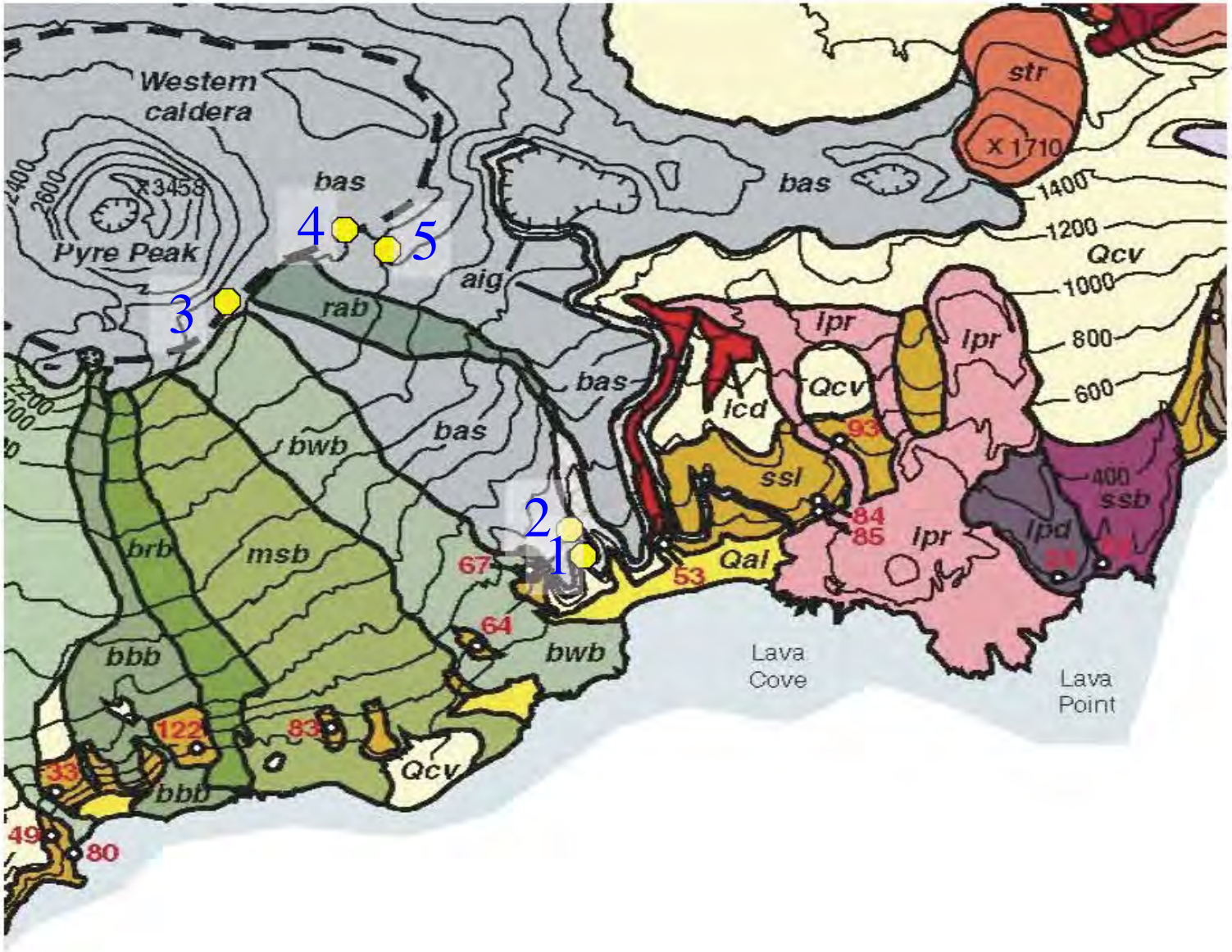
# Field Report: Seguam Island (AK) Tephra Collection, July 19-20, 2007



