

Digimap for Schools

Volcanoes Overlay

User Guide

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Introduction

The volcanoes overlay was created using data downloaded from the Global Volcanism Program. These data were then sorted and simplified, reducing the number of volcano categories from 18 to 9.

The categories included are as follows:

- Caldera
- Complex Cones
- Lava Dome
- Maar
- Shield
- Stratovolcano
- Submarine Volcanic field

These are defined below.

Caldera(s)

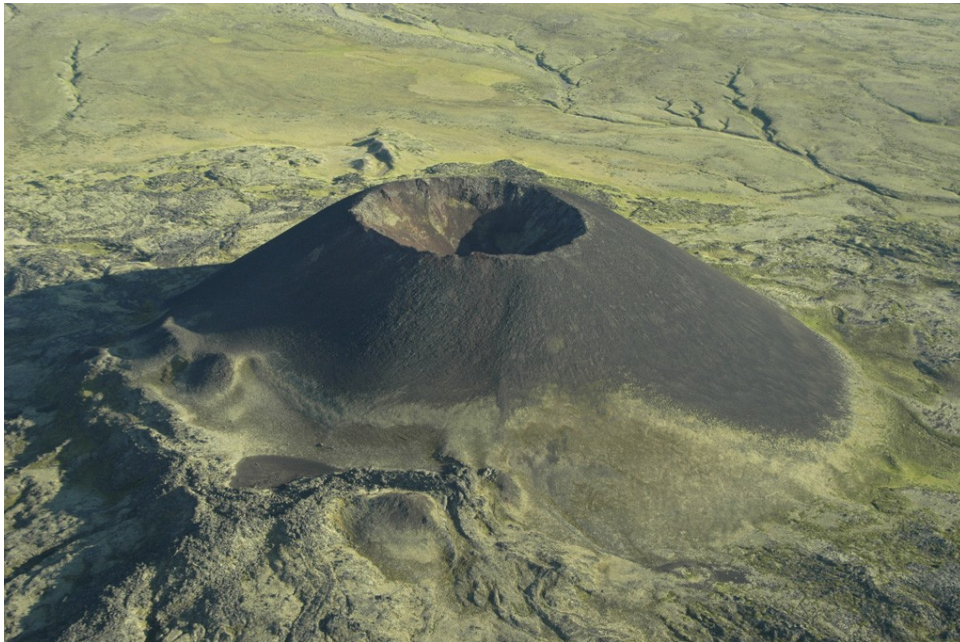
Calderas are large depressions formed through subsidence, spanning up to 50 km in diameter. They usually form when magma has drained during large explosive eruptions or lava flows, resulting in significant subsidence of the overlying ground, or incrementally through smaller collapse events.



Torihima volcano, 12 August 2002

Complex Cone(s)

Cone(s) are the smaller of volcanic features and the most abundant, with tens to hundreds occurring in volcanic fields, on shield volcanoes and stratovolcanoes, and in calderas. They range from tens to hundreds of meters in height and are often formed during a single eruption period over days to years.



Scoria cones, such as Eve Cone on the flank of Edziza volcano, are formed by the explosive ejection of fragmental material that accumulated around the vent.

Lava Dome(s)

Maar (s)

Maar volcanoes are a result of phreatomagmatic eruptions and contain a crater that cuts into the ground surface, a diatreme containing debris from explosions, and a tephra ring around the crater formed by pyroclastic surge deposits, tephra, and ballistic projectiles. Maar craters usually span tens to around 200 m deep and diameters range from a few to several hundred kilometres. They may contain overlapping craters to form one depression. Below the crater is the diatreme (the volcanic pipe), which can extend below the surface for hundreds of meters to over 1 km, narrowing downwards. Hazards include ballistic ejecta, pyroclastic surge, and tephra.



Shield(s)

Shield volcanoes are low-angled, broad volcanoes that may be part of volcanic fields or chains. These large volcanoes are mostly created through effusive eruptions producing low-viscosity, low-silica lava flows, but explosive eruptions may still occur. They can contain multiple vents, lava lakes, summit calderas, fissures, spatter ramparts, fracture networks, lava tubes, and slumping features.



Isla San Martín, the 2-km-wide island is a shield volcano capped by scoriacones that reach 230 m above sea level.

