

Major / minor selection talk series:

for a thorough understanding of course requirements, selection of courses in different areas of interests, etc.

Geology Major

Geology (Intensive) Major /Accredited Pathway

Earth Systems Science Major

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Earth's Dynamic Spheres

**EARTH SYSTEMS
SCIENCE : We study...**

**interactions and changes
within and between these
parts**

**how a change in one
component affects the
whole Earth system**

**the past, present and
future behavior**

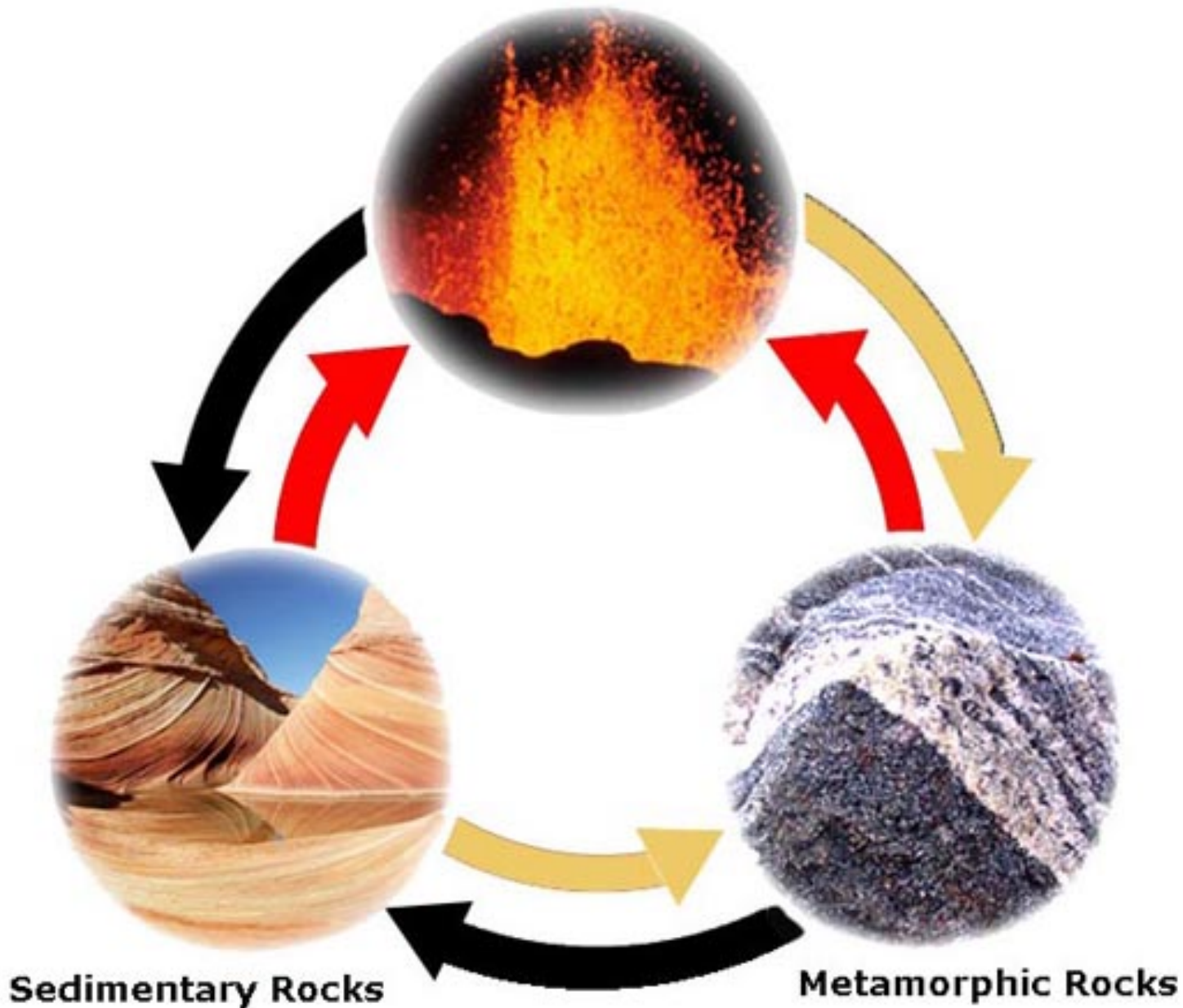


The Earth System

M. Ruzek, 1999



Igneous Rocks



The Rock Cycle!

GEOLOGY : We study...

