

# DO YOU BELIEVE OUR SURVIVAL ON PLANET EARTH IS BEING THREATENED? pdf

## 1: Stephen Hawking Says Humanity Won't Survive Without Leaving Earth

*Do you believe our survival on planet Earth is being threatened? Kitsap Unitarian Universalist Fellowship, Bremerton, WA, Rev. Liz Stevens,*

Chemistry Many astrobiologists believe that if we find living organisms on other planets in our solar system and elsewhere in the universe, they will be recognizable to us as life. They believe that the properties of carbon that allowed it to become the basis for all life on Earth are unique to that atom. The variety of types of chemical bonds that can be formed by carbon make it able to be the basis of complex chains of different molecules. No other atom seems to be able to do this in a similar way. Even silicon, which has the same number of valence electrons as carbon, cannot form the variety of molecules that carbon can. However, this does not mean that all life would necessarily be based on DNA and cells, as it is on Earth. Water is another very likely requirement for life to arise. Any life which is based on molecules almost certainly requires some kind of liquid solvent to be able to move them around. Although chemical reactions can take place in gases and solids these are much less ideal than liquid. Gas phase reactions happen only with molecules that are volatile enough to be present in large quantities in a gas. Reactions can take place in solids, but occur very slowly. Both of these limitations make it much more likely for life to develop in liquid, as indeed it seems to have on Earth. Water has many unique physical and chemical properties that make it well suited to support the complex chemistry required for life. Expanding when it freezes keeps oceans and lakes on Earth from freezing solid. Water can dissolve many substances easily and it also has a high heat capacity, which means it takes a lot of energy to cause water to change temperature. This property of water gives Earth its relatively moderate climate. Water is also the second most common molecule in the universe after H<sub>2</sub>. Other liquids exist naturally in the universe, but not in the sort of abundance water does.

Habitable Zone Many astrobiologists believe that in order for life to arise and survive, it must be found on a planet or moon within the habitable zone of a star. The habitable zone refers to the region around the star in which liquid water can form and remain liquid. The size of the star is important as well. Stars that are much larger than the Sun have such short lifetimes, that it is unlikely that there would be enough time for any kind of life, particularly complex life, to develop. The diagram below from Wikipedia compares the habitable zone of the Sun and a much smaller star, Gliese. The larger and more luminous a star, the farther away its planets must orbit to be in the habitable zone. Planets in the habitable zone of small stars may still not be habitable because these planets are so close to their star, they are tidally locked. This means that the gravitational attraction that keeps them in orbit around the star has caused the planet to always have one face of the planet facing the towards star and the other facing away. This would most likely cause the side facing the star to be too hot for liquid water to exist, and the other side would be too cold. Our Sun seems to be just the right size to allow life to develop. It is small enough to have a long lifetime, but large enough that a planet can exist in the habitable zone and maintain rapid rotation as it orbits. The strong gravitational pull caused by large planets and tidal interactions between orbiting moons may produce enough energy to heat the cores of these moons. Under certain circumstances, this energy might be enough to keep at least parts of a moon warm enough to support liquid water, even if the moon was too far away from the star to be in the habitable zone created by the star. The Milky Way also has its own habitable zone. The center of the Milky Way is much more dense with stars than the outer regions. Nearby supernova explosions are much more frequent, and the radiation would sterilize any planets with life in that region. Stars very close to center of the galaxy would receive intense x-ray radiation from the supermassive black hole at the center of the galaxy, and life would be very unlikely to be able to develop in such an environment. These very old stars have very few heavy elements, and so these stars would be less likely to have planets, and less likely to have the complex chemistry required for life. In addition, we are fortunate that our star continues to remain in the habitable zone as it has done for billions of year. Many stars in the galaxy orbit with more eccentric orbits, so although they may cross the habitable zone from time to time, they probably do not remain

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long enough for life to arise and survive long term. Solar System Clean-Up Another key ingredient to the formation of life seems to be having a large planet - like Jupiter - in a planetary system. Because Jupiter is so much more massive than all the other planets, it attracts many asteroids, comets and other objects that travel within the Solar System. This is important because otherwise, some of these objects would end up crashing into Earth, and many did in the very early formation of the Solar system. This keeps the carbon dioxide levels in the atmosphere from getting too high or too low. If the levels become too high, as they did on Venus they act as a greenhouse gas and the planet becomes too hot. Liquid water evaporates and the surface of the planet dries up. If the levels become too low, the planet cools and an ice age begins.

