

Chikurachki volcano

(Kurile Islands, Russia)

the unique volcano
with frequent basaltic plinian eruptions

Alexander Belousov, Marina Belousova

Institute of Volcanic Geology & Geochemistry,
Petropavlovsk-Kamchatsky, Russia



Historical eruptions of Chikurachki

Year	1853-59	1958	1961	1964	1973	1986	2002
Column height, km	—	0.5	0.3-0.4	2.5	1-3	2-9	0.3-3
SiO ₂ , %	54.3	52-53	50.1	52.8	52.4	51-53	

plinian eruptions

strombolian-vulcanian eruptions

Goals

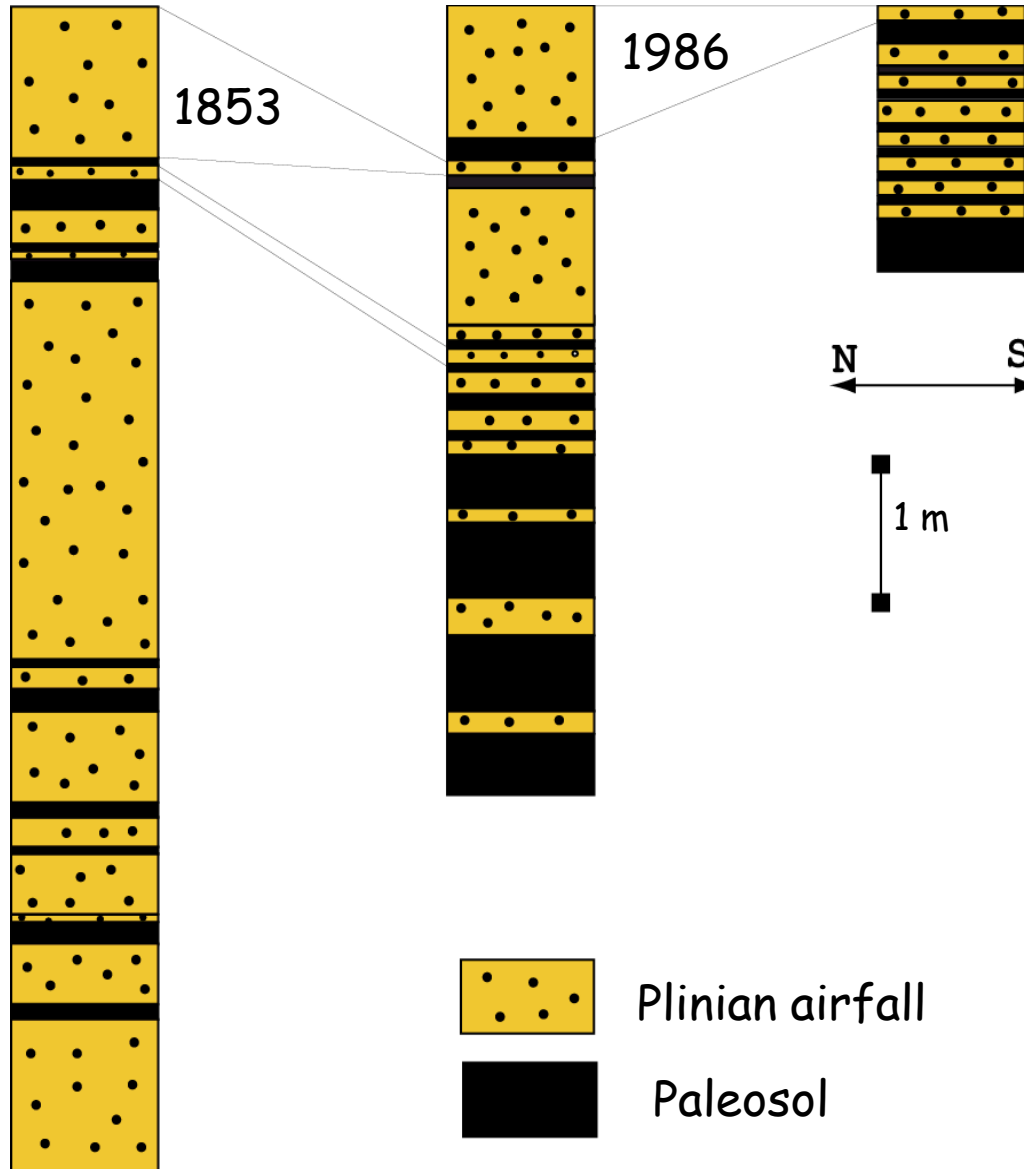
- To investigate pyroclastic deposits of the 1853 and 1986 eruptions of Chikurachki volcano.
- To determine types and parameters of the eruptions basing on characteristics of the deposits.
- To estimate volcanic hazard of Chikurachki.

