



中国地质调查局  
CHINA GEOLOGICAL SURVEY

# Metallogenic Regularity and Resource Potential of Gold Deposits in China

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**Comprehensive Survey Command Center for Natural Resources  
China Geological Survey**

**April 2023**

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# 1. Current Situation of Gold Resources in China

## 1. Widely distribution of gold deposit with huge reserves

Gold deposits are mainly distributed in Shandong, Gansu, Inner Mongolia, Yunnan, Henan, Xinjiang, Heilongjiang, and other provinces



By the end of 2021

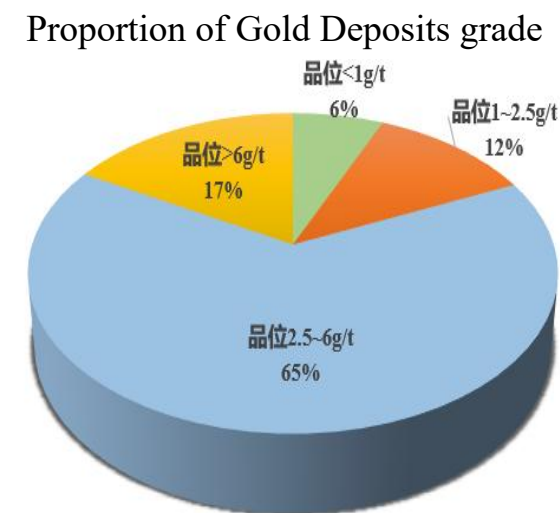
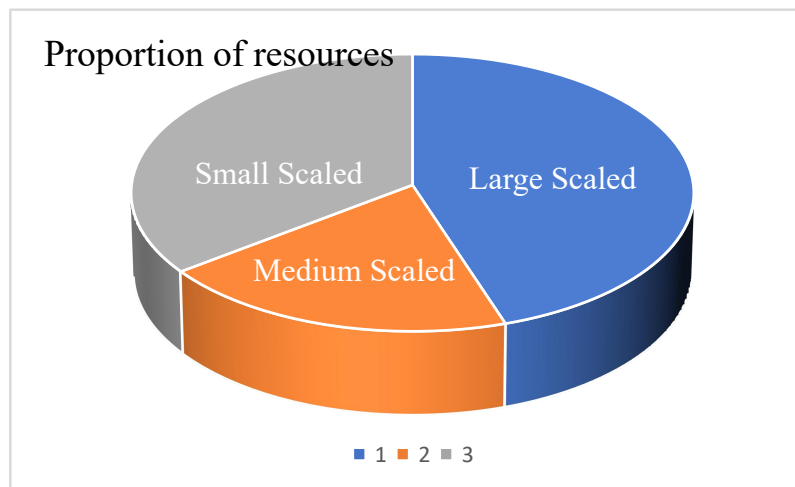
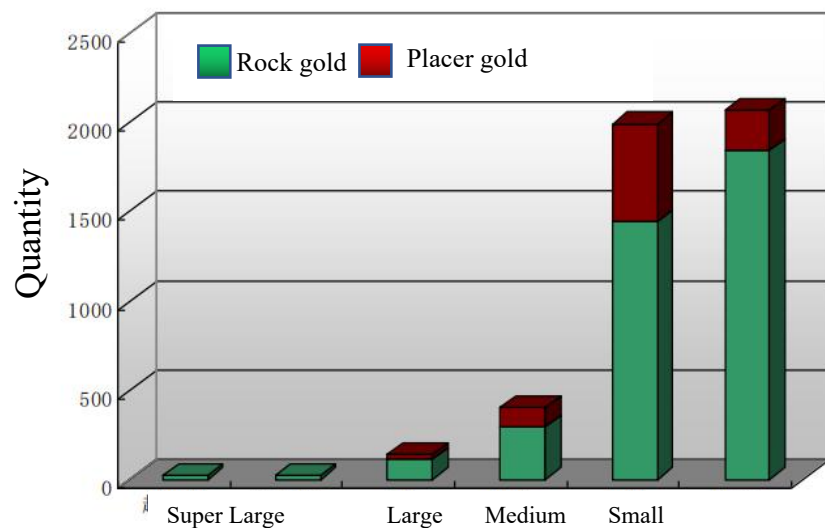
- Total Identified Resources of gold : 15341 t
- Total Identified Quantity of goldfields: 3694



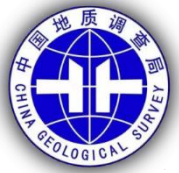
# 1. Current Situation of Gold Resources in China

## 2. Large-scale and superlarge-scale gold deposits with large resources account for a low proportion

- By quantity, only 4% are large or superlarge-scaled, while 96% are small and medium-scaled.
- By resource, large and superlarge-scaled gold deposits account for 45% (6616 tons), small and medium-scaled gold deposits account for 55%.
- Rock gold is the main ore type, with a resource reserve of 12809 tons, accounting for 83%.
- The average grade of gold deposits is **5.1 g/t**.







# 1. Current Situation of Gold Resources in China

**New breakthroughs have been made in gold prospecting in Jiaodong, Gannan, Zhenfeng Pu'an, Guizhou, and other areas**

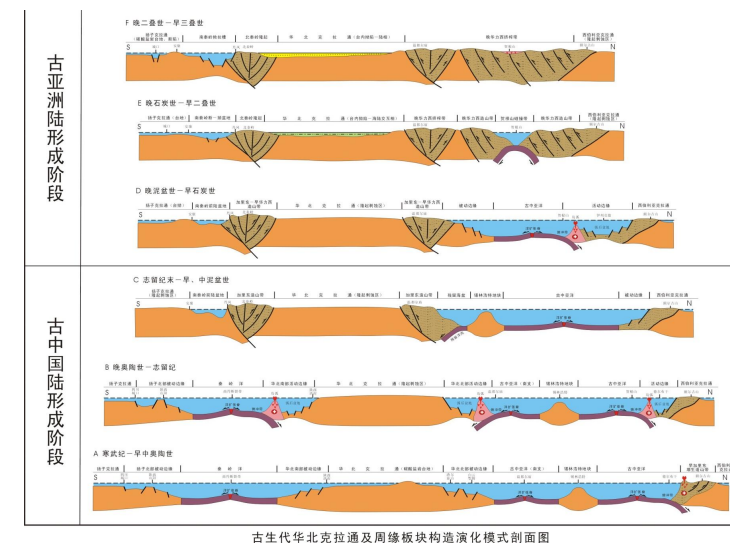
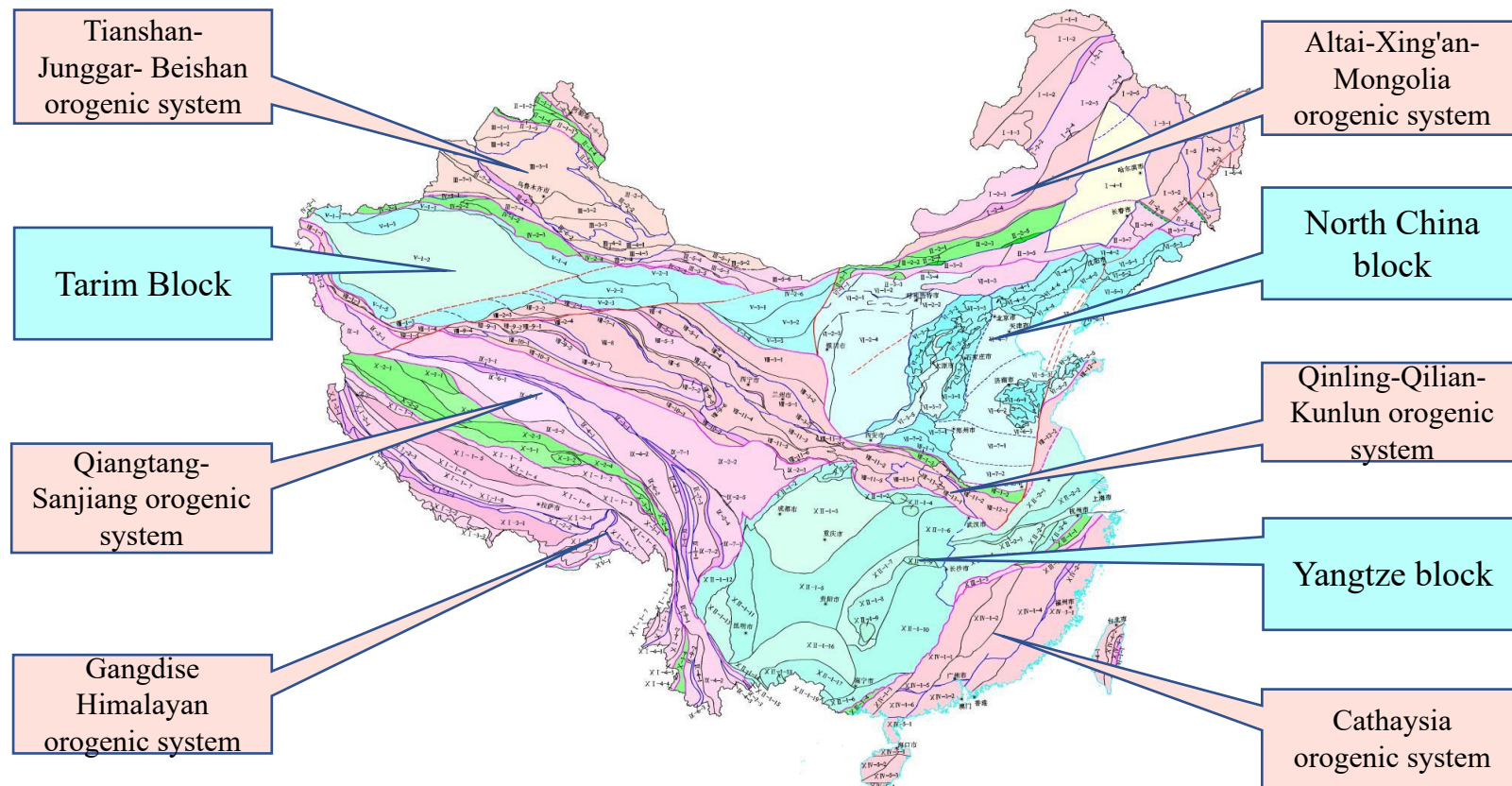
No.	Gold resource base	scale
1	Jiaodong, Shandong Province	>4000 t
2	Xiaoqinling - Xiong'er Mountains Henan Province	kiloton class
3	Gannan, Gansu Province	kiloton class
4	Pingjiang - Liling, Hunan Province	kiloton class
5	Eastern Kunlun Qinghai Province	>700t
6	Zhenfeng - Pu'an, Guizhou Province	The Largest Carlin-type gold deposit
7	Zijinshan Longyan, Fujian Province	>300 t
8	Gold resource base Eastern Liaoning Province	>500 t





## 2. Metallogenic Background of Gold Deposits

- Located at the intersection of the three tectonic domains of ancient Asia, Tethys, and the Pacific Rim, and its tectonic nature belongs to an unstable ancient land
- A composite continent composed of three blocks, six orogenic systems, and six docking zones
- Highlight of geotectonics: Archipelagic arc-basin system and Multicycle orogeny



古生代华北克拉通及周缘板块构造演化模式剖面图

The Map of Geotectonic Zoning in China(Pan, 2015)





## 2. Metallogenic Background of Gold Deposits

**(1) The most important distribution areas of gold deposits: Continental margin and exposed areas of folded basement of the orogenic system**