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### 2: What Are The Requirements For Life To Arise And Survive? | Las Cumbres Observatory

*Do you believe our survival on planet Earth is being threatened? YO: No. if somebody or something seems to be threatening our survival, take it as a warning and take care of it. We are.*

Expert says Humans are not from Earth “ we were brought on the planet by Aliens tens of thousands of years ago. Some experts say that people were most likely crossbred with other species. Perhaps from the star system Alpha Centauri “ which is one of the closest solar systems to Earth “ in the distant past, giving birth to modern humans. This ancient document is the writing of the Sumerians and the Egyptian hieroglyphs for almost one hundred years. The ability to write this language is one of the first ways in which man differed from the animal kingdom. We know that humans developed electricity, divided the atom, developed computers, and led man to the moon. Can you imagine, if, for some reason, mankind had to return to the jungle, and survive there? Experts say that most of them would not survive for a very long period of time. Scientists say that people are not very capable to have a big range of environments. People, unlike animals, have fascinating intelligence. Biologists have found the contrast between human physiology and that of other animals on earth. Experts say that compared to other species on earth, humans are rather strange. For example, a baby giraffe when is born is able to walk and function almost independently. A human baby can not, which makes us quite helpless. We are born before being neurologically ready for life. Human beings did not evolve alongside other lifeforms on Earth. In the book written by Dr. Ellis, humans might suffer from back pain because our species initially evolved on another planet with a lower gravity. It is strange that newborns have large heads and make it difficult for mothers to give birth, which can result in fatalities for both mother and child. So what do you think, where do we come from? Ellis thinks that mankind did not evolve from that particular strain of life, but was transported to Earth as fully evolved Homo sapiens between 60, and , years ago. Where did Rh negative blood come from? Is it possible to explain this by a rather controversial theory? With a few holding on to the memories and knowledge of the past race. We are in fact only just beginning to rediscover the profound wisdom of past civilizations. Sepher thinks that we are like an awakening Species with Amnesia, learning to reclaim our forgotten past.

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## 3: Scientific Facts on Water Resources

*Earth is home to millions of species. Just one dominates it. Us. Our cleverness, our inventiveness and our activities have modified almost every part of our planet. In fact, we are having a*

These five megatrends present major global threats for planet Earth - problems that must be solved if the world is to remain a supportive habitat for humans and other species. DW looks at causes and possible solutions. Air pollution and climate change. Overloading of the atmosphere and of ocean waters with carbon. Atmospheric CO<sub>2</sub> absorbs and re-emits infrared-wavelength radiation, leading to warmer air, soils, and ocean surface waters - which is good: The planet would be frozen solid without this. Burning of fossil fuels, deforestation for agriculture, and industrial activities have pushed up atmospheric CO<sub>2</sub> concentrations from parts per million ppm years ago, to about ppm today. Carbon overloading is only one form of air pollution caused by burning coal, oil, gas and wood. The World Health Organization recently estimated that one in nine deaths in were attributable to diseases caused by carcinogens and other poisons in polluted air. Replace fossil fuels with renewable energy. Reduce emissions from agriculture. The good news is that clean energy is abundant - it just needs to be harvested. Many say a percent renewable-energy future is feasible with existing technology now. Barriers in policy and finance remain to be overcome. Cities plagued by air pollution The big smog: Cities plagued by air pollution Beijing, China The Chinese capital has been suffering from smog so heavy that scientists say the city is almost uninhabitable - although it is home to 20 million people. Models suggest that 3. Having said this, it might be a surprise to learn that smog is an even bigger problem in other cities across the world. The smog is caused primarily by the high volume of road traffic, rubbish incineration and dust from the surrounding deserts. Cities plagued by air pollution New Delhi, India In the nearly 10 million-strong city of New Delhi, the number of cars has increased from , to 3. They contribute to around 80 percent of the total air pollution in the city. Cities plagued by air pollution Riyadh, Saudi Arabia Sandstorms, like here in Riyadh, can contribute to smog forming because they increase the amount of particles in the air. In a place like Saudi Arabia, the intense ultra-violet rays also transform transport and industry emissions into ozone. Cities plagued by air pollution Cairo, Egypt The poor air quality in Cairo causes a number illnesses among city residents, like chronic respiratory problems and lung cancer. The reason for the air pollution is an increase in road traffic and the booming industrial sector. Cities plagued by air pollution Dhaka, Bangladesh According to a study by the Max-Planck Institute in Mainz, some 15, people die every year in Dhaka due to air pollution. Cities plagued by air pollution Moscow, Russia Even if it looks the same the world over, smog is different, depending on the city. Smog in Moscow, for instance, is characterized by high amounts of hydrocarbons. The westerly winds which regularly plow across Moscow mean that the western part of the city generally has better air quality. Cities plagued by air pollution Mexico City, Mexico The smog in Mexico City is made worse by the geographical location. The city is surrounded on three sides by mountains. Due to the high levels of sulfur dioxide and hydrocarbons in the air, Mexico City was long considered one of the most polluted cities in the world. The situation is now improving due to new transport policies and certain factories being shut down. Species-rich wild forests are being destroyed , especially in the tropics, often to make way for cattle ranching, soybean or palm oil plantations, or other agricultural monocultures. This requires strong governance - but many tropical countries are still developing, with increasing populations, uneven rule-of-law, and widespread cronyism and bribery when it comes to allocating land use. In , some 27, square kilometers went up in flames - a global negative record. Burning down the Amazon Trading wood for wheat Intensified soy and wheat cultivation are partly to blame for the destruction of the rainforest. Destruction there rose by percent between August and June , according to the Amazon Institute. Near the city of Novo Progresso alone, some hectares of forest were torched. The Teles Pires hydropower plant on the Amazon tributary of the same name is due to start operation in Burning down the Amazon Good business? Once it is cleared, the timber is sold. The illegally cleared areas in the Amazon region are often used by cattle breeders as pasture

