Plans underway to drill supposed 1.5-million-year-old Antarctic ice

Jake Hebert

To better understand 'climate change', uniformitarian glaciologists intend to drill another deep ice core in East Antarctica, one reaching ice they believe to be between one and 1.5 Ma old.[1] Creationists should pray they are successful!

Currently the oldest Antarctic ice dated with supposed 'high confidence' is said to be 2.7 Ma old.[2,3] However, this is 'blue ice' (named because of the ice's brilliant bluish colour), obtained from a region where ice accumulation is thought to be roughly balanced by ice loss. Because ice is continually ablated from this region of Antarctica, glaciologists cannot obtain a continuous ice record, and analysis of retrieved blue ice is not trivial:

> "In such blue ice areas—just 1% of the continent's surface—the ice flows across rocky ridges, *tipping the record on its side*. Deep, old layers are driven up, while wind strips away snow and younger ice, revealing the lustrous blue of compressed ice below. *But these contortions also confound the neat ordering of the annual layers—making it impossible to date the ice by counting them* [emphases added]."[2]

The fragmentary nature of the 'blue ice' record only allows scientists to obtain 'snapshots' of past ice, rather than a much more valuable continuous record. The oldest presumed ice from a *continuous* ice core record is the ice at the bottom of the EPICA Dome C core, said to be 800 ka old.[4]

So, why pray for their success? If glaciologists succeed in drilling this new ice core, it will likely strengthen the case that the uniformitarian age assignments for the ice cores are greatly inflated.

Ice core overview

Since the ice sheets actually started forming during the post-Flood Ice Age, the Greenland and Antarctic ice sheets can be no more than 4.5 ka old.[5] Yet uniformitarian scientists assign ages of more than 100 ka to deep Greenland ice near bedrock,[6,7] and multiple hundreds of thousands of years to the deep ice cores in East Antarctica.[4,8,9]

Superficially, the deep ice cores from Greenland seem to present a strong argument for great age, because these ages were supposedly obtained by 'simple' counting of annual layers. However, creation researchers have plausibly argued that uniformitarian glaciologists may be greatly overcounting the true number of annual layers, especially in the bottom halves of the cores, which contain the greatest amount of presumed 'time'.[5,10–12]

In East Antarctica, low snowfall rates prevent visible (and countable) layers from being preserved in the deep Antarctic cores.[13,14] Uniformitarians therefore rely on theoretical age depth models which implicitly assume vast ages for the ice sheets.[15–17]

Tephra and inflated core ages

Three continuous ice core records with bottom purported ages greater than 400 ka have been drilled in East Antarctica: the Vostok, EPICA Dome C, and Dome Fuji ice cores. Within these ice core records are layers of volcanic ash and debris called tephra. When the locations of tephra layers within these three cores are plotted against their assigned uniformitarian ages, there is a dramatic apparent decrease in tephra-layer frequency as one goes deeper into the supposed 'prehistoric' past (figure 1).[18–20]

Via uniformitarian reckoning, one would expect frequencies of tephra deposition to be roughly constant in time, albeit with a random element imposed on the pattern. This is not the case and is a clear violation of the uniformitarian maxim that 'the present is the key to the past'. Secular glaciologists are forced to argue that East Antarctic tephra deposition, for some reason, was much rarer in the distant past.[19]

However, this dramatic decrease in tephra frequency is exactly what one would expect if uniformitarian age models are assigning inflated ages to the ice cores. These ages are *especially* inflated in the bottom halves of the cores, which typically contain *nearly all* the time assigned to them.[21] This apparent drop in frequency is a *systematic error* resulting from a grossly inflated uniformitarian timescale.

For this reason, creationists should expect this same pattern to show up in this proposed new Antarctic ice core.[22] Moreover, such a pattern in an 'older' core would be even harder for uniformitarians to explain. It's one thing to claim that, for some unknown reason, volcanic tephra deposits were extremely rare between 200–800 ka ago (figure 1). But it's even harder to plausibly claim Antarctic tephra deposits were exceedingly rare (or even non-existent) for a *million* years or more, only to 'erupt' in frequency (pun intended) within the last 200 ka!