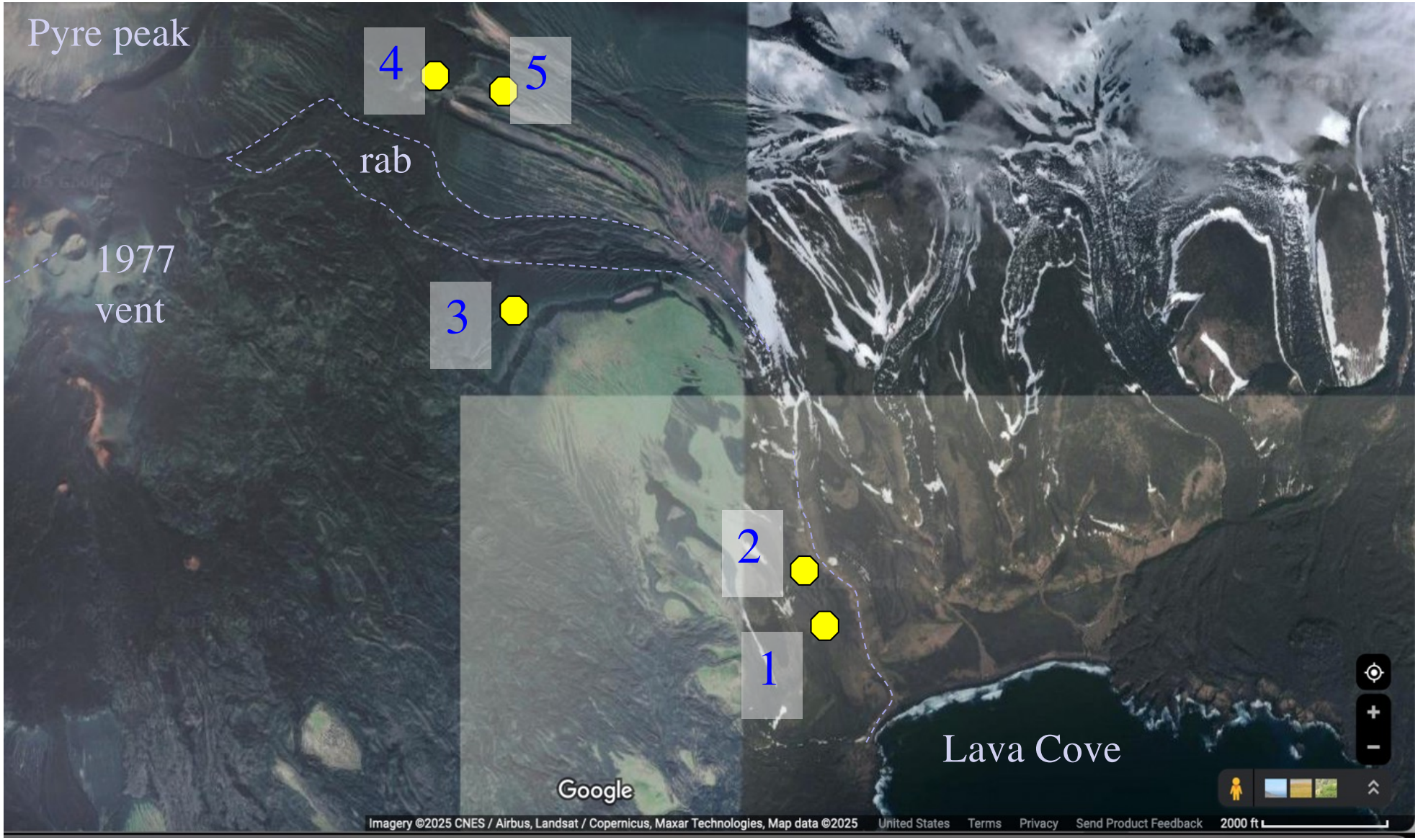
Brian Jicha and Terry Plank sampling Historic-late Holocene tephra from Pyre Peak and the western caldera.
This section is Site 5, and includes samples SEG-07-07 thru -11.
Field Report prepared January, 2026 by Terry Plank (LDEO/Columbia Univ.)
Photo: Brad Singer

# Sample Site Overview: base map from Jicha and Singer (2006)




- Sample sites from 2007 field campaign (targeting tephra)

# Sample Site Overview: base map from Google Maps



| 2007 Seguam Samples: Terry Plank, Brad Singer, Brian Jicha | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **Sample Name** | **Type** | **Date** | **Sample Site** | **lat (°N)** | **long (°W)** |
| SEG-07-01 | scoria bombs and lapilli | 19-Jul-07 | Site-1: above aig, on ridge above Lava Cove | 52.28518 | 172.45847 |
| SEG-07-02 | scoria lapilli | 19-Jul-07 | Site-2: on first scoria patch, on ridge above Lava | 52.28677 | 172.45983 |
| SEG-07-03 | dark ash layer | 19-Jul-07 | Site-2: on first scoria patch, on ridge above Lava | 52.28677 | 172.45983 |
| SEG-07-04 | dark ash layer | 19-Jul-07 | Site-2: on first scoria patch, on ridge above Lava | 52.28677 | 172.45983 |
| SEG-07-05 | scoria lapilli (also bombs) | 20-Jul-07 | Site 3: on western caldera rim, in 1977 tephra bl | 52.29847 | 172.48093 |
| SEG-07-06 | crystal clots in 1977 tephr | 20-Jul-07 | Site 4: just north of rab, in 1977 tephra blanket | 52.30817 | 172.48621 |
| SEG-07-07 | fine scoria lapilli (≤ 5 mm | 20-Jul-07 | Site 5: Lunch Site section, valley north of rab | 52.30777 | 172.48399 |
| SEG-07-08 | pumice lapilli and bombs | 20-Jul-07 | Site 5: Lunch Site section, valley north of rab | 52.30777 | 172.48399 |
| SEG-07-09 | dark ash layer | 20-Jul-07 | Site 5: Lunch Site section, valley north of rab | 52.30777 | 172.48399 |
| SEG-07-10 | scoria lapilli (and bombs) | 20-Jul-07 | Site 5: Lunch Site section, valley north of rab | 52.30777 | 172.48399 |
| SEG-07-11 | dark ash and fine lapilli | 20-Jul-07 | Site 5: Lunch Site section, valley north of rab | 52.30777 | 172.48399 |



Brad Singer and Brian Jicha
Lunch at Site 5
Photo: Terry Plank

# Seguam collection overview, July 19-20 2007

Terry Plank, Brian Jicha and Brad Singer
Goal: Collect Historic to Holocene mafic tephra (for melt inclusion studies)
Guided by recent mapping of Jicha and Singer (2006) GSAB

