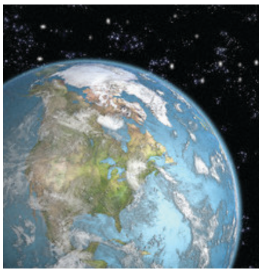
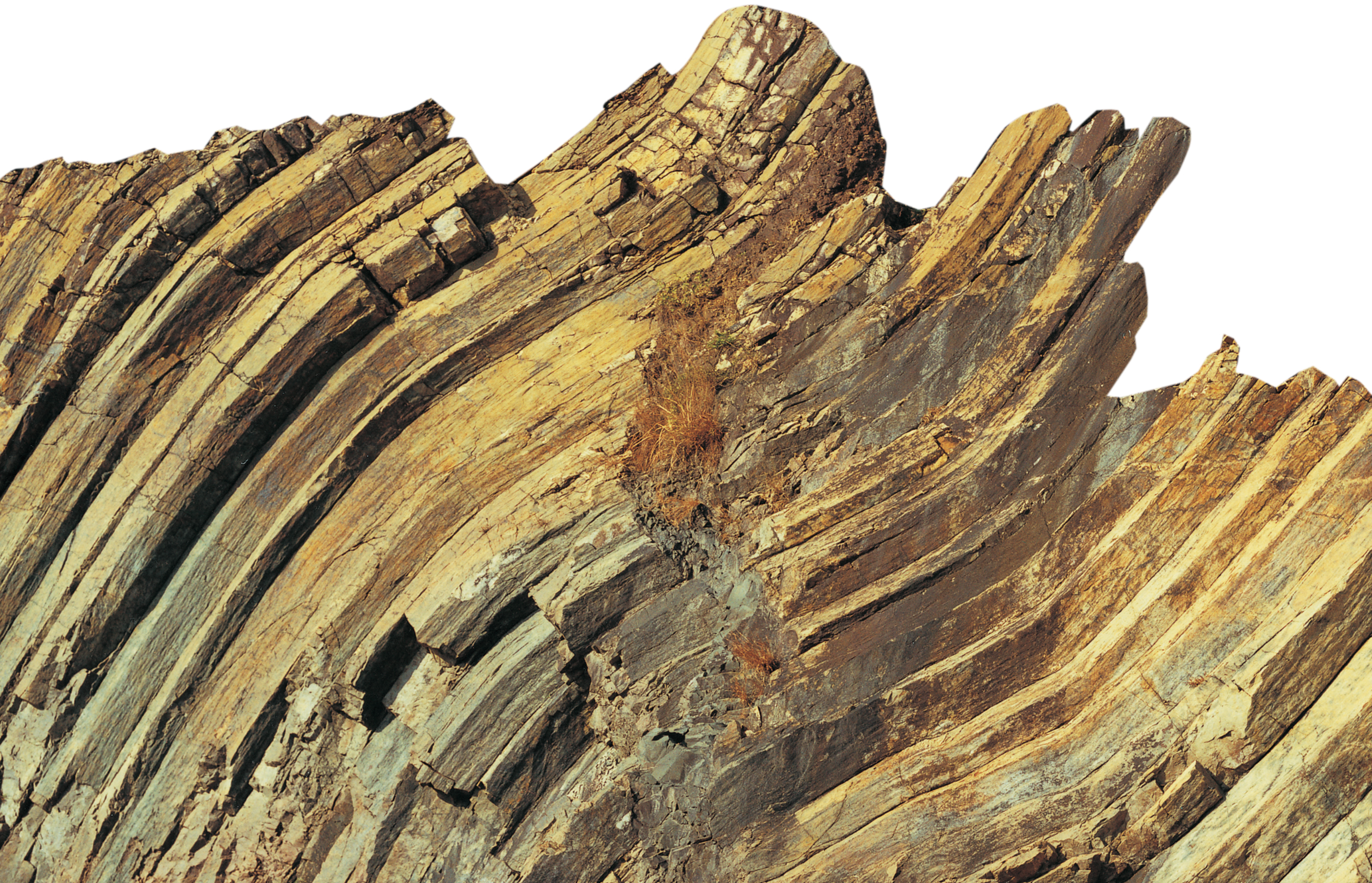
土木工程拓展署
土力工程處
Geotechnical Engineering Office
Civil Engineering and
Development Department

香港的構造演化
TECTONIC EVOLUTION OF HONG KONG



板塊運動
PLATE TECTONICS 3



前言

教育局於2005年公布，三年新高中學制將於2009年9月在中四級實施。地理科是其中一個重點的選修科目。

新高中地理科課程是根據2005年教育局出版的一份文件和課程發展議會《高中課程指引》(2007)的建議而制訂。在此課程中，地理被視為一門學科讓學生可以從空間的角度了解自身所處的地球。

土木工程拓展署轄下的土力工程處應教育局的請求，在天然災害及地球科學兩個新高中地理科課程內容上製備了一份「教學支援教材套」。其中有關香港岩石及礦物的資料亦適用於部份化學科的課程。

「教學支援教材套」包括了14本小書冊、4張海報、3片光碟及其他一些補充資料。此教材套在香港的斜坡安全、山泥傾瀉、地質及地貌等課題上提供了合適及最新的資料並同時符合新高中地理科課程的水平。

土力工程處的「香港地質調查組」負責編寫有關香港地質及地貌方面的內容，而「斜坡安全部」則負責香港斜坡安全及山泥傾瀉的部份，「斜坡安全部」的同事亦負責整個項目的策劃與安排。我謹向各位參與這項工作的同事致謝。

我相信這教材套對各位負責新高中地理科目的老師在擬備教材時能提供合適的參考。此教材套亦給予有興趣於這些課題的廣大讀者一些有用的資料。

陳建碩

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2008年12月

Foreword

In 2005, the Education Bureau (EDB) announced that a three-year New Senior Secondary (NSS) curriculum would be implemented at Secondary 4 in September 2009. Geography is one of the elective subjects under the NSS curriculum.

The NSS curriculum has been developed on the basis of the recommendations made by an EDB document in 2005 and a Senior Secondary Curriculum Guide of 2007. Within the curriculum, geography is seen as a key educational discipline that provides students with a spatial understanding of the Earth on which we live and work.

At the request of the EDB, the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department have prepared support teaching materials for the NSS Geography curriculum under the topics of Natural Hazards and Earth Science. The materials written on rocks, minerals and ores in Hong Kong are also suitable for part of the Chemistry curriculum.

The "Teaching Support Materials Kit" consists of 14 booklets, 4 posters, 3 CDs and other supplementary information sheets. This teaching kit contains pertinent and up-to-date information on slope safety, landslides, geology and geomorphology in Hong Kong, written at a level that is suitable for the NSS Geography curriculum.

Hong Kong Geological Survey of GEO have compiled the teaching materials that describe the geology and geomorphology of Hong Kong. The Slope Safety Division of GEO have prepared the teaching materials on Hong Kong slope safety and landslides. Colleagues in the Slope Safety Division are also responsible for the overall planning and coordination of this project. Their contributions are gratefully acknowledged.

I am confident that, for years to come, secondary school geography teachers will find the kit invaluable for preparing their classroom teaching materials. The contents will also be of interest to the more general readers who may wish to learn more about these topics.

