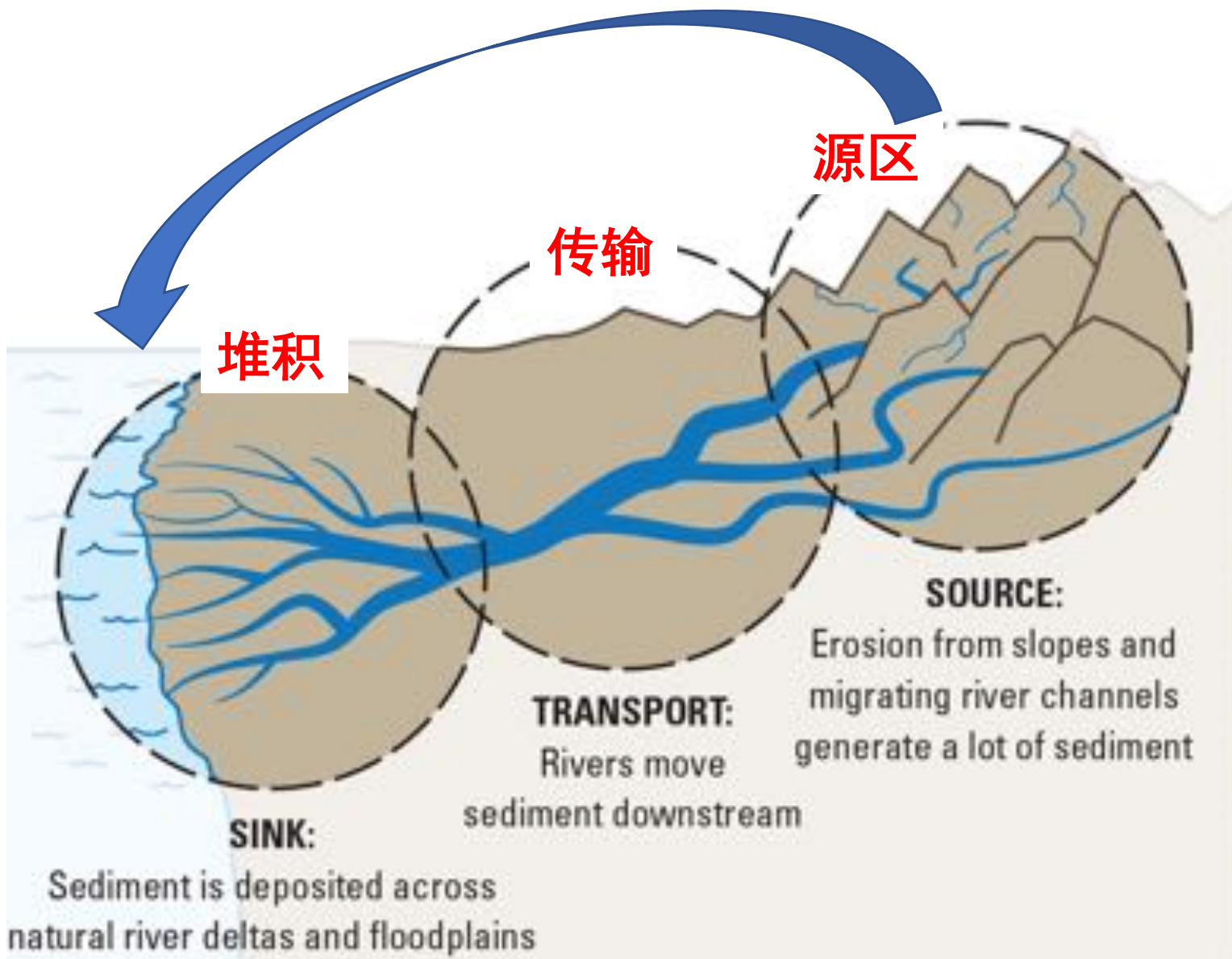


序号	报告题目	报告时间	主讲人
1	长江三峡库首区地震活动	9月03日 19:00-20:00	王墩
2	河流地貌模拟	9月03日 20:00-21:00	袁小平
3	华南地区新元古代重大地质事件与大规模锰矿沉积成矿作用	9月05日 19:00-20:00	余文超
4	秭归地区的陆源碎屑沉积-构造演化	9月05日 20:00-21:00	杨江海
5	岩浆岩野外工作方法--以黄陵杂岩体为例	9月07日 19:00-20:00	朱云海
6	花岗岩的成因与地壳演化	9月07日 20:00-21:00	张宏飞
7	三峡构造，构造三峡	9月09日 19:00-20:00	王岸
8	无人机技术在地球科学中的应用	9月09日 20:00-21:00	王江



陆源碎屑
沉积物：
源于基岩的
泥、砂、砾

造山带
沉积盆地




Reviews of Geophysics

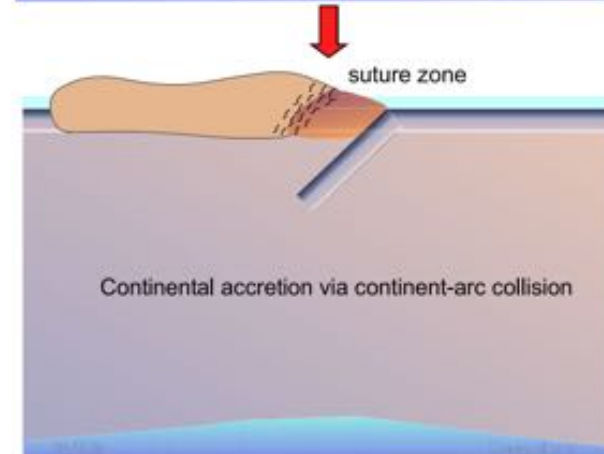
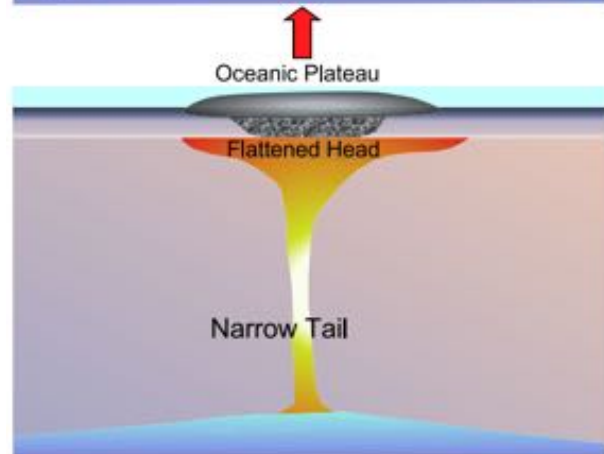
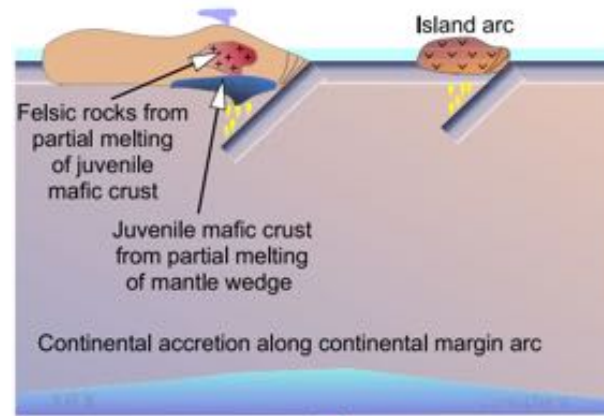
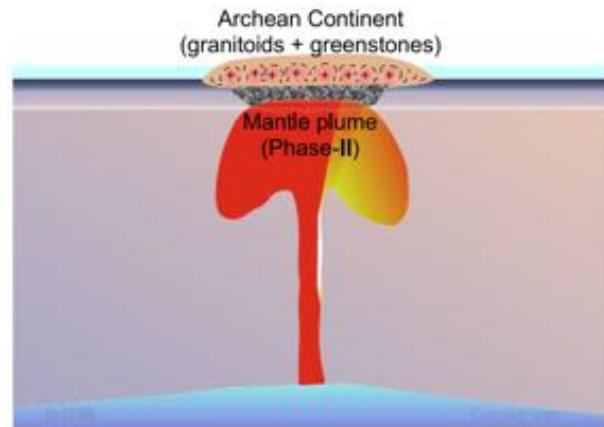
大陆的起源、增生和改造

REVIEW ARTICLE

10.1029/2019RG000689

Origin, Accretion, and Reworking of Continents

Rixiang Zhu^{1,2} , Guochun Zhao^{3,4} , Wenjiao Xiao^{1,2,5}, Ling Chen^{1,2,6} , and Yanjie Tang^{1,2}



