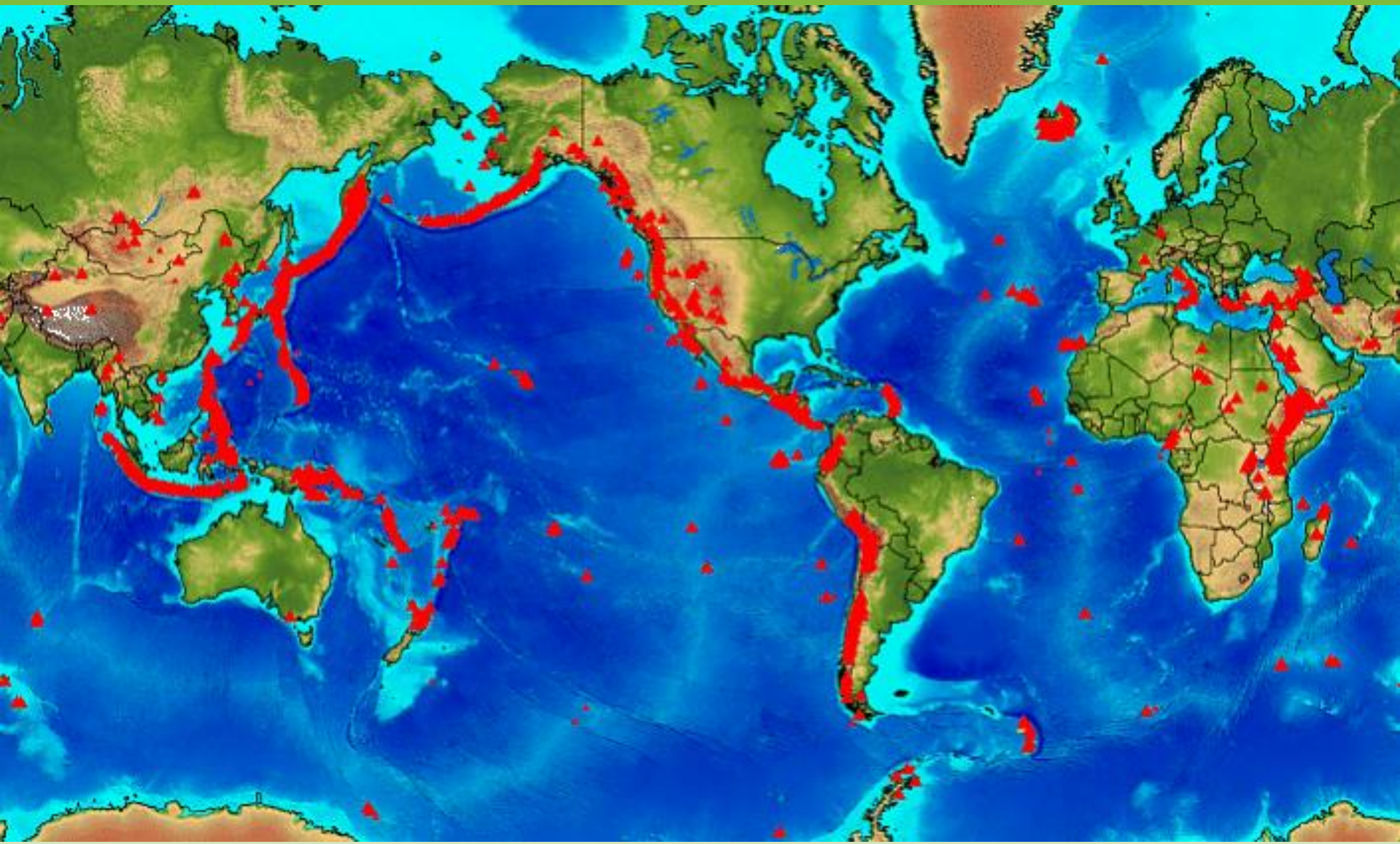
Volcanic hazards and benefits

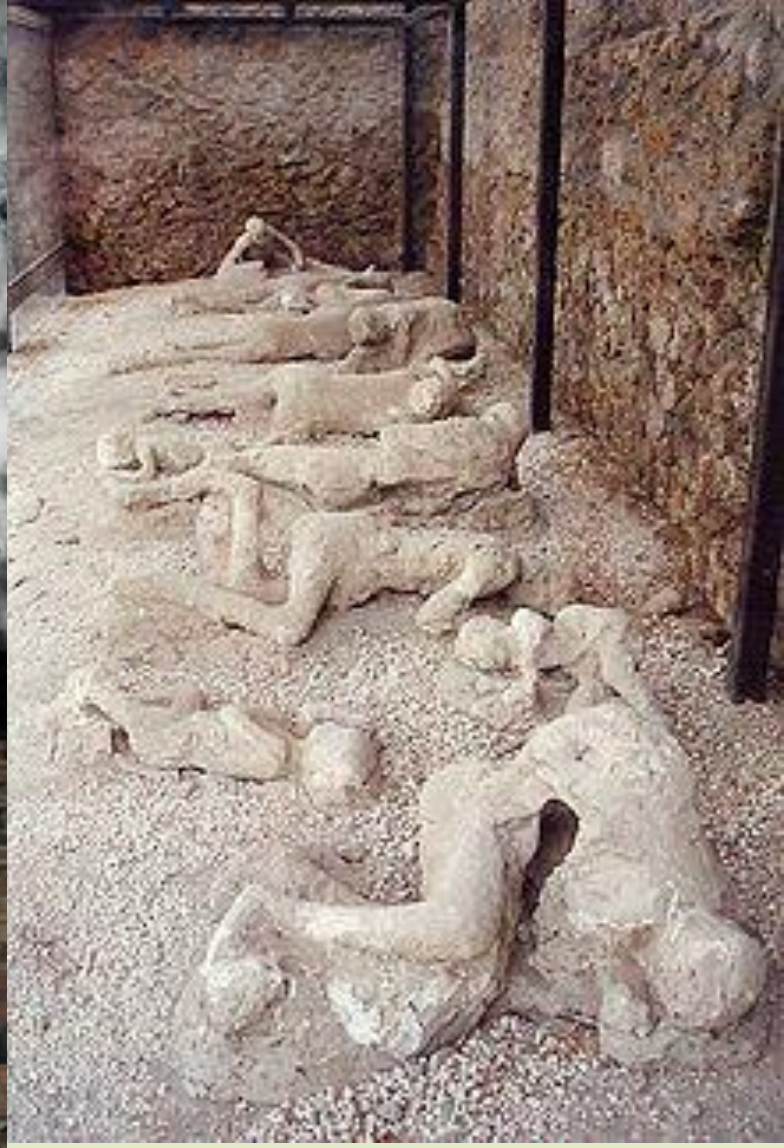
CZECH REPUBLIC
DEVELOPMENT COOPERATION

- Hazards: pyroclastic fall, flow and surge, lavas, lahars, toxic gases, volcanogenic seismic tremors

