

# GEOMORFOLOGÍA

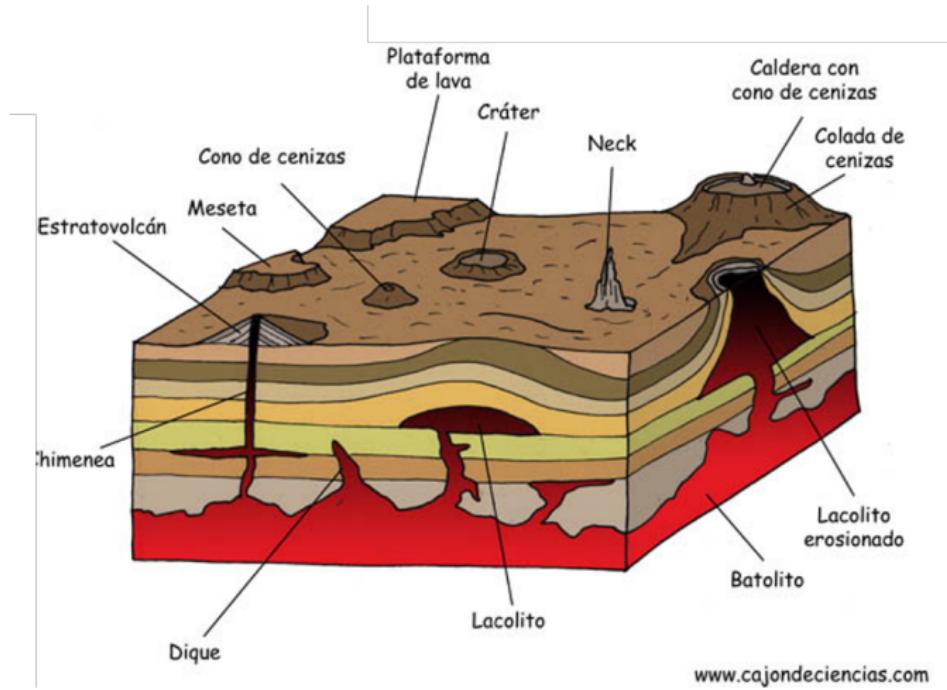
Edier V. Aristizábal G.

evaristizabal@unal.edu.co

Versión: June 25, 2020

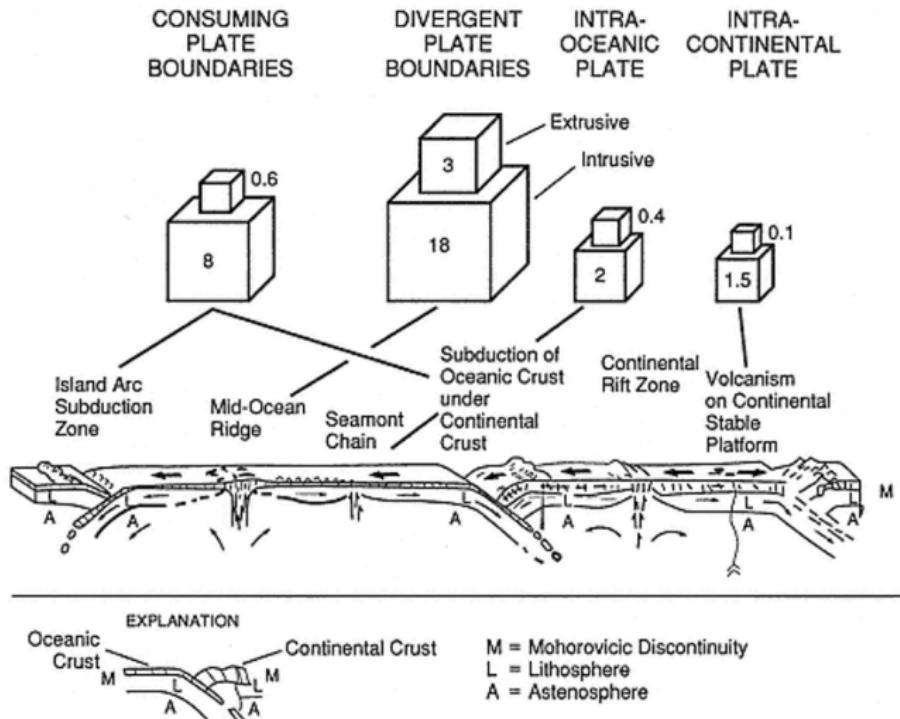


# Ambiente Volcánico



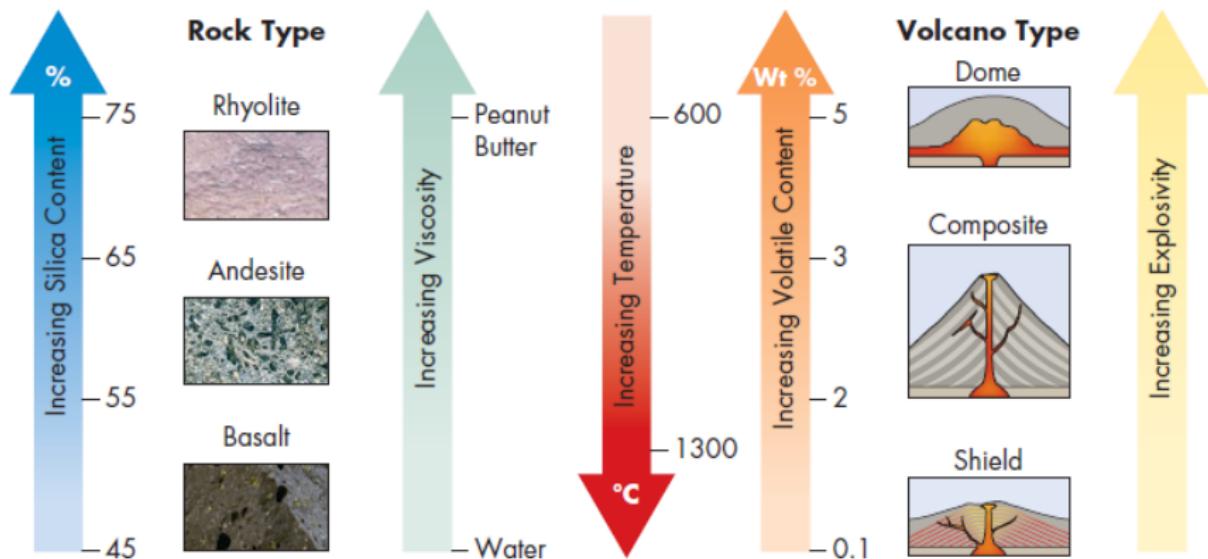
[www.cajondeciencias.com](http://www.cajondeciencias.com)

# Ambiente Tectónico de Volcánico



Fuente: Manville et al (2009)

