PANGAEA® –
Long-term archiving and publication of earth science data

Stefanie Schumacher, Amelie Driemel, Hannes Grobe, Rainer Sieger
Alfred-Wegener-Institut, Bremerhaven
What is PANGAEA®?

Pangaea is an open access data library for earth system research.

Data are stored georeferenced in space and time in a relational database and a tape archive.

Datasets have a citation and a DOI

The data content is accessible on the internet via a search engine, a data warehouse and web services.

The system is open to any scientist or project to archive and publish data.
Both institutions have committed to long-term operate PANGAEA
Data Model

**where?**
- Latitude/Longitude
- air
- ice
- water
- rock/sediment

**when?**
- date time or geological age

**what?**
- parameter [unit]

**numeric**
- 16  B. dilatata [2]
- 18
- 17
- 4

**text**
- Lithology
- Aleutian clay
- Aleutian clay
- Nannofossil clays

**object**
- investigator/author/reference

**how?**
- method
Data in PANGAEA - Supplement

Citation: Allan, ASR et al. (2008): Geochemistry of lepascha from the Taupō Volcanic Zone [doi:10.1594/PANGAEA.815946].

Abstract:
The Taupō Volcanic Zone (TVZ), central North Island, New Zealand, is the most frequently active Quaternary volcanic system in the world. Silicic lepascha recovered from Ocean Drilling Programme Site 1123 (41°17.16'S, 171°29.58'W; 3290 m water depth) in the southwest Pacific Ocean provide a well-dated record of explosive TVZ volcanism since 1.85 Ma. We present major, minor and trace element data for 70 Quaternary lepascha layers from Site 1123 determined by electron probe microanalysis (1314 analyses) and laser ablation inductively coupled plasma mass spectrometry (654 analyses). Trace element data allow for the discrimination of different lepascha with similar major element chemistries and the establishment of isochronous tie-lines between three sediment cores (1123A, 1123B and 1123C) recovered from Site 1123. These lepascha tie-lines are used to evaluate the stratigraphy and historically turned stable isotope age model of the Site 1123 composite record. Trace element fingerprinting of lepascha identifies ~4.5 m and ~7.9 m thick sections of repeated sediments in 1123A (49.0±3.5 mbsf, between seafloor) and 1123C (48.1±6.0 mbsf, respectively). These previously unrecognised repeated sections have resulted in significant errors in the Site 1123 composite stratigraphy and age model for the interval 11.15-1.36 Ma and can explain the poor correspondence between d18O profiles for Site 1123 and Site 849 (equatorial Pacific) during this interval. The revised composite stratigraphy for Site 1123 shows that the 70 lepascha layers, when correlated between cores, correspond to ~37-39 individual eruptive events (lepascha), 7 of which can be correlated to onshore TVZ deposits. The frequency of large-volume TVZ-derived silicic eruptions, as recorded by the deposition of lepascha at Site 1123, has not been uniform through time. Rather it has been typified by short periods (25-60 ka) of intense activity bracketed by longer periods (100-150 ka) of quiescence. The most active period (at least 1 event per 7 ka) occurred between ~13.1 and 1.86 Ma, corresponding to the first ~130 ka of TVZ pyroclastic magmatism. Since ~1.2 Ma ~90% of lepascha preserved at Site 1123 and the more proximal Site 1124 were erupted and deposited during glacial periods. This feature may reflect either enhanced atmospheric transport of volcanic ash to these sites (up to 1000 km from sources) during glacial conditions or, more speculatively, that these events are triggered by changes in crustal stress accumulation associated with large amplitude sea-level changes. Only 8 (~37-39) Site 1123 lepascha units (~25%) can be found in all three cores, and 22 lepascha units (~75%) are only present in one of the three cores. Whether a lepascha is preserved in all three cores does not have a simple direct relationship to eruptive volume. Instead it is postulated that lepascha preservation at Site 1123 is ‘patchy’ and influenced by the vigorous nature of their deposition to the deep ocean floors under intense currents. At this site, at least 5 cores would have needed to have been drilled within a proximity of 10s to 100s of metres of each other to yield a >99% chance of recovering all the silicic lepascha deposited on the seafloor above it in the past 1.85 Ma.

Other version:
GEOROC sample information - Coromandel-Taupo

Further details:
Table 1. Summary of laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) instrumental and analytical conditions

Property:
Ocean Drilling Program (ODP)

Coverage:

License:
CC BY Attribution 3.0 Unported

Downloaded Data:
Download ZIP file containing all datasets as tab-delimited text (use the following character encoding: UTF-8; Unicode (PANGAEA default))

