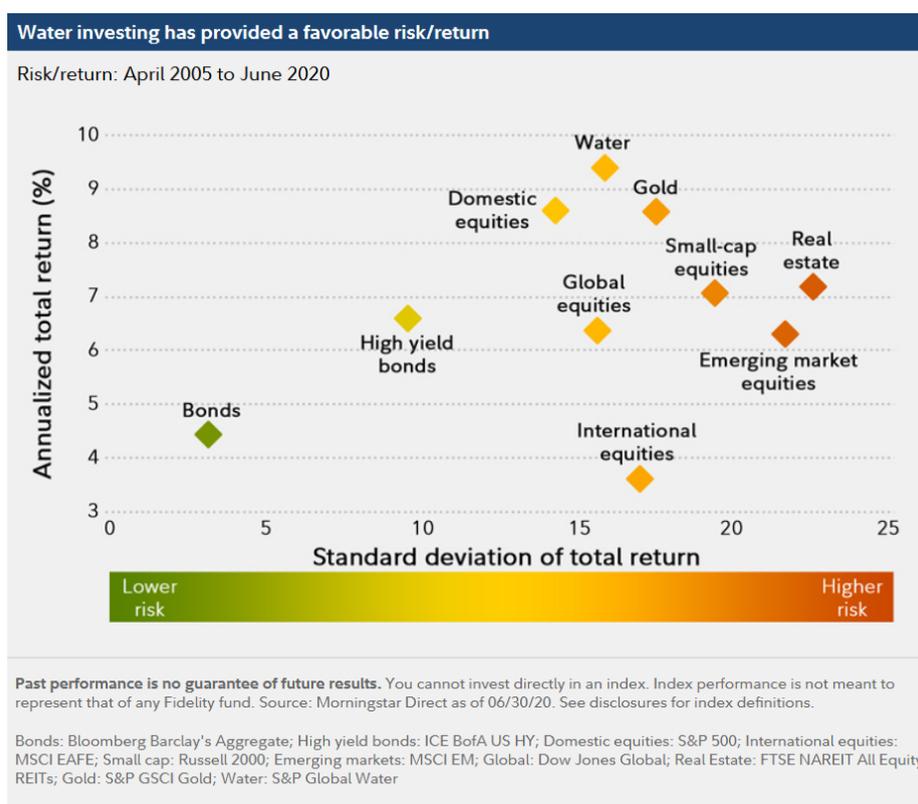
Water treatment involves the purifying of polluted water and wastewater through its life cycle to remove harmful contaminants and the buildup of harmful deposits. The industry is estimated to grow 4%–6% per year in a long-time (Glazer, 2020). The market of desalination systems is also growing fast, as some 183 countries currently rely on desalination for at least part of their freshwater consumption needs (McWhinney, 2021).

The companies producing bottled water might be a good opportunity for long-term investment as well. The demand for bottled water is growing internationally. Estimates suggest that from 2007 to 2017 American per-capita consumption of bottled water increased 61%—the average American drinks approximately 45 gallons of bottled water a year (Rodwan, 2020).

Another obvious trend in the water investments industry is buying the water-rich farmland away from large governmental and infrastructural limitations as does Michael Burry (from “the Big Short”): “What became clear to me is that food is the way to invest in water. That is, grow food in water-rich areas and transport it for sale in water-poor areas. This is the method for redistributing water that is

least contentious, and ultimately it can be profitable, which will ensure that this redistribution is sustainable” (Killik & Co, 2015).

Multiple researches show water investments could significantly improve the overall performance of the portfolio. According to the internal analysis conducted by KBI, adding a water E.T.F. to an already diverse portfolio both increased its overall return and reduced its risk (Gray, 2019). From the investment point of view the water assets are also becoming the target for the governments as these investments can bring not only a direct profit from the utilities or goods sold, but also increase the wealth of the countries through the improvement of their citizens life facilities and health. According to the United Nations every dollar invested in water and sanitation brings countries four-fold return in costs (UN News, 2014).