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land. The costs of clearing a forested area are estimated at around 3, euros 4, US dollars per hectare. Burning down the Amazon Fines for felling trees This settler has been caught red-handed by the police. He illegally cut down trees in Jamanxim National Park. In , the agency issued fines of roughly half a billion euros. This year, the figure is likely to be even higher. Burning down the Amazon Where trees are products Last year, the Brazilian government announced it would limit the destruction of the rainforest until to less than 4, square kilometers per year by increasing patrols. But an ever-growing number of trees is lost to lumberjacks, gold diggers and agricultural companies. The illegally felled jungle giant pictured here was discovered near the city of Novo Progresso in Jamanxim National Park. In the rainy season, the highway often turns into an impassable mud track. Small farmers and gold prospectors have settled along the gash cut through the jungle, pushing out the original inhabitants from their traditional areas of settlement. Burning down the Amazon Fleeing the gold-diggers The gold rush is threatening their lives. Hundreds of Yanomami have died from diseases brought into their areas by prospectors. In June this year, the Brazilian army destroyed illegal airstrips in the nearly 9. Burning down the Amazon Origin of barbecue charcoal Black gold: The illegally felled trees are turned into charcoal. This aerial image was taken from a police helicopter during a patrol in September On land, wild animals are being hunted to extinction for bushmeat, ivory, or "medicinal" products. At sea, huge industrial fishing boats equipped with bottom-trawling or purse-seine nets clean out entire fish populations. The loss and destruction of habitat are also major factors contributing to a wave of extinction - unprecedented in that it is caused by a single species: Not only do species inherently deserve to exist, they also provide products and "services" essential to human survival. Think bees and their pollinating prowess - necessary for growing food. Concerted efforts need to be made to prevent further loss of biodiversity. Protecting and restoring habitats is one side of this - protecting against poaching and wildlife trade is another. This should be done in partnership with locals, so that wildlife conservation is in their social and economic interest. Looming extinction crisis Looming extinction crisis times faster The American black bear is one of more than 22, species threatened with extinction. During the past century, animals have been disappearing about times faster than they used to, scientists from different American universities warned in a new study. According to the WWF, around 70 species go extinct every day. Looming extinction crisis In the red According to the International Union for Conservation of Nature - which publishes a "red list" of threatened and endangered species - 41 percent of amphibian species and 26 percent of mammals are facing extinction. This Titicaca water frog, found only in Lake Titicaca in South America, used to be present in the millions in the early s. By now, they have disappeared almost completely. Looming extinction crisis Pollution, deforestation, climate change The causes of species loss are mostly manmade. They range from climate change, to pollution, to deforestation and beyond. About 2, trees have been cut down every minute during the past 40 years, according to a different study. The modern rate of species loss was compared to "natural rates of species disappearance before human activity dominated. Looming extinction crisis Fossils as reference The study is based on documented extinctions of vertebrates - or animals with internal skeletons - from fossil records and other historical data. In earlier extinction events, such as the Ice Age, only two out of 10, mammals died out per century - such as this primordial horse. Looming extinction crisis Threatened ecosystems As species disappear, so do crucial services, such as pollination of crops by honeybees. Looming extinction crisis Humankind at risk If the current rate of extinction is allowed to continue, "life would take many millions of years to recover and our species itself would likely disappear early on," wrote lead author Gerardo Ceballos of the Universidad Autonoma de Mexico. Looming extinction crisis Need for accelerated action The study calls for "rapid, greatly intensified efforts to conserve already threatened species, and to alleviate pressures on their populations - notably habitat loss, over-exploitation for economic gain and climate change. About 12 million hectares of farmland a year get seriously degraded, according to UN estimates. A wide range of soil conservation and restoration techniques exist, from no-till agriculture to crop rotation to water-retention through terrace-building. Whether this will be done in a way equitable to all people around the globe, remains an open question. They ensure that the humus layer stores nutrients and water. When the earth turns to dust Sealed over As cities around the

