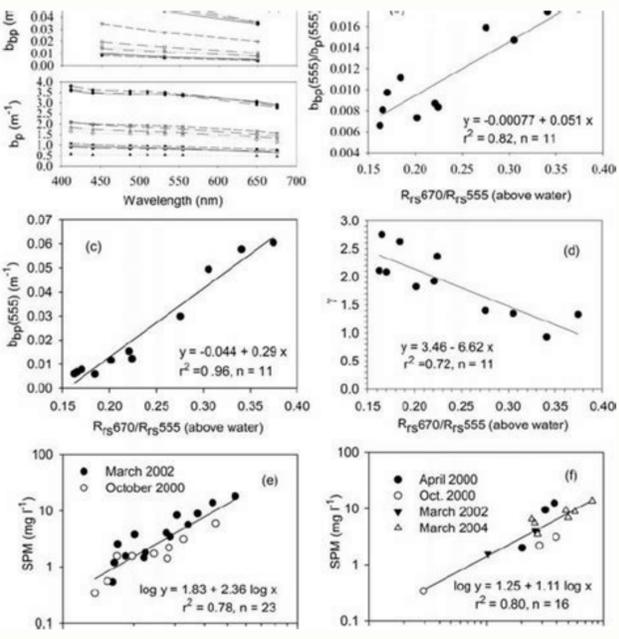
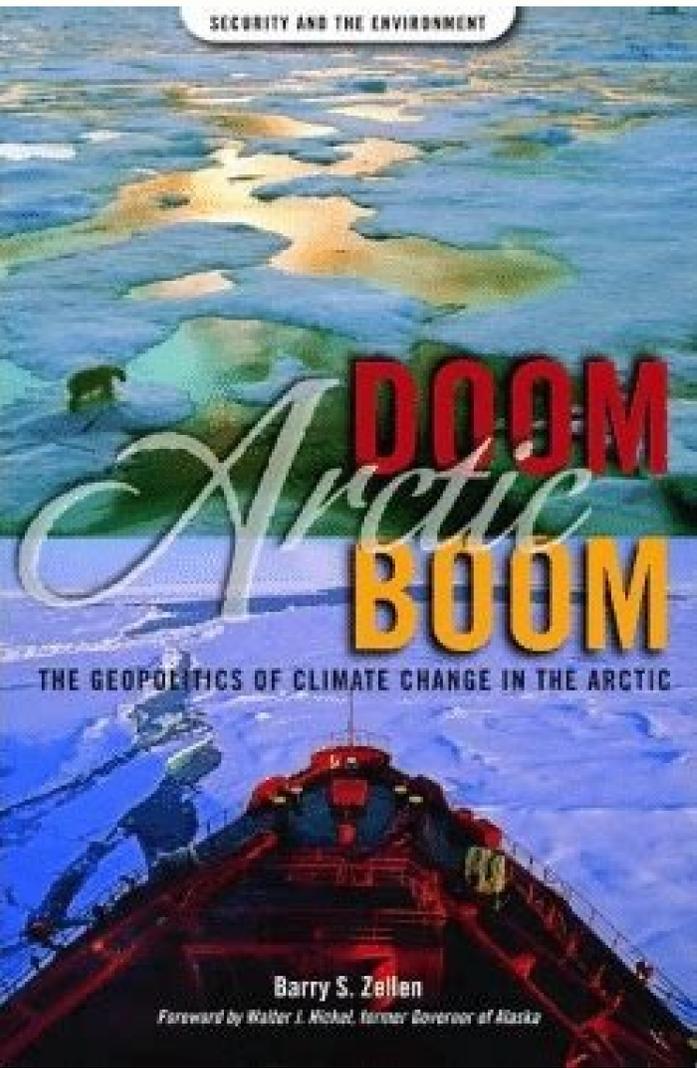
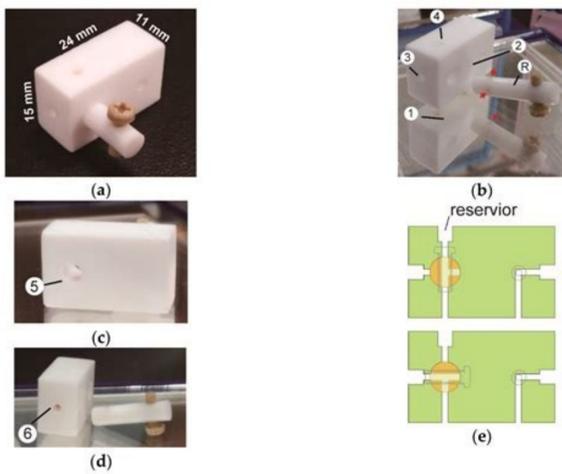


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Like the microbeads found in many face washes, glitter is a microplastic — a plastic fragment measuring less than 5 millimeters. Photo Courtesy: Hydrosami/Wikimedia Commons If the sheet of ice in Greenland started drastically melting, the likely impact on the Gulf Stream would destabilize the weather in many regions, including North America and Europe. Eating plastic can be deadly to these creatures, and they are already endangered. Photo Courtesy: Bart Braun/Wikimedia Commons Microplastics may be more toxic than normal-sized pieces of plastic because their surface area allows them to absorb more pollutants. Synthetic mica, already used by some cosmetics companies like Lush, is an eco-friendly, sparkly glitter alternative. Single-Use Plastic — Biggest Source of Trash There are 165 million tons of plastic in the ocean, and 89% of it is single-use plastic, like plastic bags, straws, utensils and packaging products. For example, 40% of our plastic use is for packaging, which is generally thrown out immediately once the package is opened. Harm to Millions of Seabirds Each Year Plastic is killing seabirds at a ridiculously high rate. They are found off the coast of every continent, except Antarctica. As coral reefs play a critical role in producing part of the oxygen we breathe and protecting coastlines from catastrophic storms hitting at full force, something must be done to stop them from dying. Rising Sea Temperatures Earth's climate is largely regulated by the oceans. You're Reading a Free Preview Pages 75 to 103 are not shown in this preview. They are the Yangtze, the Indus, Yellow River, Hai River, the Nile, the Ganges, Pearl River, Amur River, the Niger and the Mekong, listed in order of pollution. Rising Acidity Levels in the Ocean Carbon dioxide emissions are causing the ocean to get a lot more acidic than it once was. However, in this case, the diver's trip into the depths was marred by finding a plastic bag and plastic wrapper all the way down near the bottom of the Pacific Ocean's Mariana Trench — 7 miles deep. Unfortunately, reefs take no less than 10 years to recover. To put that in perspective, that's 25 times more than the weight of the Great Pyramid of Giza. Sea temperatures are rising rapidly as they absorb most of the heat trapped on Earth due to greenhouse gas emissions. The plastic takes up space in their stomachs, which can eventually cause health problems or even starvation. However, by the end of this century, that percentage could double, leaving the ocean at 7.7 pH units. Photo Courtesy: PxFuel For instance, fertilizers contain a massive amount of nutrients, and when they run off into the ocean, certain species of algae experience a growth explosion. Multiply that by millions of cars dripping oil per day, and it adds up. Scientists don't know where all that plastic ends up, so it makes sense that some of it simply sinks. Massive Marine Pollution from Land Nonpoint source pollution, also known as runoff from land, is the primary source of ocean pollution. Not only are these microplastics harmful to those creatures, but they also become harmful to us when we eat these creatures. Seas are considered smaller parts of oceans that are partially enclosed by land. It may seem unusual that some scientists would challenge whether a body of water is an ocean, but debate around the world's oceans extends beyond the Arctic. Banning destructive fishing policies as soon as possible, particularly in the wake of drastic climate change, is critical to making sure we don't run out of fish. Near Extinction of Cod in Canadian Waters In the '90s, Canadian cod had almost gone extinct, which wasn't that surprising, considering cod fisheries fed millions of people and contributed massively to the economy. The Arctic Ocean's average depth, meanwhile, is much shallower — around 0.65 miles (1.04 kilometers), or 3,407 feet. Photo Courtesy: BIH/Wikimedia Commons All of these rivers are in areas where there are massive populations