Source: (Glazer, 2020)

5. Geographical Distribution

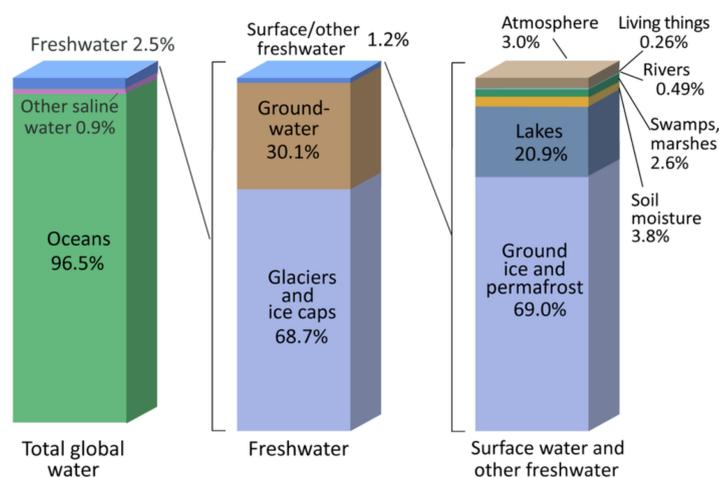
Water, even though it covers 71% of the earth surface, is a scarce resource, with only 326 million cubic miles of water on the planet. Out of this, only 3% is fresh water, but only 0.5% is readily available fresh water, the rest being locked up in glaciers, polar ice caps, atmosphere and soil; all of those highly polluted or lying too far under the earth's surface to be extracted at an affordable cost. This supply is continually collected, purified, and distributed in the natural hydrologic (water) cycle. The remaining 97% is water from the oceans, which is too salty for drinking, growing crops and useless for most industrial activities except for cooling.

This 0.5% amounts to an average of 8.4 million liters (or 2.2 million gallons) for each person on earth. However, as we will come to see, this water is very inequality distributed. An average American uses over 100,000 gallons of water a year, which makes them reach their individual quota by the age of

22. In contrast, an average individual in South Sudan will use 933 gallons of water a year, which would enable them to spend a few lifetimes on their allowance.

So where does this fresh water come from? Most of it comes from the ground; either from thousands of year old reserves which contain millions of gallons of untouched fresh water or from water which infiltrates into the ground through porous materials deeper into the earth (as an example, more than half the people in the U.S. get their water from groundwater). It fills pores and fractures in layers of underground rock called aquifers. Some of this water lies too far under the earth's surface to be extracted at an affordable cost. The rest is from surface-water runoff - precipitation that does not infiltrate into the ground or return to the atmosphere: streams, rivers, lakes, wetlands, and reservoirs.

Where is Earth's Water?



Source: (The distribution of water on, in, and above the Earth, 2021)

The top countries with freshwater resources are listed on the basis of the stats from the United Nations Environment Programme are given below:

1. **Brazil - Freshwater (Cubic Kilometre): 8,233**

Brazil has the highest freshwater resources in the world which accounts for approximately 12% of the world's freshwater. It is simply because the Amazon region of this country contains 70% of the total freshwater.

2. **Russia - Freshwater (Cubic Kilometre): 4,508**

Russia has the second largest freshwater reserve which is approximately 20% of freshwater in the world.

3. **United States of America - Freshwater (Cubic Kilometre): 3,069**

The USA is the third country in the world which has the largest freshwater reserve. There are more than 100 lakes; and Lake Superior, Lake Ontario, Lake Michigan, and Lake Erie are the major lakes.

4. **Canada - Freshwater (Cubic Kilometre): 2,902**

This is the fourth country in the world which has the largest freshwater reserve. Here, freshwater is found in its diverse river system and lakes.

5. **China - Freshwater (Cubic Kilometre): 2,840**

This is the fifth country in the world which has the largest freshwater reserve. Poyang Lake which is situated in Jiangxi Province is the largest freshwater lake in China.

6. **Colombia - Freshwater (Cubic Kilometre): 2,132**

This is the sixth country in the world which has the largest freshwater reserve.

7. **European Union - Freshwater (Cubic Kilometre): 2,057**

It hosted million kilometres of rivers and streams and more than a million lakes but unfortunately each water body has its own characteristics and specific environmental problems.