大陆的风化、剥蚀和演化

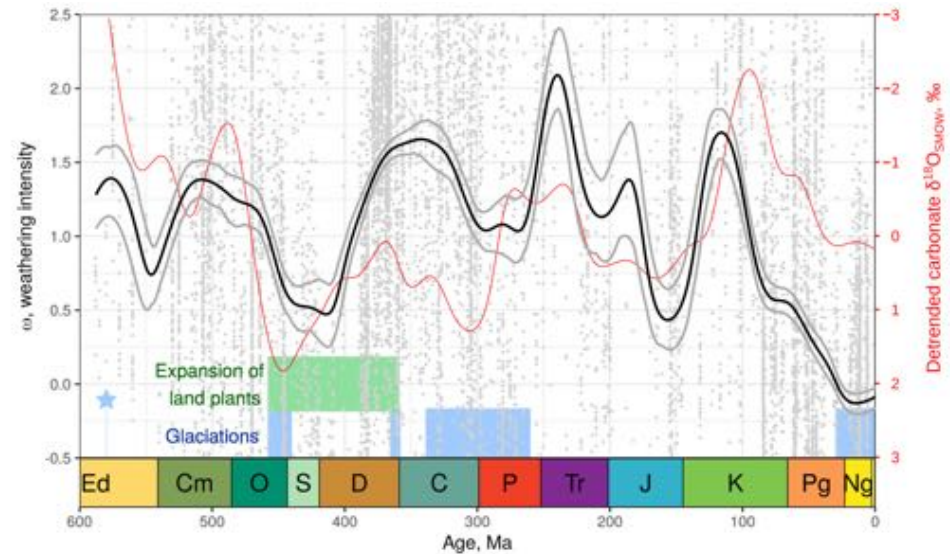
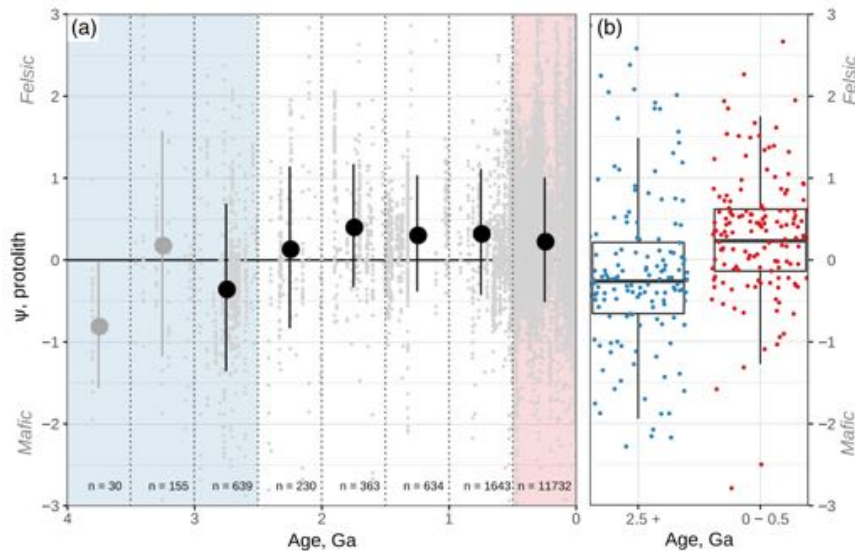
■ The composition and weathering of the continents over geologic time

A.G. Lipp^{1*}, O. Shorttle^{2,3}, E.A. Sperling⁴, J.J. Brocks⁵, D.B. Cole⁶, P.W. Crockford⁷, L. Del Mouro⁸, K. Dewing⁹, S.Q. Dornbos¹⁰, J.F. Emmings¹¹, U.C. Farrell¹², A. Jarrett¹³, B.W. Johnson¹⁴, P. Kabanov⁹, C.B. Keller¹⁵, M. Kunzmann¹⁶, A.J. Miller¹⁷, N.T. Mills¹⁸, B. O'Connell¹⁹, S.E. Peters²⁰, N.J. Planavsky²¹, S.R. Ritzer⁴, S.D. Schoepfer²², P.R. Wilby¹¹, J. Yang²³

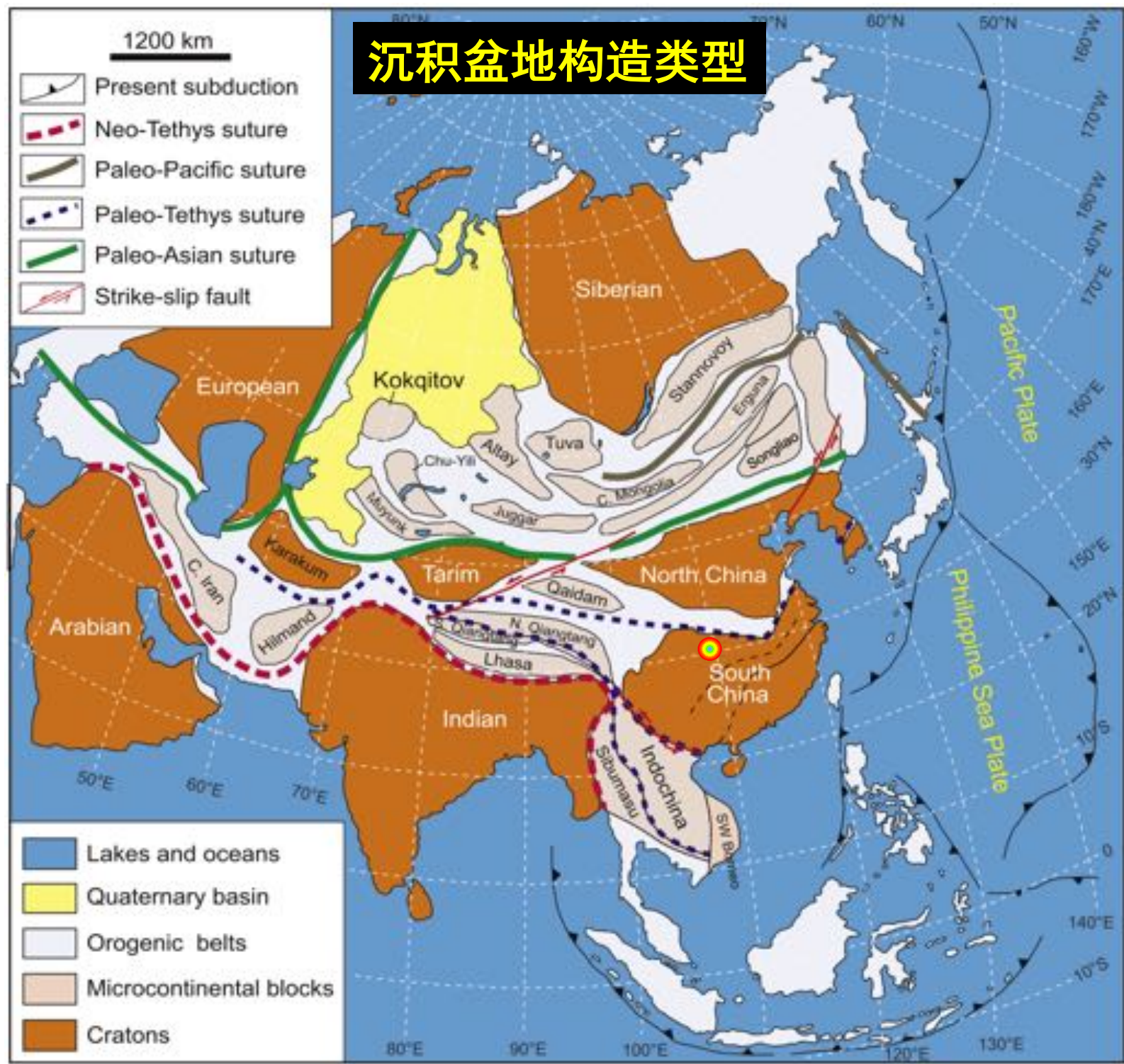


$$x' = UCC + \omega \hat{w} + \psi \hat{p} + E.$$

陆源碎屑沉积组成 =
源岩 + 风化-剥蚀-沉积改造



沉积盆地构造类型



➤ 分类标准：一级分类

标准：邻近板块边界的类型、板块边界的距离、基底的属性

类型：离散型、板内、汇聚型、转换型、混合型、混杂型

1.1 分类标准：次级分类

标准：基底属性、构造位置、沉积充填、继承型

类型：多种盆地类型（命名）

盆地的分类和命名是基于盆地沉积时的特征

Basin classification and nomenclature are based on characteristics of a basin at the time of sedimentation.

同一盆地的单个地层沉积序列可代表多个不同的构造环境

A single stratigraphic succession may represent several different tectonic settings

沉积盆地的演化可以视为一系列不连续的板块构造环境和板块相互作用的结果

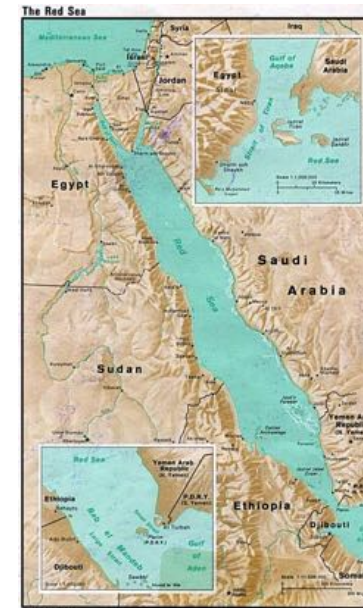
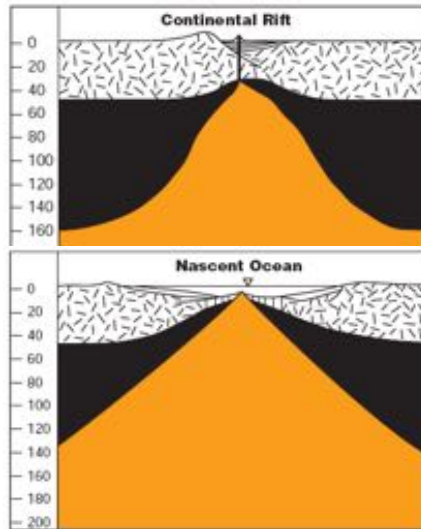
The evolution of a sedimentary basin thus can be viewed as the result of a succession of discrete plate-tectonic settings and plate interactions

盆地主要的沉陷机制：

1. 地壳减薄：伸展拉张、隆升剥蚀、岩浆抽取
2. 地幔岩石圈增厚：变冷过程中软流圈向地幔岩石圈的转变
3. 沉积和火山负载：沉积和火山作用引起的地壳局部均衡补偿/岩石圈区域挠曲
4. 构造负载：逆冲/下拉作用引起的地壳局部均衡补偿/岩石圈区域挠曲
5. 地壳下部负载：高密度岩石圈地垫驱动的岩石圈挠曲
6. 软流圈流动：俯冲岩石圈的拆沉导致的软流圈流动
7. 地壳致密化（变重）：
 - 压力/温度条件的变化导致的地壳密度增大
 - 高密度熔体侵入到低密度的地壳之中

