

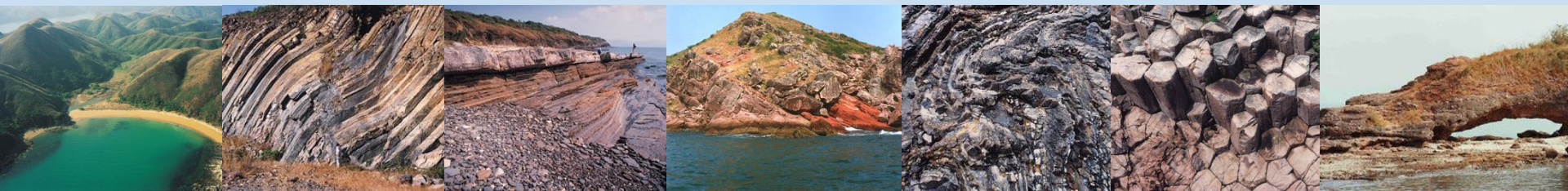
# 香港地質 GEOLOGY OF HONG KONG

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# 內容

## Contents

- Fundamentals

基礎

- Major rock types in Hong Kong

香港主要的岩石種類

- Geological history of Hong Kong

香港的地質歷史

# Geology 地質學

Physical Geology

普通地質學

Natural History

自然歷史

Applied Science

應用科學

Mineralogy  
礦物學

Petrology  
岩石學

Structural geology  
構造地質學

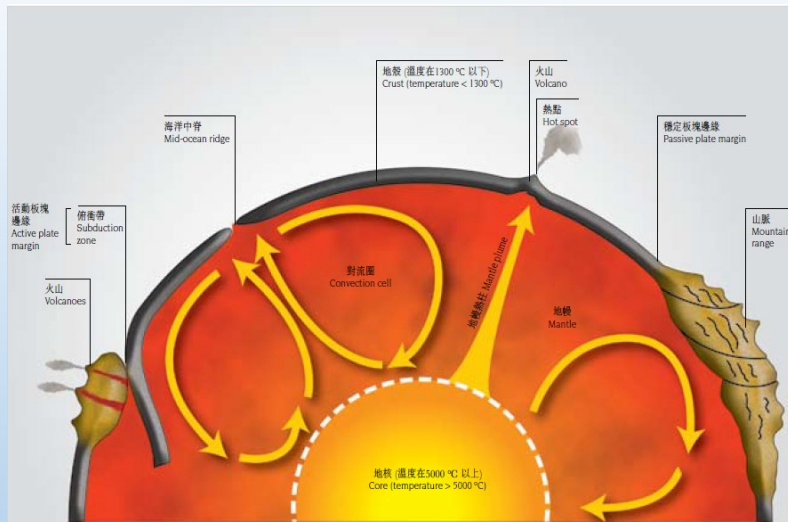
Palaeontology  
古生物學

Stratigraphy  
地層學

Engineering geology  
工程地質學

Economic geology  
經濟地質學

Hydrogeology  
水文地質學



# 岩石與礦物 Rocks & Minerals

鹼性長石  
Alkali Feldspar



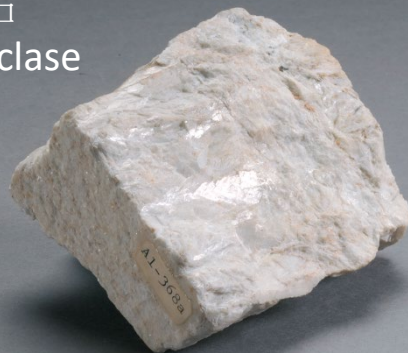
石英  
Quartz



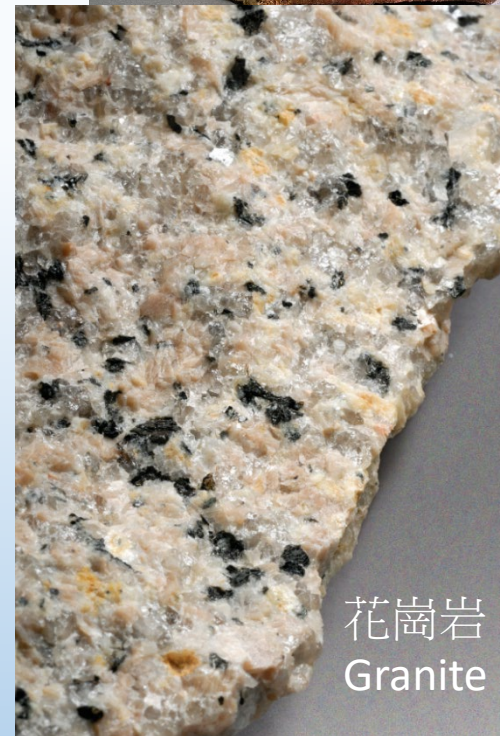
雲母  
Mica



斜長石  
Plagioclase



變質粉砂岩  
Metasiltstone

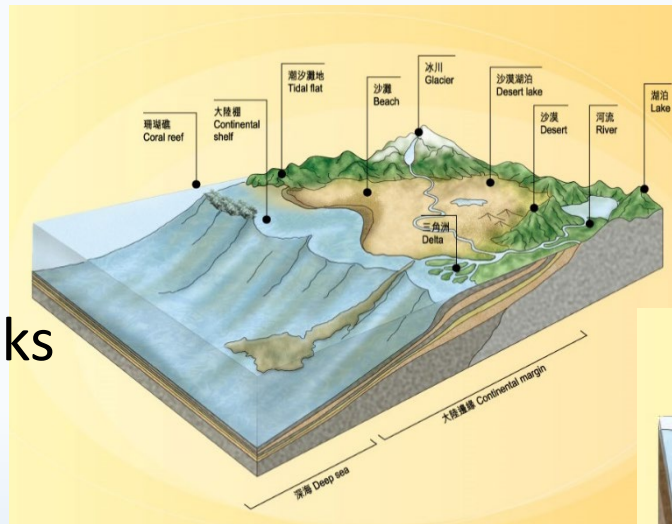


花崗岩  
Granite

# 岩石種類

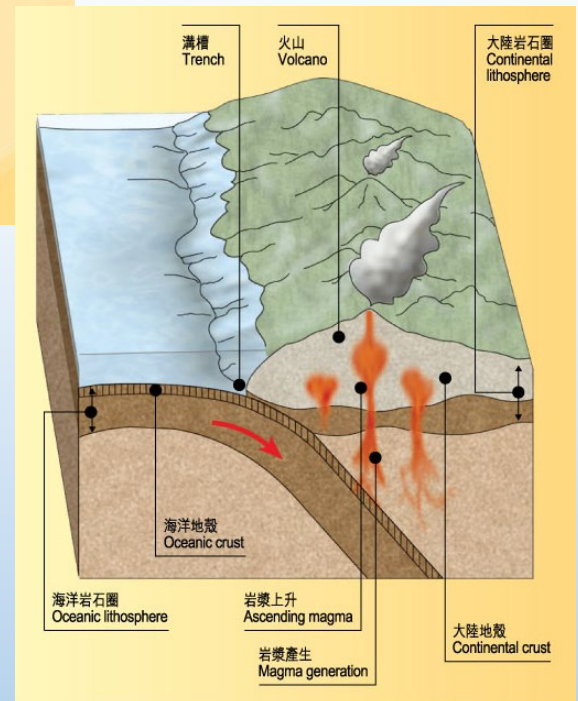
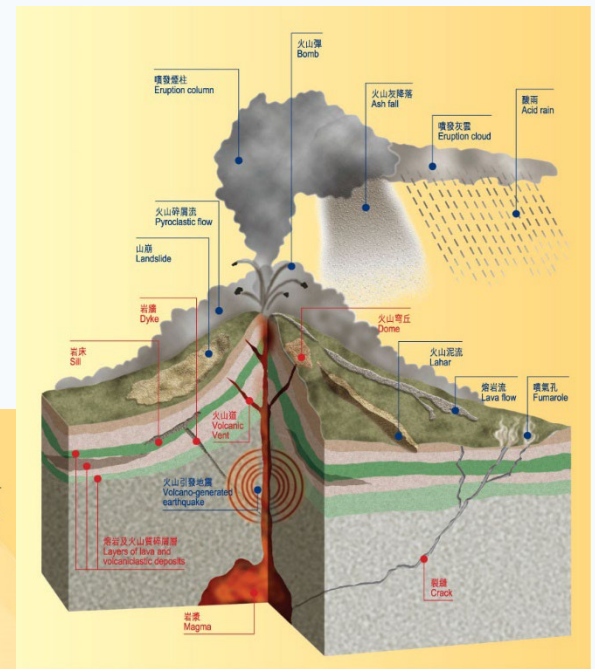
## Types of Rocks

- Igneous Rocks  
火成岩



- Sedimentary Rocks  
沉積岩

- Metamorphic Rocks  
變質岩



# 岩石循環 Rock Cycle



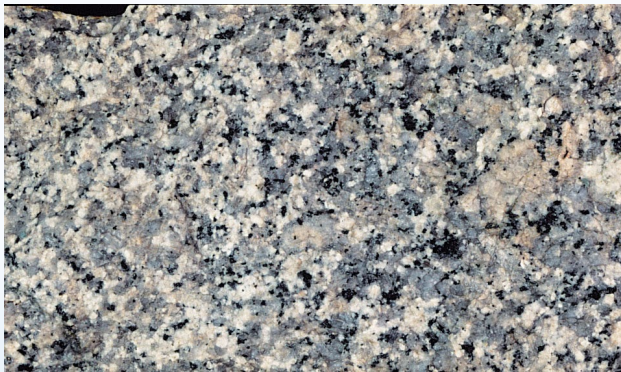
# 火成岩 Igneous Rocks



- Formed from cooling of magma
- Subdivided into “intrusive” and “extrusive” rocks

## Intrusive igneous rocks 侵入岩

- Underground magma intruding within the country rocks
- Coarse-grained texture with interlocking minerals
- e.g. granite, quartz monzonite



## Extrusive igneous rocks 噴出岩

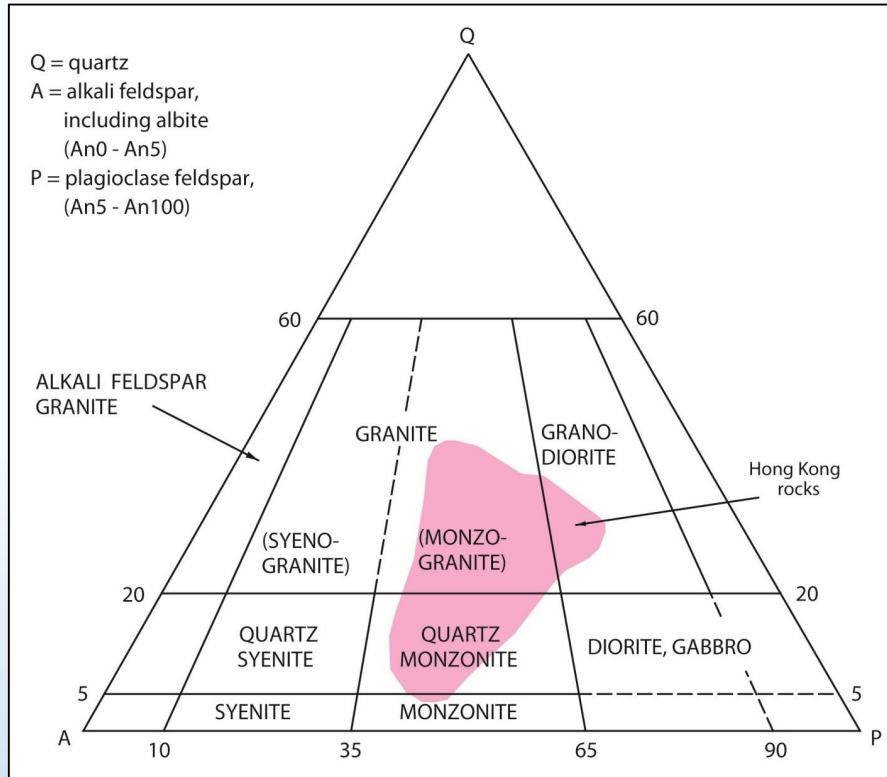
- Magma extruding above the ground surface
- Fine-grained texture
- e.g. lava, tuff