The current water situation in Europe, according to a European Commission brochure, is described as: 20% of all surface water in the EU is seriously threatened with pollution; Ground water supplies around 65% of all Europe's drinking water; 60% of European cities overexploit their ground water resources; 50% of wetlands have "endangered status" due to groundwater overexploitation; The area of irrigated land in southern Europe has increased by 20% since 1985.

8. **Indonesia - Freshwater (Cubic Kilometre): 2,019**

Although it has one of the largest freshwater reserves, it has recently been facing increasing freshwater supply problems, particularly on the islands of Java and Sumatra where the demand for freshwater is the highest. Freshwater consumption is dominated by the agricultural sector, which uses 98% of Indonesia's water resources.

9. **Peru - Freshwater (Cubic Kilometre): 1,913**

Latin America plays a key role because it has the world's largest supply of freshwater and Peru is the ninth country in the world which has the largest freshwater reserve.

10. **India - Freshwater (Cubic Kilometre): 1,911**

India constitutes 16% of the world's population, has only 2.5% of the world's land area and 4% of the world's freshwater resources at its disposal.

To this day, water use is still very unevenly distributed, as an example in the US, water usage is:

- 8% domestic use
- 33% agriculture
- 59% industry

6. Practicality

As stated, Water is an asset which has seen growing interest and relevance in recent times. With the growing importance of Water as an asset, we already see a lot of options for investments in terms of Water Stocks and ETFs. The following options are available for investing :

- Invesco Global Water ETF (PHO)
- First Trust Water ETF (FIW)
- Invesco S&P Global Water Index ETF (CGW)
- American Water Works Co. Inc. (AWK)
- York Water Co. (YORW)
- California Water Service Group (CWT)
- Evoqua Water Technologies Corp. (AQUA)

Apart from Investments, there are multiple indexes to track various water-related investment opportunities :

- The **Dow Jones U.S. Water Index** is composed of approximately 29 stocks; it is a barometer consisting of a large number of international and domestic companies that are affiliated with the water business and have a minimum market capitalization of \$150 million.
- The **ISE-B&S Water Index** was launched in January 2006, and this index represents water distribution, water filtration, flow technology, and other companies that specialize in water-related solutions. It contains over 35 stocks.
- The **S&P 1500 Water Utilities Index** is a sub-sector of the Standard & Poor's 1500 Utilities Index; this index is composed of just two companies, American States Water (NYSE: AWR) and Aqua America (NYSE: WTR).

- The **S&P Global Water Index** is an 11-year-old index that contains 50 companies around the world; their water-related businesses fall into two areas: utilities and infrastructure, and equipment and materials.

Most of the governments are also focused on water investments and infrastructure. President Biden's infrastructure bill includes \$55 billion for water infrastructure and other water system related investments. Investing in water could be a good long-term bet for those concerned about its sustainability. It is also a good option for environmentally focused investors. Although, one way water investments differ from those in some other sectors is their greater exposure to regulatory and political risk. In the developed world, water supplies are often closely regulated, and in the United States, governments are both big customers and potential competitors.

Some of the Funds and Fund Managers in this space with their returns are :

1. Martin Conroy (KBI Water A EUR)
2. Matthew Sheldon (KBI Water A EUR)
3. Justin Winter (BNP Paribas Aqua C C)
4. Dieter Küffer (RobecoSAM Sustainable Water Eqs D)
5. Arnaud Bisschop (Thematics Water I/A USD)

How To Invest in Water Commodities

A look at the holdings of any of the water indexes provides an easy way to begin your search for suitable investment opportunities. Companies from blue-chip stalwart General Electric to small-cap Layne Christensen are all seeking a piece of the water market. In addition to direct stock purchases, some of the larger firms offer dividend reinvestment plans. Firms seeking to profit from water-related businesses include beverage providers, utilities, water treatment/purification firms, and equipment makers, such as those that provide pumps, valves, and desalination units. When it comes to bottled water, the market is growing internationally. Demand is on the rise from China to Mexico, following in the footsteps of the spike in U.S. consumer demand. Estimates suggest that from 2007 to 2017 American per-capita consumption of bottled water increased 61%—the average American drinks approximately 45 gallons of bottled water a year. On the desalination front, some 183 countries currently rely on desalination for at least part of their freshwater consumption needs.

