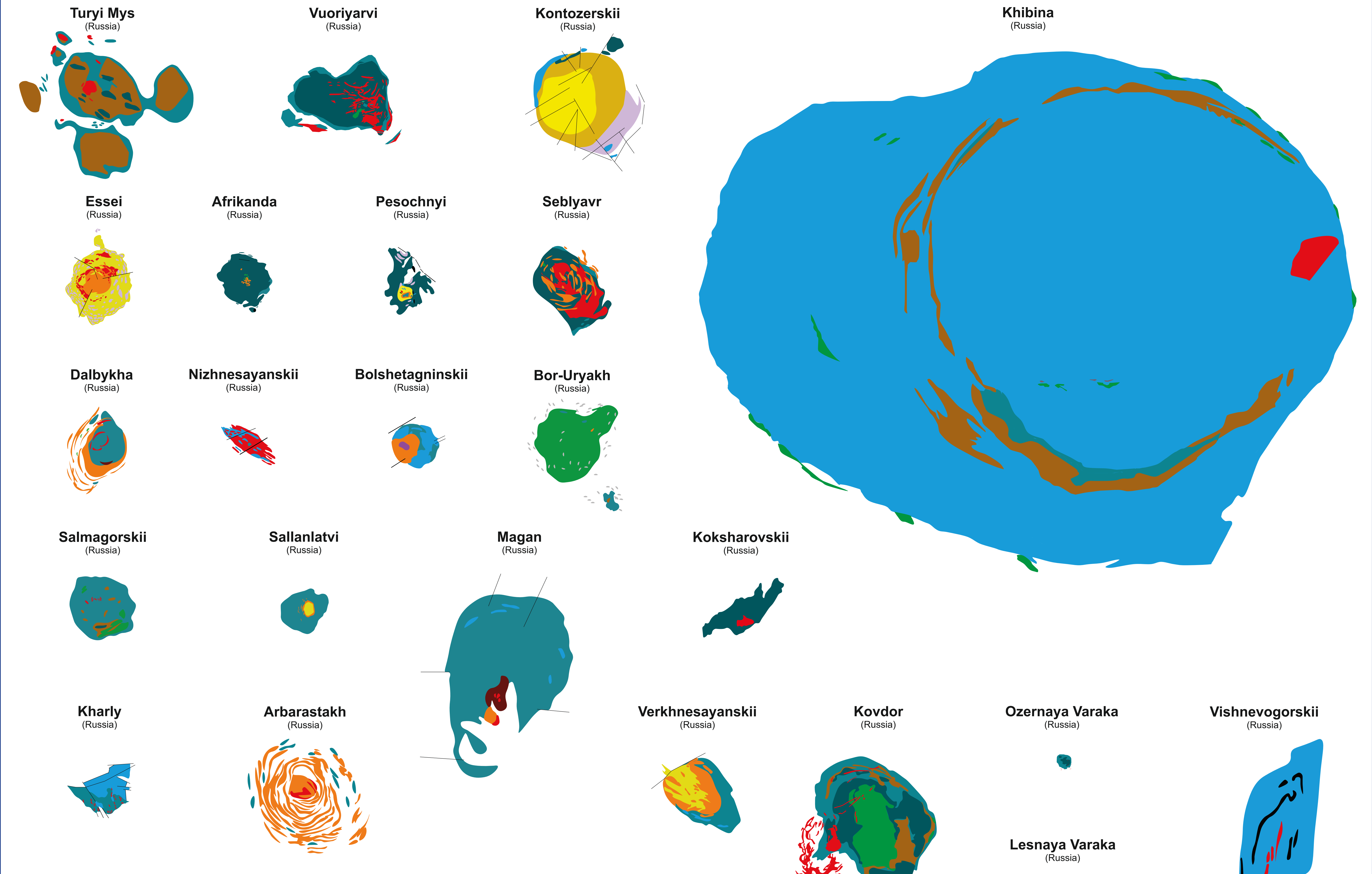
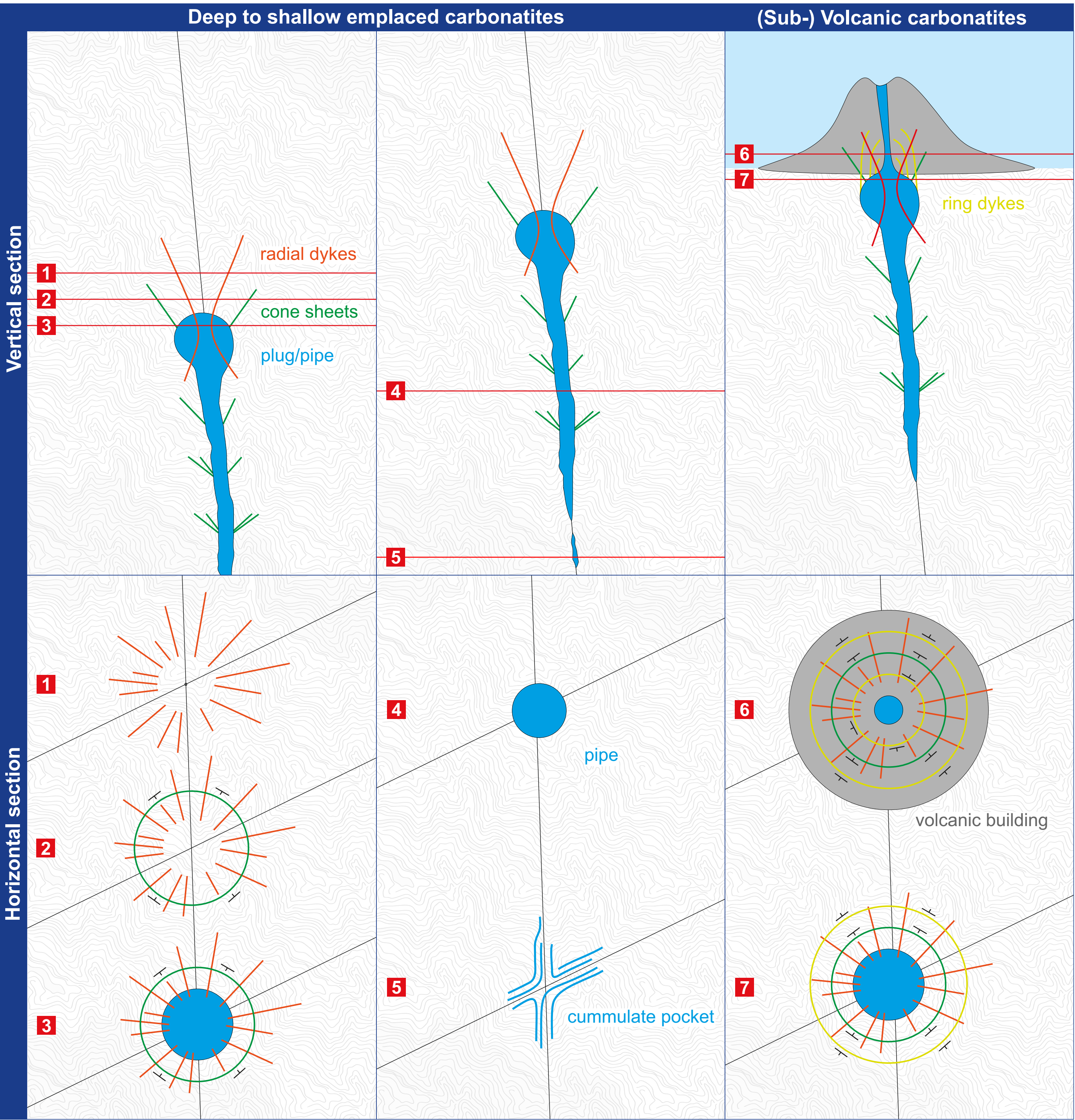