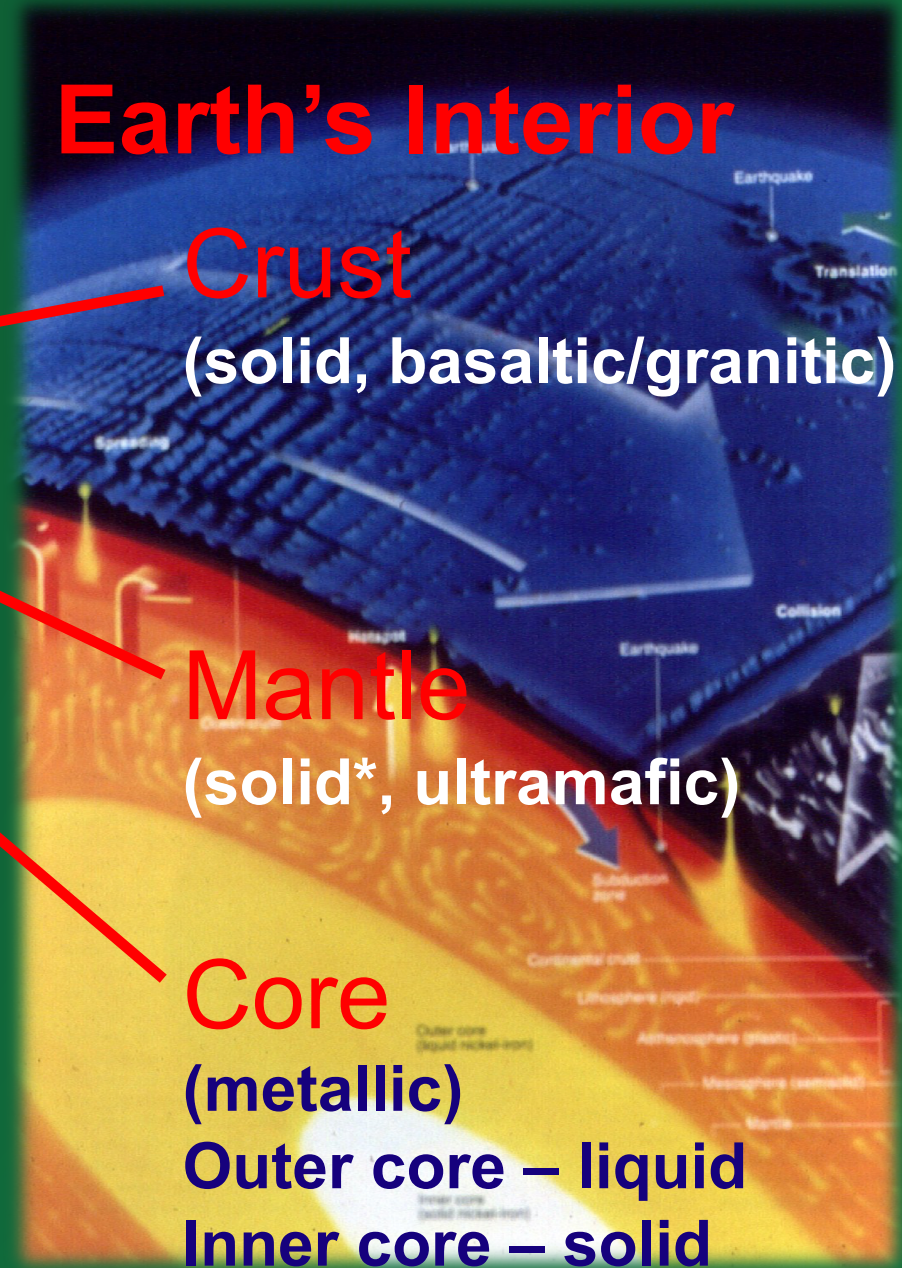
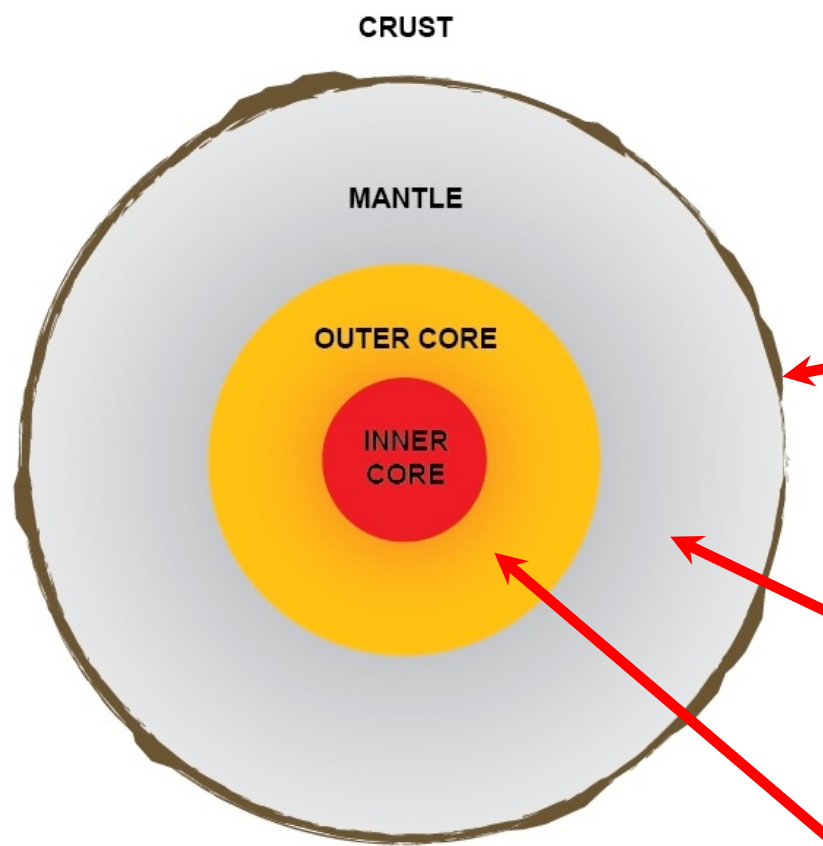
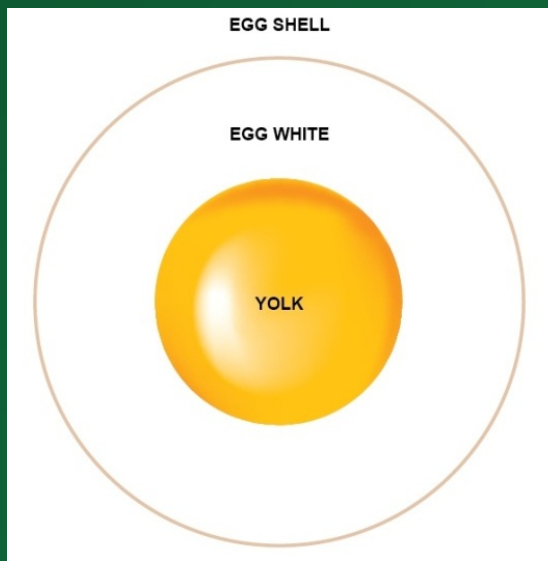
The origins and environments of these broad groups

How they relate to one and other, and how a change in one component affects the whole Earth system