and very little education about the dangers of plastic trash. Geographers divide the globe's ocean into named regions, and the smallest of these is the Arctic Ocean. Even the smallest of the world's oceans is impressively vast. Photo Courtesy: Bristol Green Party/Flickr Many places around the world have begun banning or restricting single-use plastics, including the European Union, Canada, South Korea, parts of Australia and many parts of the U.S. and Mexico. However, human noise pollution, largely created from ship traffic, creates a severe disruption among sea creatures and whales in particular. Take a look at some of the man-made destruction that needs to change if humans want to live to see another century. More Plastic Than Fish by 2050 Today, the ocean already contains more than 165 million tons of plastic. Photo Courtesy: tkremmel/NeedPix Obviously, plastic is a really cheap, handy material, but overusing it has led to extreme environmental problems. The cod population never fully recovered, and the fish will probably become extinct, despite conservation efforts in recent years. Runoff can make water unsafe for both humans and wildlife, but correcting the pollution of coastal and river waters is no cheap endeavor, costing the U.S. millions of dollars each year. Rising Sea Levels from Melting Ice Caps By 2100, experts believe glacial and ice cap melting will cause the sea to rise by up to 2.7 feet, possibly more. Ten rivers around the world are the main culprits, transporting 90% of all the plastic that ends up in the ocean. Photo Courtesy: Pylare/Pixabay Something as seemingly unrelated as oil dripping from a car onto the road can make its way into the ocean. More than 100,000 marine mammals meet their death annually due to plastic debris in the water. Of course, other factors contribute to the destruction of this ecosystem, but millions of people grabbing shells from the beach and taking them home adds significantly to the problem. Ocean Passages for the World Individual channels and apertures covering each of the world's oceans, with details of weather, climate, winds, currents, swell, seasonal factors and ice hazards. Numerous route diagrams and chartlets clearly demonstrating the effects of climate, wave heights and load line zones ADMIRALTY QR codes to enable quick access to a list of all Notices to Mariners' (NMs) that affect the publication Photo Courtesy: F119/Pixabay Some scientists believe the delicate balance in the ocean is getting ready to collapse. Residual oil can remain in the environment for upwards of 100 years. You're Reading a Free Preview Pages

2711 to 279 are not shown in this preview. The U.S. Gulf Coast, most of Europe, Japan and key cities like New York City, Mumbai, Shanghai and Dhaka are among the regions that would be underwater.Melting Ice Caps and Climate ShiftsAntarctica and Greenland where the ocean’s water layers interact regularly, surface waters get salty, sink to the bottom and take about a thousand years to make it around the world before resurfacing. Overfishing is one of the primary causes of this massive global disappearance of marine vertebrates. Photo Courtesy: Alfred T. Thoroughly gutting these sea creatures before cooking and eating them could minimize the risk of humans ingesting microplastics, at least.Glitter as a Marine Life KillerIt turns out that glitter is killing all kinds of marine life, from plankton to whales. Photo Courtesy: Pigsels Other causes that are leading our oceans to the brink of collapse are the intrinsically related climate change and pollution. Hopefully, these moves will help jump start the process of cleaning up our oceans.Oceans of Plastic in RiversThe majority of the plastic in the ocean didn’t get thrown directly in the sea. It comes from both small and large sources, including septic tanks, cars, boats, farms, ranches and forests. Photo Courtesy: AMOB/Flickr If a marine creature vital to the ecosystem is diminished or altered, the whole ecosystem could collapse. By 2050, they estimate that number will rise to 99%. On top of that, oil spills can cause delicate coastal wetland ecosystems to erode over time.Dangerously