# 火成岩 Igneous Rocks

## Intrusive igneous rocks 侵入岩

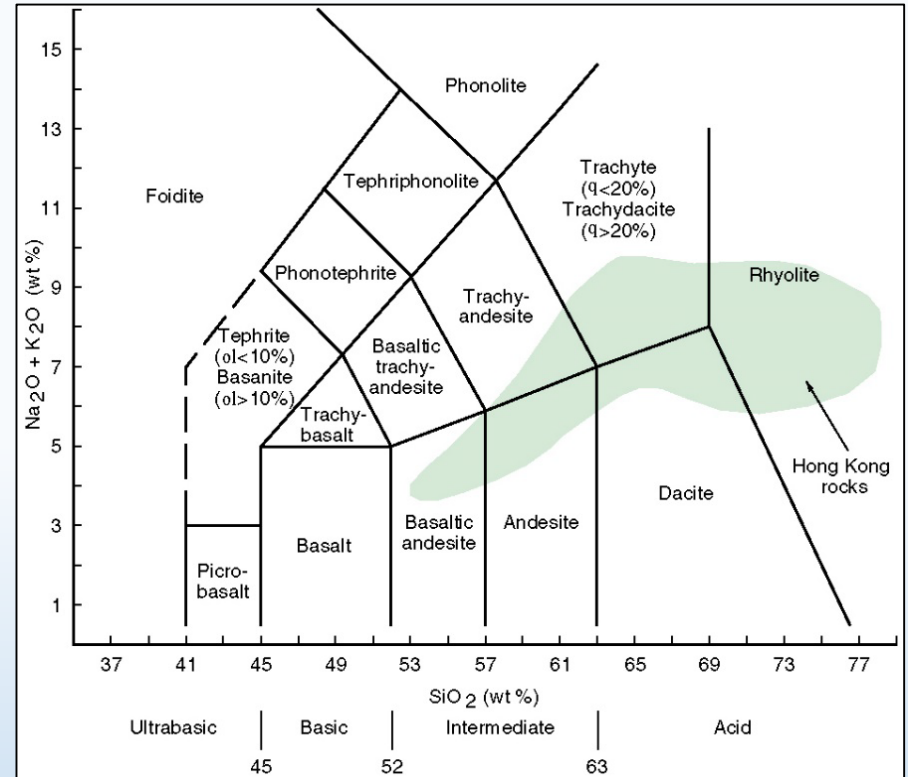
QAP Diagram



Granite - 花崗岩  
 Granodiorite - 花崗閃長岩  
 Quartz Monzonite - 石英二長岩

## Extrusive igneous rocks 噴出岩

TAS Diagram



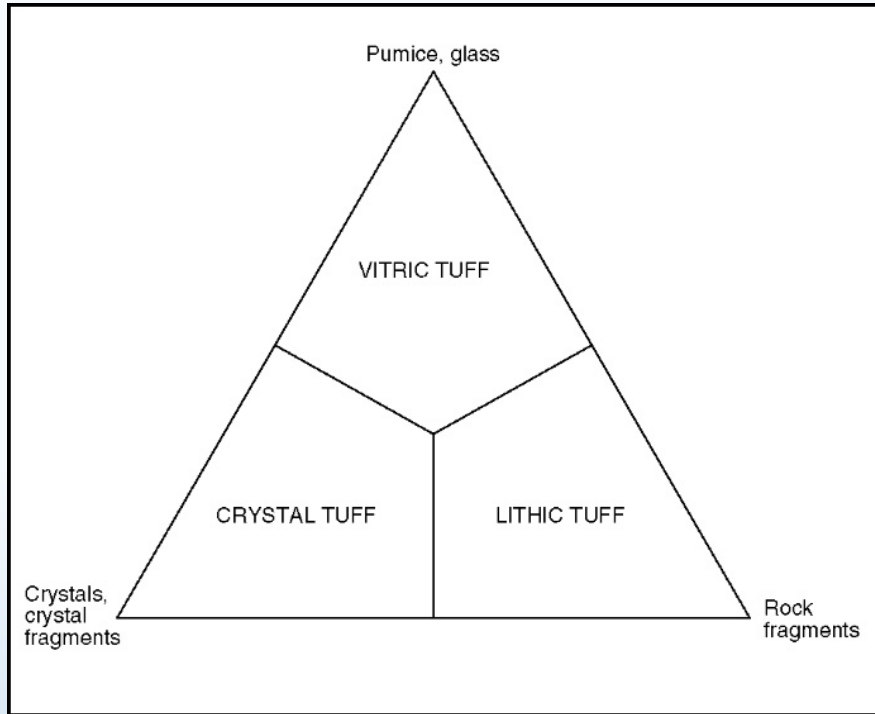
Rhyolite - 流紋岩      Trachyte - 粗面岩  
 Dacite - 英安岩      Basalt - 玄武岩  
 Andesite - 安山岩



# 火成岩 Igneous Rocks

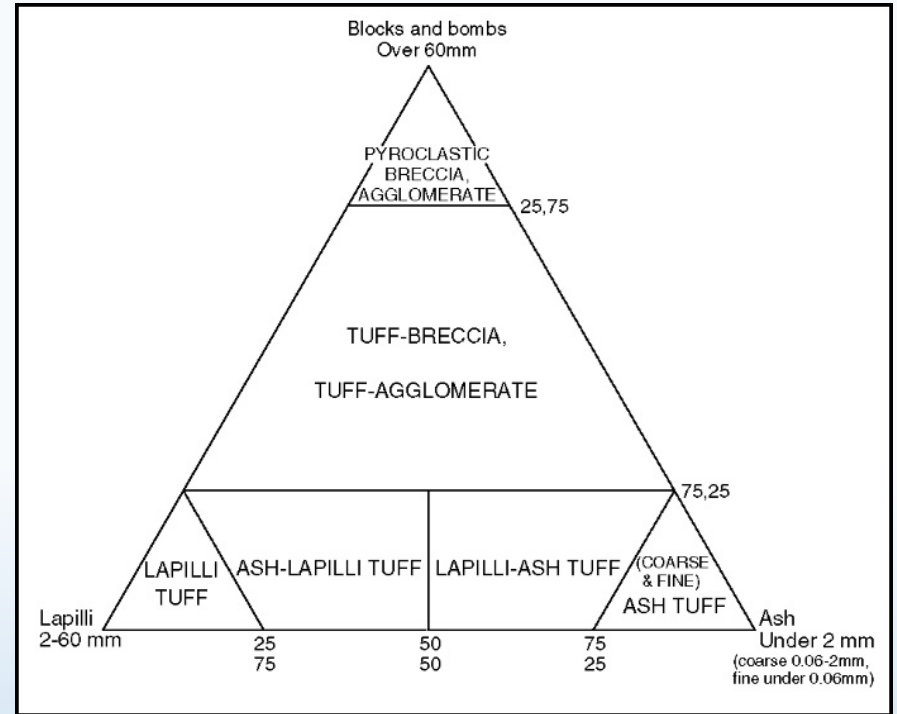
## Pyroclastic Rocks 火山碎屑岩

Classification by composition



Vitric tuff - 玻屑凝灰岩  
Crystal tuff - 晶屑凝灰岩  
Lithic tuff - 岩屑凝灰岩

Classification by clast size



Fine ash tuff - 細火山灰凝灰岩  
Coarse ash tuff - 粗火山灰凝灰岩  
Lapilli tuff - 火山礫凝灰岩  
Tuff breccia - 角礫凝灰岩  
Pyroclastic breccia - 火山碎屑角礫岩

# 沉積岩 Sedimentary Rocks

Superficial Deposits*		Grain Size (mm)	Sedimentary Rocks	
			Detrital Rocks	Chemical & Biochemical Rocks
Boulders		200	Conglomerate / Sedimentary Breccia	Limestone and Dolomite, Evaporites
Gravel	Coarse	60		
	Medium	20		
	Fine	6		
Sand	Coarse	2	Sandstone	
	Medium	0.6		
	Fine	0.2		
Silt		0.06	Siltstone	
Clay		0.002	Claystone	Chert