The past, present and future behavior

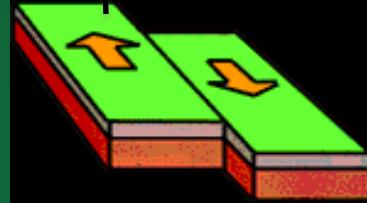
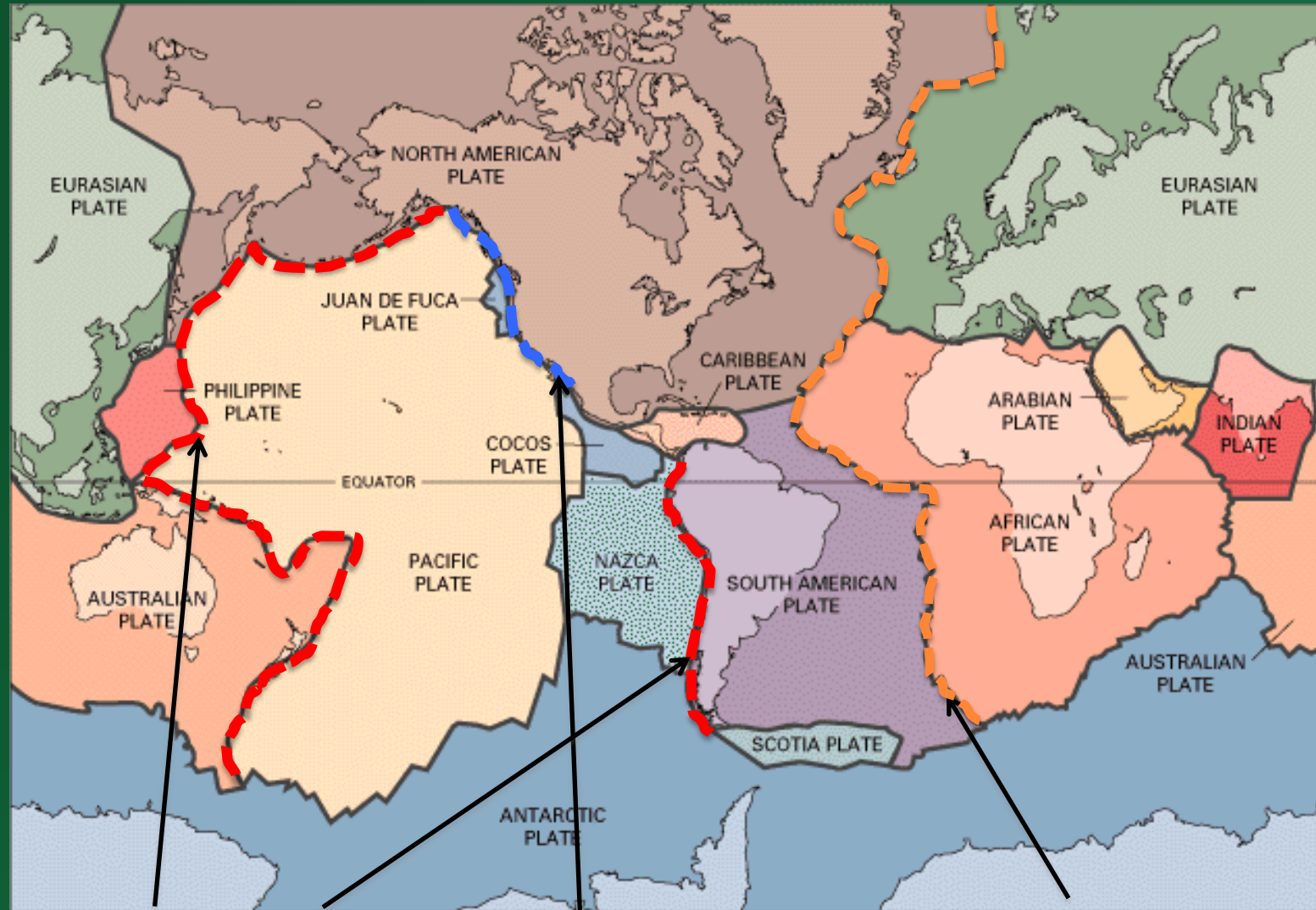


Earth vs. Egg



Geology studies:

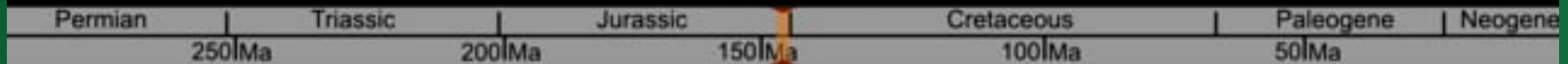
Plate Tectonics





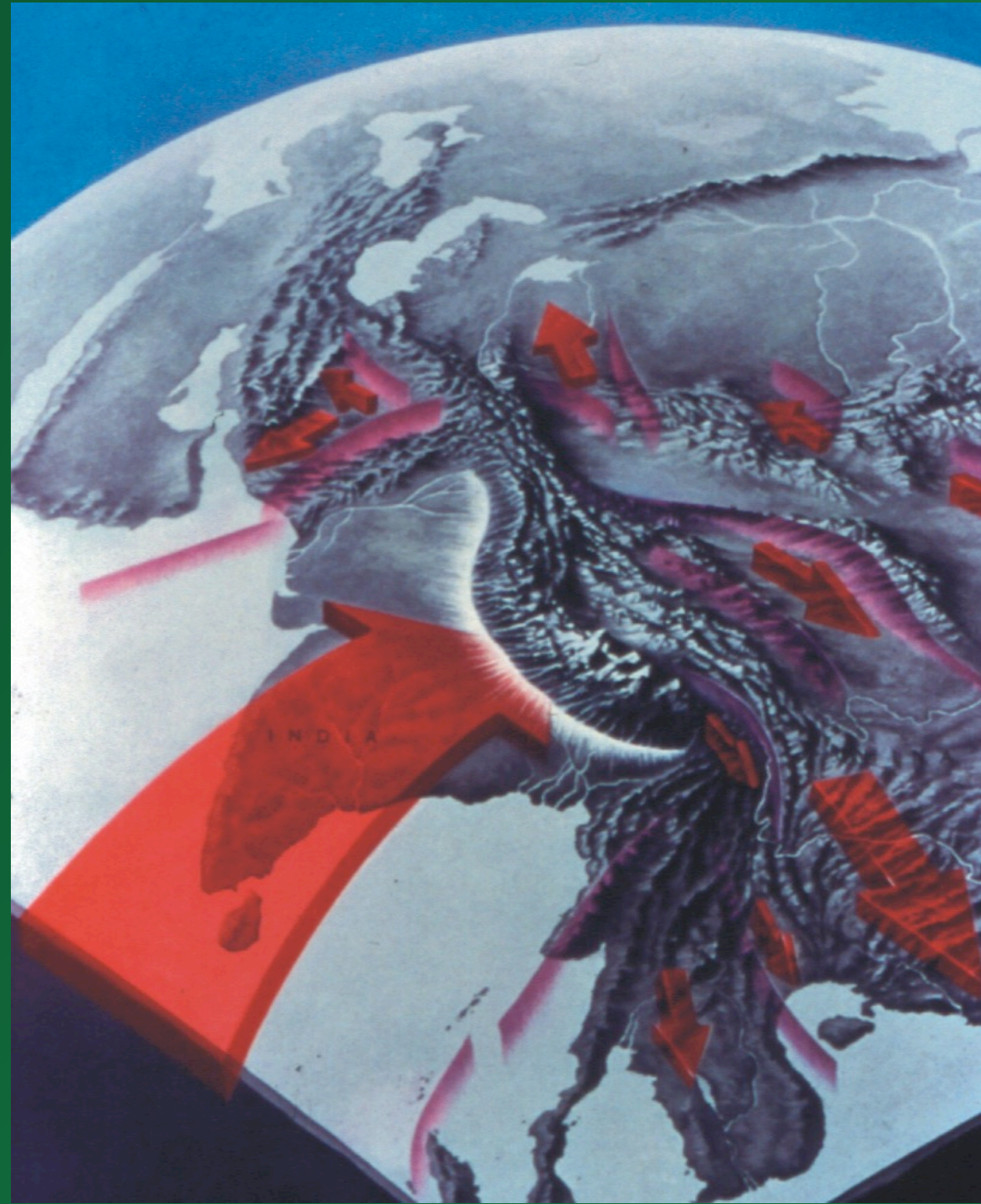
Atlantic Ocean

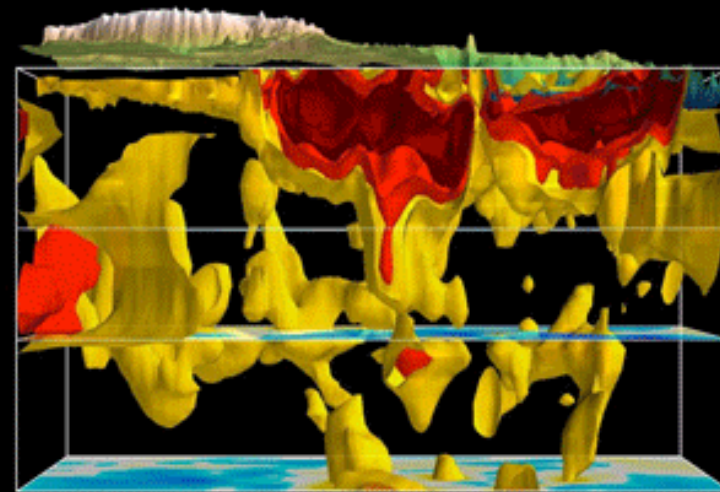
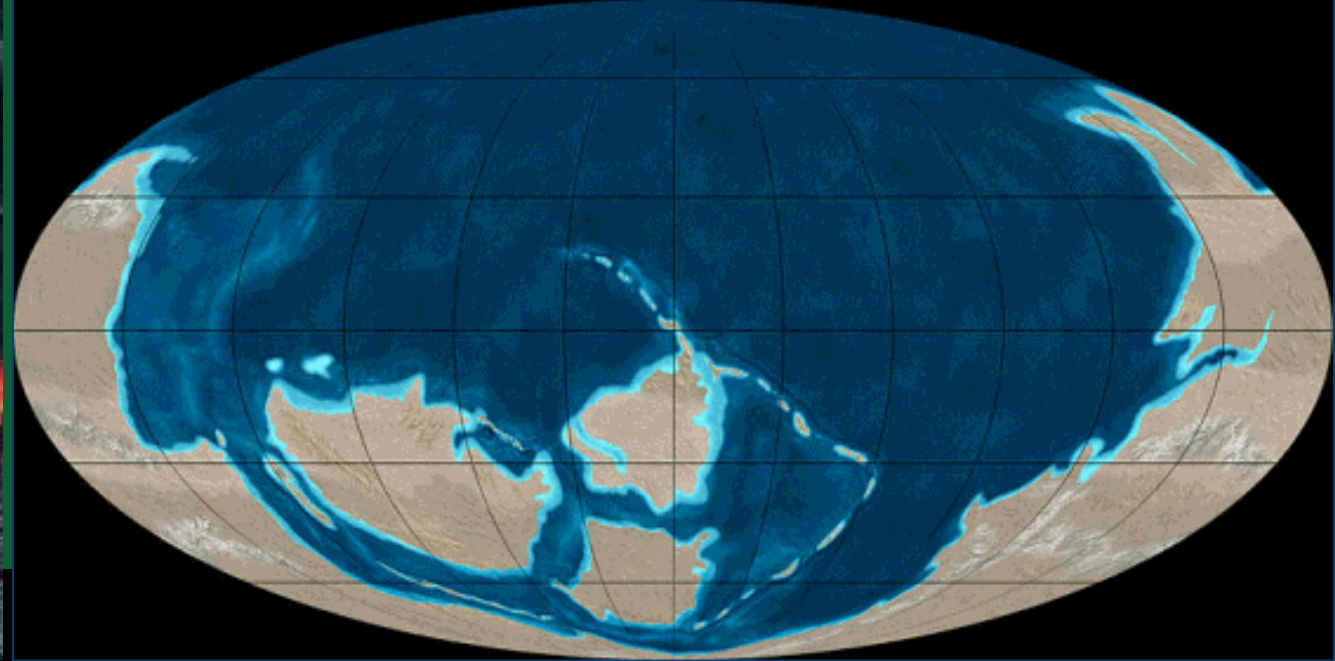
Future Africa