Depleted Fish Stocks“There are plenty of fish in the sea” may stop being the accurate saying it once was if we don’t stop overfishing. Overall, the world has seen a 38% decrease in kelp forests over the past 50 years, and it doesn’t show signs of improving.Damage from Offshore Oil DrillingThe common thread between all oil spills is that they cause long-term, irreversible damage to marine environments, even if not all the consequences are immediately obvious. Photo Courtesy: Jason Auch/Wikimedia Commons The rising sea temperature threatens marine life that make up part of the world’s food chain, causes massive population declines in many types of wildlife — polar bears and penguins, for example — and leads to more frequent and more intense storms. Photo Courtesy: daniloacarta/Pixabay Scientists think about 60% of seabirds have eaten some form of plastic to date. All of these consequences can easily lead to death.Disappearing Marine ForestsKelp forests are one of the ocean’s most diverse ecosystems. This affects humans directly, because these warmer climates end up increasing methylmercury levels in larger fish, which we eat. The only way to stop it seems to be reducing the grey seal population by 65%, which may be neither feasible nor effective.Dead Zones in the Atlantic OceanMost marine dead zones — areas where there is no dissolved oxygen in the water to support life — form seasonally in shallow areas near coastlines as a result of sewage and fertilizer runoff. The average ocean depth, according to the National Oceanic and Atmospheric Administration, is 2.3 miles (3.7 kilometers), or about 12,100 feet. You’re Reading a Free Preview Pages 385 to 410 are not shown in this preview. You’re Reading a Free Preview Pages 41 to 53 are not shown in this preview. This is how ocean currents — and stable global climate patterns — are created. Palmer/Wikimedia Commons In 2019, the U.S. experienced 15 additional days of unhealthy air compared to previous years. Plastic in a turtle’s stomach also makes it feel full, causing them to stop hunting for real food and starve.Shellfish, Crustaceans and MicroplasticsMicroplastics, such as the exfoliation beads in many cosmetic products, end up in the ocean and, subsequently, the digestive tracts of some of our favorite marine delicacies: shellfish, oysters, mussels and lobsters. Because farms use a lot of fertilizers and pesticides, those toxic substances end up in rivers and, eventually, the sea, causing damage to marine ecosystems. Unfortunately, we use items for minutes that end up staying on the planet for a few hundred years. Almost one-third of all our carbon dioxide emissions end up in the ocean.Industrial Sewage Going into the OceanIndustrial waste, even when it’s disposed of legally, is often disposed of in the ocean, much like the rest of the sewage that comes from domestic and commercial sources. Taking them from the beach endangers the ecosystem’s organisms and threatens their survival. Photo Courtesy: PeakPx Marine sound pollution also impacts many other sea creatures. Around a million birds die each year because of plastic they ingest. Collecting garbage 14,000 feet down off the seafloor is a difficult and expensive task.Mercury Levels on the RiseClimate change is causing mercury levels in the sea to increase. Imagine how much pollution we could eliminate if we just eliminated — or at least severely diminished — single-use plastic products. Also, not all chemicals are removed through the process of wastewater treatment, and much of that ends up in the ocean, contaminating the water and threatening the marine ecosystem.Difficulty Clearing Plastic from the OceanThe problem of plastic polluting our oceans at a rate of 8 million tons per year is made worse by the fact that it’s not at all easy to remove all that plastic once it’s there. Many marine animals use them for shelter and food. If the warming causes the Greenland ice sheet to melt, sea level could rise by another 20 feet around the world. Photo Courtesy: Amber Lamoreaux/Pexels Luckily, there is an alternative so we can all keep a little sparkle in our lives. Between climate change, plastic