- Conglomerate - 礫岩
- Breccia - 角礫岩
- Sandstone - 砂岩
- Mudstone - 泥岩



# 變質岩 Metamorphic Rocks

片理化變質岩

Foliated metamorphic rocks

Slate - 板岩

Phyllite - 千枚岩

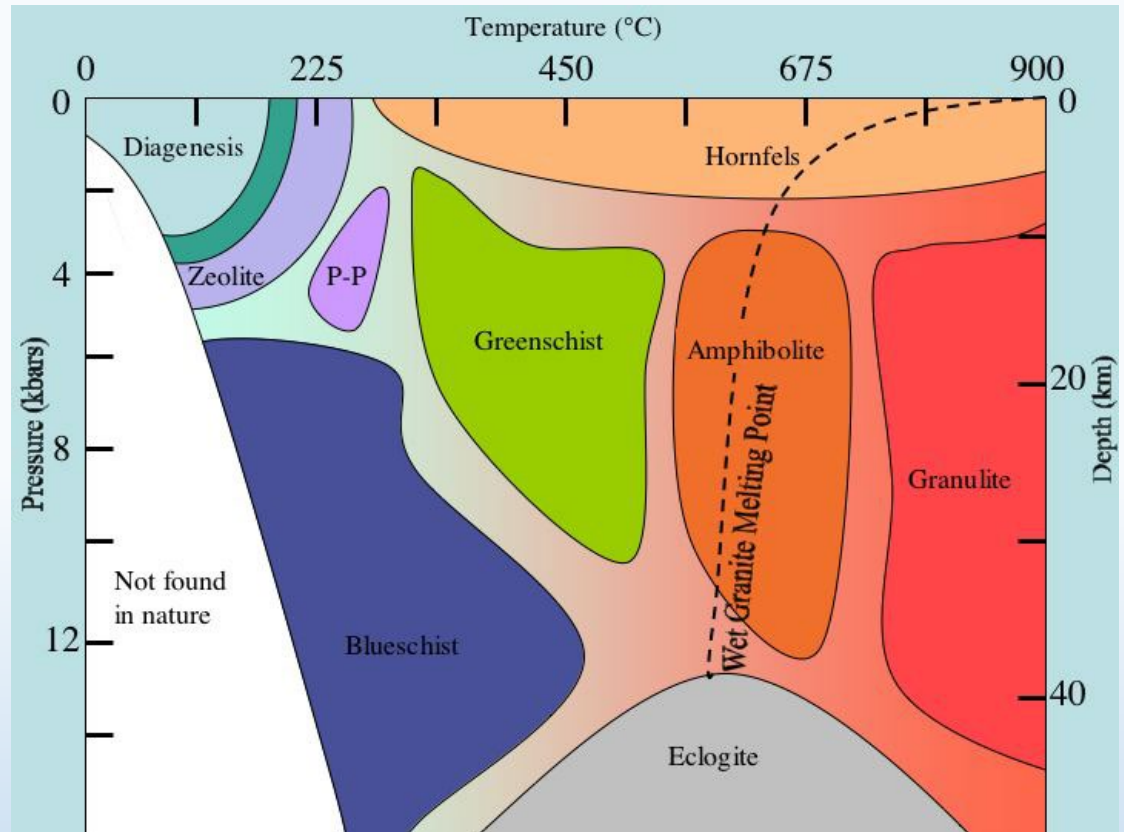
Schist - 片岩

Quartzite - 石英岩

Marble - 大理石

非片理化變質岩

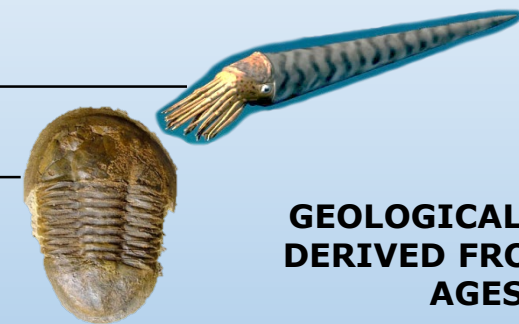
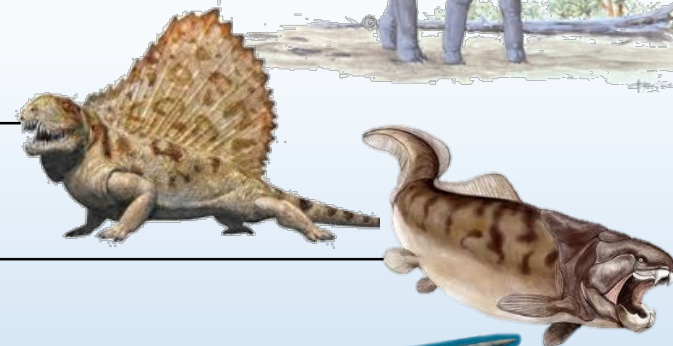
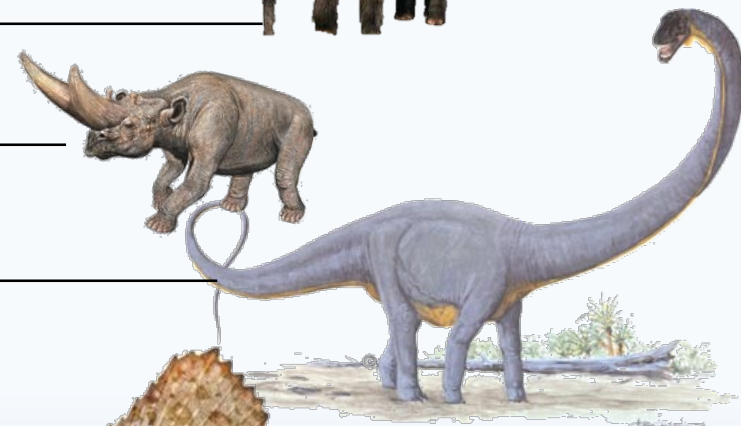
Non-foliated metamorphic rocks



# 地質年代

## Geological Time

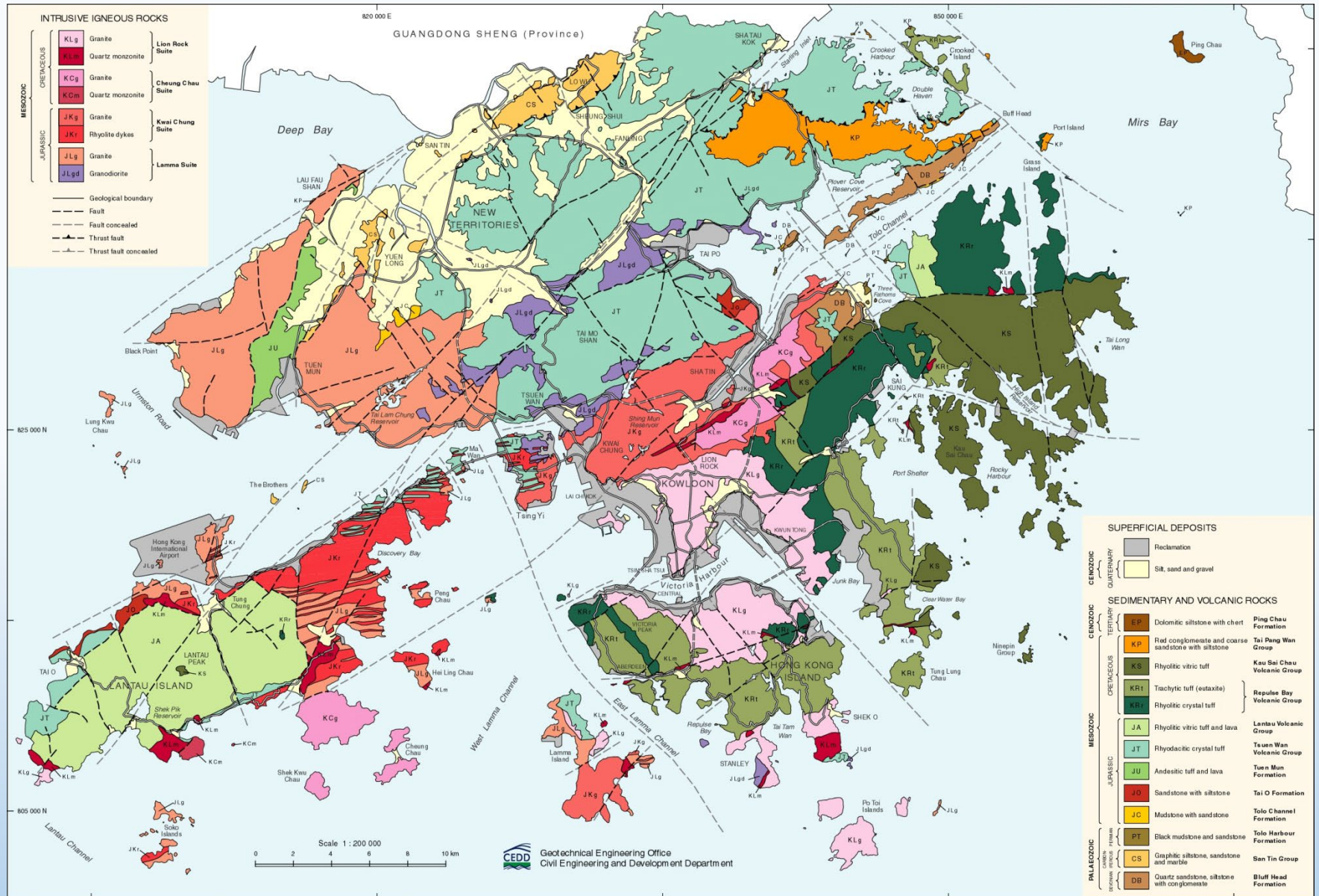
ERA 代	PERIOD 時期
新生代 <b>CENOZOIC</b> 66	<b>QUATERNARY 第四紀</b>
	<b>NEOGENE 新近紀</b>
	<b>PALAEOGENE 古近紀</b>
中生代 <b>MESOZOIC</b> 252	<b>CRETACEOUS 白堊紀</b>
	<b>JURASSIC 侏羅紀</b>
	<b>TRIASSIC 三疊紀</b>
古生代 <b>PALAEOZOIC</b> 541	<b>PERMIAN 二疊紀</b>
	<b>CARBONIFEROUS 石炭紀</b>
	<b>DEVONIAN 泥盆紀</b>
	<b>SILURIAN 志留紀</b>
	<b>ORDOVICIAN 奧陶紀</b>
<b>Ma</b>	<b>CAMBRIAN 寒武紀</b>
	<b>PRECAMBRIAN 前寒武紀</b>