➤ 离散型盆地及命名

Setting	Basin type	Definition	Modern example
Divergent	Continental rifts 大陆裂谷盆地 Nascent ocean basins and continental margins 初始大洋盆地和大陆边缘盆地	Rifts within continental crust, commonly associated with bimodal magmatism Incipient ocean basins floored by new oceanic crust and flanked by young rifted continental margins	Rio Grande rift Red Sea



➤ 板内型盆地及命名

3.1 板内大陆边缘盆地

a. 陆架-陆坡-陆隆结构

b. 转换型结构

c. 堤坝型结构

3.2 内克拉通盆地

3.3 大陆地台

3.4 活动大洋盆地

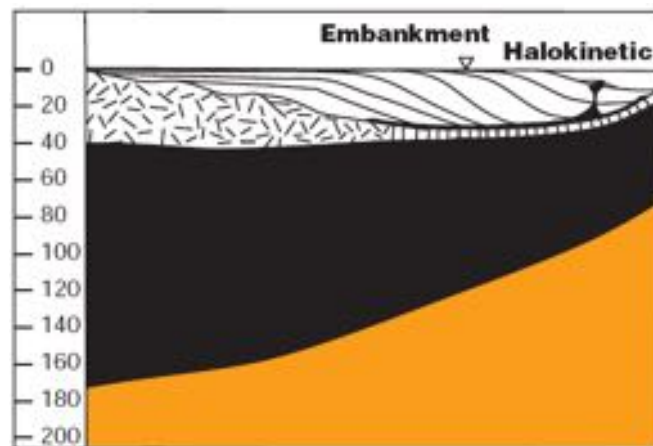
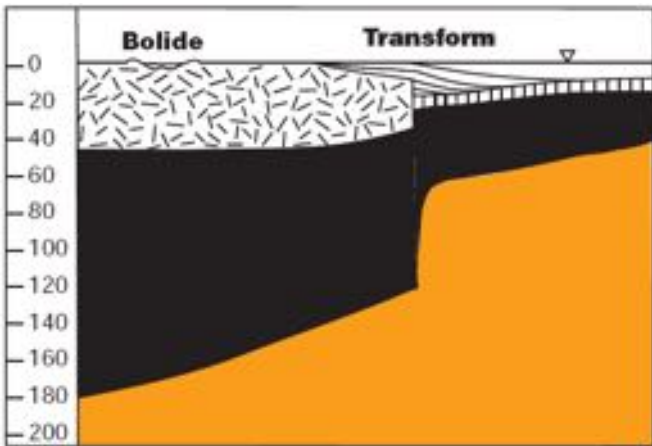
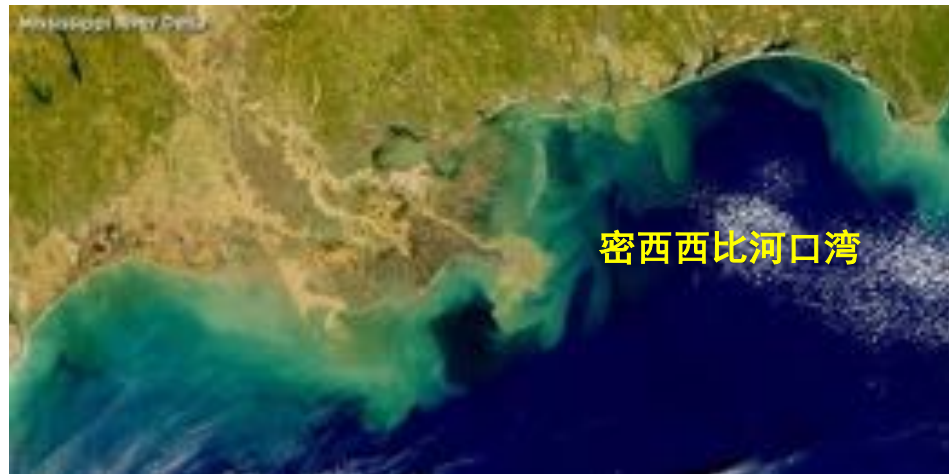
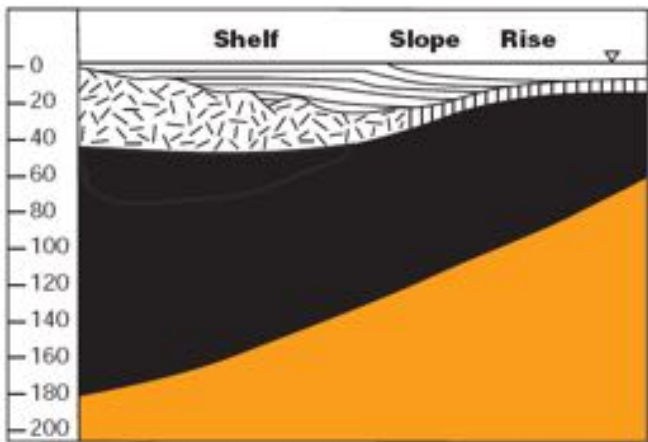
3.5 洋岛

a. 海山

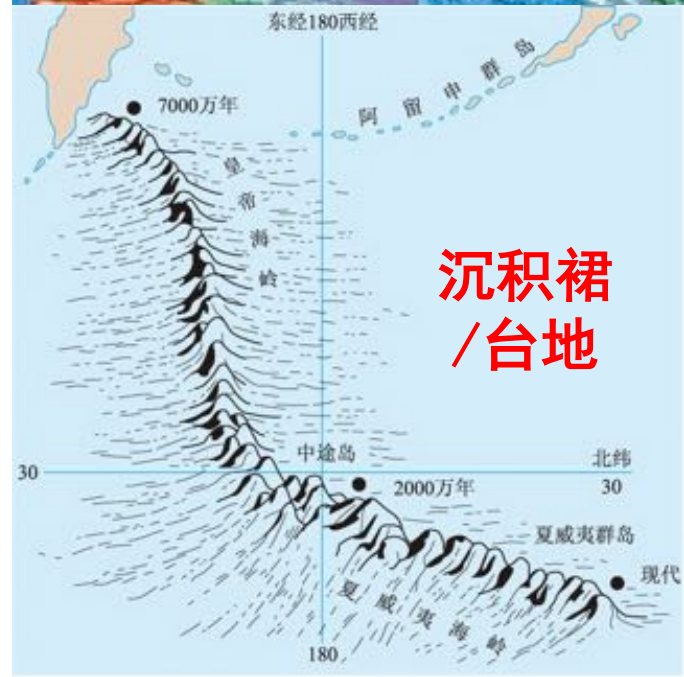
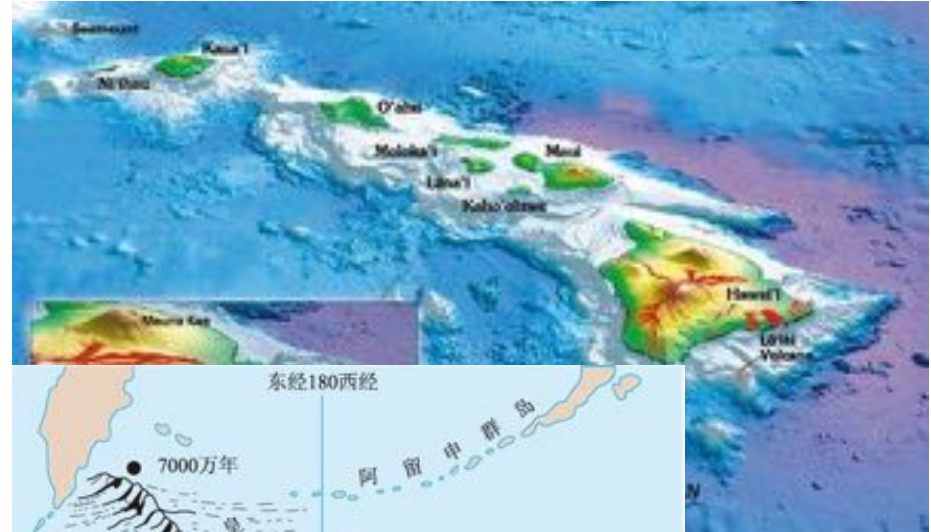
b. 无震海岭和高原

3.6 休眠大洋盆地

Setting	Basin type	Definition	Modern example
Intraplate	● Intraplate continental margins <i>Shelf-slope-rise configuration</i>	Mature rifted intraplate continental margins with shelf edge near boundary between continental and oceanic crust	East Coast of USA
	<i>Transform configuration</i>	Intraplate continental margins that originate along transform plate boundaries	South Coast of West Africa
	<i>Embankment configuration</i>	Progradational intraplate continental margins with shelf edge above oceanic crust	Mississippi River Gulf Coast
	● Intracratonic basins	Broad cratonic basins underlain by fossil rifts	Chad basin
	● Continental platforms	Stable cratons with thin and laterally extensive sedimentary strata	Barents Sea
	● Active ocean basins	Basins floored by oceanic crust formed at active divergent plate boundaries unrelated to arc-trench systems	Pacific Ocean
	● Oceanic islands, seamounts, aseismic ridges, and plateaus	Sedimentary aprons and platforms formed in intraoceanic settings other than arc-trench systems	Emperor-Hawaii seamounts
● Dormant ocean basins	Basins floored by oceanic crust, which is neither spreading nor subducting	Gulf of Mexico	