Stratigraphic sections around Chikurachki volcano

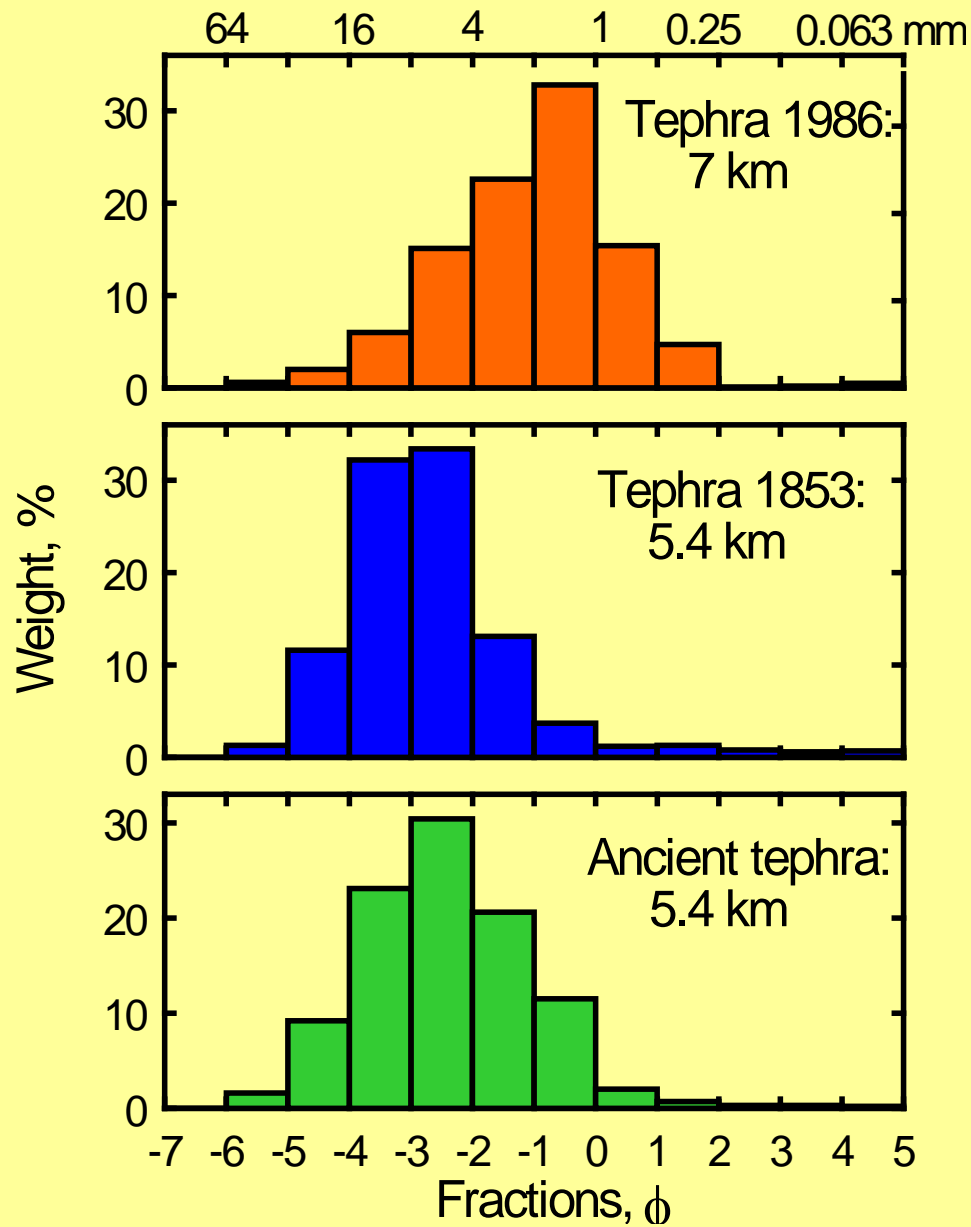
6 km NE
from crater