**GEOLOGICAL TIME SCALE  
 DERIVED FROM RELATIVE  
 AGES OF FOSSILS**

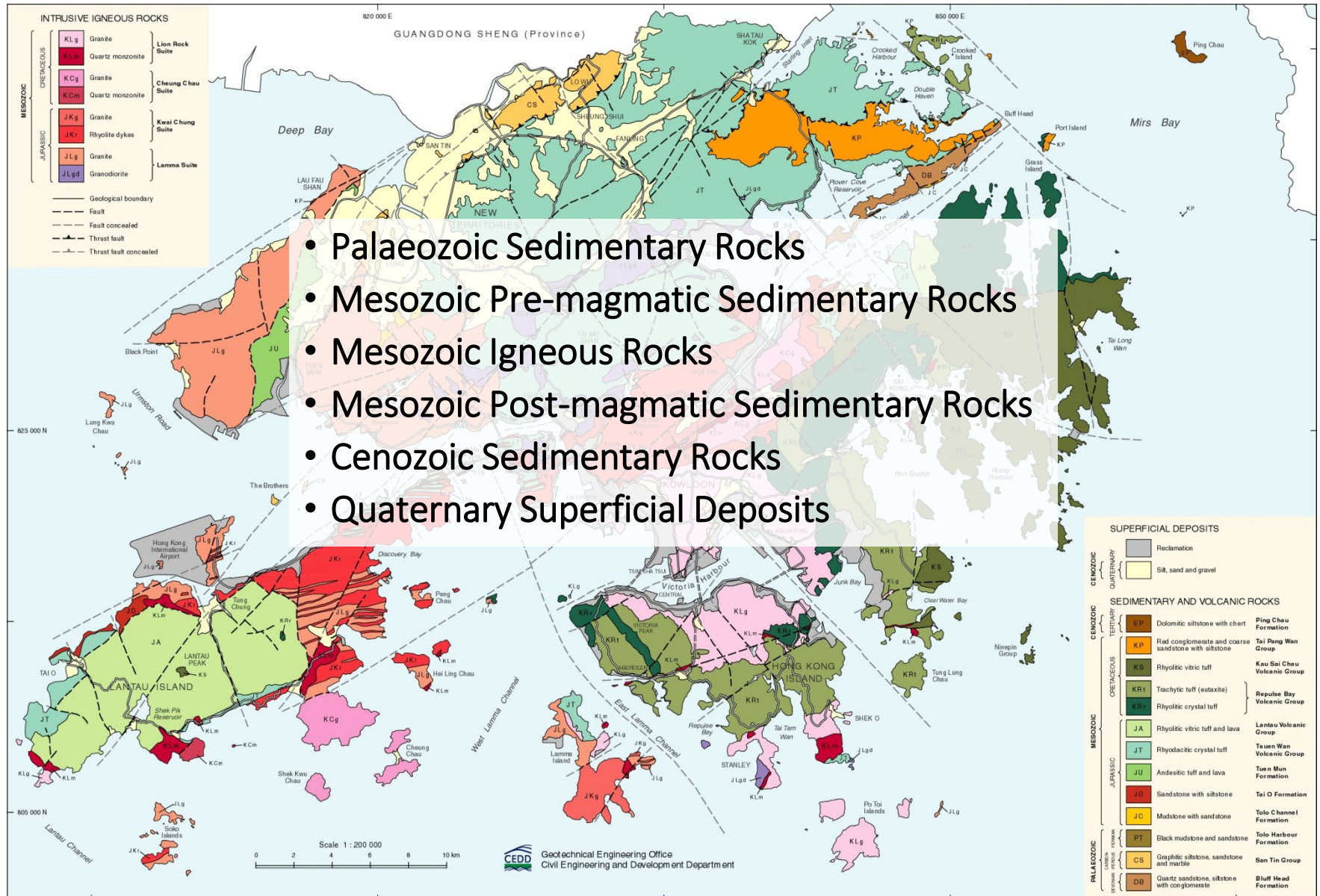
# Geological Map of Hong Kong

## 香港地質圖

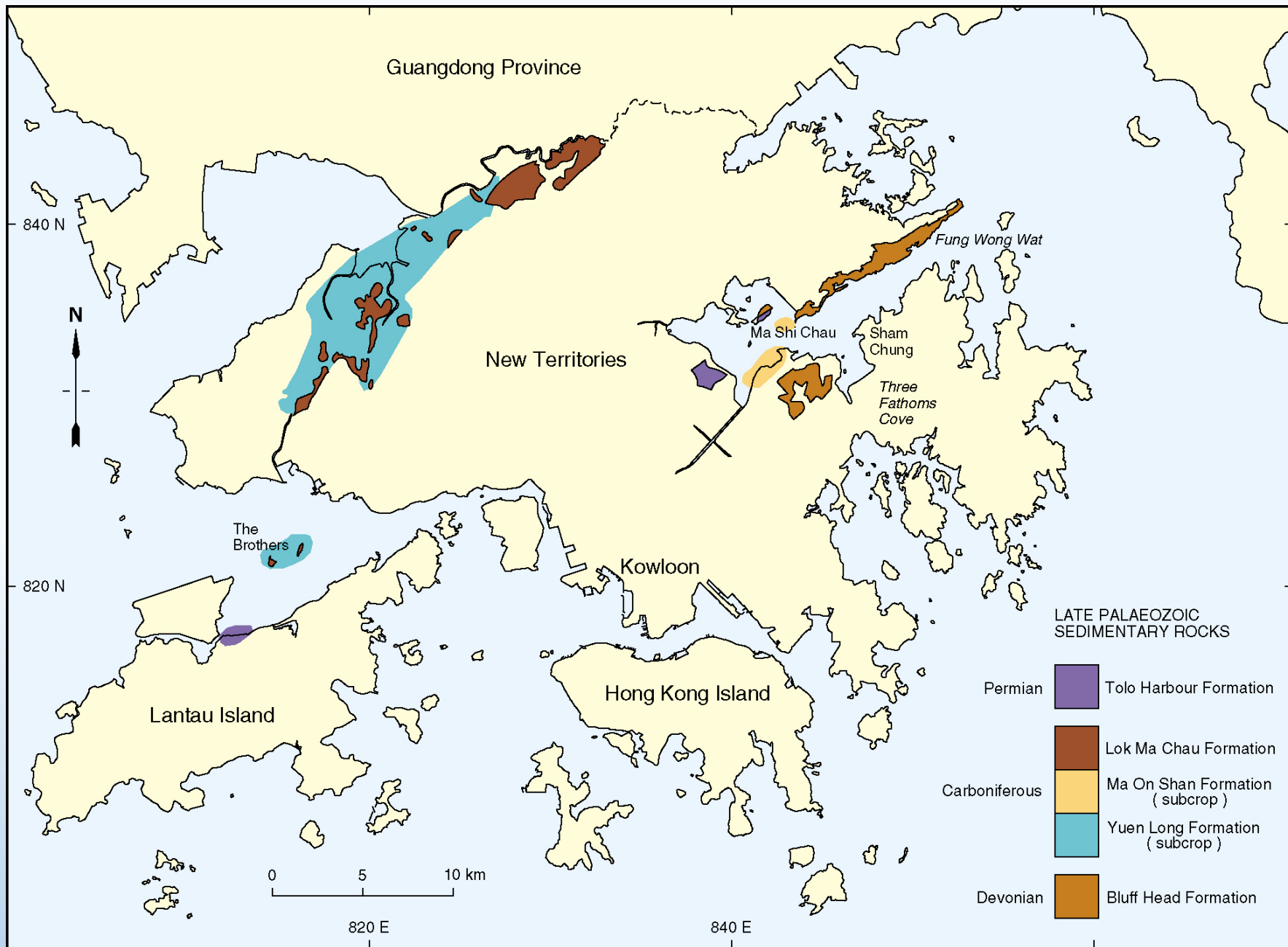


# Geological Map of Hong Kong

## 香港地質圖

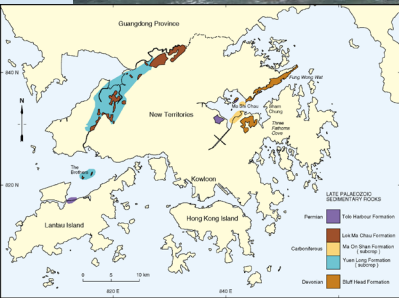


# 古生代岩石分布 Distribution of Palaeozoic Rocks



# 黃竹角嘴組

## Bluff Head Formation

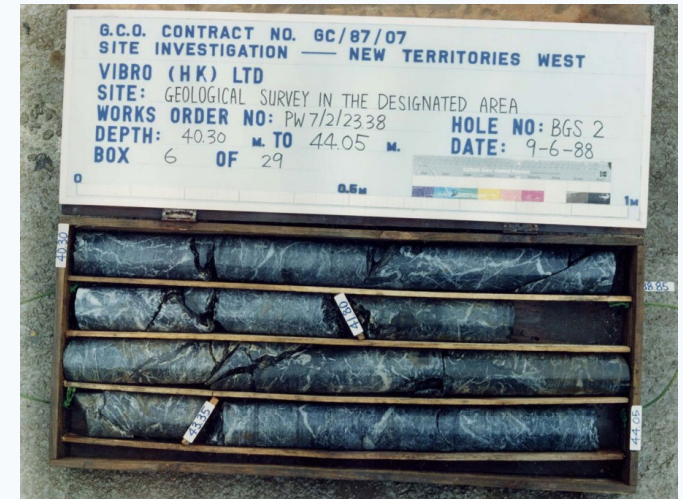
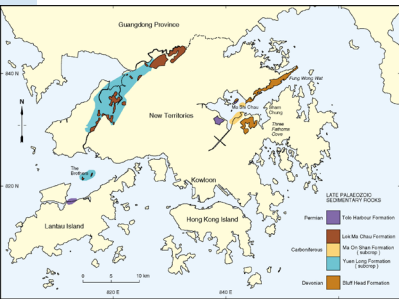
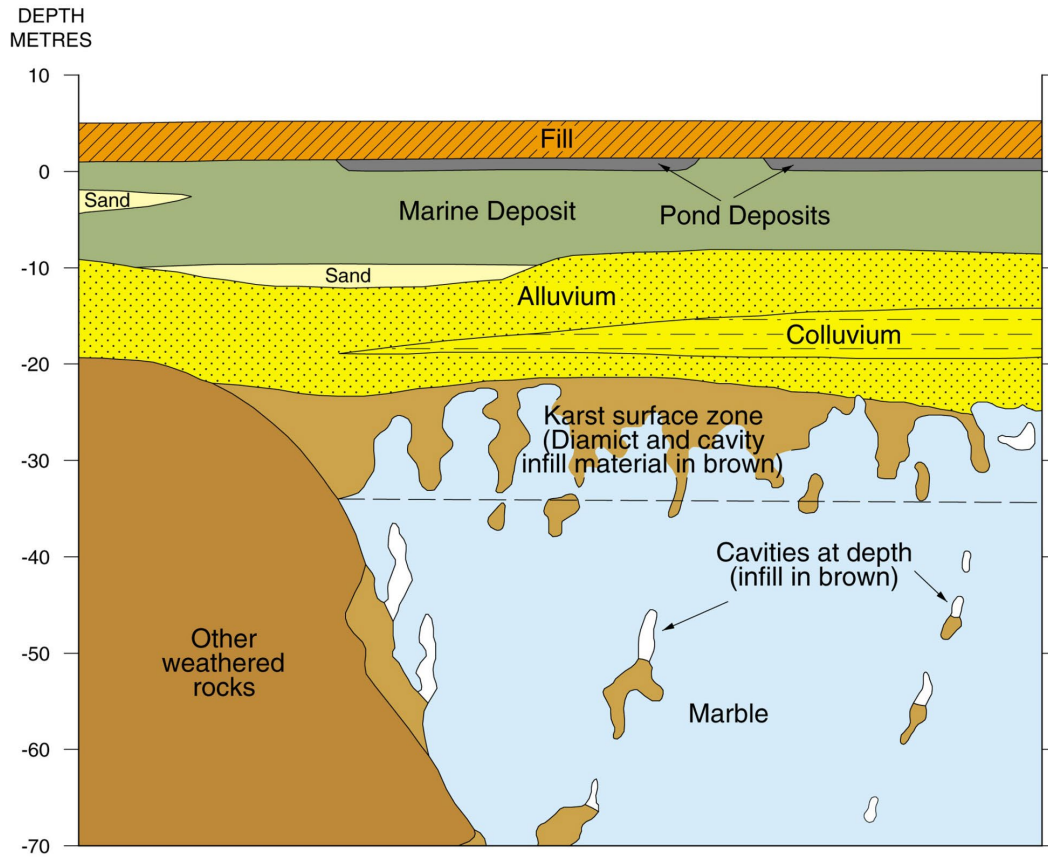


Placoderm Plate



# 元朗組

## Yuen Long Formation



Long Ping Member: Impure Marble



Ma Tin Member: Pure White Marble

# 落馬洲組

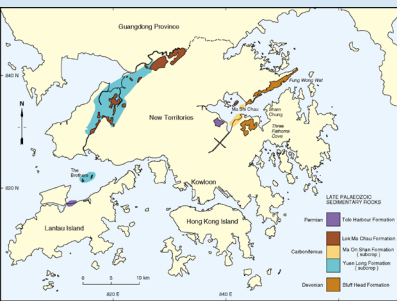
## Lok Ma Chau Formation



Mai Po Member: Graphite 'Schist'