➤ 汇聚型盆地及命名

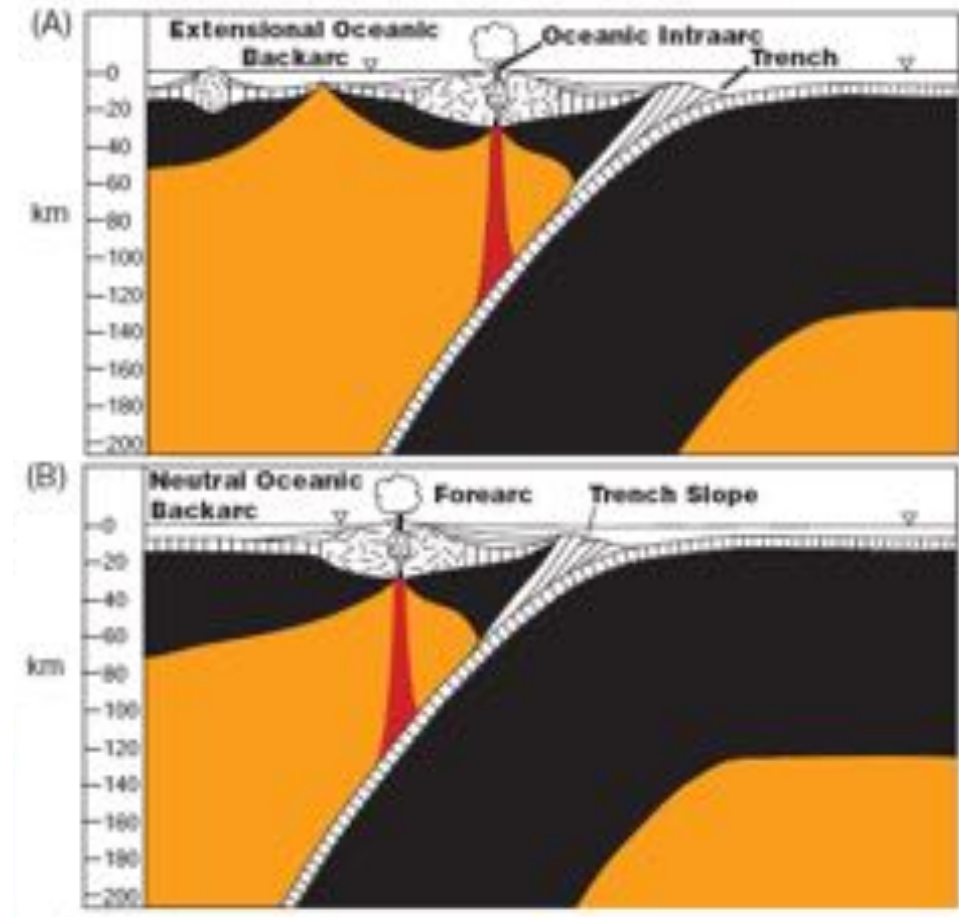
俯冲沟-弧-盆系统

海沟盆地、海沟斜坡盆地(新-老)、

弧前盆地(forearc basin)

弧内盆地(intraarc basin)：大洋、大陆

弧后盆地(backarc basin)：大洋、大陆



俯冲-碰撞造山系统

残留洋盆、弧后前陆盆地

(retroarc foreland basin)

后陆盆地

(collisional retroforeland basin)、

前陆盆地

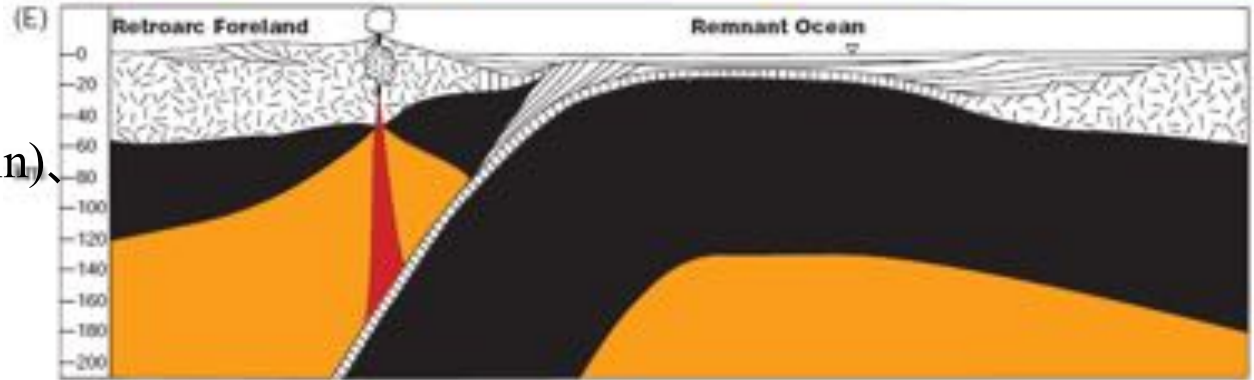
(proforeland basin)

内陆盆地(hinterland basin 造山带内部)、楔

顶盆地(wedgetop basin)

弧背前陆盆地

残留洋盆

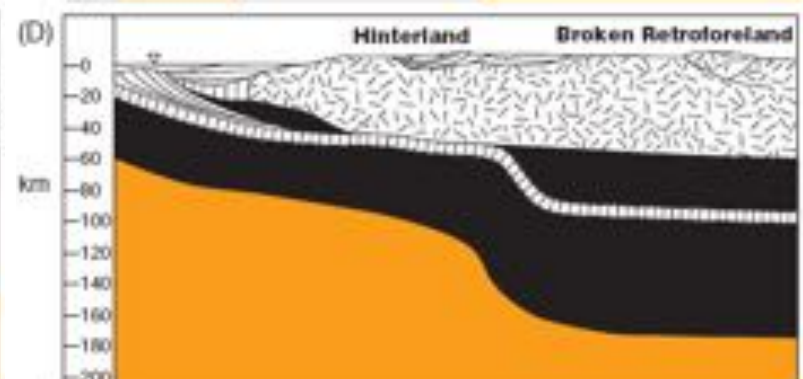


碰撞弧背前陆盆地

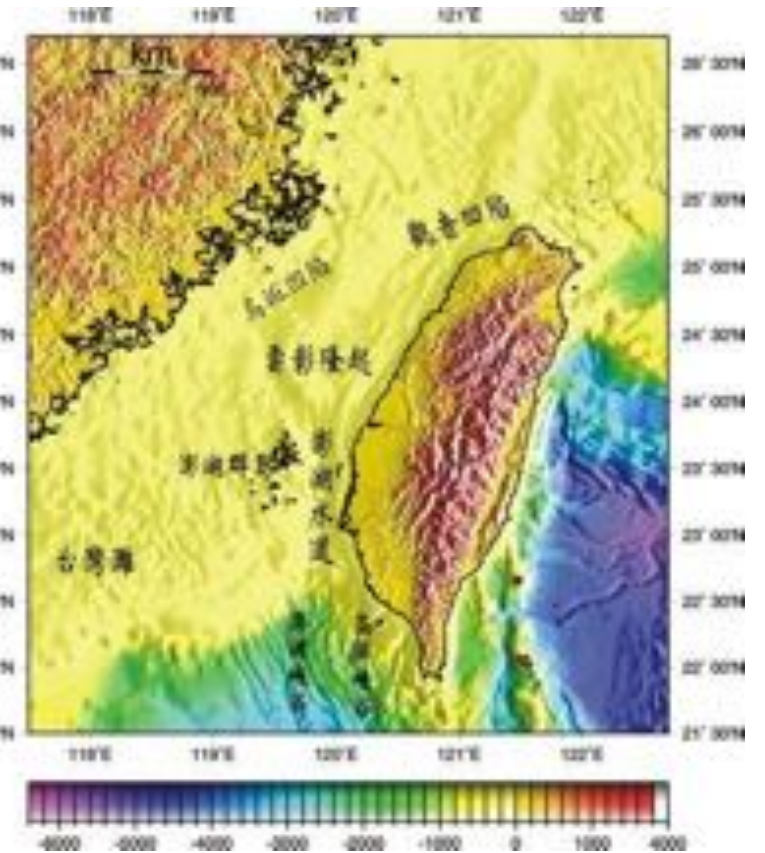
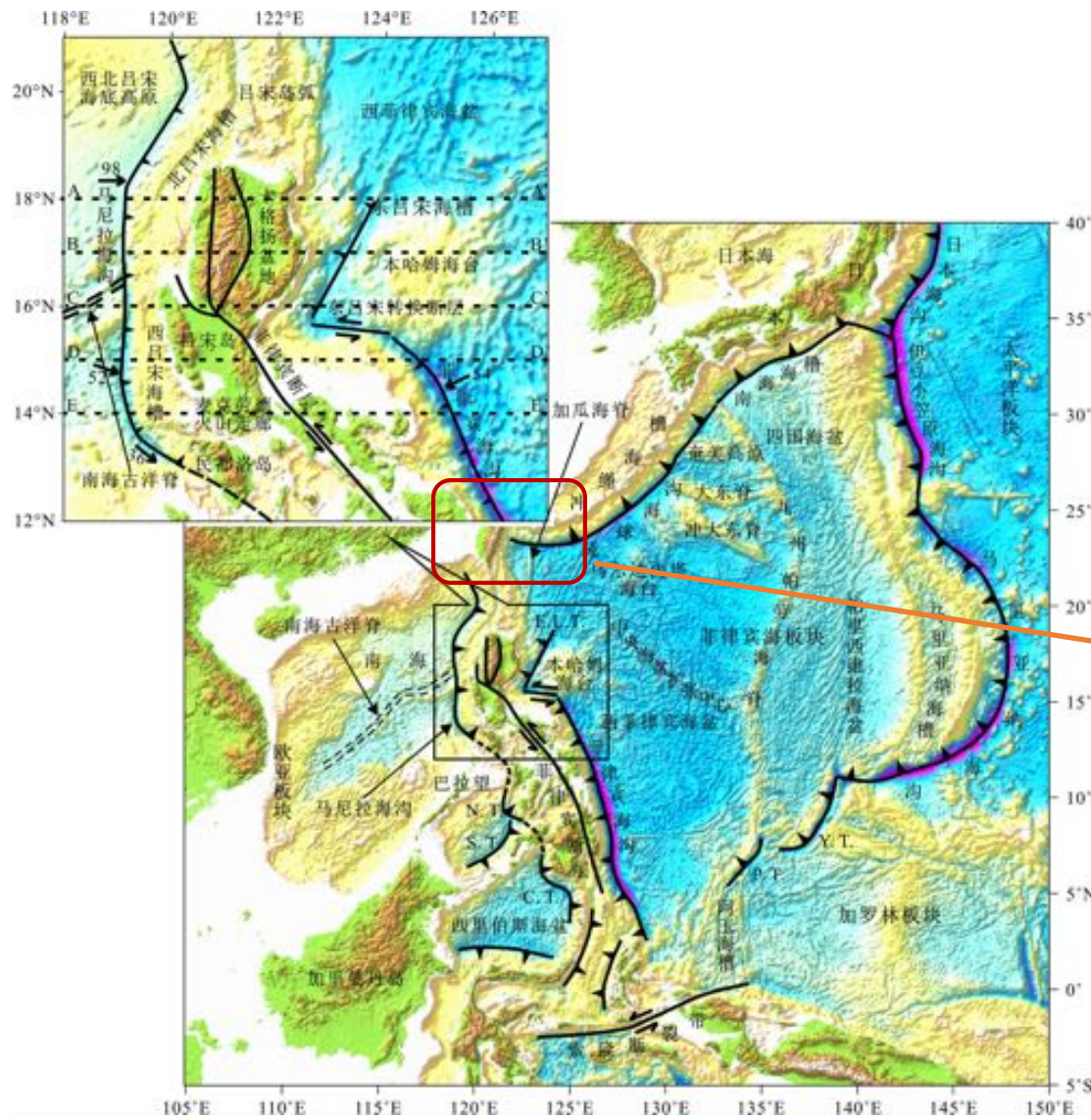
周缘前陆盆地