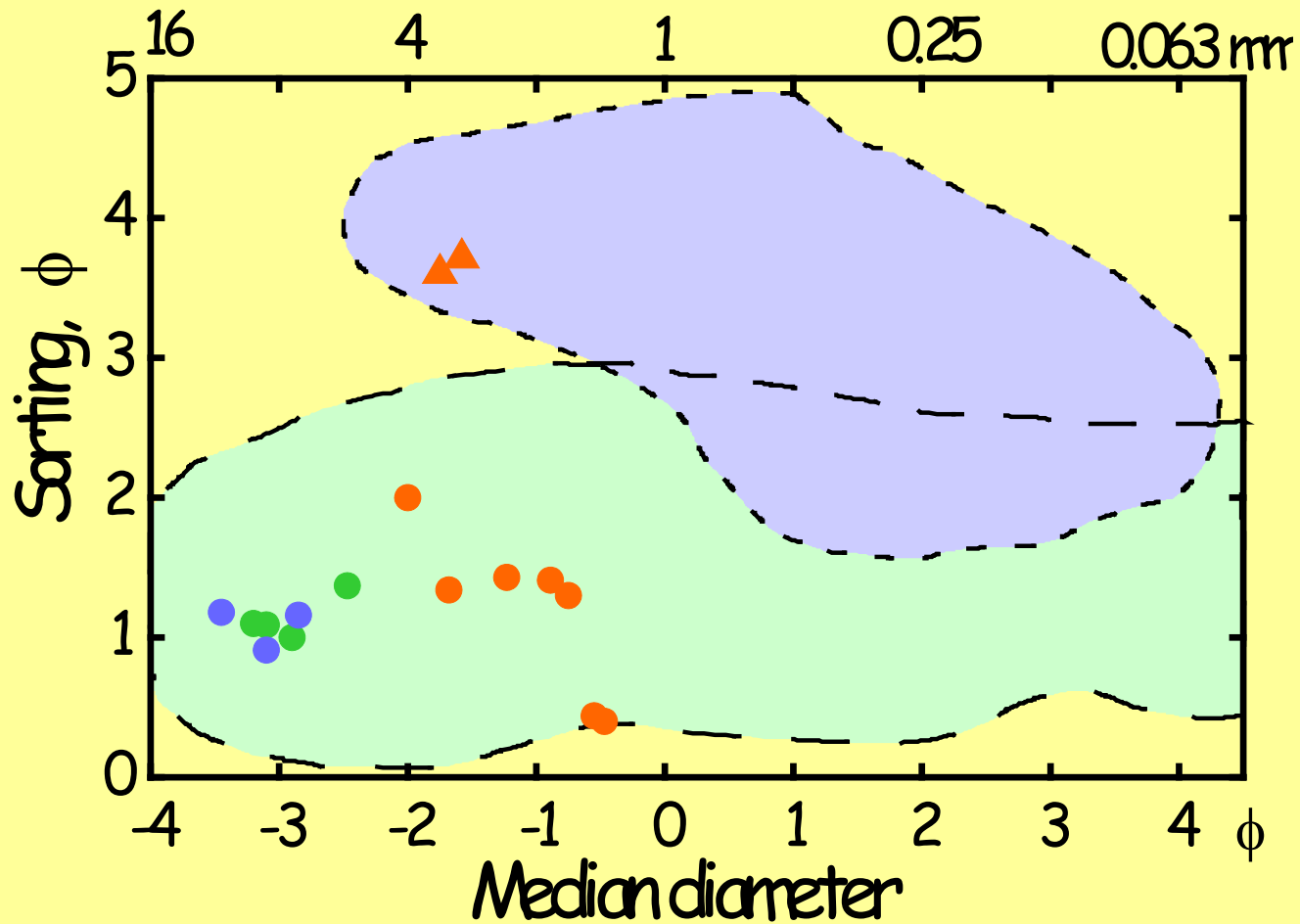
9 km SE
from crater

17 km SSE
from crater



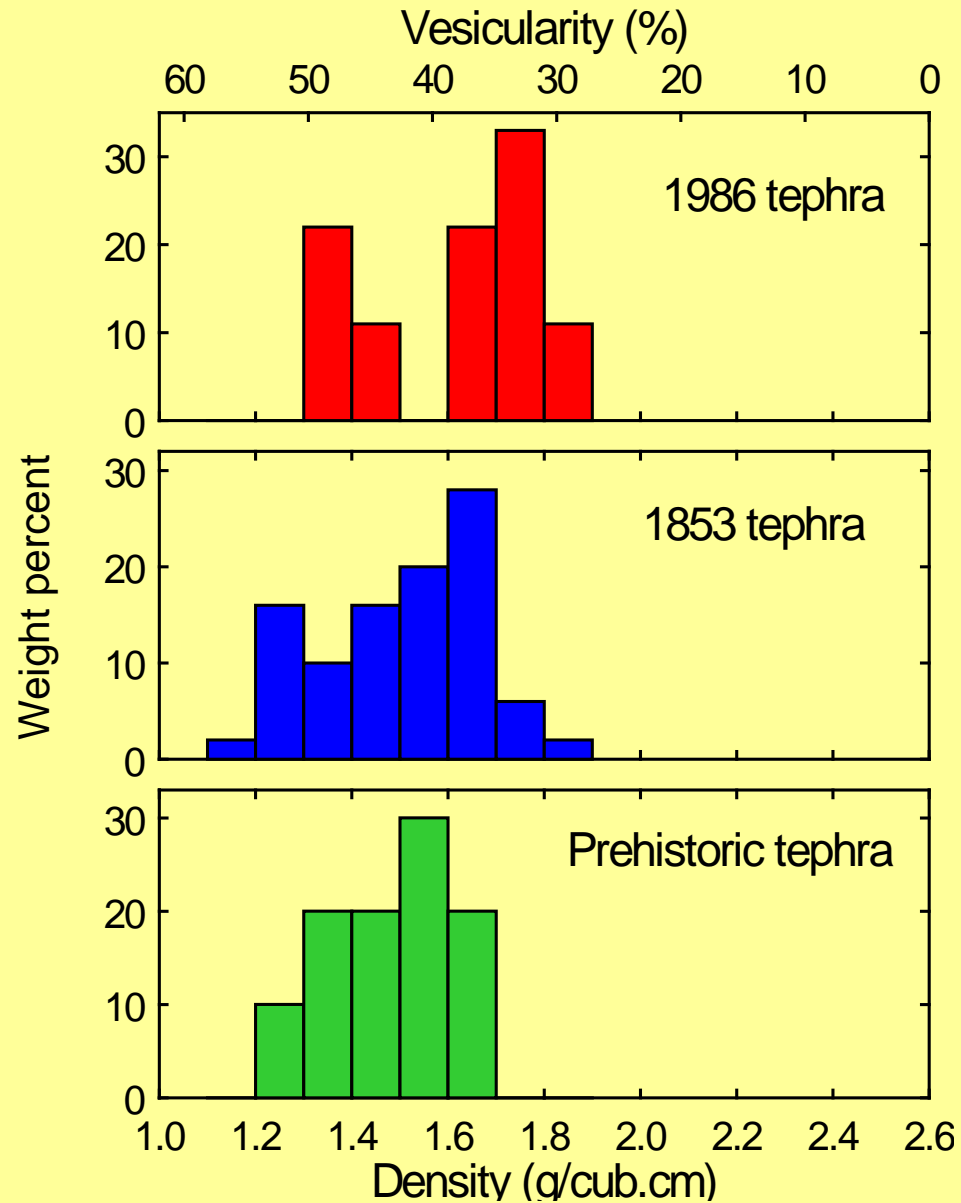