Mountain building – thicker crust

- Subduction zones
- Convergent zones
- Continents & oceans migrate
- As plates move, so do features atop







HKU Landslide 2010



Mid-level Landslide 1972

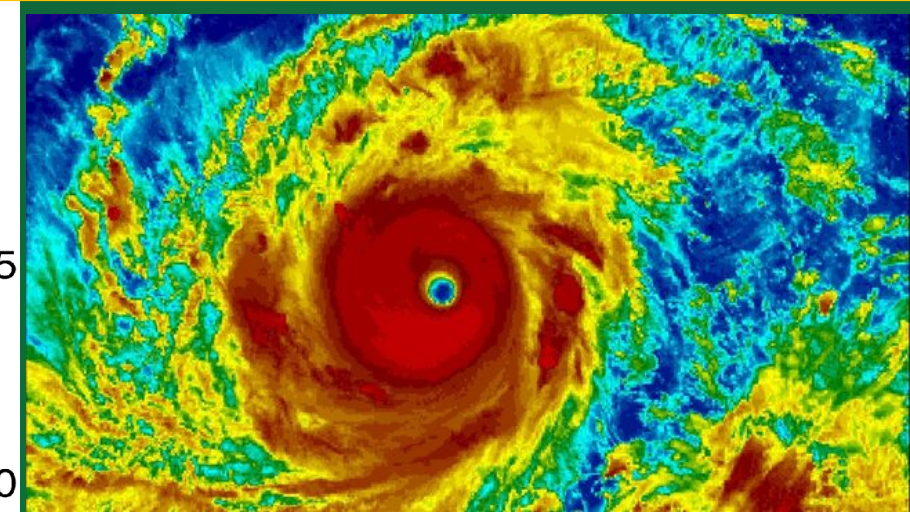
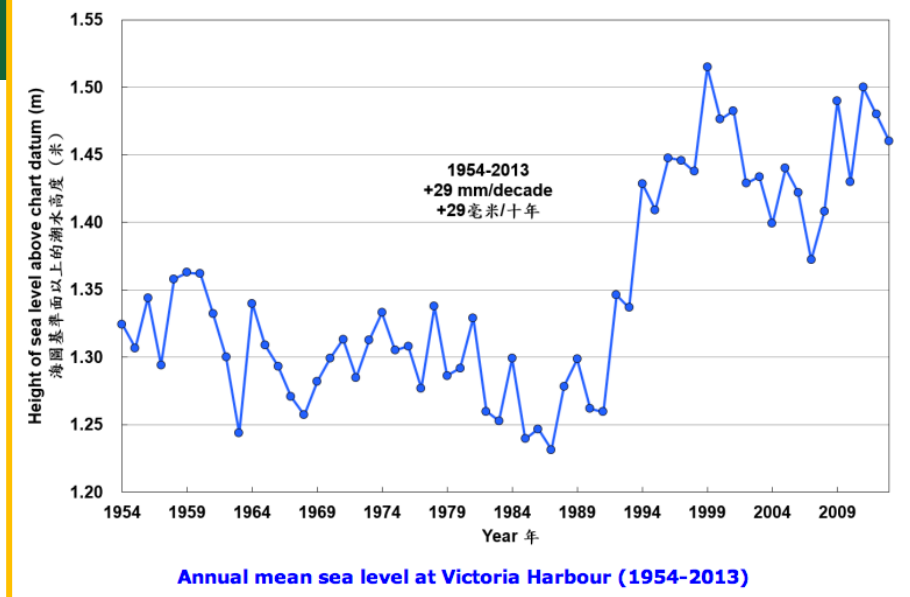
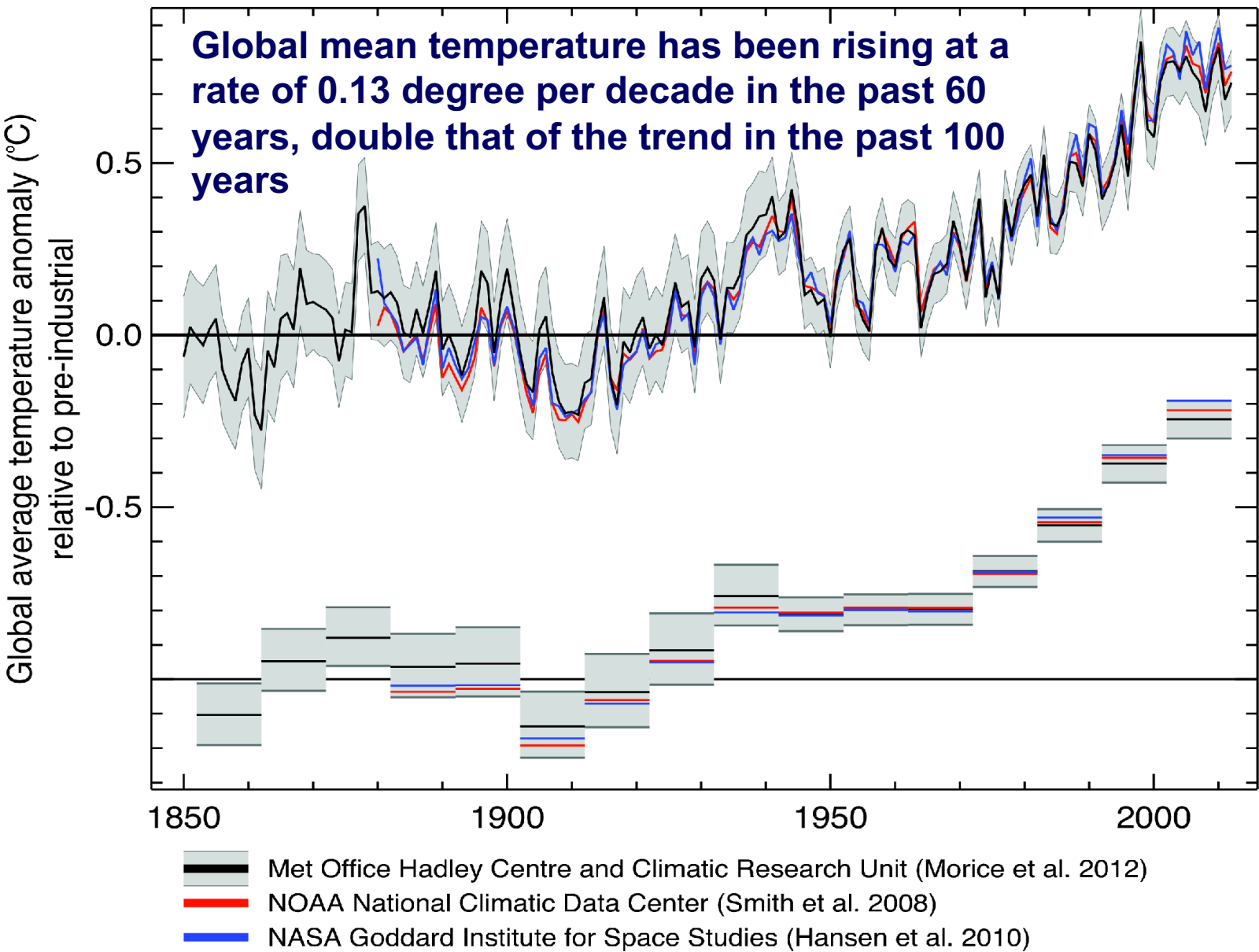