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December 2008

引言
Introduction

我們的地球是一個由大氣圈、水文圈、生物圈及岩石圈四個主要部份組成的動力體系。這四個部份在漫長的地球歷史中，持續互相影響。地質學為一門研究岩石圈的科學，並且包含岩石圈與其他三個部份相互作用的研究。

板塊運動是指在岩石圈推動地質作用的基本機制。板塊運動理論是基於對地球內部結構，不同類型板塊和板塊邊緣，以及板塊活動推動力的了解**(板塊運動之一)**。板塊運動理論扼要地闡釋地震及火山的產生、不同種類岩石的分佈、岩石循環、以及山脈的形成、大陸張裂和海洋擴張等地質現象**(板塊運動之二)**。褶皺及斷層是地質構造，是岩石以及板塊受壓而作出的反應**(板塊運動之二)**。詳細研究香港的岩石，有助解釋本港的地質歷史及板塊構造環境的演變**(板塊運動之三)**。

Our Earth is a dynamic system that comprises four main components: the atmosphere, the hydrosphere, the biosphere and the geosphere. These four components have been continuously interacting throughout the Earth's long history. Geology is the science that studies the geosphere, and encompasses the interactions between the geosphere and the other three components.

Plate tectonics is the fundamental mechanism that drives geological processes in the geosphere. Plate tectonic theory is based on an understanding of the Earth's internal structure, the different types of tectonic plates and plate boundaries, and the driving forces of plate movements **(Plate Tectonics 1)**. The occurrence of earthquakes and volcanoes, the distribution of different rock types, and the Rock Cycle, as well as the processes of mountain building, continental rifting and seafloor spreading, can be concisely explained by plate tectonic processes **(Plate Tectonics 2)**. Folds and faults are geological structures that result from the response of rocks to tectonic stresses **(Plate Tectonics 2)**. Detailed studies of the rocks enable the geological history and the evolution of the tectonic setting to be deciphered **(Plate Tectonics 3)**.

內容
Contents

我們在香港看到最古老的岩石約有四億年歷史，但香港的岩石明顯地未有記載部份主要地質時期的地質記錄，反映當時此地區極可能發生重大的區域性地殼構造變化。

中國東南地區的地殼構造架構

在香港沒有露出而深埋的大陸基盤估計超過五億五千萬年，然而鄰近的廣東省則發現遠達二十五億年的結晶岩。

中國東南部相信是由三組古老地塊構成。該等地塊稱為華北地塊、揚子地塊及華夏地塊(圖1)。它們於過去十億年間，經過大陸板塊與大陸板塊之間的碰撞而接連(縫合)一起。現時位於中國東南部的地殼環境稱為不活動大陸邊緣(即大陸地殼邊緣並不是板塊邊界)。

中國東南部屬於歐亞板塊的一部分，歐亞板塊的南端與印澳板塊之間發生大陸板塊與大陸板塊的碰撞，形成喜馬拉雅山山脈。在東面，菲律賓板塊正向西北方移動，形成歐亞板塊邊緣一帶複雜的大洋俯衝帶系統。

在台灣北面，菲律賓板塊正俯衝於歐亞板塊之下；而在台灣南面，菲律賓和歐亞兩板塊則俯衝於菲律賓群島之下。這樣的板塊構造環境，構成複雜的火山及地震歷史。

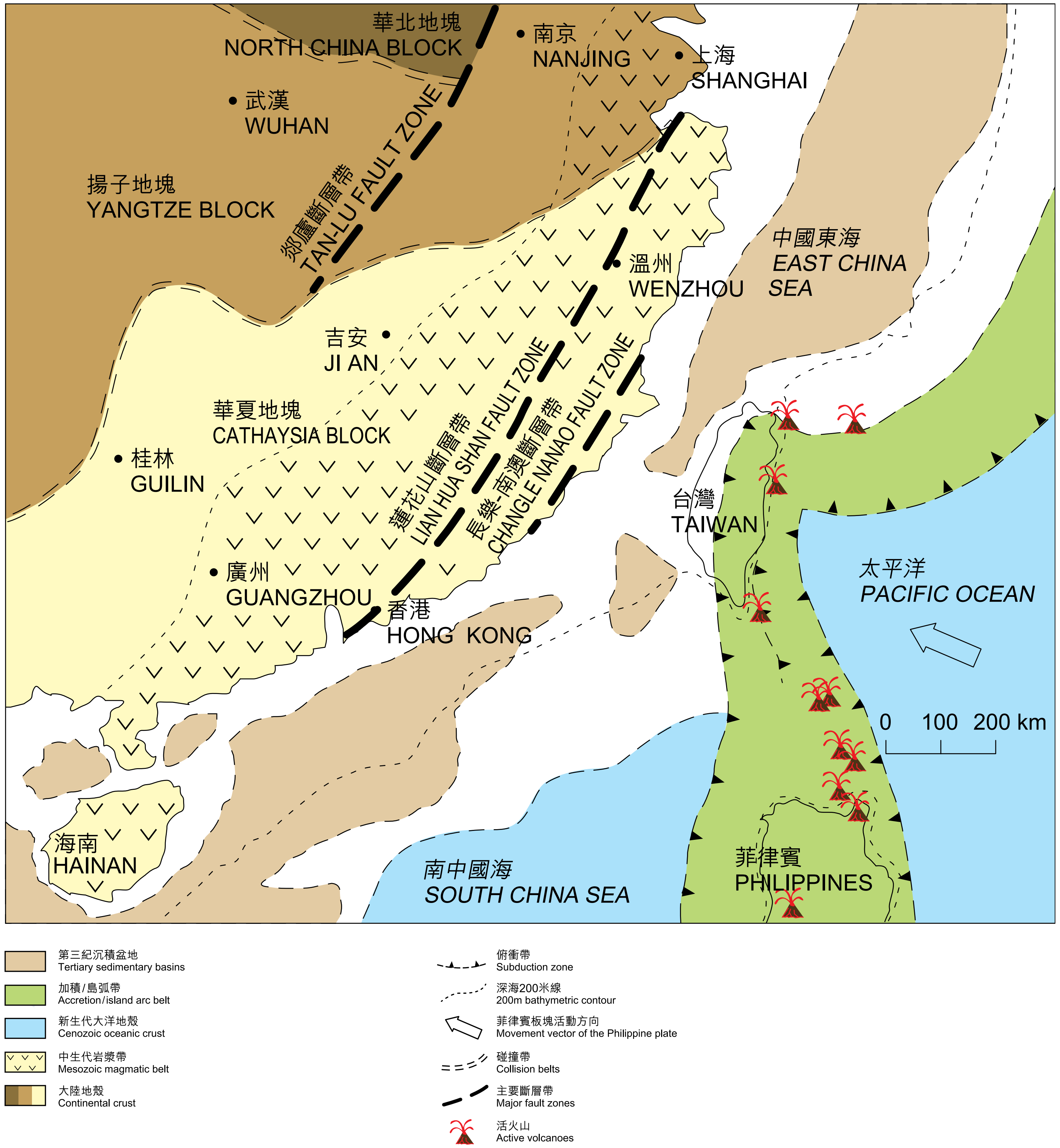

圖1. 大陸板塊與現時位於中國東南部的板塊構造。
Figure 1. Crustal blocks and the present-day tectonic setting of southeastern China.

The rocks exposed in Hong Kong cover a period of about 400 million years of Earth history. Significantly, there are major gaps in the geological record in Hong Kong, which probably reflect major changes in the tectonic regime of the region.

Tectonic Framework of Southeastern China

The unexposed (buried) continental basement of Hong Kong is thought to be older than 550 million years. However, in neighbouring Guangdong Province, crystalline rocks as old as 2.5 billion years have been discovered.

Southeastern China is believed to comprise a series of three old crustal blocks.These blocks are known as the North China Block, the Yangtze Block and the Cathaysia Block (Figure 1).The crustal blocks have been joined together (sutured) by continent-continent collision events over the past 1,000 million years.