- Benefits: soil, raw materials, energy, medical use of hot-springs, tourism



USGS

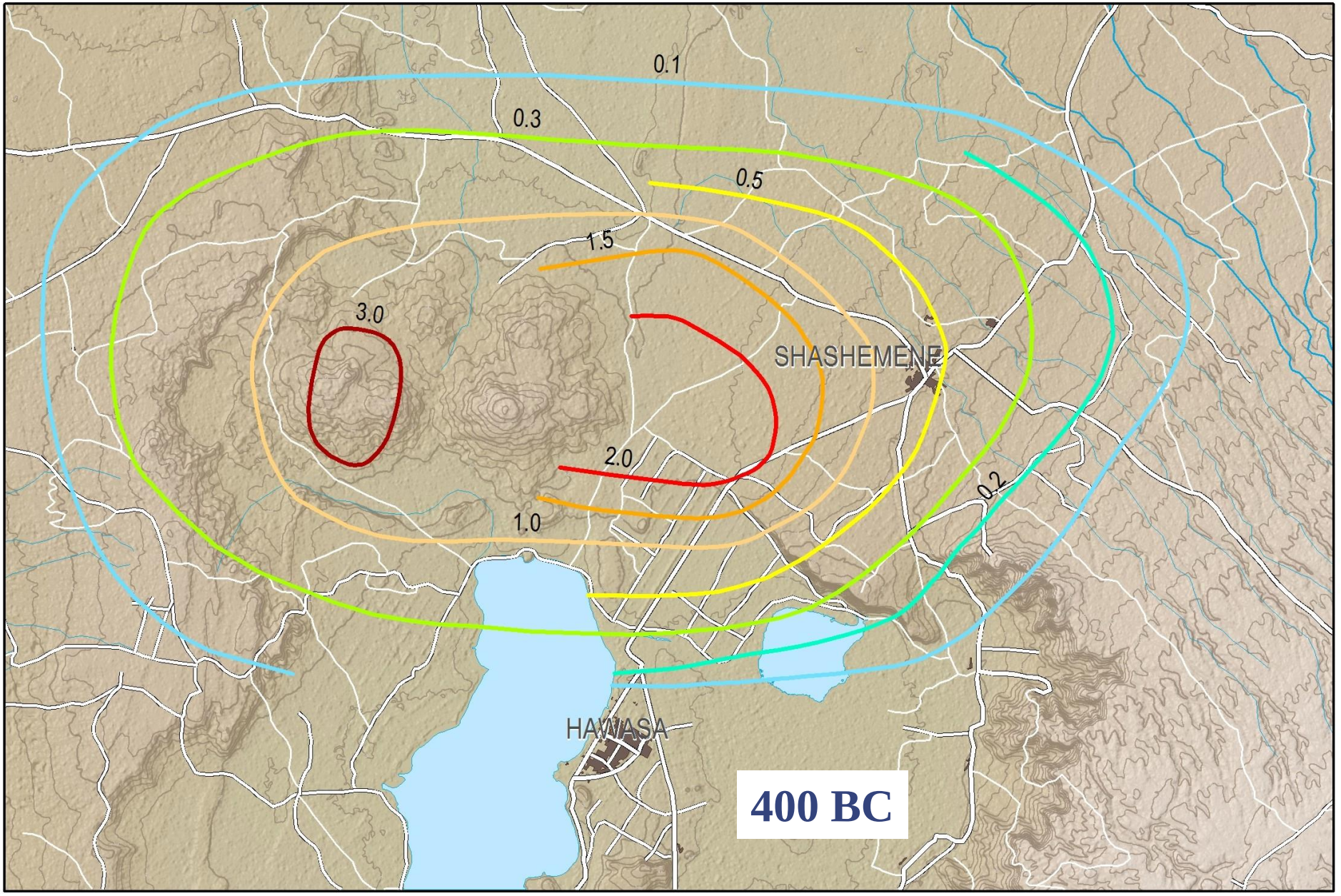


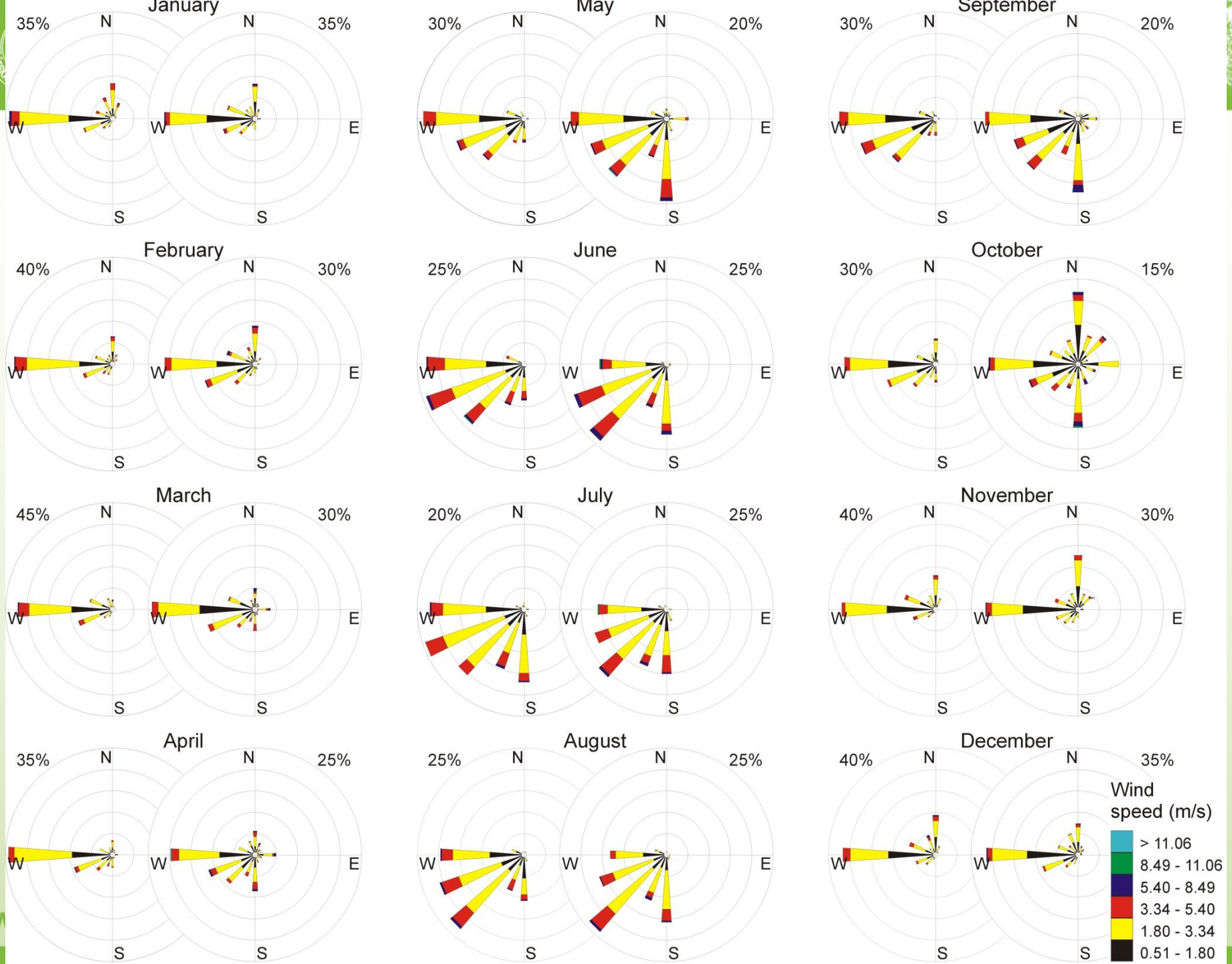
Source: internet

Vesuvius, 79 AD

Pyroclastic fall

- Covers large areas preventing cattle to reach grass and water
- Load of high thickness may destroy houses
- Distribution depends on wind, not on topography


0.1
0.3
0.5
1.5
3.0
2.0
1.0
0.2
SHASHEMENE
HAWASA
400 BC
0
5
10 km


January
February
March
April
May
June
July
August
September
October
November
December
N
S
W
E
Wind speed (m/s)
> 11.06
8.49 - 11.06
5.40 - 8.49
3.34 - 5.40
1.80 - 3.34
0.51 - 1.80