Tai Shek Mo Member: Metasilstone

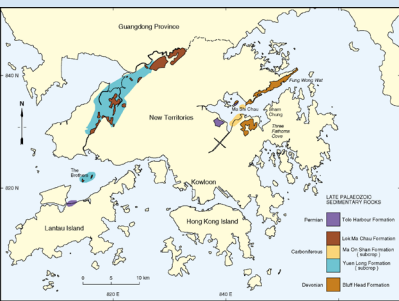


# 大埔海組

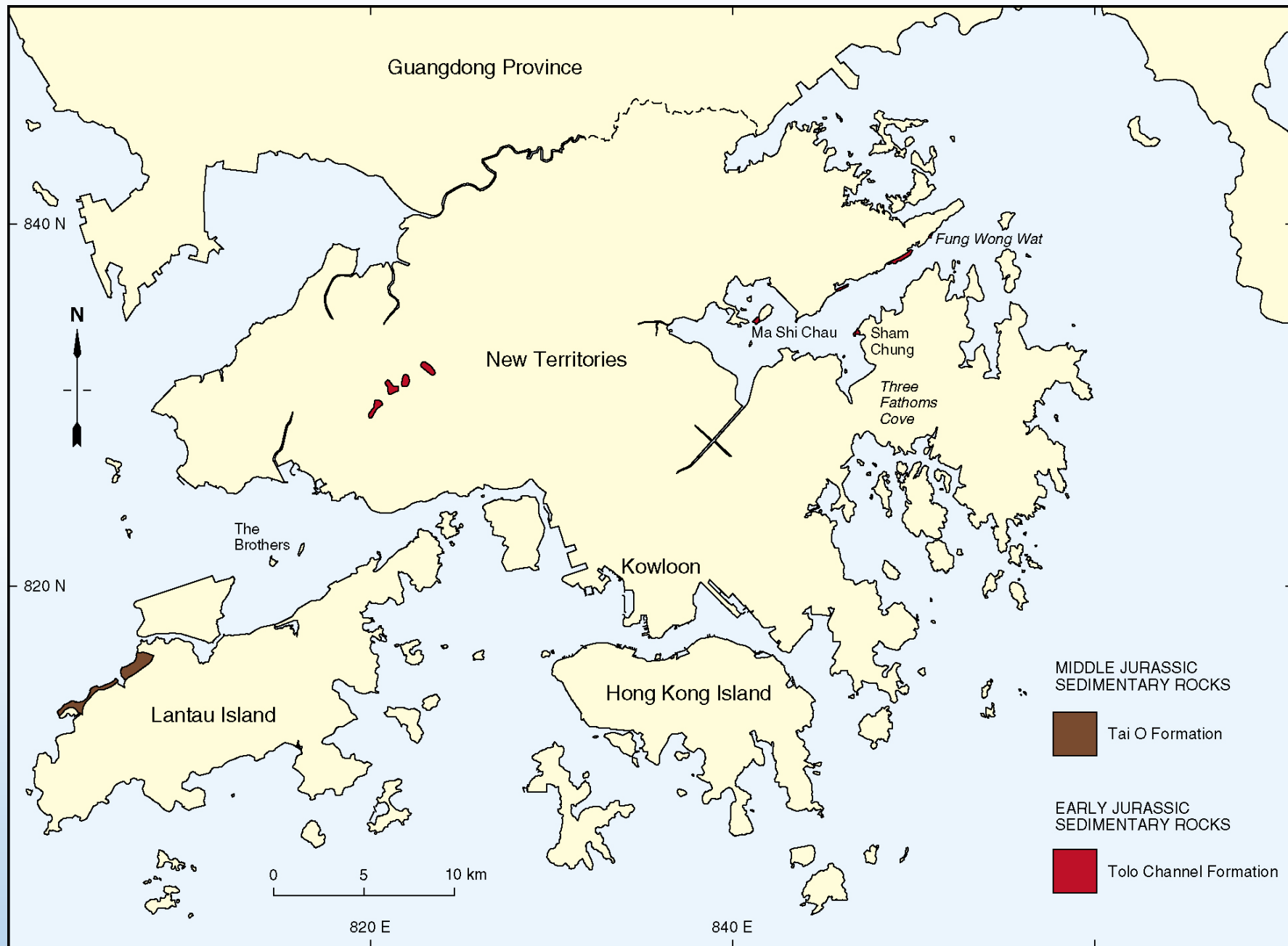
## Tolo Harbour Formation



Coral Fossil

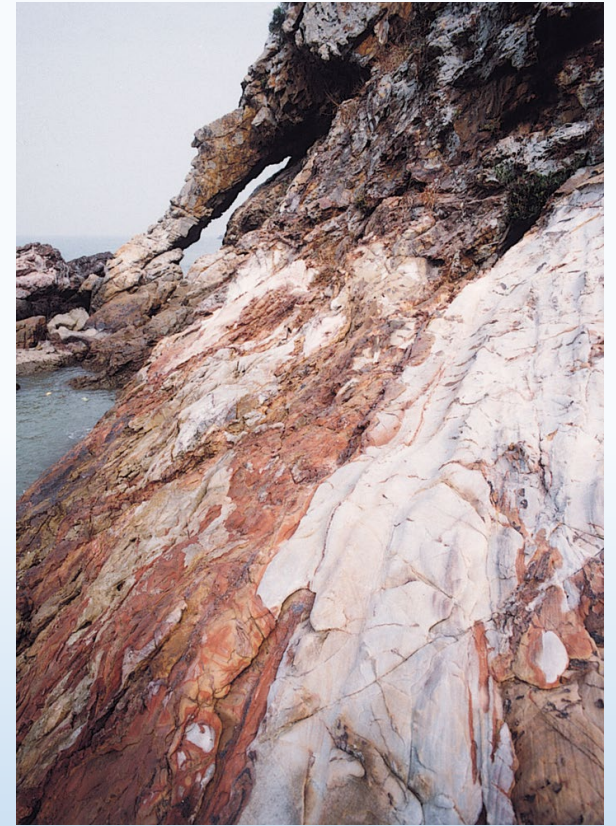


# 早中生代沉積岩分布 Distribution of Early Mesozoic Sedimentary Rocks



# 赤門海峽組 & 大澳組

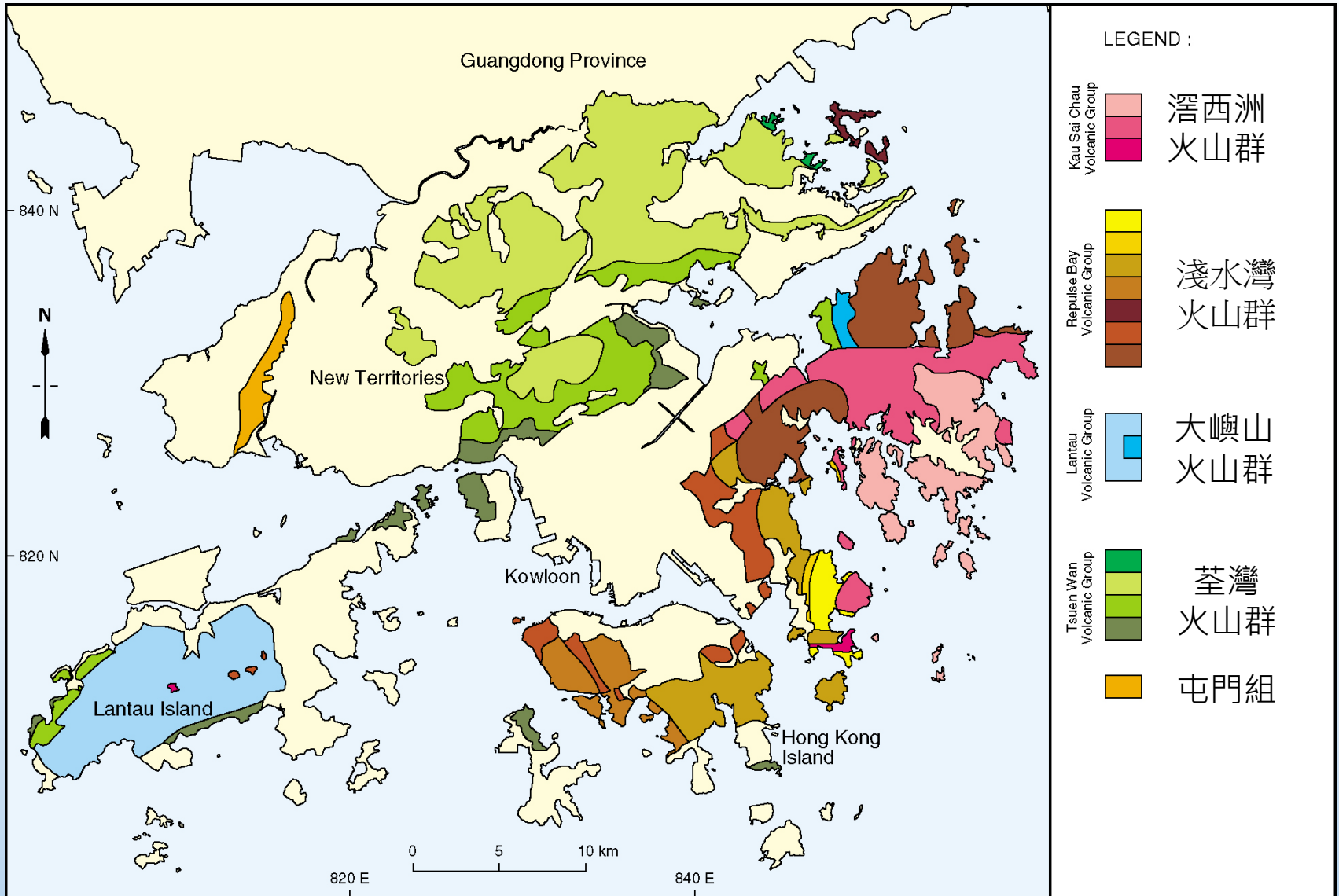
## Tolo Channel & Tai O Formations



Ammonite Fossil

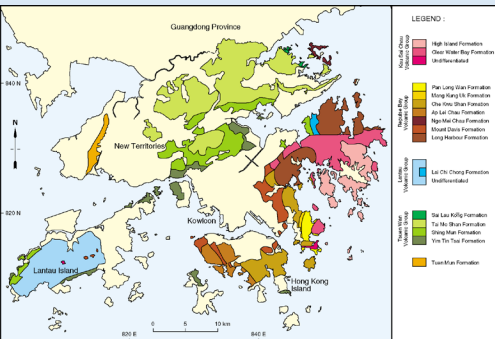


# 火山群 Volcanic Groups



# 屯門組

## Tuen Mun Formation



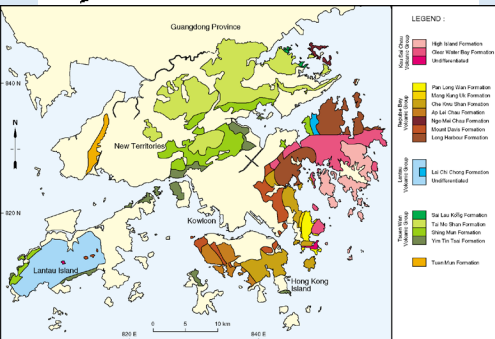
# 荃灣火山群

## Tsuen Wan Volcanic Group



Tsuen Wan  
Volcanic Group

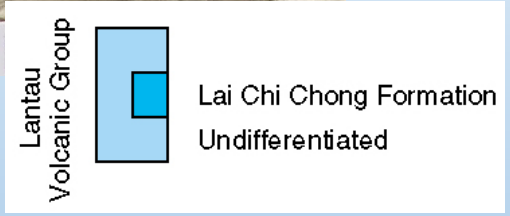
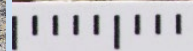
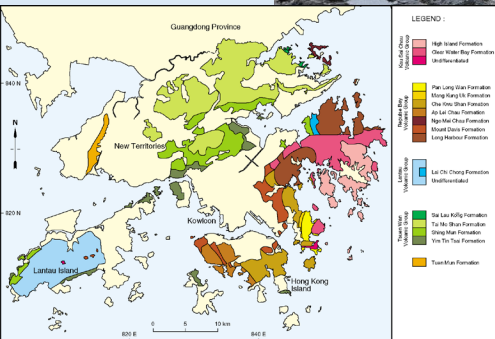
- Sai Lau Kong Formation
- Tai Mo Shan Formation
- Shing Mun Formation
- Yim Tin Tsai Formation





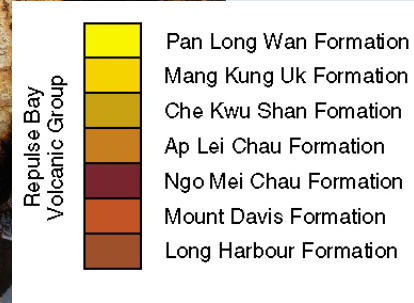
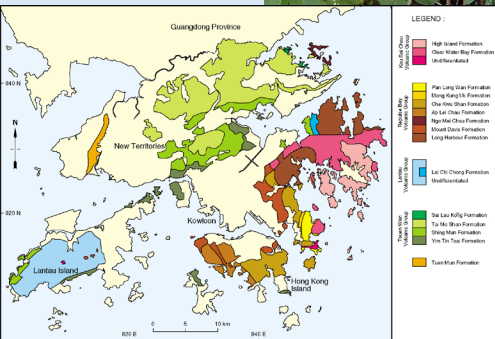
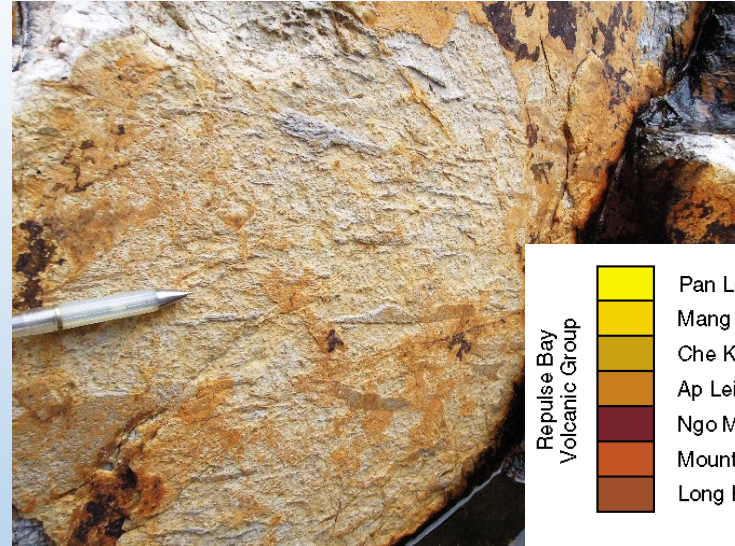
# 大嶼山火山群