The present-day tectonic setting of southeastern China is what is termed a passive continental margin (*i.e.* there is no plate boundary along the edge of the continental platform).

Southeastern China forms part of the Eurasian Plate, which is in continent-continent collision with the Indo-Australian Plate along its southern border (forming the Himalayan Mountain Chain). In the east, the Philippine Plate is moving northwestwards forming a complex oceanic subduction zone system along the margin of the Eurasian Plate. North of Taiwan, the Philippine Plate is being subducted beneath the Eurasian Plate. South of Taiwan, both the Philippine and Eurasian Plates appear to be subducting beneath the islands of the Philippines, leading to a complex history of volcanism and earthquakes.

香港地殼構造的轉變

約十億年前，香港的大陸基盤(華夏地塊)於聚合型板塊邊緣構造環境中，與揚子地塊發生碰撞。

約在六億年前，中國東南部大部份的陸地被淹沒於大陸淺海中。

到了四億年前，經由河流及其三角洲運來的沉積物在香港一帶堆積。這些沉積物成為現今香港最古老的岩石，即泥盆紀黃竹角咀組，這時期此地區的板塊活動相對穩定(圖2)。

接著的五千至七千萬年，此地區被溫暖的淺海淹沒，並沉積石灰泥漿，而這些沉積物後來變成埋藏在香港元朗地下的大理岩。

到了約於三億年前，此地區已變為大陸深海。

Changing Tectonic Setting of Hong Kong

About 1,000 million years ago, the continental basement of Hong Kong (the Cathaysia Block) collided with the Yangtze Block in a convergent margin tectonic setting.

By about 600 million years ago, a large part of southeastern China was submerged beneath a shallow continental sea.

By 400 million years ago, sediments from rivers and their deltas were being deposited in the Hong Kong region. These sediments now form the oldest rocks in Hong Kong, which are sedimentary rocks of the Devonian Bluff Head Formation. Tectonically, the area was relatively stable (Figure 2).

Over the following 50 to 70 million years, the area was submerged beneath a warm shallow sea in which calcareous muds were deposited. These deposits are preserved in Hong Kong as marble beneath Yuen Long.

By about 300 million years ago, the region had become a deep continental sea.

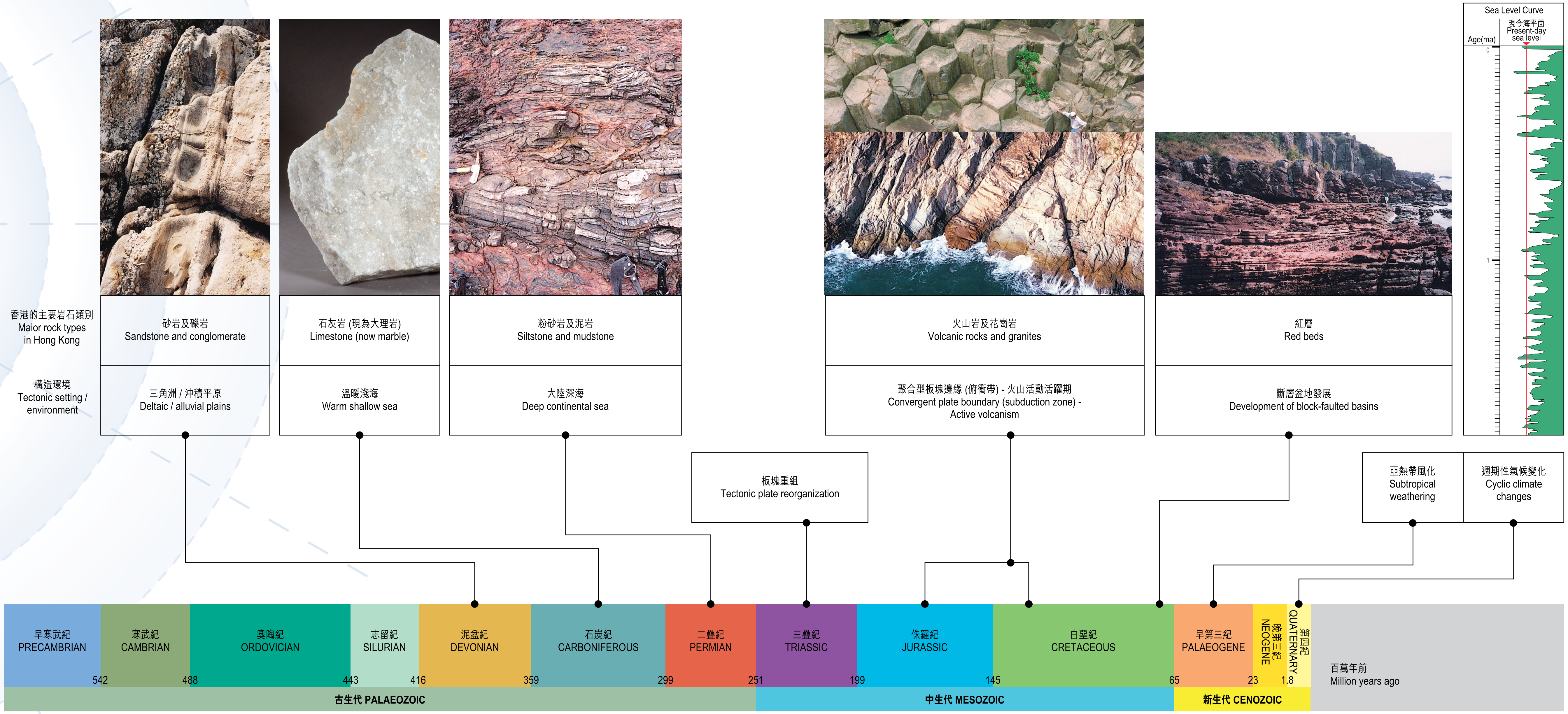

圖2. 香港在不同地質時期之構造環境的變遷。
Figure 2. Change of tectonic setting of Hong Kong through geological time.

約在二億五千萬至二億年前，可能受到板塊重組以及花崗岩岩漿侵入的影響，中國發生了重要的地殼構造活動。香港早期的岩石亦因此嚴重變形。

從大約二億至八千萬年前，中國東南海岸發展成聚合型板塊邊緣構造環境。約在一億六千五百萬至一億四千萬年前，香港區內的活火山噴出火山灰及熔岩。

由約一億四千萬至五千萬年前，香港地區仍是大陸地塊的一部分。除了有多個斷層盆地發展外，此地區的板塊構造相對穩定，而當時氣候既炎熱又乾燥。

從五千萬至約二百萬年前期間，香港地區並無任何沉積物的紀錄，但卻有強力證據顯示這段時期處於持續的亞熱帶風化作用。大部份原本藏於地下約2千米深的花崗岩露出地面，並被風化成現今厚度達250米的風化土層。

有關現今地形的發展，將於地質與地景之三討論。

由大約五百萬年前至今，歐亞板塊一直與菲律賓板塊發生碰撞，導致中國東南部的東北向斷層再度活躍。

第四紀時期，即大約由二百萬年前至今，適逢週期性的氣候變化，這段時期全球海面水位因應冰川期及間冰期之變化而分別下降或上升。

在寒冷的冰川時期，當時的海平面曾經較現在的低120米，而海岸線則約位於香港以南100米以外，同時，大量河流沖積物堆積在因海平面下降而暴露出來的海床上。

於間冰期期間地球溫度略為上升，導致冰川融化，使海水水位上升。上升的海水淹沒了沉積的河流沖積物，海泥覆蓋了大部份香港的水域，而較粗糙、多沙的沉積物則在水流較強的範圍堆積。

因此，儘管香港從來未被冰川淹蓋，但從離岸沉積物的地層證據，間接證明第四紀時期曾發生重要的全球性氣候變化。

隨著最後一個冰川期的結束，即約一萬八千年前，海面水位開始急速上升，香港地區的水位可能在八千年前已升至現時的高度。

Between 250 and 200 million years ago, there was a major tectonic event in China, possibly resulting from major plate reorganization. This was accompanied by the intrusion of granite magmas. The older rocks in Hong Kong were strongly deformed.