# Dinámica de erupciones



# Dinámica de erupciones

Magma Composition	Felsic	Intermediate	Mafic	
Silica Content	70%	60%	50%	
Water (Gas) Content	5.0%	2.0%	0.5%	
Eruption Temperature	750-900 °C	900-1000 °C	1100-1200 °C	
Viscosity	Higher	Intermediate	Lower	
Explosiveness	More Explosive		More Effusive	
Volcanism	Rhyolitic	Dacitic	Andesitic	Basaltic
Volcanic Products	Lava Domes	Pyroclastic Deposits	Lava Flows	
Volcano Types	Lava Dome Complexes	Composite Volcanoes	Shield Volcanoes Cinder Cones	

Kenneth A. Bevis © 2013

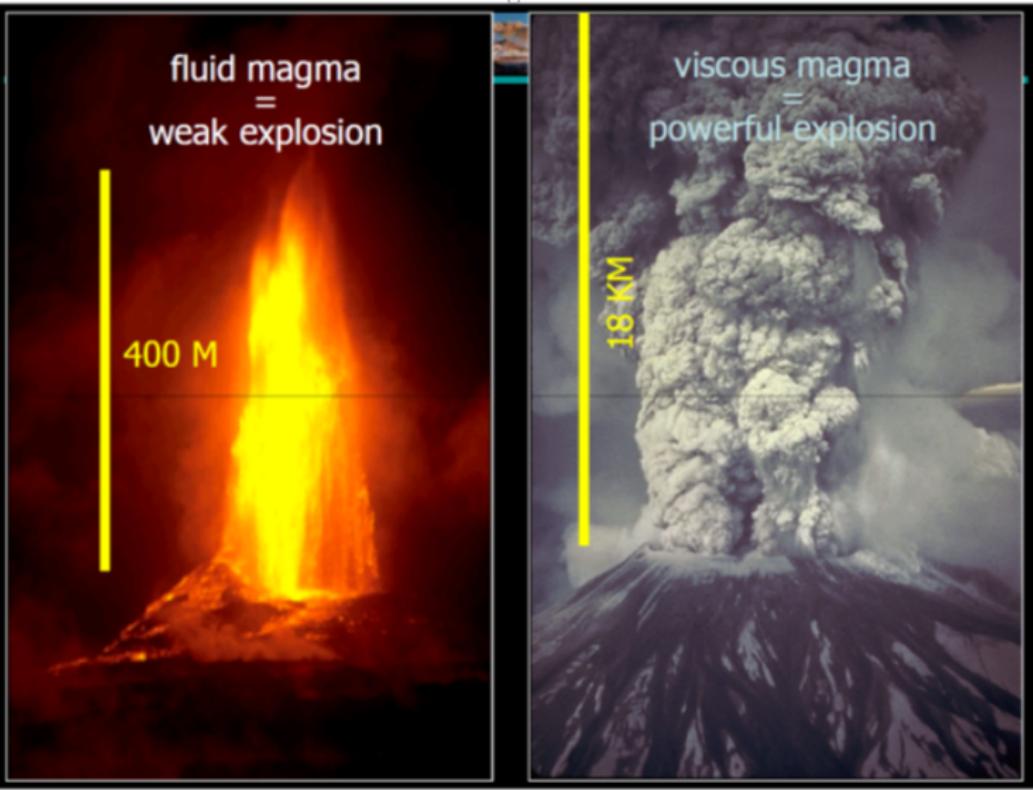
<http://intheplaygroundofgiants.com/geology-of-central-oregon/the-geology-of-volcanoes-and-volcanism/>