Pyroclastic fall

- Once eruption starts, still time to react
- Thickness? – evacuate or supply with water and food
- Evacuation and supply roads must be prepared and indicated before eruption
- Keep roads accessible
- Clean roofs from load of pyroclastic fall
- Educate locals to recognize problem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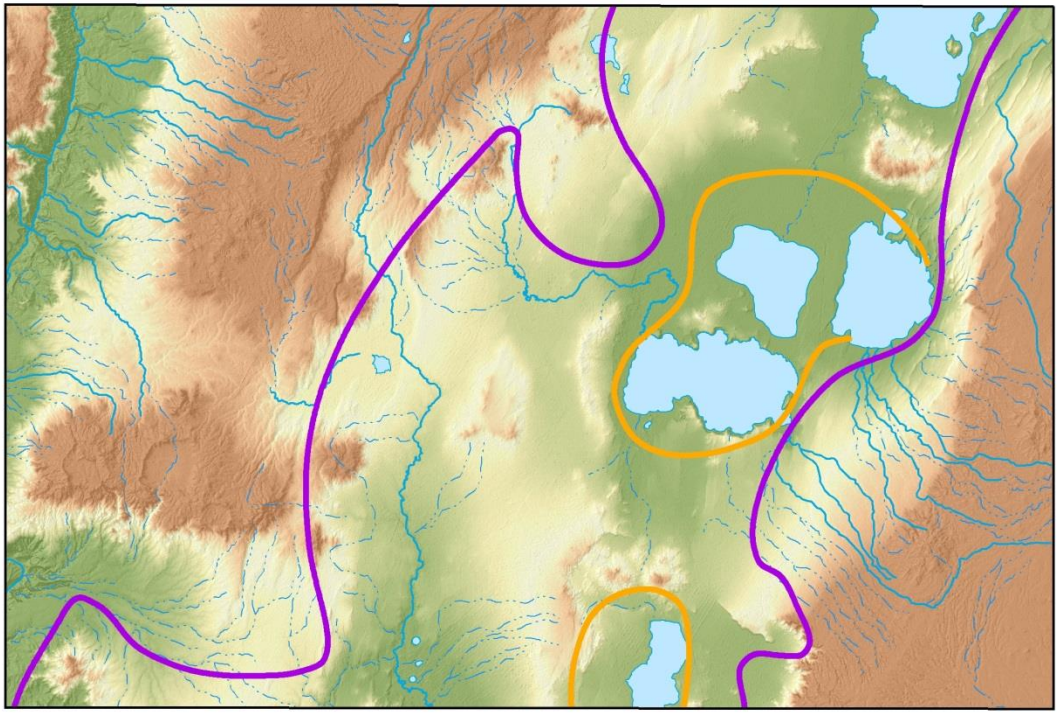
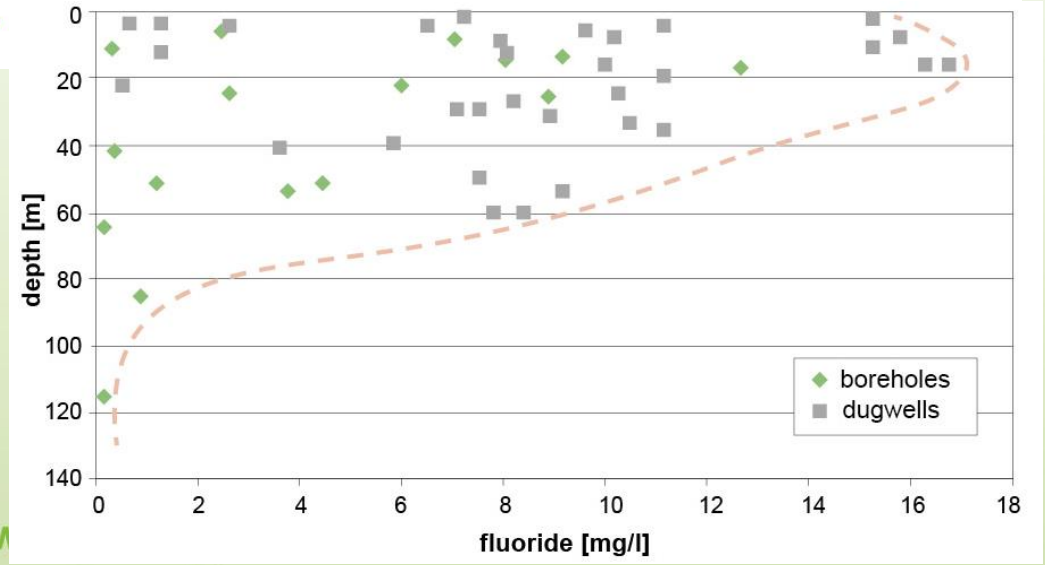
Source:
internet

Fluorosis


0
20
40 Kilometers


depth [m]
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
14
16
18
fluoride [mg/l]
boreholes
dugwells

Pyroclastic flow

- Speed up to 300 km/h – no escape
- Follow valleys – mapping necessary
- Evacuation before eruption

USGS

Lava

- Slow emplacement – chance for evacuation, routes must be prepared
- Dammage to constructions
- Flow can be diverted using trenches, cooling by water

Lahar

- Speed up to 300 km/h – no escape
- Follow valleys – mapping necessary
- Dammage to construction – necessary to keep roads accessible
- Diverting and decelerating structures

Benefits:

- soil
- raw materials
- energy
- medical use of hot-springs
- tourism

Schmincke 2004, Volcanism