From about 200 to 80 million years ago, a convergent margin tectonic setting developed along the southeastern coast of China. In the Hong Kong region, active volcanoes erupted ash and lava between about 165 and 140 million years ago.

Between about 140 and 50 million years ago, the Hong Kong region was part of a landmass. Tectonically, the region was relatively stable, except for the development of several block-faulted basins. The climate was hot and dry.

From 50 million years to about 2 million years ago, there is no record of any sediments being deposited in the Hong Kong region. However, there is strong evidence that this period was one of continued subtropical weathering. The granitic rocks, which had been emplaced about 2 kilometres below the ground surface, had largely been exposed, and were weathered to produce the thick (up to 250 metres) weathering profiles seen today.

Developments of the present day landscape is discussed in Geology and Landscape 3.

From about 5 million years ago to the present, the Eurasian Plate has been in collision with the Philippine Plate, resulting in reactivation of northeast-trending faults in southeastern China.

The Quaternary Period, which extends from about 2 million years ago to the present-day, is characterised by cyclical climatic changes, during which world sea level periodically fell and rose in response to glacial and interglacial episodes.

During the cooler glacial periods, when sea level was as much as 120 metres lower than today, the coastline was about 100 kilometres south of Hong Kong and large volumes of alluvium were deposited on the exposed areas of former sea bed.

Intervening periods of climatic warming led to melting of the ice sheets, which caused the sea level to rise during these interglacial periods. The rising sea flooded across the alluvial sediments, depositing marine mud over much of Hong Kong waters, with coarser, more sandy sediments accumulating in areas of strong tidal currents.

Thus, although Hong Kong was never covered by glacial ice, the stratigraphy of the offshore sediments provide indirect evidence of the major fluctuations in global climate over the Quaternary period.

Following the end of the last glacial period, about 18,000 years ago, sea level began to rise rapidly, probably reaching it's present height in the Hong Kong region about 8,000 years ago.

中生代時期香港的火山

在屯門一帶的少量火山灰和熔岩，含豐富鈣、鈉、鐵和鎂的鋁矽酸鹽礦物，這些火山岩皆為香港最古老火山的證據。初步放射性年齡測試斷定這些岩石的歷史約有一億八千萬年。這些岩石可能屬於侏羅紀早期至中期(二億至一億七千五百萬年前)，在中國東南沿岸的聚合型板塊邊緣構造開始形成的環境下，產生的安山岩質層狀火山遺下的一小部份。

隨著聚合型板塊邊緣構造漸趨成熟，俯衝帶相繼向東南方轉移，因而產生了類型和成份稍稍不同的火山。在一億六千五百萬至一億四千萬年前期間，香港受到火山活動的重大影響。當時猛烈火山爆發，噴出含豐富二氧化矽(石英)、鉀、鈉和鐵的鋁矽酸鹽礦物的火山灰和熔岩，形成大型破火山口型火山。火山爆發主要發生於四段時期(圖3)：一億六千五百萬至一億六千萬年期間、一億四千八百萬至一億四千六百萬年期間、一億四千三百萬至一億四千二百萬年間及一億四千萬年前。四段時期皆附隨大型花崗岩岩體侵入。

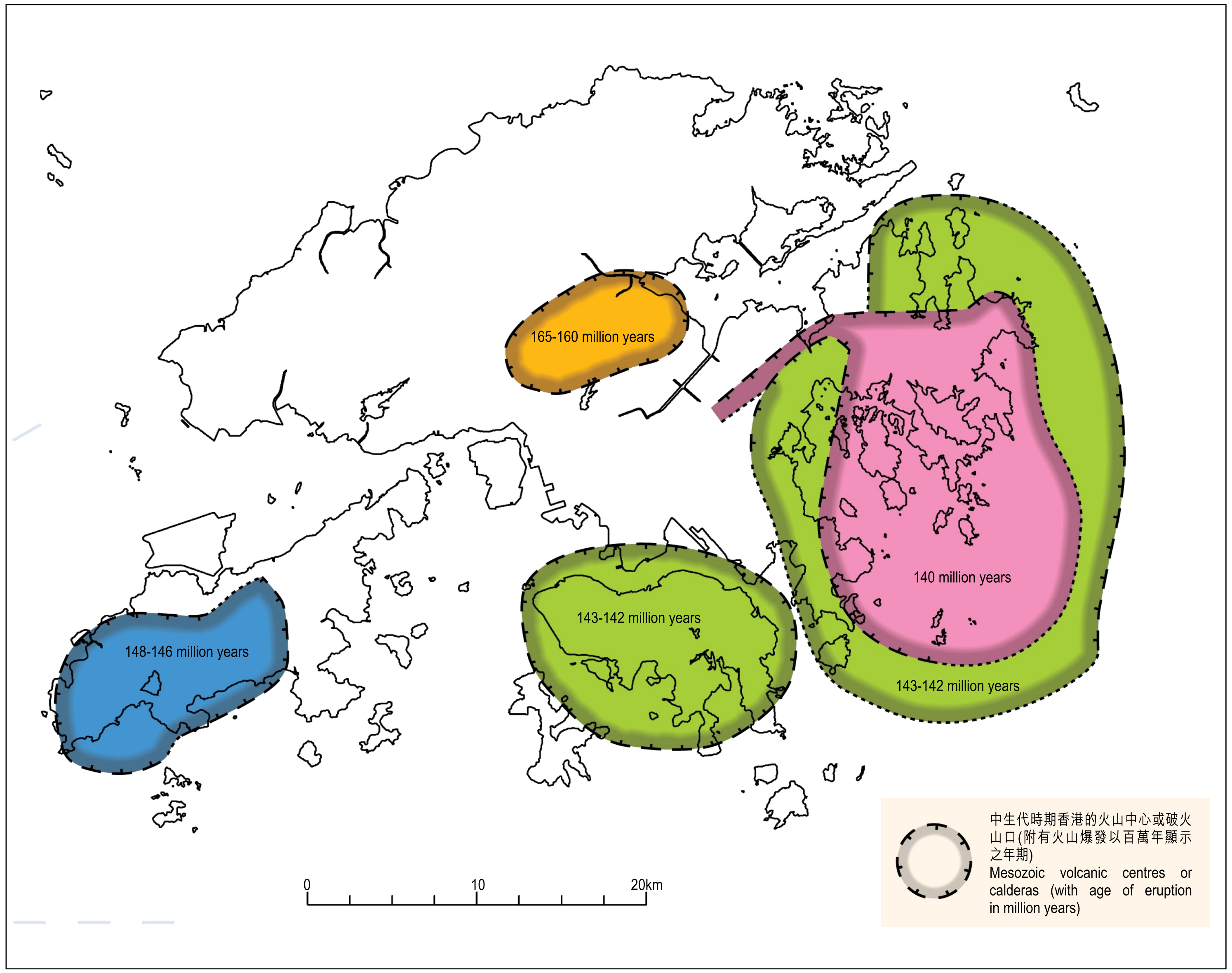

圖3. 中生代時期香港的火山中心或破火山口之推斷地點。
Figure 3. Inferred locations of the Mesozoic volcanic centres or calderas in Hong Kong.