fluid magma  
= weak explosion

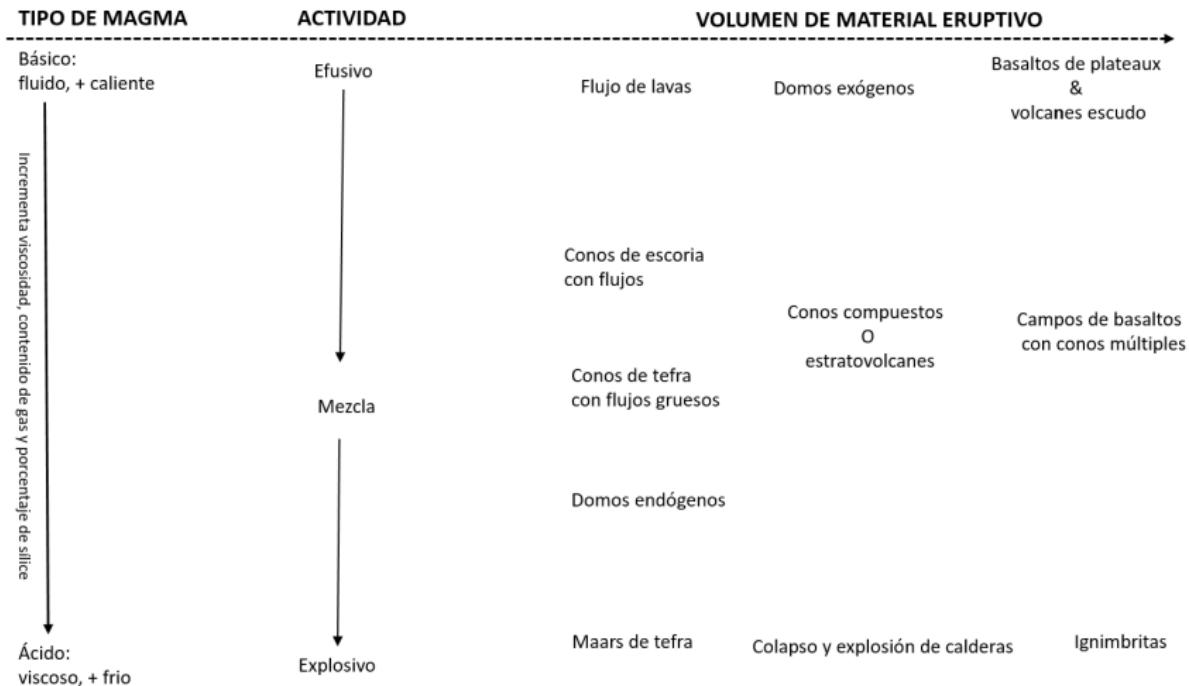
400 M

viscous magma  
= powerful explosion

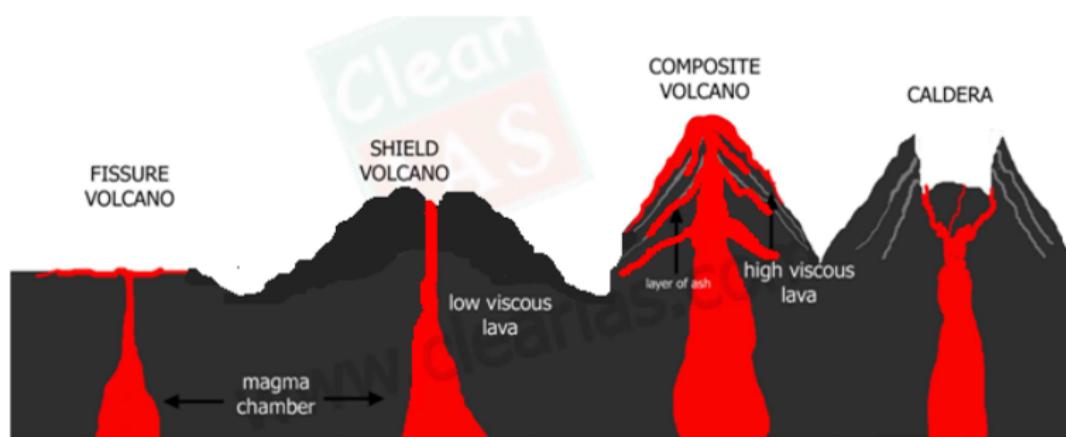
18 KM



# Geoformas Volcánicas

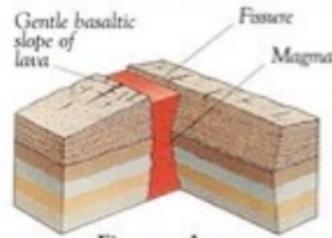


# Basado en el edificio volcánico

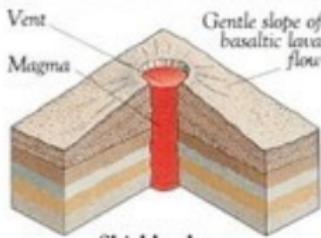


# Basado en el edificio volcánico

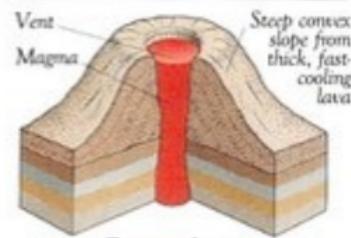
## TYPES OF VOLCANO



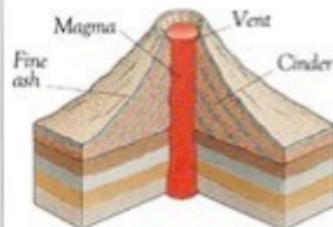
Fissure volcano



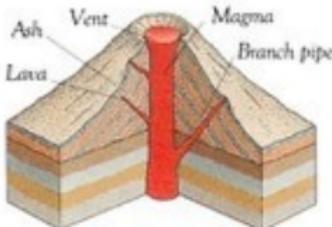
Shield volcano



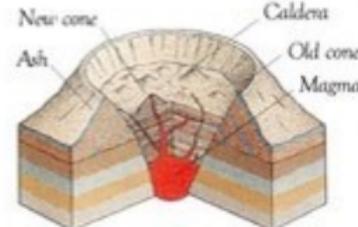
Dome volcano



Ash-cinder volcano

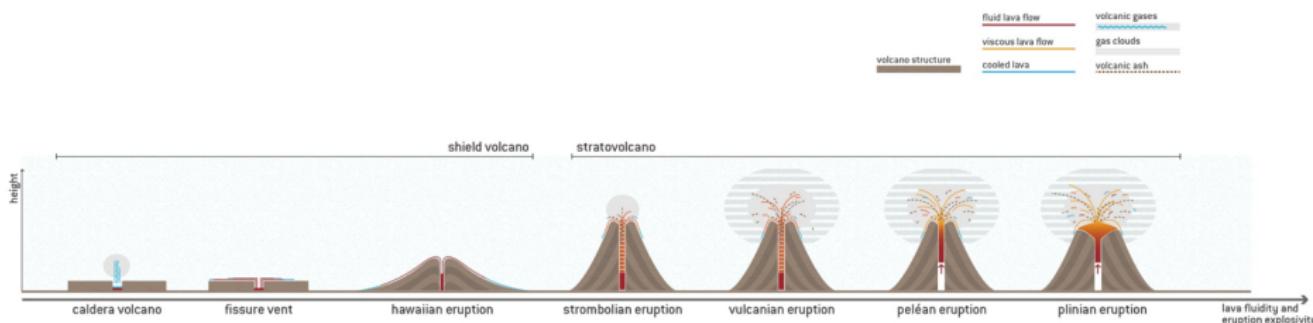


Composite volcano



Caldera volcano

# Basado en el modo de erupción



# Geoformas Monogenéticas vs Poligenéticas

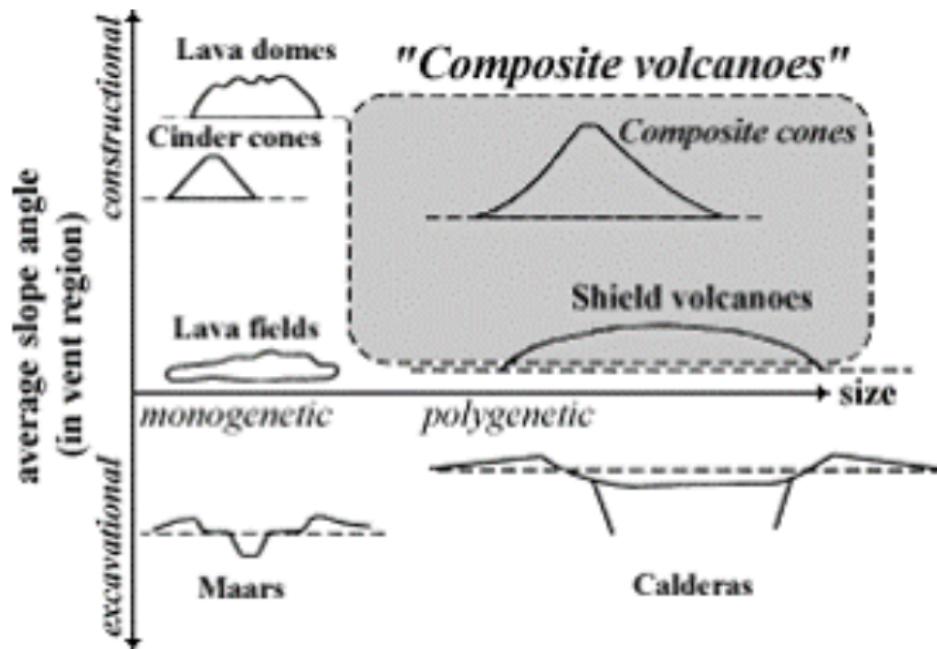




Figure: Sierra Grande (New México, USA)