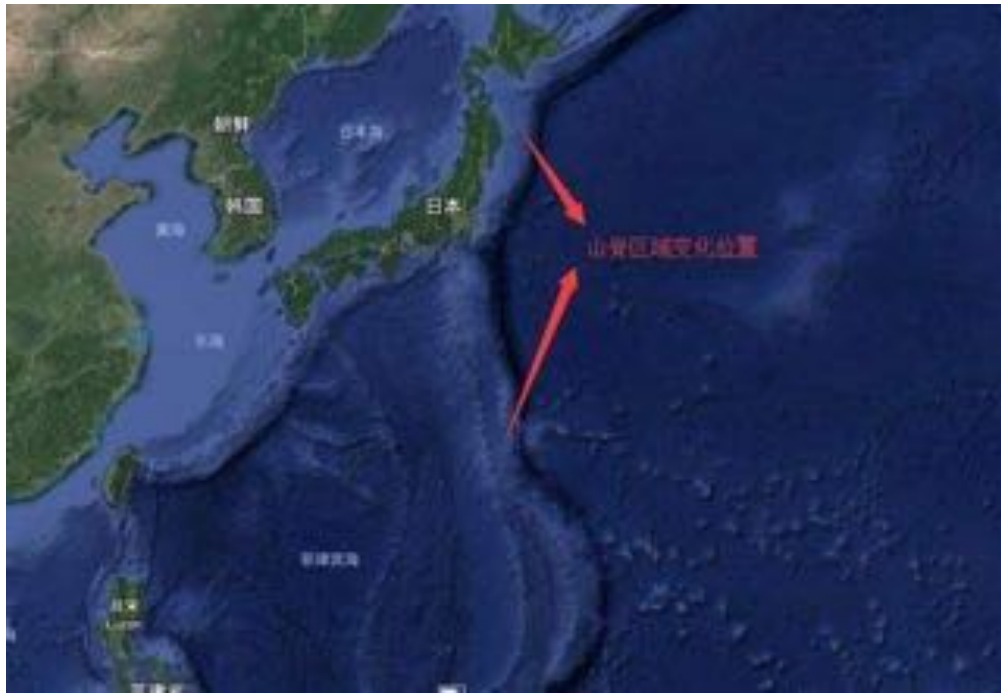
后陆

破裂前陆

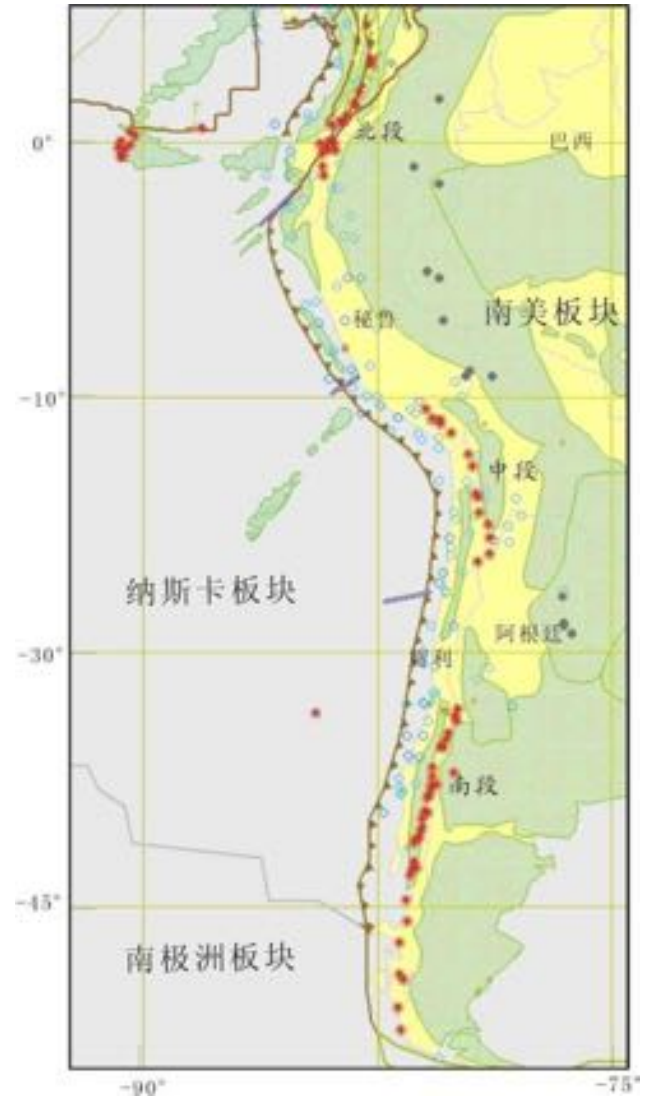


沟-弧-盆体系 弧-陆碰撞造山





大洋弧后盆地
 大陸弧后盆地
 弧后前陸盆地

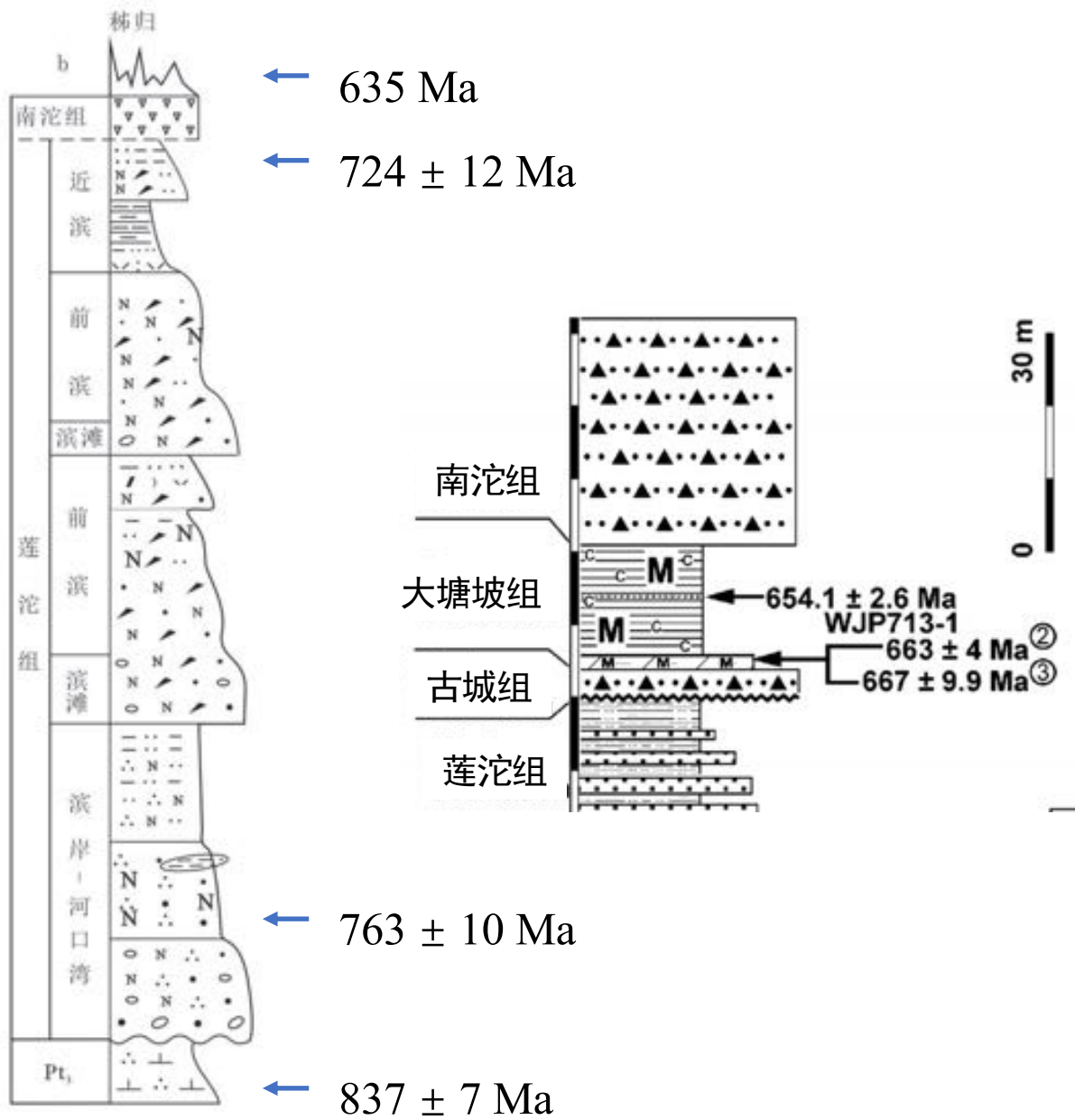


周缘前陆盆地vs. 碰撞型弧后前陆盆地



秭归地区的陆源碎屑沉积与构造演化





南沱组：冰期沉积

大塘坡组：浅海含锰沉积

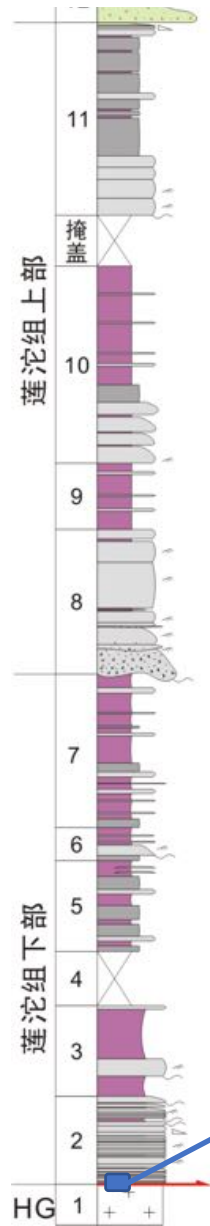
古城组：冰期沉积