Datasets listed in this Collection:
1. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 2 Mean major and trace element compositions of representative lepascha from the four melt types identified in ODP Site 181-1123. doi:10.1594/PANGAEA.815915
2. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 3a Major element compositions of ODP Hole 181-1123A lepascha. doi:10.1594/PANGAEA.815920
3. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 3b Major element compositions of ODP Hole 181-1123B lepascha. doi:10.1594/PANGAEA.815921
4. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 3c Major element compositions of ODP Hole 181-1123C lepascha. doi:10.1594/PANGAEA.815922
5. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 3d Major element compositions of onshore Taupō Volcanic Zone lepascha. doi:10.1594/PANGAEA.815923
6. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 4a Major and trace element compositions of ODP Hole 181-1123A lepascha. doi:10.1594/PANGAEA.815927
7. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 4b Major and trace element compositions of ODP Hole 181-1123B lepascha. doi:10.1594/PANGAEA.815931
8. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 4c Major and trace element compositions of ODP Hole 181-1123C lepascha. doi:10.1594/PANGAEA.815932
9. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 4d Major and trace element compositions of onshore Taupō Volcanic Zone lepascha. doi:10.1594/PANGAEA.815938
10. Allan, ASR; Baker, JA; Carter, L et al. (2008): Table 5a Teaspa tie-lines established between the Site ODP 181-1123 sediment cores. doi:10.1594/PANGAEA.815948
Acknowledgements:
For supplementary data see: doi:10.1594/PANGAEA.815949
Data in PANGAEA - Supplement

Citation: Allan, ASR et al. (2008): Geochemistry of tephras from the Taupō Volcanic Zone. doi:10.1594/PANGAEA.815944.
Supplement to: Allan, Adrian SR; Baker, Joel A; Carter, Lionel; Wysoczanski, Richard J (2008): Reconstructing the Quaternary evolution of the world’s most active silicic volcanic system: insights from an ~1.85 Ma deep ocean tephra record sourced from Taupō Volcanic Zone, New Zealand. Quaternary Science Reviews, 27(25-26), 2341-2360, doi:10.1016/j.quascirev.2008.09.003

Abstract: The Taupō Volcanic Zone (TVZ), central North Island, New Zealand, is the most frequently active Quaternary rift system in the world. Silicic tephras recovered from Ocean Drilling Programme Site 1123 (41°47.16’S, 171°29.94’W; 3290 m water depth) in the southwest Pacific Ocean provide a well-dated record of explosive TVZ volcanism since ~1.85 Ma. We present major, minor and trace element data for 70 Quaternary tephras layers from Site 1123 determined by electron probe microanalysis (1314 analyses) and laser ablation inductively coupled plasma mass spectrometry (654 analyses). Trace element data allow for the discrimination of different tephras with similar major element chemistry and the establishment of isochronous tie-lines between three sediment cores (1123A, 1123B and 1123C) recovered from Site 1123. These tephras tie-lines are used to evaluate the stratigraphy and orbitally tuned stable isotope age model of the Site 1123 composite record. Trace element fingerprinting of tephras identifies ~4.5 m and ~7.6 m thick sections of repeated sediments in 1123A (49.0-53.0 mbsf [meters below seafloor]) and 1123C (46.8-50.0 mbsf), respectively. These previously unrecognised repeated sections have resulted in significant errors in the Site 1123 composite stratigraphy and age model for the interval 11.5-1.36 Ma and can explain the poor correspondence between d18O profiles for Site 1123 and Site 849 (equatorial Pacific) during this interval. The revised composite stratigraphy for Site 1123 shows that the 70 tephras layers, when correlated between cores, correspond to ~37-38 individual eruptive events (tephras), 7 of which can be correlated to oceano TVZ deposits. The frequency of large-volume TVZ-derived silicic eruptions, as recorded by the deposition of tephras at Site 1123, has not been uniform throughout time. Rather it has been typified by short periods (25-60 ka) of intense activity bracketed by longer periods (100-150 ka) of quiescence. The most active period (at least 1 event per 7 ka) occurred between ~1.53 and 1.96 Ma, corresponding to the first ~130 ka of TVZ rifty basalt magmatism. Since 1.2 Ma, ~40% of tephras preserved at Site 1123 and the more proximal Site 1124 were erupted and deposited during glacial periods. This feature may reflect either enhanced atmospheric transport of volcanic ash to these sites (up to 1000 km from source) during glacial conditions or, more speculatively, that these events are triggered by changes in crustal stress accumulation associated with large amplitude sea-level changes. Only 8 (~37-38 Site 1123 tephras units ~3%) can be found in all three cores, and 22 tephras units (~6%) are only present in one of the three cores. Whether a tephra is preserved in all three cores does not have any direct relationship to eruptive volume. Instead it is postulated that tephras preservation at Site 1123 is ‘patchy’ and influenced by the ‘vigorous nature of their’ deposition to the deep ocean floor as vertical density currents. At this site, at least 5 cores would have to be drilled with a proximity of ‘10’s to ‘100’s of metres of each other’ to yield a ~99% chance of recovering all the silicic tephras deposited on the ocean surface above it in the past 1.85 Ma.