**Figure:** Domo de lava creciendo dentro del cráter de Mt. St. Helens después de la erupción de 1980)

# Cono de Escoria

## (A) volcano-sedimentary processes

### constructive

lava flow, rafting,  
littoral cones

dyke intrusion  
lava lake and  
fountaining  
debris infill,  
slope failure

proximal ballistics/  
fallout from eruption  
column, grain-flow,  
rootless lava flow

ash-fallout

### destructive

post-emplacement  
lava tube  
phreatic eruptions

slope failure, intermittent or initial  
cone collapse  
ph eruption

vent migration,  
crater breaching

rarely PDC,  
multiple venting

## (B) typical deposits

lava rock and  
scoriaceous lapilli  
(+fallout tephra)

ash to block,  
spatter

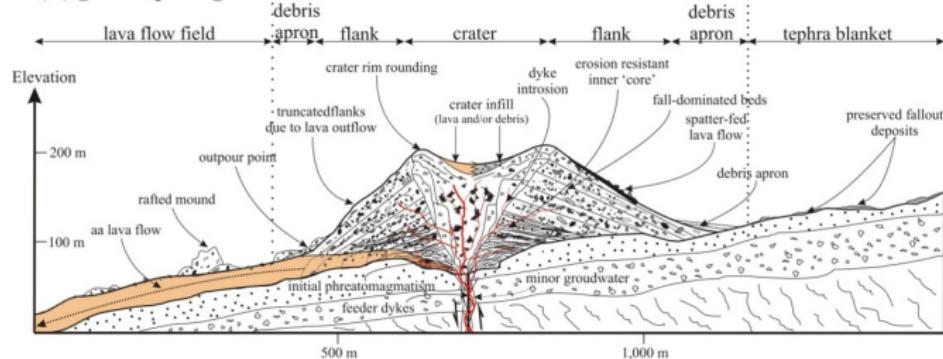
welded or  
agglutinated  
spatter

debris  
infill

ash to block,  
spatter

ash  
fine lapilli  
rarely bombs

## (C) geomorphologic features



# Cono de Escoria(*cinder cone*)



# *Tuff ring*



Figure: Diamond Head Crater, Honolulu (Hawaii)