RUSSIA (+ INDIA and AUSTRALIA)



Schematic Illustration of Carbonatite Geometries



Schematic illustration demonstrating the influence of the erosion level on the exposed architectural features of the carbonatite:

- 1 Radial dyke systems propagating above an intruding melt pocket.
- 2 Slightly below the top of the radial dyke system and above the melt pocket, radial dykes and cone sheets occur together.
- 3 If exhumation cuts through the emplaced carbonatite pocket itself, a central plug/pipe surrounded by radial dykes and cone sheets can be identified.
- 4 The ascending/emplacing main melt pocket may blur/overprint parts of the radial dyke and/or cone sheet system.
- 5 Below the main melt pocket, the system closes. Due to the strong lithostatic forces at depth, the pocket-tail becomes filter-pressed and the remaining melt moves upwards. A cumulate pocket remains (e.g., cumulates of apatite → type Nolans Bore).
- 6 If the melt pocket reaches the land surface, a sudden release of the melt causes rapid deflation of the pocket. In consequence, a collapse of the caldera ensures the formation of ring faults, which get locally filled with the remaining melt and form ring dykes. Depending on the erosion-level, the occurrence of ring dykes is either associated with volcanic rocks of the volcanic building and carbonatite-bearing volcanic vents 6, or with the shallowly intruded roof top section of the carbonatite pocket 7.

Undifferentiated carbonatite, phoscorite	Glimmerite	Undifferentiated plutonic silicate rock	Undifferentiated dyke/volcanic silicate rock
Calcite carbonatite (calciocarbonatite, sövite, alvikite)	Olivinite (dunite)	Foidolite	Foidite
Dolomite carbonatite (magnesiocarbonatite, rauhaugite, beforsite)	Pyroxenite	Ijolite - urtite - melteigite	Lamprophyre
Ankerite/Siderite carbonatite (ferrocarbonatite, Mn-rich carbonatite)	Fault	Syenite - foid syenite	Trachyte - phonolite
Extrusive carbonatite	Breccia/agglomerate	Gabbro, diorite, monzonite	Tephrite, basanite, basalt

For references to geological maps, please refer to Supplementary Information - Appendix 2