pollution, toxic chemicals and overfishing, marine ecosystems are on the brink of undergoing potentially catastrophic changes. Photo Courtesy: annca/NeedPix Eating plastic is most dangerous to marine mammals, but getting entangled in plastic fishing gear is another way they can die from it. This disruption can actually impact whales’ reproduction and survival. They can have a huge environmental impact, including depleting the fishing economy.Marine Vertebrates DisappearingSince 1970, 50% of marine life has disappeared completely. A mere 14% of plastic packaging is recycled today, while our overall plastic usage continues to rise.8 Million Tons of Plastic in the Ocean AnnuallyEach year, we add approximately 8 million tons of plastic to the ocean. Photo Courtesy: MichaelisScientists/Wikimedia Commons With the millions of tons of plastic finding its way into the ocean each year, it probably shouldn’t be a surprise to find plastic making its way to the ocean’s depths. Frigid conditions keep the Arctic Ocean partly covered in ice throughout the year and entirely covered in winter, although rising global temperatures have led to increased melting of this Arctic sea ice.The Arctic Ocean is not only ranked the smallest in size (it’s 10 times smaller than the Pacific Ocean), it’s also the shallowest. Whoa! The Ellen MacArthur Foundation predicts there will be more plastic in the oceans than fish by 2050, with the plastic speculated to weigh at least 937 million tons versus 895 million tons of fish. You’re Reading a Free Preview Pages 233 to 254 are not shown in this preview. Photo Courtesy: NAPAxFuel Sometimes, industrial waste doesn’t even undergo pretreatment to minimize the harm it can cause to the environment. Photo Courtesy: California Sea Grant/Flickr Scientists think kelp forests are disappearing as a result of warming oceans. Пpocopmp World Cruising Routes: 1,000 Sailing Routes in All Oceans of the World - Jimmy Cornell [2022, EPUB] Ships’ Routeing 2017 edition - IMO [2017, PDF] Marine Meteorology (Meteorology Notes) - WMO [2016, PDF] Guidelines on the application of the ILO MLC - International Shipping Federation [2012, PDF] Indian Ocean Cruising Guide - Rod Heikell [1999, PDF] World Voyage Planner - Jimmy Cornell [2012, EPUB] Atlantic Pilot Atlas Including the Caribbean & Mediterranean - James Clarke [2005,PDF] Briefing Paper for OCIMF Member Companies on Guidelines for Transiting the Straits of Magellan... Maritime Security Charts - UKHO & IHO [2019, PDF] Ace Your 105, Coastal Navigation Written Sailing Exam (2020, MP4) We humans may spend most of our time on land, but we live in a saltwater-dominated world, with ocean covering 71 percent of Earth’s surface. You’re Reading a Free Preview Pages 376 to 380 are not shown in this preview. Photo Courtesy: NAPAxFuel This level of acidity will kill many marine creatures, such as corals, plankton and oysters. You’re Reading a Free Preview Pages 290 to 341 are not shown in this preview. Unfortunately, CO2 and other types of air pollution are absorbed by the sea, dissolving into carbonic acid. Considering that the World Health Organization has listed mercury as one of the most toxic metals in the world as well as one of the top ten threats to public health, this is a severe problem. Photo Courtesy: August Linnman/Wikimedia Commons New studies suggest that because of natural predation by grey seals in the Gulf of St. Lawrence and surrounding areas adding to the problem, the region’s cod will likely be extinct by 2020. You’re Reading a Free Preview Pages 14 to 10 are not shown in this preview. In 2000, the International Hydrographic Organization (IHO), added a fifth: The Southern Ocean. Photo Courtesy: kormandallas/NeedPix When turtles eat plastic, it can block their intestines or even pierce them and cause internal bleeding. For now, the surest answer may be one since, technically, all the world’s oceans are in fact connected as a single, vast body of salt water. Half of the reef has died since 2016 because of warmer ocean waters killing the reef’s main food source: colorful algae. The root of the problem is that humans produce more than 300 million tons of