# Estratovolcano



Figure: Estratovolcán del Arenal en erupción (Costa Rica)

tomada de <http://www.biodiversidadvirtual.org/geologia/Estratovolcan-del-Arenal-en-erupcion-img2832.html>

Edier Aristizabal (evaristizabal@unal.edu.co)

Ambiente Volcánico

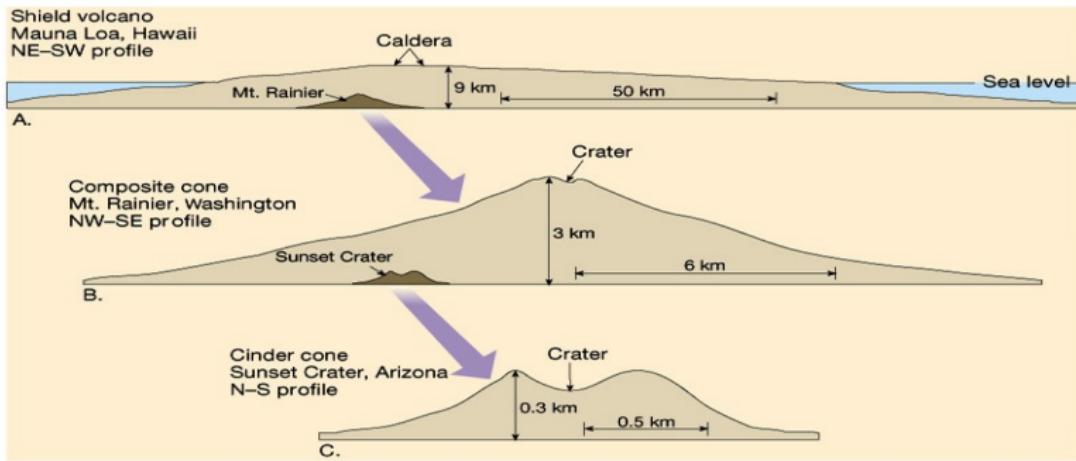
Versión: June 25, 2020

17 / 47

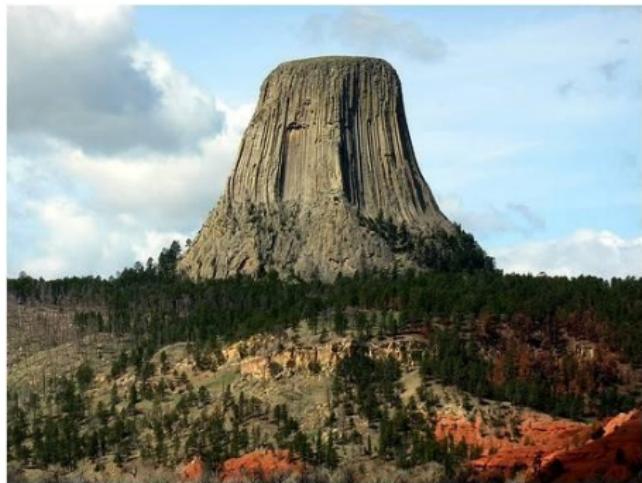
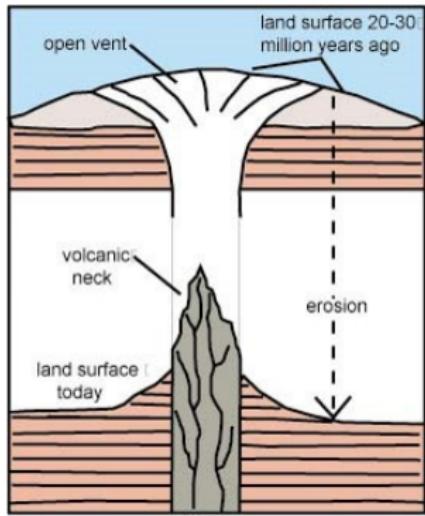
# Estratovolcán



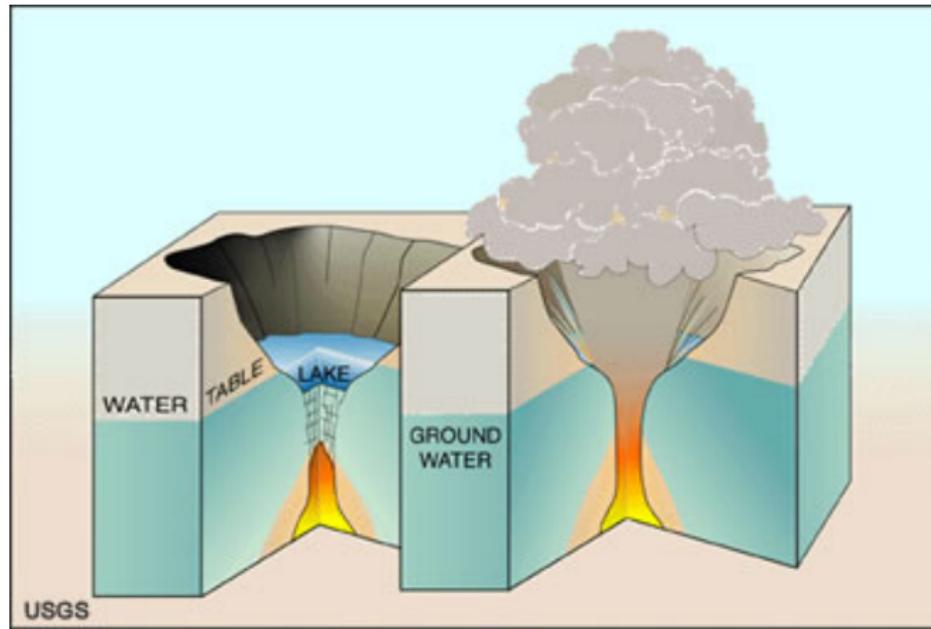
Figure: Estratovolcán del Monte Fuji (Japón)



