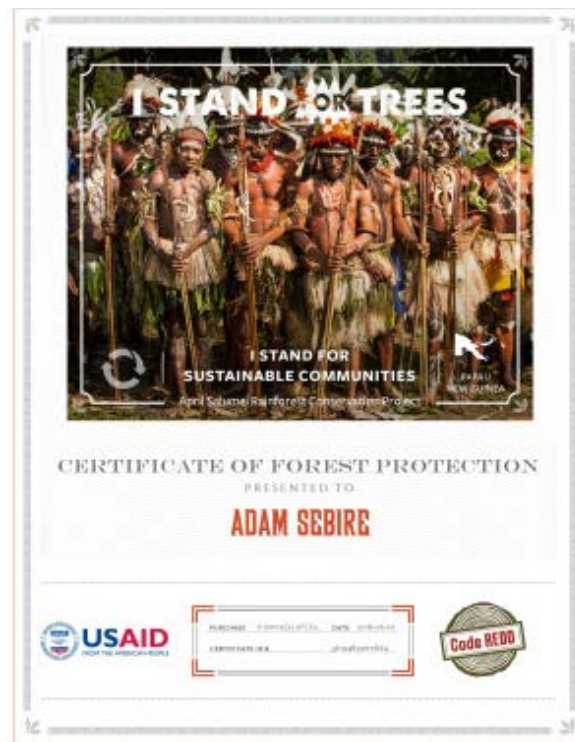


Adrift:

**Attribution & Responsibility
in a Changing Climate**

by Adam Sébire

3.



I don't quite remember when my barely-concealed boasts of jet-setting—"Guess what? I've booked an around-the-world ticket this time!"—turned to an awkward sense of shame, but it was soon after that I started buying carbon credits. This contrivance of late capitalism would, the website assured me, assuage my frequent flyer's guilt by paying Papua New Guinean tribespeople to preserve enough of their forests against the pillage of loggers in order to act as a carbon sink for the exact tonnage of my greenhouse gas emissions. I was sent a "Certificate of Forest Protection" fronted by exotic-looking people with nose piercings who'd apparently emerged from the jungle to thank me personally. George Monbiot has incisively compared these little slips of paper to medieval Papal indulgences with which one could pay the Church to 'offset' one's mortal sins (the main difference being

that mine were PayPal indulgences).¹ Adding a contemporary twist, such carbon offsets were recently condemned by Pope Francis in his encyclical on climate change since their use negates any actual behavioural change.² “You’re paying poor people to die for your lifestyle,” Kevin Anderson, a British climate scientist who refuses to fly, once told me.

Hence my interest in what I later heard termed “climate change attribution research” or “probabilistic event attribution”³: the ability to link a particular event to anthropogenic greenhouse gas emissions. I’d figured it was unlikely that any particular person’s death in an extreme weather event would ever be able to be ascribed to the CO₂ from my Singapore to London leg. (Phew, no manslaughter charges for this flight at least?) However, a peer-reviewed research paper in *Science* in late 2016 revealed that certain kinds of attribution were already entirely plausible—beyond the purely probabilistic “this event was made x times more likely by global warming” (oh-oh, time to lawyer-up...). With a 10% margin of error, Notz & Stroeve’s formula allowed one to calculate how much Arctic sea-ice would be lost—that is, would not regenerate as it would otherwise, come September each year—per tonne of anthropogenic CO₂ emitted.⁴ With less sea-ice to reflect sunlight back into space the ocean warms faster, which in turn melts more ice: a feedback loop.