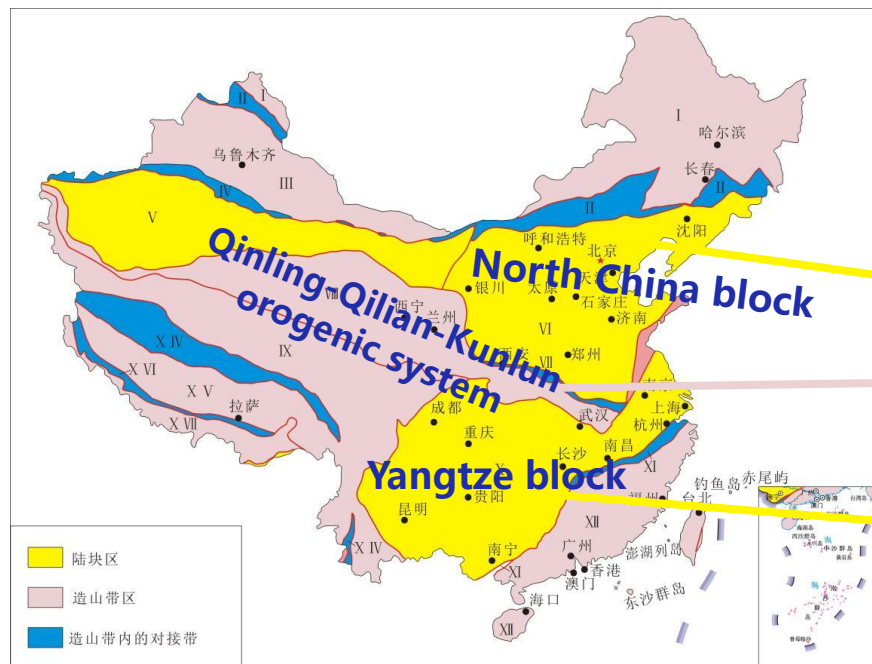


Table 2 Distribution of gold deposits in different geotectonic units in China

序号	构造单元	金矿床个数				总数	总数比例/%
		超大型	大型	中型	小型		
1	阿尔泰—兴蒙造山系(I)		6	9	34	49	3.12
2	额尔齐斯—西拉木伦对接带(II)		4	5	48	57	3.63
3	天山—准噶尔—北山造山系(III)		3	18	36	57	3.63
4	南天山对接带(IV)		1	1	6	8	0.51
5	塔里木陆块区(V)			7	19	26	1.65
6	华北陆块区(VI)	6	38	98	413	555	35.31
7	宽坪—佛子岭对接带(VII)				9	9	0.57
8	秦—祁—昆造山系(VIII)	2	18	34	172	226	14.38
9	羌塘—三江造山系(IX)	3	5	17	58	83	5.28
10	班公湖—双湖—怒江—昌宁—孟连对接带(X)			2	3	5	0.32
11	冈底斯—喜马拉雅造山系(XI)		3	10	19	32	2.04
12	扬子陆块区(XII)	2	21	46	288	357	22.71
13	江绍—郴州—钦防对接带(XIII)				14	14	0.89
14	武夷—云开造山系(XIV)	1	5	7	81	94	5.98
合计		14	104	254	1 200	1 572	100.00

Proportion in the total number of gold deposits

35.13%

14.38%

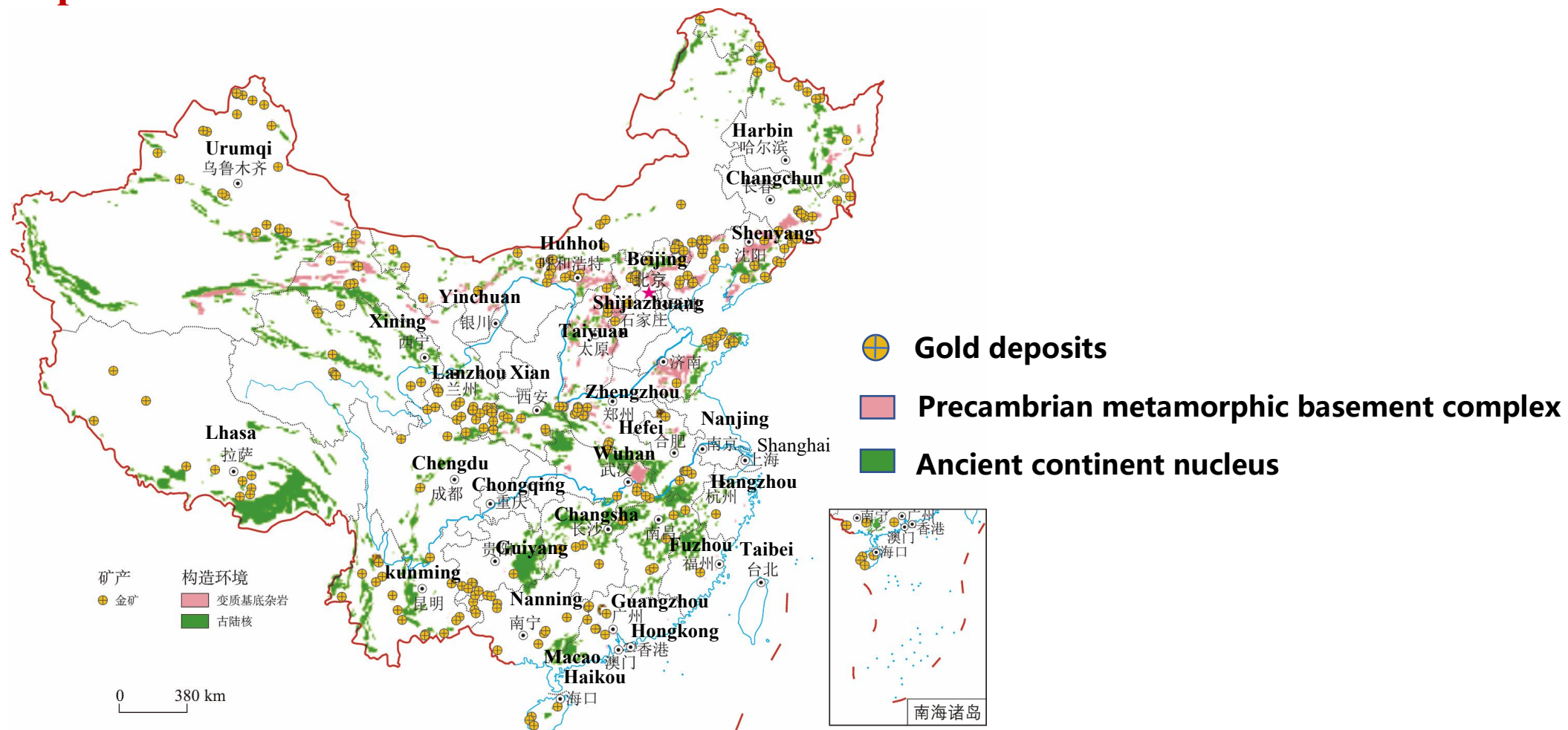
22.71%

These areas have a long and complex history of geological activity, with the development of primitive gold-bearing rock series, strong tectonic, magmatic intrusion, and volcanic activity, providing a superior geological environment for the activation, migration, and mineralization of gold.



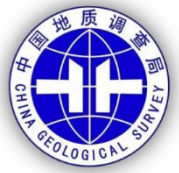
## 2. Metallogenic Background of Gold Deposits

(2) Important distribution areas of rock gold deposits: the distribution of Precambrian metamorphic rock and active area of Precambrian basement



The Distribution of Gold Deposits and Precambrian Basement



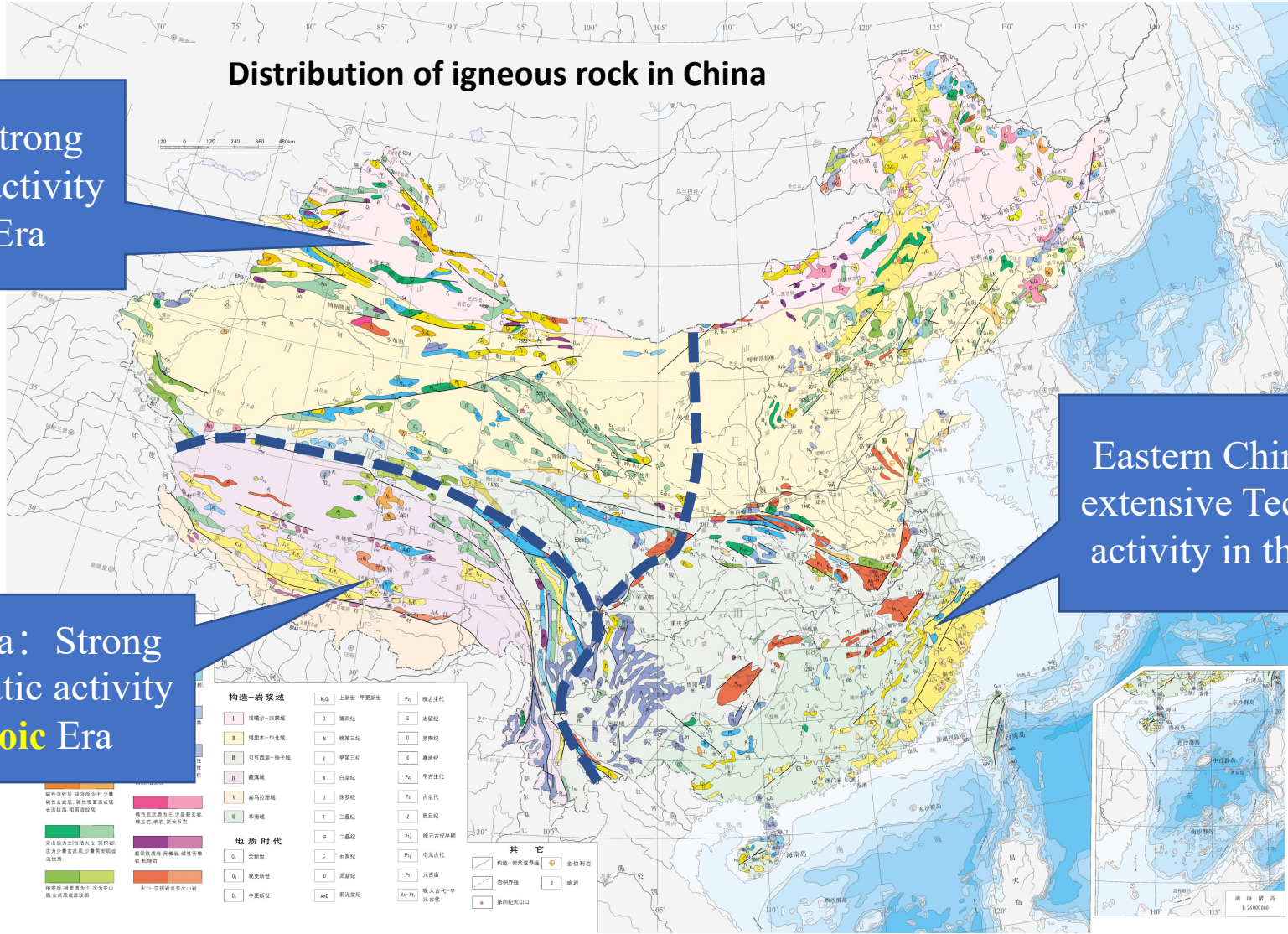


## 2. Metallogenic Background of Gold Deposits

### (3) The concentrated areas of gold deposits: Tectonic-Magmatic activity belts of different ages

Northwest China: Strong Tectonic-Magmatic activity in the **Paleozoic** Era

Distribution of igneous rock in China



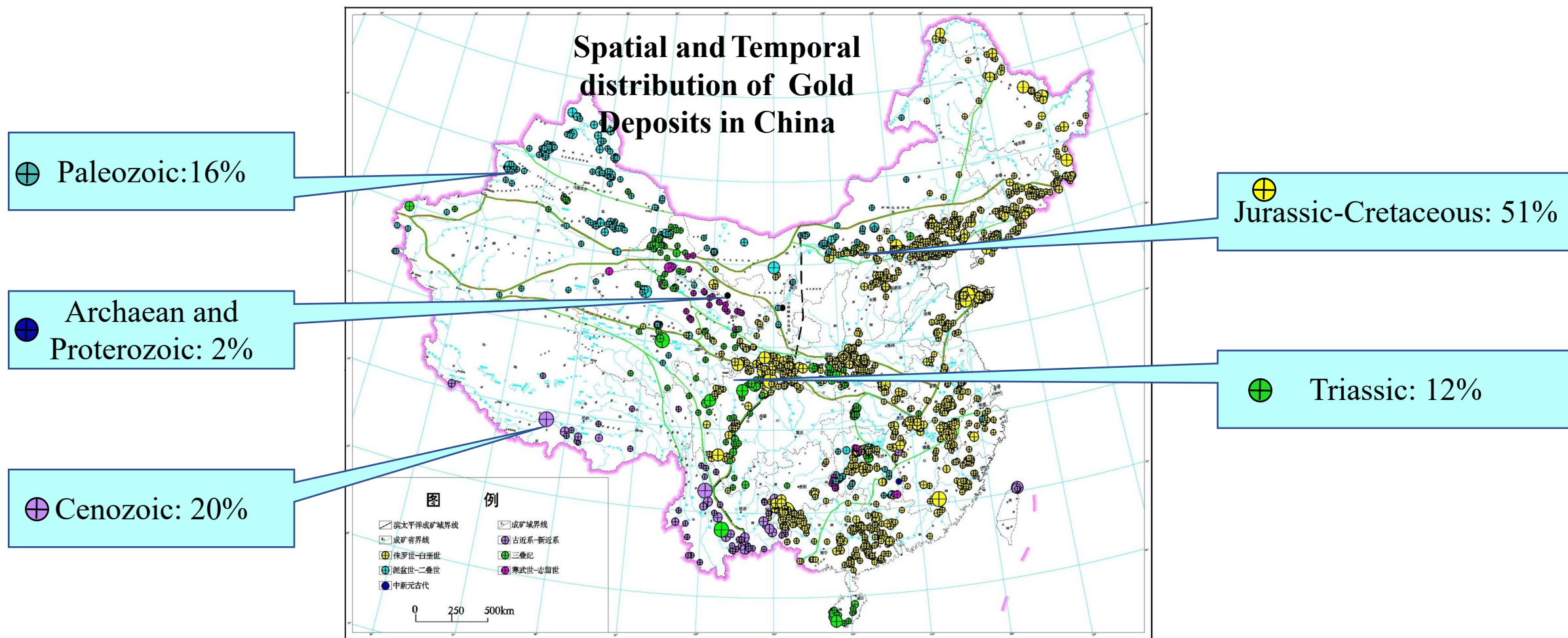
Eastern China: Strong and extensive Tectonic-Magmatic activity in the **Mesozoic** Era