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world expand, fertile land is disappearing under concrete and asphalt. Microorganisms are suffocated under this artificial surface, and above it rainwater flows away rather than seeping into the soil. Large areas can dry out, and ploughing can dislodge the top layer so that it is blown away by the wind. When the earth turns to dust Ongoing desertification Depletion of the soil through deforestation, over-fertilization and overgrazing can turn land into desert. Climatic factors like drought become a catalyst in a chain reaction - that is set in motion by human activity. When the earth turns to dust Exhausted land Monoculture plantations need large amounts of fertilizer and pesticides to remain productive. When the earth turns to dust Widespread contamination Whether resulting from industrial leakage, disaster or weapons, or from years of over-fertilization: According to official sources in China, nearly one-fifth of agricultural land there is contaminated. When the earth turns to dust Resource extraction The earth is also dug up to get to raw materials. This photo from Germany shows how brown coal mining strips away the topsoil. Through resource extraction, land that could provide wildlife habitat, or be used for agriculture or human habitation, is lost. When the earth turns to dust New life It takes 2, years for nature to produce a centimeter 4-inch layer of fertile soil that holds water and nutrients, and where plants can grow. To protect fertile soils worldwide, the United Nations has declared International Year of Soils.



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### 4: BBC - Earth - How many people can our planet really support?

*This Sunday is Earth Day, and while it's a time to celebrate our planet, it's also a prime opportunity to take a closer look at the serious environmental issues we're facing and the.*

Changes in atmospheric composition and consequent global warming. Rich countries with high population densities have low rates of infant mortality. It results in human threats including the evolution and spread of antibiotic resistant bacteria diseases, excessive air and water pollution, and new viruses that infect humans. Increased chance of the emergence of new epidemics and pandemics. However, rich countries with high population densities do not have famine. Poverty and inflation are aggravated by bad government and bad economic policies. Many countries with high population densities have eliminated absolute poverty and keep their inflation rates very low. However, this problem can be reduced with the adoption of sewers. For example, after Karachi, Pakistan installed sewers, its infant mortality rate fell substantially. Laws regulate and shape politics, economics, history and society and serve as a mediator of relations and interactions between people. It was even speculated by Aldous Huxley in that democracy is threatened due to overpopulation, and could give rise to totalitarian style governments. David Attenborough described the level of human population on the planet as a multiplier of all other environmental problems. According to Paul R. We want to build highways across the Serengeti to get more rare earth minerals for our cellphones. We grab all the fish from the sea, wreck the coral reefs and put carbon dioxide into the atmosphere. We have triggered a major extinction event A world population of around a billion would have an overall pro-life effect. This could be supported for many millennia and sustain many more human lives in the long term compared with our current uncontrolled growth and prospect of sudden collapse If everyone consumed resources at the US level " which is what the world aspires to " you will need another four or five Earths. Williams [] argue that third world poverty and famine are caused in part by bad government and bad economic policies. Resources[ edit ] Youth unemployment is also soaring, with the economy unable to absorb the spiraling numbers of those seeking to enter the work force. Many young people do not have the skills to match the needs of the Egyptian market, and the economy is small, weak and insufficiently industrialized Instead of being something productive, the population growth is a barrel of explosives. It also depends on how resources are managed and distributed throughout the population. The resources to be considered when evaluating whether an ecological niche is overpopulated include clean water , clean air, food, shelter, warmth, and other resources necessary to sustain life. If the quality of human life is addressed, there may be additional resources considered, such as medical care, education, proper sewage treatment , waste disposal and energy supplies. Overpopulation places competitive stress on the basic life sustaining resources, [] leading to a diminished quality of life. With the global population at about 7. Weather patterns, elevation, and climate all contribute to uneven distribution of fresh drinking water. Without clean water, good health is not a viable option. Besides drinking, water is used to create sanitary living conditions and is the basis of creating a healthy environment fit to hold human life. In addition to drinking water, water is also used for bathing, washing clothes and dishes, flushing toilets, a variety of cleaning methods, recreation, watering lawns, and farm irrigation. Irrigation poses one of the largest problems, because without sufficient water to irrigate crops, the crops die and then there is the problem of food rations and starvation. In addition to water needed for crops and food, there is limited land area dedicated to food production, and not much more that is suitable to be added. Arable land, needed to sustain the growing population, is also a factor because land being under or over cultivated easily upsets the delicate balance of nutrition supply. There are also problems with location of arable land with regard to proximity to countries and relative population Bashford Access to nutrition is an important limiting factor in population sustainability and growth. No increase in arable land added to the still increasing human population will eventually pose a serious conflict. Although plants produce 54 billion metric tons of carbohydrates per year, when the population is expected to grow to 9 billion by , the plants may not be able to keep up Biello. Food

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supply is a primary example of how a resource reacts when its carrying capacity is exceeded. By trying to grow more and more crops off of the same amount of land, the soil becomes exhausted. Because the soil is exhausted, it is then unable to produce the same amount of food as before, and is overall less productive. Therefore, by using resources beyond a sustainable level, the resource become nullified and ineffective, which further increases the disparity between the demand for a resource and the availability of a resource. There must be a shift to provide adequate recovery time to each one of the supplies in demand to support contemporary human lifestyles. There is a need to develop renewable energy resources. Scientific Challenges in the Coming Century.