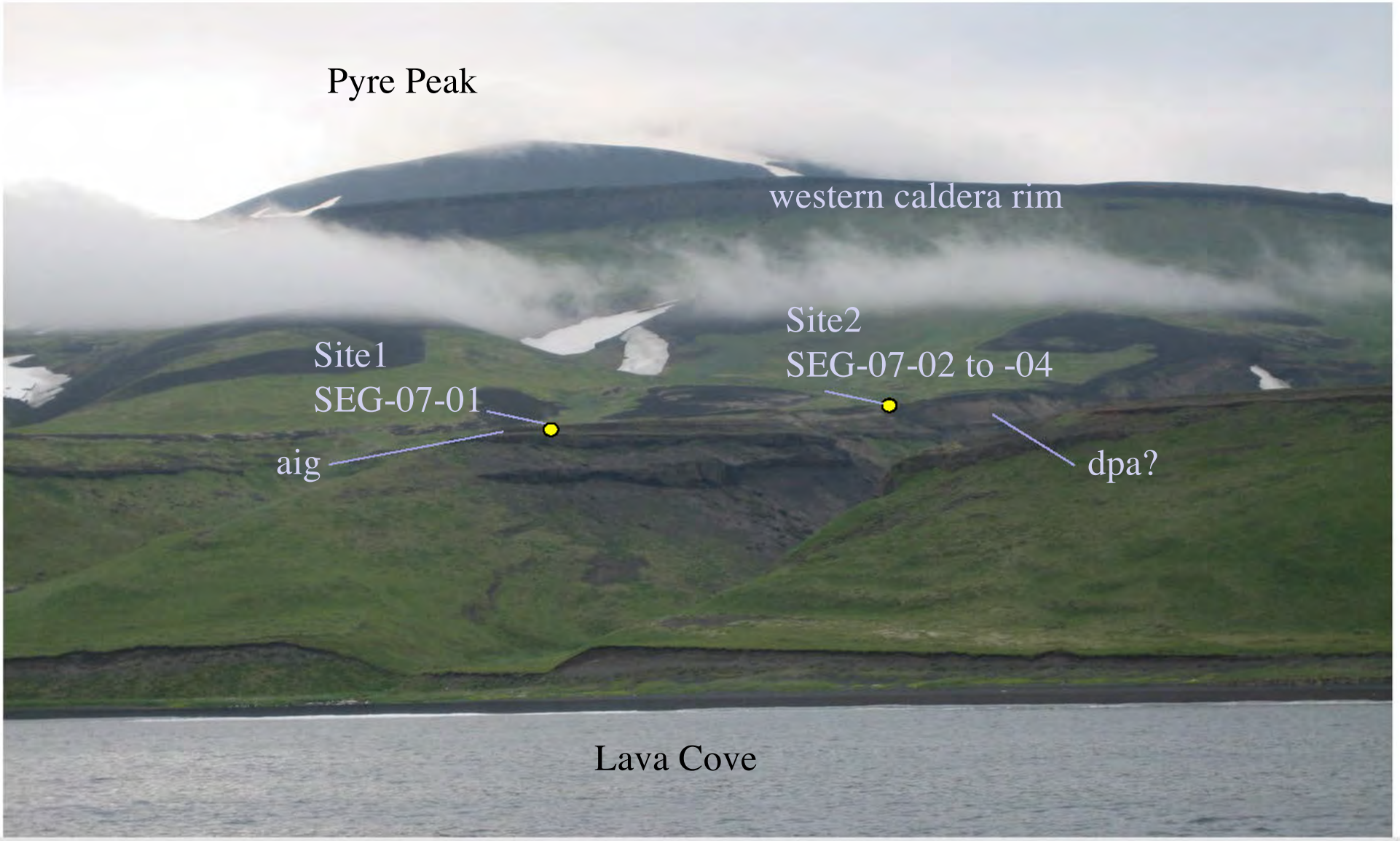
**Timeline**

| | |
|---|---|
| July 16 | Arrive in Sand Point, AK |
| July 17-19 | Board R/V Tiglax and transit from Sand Point to Seguam via Aiktak |
| July 19 | Skiff to beach at Lava Cove in late afternoon of July 19, Samples Site 1-2 |
| July 20 | Skiff to beach at Lava Cove in morning of July 20, Samples Site 3-5 |



Getting ready to skiff back to Tiglax
July 20, 2007
Photo: Brad Singer

# July 19, 2007: Site 1-2 sampling the ridge above Lava Cove




aig = andesite ignimbite, from western caldera-forming eruption
dpa = dacitic pumice airfall from Pyre Peak




Site 1

Brian Jicha and Terry Plank
Photo: Brad Singer




**SEG-07-01**
scoria bombs and lapilli, 50 cm thick
several m above aig,
andesite ignimbrite (late Holocene)
Plag-hosted MI 57-61% $SiO_2$
Plag $An_{55-88}$
Bulk scoria 56% $SiO_2$