Stratovolcano(es)

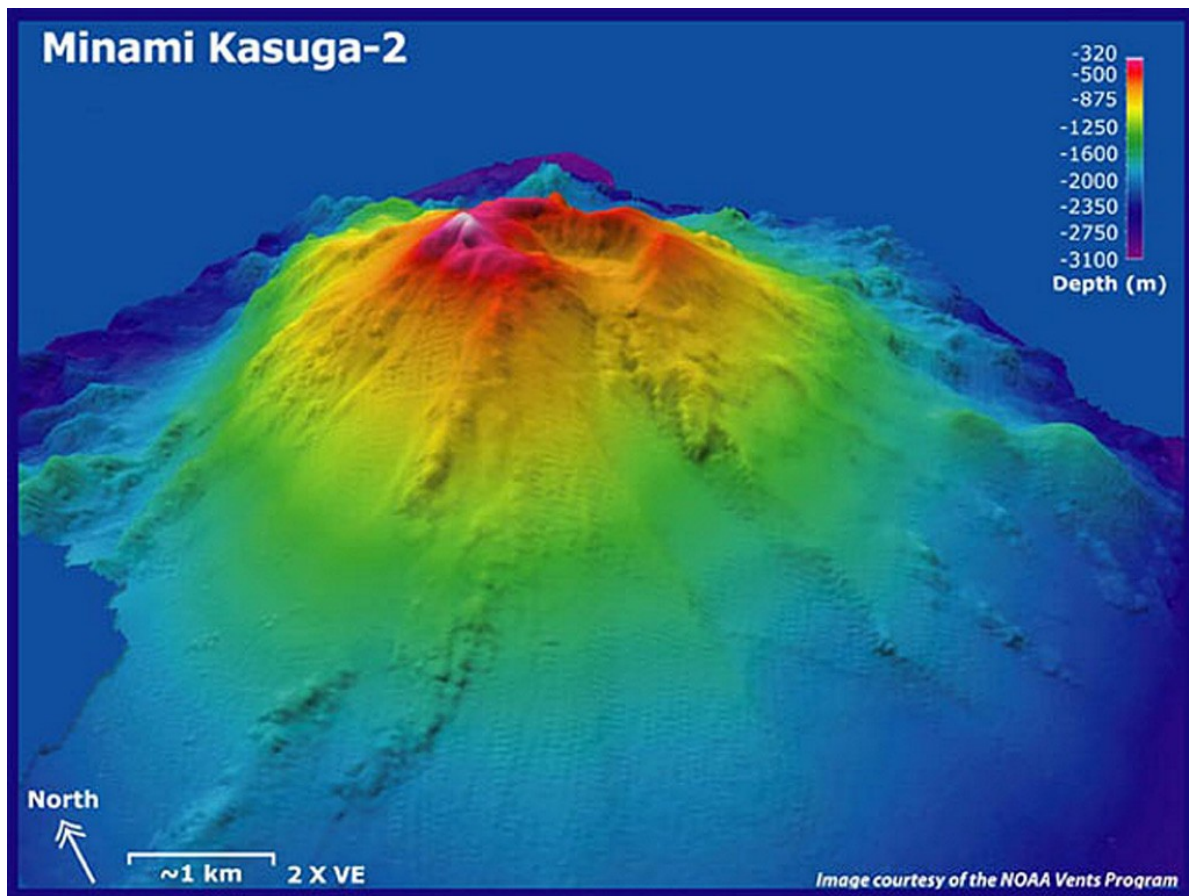
Stratovolcanoes, also called composite volcanoes, erupt a variety of magma types spanning basalt, andesite, dacite, and rhyolite to produce a wide range of eruption styles. These large complex volcanoes form over tens to hundreds of thousands of years from accumulating lava flows, lavadomes, and explosive deposits, and may have multiple eruption centres or vents. Hazards include lava flows, pyroclastic flows (also called pyroclastic density currents), dome collapse, structural failure (small landslides and large flank collapse), ballistic ejecta, lahars (also called debris flows), volcanic gas, volcanic lightning, and ashfall. Over the course their lifespans, dormant periods may last tens of thousands of years.