Grain size distributions





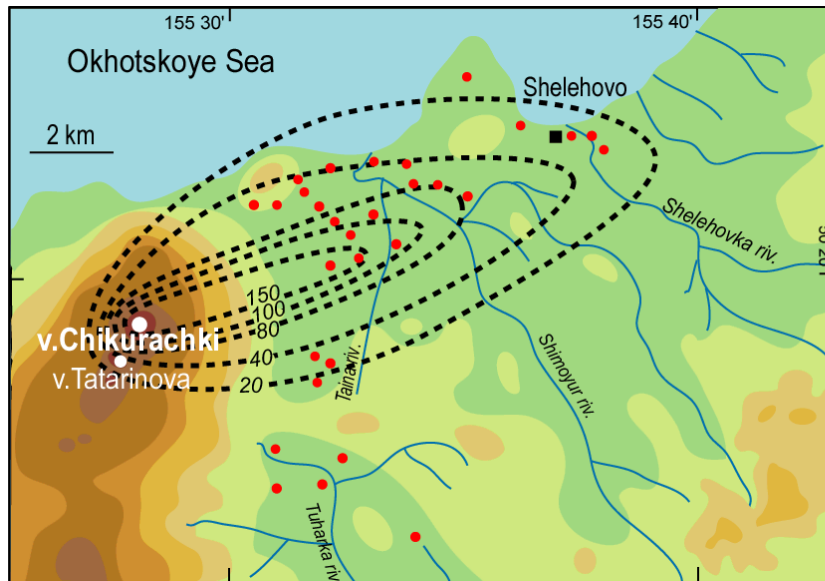
- 1986 tephra
- 1853 tephra
- ▲ 1986 pyr. flow
- ancient tephra