photo: Terry Plank

# Looking Toward Site 1 from Site 2



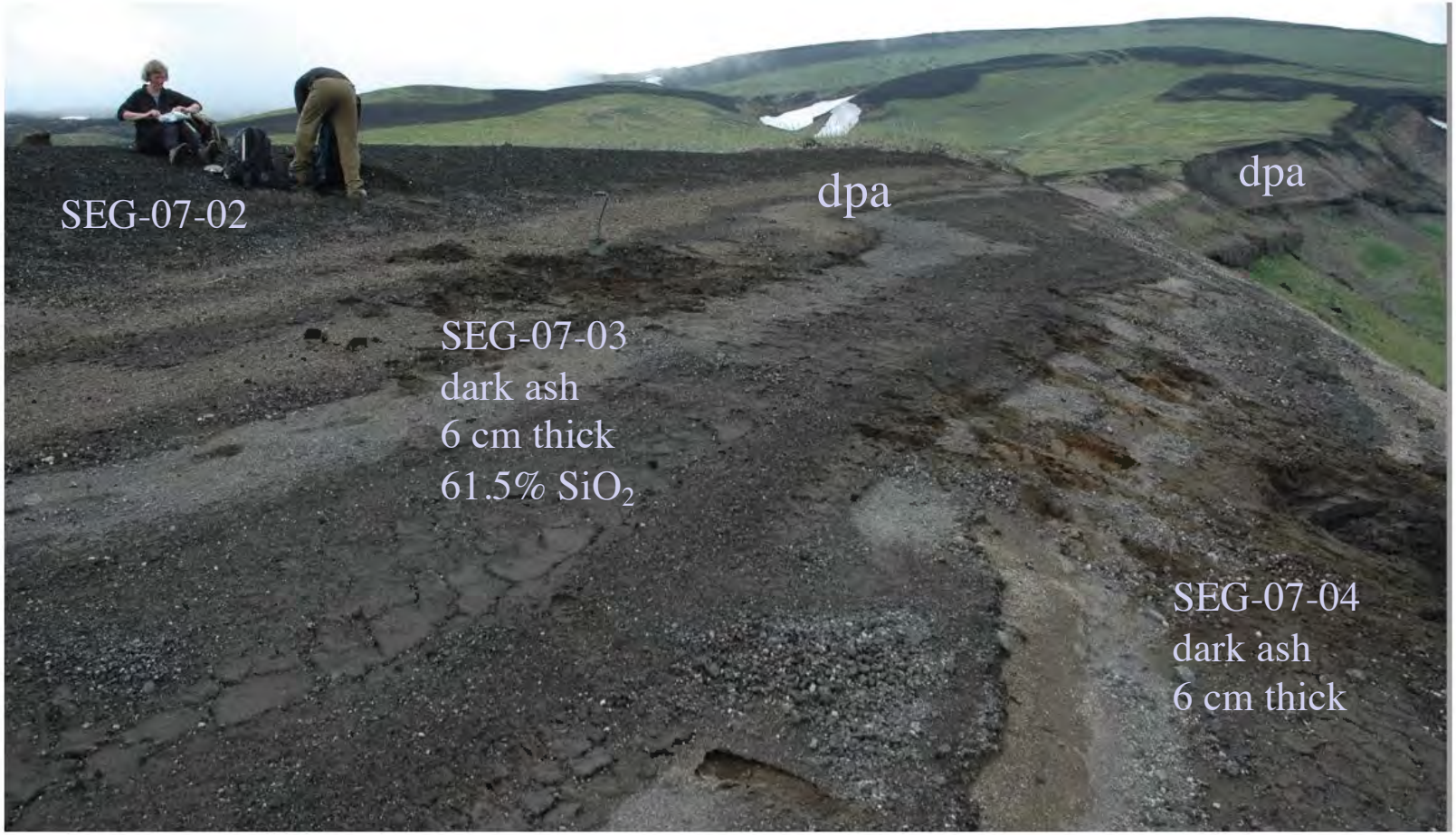
Terry Plank and Tiglax in distance
Photo: Brad Singer