If stock picking doesn't interest you, ETFs, mutual funds, and unit investment trusts (UITs) also provide plenty of opportunities to invest in water. The Invesco Water Resource Portfolio ETF (PHO) is the largest, with a U.S.-centric basket of 38 holdings (as of March 2020) that tilts toward mid- and small-cap companies. The iShares Dow Jones U.S. Utilities Index ETF (IDU) provides some exposure to water-related stocks. Other new alternatives include the Invesco Global Water Portfolio ETF (PIO), which tracks the Nasdaq OMX Global Water Index, and the First Trust ISE Water Index Fund (FIW). Based on popularity, new alternatives are slowly emerging.

Additionally, two-unit investment trusts that specialize in water-related investments are the Claymore-Boenning & Scattergood Global Water Equities UIT and the Claymore-Boenning & Scattergood U.S. Water Equities portfolio.

Some of the popular World Water Funds are :

1. The Latin American Water Funds - Website -> <https://www.fondosdeagua.org/en/>
2. Water WIP Fund -> Website -> <https://wip.fi/en/services/wip-water-fund>
3. Water Asset Management, LLC -> Website -> https://waterinv.com/investment_vehicles
4. Water Equity -> Website -> <https://waterequity.org>
5. Global Water Funds -> Website -> <https://globalwaterfund.com>

Bibliography

- Usgs.gov. 2021. *The distribution of water on, in, and above the Earth*. [online] Available at: <<https://www.usgs.gov/media/images/distribution-water-and-above-earth>> [Accessed 14 November 2021].
- . 2021. [online] Available at: <<https://www.usbr.gov/mp/arwec/water-facts-ww-water-sup.html>> [Accessed 14 November 2021].
- Patnauniversity.ac.in. 2021. [online] Available at: <<https://www.patnauniversity.ac.in/e-content/science/geology/Distribution%20of%20water%20on%20the%20Earth.pdf>> [Accessed 14 November 2021].
- Millenniumassessment.org. 2021. [online] Available at: <<https://www.millenniumassessment.org/documents/document.276.aspx.pdf>> [Accessed 14 November 2021].
- Ryan Barnes for CapitalCube | Aug 25, 2., 2021. *Water - The World's Most Important Commodity*. [online] Wealth Management. Available at: <<https://www.wealthmanagement.com/etfs/water-worlds-most-important-commodity>> [Accessed 14 November 2021].
- Allianz Global Investors White Paper Series. 2013. "Water: A Key 21st-Century Growth Opportunity". [online] Available at : <https://www.allianz.com/content/dam/onemarketing/azcom/Allianz_com/press/knowledge/finance/water_a_key_21st_century_growth_opportunity.pdf>
- Buckingham, R. 2008. "Water will become the Oil of the 21st Century" in Institute for Agriculture & Trade Policy. [online] Available at : <<https://www.iatp.org/news/water-will-become-the-oil-of-the-21st-century>>
- Harding, A. 2021. "Madagascar on the brink of climate change-induced famine". BBC News. [online] Available at : <<https://www.bbc.com/news/world-africa-58303792>>
- Hutton G. and M. Varughese. 2016. "The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene, WSP". The World Bank Group.
- Obaid, Ahmed T. 2001. "Footprints and Milestones: Population and Environmental Change - The State of World Population 2001". United Nations Population Fund.
- OECD. 2011." Benefits of Investing in Water and Sanitation: An OECD Perspective".
- Perry, G. 2021. "The Futures of Water". *Chicago Magazine*. [online] Available at : <<https://www.chicagogmag.com/chicago-magazine/february-2021/two-minute-guide-the-futures-of-water/>>
- The World Bank. 2016. "High and Dry: Climate Change, Water and the Economy".
- The World Bank. 2016. "Water Overview".
- UNDP Human Development Report. (2006). "Beyond scarcity: Power, poverty and the global water crisis"
- WHO-UNICEF. 2017. "Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines".
- World Health Organization. 2011. "Guidelines for Drinking-water Quality". [online] Available at : <http://apps.who.int/iris/bitstream/handle/10665/44584/9789241548151_eng.pdf;jsessionid=60DDCBE8D413213825C82EB609D2CF37?sequence=1>

Nasdaq. 2021. Nasdaq Veles Water Indexes: A Clear Solution for Water Price Discovery. [online] Available at: <<https://www.nasdaq.com/solutions/nasdaq-veles-water-index>> [Accessed 14 November 2021].