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## 5: Why Is Biodiversity Important? Who Cares? – Global Issues

*Climate change is the Big Kahuna of all scenarios in which our presence on Earth is ended. Despite what the climate change deniers would have you believe, climate change is real.*

By Colin Barras 23 March All things must pass. That includes life on Earth, which will surely be wiped out eventually. But how long does it have? The fossil record tells us that life on Earth has lasted at least 3. In that time it has survived being frozen, clobbered by rocks from space, mass poisoning, and even lethal radiation. Which of them will finally render the Earth barren? Probably the nearest life has come to ultimate destruction was million years ago, during the end-Permian mass extinction. Lava smothered an area eight times the size of the UK No one is quite sure what happened, but it seems to be no coincidence that the extinction coincided with volcanic activity on a truly apocalyptic scale. Today we worry about the destructive power of supervolcanoes like Yellowstone. But the damage they might bring is nothing compared to what happened million years ago. Back then, Siberia experienced such a large and sustained period of activity that lava smothered an area eight times the size of the UK. Volcanic activity on that scale is rare, but not unheard of. No one knows when the next such episode will happen, says Henrik Svensen at the University of Oslo in Norway. But one will surely happen eventually, and when it does the key question will be where it goes off. The killer ingredient might have been salt. When they were baked by the volcanic activity, Svensen thinks they released vast quantities of ozone-destroying chemicals into the atmosphere. Species all over the world then had to cope with harmful radiation from space that atmospheric ozone normally soaks up. The stress might well have killed most of them. The bad news is that there are plenty of massive salt deposits on Earth today. After all, while plants and animals fared poorly during the end-Permian extinction, single-celled organisms like bacteria sailed through virtually unharmed. Again, that might depend on exactly where the rock lands. We know that the Earth has been hit by some very large asteroids that have barely registered as life destroyers. Impacts on the scale of the dinosaur killer are rare The Manicouagan crater in Canada - one of the largest impact craters on the planet - was created in a destructive impact about million years ago. That might be because the crater formed in relatively inert crystalline rock. Craters that form in volatile-rich sedimentary rocks, in contrast, might send clouds of climate-changing gases into the atmosphere , triggering global mass extinctions. The good news is that impacts on the scale of the dinosaur killer are rare. Such big rocks may only strike Earth once every million years. But even if one does come along, mass extinction is unlikely to become mass sterilisation. That would probably only be possible if Earth was hit by something even bigger than an asteroid: There might be a precedent for that. Some scientists think Earth was clobbered by a rogue planet soon after it formed, and that the resulting cloud of debris formed the Moon. Still, this possibility seems pretty remote. When the core freezes over Timeframe: Mars once had, and then lost, a magnetic field The Core is mostly nonsense and has been rightly derided by scientists. But not all of the science it features is junk. If they are right, then without a magnetic field our planet will lose its atmosphere too, and all life will die. Something like this may have happened on Mars, which may once have been more hospitable to life than it is now. In , Joseph Kirschvink at the California Institute of Technology in Pasadena and his colleagues found good evidence that Mars once had, and then lost, a magnetic field. These flips have happened periodically for millions of years. For that to happen the core would have to completely solidify. Currently only the inner core is solid, while the outer core is liquid. View image of Gamma-ray bursts have been tentatively linked to past extinctions Credit: Another life destroyer could be to blame: Many regions of space may have been rendered inhospitable to life GRBs are formed by intense explosions in space, for instance when a giant star explodes or two stars collide. They can last a fraction of a second, or several minutes. But our neighbourhood may be OK. GRBs happen more often near the centre of the galaxy and in regions where stars are densely packed, and Earth is far away from both. About million years ago, many species were wiped out in the Ordovician-Silurian extinction , which some scientists have suggested was triggered by a GRB. In even more good news, the rate that GRBs