莲沱组：河流-三角洲
-滨浅海

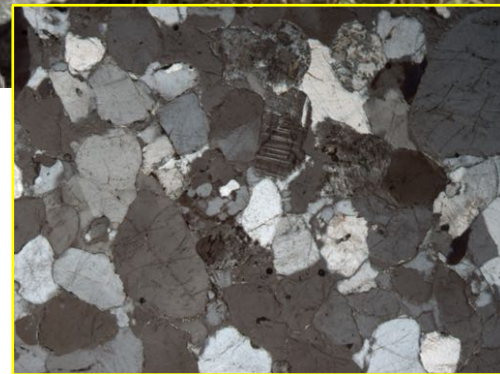
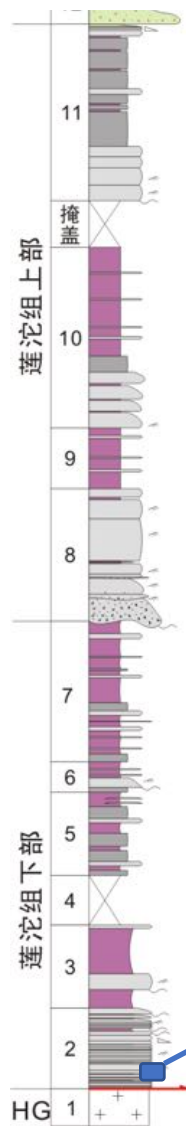
780-714 Ma

高维和张传恒, 2009; Liu et al., 2015; 景先庆等, 2018

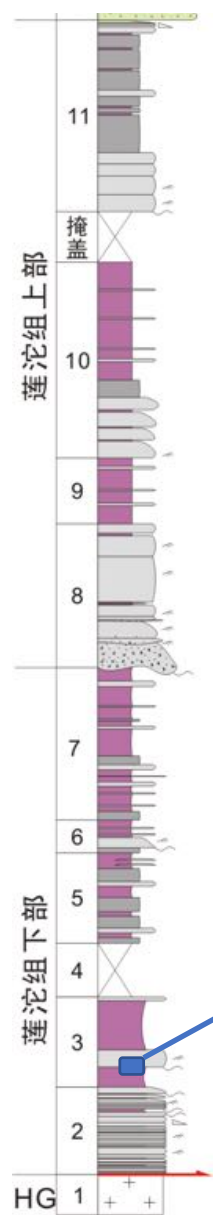
青林口：莲沱组剖面



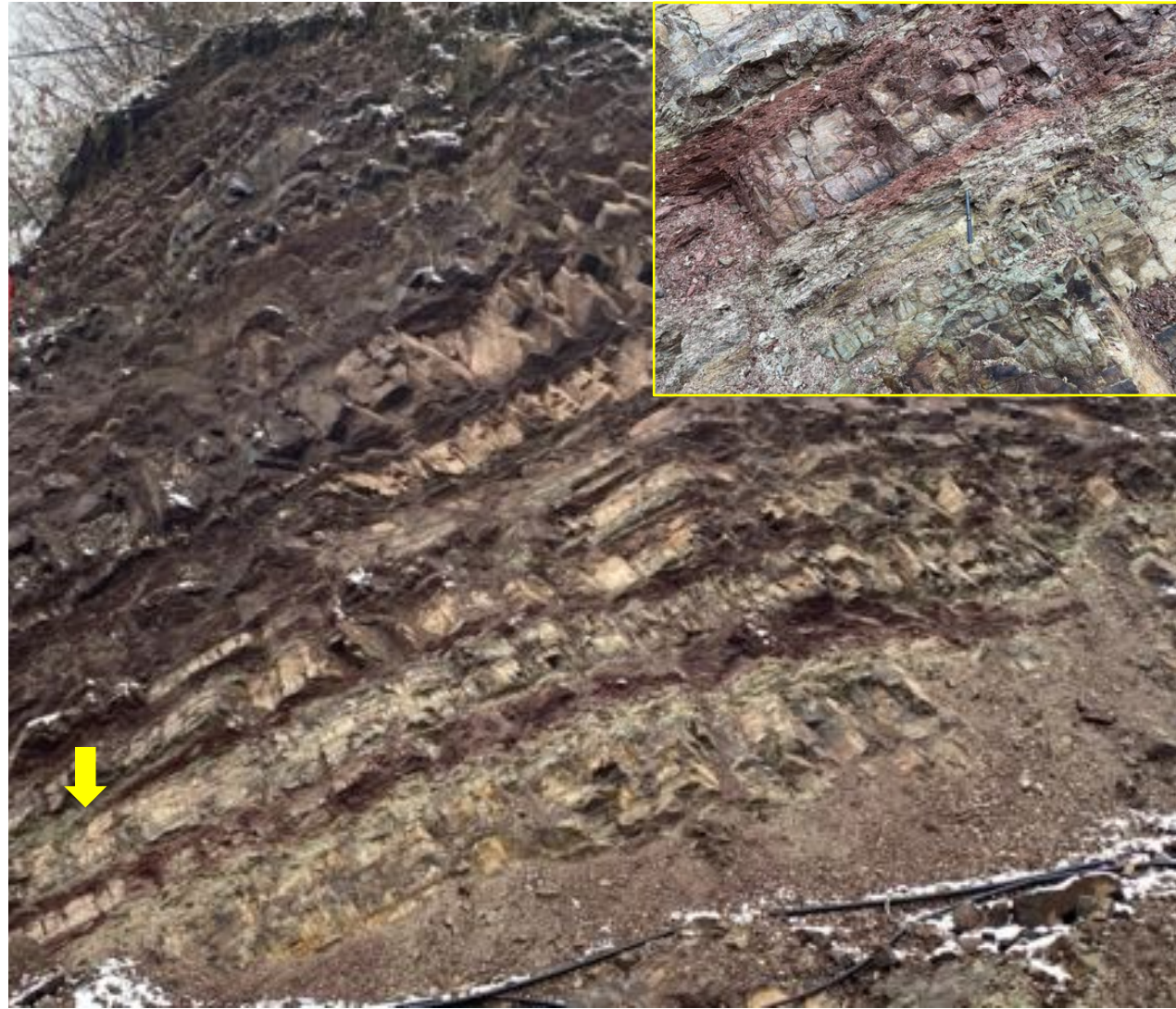
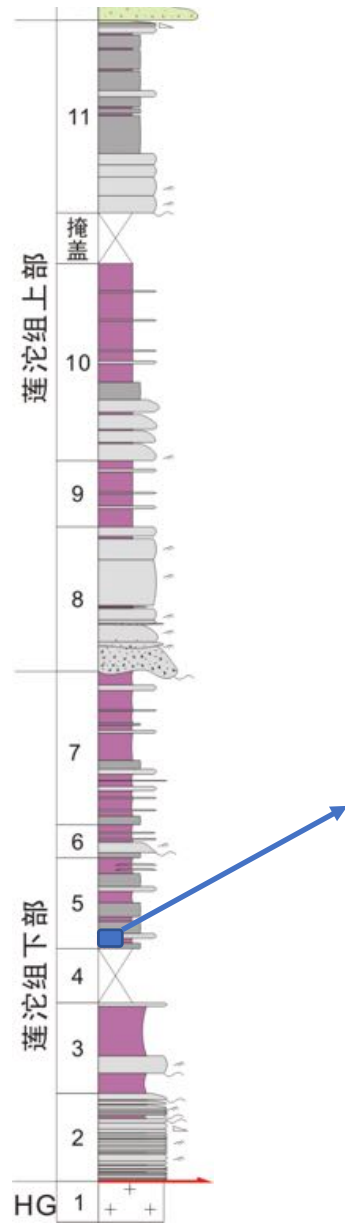
□ 典型沉积现象



