The geoengineering genie

Like any human endeavour, geoengineering carries hefty doses of uncertainty, doubt and fear.

HOW TO COOL THE PLANET: GEOENGINEERING AND THE AUDACIOUS QUEST TO FIX EARTH'S CLIMATE

by Jeff Goodell

Houghton Mifflin Harcourt: 2010.
272pp. £17.99

HACK THE PLANET: SCIENCE'S BEST HOPE — OR WORST NIGHTMARE — FOR AVERTING CLIMATE CATASTROPHE

by Eli Kintisch

Wiley: 2010. 288pp. £17.99

Only a couple of years ago, geoengineering seemed like science fiction. Some scientists talked about cooling the planet using massive shields to reflect sunlight back into space or by loading the atmosphere with aerosols, but few thought of these planetary-scale projects as real contenders for averting climate catastrophe. But — perhaps because the challenge of mitigation is now fully recognized — geoengineering has gone mainstream. Increasingly, scientists are turning their attention to it: last month at the Asilomar conference centre in Monterey, California, experts met for the first time to consider how the field can be regulated. Meanwhile, governments are holding parliamentary hearings on the subject and venture capitalists are looking to it as an investment opportunity.

“I don’t especially want to work on geoengineering. But now that the genie is out of the bottle, I feel I have to,” says climate modeller Raymond Pierrehumbert of the University of Chicago in Eli Kintisch’s *Hack the Planet*, one of the first books to cover this burgeoning subject for a popular audience. Though potentially capable of rapidly reducing temperatures, the numerous technologies that come under the geoengineering umbrella would probably have unintended — and potentially disastrous — consequences. Despite its promise and perils, however, geoengineering is a virtual unknown among the general public, so Kintisch’s book and another, Jeff Goodell’s *How to Cool the Planet*, both published this month, have come at a crucial time. These two fast-paced tours through the science of geoengineering will help

inform growing debates about whether governments should fund large research projects into climatic cooling and about how the various methods might be tested.

Both Goodell and Kintisch make it clear that geoengineering is at best a complement to drastic cuts in carbon dioxide emissions. “We have to immediately launch a worldwide program to stop polluting our atmosphere with this surprisingly pernicious trace gas,” Kintisch argues. Most scientists feel much the same, viewing geoengineering strictly as a possible emergency backup plan that should be used only if things get really dire. And because of the risks involved, the idea of doing field trials, especially of technologies for so-called ‘solar radiation management’ — that is, blocking out sunlight in one way or another — is still contentious among scientists.

But Goodell makes a strong argument in favour of at least some limited tests. He tells the tale of Charles Hatfield, a travelling rainmaker who won acclaim across the United States in the early 1900s. When Hatfield tried to bring rain to San Diego and torrential floods ensued, he was hounded out of the city, his reputation in tatters. With geoengineering, writes Goodell, “it might be smart to begin sorting good ideas from bad, lest we fall under the spell of another generation of Charles Hatfields”. That is, if we do the research, then perhaps we’ll decide that some methods are best forgotten.

[DANGEROUS JOURNEY](#)

For the time being, however, all of the existing plans and proposals are just “armchair geoengineering”, as

Kintisch puts it. And the cast of armchair geoengineers is still very small. The result is that both books cover a lot of the same ideas and quote many of the same sources, and both have in-depth chapters about two particular options: fertilizing the oceans with iron, and ships spewing cloud-brightening particles. Kintisch’s book, though, offers up more examples of geoengineering. One is a proposition by the nonprofit Ice911, started by California-based engineer Leslie Field, to protect sea ice from melting by covering it with sacks full of silicon beads. Another is a scheme put forward by atmospheric scientist Brian Toon, who proposes modifying coal-fired power plants to belch the chemical carbonyl sulphide at ground level, from where, Toon figures, it will eventually be carried up to the stratosphere and turn into light-reflecting sulphates.

Kintisch also digs deeper than Goodell into explaining the details of how geoengineering might work — and why it would be so difficult to do well. A reporter for the journal *Science* who regularly covers geoengineering for the journal’s *ScienceInsider* blog, Kintisch likewise takes an insider’s view in *Hack the Planet*. That’s not to say Kintisch argues in favour of geoengineering, but that he writes from firmly within the world of science, and for an audience who’s comfortable with science, too. He never explains the term ‘hack’ in the title, for example, which is borrowed from computer hacking and reflects the idea that geoengineering involves interfering with fundamental aspects of the climate to change how the whole system works. For this reason, scientists and other

science-literate readers — especially those who already have some familiarity with geoengineering — will probably prefer Kintisch's book over Goodell's. In contrast, Goodell's book takes a step back, presenting an outsider's view — unsurprising, as he is a regular reporter for *Rolling Stone*, the music and politics magazine. This perspective allows Goodell to be a guide to those who might reject the whole idea of geoengineering as far-fetched or crazy. "You don't need a Ph.D. in physics to understand the basic insanity of this undertaking," Goodell writes, while emphasizing that the outlook for the planet is so bad that we have to think about these options anyway. Of the two authors, Goodell does a better job of taking the reader on a journey. Most

chapters in *How to Cool the Planet* feature a central character, from geoengineer David Keith tinkering in his lab at the University of Calgary to environmentalist and scientist James Lovelock strolling the countryside around his quaint English home. By digging into their stories, Goodell portrays geoengineering as a human endeavour, carrying hefty doses of uncertainty, doubt and fear.

It what seems to be an odd coincidence, both books end by likening geoengineering to some kind of planetary gardening. Goodell takes some comfort in this notion, whereas Kintisch is sceptical about the idea that we can tame and control ecosystems, let alone the whole planet. To my mind, a better analogy for geoengineering would be industrial agriculture,

with vast feedlots and fields of crops planted and harvested by machines. This system works for now, but its sustainability is increasingly coming into question. Similarly, geoengineering might appear to work well for a while before its dark side becomes evident. As Princeton University's Robert Socolow recently told the Asilomar meeting: "Be very careful." Geoengineering comes with some strong warnings, and they're worth heeding.

PUBLISHED ONLINE: 15 APRIL 2010

DOI:10.1038/CLIMATE.2010.36

Mason Inman

Mason Inman is a freelance writer based in Karachi, Pakistan.

natureevents.com

Discover scientific events and courses at the new look **natureevents.com**

GLOBAL EVENTS

- conferences
- meetings
- workshops
- symposia
- courses
- seminars
- scientific programs
- Keep up-to-date with advances in your scientific field
- Find out what's on in your local area
- Download the digital directory & wall-chart

FREE EVENT POST

Basic event listings are free — add your event today.

Apply our innovative online upgrades to:

- attract more delegates
- increase visibility of your event
- target your audience
- reach passive as well as active event seekers

CONTACT DETAILS

To advertise events across Nature Publishing Group journals as well as on natureevents.com please contact:

AMERICA:

+1 202 626 2522

INDIA:

+91 124 288 1057

EUROPE:

+44 (0)20 7014 4015

ASIA/PACIFIC:

+81 3 3267 8765

natureevents@nature.com

natureevents

nature publishing group