Southwest China: Strong Tectonic-Magmatic activity in the **Cenozoic** Era



### 3. Spatial and Temporal Distribution of Gold Deposits

■ Main mineralization epoch of the Gold Deposit: the Mesozoic and Cenozoic periods

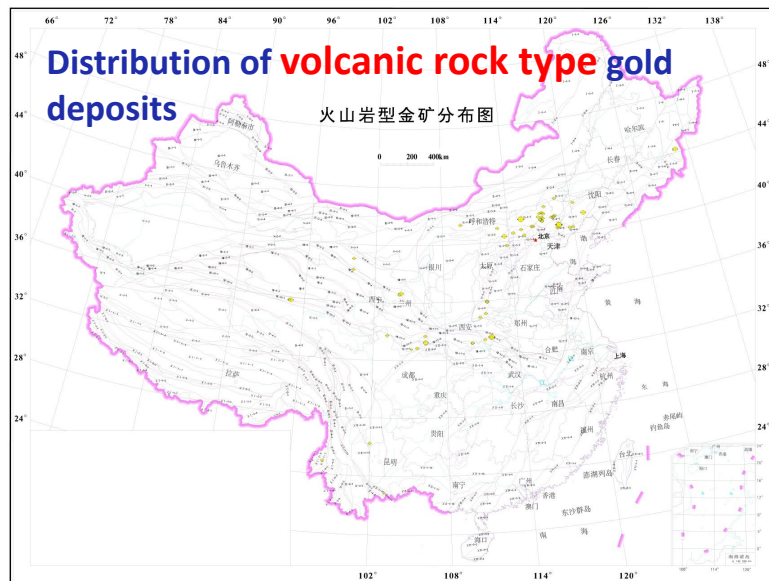
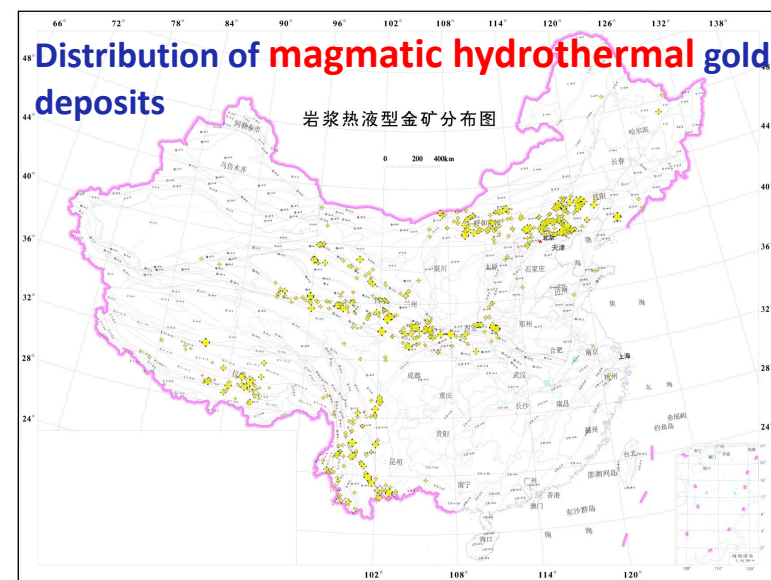
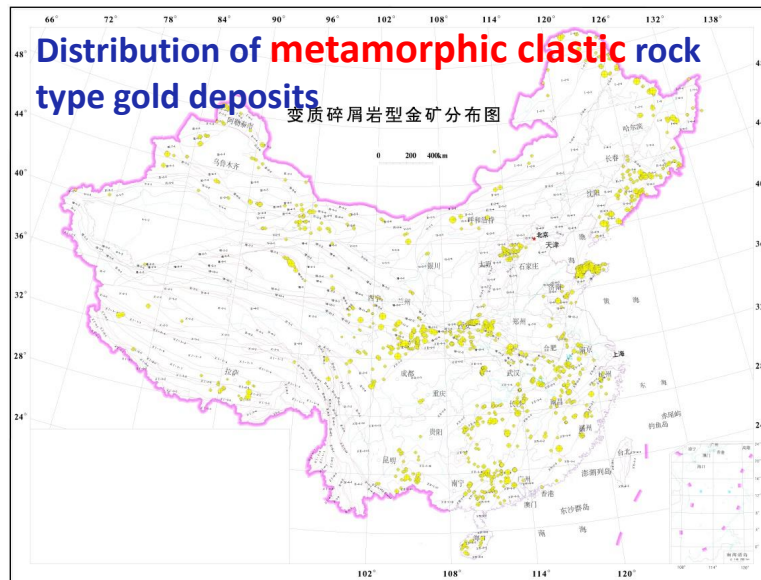






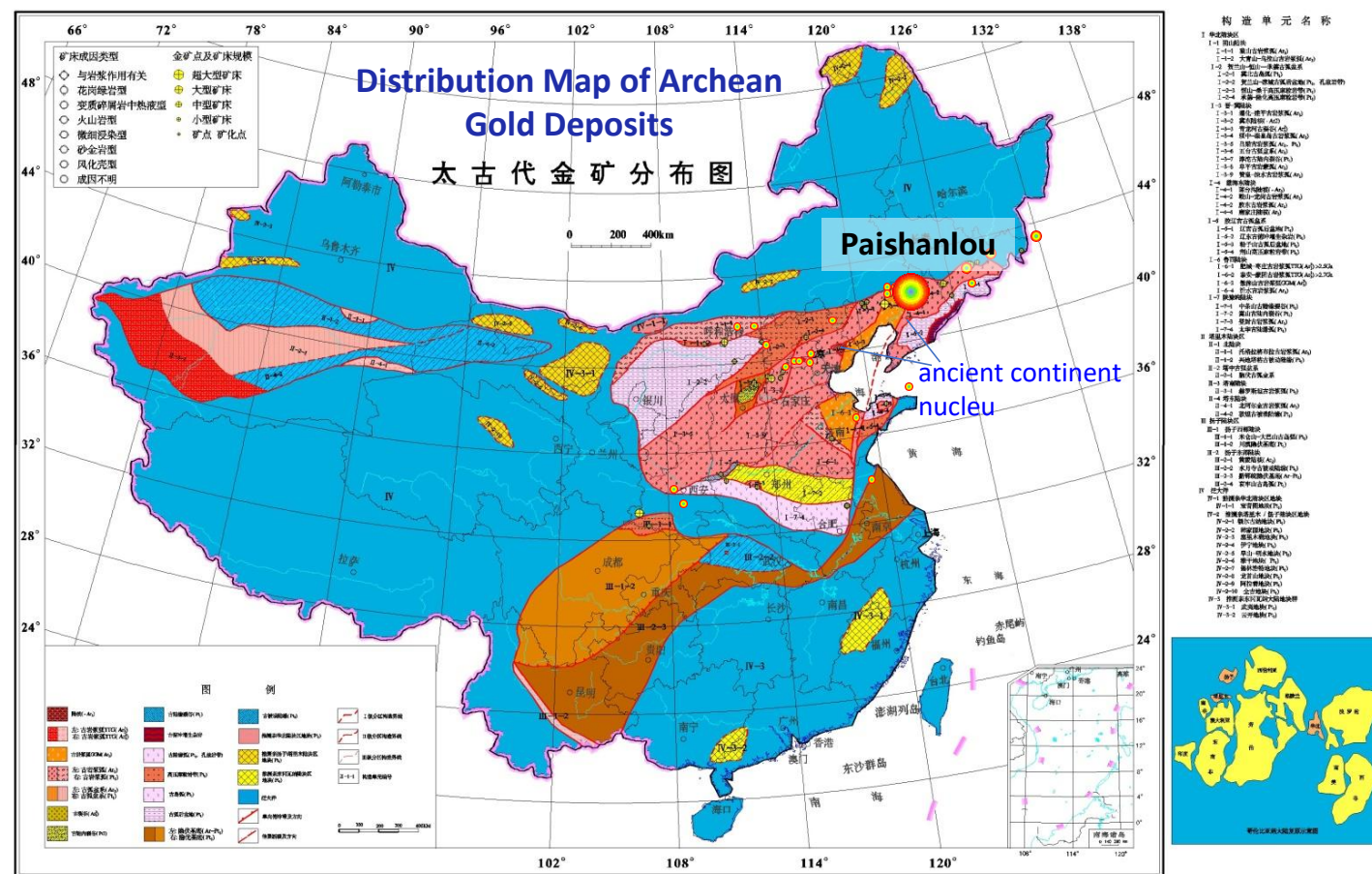
### 3. Spatial and Temporal Distribution of Gold Deposits

- Main genetic types of gold deposits:  
Magmatic hydrothermal type and metamorphic clastic rock type, accounting for 36.7%.





**Type:** Granitic-Greenstone type gold deposits  
**Superimposition:** Transformed by Yanshanian orogeny



(Pan, 2017)



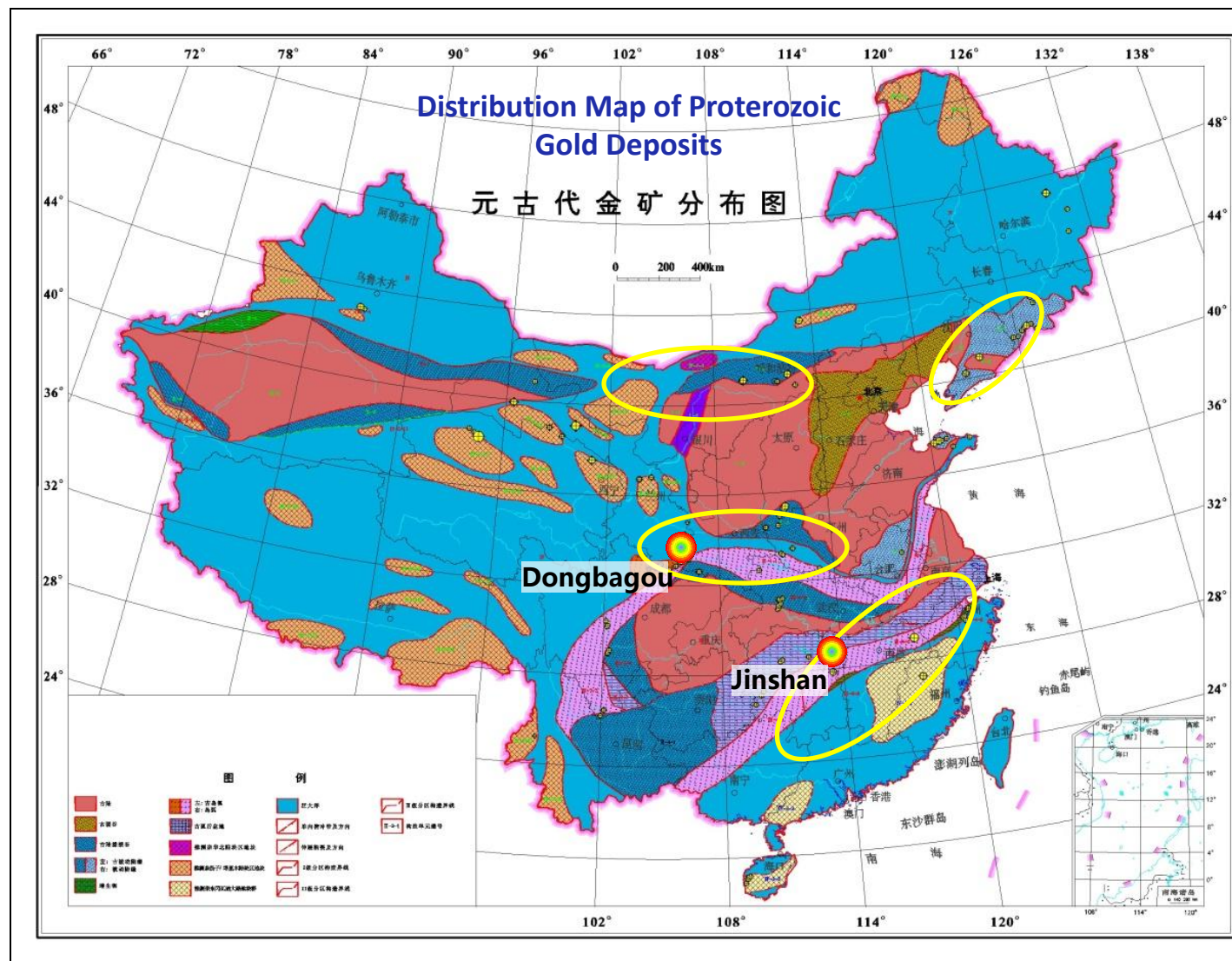


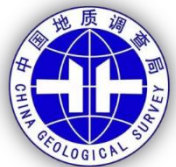
### 3. Spatial and Temporal Distribution of Gold Deposits