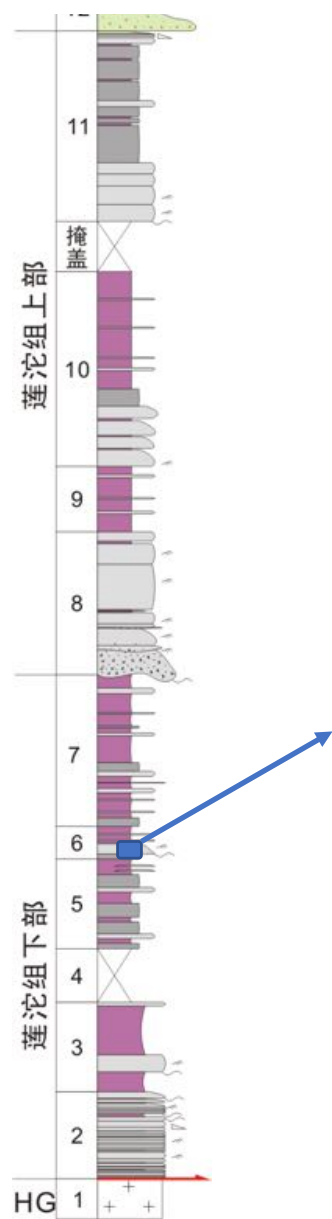
□ 典型沉积现象



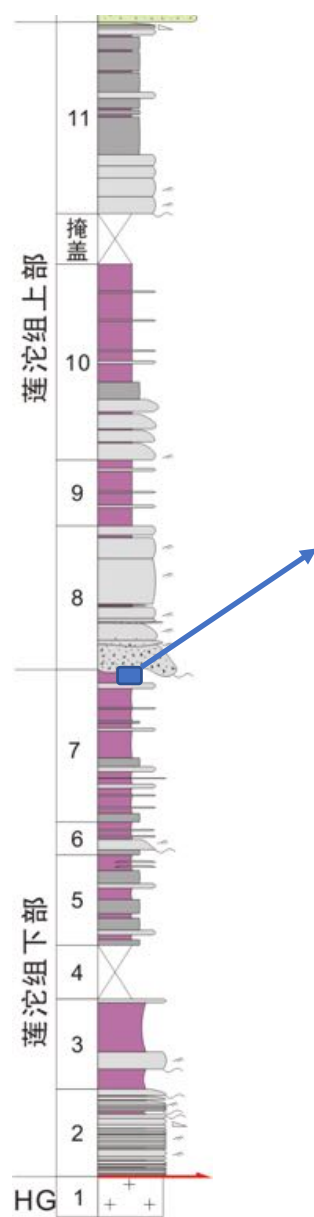
□ 典型沉积现象



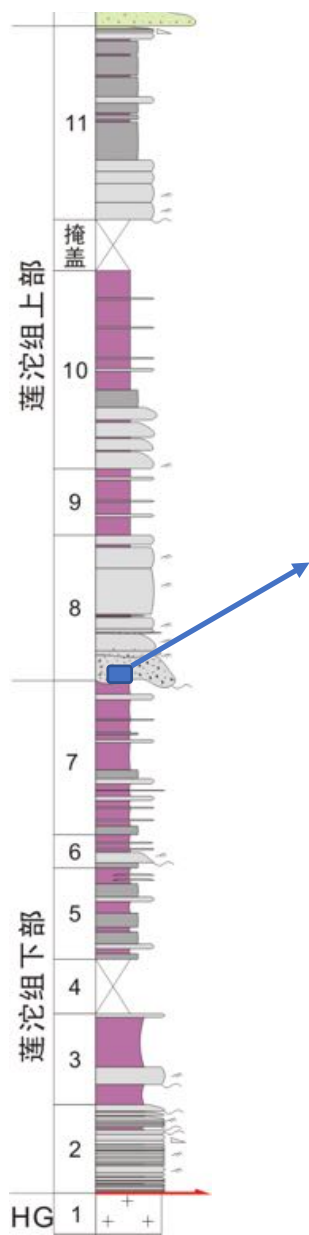
□ 典型沉积现象



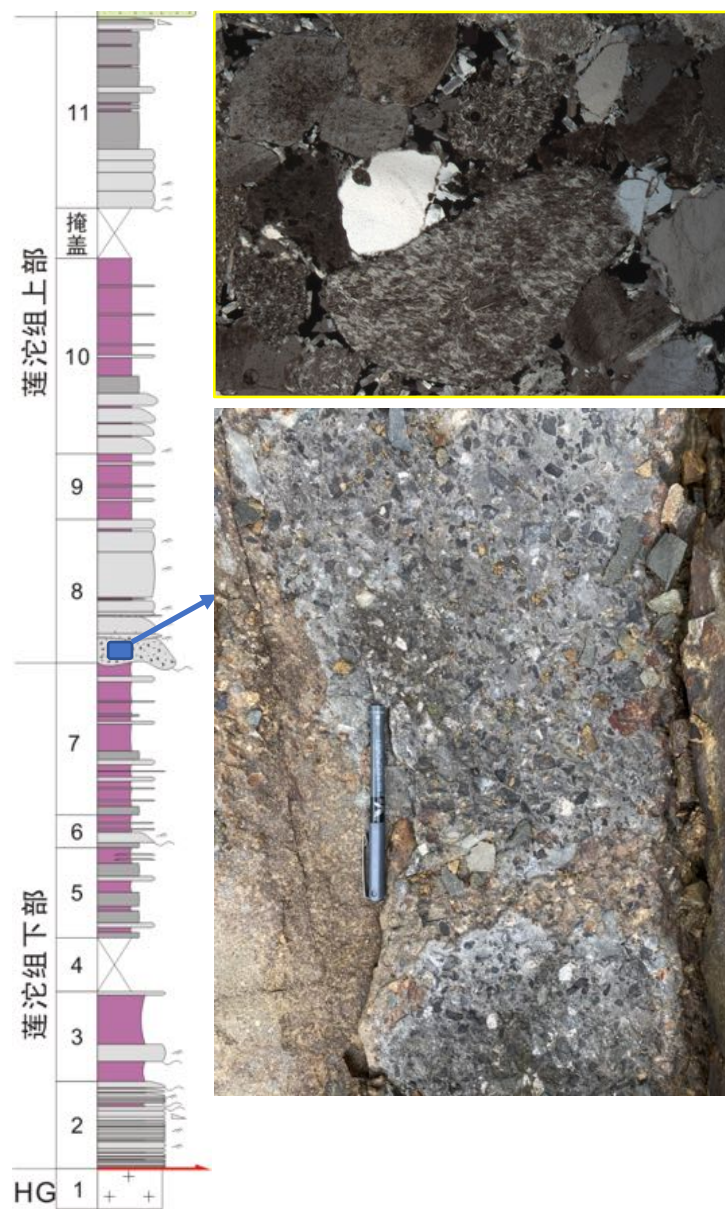
□ 典型沉积现象



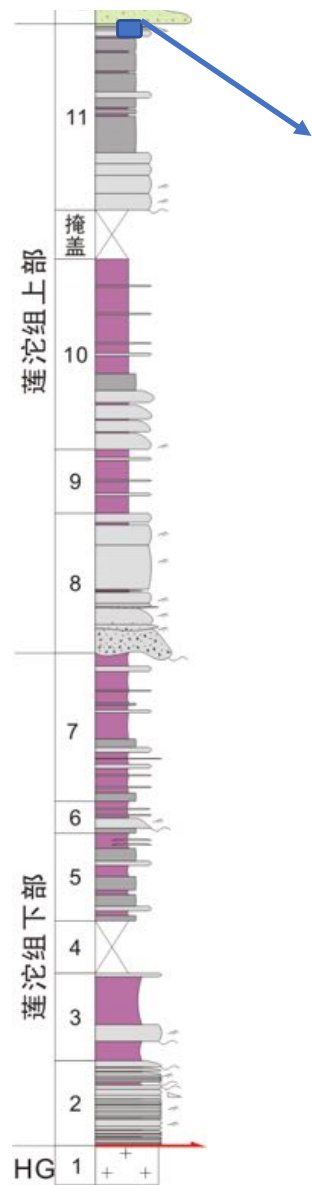
□ 典型沉积现象



□ 典型沉积现象



□ 典型沉积现象



高家堰：莲沱组剖面



□ 郭家坝-文化：三叠-侏罗纪地层

地层系统		地层分区	年龄 Ma	扬子北缘		
				四川盆地北部	秭归盆地	当阳盆地
侏罗系	下侏统	174	白田坝组	桐竹园组	桐竹园组	
		201				
三叠系	上三统	235	须家河组	九里岗组	王龙滩组	
					九里岗组	
	中三统	247	雷口坡组	巴东组	巴东组	