plastic yearly, and half of that production is single-use plastic. Air pollution also contributes to its toxicity. When humans consume mercury, it can lead to neurological disorders.Human Sound Pollution and Marine LifeSound pollution is often not considered when thinking about the ways humans are impacting marine ecosystems and life. Stretching for about 5.4 million square miles (8.7 million kilometers), the Arctic Ocean measures about 150 percent larger than North America. So how many oceans are there — four or five? With 165 million tons of plastic in the ocean on top of the water rapidly warming and acidifying, many marine ecosystems are dying, and the marine animals are dying along with them.Problem with Seashell SouvenirsCoastal ecosystems actually depend on seashells. Climate change alone is causing sea levels to rise and bleaching coral reefs that are at the heart of many marine ecosystems. In addition, they are part of the global tourism and fishing economies. It’s possible the Great Barrier Reef may never recover, based on how much of it has died over the past few years.More Than 100,000 Marine Mammal Deaths YearlyA sperm whale died on a Spanish beach after suffering from inflamed abdominal tissues as a result of ingesting at least 30 kilograms of plastic, including fishing nets and shopping bags. That sperm whale definitely wasn’t the only casualty of the growing crisis. This temperature rise is responsible for drastic changes in marine ecosystems, including deadly coral bleaching. Photo Courtesy: Chokniti Khongchum/Pexels The ocean is more acidic because of climate change, and a more acidic ocean increases how much methylmercury is in the food web. Many U.S. states have already passed laws restricting or banning the sale of microbeads, but glitter hasn’t been included. However, the dead zones found in the Atlantic Ocean in recent years are way out in the middle, far away from the coast. Extreme noise underwater can cause them to hemorrhage, damage their internal organs and even cause them to migrate. Photo Courtesy: Wise Hok Wai Lum/Wikimedia Commons Scientists estimate that by 2050, 90% of the world’s coral reefs will be gone unless drastic measures are taken. Photo Courtesy: Pigsels Another problem is that a lot of the plastic polluting the ocean sinks to the bottom. Photo Courtesy: vaihehi shah/Wikimedia Commons This growth can be curbed if we lower our plastic use and increase recycling rates for plastic. In addition to the threat that comes from eating items, plastic trash also kills seabirds by entangling them and causing them to drown, starve or suffocate.30 Years of Mass Coral Reef DeathsIn the past 30 years, we have watched half the coral reefs in the oceans die. That may not sound bad, but algae blooming at such a high rate releases dangerous levels of toxins into the water, poisoning marine life and potentially destroying ecosystems and turning them into dead zones, unable to support any marine life.Crisis for Mass Numbers of Sea TurtlesSea turtles eat plastic because they mistake it for food. Since the 1960s, dead zones have doubled every decade. A fourth of all marine species are supported by coral reefs, and half a billion people also depend on them. While much of the damage occurs within the first few weeks of the spill, indirect damage that takes longer to appear is also an issue. We may not seem connected, but the health of the world’s oceans plays a key role in the survival of humanity. Whether seabirds use them to build nests, fish use them as protection to hide from predators or algae and other microorganisms turn them into homes, seashells have a lot of functional purposes. In some species, like tuna and mackerel, the population has gone down by 75%, while others are very near extinction. One third of the world’s commercial fish stocks have reached unsustainable harvesting levels, with 90% of them already completely exploited. The issue is that industrial sewage tends to be much more hazardous, containing heavy metals like lead, arsenic and mercury. It’s located at the polar region of the Northern Hemisphere and is almost completely surrounded by the continents