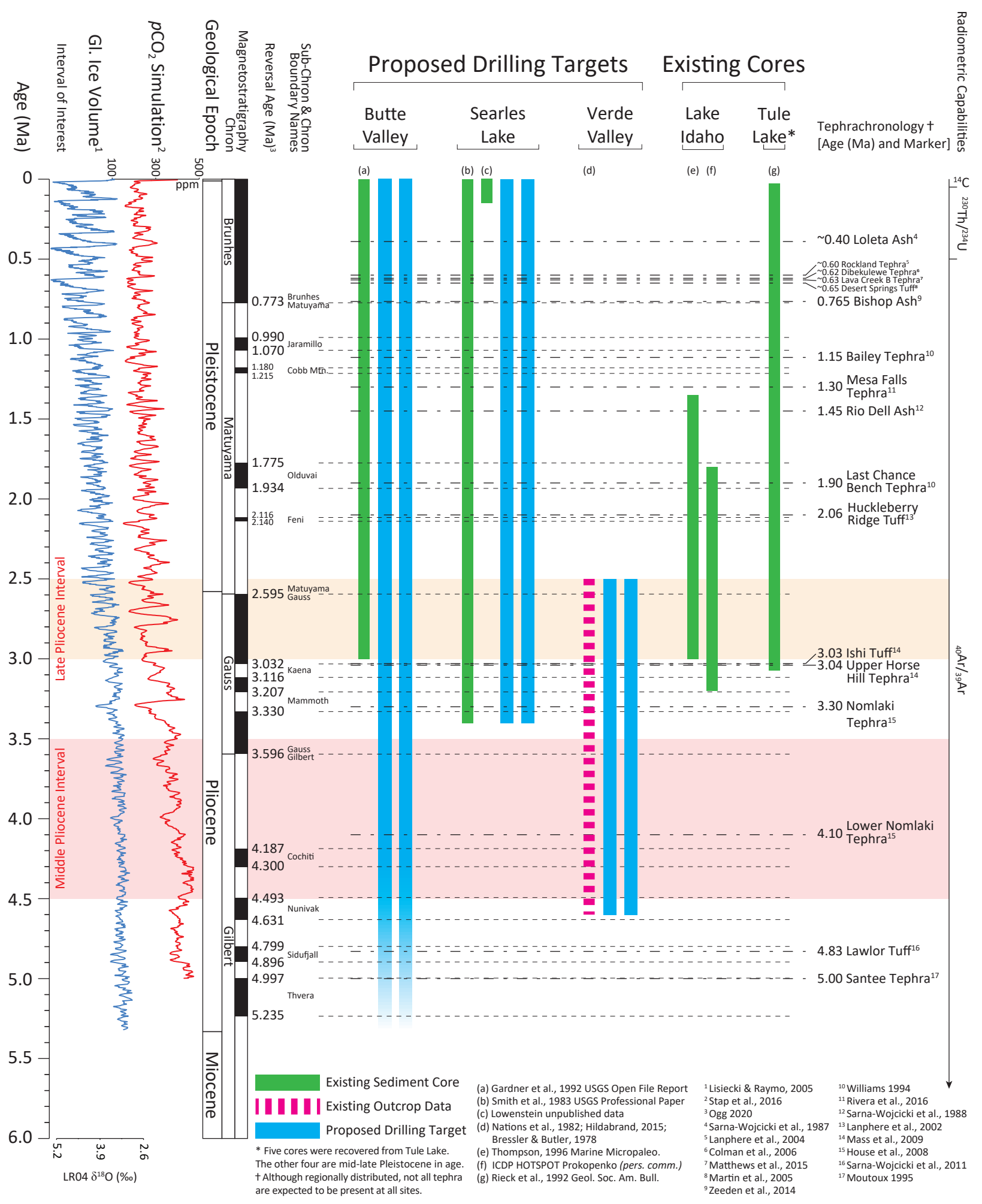
Age (Ma)
Interval of Interest
Gl. Ice Volume[1]
pCO2 Simulation[2]
Geological Epoch
Magnetostratigraphy Chron
Reversal Age (Ma)[3]
Sub-Chron & Chron Boundary Names
Proposed Drilling Targets
Existing Cores
Butte Valley
Searles Lake
Verde Valley
Lake Idaho
Tule Lake*
Tephrachronology † [Age (Ma) and Marker]
Radiometric Capabilities
14C
230Th/234U
40Ar/39Ar
Late Pliocene Interval
Middle Pliocene Interval
Brunhes
Matuyama
Gauss
Gilbert
Pleistocene
Pliocene
Miocene
0.773 Brunhes Matuyama
0.990 Jaramillo
1.070
1.180 Cobb Mtn.
1.215
1.775 Olduvai
1.934
2.116 Feni
2.140
2.595 Matuyama Gauss
3.032 Kaena
3.116
3.207 Mammoth
3.330
3.596 Gauss Gilbert
4.187 Cochiti
4.300
4.493 Nunivak
4.631
4.799 Sidufjall
4.896
4.997 Thvera
5.235
~0.40 Loleta Ash[4]
~0.60 Rockland Tephra[5]
~0.62 Dibekulewe Tephra[6]
~0.63 Lava Creek B Tephra[7]
~0.65 Desert Springs Tuff[8]
0.765 Bishop Ash[9]
1.15 Bailey Tephra[10]
1.30 Mesa Falls Tephra[11]
1.45 Rio Dell Ash[12]
1.90 Last Chance Bench Tephra[10]
2.06 Huckleberry Ridge Tuff[13]
3.03 Ishi Tuff[14]
3.04 Upper Horse Hill Tephra[14]
3.30 Nomlaki Tephra[15]
4.10 Lower Nomlaki Tephra[15]
4.83 Lawlor Tuff[16]
5.00 Santee Tephra[17]
LR04 δ18O (‰)
Existing Sediment Core
Existing Outcrop Data
Proposed Drilling Target
* Five cores were recovered from Tule Lake. The other four are mid-late Pleistocene in age.
† Although regionally distributed, not all tephra are expected to be present at all sites.
(a) Gardner et al., 1992 USGS Open File Report
(b) Smith et al., 1983 USGS Professional Paper
(c) Lowenstein unpublished data
(d) Nations et al., 1982; Hildabrand, 2015; Bressler & Butler, 1978
(e) Thompson, 1996 Marine Micropaleo.
(f) ICDP HOTSPOT Prokopenko (pers. comm.)
(g) Rieck et al., 1992 Geol. Soc. Am. Bull.
[1] Lisiecki & Raymo, 2005
[2] Stap et al., 2016
[3] Ogg 2020
[4] Sarna-Wojcicki et al., 1987
[5] Lanphere et al., 2004
[6] Colman et al., 2006
[7] Matthews et al., 2015
[8] Martin et al., 2005
[9] Zeeden et al., 2014
[10] Williams 1994
[11] Rivera et al., 2016
[12] Sarna-Wojcicki et al., 1988
[13] Lanphere et al., 2002
[14] Mass et al., 2009
[15] House et al., 2008
[16] Sarna-Wojcicki et al., 2011
[17] Moutoux 1995