## Lantau Volcanic Group



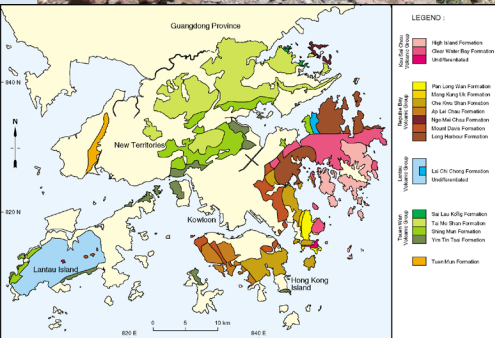
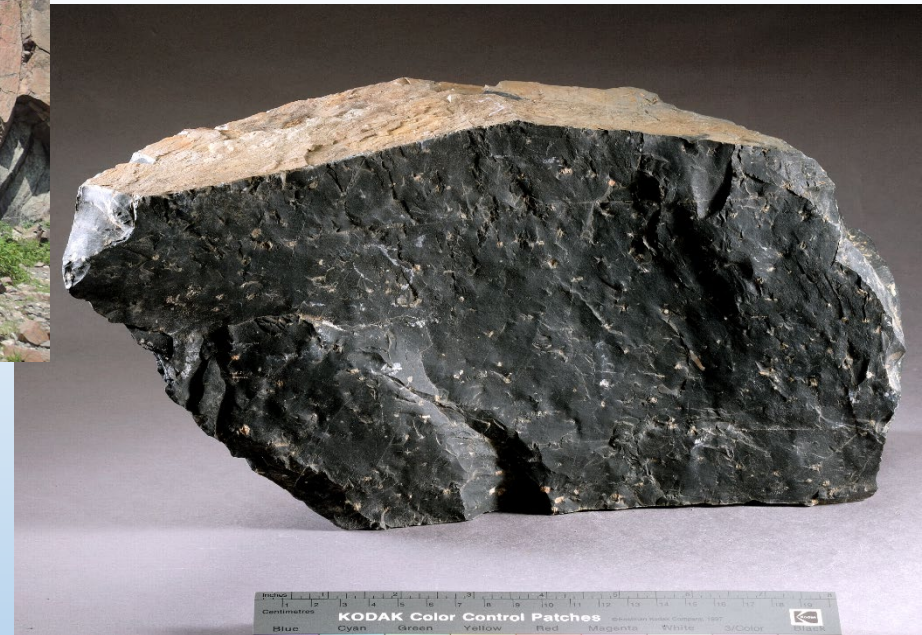
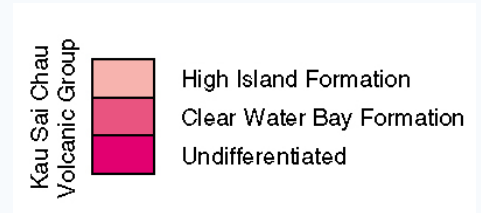
# 淺水灣火山群

## Repulse Bay Volcanic Group



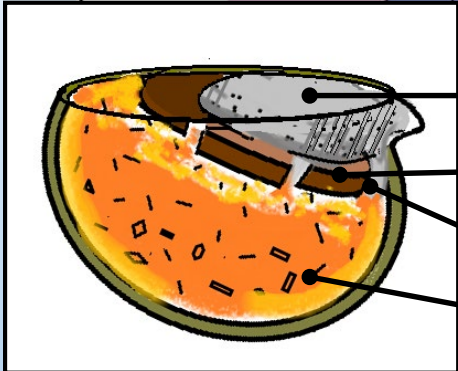
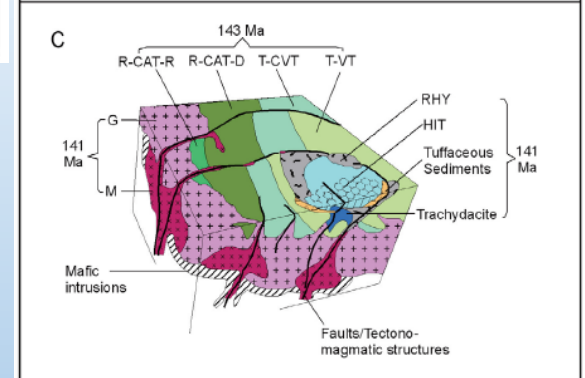
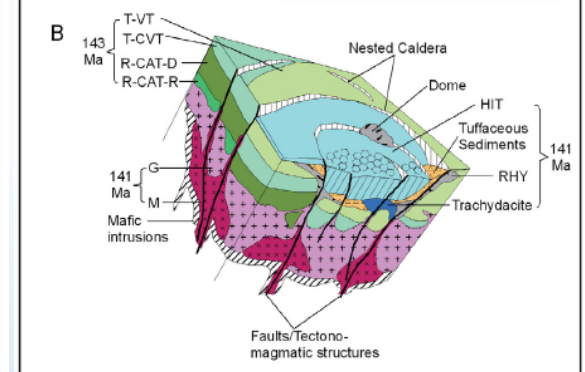
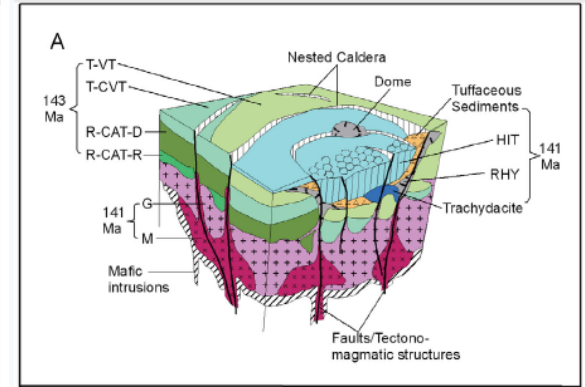
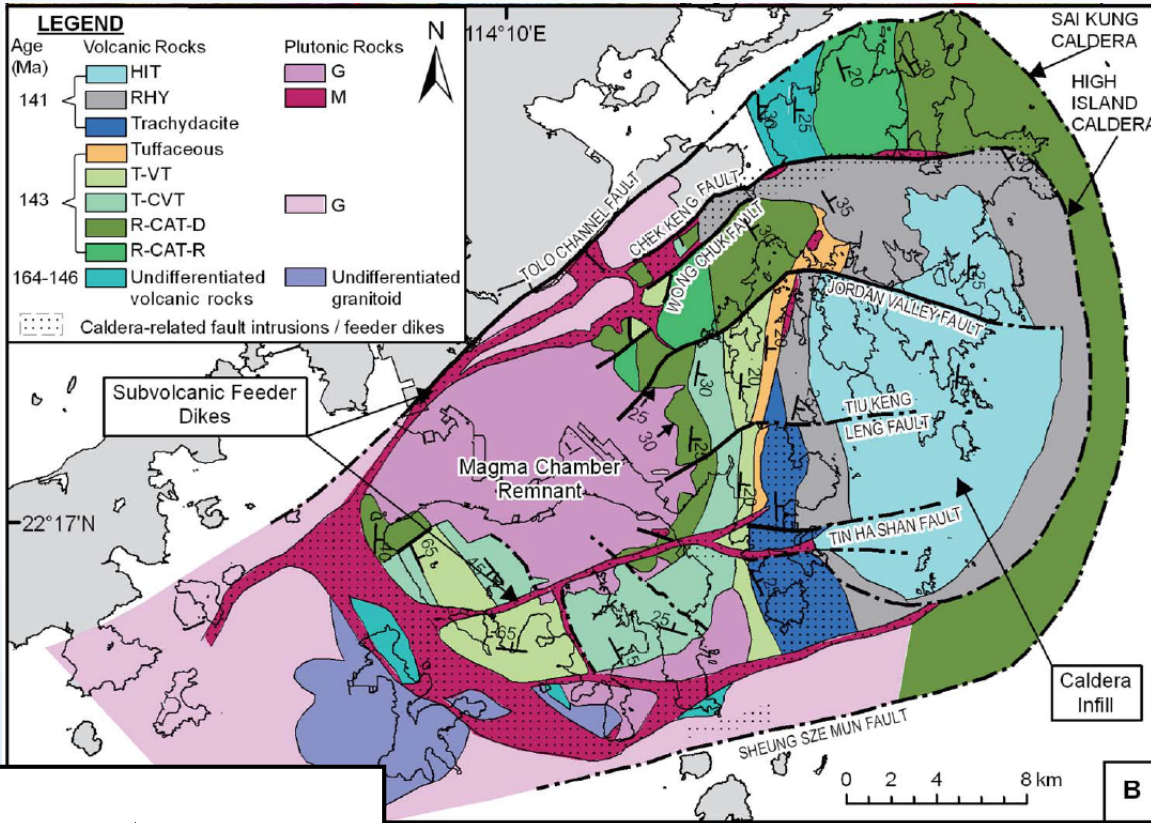
# 滙西洲火山群

## Kau Sai Chau Volcanic Group

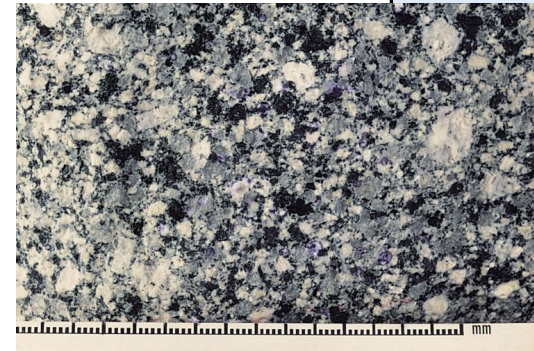
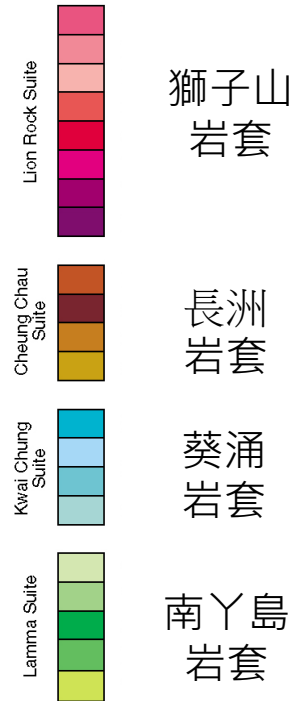
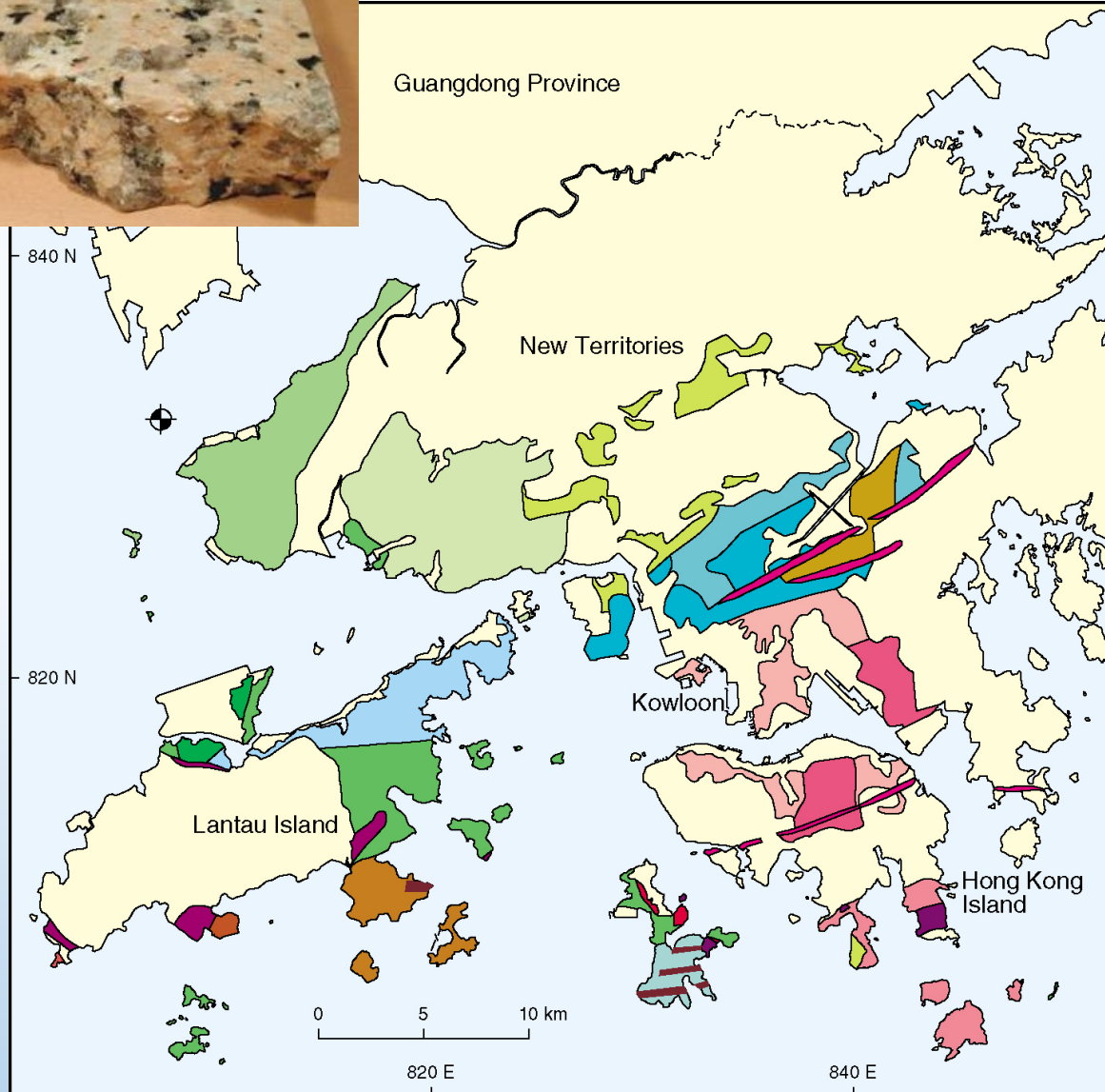