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occur is decreasing. James Annis at Fermilab in Batavia, Illinois did some number-crunching for this story, and estimates that the average galaxy will now experience just 5 to 50 GRBs every billion years. Since the Milky Way is big, the chances of any coming near Earth are slim. Even if a rogue GRB did hit Earth, Annis thinks it would be very unlikely to wipe out all life, because sea water is an excellent radiation shield. But what would happen if another star came barrelling through? The idea might sound implausible, but in February researchers led by Eric Mamajek at the University of Rochester in New York announced that it has happened – and surprisingly recently. It passed through a region called the Oort cloud, a sparse cluster of small, icy lumps that lies far beyond the planets. Astronomers have identified other stars on a collision course with the solar system in the next few million years. Hip is due in our neighbourhood in , to , years, while GL will arrive in about 1. Even so, could it, or Hip , threaten life on Earth? In a word, no. Things could get hairy if one of those rogue stars went supernova. Either star could push some of the small objects in the Oort cloud onto a collision course with Earth. In theory, things could get hairy if a larger rogue star went supernova as it passed through the Oort cloud, sending gamma rays into the inner solar system. Ten times nearer, times more intense," says Bailer-Jones. A rogue star would also be more dangerous if it passed through the inner parts of the solar system, where the planets are found. But this is again unlikely. There are almost certainly organisms that could survive nearly any cataclysm. Researchers can hypothesise almost no end of threats to life on Earth. February was evidently apocalypse month: There is nothing to fear but life itself. Timeframe: The microbes living on Earth could not cope, and a massive extinction followed. He calls the idea the Medea hypothesis. The name is a nod to the famous Gaia hypothesis, named for the Greek goddess of the Earth, which suggests that life helps keep Earth habitable. Medea, in stark contrast, is a Greek mythological figure famous for killing her own children. For instance, about 2. There had never before been free oxygen, so the microbes living on Earth could not cope with it, and a massive extinction followed. Then there were the first land plants, about million years ago. Plant roots broke up bedrock into soil, speeding up the chemical reaction between minerals in those rocks and carbon dioxide in the atmosphere. This stripped carbon dioxide from the atmosphere and weakened the greenhouse effect, triggering a lethal ice age. The sun is getting hotter as it ages, and as a consequence the Earth will warm up. Alien forensic scientists might well conclude that life on Earth had a hand in its own demise. Eventually, so much carbon dioxide will have been removed from the air that plants can no longer perform photosynthesis. This could happen surprisingly soon, says Ward, perhaps in just million years. No one single event is going to do it. Alien forensic scientists might well conclude that life on Earth had a hand in its own demise. Our home star bathes us in light, and supplies the energy for almost all the life on Earth. As we saw earlier, the Sun is gradually getting hotter. This process might begin in about a billion years , and would wipe out all but the most resistant microorganisms. Beginning around 5 billion years from now, the Sun will expand, becoming a swollen star called a red giant. So the expanding Sun will engulf, and destroy, the Earth. The Sun will lose mass as it grows, so Earth will spiral further out. If any humans are still around, they might have the technology to move the Earth to safety. Otherwise, life on Earth has a maximum life expectancy of 7.

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### 6: BBC - Earth - How long will life survive on planet Earth?

*Our home star bathes us in light, and supplies the energy for almost all the life on Earth. But it won't be friendly forever. As we saw earlier, the Sun is gradually getting hotter.*

From a cost perspective p. What the global economy would look like with nature on the balance sheet What is the world worth? Despite these free benefits, it has long been recognized that we tend to ignore or underestimate the value of those services. So much so that economic measures such as GDP often ignores environmental costs. The economic benefits of protecting the environment are well-understood, even if seemingly rarely practiced: Numerous studies also show that investments in protected areas generate a cost-benefit ratio of one to 25 and even one to in some cases, [Pavan Sukhdev, from TEEB] said. Planting and protecting nearly 12, hectares of mangroves in Vietnam costs just over a million dollars but saved annual expenditures on dyke maintenance of well over seven million dollars. Save At Least Half the Planet, or Lose It All , Inter Press Service, November 17, It has perhaps taken about a decade or so “ and a severe enough global financial crisis that has hit the heart of this way of thinking “ to change this mentality in which time, more greenhouse gases have been emitted “ inefficiently. Economists talk of the price signal that is fundamental to capitalism; the ability for prices to indicate when a resource is becoming scarcer. At such a time, markets mobilize automatically to address this by looking for ways to bring down costs. As a result, resources are supposedly infinite. Running out of resources should therefore be averted. The price signal also implies the poorest often pay the heaviest costs. For example, commercially over-fishing a region may mean fish from that area becomes harder to catch and more expensive, possibly allowing that ecosystem time to recover though that is not guaranteed, either. This then has an impact on various local social, political and economic issues. In addition to that, other related measurements, such as GNP are therefore flawed, and even reward unproductive or inefficient behavior e. Efficiently producing unhealthy food “ and the unhealthy consumer culture to go with it “ may profit the food industry and a private health sector that has to deal with it, all of which require more use of resources. Our continued inefficient pumping of greenhouse gases into the environment without factoring the enormous cost as the climate already begins to change is perhaps an example where price signals may come too late, or at a time when there is already significant impact to many people. Resources that could be available more indefinitely, become finite because of our inability or unwillingness to change. Markets fail to capture most ecosystem service values. Existing price signals only reflect - at best - the share of total value that relates to provisioning services like food, fuel or water and their prices may be distorted. Even these services often bypass markets where carried out as part of community management of shared resources. The values of other ecosystem services are generally not reflected in markets apart from a few exceptions such as tourism. In addition, their benefits are felt differently by people in different places and over different timescales. Private and public decisions affecting biodiversity rarely consider benefits beyond the immediate geographical area. They can also overlook local public benefits in favor of private benefits, even when local livelihoods are at stake, or focus on short-term gains to the detriment of the sustained supply of benefits over time. Benefits that are felt with a long-term horizon e. Values that are not overtly part of a financial equation are too often ignored. In effect, as TEEB , and many others before have argued, a key challenge will be adapting our economic systems to integrate sustainability and human well-being as well as other environmental factors to give us truer costs after all, market systems are supposed to work when there is full availability of information. Think of some of the effects this could have: A reduction in meat production could protect forests or help reduce clearance of forests for cattle ranches, which would have a knock-on benefit for climate change concerns. Appropriate investment in renewable energy could threaten the fossil fuel industry though they are trying to adapt to that perhaps slowly, and after initial resistance. But at the same time, governments that are able to use renewable sources are less likely to find themselves spending so many resources in geopolitical areas e. Cradle to cradle type of design “ where