#### (2). Gold Deposits-Forming Periods: Proterozoic(2500-570Ma)

**Distribution:** Wutai-Liaodong Fault  
Depression Zone, North and South margins  
of the North China Block and Southeast  
margin of Yangtze Block

**Type:** Low-metamorphic detrital rock Type  
Gold Deposit





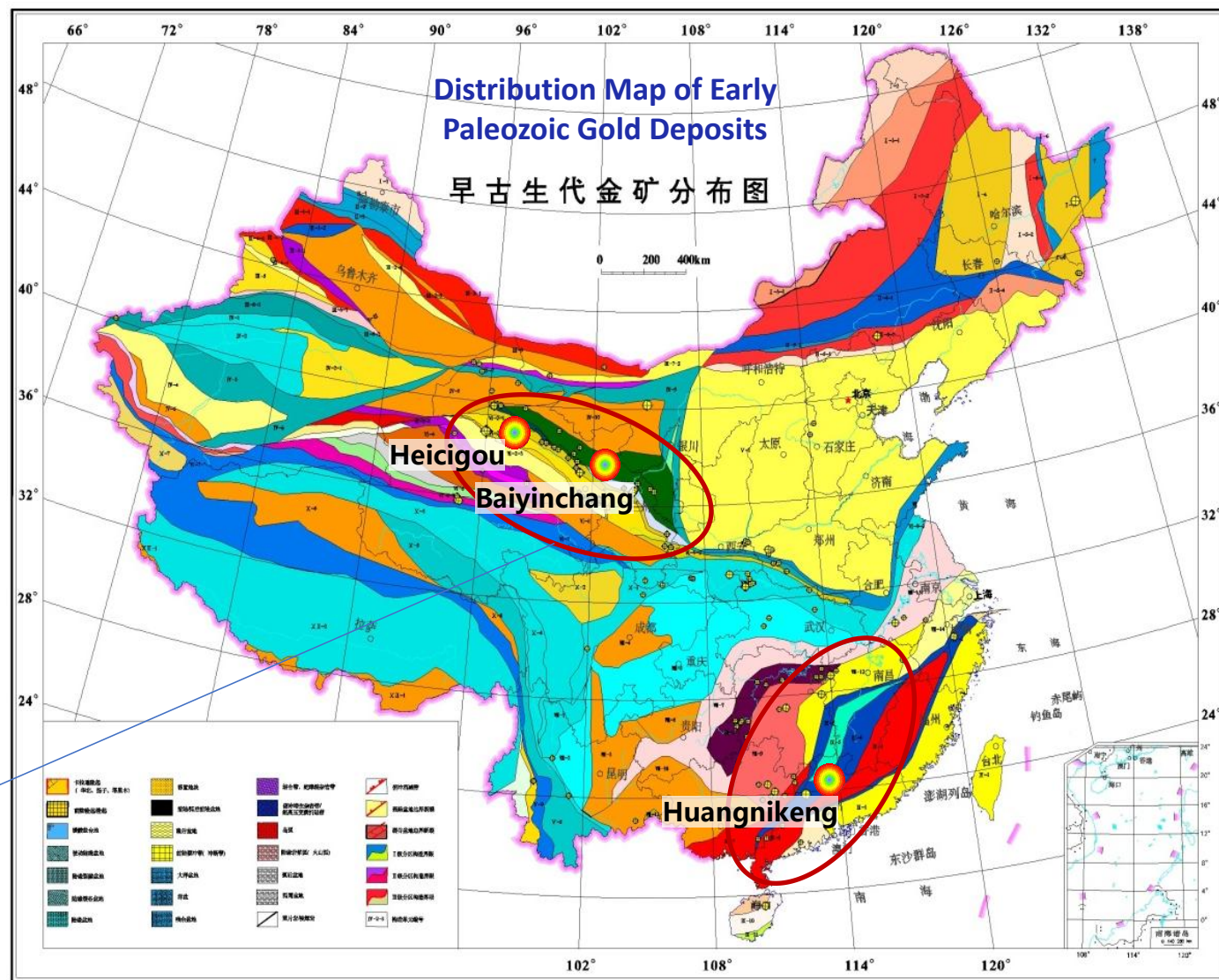
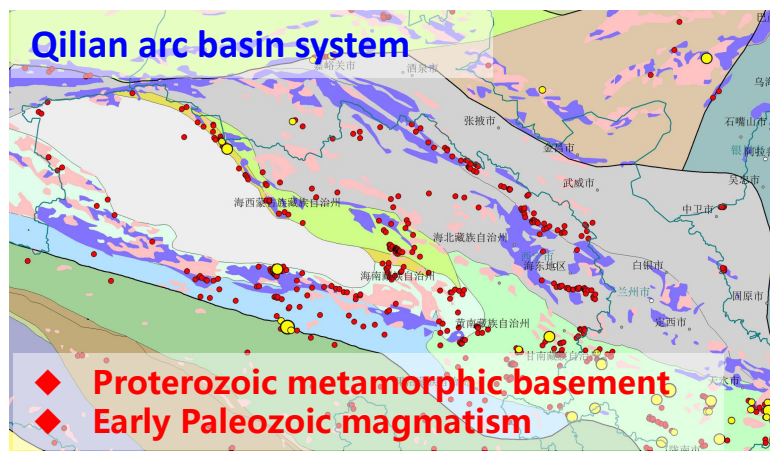
# 3. Spatial and Temporal Distribution of Gold Deposits

## (3). Gold Deposits-Forming Periods:

### Early Paleozoic (570-409Ma)

**Distribution:** Qilian Arc-Basin System, Wuyi-Yunkai Arc-Basin System

**Type:** Magmatic Hydrothermal Type, Metamorphic Detrital Rock Type and Volcanic Type Gold Deposits







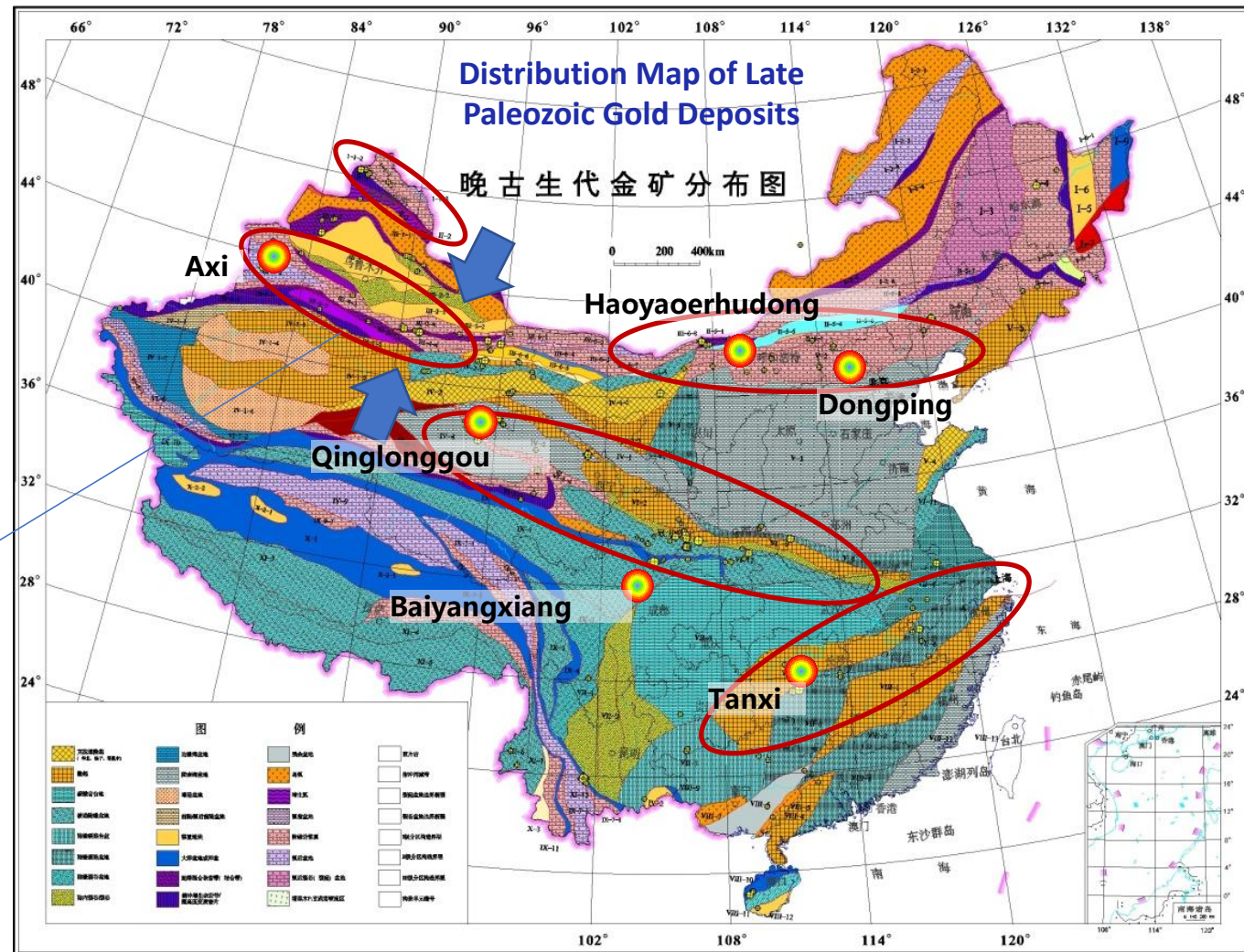
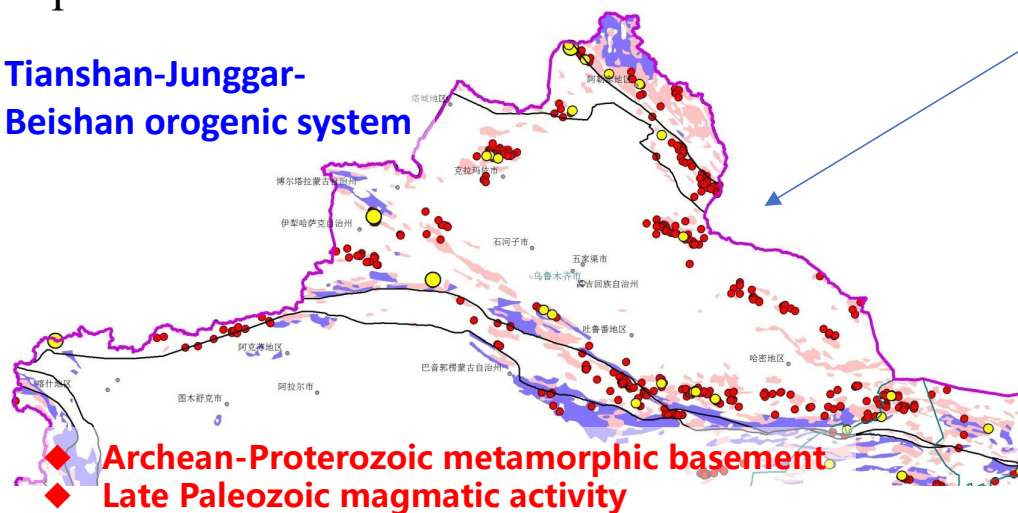
#### (4). Gold Deposits-Forming Periods