# Cuellos volcánicos

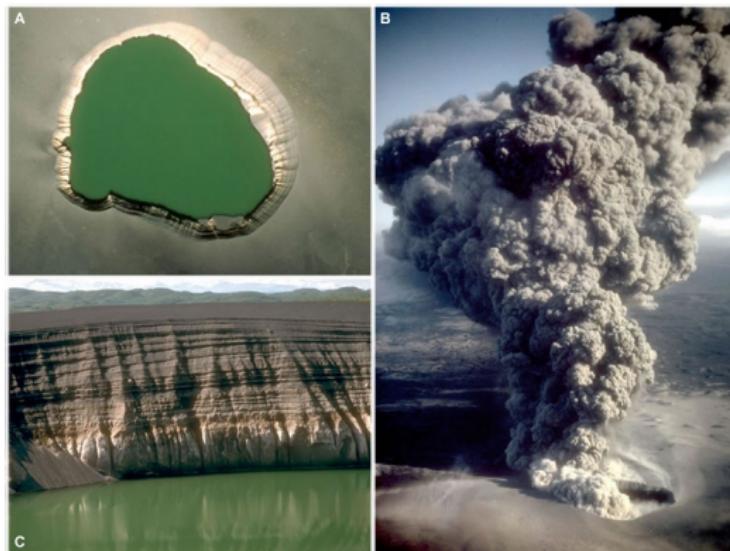


# Cráteres Maar



Source:USGS

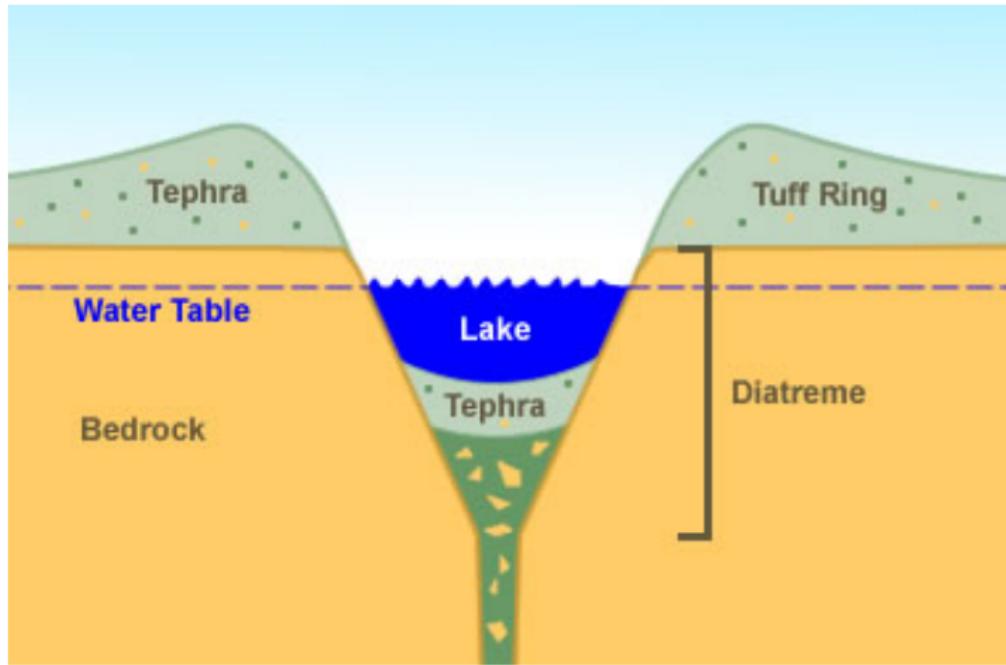
# Cráteres Maar



**Figure:** Views of East Ukinrek Maar Crater, which formed in April, 1977 during a 10-day eruption

<https://geology.com/stories/13/maar/>

# Crateres Maar

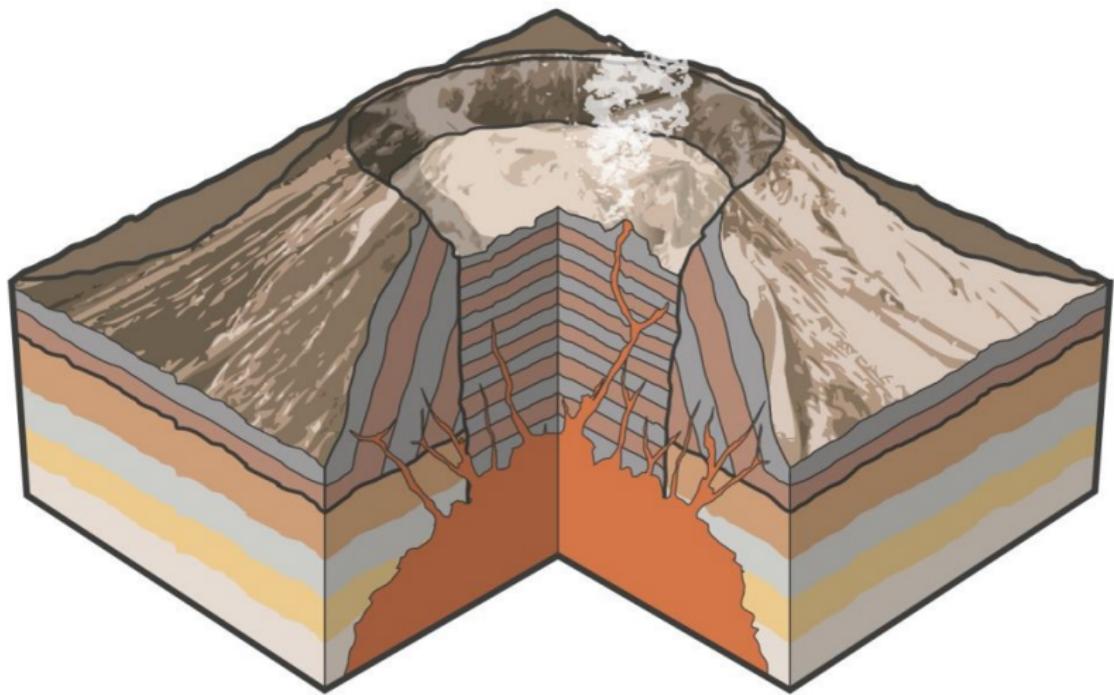


<https://geology.com/stories/13/maar/>

# Campos de Lava



# Calderas

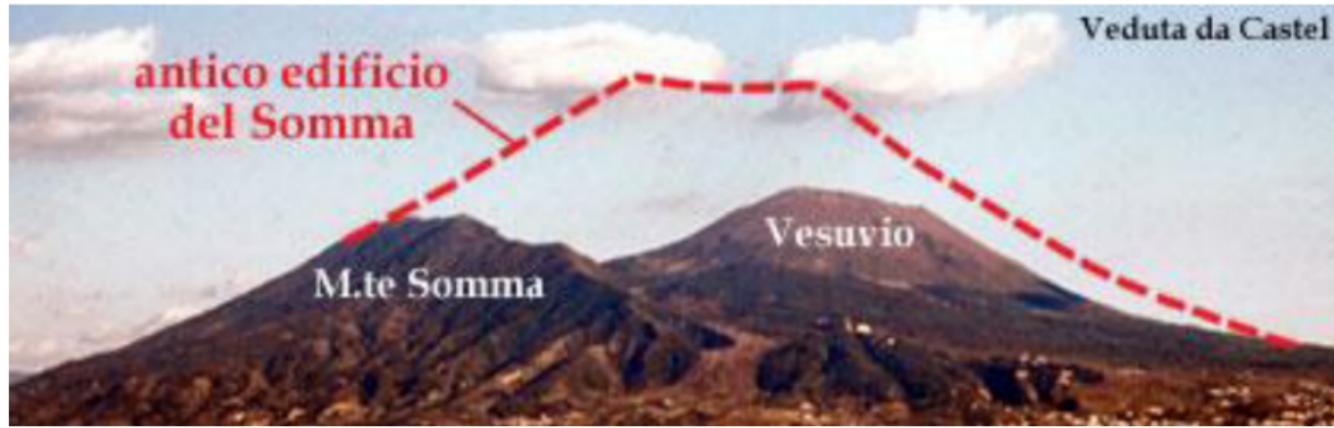


# Calderas



Figure: Calderas Taal (Filipinas)