下三叠统

大冶组-嘉陵江组



A

两河口剖面

巴东组



B

两河口剖面

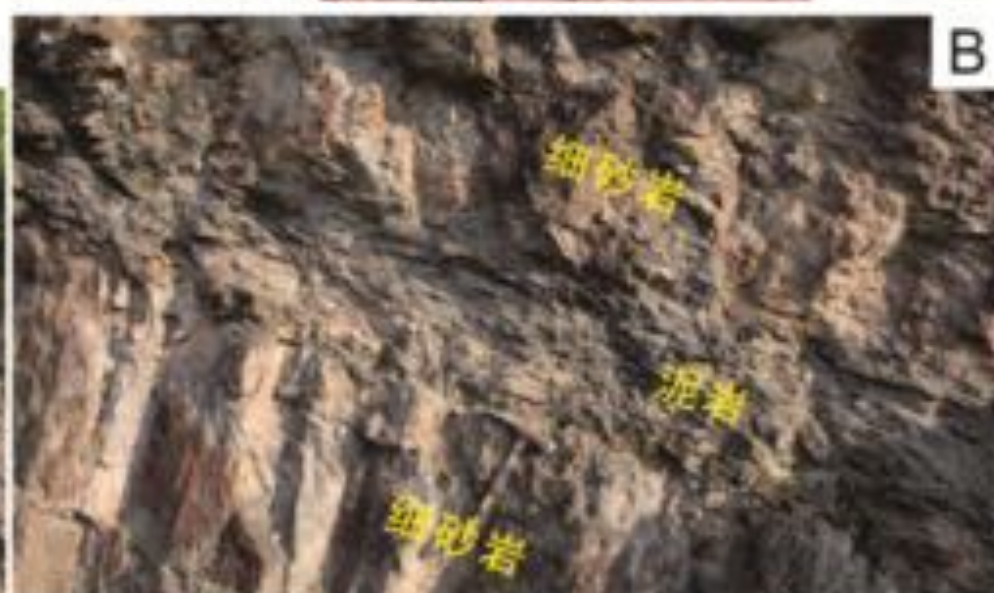
巴东组



A

两河口剖面

九里岗组



B

两河口剖面

九里岗组

桐竹园组



文化剖面

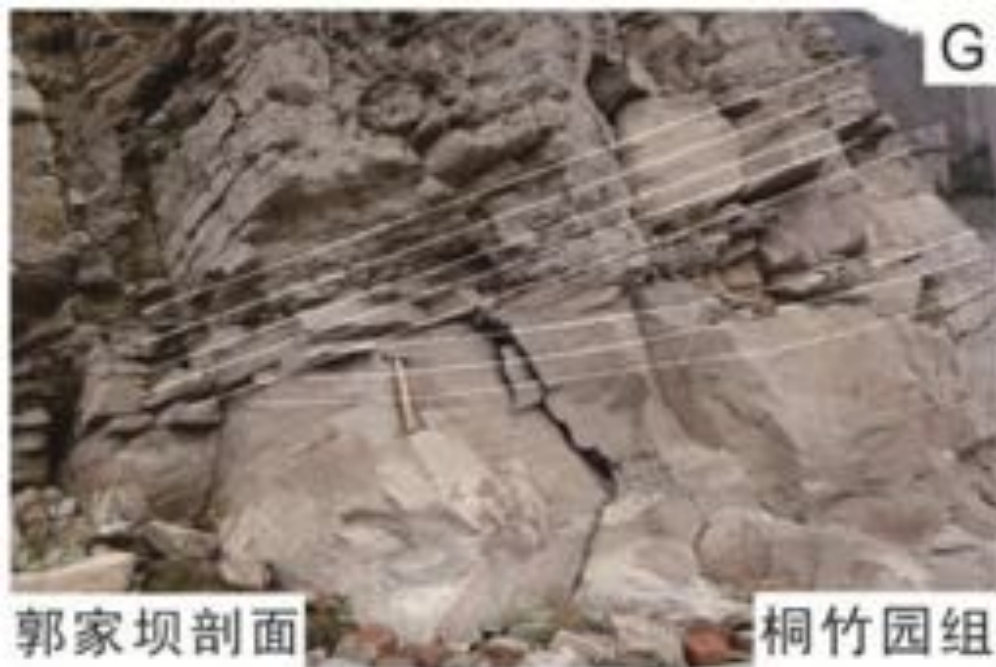
G 桐竹园组



H

九里岗组 郭家坝剖面

九里岗组



郭家坝剖面

G

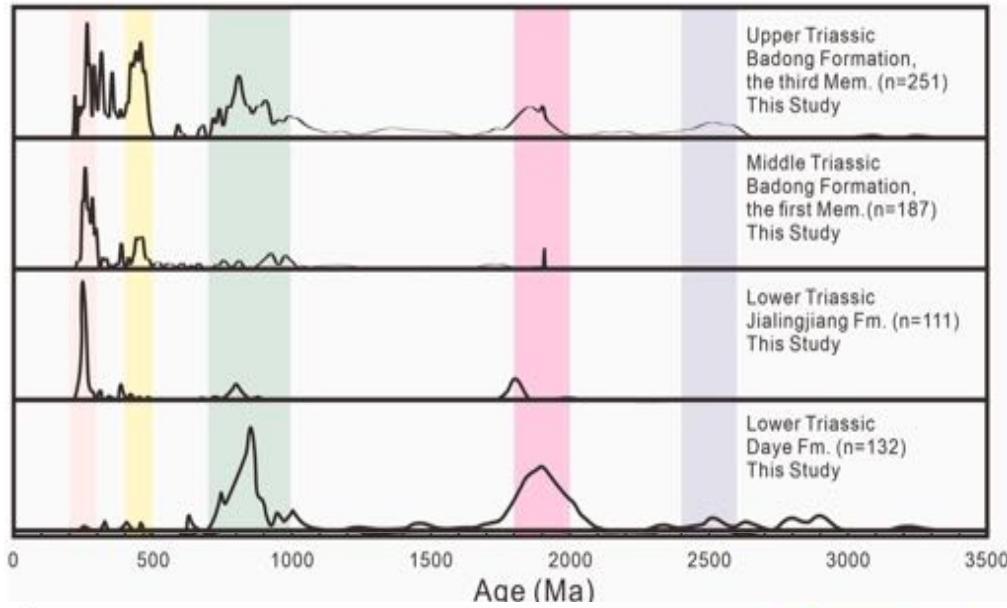


H

桐竹园组 郭家坝剖面

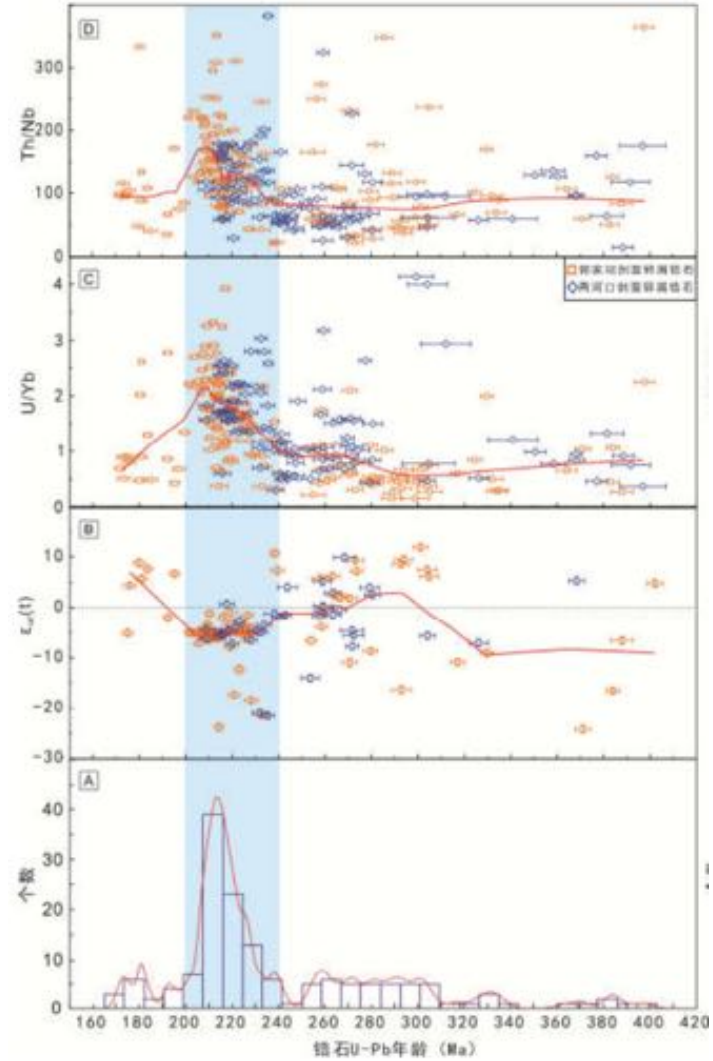
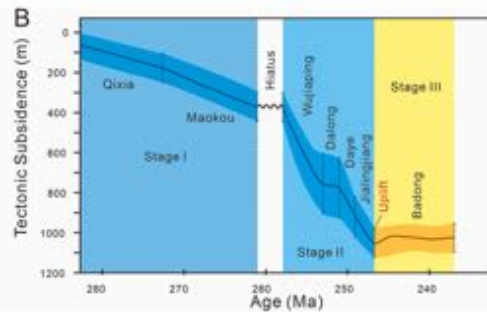
桐竹园组

碎屑沉积物源分析、盆地折返模型、沉积相和环境分析、地层定年



A

Age (Ma)	Formation	Thickness (m)	Paleowater depth (m)	Paleowater depth error (m)	References
232-237	Jialing	50	None		11
237-232	The third Member, Badong	400	0-15	10	10
242-237	The second Member, Badong	300	15-30	10	9
247-242	The first Member, Badong	400	0-10	10	8
260-247	Jialingjiang	787	0-80	25	7
262-260	Daye	661	50-200	50	6
254-262	Dalong	20	200-400	50-100	5
258-254	Wujiaoping	128	0-60	10	4
261-258			Halitus		3
272-261	Maokou	182	20-60	10	2
263-272	Qixia	128	20-60	10	1



Chai et al., 2020; Ma et al., 2021;
 马千里等, 2020; 柴嵘等, 2016;
 未刊数据

碎屑沉积物源分析、盆地折返模型、沉积相和环境分析、地层定年

早三叠世碳酸盐岩潮坪—

中三叠世碎屑岩潮坪—

中-晚三叠世冲积平原—

晚三叠世三角洲—

早侏罗世早期砾质辫状河—

早侏罗世曲流河沉积

初始碰撞造山

地壳快速增厚

大规模前陆逆冲推覆

造山带隆升剥蚀

Chai et al., 2020; Ma et al., 2021; 马千里等, 2020; 柴嵘等, 2016; 未刊数据

谢谢！！