Density distributions

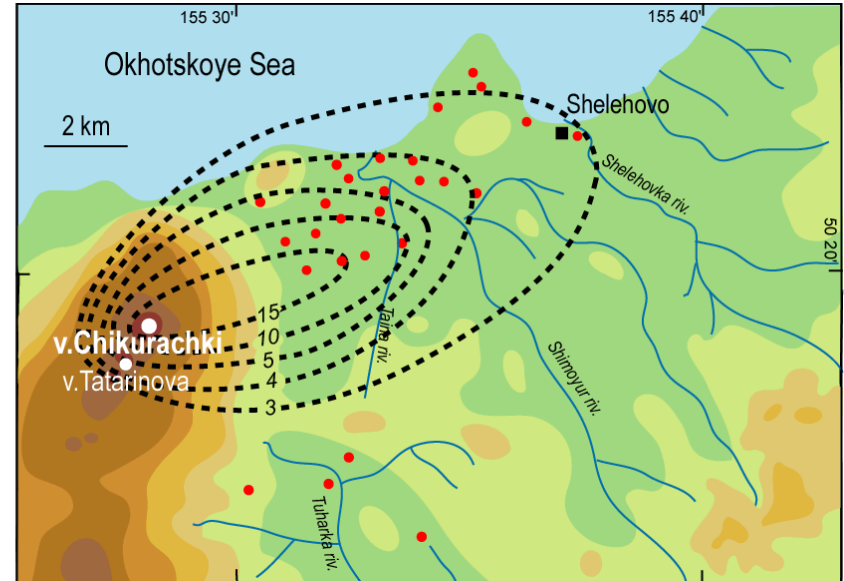


1853 eruption

Isopachs (lines of equal thickness)