Volcanoes in Hong Kong during the Mesozoic

Evidence for the oldest volcanoes in Hong Kong occurs in the Tuen Mun area, where a relatively small volume of volcanic ash and lavas rich in calcium-, sodium-, iron-, and magnesium-aluminosilicate minerals are exposed. Preliminary radiometric dating of these rocks suggests that they are about 180 million years old. They probably represent the remnants of a chain of andesitic stratovolcanoes that developed along the southeastern coast of China after the onset of a convergent margin tectonic setting in the Early to Middle Jurassic Period (200 to 175 million years ago).

As the convergent margin matured, the subduction zone migrated southeastwards, and volcanoes of a slightly different type and composition soon developed. Volcanic ash and lava rich in dominantly silica (quartz), potassium-, sodium- and iron-aluminosilicate minerals were erupted from large caldera-type volcanoes during the major period of volcanic activity that affected Hong Kong between 165 and 140 million years ago. Eruptions occurred in four distinct episodes (Figure 3): 165-160 million years, 148-146 million years, 143-142 million years and 140 millions years, and were accompanied by the intrusion of large granite plutons.

主要火山爆發時段：

一億六千五百萬至一億六千萬年期間

現時我們在新界中部看到的岩石，大部份在首段火山爆發時期形成，這些岩石主要是含有豐富結晶碎屑的火山灰，當中也包括大量的岩石碎片。火山爆發非常猛烈，僅留下極少證據顯示有任何熔岩流。雖然這時期形成的破火山口早已消失，但其大約位置仍可根據火山噴道的物質及相關深成岩的位置推斷。火山噴道的物質及相關的深成岩形成東北向間斷的、環狀構造，它們很可能是原來破火山口型火山的邊界(圖4)。而東北向、平行於當時聚合型板塊邊緣的斷層，則可能控制了破火山口的大小和形狀。

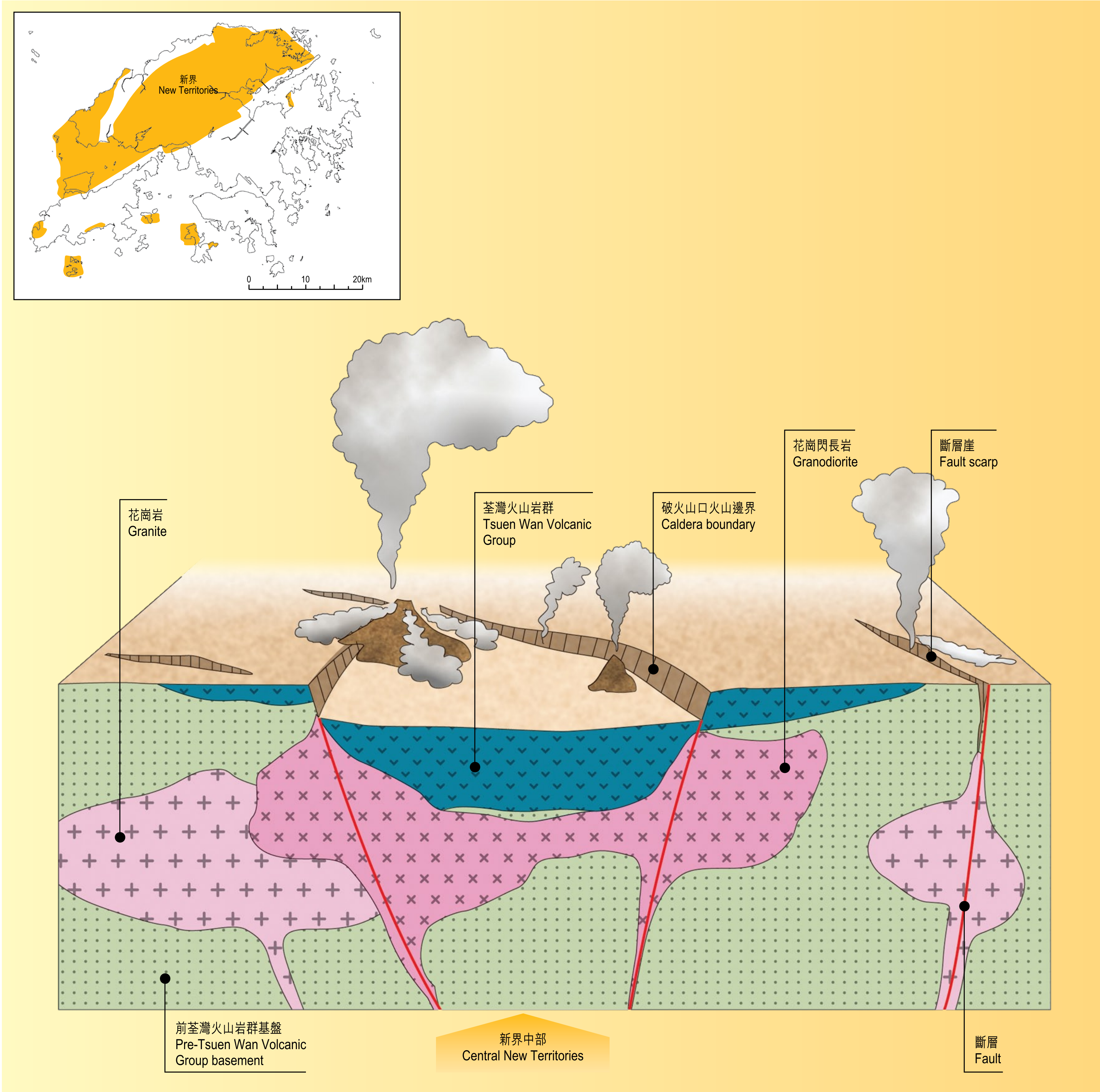

圖4. 一億六千五百萬至一億六千萬年前的破火山口及相關的侵入岩之圖解 (細圖為該火山活動時期形成的火成岩於本港之分佈)。
Figure 4. Schematic representation of caldera development and related subvolcanic intrusions between 165 and 160 million years ago (Insert map indicates the distribution of igneous rocks in Hong Kong associated with this volcanic episode).

Major Volcanic Episodes:

165-160 million years

The first major episode of eruption formed much of the volcanic rock exposed in the central New Territories. These rocks are dominantly crystal-rich ashes containing abundant rock fragments. The volcanic eruptions were very violent, and there is very little evidence of any lava flows. Although the caldera that produced the ash has long since disappeared, its approximate location can be determined from the concentration of volcanic vent-type materials and the associated plutonic rocks. Volcanic vent materials and related plutonic bodies form a discontinuous, northeast-oriented ring-like structure that probably marks the original caldera boundary (Figure 4). Northeast-trending faults, subparallel to the convergent margin, probably controlled the shape and size of the caldera.