## Late Paleozoic (409-250Ma)

**Distribution:** North margin of the Tarim North China Block, Junggar, Tianshan, Qilian, Southern margin of Jiangnan Block

**Type:** Metamorphic Detrital Rock Type, Magmatic Hydrothermal Type and volcanic Type Gold Deposits

## Tianshan-Junggar-Beishan orogenic system





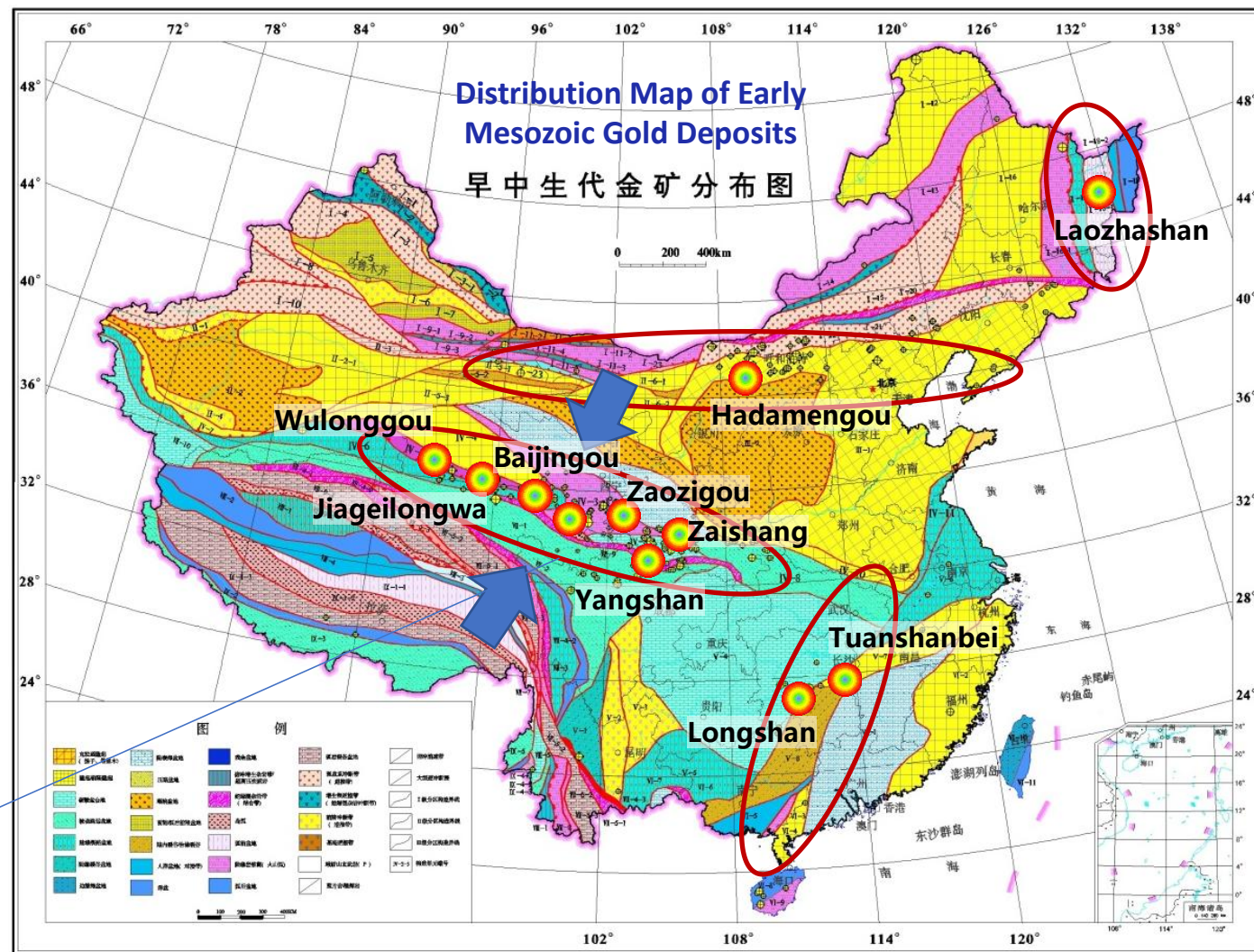
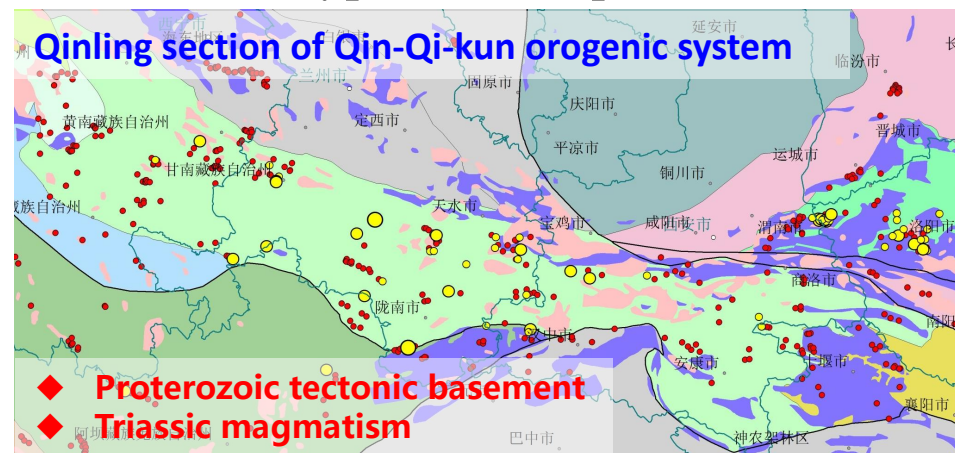


### 3. Spatial and Temporal Distribution of Gold Deposits

#### (5). Gold Deposits-Forming Periods : Triassic(250-208 Ma)

**Distribution:** The junction of Tethys, Tarim, North China Block, and South China Block. Such as Eastern Kunlun and Western Qinling

**Type:** Magmatic Hydrothermal Type, Microdisseminated Type, Metamorphic detrital Rock type Gold Deposits





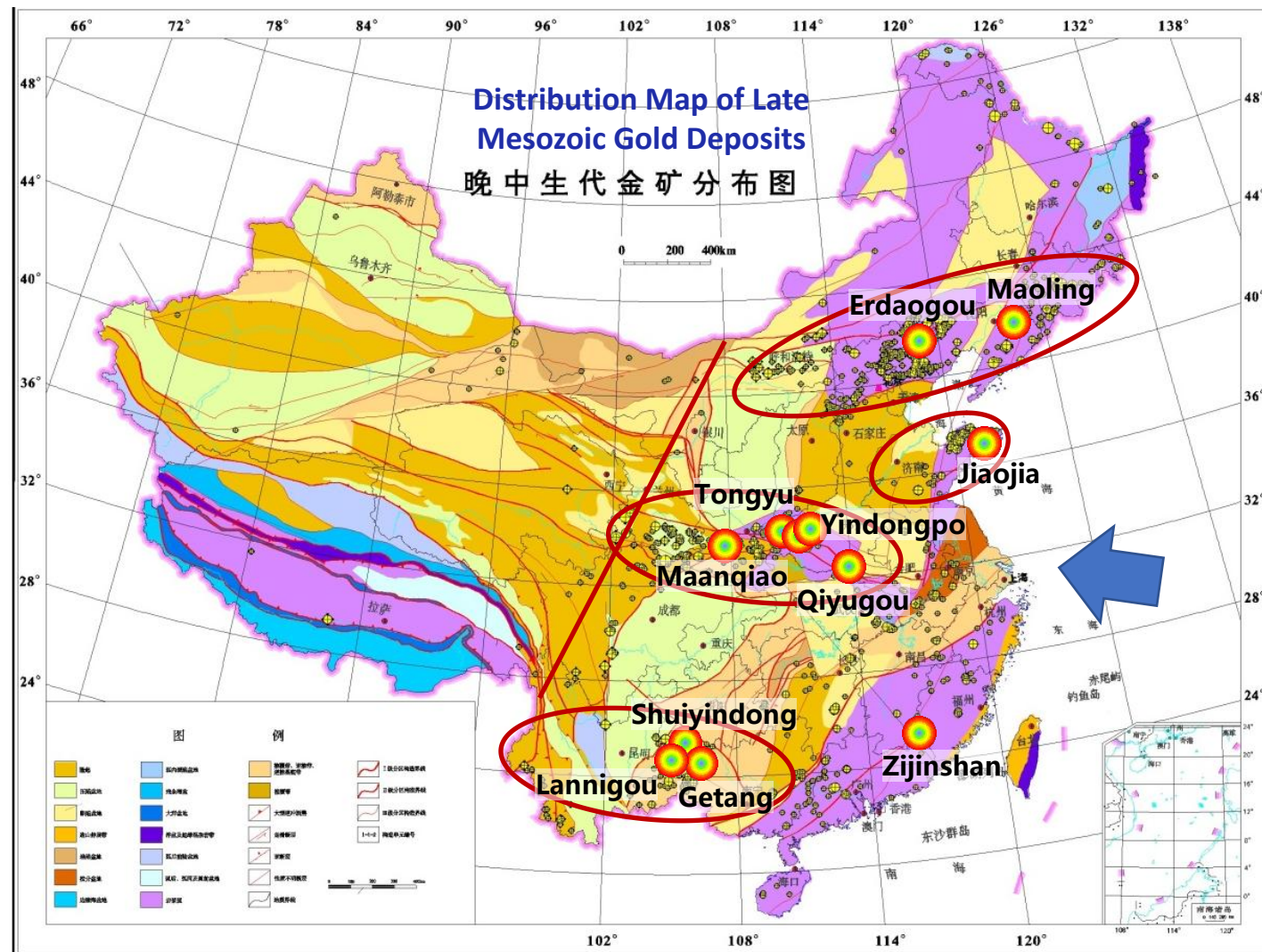
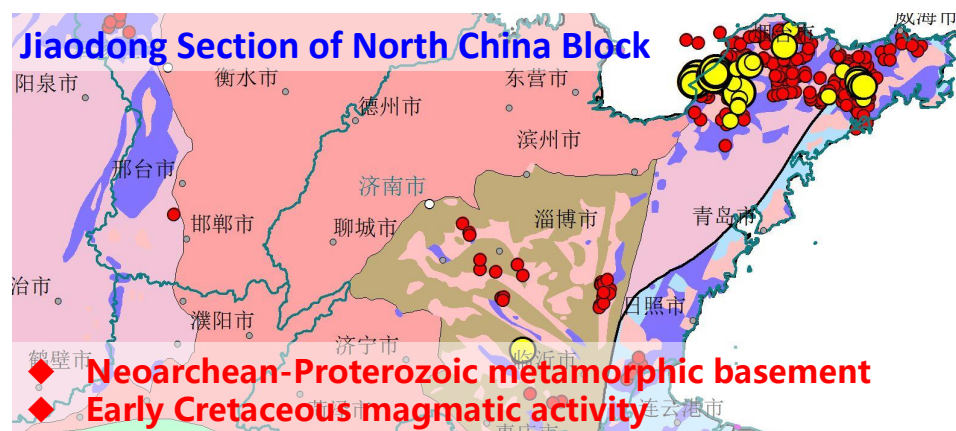