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products are designed to be produced and recycled or disposed of more sustainably” could considerably reduce costs for producers and consumers alike, and possibly reduce stress on associated ecosystems. Land that is used to produce unhealthy or marginally nutritious items e. For example, while factoring in environmental costs could make healthy produce more expensive too, expanding production of healthier foods could help contain costs rises to some extent. How much would such accounting save? It is hard to know, but there is a lot of waste in the existing system. In the mids, the Institute for Economic Democracy calculated that as much as half the American economy constituted of wasted labor, wealth and resources book: Naturally, those who benefit from the current system may be hostile to such changes, especially if it may mean they might lose out. This is a clear case of inter-related issues:

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## 7: The Extinction Crisis

*So a move to another planet does not offer an imminent answer to our problems. For the foreseeable future, Earth is our only home and we must find a way to live on it sustainably.*

By Vivien Cumming 14 March Overpopulation. It is a word that makes politicians wince, and is often described as the "elephant in the room" in discussions about the future of the planet. You often hear people citing overpopulation as the single biggest threat to the Earth. But can we really single out population growth in this way? Are there really too many people on our planet? It is clear to all of us that the planet is not expanding. There is only so much space on Earth, not to mention only so many resources – food, water and energy – that can support a human population. View image of Earth is not getting any bigger Credit: Just 10, years ago there might have been no more than a few million people on the planet. The one billion mark was not passed until the early s; the two billion mark not until the s. According to United Nations predictions it could reach 9. Population growth has been so rapid that there is no real precedent we can turn to for clues about the possible consequences. In other words, while the planet might hold over 11 billion people by the end of the century, our current level of knowledge does not allow us to predict whether such a large population is sustainable, simply because it has never happened before. We can get clues, though, by considering where population growth is expected to be strongest in the years ahead. Satterthwaite says that most of the growth over the next two decades is predicted to be in urban centres in what are currently low and middle-income countries. It is not the number of people on the planet that is the issue – but the number of consumers and the scale and nature of their consumption On the face of it, the global impact of adding several billion people to these urban centres might be surprisingly small. This is because urbanites in low- and middle-income countries have historically consumed little. The emissions of carbon dioxide and other greenhouse gases give us a good indication of how high consumption is in a city. Copenhagen is the capital of a high-income nation – Denmark – while Porto Alegre is in upper-middle-income Brazil. Living standards are high in both cities, yet per capita emissions are relatively low. View image of Copenhagen: There are many low-income urban dwellers whose consumption is so low that they contribute almost nothing to greenhouse gas emissions. But the world is changing. Low-income urban centres may not continue on low-carbon development trajectories. The real concern would be if the people living in these areas decided to demand the lifestyles and consumption rates currently considered normal in high-income nations; something many would argue is only fair. If they do, the impact of urban population growth could be much larger. This fits with a general pattern that has played out over the past century or so, explains Will Steffen , an emeritus professor with the Fenner School of Environment and Society at the Australian National University. It is not the rise in population by itself that is the problem, but rather the even more rapid rise in global consumption which of course is unevenly distributed. This leads to an uncomfortable implication: Only when wealthier groups are prepared to adopt low-carbon lifestyles, and to permit their governments to support such a seemingly unpopular move, will we reduce the pressure on global climate, resource and waste issues. A study in the Journal of Industrial Ecology looked at environmental impact from a household perspective. It puts consumption firmly in the spotlight. Diana Ivanova at the Norwegian University of Science and Technology in Trondheim, the author of the study, explains that the finding comes from simply changing our perspective on who is responsible for emissions associated with producing consumer goods. For instance, consumers in the west might argue that countries that produce many consumer goods, such as China, should take responsibility for the emissions needed to make them. Ivanova and her colleagues argue the consumers themselves are just as responsible. View image of Our society depends on manufacturing Credit: So Steffen suggests that we should stabilise the global population, hopefully at around nine billion, and then begin a long, slow trend of decreasing population. That means reducing fertility rates. The trends are so deeply set, he says, that even a dramatic catastrophe might not change their course. What is urgently needed, then, is ways to speed up the decline in fertility rates.