# Calderas



Veduta da Castel

# Calderas Colapso - Resurgimiento



# Caldera Krakatoa



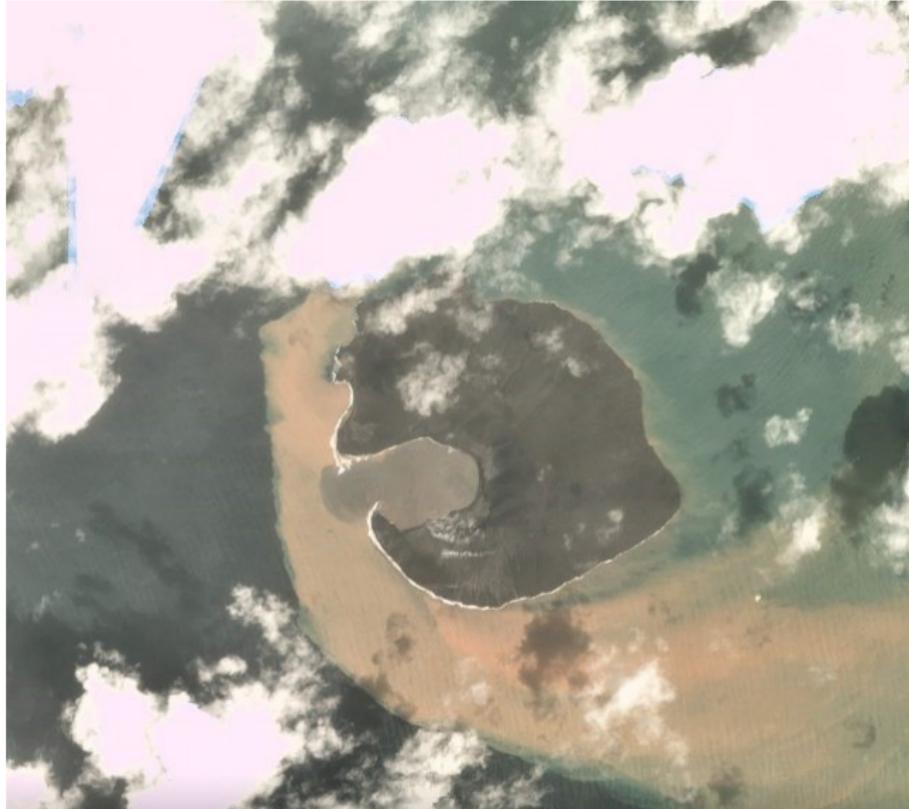
**Volcán Krakatoa, Indonesia. 813 m**

Fotografía cortesía del VSI

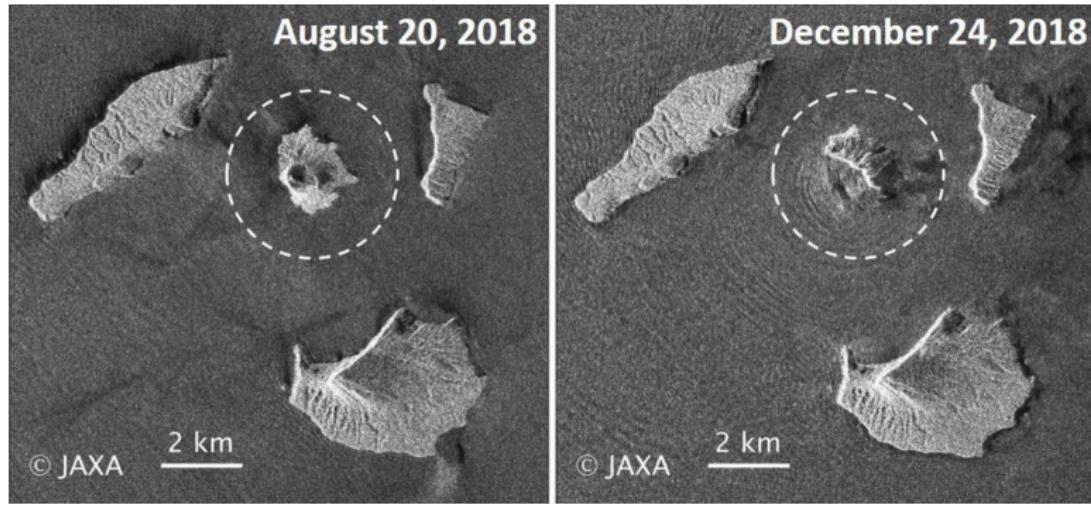
# Caldera Krakatoa



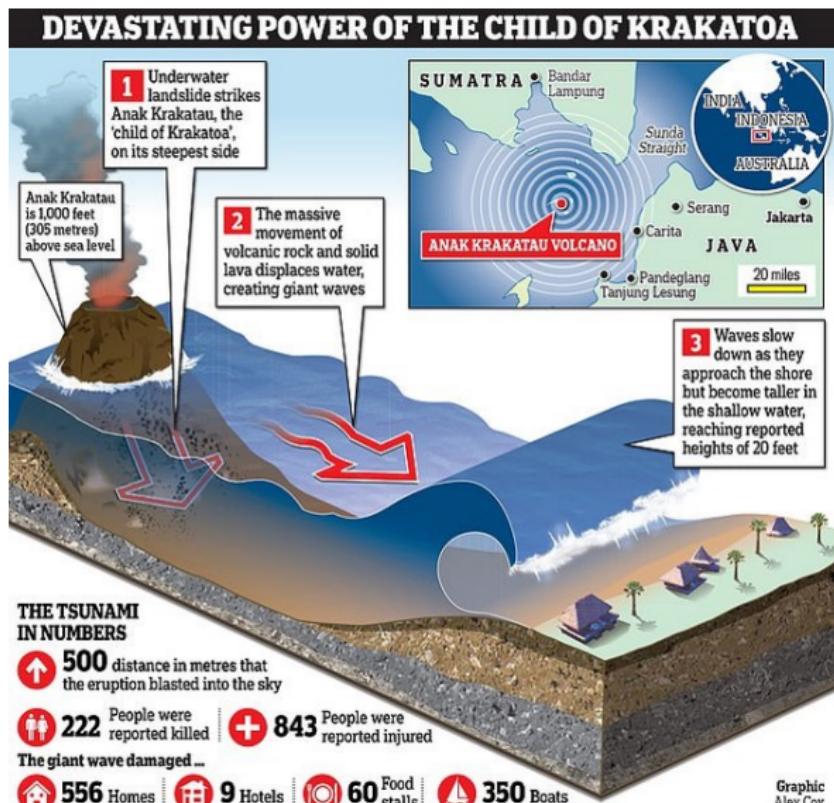
# Caldera Krakatoa



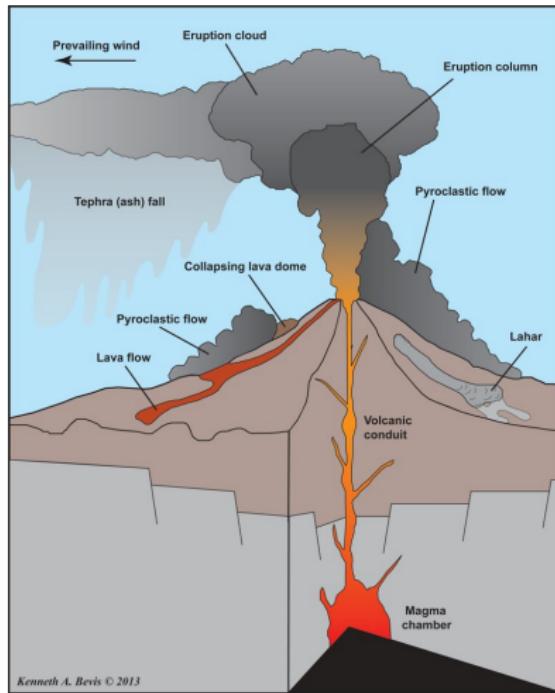
# Caldera Krakatoa



# Caldera Krakatoa



# Depósitos de origen Volcánico



# Depósitos de origen Volcánico

Los sedimentos y depósitos de origen volcánico pueden ser divididos de acuerdo a su origen en:

**Piroclásticos** → primarios → restringido a material generado, transportado y depositado por vulcanismo explosivo subaereo (Explosivo).

**Hyaloclásticos** → primarios → Fragmentos formados por el choque térmico cuando la lava caliente entra en contacto con el agua fría (efusivo).

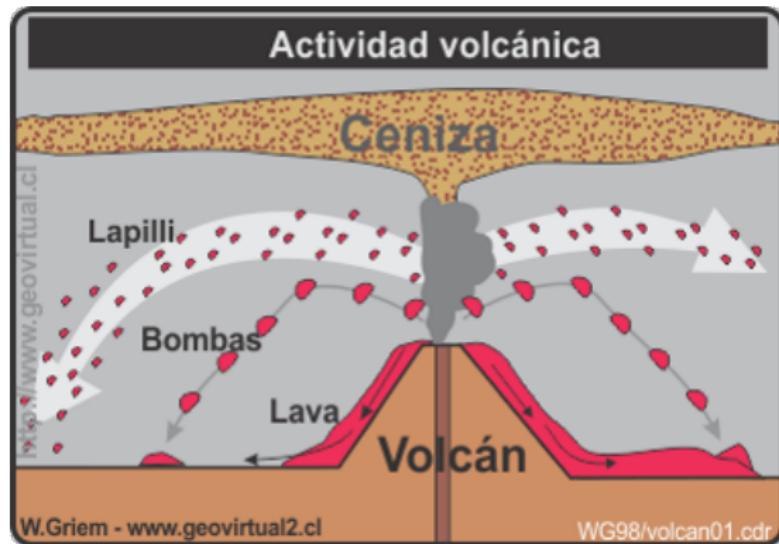
**Autoclásticos** → primarios → formados por movimiento mecánico o gravitacional de flujos de lava y/o domos (efusivo).

**Epiclásticos** → secundarios → fragmentos volcánicos que son producidos por erosión de rocas volcánicas por viento, agua o hielo de rocas volcánicas preexistentes consolidadas.