### 3. Spatial and Temporal Distribution of Gold Deposits

#### (6). Gold Deposits-Forming Periods : Jurassic-Cretaceous(208-65Ma)

**Distribution:** East of Helan, Longmen, and  
Hengduan Mountain

**Type:** Clastic Altered Rock Type, Volcanic  
Type, Magmatic Hydrothermal Type Gold  
Deposits







### 3. Spatial and Temporal Distribution of Gold Deposits

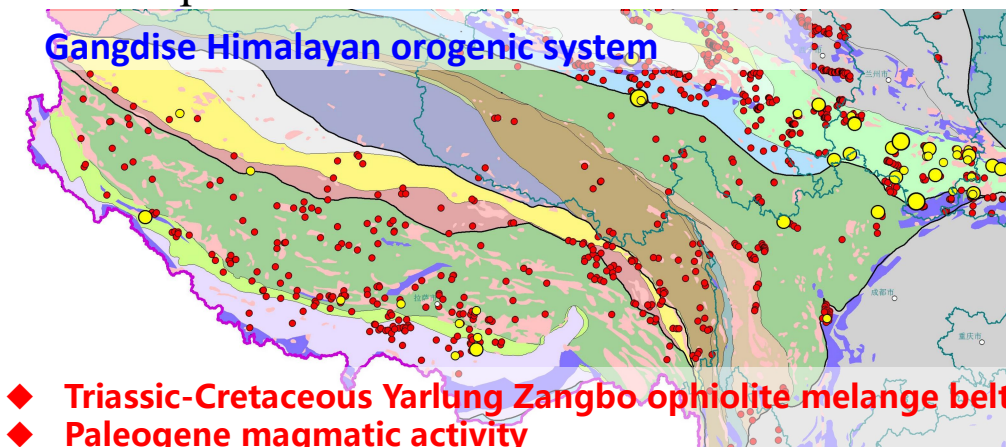
#### (7) Gold Deposits-Forming Periods :

##### Cenozoic (Since 65 Ma)

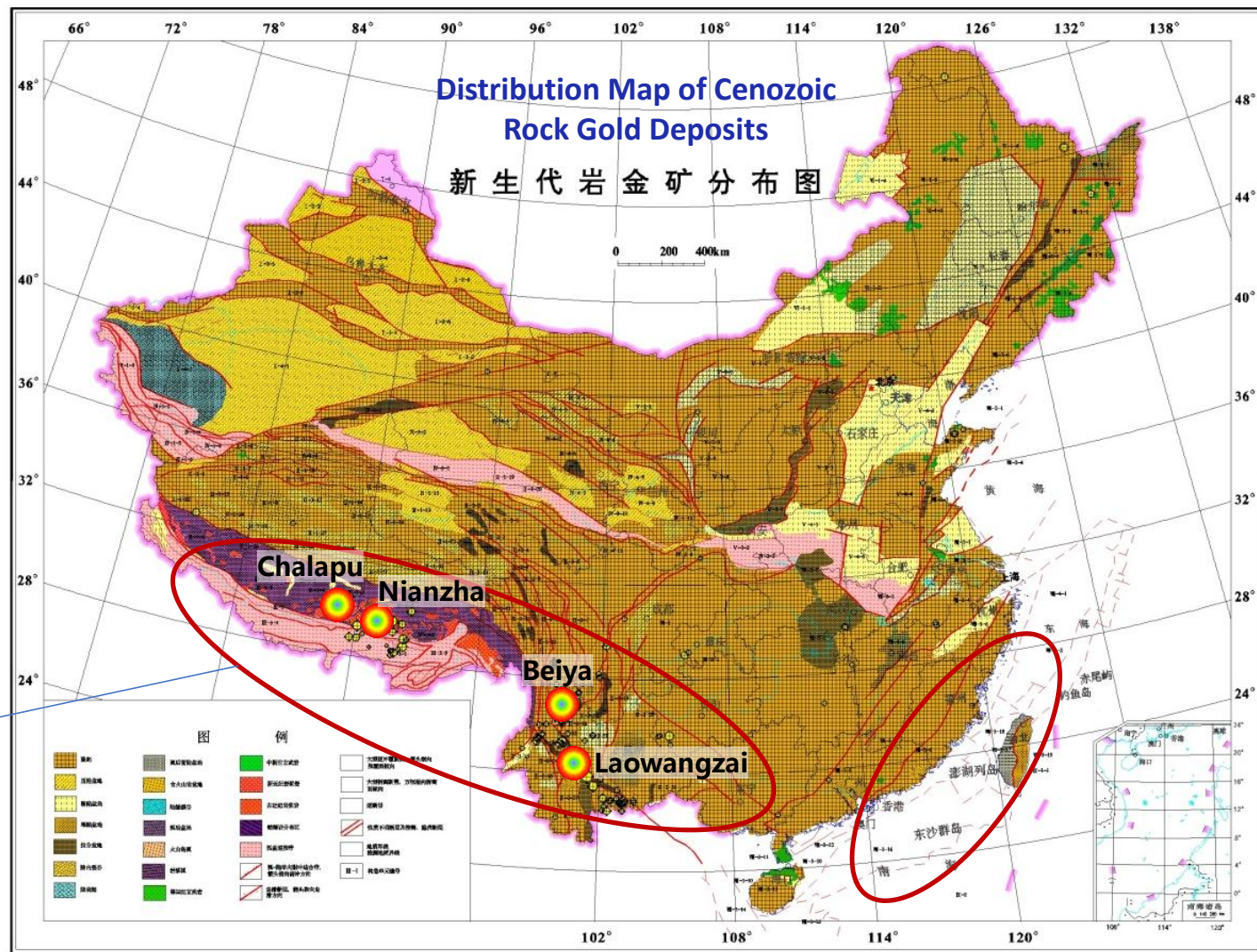
**Distribution:** Southern Tibet, Southwest Sanjiang, and island arc volcanic activity zones along the Southeast Coast

**Type:** Magmatic Hydrothermal Type, Metamorphic Detrital Rock Type and Volcanic Type Gold Deposits

##### Gangdise Himalayan orogenic system



- ◆ Triassic-Cretaceous Yarlung Zangbo ophiolite melange belt
- ◆ Paleogene magmatic activity

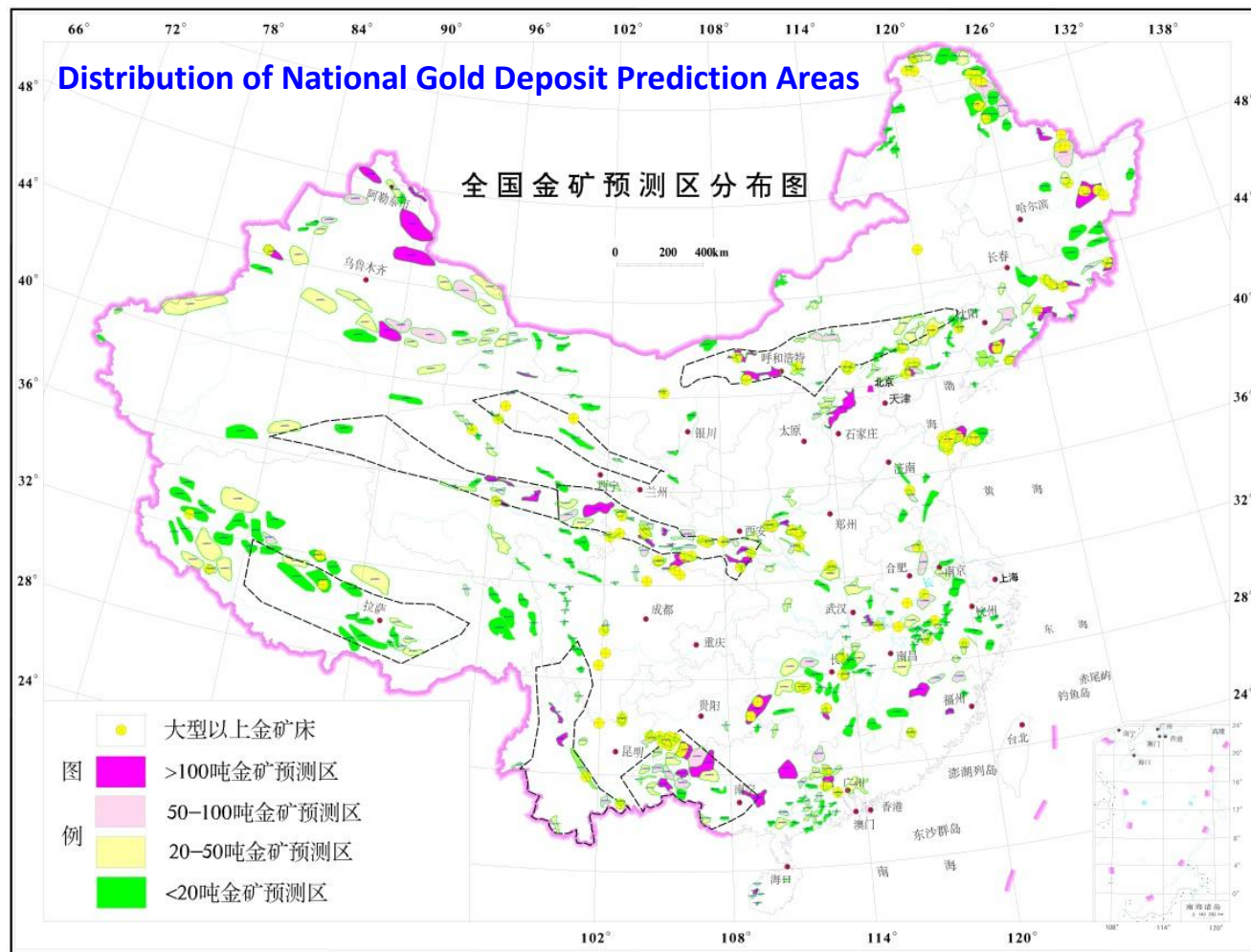




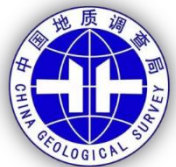


## 4. Potential of Gold Resources in Main Metallogenic Belts

**Based on 384 level 3 prediction areas nationwide,  
the predicted resources of gold shallower than 2000m is 34210 tons.**

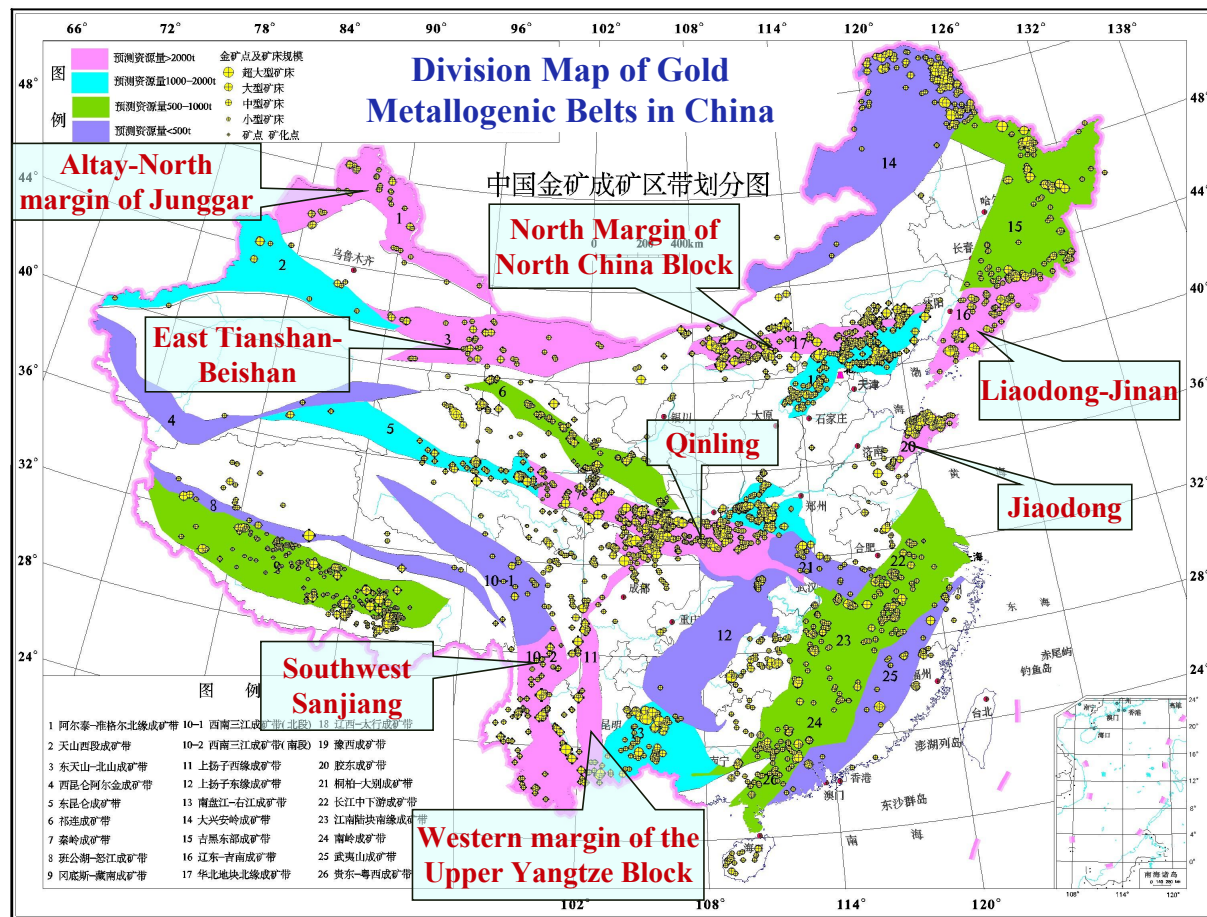


序号	预测区名称	预测区编号	预测区面积 (km <sup>2</sup> )	预测区资源量 (吨)	预测区级别	预测区类型	预测区备注
1	阿勒泰	1	1000	1000	1	1	
2	乌鲁木齐	2	1000	1000	1	1	
3	阿勒泰	3	1000	1000	1	1	
4	阿勒泰	4	1000	1000	1	1	
5	阿勒泰	5	1000	1000	1	1	
6	阿勒泰	6	1000	1000	1	1	
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193	阿勒泰	193	1000	1000	1	1	
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198	阿勒泰	198	1000	1000	1	1	
199	阿勒泰	199	1000	1000	1	1	
200	阿勒泰	200	1000	1000	1	1	