The 2011 tsunami in Japan



Global Temperatures (1850-2012)

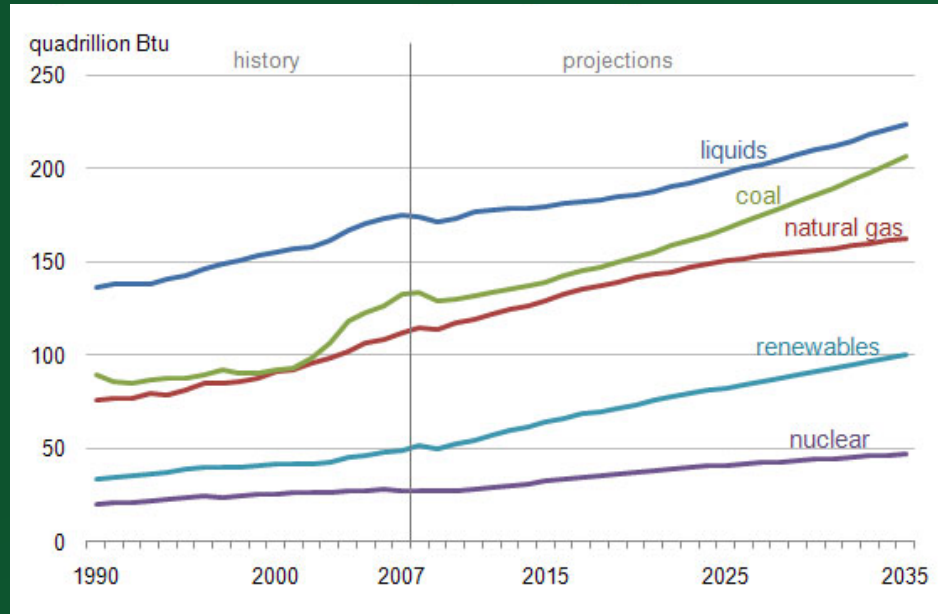
annual average and 10-year average



Typhoon Mangkhut (2018)



Earth's Crisis: energy supply



All photos credited to original authors



Earth Scientists are in demand globally

Since 1996, ~500 graduates...

Engineering/geotechnical Firms

Survey Companies

Mining Companies

Government

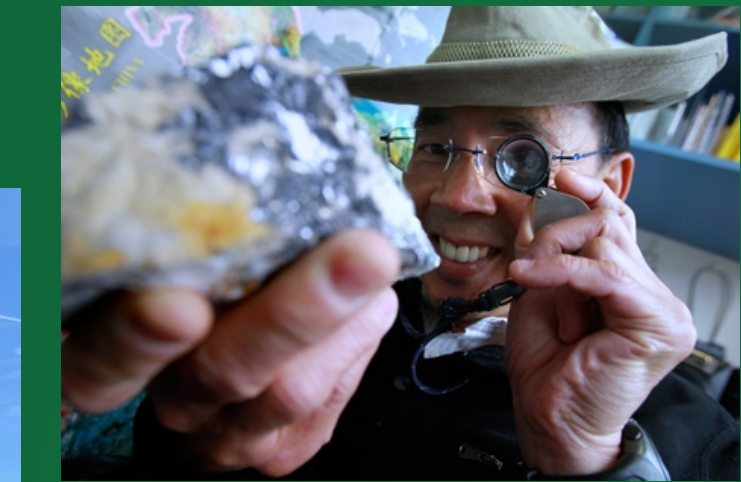
Schools

Resource management and
planning;

Disaster management

Environmental testing

Geotourism



Employers of HKU Earth Science students: a few examples

Public bodies



Commercial Earth Sciences



Commercial outside the Earth Sciences



Geology Major

Training in solid Earth geology and related disciplines: to prepare students for careers as professional geologists pursuing geotechnical investigations, mining, resource development, etc.