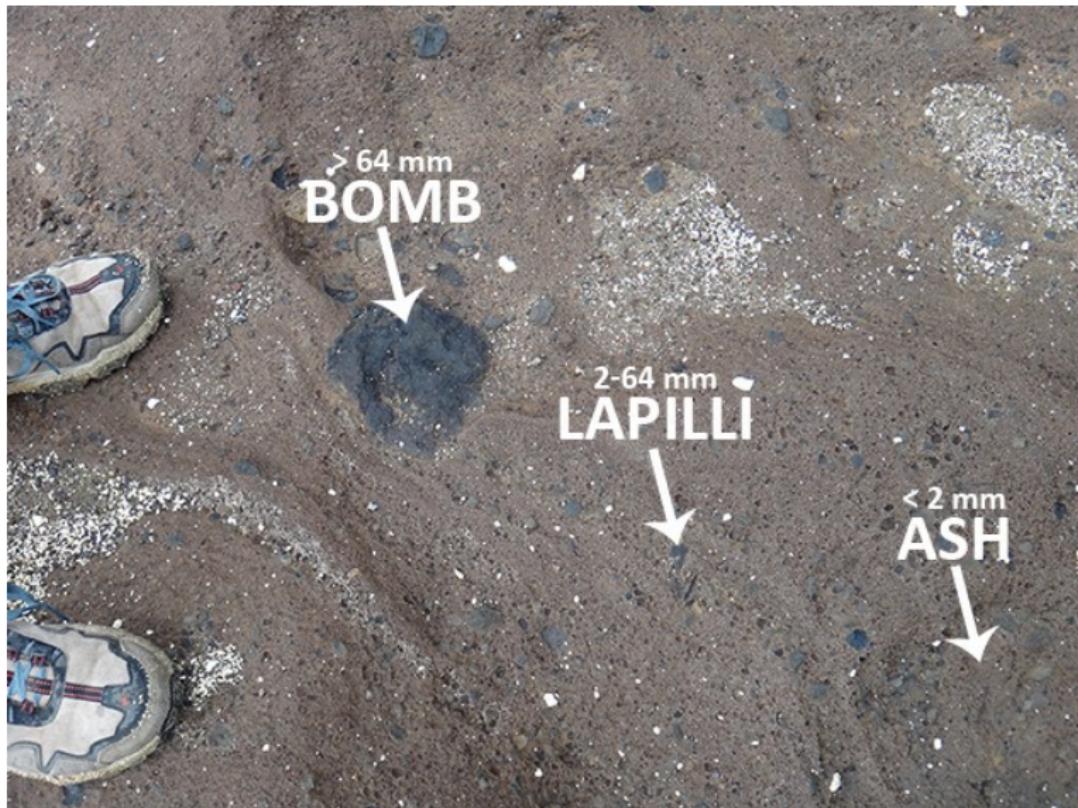
# Depósitos Piroclásticos

## Teffra

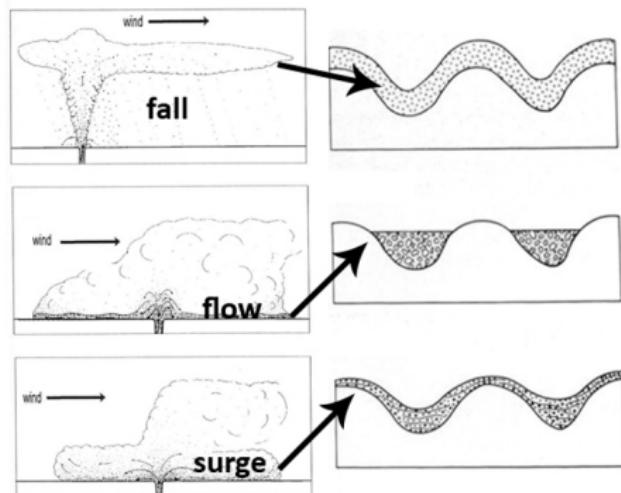
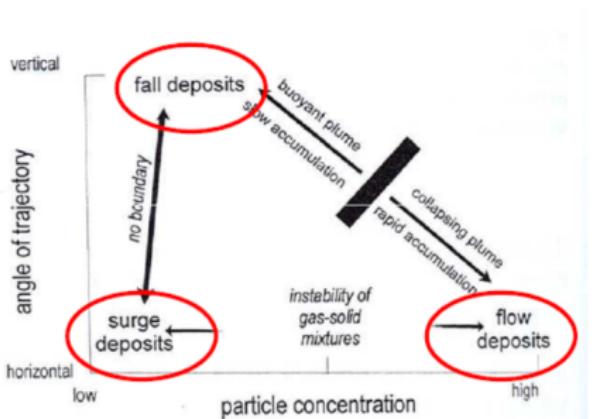
**Teffra:** Material expulsado, fragmentado y distribuido por el viento, no compactado se denomina tefra, independientemente de la composición o del tamaño de los granos. Los diferentes fragmentos, sueltos o compactados, son llamados piroclástos.



# Depósitos Piroclásticos



# Depósitos Piroclásticos



# Flujos Piroclásticos



# Flujos



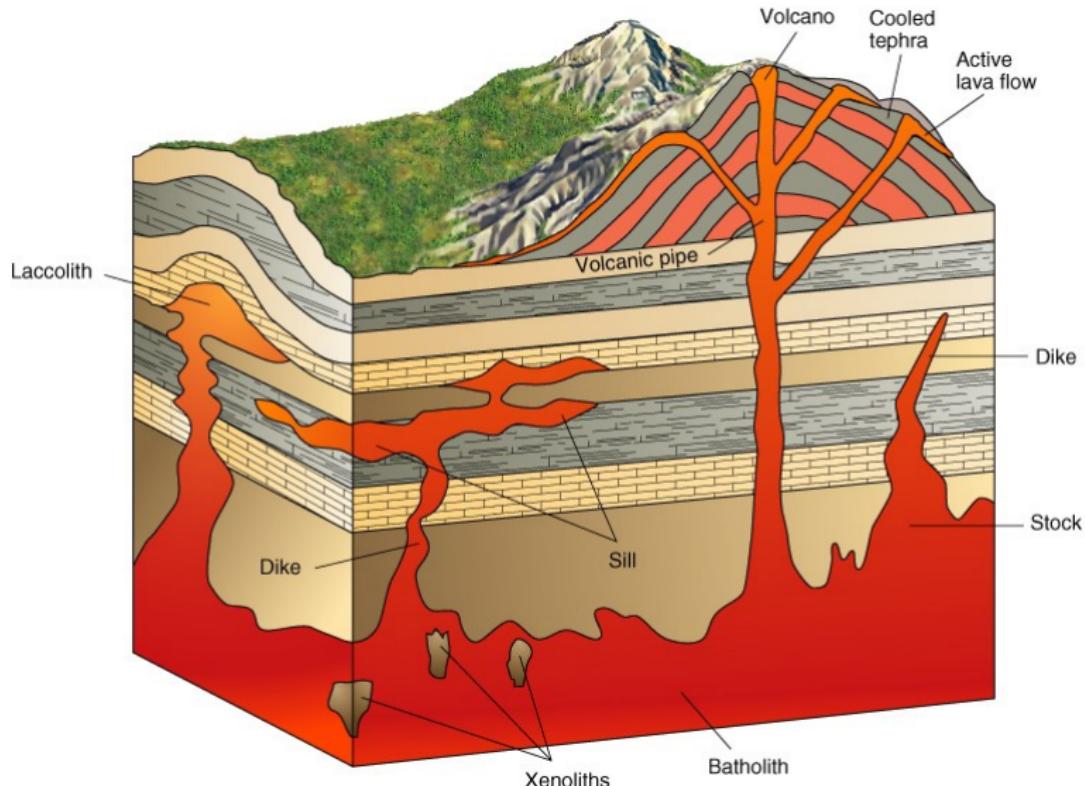
# Nube Ardiente



# Lahar



# Geoformas Plutónicas



# Geoformas Plutónicas

## Lacolitos

Cuerpos intrusivos que generan formas dómicas sobre los techos de la roca encajante, son usualmente ácidos y se generan comparativamente superficiales en áreas relativamente poca afectadas (Twidale, 1971).



# Geoformas Plutónicas

## Lacolitos, lopolitos y facolitos

Lacolito



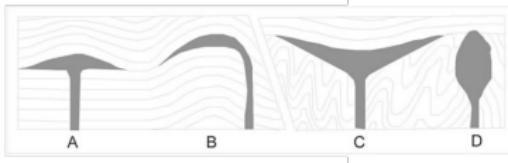
Los lopolitos son grandes, lenticulares donde la masa central se hunde. El espesor es entre 1/10 y 1/20 del ancho o diámetro.

Lopolito



Los facolitos están en la cresta de anticlinales y fueron instruidos contemporáneamente con el plegamiento.

Facolito

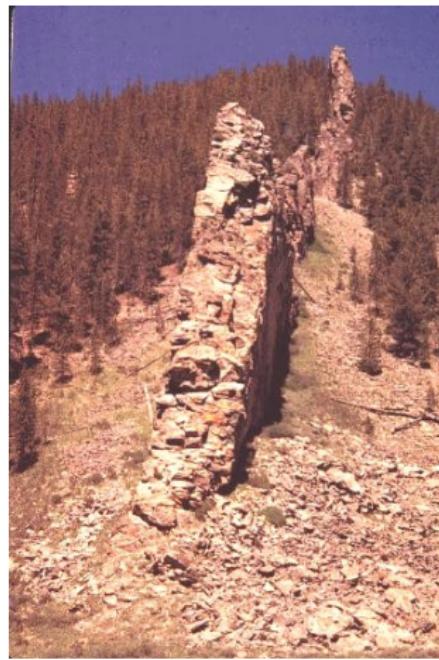


Sill



# Dikes

Cuerpos intrusivos tabulares, verticales o cercanos, usualmente cortando la roca encajante (Twidale, 1971).



# Sill

Masas tabulares emplazadas horizontalmente y usualmente paralelas a la estratificación, clivaje o foliación de la roca encajante (Twidale, 1971).

