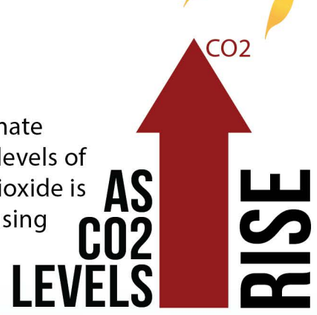
WHAT DOES CLIMATE CHANGE REALLY MEAN?

Jean-Michel Cousteau's Ocean Futures Society

AT A GLANCE

Humans are responsible for the acceleration of climate change by the burning fossil fuels, which increase levels of carbon dioxide (CO2) in the atmosphere. Carbon dioxide is a greenhouse gas that traps heat from the sun, causing **the temperature of our planet to rise and our oceans to acidify.**



EXTREME HEAT

An increase in *average* temperature could mean local temperature rises of up to 10 degrees C or more, depending on location. Consider this: during the last global ice age, Earth was only 5 degree C (10 degrees F) cooler. Not only is heat a concern for people, but many ocean species cannot tolerate such a rapid increase in ocean temperatures to sustain their survival.

OCEAN ACIDIFICATION

When carbon dioxide interacts with water, the chemistry of the oceans change. This rise in acidity negatively affects coral reefs, fishes, certain invertebrates and plankton - the foundation of the entire food web - ***threatening global food security.***

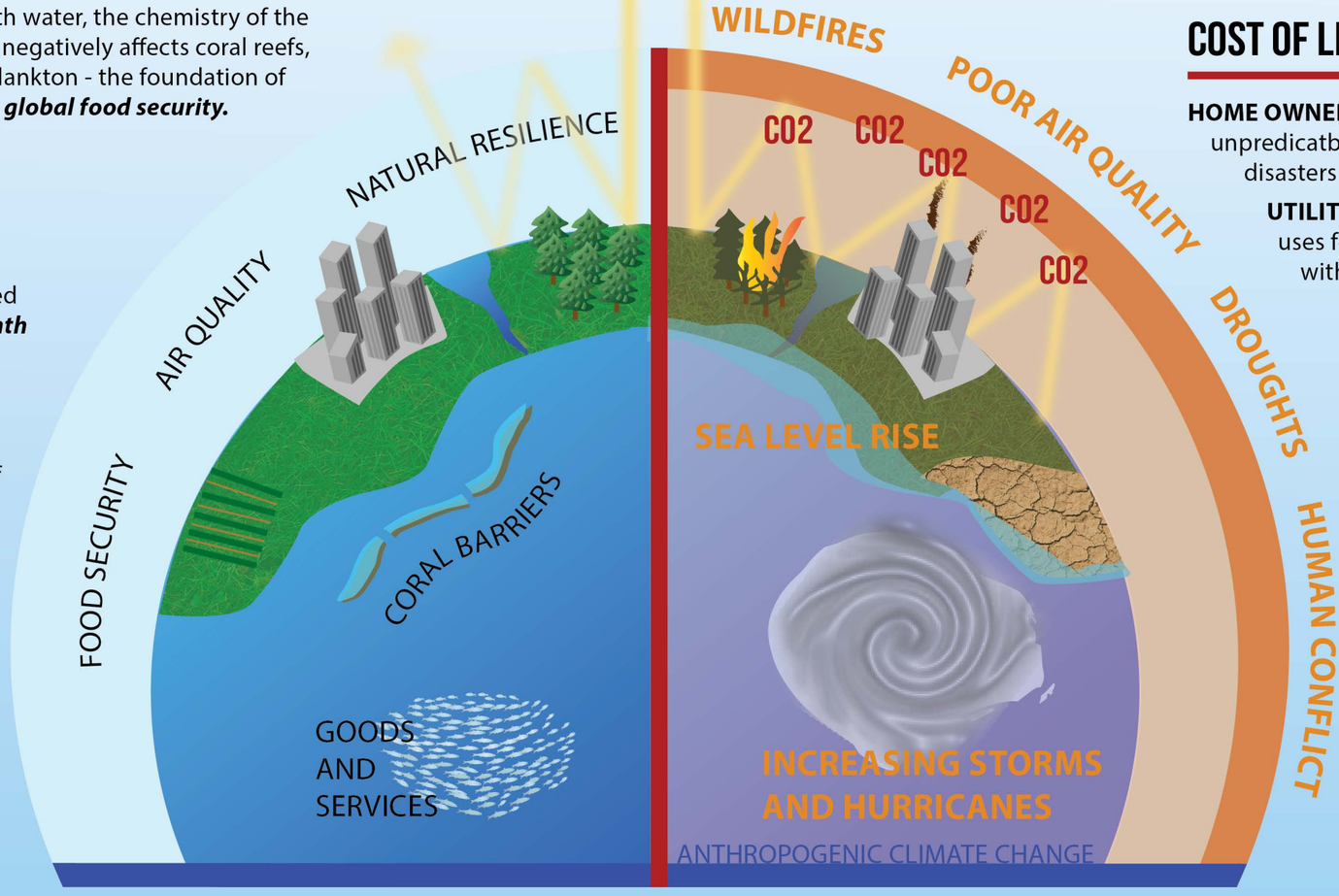
AT RISK

ECONOMY - The oceans are valued at $24 trillion, making it the ***seventh largest economy in the world***[1]**.**

COASTAL CITIES -
Presently, 40% of the world's populations lives within 100km of the coast. As sea levels rise due to warming, expanding oceans and glacial melting, over two thirds of the world's largest cities (>5 million people) are at least partially in low-lying areas, placing over 650 million people at risk by the end of the century[2].