in cm

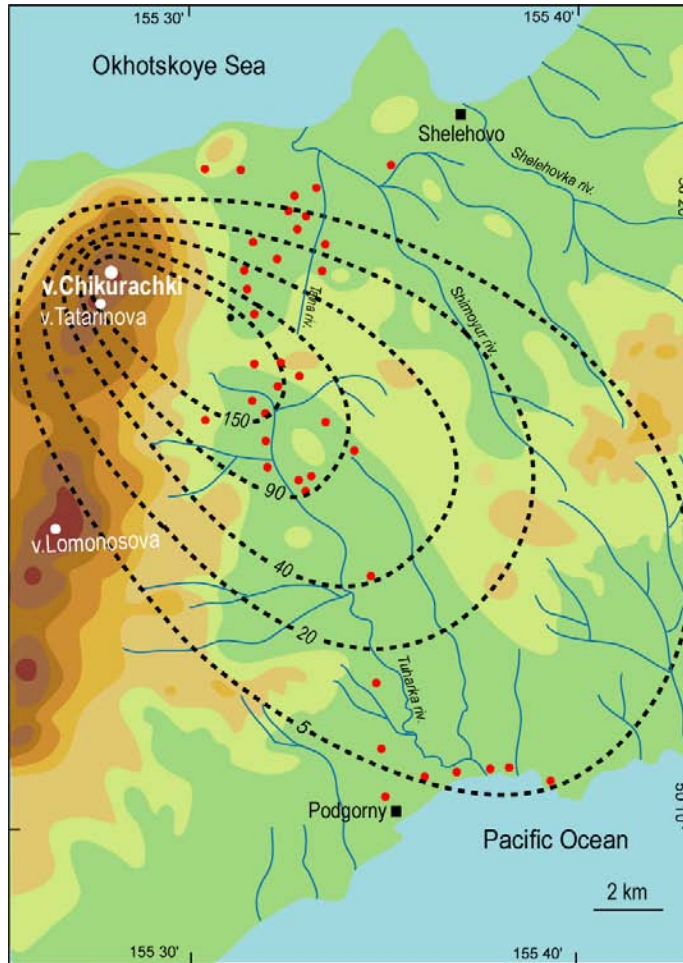


Isopleths (lines of equal maximum size)
in cm

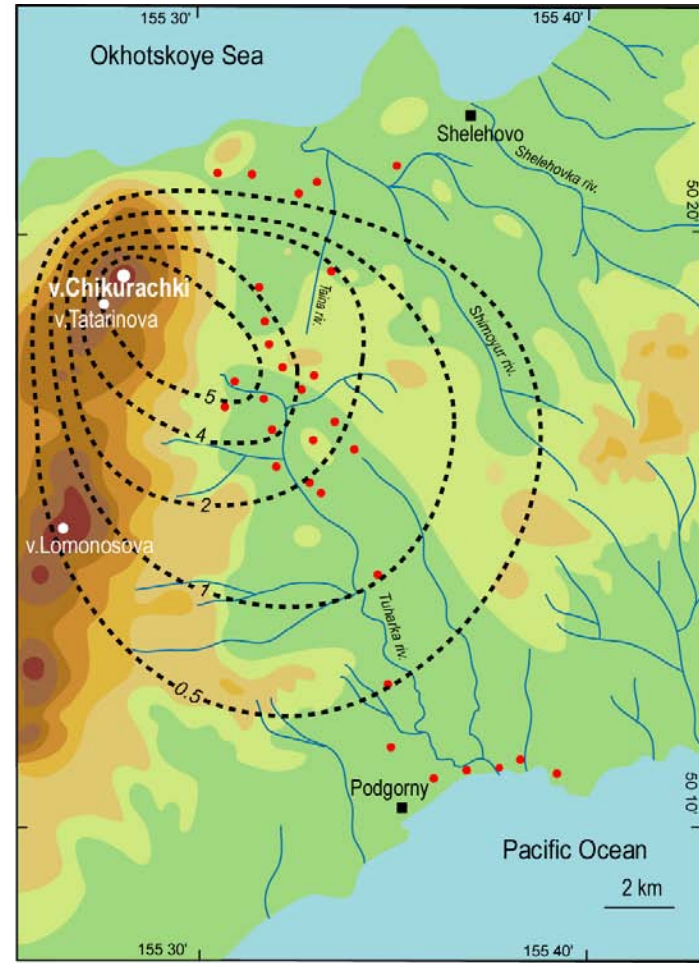