Yahoo Finance. 2021. First Trust Water ETF. [online] Available at: <<https://finance.yahoo.com/quote/FIW?p=FIW&.tsrc=fin-srch>> [Accessed 14 November 2021].

Yahoo Finance. 2021. Invesco Water Resources ETF. [online] Available at: <<https://finance.yahoo.com/quote/PHO?p=PHO&.tsrc=fin-srch>> [Accessed 14 November 2021].

Killik & Co. 2015. Why Michael Burry is Investing in Water | Killik & Co. [online] Available at: <<https://www.killik.com/the-edit/why-michael-burry-is-investing-in-water/>> [Accessed 16 November 2021].

Gray, T., 2019. As Fresh Water Grows Scarcer, It Could Become a Good Investment (Published 2019). [online] Nytimes.com. Available at: <<https://www.nytimes.com/2019/07/11/business/fresh-water-shortage-invest.html>> [Accessed 16 November 2021].

Glazer, J., 2020. Global water crisis | Investing in sustainable water | Fidelity. [online] Fidelity.com. Available at: <<https://www.fidelity.com/learning-center/trading-investing/investing-in-water>> [Accessed 16 November 2021].

UN Environment. 2016. Half the World to Face Severe Water Stress by 2030 unless Water Use is "Decoupled" from Economic Growth, Says International Resource Panel. [online] Available at: <<https://www.unep.org/news-and-stories/press-release/half-world-face-severe-water-stress-2030-unless-water-use-decoupled>> [Accessed 16 November 2021].

UN News. 2014. Every dollar invested in water, sanitation brings four-fold return in costs – UN. [online] Available at: <<https://news.un.org/en/story/2014/11/484032-every-dollar-invested-water-sanitation-brings-four-fold-return-costs-un#.WUqtiRPYuQ5>> [Accessed 16 November 2021].

McWhinney, J., 2021. Water Investments: How to Invest in Water. [online] Investopedia. Available at: <<https://www.investopedia.com/articles/06/water.asp>> [Accessed 16 November 2021].

Rodwan, J., 2020. Bottled Water 2020: Continued Upward Movement. [online] Bottledwater.org. Available at: <https://bottledwater.org/wp-content/uploads/2021/07/2020BWstats_BMC_pub2021BWR.pdf> [Accessed 16 November 2021].

World Health Organization. 2019. 1 in 3 people globally do not have access to safe drinking water – UNICEF, WHO. [online] Available at: <<https://www.who.int/news/item/18-06-2019-1-in-3-people-globally-do-not-have-access-to-safe-drinking-water-unicef-who>> [Accessed 16 November 2021].

United Nations Sustainable Development. 2018. Water and Sanitation. [online] Available at: <<https://www.un.org/sustainabledevelopment/water-and-sanitation/>> [Accessed 16 November 2021].

World Wildlife Fund. 2020. Water Scarcity | Threats | WWF. [online] Available at: <<https://www.worldwildlife.org/threats/water-scarcity>> [Accessed 16 November 2021].

Spglobal.com. 2015. [online] Available at: <<https://www.spglobal.com/esg/trucost>> [Accessed 16 November 2021].

Finance.harvard.edu. 2021. [online] Available at: <https://finance.harvard.edu/files/fad/files/fy19_harvard_financial_report.pdf> [Accessed 18 November 2021].

Valdmanis, R., 2021. Harvard buys up water rights in drought-hit wine country. [online] U.S. Available at: <<https://www.reuters.com/article/harvard-water/harvard-buys-up-water-rights-in-drought-hit-wine-country-idUSL1N0V02Z320150122>> [Accessed 18 November 2021].

Emerging Assets Team

Publication date: 02-12-2021

Title: Water; an untraditional investment

**EMERGING
ASSETS**



Gold, R., 2021. Harvard Quietly Amasses California Vineyards—and the Water Underneath. [online] WSJ. Available at: <<https://www.wsj.com/articles/harvard-quietly-amasses-california-vineyardsand-the-water-underneath-1544456396>> [Accessed 18 November 2021].