A PhD research trip to Upernavik, Greenland in May 2018 offered an opportunity to investigate this further.⁵ My economy-class return flights (SYD-ICN-CPH-SFJ-JAV-JUV; the last leg delayed 94 hours due to extreme

weather) worked out at just under 40,000km, or 5.23 tonnes of CO₂e. The little ‘e’ on CO₂e indicates equivalence to land-based emissions. Indeed I’d searched to find a carbon calculator that acknowledges this inconvenient truth (ignored by many airlines in their improbably small “offset your flight” greenwashing) that jet aviation emissions are deposited in the worst place possible: our upper atmosphere. It was important to use a carbon calculator that took into account not only class of travel⁶ but calculated this extra “radiative forcing” effect of aviation emissions above 9,000 metres—by multiplying them by a factor of three.⁷

During my month-long stay I met a local narwhal hunter who agreed to take me up to the nearest remaining sea-ice, 72° 55’ 53.84” N 56° 3’ 34.19” W. It had been a particularly bad year for ice in northwest Greenland; indeed the Arctic as a whole is warming two to four times faster than the rest of the planet’s surface.⁸ One practical effect of this was the curtailment of the use of sledge dogs who now let their chained-up misery be known by howling continuously throughout the midnight sun. Only after some kilometres of sailing, and much cautious prodding of potential sites with the hunter’s auger, did we find sea-ice thick enough for me to tentatively step upon it without plunging through.

Into its frozen surface I inscribed the scientists’ formula:

$$\Delta A_{\text{seaice}} = \frac{dF_{\text{nonSW,in}}}{dE_{\text{CO}_2}} \Delta E_{\text{CO}_2}$$



Handwritten text in the snow, including the number "450" and other illegible markings.

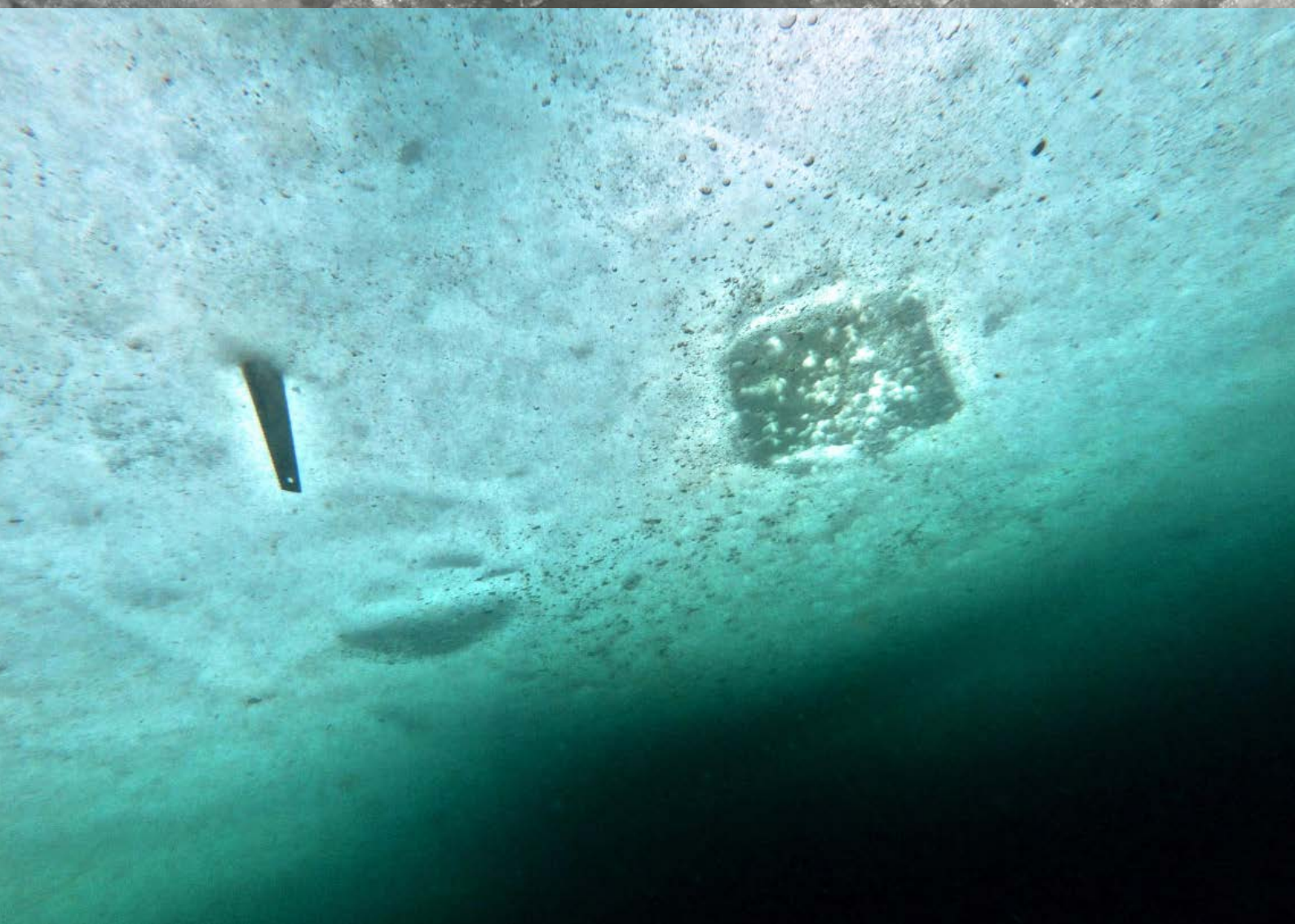
As patiently explained to me by a friendly climatologist, this states that the area of sea-ice lost equals a constant (derived from their research into surface energy flux at the ice edge) of 3.0 ± 0.3 square metres per metric tonne of CO₂ emitted, multiplied by the sum of my own emissions. Inserting my 5.23 tonnes into the equation, this worked out at 15.69 ± 1.57 m² which I duly measured, pegged and, with a rusty saw I'd found, cut from the pack.