一億四千八百萬至一億四千六百萬年期間

聚合型板塊邊緣進一步向東南方移徙，導致火山活動的焦點轉至東南方，並促使西北與東南方的拉張性構造營力增強。一座新的破火山口形成於現時大嶼山中部的位置(圖5)。該火山的岩漿源自地下深處的岩漿庫，岩漿沿岩牆注入。沙田區附近的花崗岩體便是該岩漿庫的殘餘部分，而位於大嶼山西北部、馬灣及青衣一系列東東北及東北向的岩牆，則屬於該火山系統中輸送岩漿的岩脈。該岩牆系統的闊度約達6千米，相等於在火山爆發期間(約一百五十萬年)，西北-東南向地殼拉張的寬度。

與早期的火山活動比較，第二期的火山活動溫度較高、噴出的晶體碎屑數量較少而爆發較強烈。火山灰因溫度極高而熔成一體，形成熔岩流。這個過程稱為熔結，估計是大嶼山一些帶狀火山岩的成因。

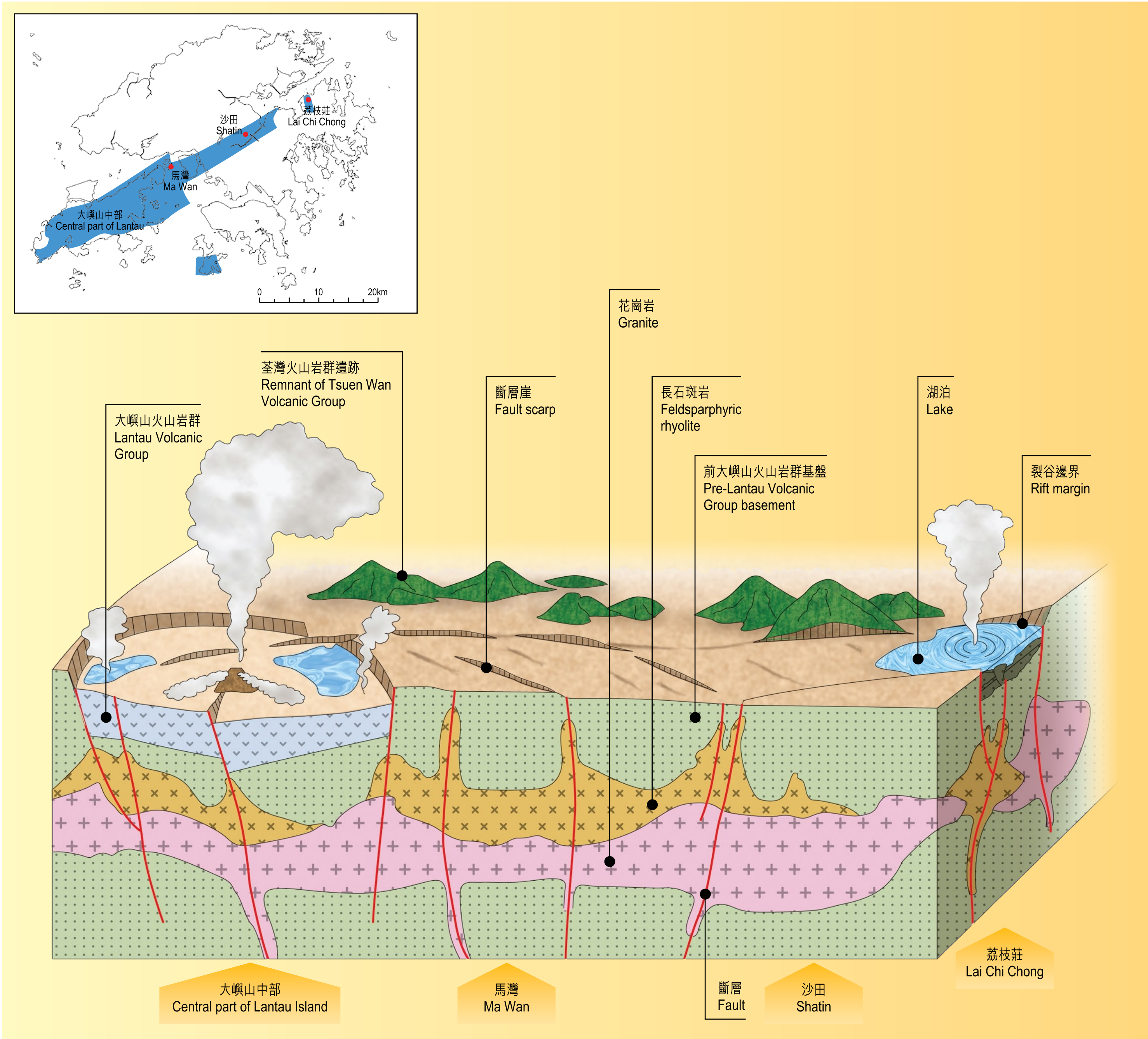

圖5. 一億四千八百萬至一億四千六百萬年前的破火山口及相關的侵入岩之圖解(細圖為該火山活動時期形成的火成岩於本港之分佈)。

Figure 5. Schematic representation of caldera development and related subvolcanic intrusions between 148 and 146 million years ago. (Insert map indicates the distribution of igneous rocks in Hong Kong associated with this volcanic episode).

148-146 million years

Further migration of the convergent margin southeastward led to a shift in focus of volcanism towards the southeast and towards the development of stronger northwest-southeast tensional forces. A major new volcanic caldera developed in the area that is now the central part of Lantau Island (Figure 5). This caldera was fed from a deep magma chamber, with the magma injected along dykes. A granite body in the vicinity of Sha Tin represents the remnants of the magma chamber, while numerous east-northeast and northeast-trending dykes on northeast Lantau Island, Ma Wan and Tsing Yi represent the feeder dyke plumbing system of the volcano. Measurement of the width of the dyke complex suggests that approximately 6km of northwest-southeast crustal extension took place over about 1.5 million years.

Compared with the earlier volcanic episode, the volcanic activity appears to have been hotter, less crystal-rich, and more violent. In places, the volcanic ash was so hot that it fused together to form lava. This process, called welding, is thought to be the origin of some of the banded volcanic rocks on Lantau Island.

一億四千三百萬至一億四千二百萬年期間

隨著聚合型板塊邊緣持續移向東南方，中生代火山活動的規模和強度亦繼續增加。香港的第三段主要火山活動時期尤其複雜，出現至少兩座破火山口，噴出稍稍不同成份的火山物質。證據顯示，其中一座以香港島為中心的破火山口，爆發時噴出非常少量含晶體碎屑的火山灰。而位於西貢區和大灘海的另一破火山口，爆發時噴出的火山灰則含有大量的晶體碎屑(圖6)。該兩座火山可能於同一時期同時爆發，並釋放出少量的熔岩。隨著每次火山爆發，溫度逐步提高，威力增強，達至最終一次毀滅性的強烈爆發導致兩座破火山口倒塌。現在，這兩座破火山口的邊界，透過間斷而呈岩牆狀的侵入岩顯示出來。

一億四千萬年前

香港的第四期(即最後一段)主要火山活動時期，開展於西貢糧船灣海位置。破火山口在該處形成，岩漿從破火山口北邊和南邊的東北向裂縫噴出(圖7)。噴發主要為一層一層厚厚的、含少量晶體碎屑的火山灰，局部地方可見火山灰受熱力熔結，證實當時爆發非常熾熱。隨著聚合型板塊邊緣繼續向東南方移徙，香港的板塊構造環境發展為強烈的弧後型擴張。最終的火山活動是一次極強烈的爆發，導致破火山口倒塌，大量火山灰於倒塌的火山口積存，最少達400米厚。火山灰逐漸冷卻，形成位於萬宜水庫東壩所見，壯觀的六角形柱狀岩石。這場災難性的爆發，便是香港地區於中生代火山活動的最後記錄。