Moreover, creation researchers have already found preliminary evidence that uniformitarian age models are implying ridiculously long durations to some tephra deposits. Explosive volcanic eruptions (which deposit tephra and ash) are very short geological events, and ashfall durations should be quite short, even when atmospheric dispersion times are taken into account. For someone

not present in order to see the volcanic eruption, the inferred time over which he/she determines a tephra layer to have been deposited depends on both the actual, true time of tephra fallout, as well as distance from the source volcano. A tephra layer deposited right next to a source volcano will be quite thick, and failure to recognize the nearness of the source volcano could result in the thickness being incorrectly interpreted as the result of an ashfall of very long duration. However, tephra layers rapidly (more or less exponentially) decrease in thickness with increasing distance from the source volcano.[23] And it is sometimes possible to identify the source volcano by examining the chemical composition of the tephra.[9]

As a case in point, a rough uniformitarian age model implies that one particular tephra layer in the Dome Fuji core was deposited over five years or so. Moreover, this apparent lengthy duration cannot be attributed to the nearness of the source volcano, which scientists think is Mt Berlin, West Antarctica, almost 3,000 km (1,860 mi) away.[20] But has anyone ever observed ash or tephra fallout at a single location lasting this long? This is another clue that uniformitarian age models are assigning way too much time to the deep ice cores.

An opportunity for creationists

Depending on its thickness and the depth at which it is located, a tephra layer near the bottom of this proposed East Antarctic core could potentially provide even more evidence for inflated secular timescales. As a hypothetical example, suppose a tephra layer is located in ice said to be 1.4 Ma old. Yet by creationist reckoning, suppose the age of that ice is roughly 4 ka. The timescale at the tephra layer's location would thus be inflated by roughly a factor of 1,400,000 ÷ 4,000 ~ 350. A tephra layer at this depth, that was actually deposited over, say, two weeks, would seem to have been deposited over 700 weeks—about 13 years! And what if chemical analysis revealed that the tephra originated from a distant—*not a nearby*—source volcano? In that case, the apparently absurd tephra fallout time could in no way be attributed to the nearness of the source volcano. It would then be painfully obvious that there is something *badly* wrong with the secular timescale.

Hence, the possibility of another long, continuous ice core from East Antarctica should excite creationists, and we should pray that the Lord Jesus would grant uniformitarian glaciologists success in drilling such a core. Although secularists have long used deep ice cores as a club with which to beat Bible-believing Christians, this could turn out to be yet another example of how even "the wrath of man shall praise" the Lord (Psalm 76:10).

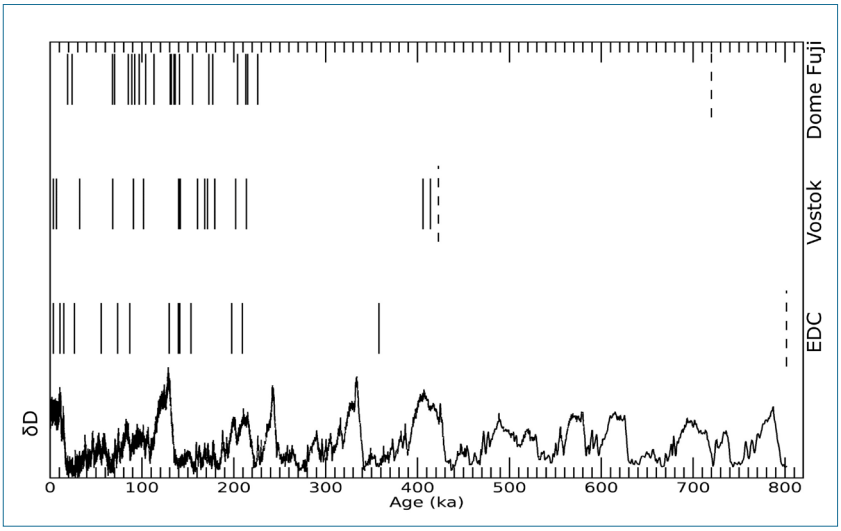

Figure 1. Tephra layers in the Antarctic Dome Fuji, Vostok, and EPICA Dome C cores, along with the (relative) delta deuterium signal from EPICA Dome C, as a function of uniformitarian age assignment. Dashed lines indicate greatest approximate ages/depths of core sections that were inspected for tephra layers. Dark tephra bands indicate multiple, closely spaced tephra layers. See reference 18 for details.