GLOBAL EQUITY -
The unequal effects of climate change will contribute to greater inequality among people of the world. Low-lying islands and impoverished countries will suffer more greatly due to lack of resources to deal with major droughts, water and resource scarcity, among others changes.

EARHT'S CAPACITY TO STABILIZE -
The planet has long been regulated by numerous feedback mechanisms. For example, the oceans have been absorbing 90% of the excess heat from by greenhouse gasses, including carbon dioxide, since 1955. Through time, the oceans have been absorbing less of that heat, meaning it's capacity to act as a buffer is decreasing.[4]



THE OCEANS COVER 71% OF EARTH

PROVIDE OVER HALF THE OXYGEN ON THE PLANET

REDISTRIBUTE HEAT FROM EQUATOR TO POLES

ABSORB OVER HALF EXCESS CARBON EMISSIONS

EXCHANGE HEAT AND CHEMICALS AMONG WORLD

OCEANS AND CLIMATE ARE ONE

IMPACTS TO PEOPLE

The impacts of climate change will disrupt nearly every natural systems on Earth, from the availability of food, water, to the natural resources used to build our cities and create our products, to the species and ecosystems that protect our coastlines and stabilize our planet: ***climate change will change our quality of life.***

PUBLIC HEALTH

POOR AIR QUALITY - Sunlight, warm air, and pollution from power plants and cars combine to produce ground-level ozone, known as smog. Air pollution is already respsinsible for 3.3 million deaths per year, and that number will only increase. The U.S. is estimated to pay up to $5.4 billions dollars in health impact costs associated with increased ozone levels[5]. Furthermore, increasing CO2 levels propogate plants, causing more allergens in the air.

SPREADING DISEASE - Scientists expect a warmer world to bring greater risk of disease. Insects normally stopped by cold winters can travel further north and warmer oceans could increase cholera outbreaks and harmful bacteria in seafood. Temperature increase of 2-3 degrees C could put an estimated 150 million more people at risk of contracting malaria alone[6].

COST OF LIVING

HOME OWNERS INSURANCE - Insurance prices are expected to rise as unpredicatble weather patterns and stronger, more frequent natural disasters impact homes and livelihoods.

UTILITIES - Larger fluctuactions in weather will result in increasing uses for AC and heat. In the U.S., this trend has already been seen with the polar vortex and persistent cold weather event in 2014.

GLOBAL SECURITY

RESOURCE CONFLICT - The availability of water and other resources is expected to dimish from extreme weather and rising pollution levels, leading to global resource conflict.

MASS MIGRATIONS- As weather fluctuations disrupt food and critical resouces, and sea levels rise, people in vulnerable regions will be forced to move to survive.

BIODIVERSITY

MASS EXTINCTIONS - The rapid changes on Earth are threatening our planet. **We have lost over half of the world's wildlife populations in less than 40 years.**[7] We are loosing essential habitats and species that could hold cures to diseases, innovations in bio-technology, provide resilience to disasters and stabilize our planet.

FOOD AND WATER SECURITY

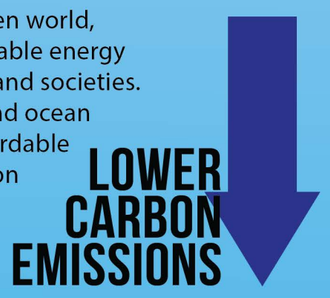
AGRICULTURE - Heat and water stress from climate change will negatively impact global food production, predicted to lower crop yields up to 25% by 2050.[8] Food processing, transport, and storage will also be affected.

FISHERIES - Over 90% of all large fish species are gone. Warmer, more acidic oceans will increase ocean species losses, fisheries declines and direct impacts to jobs, livelihoods, economic opportunity and food.

FRESHWATER - As unpredictable episodes of worsening drought and stronger storms occur, freshwater resources can become contaminated, leading to fresh water scarcity, with repercussions to nature systems and to our health, societies, and industries.

SOLUTIONS

1. **TECHNOLOGY** created our carbon driven world, and we have the technologies in renewable energy to transition to low-carbon economies and societies. Sustainable energy using solar, wind, and ocean currents are becoming increasingly affordable and energy efficient. We need to focus on **SMARTER SUSTAINABLE ENERGY TECHNOLOGY**



2. **EMBRACE NATURAL SYSTEMS** and their value to human health, services, and quality of life. We must change our mindset about the environment and realize 'mother nature' is worth more than what we can exploit from it. We depend on healthy and biodiverse ecosystems for our species to thrive. There is an infinite amount for humans to learn, appreciate, and mimic from the ingenuity of nature, by **INTEGRATING THE HEALTH OF NATURE AS PART OF HUMAN WELL-BEING**

3. **RESTORE, PROTECT, AND PREVENT** further environmental degradation. The planet we live on supports us: from oxygen and nutrients to stabilizing the temperature on Earth, allowing us survive in an otherwise desolate universe. The planet is home to all of us, and we must ensure its health for the future of humans. Restoring ecosystems, establishing protected areas so nature may replenish, and preventing exploitation and pollution are benefits to both the planet and us. As Jean-Michel Cousteau always says,

"WHEN YOU PROTECT THE OCEANS, YOU PROTECT YOURSELF"

SOURCES:

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