1986 eruption

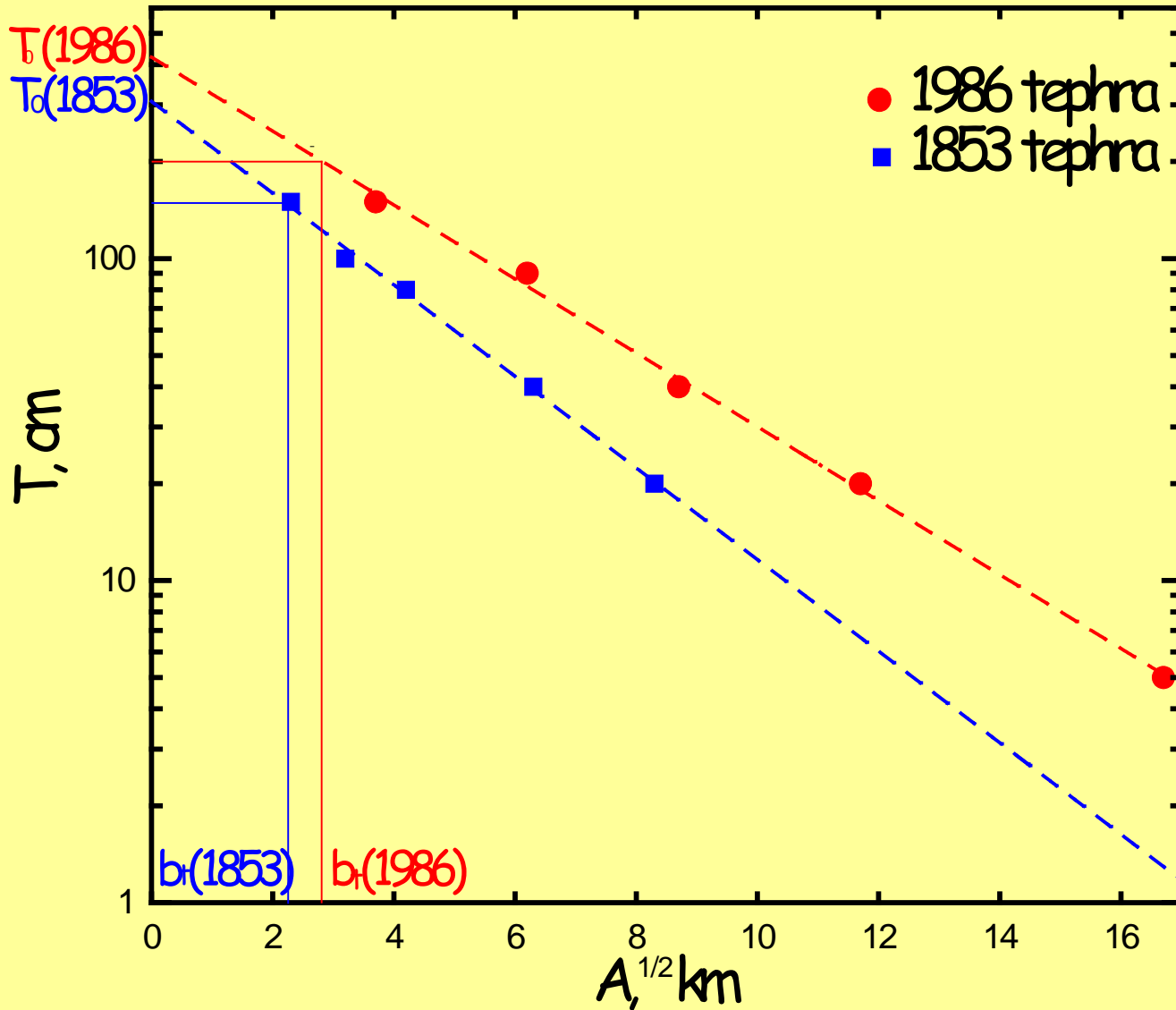
Isopachs (lines of equal thickness)
in cm