# Site 2: Scoria bench above aig




**SEG-07-02**
Scoria lapilli
below surface
> 50 cm thick
57% $SiO_2$

Brian Jicha and Terry Plank sampling
Photo: Brad Singer




Site 2
Looking upslope

Brian Jicha and Terry Plank sampling
Photos: Brad Singer



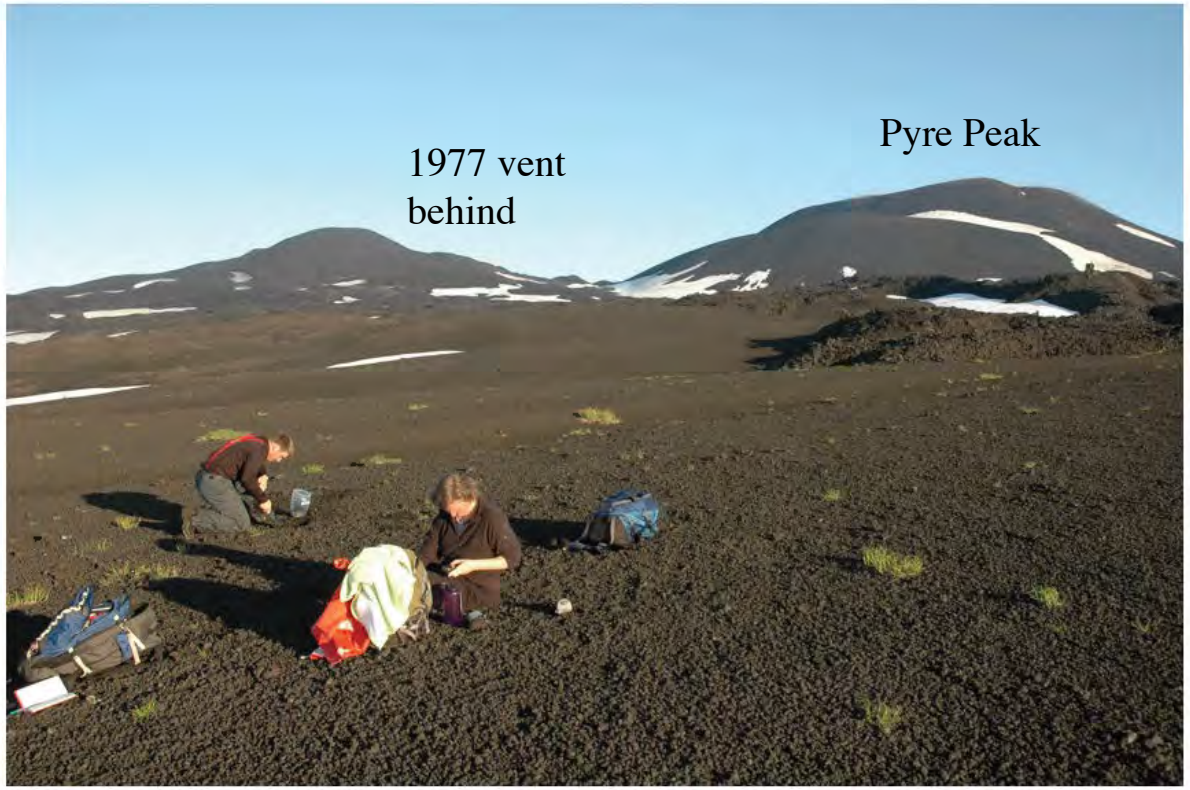
**SEG-07-02**, close up
57% $SiO_2$




**SEG-07-04**, close up

Site 3, July 20, 2007
tephra blanket from 1977, on western caldera rim



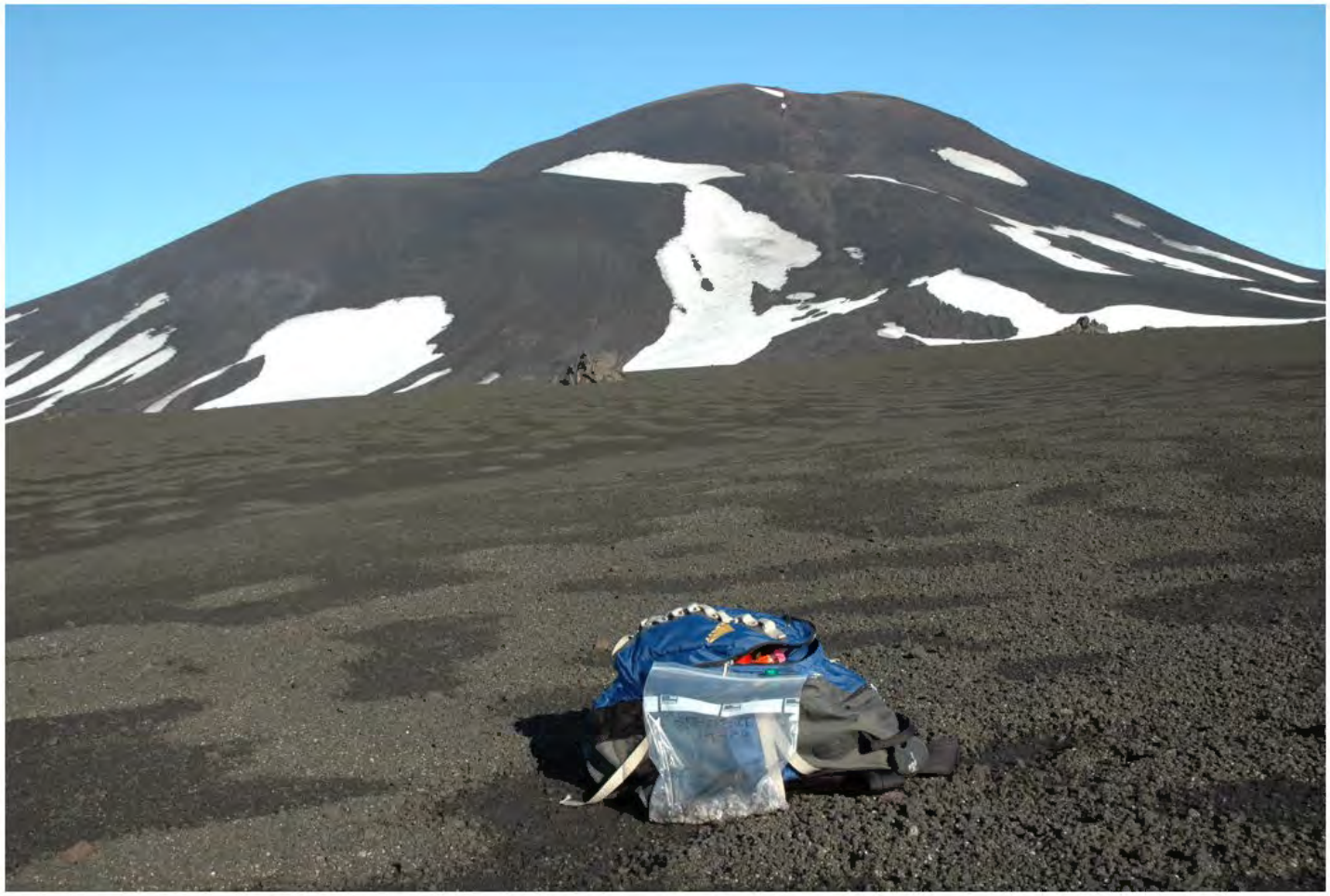



**SEG-07-05**

1977 scoria lapilli and bombs, within 6 cm of surface
> 50 cm thick
oily glass, red brick lithics, ol+pl+cpx
ol Fo74-85; An42-45 plag, $H_2O$ up to 2.75 wt%; S up to 1600 ppm
WR = 50.6 wt% SiO2

Brian Jicha and Terry Plank sampling
Photos: Brad Singer

Site 4, July 20, 2007
just N of lava flow rab, tephra blanket from 1977, western caldera rim

