Impacts of Climate Change: Freshwater Availability

Introduction

Freshwater is an essential resource, meaning without it you and I wouldn't be able to survive. According to BBC "water demand globally is projected to increase by 55% between 2000 and 2050" [8]. This drastic increase will mainly be fueled by the agriculture demand that will also be increasing in the coming decades, but current anthropogenic effects on climate change do nothing to alleviate this projected problem. We will discuss the effects of climate change on freshwater availability and the human contribution to that issue.

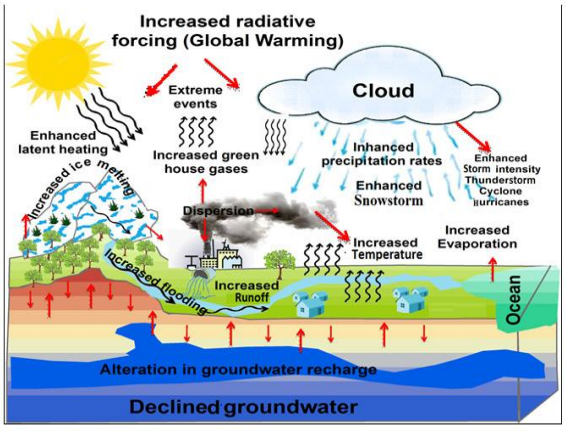
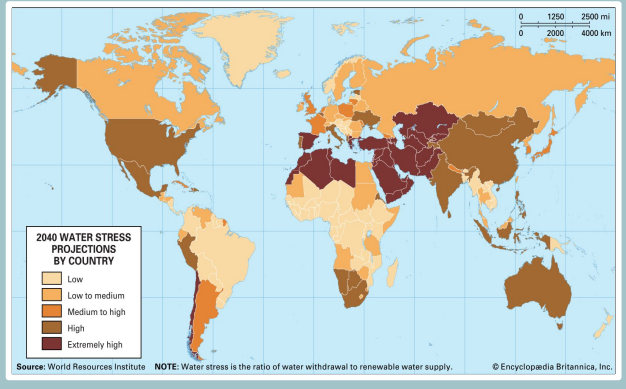


Fig. 2 Influences of global hydrological cycle in context of climate change

The figure depicts that as global climate change, specifically global warming, continues, the access to fresh groundwater declines, thus creating problems on how to access freshwater [7].

How Current Global Change is Negatively Impacting Freshwater Availability: Anthropogenic Effects

It is no secret that humans facilitate climate change. As a result, humans negatively impact freshwater availability. The quality as well as quantity can be doctored by anthropogenic effects. According to the journal, *Water International,* "Alteration of the landscape and associated vegetation has not only changed the water balance, but typically has altered processes that control water quality" [4]. When humans use, modify, and destroy land with freshwater beneath it, the water can be diminished and altered, rendering it undrinkable and inaccessible. Freshwater in glaciers and ice caps are also negatively impacted by human activity. An article from *Climate Home News* explains the benefits glaciers would experience without human activity, "without anthropogenic forcing, the glaciers would stabilise at slightly higher elevations, and eventually stop losing mass." [6]. The availability of freshwater would not decrease nearly as much if not for anthropogenic forces.



These projections show the water scarcity in the next 20 years in each country. [5] Many of the countries with high scarcity, like the U.S., China, Saudi Arabia, and Pakistan produce a majority of the world's freshwater from groundwater.

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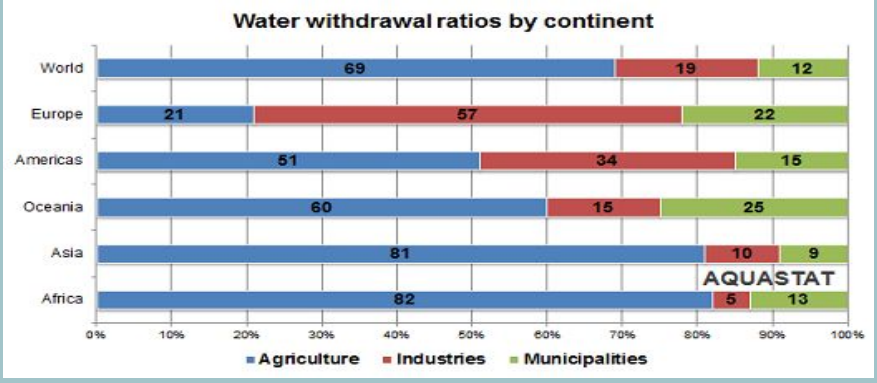
Almost 70% of available freshwater is used for agriculture. With rapid population increase, by 2050, water withdrawal for agriculture may rise by 15% [2] Thus, insufficient water supply may lead to food shortages as well

Graph Source: http://www.fao.org/aquastat/en/overview/methodology/water-use



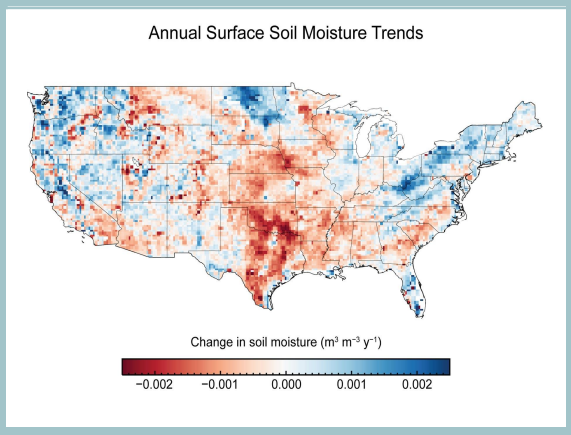
How climate change will impact humans &/or wildlife in the near future

Humans

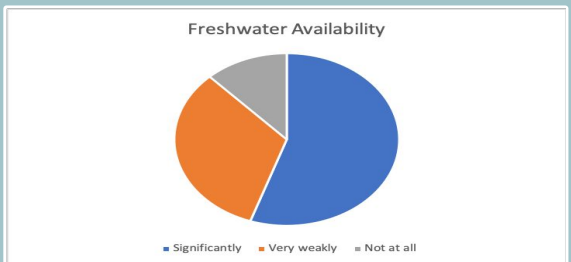
- changing patterns in precipitation may lead to increased occurrence and intensity of droughts, hurricanes, or flooding [10]
- With climate change decreasing overall availability of freshwater, the lack of water for crops and daily life, may eventually lead to economic downturn [3]
- Reduced freshwater availability contributes of poverty and increased health risks

Wildlife

- Some aquatic species rely on timing and volume of water for reproduction but are thrown off due to decreased snowpack depth and extent [10]
- Human negligence due to agricultural runoff, industrial waste, and untreated human waste can increase the salinity of the water, damaging wildlife ecosystems [3]
- Increased salinity can also lead to dead zones and higher risk of disease in aquatic species [10]



According to an Annual Surface Soil Moisture trend from the National Climate Assessment, over the time between 1988 to 2010, the soil has become dryer; thus, affecting various resources like freshwater availability [9].



Public Perception of results of 333 respondents conducted in Spring 2020 to the query. The phenomenon will intensify in the next 30 years as global climate change continues because individuals rely on freshwater each day [11].

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