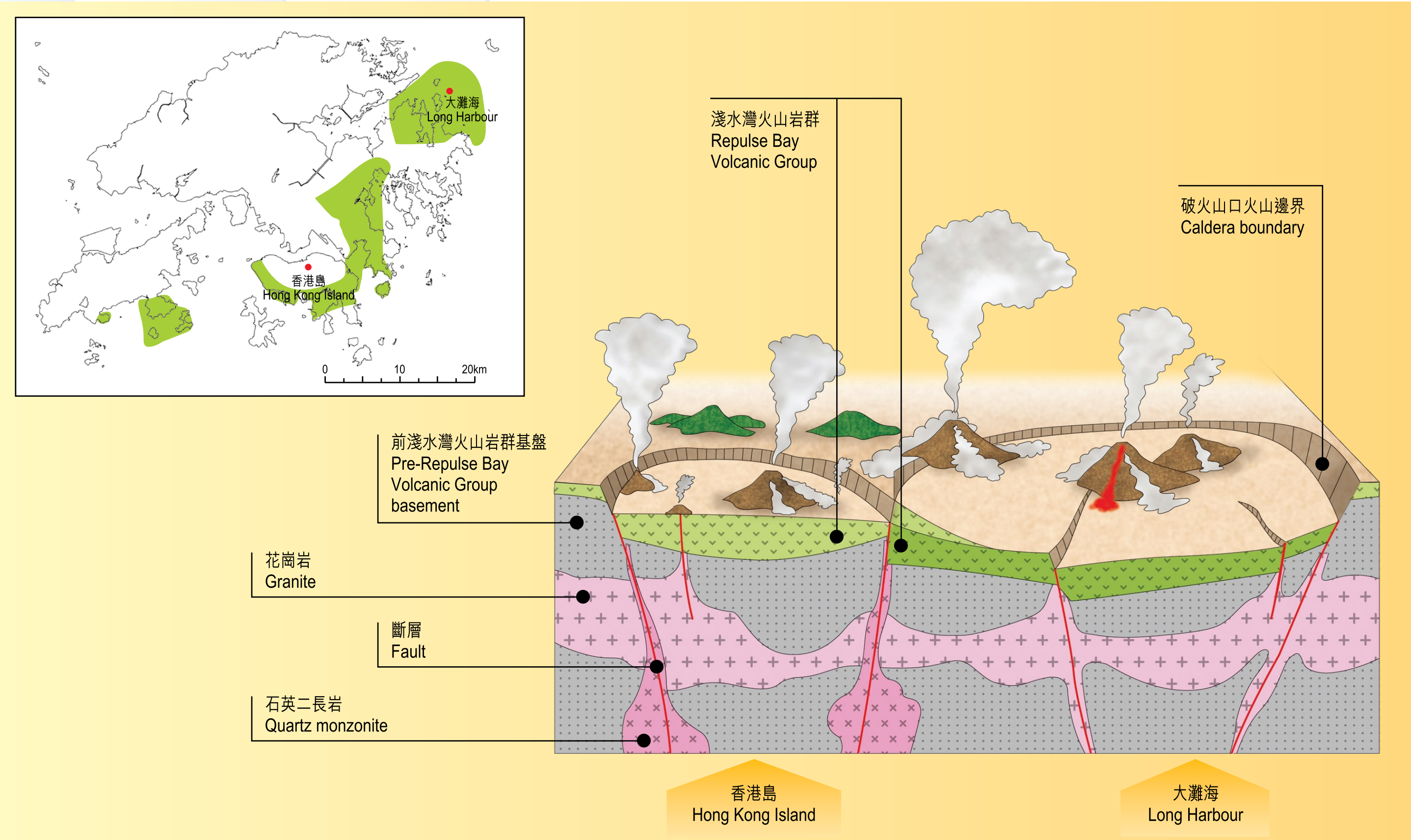

圖6. 一億四千三百萬至一億四千二百萬年前的破火山口及相關的侵入岩之圖解 (細圖為該火山活動時期形成的火成岩於本港之分佈)。
Figure 6. Schematic representation of caldera development and related subvolcanic intrusions between 143 and 142 million years ago (Insert map indicates the distribution of igneous rocks in Hong Kong associated with this volcanic episode).

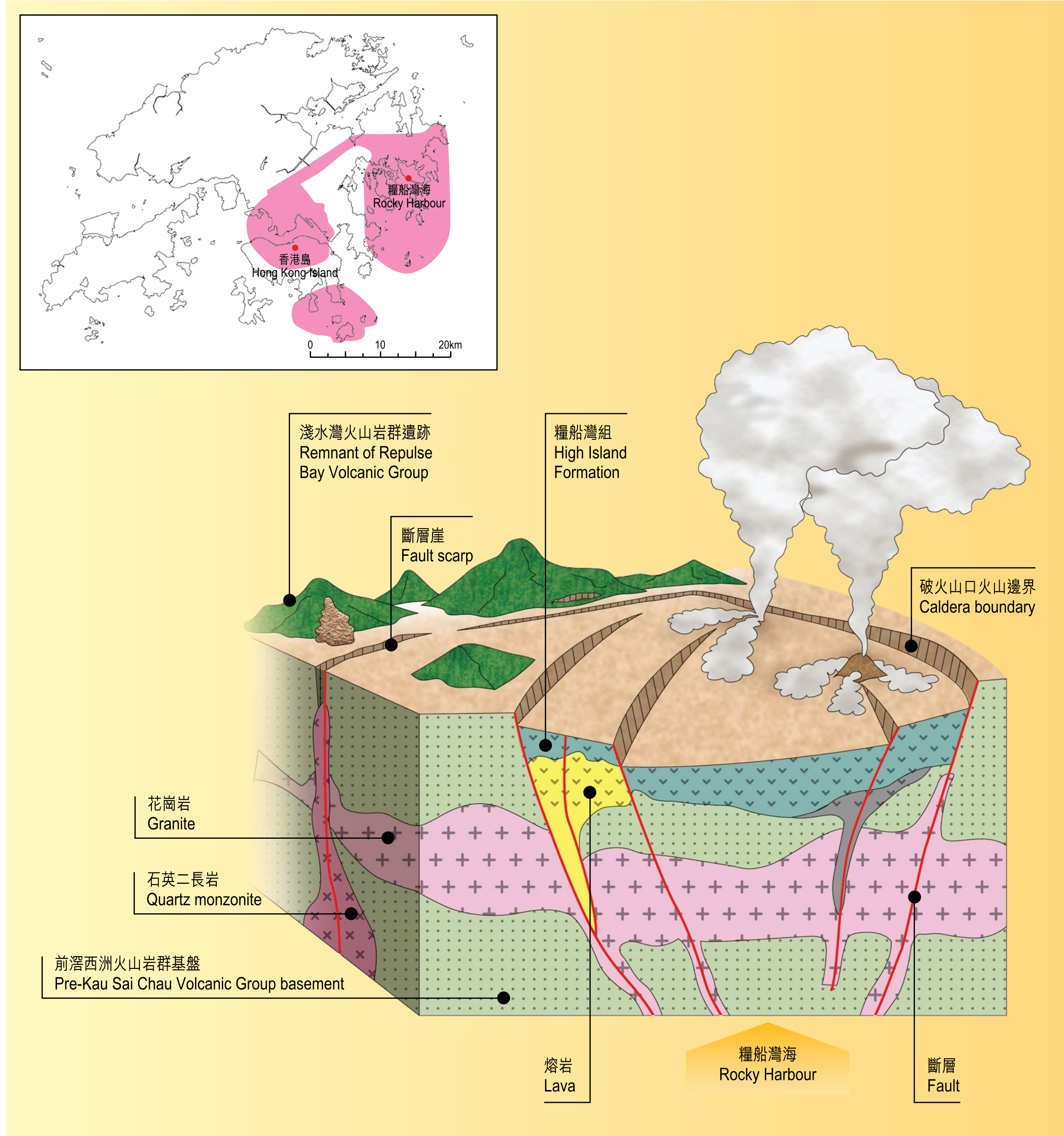

圖7. 一億四千萬年前的破火山口及相關的侵入岩之圖解 (細圖為該火山活動時期形成的火成岩於本港之分佈)。
Figure 7. Schematic representation of caldera development and related subvolcanic intrusions 140 million years ago (Insert map indicates the distribution of igneous rocks in Hong Kong associated with this volcanic episode).