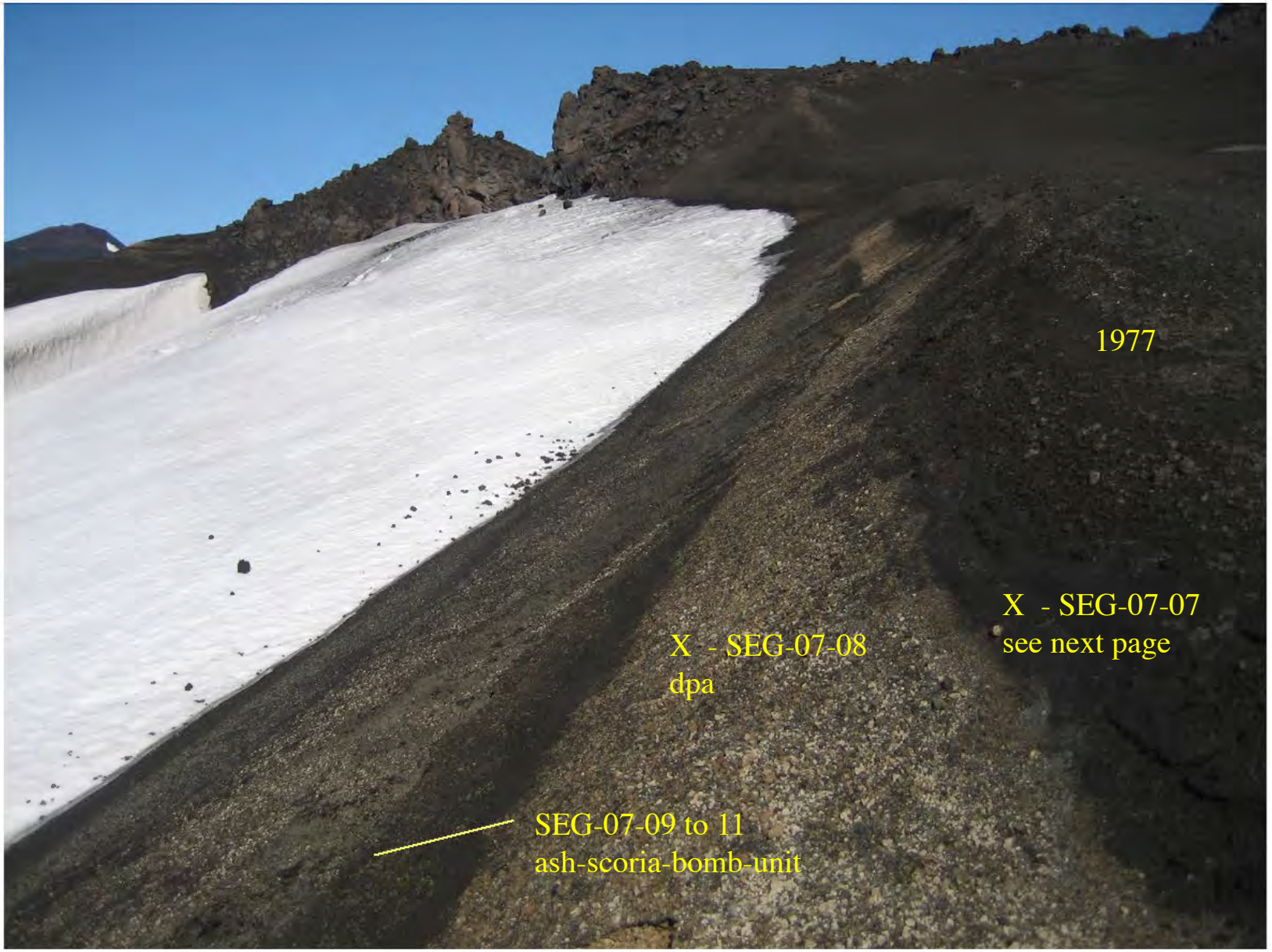


**SEG-07-06**: (sample most extensively studied for volatiles in melt inclusions – see Bibliography)
1977 scoria surface, pluck large megacrysts and clasts from small lag deposits
Pyre Peak in background
ol Fo80-83, cpx Mg# 74-75, An91-92 plag
$H_2O$ up to 3.75 wt%; S up to 1076 ppm.
WR = 50.2 wt% SiO2




View of vent for 1977 and 1993 eruptions
Terry Plank walking on 1997 tephra blanket
Photo: Brad Singer