## 4. Potential of Gold Resources in Main Metallogenic Belts

According to the endowment of gold resources and metallogenic geological conditions, 26 metallogenic belts nationwide are divided into three categories



■ Key Metallogenic Belts: 8

■ Potential Metallogenic Belts: 5

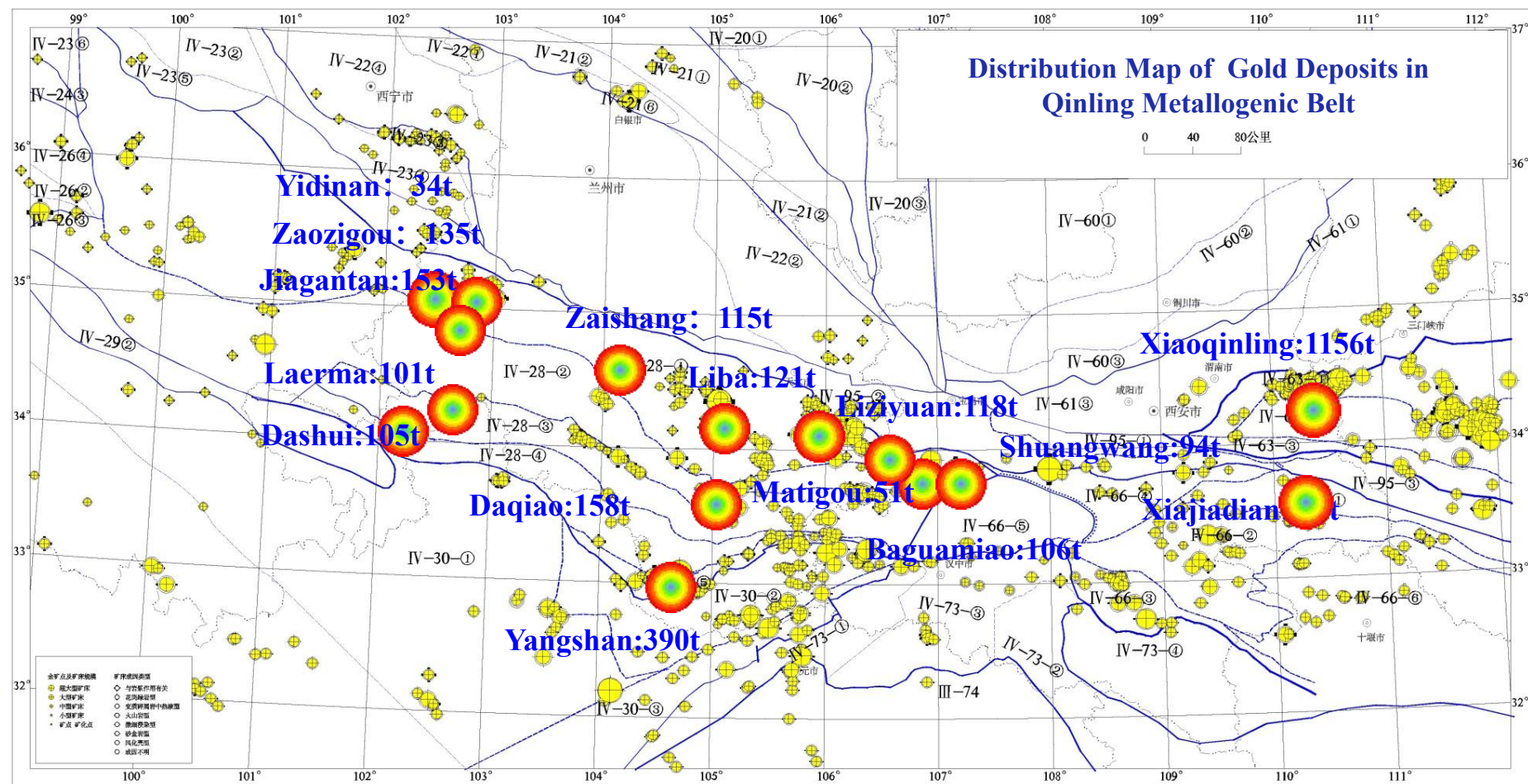
■ Reserve Metallogenic Belts: 13





## Qinling metallogenic belt

- 3000 tons of gold resources
- Breakthroughs in the West  
Qinling Mountains
- 13 super large gold deposits
- 2000 tons of measured  
resources

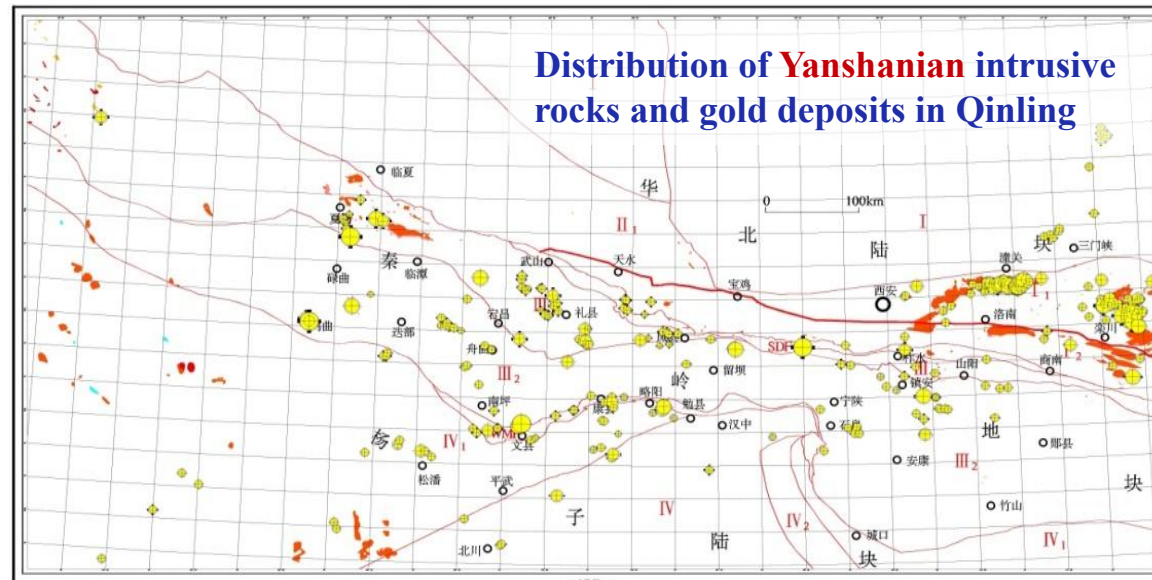
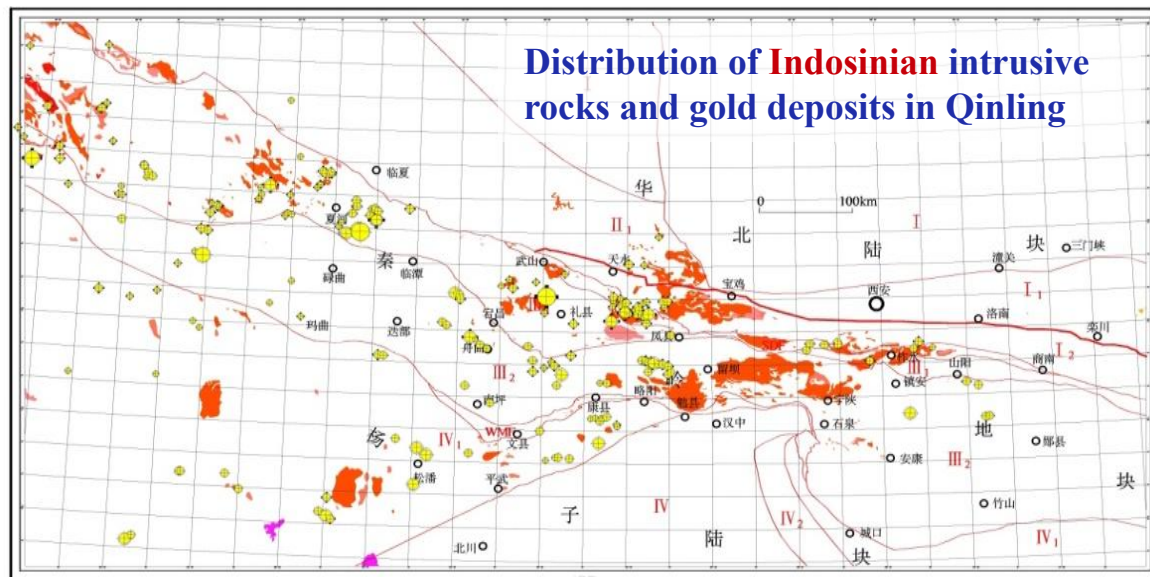