143-142 million years

The scale and intensity of Mesozoic volcanic activity continued to increase as the convergent margin migrated southeastwards. The third major episode of volcanic activity in the Hong Kong region is particularly complex, with the formation of at least two calderas that each erupted volcanic materials of slightly different compositions. Evidence suggests that one caldera, centred on Hong Kong Island, erupted volcanic ash with very little crystal content, while the other caldera, centred in the area of Sai Kung and Long Harbour, erupted volcanic ash with abundant crystal content (Figure 6). The two volcanoes probably erupted simultaneously for a period. Very little lava appears to have been erupted from either volcano. Over time, the volcanic eruptions became hotter and increasingly more violent. Both volcanoes probably culminated in caldera collapse following a catastrophic eruption. Today, the caldera margins are marked by discontinuous dyke-like intrusions of plutonic rock.

香港的斷層

香港的主要斷層多屬東北-西南向，以及西北-東南向(圖8)，一般與鄰近廣東省的斷層方向相同。

個別斷層可長達60千米，大部分的斷層僅數米闊，但亦有部分斷層可覆蓋近1千米寬的地段。

香港附近並沒有已知的活動斷層。

雖然香港位於中度地震帶，但有史以來並沒有感受到重大的地震。過去的地震活動大多因歐亞板塊和菲律賓板塊間的相互作用產生。

距香港最近而記錄中強度最高的地震是於1991年發生，位於香港以東85千米外的紅海灣，震級高達6.0級。

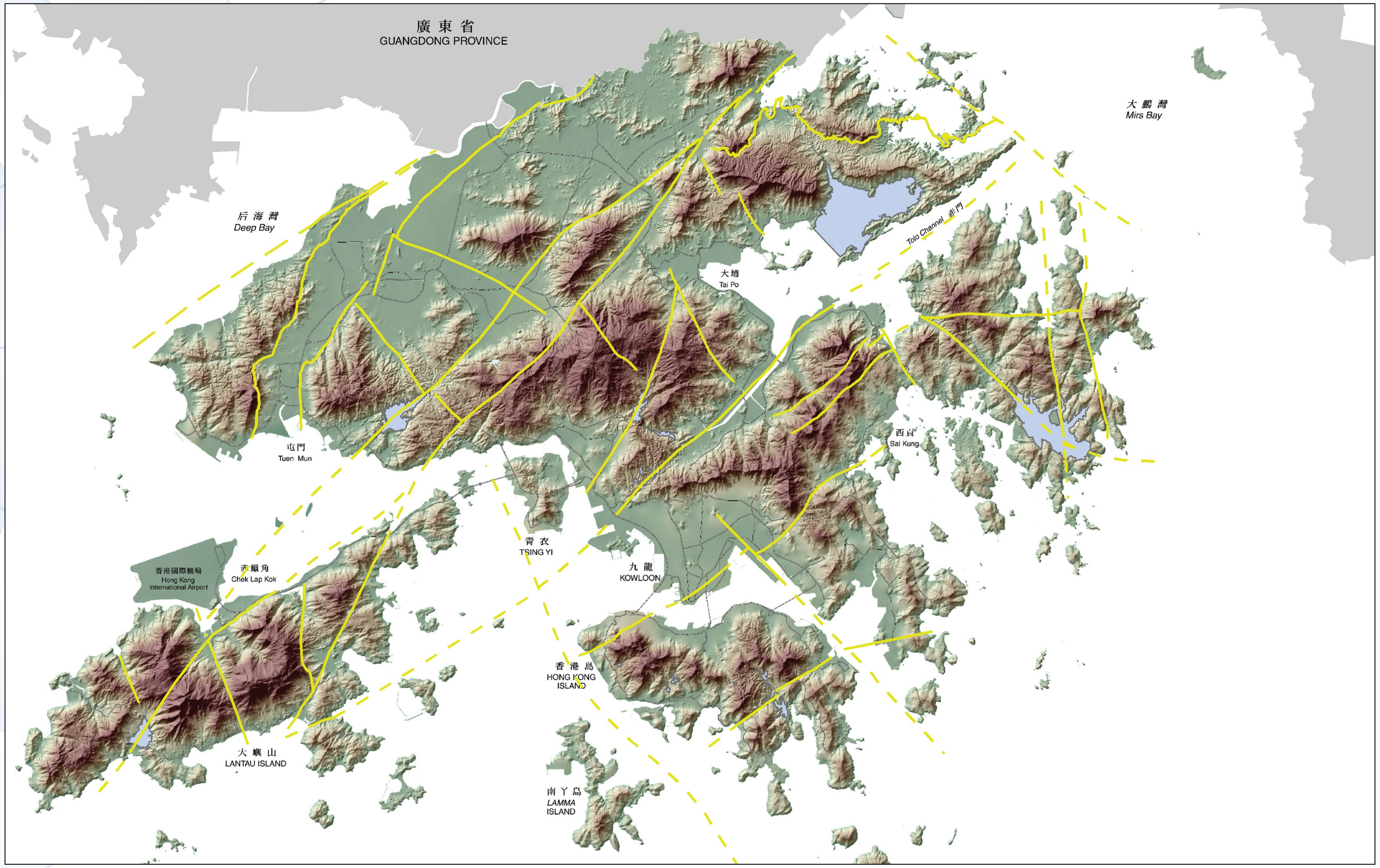

圖8. 香港主要斷層。
Figure 8. Major faults of Hong Kong.

140 million years

The fourth and final episode of volcanic activity in Hong Kong is marked by the development of a large caldera volcano centred in the Rocky Harbour area, which was fed from northeast-trending fissure dykes along its northern and southern margins (Figure 7). Eruptions were dominated by large volumes of crystal-poor volcanic ash that accumulated as thick layers, which are, in places, strongly fused together. Fusing indicates that the eruptions were extremely hot. The tectonic setting of Hong Kong appears to have been strongly back-arc extensional as the convergent margin continued to shift farther southeastwards. The final volcanic episode culminated with one extremely explosive eruption associated with caldera collapse. Following the caldera collapse, an enormous volume of ash, with a minimum thickness of 400 metres, accumulated in the volcanic depression. The ash slowly cooled to form the spectacular six-sided columns of rock seen at the East Dam of High Island Reservoir. This cataclysmic eruption marked the end of Mesozoic volcanism as recorded in the Hong Kong region.

Faults in Hong Kong

The main faults in Hong Kong are oriented northeast-southwest, and northwest-southeast (Figure 8). They are generally of the same orientation as those in neighbouring Guangdong Province.

Individual faults can be traced over distances of up to 60 kilometres. Some faults are associated with zones up to 1 kilometre wide, although most faults appear to be only a few metres wide.

There are no known active faults in Hong Kong.

Although Hong Kong is considered to lie in a region of moderate seismicity, it has not experienced a major earthquake during the historical period. Seismic activity in the region is generated mainly by the interaction between the Eurasian and Philippine plates.

The largest recorded earthquake close to Hong Kong was a magnitude 6.0 event in Honghai Bay, 85km east of Hong Kong, in 1991.

首刊，2008年

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First Published, 2008

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