Site 5, July 20, 2007
NE side of ravine below caldera rim




Looking up to caldera rim, from Site 5 tephra section

Photo: Brad Singer

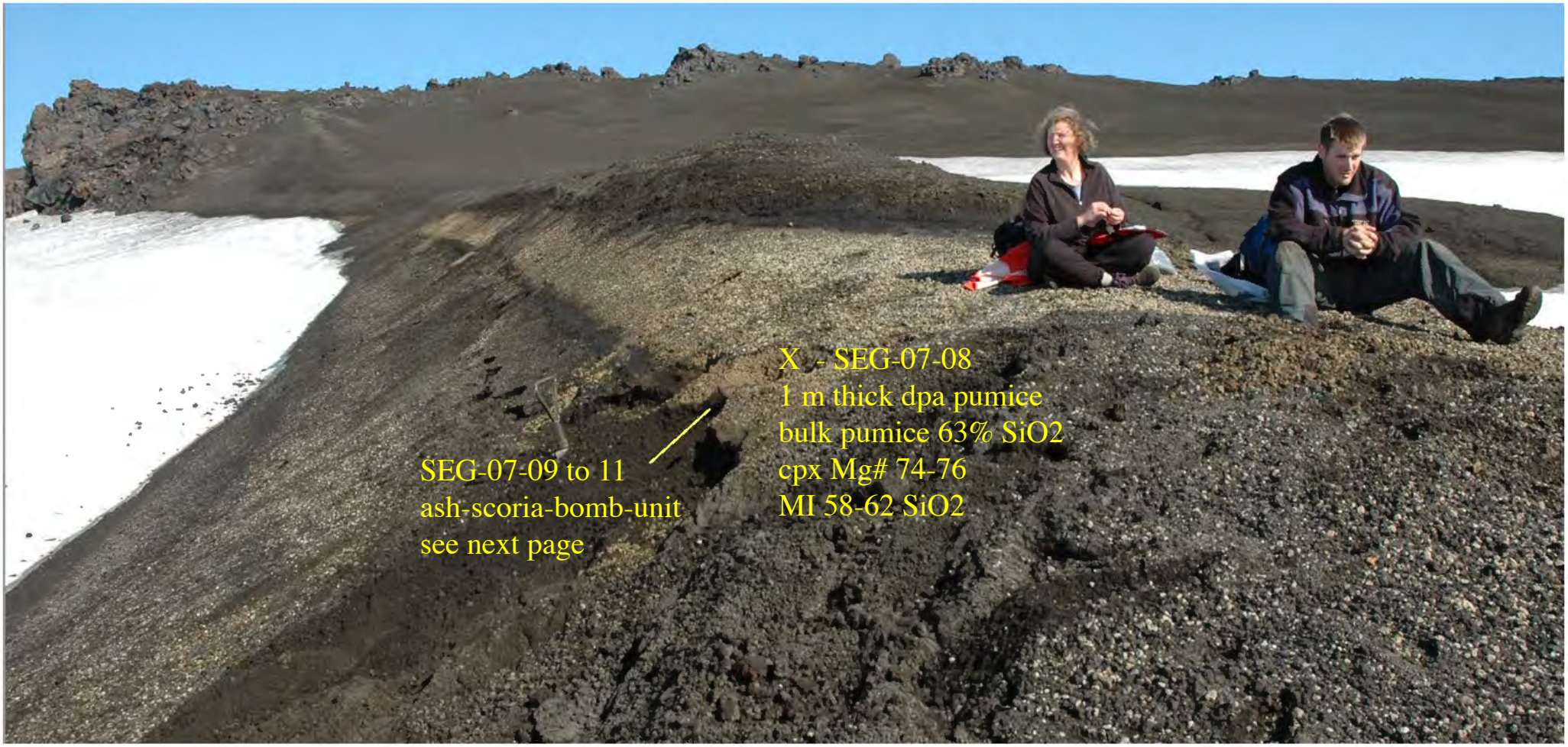


# Site 5

buff layer

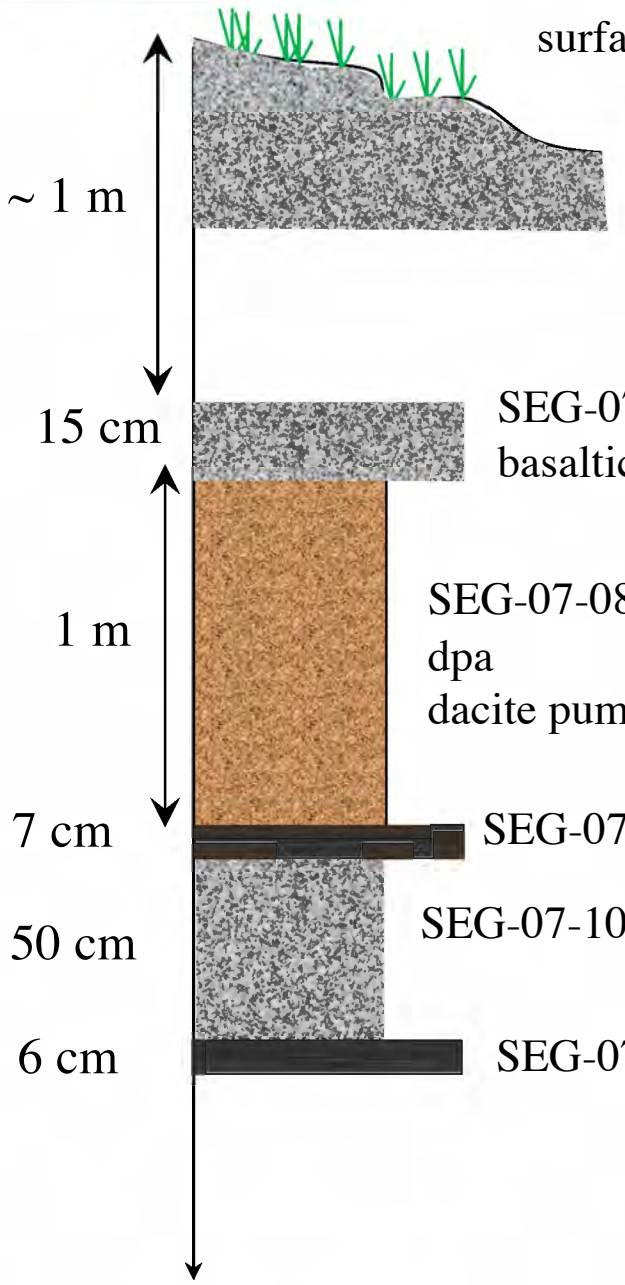
**SEG-07-07**
fine scoria lapilli (< 5 mm)
15 cm thick
above light pumice (dpa)
$Fo_{72-73}$ ol
51% $SiO_2$ MI
Bulk lapilli 55% $SiO_2$