# 糧船灣超級噴發

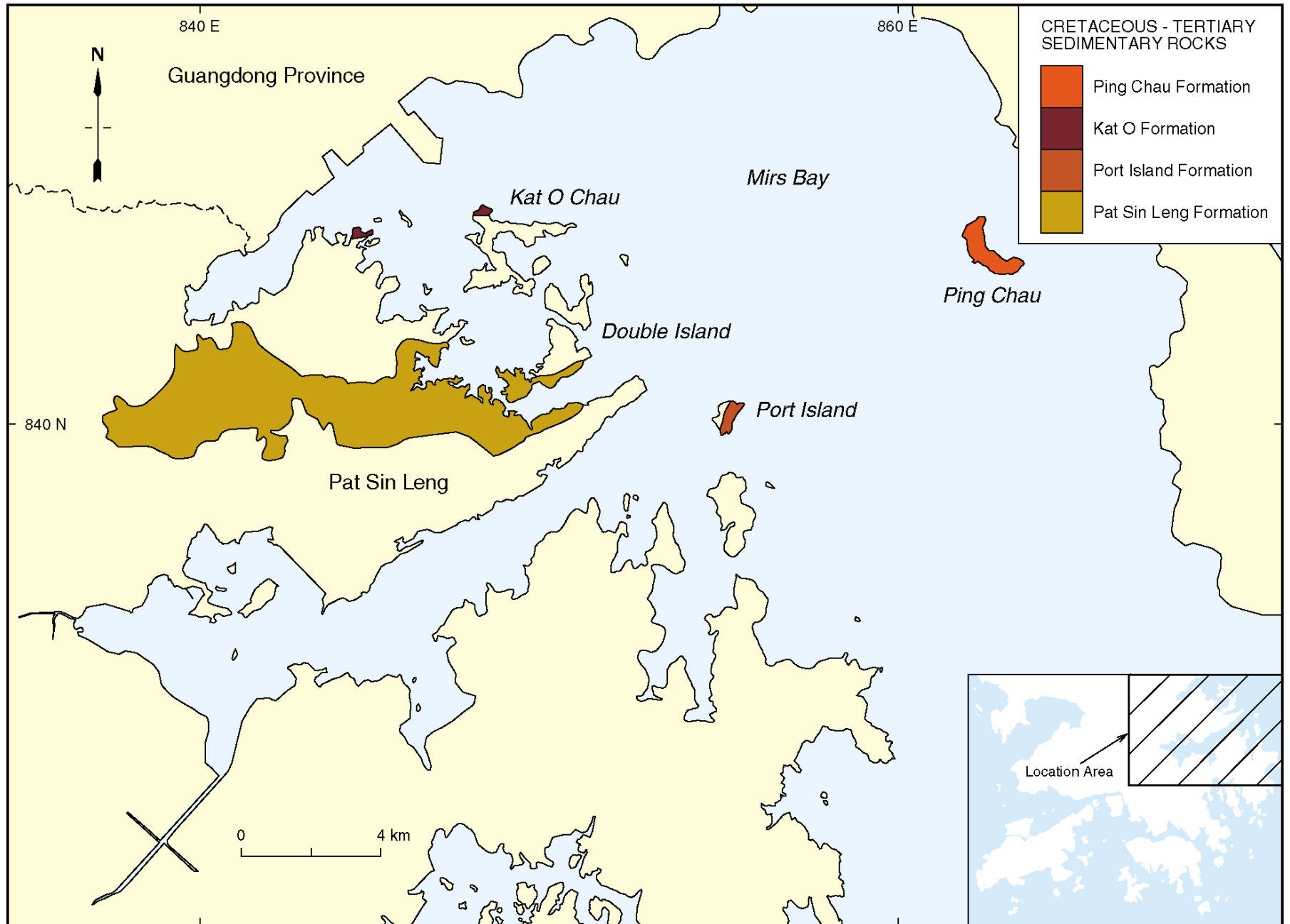
## High Island Supereruption



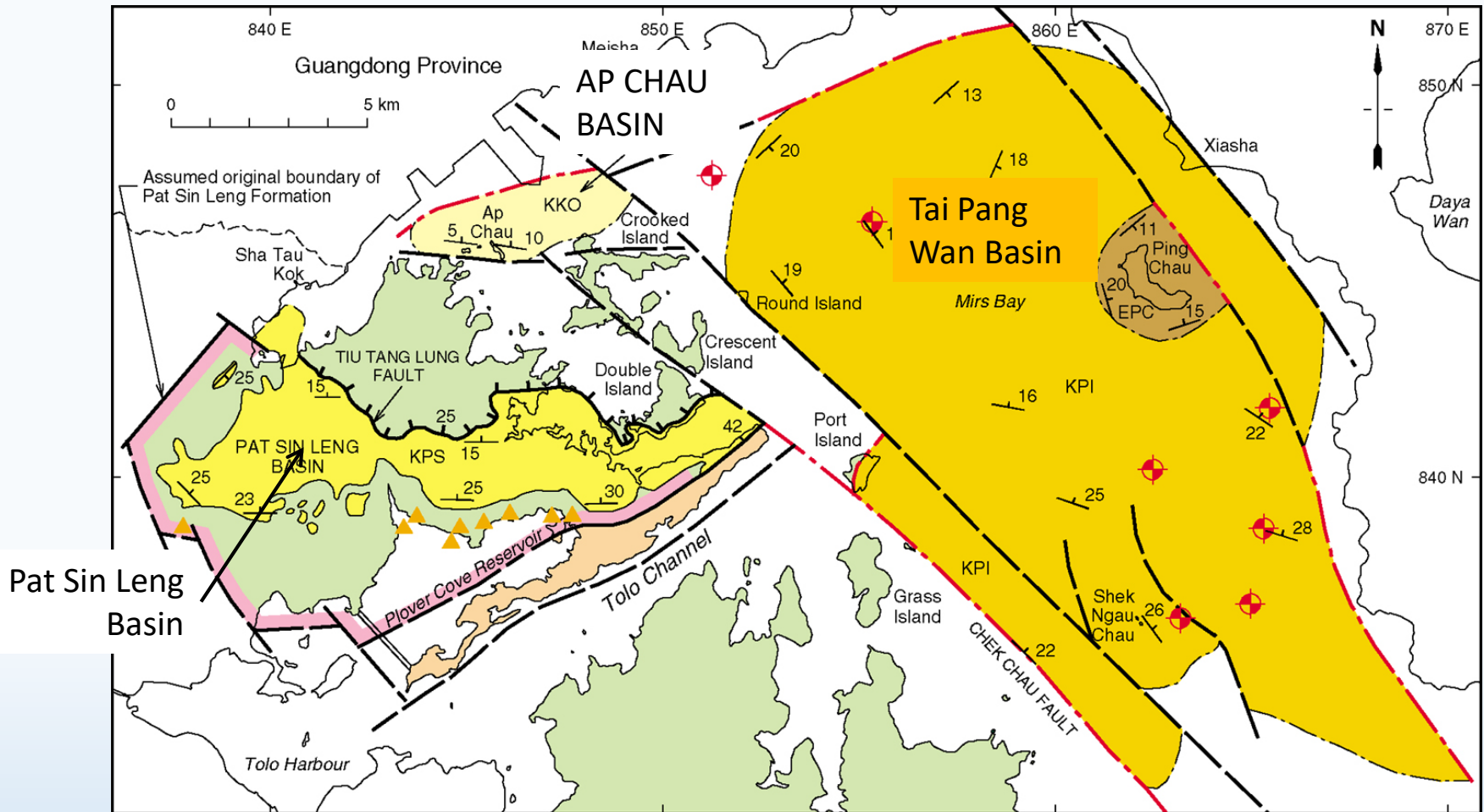
# 侵入岩套 Intrusive Suites



# 晚中生代至早新生代沉積岩 Late Mesozoic to Cenozoic Sedimentary Rock



# 晚中生代至早新生代沉積岩 Late Mesozoic to Cenozoic Sedimentary Rock



## LEGEND

EPC	Early Tertiary : Ping Chau Formation	Boulders of Pat Sin Leng Formation	Thrust
KKO	Late Cretaceous : Kat O Formation	Strike and dip	Geological boundary interpreted from seismic data
KPI	Late Cretaceous : Port Island Formation (Hong Kong)	Geological boundary (solid-certain, broken-inferred)	Fault line interpreted from seismic data
KPS	Early Cretaceous : Pat Sin Leng Formation	Fault (solid-certain, broken-inferred)	Borehole
	Jurassic Volcanic rocks	Devonian sedimentary rocks	Margin of Pat Sin Leng Basin

(Source: Sewell et al., 2000)