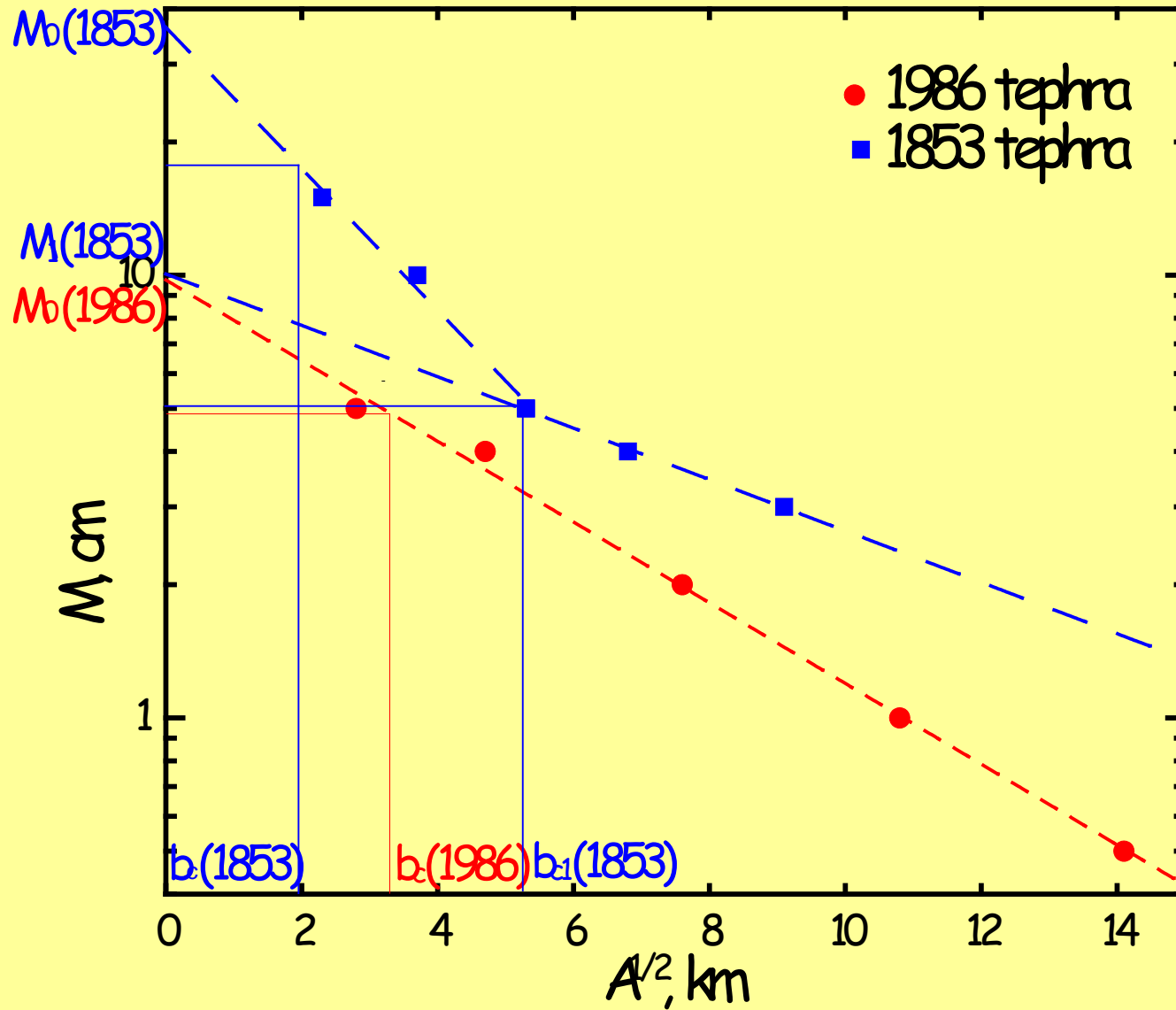
Isopleths (lines of equal maximum size)
in cm



Thickness / distance



Maximum clast size / distance



Eruptions characteristics	1853 eruption	1986 eruption	Method
H_T : max plume height (km)	13-13.5	13-14	Carey & Sparks, 1986
v: wind velocity (m/s)	35-40	25	-//-
mass discharge rate of magma (kg/s)	5×10^6	5×10^6	Wilson & Walker, 1987
eruption duration (h)	5	6.7	-//-
V: tephra volume (km ³)	0,09	0,12	Fierstein & Nathenson, 1992
V_{DRE} : erupted magma volume (km ³)	0,03	0,04	-//-

Conclusions

- The 1853 and 1986 eruptions of Chikurachki had similar characteristics and were of plinian type.
- Eruptive history of Chikurachki is quite unusual for basaltic volcano. It includes frequent plinian eruptions with reoccurrence interval ca. 100-200 years.
- Plinian eruptions of Chikurachki pose a serious hazard for aviation traffic, which is very intensive in this region.