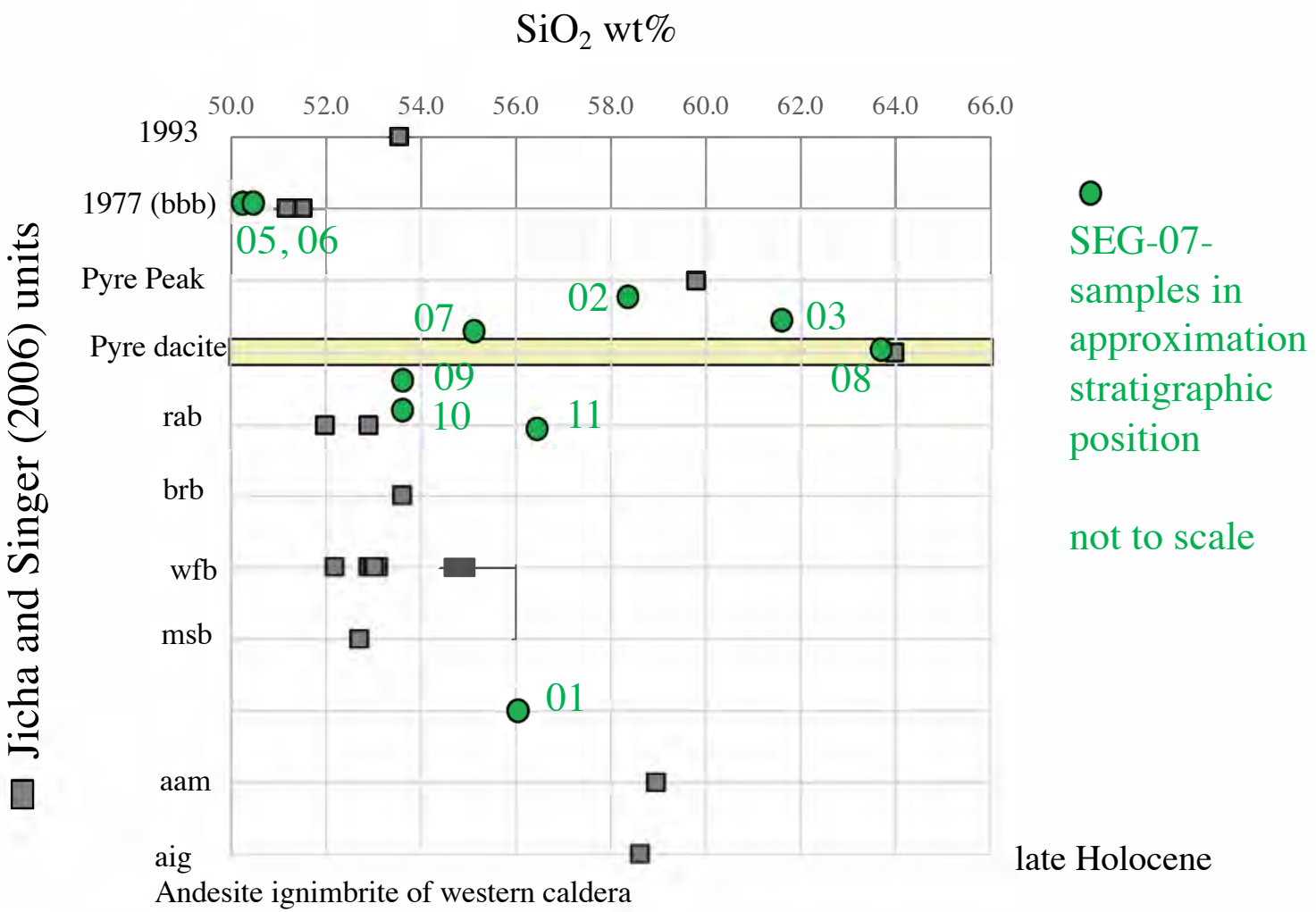
# Site 5




Lunch on dpa
Terry Plank and Brian Jicha
Photo: Brad Singer

# Site 5


surface
~ 1 m
1977 scoria
15 cm
SEG-07-07
basaltic andesite lapilli
1 m
SEG-07-08
dpa
dacite pumice
7 cm
SEG-07-09 • dark ash layer, gradational lower contact, bulk ash 54% SiO2
50 cm
SEG-07-10 • scoria laplli and bombs up to 9 cm, cpx Mg# 68-76
MI 56-59 SiO2; bulk lapilli 54% SiO2
6 cm
SEG-07-11 • dark ash layer, gradational upper contact, bulk ash 56% SiO2
several m to aig


SiO2 wt%
50.0
52.0
54.0
56.0
58.0
60.0
62.0
64.0
66.0
1993
1977 (bbb)
Pyre Peak
Pyre dacite
rab
brb
wfb
msb
aam
aig
Jicha and Singer (2006) units
05, 06
07
02
03
09
10
11
08
01
SEG-07-samples in approximation stratigraphic position
not to scale
late Holocene
Andesite ignimbrite of western caldera

# Bibliography:


Zimmer et al. (2010) JPet, Supplement and Zimmer thesis – Tholeiitic Index
all data quoted herein, with additional volatiles and trace element analyses

Lloyd et al. (2016) JPet – Water in cpx
more extensive MI-volatile analyses of SEG07-06, ol, cpx, plag and opx-hosted
$H_2O$ in Seguam cpx from tephra and lava

Moore et al. (2015) AmMn – Bubbles Matter
Raman analysis of SEG-07-06 MI – $CO_2$ rises from 500 to 900 ppm

Rasmussen et al. (2020) AmMn – Bubbles Still Matter
Homogenized SEG-07-06 MI – $CO_2$ rises now to 1500 ppm, 12-15 km max depth

Newcombe et al. (2020a) JVGR– Every Crystal is a Clock
SEG-07-06 embayments – decompression rates increase with decreasing P (acceleration)
Water zonation in Seguam olivines yields decompression rates ~ 0.05 MPa/s

Newcombe et al. (2020b) FES– P, T, t of magma ascent to eruption
SEG-07-06 MI – MgO zonation constraints syn-eruptive cooling rate to 1-10 degrees/s

Taracsak et al. (2026) Science Advances, submitted
SEG-07-06 MI – S iostopes by SIMS (and major elements, volatiles, light elements).
Evidence for Seguam being at the reduced end of arcs, showing reductive degassing