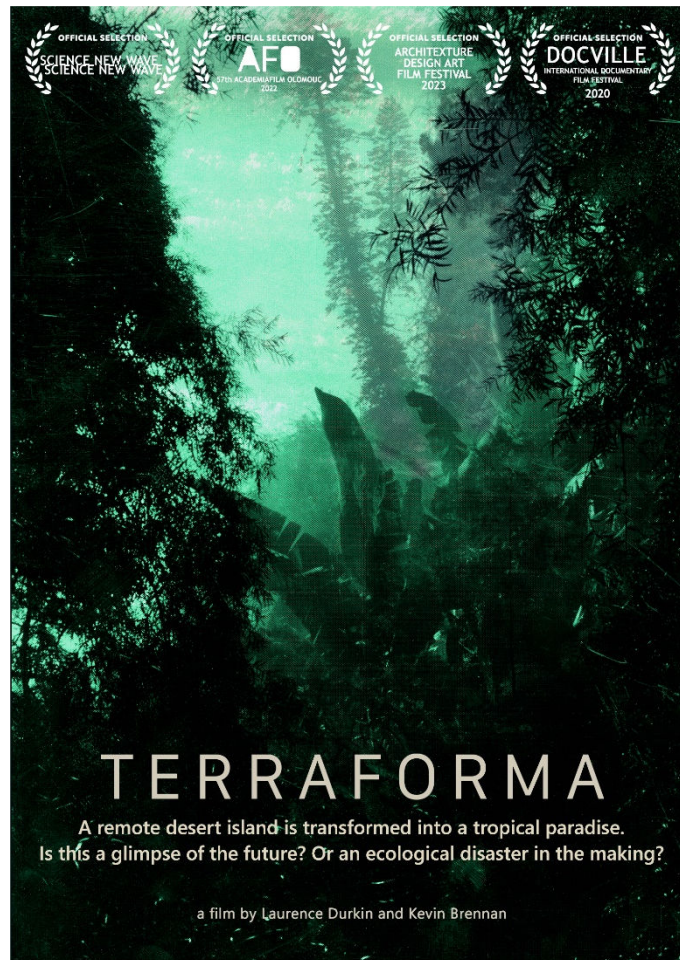




# TERRAFORMA



## STUDY GUIDE

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## **TerraForma**

TerraForma is the story of the remote desert island of Ascension: for a million years entirely devoid of life, but which was engineered by process of 'terraforming' into a tropical paradise. It is also the story of what that transformation may mean for the fate of our planet, in a future when terraformed landscapes and human-engineered environments may come to warp our understanding of nature itself.

### **About Ascension**

Ascension is an island in the South Atlantic Ocean. It is approximately 88 square kilometers in area. The island has two main settlements: Two Boats, and Georgetown. Georgetown is the largest and is home to Ascension's administrative headquarters. The island also has two military bases and a BBC relay station. It has an airport and people can get there by airplane or by ship. According to the Ascension Island Government website, the island has a few shops, a gym, a number of swimming pools, and a cinema. It says, "The terrain of the island is wild, barren and rugged. The lower coastal areas are hot and dry but the island is dominated by the 859m Green Mountain, the summit of which is lush, green and offers a slightly cooler climate." <sup>1</sup> Britannica explains that Ascension has no streams, and the people living there get some water from catchment basins, and the majority from desalination plants.<sup>2</sup>

There are about 800 people living on Ascension. It is also visited by some tourists. Even those people who live there permanently are considered temporary, however. The Ascension Island Government website notes, "Ascension Island is a working island which means that everyone on the island is here to work or to accompany someone who works. As such there is no right of abode. It may be possible for individuals to be offered new contracts following the end of a previous contract, so some individuals may have been on the island for significant periods of time. However when their contract ends for a final time they will also need to leave the island and return to their place of residence."

### **History and Government**

Ascension was discovered in 1501 by Portuguese navigator João da Nova and was named Conception. Two years later it was rediscovered by Alphonse d'Albuquerque, on Ascension Day—which is a religious holiday—and it was named Ascension. The island was uninhabited until 1815. That year, French emperor Napoleon I was exiled to nearby St. Helena Island, and in order to prevent the French from occupying Ascension, the British stationed a naval garrison there. After that, Ascension was used as a stop for British ships sailing to the South Atlantic.

Today, Ascension island is part of the British overseas territory of St Helena, Ascension and Tristan da Cunha. St Helena and Tristan da Cunha are also islands in the South Atlantic Ocean. All three islands are all located far from one another—with St Helena about 700 miles to the southeast and Tristan da Cunha about 1,200 miles south of that—however, these three islands are part of the same territory. The territory has its own constitution and makes its own laws. It has a governor, who is appointed by the

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<sup>1</sup> <https://www.ascension.gov.ac/lifestyle-and-employment/living-here-2>

<sup>2</sup> <https://www.britannica.com/place/Ascension-island-Atlantic-Ocean>

King, and is based in St. Helena. Ascension has an Administrator. The United Kingdom is responsible for the territory's international relations and defense.