Other versions: GEOROC Sample Information - Coromandel-Taupō

Further details: Table 1. Summary of laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) instrumental and analytical conditions

Properties: Ocean Drilling Program (ODP)


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Download Data: Download ZIP file containing all datasets as tab-delimited text (use the following character encoding: UTF-8; Unencoded PANGAEA defaults)

Datasets listed in this Collection:

1. Allan, ASR; Baker, JA; Carter, L; et al. (2008): [Table 2] Major and trace element compositions of representative tephras from the four main types identified in ODP Site 181-1123A tephras. doi:10.1594/PANGAEA.815925
5. Allan, ASR; Baker, JA; Carter, L; et al. (2008): [Table 3d] Major element compositions of onshore Taupō Volcanic Zone tephras. doi:10.1594/PANGAEA.815923
10. Allan, ASR; Baker, JA; Carter, L; et al. (2008): [Table 5] Tephra tie-lines established between the Site ODP 181-1123 sediment cores. doi:10.1594/PANGAEA.815948
Data Description

Citation: Allan, ASR et al. (2008): (Table S3a) Major element compositions of ODP Hole 181-1123A tephras. doi:10.1594/PANGAEA.815920, In Supplement to: Allan, Adrian SR; Baker, Joel A; Carter, Lionel; Wysoczanski, Richard J (2008): Reconstructing the Quaternary evolution of the world’s most active silicic volcanic system: insights from an ~1.65 Ma deep ocean tephra record sourced from Taupo Volcanic Zone, New Zealand. Quaternary Science Reviews, 27(25-26), 2341-2360, doi:10.1016/j.quascirev.2008.09.003

Project(s): Ocean Drilling Program (ODP) %

Coverage: Latitude: -41.786230 * Longitude: -171.499000
Date/Time Start: 1998-09-12T08:00:00 * Date/Time End: 1998-09-14T23:55:00
Minimum DEPTH, sedimentfrock: 1.01 m * Maximum DEPTH, sedimentfrock: 60.88 m

Event(s): <b>Hole 181-1123A</b> | Latitude: -41.786230 * Longitude: -171.499000 | Date/Time Start: 1998-09-12T08:00:00 | Date/Time End: 1998-09-14T23:55:00 | Elevation: -3290.1 m | Penetration: 158.1 m | Recovery: 158.63 m | Location: South Pacific Ocean | Campaign: Leg181 | Base: Joides Resolution | Device: Drillingdiphrig (DRILL) %

Comment: All standard deviations = 2sd.

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**Citation:** Monien, Patrick; Schnetger, Bernhard; Brumsack, Hans-Jürgen (2015): Geochemistry of sediment core PS69/339-1. Institute for Chemistry and Biology of the Marine Environment, Carl-von-Ossietzky University of Oldenburg, Germany, doi:10.1594/PANGAEA.844917

**Project(s):** Impact of climate induced glacier melt on marine coastal systems, Antarctica (IMCOAST/IMCONet)

**Coverage:**
- Latitude: -62.201300
- Longitude: -58.858200
- Date/Time Start: 2006-04-06T21:38:00
- Date/Time End: 2006-04-06T21:38:00
- Minimum DEPTH, sediment/truck: 0.01 m
- Maximum DEPTH, sediment/truck: 7.25 m

**Event(s):** PS69/339-1
- Latitude: -62.201300
- Longitude: -58.858200
- Date/Time: 2006-04-06T21:38:00
- Elevation: 268.0 m
- Recovery: 7.25 m
- Location: Potter Cove, King George Island, Antarctic Peninsula
- Campaign: ANT-XXIII/4 (PS69)
- Basis: Polarstern
- Device: Gravity corer (GC)
- Comment: 8 sections: 0-37, 37-132, 132-228, 228-329, 329-428, 428-528, 528-628, 628-728

**Comment:** Data are given in weight fractions (mass %) and are not corrected for sea salt.

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<td>Wave-length dispersive X-ray fluorescence spectroscopy (WD-XRF)</td>
<td>total iron given in iron(III) oxide, mass percentages</td>
</tr>
<tr>
<td>Manganese oxide</td>
<td>MnO</td>
<td>%</td>
<td>Monien, Patrick</td>
<td>Wave-length dispersive X-ray fluorescence spectroscopy (WD-XRF)</td>
<td>mass percentages</td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>MgO</td>
<td>%</td>
<td>Monien, Patrick</td>
<td>Wave-length dispersive X-ray fluorescence spectroscopy (WD-XRF)</td>
<td>mass percentages</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>CaO</td>
<td>%</td>
<td>Monien, Patrick</td>
<td>Wave-length dispersive X-ray fluorescence spectroscopy (WD-XRF)</td>
<td>mass percentages</td>
</tr>
<tr>
<td>Sodium oxide</td>
<td>Na2O</td>
<td>%</td>
<td>Monien, Patrick</td>
<td>Wave-length dispersive X-ray fluorescence spectroscopy (WD-XRF)</td>
<td>mass percentages</td>
</tr>
</tbody>
</table>

**Download Data (login required)**

Download dataset as tab-delimited text (see the following character encoding: UTF-8: Unicode (PANGAEA default))

View dataset as HTML (shows only first 2000 rows)
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- OAIster
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Projecte
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- IODP

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- TIB
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   doi:10.1594/PANGAEA.674402 - Score: 1.29 - Similar datasets
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Data search: www.pangaea.de

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   Size: 160816 data points
   doi: 10.1594/PANGAEA.674424 - Score: 1.28 - Similar datasets

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Data diversity
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