And so this is how I came to be floating in Baffin Bay sitting atop a small, slowly-disintegrating drift of ice on a wonky chair with a piece of string, a foldable ruler and a rusting (now fairly blunt) saw.

I'll be the first to admit that this was not exactly shaping up as the classic desert-island fantasy.

Bemused by my bizarre activities on the ice, the hunter had gone fishing, sailing behind some icebergs with what sounded like a vague promise in Greenlandic to return. After I'd stopped shaking (fear of slipping beneath the ice and the biting chill of sitting atop it now cancelling each other out) I gingerly sent up a drone to take some video. This was perhaps an ill-advised strategy given the diminishing potential for a dry landing when the time came—but, hey, that's how we humans progressed this far, no?! The vague notion that we'll cross that (flooded) bridge when we come to it...

The drone's video link enabled me to look down upon my tiny melting island from above. At last I could visualise the impact of my fossil-fuelled lifestyle—an attribution that had hitherto remained conveniently invisible





to me. Of course, it was much easier to stomach the idea that this particular chunk of ice would melt rather than that a specific living thing would die as a result of my choices; who's to say who or what will feel the impact of my 5.23 tonnes of CO₂? Or indeed where or when?

In creating this small video performance art work I don't seek to individualise the problem; to falsely ascribe it to some supposedly innate human failing; nor to overlook the systemic economic and geopolitical culpabilities underlying global warming.⁹ Rather, I want to get a sense of the disconnects operating within my own psychology—of cause from effect; of my actions today from their outcomes in the future; of invisible emissions here from their impact elsewhere: cognitive dissonances which can be relied upon to kick in every time I turn on air conditioning, fuel up a car, or take a flight, and which enable me to avoid confronting the destruction of the environment



that results on my behalf. Society subsidises fossil-fuelled activities globally to the tune of over US\$5 trillion annually—a subsidy amounting to 6.5% of global GDP¹⁰—while international air travel burgeons, lubricated by a prohibition on taxation of aviation kerosene.¹¹ “Slow Travel” is touted as an antidote to unsustainable lifestyles that feature long-distance journeys at breakneck speeds, but as I fly out of a country that has cancelled the last of its night trains, it’s reduced to a romantic aspiration, to be contemplated wistfully as I sip my 2015 Burgundy from a plastic cup at 33,000 feet. As the flight tracks over the soon-to-be-submerged Bangladeshi river delta, the wine leaves a bitter aftertaste. This is not some Proustian sense-memory, but the probabilistically attributable traces of my earlier voyage, Sydney to Paris, the extreme weather event in France the following year, and now its entirely conceivable manifestation in the sunburnt grapes of my inflight red.