of Europe, Asia and North America. The effects will completely alter the marine food chain, causing food shortages for marine animals and severely altering the amount of seafood humans can harvest.Air Pollution’s Connection to Coastal ToxinsIt isn’t just trash and agricultural runoff that pollutes the oceans. MORE FROM SIMPLI That’s like water sloshing in a kiddie pool when compared to the deepest regions of the Pacific Ocean, which have been measured to around 6.85 miles (11 kilometers), or 36,200 feet, deep. The relatively small size and depth of the Arctic Ocean have led some to resist classifying it as an ocean, instead referring to it as part of the Atlantic Ocean called the Arctic Mediterranean Sea or simply the Arctic Sea. This is a huge environmental concern, considering that humanities health depends on them. Photo Courtesy: Royal Opera House Covent Garden/Flickr About 40% of people live within 25 miles of the coast. Unless we can prevent the sea temperature from increasing even further, we face irreversible damage to the planet.Massive Coral Bleaching of the Great Barrier ReefMuch of the ocean’s coral reefs are bleaching at unprecedented rates, thanks to rising sea temperatures. You’re Reading a Free Preview Pages 352 to 363 are not shown in this preview. Despite awareness about climate change and the disastrous impacts it could have on Earth and human life, air quality in the U.S. has actually gotten worse in the past few years. If sea levels rise, a huge chunk of the world’s population will be severely impacted. You’re Reading a Free Preview Pages 415 to 420 are not shown in this preview. This ocean, also called The Antarctic Ocean, encircles Antarctica and makes up the southernmost waters on Earth, below the 60-degree south latitude.The addition of the Southern Ocean, while generally accepted, has not yet been ratified because not all members of the IHO have officially accepted the parameters defining the Southern Ocean as a fifth ocean. Microplastic particles that contaminate the ocean are hard to detect, and effective strategies for removing them are slim to none at this point. Marine mammals can’t breathe underwater and can easily drown when they become tangled in plastic.Dangerous Plastic Deep in the OceanAn American diver broke the record for the deepest dive on record in 2019. It entered from rivers, which then carried the plastic out to sea. Historically, the global community has recognized four oceans: the Atlantic, Pacific, Indian and Arctic Oceans. Photo Courtesy: Elaine Bernadine Castro/Pexels Climate change is the likeliest cause of these North Atlantic dead zones, as warmer water can’t hold as much oxygen. Normally, that would be an extremely exciting occasion. Invasive species are another cause of damage. Over the past century, the ocean has become 26% more acidic, going from 8.2 to 8.1 on the pH scale. The end result of that includes extreme weather, like hurricanes, becoming much more prevalent and intense.Fertilizers and Pesticides in the OceanA big part of the pollution of our oceans comes from land pollution, such as runoff from farms. Plastic bags look a lot like jellyfish, for example, and fishing nets look like seaweed. This is because whales use sound to communicate with one another and maintain their locational bearings. The Great Barrier Reef, in particular, has been severely impacted. The oceans gain another 8 tons of plastic every year, so this has become a big problem. Photo Courtesy: Kyle Taylor/Flickr Serious coral bleaching used to happen to reefs about every 27 years, but since the ‘80s, the average rate has risen to every six years. For instance, in Australia, Japan and the Mediterranean, tropical fish are chowing down on kelp that isn’t a normal part of their diet. Photo Courtesy: David Stanley/Flickr While nations made promises to the World Trade Organization to decrease their fishing, funding for fisheries has actually increased in many countries in recent years. Photo Courtesy: Ian L/NeedPix Pocketing shells as souvenirs also contributes to the rate of shoreline erosion. You’re Reading a Free Preview Pages 426 to 436 are not shown in this preview.