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One relatively easy way to do so might be to raise the status of women, especially in terms of their education and employment opportunities, says Steffen. If some or all of us consume a lot of resources, the maximum sustainable population will be lower. The UN Population Fund has calculated that million women in the poorest countries did not want their last child, but did not have the means to prevent the pregnancy. So if a world population of 11 billion is probably unsustainable, how many people, in theory, could Earth support? Bradshaw says that it is nearly impossible to say what this number would be, because it is entirely dependent on technologies like farming, electricity production and transport and on how many people we are willing to condemn to a life of poverty or malnutrition. View image of A shanty town in Mumbai, India Credit: In support of this, they point to the problems of climate change, the biodiversity extinction crisis underway, mass ocean pollution, the fact that one billion people are already starving and that another one billion people have nutrient deficiencies. In the early 20th Century, the global population problem was as much about the fertility of soil as the fertility of women. A UN report summarised 65 different estimated maximum sustainable population sizes. The most common estimate was eight billion, a little larger than the current population. But the estimates ranged from as few as two billion to, in one study, a staggering 1, billion. These estimates all depend on so many assumptions that it is difficult to say which is closest to the truth. Ultimately the real determinant is how we choose to run our society. If some or all of us consume a lot of resources, the maximum sustainable population will be lower. If we find ways to each consume less, ideally without sacrificing our creature comforts, Earth will be able to support more of us. Changes in technology, which are often wildly unpredictable, will also affect the maximum population. In the early 20th Century, the global population problem was as much about the fertility of soil as the fertility of women.



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### 8: Humans will be extinct in years says eminent scientist

*Most population experts think planet Earth can support about 10 billion people, and that when our population reaches that number, it will start to decline. This will likely happen by the year*

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### 9: Population and Sustainability: Can We Avoid Limiting the Number of People? - Scientific American

*"Our only chance of long-term survival is not to remain inward-looking on planet Earth, but to spread out into space." Humans stuck on Earth are at risk from two kinds of catastrophes, Hawking said.*

Before we even get into the solutions, we all regardless of political party need to come to the realization that yes, climate change is real and yes, it is affecting us in ways that we can see and feel. Furthermore, even small temperature changes are causing crops to die, decreasing the amount of food available. On top of all that, higher temps are causing the polar icecaps to melt, flooding certain areas and leading to an imbalance for wildlife. So we know the threat is real, but what can we do to prevent climate change from being exacerbated even more? On a more global scale, leaders have come to an agreement on how to curb harmful greenhouse gases – even if the US is the only country not participating – and steps are being taken to plant more forests which act as natural carbon sinks. Deforestation We mentioned planting more forests above, and sadly at a time when we need more forests, trees are being uprooted at an alarming rate. Deforestation is a rapidly-growing problem in areas like Africa, Central and South America. Removing trees also leads to much drier climates, as trees extract groundwater to release into the air. If rainforests are so important, why are they being destroyed so carelessly? Luckily, deforestation is an issue that we as individuals can combat. Last but not least, why not plant a tree or even a hundred trees like this man did. This need for manufactured items also leads to the air and water pollution emitted from factories, which in many countries are highly unregulated. Looking at the bigger picture, government oversight and sloppy industrial practices on the part of big companies has also exacerbated our pollution problem. The first thing we can all do to reduce the amount of pollution in our streets, air and water is to make a mental change. Before buying a new product, ask yourself if you really need it or if you might be able to purchase it secondhand. It could make a big difference in the amount of trash we see in our landfills. If everyone adopted these easy principles, the world would be in a much better place. Loss of Biodiversity Each species has a role in our planet, and when one dies out, it can have catastrophic effects on the rest of us. Currently, many other animals are in danger of becoming extinct, either from being forced out of their habitats by man or by climate change. This particular problem is more difficult for individuals to combat but we can start by educating ourselves with the facts and donating to organizations like the World Wildlife Fund that facilitate the preservation of animals on the brink of extinction. This problem is also closely linked to deforestation and unchecked habitat destruction so by fighting those two issues, we can also slow down loss of biodiversity. At that rate, the Arctic could be totally ice-free in the summer season within decades. And if all of that ice melted, where would it go? You guessed it – our oceans. Manhattan alone has already dreamt up ways to deal with the potential rising tides over the next few years, but coming up with solutions after the fact is not enough. In order to reverse the melting of polar icecaps, we have to start at the root of the problem. See our section above on climate change to learn what you can do personally to keep global warming from continuing on its deadly course. Oceanic Dead Zones Along the coasts of heavily populated communities, scientists have found more and more dead zones – areas where depleted oxygen levels cannot support marine life. The good news is that dead zones can be reversed, though it is difficult. To find out more about how you can help with dead zone cleanups, visit Oceana. If everyone were more conscious of the fact that our limited resources need to be shared how many times have you grabbed a fistful of paper napkins when you only needed one? Another example is our world food supply. While we might not be able to stop the population from growing, we can educate the people who currently live here and the new ones that are being born to make smarter choices and consume more responsibly.

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