- Course work in field geology, mineralogy, geochemistry, petrology, geophysics, structural geology, **overseas field camp!**
- Optional courses in engineering geology, hydrogeology, soil and rock mechanics and other more applied or specialized areas
- The new **Intensive version of the major** is accredited by the Geological Society of London



Geology Major



Introductory Level Courses		Advanced Level Courses		Capstone Courses	
<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>	<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>	<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>
EASC1402 EASC2401 EASC2402 EASC2406 EASC2407 SCNC1111 SCNC1112		EASC3402 EASC3403 EASC3404 EASC3408 EASC3409 EASC4406	EASC3406 EASC3410 EASC3412 EASC3413 EASC3414 EASC3416 EASC3417 EASC3999 EASC4403 EASC4407 EASC4408 EASC4999 ENVS3007	EASC4955	



Earth Systems Science Major



<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>	<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>	<i>Disciplinary Core Course</i>	<i>Disciplinary Elective</i>
EASC1401 EASC1406 EASC2401 EASC2402 EASC2404 EASC2410 SCNC1111 SCNC1112		EASC4403	EASC3020 EASC3403 EASC3405 EASC3406 EASC3410 EASC3412 EASC3415 EASC3417 EASC3418 EASC3419 EASC3999 EASC4408 EASC4999 ENVS3007 ENVS3313	EASC4911	



Geology Major (Intensive)

Introductory-level course:

EASC1402 Principles of Geology (+ EASC1401 Blue Planet)

Intermediate-level courses:

Mineralogy, Geochemistry, Fluid/solid Interactions, Field Methods
(+Regional Field Studies)

Advanced-level courses:

Petrology, Sedimentary Environments, Structural Geology, Geophysics,
Igneous and metamorphic petrogenesis, Earth dynamics & global tectonics,
Integrated Field Studies (+Earth through Time, Regional Geology, Earth
Science Project)

N.B. Accredited pathway (Intensive Major) **requires specific additional courses**



Elective Courses (12 credits) (30 credits)

EASC2404 Introduction to Atmosphere and Hydrosphere

EASC2408 Planetary Geology

EASC3405 Environmental Remote Sensing

EASC3406 Reconstruction of Past Climate

EASC3410 Hydrogeology

EASC3412 Earth Resources

EASC3413 Engineering Geology

EASC3414 Soil and Rock Mechanics

EASC3416 Advanced Geochemistry and Geochronology

EASC4999 Earth Sciences Project (12)

ENVS3007 Natural Hazards and Mitigation

ENVS3313 Environmental Oceanography

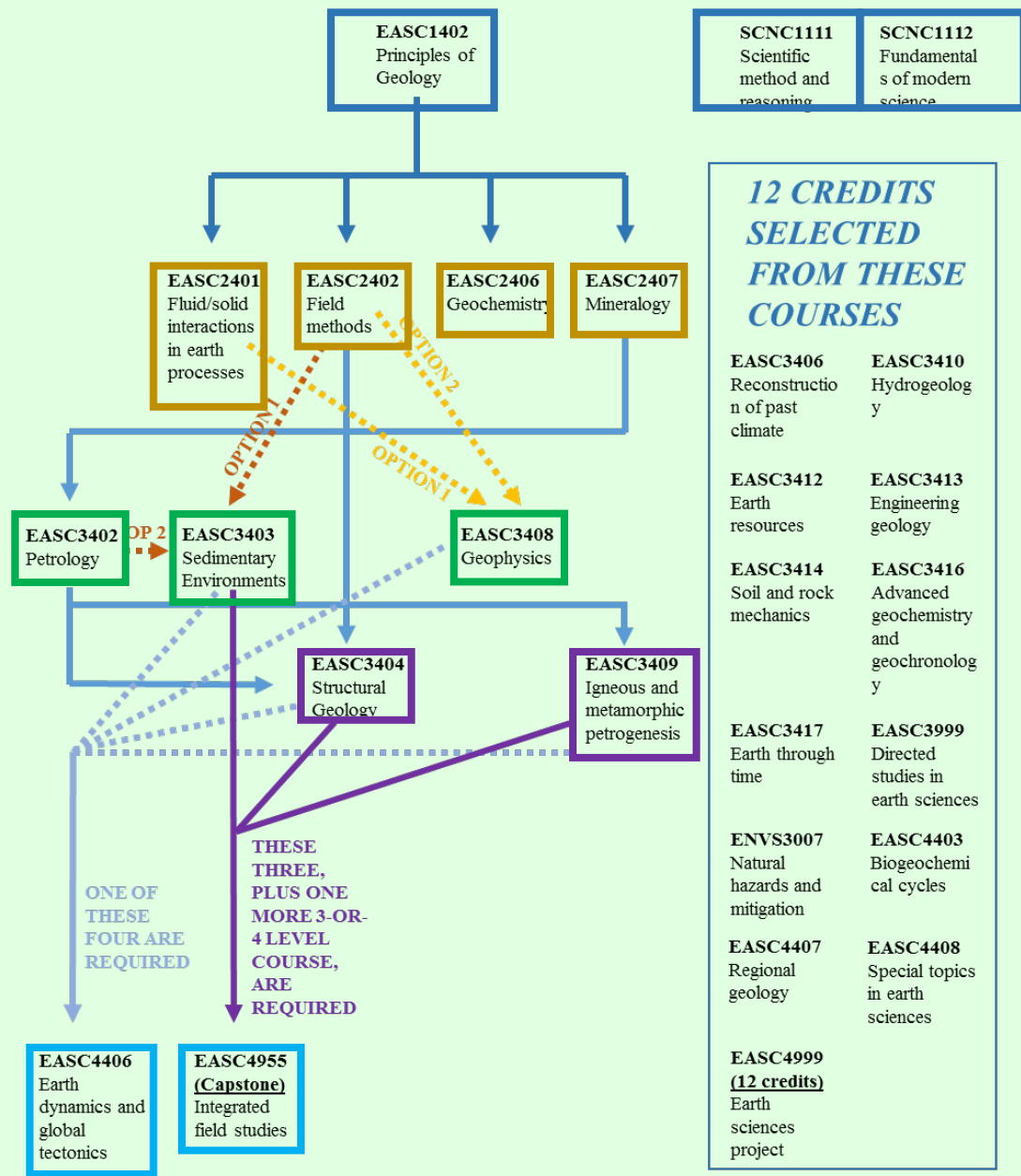
EASC3999 Directed Studies in Earth Sciences

EASC4408 Biogeochemical Cycles

EASC4408 Special Topics in Earth Sciences

EASC4966 Earth Science Internship





You can do it in three years!

	Fall	Spring
Y1	<div>1402</div> <div>1111</div>	<div>1112</div> <div>2401</div>
Y2	<div>2402</div> <div>2407</div>	<div>2406</div> <div>3402</div> <div>3403</div> <div>3408</div>
Y3	<div>3404</div> <div>????</div>	<div>3409</div> <div>4406</div> <div>4955</div>

Geology Major Pathway





Field work is essential
and fun!