Submarine

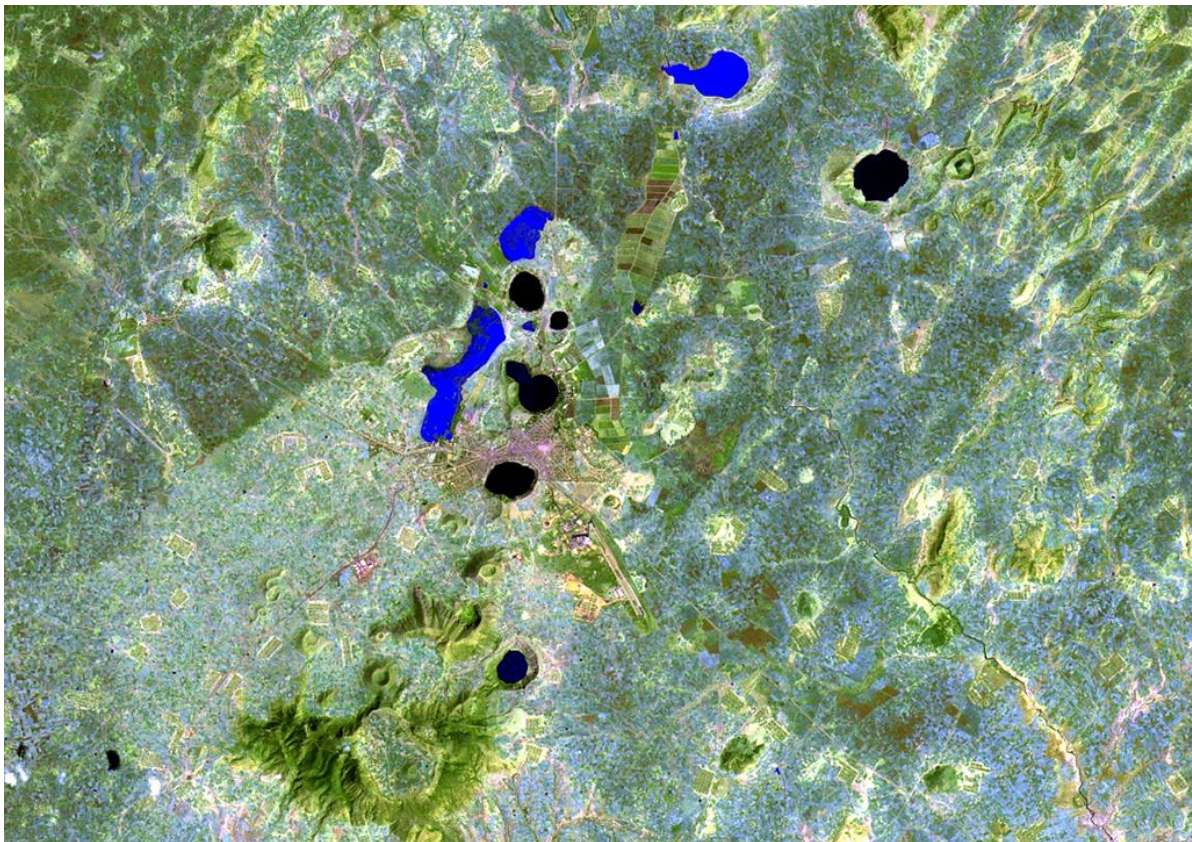
Most submarine eruptions are too deep to impact the surface, but shallow activity can result in explosive lava-water interactions resulting in the ejection of wet volcanic material called cocks-tail jets, and pyroclastic surges traveling across the water. Submarine eruptions can result in pumice rafts – large areas of floating pumice that travel across oceans.

These eruptions can also produce features like pillow, lobate, or sheet lavas, hyaloclastites (from fragmentation of lava), and black smokers (hydrothermal vents). Hazards include steam explosions, ballistic ejecta, pyroclastic surge (a type of pyroclastic flow), and ashfall.



Volcanic field

Volcanic fields, or monogenetic volcanic fields, are systems that produce numerous volcanic features including scoria cones, lava flows, maar craters, stratovolcanoes, and vents. These fields can consist of tens to hundreds of distributed vents, most of them only producing one eruption, and can span up to thousands of square kilometres. Hazards include ashfall, pyroclastic flows and surges, lava flows, ballistic ejecta, lahars, and flooding from dammed drainages. New vents can open anywhere within the field resulting in a widespread area that could be impacted by an eruption.



Naming volcanoes

The Volcanoes of the World database designates a "primary" name for each volcano, but also include synonyms and a large number of feature names (and their synonyms).

Primary names are determined based on official use by national geological or geographical agencies, use in scientific publications, names in common use, or local geographical features. In some cases, volcanoes are simply listed as "Unnamed" where no other criteria can be applied. (GVP, 2013).

Source

Global Volcanism Program, 2013. Volcanoes of the World, v. 4.10.1. Venzke, E (ed.). Smithsonian Institution. Downloaded 05 Jul 2021.
<https://doi.org/10.5479/si.GVP.VOTW4-2013>