# 白堊紀紅層 Cretaceous Red Beds



八仙嶺  
Pat Sin Leng



鴨洲  
Ap Chau



赤洲  
Port Island



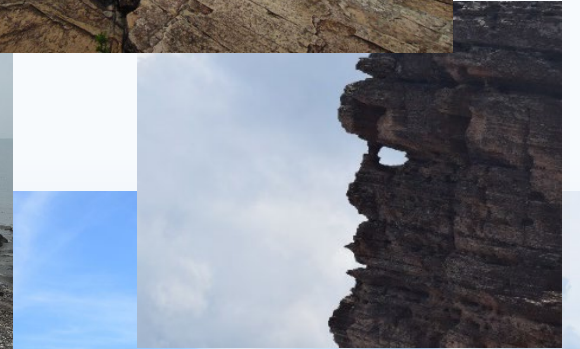
# 白堊紀紅層

## Cretaceous Red Beds



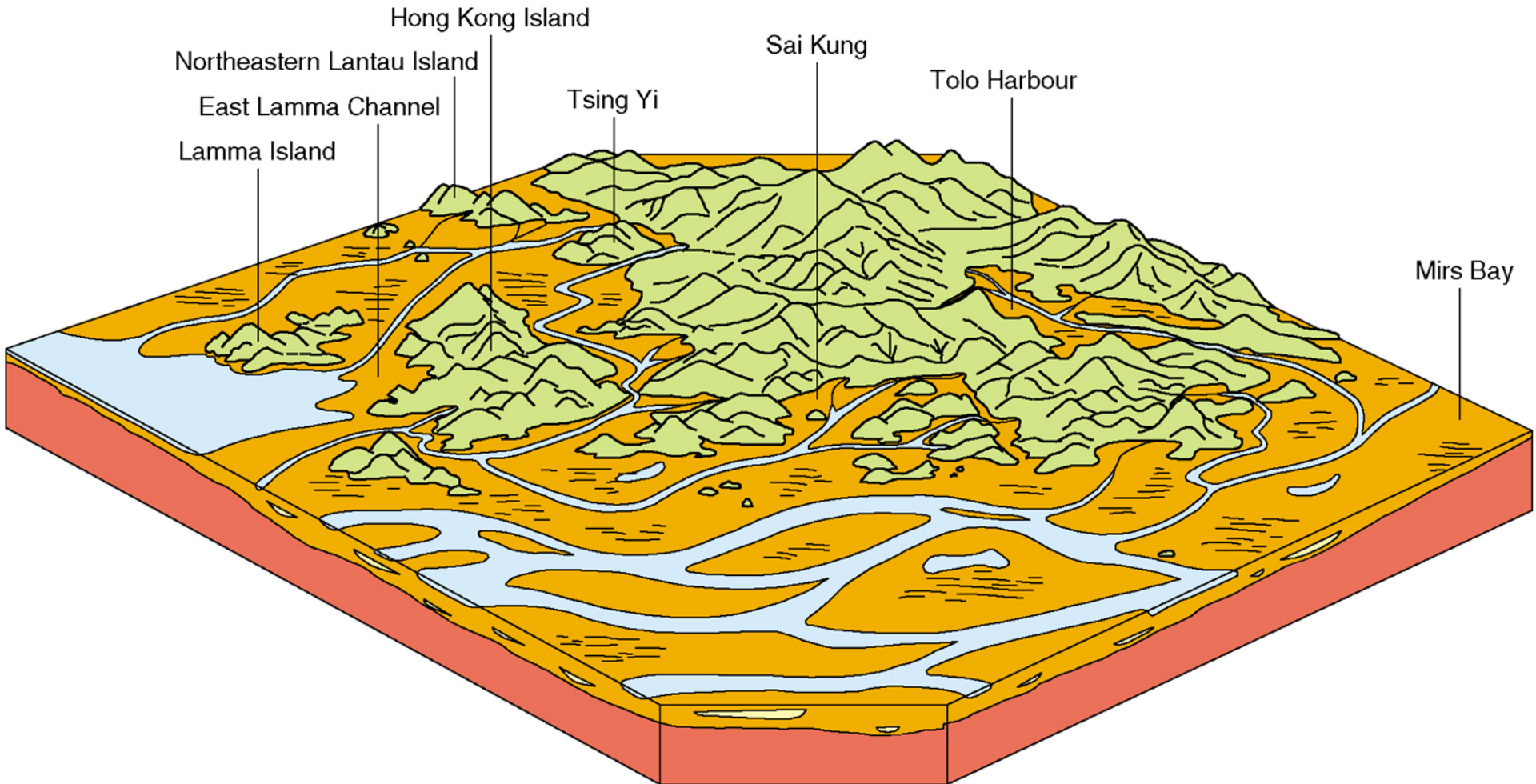
# 平洲組

## Ping Chau Formation



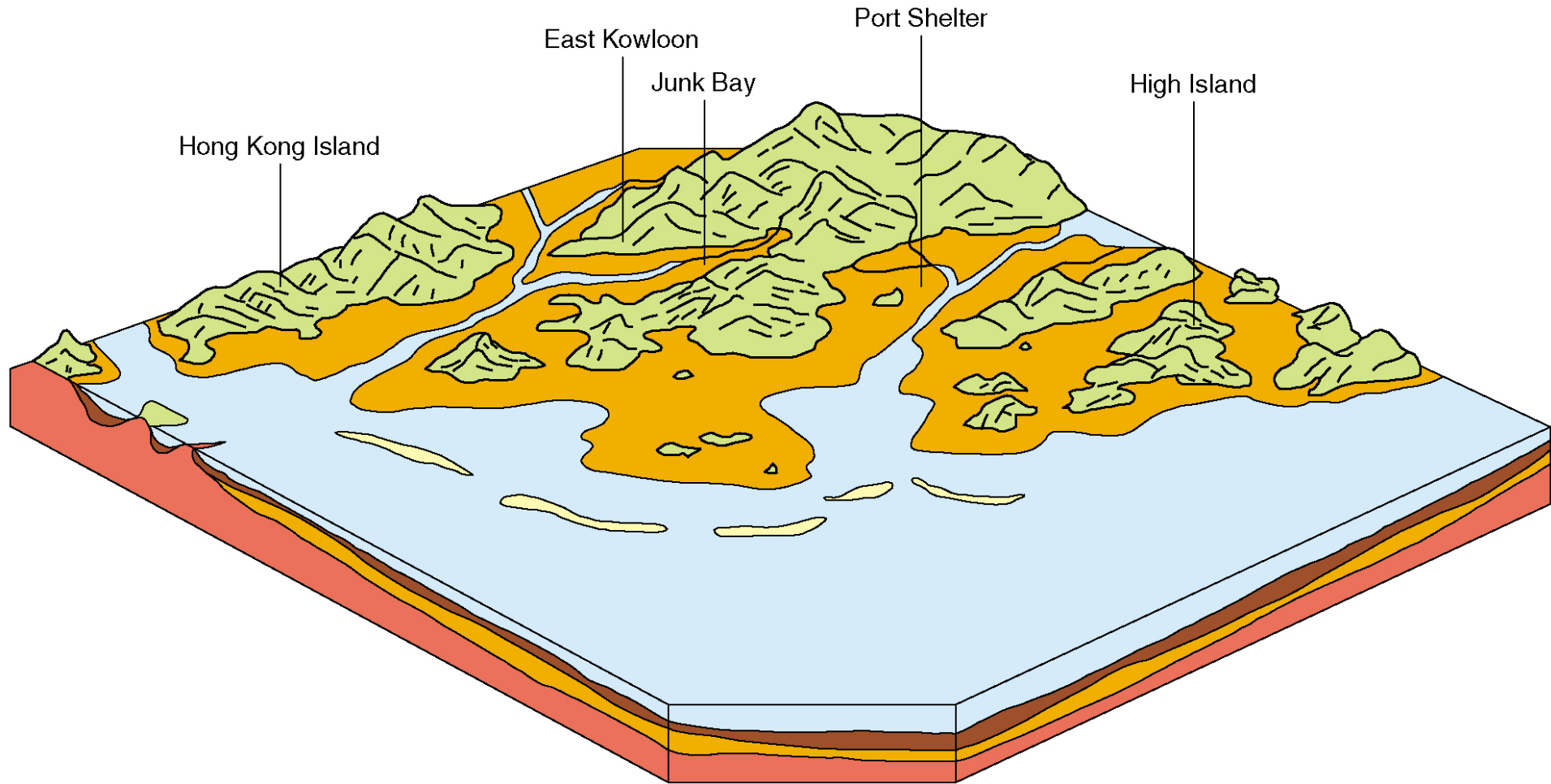
# 冰川期沉積環境

## Depositional Environment at Glacial Periods



# 全新世沉積環境

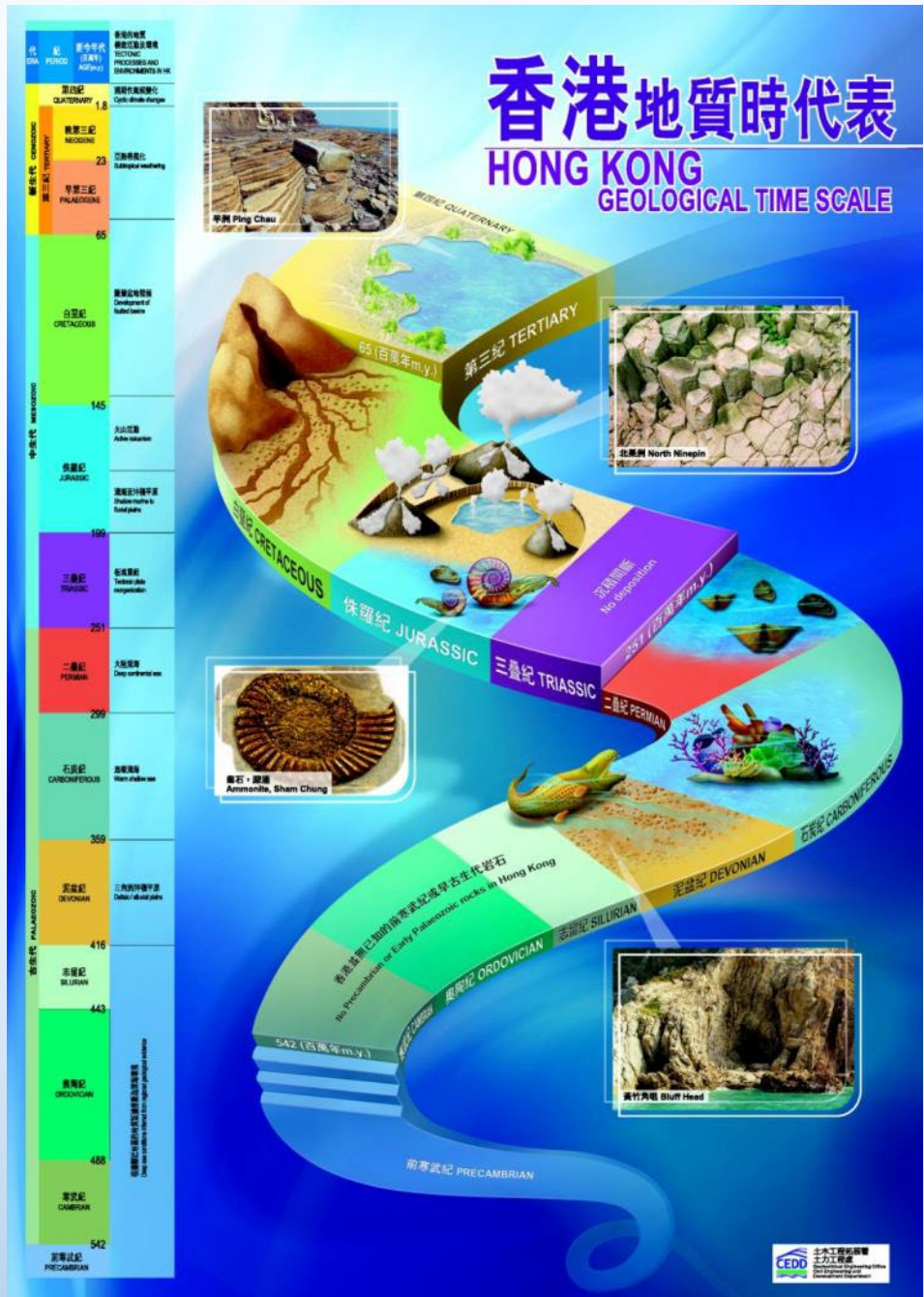
## Depositional Environment of Holocene Sediments



# 現今地貌

## Present Landscape





- Quaternary:  
Changes in climate and sea level  
Deposition of superficial deposits
- Late Mesozoic to Cenozoic:  
Extensional setting  
Sedimentation in opened basins
- Middle Mesozoic:  
Marine and fluvial sedimentation  
Subduction-related magmatism
- Palaeozoic:  
Sedimentation in response to changes in sea levels



<http://hkss.cedd.gov.hk/hkss/eng/education/GS/eng/hkg/indexe.htm>