References

1. Voosen, P., Hunt begins for ancient Antarctic ice—and clues to Earth's response to rising temperatures, *Science*, science.org, 20 October 2021.
2. Voosen, P., Record-shattering 2.7-million-year-old ice core reveals start of the ice ages, *Science*, science.org, 15 August 2017.
3. Greenfieldboyce, N., Scientists have found some truly ancient ice, but now they want ice that's even older, *NPR*, npr.org, 26 December 2020.
4. Jouzel, J. *et al.*, Orbital and millennial Antarctic climate variability over the past 800,000 years, *Science* **317**(5839):793–797, 2007.
5. Oard, M.J., *The Frozen Record*, Institute for Creation Research, Santee, CA, 2005.
6. Meese, D.A. *et al.*, The Greenland Ice Sheet project 2 depth-age scale: Methods and results, *J. Geophysical Research* **102**(C12):26411–26423, 1997.
7. Yau, A.M. *et al.*, Reconstructing the last interglacial at Summit, Greenland: Insights from GISP2, PNAS **113**(35):9710–9715, 2016.
8. Basile, I., Volcanic layers in Antarctic (Vostok) ice cores: source identification and atmospheric implications, *J. Geophysical Research* **106**(D23):31915–31931, 2001.
9. Narcisi, B. *et al.*, Characteristics and sources of tephra layers in the EPICA-Dome C ice record (East Antarctica): implications for past atmospheric circulation and ice core stratigraphic correlations, *Earth and Planetary Science Letters* **239**:253–265, 2005.
10. Hebert, J., Ice cores, seafloor sediments, and the age of the Earth, Part 2, *Acts & Facts* **43**(7):12–14, 2014.
11. Hebert, J., Thick ice sheets: how old are they really? *Acts & Facts* **44**(6):15, 2015.
12. Hebert, J., *The Ice Age and Climate Change: A creation perspective*, Institute for Creation Research, Dallas, TX, pp. 158–187, 2021.

13. Palerme, C., Kay, J.E., Genthon, C., L'Ecuyer, T., Wood, N.B., and Claud, C., How much snow falls on the Antarctic ice sheet? *The Cryosphere Discussions* **8**:1279–1304, the-cryosphere-discuss.net/8/1279/2014/tcd-8-1279-2014-print.pdf, accessed 3 May 2018.

14. Dating by forward and inverse modelling, Centre for Ice and Climate, Niels Bohr Institute, www.iceandclimate.nbi.ku.dk/research/strat_dating/forward_inv_modelling/, accessed 3 May 2018.

15. Cuffey, K.M. and Paterson, W.S.B., *The Physics of Glaciers*, 4th edn, Butterworth-Heinemann, Burlington, MA, pp. 617–620, 2010.

16. Nye, J.F., Correction factor for accumulation measured by the thickness of the annual layers in an ice sheet, *J. Glaciology* **4**(36):785–788, 1963.

17. Dansgaard, W. and Johnsen, S.J., A flow model and a time scale for the ice core from Camp Century, Greenland, *J. Glaciology* **8**(53):215–223, 1969.

18. Hebert, J., Tephra and inflated ice core ages, *J. Creation* **32**(3):4–6, 2018.

19. Narcisi, B., Petit, J.R., and Delmonte, B., Extended East Antarctic ice-core tephrostratigraphy, *Quaternary Science Reviews* **29**:21–27, 2010.

20. Fuji, Y. *et al.*, Tephra layers in the Dome Fuji (Antarctica) deep ice core, *Annals of Glaciology* **29**:126–130, 1999.

21. This can easily be verified by a visual inspection of published age versus depth models for ice cores.

22. Hebert, J., New ice core expected to contain Creation evidence, *Creation Science Update*, icr.org, 18 November 2021.

23. Bonadonna, C., Ernst, G.G.J., and Sparks, R.S.J., Thickness variations and volume estimates of tephra fall deposits: the importance of particle Reynolds number, *J. Volcanology and Geothermal Research* **81**:173–187, 1998.