## 4. Potential of Gold Resources in Main Metallogenic Belts

### Mineralization Peak Period of Qinling Metallogenic Belt: Indosinian-Yanshanian

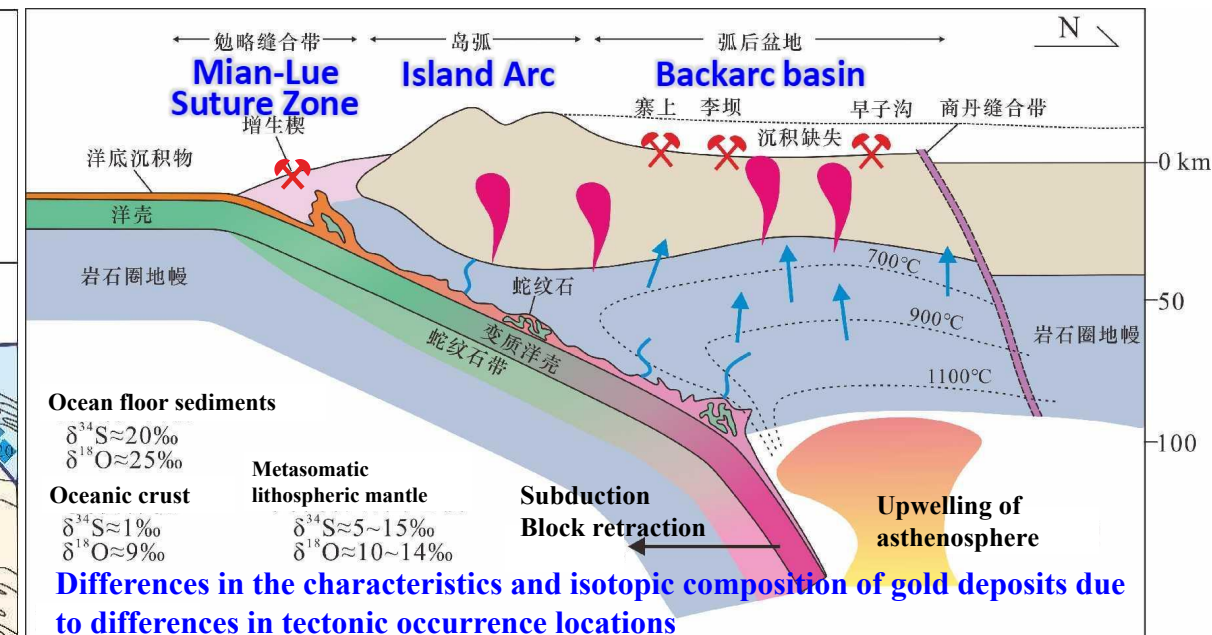
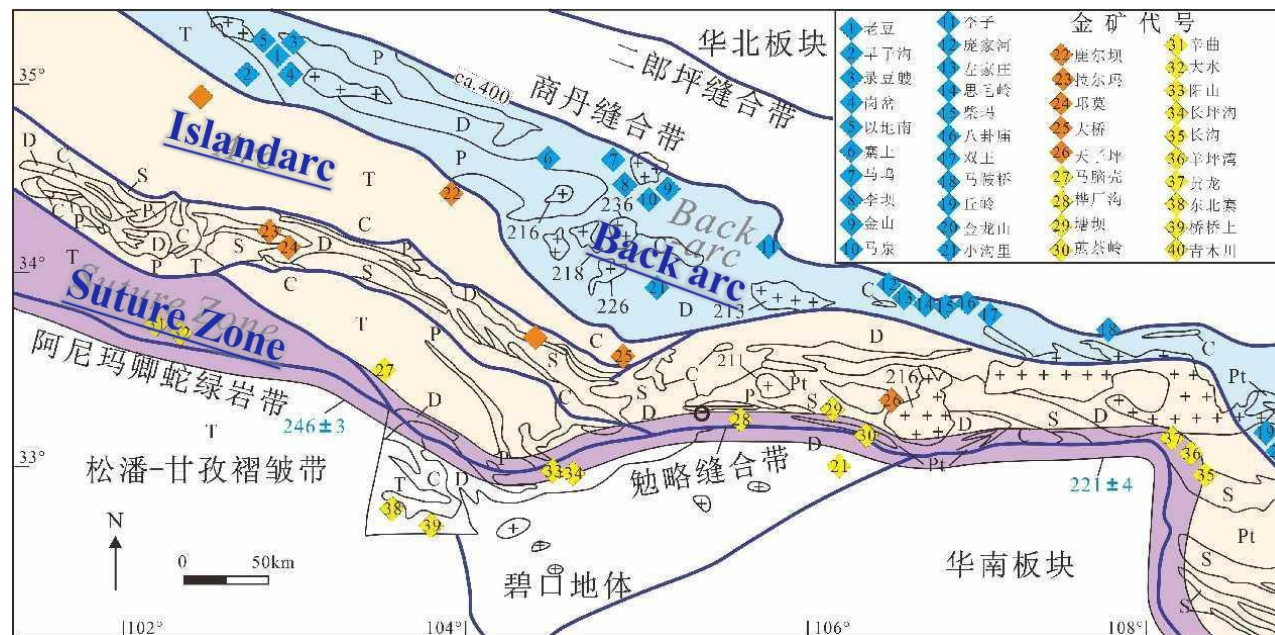
- **Indosinian Gold Deposits: Western Qinling Mountain**, related to tectono-magmatism during the transition from Closing collision to extension of the Mianlue Ocean
- **Yanshanian Gold Deposits: Eastern Qinling Mountain**, related to the tectono-magmatism during the transition from Collision orogeny to extension. Main Type: Magmatic Hydrothermal Type, Metamorphic Detrital Rock Type, and Micro-Disseminated Type Gold Deposits







## 4. Potential of Gold Resources in Main Metallogenic Belts



### Space Distribution:

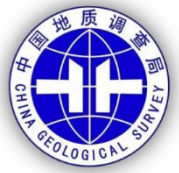
**Back-arc:** 21 Gold Deposits ◆ **Island-arc:** 5 Gold Deposits ◆ **Suture Zone:** 14 Gold Deposits ◆

### Time Distribution:

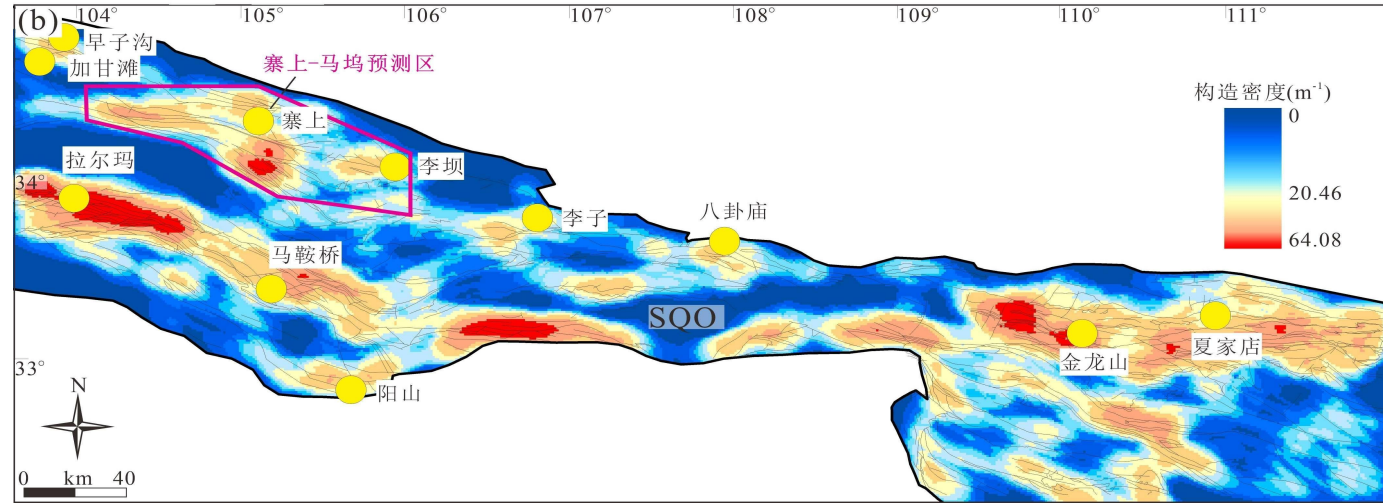
**Back arc - island arc:** The formation time of gold deposits ranges from 250 to 210 Ma, mainly during a collision period, accompanied by extensive magmatic activities.

**Suture Zone:** The formation age of gold deposits ranges from 215 to 189 Ma, which is a post-collision period. The formation time of most gold deposits is later than magmatic activities.

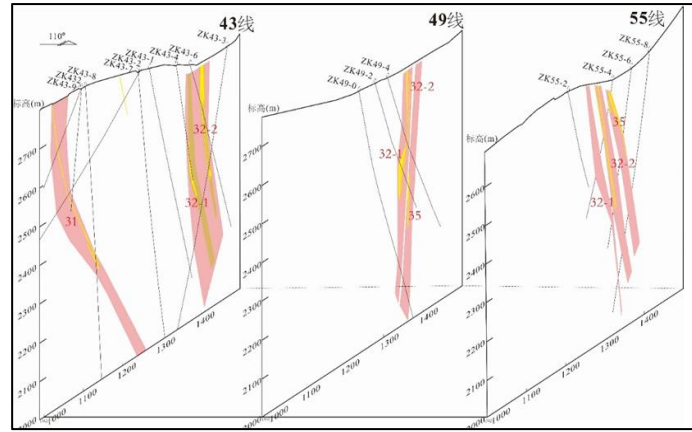




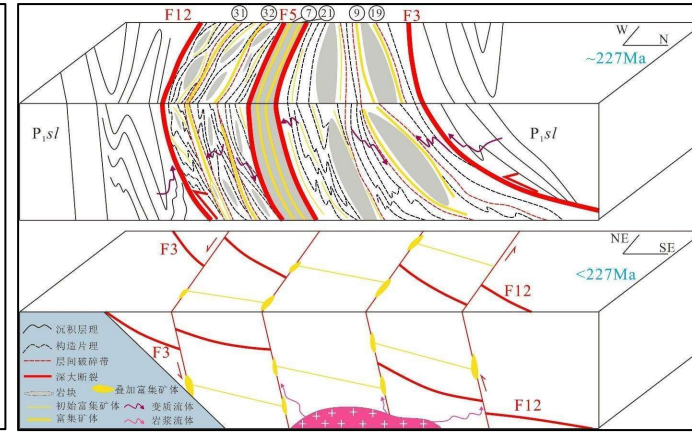
# 4. Potential of Gold Resources in Main Metallogenic Belts



Structural Density Map of Zhaishang Area



Section of 31 # ore body in the south ore belt of Zhaishang Gold Deposit



Metallogenic Model Map of Zhaishang Gold Deposit

## Prospective Area (Zhaishang)

### Resources:

Inferred Resources is 115 tons

### Prospect:

The ore bodies are controlled by thrust faults.

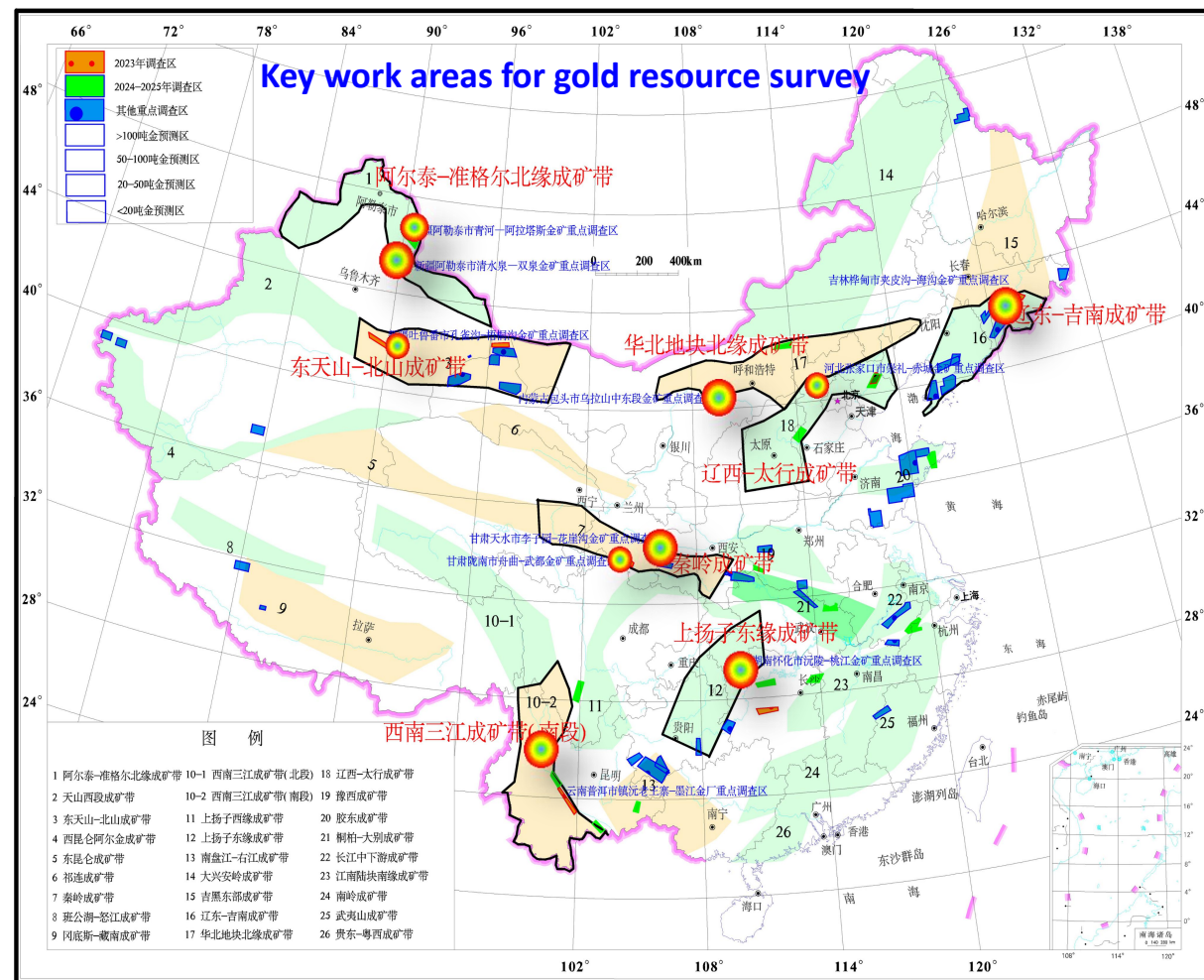
The surface of the south ore section dips southward, and the deep part dips northward.

The deep still has a good potential of prospecting.



## 5. Key Work for The Next Step

- Conduct investigation and evaluation for key investigation areas and submit high-quality exploration block suggestions
- Assist in the construction of large gold resource bases in Qinling, Xiangxi, and Liaodong
- Exploring rapid prospecting and prediction methods for gold deposits (hyperspectral minerals and alteration mapping techniques)







**Thanks  
For  
Listening**