Notes

1 Monbiot, G., “Paying for our sins,” <https://www.theguardian.com/environment/2006/oct/18/green.guardiansocietysupplement>, *The Guardian*, 18 October 2006.

2 Garside, B., “Pope Francis encyclical warns on use of carbon credits,” <http://carbon-pulse.com/5149/>, *Carbon Pulse*, 18 June 2015.

3 Otto, F., James, R., & Allen, M. (2014). The science of attributing extreme weather events and its potential contribution to assessing loss and damage associated with climate change impacts. Retrieved from https://unfccc.int/files/adaptation/workstreams/loss_and_damage/application/pdf/attributingextremeevents.pdf

See also Readfearn, Graham, “Was that climate change? Scientists are getting faster at linking extreme weather to warming,” <https://www.theguardian.com/environment/planet-oz/2016/sep/15/was-that-climate-change-scientists-are-getting-faster-at-linking-extreme-weather-to-warming>, *The Guardian*, 15 September 2016.

4 Notz, D., & Stroeve, J. (2016). Observed Arctic sea-ice loss directly follows anthropogenic CO₂ emission. *Science*, 354 (3 November), 747–750. <http://doi.org/10.1126/science.aag2345>

5 There, did you catch it?! I managed to justify my own cognitive dissonance: it was a doctoral research trip, not a lifestyle choice.

6 Jarrett, D., “Fact Sheet: The One-Tonne Flight,” https://ecometrica.com/assets/one_tonne_flight.pdf, *Ecometrica*, February 2012.

7 Note that my initial choice of carbon calculator for these figures employed a rather too optimistic factor of 1.89; only in subsequent fact-checking with the paper’s co-author Dirk Notz was I directed to Atmosfair’s calculator which used a more realistic factor of 3.0: <https://www.atmosfair.de/en/offset/flight>

For a detailed explanation see “Atmosfair Flight Emissions Calculator: Documentation of the Method and Data,” <https://www.atmosfair.de/wp-content/uploads/atmosfair-flight-emissions-calculator-englisch-1.pdf>, Berlin, September 2016.

- 8 Coumou, D., Di Capua, G., Vavrus, S., Wang, L., & Wang, S. (2018). The influence of Arctic amplification on mid-latitude summer circulation. *Nature Communications*, 9 (1), 2959. <http://doi.org/10.1038/s41467-018-05256-8>
- 9 For a biting critique of the Anthropocene as a depoliticization strategy see Swyngedouw, E., & Ernstson, H. (2018). Interrupting the Anthro-po-obScene: Immuno-biopolitics and Depoliticizing Ontologies in the Anthropocene. *Theory, Culture & Society*, 35(6), 3–30. <http://doi.org/10.1177/0263276418757314>, available at https://www.research.manchester.ac.uk/portal/files/68936152/Swyngedouw_Ernstson_Interrupting_TCS-FinalNovember2017SubmittedFINALRG.pdf
- 10 Coady, D., Parry, I., Sears, L., & Shang, B. (2017). How Large Are Global Fossil Fuel Subsidies? *World Development*, 91, 11–27. <https://doi.org/10.1016/j.worlddev.2016.10.004>
- 11 Tyers, R., “It’s time to wake up to the devastating impact flying has on the environment,” <https://theconversation.com/its-time-to-wake-up-to-the-devastating-impact-flying-has-on-the-environment-70953>, *The Conversation*, 11 January 2017.

About the Author

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To view a preview of the video diptych and triptych produced during this project please visit:

www.adamsebire.info/the-works/anthroposcenes/#anthropoScene4

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