Students Earth Sciences
Society: also run fieldtrips &
career talks!



**OVERSEAS
FIELD STUDIES
(China, Taiwan,
North America,
Australia)**



Typical trips & Camps

- **Lai Chi Chong**: Geology, environment (5 days)
- **Zhaoqing**: Gold mining, fossils, rocks (4 days)
- **Wuhan**: Sedimentary rocks, Engineering geology (7 days)
- **Taiwan**: Active tectonic zones, subduction boundary (7 days)
- **US/Australia/Europe**: Geological mapping, tectonic evolution, economic resources (24 days) (GEOLOGY Capstone)
- **Tibet**: Earth Systems field studies, Geomorphology
- Numerous trips around Hong Kong: Ping Chau, Sai Kung, Ninepins, Po Toi, Lantau ...



Placement: Credit bearing internship

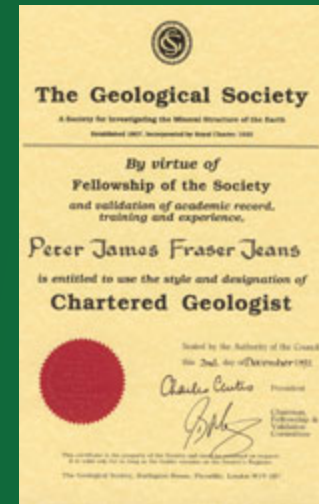
- **Government**
(e.g. GEO, CEDD, Housing, HK Observatory)
- **Geotechnical Contractors**
(e.g. Gammon, AECOM, Lam Geotechnics, MTR)
- **Consultants**
(e.g. Ove Arup, Halcrow, Bunnie)
- **Mining Companies**
(BHP, Dragon Mining, BMI)



Professional Registration

Chartered Geologist

Graduate of Geology who follows **accreditation pathway**
4 years of relevant work experience
Membership, Geological Society, UK



Building Department: “Competent Person for Ground Investigation”

Graduate with Earth Sciences degree
5 years relevant work experience including 3 years with contractor(s)

Registered Geologist with GEO

HK Institution for Engineers (as an Engineer)

BSc in Earth Sciences + MSc in Applied Geosciences
5 years relevant work experience



Accreditation Pathway

- Specific courses satisfying the Geological Society of London's educational requirements for Chartered Geologist
- Chartered Geologist is an internationally recognized professional status
- GSL Certificate + 4 years work experience + exam



PROGRAMME STRUCTURE

BSc (Major in Geology) GSL Accredited Pathway – rev6 17.1.17 AAGW

Table 1 *Introductory level, compulsory (12 credits/2 courses)*

Code	Name	Credits	
EASC1401	Blue planet	6	
EASC1402	Principles of geology	6	

Table 2 *Science Faculty requirements (12 credits/2 courses)*

Code	Name	Credits	
SCNC1111	Scientific method and reasoning	6	
SCNC1112	Fundamentals of modern science	6	

Table 3 *University requirements (54 credit/9 courses)*

6 Common Core Courses in four AOIs	36	
English language	6	
English language within the discipline	6	
Chinese language	6	

Table 4 *Compulsory Advanced level courses (96 credits/15 courses)*

Code	Name	Credits	
EASC2401	Fluid / Solid interactions in earth processes	6	
EASC2402	Field methods	6	
EASC2406	Geochemistry	6	
EASC2407	Mineralogy	6	
EASC2409	Regional Field Studies	6	
EASC3402	Petrology	6	
EASC3403	Sedimentary environments	6	
EASC3404	Structural geology	6	
EASC3408	Geophysics	6	
EASC3409	Igneous and metamorphic petrogenesis	6	
EASC3417	Earth through time	6	
EASC4406	Earth dynamics and global tectonics	6	
EASC4407	Regional geology	6	
EASC4955	Integrated Field Studies	6	
EASC4999	Earth sciences project. <u>Requires approval to qualify for accredited pathway: see Revision 6</u>	12	

Table 5 *5 courses from list below*

Code	Name	Credits	
EASC2404	Introduction to atmosphere and hydrosphere	6	
EASC2408	Planetary geology	6	
EASC3020	Global change: anthropogenic impacts	6	
EASC3405	Environmental Remote Sensing (renamed from Earth observation)	6	
EASC3406	Reconstruction of past climate	6	
EASC3410	Hydrogeology	6	
EASC3412	Earth resources	6	
EASC3413	Engineering geology	6	
EASC3414	Soil and rock mechanics	6	
EASC3416	Advanced geochemistry and Geochronology(renamed from Advanced geochemistry)	6	
EASC3999	Directed studies in earth sciences	6	
EASC4403	Biogeochemical cycles	6	
EASC4408	Special topics in earth sciences	6	
EASC4911	Earth system: contemporary issues (renamed from Earth system history)	6	
EASC4966	Earth Sciences Internship	6	
ENVS3007	Natural Hazards and Mitigation	6	
ENVS3313	Environmental oceanography (renamed from Solid earth, ocean, atmosphere interactions)	6	

Table 6 *If neither Engineering Geology nor Environmental Remote Sensing is chosen 3-credits in GIS is required.*

Code	Name	Credits	

Revision 1 (5.9.13): altered order of courses in list to numerical order

Revision 2 (8.3.14): new course (EASC2409); course title changes (EASC3405, EASC3416, EASC4955 and ENVS3313); course number changes (to EASC3999, EASC4956, EASC4966 and EASC4999). Add Table numbers.

Revision 3 7.8.14 Revise course code for EASC4955 and EASC4911

Revision 4 29.7.15 Revise course title for SCNC1111 and EASC4406

Revision 5 04.8.2016 Add EASC3417 Earth through time to Compulsory Advanced level courses, decrease Table 5 courses (electives) from 6 to 5 courses to balance the credit load.

Revision 6 17.1.17 EASC4999 projects must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.

AAGW 17.1.17

Pathway courses

(Little possibility for double major or minor)