## Natural Environment

According to the Pew Charitable Trusts Ascension is important to a number of different species including yellowfin tunas, blue marlins, sharks, rock hind groupers, spotted moray eels, dolphins, and whales. In addition, it says, endangered green turtles mate and nest on Ascension, where they are protected. It says, "Ascension is also an important sea-bird breeding and nesting site in the tropical Atlantic, providing a breeding area for 12 species, including the brown noddy, sooty tern, and endemic frigate bird." Overall, it says, "Ascension Island's marine ecosystem is one of the most intact in the Atlantic."<sup>3</sup>

However, critics argue that the way that the island's landscape has been altered also threatens many species. For instance, biologist Sam Weber says, "On a superficial level it looks like a tropical paradise – it's humid, there's lots of plants - but if you scratch the surface it really doesn't go a lot beyond that. There's none of the complex interrelationships you'd expect in a real tropical cloud forest - and all of the species that were here are vanishing."<sup>4</sup>

## Geoengineering

Geoengineering is the use of technology to manipulate the environment. In recent years, there has been increased interest in geoengineering as a way to mitigate the effects of climate change. Proposed ideas include techniques that will reduce the amount of sunlight reaching the earth, taking carbon dioxide out of the air, and taking steps to reduce the high concentration of carbon dioxide in the ocean.

Some types of geoengineering have already been used. For example, cloud seeding involves adding particles to the atmosphere in an attempt to induce precipitation. Various substances are used, including silver iodide. A news article explains how it works: "When done aerially, cloud seeding involves loading up a plane with silver iodide. Flares are placed on the wings and fuselage. The pilot reaches a certain altitude, where temperatures are ideal, and shoots the flares into the cloud. The silver iodide causes individual water droplets within the clouds to freeze together, forming snowflakes that eventually become so heavy that they fall."<sup>5</sup> A number of Western U.S. states that are facing drought have been experimenting with this practice in order to try to increase precipitation.

Geoengineering is extremely controversial. Proponents insist that it could provide a needed solution to climate change, while critics worry that it could have a wide range of unintended effects. A *Time* magazine article explains, "One side says that humanity may doom itself by refusing to look into potential chemical means of cooling our atmosphere. The other claims that undertaking such research could lead to disastrous consequences that we can barely imagine."<sup>6</sup>

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<sup>3</sup> <https://www.pewtrusts.org/en/projects/pew-bertarelli-ocean-legacy-ascension-island>

<sup>4</sup> <https://www.bbc.com/news/magazine-36076411>

<sup>5</sup> <https://www.cnbc.com/2022/12/17/how-cloud-seeding-can-help-replenish-reservoirs-in-the-west.html>

<sup>6</sup> <https://time.com/6264143/geoengineering-climate-scientists-divided/>

## Terraforming

Terraforming is the process of modifying an environment to make it more habitable for humans. This could include changing the atmosphere, the temperature, or the surface environment. It is often discussed in relation to the idea of terraforming Mars or other planets. Like geoengineering, terraforming is a controversial idea. Many people worry about its unintended consequences, and there is also widespread debate about the ethics of this practice and the impact it could have on other life forms.

### Additional Resources

#### Books

- Stephen M. Gardiner, *The Ethics of Geoengineering the Global Climate: Justice, Legitimacy, and Governance*. New York: Taylor & Francis, 2024.
- Brynna Jacobson, *Geoengineering Discourse Confronting Climate Change: The Move from Margins to Mainstream in Science, News Media, and Politics*. Lanham, MD: Lexington Books, 2024.

#### Online Resources

- Jovana Andrejevic, "Reversing Climate Change with Geoengineering," Science in the News Blog, Harvard Graduate School of Arts and Sciences, January 3, 2023. <https://sitn.hms.harvard.edu/flash/2022/reversing-climate-change-with-geoengineering/>
- Ascension Island Government, "Living on Ascension Island." <https://www.ascension.gov.ac/lifestyle-and-employment/living-here-2>
- Britannica, "Ascension," updated March 10, 2024. <https://www.britannica.com/place/Ascension-island-Atlantic-Ocean>
- Alejandro De La Garza, "A Controversial Technology Is Creating an Unprecedented Rift Among Climate Scientists," *Time*, March 17, 2023. <https://time.com/6264143/geoengineering-climate-scientists-divided/>
- Pew Charitable Trusts, "Protections for Ascension Island, the Crossroads of the Atlantic," Fact Sheet, October 23, 2019. <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2019/10/protections-for-ascension-island-the-crossroads-of-the-atlantic>

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