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BOOK REVIEW Elizabeth Kolbert, *Under A White Sky: The Nature of the Future* (New York: Crown, 2021).

Robert Hellström

Bridgewater State University, rhellstrom@bridgew.edu

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BOOK REVIEW

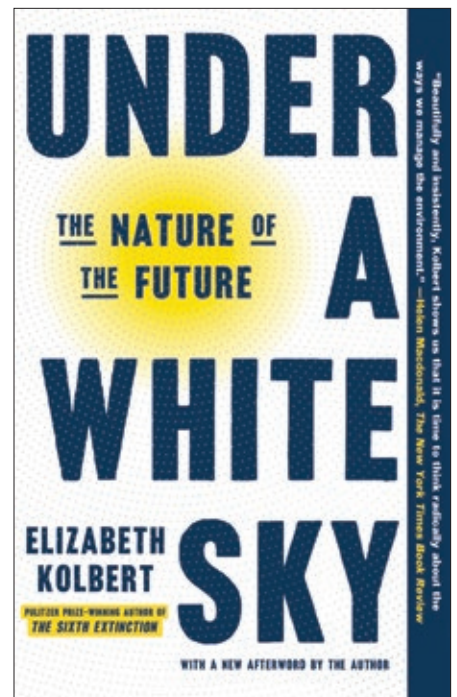
Elizabeth Kolbert, *Under A White Sky: The Nature of the Future* (New York: Crown, 2021).

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Under a White Sky, a book by Elizabeth Kolbert, best known for her work, *The Sixth Extinction*, is a quick read that very eloquently sheds light on how humans have embedded their values and technology into the evolution of our natural landscapes. As a climate scientist, I am particularly impressed with Kolbert's astute observations and immersive interviews with experts in the natural sciences and engineers finding solutions to our current climate crisis. Her anecdotal writing style brings the reader on a vivid journey from one fascinating location to another. She does not dwell on the doom and gloom of climate change, but rather the increasingly clear and inseparable connection between humans and their ecosystem through engaging historical and modern real-life stories of people seeking to control nature for the betterment of society.

Kolbert introduces a period of human intervention called the Anthropocene, a time period when humans began having major and geologically detectable impacts on their natural environment, sometimes denoted by nuclear bomb tests in the 1950s. Consequently, people on Earth, through their actions, have now created a new geological epoch as part of its 4.6 billion years of evolution. In my teaching of climate principles at BSU, I talk about the use of ice cores as an archive of past climate and commonly use the 1950s nuclear fallout as a chronological time reference. Herein, I provide just a few samples of Kolbert's enthralling stories of human/nature interventions and their unintended consequences.

Kolbert presents her evidence from her journeys that reveal the fingerprints of humans trying desperately to conserve our ecosystem. An example includes the attempt to preserve the nearly extinct pupfish that once



thrived in Death Valley, California, in the geothermally regulated 93 degree Fahrenheit water. They built a \$4.5 million facility to replicate the pupfish habitat one mile from Devils Hole to try to save this species and other aquatic life in Death Valley. However, serious problems erupted when biologists also introduced an aquatic beetle from Devils Hole into the simulation facility and these beetles were feasting on the pupfish larva and reproducing at higher rates than natural. Kolbert goes on to explain that staff at the facility spent every day manually attempting to

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control the beetle population, showing again how human intervention can lead to unintended consequences.

Kolbert provides additional examples of unregulated actions and lack of holistic oversight and subsequent human solutions and struggles to reverse or slow down loss of biodiversity. She speaks to the irony of damming the Yangtze River in China, which greatly benefited society by providing electricity for a developing country, but disrupted the spawning of carp, thereby nearly severing local communities from a

that we can inject compounds into the atmosphere (much like volcanoes erupt and create large reflective clouds). If we have enough of these injections of sulfur, for example, or other cloud-enhancing substances, then humans could help offset the warming impact of an enhanced greenhouse effect.

This enhanced greenhouse effect, due to human activity, and often called global warming, began with the Industrial Revolution and the necessity to heat water for steam power and electricity by burning fossil fuels.

the air every year but the semi-trailer size carbon removal systems remove about 400 tons per year. We would need about 100 million units.

Kolbert closes the chapter with the Stratospheric Aerosol Injection Lofter (SAIL) project that seeks to brighten our atmosphere through the injection of reflective particles high into the stratosphere from aircraft, above the air layer containing Earth's weather and clouds. Imagine not seeing a deep blue sky on a clear day in the countryside, but rather a hazy light blue as you typically see over urban areas. That, and the subtle hum of carbon capture machines, is the reality we face even with significant reductions in fossil fuel use. Elizabeth Kolbert's *Under A White Sky: The Nature of the Future* offers first-hand journeys with scientists and engineers by shadowing them and revealing the inner workings of their fascinating lab and field locations. She realizes that the nature of the future will look nothing like that of the past, and she leaves the reader with a sense of confidence that we will find the path to a sustainable future, it is human nature. Give it a read.

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traditional food source. She also speaks to innovations in bioengineering such as creating genetically modified super corals for the Great Barrier Reef off the east coast of Australia. These are more resilient to the high temperatures that are resulting in ocean acidification and coral bleaching.

Elizabeth Kolbert references her title, *Under A White Sky*, with visits to innovative facilities engaged in geo-engineering efforts to brighten our planet thereby reflecting more sunlight to reduce warming. The idea is

Kolbert points to reduction of transportation during the Covid-19 pandemic that reduced global emissions by almost 20% for a year, but held a record high CO₂ concentration thereafter. She travels to Iceland to show how the Swiss have integrated technology into their geothermal system that helps remove carbon dioxide from the atmosphere by mixing it with water and injecting it deep into the volcanic rock where the mixture mineralizes and deposits its carbon deep below the surface. However, when you do the math, you see that modern human activity injects 40 billion tons of carbon dioxide into



Robert Hellström is Professor in the Department of Geography.